

*A single-unit reversible air/  
water heat pump for heating,  
cooling and the production of  
domestic hot water*

**Edge F**  
**WiSAN-PME 1 S 2.1-8.1 RANGE**



TECHNICAL BULLETIN

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# General characteristics

## Technical features of a standard unit

Edge F is a monobloc reversible air/water heat pump for heating, cooling and domestic hot water production. The unit was designed and made to be installed outdoors, with the need to only connect the power supply and water pipes. Seasonal efficiency class in heating mode (according to EU 811/2013):

- A++ (water supply at 55 °C)
- A+++ (water supply at 35 °C)



### Refrigeration circuit

The unit is equipped with a steam compression refrigeration circuit, which comprises:

- brushless DC inverter hermetic rotary compressor with intake and supply gas temperature probes and heater for preheating the oil
- source side finned coil heat exchanger with “Blue fin” treatment
- user side plate heat exchanger with antifreeze heater
- electronic expansion valve with self-regulating PWM logic
- 4-way valve for reversing the refrigeration cycle
- liquid separator and receiver
- filter
- high and low pressure sensors
- high pressure switch

### Compressor

Twin Rotary DC hermetic type compressor with soft start and controlled by an inverter that allows the power delivered to be constantly modulated according to actual demand, ensuring the best in terms of reliability, low consumption and high seasonal efficiency. It is equipped with a motor protection device for overheating, overcurrent and excessive temperature of the supply gas, and comes with oil charge. A guard heater with automatic insertion prevents the refrigerant from diluting the oil when the compressor stops. It is mounted on vibration-absorbing rubber mounts to ensure vibration-free operation under all operating conditions and has a soundproofed casing which minimises noise emissions.

### Refrigerant

Eco-friendly refrigerant gas R-290

### Fan

Single fan with sickle-shaped blades made of ABS resin, housed in an aerodynamically shaped nozzle to increase efficiency and lower the noise level. Condensation is controlled by means of a directly coupled high-efficiency variable speed brushless DC motor, which regulates its speed continuously.

### User side exchanger

AISI 316 stainless steel brazed plate heat exchanger with low refrigerant content and high exchange surface, complete with external anti-condensation thermal insulation 10 mm thick in sintered expanded polypropylene. There are water temperature probes at the inlet and outlet of the heat exchanger for constant monitoring and protection: they activate the antifreeze function when the room temperature and/or the water supply temperature fall below the limit values. The antifreeze function is also active when the unit is in stand-by mode.

### Source side exchanger

Direct expansion finned coil exchanger made with aluminium fins and copper pipes mechanically expanded to better adhere to the fin collar. The spacing between the fins is carefully designed to maximise heat exchange efficiency and reduce defrosting in the interest of seasonal efficiency. The fins are made of aluminium with “Blue fin” hydrophilic treatment which facilitates the elimination of condensate, further improving defrosting. The unit has been designed in such a way that, when it is in Heating mode, the refrigerant fluid circulates effectively inside the exchanger during evaporation to prevent the formation of ice at the bottom. There are also two probes that detect the outdoor air temperature and the temperature of the heat exchanger, in order to monitor and optimize defrosting.

## Structure

Structure designed for outdoor installation, base and supporting structure in sheet steel with 12/10 thick hot-dip galvanized surface treatment, and insulation in thermoformed material. Full polyester powder coating in SB1436 for exposed parts, which guarantees complete resistance to corrosion and weathering over time.

## Panelling

SB1436 painted zinc-magnesium sheet metal panels for outdoor installation that ensures superior resistance to corrosion and eliminates the need for periodic painting. Each panel can be easily removed to allow full access to internal components for the purpose of inspection and maintenance

## Water circuit

The unit can be connected to a water circuit and is equipped with:

- high-efficiency primary circulator
- automatic vent valve
- 3 bar pressure relief valve
- flow switch for water circulation control
- 8-litre system-side expansion vessel (with an available volume of 4.8 litres and a pre-charge pressure of 1 bar)

## Pump

Modulating primary circulator equipped with brushless DC motor, with IP44 protection rating.

The regulation for sizes 2.1÷8.1 is with a self-regulating inverter: it adjusts its speed depending on how much the water supply temperature (T1) follows the required set-point.

## Electrical panel (power supply and control)

Electrical panel inside the unit with door for ease of access and a power section and control section. The power section consists of:

- inverter board for management of the compressor
- main power terminals

The control section consists of:

- 2 in1 main PCB board for management of both the refrigeration circuit and hydraulic system
- Refrigerant circuit management: connected to all the sensors that detect the temperature of the outdoor air, evaporation, condensation and compressor. Optimised algorithm for efficient management of defrosting
- Hydraulic system management: connected to the flow switch that protects against water shortage and to the temperature probes of the return and supply water
- inverter board for management of the compressor
- connection terminals for controlling the functions of the unit
- terminals for connecting the user interface
- inputs for connecting 1 or 2 zone thermostats
- remote ON/OFF input
- inputs for connection of optional probes (auxiliary heat source, DHW storage, secondary circuit)
- defrosting alarm and status outputs
- outputs for management of secondary pumps, recirculation of domestic hot water, and solar thermal power
- output for management of an auxiliary heat source
- output for electrical management of the heater of the domestic hot water storage tank (max. 4kW)
- RS485 communication port with Modbus output (in the user interface)

## User interface

The user interface is used to control the operating parameters of the unit and to manage certain components of the system. It has an integrated temperature sensor and can also be used as a zone thermostat. It also has a Wi-Fi module for management via an App. The main functions on the user interface are:

- basic settings (ON/OFF, change of operating mode, room/water/DHW temperature settings)
- daily and weekly programming (ON/OFF, set-point and mode settings)
- automatic management of the set-point according to outdoor temperature (in Heating and Cooling mode)
- management of a second zone of the system
- priority management of auxiliary heat sources
- management and programming of ECO, SILENT and anti-legionella modes
- control of all functions of the unit
- displaying of alarms

## Accessories supplied with the unit

Some accessories are supplied with the unit that require installation on site:

- 10-metre long water temperature probe, with various uses: for regulating domestic hot water storage tanks, an auxiliary heat source, a mixed zone and the solar circuit, or to detect the temperature of a hydraulic separator.
- steel mesh Y filter
- condensate drain connection

## Hybrid version

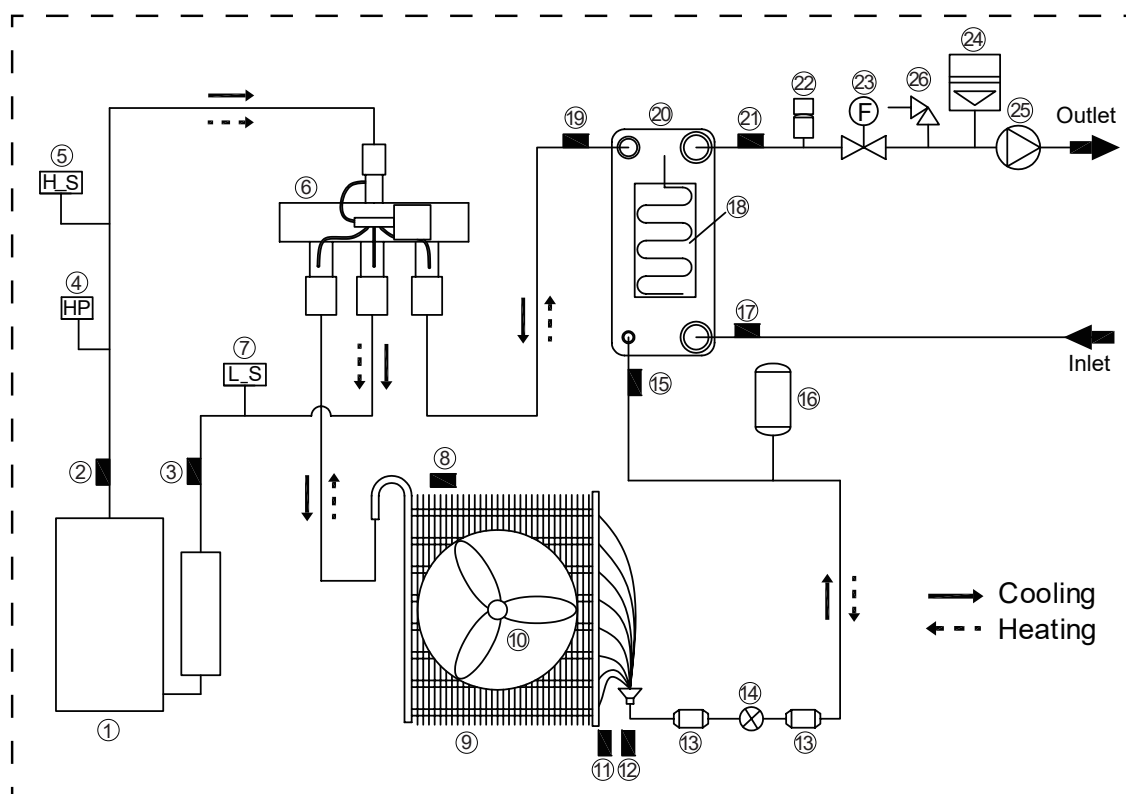
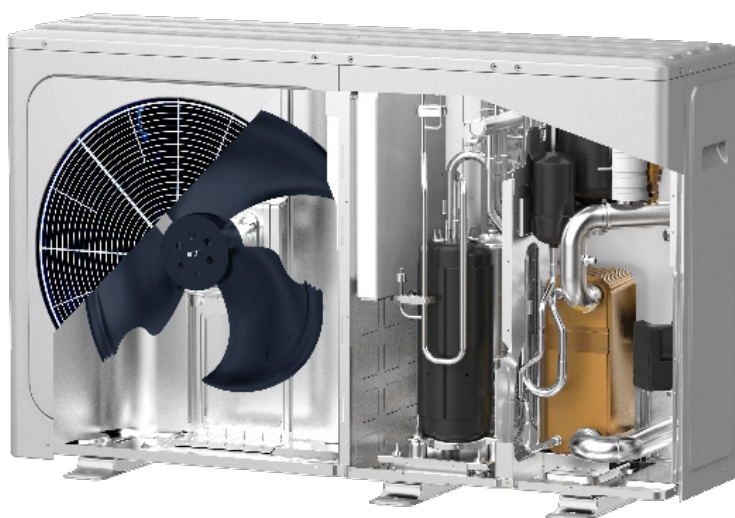
The hybrid version envisages the installation of a boiler to support/supplement the heat pump. The boiler can produce DHW instantly and is managed by the logic of the heat pump with ON/OFF request and optionally with 0-10V signal for modulation of the set-point.

The integrated €/switch function optimises the integration between the two generators, activating the most cost-effective one based on operating conditions and system efficiency.



# General characteristics

## View and functional diagram



----- Perimeter of the unit

- |   |  |
|---|--|
| 1. Compressor   | 16. Liquid reservoir   |
| 2. Compressor discharge temperature probe                               | 17. Temperature probe (water inlet)                                      |
| 3. Compressor suction temperature probe                                 | 18. Heat tape (plate heat exchanger)                                     |
| 4. High pressure switch   | 19. Temperature probe (plate heat exchanger outlet refrigerant: cooling) |
| 5. High pressure sensor   | 20. Plate heat exchanger   |
| 6. 4-way valve  | 21. Temperature probe (water outlet)                                     |
| 7. Low pressure sensor  | 22. Automatic air vent valve   |
| 8. Outdoor air temperature probe  | 23. Water flow switch  |
| 9. Heat exchanger   | 24. Expansion vessel   |
| 10. Fan   | 25. Water pump   |
| 11. Temperature probe (heat exchanger)                                  | 26. Pressure relief valve  |
| 12. Temperature probe (heat exchanger outlet refrigerant: cooling)      |  |
| 13. Filter  |  |
| 14. Electronic expansion valve  |  |
| 15. Temperature probe (plate heat exchanger inlet refrigerant: cooling) |  |

## Unit terminology

Parameter	Description
AHS	Backup boiler
IBH	Backup electric heater
P_i	Unit pump or Zone 1 pump (for double zone systems)
P_o	Secondary circuit pump (or Zone 1 pump for double zone systems)
P_c	Zone 2 pump (for double zone systems)
P_d	DHW recirculation pump
P_s	Solar circuit pump
Pe	Evaporation pressure
Pc	Condensation pressure
SV1	3-way circuit/DHW diverter valve
SV2	2-way diverter valve for direct 2-zone systems
SV3	3-way mixing valve for mixed circuit
T1	Water supply temperature from additional heating source (with IBH heater or AHS boiler)
T2	Refrigerant temperature entering the user side exchanger (plate heat exchanger) in Cooling mode (or leaving in Heating mode)
T3	Refrigerant temperature leaving the source exchanger (coil) in Cooling mode (or entering in Heating mode)
T4	Outdoor air temperature
T5	DHW tank temperature
T1S	Water supply temperature setpoint
Ta	Room air temperature, detected by the probe in the HMI
Tbt1	Temperature of the upper part of the inertial storage tank
TBH	Backup electric heater for DHW (Domestic Hot Water) storage tank
Th	Compressor suction refrigerant temperature
Tp	Compressor discharge refrigerant temperature
Tsolar	Water temperature in the solar thermal circuit
Tw2	Water supply temperature for the mixed zone (for double zone systems)
TWin	Unit water return temperature
TWout	Unit water supply temperature

## Configurations with auxiliary heat sources

The unit has electronics designed for integration with other heat sources to ensure performance even in the most difficult conditions and to maximise efficiency of the system. The auxiliary heat sources are managed by the unit as dry contacts and can be:

- **Additional electric heater for DHW boiler (TBH)**, for DHW contribution only
- **Solar thermal circuit**, for DHW contribution only
- **Additional electric heater (IBH)**, the heater can be supplied integrated in the unit's body or as an external accessory, for system and/or DHW contribution
- **External generator (AHS)**, e.g. a **boiler** from another supplier, for system and/or DHW contribution

 Only IBH or AHS can be managed at the same time.

The additional electric heater or the external generator can operate as:

- **Integration:** when it is not convenient/possible to work with the heat pump capacity alone
- **Replacement:** outside the work settings of the heat pump
- **Back-up:** in case of failure in the unit's refrigerant circuit (the unit keeps the pump running at maximum speed)

# General characteristics

## Full list of accessories

For further details, refer to the relevant section in the “CONFIGURATIONS AND ACCESSORIES” chapter.

### "Mandatory accessories" section

- HMINX – KJRH-120L Black Control
- HMIK – KJRH-120L white Control

⚠ *Accessory that must be ordered in order to operate the unit.*

### "Hybrid configuration" section

- GAS BOILER\_UC / GAS BOILER\_FE 24.4-33.4 - 4-pipe condensing boiler for hybrid heat pumps
  - KCSAFX - ø 60/100 mm vertical coaxial fitting
  - CCOAX - 90° coaxial elbow for ø 60/100 mm horizontal outlet that can be adjusted at 360°
  - TCOAX - L1000mm ø 60/100 coaxial pipe with terminal
  - KAS80X - ø 80 mm vertical fittings
  - KSDFX - ø 80 mm flue gas splitter kit
  - VDACSX - Thermostatic switching valve for domestic water
- GAS BOILER\_UC 70.2-115.2-200F.2 - 2-pipe condensing boiler for hybrid heat pumps
  - INAILX - INAIL safety kit for installation of single boiler
  - FH100X - ø 100 mm vertical flue gas terminal
  - HIDUCX - Remote control for UC 70.2-115.2 boilers

⚠ *Please refer to the EDGE EVO 2.0 bulletin for further information on accessories for the hybrid configuration.*

### "Configuration with electric heater" section

- IBH - Integrated back-up heater
- IBHX - Back-up electric heater (single-phase)
- IBHTX - Back-up electric heater (three-phase)

### "Configuration with DHW boiler" section

- ACS200X - 200-litre DHW boiler
- ACS300X - 300-litre DHW boiler
- ACS500X - 500-litre DHW boiler
- ACS1000X - 1000-litre DHW boiler
- ACS10SX - 1.000-litre DHW boiler with solar coil
- SCS08X - Solar coil for ACS200X/ACS300X DHW boilers
- SCS12X - Solar coil for ACS ACS500X DHW boilers
- QERAX - Connection kit for single-phase heater on DHW storage tank (for ACS200/300/500X)
- QERATX - Connection kit for three-phase heater on DHW storage tank (for ACS1000X)
- 3DHWX - System/DHW 3-way switching valve (SV1)
- PRSX - DHW recirculation pump

### "Configuration with solar thermal panels" section

- ELFOSun<sup>3</sup>

### "Configuration with primary and secondary circuit" section

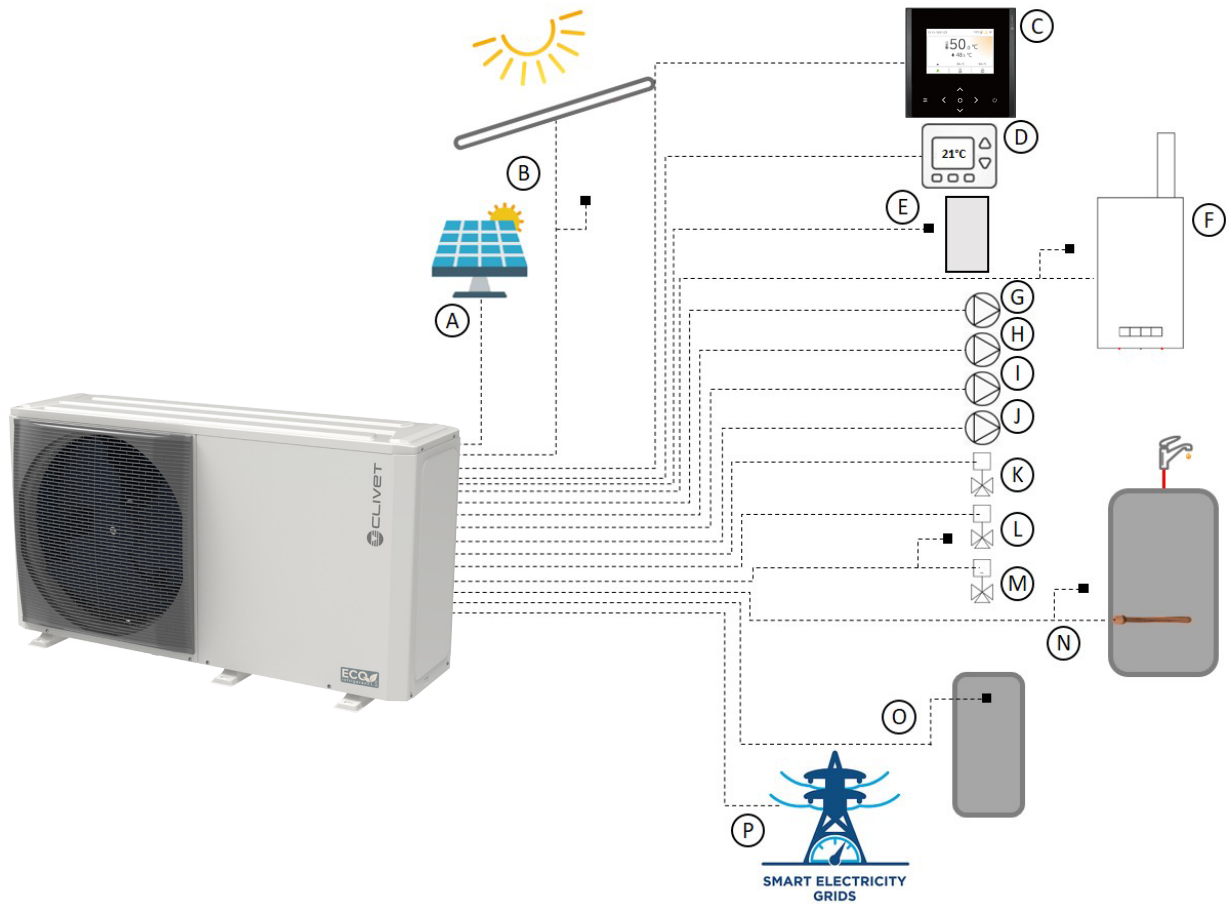
- TANKX - System inertial storage tank
- KTCAX - Hose kit for connecting the unit to the inertial storage tank
- DIX - 1-litre hydraulic circuit breaker
- DI50-2X - 50-litre hydraulic circuit breaker
- DI100X - 100-litre hydraulic circuit breaker
- KCSX - Secondary circuit kit (1-litre hydraulic circuit breaker + pump)
- KIRE2HX - Double zone distribution unit: direct + direct
- KIRE2HLX - Double zone distribution unit: direct + mixed (with mixing valve)
- PCSX - Circulation pump for secondary circuit
- PCS2X - Oversized circulation pump for secondary circuit

### "Other accessories supplied separately" section

- KTFLX - Hose kit for connection to the unit
- FDMX - Magnetic dirt separator filter for water distribution systems
- VAGX - Safety antifreeze valve for system
- DTX - Drain pan with electric heater
- T1BX - DHW temperature probe and additional heating source at 10 m
- T1B30X - DHW temperature probe and additional heating source at 30 m
- AMRX - Kit of antivibration mounts for floor installation
- AMMSX - Kit of anti-seismic antivibration mounts for floor installation
- ASTFX - Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray
- KSIPX - Wall fixing bracket kit
- HTC2WX - HID-TConnect 2 white chronothermostat for temperature control
- SWCX - IoT SwitchConnect receiver / switch
- ELFOControl<sup>3</sup> EVO

## Components that can be managed by the unit

The unit can communicate, receive information and manage a number of system and control components:



- A. Solar photovoltaic
- B. Tsolar solar thermal circuit and probe
- C. HMI user interface
- D. Zone thermostat (up to 2)
- E. T1 probe and control signal for additional IBH / IBHX electric heater
- F. AHS boiler: control signal and T1 probe
- G. P\_o secondary / zone 1 circuit pump
- H. P\_c zone pump 2
- I. P\_d DHW recirculation pump
- J. P\_s solar circuit pump
- K. SV1 circuit / DHW switching 3-way valve
- L. SV2 2-way switching valve for direct 2-zone systems
- M. Zone 2 mixed management: SV3 3-way switching valve for mixed circuit and Tw2 probe
- N. DHW boiler: TBH heater and T5 probe management signal
- O. Hydraulic separator: Tbt1 probe
- P. Smart Grid

# Technical data

## General technical data

### Heating

SIZES			2.1	3.1	4.1	5.1	6.1 / 6.1T	7.1 / 7.1T	8.1 / 8.1T
<b>Air 7 °C - Water 35 °C</b>									
Nominal heating capacity	1	kW	4,50	6,20	8,40	10,0	12,0	14,0	15,0
Total power input	1	kW	0,87	1,27	1,68	2,13	2,50	3,11	3,41
COP	1	-	5,15	4,90	5,00	4,70	4,80	4,50	4,40
Water flow-rate	1	l/s	0,21	0,30	0,40	0,48	0,57	0,67	0,71
Nominal available pressure	1	kPa	89	87	80	71	63	54	49
<b>Air 2 °C - Water 35 °C</b>									
Nominal heating capacity	2	kW	4,40	5,60	7,10	8,20	9,10	10,1	12,8
Total power input	2	kW	1,07	1,44	1,84	2,25	2,39	2,81	4,00
COP	2	-	4,10	3,90	3,85	3,65	3,80	3,60	3,20
Water flow-rate	2	l/s	0,21	0,27	0,34	0,39	0,43	0,48	0,61
Nominal available pressure	2	kPa	89	88	85	80	81	75	60
<b>Air -7 °C - Water 35 °C</b>									
Nominal heating capacity	3	kW	4,50	5,90	7,00	8,00	10,0	11,5	12,7
Total power input	3	kW	1,45	2,00	2,33	2,81	3,57	4,00	4,26
COP	3	-	3,10	2,95	3,00	2,85	2,80	2,70	2,50
Water flow-rate	3	l/s	0,21	0,28	0,33	0,38	0,48	0,52	0,55
Nominal available pressure	3	kPa	89	88	85	80	75	68	66
<b>Air 7 °C - Water 45 °C</b>									
Nominal heating capacity	4	kW	4,50	6,40	8,20	10,0	12,0	14,0	15,0
Total power input	4	kW	1,11	1,68	2,13	2,74	3,24	4,00	4,48
COP	4	-	4,05	3,80	3,85	3,65	3,70	3,50	3,35
Water flow-rate	4	l/s	0,21	0,30	0,39	0,48	0,57	0,67	0,71
Nominal available pressure	4	kPa	89	87	80	71	63	54	49
<b>Air 7 °C - Water 55 °C</b>									
Nominal heating capacity	5	kW	4,60	6,20	7,80	9,50	12,0	14,0	15,0
Total power input	5	kW	1,44	2,00	2,44	3,11	3,87	4,67	5,26
COP	5	-	3,20	3,10	3,20	3,05	3,10	3,00	2,85
Water flow-rate	5	l/s	0,14	0,18	0,23	0,28	0,36	0,42	0,45
Nominal available pressure	5	kPa	90	89	86	85	87	81	78

Data according to EN 14511:2018.

1. inlet/outlet water temperature 30/35 °C, outdoor air temperature 7 °C dry bulb / 6 °C wet bulb
2. inlet/outlet water temperature 30/35 °C, outdoor air temperature 2 °C dry bulb / 1 °C wet bulb
3. inlet/outlet water temperature 30/35 °C, outdoor air temperature 7 °C dry bulb / 8 °C wet bulb
4. inlet/outlet water temperature 40/45 °C, outdoor air temperature 7 °C dry bulb / 6 °C wet bulb
5. inlet/outlet water temperature 47/55 °C, outdoor air temperature 7 °C dry bulb / 6 °C wet bulb

### Heating silent mode

SIZES			2.1	3.1	4.1	5.1	6.1 / 6.1T	7.1 / 7.1T	8.1 / 8.1T
<b>Air 7 °C - Water 35 °C</b>									
<b>Silent mode 1</b>									
Nominal heating capacity	1	kW	3,34	4,64	6,37	7,50	9,06	10,53	11,17
Total power input	1	kW	0,64	0,91	1,18	1,46	1,77	2,12	2,28
COP	1	-	5,25	5,12	5,39	5,12	5,11	4,97	4,89
Water flow-rate	1	l/s	0,16	0,22	0,30	0,36	0,43	0,50	0,53
Nominal available pressure	1	kPa	89	89	85	83	81	69	68
<b>Silent mode 2</b>									
Nominal heating capacity	1	kW	2,93	3,15	4,40	4,97	5,87	7,07	7,50
Total power input	1	kW	0,55	0,60	0,78	0,90	1,05	1,31	1,41
COP	1	-	5,32	5,26	5,64	5,52	5,61	5,38	5,31
Water flow-rate	1	l/s	0,14	0,15	0,21	0,24	0,28	0,34	0,36
Nominal available pressure	1	kPa	90	90	86	86	88	87	87

Data according to EN 14511:2018.

1. inlet/outlet water temperature 30/35 °C, outdoor air temperature 7 °C dry bulb / 6 °C wet bulb

## Cooling

SIZES			2.1	3.1	4.1	5.1	6.1 / 6.1T	7.1 / 7.1T	8.1 / 8.1T
<b>Air 35 °C - Water 18 °C</b>									
Nominal cooling capacity	1	kW	4,50	6,50	8,30	10,0	12,0	14,0	16,0
Total power input	1	kW	0,82	1,27	1,61	2,11	2,67	3,33	4,10
EER	1	-	5,50	5,10	5,15	4,75	4,50	4,20	3,90
Water flow-rate	1	l/s	0,21	0,31	0,40	0,48	0,57	0,67	0,76
Nominal available pressure	1	kPa	89	87	80	71	63	54	45
<b>Air 35 °C - Water 7 °C</b>									
Nominal cooling capacity	2	kW	4,70	6,80	7,50	8,90	11,5	12,7	14,0
Total power input	2	kW	1,29	2,19	2,17	2,74	3,77	4,38	5,09
EER	2	-	3,65	3,10	3,45	3,25	3,05	2,90	2,75
Water flow-rate	2	l/s	0,22	0,32	0,36	0,42	0,55	0,60	0,67
Nominal available pressure	2	kPa	89	86	83	81	66	60	54

Data according to EN 14511:2018.

- inlet/outlet water temperature 23/18 °C, outdoor air temperature 35 °C dry bulb / 27 °C wet bulb
- inlet/outlet water temperature 12/7 °C, outdoor air temperature 35 °C dry bulb / 27 °C wet bulb

## Cooling silent mode

SIZES			2.1	3.1	4.1	5.1	6.1 / 6.1T	7.1 / 7.1T	8.1 / 8.1T
<b>Air 35 °C - Water 18 °C</b>									
<b>Silent mode 1</b>									
Nominal cooling capacity	1	kW	3,42	4,91	6,19	7,48	9,06	10,51	12,15
Total power input	1	kW	0,57	0,90	1,02	1,36	1,64	1,99	2,48
EER	1	-	5,98	5,48	6,08	5,51	5,54	5,29	4,90
Water flow-rate	1	l/s	0,16	0,23	0,29	0,36	0,43	0,50	0,58
Nominal available pressure	1	kPa	89	89	85	83	81	69	63
<b>Silent mode 2</b>									
Nominal cooling capacity	1	kW	3,25	3,29	4,69	5,04	6,08	6,99	7,99
Total power input	1	kW	0,54	0,55	0,75	0,81	1,06	1,25	1,45
EER	1	-	6,01	6,00	6,27	6,23	5,72	5,61	5,50
Water flow-rate	1	l/s	0,15	0,16	0,22	0,24	0,29	0,33	0,38
Nominal available pressure	1	kPa	90	89	86	86	88	87	83

Data according to EN 14511:2018.

- inlet/outlet water temperature 23/18 °C, outdoor air temperature 35 °C dry bulb / 27 °C wet bulb

# Technical data

## ErP

SIZES			2.1	3.1	4.1	5.1	6.1	7.1	8.1	6.1T	7.1T	8.1T
<b>Average climatic conditions - Heat pump for Average temperature application</b>												
Nominal power	1	kW	4,9	5,9	6,8	7,8	12	13	14,4	12	13	14,4
SCOP	1	-	3,79	3,82	3,82	3,82	3,62	3,61	3,57	3,62	3,61	3,57
Generator energy class	1	-	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
ηs	1	%	148,6	149,7	149,5	149,5	141,8	141,4	139,9	141,8	141,4	139,9
<b>Average climatic conditions - Heat pump for Low temperature application</b>												
Nominal power	2	kW	5	6,4	8	9,2	12,1	13,7	14,7	12,1	13,7	14,7
SCOP	2	-	5,07	4,89	5,19	5,07	4,67	4,63	4,59	4,67	4,63	4,59
Generator energy class	2	-	A+++	A+++	A+++	A+++	A+++	A+++	A+++	A+++	A+++	A+++
ηs	2	%	199,8	192,6	200,4	196,3	183,7	182,2	180,5	183,7	182,2	180,5
<b>Average climatic conditions - Heat pump for application with Fan coil</b>												
Nominal power	3	kW	4,7	6,8	7,5	8,9	11,5	12,7	14	11,5	12,7	14
SEER	3	-	5,23	5,32	5,86	5,55	5,19	5,18	5,12	5,19	5,18	5,12
ηs	3	%	206,3	209,8	224	213,8	204,4	204,1	201,6	204,4	204,1	201,6

The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) no. 811/2018 and Commission Delegated Regulation no. 813/2018 of the Commission.

Data according to EN 14825

1. Average climate, Medium temperature 47/55 °C
2. Average climate, Low temperature 30/35 °C
3. Average climate, Low temperature 12/7 °C

## Technical specifications

SIZES				2.1	3.1	4.1	5.1	6.1	7.1	8.1	6.1T	7.1T	8.1T
Refrigeration circuit													
Compressor	no./type	-	-	1	1	1	1	1	1	1	1	1	1
	type	-	-	Twin Rotary									
Oil	charge	-	ml	600	830			1100					
Refrigerant	type/GWP	-	-	R290 / 3									
	charge	-	kg	0,70	0,70	1,10	1,10	1,25	1,25	1,25	1,25	1,25	1,25
	CO <sub>2</sub> equiv.	-	kg CO <sub>2</sub>	2	2	3	3	4	4	4	4	4	4
Number of fans	number	-	-	1	1	1	1	1	1	1	1	1	1
	air flow	-	m³/h	2875	4031			4457		5042	4457		5042
Water circuit													
Minimum system water content	-	l	30			70							
Admissible water flow rate	minimum	1	l/s	0,10			0,17						
	maximum	-	l/s	0,42	0,42	0,64	0,69	0,89	1,00	1,08	0,89	1,00	1,08
Maximum system pressure	-	bar	3	3	3	3	3	3	3	3	3	3	3
System expansion vessel	volume	2	l	8									
	pre-charge	-	bar	8									
Hydraulic connections	-	inches	1"			1 1/4"							
Sound data													
Sound pressure at 1 metre	3	dB(A)	44	46	48		49	51	52	56	51	52	56
Sound power	3	dB(A)	56	58	60		61	65	65	69	65	65	69
Dimensions and weights													
Dimensions (Length x Height x Depth)	unit	-	mm	1295*718*381				1385*865*423					
	packaging	-	mm	1375*885*475				1465*1035*560					
Weight	unit	-	kg	90			117			135			137
	packaging	-	kg	110			139			157			159

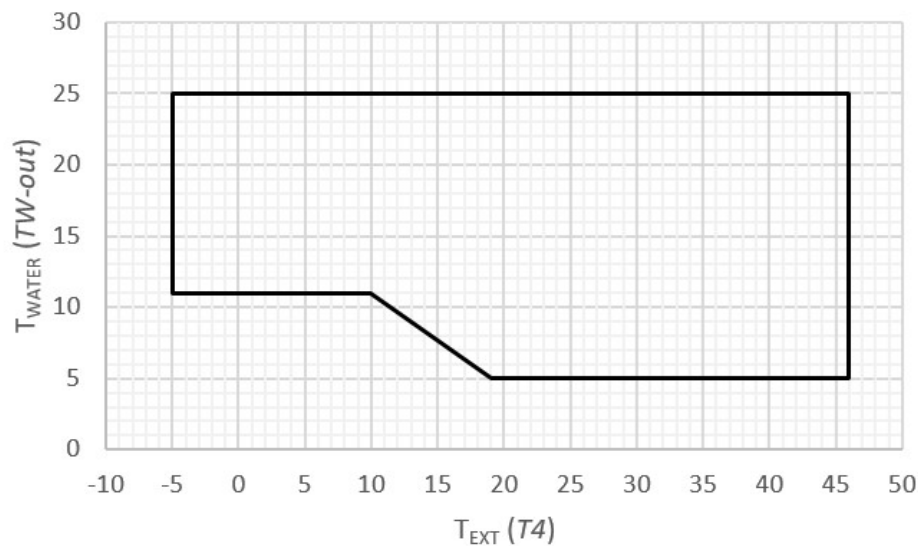
1. consider the water content of the area with less volume
2. sufficient volume up to a maximum of 60 litres of water content in the system.
3. Sound power levels are determined using the intensimetric method (UNI EN ISO 9614-2). Data referring to the following conditions at full load.  
Heating: inlet/outlet water temperature 47/55 °C, outdoor air temperature 7 °C.  
Cooling: water inlet/outlet temperature 12/7 °C, outdoor air temperature 35 °C.



## Operating range

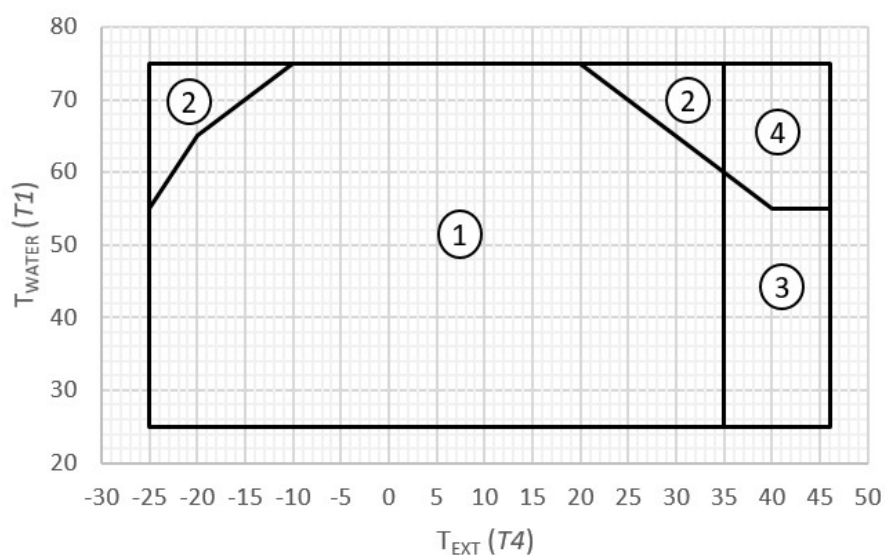
### Cooling

2.1 ÷ 8.1



### Heating / DHW

2.1 ÷ 8.1



1. Heating / DHW in heat pump only
2. Back-up / integration with electric resistance
3. DHW mode only
4. DHW mode only with back-up / integration electric resistance

# Technical data

## Electric data

Sizes			2.1	3.1	4.1	5.1	6.1	7.1	8.1	6.1T	7.1T	8.1T
Power supply	1	V/Hz/p	230/50/1						400/50/3+N			
Standard Unit												
F.L.I. - Power input at max admissible conditions	-	kW	2,70	3,00	3,60	3,90	5,70	6,00	6,40	5,70	6,00	6,40
F.L.A. - Absorbed current at maximum admissible conditions	-	A	12,0	13,5	16,0	17,5	25,0	26,5	28,0	8,50	9,00	9,50
Configurazione IBH: resistenza elettrica di integrazione a bordo												
F.L.I. - Potenza assorbita alle massime condizioni ammesse		kW	6,00	6,30	6,90	7,20	9,00	9,30	9,70	15,6	15,9	16,3
F.L.A. - Corrente assorbita alle massime condizioni ammesse		A	25,5	27,0	29,5	31,0	38,5	40,0	41,5	22,0	22,5	23,0

### Boilers for hybrid versions

Model			FE 24.4	FE 33.4	UC 24.4	UC 33.4	UC 70.2	UC 115.2	UC 200F.2
Power supply	-	[V-Hz]	230/50	230/50	230/50	230/50	230/50	230/50	230/50
F.L.A. - Absorbed current at maximum admissible conditions	2	[A]	0,41	0,53	0,36	0,43	1,16	1,37	2,52
F.L.I. - Power input at max admissible conditions	2	[kW]	0,095	0,122	0,082	0,099	0,267	0,314	0,58
Protection rating	IP	-	X5D	X5D	X4D	X4D	X4D	X5D	X5D

## Power input limitation

Setting	Unit			
	SIZE 2.1-3.1	SIZE 4.1-5.1	SIZE 6.1-8.1	SIZE 6.1T-8.1T
1	13.5	17.5	28	9.5
2	12	16	26	8.5
3	11	15	24	7.5
4	10	14	22	7
5	9	13	20	6.5
6	8	12	18	6
7	8	12	18	6
8	8	12	18	6

## Accessories

<b>ACS200X / ACS300X / ACS500X</b> TBH and QERAX heater	F.L.I.	4	kW	2.10
	F.L.A.	4	A	9.13
<b>ACS1000X / ACS10SX</b> - TBH and QERATX heater	F.L.I.	4	kW	4.73
	F.L.A.	4	A	6.82
<b>IBHX</b>	F.L.I.	3-4	kW	6.6
	F.L.A.	3-4	A	28.7
<b>IBHTX</b>	F.L.I.	3-4	kW	9.9
	F.L.A.	3-4	A	14.3
<b>DTX</b> - antifreeze heater	F.L.I.	2	W	110
	F.L.A.	2	mA	480
<b>KIRE2HX / KIRE2HLX</b> - two identical circulators	F.L.I.	4	W	90
	F.L.A.	4	mA	880
<b>KCSX</b> - circulator	F.L.I.	4	W	60
	F.L.A.	4	mA	580
<b>PRSX</b> - circulator	F.L.I.	4	W	76
	F.L.A.	4	mA	330
<b>PCSX</b> - circulator	F.L.I.	4	W	52
	F.L.A.	4	mA	520
<b>PCS2X</b> - circulator	F.L.I.	4	W	140
	F.L.A.	4	mA	1100

The units comply with the requirements of European standard IEC EN 60335.

1. permissible power supply: 220-240V±10% and 380-415V±6%.
2. data to be added to standard unit values
3. data on the maximum installable power (3 stages). It is possible to power 1 or 2 stages and the electrical sizing values are proportional to the number of stages
4. the application requires independent power supply: data required for sizing the relevant power lines

The tanks are supplied with immersed electric heater

⚠ When defining the size, make sure all absorption values are compliant with current power supply contracts in the country of installation.

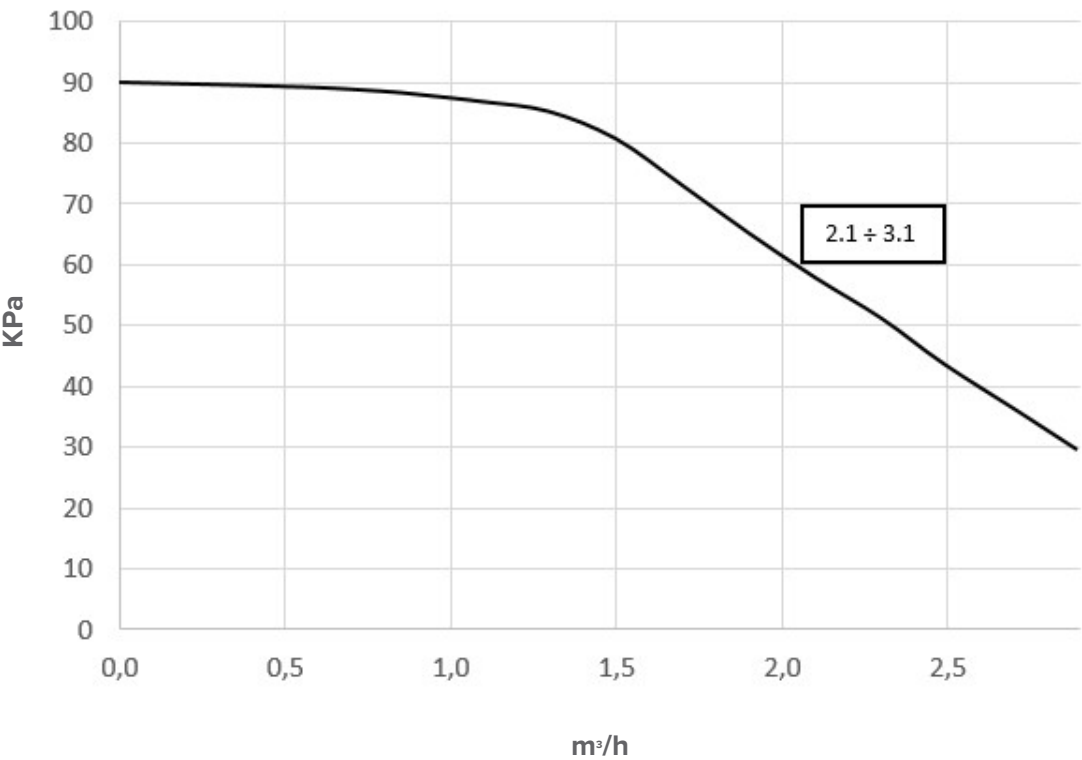
## Sound levels

SIZES			2.1	3.1	4.1	5.1	6.1	7.1	8.1	6.1T	7.1T	8.1T	
Sound power	Heating A7W35		dB(A)	56	58	60	61	65	65	69	65	65	69
	Heating max		dB(A)	58	60	62	63	67	68	70	67	68	70
	Heating slince mode 1	1	dB(A)	54	56	58	59	62	63	64	62	63	64
	Heating slince mode 2	2	dB(A)	51	53	55	56	58	59	60	58	59	60
	Cooling A35W18		dB(A)	56	58	60	61	65	66	69	65	66	69
	Cooling max		dB(A)	58	60	62	63	66	67	70	66	67	70
	Cooling slince mode1	1	dB(A)	54	56	57	58	62	62	64	62	62	64
	Cooling slince mode2	2	dB(A)	51	53	54	55	58	59	60	58	59	60
Sound pressure @1m	Heating A7W35		dB(A)	44	46	48	49	51	52	56	51	52	56
	Heating max		dB(A)	46	48	50	51	53	54	58	53	54	58
	Heating slince mode 1	1	dB(A)	42	44	45	46	47	48	52	47	48	52
	Heating slince mode 2	2	dB(A)	40	42	42	43	43	44	48	43	44	48
	Cooling A35W18		dB(A)	44	46	48	49	51	52	56	51	52	56
	Cooling max		dB(A)	46	48	50	51	53	54	58	53	54	58
	Cooling slince mode1	1	dB(A)	42	43	45	46	47	48	52	47	48	52
	Cooling slince mode2	2	dB(A)	39	40	42	43	44	45	48	44	45	48

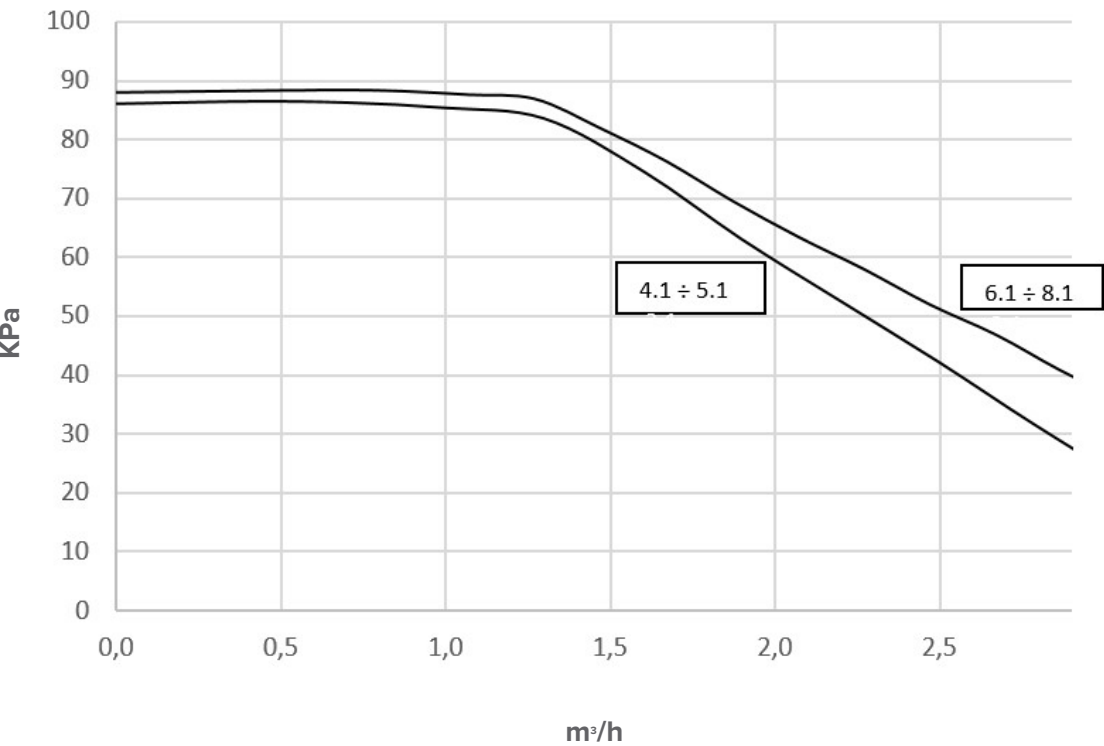
Hydraulic data

Available pressure of the standard units

2.1 ÷ 3.1



4.1 ÷ 8.1

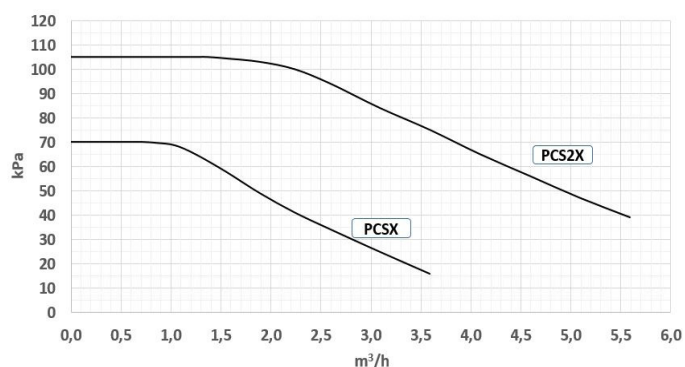


Note: it is advisable to install a hydraulic separator  
Note: IBH;IBHX;IBHTX have negligible pressure drops.

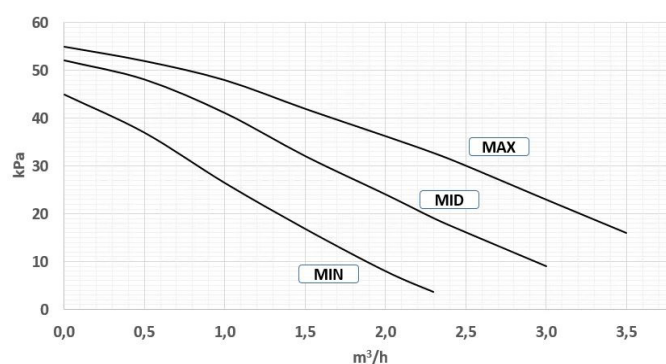
## Hydraulic data

### Available pressure of the accessories

#### PCSX / PCS2X

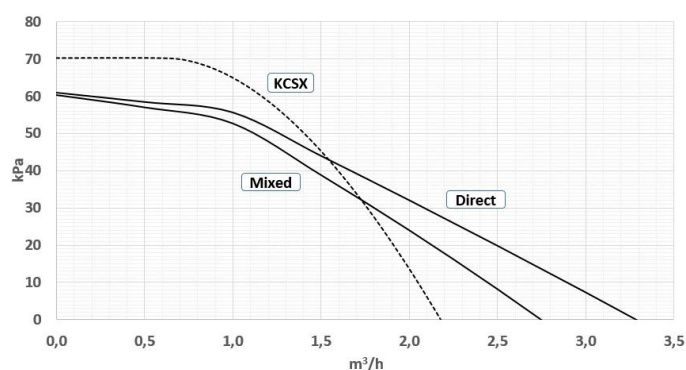


#### PRSX



Note: the circulators for the secondary circuit can be set with 3 curves at constant speed, or 3 curves at proportional head or constant head. The curve shown represents operation with the limit curve at constant speed

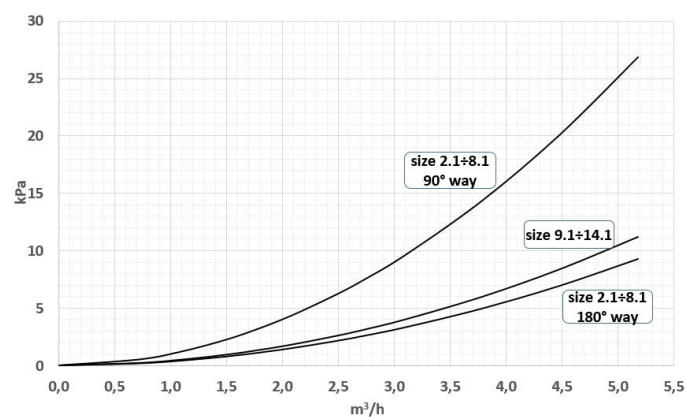
#### KIRE2HX / KIRE2HLX - two zone kit and KCSX - kit for secondary circuit



Note: the circulators in the two-zone kit can be adjusted with either 3 constant speed curves or 3 proportional pressure drop curves. The curve shown represents operation with the limit curve at constant speed

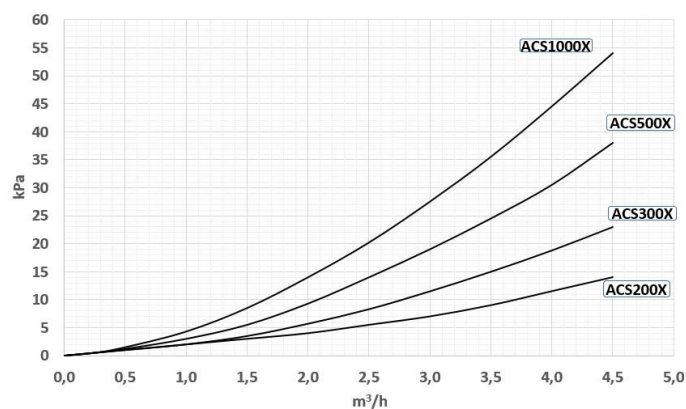
## Pressure drops of the accessories

### 3DHWX - 3-way switching valve

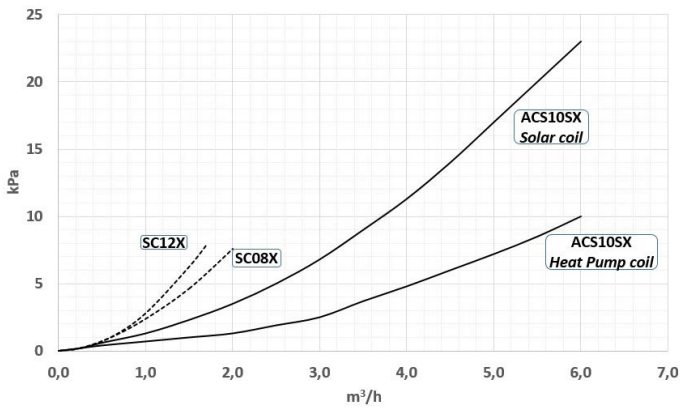


Note: pressure drops refer to the valve body only, without any fittings. Valves have a 90° way for DHW and a 180° way for the system

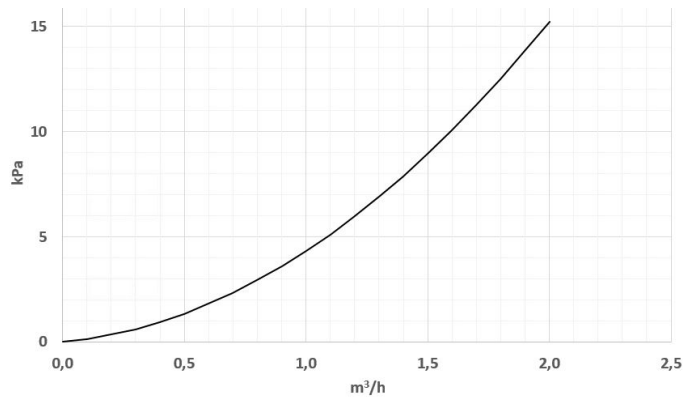
### Boilers - standard



Boilers - with solar coil

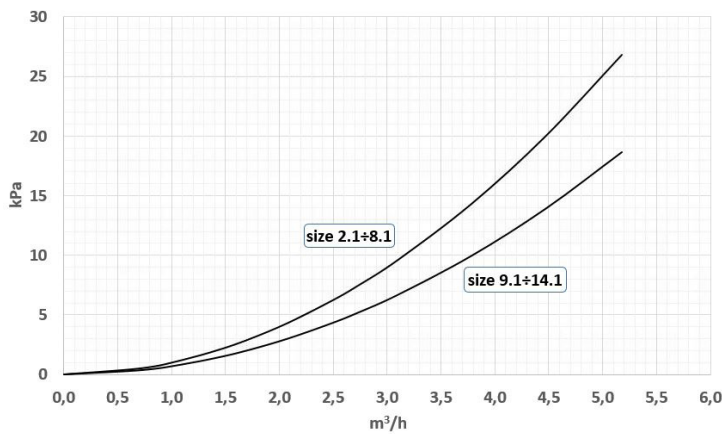


VDACSX



Note: pressure drops refer to the valve body only, without any fittings

FDMX



Note: pressure drops refer to the valve body only, without any fittings

## Boilers for stand-alone installations

MODEL				UC 24.4	UC 33.4	FE 24.4	FE 33.4
Heating Performance							
Nominal heat capacity (Qn)	-	Maximum	[kW]	24.0	34.0	24.5	34.8
		Minimum	[kW]	5.0	5.0	4.8	5.0
Heating capacity (Pn)	60/80 °C	Maximum	[kW]	23.4	33.2	24.0	34.0
		Minimum	[kW]	4.8	4.8	4.7	4.9
	30/50 °C	Maximum	[kW]	25.2	35.8	26.0	37.0
		Minimum	[kW]	5.3	5.4	5.2	5.4
Efficiency	60/80 °C	Maximum	%	97.7	97.7	97.8	97.7
		Minimum	%	96.5	96.4	97.6	97.2
	30/50 °C	Maximum	%	105.1	105.2	106.1	106.2
		Minimum	%	106.9	107.0	107.3	107.1
	30% of Pn	-	%	108.7	108.6	109.7	109.7
		-	-	-	-	-	-
Boiler water content	-	-	[l]	2.5	2.8	3.4	4.3
Operating pressure	PMS	Maximum	[bar]	3	3	3	3
	-	Minimum	[bar]	0.5	0.5	0.8	0.8
Expansion tank	Volume	-	[l]	10	10	8	10
	Pre-charge	-	[bar]	1	1	0.8	0.8
DHW performance							
Nominal heat capacity (Qnw)	-	Maximum	[kW]	28.0	34.0	28.5	34.8
		Minimum	[kW]	5.0	5.0	4.7	5.0
Heating capacity	-	Maximum	[kW]	27.3	33.2	28.0	34.0
		Minimum	[kW]	4.8	4.8	4.7	4.8
DHW flow rate	ΔT=25 °C	-	[l/min]	16.2	19.2	16.1	19.5
	ΔT=30 °C	-	[l/min]	13.5	16.0	13.4	16.2
DHW production in continuous operation	ΔT=45 K	-	[l/min]	9.0	10.6	8.9	10.8
	ΔT=40 K	-	[l/min]	10.1	11.9	10.0	12.1
	ΔT=35 K	-	[l/min]	11.6	13.6	11.5	13.9
	ΔT=30 K	-	[l/min]	13.5	15.8	13.4	16.2
	ΔT=25 K	-	[l/min]	16.2	19.0	16.1	19.5
	-	-	-	-	-	-	
Water temperature		Maximum	[°C]	60	60	65	65
		Minimum	[°C]	38	38	40	40
Operating pressure	PMW	Maximum	[bar]	6	6	9	9
	-	Minimum	[bar]	0.5	0.5	0.3	0.3
ErP data							
Seasonal eff. Average climate	Heating	ηs	%	93	93	94	94
		Energy class	-	A	A	A	A
	DHW	ηwh	%	87	90	85	85
		Energy class	-	A	A	A	A
		Withdrawal profile	-	XL	XL	XL	XXL
Sound power level		Lwa	[dB(A)]	53	56	49	52
Thermal losses and discharge of flue gas							
Flue loss	burner ON 80/60 °C	Pmax	%	2.33	2.27	2.00	2.10
		Pmin	%	2.24	2.32	2.00	2.90
	burner ON 50/30 °C	Pmax	%	1.70	1.15	1.40	1.40
		Pmin	%	1.37	1.44	1.00	1.00
Flue gas temperature	80/60 °C	Pmax	[°C]	66.5	64.9	66	67
		Pmin	[°C]	64.3	65.9	64	62
	50/30 °C	Pmax	[°C]	53.6	52.7	52	53
		Pmin	[°C]	47.2	48.4	44	45
Flue gas flow rate	-	Pmax	[g/s]	13.8	15.6	11.2	16
	-	Pmin	[g/s]	2.3	2.3	2.3	2.4
Nitrogen oxide (NOX) emissions		Class	-	6	6	6	6
		-	[mg/kWh]	45	49	35	33



## Boilers for centralised systems

MODEL				UC 70.2	UC 115.2	UC 200.2	
Heating Performance							
Modulation ratio	-	-	-	1 : 7	1 : 5.8	1 : 10	
Nominal heat capacity (Qn)	-	Maximum	[kW]	67.5	115.0	199.0	
		Minimum	[kW]	9.6	20.0	20.0	
Heating capacity (Pn)	60/80 °C	Maximum	[kW]	65.7	111.9	194.8	
		Minimum	[kW]	9.1	19.2	19.1	
	30/50 °C	Maximum	[kW]	68.7	120.0	205.2	
		Minimum	[kW]	10.3	21.4	21.1	
Efficiency	60/80 °C	Maximum	%	97.3	97.3	97.9	
		Minimum	%	94.9	95.9	95.6	
	30/50 °C	Maximum	%	101.7	104.3	103.1	
		Minimum	%	107.6	107.1	105.4	
	30% of Pn		-	%	107.3	107.2	108.9
	Reduced load		%	98.3	98.3	98.2	
Nominal load		%	97.4	97.7	98.0		
Water content			[l]	3.9	9.0	22.0	
Operating pressure	PMS	Maximum	[bar]	6	6	6	
	-	Minimum	[bar]	0.5	0.5	0.5	
ErP data							
Seasonal eff.	Heating	ηs	%	93	92	93	
Average climate		Energy class	-	A	A	A	
Sound power level			Lwa	[dB(A)]	63	-	-
Thermal losses and discharge of flue gas							
Casing losses	burner ON	Qn	%	0.09	0.41	0.14	
		Qmin	%	3.44	2.36	2.60	
Flue loss	burner ON	Pmax	%	2.62	2.27	2.00	
		Pmin	%	1.66	1.74	1.80	
Flue gas temperature (T <sub>F</sub> -T <sub>A</sub> )		Pmax	[°C]	51.3	46.1	40	
		Pmin	[°C]	34	33.4	34	
Flue gas flow rate	-	Pmax	[g/s]	111.4	184.7	319.57	
	-	Pmin	[g/s]	15.9	34.3	34.3	
Nitrogen oxide (NOX) emissions			Class	-	6	6	
			-	[mg/kWh]	59	47	68

## Performance in heating

### Maximum operating data according to EN 14511:2022

The data shown in the "Performance Tables" are at the maximum operating conditions of the unit, i.e. at the maximum frequency.

The data shown in the "General technical data" are at the nominal operating conditions of the unit, i.e. at a lower partial frequency than the maximum frequency.

For this reason, nominal data typically have lower powers but optimized efficiencies as opposed to maximum data where power is at maximum level.

Sizes	Tae (°C) DB/WB	Water supply temperature (°C)																				
		35			45			55			60			65			70			75		
	°C	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe
2.1	-25/-	3,19	1,90	1,68	3,10	1,68	1,84	2,87	1,44	2,00	/	/	/	/	/	/	/	/	/	/	/	/
	-20/-20,1	3,82	2,18	1,75	3,69	1,91	1,94	3,33	1,59	2,10	3,29	1,49	2,21	3,14	1,36	2,31	/	/	/	/	/	/
	-15/-15,3	4,47	2,46	1,82	4,28	2,12	2,02	3,93	1,77	2,22	3,78	1,62	2,34	3,61	1,47	2,45	3,46	1,35	2,57	/	/	/
	-10/-11	5,35	2,81	1,90	5,11	2,41	2,12	4,66	1,98	2,36	4,47	1,80	2,49	4,26	1,62	2,62	4,06	1,47	2,77	3,74	1,28	2,93
	-7/-8	5,56	3,04	1,83	5,31	2,58	2,05	4,85	2,11	2,30	4,68	1,93	2,43	4,44	1,73	2,57	4,25	1,57	2,71	3,93	1,37	2,86
	-5/-6	5,70	3,18	1,80	5,46	2,70	2,02	5,00	2,20	2,27	4,82	2,00	2,40	4,61	1,81	2,55	4,42	1,64	2,69	4,12	1,44	2,86
	-2/-3	5,82	3,44	1,69	5,55	2,90	1,91	5,11	2,37	2,16	4,93	2,16	2,29	4,93	2,03	2,43	4,75	1,85	2,57	4,42	1,62	2,7
	0/-1	5,90	3,64	1,62	5,64	3,06	1,85	5,37	2,58	2,08	5,20	2,34	2,22	4,98	2,11	2,36	4,84	1,93	2,50	4,52	1,70	2,66
	2/1	6,05	3,84	1,57	5,77	3,21	1,80	5,50	2,70	2,04	5,32	2,44	2,18	5,11	2,20	2,32	4,96	2,01	2,46	4,64	1,77	2,63
	5/4	6,50	4,40	1,48	6,19	3,64	1,70	5,88	3,03	1,94	5,67	2,73	2,08	5,42	2,45	2,22	5,26	2,23	2,36	4,90	1,94	2,52
	7/6	6,86	4,72	1,46	6,55	3,88	1,69	6,20	3,21	1,93	5,97	2,89	2,07	5,71	2,58	2,22	5,52	2,33	2,37	5,15	2,04	2,53
	10/8	7,00	5,21	1,34	6,66	4,22	1,58	6,32	3,46	1,82	6,06	3,09	1,96	5,80	2,75	2,11	5,59	2,48	2,26	5,19	2,15	2,42
	12/9	7,23	5,59	1,29	6,87	4,48	1,53	6,50	3,65	1,78	6,26	3,26	1,92	5,98	2,89	2,07	5,77	2,60	2,22	5,35	2,24	2,38
	15/12	6,86	5,87	1,17	6,51	4,66	1,40	6,15	3,77	1,63	5,91	3,35	1,77	5,62	2,95	1,90	5,37	2,63	2,05	4,94	2,25	2,20
	20/15	6,20	6,23	0,99	6,14	5,09	1,21	5,78	4,04	1,43	5,52	3,56	1,55	5,19	3,09	1,68	4,92	2,72	1,81	4,38	2,24	1,95
	25/17	6,17	7,12	0,87	6,14	5,71	1,07	5,76	4,47	1,29	5,48	3,90	1,40	5,12	3,35	1,53	4,78	2,90	1,65	/	/	/
30/21	6,51	8,05	0,81	6,47	6,35	1,02	6,07	4,91	1,24	5,78	4,27	1,35	5,40	3,65	1,48	/	/	/	/	/	/	
35/24	6,76	9,10	0,74	6,42	6,75	0,95	6,32	5,37	1,18	/	/	/	/	/	/	/	/	/	/	/	/	
3.1	-25/-	3,40	1,76	1,94	3,28	1,55	2,11	3,00	1,32	2,27	/	/	/	/	/	/	/	/	/	/	/	/
	-20/-20,1	4,24	2,10	2,01	4,08	1,86	2,20	3,73	1,57	2,38	3,60	1,41	2,55	3,44	1,29	2,66	/	/	/	/	/	/
	-15/-15,3	5,05	2,43	2,08	4,88	2,08	2,34	4,46	1,71	2,61	4,31	1,60	2,70	4,12	1,45	2,84	3,96	1,30	3,04	/	/	/
	-10/-11	5,91	2,77	2,13	5,71	2,36	2,41	5,23	1,93	2,71	5,05	1,78	2,83	4,83	1,61	2,99	4,18	1,39	3,00	3,81	1,21	3,14
	-7/-8	6,18	2,98	2,08	5,95	2,58	2,30	5,47	2,03	2,69	5,27	1,87	2,82	5,05	1,69	2,99	4,48	1,48	3,03	4,09	1,29	3,17
	-5/-6	6,36	3,12	2,04	6,08	2,67	2,28	5,59	2,19	2,55	5,39	1,92	2,81	4,93	1,73	2,86	4,50	1,54	2,91	4,60	1,34	3,43
	-2/-3	6,61	3,32	1,99	6,32	2,81	2,25	5,81	2,30	2,53	5,61	2,01	2,79	5,36	1,81	2,96	5,13	1,70	3,01	4,67	1,50	3,11
	0/-1	6,75	3,49	1,93	6,44	2,95	2,19	6,16	2,50	2,46	5,92	2,17	2,73	5,68	1,96	2,90	5,46	1,74	3,14	5,06	1,51	3,34
	2/1	6,83	3,67	1,86	6,53	3,09	2,11	6,22	2,60	2,39	6,01	2,26	2,66	5,78	2,04	2,84	5,57	1,82	3,06	5,17	1,58	3,27
	5/4	7,42	4,26	1,74	7,07	3,55	1,99	6,72	2,88	2,33	6,49	2,59	2,51	6,23	2,32	2,68	6,02	2,07	2,91	5,60	1,80	3,11
	7/6	7,70	4,61	1,67	7,35	3,82	1,92	6,97	3,19	2,19	6,75	2,80	2,41	6,46	2,50	2,58	6,27	2,23	2,81	5,84	1,95	3,00
	10/8	8,00	5,08	1,57	7,63	4,18	1,83	7,24	3,46	2,09	7,00	3,02	2,32	6,68	2,69	2,48	6,46	2,38	2,71	6,03	2,08	2,90
	12/9	8,17	5,43	1,50	7,79	4,43	1,76	7,40	3,64	2,03	7,13	3,17	2,25	6,82	2,82	2,42	6,58	2,49	2,65	6,12	2,12	2,89
	15/12	7,92	5,66	1,40	7,52	4,57	1,64	7,14	3,74	1,91	6,88	3,25	2,12	6,57	2,88	2,28	6,34	2,54	2,50	5,91	2,20	2,69
	20/15	7,53	6,21	1,21	7,14	5,00	1,43	6,77	4,03	1,68	6,49	3,46	1,87	6,18	3,05	2,03	5,94	2,67	2,22	5,46	2,22	2,46
	25/17	6,96	6,92	1,01	6,78	5,61	1,21	6,39	4,42	1,44	6,09	3,76	1,62	5,74	3,27	1,76	5,41	2,80	1,93	/	/	/
30/21	6,94	7,95	0,87	6,91	6,31	1,10	6,50	4,80	1,35	6,18	4,13	1,50	5,78	3,55	1,63	/	/	/	/	/	/	
35/24	7,12	9,07	0,79	6,78	6,75	1,01	6,69	5,24	1,28	/	/	/	/	/	/	/	/	/	/	/	/	
4.1	-25/-	4,85	1,91	2,55	4,58	1,63	2,80	4,34	1,39	3,12	/	/	/	/	/	/	/	/	/	/	/	/
	-20/-20,1	5,95	2,22	2,68	5,74	1,94	2,96	5,50	1,68	3,29	5,48	1,58	3,47	5,43	1,51	3,60	/	/	/	/	/	/
	-15/-15,3	7,32	2,63	2,78	6,54	2,12	3,08	6,27	1,83	3,43	6,21	1,71	3,63	6,15	1,67	3,68	6,16	1,53	4,03	/	/	/
	-10/-11	8,47	2,92	2,90	8,07	2,27	3,56	7,56	2,10	3,60	7,53	1,98	3,81	7,41	1,84	4,03	7,47	1,77	4,22	7,34	1,65	4,45
	-7/-8	8,74	3,12	2,80	8,64	2,44	3,54	7,89	2,25	3,50	7,86	2,11	3,72	7,75	1,96	3,95	7,79	1,87	4,16	7,65	1,74	4,41
	-5/-6	8,93	3,25	2,75	8,86	2,91	3,05	8,18	2,37	3,45	8,13	2,22	3,66	8,03	2,10	3,83	8,03	1,95	4,11	7,89	1,81	4,36
	-2/-3	9,21	3,51	2,63	9,11	3,10	2,94	8,97	2,71	3,31	8,90	2,52	3,53	8,81	2,35	3,75	8,83	2,23	3,96	8,06	1,90	4,23
	0/-1	9,09	3,59	2,53	8,88	3,11	2,86	8,63	2,67	3,23	8,48	2,46	3,44	8,38	2,28	3,67	8,30	2,13	3,90	7,47	1,86	4,01
	2/1	9,17	3,79	2,42	8,97	3,26	2,75	8,69	2,78	3,12	8,58	2,58	3,33	8,35	2,35	3,55	8,30	2,20	3,78	7,54	1,93	3,91
	5/4	9,90	4,29	2,31	9,46	3,55	2,67	9,27	3,04	3,05	9,10	2,80	3,25	8,89	2,57	3,46	8,77	2,38	3,69	7,79	1,98	3,93
	7/6	10,44	4,71	2,22	9,57	3,53	2,71	9,69	3,28	2,95	9,47	3,00	3,16	9,26	2,74	3,38	9,06	2,52	3,60	8,04	2,15	3,73
	10/8	10,87	5,21	2,09	10,02	4,09	2,45	10,07	3,57	2,82	9,86	3,25	3,04	9,59	2,95	3,25	9,42	2,71	3,48	8,49	2,27	3,74
	12/9	11,12	5,61	1,98	10,26	4,37	2,35	10,28	3,78	2,72	10,04	3,43	2,93	9,77	3,11	3,14	9,63	2,86	3,37	8,74	2,41	3,63
	15/12	10,90	5,94	1,84	10,06	4,61	2,18	10,01	3,93	2,54	9,74	3,55	2,74	9,45	3,20	2,96	9,32	2,94	3,18	8,53	2,49	3,43
	20/15	10,56	6,68	1,58	9,99	5,24	1,91	9,66	4,30	2,25	9,36	3,85	2,43	9,02	3,43	2,63	8,84	3,12	2,83	8,50	2,79	3,04
	25/17	10,35	7,71	1,34	9,79	5,93	1,65	9,41	4,77	1,97	9,09	4,24	2,14	8,73	3,75	2,33	8,44	3,37	2,50	/	/	/
30/21	10,53	9,02	1,17	9,92	6,72	1,48	9,55	5,34	1,79	9,17	4,69	1,96	8,74	4,12	2,12	/	/	/	/	/	/	
35/24	10,35	10,66	0,97	9,78	7,68	1,27	9,35	5,98	1,56	/	/	/	/	/	/	/	/	/	/	/	/	

# Technical data

Sizes	Tae (°C) DB/WB	Water supply temperature (°C)																					
		35			45			55			60			65			70			75			
		°C	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe
5.1	-25/-	5,37	1,90	2,84	5,21	1,59	3,27	5,00	1,36	3,67	/	/	/	/	/	/	/	/	/	/	/	/	/
	-20/-20,1	6,54	2,19	2,99	6,41	1,91	3,36	6,21	1,62	3,84	6,12	1,50	4,08	6,10	1,47	4,16	/	/	/	/	/	/	/
	-15/-15,3	7,45	2,39	3,12	7,24	2,08	3,47	6,98	1,76	3,97	6,94	1,61	4,31	6,81	1,57	4,34	6,86	1,48	4,63	/	/	/	/
	-10/-11	8,54	2,69	3,18	8,32	2,16	3,86	8,06	2,06	3,90	8,04	1,94	4,14	7,93	1,82	4,36	8,03	1,76	4,56	7,93	1,58	5,01	
	-7/-8	8,89	2,88	3,08	8,67	2,22	3,91	8,44	2,21	3,82	8,41	2,08	4,05	8,31	1,94	4,28	8,38	1,87	4,48	8,26	1,67	4,95	
	-5/-6	9,12	3,04	3,00	8,92	2,42	3,68	8,70	2,34	3,73	8,63	2,18	3,96	8,56	2,04	4,19	8,60	1,95	4,41	8,48	1,75	4,84	
	-2/-3	9,49	3,29	2,88	9,34	2,66	3,50	9,13	2,53	3,61	9,00	2,34	3,85	8,96	2,19	4,09	8,96	2,07	4,32	8,80	1,85	4,77	
	0/-1	9,42	3,37	2,80	9,16	2,68	3,42	8,85	2,50	3,54	8,73	2,31	3,77	8,58	2,14	4,01	8,54	2,01	4,25	8,26	1,84	4,49	
	2/1	9,57	3,55	2,69	9,29	2,96	3,14	8,96	2,61	3,44	8,82	2,35	3,75	8,64	2,21	3,90	8,57	2,07	4,13	8,30	1,89	4,39	
	5/4	10,40	4,00	2,60	9,92	3,34	2,97	9,68	2,86	3,39	9,46	2,62	3,62	9,21	2,39	3,85	9,08	2,23	4,08	8,78	1,95	4,51	
	7/6	11,05	4,40	2,51	10,47	3,45	3,04	10,17	3,08	3,30	9,90	2,80	3,53	9,61	2,55	3,77	9,43	2,36	3,99	9,03	2,12	4,25	
	10/8	11,44	4,93	2,32	10,81	3,99	2,71	10,48	3,36	3,12	10,18	3,04	3,35	9,84	2,75	3,58	9,62	2,52	3,81	9,10	2,23	4,08	
	12/9	11,73	5,33	2,20	11,08	4,27	2,59	10,72	3,57	3,00	10,41	3,23	3,22	10,05	2,90	3,46	9,86	2,66	3,70	9,31	2,35	3,96	
	15/12	11,53	5,60	2,06	10,87	4,47	2,43	10,48	3,71	2,83	10,17	3,34	3,04	9,81	3,00	3,27	9,59	2,74	3,51	9,12	2,43	3,76	
	20/15	11,35	6,33	1,79	10,67	4,97	2,15	10,25	4,06	2,53	9,93	3,63	2,73	9,56	3,24	2,95	9,40	2,95	3,18	9,07	2,65	3,43	
	25/17	11,48	7,24	1,59	10,79	5,57	1,94	10,35	4,50	2,30	9,99	4,00	2,50	9,60	3,54	2,71	9,37	3,20	2,93	/	/	/	/
	30/21	11,25	8,57	1,31	10,54	6,41	1,64	10,04	5,07	1,98	9,64	4,45	2,17	9,18	3,90	2,36	/	/	/	/	/	/	/
	35/24	10,81	10,44	1,04	10,09	7,50	1,35	9,59	5,51	1,74	/	/	/	/	/	/	/	/	/	/	/	/	/
6.1/6.1T	-25/-	7,00	1,88	3,73	6,64	1,63	4,08	6,35	1,43	4,44	/	/	/	/	/	/	/	/	/	/	/	/	/
	-20/-20,1	8,53	2,18	3,92	8,18	1,90	4,31	7,93	1,69	4,70	7,69	1,56	4,93	7,42	1,43	5,19	/	/	/	/	/	/	/
	-15/-15,3	10,21	2,50	4,08	9,85	2,18	4,51	9,62	1,94	4,96	9,38	1,80	5,21	8,99	1,66	5,41	8,45	1,57	5,40	/	/	/	/
	-10/-11	10,44	2,52	4,14	10,13	2,20	4,59	10,06	1,98	5,09	10,01	1,87	5,36	9,76	1,78	5,48	9,40	1,72	5,47	8,97	1,58	5,67	
	-7/-8	11,10	2,79	3,98	10,50	2,45	4,29	10,40	2,15	4,84	10,35	1,99	5,20	10,27	1,91	5,37	9,86	1,80	5,47	9,18	1,66	5,54	
	-5/-6	10,91	2,86	3,81	10,49	2,46	4,27	10,24	2,16	4,75	10,15	2,02	5,03	9,83	1,93	5,10	9,52	1,82	5,24	8,79	1,68	5,23	
	-2/-3	11,46	3,09	3,71	11,03	2,64	4,18	10,69	2,29	4,67	10,44	2,11	4,96	10,06	1,96	5,14	9,71	1,85	5,24	8,89	1,70	5,23	
	0/-1	11,72	3,28	3,58	11,27	2,78	4,05	10,91	2,40	4,54	10,59	2,19	4,84	9,97	2,01	4,96	9,56	1,89	5,06	8,83	1,74	5,09	
	2/1	12,04	3,45	3,49	11,58	2,89	4,01	11,30	2,55	4,43	10,87	2,28	4,77	10,37	2,06	5,03	10,04	1,93	5,19	9,26	1,76	5,25	
	5/4	13,47	3,99	3,38	12,94	3,34	3,87	12,49	2,84	4,40	12,75	2,65	4,81	12,26	2,39	5,14	11,62	2,19	5,32	10,51	1,97	5,33	
	7/6	14,72	4,42	3,33	14,06	3,66	3,84	13,61	3,11	4,37	13,13	2,80	4,68	12,53	2,51	4,99	12,22	2,29	5,32	10,89	2,03	5,35	
	10/8	15,57	4,92	3,17	14,85	4,03	3,68	14,25	3,37	4,23	13,75	3,03	4,54	13,19	2,71	4,87	12,49	2,48	5,03	11,27	2,20	5,13	
	12/9	15,92	5,33	2,99	15,17	4,32	3,51	14,54	3,59	4,05	14,03	3,22	4,36	13,45	2,87	4,69	13,09	2,60	5,03	12,01	2,31	5,21	
	15/12	15,03	5,61	2,68	14,34	4,51	3,18	13,74	3,71	3,71	13,28	3,33	3,99	12,73	2,96	4,31	12,39	2,68	4,62	11,73	2,36	4,97	
	20/15	13,54	6,47	2,09	13,11	4,93	2,66	12,80	4,05	3,16	12,49	3,64	3,43	12,14	3,24	3,75	11,95	2,95	4,05	11,12	2,79	3,98	
	25/17	13,43	7,08	1,90	12,99	5,34	2,43	12,67	4,39	2,88	12,36	3,95	3,13	11,99	3,52	3,41	11,82	3,21	3,68	/	/	/	/
	30/21	13,45	8,04	1,67	13,00	6,21	2,09	12,64	5,02	2,52	12,30	4,45	2,77	11,95	3,96	3,02	/	/	/	/	/	/	/
	35/24	13,22	9,58	1,38	12,81	7,19	1,78	12,42	5,66	2,19	/	/	/	/	/	/	/	/	/	/	/	/	/

kWt: delivered heat capacity [kW].

kWe: electrical power absorbed [kW].

Tae: outdoor air temperature [°C].

Performance in relation to the difference between inlet and outlet water temperature = 5 °C

Note: Data are at maximum operation according to EN 14511:2022

The values indicate the integrated heat capacity: the current heat capacity considering any defrosting cycles

**!** At maximum operating conditions, the unit operates at maximum frequency (data in performance tables) as opposed to nominal operating conditions (general technical data) where it operates at partial frequency.

Sizes	Tae (°C) DB/WB	Water supply temperature (°C)																				
		35			45			55			60			65			70			75		
	°C	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe
7.1/7.1T	-25/-	7,78	1,85	4,22	7,41	1,58	4,69	7,14	1,41	5,08	/	/	/	/	/	/	/	/	/	/	/	/
	-20/-20,1	9,38	2,11	4,45	9,02	1,85	4,87	8,78	1,66	5,28	8,54	1,54	5,55	8,14	1,42	5,75	/	/	/	/	/	/
	-15/-15,3	10,75	2,35	4,57	10,67	2,09	5,11	10,58	1,88	5,62	10,11	1,70	5,94	9,46	1,54	6,15	8,93	1,54	5,79	/	/	/
	-10/-11	11,34	2,42	4,68	10,95	2,10	5,21	10,79	1,93	5,58	10,52	1,84	5,71	10,25	1,75	5,85	9,87	1,68	5,87	9,33	1,46	6,41
	-7/-8	12,05	2,62	4,59	11,40	2,30	4,96	11,30	2,10	5,38	11,24	1,95	5,75	10,74	1,80	5,96	10,07	1,75	5,74	9,48	1,60	5,93
	-5/-6	12,03	2,74	4,39	11,58	2,35	4,92	11,12	2,14	5,21	10,65	1,99	5,35	10,18	1,84	5,53	9,75	1,77	5,52	9,04	1,65	5,48
	-2/-3	12,45	2,99	4,16	11,99	2,55	4,69	11,64	2,22	5,24	11,17	2,07	5,39	10,77	1,93	5,59	10,33	1,80	5,74	9,55	1,66	5,74
	0/-1	12,63	3,17	3,99	12,19	2,71	4,50	11,83	2,35	5,04	11,52	2,15	5,36	10,70	1,98	5,40	10,33	1,84	5,63	9,62	1,69	5,70
	2/1	12,84	3,35	3,83	12,38	2,85	4,35	12,00	2,50	4,80	11,69	2,25	5,20	11,08	2,04	5,42	10,55	1,89	5,58	9,66	1,71	5,65
	5/4	14,43	3,85	3,75	13,90	3,25	4,28	13,46	2,79	4,83	13,37	2,58	5,18	13,21	2,36	5,60	12,27	2,16	5,69	11,18	1,91	5,85
	7/6	15,95	4,26	3,74	15,27	3,56	4,29	14,81	3,04	4,87	14,36	2,77	5,19	13,71	2,51	5,47	12,71	2,24	5,67	11,40	1,97	5,79
	10/8	16,52	4,76	3,47	15,78	3,92	4,02	15,19	3,31	4,59	14,70	2,99	4,92	13,94	2,69	5,19	13,03	2,46	5,30	11,82	2,12	5,57
	12/9	17,19	5,13	3,35	16,40	4,19	3,91	15,75	3,50	4,50	15,23	3,15	4,83	14,63	2,79	5,24	13,87	2,58	5,38	12,40	2,23	5,56
	15/12	16,04	5,36	2,99	15,34	4,36	3,52	14,75	3,63	4,07	14,26	3,25	4,38	13,72	2,91	4,71	13,36	2,73	4,90	12,50	2,37	5,28
	20/15	14,32	6,15	2,33	13,89	4,79	2,90	13,59	3,97	3,43	13,27	3,55	3,74	12,90	3,17	4,06	12,74	2,89	4,41	11,12	2,64	4,21
	25/17	14,32	6,82	2,10	13,87	5,17	2,68	13,54	4,27	3,17	13,23	3,84	3,44	12,85	3,44	3,74	12,67	3,14	4,03	/	/	/
	30/21	13,95	7,83	1,78	13,49	6,06	2,23	13,13	4,91	2,67	12,80	4,38	2,92	12,43	3,90	3,18	/	/	/	/	/	/
	35/24	13,22	9,58	1,38	12,81	7,19	1,78	12,42	5,57	2,23	/	/	/	/	/	/	/	/	/	/	/	/
8.1/8.1T	-25/-	8,83	1,74	5,08	8,45	1,48	5,70	8,18	1,30	6,30	/	/	/	/	/	/	/	/	/	/	/	/
	-20/-20,1	10,56	1,96	5,39	10,59	1,78	5,94	9,82	1,56	6,28	9,37	1,45	6,45	8,66	1,39	6,21	/	/	/	/	/	/
	-15/-15,3	11,96	2,27	5,28	11,60	1,90	6,11	11,19	1,79	6,26	10,45	1,67	6,24	9,67	1,52	6,36	9,17	1,53	5,99	/	/	/
	-10/-11	12,55	2,33	5,39	12,08	2,04	5,92	11,30	1,90	5,95	10,85	1,75	6,20	10,37	1,72	6,02	9,99	1,67	5,98	9,69	1,43	6,79
	-7/-8	13,18	2,48	5,31	12,50	2,25	5,56	12,40	2,05	6,05	11,65	1,84	6,32	10,85	1,79	6,05	10,61	1,73	6,14	10,06	1,57	6,42
	-5/-6	13,38	2,62	5,10	12,89	2,25	5,72	11,85	2,09	5,68	11,39	1,87	6,10	10,83	1,81	5,98	10,38	1,75	5,92	9,71	1,63	5,94
	-2/-3	13,78	2,87	4,81	13,28	2,45	5,43	12,28	2,18	5,64	11,54	1,97	5,86	10,89	1,90	5,72	10,45	1,79	5,84	9,71	1,65	5,89
	0/-1	14,05	3,03	4,64	13,57	2,59	5,24	12,91	2,26	5,70	11,91	2,04	5,83	11,29	1,94	5,83	10,45	1,82	5,73	9,68	1,67	5,79
	2/1	14,27	3,20	4,46	13,77	2,73	5,04	13,10	2,45	5,35	12,18	2,14	5,70	11,32	2,01	5,63	10,68	1,88	5,70	9,72	1,69	5,74
	5/4	15,77	3,72	4,24	15,19	3,15	4,83	14,74	2,66	5,54	14,19	2,49	5,70	13,21	2,36	5,60	12,90	2,13	6,07	11,59	1,89	6,15
	7/6	17,57	4,13	4,25	16,85	3,47	4,85	16,00	2,81	5,70	15,59	2,63	5,93	14,71	2,43	6,06	13,59	2,19	6,22	12,36	1,92	6,43
	10/8	18,31	4,58	4,00	17,50	3,81	4,60	16,89	3,14	5,38	16,34	2,82	5,79	15,00	2,61	5,75	13,71	2,44	5,61	11,91	2,10	5,68
	12/9	18,87	4,93	3,82	18,04	4,07	4,43	17,36	3,38	5,13	16,78	3,05	5,50	15,35	2,72	5,65	13,87	2,58	5,38	12,40	2,23	5,56
	15/12	17,44	5,10	3,42	16,72	4,20	3,98	16,14	3,53	4,58	15,61	3,14	4,97	15,04	2,81	5,36	14,32	2,64	5,42	12,88	2,31	5,57
	20/15	15,44	5,70	2,71	15,01	4,62	3,25	14,72	3,79	3,88	14,03	3,35	4,18	13,09	3,06	4,27	13,14	2,86	4,60	11,12	2,64	4,21
	25/17	15,82	6,18	2,56	15,36	4,99	3,08	15,00	4,14	3,63	14,67	3,73	3,93	14,27	3,31	4,32	13,45	3,12	4,32	/	/	/
	30/21	14,95	7,47	2,00	14,48	5,86	2,47	14,09	4,75	2,97	13,75	4,24	3,24	13,37	3,79	3,52	/	/	/	/	/	/
	35/24	13,82	9,45	1,46	13,38	7,10	1,88	12,99	5,50	2,36	/	/	/	/	/	/	/	/	/	/	/	/

kWt: delivered heat capacity [kW].

kWe: electrical power absorbed [kW].

Tae: outdoor air temperature [°C].

Performance in relation to the difference between inlet and outlet water temperature = 5 °C

Note: Data are at maximum operation according to EN 14511:2002

The values indicate the integrated heat capacity: the current heat capacity considering any defrosting cycles

**!** At maximum operating conditions, the unit operates at maximum frequency (data in performance tables) as opposed to nominal operating conditions (general technical data) where it operates at partial frequency.

# Technical data

## Data for calculation UNI/TS 11300-4

### Data for Energy Certification

Data to be used for the calculation of the energy performance of the building, referring to the energy efficiency of heat pump generation. The data provided can be used for calculation according to UNI/TS 11300 - part 4 and refer to the conditions defined in UNI EN 14825. *The data may be updated by the manufacturer in the event of updates to the range without obligation of prior notice.*

### Performance at full load in heating mode

Heating capacity and COP at full load, under the conditions defined in EN 14825.

Sizes	Outdoor air temp	Heating						Outdoor air temp.	DHW	
		Supply water temperature							Supply water temperature	
		35°C		45°C		55°C			55°C	
		Heating capacity ΦH,HP out [kW]	COP	Heating capacity ΦH,HP out [kW]	COP	Heating capacity ΦH,HP out [kW]	COP		Heating capacity ΦH,HP out [kW]	COP
2.1	-7 °C	4,50	3,10	4,70	2,70	4,70	2,20	7°C	4,60	3,19
	2 °C	4,40	4,11	4,40	3,36	4,60	2,71	15°C	4,83	3,80
	7 °C	4,50	5,17	4,50	4,05	4,60	3,19	20°C	4,60	4,06
	12 °C	4,49	6,01	4,43	4,64	4,69	3,69	35°C	5,73	5,40
3.1	-7 °C	5,90	2,95	5,50	2,50	5,20	2,16	7°C	6,20	3,10
	2 °C	5,60	3,89	5,80	3,10	5,80	2,65	15°C	6,25	3,76
	7 °C	6,20	4,88	6,40	3,81	6,20	3,10	20°C	6,24	4,02
	12 °C	6,24	5,77	6,35	4,53	6,20	3,66	35°C	6,18	5,39
4.1	-7 °C	7,00	3,00	7,10	2,30	6,90	2,15	7°C	7,80	3,20
	2 °C	7,10	3,86	7,70	3,00	7,80	2,55	15°C	7,85	4,13
	7 °C	8,40	5,00	8,20	3,85	7,80	3,20	20°C	7,78	4,49
	12 °C	8,34	6,33	8,36	4,89	8,05	4,02	35°C	8,10	5,78
5.1	-7 °C	8,00	2,85	7,60	2,25	7,40	2,10	7°C	9,50	3,05
	2 °C	8,20	3,64	8,20	2,95	8,40	2,50	15°C	9,24	3,83
	7 °C	10,00	4,69	10,00	3,65	9,50	3,05	20°C	9,07	4,14
	12 °C	9,70	5,81	9,63	4,49	9,24	3,70	35°C	9,13	5,55
6.1	-7 °C	10,00	2,80	10,50	2,45	10,40	2,15	7°C	12,00	3,10
	2 °C	9,10	3,80	11,30	2,90	11,30	2,55	15°C	11,92	4,14
	7 °C	12,00	4,80	12,00	3,70	12,00	3,10	20°C	11,87	4,32
	12 °C	12,12	5,91	11,90	4,63	11,96	3,75	35°C	11,85	5,67
7.1	-7 °C	11,50	2,70	11,40	2,30	11,30	2,10	7°C	14,00	3,00
	2 °C	10,10	3,60	12,00	2,85	12,00	2,50	15°C	14,16	3,68
	7 °C	14,00	4,50	14,00	3,50	14,00	3,00	20°C	13,59	4,00
	12 °C	13,98	5,72	14,11	4,44	13,93	3,64	35°C	12,42	5,66
8.1	-7 °C	12,70	2,50	12,50	2,25	12,40	2,05	7°C	15,00	2,85
	2 °C	12,80	3,20	13,10	2,75	13,10	2,45	15°C	14,95	3,61
	7 °C	15,00	4,40	15,00	3,35	15,00	2,85	20°C	14,72	3,66
	12 °C	15,01	5,52	15,12	4,34	15,00	3,56	35°C	12,99	5,56
6.1T	-7 °C	10,00	2,80	10,50	2,45	10,40	2,15	7°C	12,00	3,10
	2 °C	9,10	3,80	11,30	2,90	11,30	2,55	15°C	11,92	4,14
	7 °C	12,00	4,80	12,00	3,70	12,00	3,10	20°C	11,87	4,32
	12 °C	12,12	5,91	11,90	4,63	11,96	3,75	35°C	11,85	5,67
7.1T	-7 °C	11,50	2,70	11,40	2,30	11,30	2,10	7°C	14,00	3,00
	2 °C	10,10	3,60	12,00	2,85	12,00	2,50	15°C	14,16	3,68
	7 °C	14,00	4,50	14,00	3,50	14,00	3,00	20°C	13,59	4,00
	12 °C	13,98	5,72	14,11	4,44	13,93	3,64	35°C	12,42	5,66

Sizes	Out-door air temp	Heating						Out-door air temp.	DHW	
		Supply water temperature							Supply water temperature	
		35°C		45°C		55°C			55°C	
		Heating capacity ΦH,HP out [kW]	COP	Heating capacity ΦH,HP out [kW]	COP	Heating capacity ΦH,HP out [kW]	COP		Heating capacity ΦH,HP out [kW]	COP
8.1T	-7 °C	12,70	2,50	12,50	2,25	12,40	2,05	7°C	15,00	2,85
	2 °C	12,80	3,20	13,10	2,75	13,10	2,45	15°C	14,95	3,61
	7 °C	15,00	4,40	15,00	3,35	15,00	2,85	20°C	14,72	3,66
	12 °C	15,01	5,52	15,12	4,34	15,00	3,56	35°C	12,99	5,56

## Performance with partial loads in Heating mode

Standard UNI/TS 11300 - part 4, taking the Average climate according to UNI EN 14825 as reference, defines a design temperature of -10 °C and operating conditions A = -7 °C (bivalent temperature), B = 2 °C, C = 7 °C and D = 12 °C.

The Load Factor (CR) is calculated for each condition; this is the ratio between the load required by the system and the maximum power that can be delivered by the unit. CR therefore represents the unit's capacity to partialise.

Similarly, the Correction Factor (f<sub>cop</sub>), is the ratio between the efficiency of partialisation and the efficiency at full load.

Size 2.1	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	4,50	4,40	4,50	4,49
CR - Load factor of the heat pump	>1	1,00	0,63	0,40	0,17
P - Load of the system	-	4,50	2,75	2,72	3,14
COP - Efficiency with partial load	-	3,10	5,04	5,84	5,73
COP' - Efficiency with full load	-	3,10	4,11	5,17	6,01
f <sub>cop</sub> - Correction factor	1	1,00	1,23	1,13	0,95

Size 6.1	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	10,00	9,10	12,00	12,12
CR - Load factor of the heat pump	>1	1,00	0,67	0,33	0,14
P - Load of the system	-	10,00	6,73	5,23	5,34
COP - Efficiency with partial load	-	2,80	4,55	5,73	4,60
COP' - Efficiency with full load	-	2,80	3,80	4,80	5,91
f <sub>cop</sub> - Correction factor	1	1,00	1,20	1,19	0,78

Size 3.1	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	5,90	5,60	6,20	6,24
CR - Load factor of the heat pump	>1	1,00	0,65	0,38	0,16
P - Load of the system	-	5,90	3,71	2,72	3,15
COP - Efficiency with partial load	-	2,95	4,73	5,94	5,69
COP' - Efficiency with full load	-	2,95	3,89	4,88	5,77
f <sub>cop</sub> - Correction factor	1	1,00	1,22	1,22	0,99

Size 7.1	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	11,50	10,10	14,00	13,98
CR - Load factor of the heat pump	>1	1,00	0,70	0,33	0,14
P - Load of the system	-	11,50	7,55	5,25	5,23
COP - Efficiency with partial load	-	2,70	4,45	5,85	4,62
COP' - Efficiency with full load	-	2,70	3,60	4,50	5,72
f <sub>cop</sub> - Correction factor	1	1,00	1,24	1,30	0,81

Size 4.1	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	7,00	7,10	8,40	8,34
CR - Load factor of the heat pump	>1	1,00	0,60	0,33	0,14
P - Load of the system	-	7,00	4,53	3,96	4,51
COP - Efficiency with partial load	-	3,00	5,10	6,22	6,04
COP' - Efficiency with full load	-	3,00	3,86	5,00	6,33
f <sub>cop</sub> - Correction factor	1	1,00	1,32	1,24	0,95

Size 8.1	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	12,70	12,80	15,00	15,01
CR - Load factor of the heat pump	>1	1,00	0,61	0,34	0,14
P - Load of the system	-	12,70	8,00	5,26	5,28
COP - Efficiency with partial load	-	2,50	4,40	7,12	4,74
COP' - Efficiency with full load	-	2,50	3,20	4,40	5,52
f <sub>cop</sub> - Correction factor	1	1,00	1,38	1,62	0,86

Size 5.1	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	8,00	8,20	10,00	9,70
CR - Load factor of the heat pump	>1	1,00	0,60	0,32	0,14
P - Load of the system	-	8,00	5,10	3,96	9,56
COP - Efficiency with partial load	-	2,85	4,96	6,15	5,93
COP' - Efficiency with full load	-	2,85	3,64	4,69	5,81
f <sub>cop</sub> - Correction factor	1	1,00	1,36	1,31	1,02

Size 6.1T	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	10,00	9,10	12,00	12,12
CR - Load factor of the heat pump	>1	1,00	0,67	0,33	0,14
P - Load of the system	-	10,00	6,73	5,23	5,34
COP - Efficiency with partial load	-	2,80	4,55	5,73	4,60
COP' - Efficiency with full load	-	2,80	3,80	4,80	5,91
f <sub>cop</sub> - Correction factor	1	1,00	1,20	1,19	0,78



Size 7.1T	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	11,50	10,10	14,00	13,98
CR - Load factor of the heat pump	>1	1,00	0,70	0,33	0,14
P - Load of the system	-	11,50	7,55	5,25	5,23
COP - Efficiency with partial load	-	2,70	4,45	5,85	4,62
COP' - Efficiency with full load	-	2,70	3,60	4,50	5,72
f <sub>COP</sub> - Correction factor	1	1,00	1,24	1,30	0,81

Size 8.1T	T <sub>designh</sub>	A	B	C	D
Outdoor air temperature	-10 °C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load	-	12,70	12,80	15,00	15,01
CR - Load factor of the heat pump	>1	1,00	0,61	0,34	0,14
P - Load of the system	-	12,70	8,00	5,26	5,28
COP - Efficiency with partial load	-	2,50	4,40	7,12	4,74
COP' - Efficiency with full load	-	2,50	3,20	4,40	5,52
f <sub>COP</sub> - Correction factor	1	1,00	1,38	1,62	0,86

# Technical data

## Performance in cooling

### Maximum operating data according to EN 14511:2022

The data shown in the "Performance Tables" are at the maximum operating conditions of the unit, i.e. at the maximum frequency.

The data shown in the "General technical data" are at the nominal operating conditions of the unit, i.e. at a lower partial frequency than the maximum frequency.

For this reason, nominal data typically have lower powers but optimized efficiencies as opposed to maximum data where power is at maximum level.

Sizes	Tae	Water supply temperature (°C)																	
		5			7			10			12			15			18		
		°C	kWf	EER	kWe	kWf	EER	kWe	kWf	EER	kWe	kWf	EER	kWe	kWf	EER	kWe	kWf	EER
2.1	-5	/	/	/	/	/	/	/	/	/	/	/	/	5,11	12,92	0,40	5,35	13,33	0,40
	0	/	/	/	/	/	/	/	/	/	/	/	/	4,70	10,44	0,45	5,45	12,42	0,44
	5	/	/	/	/	/	/	/	/	/	/	/	/	4,60	9,92	0,46	5,60	11,68	0,48
	10	/	/	/	/	/	/	/	/	/	4,40	8,40	0,52	4,46	10,22	0,44	5,66	10,75	0,53
	15	/	/	/	/	/	/	4,75	7,31	0,65	4,89	7,55	0,65	5,39	8,48	0,64	5,91	9,55	0,62
	19	4,48	5,70	0,79	4,76	6,06	0,78	5,23	6,68	0,78	5,40	6,90	0,78	5,96	7,75	0,77	6,51	8,54	0,76
	20	4,53	5,50	0,82	4,81	5,84	0,82	5,30	6,43	0,82	5,46	6,63	0,82	6,03	7,42	0,81	6,59	8,15	0,81
	25	4,96	4,59	1,08	5,28	4,85	1,09	5,81	5,27	1,10	5,99	5,42	1,11	6,75	6,03	1,12	7,18	6,49	1,11
	30	5,23	3,92	1,33	5,57	4,13	1,35	6,13	4,46	1,37	6,32	4,57	1,38	7,13	5,04	1,41	7,78	5,42	1,44
	35	5,31	3,38	1,57	5,66	3,54	1,60	6,22	3,80	1,64	6,41	3,89	1,65	7,18	4,24	1,70	7,84	4,52	1,73
	40	4,99	2,96	1,69	5,33	3,10	1,72	5,86	3,32	1,77	6,04	3,39	1,78	6,79	3,69	1,84	7,41	3,92	1,89
	43	4,80	2,73	1,76	5,13	2,86	1,80	5,63	3,05	1,85	5,82	3,12	1,86	6,54	3,39	1,93	7,13	3,60	1,98
	46	4,49	2,55	1,76	4,79	2,67	1,80	5,27	2,86	1,85	5,44	2,92	1,86	6,14	3,18	1,93	6,70	3,38	1,98
3.1	-5	/	/	/	/	/	/	/	/	/	/	/	/	5,89	11,26	0,52	6,37	13,02	0,49
	0	/	/	/	/	/	/	/	/	/	/	/	/	5,78	10,21	0,57	6,28	12,03	0,52
	5	/	/	/	/	/	/	/	/	/	/	/	/	5,54	9,43	0,59	6,02	10,55	0,57
	10	/	/	/	/	/	/	/	/	/	4,94	8,34	0,59	5,40	9,31	0,58	5,89	10,67	0,55
	15	/	/	/	/	/	/	5,72	6,98	0,82	5,89	7,19	0,82	6,45	8,01	0,81	7,04	8,77	0,80
	19	5,40	5,20	1,04	5,76	5,51	1,04	6,31	5,99	1,05	6,50	6,16	1,06	7,13	6,77	1,05	7,79	7,37	1,06
	20	5,54	5,02	1,10	5,90	5,31	1,11	6,47	5,76	1,12	6,68	5,93	1,13	7,32	6,51	1,13	7,98	7,04	1,13
	25	6,10	4,08	1,49	6,50	4,29	1,52	7,16	4,66	1,54	7,39	4,78	1,55	8,30	5,16	1,61	9,03	5,48	1,65
	30	6,67	3,44	1,94	7,11	3,60	1,97	7,80	3,85	2,03	7,98	3,85	2,07	8,99	4,17	2,16	9,77	4,40	2,22
	35	6,70	2,91	2,30	7,14	3,01	2,38	7,80	3,17	2,46	8,04	3,23	2,49	8,99	3,45	2,61	9,75	3,62	2,70
	40	5,44	2,80	1,95	5,82	2,94	1,98	6,40	3,14	2,04	6,61	3,21	2,06	7,42	3,44	2,16	8,07	3,63	2,22
	43	4,86	2,67	1,82	5,19	2,79	1,86	5,70	2,98	1,91	5,88	3,05	1,93	6,60	3,30	2,00	7,20	3,50	2,06
	46	4,49	2,55	1,76	4,79	2,67	1,80	5,27	2,86	1,85	5,44	2,92	1,86	6,14	3,18	1,93	6,70	3,38	1,98
4.1	-5	/	/	/	/	/	/	/	/	/	/	/	/	7,35	12,33	0,60	8,01	12,52	0,64
	0	/	/	/	/	/	/	/	/	/	/	/	/	6,42	11,11	0,58	7,03	10,94	0,64
	5	/	/	/	/	/	/	/	/	/	/	/	/	6,23	9,90	0,63	6,84	10,11	0,68
	10	/	/	/	/	/	/	/	/	/	6,21	8,12	0,77	6,48	9,12	0,71	6,87	9,61	0,71
	15	/	/	/	/	/	/	7,20	7,48	0,96	7,33	7,35	1,00	8,27	8,35	0,99	9,03	8,42	1,07
	19	6,76	5,39	1,26	7,18	5,73	1,25	7,91	6,32	1,25	8,04	6,21	1,30	8,48	7,46	1,14	8,83	7,16	1,23
	20	6,82	5,18	1,32	7,24	5,51	1,31	7,97	6,06	1,32	8,29	6,12	1,35	8,71	6,99	1,25	8,90	6,83	1,30
	25	7,29	4,26	1,71	7,78	4,50	1,73	8,54	4,88	1,75	8,83	5,02	1,76	9,93	5,59	1,78	10,84	6,05	1,79
	30	7,67	3,57	2,15	8,17	3,76	2,17	9,00	4,08	2,20	9,25	4,15	2,23	10,38	4,55	2,28	11,39	4,91	2,32
	35	7,69	3,02	2,55	8,19	3,17	2,59	8,98	3,39	2,65	9,26	3,47	2,67	10,45	3,79	2,76	11,36	4,03	2,82
	40	6,76	2,77	2,44	7,23	2,92	2,48	7,95	3,13	2,54	8,17	3,19	2,57	9,25	3,49	2,65	10,09	3,72	2,71
	43	6,18	2,63	2,35	6,60	2,76	2,39	7,26	2,96	2,45	7,50	3,04	2,47	8,49	3,33	2,55	9,28	3,56	2,61
	46	5,26	2,55	2,06	5,63	2,68	2,10	6,20	2,89	2,14	7,20	2,79	2,58	8,20	3,08	2,66	7,96	3,52	2,26
5.1	-5	/	/	/	/	/	/	/	/	/	/	/	/	8,12	11,50	0,71	8,89	11,75	0,76
	0	/	/	/	/	/	/	/	/	/	/	/	/	8,05	10,55	0,76	8,79	10,74	0,82
	5	/	/	/	/	/	/	/	/	/	/	/	/	7,82	9,60	0,81	8,54	9,74	0,88
	10	/	/	/	/	/	/	/	/	/	6,74	7,92	0,85	7,65	8,65	0,88	8,36	8,73	0,96
	15	/	/	/	/	/	/	7,48	7,35	1,02	7,71	7,01	1,10	8,79	8,01	1,10	9,61	7,73	1,24
	19	7,06	5,21	1,36	7,54	5,55	1,36	8,30	6,11	1,36	8,56	6,16	1,39	9,69	7,00	1,38	10,60	6,92	1,53
	20	7,23	4,97	1,45	7,72	5,29	1,46	8,49	5,80	1,47	8,76	5,97	1,47	9,91	6,75	1,47	10,83	6,72	1,61
	25	7,81	4,09	1,91	8,33	4,32	1,93	9,15	4,68	1,96	9,43	4,80	1,96	10,66	5,39	1,98	11,55	5,70	2,03
	30	8,20	3,41	2,40	8,73	3,58	2,44	9,58	3,84	2,49	9,86	3,93	2,51	11,11	4,31	2,58	12,11	4,60	2,63
	35	8,23	2,88	2,86	8,90	3,25	2,74	9,60	3,22	2,98	9,90	3,29	3,01	11,16	3,58	3,12	12,13	3,79	3,20
	40	6,76	2,77	2,44	7,23	2,92	2,48	7,95	3,13	2,54	8,17	3,19	2,57	9,25	3,49	2,65	10,09	3,73	2,71
	43	6,18	2,63	2,35	6,60	2,76	2,39	7,26	2,96	2,45	7,50	3,03	2,47	8,49	3,33	2,55	9,28	3,56	2,61
	46	5,26	2,55	2,06	5,63	2,68	2,10	6,20	2,89	2,14	7,20	2,79	2,58	8,20	3,08	2,66	7,96	3,52	2,26

kWf: delivered cooling capacity [kW].

kWe: electrical power absorbed [kW].

Tae: outdoor air temperature [°C].

Performance in relation to the difference between inlet and outlet water temperature = 5 °C

Note: Data are at maximum operation according to EN 14511:2022



At maximum operating conditions, the unit operates at maximum frequency (data in performance tables) as opposed to nominal operating conditions (general technical data) where it operates at partial frequency.

Sizes	Tae	Water supply temperature (°C)																	
		5			7			10			12			15			18		
		°C	kWf	EER	kWe	kWf	EER	kWe	kWf	EER	kWe	kWf	EER	kWe	kWf	EER	kWe	kWf	EER
6.1/6.1T	-5	/	/	/	/	/	/	/	/	/	/	/	/	9,88	13,06	0,76	10,78	13,80	0,78
	0	/	/	/	/	/	/	/	/	/	/	/	/	10,00	12,18	0,82	10,91	13,36	0,82
	5	/	/	/	/	/	/	/	/	/	/	/	/	10,27	10,97	0,94	11,21	12,70	0,88
	10	/	/	/	/	/	/	/	/	/	8,97	9,13	0,98	10,10	9,60	1,05	11,05	11,69	0,94
	15	/	/	/	/	/	/	10,09	7,20	1,40	10,40	7,44	1,40	11,68	8,44	1,38	12,80	8,92	1,44
	19	9,56	5,20	1,84	10,19	5,53	1,84	11,19	6,08	1,84	11,54	6,27	1,84	13,03	7,14	1,83	14,21	7,83	1,81
	20	9,82	4,94	1,99	10,46	5,24	1,99	11,49	5,74	2,00	11,84	5,91	2,00	13,35	6,68	2,00	14,56	7,31	1,99
	25	10,63	3,97	2,68	11,32	4,18	2,71	12,40	4,51	2,75	12,78	4,63	2,76	14,35	5,11	2,81	15,67	5,52	2,84
	30	11,13	3,28	3,39	11,85	3,44	3,44	12,97	3,70	3,51	13,36	3,78	3,53	15,04	4,16	3,62	16,33	4,43	3,68
	35	11,25	2,79	4,03	11,96	2,92	4,10	13,05	3,10	4,21	13,44	3,17	4,24	15,26	3,57	4,27	16,40	3,66	4,48
	40	9,88	2,56	3,86	10,57	2,70	3,91	11,55	2,87	4,02	11,89	2,93	4,05	13,31	3,19	4,17	14,68	3,46	4,24
	43	8,60	2,45	3,51	9,13	2,55	3,58	10,04	2,74	3,66	10,34	2,80	3,69	11,58	3,05	3,80	12,60	3,24	3,88
	46	6,64	2,31	2,88	7,08	2,42	2,93	7,80	2,61	2,99	8,05	2,68	3,01	9,05	2,93	3,08	9,88	3,15	3,14
7.1/7.1T	-5	/	/	/	/	/	/	/	/	/	/	/	/	10,12	12,81	0,79	11,03	13,79	0,80
	0	/	/	/	/	/	/	/	/	/	/	/	/	10,25	12,02	0,85	11,18	13,24	0,84
	5	/	/	/	/	/	/	/	/	/	/	/	/	10,54	10,93	0,96	11,50	12,41	0,93
	10	/	/	/	/	/	/	/	/	/	9,45	9,04	1,04	10,63	9,39	1,13	11,63	11,13	1,05
	15	/	/	/	/	/	/	10,50	6,95	1,51	10,84	7,18	1,51	12,14	8,09	1,50	13,30	8,69	1,53
	19	10,25	4,96	2,06	10,92	5,26	2,07	11,99	5,77	2,08	12,36	5,95	2,08	13,94	6,72	2,07	15,18	7,39	2,05
	20	10,32	4,77	2,16	11,00	5,06	2,17	12,07	5,53	2,18	12,45	5,69	2,19	14,02	6,39	2,19	15,34	6,94	2,21
	25	11,21	3,79	2,96	11,93	3,99	2,99	13,07	4,30	3,04	13,46	4,41	3,05	15,09	4,84	3,12	16,47	5,22	3,16
	30	11,92	3,11	3,83	12,67	3,25	3,89	13,86	3,48	3,98	14,27	3,56	4,01	16,05	3,89	4,12	17,48	4,16	4,21
	35	11,98	2,65	4,52	12,70	2,90	4,38	13,87	2,92	4,74	14,38	3,00	4,80	16,03	3,24	4,95	17,33	3,41	5,09
	40	9,88	2,56	3,86	10,57	2,70	3,91	11,55	2,87	4,02	11,89	2,93	4,05	13,31	3,19	4,17	14,68	3,46	4,24
	43	8,60	2,45	3,51	9,13	2,55	3,58	10,04	2,74	3,66	10,34	2,80	3,69	11,58	3,05	3,80	12,60	3,24	3,88
	46	6,64	2,31	2,88	7,08	2,42	2,93	7,80	2,61	2,99	8,05	2,68	3,01	9,05	2,93	3,08	9,88	3,15	3,14
8.1/8.1T	-5	/	/	/	/	/	/	/	/	/	/	/	/	10,20	12,50	0,82	11,10	13,06	0,85
	0	/	/	/	/	/	/	/	/	/	/	/	/	10,50	11,74	0,89	11,44	12,66	0,90
	5	/	/	/	/	/	/	/	/	/	/	/	/	10,81	10,66	1,01	11,79	12,02	0,98
	10	/	/	/	/	/	/	/	/	/	10,22	8,84	1,16	11,46	9,04	1,27	12,30	10,91	1,13
	15	/	/	/	/	/	/	11,32	6,92	1,64	11,67	7,15	1,63	13,11	7,97	1,64	14,30	8,45	1,69
	19	11,00	4,80	2,29	11,72	5,10	2,30	12,86	5,57	2,31	13,26	5,74	2,31	14,94	6,46	2,31	16,28	7,11	2,29
	20	11,22	4,57	2,45	11,95	4,84	2,47	13,12	5,28	2,49	13,52	5,43	2,49	15,19	6,09	2,49	16,58	6,61	2,51
	25	12,16	3,62	3,36	12,93	3,80	3,40	14,16	4,10	3,46	14,58	4,19	3,48	16,41	4,62	3,55	17,81	4,93	3,61
	30	13,12	2,95	4,44	13,94	3,09	4,52	15,23	3,29	4,62	15,68	3,37	4,66	17,63	3,68	4,80	19,18	3,91	4,90
	35	13,41	2,55	5,26	14,26	2,60	5,48	15,55	2,76	5,63	15,99	2,81	5,69	17,42	3,07	5,68	18,64	3,32	5,62
	40	10,48	2,51	4,17	11,13	2,61	4,26	12,23	2,73	4,48	12,64	2,78	4,55	14,12	3,14	4,50	15,34	3,34	4,59
	43	9,13	2,39	3,82	9,71	2,50	3,89	10,67	2,69	3,97	10,99	2,74	4,01	12,33	3,00	4,12	13,42	3,19	4,21
	46	7,02	2,19	3,21	7,48	2,30	3,26	8,24	2,48	3,32	8,51	2,54	3,35	9,56	2,79	3,43	10,43	2,99	3,49

kWf: delivered cooling capacity [kW].

kWe: electrical power absorbed [kW].

Tae: outdoor air temperature [°C].

Performance in relation to the difference between inlet and outlet water temperature = 5 °C

Note: Data are at maximum operation according to EN 14511:2002

⚠ At maximum operating conditions, the unit operates at maximum frequency (data in performance tables) as opposed to nominal operating conditions (general technical data) where it operates at partial frequency.

# Technical data

## Data for calculation UNI/TS 11300-3

### Performance with partial loads in Cooling mode

UNI/TS 11300 - part 3 is the reference standard to be considered for the evaluation of operation of the unit at partial loads in Cooling mode. It indicates the operating temperatures and load factors (100 per cent, 75 per cent, 50 per cent and 25 per cent) to be used, based on the conditions of standard UNI EN 14825.

EER efficiency indices are calculated for each condition for assessing the actual performance of the unit.

Condition	Cooling capacity [kW]				EER			
	1	2	3	4	1	2	3	4
Load factor	100%	75%	50%	25%	100%	75%	50%	25%
<b>Size 2.1</b>	4,70	3,57	2,88	2,88	3,65	4,73	6,16	7,34
<b>Size 3.1</b>	6,80	5,22	3,23	2,89	3,10	4,58	6,19	7,35
<b>Size 4.1</b>	7,50	5,74	3,80	4,32	3,45	4,89	6,68	9,13
<b>Size 5.1</b>	8,90	6,85	4,36	4,32	2,74	4,61	5,98	9,13
<b>Size 6.1</b>	11,56	8,58	5,71	5,15	2,99	4,61	6,16	7,34
<b>Size 7.1</b>	12,70	9,72	6,19	5,18	2,90	4,43	6,05	6,88
<b>Size 8.1</b>	14,00	10,78	6,94	5,20	2,75	4,22	6,06	6,93
<b>Size 6.1T</b>	11,56	8,58	5,71	5,15	2,99	4,61	6,16	7,34
<b>Size 7.1T</b>	12,70	9,72	6,19	5,18	2,90	4,43	6,05	6,88
<b>Size 8.1T</b>	14,00	10,78	6,94	5,20	2,75	4,22	6,06	6,93

Points calculated for fixed capacity systems according to prEN 14825:2018 referred to in UNI TS 11300-3

Reference conditions:

1. inlet/outlet water temperature 12/7 °C, outdoor air temperature 35 °C dry bulb
2. outlet water temperature 7 °C, outdoor air temperature 30 °C dry bulb
3. outlet water temperature 7 °C, outdoor air temperature 25 °C dry bulb
4. outlet water temperature 7 °C, outdoor air temperature 20 °C dry bulb

## Mandatory accessories

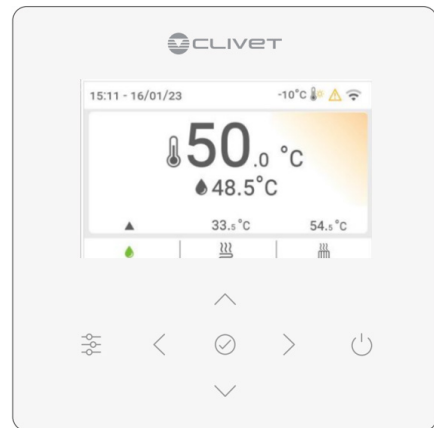
The user interface (HMI) is supplied separately as an accessory.

In order to configure the unit correctly, it will be necessary when ordering to select the unit of the desired size and, among the accessories, the user interface in the desired colour.

The user interface is available in 2 colours:

- HMINX - KJRH-120L control black
- HMIX - KJRH-120L control black

 For more information about this accessory, please refer to the Edge F technical bulletin.



# Configuration and accessories

## Configuration with integrated electric heater

Configuration where the heat pump and electric heater work together.

The unit's logic manages the ON/OFF function of the heater, which can support, replace or back up the heat pump and can work in Heating mode only, DHW mode only or both modes.

**!** The configuration with backup electric heater excludes the hybrid version with boiler.

### Heater installation and operation

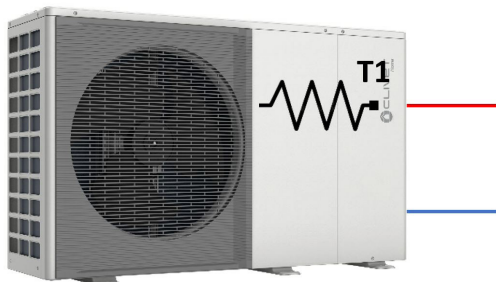
The heater must be positioned on the unit's water supply line and can be::

- Factory-mounted on the unit (**IBH** configuration)
- For outdoor installation (**IBHX/IBHTX** accessory)

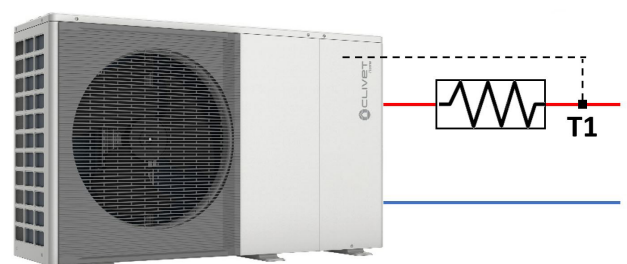
In both cases, its operation is linked to a dedicated T1 temperature probe to be positioned downstream of the heater.

(Note: the T1 probe is included in the Clivet configuration and accessories and does not need to be selected separately)

**Configuration**



**Accessory**



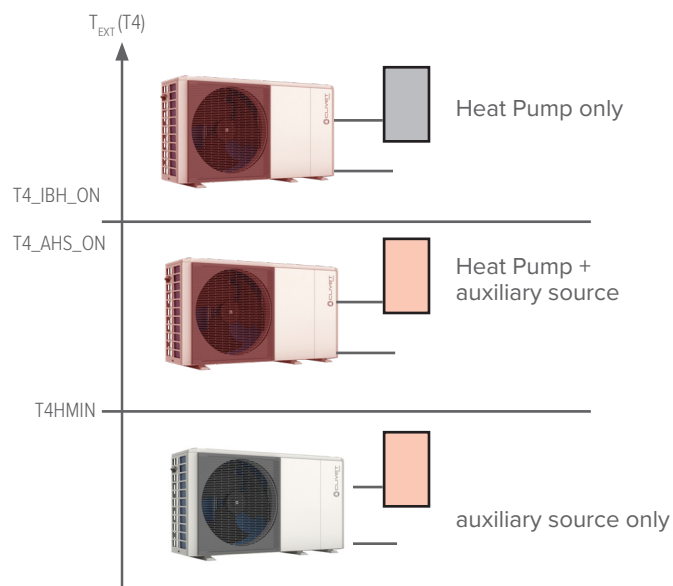
**!** Caution: during operation in cooling mode of systems with boilers for centralised systems or heater, it is important not to circulate cold water in the boiler/heater, as there is a risk of condensation forming. It is advisable to install a thermostatic switching valve or a 3-way or 2-way valve controlled by a back-up relay on the boiler/heater branch.

Note: boilers for stand-alone systems do not need this safety feature as they are already equipped with a bypass valve

Activation of the auxiliary source is linked to the simultaneous presence of 3 conditions, each of which is associated with a parameter that can be adjusted during initial start-up on the user interface:

- **Very low outdoor temperature**

parameter T4\_IBH\_ON the minimum outdoor air temperature for heat pump operation only.



**!** To make the auxiliary source work only in replacement of the unit, set the parameter to the same value as T4HMIN (default -15 °C, can be adjusted to between -25 and 15); the minimum outdoor air temperature at which the heat pump can operate.

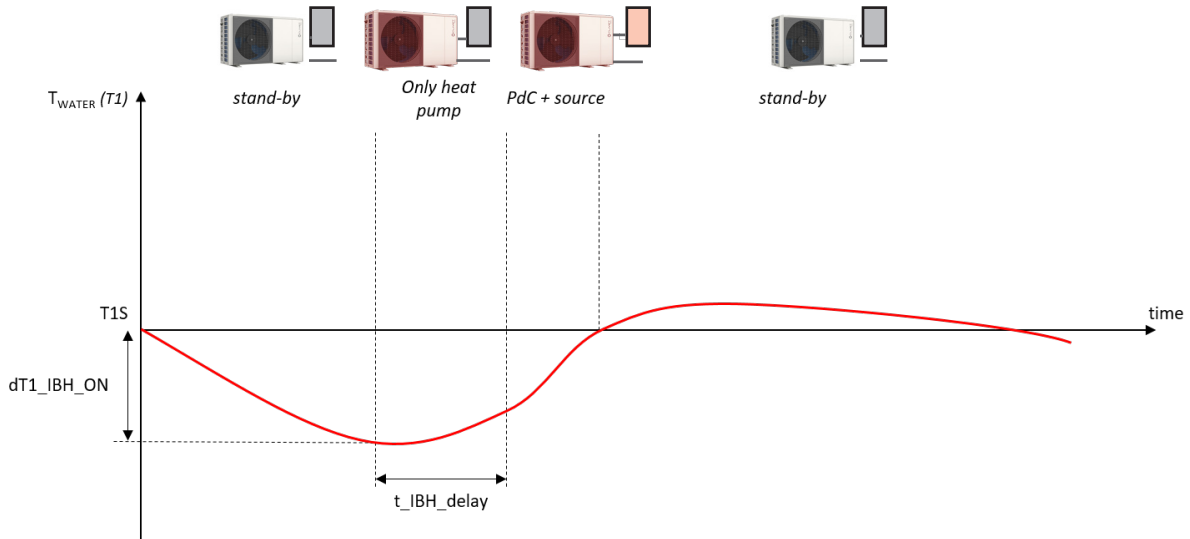
- **Supply temperature too far from the set-point**

parameter  $dT1\_IBH\_ON$ : the minimum  $\Delta T$  between water set-point  $TS1$  and supply of the unit  $T1$

- **Too long to reach the set-point**

parameter  $t\_IBH\_DELAY$ : the maximum delay between starting of the compressor and activation of the auxiliary source

⚠ The **BACKUP HEATER** function on the HMI allows activation of the IBH or AHS auxiliary source to be forced



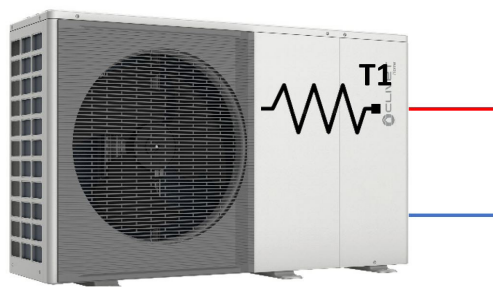
## Configuration with factory-mounted integrated electric heater (IBH)

Electric heater kit integrated in the body of the unit, factory-wired and already equipped with management probe  $T1$ .

In this configuration, the IBH is powered by the unit (the unit's F.L.A. must be taken as the sum of the refrigerant circuit's F.L.A. plus that of the IBH heater).

The capacity of the heater varies according to the size of the unit:

- **units 2.1 to 8.1: 3 kW heater (single-phase)**
- **units 6.1T to 8.1T: 3/6/9 kW heater with three selections (three-phase)**



The 9 kW heater version for three-phase units is equipped with one 3 kW and one 6 kW heater. One of three situations can be set during installation at the board of the unit:

- 3 kW in Heating and DHW mode
- 6 kW for heating and DHW
- 9 kW in Heating mode and 6 kW in DHW mode

In the latter case, only the 3 kW heater is switched on when heating is requested.

If the temperature does not rise sufficiently within a certain time, it is switched off and replaced by the 6 kW heater.

If again the temperature does not rise sufficiently within a certain time, the 3kW heater is also activated at the same time, so that a total of 9kW is provided for heating.



# Configuration and accessories

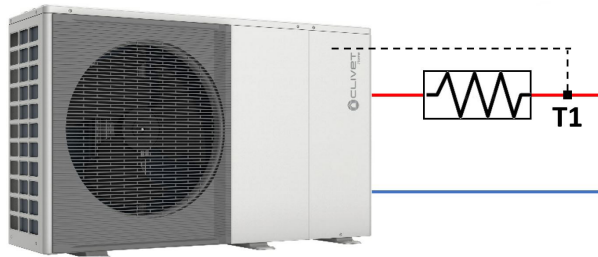
## Configuration with electric heater mounted outside the unit

In this configuration, the electric heater is **not powered by the unit** but by an external power supply.  
The following types of external electric heaters are available:

- **IBHX (single-phase power supply), with deliverable power of 2/4/6 kW**
- **IBHTX (three-phase + N power supply), with deliverable power of 3/6/9 kW**

During installation, it is possible to select a power by appropriately modifying the internal wiring and correctly selecting the protection fuses to be applied.

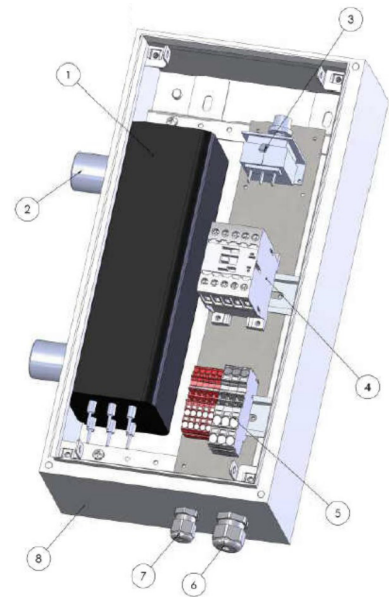
### Accessory



*Note: the kit requires field connection of the T1 control probe supplied as standard with the accessory*

The kit includes:

- Electric heater
- 1" 1/4 connections
- 85° C automatic reset safety thermostat
- 95° C non-automatic reset safety thermostat
- Safety contactor
- Painted steel casing
- water temperature NTC probe with 10 m cable, to be connected to the board of the unit in the field
- fuses (*various power ratings to protect all available configurations*)
- control contactor



## Hybrid configuration

Configuration where the heat pump and boiler work together. The boiler operates in support, as replacement or back-up to the heat pump. The logic of the heat pump controls the boilers with an ON/OFF signal to ensure optimal operation of the complete system. If the boiler is set up, the heat pump can control the set-point with a 0-10V signal.

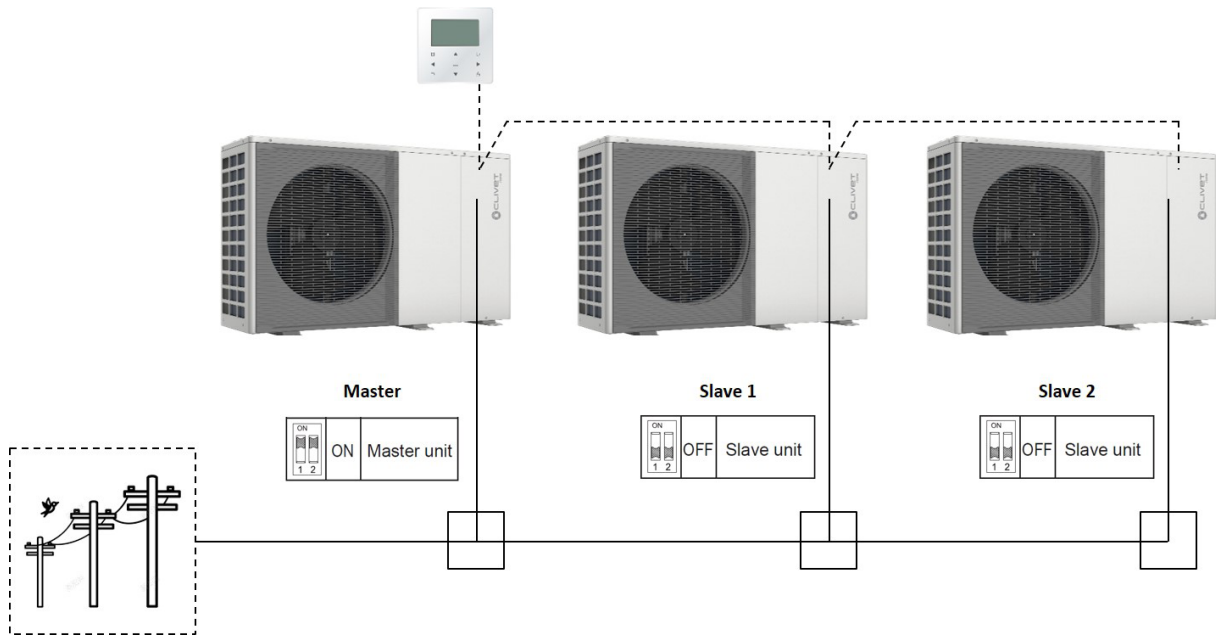
- ⚠ *The configuration with back-up electric heater excludes the hybrid version with boiler*
- ⚠ *Please refer to the EDGE EVO 2.0 bulletin for further information on accessories for the hybrid configuration.*

## Cascade management

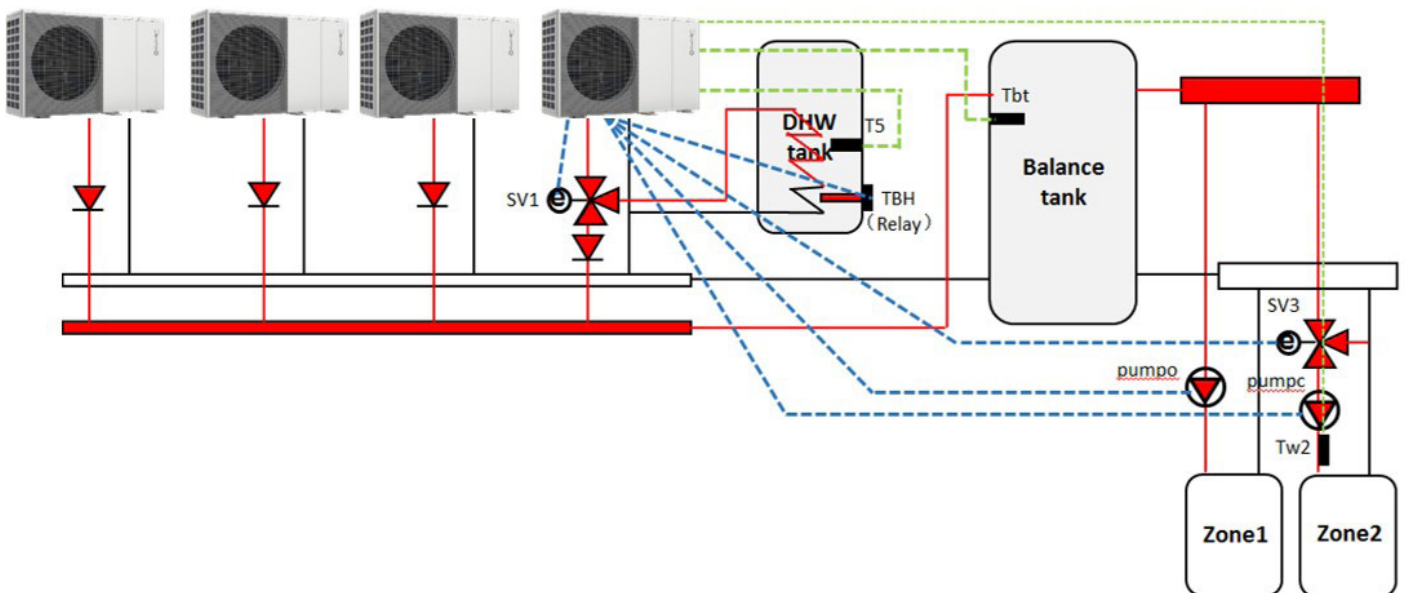
Many applications require units to be installed as back-up for the main system or have loads that can change significantly during annual operation. Cascade operation allows connection of up to 6 units in parallel, running a Master unit and activating the Slave units when its own capacity is not sufficient to meet the load of the system, ensuring maximum reliability and efficiency of the system.

The system rotates operation of all of the units by counting the compressor's operating hours, so as to use them evenly. In the event of failure of a unit, including the Master, the system ensures continuity of service.

Cascade management is provided as standard by the logic of the units; it must be set with the dip-switches (Master or Slave unit) on the board and all Slave units must be connected with a serial to the HMI of the Master. The slave units are automatically addressed by the Master at start-up.



The Master unit is the only one that can:



- receive signals (in green in the figure) from the optionally installed temperature probes: T5 of the DHW tank, Tbt1 of the hydraulic separator, Tsolar of the solar system and Tw2 of the supply of the mixed circuit
- manage the components of the system (in blue in the figure): SV1 3-way switching valve, heater of the TBH DHW tank, SV2 3-way switching valve for direct 2-zone systems or SV3 mixed circuit, P\_o secondary circuit pump, P\_c mixed circuit pump, P\_s solar pump, P\_d DHW recirculation pump and AHS auxiliary source
- receive external inputs: external ON/OFF signal via potential-free contact, signal from zone thermostat, Smart Grid signal and solar signal

*Note: each unit manages its own IBH additional electric heater, if present*

# Configuration and accessories

When the Master is started up, it calculates the load to be supplied and activates the necessary Slave units when its own capacity is insufficient to meet the load of the system, providing them with mode and set-point settings. Should the Master start several Slaves, these are activated with a 10-second delay between each one.

If a Slave fails to start for 10 minutes, the unit is considered out of service and the Master will try to activate the next Slave. After 20 minutes, the unit considered to have failed is reset in the system management.

*Note: In the event of failure of the Master's outdoor air probe, the Master will show the error on the display but will continue to operate using the average of the value detected in the Slave units.*

When the system is switched off, the Slaves send the cumulative running time of their compressor to the Master, which prioritises the one with the lower value the next time it starts up.

Only the Master is set to work also in DHW mode: in case of simultaneous demand in the system, the system works simultaneously producing DHW through the Master and Heating or Cooling in the system through the Slave.

Each unit normally manages its own defrosting cycles, but if the system is running with two or more units, the Master checks that the units defrosting at the same time are a maximum of 50 per cent (rounded down) of these.

It is also possible to set up a Slave unit to act as a back-up to the Master (set with the dip-switches), and continuity of service is guaranteed in case of failure of the Master. The back-up Master will require a second set of wiring for connecting the back-up SV1 valve and dedicated pipes for connection to the DHW tank.

Some operating parameters can be set at the HMI:

- PER\_START: coefficient used by the cascade adjustment logic to calculate how many units are activated at system start-up
- TIME\_ADJUST: the time during which the Master checks whether it is necessary to activate or deactivate a Slave

## Configuration with solar thermal circuit

As an option, the DHW boiler can be connected to a solar thermal panel system so that solar energy can be used for the production of DHW.

### Solar thermal panel installation and operation

The solar thermal panels must be hydraulically connected to appropriate double-coil DHW boilers via a circuit with a dedicated P<sub>s</sub> pump (from ELFOSun or other supply, with consent provided by the unit).

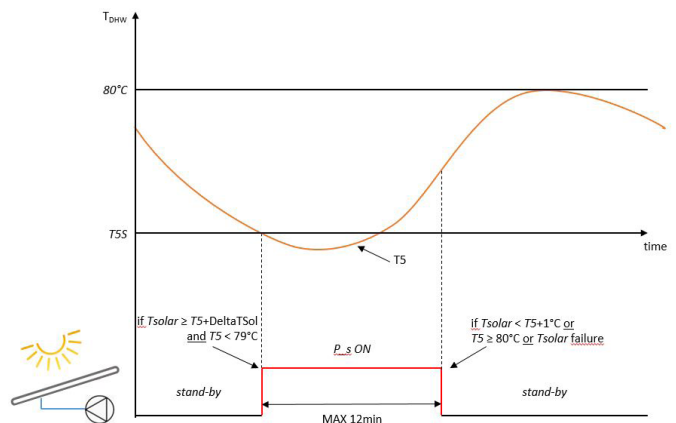
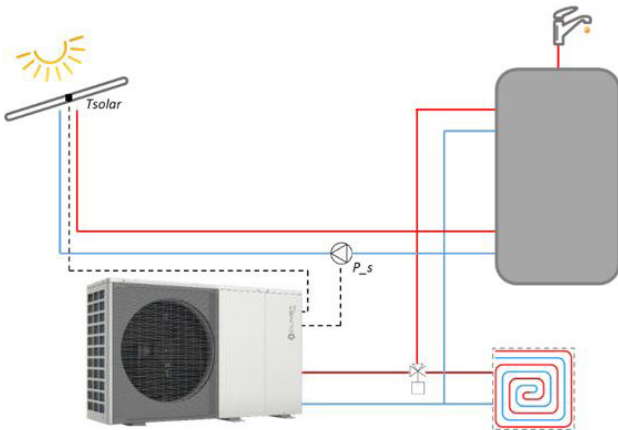
The solar system is set at the HMI, where it is possible to select between two types of control:

- DHW from both solar panels and heat pump: when there is a demand for DHW, the heat pump (and any other auxiliary sources) works normally, and the solar system can work alongside it, activating itself according to the unit's logic.
- DHW from solar panels only: heat pump and any other auxiliary sources cannot work in DHW mode, remaining available for the system. DHW is managed with only production from the solar system, which is activated according to the unit's logic.

**⚠** The Smart Grid function can still activate the heat pump and any auxiliary sources. TBH can be forced with the relevant function.

The F unit can control the P<sub>s</sub> solar circuit pump in three different ways:

1. The unit manages activation of the P<sub>s</sub> pump based on the value detected by the T<sub>solar</sub> temperature probe and the setting of the DELTATSOL parameter. DELTATSOL is the  $\Delta T$  between the temperature of the water in the T<sub>solar</sub> solar circuit and the T<sub>5</sub> temperature of the DHW boiler above which the P<sub>s</sub> pump is activated.
2. The unit manages activation of the P<sub>s</sub> pump via an external signal from the solar control box (ON/OFF signal). The solar control box detects the conditions for which the solar circuit pump is to be activated.
3. The solar circuit is fully managed by the ELFOSun external solar control box (see the specific Technical Bulletin for further details). In this case, it is not necessary to make any settings on the unit, as management is set directly on ELFOSun. Alternatively, a control box from an external supplier can also be used.



### Clivet solar thermal panels

#### ELFOSun<sup>3</sup>

Flat-plate solar thermal manifold for empty or pressurised systems for connection to domestic hot water production systems, with optional circulation kit consisting of pump unit, control unit and expansion tank. The panels can be combined in series (up to 5) and are suitable for horizontal or inclined installation with specific kits.

See the specific documentation for more details

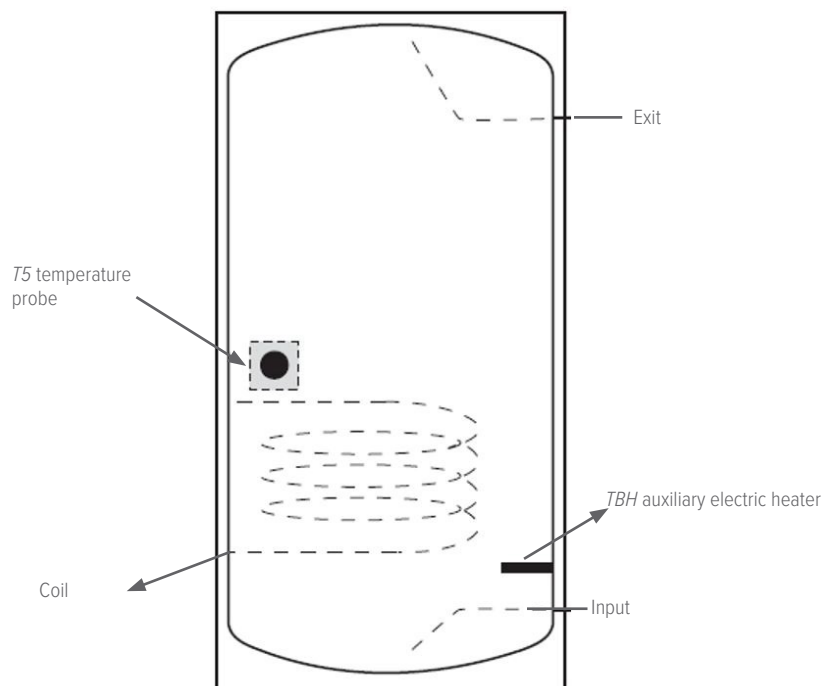


# Configuration and accessories

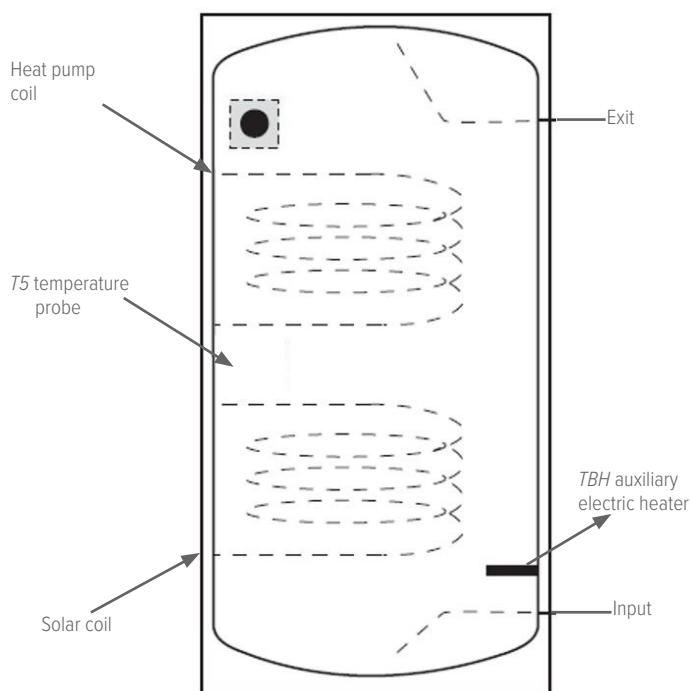
## Configuration with DHW boiler

As an option, the unit can be connected to a DHW storage tank of suitable volume, by fitting the system with a 3-way diverter valve controlled by the unit.

The standard boiler must have these characteristics:



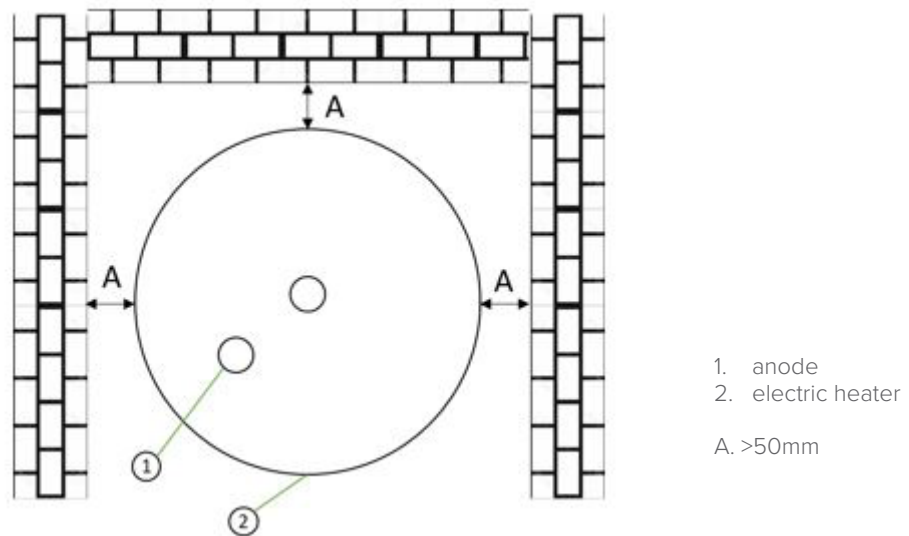
It is also possible to connect a boiler with additional coil for solar thermal circuit with these features:



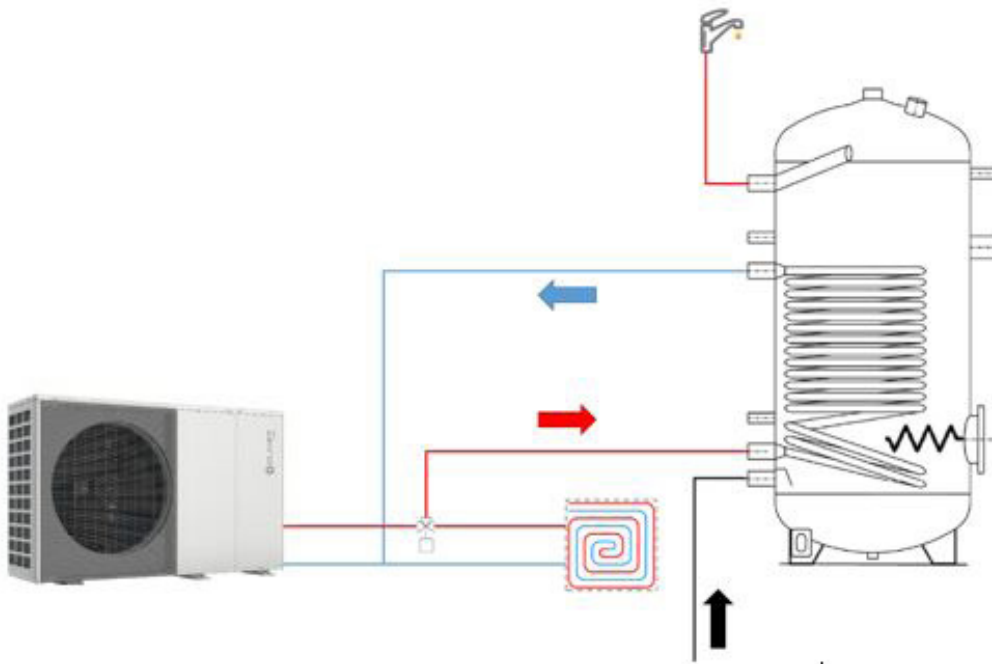
### DHW boiler installation and operation

It is advisable to connect the DHW tank at a distance of no more than 10 m from the unit, and preferably as close as possible to the unit. The sizing of the connecting pipes and their thermal insulation must always be considered with care, especially in the case of long distances between the unit and the storage tank.

Installation should be carried out bearing the inspection spaces in mind:

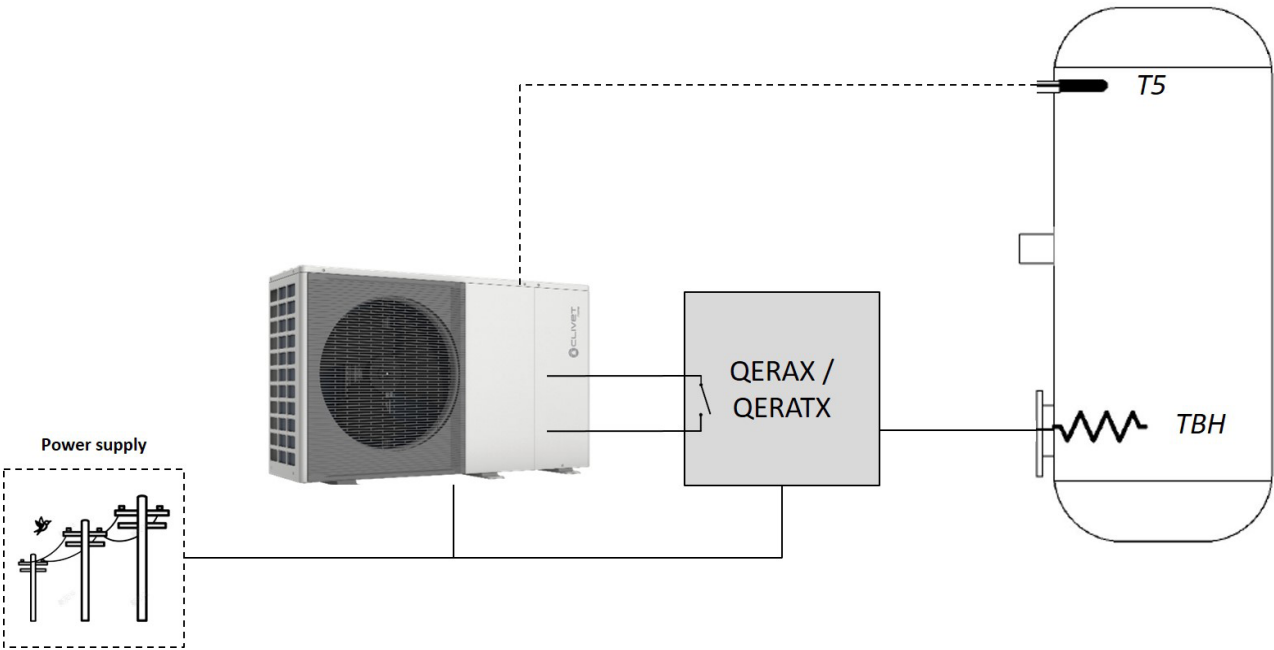


The hydraulic connection diagram features the insertion of a 3-way switching valve (**3DHWX** accessory), and the optional temperature probe T5 must be installed to control it.

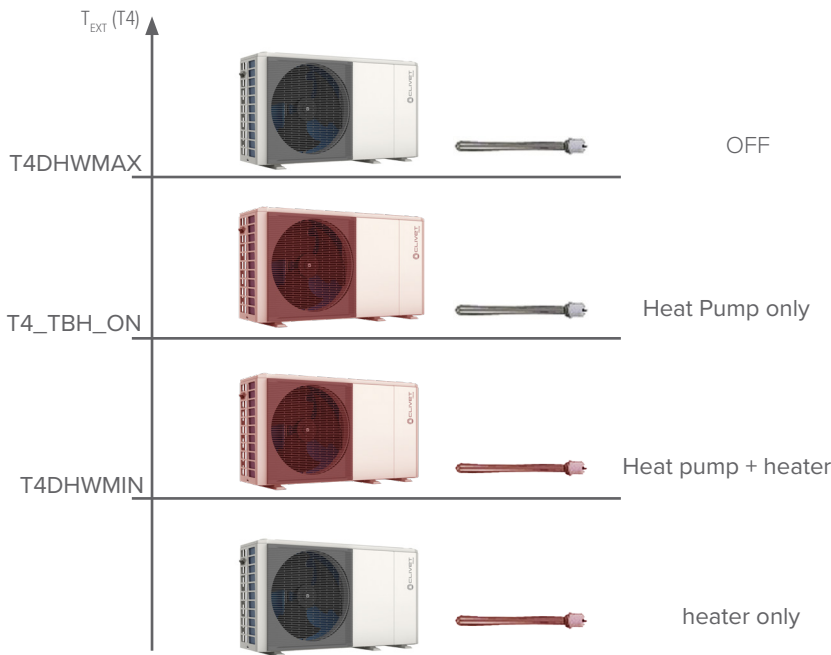


The dedicated accessory (**QERAX** for ACS200/300/500X, **QERATX** for ACS1000X) must be used to power the electric heater of the boiler. The electrical connections are as shown:

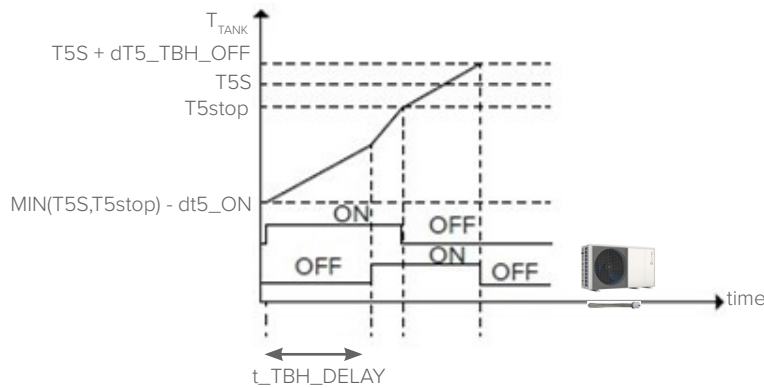
# Configuration and accessories



The electric heater of the TBH boiler is activated below the outdoor air temperature  $T4\_TBH\_ON$ .



Other parameters related to TBH management are the maximum time of DHW production in heat pump mode only without reaching the set-point before activating TBH  $t_{TBH\_DELAY}$  and the temperature delta beyond the set-point to which the heater can bring the boiler  $dT5\_TBH\_OFF$ . The logic is:



Other functions related to the TBH heater are:

- Fast DHW: forces DHW production with heat pump and TBH heater up to set-point
- TANK HEATING: the unit produces DHW with the TBH heater in the event of simultaneous demand for DHW and system (continuing to work as a heat pump in the system) and in the event of a failure.

## Clivet DHW boilers

“Factory made” DHW boilers are optimised for domestic hot water production.

The following versions are available:

- **ACS200X - 200-litre DHW boiler**
- **ACS300X - 300-litre DHW boiler**
- **ACS500X - 500-litre DHW boiler**
- **ACS1000X - 1.000-litre DHW boiler**
- **ACS10SX - 1.000-litre DHW boiler with solar coil**

All boilers are made of carbon steel with internal vitrification treatment according to DIN 4753-3 and UNI 10025.

They are equipped with a water/water exchange coil with a surface area compatible with the power ratings of the heat pumps, an inspection flange in the lower part (ACS200/300/500X), a magnesium anode for corrosion protection, and an electric heater.

The boilers have an integrated electric heater and are equipped with removable 70 mm polyurethane (ACS200/300/500X) or 100 mm polyester (ACS1000/10SX) external insulation to minimise heat loss and ensure high efficiency.

For connection to solar thermal circuit:

- the 200, 300 and 500-litre versions can be connected to a solar thermal circuit with a specific optional kit
- the 1,000-litre version has a dedicated tank that, compared to the standard version, has a second integrated coil located in the lower part of the tank

⚠ Electrical connection to the heat pump requires the optional QERAX kit (for ACS200X, ACS300X or ACS500X) or QERATX (for ACS1000X or ACS10SX)

## DHW boilers from other suppliers

In the case of a boiler from another supply, it is advisable to select one with a stainless steel tank, sacrificial anode and integrated auxiliary electric heater.

You can therefore select the QERAX or QERATX kits or alternatively use an equivalent auxiliary panel: a dedicated power supply is required in any case.

The requirements for optimal selection are:

		2.1-3.1	4.1-5.1	6.1-8.1
Tank volume	l	100 ÷ 250	150 ÷ 300	200 ÷ 500
Minimum surface area of the coil (stainless steel tank)	m <sup>2</sup>	1.4	1.4	1.6
Minimum surface area of the coil (enamelled steel tank)	m <sup>2</sup>	2	2	2.5



# Configuration and accessories

## Clivet DHW boilers technical data

			ACS200X	ACS300X	ACS500X	ACS1000X
Performance	Net water volume	l	196	273	475	930
	Energy efficiency class	-	B			C
	Maximum water temperature	°C	95			
	Insulation: material / average thickness	-/mm	PU / 70			PE / 100
	Heat loss	W/K	1.13	1.40	1.78	3.16
	Electric heater	kW	2 / 1-phase			4.5 / 3-phase
Coil	Surface	m <sup>2</sup>	1.5	1.8	2.2	3.5
	Internal volume	l	8.6	10.4	12.7	21.0
	Maximum operating pressure	bar	10			

Data according to DIN 4708 / EN 12897 / EN 15332

PU = polyurethane / PE = polyester fibre

For the 1,000 litre model, the ACS10SX boiler with integrated additional heat exchanger is available:

			ACS10SX
Performance	Net water volume	l	900
	Energy efficiency class	-	C
	Maximum water temperature	°C	95
	Insulation: material / average thickness	-/mm	PE / 100
	Heat loss	W/K	3.16
	Electric heater	kW	4.5 / 3-phase
Lower coil	Surface	m <sup>2</sup>	3.7
	Internal volume	l	23
Upper coil	Surface	m <sup>2</sup>	6
	Internal volume	l	35
	Maximum operating pressure	bar	10

Data according to DIN 4708 / EN 12897 / EN 15332

PU = polyurethane / PE = polyester fibre

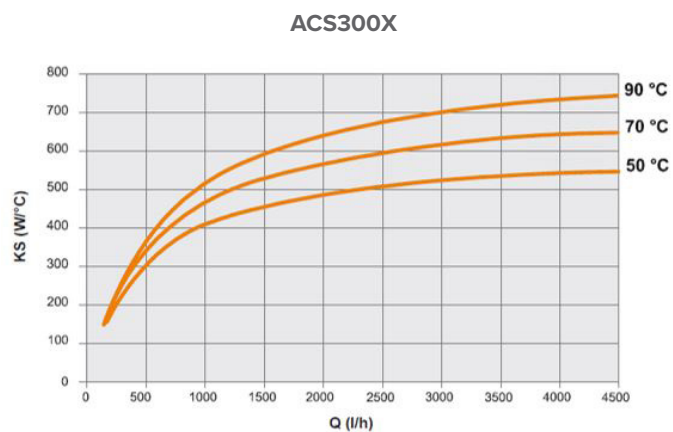
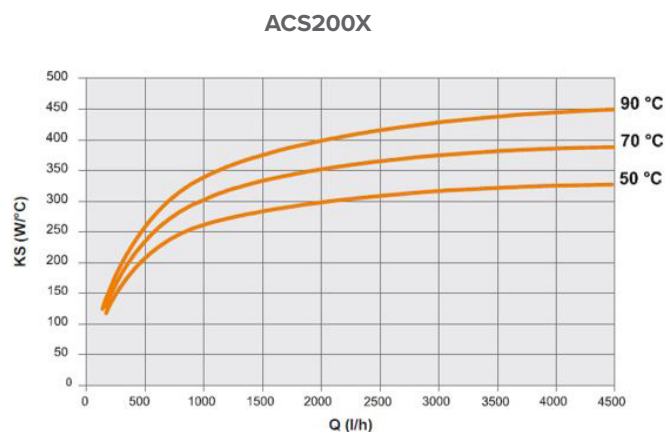
The power transmitted from the coil to the boiler can be calculated using the formula:

$$P_A = (T_i - T_A) \times K_S \quad [W] \quad \text{where:}$$

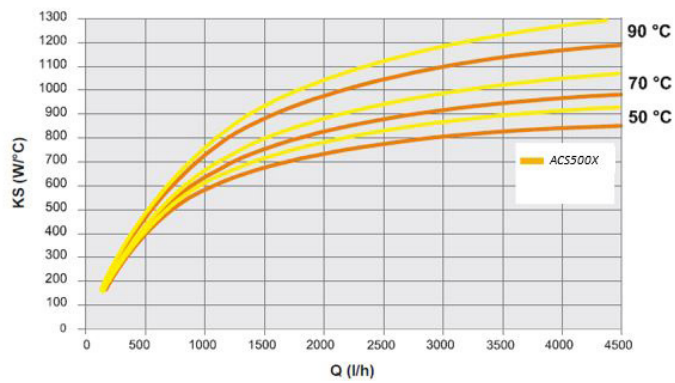
$T_i$ : heat exchanger inlet temperature

$T_A$ : average temperature of the boiler

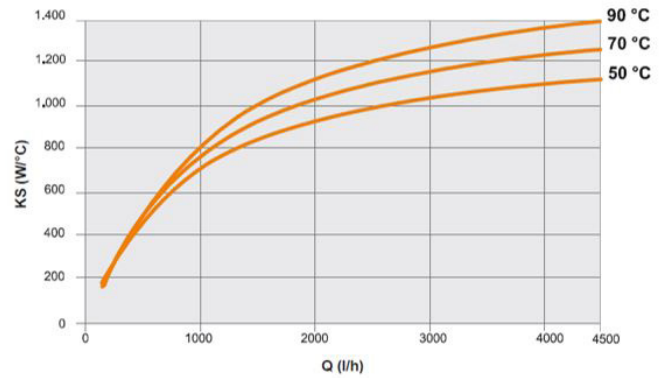
$K_S$ : specific yield coefficient as a function of  $T_i$ , obtainable from the diagrams:



ACS500X



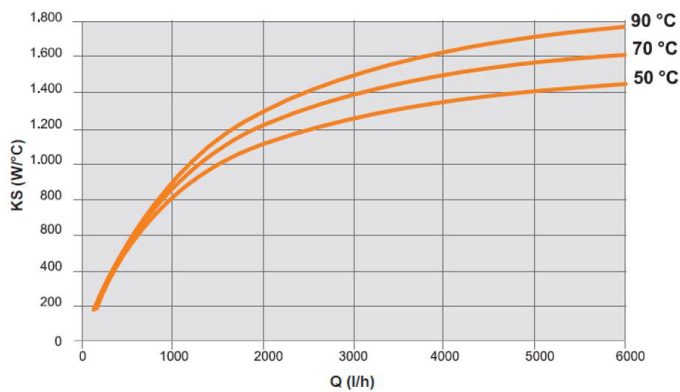
ACS1000X



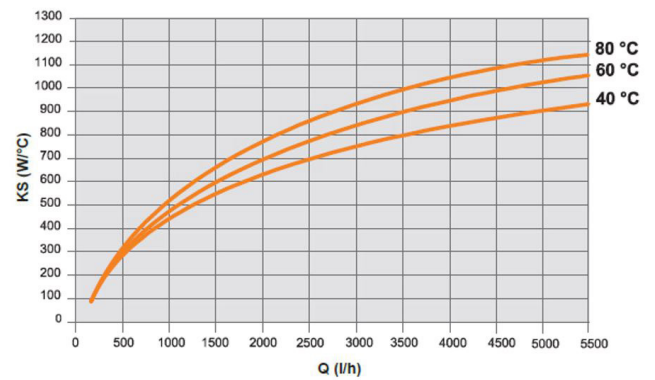
Note:  $Q$  = water flow-rate in the coil

## For ACS10SX

Lower coil



Upper coil



Note:  $Q$  = water flow-rate in the coil

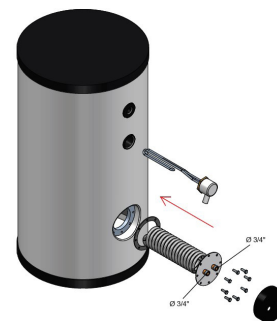
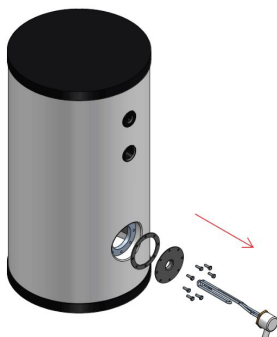
## Combining Clivet DHW boilers and solar thermal panels

The boilers can be combined with solar thermal panels via an additional heat exchanger.

An additional exchanger is provided for 200, 300 or 500 litre models:

- accessory SCS08X for the exchanger to be combined with ACS200X or ACS300X
- accessory SCS12X for the exchanger to be combined with ACS500X.

The heater must be moved to the upper position and the solar exchanger must be installed in its place.



			SCS08X	SCS12X
Solar coil	Surface	$m^2$	0.8	1.2
	Internal volume	$l$	0.65	0.95
	Maximum operating pressure	bar	10	

For the 1,000 litre model, the ACS10SX boiler with integrated additional heat exchanger is available:

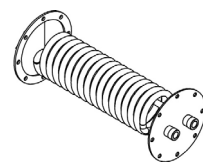
# Configuration and accessories

## Accessories for DHW boilers

**SCS08X** - Solar coil for ACS200X/ACS300X DHW boilers

**SCS12X** - Solar coil for ACS ACS500X DHW boilers

Kit for connection of the solar thermal circuit to DHW boilers consisting of a tin-plated finned copper coil and including a perforated flange, flange cover and bolts for fastening.



**QERAX** - Connection kit for single-phase heater on DHW storage tank

**QERATX** - Connection kit for three-phase heater on DHW storage tank

Kit for managing the electric heater of a DHW storage tank, consisting of:

- Gewiss box to contain and protect the components
- back-up relay to transfer the incoming ON/OFF signal from the unit to the heater of the storage tank (230V voltage signal for QERAX, 400V for QERATX)
- protection fuse



⚠ The cable of the heater is 1.5m long, so the accessory must be installed close to the storage tank. For installations involving greater distances, replace the cable with one of suitable length

**3DHWX** - System/DHW 3-way switching valve (SV1)

Motorised 3-way switching valve with actuator and 1"1/4 M connections, for diverting the flow of water from the system to the domestic hot water storage tank.

Kits available:

- for sizes 2.1 - 3.1: valve, 1"1/4 F - 1" F reduction and 1" concealed nipple
- for sizes 4.1 to 8.1 (recommended for storage tanks up to 500 litres): valve and M-F connection
- for sizes 4.1 to 8.1 (recommended for storage tanks over 500 litres): valve and M-F fitting



Model		2.1 TO 3.1	4.1 TO 8.1
Power supply	V/Hz/p	230 / 50 / 1	230 / 50 / 1
Absorption	W	5	5
Control	-	SPST - 2-point direct system	SPST - 2-point direct system
ΔP max	bar	2	2
Ps	bar	10	10
Temperature limits - water	°C	-10 to 110	-10 to 110
Temperature limits - air	°C	-5 to 55	-5 to 55
Hydraulic connection	-	1" 1/4 M*	1" 1/4 M
Cable length	mm	1,500	1,500
Switching time	s	30	30

\*with reductions

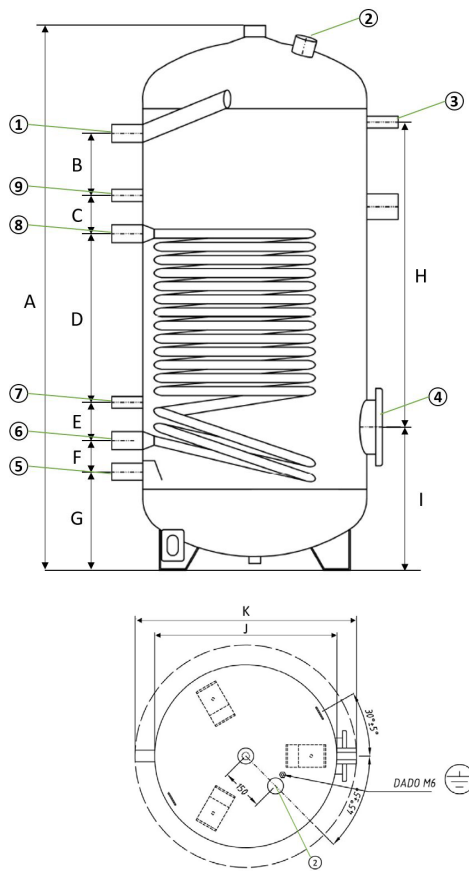
n.s.: not provided

**PRSX** - DHW recirculation pump

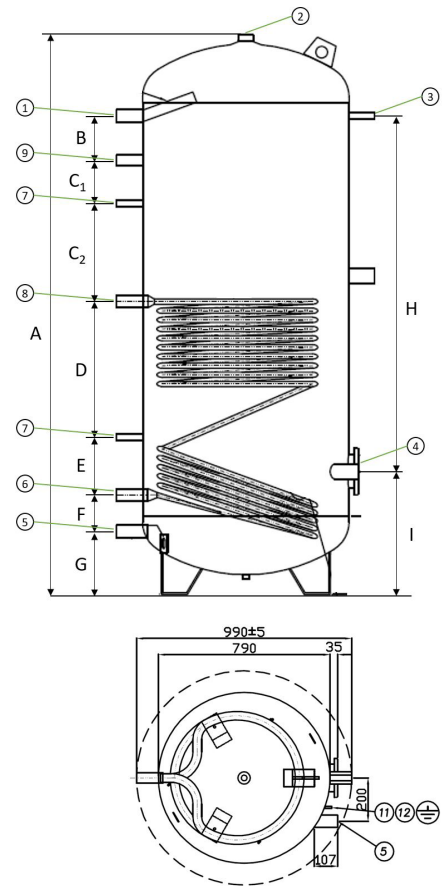
Circulator with 3-speed selector switch for DHW recirculation



## DHW boiler dimensions and connections



**ACS200X/ACS300X/ACS500X**

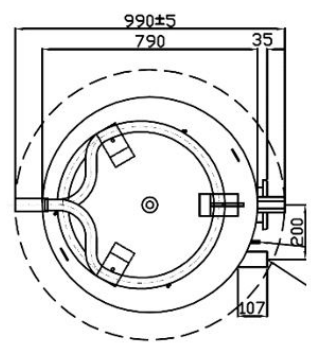
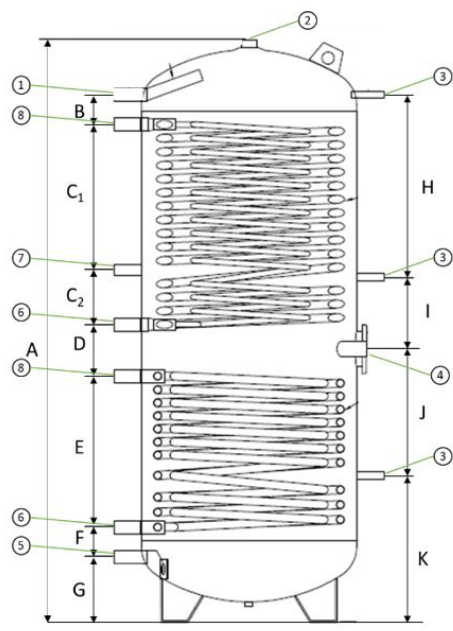


**ACS1000X**

[MM]	ACS200X	ACS300X	ACS500X	ACS1000X
A	1.215	1.615	1.705	2.140
B	140	225	245	170
C	85	275	290	-
C1	-	-	-	165
C2	-	-	-	375
D	375	515	440	520
E	85	-	95	220
F	70	-	80	140
G	220	-	265	240
H	680	1.070	1.060	1.370
I	320	-	365	470
J	500	-	650	-
K	640	-	790	-
Weight	77kg	98kg	128kg	224kg

		ACS200/300/500X	ACS1000X
1	DHW supply	1"1/4	1"1/4
2	Anode	1"1/4	1"1/2
3	Temperature probe	1/2"	-
4	Electric heater	1"1/2	-
5	Cold water inlet	1"	1"1/4
6	Exchanger return	1"	1"1/4
7	Temperature probe	1/2"	-
8	Exchanger supply	1"	1"1/4
9	Recirculation	1/2"	1"

# Configuration and accessories



[mm]		ACS10SX	
A	2140	G	240
B	110	H1	670
C1	535	H2	265
C2	200	I1	540
D	190	I2	465
E	555	-	-
Weight		294kg	

ACS10SX		
1	DHW supply	1"1/4
2	Anode	1"1/2
3	Temperature probe	1/2"
4	Electric heater	1"1/2
5	Cold water inlet	1"1/4
6	Exchanger return	1"1/4
7	Recirculation	1"
8	Exchanger supply	1"1/4

## Configuration with primary and secondary circuit

In order to optimise operation and avoid continuous on/off cycles of the unit, it is advisable to create a primary circuit and a secondary circuit by installing an inertial storage tank and/or a hydraulic separator.

### Primary and secondary circuit installation and operation

The circuit can be hydraulically separated by installing the following in the system:

- an inertial tank (TANKX accessory)
- a hydraulic separator (DIX, DI50-2X, DI100X, KCSX, KIRE2HX, KIRE2HLX accessories)

A circulator must be installed for the secondary circuit (P\_o), which can be managed by the unit.

### Management of primary circuit and secondary circuit pumps

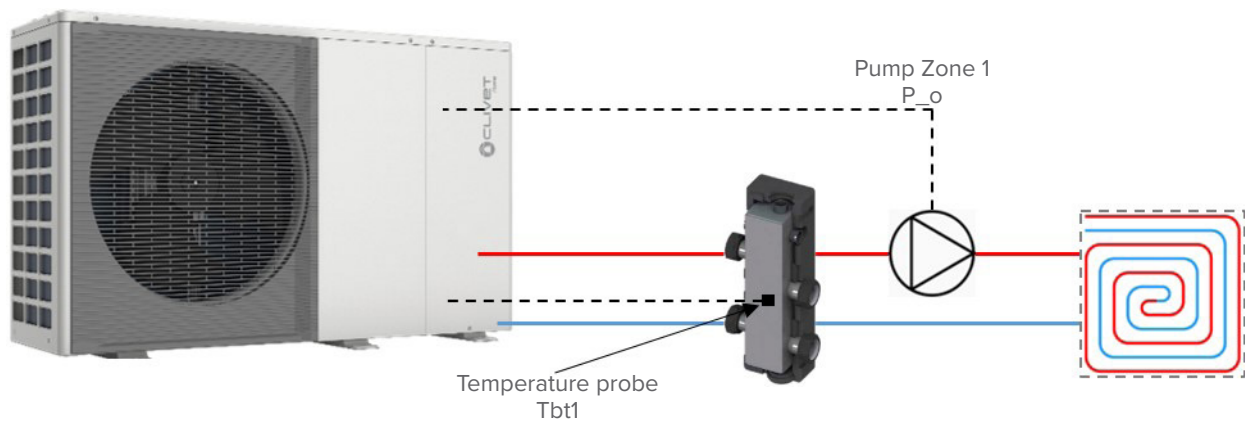
Hydraulic and electrical connections: the hydraulic separator requires the installation of a circulator for the secondary circuit (P\_o), managed by the unit. The basic logic entails the simultaneous start-up/stopping of the primary circuit circulator (P\_l) and the secondary circuit circulator (P\_o).

As an option, the start-up/stopping of the primary circuit circulator (P\_l) and the secondary circuit circulator (P\_o) can be managed independently. For this type of management, a temperature probe must be inserted at the inertial tank water outlet.

The presence of the probe must be set on the HMI by enabling the specific Tbt1 parameter.

This way, the primary circuit pump (P\_l) will start when the compressor activation conditions are met (considering the Twin, Twout and Tbt values) *e la presenza di richiesta della zona termica*.

When the compressor stop conditions are met, P\_l will stop after running at a nominal flow-rate for the t\_DELAY\_PUMP time in minutes. The secondary circuit pump, P\_o, will start or stop following the request of the thermal area.



The unit can independently manage the secondary circuit's set-point. Up to two thermal area can be managed, even at different temperatures.

Specific kits, containing hydraulic separator and pump(s), are available to manage different types of circulation:

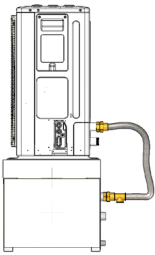
- KCSX kit is designed to manage single-area systems
- KIRE2HX kit is designed for systems with two direct areas (two high temperature areas)
- KIRE2HLX kit is designed for systems with one direct and one mixed area (one high and one low temperature area).

# Configuration and accessories

## Clivet inertial tank

- TANKX - System inertial storage tank
- KTCAX - Hose kit for connecting the unit to the inertial storage tank

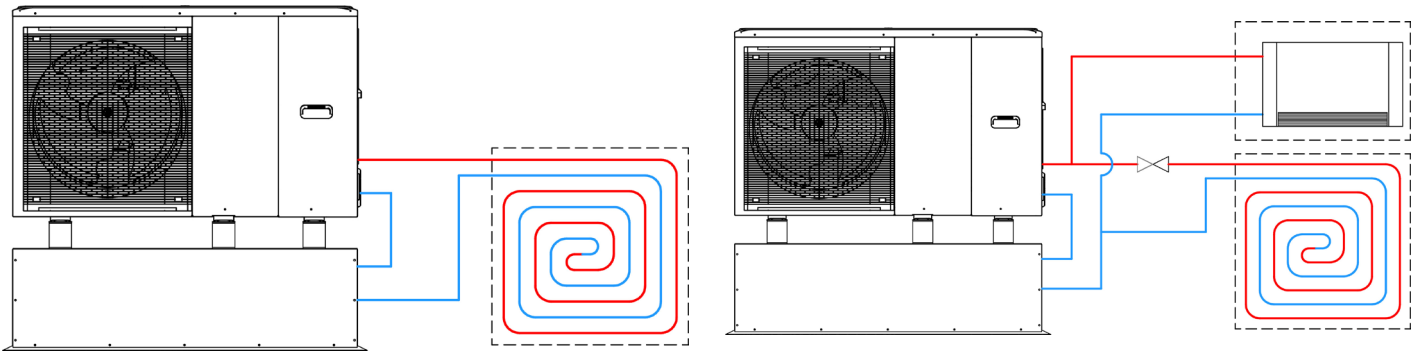
TANKX is designed to be installed under the unit's base, so as to occupy the least space. It is made of RAL 9001 painted sheet metal, thermally insulated with internal foaming and housed inside an enclosure also made of painted sheet metal.  
It can be typically connected on the intake with the dedicated KTCAX hose kit.



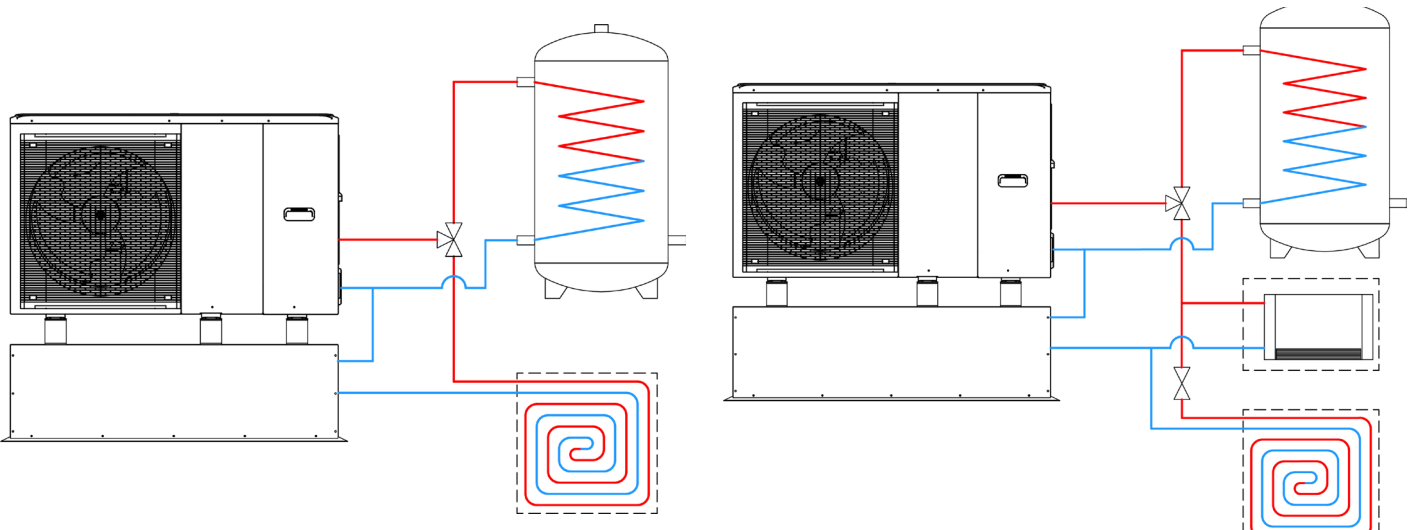
- The tank is available in the following capacities:
- 30l (for sizes 2.1 to 3.1), pipe kit with 1" M connections
  - 70l (for sizes 4.1 to 8.1), pipe kit with 1 1/4" M connections

Model		2.1÷3.1	4.1÷8.1
Efficiency class	-	A	A
Thermal dispersion	W/K	0,38	0,48
Available volume	l	44,8	79
Temperature limit	kg	53,5	67,5
Maximum pressure	kg	98,3	146,5
Material	°C	80	80
Pressione massima	bar	6	6
Materiale	-	Steel DD11*	

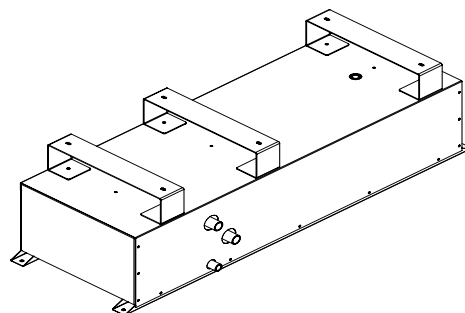
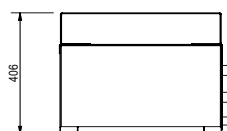
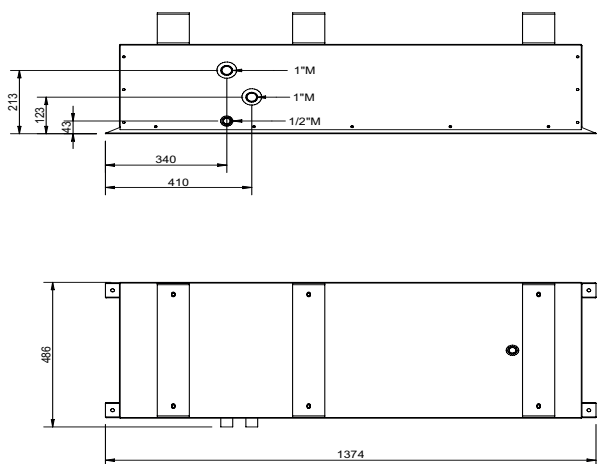
- Examples of hydraulic connections with inertial tank
- Heating / cooling system



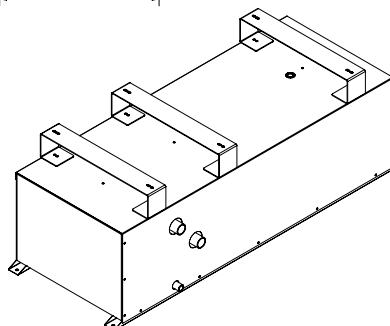
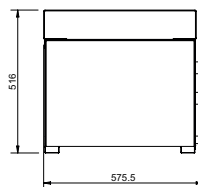
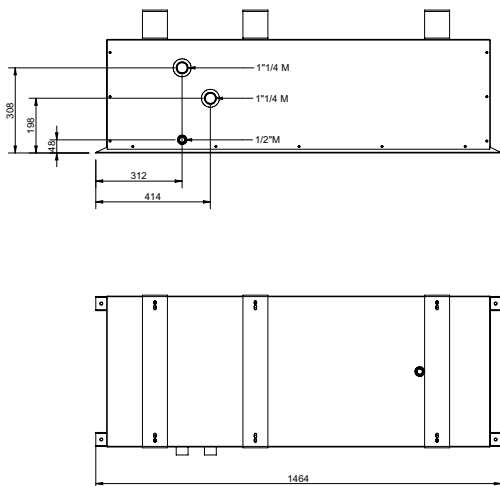
- Heating / cooling / DHW system



## 30-litre tank (sizes 2.1 to 3.1)



## 70-litre tank (sizes 4.1 to 8.1)





# Configuration and accessories

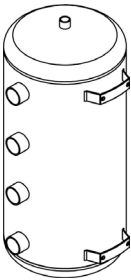
## Clivet hydraulic separator

Depending on the type of system, the water content of the system and the power of the unit, it is possible to choose a hydraulic separator with one or two pairs of inlet or outlet connections.

- separators with one pair of connections, designed for simple systems with one generator and one zone of use:
  - DIX - 1-litre hydraulic circuit breaker
  - KCSX - Secondary circuit kit (1-litre hydraulic circuit breaker + pump)
- separators with two pairs of connections, ideal where there are two generators or several distribution zones:
  - DI50-2X - 50-litre hydraulic circuit breaker
  - DI100X - 100-litre hydraulic circuit breaker
  - KIRE2HX - Double zone distribution unit: direct + direct
  - KIRE2HLX - Double zone distribution unit: direct + mixed (with mixing valve)

- DIX - 1-litre hydraulic circuit breaker**
- DI50-2X - 50-litre hydraulic circuit breaker**
- DI100X - 100-litre hydraulic circuit breaker**

The 50-litre and 100-litre versions have 2 pairs of connections on the supply side and 2 pairs of connections on the return one. The external insulation is made of polyurethane foam (30 mm for DI50-2X and DI100X) to minimize thermal leakage and ensure high efficiency.

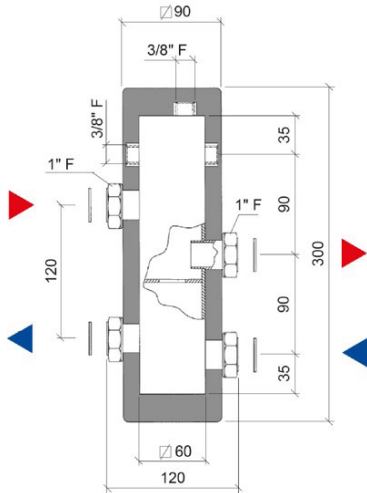


*Note: DI50-2X and DI100X are supplied with wall mounting kits and 4 caps with gaskets for any unused connections. DI100X is also equipped with feet for floor mounting.*

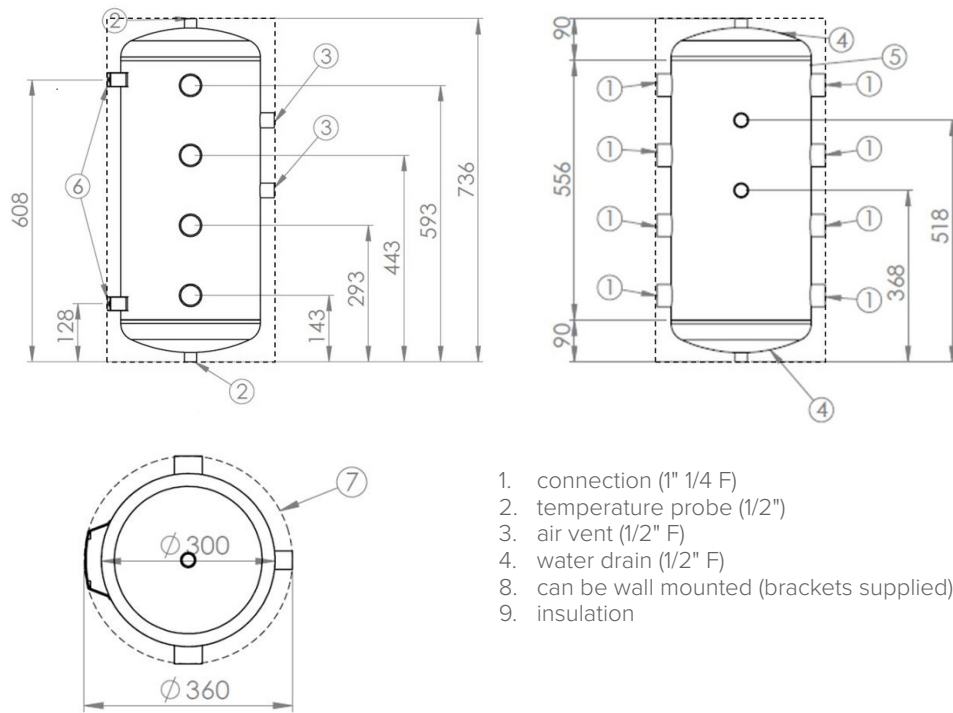
Model		DIX / KCSX	DI50-2X	DI100X
Efficiency class	-	B	B	B
Maximum flow rate	l/s	0.47	-	-
Thermal dispersion	W/K	0.3	0.75	1.07
Available volume	l	0.7	45.3	45.3
Temperature limit	°C	120	80	80
Maximum pressure	bar	6	6	6
Material	-	Carbon steel	Carbon steel	Carbon steel
Unladen weight	kg	3	20	24.5

*Note: all versions can be wall mounted and DI100X can also be floor-standing with special feet*

DIX

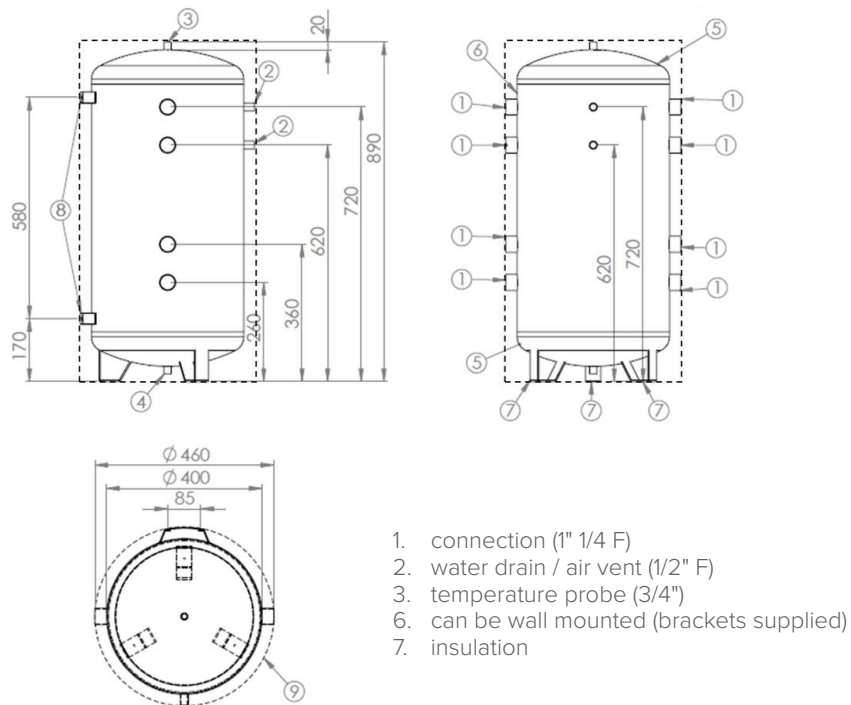


## DI50-2X



Note: 4 plugs and 4 gaskets are included for insertion on any unused connections

## DI100X



Note: 4 plugs and 4 gaskets are included for insertion on any unused connections

# Configuration and accessories

## KCSX - Secondary circuit kit (1-litre hydraulic circuit breaker + pump)

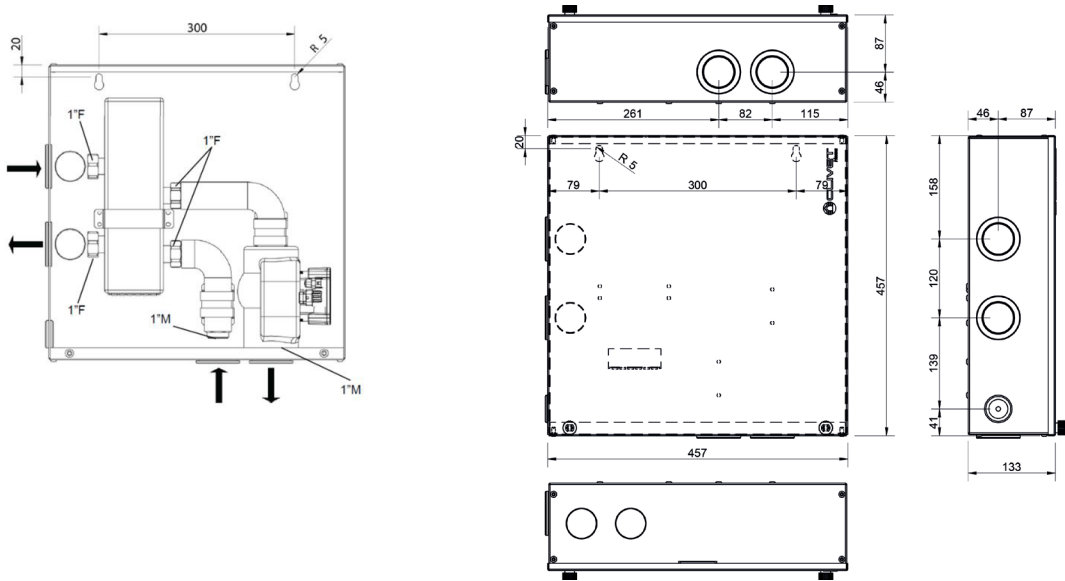
Kit for single-zone systems with 1" F primary side and 1" M secondary side connections, with insulated separator and internal hydraulic components.

The kit consists of:

- sheet metal case with holes for wall mounting
- 1-litre single-zone hydraulic separator
- variable speed zone circulator
- connecting pipes



Model	DIX / KCSX	
Efficiency class	-	B
Maximum flow rate	l/s	0,47
Thermal dispersion	W/K	0,3
Available volume	l	0,7
Temperature limit	°C	120
Maximum pressure	bar	6
Material	-	Carbon steel
Unladen weight	kg	3



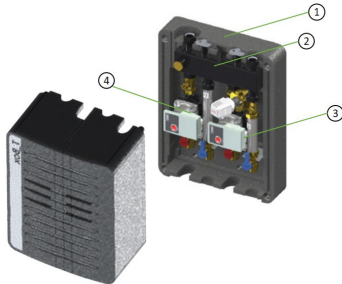
**KIRE2HX - Double zone distribution unit: direct + direct**

**KIRE2HLX - Double zone distribution unit: direct + mixed (with mixing valve)**

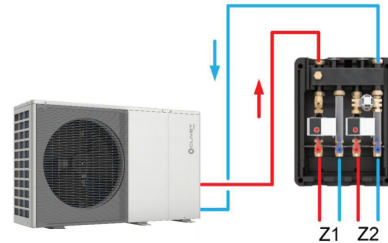
Kit for managing two-zone distribution systems with 1" F primary side and 1" 1/2 F secondary side connections.

The kit consists of an insulated box for wall installation including manifold/separator, support bracket, anti-rotation jig, 2 distribution units with circulators, water temperature probe and complete water circuits.

The KIRE2HLX version is also equipped with a mixing valve.



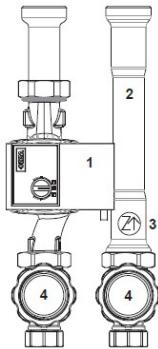
Hydraulic connections



*Note: for mixed Zone 2 systems, install the supplied temperature probe on the Zone 2 supply pipe of the KIRE2HLX*

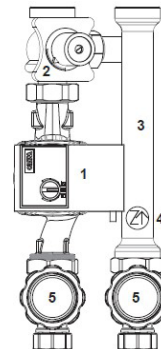
1. EPP insulation
2. Separator with 2 connections on the user side
3. Distribution unit - Zone 2 (direct or mixed)
4. Distribution unit - Zone 1 (direct)

Distribution units:



## Direct

1. Wilo YONOS PARA RS 25/1-6 180 circulator
2. Pipes kit
3. Check valve
4. Ball valves with handle and thermometer

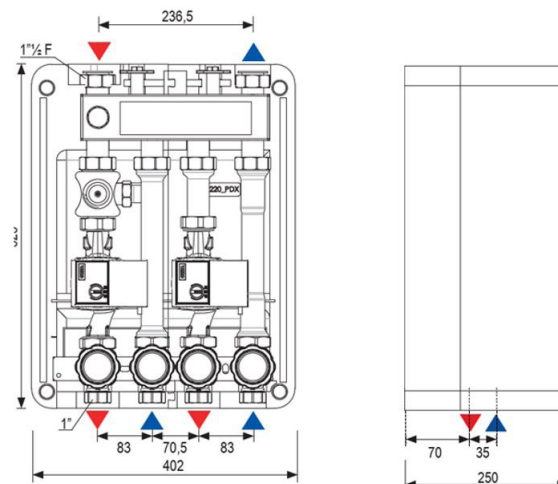


## Mixed

1. Wilo YONOS PARA RS 25/1-6 180 circulator
2. DN25 TV3 sliding temperature mixing valve\*
3. Pipes kit
4. Check valve
5. Ball valves with handle and thermometer

\* opening/closing time: 120s

Dimensions and connections:



# Configuration and accessories

## Clivet circulator for secondary circuit

If the system is divided into primary and secondary, the unit can manage a circulator at the secondary.

- PCSX - Circulation pump for secondary circuit
- PCS2X - Oversized circulation pump for secondary circuit



The pumps are equipped with different types of control, which can be set in the field and used in different types of systems:

### 1) at constant speed

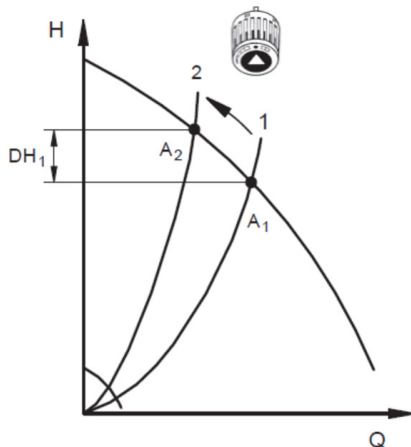


The pump works according to one of three classic preset operating curves at constant speed

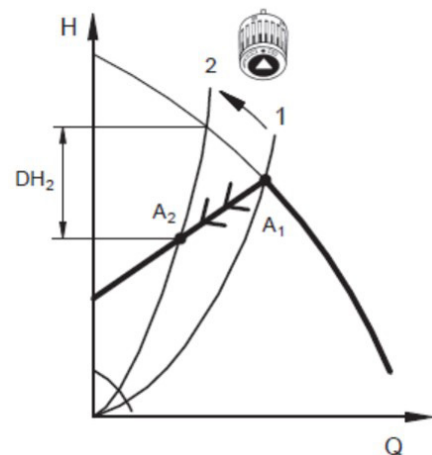
### 2) proportional head



An operating curve is set in which the pump reduces the head as the heating load in the system decreases, or the pump increases the head as the load increases, in order to save energy and ensure quieter operation. It is possible to choose between three preset curves and it is advisable to use this mode in the case of distribution to terminal units or radiators.



**Control with standard pump**  
Head increases by  $DH_1$



**Control with proportional head pump**  
The head is reduced by  $DH_2$

e.g. the heat load may be reduced, e.g. by the presence of solar radiation, during daily operation in heating mode. The valves of the distribution system are closed and the system pressure drops from A1 to A2.

### 3) with constant head



A constant head curve is set, which the pump will maintain regardless of heating load variations in the system. It is possible to choose between three preset curves, and it is advisable to use this mode in the case of distribution to a radiant floor.

For the PCSX accessory it is possible, instead, to use logic 2 or 3, but with the AUTOADAPT function, where the pump logic automatically switches between curves to maintain constant power or to follow the system's load demands. PCS2X does not have this function.

The PRSX circulator, on the other hand, is fixed speed with 3 selectable speeds and can be used for DHW recirculation.

## Other accessories supplied separately

### KTFLX - Hose kit for connection to the unit

Kit for connecting the unit to the system, consisting of:

- two 300mm hoses, connections with female swivel flat seat couplings with diameter of 1" (sizes 2.1 to 3.1) or 1 1/4" (sizes 4.1 to 8.1)
- two concealed nipples 1" M - 1" M (sizes 2.1 to 3.1) or 1 1/4" M - 1 1/4" M (sizes 4.1 to 8.1)
- two insulation seals for fixing.



### KTFLX - Magnetic dirt separator filter for water distribution systems

The filter supplied as standard with the unit is a mesh filter, but it is advisable to install a dirt separator filter (FDMX accessory) to trap not only general dirt, but also fine ferromagnetic particles dispersed during use that are not trapped by the mesh filter.



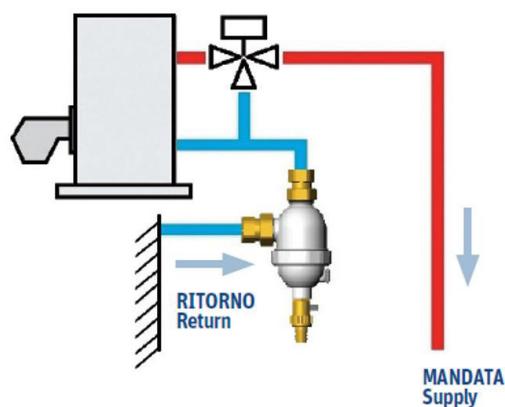
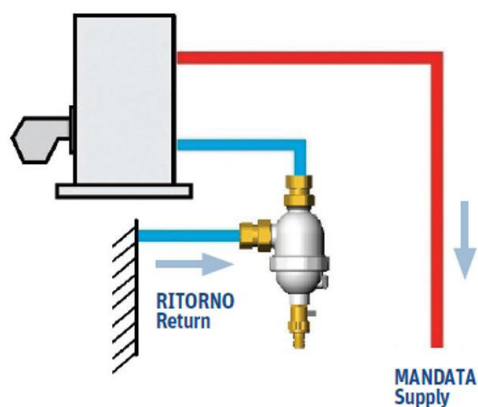
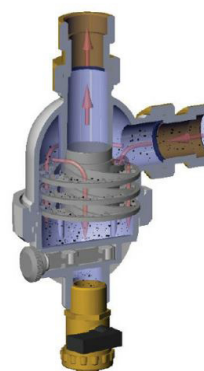
The dirt separator filter has two main components:

- cyclone-effect filter, which slows down and makes solid particles and impurities settle more easily
- removable ferromagnetic cartridge (magnet) that separates and captures ferrous impurities

The retained impurities are collected in the lower part of the filter (sump), which must be periodically opened and emptied (routine cleaning can also be done while the system is running).

The filter can be used in systems with water or water with glycol (max. 30%), maximum operating pressure 3 bar and temperatures 0 to 90 °C. The model has transparent material on the bottom that allows the filter cleaning status to be visually checked.

⚠ It is advisable to use this filter in addition to the normal mesh filter in the system-side circuit.



# Configuration and accessories

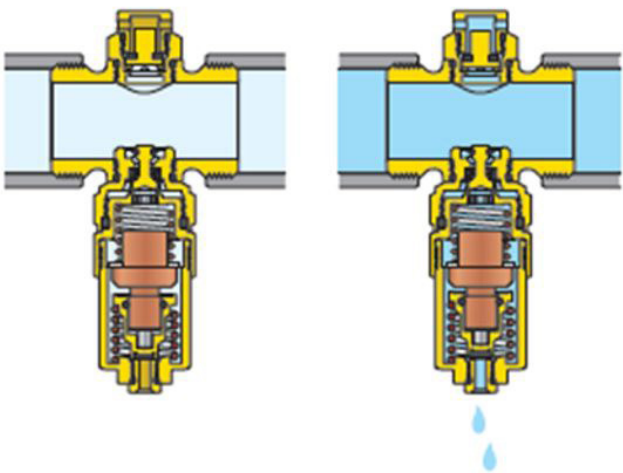
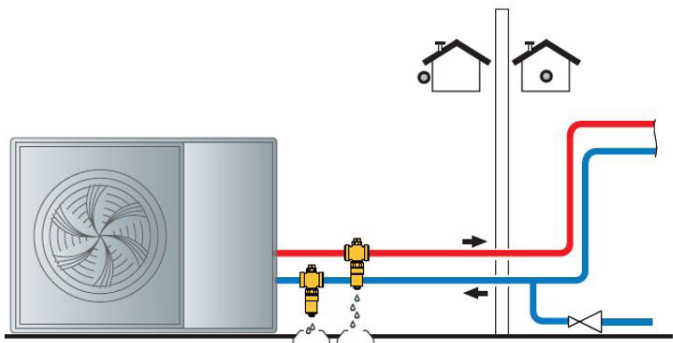
## VAGX - Safety antifreeze valve for system

The kit consists of antifreeze valves that allow the fluid to be discharged from the circuit when its temperature reaches a limit value, preventing the formation of ice in the system and consequent damage to the unit and pipes.  
Kits available:

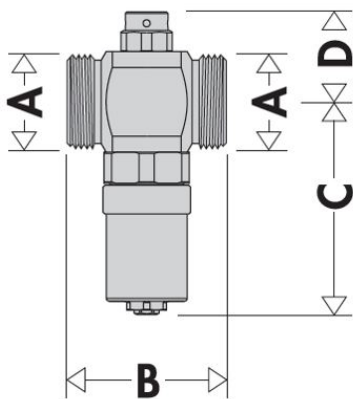
- 2 valves with 1" M connections (for sizes 2.1-3.1) or 1 1/4" M connections (for sizes 4.1 to 8.1)

When the water temperature falls below 3 °C (±1 °C) the valve shutter opens and drains, when the water temperature returns to 4 °C (±1 °C) the valve shutter closes.

⚠ Maximum operating temperature 65°C



The valves must be installed outdoors, in a vertical position and on both the supply and return branches of the system



[mm]	2.1÷3.1	4.1÷8.1
A	1"	1" 1/4
B	52	59
C	78,6	83
D	32	36

### TECHNICAL DATA

Fluid of use	Water (no glycol)	
Maximum operating pressure	10 bar	
Operating range with water	0 to 65 °C	
Operating range with air	-30 to 60	
Kv	55m³/h (2.1 to 3.1)	
	70m³/h (4.1 to 8.1)	

### Discharge conditions

outdoor T	-5 °C	-20 °C
Flow rate	0.5 l/h	1 l/h

Conditions:  
- straight pipe (Ø12 mm, length 1 m) exposed to the outside  
- water temperature in the building 18°C  
- operating pressure 3 bar

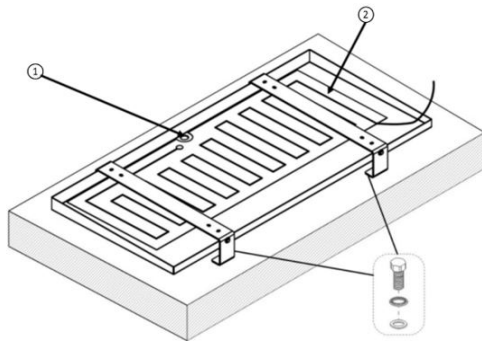
Note: the kit is already equipped with fittings for connection to the unit when required  
\* for connection to the plate heat exchanger

## DTX - Drain pan with electric heater

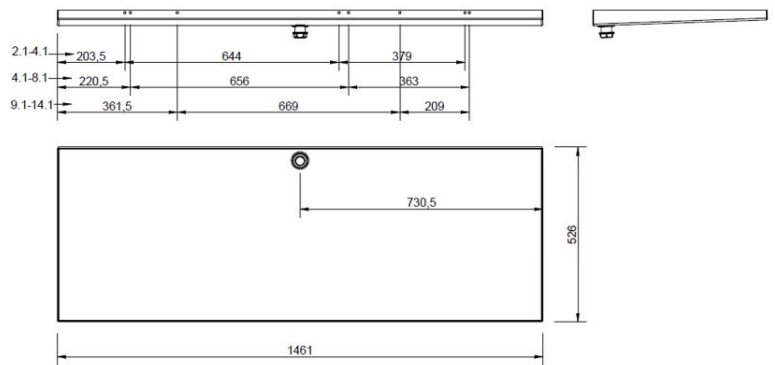
Drain pan to be fitted to the base of the unit for collecting condensate, with fitting for connection to the drain trap. The drain pan has an automatically activated antifreeze heater that prevents the condensate from freezing, controlled by a dedicated thermostat.

The drain pan is made of two-layer plastic material painted RAL 9001 and is equipped with a 100W 230V electric heater that automatically prevents the formation of ice with temperature set by its thermostat.

The kit includes support brackets painted RAL 9001 (with holes for installation of antivibration mounts and for fixing to base, inertial storage tank or wall brackets), screws and washers.



1. 1" drain hole
2. Heater

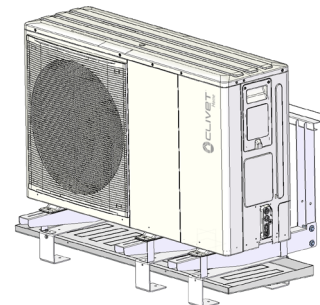
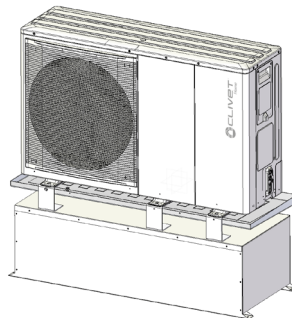
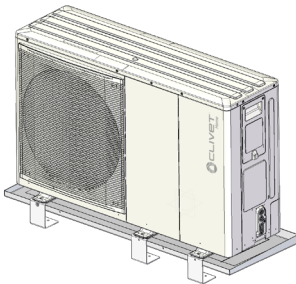


Note: the installation of vibration dampers is also mandatory with this accessory, to be applied between the unit and drain pan.

Floor-standing installation (standard)

Installation on inertial storage tank

Wall installation (with KSPIX accessory brackets)



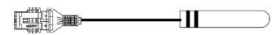
## T1BX - DHW temperature probe and additional heating source at 10 m

## T1B30X - DHW temperature probe and additional heating source at 30 m

NTC water temperature probe with 10 m or 30 m cable.

The probe can be used to detect temperatures:

- Tsolar: solar thermal circuit
- T1: boiler or external electric heater
- T5: DHW tank
- Tw2: mixed zone 2
- Tbt1/Tbt2: hydraulic separator



⚠ The unit is equipped with a T1BX probe as standard.

		T1BX	T1B30X
Length	m	10	30
Bulb dimensions (φxL)	mm	6x24	6x24
NTC sensor (50°C)	kΩ	17,6	17,6
Field of operation	°C	-3÷105	-3÷105
Insulation to resistance	MΩ	100	100
Voltage isolation	V	1.800	1.800
Protection rating	IP	67	67

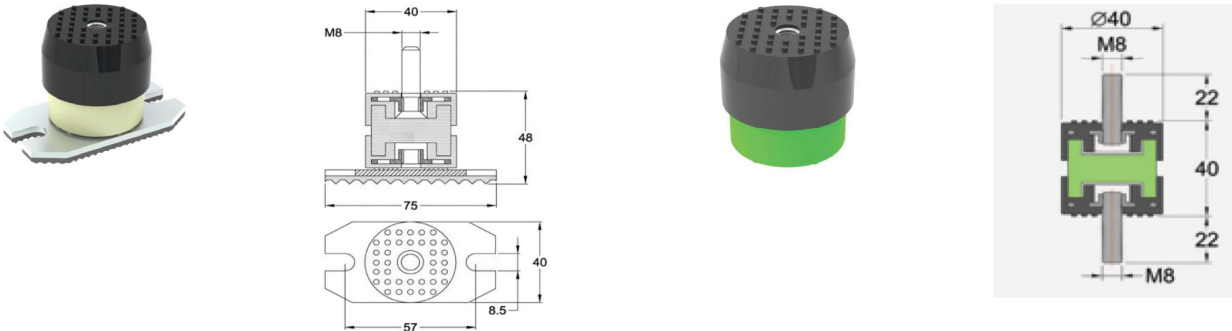


# Configuration and accessories

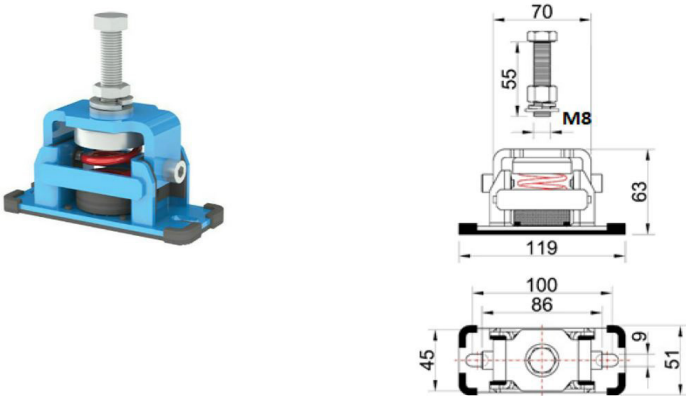
- AMRX** - Kit of antivibration mounts for floor installation
- AMMSX** - Kit of anti-seismic antivibration mounts for floor installation
- ASTFX** - Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray

Antivibration mounts are an essential element for the correct installation of the unit as they are used to dampen noise and vibrations produced by components such as the compressor, circulators and pipes. Their installation is compulsory and their selection depends on the characteristics of the site: in the case of the F units, one element is required for each supporting point, for a total of 6 vibration dampers.

Antivibration kits for installation on the floor (AMRX accessory) or on brackets, inertial storage tank or drain pan (ASTFX accessory): 6 rubber vibration dampers fitted with screws for attachment to the unit.  
 They consist of two plates made of galvanised steel discs, coated with recyclable thermoplastic elastomer material suitable for temperatures of -45 to 110 °C, with high resistance to ageing, pollutants, hydrocarbons, salt spray, UV radiation and detergents.  
 AMRX is also equipped with a steel base plate with holes for anchoring to the base.

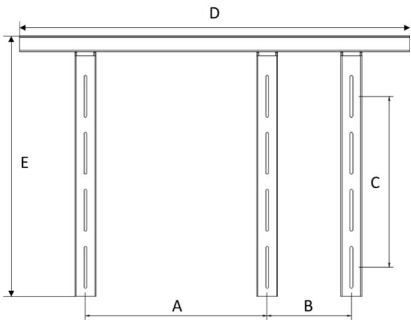
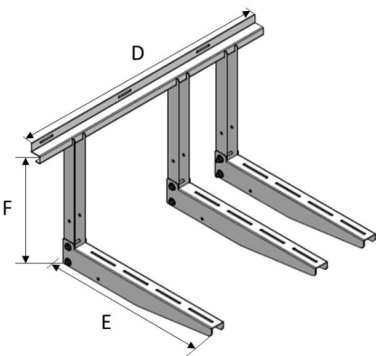


Anti-seismic antivibration kits for floor installation (AMMSX): 6 spring-loaded vibration dampers equipped with a screw for fixing to the unit and a base plate with holes for anchoring to the base.  
 They consist of a sandblasted, painted steel frame and a painted steel spring and are designed to act both as vibration isolators and as seismic restraints to prevent the unit from tipping over in the event of an earthquake or wind.



## KSIPX - Wall fixing bracket kit

Wall fixing bracket for outdoor unit, adjustable, in galvanised steel painted with polyester powders for outdoor use, weather-resistant



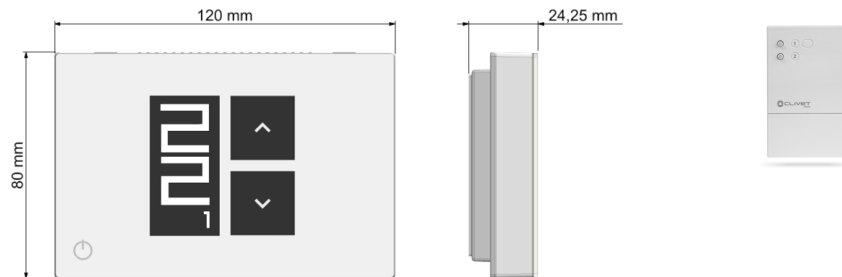
[mm]	2.1-3.1	4.1-8.1	9.1-14.1
A	644	656	668
B	379	363	206
C	375	469	494
D	1.200		
E	860		
F	600		

**HTC2WX** - **HID-TConnect 2 white chronothermostat for temperature control**

**SWCX** - **IoT SwitchConnect receiver / switch**

Chronothermostat for semi-recessed installation with temperature probe. The thermostat is able to manage the request for the heat pump and allows control of the system with the App (Clivet Home Connect) or voice assistant (Amazon Alexa or Google Home).

The thermostat can be combined with a radio receiver for managing the request of terminal units or radiant systems, the mode change of the heat pump, or the systems with double set-point.



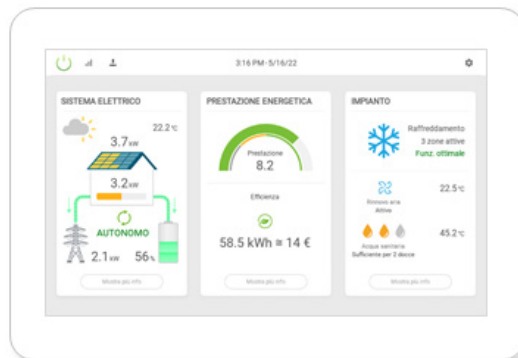
For more details on this product, refer to the “CONTROL AND CONNECTIVITY - Management with Wi-Fi area thermostat” chapter

## ELFOControl<sup>3</sup> EVO

Energy assistant for the air-conditioning system that enables efficient management of up to 12 climate zones and, in combination with photovoltaic systems, energy management and monitoring of electricity consumption and self-consumption.

Installation of this allows class A control according to EN15232.

See the specific documentation for more details.



For more details on this product, refer to the “CONTROL AND CONNECTIVITY - Management via ELFOControl” chapter and the dedicated documentation.

# Configuration and accessories

## Compatibility of accessories/configurations

### Sizes and accessories

GRANDEZZA	2.1	3.1	4.1	5.1	6.1	7.1	8.1	6.1T	7.1T	8.1T
3DHWX	0						0			
QERAX							o (ACS200X / ACS300X / ACS500X)			
QERATX				-				o (ACS1000X / ACS10SX)		
ACS200X					0					
ACS300X					0					
ACS500X					0					
ACS1000X				-					0	
ACS10SX				-					0	
SCS08X						o (ACS200X / ACS300X)				
SCS12X						o (ACS500X)				
IBHX				0					-	
IBHTX				-					0	
TANKX	o (30 l)						o (70 l)			
KTCAX	0						0			
DIX					0					
DI50-2X					0					
DI100X					0					
KTFLX	0						0			
PRSX					0					
PCSX					0					
PCS2X					0					
KCSX					0					
KIRE2HX					0					
KIRE2HLX					0					
VAGX	0						0			
VDACSX						o (Hybrid version)				
DTX					0					
KSIPX					0					
AMRX					0					
ASTFX					0					
AMMSX	0						0			
FDMX	0						0			
T1BX					0					
T1B30X					0					
HTC2WX					0					
SWCX					0					

## Rules of compatibility between accessories

Auxiliary heat sources	IBH IBHX IBHTX	ELFOSun	ACS10SX SCS08X SCS12X	GAS BOILER
IBH / IBHX / IBHTX	-	0	0	NO
ELFOSUN	0	-	0	0
GAS BOILER	NO	0	0	-

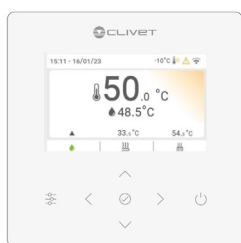
Accessories for installation	DTX	KSIPX	TANKX	VAGX	ASTFX	AMMSX	AMRX
DTX	-	0	0	0	0	NO	NO
KSIPX	0	-	NO	0	0	NO	NO
TANKX	0	NO	-	NO	0	NO	NO
VAGX	0	0	NO	-	0	0	0
ASTFX	0	0	0	0	-	NO	NO
AMMSX	NO	NO	NO	0	NO	-	NO
AMRX	NO	NO	NO	0	NO	NO	-

ACS	T1BX T1B30X	SCS08X	SCS12X	QERAX	QERATX
ACS200X	0	0	NO	0	NO
ACS300X	0	0	NO	0	NO
ACS500X	0	NO	0	0	NO
ACS1000X	0	NO	NO	NO	0
ACS10SX	0	NO	NO	NO	0

Note: the accessories that are not mentioned can be freely selected without issues of compatibility

# Control and connectivity

## User interface



Resolution	3.5 in 480*320	
Temperature sensor	±0.5 °C @25 °C ±1 °C	
Power input	<3.6W	
Storage temperature	Storage	-30~80 °C
Wiring	Type	2-core shielded twisted pair cable, Wiring size: 0.75mm²
	MAX length	50 m

The unit is equipped with a user interface(HMI) to be installed in the field, for managing the functions, and with abuilt-in temperature probe for possible use as a thermostat.

The user interface comes as standard with 21 selectable languages: Italian / English / French / Spanish / Polish / Portuguese / German / Dutch / Romanian / Russian / Turkish / Greek / Swedish / Slovenian / Czech / Slovak / Hungary / Croatia / Danish / Finnish / Ukrainian.

-10°C	External temperature		Silent mode (activated)
15:11 - 16/01/23	Date and time		Wi-fi (activated)
50.0 °C 48.5 °C	The temperature does not change		Smart grid (activated)
	Keypad lock		Alarm (activated)

	Control based on room temperature		Appliance zone type: radiant panels
	Control based on water temperature		Appliance zone type: radiator
	Appliance zone type: fan coil		Appliance zone type: domestic hot water

08:20	Scheduling start time	30°C	Set temperature
	Heating mode		

	Auxiliary electric heater		Cooling mode
	Daily scheduling		Defrosting
	Silent mode		Auxiliary heat generator
	Holiday mode		Solar
	Compressor		Antilegionella
	Circulation pump		Weekly scheduling
	Eco mode		

Energy cost	Free	Low	High
Smart grid			
Energy source	Photovoltaics	From the network	From the network
Energy absorbed	Average	Average	Peak

## Main functions

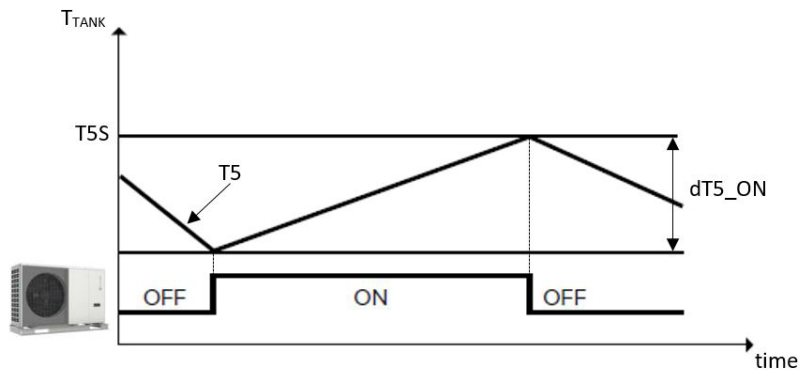
The user interface (HMI) has intuitive setting sub-menus and allows most of the unit's functions to be managed during start-up or subsequent operation.

### DHW (Domestic Hot Water) settings and management

The unit is designed to be coupled to DHW storage boilers(*HMI-enabled*), connected with the heater management kit (*QERAX* or *QERATX*) and T5 probe.

Logic dictates that there is a demand for DHW when the difference between the DHW set-point and the temperature of the storage tank T5 is greater than or equal to the value dT5\_ON.

Operation of the unit in DHW mode ends when  $T5 \geq T5S$  or when T5 reaches the maximum temperature for DHW in the heat pump T5stop, which is parameterised according to the outdoor temperature T4:



# Control and connectivity

If there is a further demand for DHW beyond  $T5_{stop}$ , the unit can activate the TBH boiler heater until setpoint is reached.

In DHW mode, the heat pump delivers water at  $T_{wout} = T5 + dT1S5$ , where the parameter  $dT1S5$  can be set from the HMI.

The outdoor air temperature range  $T4$  within which the heat pump can operate in DHW mode adjusting it between  $T4DHW_{MIN}$  and  $T4DHW_{MAX}$ . Outside the operating range set in this way, but within the generic operating range of the heat pump, the unit can produce DHW with the heater of the TBH DHW storage tank.

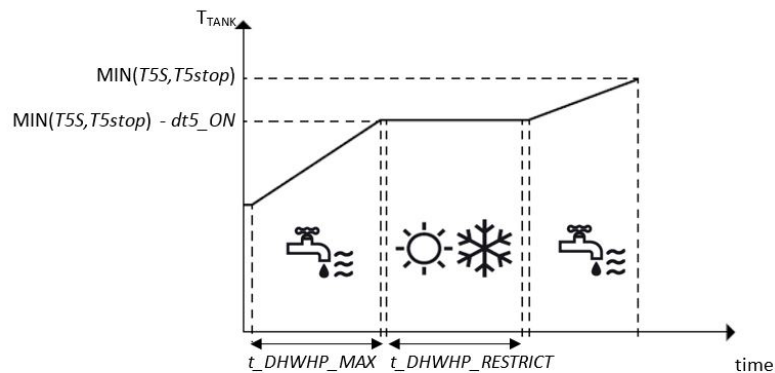
If there is simultaneous demand from DHW and the system, the former has priority as standard, but this can be changed at the HMI. However, the unit's logic controls several parameters and alternates between DHW and system operation in order to preserve comfort.

In particular, two controls can be activated, which process the maximum operating time of the unit in the system before switching to DHW  $t_{DHWHP\_RESTRICT}$  and the maximum operating time of the unit in DHW mode before switching to system  $t_{DHWHP\_MAX}$ .

By default, when the compressor of the unit is stopped, the heat pump waits a minimum of 5 minutes for it to be reactivated.

Other functions related to the production of DHW are:

- DISINFECT: management of periodic antilegionella cycles (*to be enabled, with logic as per the diagram*)



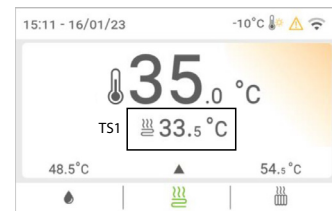
- FAST DHW: forces the unit and the heater of the TBH boiler to run in DHW mode up to the set-point
- TANK WATER: forces the heater of the TBH boiler to run in DHW mode, letting the unit of the system to work or act as a back-up in case of failure
- DHW PUMP: cycle programme for the DHW recirculation pump. The recirculation pump must be enabled at the HMI, selecting whether it should also work during anti-legionella cycles, and setting the time of operation in minutes when activated in PUMP\_D RUNNING TIME.

## Type of system adjustment and request to unit

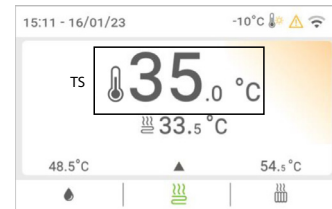
During the initial start-up phase, the type of control required for the system can be selected.

The unit can be managed with control of:

- **supply water temperature**, which has two options
  - fixed setpoint, set from the user interface
  - auto control setpoint, calculated from a preselected climate curve



- **room temperature**  
In this case, the water supply set-point is automatically adjusted according to the climatic curve



The request to the unit can be made from the user interface (thanks to the built-in temperature sensor) or from the electromechanical thermostat. In the second case, the zone thermostat can only control the Heating/Cooling mode change if it has a double relay, otherwise it must be managed by HMI.

## Setting two zones

The unit can independently manage two zones, even with different temperatures.

Control can be:

- of the supply water temperature for both zones.  
In this case, the user can set the set-point of Zone 1 TS1 and Zone 2 TS2
- of supply water temperature for Zone 1 and of room air temperature for Zone 2 (from HMI)  
In this case, the user can set the Zone 1 TS1 set-point, while the Zone 2 supply water temperature will be automatically adjusted with a climate curve

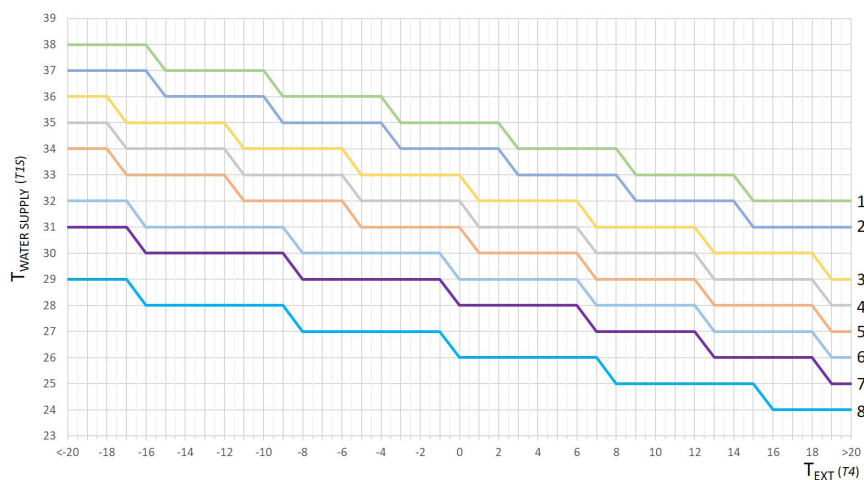
 Both zones can be equipped with an electromechanical thermostat to manage the request. In double zone systems, Zone 1 cannot have room air temperature control.



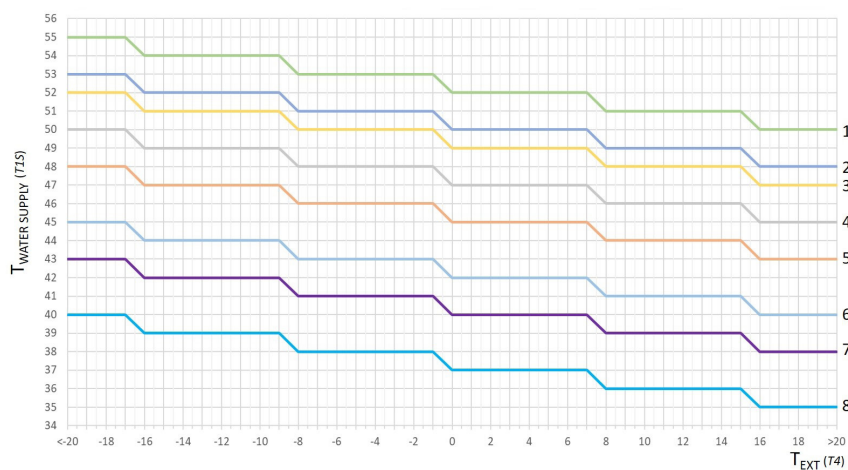
# Control and connectivity

One of the curves designed to optimise the system can be selected at the user interface:

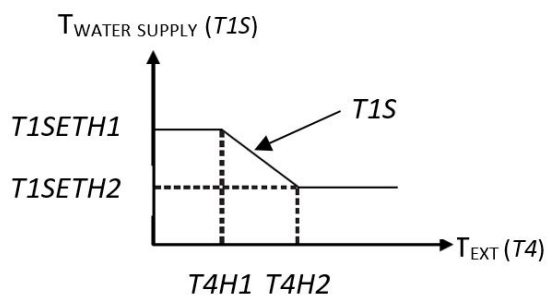
- 8 default curves for Heating mode on systems with radiant distribution



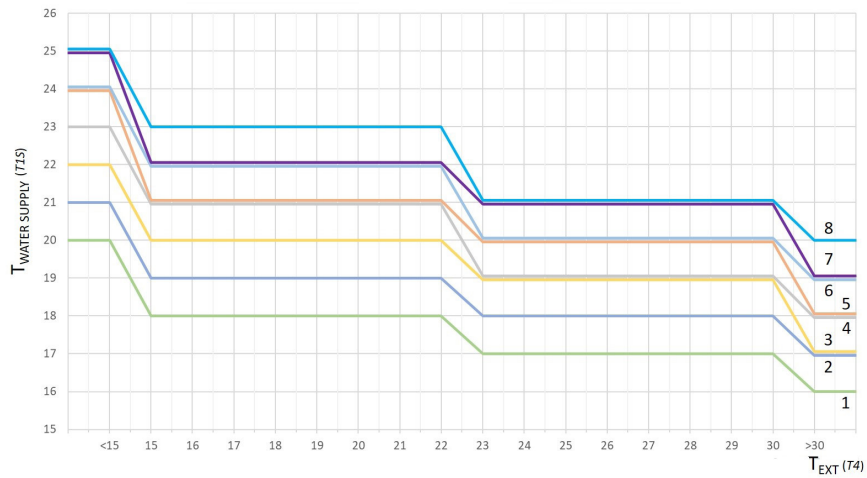
- 8 default curves for Heating mode on systems with terminal distribution



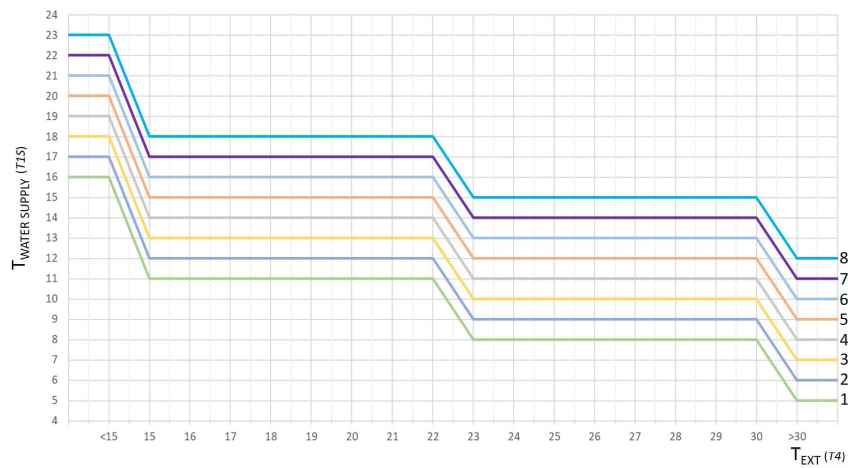
- 1 customisable curve, using the outdoor air temperature ( $T4H1$ ,  $T4H2$ ) and water supply ( $T1SETH1$ ,  $T1SETH2$ ) parameters



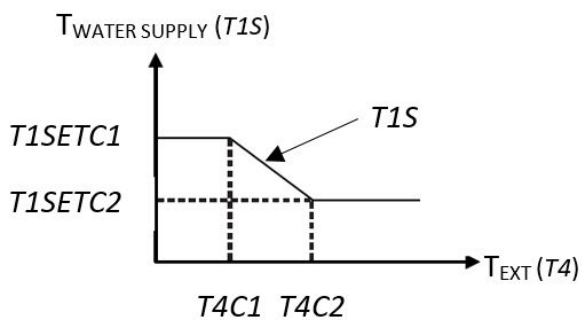
- 8 default curves for Cooling mode on systems with radiant distribution



- 8 default curves for Cooling mode on systems with terminal distribution



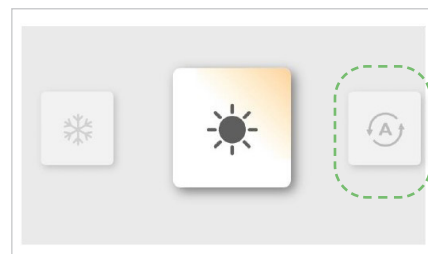
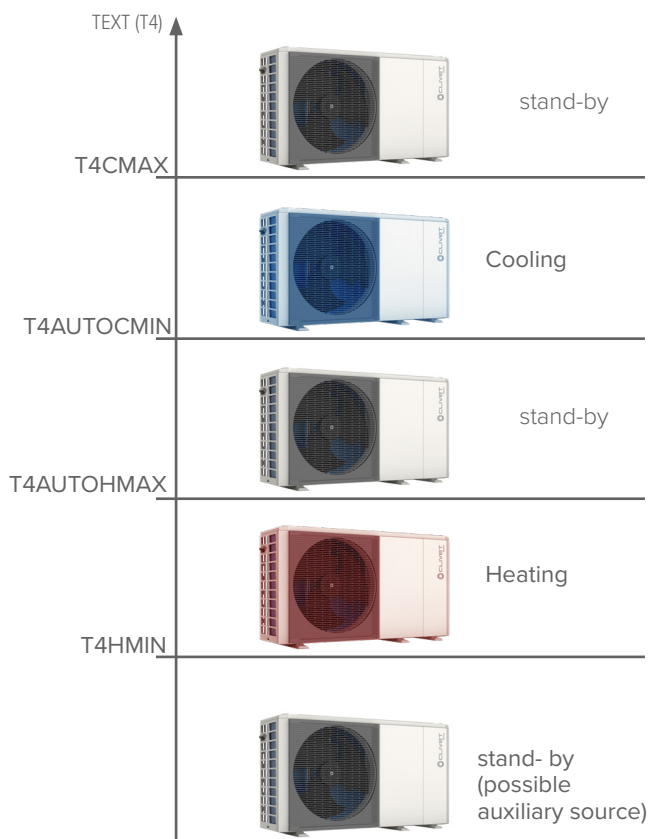
- 1 customisable curve, using the outdoor air temperature ( $T4C1$ ,  $T4C2$ ) and water supply ( $T1SETC1$ ,  $T1SETC2$ ) parameters



# Control and connectivity

## AUTO mode

The unit can autonomously manage its own operating mode during the year, adjusting itself according to the outdoor air temperature and a series of parameters that can be set during initial start-up:



## Silent function

The Silent function can be enabled at the HMI (also with an on/off timer) and makes the unit run in one of two silent modes. It electronically limits the maximum operating frequency of the fan and compressor, thus reducing the maximum power output of the unit depending on the operating conditions.

Activation is linked to the outdoor air temperature T4 according to this logic:

Level 1 (Silent) reduces the sound power of the unit by half on average, while level 2 (Super Silent) reduces it to 25 per cent on average.

**⚠** The maximum power at limited frequency varies according to the operating conditions and can be roughly estimated using a reduction coefficient  $K$ : for Silent  $K = 0.75$ , for Super Silent  $K = 0.5$ .

## Photovoltaics and the Smart Grid

The unit is Smart Grid Ready certified and is equipped with logic for connection to devices that balance loads connected to the power grid and optimise overall power consumption. Connection is optional and the function can be enabled at the HMI and is linked to the SGO ON/OFF input, which receives a status signal from the mains.

The unit is also able to automatically consume the excess energy produced by a photovoltaic system, using it to store free thermal energy in the DHW tank. The function is activated at the HMI with the Smart Grid function and is linked to the SG1 ON/OFF input, which receives a signal from the energy meter that indicates to the unit when excess free energy is available.

The control logic of the two contacts is

ENERGY COST	CONTACT		AVAILABLE HEATERS	SYSTEM	OPERATION	
	SG0	SG1			DHW	
Free	ON	ON	-	Standard	No demand for Heating / Cooling: forced operation in DHW mode with T5S set-point = 60 °C	
			IBH			
			TBH		Forced DHW operation with T5S set-point = 70 °C TBH is activated as long as the DHW set-point is met	
			IBH + TBH*		<i>If necessary, the heat pump can work simultaneously with the system in Heating/Cooling mode</i>	
Economical	OFF	ON	-	Standard	The DHW set-point is forced to T5S + 3 °C	
			IBH			
			TBH		The DHW set-point is forced to T5S + 3 °C	
			IBH + TBH*		TBH is activated when T5 < T5S - 2 °C and is stopped when T5 ≥ T5s + 3 °C	
Standard	OFF	OFF	any	Standard	Standard	
Expensive	ON	OFF	-	Forced OFF	Forced OFF**	
			IBH / TBH			

\*If IBH and TBH are enabled together, IBH can only be used with the system in heating mode

\*\*DISINFECT, FAST DHW, TANK WATER and other DHW-related functions are disabled

⚠ Frost protection and defrosting operate smoothly in all conditions

⚠ If AHS is available, it can operate normally in heating or DHW mode in all conditions

## €/Switch (for hybrid version)

The hybrid version of the unit is based on a logic of economical optimisation of the various heat sources available: while the efficiency of the boiler is a constant value, that of the heat pump is dependent on the outdoor air temperature and the water supply temperature.

The function has to be activated at the HMI and compares the economic expenditure in the operating conditions with the Heat Pump or Back-up Boiler, giving it priority. It does this by using values which can be easily found in household supply bills and can be entered by the HMI at start-up:

- average cost of gas feeding the boiler, expressed in €/m<sup>3</sup>.
- average cost of electricity, expressed in €/kWh.

Based on these values, the unit calculates the minimum operating efficiency where it is economically viable to operate the heat pump alone. When the unit detects operation with instantaneous efficiency below this value, it makes the boiler alone meet the load.

## Energy metering

The Energy metering is available for heating, cooling and domestic hot water mode.

The Energy metering interface are the same for all the three different working modes.

After you choose the operation mode, you can view the energy metering data divided by time (hour, total, day, week, month, year, and historical).

The "Historical data" includes historical energy data of the past 10 years. In this case, data are shown on monthly / yearly base.

On the HMI you can see the following parameters:



- PRODUCTION: Heating/Cooling production (includes electric heater production).
- RE PRODUCTION: is the difference between unit production and consumption.
- CONSUMPTION: Electricity consumption (includes electric heater consumption).
- COP/EER: Efficiency evaluated as the ratio between the production and consumption (includes electric heater).

It is also possible to view the Energy metering data from the Clivet Eye interface.

## Other functions for the installer

- ✓ **Service call:** stores up to 2 telephone contacts to be displayed in case of need
- ✓ **Restore factory settings:** resets all HMI parameters to factory settings
- ✓ **Underfloor pre-heating:** in the case of systems with a radiant floor that have been idle for some time, perform a slow start-up cycle of the unit to avoid damaging it. You can set start and final water set-point TS1 of the cycle
- ✓ **Remote ON/OFF contact:** clean contact that can be enabled from the HMI to work as an ON/OFF input. The contact is of the NO type (normally open). When the contact is open the unit works normally, when it is closed the unit turns (OFF) and shows an identification code on the display, in this last state the machine cannot be managed by either the HMI or the BMS but the protections antifreeze of the unit remain active.
- ✓ **Floor drying:** in the case of new systems with radiant floors, perform a drying cycle of the unit to avoid damaging it. The cycle includes a phase of gradual rise in temperature, a holding phase and a phase of gradual shutdown.  
You can set the duration of all phases and the peak water temperature.
- ✓ **Automatic restart:** sets whether the unit, after a power failure, should automatically restart with the last settings or remain in stand-by mode.
- ✓ **Power input limitation:** sets a parameter 0-8 that limits the maximum current absorbed by the unit (see dedicated section for further details)
- ✓ **Error codes and parameters:** displays the list of the last 8 error codes and operating parameters
- ✓ **Defrost or alarm status signal:** allows this information to be controlled remotely

## Other functions for the user

- ✓ **Default temperatures:** sets a daily profile of up to 6 water supply temperatures for Heating or Cooling, which can be used as an alternative to selecting a climate curve  
 *in the case of 2-zone systems, the default temperatures operate only in zone 1*
- ✓ **ECO function:** sets an energy-saving climate curve in Heating mode for setting the water supply set-point. The curve set by the ECO mode for radiant distribution systems is number 3, while for terminal distribution systems it is number 6.  
 *the function is not available with 2-zone systems*
- ✓ **Weekly scheduling (hourly programming):** sets the unit's weekly schedule of up to 6 time slots with different modes and set-points
- ✓ **Holiday Away function:** prevents the system from freezing during prolonged periods of absence and activates the system before the user returns home.
- ✓ **Holiday at home function:** sets a weekly schedule for a period of time without eliminating the standard one.
- ✓ **Child lock:** prevents accidental changes to settings by blocking selection of the set-point and mode

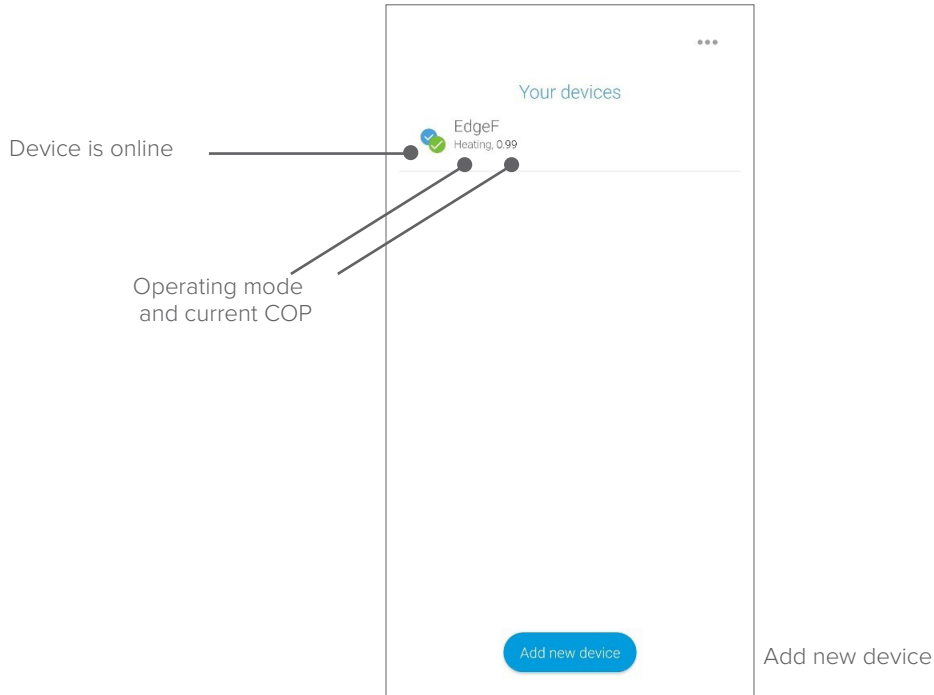
## Management and monitoring via Clivet-Eye

The App is available in these languages: English / Italian / German / French / Spanish / Dutch / Portuguese

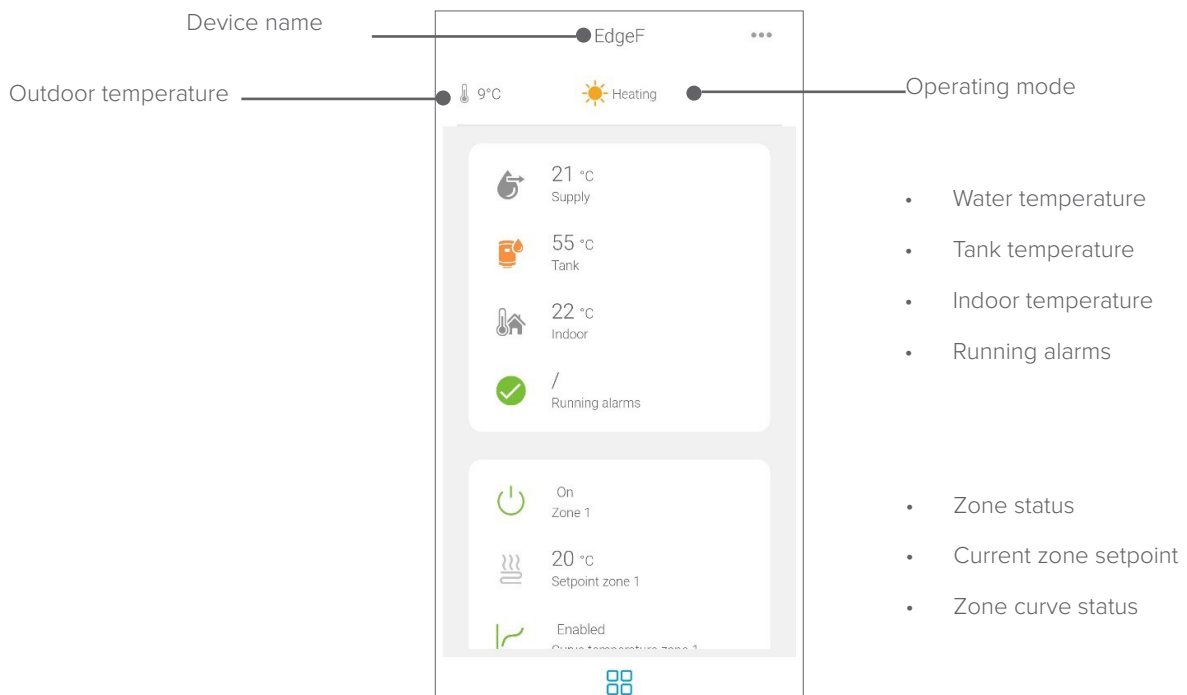
The unit has standard control and management with App via a device located inside the HMI, which provides the following functionality:



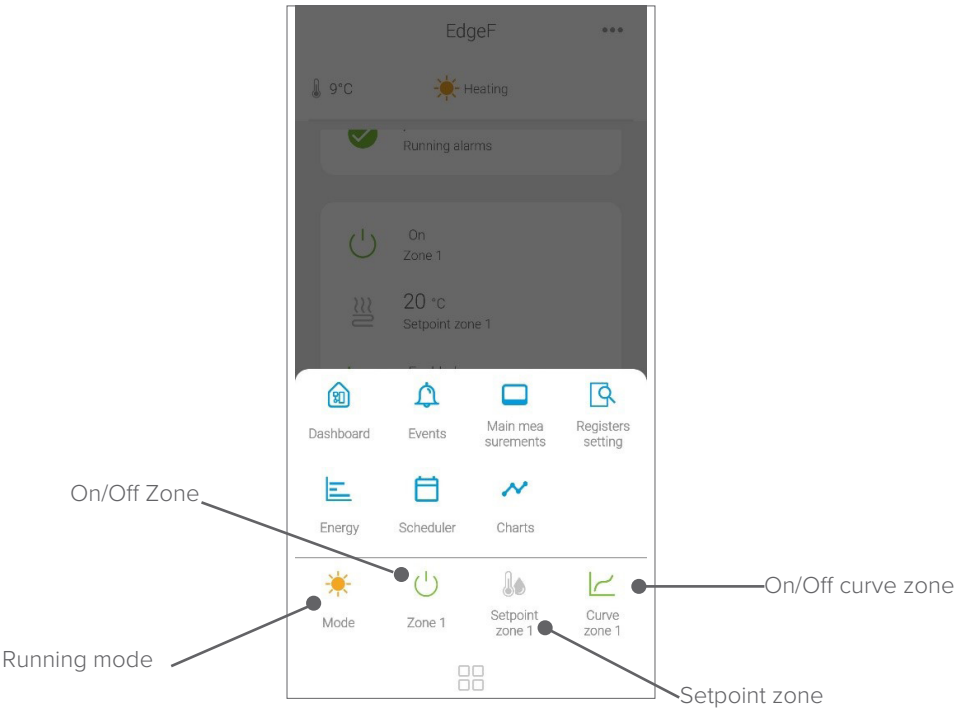
### 1. 1. Access to the devices list



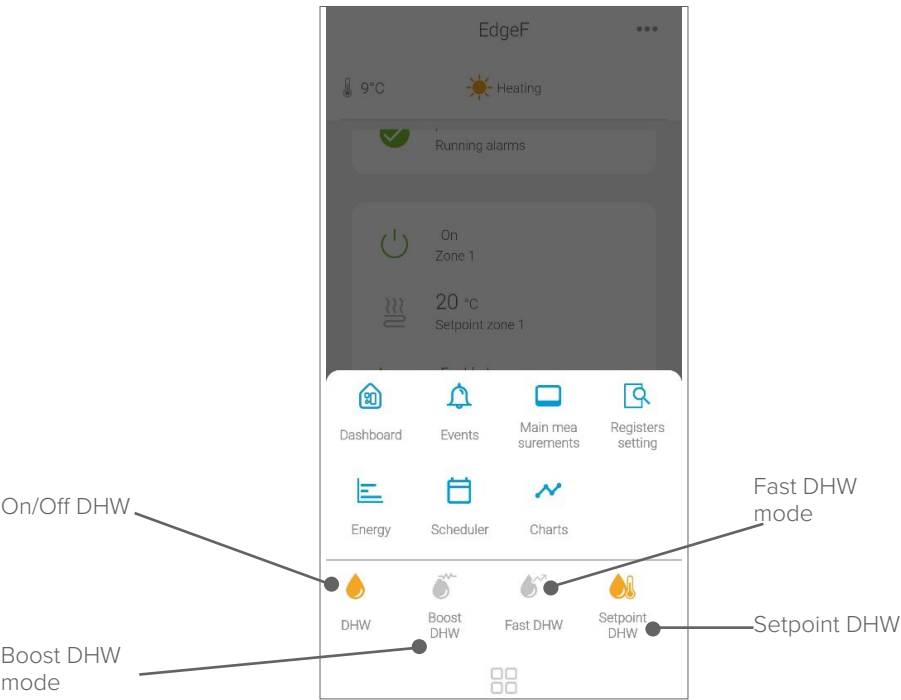
### 2. Main dashboard



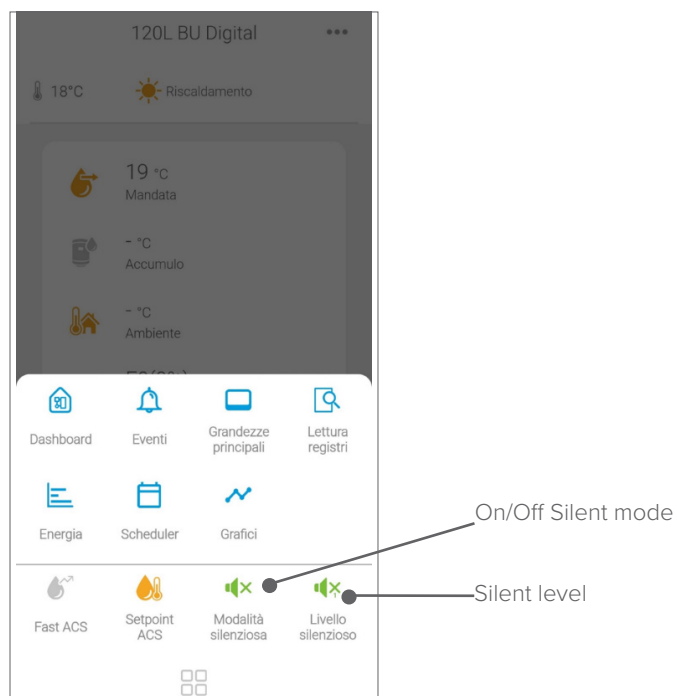
## 3. Commands: Zone control



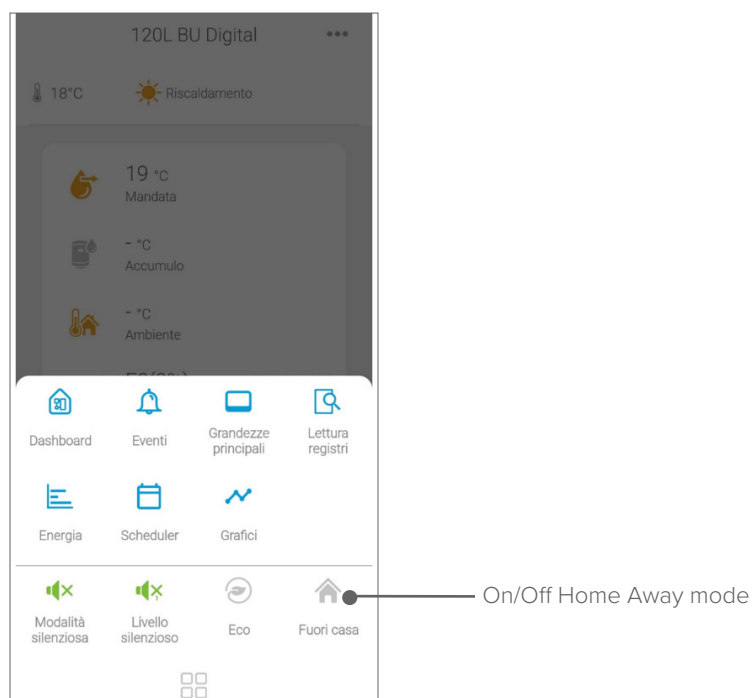
## 4. Commands: Domestic hot water



## 5. Commands: Silent Mode

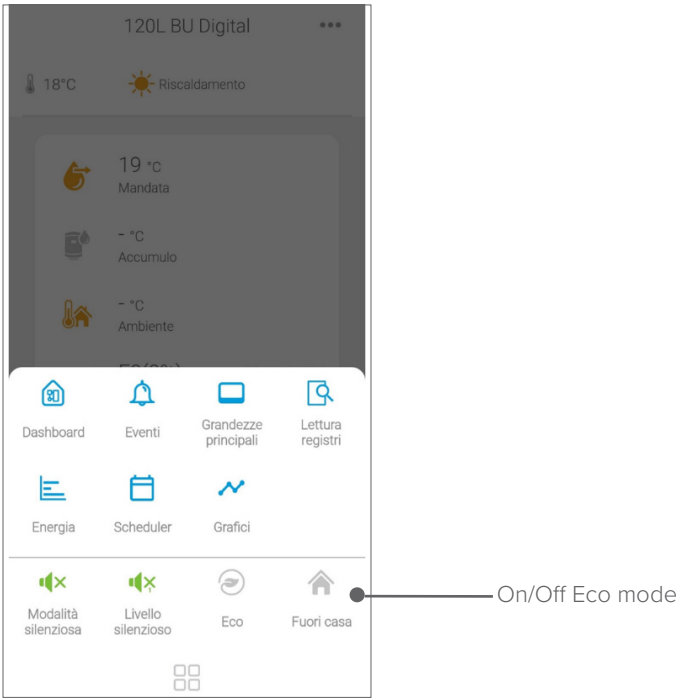


## 6. Commands: Home away

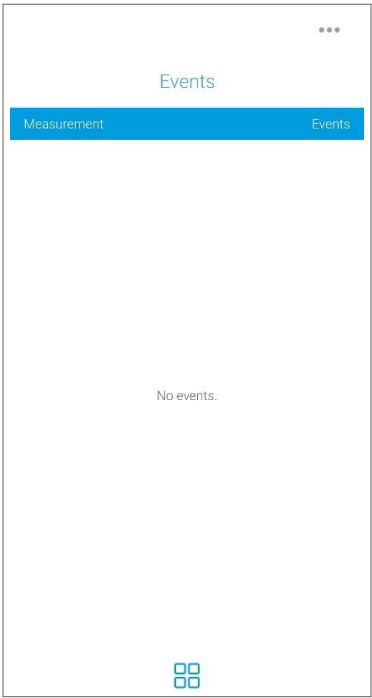




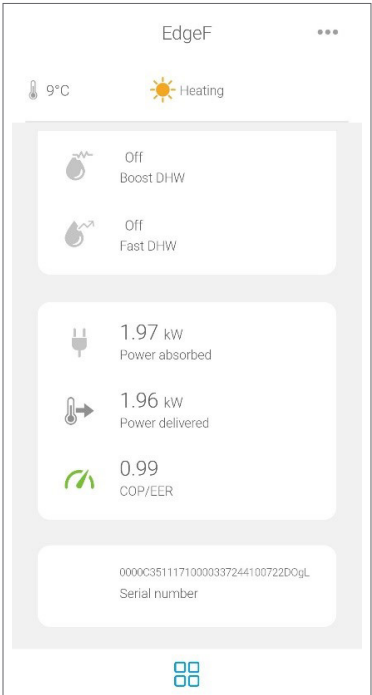
## 7. Controls: Eco Mode



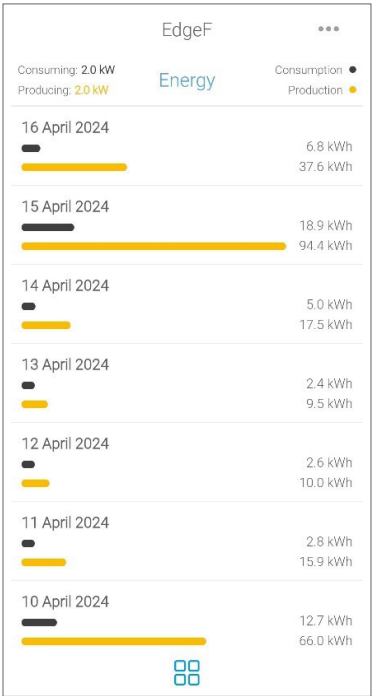
## 8. Alarm history



9. Energy data



- Power absorbed
- Power delivered
- COP / EER



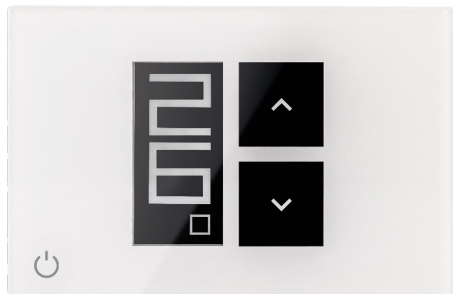
- Daily energy consumption and production for last 7 days

# Control and connectivity

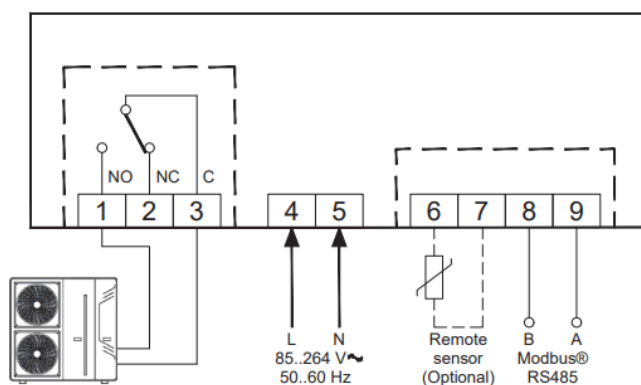
## Management with Wi-Fi area thermostat

The semi-recessed or wall-mounted HTC2WX chronothermostat is designed for system management via touch interface, App or Alexa voice or Google Home assistant.

Thermostat languages: ITA/ENG/FRA/GER/SPA, App languages: ITA/ENG/FRA/GER/SPA/CRO/POL/SER/NED



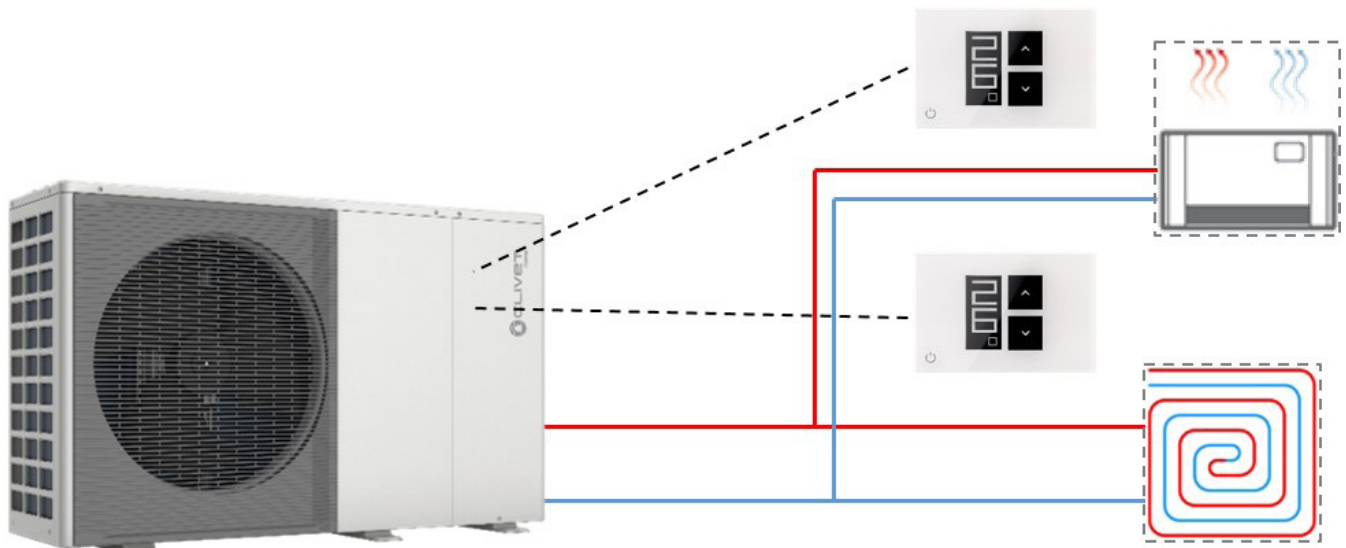
- 2.13" rectangular e-paper display
- SwitchConnect paired receivers: max. 2
- power supply: 100-253V / 50-60Hz
- settable temperature: 5-40°C
- antifreeze temperature: 0.5-10°C
- temperature offset:  $\pm 5^{\circ}\text{C}$  (std  $0^{\circ}\text{C}$ )
- protection rating: IP30
- Wi-Fi: 802.11 b/g/n
- self-adjusting clock via web with back-up battery
- dimensions: 120x80x24 mm



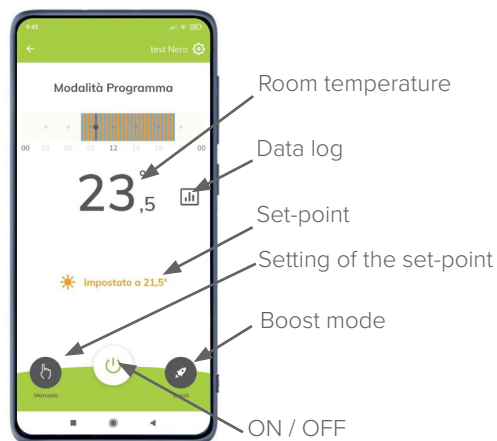
✓ Connection to a zone; the thermostat manages the request and the HMI manages the mode change



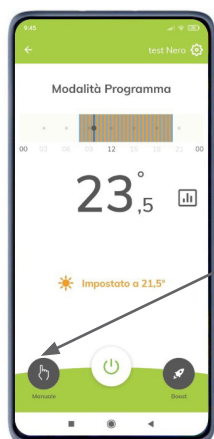
- ✓ Two-zone connection: each thermostat manages the request of its own zone, the mode is changed by the HMI



System management via Clivet Home Connect App:



- ✓ automatic management with scheduler or manual setting



Manual setting

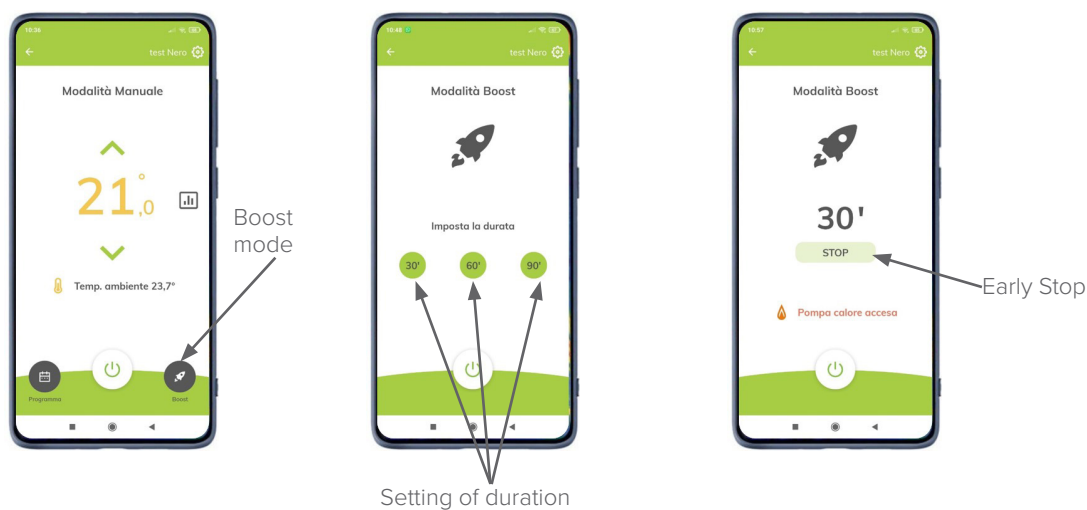


Manual setting of the set-point

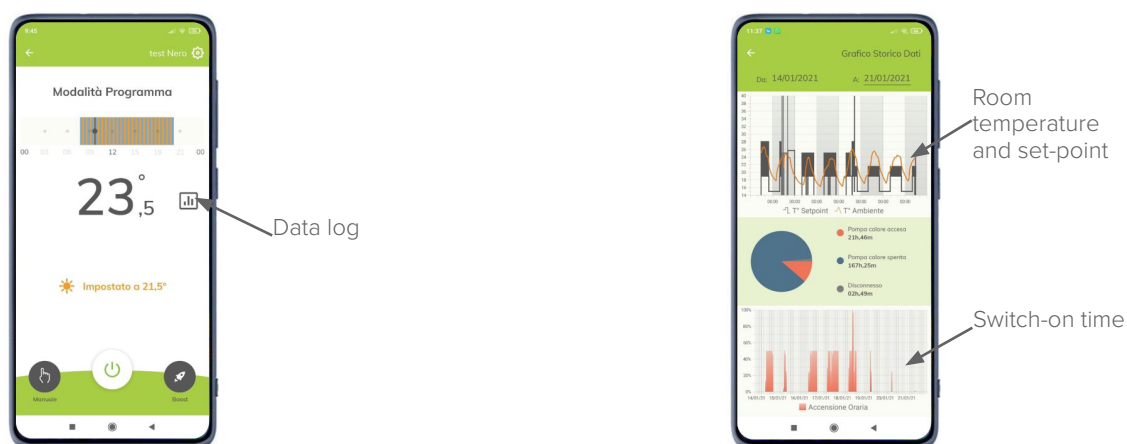
Weekly scheduling

# Control and connectivity

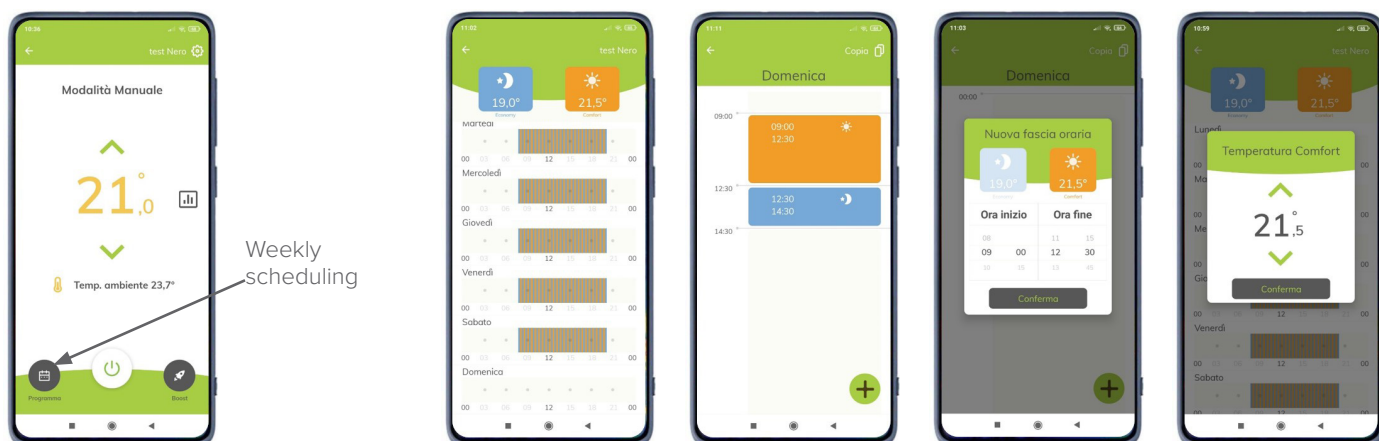
✓ Boost mode, forced start-up of the system



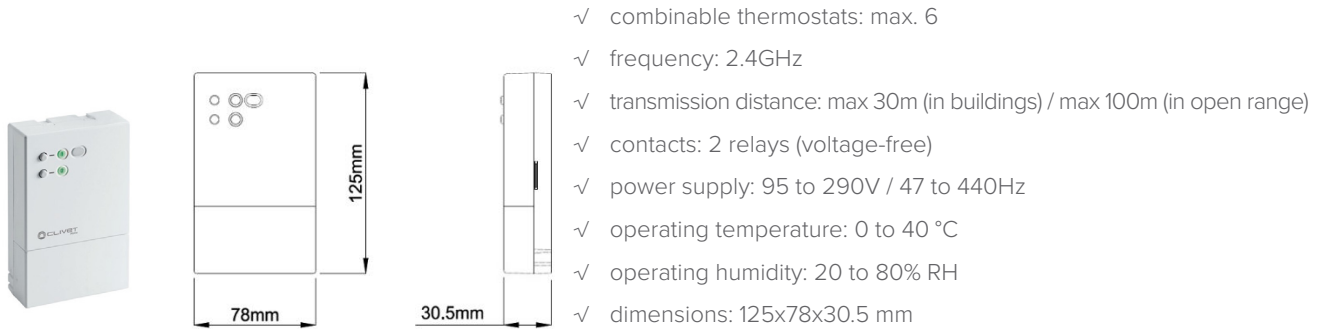
✓ System data log



✓ Weekly scheduling



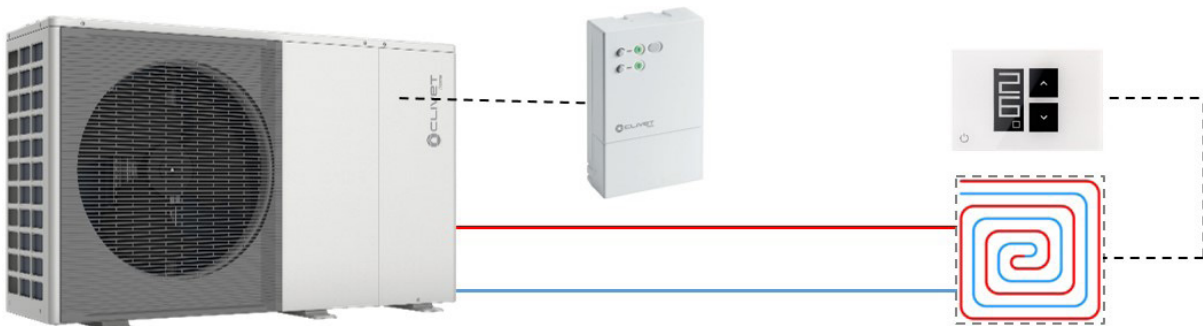
The SWCX receiver can be used to set up a wireless system:



- ✓ connection to a zone: the thermostat manages the request via SWCX with Wi-Fi signal and can enable distribution, while the HMI manages the mode change



- ✓ connection to a zone with mode change: the thermostat manages the request and mode change of the unit via SWCX with Wi-Fi signal and can enable the distribution



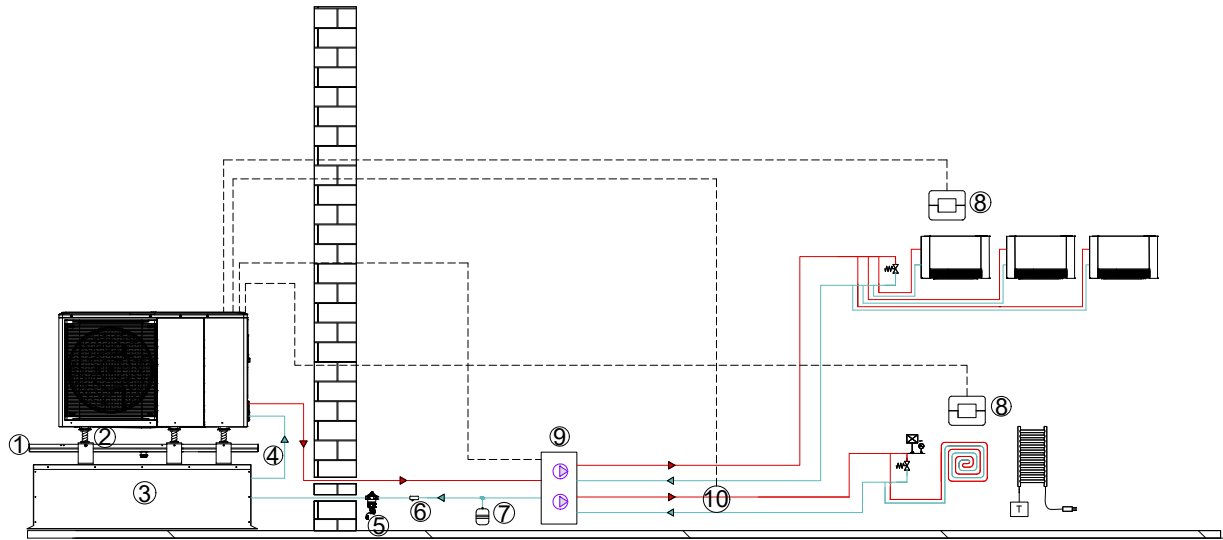
- ✓ Two-zone connection: each thermostat manages the request of its own zone and can enable distribution, the mode is changed by the HMI



# Diagram and installation

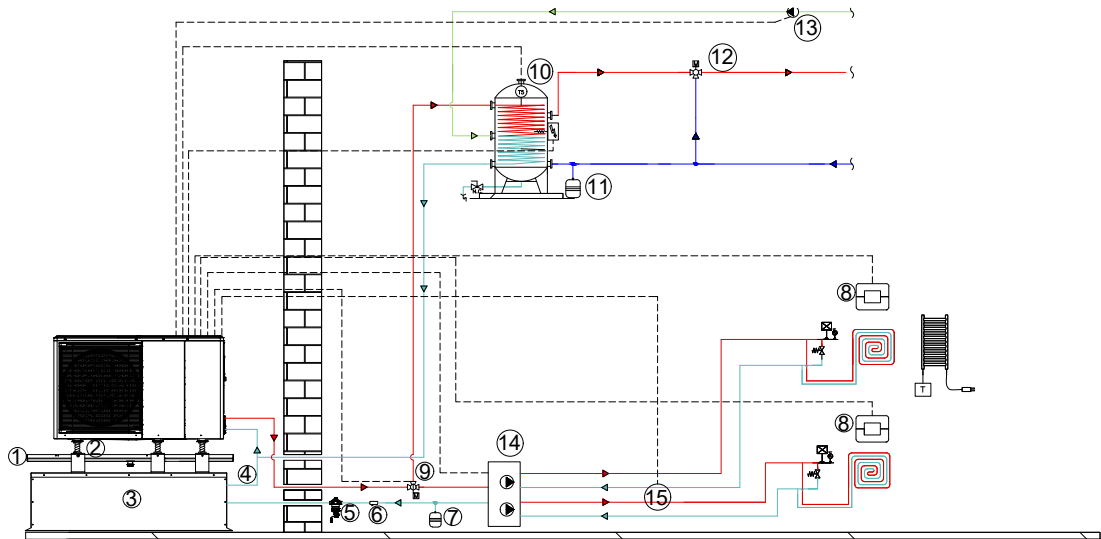
## Simplified system diagrams

### Heating/cooling with 2-zone system (mixed zone 2)



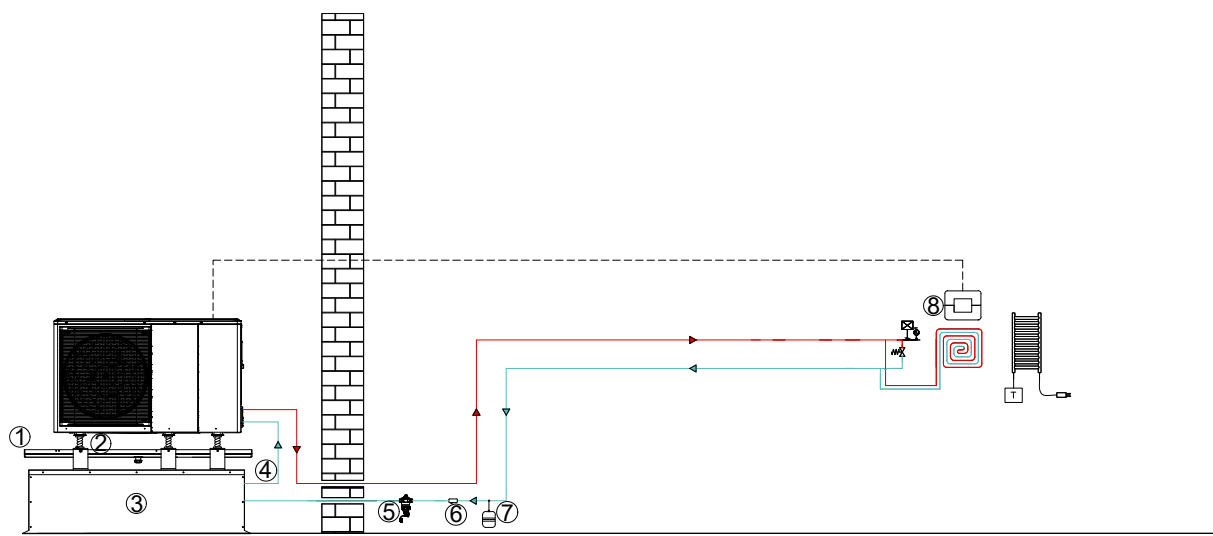
- 1 - DTX: Drain pan with electric heater
- 2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray
- 3 - TANKX: inertial storage tank
- 4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - KIRE2HLX: Double zone distribution unit: direct + mixed (with mixing valve)
- 10 - Tw2 – Water supply temperature for the mixed zone

### Heating/cooling/DHW with 2-zone system (direct zone 2)



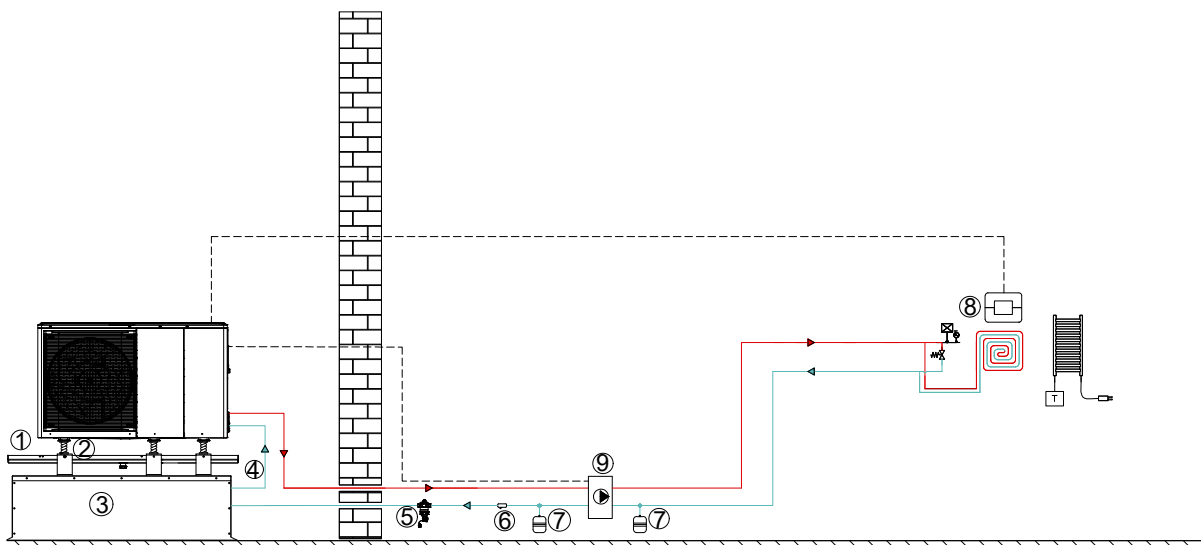
- 1 - DTX: Drain pan with electric heater
- 2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray
- 3 - TANKX: system's inertial storage tank
- 4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - 3DHWX: 3-way system/DHW switching valve
- 10 - ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank
- 11 - DHW expansion tank (externally supplied)
- 12 - anti-scalding valve
- 13 - PRSX: DHW recirculation pump
- 14 - KIRE2HX: Double zone distribution unit: direct + direct
- 15 - Tw2 – Water supply temperature for the mixed zone

## Heating/cooling



- 1 - DTX: Drain pan with electric heater
- 2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray
- 3 - TANKX: system's inertial storage tank
- 4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control

## Heating/cooling with primary and secondary

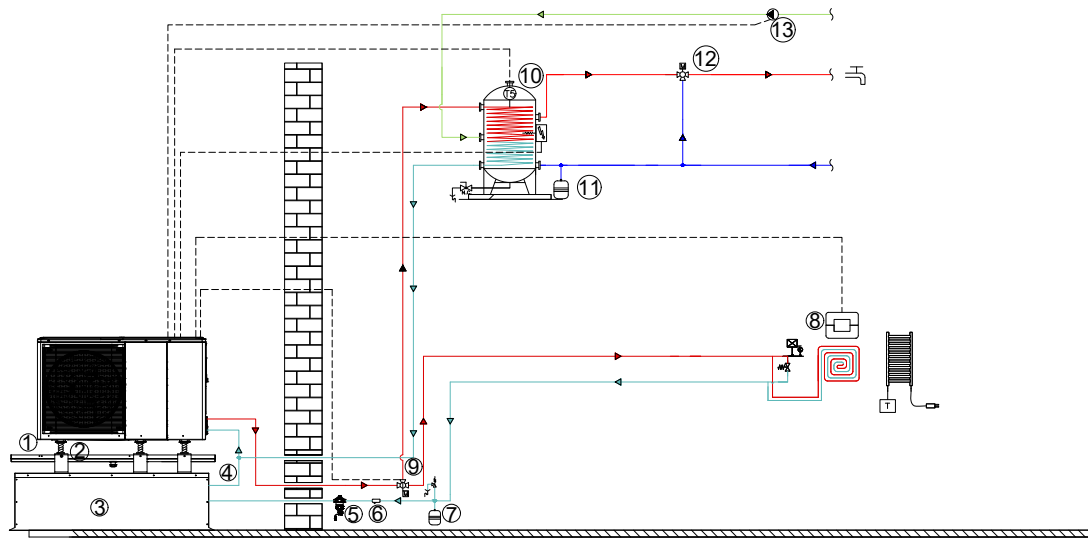


- 1 - DTX: Drain pan with electric heater
- 2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray
- 3 - TANKX: inertial storage tank
- 4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - Secondary circuit kit (1-litre hydraulic circuit breaker + pump)



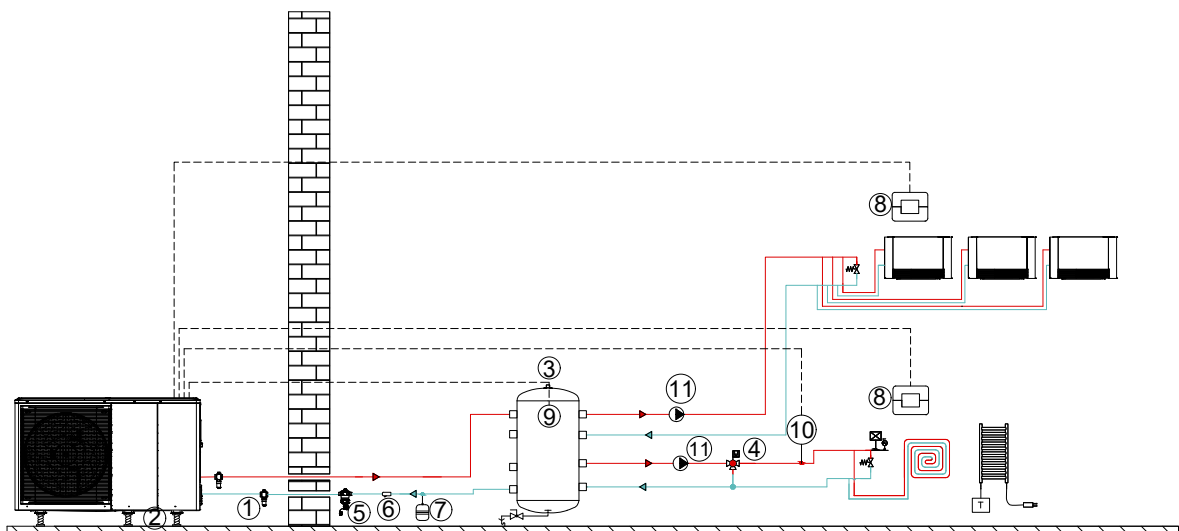
# Diagram and installation

## Heating/cooling/DHW



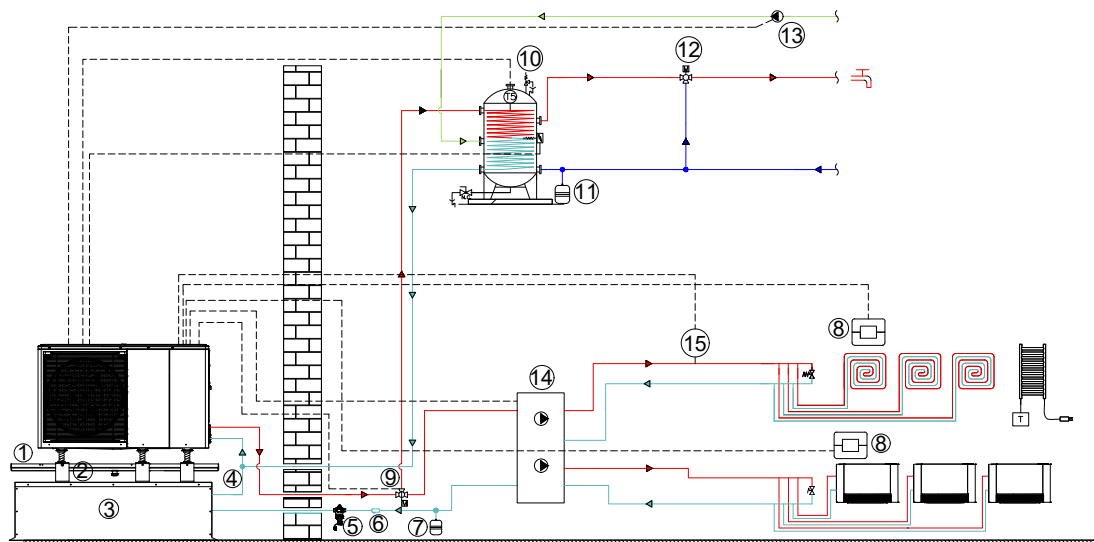
- 1 - DTX: Drain pan with electric heater
- 2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray
- 3 - TANKX: system's inertial storage tank
- 4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - 3DHWX: 3-way system/DHW switching valve
- 10 - ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank
- 11 - DHW expansion tank (externally supplied)
- 12 - anti-scalding valve
- 13 - PRSX: DHW recirculation pump

## Heating/cooling with 2-zone system (dual emitter)



- 1 - VAGX: Safety antifreeze valve for system
- 2 - AMRX: Kit of antivibration mounts for floor installation
- 3 - DI50-2X: 50-litre hydraulic circuit breaker
- 4 - 3-way valve (externally supplied)
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 10 - Tw2 - Water supply temperature for the mixed zone
- 11 - PCSX/PCS2X: Circulation pump standard/Oversized head for secondary circuit

## Heating/cooling/DHW with 2-zone system (mixed zone 2)



1 - DTX: Drain pan with electric heater

2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray

3 - TANKX: system's inertial storage tank

4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank

5 - FDMX: Magnetic dirt separator filter for water distribution systems

6 - mesh filter (supplied as standard with the unit)

7 - additional expansion tank (externally supplied)

8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control

9 - 3DHWX: 3-way system/DHW switching valve

10 - ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank

11 - DHW expansion tank (externally supplied)

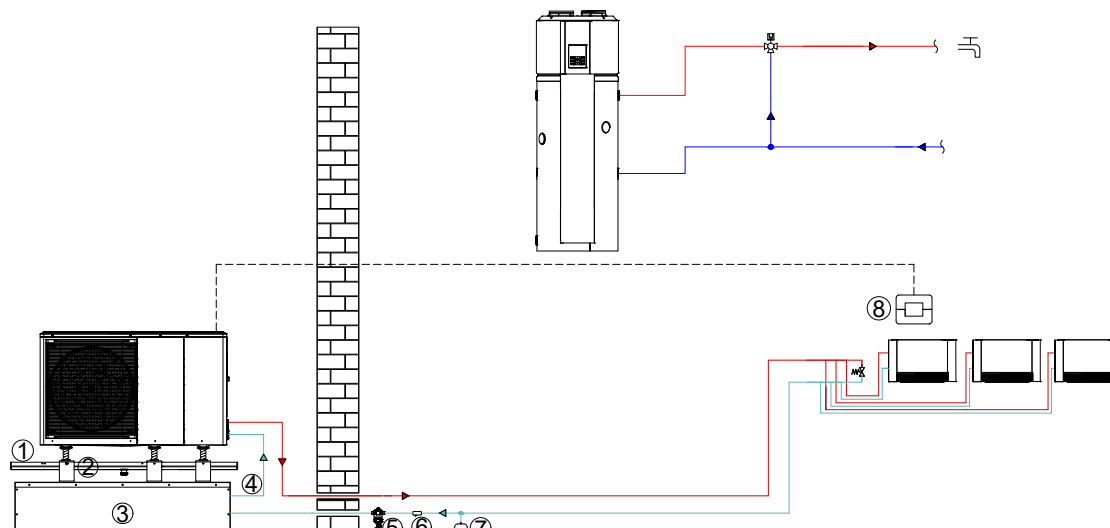
12 - anti-scalding valve

13 - PRSX: DHW recirculation pump

14 - KIRE2HLX: Double zone distribution unit: direct + mixed (with mixing valve)

15 - Tw2 - Water supply temperature for the mixed zone

## Heating/cooling with dedicated heat pump for DHW



1 - DTX: Drain pan with electric heater

2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray

3 - TANKX: inertial storage tank

4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank

5 - FDMX: Magnetic dirt separator filter for water distribution systems

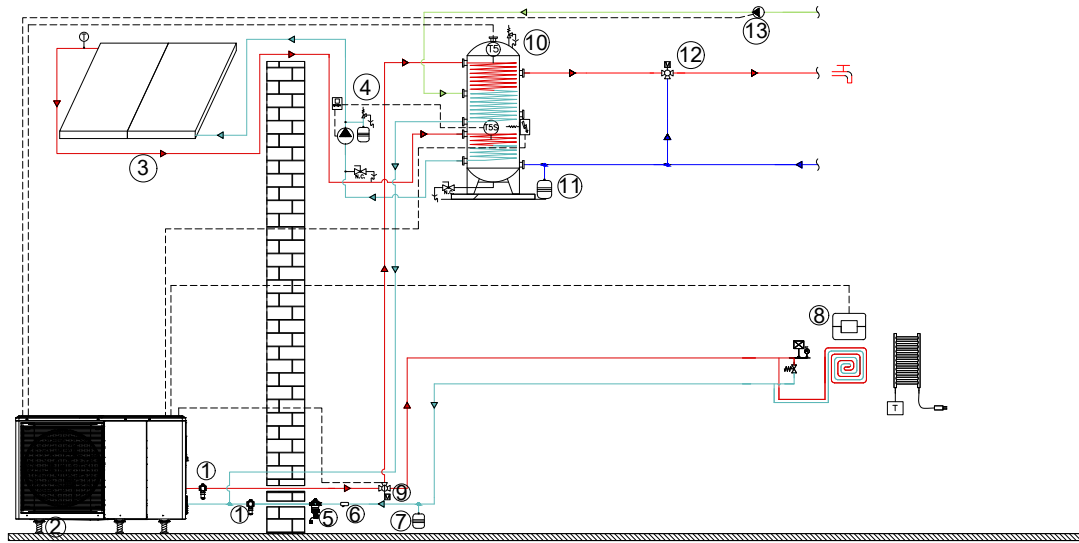
6 - mesh filter (supplied as standard with the unit)

7 - additional expansion tank (externally supplied)

8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control

# Diagram and installation

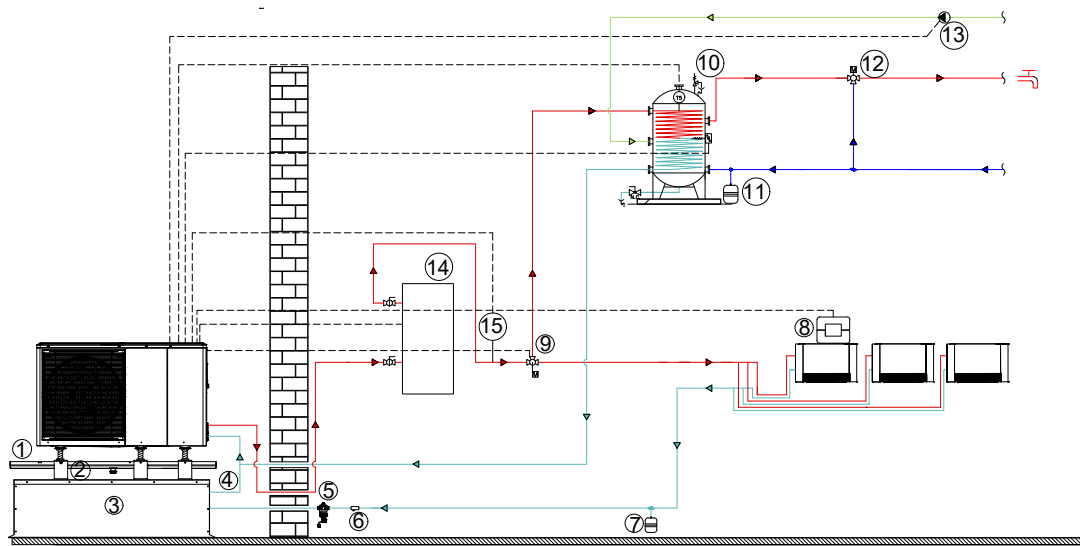
## Heating / cooling / DHW with solar thermal circuit



- 1 - VAGX: Safety antifreeze valve for system
- 2 - AMRX: Kit of antivibration mounts for floor installation
- 3 - Elfosun solar thermal
- 4 - Solar power unit
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)

- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - 3DHWX: 3-way system/DHW switching valve
- 10 - ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank
- 11 - DHW expansion tank (externally supplied)
- 12 - anti-scalding valve
- 13 - PRSX: DHW recirculation pump

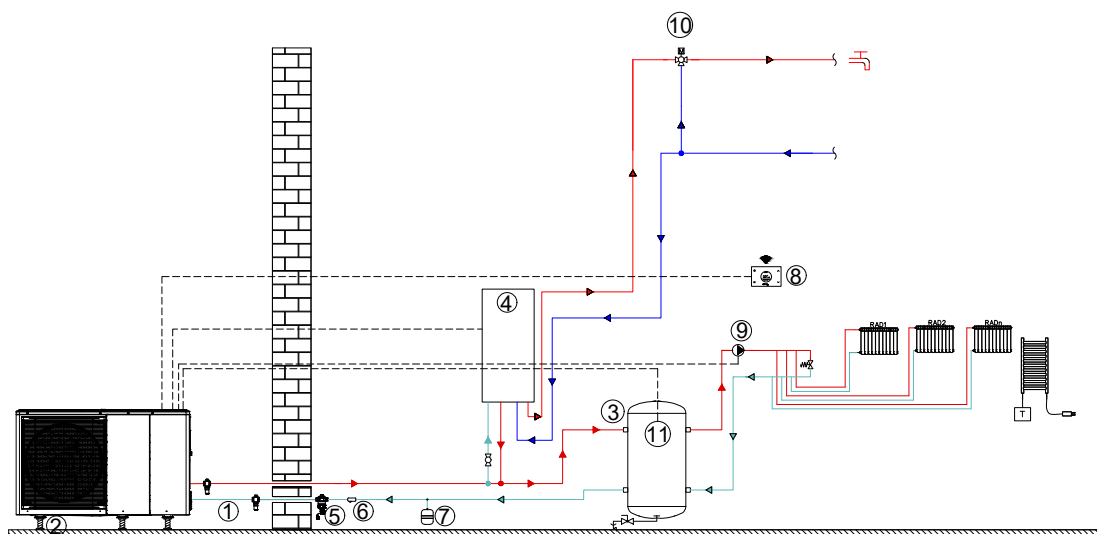
## Heating / cooling / DHW with electric heater



- 1 - DTX: Drain pan with electric heater
- 2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray
- 3 - TANKX: system's inertial storage tank
- 4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control

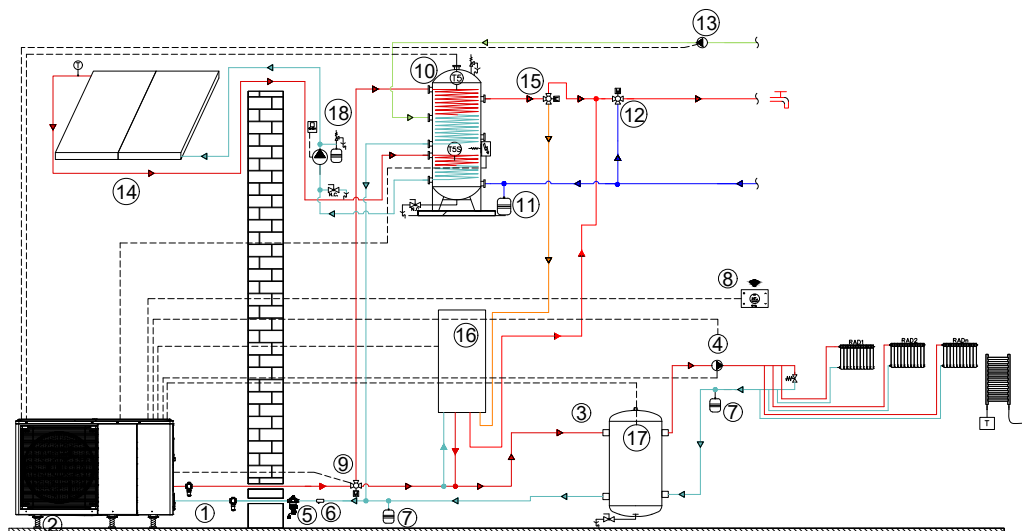
- 9 - 3DHWX: 3-way system/DHW switching valve
- 10 - ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank
- 11 - DHW expansion tank (externally supplied)
- 12 - anti-scalding valve
- 13 - PRSX: DHW recirculation pump
- 14 - IBHX: electric heater
- 15 - DHW temperature probe

## Heating / DHW with back-up boiler



- 1 - VAGX: Safety antifreeze valve for system
- 2 - AMRX: Kit of antivibration mounts for floor installation
- 3 - DI50-2X: 50-litre hydraulic circuit breaker
- 4 - GAS BOILER: boiler for stand-alone systems
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - PCSX: secondary circuit pump
- 10 - anti-scalding valve
- 11 - T1BX - Storage tank temperature probe

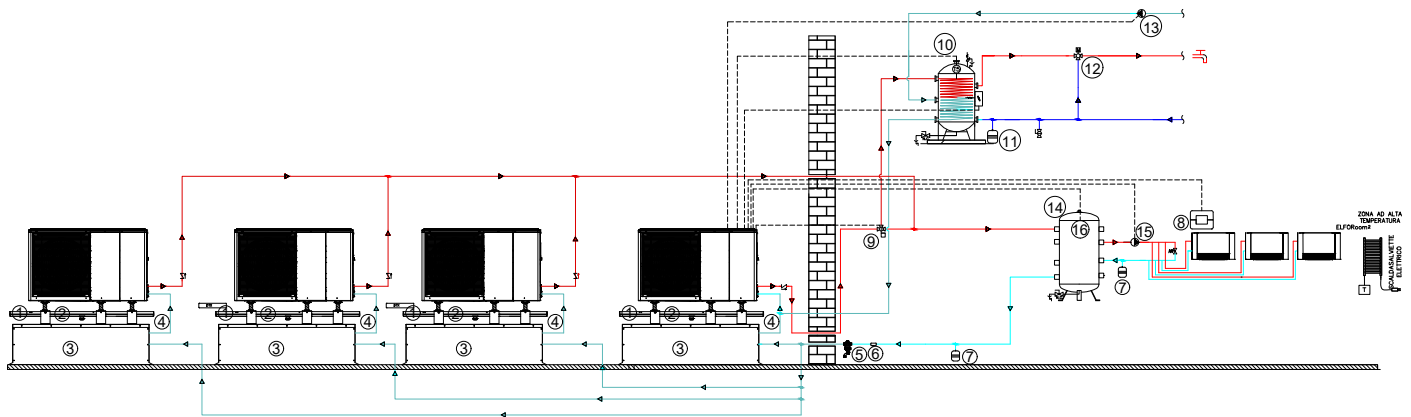
## Heating / cooling / DHW with back-up boiler



- 1 - VAGX: Safety antifreeze valve for system
- 2 - AMRX: Kit of antivibration mounts for floor installation
- 3 - DI50-2X: 50-litre hydraulic circuit breaker
- 4 - PCSX: secondary circuit pump
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - 3DHWX: 3-way system/DHW switching valve
- 10 - ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank
- 11 - DHW expansion tank (externally supplied)
- 12 - anti-scalding valve
- 13 - PRSX: DHW recirculation pump
- 14 - ELFOSun solar thermal circuit
- 15 - VDACSX: thermostatic switching valve for DHW
- 16 - GAS BOILER: boiler for stand-alone systems
- 17 - T1BX - Storage tank temperature probe
- 18 - Efilosun control unit

# Diagram and installation

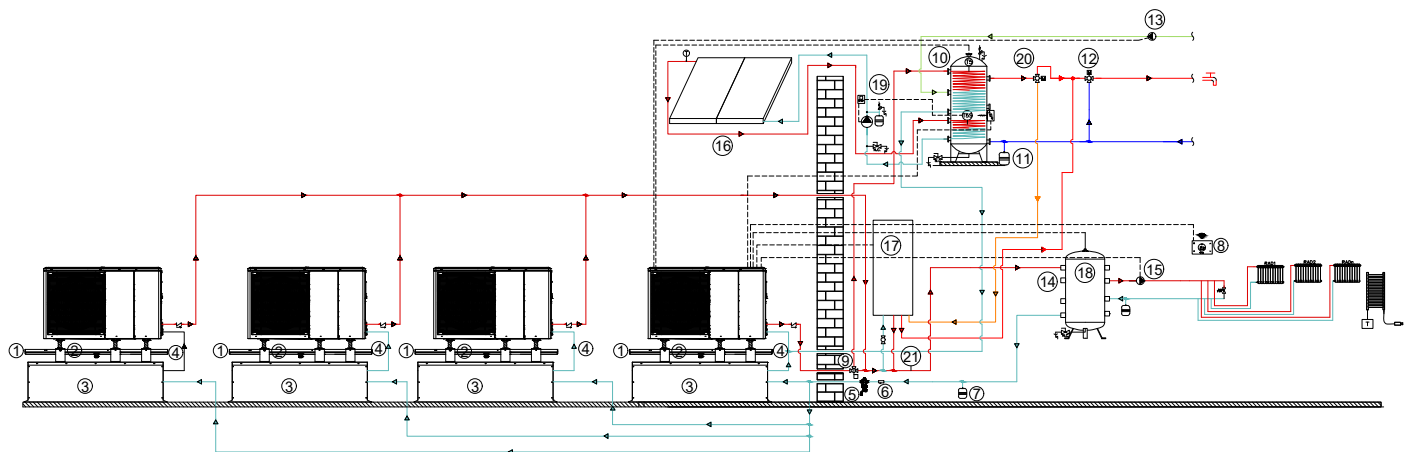
## Cascade x 4 Heating / cooling / DHW units



- 1 - DTX: Drain pan with electric heater
- 2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray 3 - TANKX: system's inertial storage tank
- 4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - 3DHWX: 3-way system / DHW switching valve

- 10 - ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank
- 11 - DHW expansion tank (externally supplied)
- 12 - anti-scalding valve
- 13 - PRSX: DHW recirculation pump
- 14 - DI100X: 100-litre hydraulic circuit breaker
- 15 - PCS2X: oversized pump for secondary circuit
- 16 - T1BX - Storage tank temperature probe

## Cascade x 4 Heating / cooling / DHW units with back-up boiler



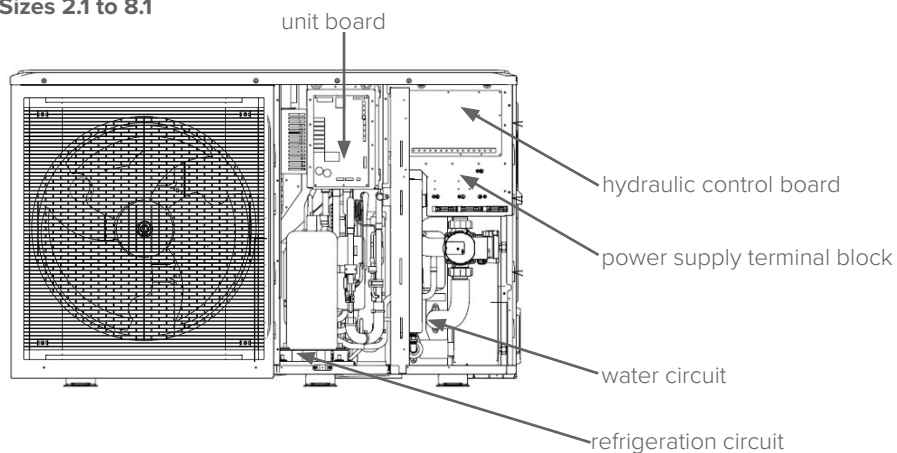
- 1 - DTX: Drain pan with electric heater
- 2 - ASTFX: Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray 3 - TANKX: system's inertial storage tank
- 4 - KTCAX: Hose kit for connecting the unit to the inertial storage tank
- 5 - FDMX: Magnetic dirt separator filter for water distribution systems
- 6 - mesh filter (supplied as standard with the unit)
- 7 - additional expansion tank (externally supplied)
- 8 - HTC2WX: HID-TConnect 2 white chronothermostat for temperature control
- 9 - 3DHWX: 3-way system/DHW switching valve
- 10 - ACS300X: DHW boiler / T1BX: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank

- 11 - DHW expansion tank (externally supplied)
- 12 - anti-scalding valve
- 13 - PRSX: DHW recirculation pump
- 14 - DI100X: 100-litre hydraulic circuit breaker
- 15 - PCS2X: oversized pump for secondary circuit
- 16 - ELFOSun solar thermal circuit
- 17 - GAS BOILER: boiler for centralised systems
- 18 - T1BX - Storage tank temperature probe
- 19 - Elfosun control unit
- 20 - Thermostatic switching valve for domestic water
- 21 -

## Connections and wiring diagram

The unit can be accessed for the purpose of making connections by removing the front panel.  
The unit has an internal control board and a dedicated board for management of the system:

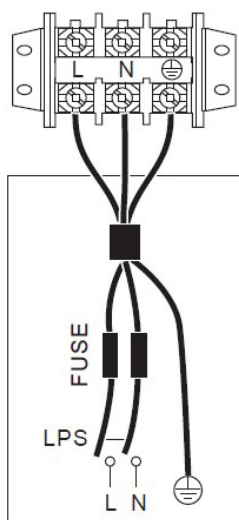
**Sizes 2.1 to 8.1**



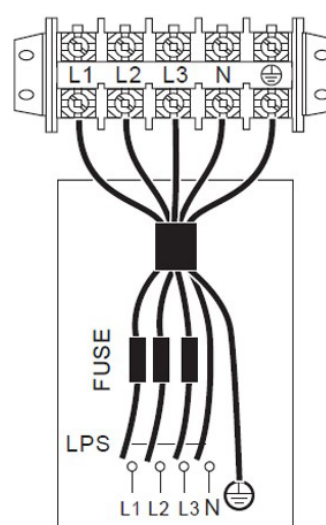
### Wiring the power supply

The power supply must be connected to the power supply terminal block, with dedicated fuses or circuit breaker protections.

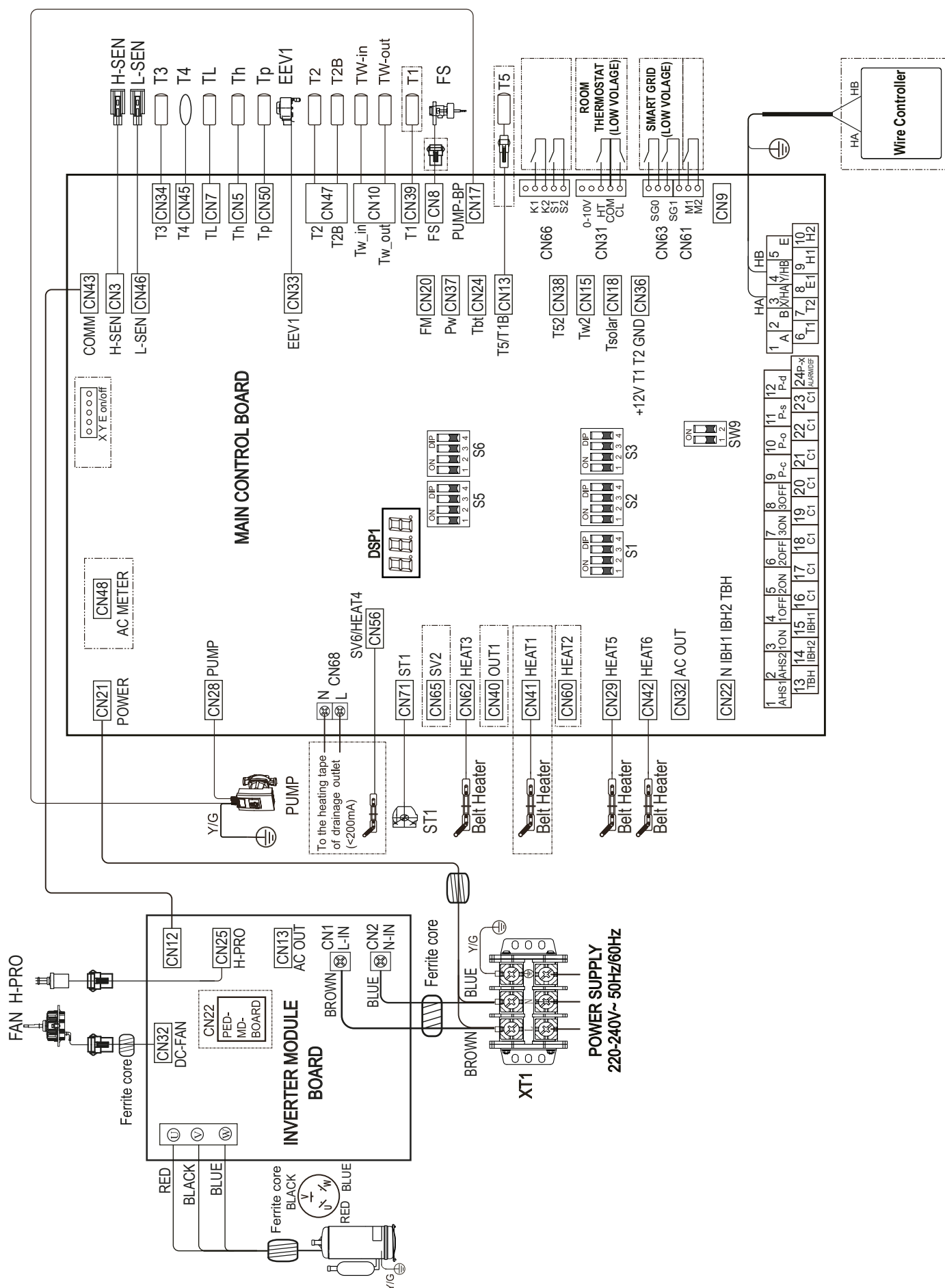
**Connection of single-phase versions**



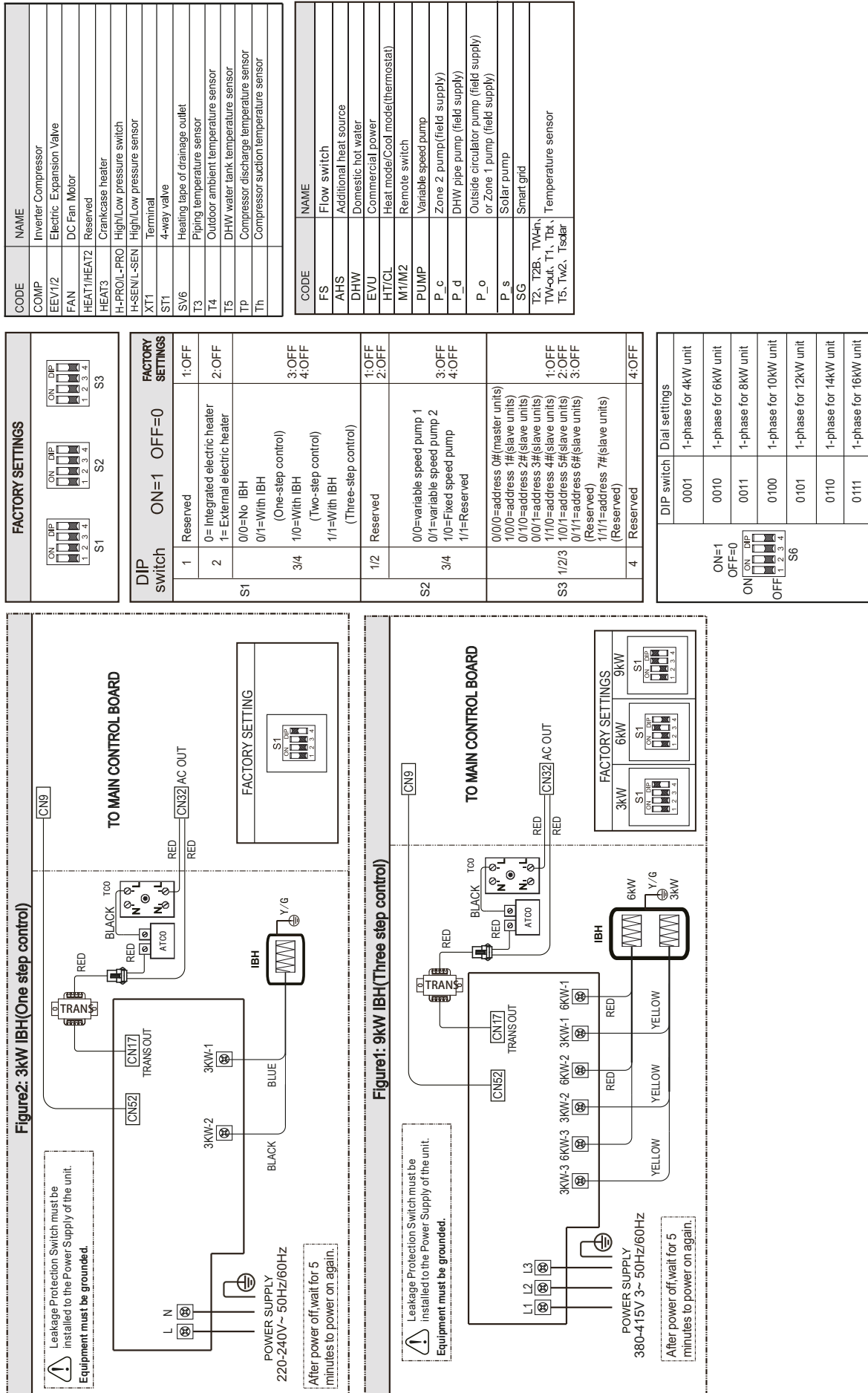
**Connection of three-phase versions**



## Wiring diagrams - 2.1 ÷ 8.1



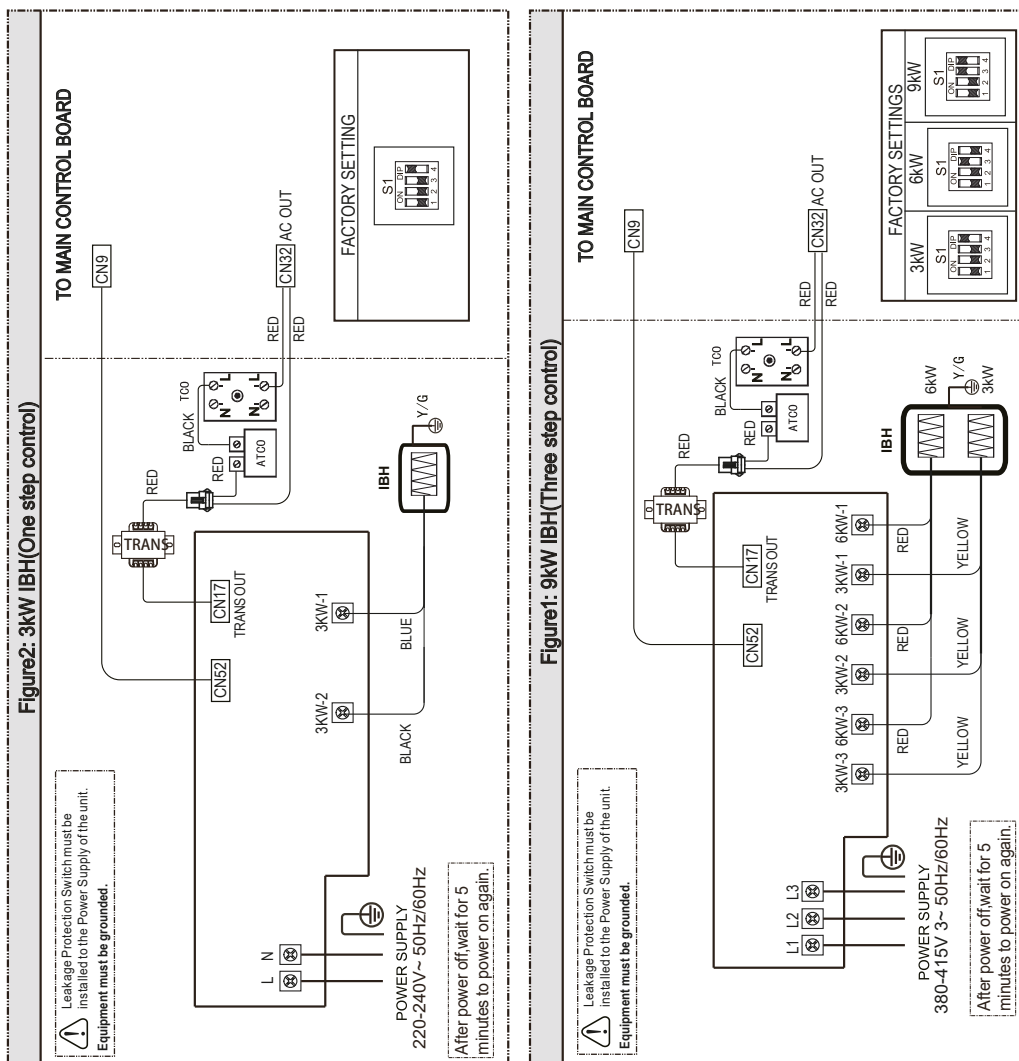
## Wiring diagrams - 2.1 ÷ 8.1





## Wiring diagrams - 6.1T ÷ 8.1T





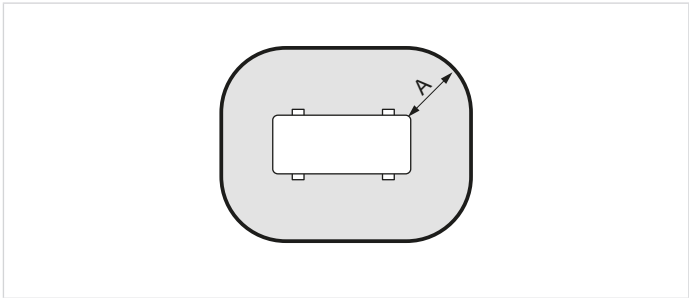
**! The wiring diagram refer to internal back-up heater mounted in factory**

FACTORY SETTINGS			
S1	ON DIP 1 2 3 4	ON DIP 1 2 3 4	ON DIP 1 2 3 4
	S2		
	S3		
S2	FACTORY SETTINGS		
	DIP switch	ON=1 OFF=0	
	1	Reserved	1: OFF
S1	2	0= Integrated electric heater 1= External electric heater	2: OFF
	3/4	0/0=No IBH 0/1=With IBH (One-step control) 1/0=With IBH (Two-step control) 1/1=With IBH (Three-step control)	3: OFF 4: OFF
	1/2	Reserved	1: OFF 2: OFF
S2	3/4	0/0=variable speed pump 1 0/1=variable speed pump 2 1/0=Fixed speed pump 1/1=Reserved	3: OFF 4: OFF
		0/0/0=address 0#(master units) 1/0/0=address 1#(slave units) 0/1/0=address 2#(slave units) 0/0/1=address 3#(slave units) 1/1/0=address 4#(slave units) 1/0/1=address 5#(slave units) 0/1/1=address 6#(slave units)	
	1/2/3		1: OFF 2: OFF 3: OFF

# Diagram and installation

## Clearances for installation

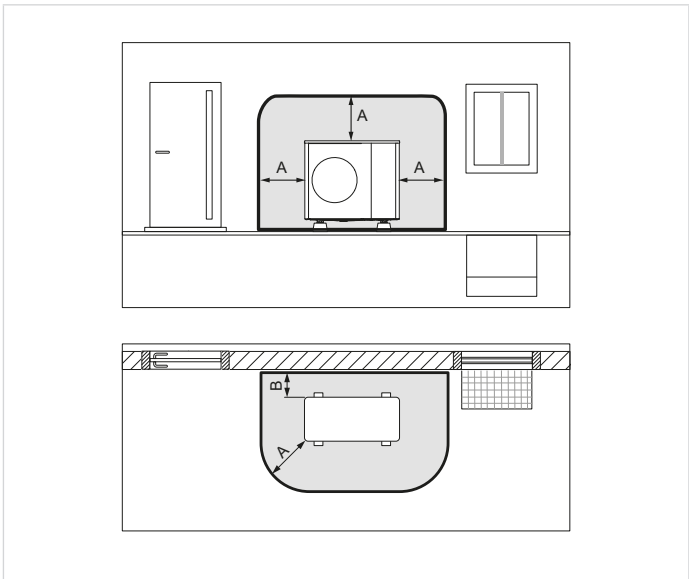
### Free-standing installation



Clear space around the unit.

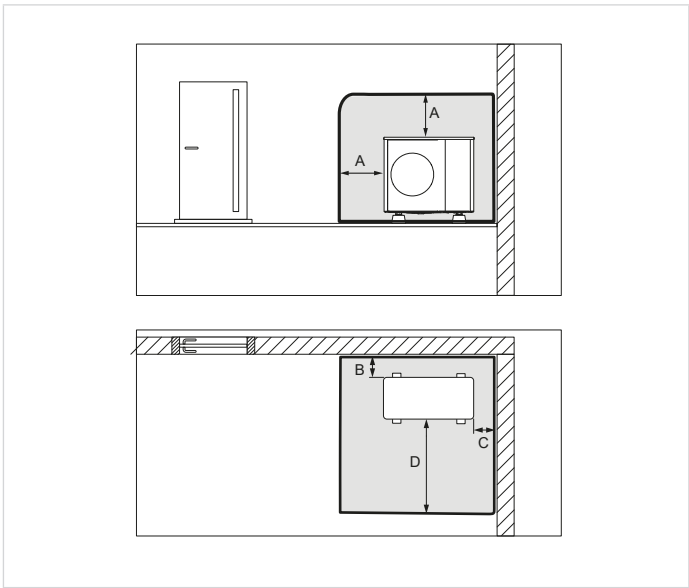
A	mm	1000
---	----	------

### Ground installation in front of a wall



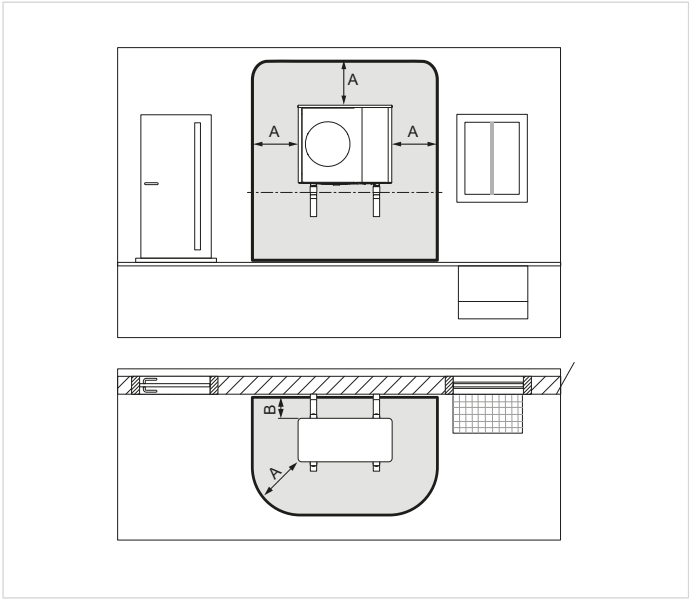
A	mm	1000
B	mm	300

### Ground installation in a corner



A	mm	1000	C	mm	500
B	mm	300	D	mm	2300

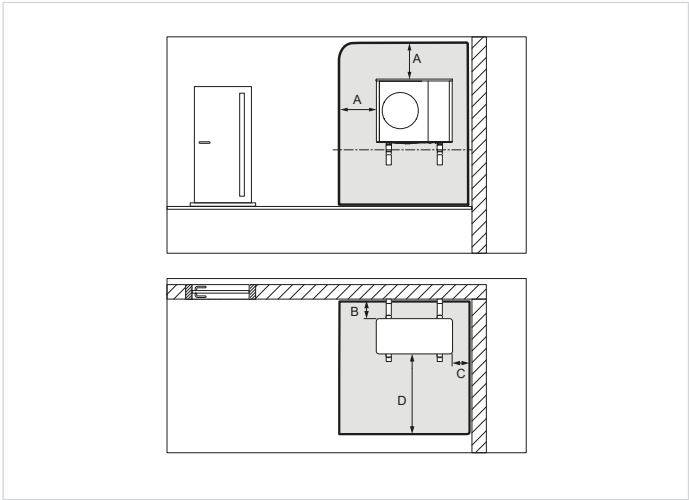
### Suspended installation



A	mm	1000
B	mm	300

The safety area is extended under the unit down to the ground.

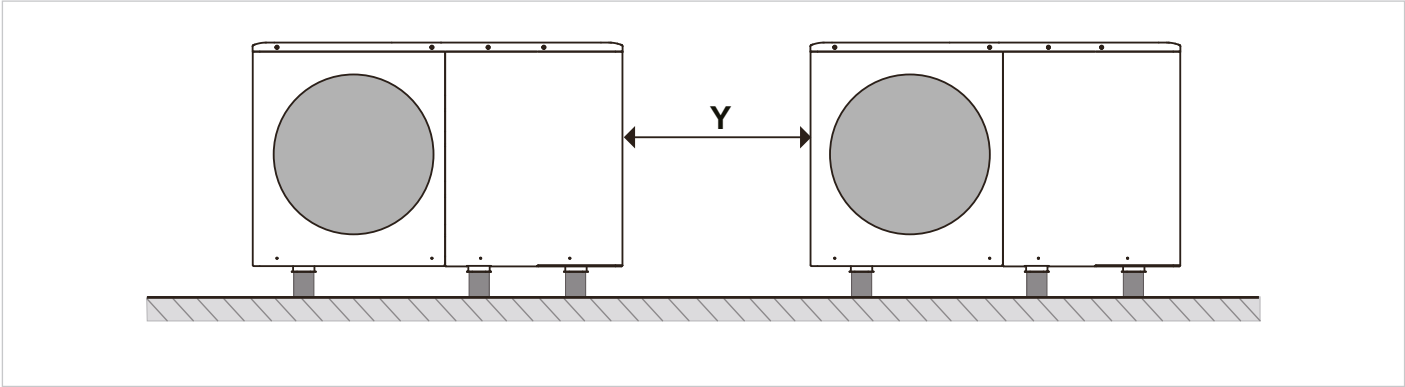
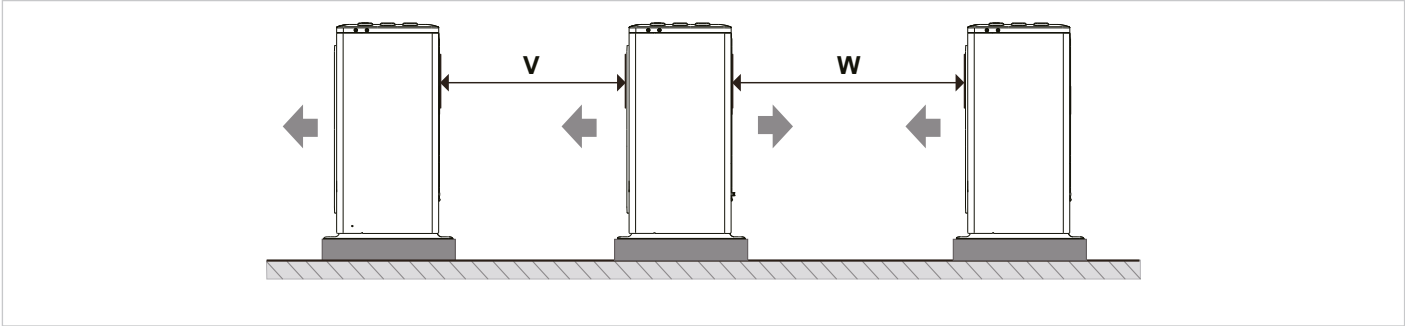
### Installation suspended in a corner



A	mm	1000	C	mm	500
B	mm	300	D	mm	2300

The safety area is extended under the unit down to the ground.

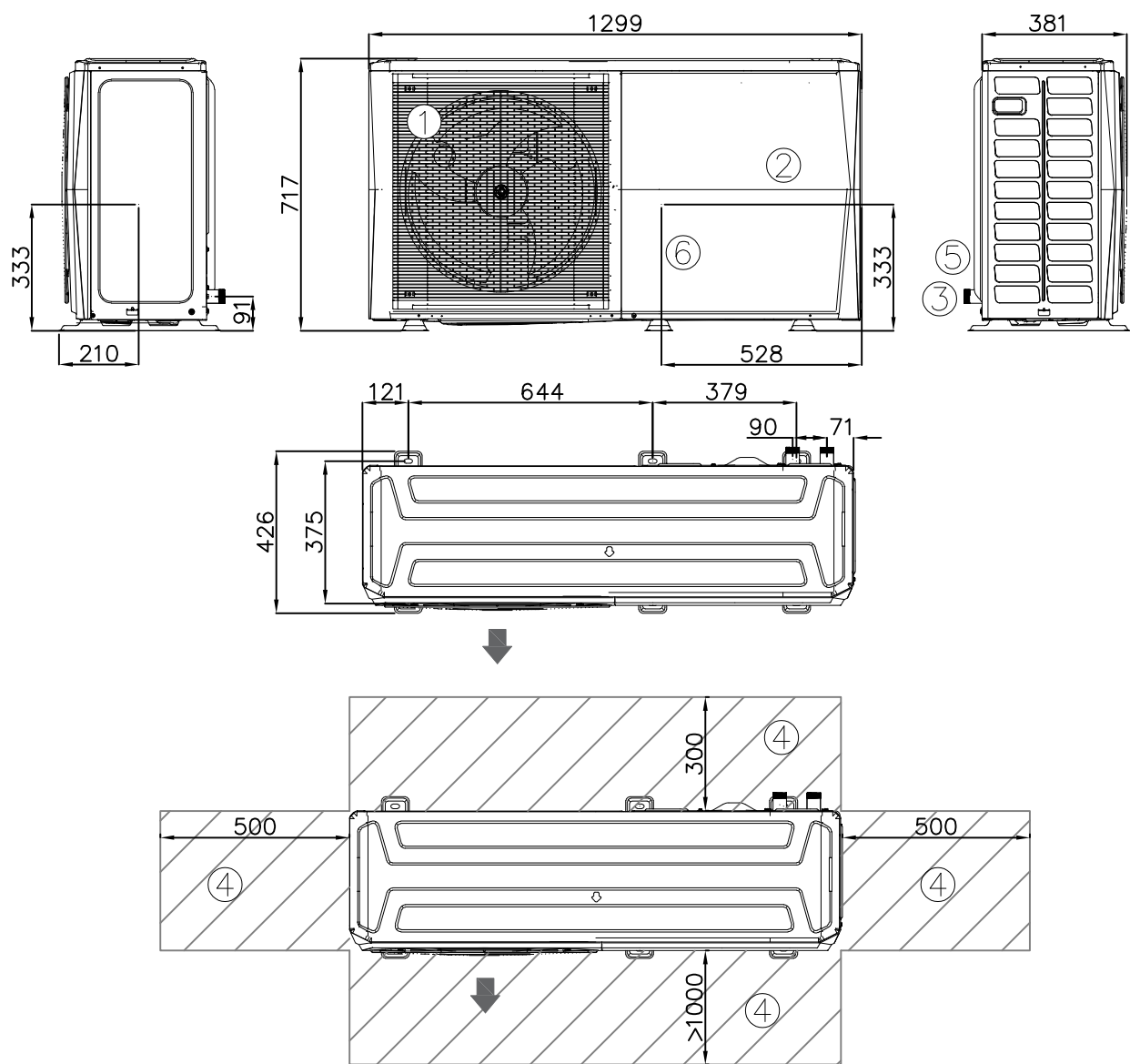
Multiple installation



SIZE 2.1-4.1			SIZE 5.1-8.1		
V	mm	≥600			≥600
W	mm	≥2500			≥3000
Y	mm	≥500			≥500

# Dimensions, weights and connections

## 2.1 to 3.1

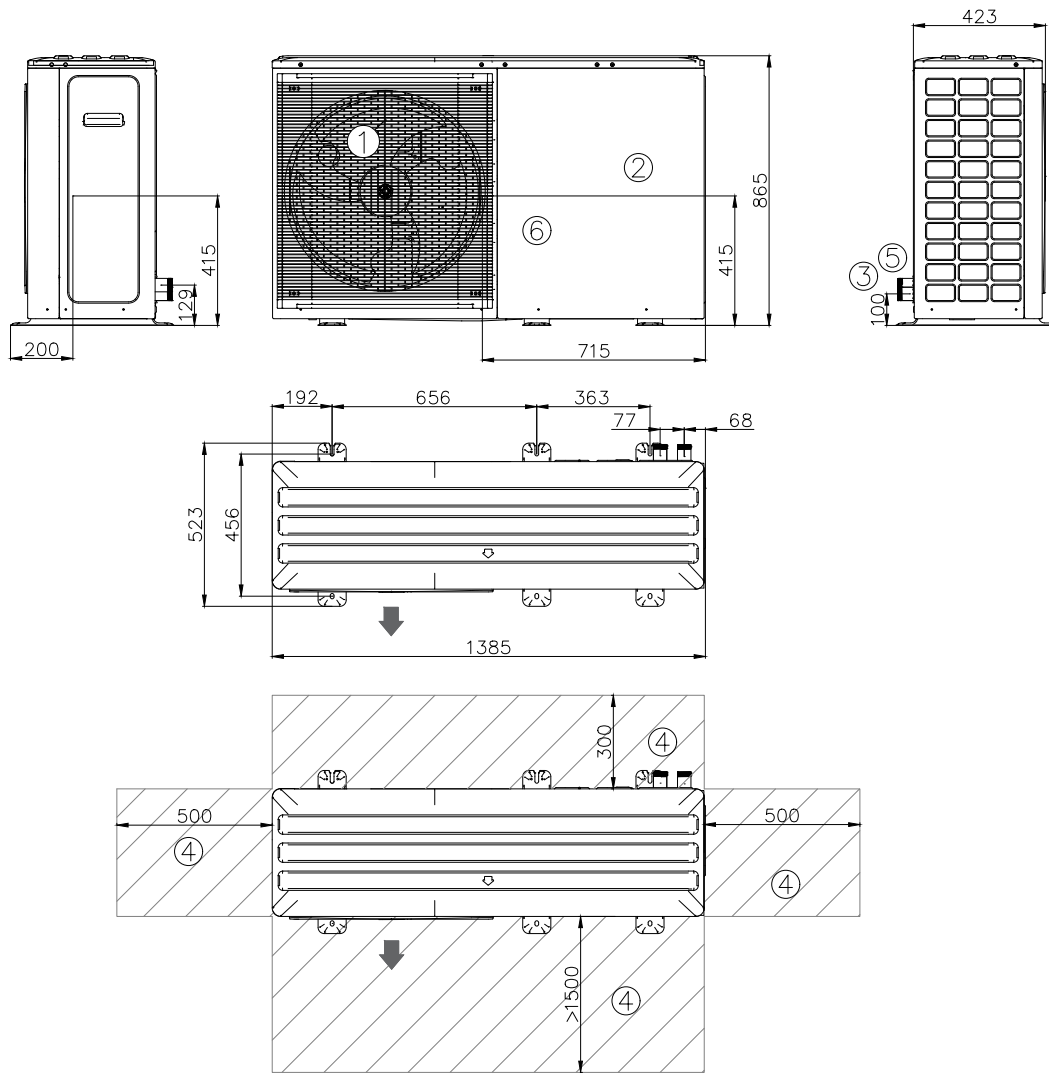


- 1. Electric fan
- 2. Electrical panel
- 3. Water connections
- 4. Functional spaces
- 5. Power input
- 6. Compressor compartment

SIZES			2.1	3.1
Operating weight		kg	90	90
Shipping weight		kg	110	110
Operating weight (with IBH)		kg	95	95
Shipping weight (with IBH)		kg	115	115

Note: the presence of optional accessories may result in significant variation of the weights indicated.

## 4.1 to 8.1 / 6.1T to 8.1T



1. Electric fan
2. Electrical panel
3. Water connections
4. Functional spaces
5. Power input
6. Compressor compartment

SIZES			4.1	5.1	6.1	7.1	8.1	6.1T	7.1T	8.1T
Operating weight		kg	117	117	135	135	135	137	137	137
Shipping weight		kg	139	139	157	157	157	159	159	159
Operating weight (with IBH)		kg	122	122	140	140	140	142	142	142
Shipping weight (with IBH)		kg	144	144	162	162	162	164	164	164

Note: the presence of optional accessories may result in significant variation of the weights indicated.

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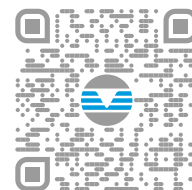


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