Air-to-water hybrid split heat pump for heating, cooling and domestic hot water production

SPHERA EVO 2.0 EASYHybrid

SQKN-YEE 1 BH + MiSAN-YEE 1 S 2.1-8.1 RANGE

TECHNICAL BULLETIN

R-32

ErP

SIZE	2.1	3.1	4.1	5.1	6.1	7.1	8.1
HEATING CAPACITY KW	4,32	6,18	8,30	10,9	12,13	14,51	16,01
COOLING CAPACITY KW	4,55	6,44	8,10	10,00	12,06	13,79	14,84

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Clivet is taking part in the EUROVENT certification programme up to 1.500 kW. The products concerned appear in the certified products list of the EUROVENT www.eurovent-certification.com site.

Features and benefits

SPHERA EVO 2.0 EASYHybrid BOX

SPHERA EVO 2.0 EASYHybrid BOX is the hybrid solution with heat pump and integrated boiler, perfect to replace an old generation boiler, with a compact and efficient hybrid system to ensure the utmost comfort and minimum running costs.
The interaction between the boiler and heat pump is controlled by the latter and by enabling the Euroswitch function you can save money on your bills.
SE2.0EHd BOX is easily installed in place of a boiler thanks to its compact size and the simplicity of connecting the refrigerant piping from the outdoor unit to the hybrid module; the piping can easily be hidden with ducting, as it can for a common split system.
SE2.0EHd BOX can be equipped with modular cabinets that transform the hybrid heat pump into a complete, tidy central heating plant.

Heat pump and 24 or 34 kW boiler.

The **T-UNO** main cabinet can house the hybrid module and any accessories such as the inertial storage tank, the single zone or dual zone kit.

Heat pump and 24 or 34 kW boiler and accessories.

The **T-DUE** aesthetic cabinet contains a 150-litre domestic hot water storage tank, which is also available with a double coil for connecting the solar thermal system.

Heat pump and 24 or 34 kW boiler + DHW storage tank and accessories.

The **T-TRE** aesthetic cabinet transforms the unit into a central heating plant complete with all the accessories required for an efficient system.

Heat pump and boiler... + DHW storage tank + accessories and more.....

SPHERA EVO 2.0 EASYHybrid Box - Indoor unit

Zinc-Magnesium frame
Supporting frame in Zinc-Magnesium panelling, excellent mechanical characteristics and high resistance to corrosion over time.

Panelling
External panelling in zinc-magnesium sheet, with white paint in RAL 9003 to ensure better resistance to corrosion. Panels that can be easily removed to allow full access to internal components.

Internal exchanger
Direct expansion heat exchanger with INOX AISI 316 stainless steel braze-welded plates. With low refrigerant content and high exchange surface, complete with external anti-condensation thermal insulation 10 mm thick in sintered expanded polypropylene.

Hydronics module
- DC primary circulate pump, vary at variable flow
- Flow meter for reading the water flow rate
- Magnetic dirt separator filter

Boiler
Instantaneous gas boiler with condensation exchanger offering high efficiency in both heating and DHW production, with larger DN28 stainless steel single-pipe coils, to substantially reduce the possibility of clogging and facilitate maintenance.
Modulation ratio 1/9, for optimal performance in new, efficient systems at low temperatures, avoiding continuous switch-on and -off for higher energy saving and less consumption.
Including:
- circulator
- 8-litre expansion tank (24 kW) and 10 liters (34 kW)
- 3 bar system water side pressure relief valve
- system vent valve
- heat exchanger in stainless steel for instantaneous DHW production

Electrical panel
The electrical panel is located inside the unit and is easily accessible thanks to removable panel. Moreover, a LED on the front panel is connected to check the operating status of the unit.

The capacity section includes:
- main power supply terminals.

The control section includes:
- touchscreen microprocessor control;
- BMS management;
- daily, weekly temperature set point and start-up/shutdown scheduler;
- anti-legionella function scheduling;
- antifreeze protection water side;
- no water flow-rate protection with flow meter;
- provision for DHW circulation pump
- remote interface terminal with touchscreen graphic display;
- cascade operation;
- Wi-Fi for connection to the APP dedicated to managing the unit.

Inside the electrical panel there are:
- provision for a temperature probe in the DHW storage tanks
- provision for a 3-way valve for DHW production
- provision for supplying an electric heater for a DHW storage tank

The immersion heater in the DHW storage tanks must not exceed 2kW.

Standard unit kit:
- Mesh filter for system water
- Copper gas reduction for 4-6 kW external unit connection
- Unit connection fittings
- Key and torx insert for opening and closing unit panels

SPHERA EVO 2.0 - Outdoor unit

Zinc-Magnesium frame
High strength frame for outstanding durability and excellent mechanical characteristics.

Panelling
Outer panelling made of Zinc-Magnesium sheet metal painted with pantone warm gray 2C to ensure superior corrosion resistance. Each panel can be easily removed to allow full access to internal components.

Rotary DC inverter compressor
Inverter controlled rotary hermetic compressor for constant modulation of the power supplied according to actual needs, ensuring high seasonal efficiency. With a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on anti-vibration mounts and it is equipped with oil charge. The compressor is wrapped by a sound-absorbing hood, that reduces its sound emissions. A guard heater with automatic insertion prevents the refrigerant from diluting the oil when the compressor stops.

EC inverter fan
Axial fan with variable speed control and sickle shaped blades in ABS resin. It is directly coupled to the electronically controlled motor (IP23), which, thanks to brushless technology and the particular power supply, increases its lifespan and reduces consumption. The fan is housed in an aerodynamically shaped nozzle to increase efficiency and minimise noise. It is also fitted with anti-intrusion grid.

External exchanger
Direct expansion finned coil exchanger made with copper pipes mechanically expanded to better adhere to the fin collar. It has a large surface area to improve heat exchange and reduce defrosting in the interest of seasonal efficiency. The fins are made of aluminium with hydrophilic treatment which facilitates the elimination of condensate, further improving defrosting.

Refrigerant circuit
The refrigeration circuit includes:
- Electronic expansion valve
- 4-way cycle inversion valve
- Liquid separator in extraction
- Mechanical filters
- Low pressure pressure switch
- High pressure pressure switch

HYFE24 **Hybrid solution with 24kW 4-pipe boiler**
HYFE34 **Hybrid solution with 34kW 4-pipe boiler**

SPHERA EVO 2.0 EASYHybrid version consisting of the heat pump and boiler, designed to work simultaneously with or in replacement of each other.
The production of domestic hot water is guaranteed instantly by the boiler, which also allows simultaneous heating or cooling operation by the heat pump.
The boiler is supplied separately, assembly is the responsibility of the installer.

⚠ 24kW boiler available only in combination with 2.1 - 5.1 outdoor units

Accessories separately supplied

KIRE2HX -
KIRE2HLX

2 zones: external kit, high temperature
2 zones: external kit, high temperature + low temperature

Distribution module for 2-zone heating systems with compact design (402 mm x 250 mm x h525 mm) and ample versatility for different types of installation.
Kit composed of:

- 1 collector / Black painted separator;
- 2 circulator;
- 1 sliding temperature mixing valve (only for the kit KIRE2HL);
- 1 EPP insulation (front and rear);
- 1 threaded disc with hermetic sealing cap,
- 1 lower anti-rotation jig;
- 1 support bracket module.
- 1 probe for managing the mixed circuit temperature
- electrical control panel

For the technical data of the hydraulic head of the pumps, please refer to the dedicated section in the HYDRAULIC DATA chapter.

KCSX
KCSIX*

Secondary circuit kit (1-litre circuit breaker + pump)
Secondary circuit kit for indoor instalation (1-litre circuit breaker + pump)

The single-zone kit consists of a DIX hydraulic separator combined with a high efficiency pump, all inside a box for easy installation. Allows interaction between the primary circuit circulator and the secondary circuit circulator. Furthermore, the separator also has the function of a deaerator. With the following benefits and advantages:

- makes the connected hydraulic circuits independent;
- ensures effective operation of the secondary circulator that provides the hydraulic demand of air conditioning systems
- air extraction system;
- thermally insulated black EPP
- zone manifold connection kit
- electrical control panel

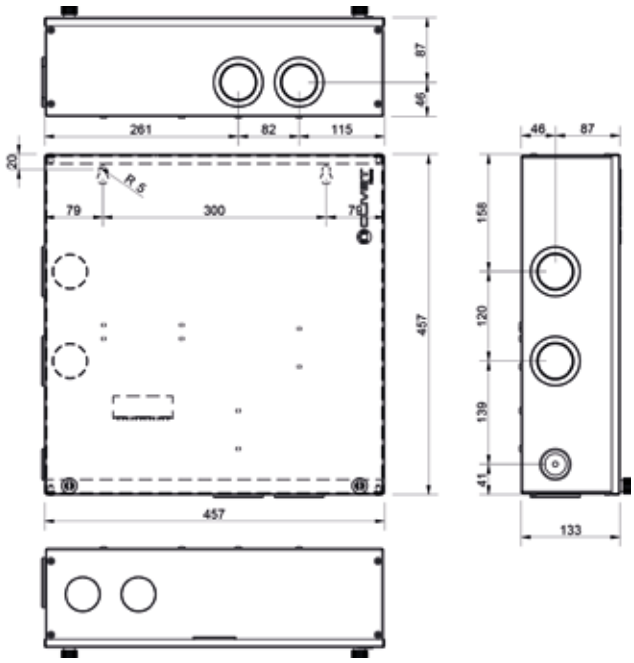
* accessory compatible with the T-UNO, T-DUE and T-TRE versions

The kit is comprised of:

- 1 1-litre circuit breaker;
- 2 copper pipe;
- 1 circulator;
- closing plates (only KCSX)
- electrical control panel

Dimensions:
Length 457 mm
Height 457 mm
Depth 133 mm

DIMENSIONAL



DIX **1 l hydraulic circuit break**

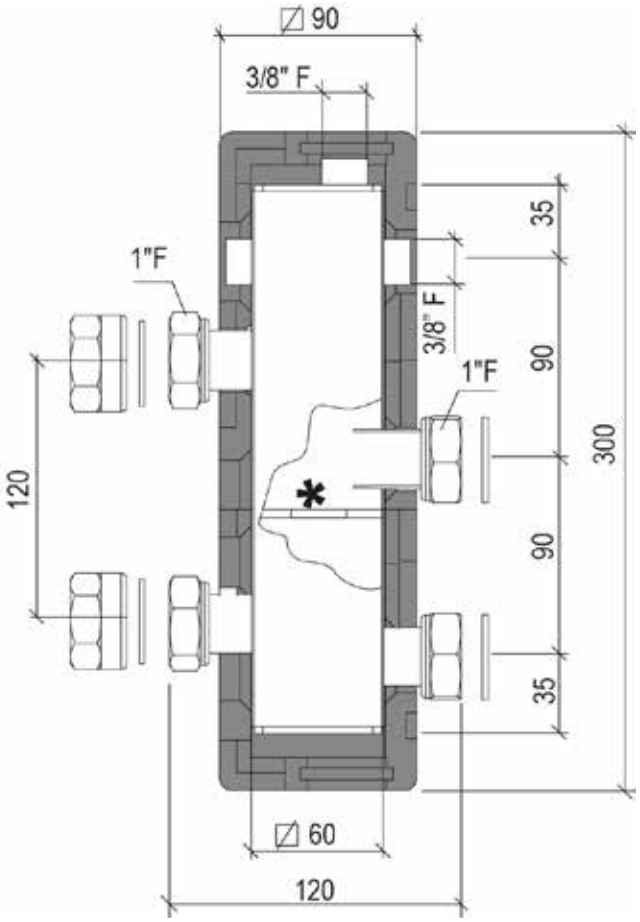
The hydraulic separator is a compensation chamber designed to make connected hydraulic circuits independent.
It is used when the circulator of the primary circuit interacts with one or more parts of the secondary circuit in the same system.
Furthermore, the separator performs the function of a deaerator.
With the following benefits and advantages:

- makes the connected hydraulic circuits independent;
- ensures effective operation of the secondary circulators that provide the hydraulic demand of air conditioning systems
- air extraction system;
- thermally insulated black EPP
- zone manifold connection kit

Technical data:
Nominal diameter DN 20
Connection 1" F
Max overall dimensions 120 x 420 x 945
Max temperature 110°C
Max pressure 6 bar
Circuit breaker material S235 steel
Insulation material EPP (40 g/l)
Insulation thickness 20 mm

The kit is supplied with a plate for wall mounting.

DIMENSIONAL



⚠ Not compatible with Tower version

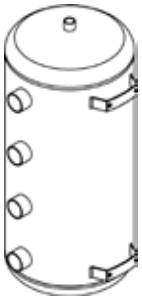
Accessories separately supplied

DI50-2X

50-litre hydraulic circuit breaker

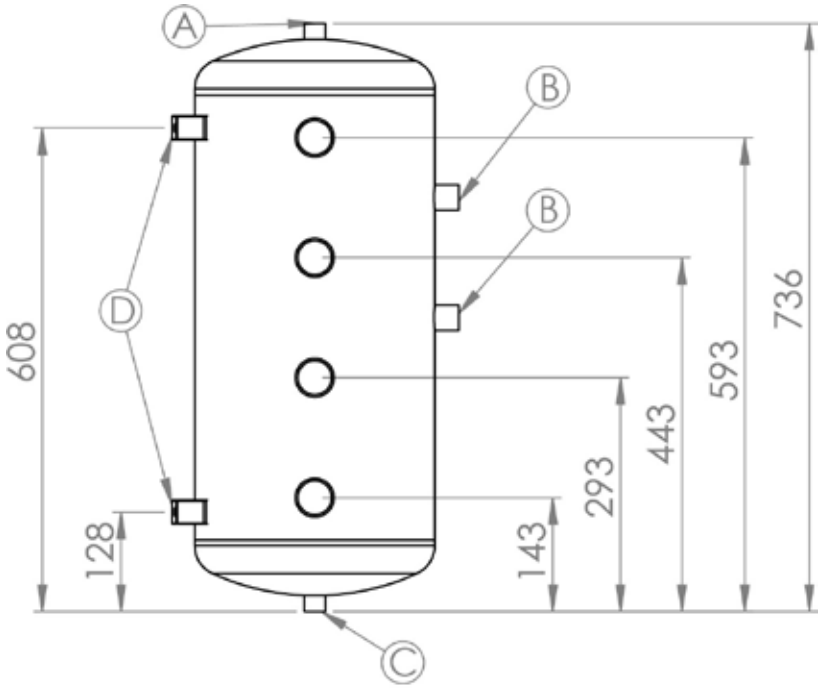
Hydraulic separator used to make the connected hydraulic circuits independent, also with inertial storage and deaerator function. The 50-litre version has 2 pairs of connections on the supply side and 2 pairs of connections on the return one.

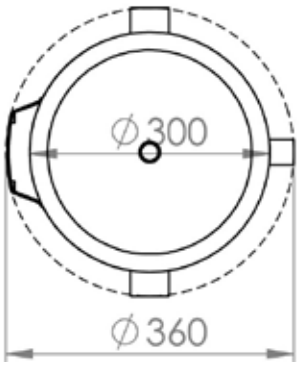
The external insulation is made of 30 mm polyurethane foam to minimize thermal leakage and ensure high efficiency.



⚠ DI50-2X is supplied with 4 caps and relative sealing gaskets for any unused connections and with a wall mounting kit.

DIMENSIONAL





A - Air vent
B - Temperature probe
C - Discharge
D - Fixing brackets

SRICX

Additional card for customer bids management

Electrical panel complete with wiring and card for customer relaunch control, allowing you to manage 2 secondary circuits with or without mixing valve. The additional card is able to manage circulators with different types of PWM signal (the voltage of the PWM command signal is maintained between 12V and 15V, in order to manage the two 2 types of pumps), with a 0-10V control signal. or on-off type.

ACS200X **200-liter domestic hot water storage tank**
ACS300X **300-liter domestic hot water storage tank**
ACS500X **500-liter domestic hot water storage tank**

Carbon steel tanks with internal vitrification treatment according to DIN 4753-3 and UNI 10025. Complete with magnesium anodic protection, inspection flange, electric heater.
All the tanks have an external insulation in 70 mm rigid polyurethane which allows to reduce heat losses to a minimum and increase efficiency.

		ACS200X	ACS300X	ACS500X
Capacity	[litri]	196	273	475
Diameter	[mm]	640	640	790
Height	[mm]	1215	1615	1705
Surface of exchanger	[m^2]	1,5	1,8	2,2
Surface of solar exchanger	[m^2]	\	\	\
Max pressure of hot water	[bar]	10	10	10
Tank energy class	[-]	B	B	B
Storage dispersion	[W]	51	63	80
Thermal dispersions	[W/K]	1,13	1,40	1,78
Electric heater	[kW]	2,0	2,0	2,0

Data according to DIN 4708 / EN 12897 / en 15332

⚠ Not compatible with Tower version

SCS08X **0.8 m^2 solar exchanger for flange installation**
SCS12X **1.2 m^2 solar exchanger for flange installation**

The kit is available in two sizes: 0.8 m^2 when combined with the 200 and 300 litre tank and 1.2 m^2 when combined with the 500 litre tank.
The kit is comprised of:

- tin-plated finned copper coil
- plastic cover

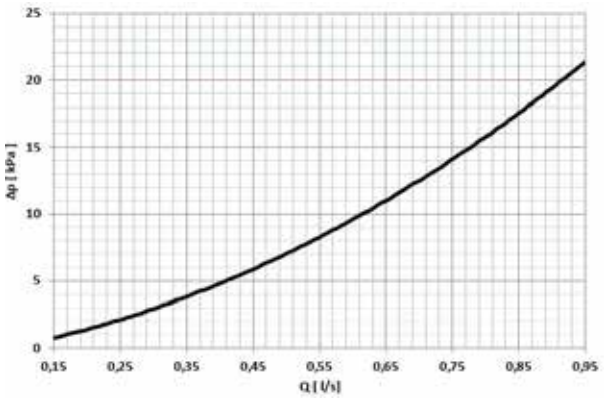
⚠ Not compatible with Tower version

3DHWX **3-way valve for domestic hot water**

3-way valve for the production of domestic hot water by means of a heat pump. The valve must be combined with a storage tank with integrated heat exchanger.

* Standard accessory in the T-DUE and T-TRE versions

3-way valve pressure drops



Q [l/s] = Water flow-rate
DP =Water side pressure drops [kPa]

⚠ Standard with T-DUE version with 150 L DHW tank

Accessories separately supplied

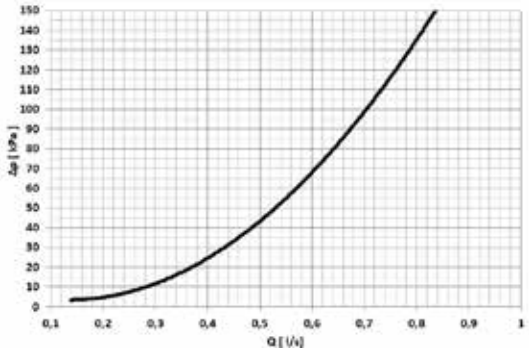
VDACSX **Thermostatic switching valve for DHW**

The thermostatic switching valve is used in the DHW circuit.
It is designed to divert the water from the DHW storage tank directly to the utility as the water temperature is suitable for use. If the temperature is not adequate for direct use, the switching valve ensures the water passes inside the boiler which, thanks to instant production, guarantees continuous supply.

1 1/4 "M connections.
Body in anti-dezincification alloy. Chromium-plated.
PSU shutter.
Stainless steel springs.
EPDM sealing elements.
Maximum inlet temperature 100°C.
Adjustment range: 38÷52°C
Accuracy: ± 2°C
Max (static) working pressure: 10 bar
Max (dynamic) working pressure: 5 bar
Default calibration: 40°C
Minimum range for steady operation: 4 l/min

⚠ Reductions for connections of different diameters are the responsibility of the client
⚠ Not compatible with Tower version

Thermostatic switching valve for DHW pressure drops



Q [l/s] = Water flow-rate
DP =Water side pressure drops [kPa]

KCVEX **Circulation kit: circulation group, control unit, expansion tank**

The circuit has a high efficiency heat exchange. This is because an additional exchanger is fitted inside the DHW tank to allow the hot water from the solar manifolds to exchange its energy directly with that contained in the tank. This prevents double heat exchange and increases efficiency.
The kit is comprised of:

- 1 18-litre expansion tank with fixing bracket;
- 2 PT1000 temperature probes;
- 1 shut-off ball valve with MF 3/4" threaded fittings;
- 1 electronic control unit with fixing bracket;
- 1 forced circulation solar return unit including:
  - WILO PARA ST 15/7 iPWM circulator;
  - 2-12 l/min flow regulator;
  - 1/2" M shut-off valve for system loading/draining/washing;
  - DN 20 VRM3 return ball valve with non-return valve;
  - thermometer;
  - black EPP front and rear insulation shell;
  - safety unit with: 0-10 bar pressure gauge, 6 bar pressure relief valve;
  - coupling for connection to the expansion tank;
- copper pipes for connecting the DHW storage kit;
- screws, gaskets and brackets for fixing;
- kit installation manual.

* Accessory compatible with T-UNO, T-DUE and T-TRE versions. For the BOX version, the combination of ELFOSun2 is suggested

⚠ For electrical and technical data on the circulator, refer to the "Electrical data" and Circulator head" sections.

HID-TCXB **Black soft touch chronothermostat, with temperature control and management via App / Voice control**
HID-TCXN **White soft touch chronothermostat, with temperature control and management via App / Voice control**

For semi-uncased installation

Main functions available from the thermostat:
- ON/OFF
- keypad lock
- set-point control and limitation
- room temperature display
- setting change (manual / scheduled)
- antifreeze function (prevents temperatures that are too low)

Additional functions available on the Clivet Home Connect App
- weekly schedule
- boost (forced system switch-on)
- temperature and consumptions log
-

Technical specifications:
- display: colour soft-touch
- combinable SwitchConnect receivers: max 2
- installation: semi-uncased
- power supply: 100÷253V / 50÷60Hz
- settable temperature: 5÷40°C
- antifreeze temperature: 2÷25°C
- temperature offset: ±5°C (std 0°C)
- protection rating: IP30
- Wi-Fi: 802.11 b/g/n
- self-adjusting clock via web with back-up battery
- dimensions: 122 x 82 x 15 mm

SWCX **SwitchConnect radio receiver**

Radio receiver for HID-TConnect, for managing the request of terminal units or radiant systems, the heat pump mode change or the double set-point.

Technical specifications:
- functions: radio receiver for use with HID-TConnect
- combinable thermostats: max 6
- frequency: 2.4GHz
- transmission distance: max 30m (in buildings) / max 100m (in open range)
- contacts: 2 relays (voltage-free)
- power supply: 95÷290V / 47÷440Hz
- operation temperature: 0÷40°C
- operation humidity: 20÷80% RH
- dimensions: 125x78x30.5mm

Accessories separately supplied

DTX **Auxiliary drain pan**

Outdoor unit

The base plate of the outdoor unit is fitted with a drain for the condensate produced during the winter phase in the defrosting period. This can help (not guarantee) condensate flow correctly into the relevant drains.

To ensure the condensate is drained correctly, in the various operating conditions it is mandatory to use the auxiliary condensate drain pan with drainage to be connected to the drain trap, according to the relevant technical standards and regulations in force.

An anti-freeze heater is also included in the drain pan. It prevents the condensate produced from freezing when the outdoor temperature drops below zero.

APAVX **Kit of antivibration mounts for floor installation**

The antivibration mounts for floor installation reduce the vibrations of the compressor during its operation. They are secured to the feet of the base plate.

ASTFX **Kit of antivibration mounts for wall bracket installation**

The antivibration mounts reduce the vibrations of the compressor during its operation. They are secured to the wall support brackets

KSIPX **Kit with wall fixing brackets**

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

KCSAFX **Coaxial fitting for smoke discharge and intake (ø60/100)**

Coaxial polypropylene flanged connection (ø60/100) for combustion gas discharge and air intake through two coaxial ducts.

CCOAX **90 ° coaxial curve for horizontal outlet ø 60 / 100mm adjustable 360°**

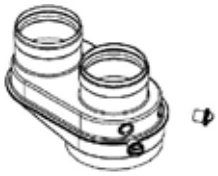
Curve for smoke discharge and air intake, combinable with ø 60/100 coaxial pipe with terminal.
The internal section is used for the discharge of the combustion gas while the external section is used for the intake of combustion air.

TCOAX **Coaxial pipe L = 1000mm ø 60/100 with terminal**

Pipe for smoke discharge and air intake through an external wall with exhaust terminal. .
The internal section is used for the discharge of the combustion gas while the external section is used for the intake of combustion air.

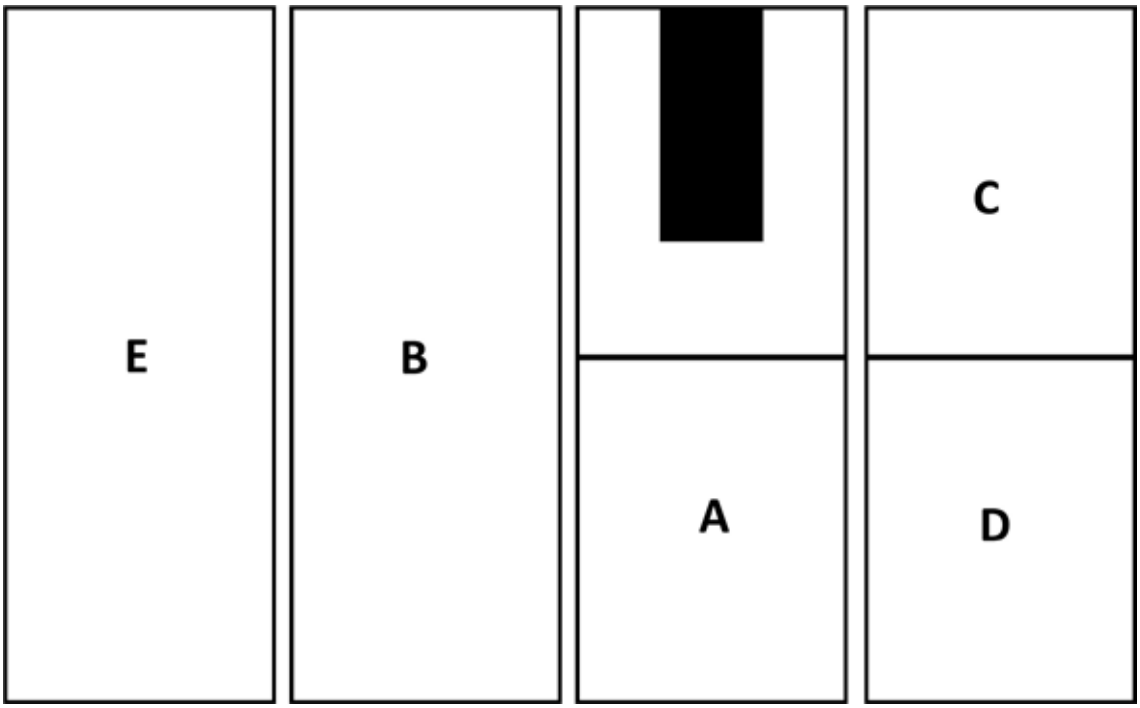
KSDFX **Smoke discharge splitter kit ø 80mm**

Polypropylene kit to split the air intake and the smoke discharge into two 80mm connections with inspection inlets to connect to vertical or bent pipes



Accessories separately supplied

Tower version - options compatibility



POSITION	DESCRIPTION	
A	KIRE2HX	2 zones: external kit, high temperature
	KIRE2HXL	2 zones: external kit, high temperature + low temperature
	KCSIX	Secondary circuit kit (1-litre circuit breaker + pump)
	AC50X	50-litre inertial storage tank for indoor installation
	KCVEX	Circulation unit, control unit, expansion tank
	KCSIX + AC50X	Secondary circuit kit (1-litre circuit breaker + pump) + 50-litre inertial storage tank for indoor installation
	KCSIX + KCVEX	Secondary circuit kit (1-litre circuit breaker + pump) + Circulation unit, control unit, expansion tank
B	TDUEX	Additional aesthetic cabinet with 150L DHW storage tank
	TDUESX	Additional aesthetic cabinet with 150L DHW storage tank with 1 m^2 solar exchanger
	KPRSX	DHW recirculation pump kit
	KCACSX	DHW storage tank connection kit T-DUE only (Mandatory kit for T-DUE connection)
C	KCVEX	Circulation unit, control unit, expansion tank
D	KIRE2HX	2 zones: external kit, high temperature
	KIRE2HXL	2 zones: external kit, high temperature + low temperature
	KCSIX	Secondary circuit kit (1-litre circuit breaker + pump)
E	TTREAX	Additional double aesthetic cabinet with 150+150L DHW storage tank with 11 m^2 solar exchanger
	KC150X	Additional DHW storage tank connection kit (mandatory kit for TTREAX connection)

TUNOX

Main aesthetic heat pump cabinet

SPHERA EVO 2.0 EASYHybrid Tower Version consisting of the hybrid heat pump and one or more modular cabinets.

This solution allows you to incorporate all the system components in a single cabinet with Alto Design appearance.

Dimensions 1 module: 562 mm x 2120 mm x 530 mm

TDUEX **Additional aesthetic cabinet with 150L DHW storage tank**
TDUESX **Additional aesthetic cabinet with 150L DHW storage tank with 1 m² solar exchanger**
KCACSX **DHW storage tank connection kit T-DUE only (Mandatory kit for T-DUE connection)**

Cabinet consisting of:
- 150L domestic hot water storage tank in AISI 316 stainless steel, outer insulation in polyurethane (20 mm thick) and cover in black PVC;
- DHW 3-way valve;
- 8-litre DHW expansion tank;
- anti-scalding valve;
- system load unit;
- additional coil for solar system (TDUESX versions only);

Dimensions 2 modules: 1100 mm x 2120 mm x 530 mm

TTREX **Additional practical cabinet for system accessories**

Additional practical cabinet for containing system accessories

Dimensions of 3 modules: 1660 mm x 2120 mm x 530 mm

TTREAX **Second additional practical cabinet with 150L DHW storage tank**
KC150X **Additional DHW storage tank connection kit (mandatory kit for TTREAX connection)**

Cabinet consisting of:
- 150L domestic hot water (DHW) storage tank in AISI 316 stainless steel, outer insulation in polyurethane (20 mm thick) and black PVC covering;
- 8-litre DHW expansion tank;
- additional coil for solar system (only TDUESX versions)
- DHW recirculation pump kit

AC50X **50 litre system inertial storage tank for indoor installation**

Inertial storage tank to be installed inside the unit. In AISI 316 stainless steel with outer insulation in rigid polyurethane (20 mm thick) and black PVC cover. It has a volume of 50 litres and is compatible with all sizes of the SPHERA EVO 2.0. It facilitates operation and helps to fulfil heat demand while guaranteeing optimal modulation.
The kit consists of:
- 1 50-litre stainless steel inertial storage tank;
- 2 copper pipes for connection to the tank;
- screws, gaskets and brackets for fixing;
- kit installation manual.

KPRSX **DHW recirculation pump kit**

Kit offering the option of installing the pump needed for the booster circuit inside the unit.
It can be electrically connected to the SPHERA EVO 2.0 electrical panel, which is used to set the hourly sc optimise its operation.

The kit includes:
- 1 UPSO 15-55 circulator;
- 1 flexible hose for the connection;
- kit installation manual.

Performance

SIZE			2.1	3.1	4.1	5.1	6.1	7.1	8.1
			A	A	A	A	B	C	D
HEATING									
Air 7°C - Water 35°C									
Nominal Heating capacity / Max	1	kW	4,32 / 6,26	6,18 / 7,41	8,30 / 9,11	10,09 / 10,3	12,13 / 14,60	14,51 / 15,5	16,01 / 16,80
Total power input	1	kW	0,80	1,19	1,56	2,01	2,42	3,09	3,52
COP	1	-	5,42	5,21	5,31	5,01	5,00	4,70	4,55
Water flow-rate	1	l/s	0,21	0,30	0,41	0,49	0,57	0,67	0,75
Nominal available pressure	1	kPa	31,2	36,5	33,1	31,0	25,7	31,7	22,6
Maximum available pressure	1	kPa	69	62	47	31	70	55	39
Air -7°C - Water 35°C									
Nominal Heating capacity / Max	2	kW	4,17 / 6,25	6,05 / 6,97	7,33 / 8,35	8,20 / 9,30	10,49 / 13,85	12,23 / 14,09	13,43 / 14,33
Total power input	2	kW	1,32	2,01	2,27	2,67	3,36	4,33	4,90
COP	2	-	3,16	3,00	3,23	3,07	3,13	2,82	2,74
Water flow-rate	2	l/s	0,22	0,29	0,34	0,40	0,56	0,62	0,70
Nominal available pressure	2	kPa	35,0	39,8	34,0	31,7	65,8	63,1	47,7
Maximum available pressure	2	kPa	69	64	58	49	71	63	49
Air 7°C - Water 45°C									
Nominal Heating capacity / Max	3	kW	4,16 / 5,96	6,03 / 7,13	8,22 / 8,98	10,01 / 10,30	12,30 / 14,50	14,00 / 15,70	16,01 / 16,60
Total power input	3	kW	1,06	1,57	2,08	2,59	3,24	3,84	4,45
COP	3	-	3,93	3,83	3,95	3,86	3,80	3,65	3,60
Water flow-rate	3	l/s	0,19	0,30	0,39	0,49	0,60	0,67	0,76
Nominal available pressure	3	kPa	32,3	36,4	34,9	31,0	51,6	41,8	21,7
Maximum available pressure	3	kPa	70	63	51	31	65	55	38
Air 7°C - Water 55°C									
Nominal Heating capacity / Max	4	kW	4,08 / 5,74	5,94 / 6,90	7,50 / 7,80	9,60 / 9,72	12,07 / 13,90	13,85 / 14,50	13,85 / 14,50
Total power input	4	kW	1,36	1,93	2,35	3,10	3,89	4,53	5,52
COP	4	-	3,00	3,07	3,19	3,10	3,10	3,05	2,90
Water flow-rate	4	l/s	0,12	0,18	0,23	0,29	0,36	0,41	0,48
Nominal available pressure	4	kPa	35,6	33,4	31,2	33,6	14,1	16,5	17,4
Maximum available pressure	4	kPa	70	70	69	63	90	105	80
COOLING									
Air 35°C - Water 18°C									
Nominal Cooling capacity / Max	5	kW	4,55 / 6,88	6,44 / 7,65	8,10 / 11,13	10,00 / 12,03	12,06 / 15,02	13,79 / 15,30	14,84 / 16,38
Total power input	5	kW	0,75	1,23	1,58	2,10	3,00	3,73	4,07
EER	5	-	6,08	5,24	5,12	4,77	4,02	3,70	3,65
Water flow-rate	5	l/s	0,22	0,32	0,38	0,48	0,60	0,63	0,71
Nominal available pressure	5	kPa	34,9	34,8	34,6	10,6	13,1	16,3	15,1
Maximum available pressure	5	kPa	69	61	51	32	65	61	48
Air 35°C - Water 7°C									
Nominal Cooling capacity / Max	6	kW	4,26 / 6,14	6,25 / 6,39	7,46 / 7,94	9,10 / 8,67	11,80 / 11,16	12,86 / 11,72	14,2 / 12,88
Total power input	6	kW	1,22	2,02	2,24	2,94	4,29	5,04	5,80
EER	6	-	3,50	3,09	3,33	3,09	2,75	2,55	2,45
Water flow-rate	6	l/s	0,20	0,29	0,36	0,43	0,54	0,59	0,64
Nominal available pressure	6	kPa	35,8	36,1	34,3	36,8	18,1	20,3	25,1
Maximum available pressure	6	kPa	70	64	56	43	74	67	60

1. User side entering/leaving water temperature 30/35°C, source side air 7°C (U.R. = 85% Heat power data, Total power input and COP in accordance with EN 14511:2018.
2. User side entering/leaving water temperature 30/35°C, source side air -7°C Heat power data, Total power input and COP in accordance with EN 14511:2018.
3. User side entering/leaving water temperature 40/45°C, source side air 7°C (U.R. = 85% Heat power data, Total power input and COP in accordance with EN 14511:2018.
4. User side entering/leaving water temperature 18/23°C, source side air 35°C Heat power data, Total power input and COP in accordance with EN 14511:2018.
5. User side entering/leaving water temperature 7/12°C, source side air 35°C Heat power data, Total power input and COP in accordance with EN 14511:2018.
6. The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) N. 811/2018 and Commission Delegated Regulation N. 813/2013, Clima Average, High Temperature 47/55°C.

Outdoor unit available both with single-phase power supply 220-240V ~ 50Hz and with three-phase power supply 380-415V 3N ~ 50Hz.
All data calculated with zero elevation gain and equivalent length of 7m.

SIZE			2.1	3.1	4.1	5.1	6.1	7.1	8.1
			A	A	A	A	B	C	D
ERP									
Clima Average High temperature Heat pumps									
Nominal power	7	kW	4	6	7	9	12	13	13
SCOP	7	-	3.32	3.54	3.72	3.73	3.56	3.52	3.48
Generator energy class	7	-	A++	A++	A++	A++	A++	A++	A++
ηs	7	%	130	138	146	146	139	138	136
System energy class	7	-	A++	A++	A++	A++	A++	A++	A++
ηs	7	%	135	143	151	151	144	143	141
Clima Average Low temperature Heat pumps									
Nominal power	8	kW	5	6	8	10	12	14	16
SCOP	8	-	5,13	5,15	5.32	5.27	5.00	4.91	4.89
Generator energy class	8	-	A+++	A+++	A+++	A+++	A+++	A+++	A+++
ηs	8	%	202	203	210	208	196	193	193
System energy class	8	-	A+++	A+++	A+++	A+++	A+++	A+++	A+++
ηs	8	%	207	208	215	213	201	198	198
Average climatic conditions - Heat pump for application with Fan coil									
Nominal power	9	kW	4	6	7	9	12	13	14
SEER	9	-	5,09	5,42	5.95	6.01	5.16	5.10	4.87
Generator energy class	9	-	A+++	A+++	A+++	A+++	A+++	A+++	A+++
ηs	9	%	201	214	235	238	203	201	192
Heat pump for Domestic Hot Water application - TDUEX option									
Net boiler capacity	10	l	141	141	141	141	141	141	141
Heating time	10	h:min	02:11	02:11	01:47	01:47	01:15	01:15	01:15
DHW tank setpoint	10	°C	50	50	49	49	48	48	48
Load profile declared	10	-	L	L	L	L	L	L	L
ηwh	10	%	115	115	115	115	91	91	91
Sanitary water energy class	10	-	A+	A+	A+	A+	A	A	A
Mixed water at 40 ° C (V40)	10	l	187	187	189	189	177	177	177

7. The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) N. 811/2018 and Commission Delegated Regulation N. 813/2013, Clima Average, Medium temperature 47/55°C
8. The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) N. 811/2018 and Commission Delegated Regulation N. 813/2013, Clima Average, Low temperature 30/35°C
9. The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) N. 811/2018 and Commission Delegated Regulation N. 813/2013, Clima Average, Low temperature 12/7°C
10. Dati secondo EN 16147:2017

All data calculated with zero elevation gain and equivalent length of 7 m.

Condensing boiler technical data

MODEL				FE 24.4	FE 33.4
Heating capacity					
Nominal heating capacity (Qn)	-	Maximum	[kW]	24,5	34,8
		Minimum	[kW]	4,8	5,0
Heating capacity (Pn)	60/80°C	Maximum	[kW]	**24,0**	**34,0**
		Minimum	[kW]	4,7	4,9
	30/50°C	Maximum	[kW]	26,0	37,0
		Minimum	[kW]	5,2	5,4
Performance	60/80°C	Maximum	%	97,8	97,7
		Minimum	%	97,6	97,2
	30/50°C	Maximum	%	106,1	106,2
		Minimum	%	107,3	107,1
	30% di Pn	-	%	109,7	109,7
Boiler water content	-	-	[l]	3,4	4,3
Operating pressure	PMS	Maximum	[bar]	3	3
	-	Minimum	[bar]	0,8	0,8
Expansion tank	Volume	-	[l]	8	10
	Precarica	-	[bar]	0,8	0,8
ACS performances					
Nominal heating capacity (Qnw)	-	Maximum	[kW]	28,5	34,8
		Minimum	[kW]	4,7	5,0
Heating capacity	-	Maximum	[kW]	28,0	34,0
		Minimum	[kW]	4,7	4,8
Specific flow rate	ΔT=25°C	-	[l/min]	16,1	19,5
	ΔT=30°C	-	[l/min]	13,4	16,2
DHW production in continuous operation	ΔT=45 K	-	[l/min]	8,9	10,8
	ΔT=40 K	-	[l/min]	10,0	12,1
	ΔT=35 K	-	[l/min]	11,5	13,9
	ΔT=30 K	-	[l/min]	13,4	16,2
	ΔT=25 K	-	[l/min]	16,1	19,5
Water temperature		Maximum	[°C]	65	65
		Minimum	[°C]	40	40
Operating pressure	PMW	Maximum	[bar]	9	9
	-	Minimum	[bar]	0,3	0,3
ErP Data					
Seasonal efficiency *Medium climate*	Heating	ηs	%	94	94
		Energy class	-	A	A
	ACS	ηwh	%	85	85
		Energy class	-	A	A
		DHW profile	-	XL	XXL
Sound power level		Lwa	[dB(A)]	49	52
Thermal losses and smoke discharge					
Chimney losses	"burner ON 80/60°C"	Pmax	%	2,00	2,10
		Pmin	%	2,00	2,90
	"burner ON 50/30°C"	Pmax	%	1,40	1,40
		Pmin	%	1,00	1,00
Smoke temperature	80/60°C	Pmax	[°C]	66	67
		Pmin	[°C]	64	62
	50/30°C	Pmax	[°C]	52	53
		Pmin	[°C]	44	45
Smoke flow rate	-	Pmax	[g/s]	11,2	16
	-	Pmin	[g/s]	2,3	2,4
Nitrogen oxide (NOX) emissions		Class	-	6	6
		-	[mg/kWh]	35	33

Construction - Outdoor unit

SIZE			2.1	3.1	4.1	5.1	6.1	7.1	8.1
Characteristics									
Compressor			Twin Rotary						
Refrigerant			R32						
Refrigerant charge		kg	1.50	1.50	1.65	1.65	1.84	1.84	1.84
GWP		t_{CO2}	675	675	675	675	675	675	675
Equivalent tons of CO_2 (*)		t_t	1.02	1.02	1.11	1,11	1.24	1.24	1.24
Oil charge		l	0,46	0,46	0,46	0,46	1,10	1,10	1,10
Type of fan			Assiale						
Standard air flow rate		m^3/h	2770	2770	4030	4030	4060	4060	4060
Outdoors unit sound pressure at 1 metre	1	dB(A)	42	44	45	47	50	51	53
Sound power	1	dB(A)	55	57	58	60	63	64	66
Dimensions									
Operating (L x P x A)		mm	1008x426x712	1008x426x712	1118x523x865	1118x523x865	1118x523x865	1118x523x865	1118x523x865
Packaging (L x P x A)		mm	1065x485x800	1065x485x800	1180x560x890	1180x560x890	1180x560x890	1180x560x890	1180x560x890
Operating weight		kg	58	58	77	77	96/112	96/112	96/112
Shipping weight		kg	64	64	88	88	110/125	110/125	110/125

1. Sound pressure level determined using the intense metric method (UNI EN ISO 9614-2). Data referred to the following full load conditions: Heating - utility side water inlet/outlet 47/55°C, air source side 7°C. Cooling - utility side water inlet/outlet 12/7°C, air source side 35°C.

(*) It contains fluorinated greenhouse gases

Construction - Indoor unit

SIZE			A 24kW	A/D 34 kW
System Characteristics				
Maximum circuit pressure		bar	3,0	3,0
System expansion tank	1	l	8,0	8,0
Preload expansion tank		bar	1,0	1,0
System water connections		inch	1"	1"
System water connections		inch	3/4"	3/4"
Dimensions				
Operating (L x P x A)		mm	1086 x 450 x 410	1086 x 450 x 410
Packaging (L x P x A)		mm	1180 x 500 x 560	1180 x 500 x 560
Operating weight		kg	70	81
Shipping weight	2	kg	42	44

1. Sufficient volume up to a maximum of 60 liters of system water content.
2. Gas boiler shipped separately

Hydronic data - Indoor unit + outdoor unit

SIZE			2.1	3.1	4.1	5.1	6.1	7.1	8.1
			A	A	A	A	B	C	D
Characteristics									
Minimum system water content	1	l	40	40	40	40	60	60	60
Minimum admitted water flow rate		l/s	0,16	0,16	0,16	0,16	0,16	0,16	0,16
Maximum admitted water flow rate		l/s	0,61	0,61	0,61	0,61	0,92	0,92	0,92

1. The minimum water content of the area with the smallest volume of water is considered.

Electrical data

Outdoor unit

SIZE		2.1	3.1	4.1	5.1	6.1	7.1	8.1
Power supply 220-240V ~ 50Hz								
F.L.A. - Full load current at max admissible conditions	A	10.0	11.8	15.0	16.4	24.5	25.9	27.7
F.L.I. - Full load power input at max admissible conditions	kW	2.20	2.60	3.30	3.60	5.40	5.70	6.10
M.I.C - Maximum inrush current	A	10.0	11.8	16,7	16.4	24.5	25.9	27.7
Power supply 380-415V 3N~ 50Hz								
F.L.A. - Full load current at max admissible conditions	A	-	-	-	-	8.20	8.70	9.30
F.L.I. - Full load power input at max admissible conditions	kW	-	-	-	-	5.40	5.70	6.10
M.I.C - Maximum inrush current	A	-	-	-	-	8.20	8.70	9.30

Indoor unit

SIZE		A 24 kW	A/D 34 kW
Power supply 220-240V ~ 50Hz			
F.L.A. - Full load current at max admissible conditions	A	1,58	2,30
F.L.I. - Full load power input at max admissible conditions	W	190	270
M.I.C - Maximum inrush current	A	1,58	2,30

Power supply 220-240V ~ 50Hz +/-10%.
The units are conforming with the prescriptions of European Standards CEI EN 60335 and EN 60335-2-40.
Data to be added to the values of the standard indoor unit.

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

External 2 zone kit

SIZE		KIRE2HX - KIRE2HLX
Power supply 220-240V ~50Hz		
F.L.A. - Full load current at max admissible conditions	A	0,88
F.L.I. - Full load power input at max admissible conditions	W	90

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335 and EN 60335-2-40
Data to be added to the values of the standard indoor unit.

Secondary circuit kit (1-litre circuit breaker + pump)

SIZE		KCSX - KCSIX
Power supply 220-240V ~50Hz		
F.L.A. - Full load current at max admissible conditions	A	0,58
F.L.I. - Full load power input at max admissible conditions	W	60

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335 and EN 60335-2-40
Data to be added to the values of the standard indoor unit.

Circulation kit: circulation group, control unit, expansion tank

SIZE		KCVEX
Power supply 220-240V ~50Hz		
F.L.A. - Full load current at max admissible conditions	A	0,33
F.L.I. - Full load power input at max admissible conditions	W	55

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335 and EN 60335-2-40
Data to be added to the values of the standard indoor unit.

Storage tanks for domestic hot water

SIZE		ACS200X	ACS300X	ACS500X	TDUEX - TDUESX - TTREAX
Power supply 220-240V ~50Hz					
F.L.A. - Full load current at max admissible conditions	A	8,70	8,70	8,70	8,7
F.L.I. - Full load power input at max admissible conditions	kW	2,00	2,00	2,00	2
M.I.C - Maximum inrush current	A	8,70	8,70	8,70	8,7

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335 and EN 60335-2-40.
Data to be added to the values of the standard indoor unit.
The tanks are supplied with immersed electrical resistance.

Auxiliary condensate drain pan

SIZE		DTX
Power supply 220-240V ~50Hz		
F.L.A. - Full load current at max admissible conditions	A	0,40
F.L.I. - Full load power input at max admissible conditions	kW	0,08

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335 and EN 60335-2-40.
Data to be added to the values of the standard indoor unit.

Sound levels outdoor unit

Standard mode

SIZE	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
2.1	46	49	49	52	52	46	37	27	42	55
3.1	49	48	50	55	53	48	39	30	44	57
4.1	36	51	53	56	55	49	44	30	45	58
5.1	37	56	53	57	57	51	47	36	47	60
6.1	44	53	54	60	58	55	52	51	50	63
7.1	44	54	55	60	59	57	56	54	51	64
8.1	46	58	57	60	61	59	54	51	53	66

Sound levels refer to units with full load under nominal test conditions. Data referred to the following conditions:
Data referred to the following conditions: entering / leaving exchanger water temperature user side 47/55°C source side exchanger air inlet 7°C.
The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2)

Silenced mode

SIZE	Sound pressure level	Sound power level
2.1	40	53
3.1	40	53
4.1	42	55
5.1	42	55
6.1	46	59
7.1	47	60
8.1	48	61

Sound levels refer to units with full load under nominal test conditions.
For maximum capacity delivered in silent mode use a correction factor of 0.8.
Data referred to the following conditions: entering / leaving exchanger water temperature user side 47/55°C source side exchanger air inlet 7°C.
The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2)

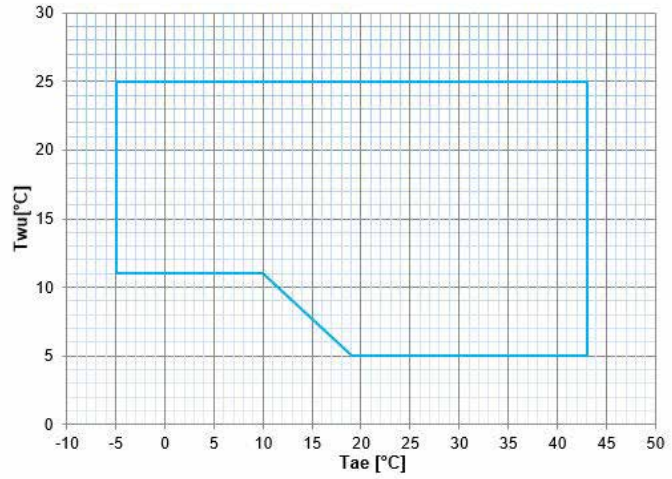
Super-silenced mode

SIZE	Sound pressure level	Sound power level
2.1	37	50
3.1	38	51
4.1	39	52
5.1	39	52
6.1	41	54
7.1	41	54
8.1	41	54

Sound levels refer to units with full load under nominal test conditions.
For maximum capacity delivered in silent mode use a correction factor of 0,6
Data referred to the following conditions: entering / leaving exchanger water temperature user side 47/55°C source side exchanger air inlet 7°C.
The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2

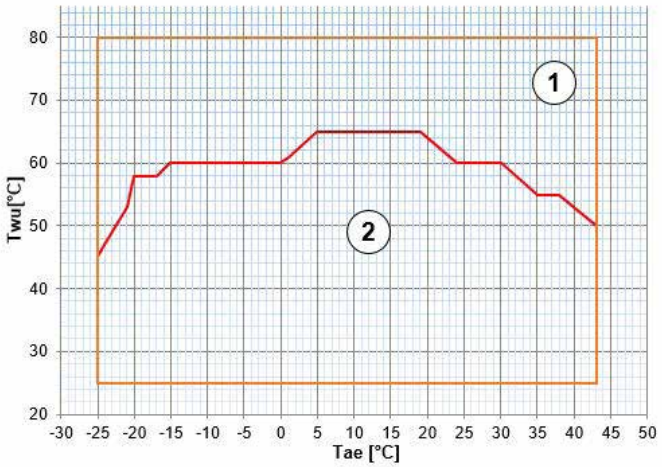
Operating limits

Cooling



Twu [°C] = Exchanger water outlet temperature
Tae [°C] = Outdoors exchanger air inlet temperature

Heating

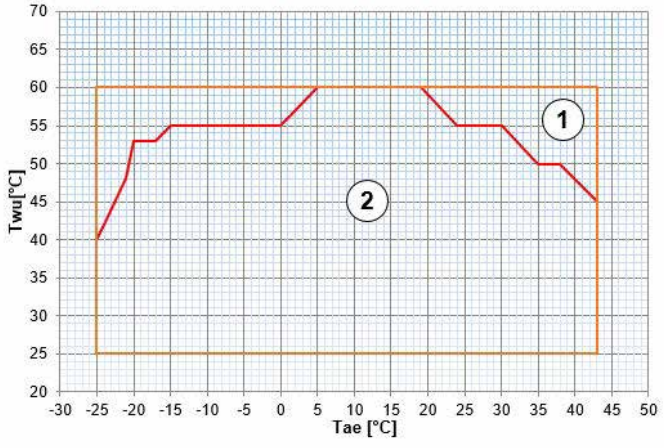


Twu [°C] = Exchanger water outlet temperature
Tae [°C] = Outdoors exchanger air inlet temperature

1. Normal operating range
2. Operation range heat pump only

In the configuration with the integration electric heater, the extension of the limits varies according to the electrical capacity of the electric heater chosen.

DHW



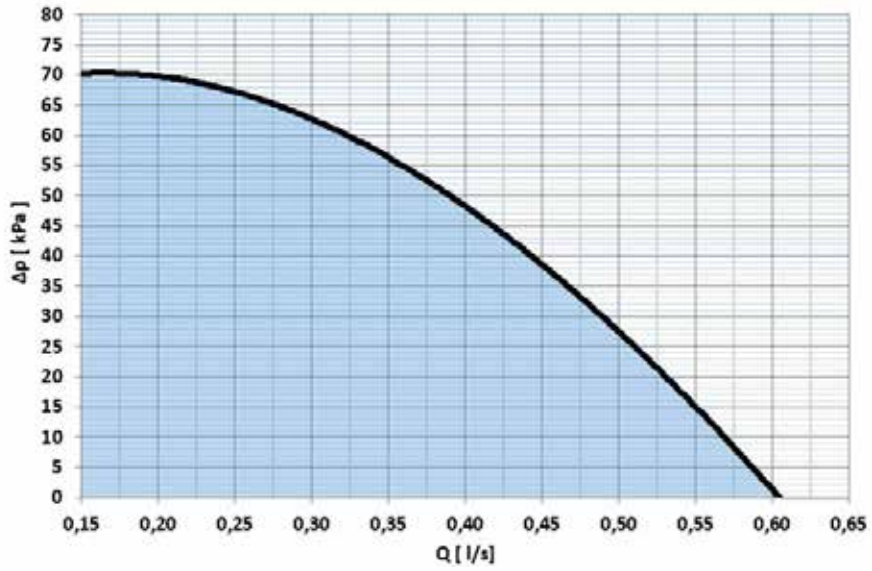
Twu [°C] = Exchanger water outlet temperature
Tae [°C] = Outdoors exchanger air inlet temperature

1. Instantaneous production operating range with boiler
2. Heat pump only operating range - storage tank and DHW 3-way valve required

In the configuration with the integration electric heater, the extension of the limits varies according to the electrical capacity of the electric heater chosen.

General technical data

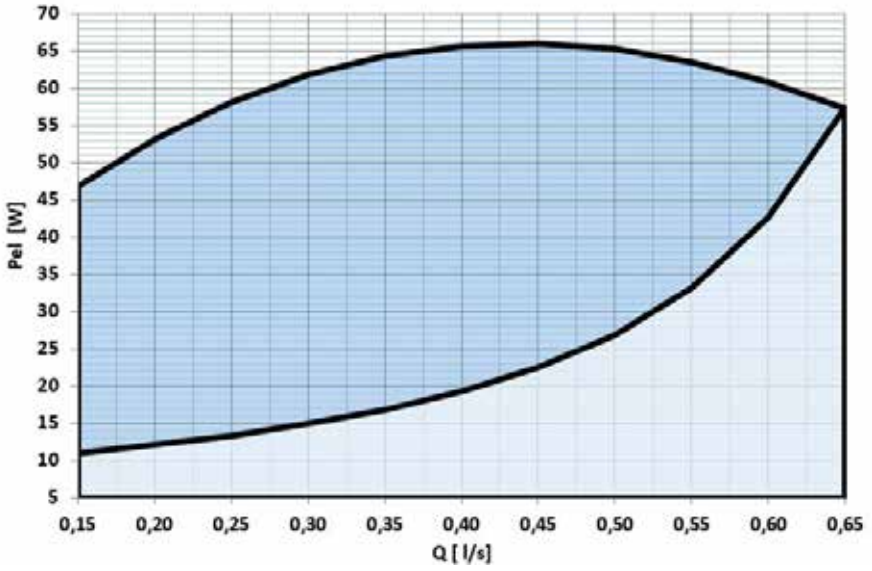
Available pressure of the standard circulator at the unit A connections with 24kW boiler



ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

Circulator operating field

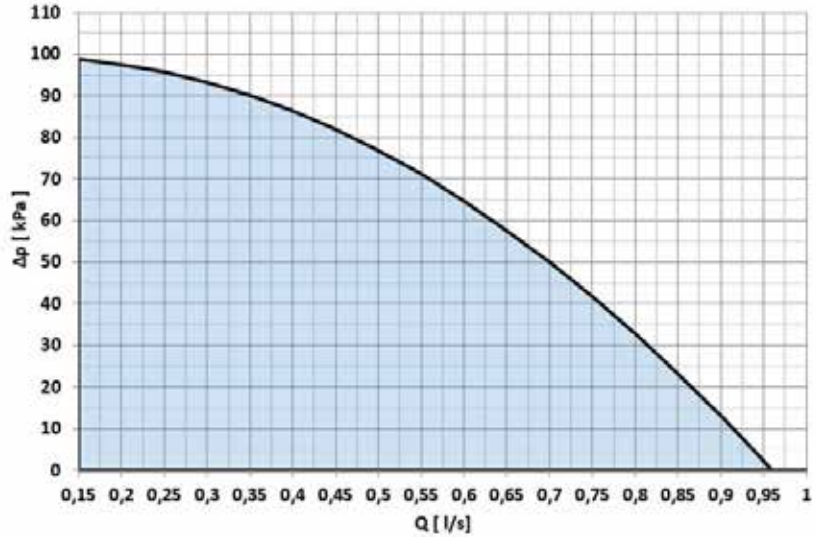
Absorption of the standard circulator at the unit 190 L A with 24kW boiler



Pel [W] = Electrical power input
Q [l/s] = Water flow-rate

Circulator operating field

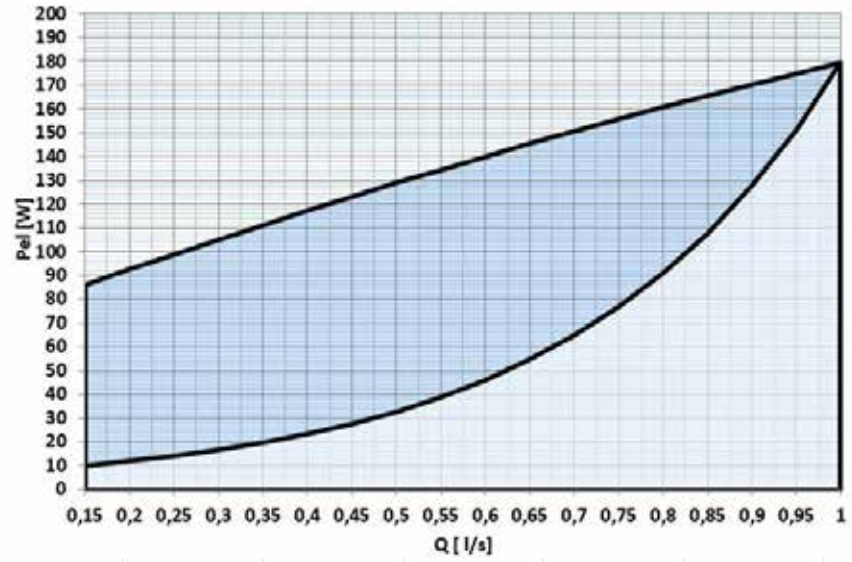
Available pressure of the standard circulator at the unit A/D with 34 kW boiler



ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

Circulator operating field

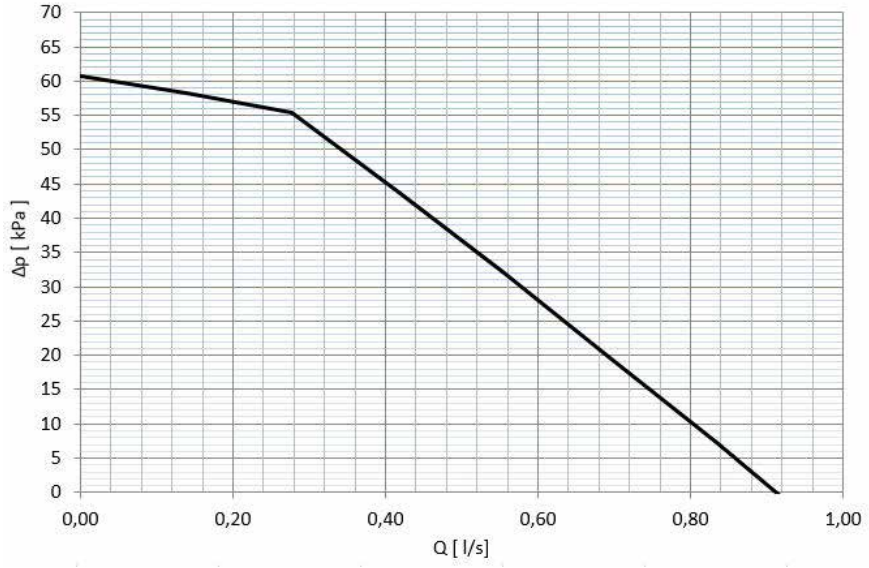
Absorption of the standard circulator at the unit 190 L A/D with 34 kW boiler



Pel [W] = Electrical power input
Q [l/s] = Water flow-rate

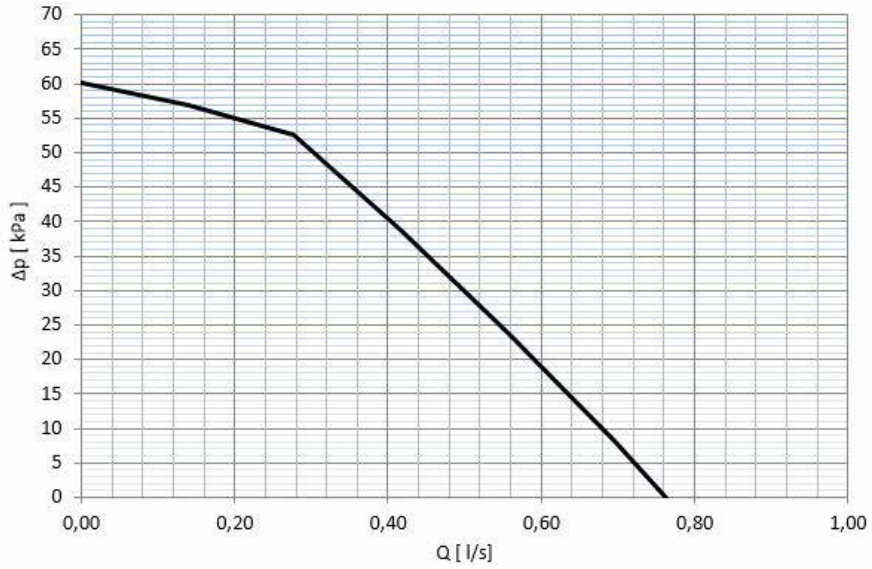
Circulator operating field

Pressure drop for direct booster system circulator



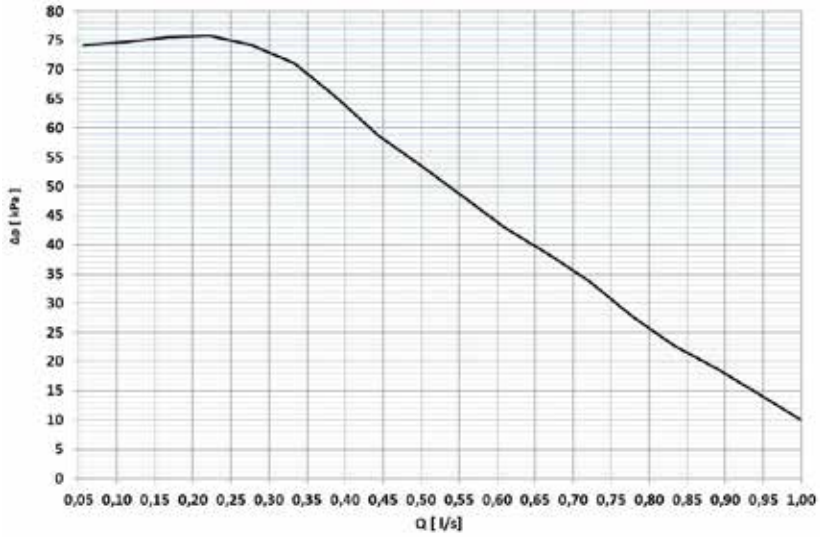
ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

Available head for mixed booster system circulator



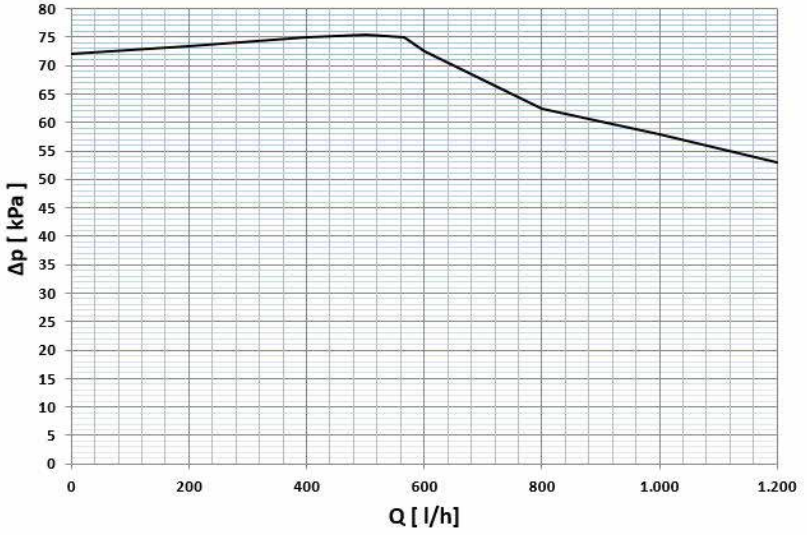
ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

KCSX secondary circuit kit available pressure



ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

Available circulator head present in the KCVEX solar kit



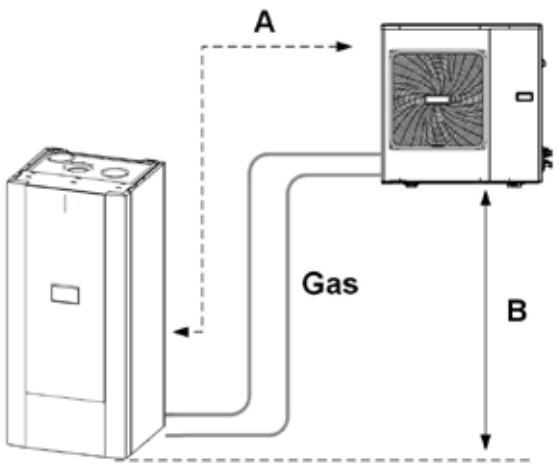
ΔP [kPa] = Available pressure
Q [l/h] = Water flow-rate

Refrigerant connections

Sizing the refrigerant pipes

Equivalent length of pipes (metres) = Effective length (metres) + Number of bends x K
Consider K= 0.3 m per wide radius elbow bend.
Consider K= 0.5 m per standard 90° elbow bend.

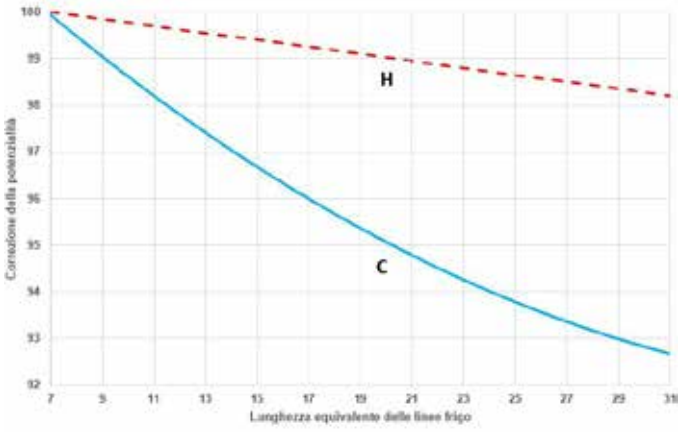
⚠ To correctly install the refrigerant pipes and charge the refrigerant gas, refer to the SPHERA EVO 2.0 EASYHybrid MANUAL



SIZE		2.1	3.1	4.1	5.1	6.1	7.1	8.1
Length and height difference of refrigerant pipes								
A - Refrigerant pipe min/max equivalent length	m	2 - 30	2 - 30	2 - 30	2 - 30	2 - 30	2 - 30	2 - 30
B - Maximum level difference of refrigerant piping with external unit above internal unit	m	25	25	25	25	25	25	25
B - Maximum level difference of refrigerant piping with external unit above internal uni	m	25	25	25	25	25	25	25
Diameters of refrigerant pipes								
Gas pipe diameter	inch	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"
Fluid line diameter	inch	1/4"	1/4"	3/8''	3/8''	3/8''	3/8''	3/8''
Additional charge per metre	kg/m	0,020	0,020	0,038	0,038	0,038	0,038	0,038

Determination of cooling and heating power loss

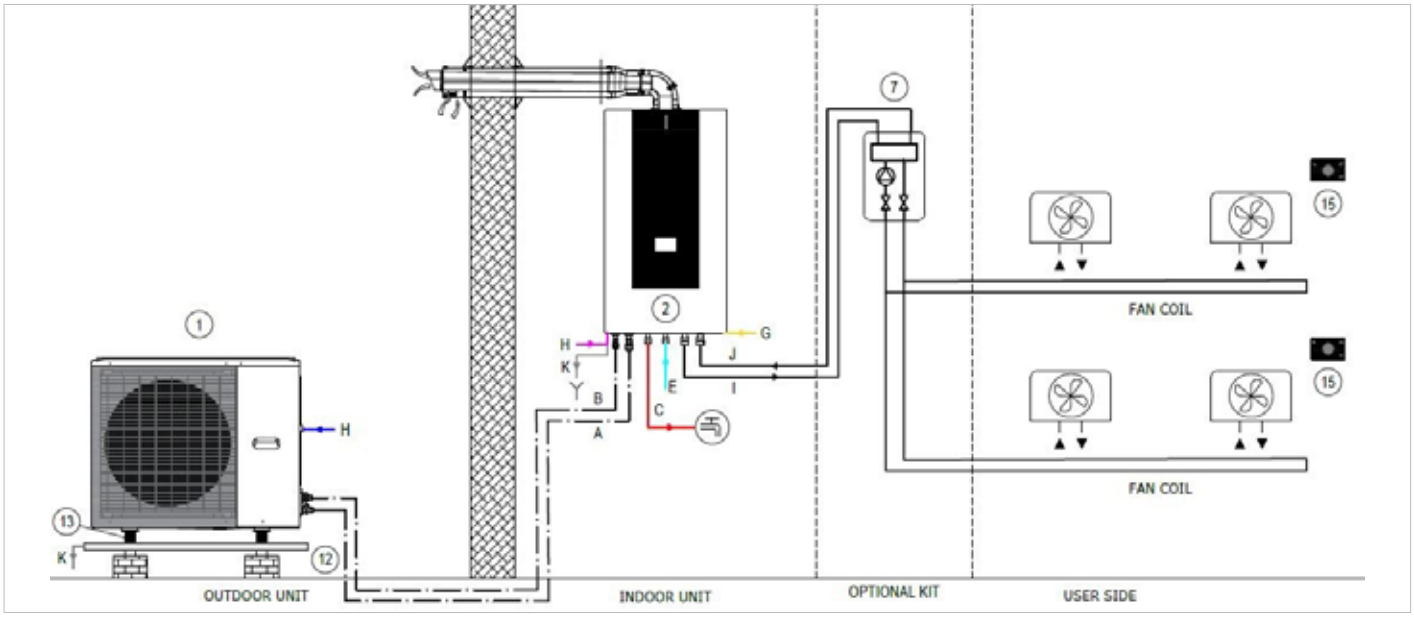
The equivalent length of the cooling lines results in a loss of cooling and heating power supplied to the circuit and DHW system.
The graph shows the amount of this loss of powergh



C = Cooling power efficiency curve
H = Heating power efficiency curve

Here are some diagrams of system connections provided as an indication. The connection and design of the system must be carried out in accordance with national regulations in force.
The diagrams do not report the mandatory components to be taken care of by the customer.

BOX configuration



1. Outdoor unit
2. Indoor unit
3. DHW cabinet
4. Accessories cabinet
5. 2 zone kit
6. 50L inertial storage tank
7. Single zone kit
8. Solar kit
9. 40L inertial storage tank
10. 1-litre circuit breaker
11. Circuit breaker/50L inertial storage tank
12. Condensate drain pan
13. Anti-vibration mounti
14. Solar panel
15. Chronothermostat
16. External domestic hot water storage
17. ElfoControl[3] EVO

220-240V~50Hz

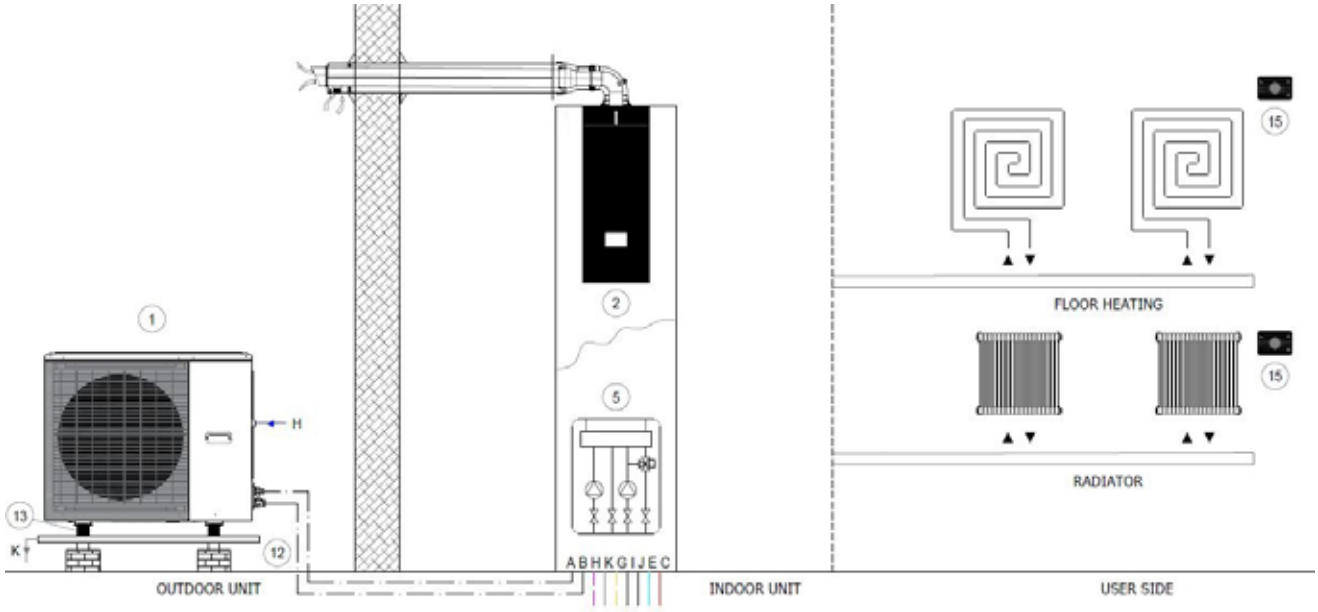
2.1 - 5.1 single phase 220-240V ~50Hz
6.1 - 8.1 single phase 220-240V ~50Hz
6.1 - 8.1 three-phase 380415V 3N~50Hz

BUS RS 485
Technical water
Domestic cold water
Domestic hot water
Condensate drain

Refrigeration connections

Here are some diagrams of system connections provided as an indication. The connection and design of the system must be carried out in accordance with national regulations in force.
The diagrams do not report the mandatory components to be taken care of by the customer.

T-UNO configuration



1. Outdoor unit
2. Indoor unit
3. DHW cabinet
4. Accessories cabinet
5. 2 zone kit
6. 50L inertial storage tank
7. Single zone kit
8. Solar kit
9. 40L inertial storage tank
10. 1-litre circuit breaker
11.Circuit breaker/50L inertial storage tank
12. Condensate drain pan
13. Anti-vibration mounti
14. Solar panel
15. Chronothermostat
16. External domestic hot water storage
17. ElfoControl³ EVO

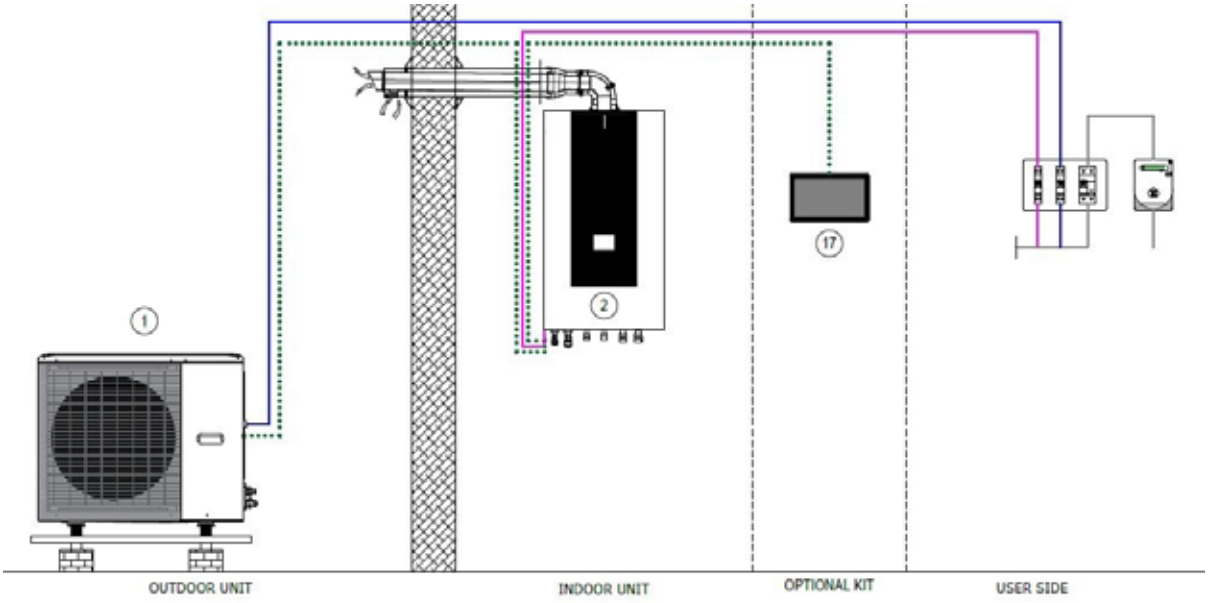
220-240V~50Hz

2.1 - 5.1 single phase 220-240V ~50Hz
6.1 - 8.1 single phase 220-240V ~50Hz
6.1 - 8.1 three-phase 380415V 3N~50Hz

BUS RS 485
Technical water
Domestic cold water
Domestic hot water
Condensate drain

Electrical connections

The electrical hookup must be conforming with the local regulations. The hookup must be done by a specialised technician, qualified to work on live equipment.
SPHERA EVO 2.0 EASYHybrid can be controlled with the on-board controller. To operate the unit, you may use: the ELFOControl[3] EVO supervision system or normal electromechanical thermostats.
For more information on connections, consult the installation manual.



1. Outdoor unit
2. Indoor unit
3. DHW cabinet
4. Accessories cabinet
5. 2 zone kit
6. 50L inertial storage tank
7. Single zone kit
8. Solar kit
9. 40L inertial storage tank
10. 1-litre circuit breaker
11.Circuit breaker/50L inertial storage tank
12. Condensate drain pan
13. Anti-vibration mounti
14. Solar panel
15. Chronothermostat
16. External domestic hot water storage
17. ElfoControl[3] EVO

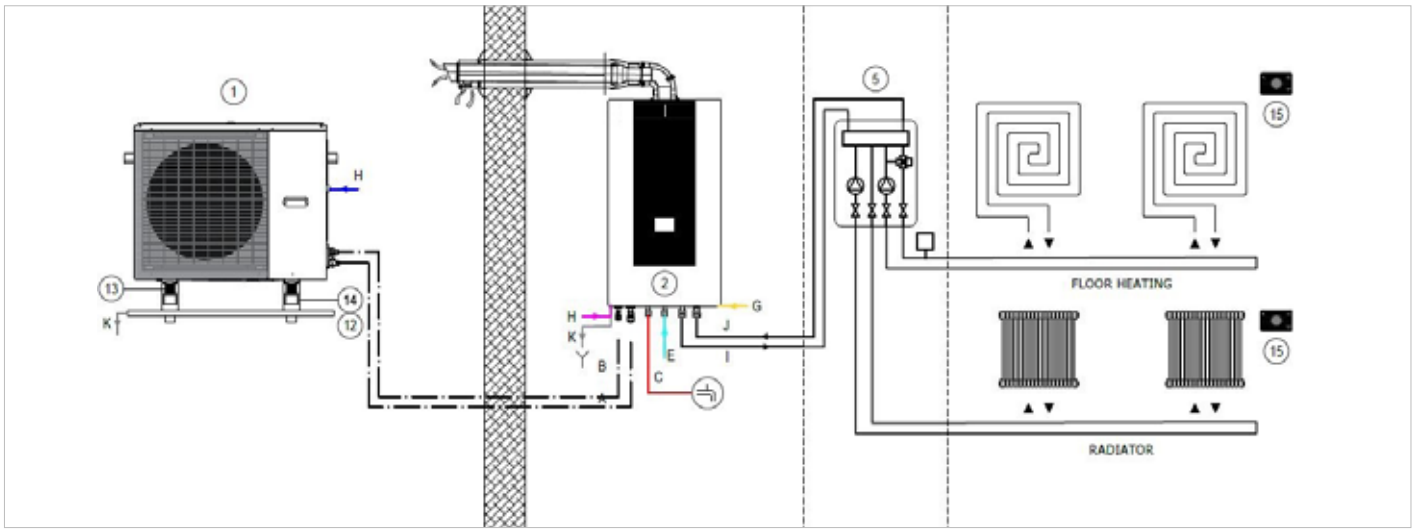
220-240V~50Hz

2.1 - 5.1 single phase 220-240V ~50Hz
6.1 - 8.1 single phase 220-240V ~50Hz
6.1 - 8.1 three-phase 380415V 3N~50Hz

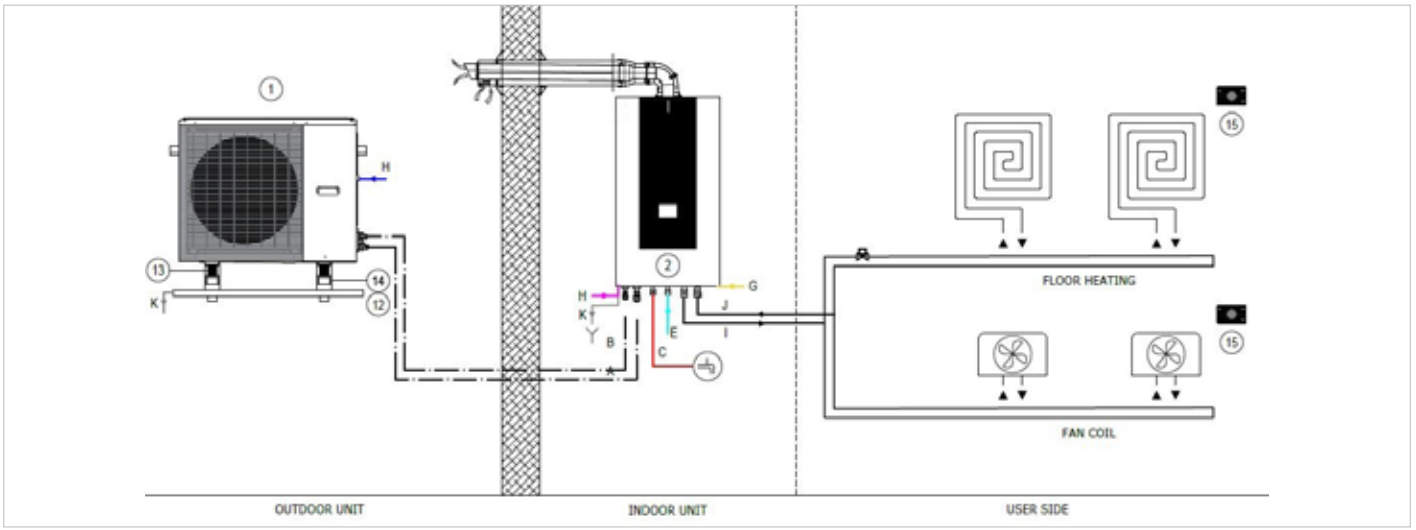
BUS RS 485
Technical water
Domestic cold water
Domestic hot water
Condensate drain

General description of the system and possible connections - BOX configuration

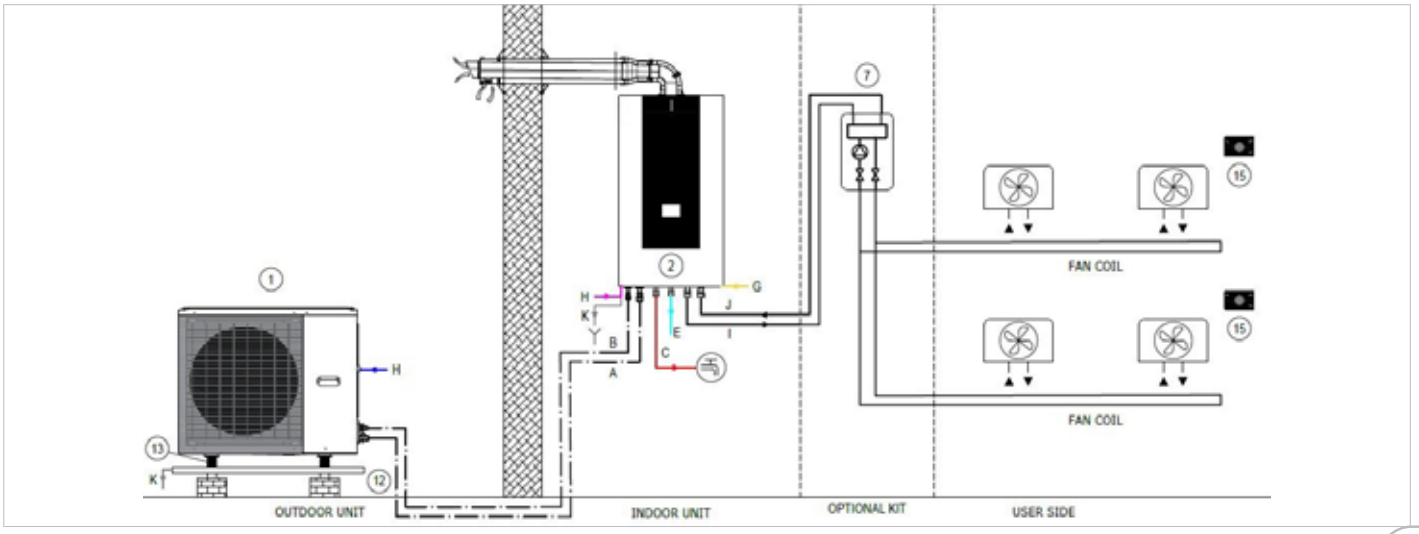
2-zone Kit



Single zone kit

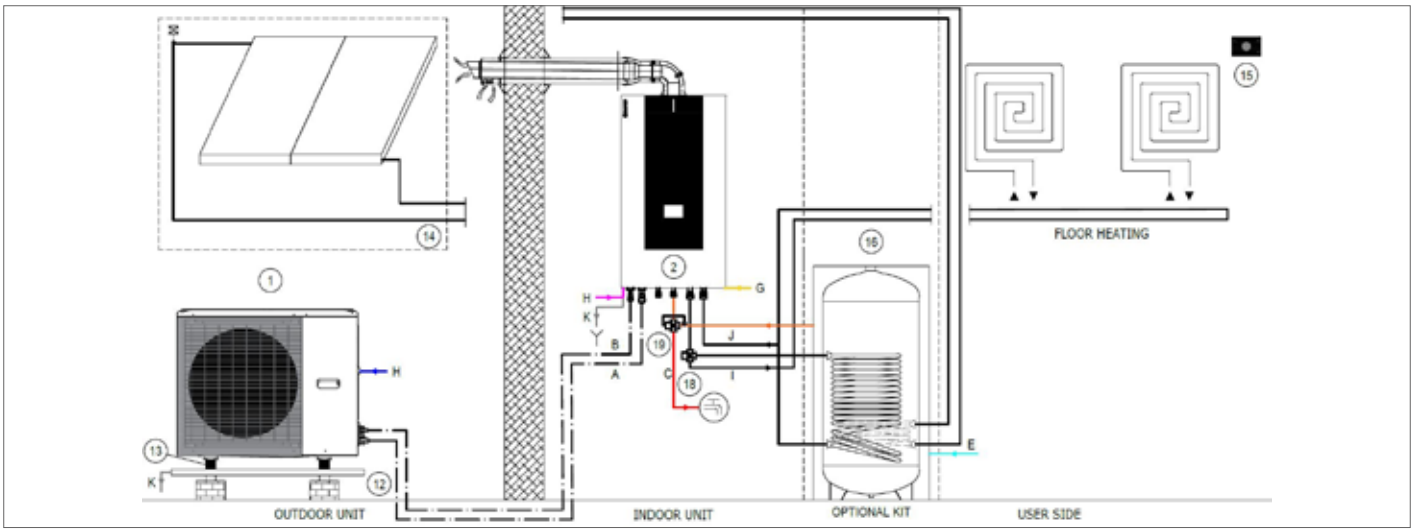


Single zone

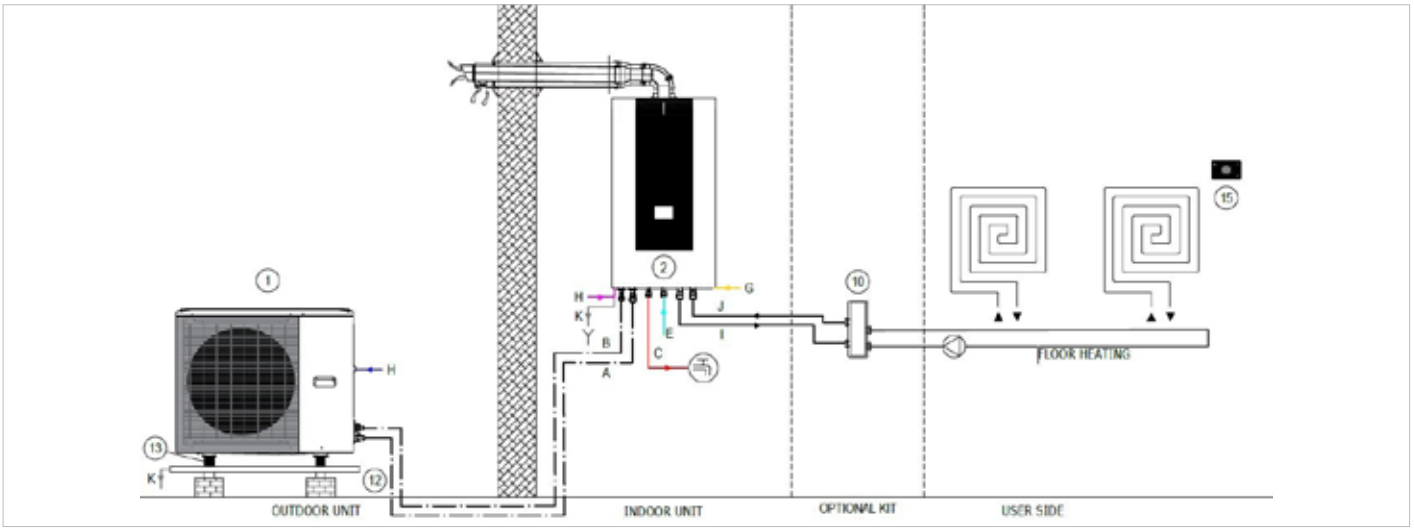


General description of the system and possible connections - BOX configuration

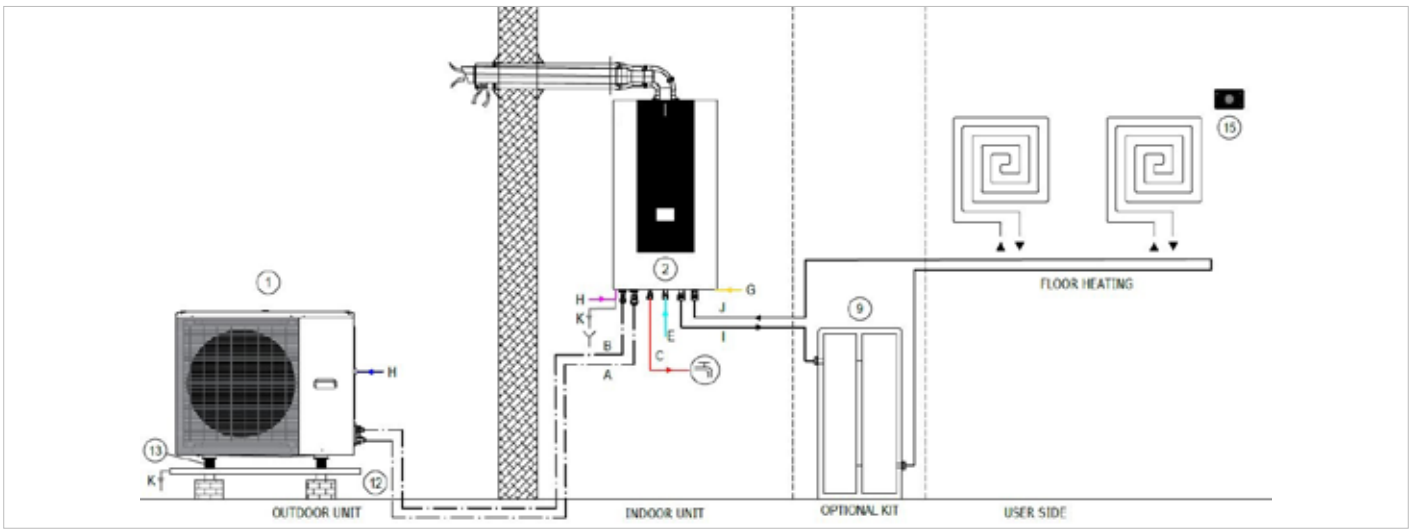
DHW storage



1 L circuit breaker

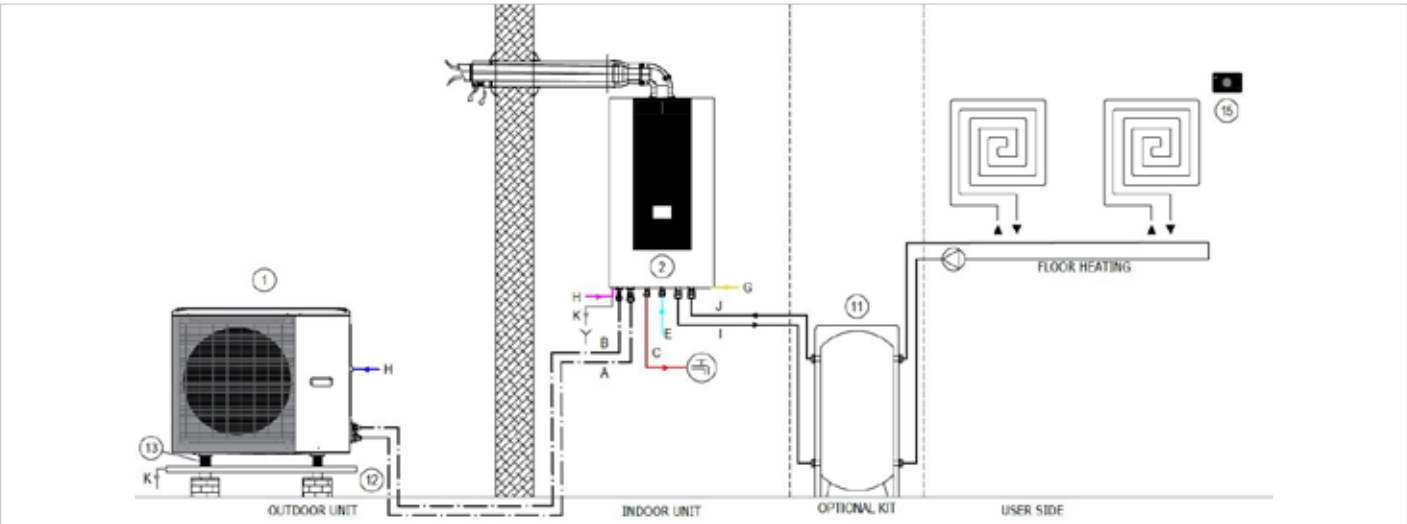


Inertial storage 40 L



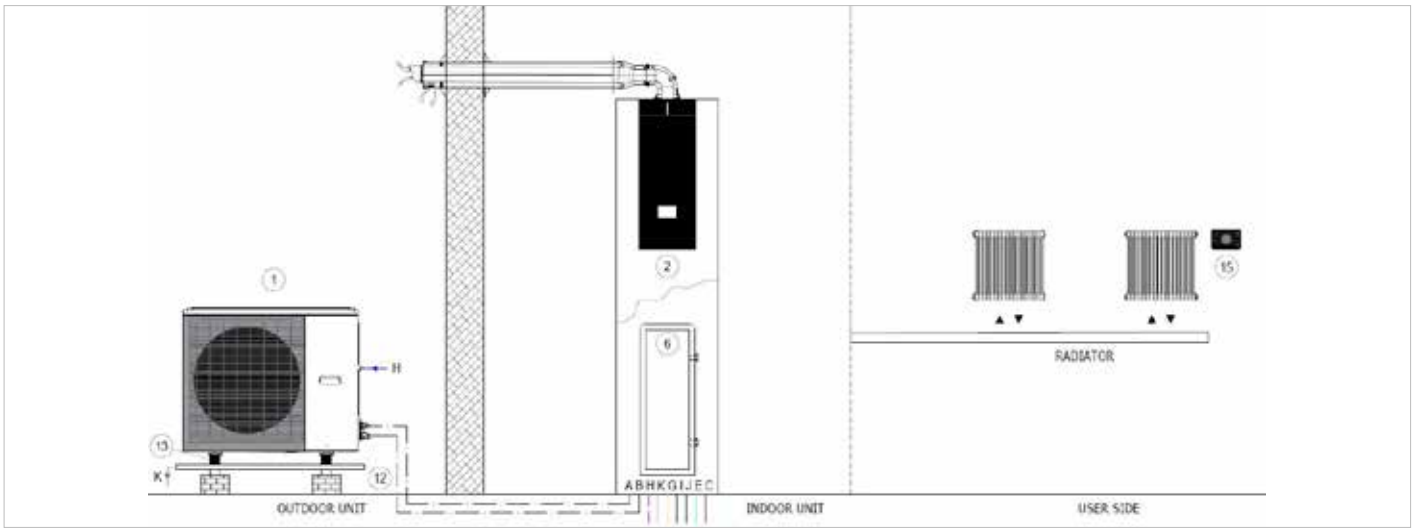
General description of the system and possible connections - BOX configuration

Circuit breaker/Storage 50L

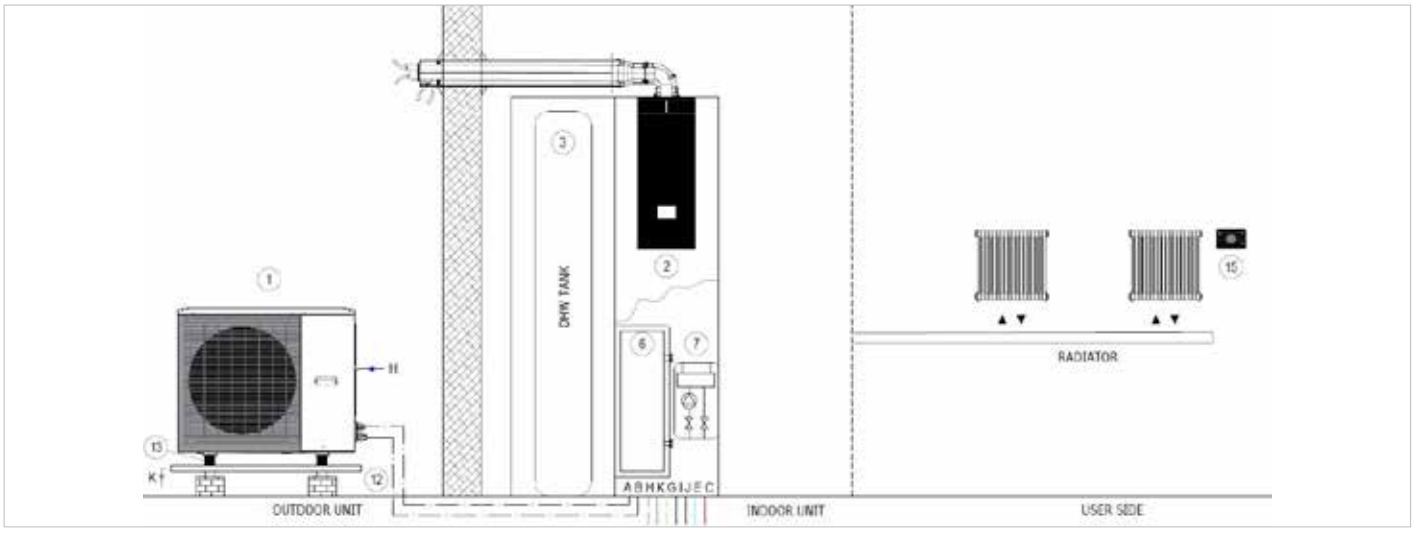


General description of the system and possible connections - T-UNO configuration

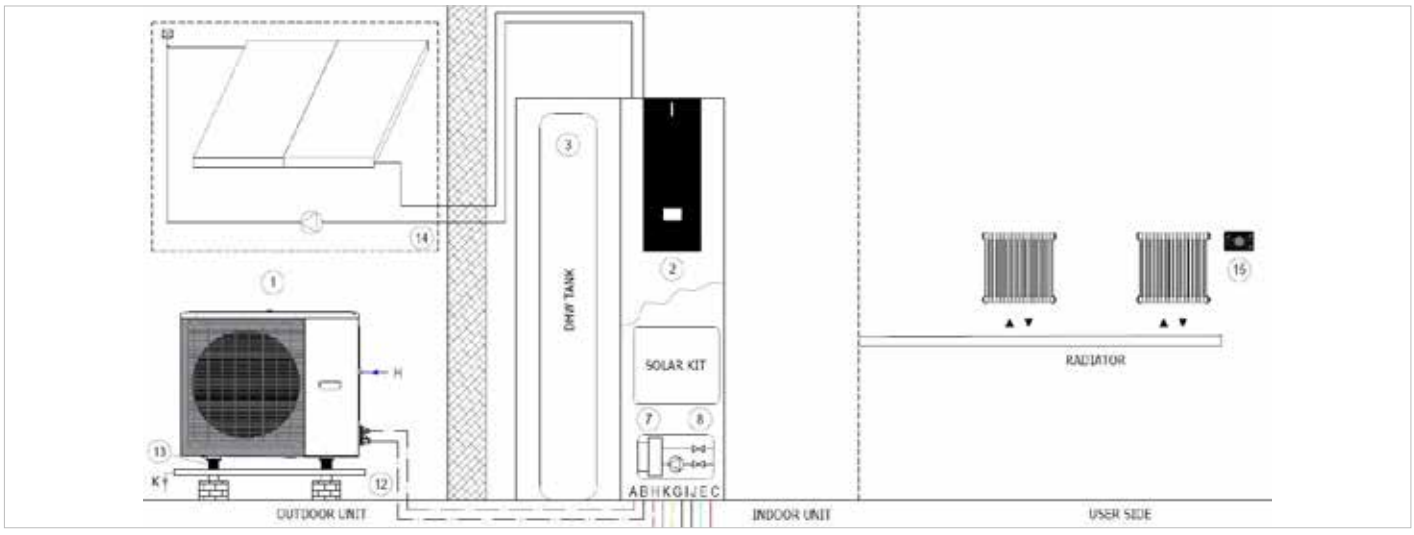
T-UNO 2 zone kit module



T-UNO inertial storage module

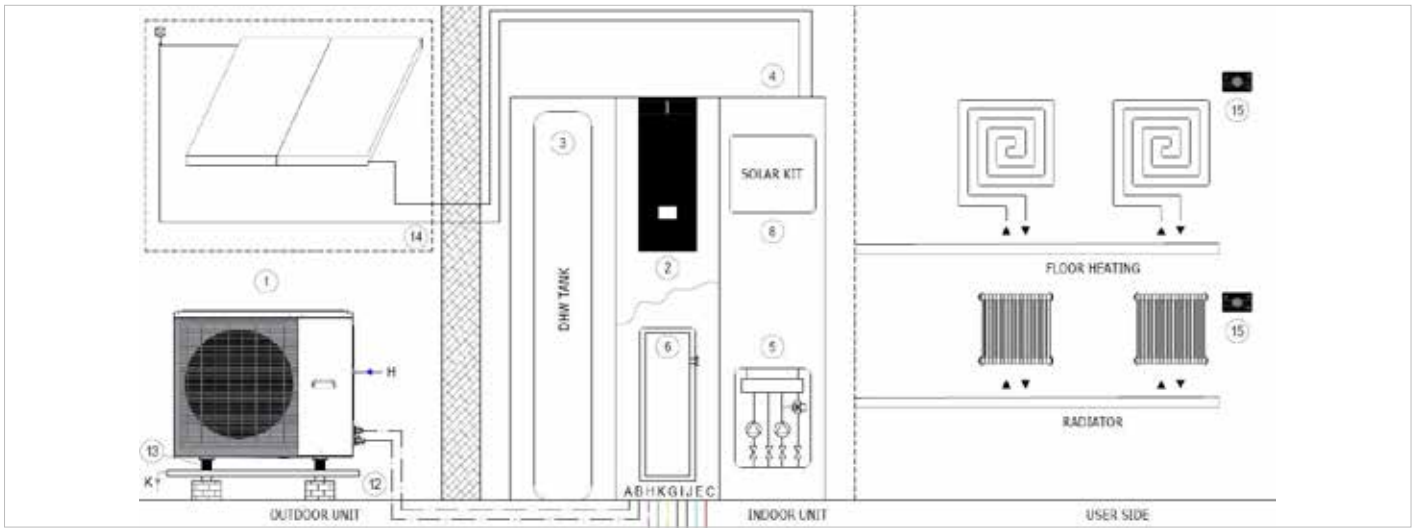


T-DUE DHW module + Solar Kit + Single zone kit



General description of the system and possible connections - Tower configuration

T-TRE DHW modules + Inertial storage + 2 zone Kit + Solar Kit



T-TRE DHW modules + ACS + Solar Kit

Clivet S.p.A. declares that the data to be used for the calculation pursuant to UNI/TS 11300 part 4 of the efficiency of their heat pump are given in the following tables.
The data given in this document may be updated without advance notice by the manufacturer when upgrading his product range.

UNI/TS 11300 Part 4

SPHERA EVO 2.0 - Size 2.1

Data for determination of COPPL T delivery 20°C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
2.1	PLR	100%	88%	54%	35%	15%
	DC		4,74	4,50	4,32	4,33
	CR		1,00	0,65	0,44	0,19
	P	5,39	4,74	3,05	1,99	1,45
	COP (part load)		3,15	4,96	6,81	6,23
	COP (full load)		3,15	4,46	5,42	6,37
	Fcop		1,00	1,11	1,26	0,98
Data to be provided for power and COP under full load cold source air						
	Te	Tm	-7	2	7	12
2.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	35°C	4,74	4,50	4,32	4,33
		45°C	4,31	4,35	4,16	4,16
		55°C	4,40	4,40	4,08	4,50
	COP	35°C	3,15	4,46	5,42	6,37
		45°C	2,51	3,27	3,93	4,52
		55°C	1,99	2,56	3,00	3,44
DHW Power and COP data under full load				Te		
	Te	Tm	7	15	20	35
2.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	55°C	4,08	5,11	5,71	6,85
	COP	55°C	3,00	3,84	4,23	3,90

SPHERA EVO 2.0 - Size 3.1

Data for determination of COPPL T delivery 20°C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
3.1	PLR	100%	88%	54%	35%	15%
	DC		5,51	5,89	6,18	6,28
	CR		1,00	0,57	0,35	0,15
	P	6,26	5,51	3,30	2,24	1,45
	COP (part load)		3,13	4,91	7,11	5,70
	COP (full load)		3,13	4,15	5,21	6,10
	Fcop		1,00	1,18	1,36	0,93
Data to be provided for power and COP under full load cold source air				Te		
	Te	Tm	-7	2	7	12
3.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	35°C	5,51	5,89	6,18	6,28
		45°C	5,22	6,42	6,03	6,53
		55°C	5,15	5,46	5,94	6,64
	COP	35°C	3,13	4,15	5,21	6,10
		45°C	2,41	3,07	3,83	4,41
		55°C	2,03	2,56	3,07	3,55
DHW Power and COP data under full load				Te		
	Te	Tm	7	15	20	35
3.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	55°C	5,94	6,99	7,33	8,80
	COP	55°C	3,07	3,97	4,44	4,10

Data for the UNI/TS 11300 calculation

SPHERA EVO 2.0 - Size 4.1

Data for determination of COPPL T delivery 20°C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
4.1	PLR	100%	88%	54%	35%	15%
	DC		7,15	5,64	8,30	8,21
	CR		1,00	0,78	0,34	0,15
	P	8,13	7,15	4,65	2,91	1,85
	COP (part load)		3,30	5,17	7,08	6,01
	COP (full load)		3,30	3,69	5,31	6,41
	Fcop		1,00	1,40	1,33	0,94
Data to be provided for power and COP under full load cold source air				Te		
	Te	Tm	-7	2	7	12
4.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	35°C	7,15	5,64	8,30	8,21
		45°C	6,34	6,59	8,22	8,07
		55°C	6,08	6,27	7,50	7,55
	COP	35°C	3,30	3,69	5,31	6,41
		45°C	2,56	3,26	3,95	4,69
		55°C	2,17	2,69	3,19	3,72
DHW Power and COP data under full load				Te		
	Te	Tm	7	15	20	35
4.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	55°C	7,50	8,37	9,18	11,02
	COP	55°C	3,19	4,11	4,50	4,15

SPHERA EVO 2.0 - Size 5.1

Data for determination of COPPL T delivery 20°C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
5.1	PLR	100%	88%	54%	35%	15%
	DC		8,45	9,30	10,09	10,26
	CR		1,00	0,56	0,33	0,14
	P	9,60	8,45	5,23	3,47	1,96
	COP (part load)		3,18	5,03	7,33	6,16
	COP (full load)		3,18	4,12	5,01	5,97
	Fcop		1,00	1,22	1,46	1,03
Data to be provided for power and COP under full load cold source air				Te		
	Te	Tm	-7	2	7	12
5.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	35°C	8,45	9,30	10,09	10,26
		45°C	7,71	9,16	10,01	10,06
		55°C	7,08	8,49	9,60	9,19
	COP	35°C	3,18	4,12	5,01	5,97
		45°C	2,59	3,11	3,86	4,32
		55°C	2,11	2,66	3,10	3,65
DHW Power and COP data under full load				Te		
	Te	Tm	7	15	20	35
5.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	55°C	9,60	8,99	8,78	10,54
	COP	55°C	3,10	4,03	4,53	4,18

Terms and definitions
Tm = Delivery temperature
Tdesignh = A - Average design climate temperature (pursuant to UNI EN 14825)
A, B, C, D = names of the four conditions with which different outdoors air temperatures are associated (Te)
Te = Outdoors air temperature
PLR = part load ratio
DC = power under full load referred to the specified temperatures
CR = heat pump load factor
P = system power demand
COP' (full load) = COP under full load referred to the indicated outdoors air temperatures
COP' (partial load) = COP under partial load referred to the indicated outdoors air temperatures
fCOP = COP correction factor, as follows: COP' (full load) / COP (partial load)HP= heat pump
DHW = domestic hot water

SPHERA EVO 2.0 - Size 6.1

Data for determination of COPPL T delivery 20°C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
6.1	PLR	100%	88%	54%	35%	15%
	DC		10,69	13,01	12,13	12,26
	CR		1,00	0,50	0,35	0,15
	P	12,14	10,69	6,57	4,48	3,67
	COP (part load)		3,07	4,68	6,90	6,33
	COP (full load)		3,07	3,93	5,00	5,68
	Fcop		1,00	1,19	1,38	1,12
Data to be provided for power and COP under full load cold source air			Te			
	Te	Tm	-7	2	7	12
6.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	35°C	10,69	13,01	12,13	12,26
		45°C	11,21	12,52	12,30	11,56
		55°C	10,10	12,05	12,07	10,89
	COP	35°C	3,07	3,93	5,00	5,68
		45°C	3,14	3,34	3,80	4,59
		55°C	1,76	2,88	3,10	3,78
DHW Power and COP data under full load			Te			
	Te	Tm	7	15	20	35
6.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	55°C	12,07	12,30	13,71	16,45
	COP	55°C	3,10	4,19	4,59	4,23

SPHERA EVO 2.0 - Size 7.1

Data for determination of COPPL T delivery 20°C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
7.1	PLR	100%	88%	54%	35%	15%
	DC		12,33	12,71	14,51	12,31
	CR		1,00	0,60	0,34	0,17
	P	14,01	12,33	7,97	5,21	3,67
	COP (part load)		2,87	4,62	7,07	6,70
	COP (full load)		2,87	4,00	4,70	5,70
	Fcop		1,00	1,16	1,50	1,18
Data to be provided for power and COP under full load cold source air			Te			
	Te	Tm	-7	2	7	12
7.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	35°C	12,33	12,71	14,51	12,31
		45°C	11,27	11,21	14,00	11,61
		55°C	10,35	11,71	13,85	10,94
	COP	35°C	2,87	4,00	4,70	5,70
		45°C	2,61	3,11	3,65	4,61
		55°C	2,18	2,91	3,05	3,80
DHW Power and COP data under full load			Te			
	Te	Tm	7	15	20	35
7.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	55°C	13,85	12,35	13,76	16,51
	COP	55°C	3,05	4,21	4,60	4,25

Terms and definitions
Tm = Delivery temperature
Tdesignh = A - Average design climate temperature (pursuant to UNI EN 14825)
A, B, C, D = names of the four conditions with which different outdoors air temperatures are associated (Te)
Te = Outdoors air temperature
PLR = part load ratio
DC = power under full load referred to the specified temperatures
CR = heat pump load factor
P = system power demand
COP' (full load) = COP under full load referred to the indicated outdoors air temperatures
COP' (partial load) = COP under partial load referred to the indicated outdoors air temperatures
fCOP = COP correction factor, as follows: COP' (full load) / COP (partial load)HP= heat pump
DHW = domestic hot water

Dati per il calcolo UNI/TS 11300

SPHERA EVO 2.0 - Size 8.1

Data for determination of COPPL T delivery 20°C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
8.1	PLR	100%	88%	54%	35%	15%
	DC		13,82	14,30	16,01	15,20
	CR		1,00	0,59	0,34	0,16
	P	15,71	13,82	8,55	5,88	3,67
	COP (part load)		2,86	4,59	7,13	6,44
	COP (full load)		2,86	3,85	4,55	5,43
	Fcop		1,00	1,19	1,57	1,19
Data to be provided for power and COP under full load cold source air			**Te**			
	Te	Tm	-7	2	7	12
8.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	35°C	13,82	14,30	16,01	15,20
		45°C	12,35	13,79	16,01	14,55
		55°C	11,23	13,32	16,00	13,91
	COP	35°C	2,86	3,85	4,55	5,43
		45°C	2,58	3,28	3,60	4,49
		55°C	2,13	2,80	2,90	4,00
DHW Power and COP data under full load			**Te**			
	Te	**Tm**	7	15	20	35
8.1	Heating capacity $\Phi_{H,HP\ out}$ (kW)	55°C	16,00	13,91	13,90	16,68
	COP	55°C	2,90	4,39	4,86	4,49

Terms and definitions
Tm = Delivery temperature
Tdesignh = A - Average design climate temperature (pursuant to UNI EN 14825)
A, B, C, D = names of the four conditions with which different outdoors air temperatures are associated (Te)
Te = Outdoors air temperature
PLR = part load ratio
DC = power under full load referred to the specified temperatures
CR = heat pump load factor
P = system power demand
COP' (full load) = COP under full load referred to the indicated outdoors air temperatures
COP' (partial load) = COP under partial load referred to the indicated outdoors air temperatures
fCOP = COP correction factor, as follows: COP' (full load) / COP (partial load)HP= heat pump
DHW = domestic hot water

The specified data refer to the nominal power values under the declared conditions.

UNI/TS 11300 Part 3

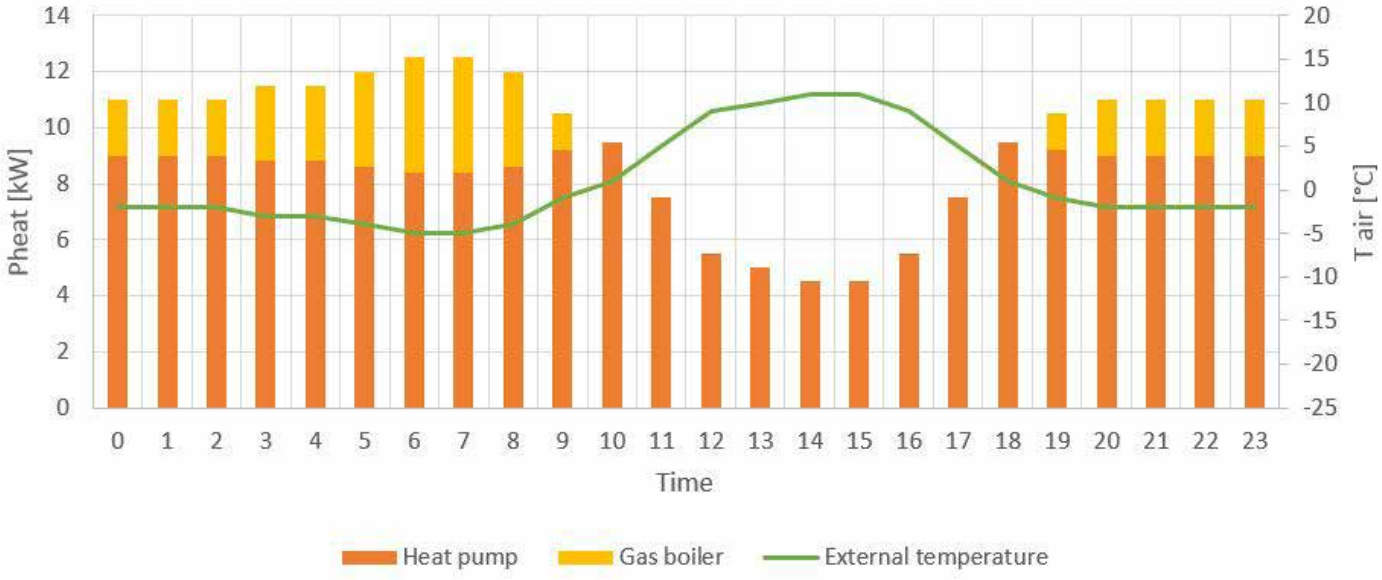
SIZE	Cooling capacity kW				EER			
Test	1	2	3	4	1	2	3	4
	100%	75%	50%	25%	100%	75%	50%	25%
220-240V N 50Hz								
2.1	4,26	3,20	2,05	0,90	3,50	4,71	5,84	5,81
3.1	6,25	4,59	2,96	1,35	3,09	4,43	6,17	7,40
4.1	7,46	5,20	3,51	1,63	3,33	4,48	6,67	9,30
5.1	9,10	6,43	4,25	1,94	3,09	4,26	6,73	10,48
6.1	11,80	8,89	6,01	2,91	2,75	3,89	5,73	7,88
7.1	12,86	9,40	6,29	2,91	2,55	3,78	5,71	7,88
8.1	14,20	10,53	7,12	2,91	2,45	3,54	5,38	7,88

Reference conditions prescribed by UNI/TS 11300-3:
1. External air temperature B.S. 35°C Refrigerated water temperature at the fancoil inlet/outlet 12/7 °C
2. External air temperature B.S. 30°C Refrigerated water temperature at the fancoil outlet /7 °C
3. External air temperature B.S. 25°C Refrigerated water temperature at the fancoil outlet /7 °C
4. External air temperature B.S. 20°C Refrigerated water temperature at the fancoil outlet /7 °C

The SPHERA EVO EASYHybrid unit is designed to integrate the hybrid solution with gas boilers. The keypad of the unit can be used to set the system temperature and domestic hot water (DHW) values for the heat pump and boiler.

Operation modes:

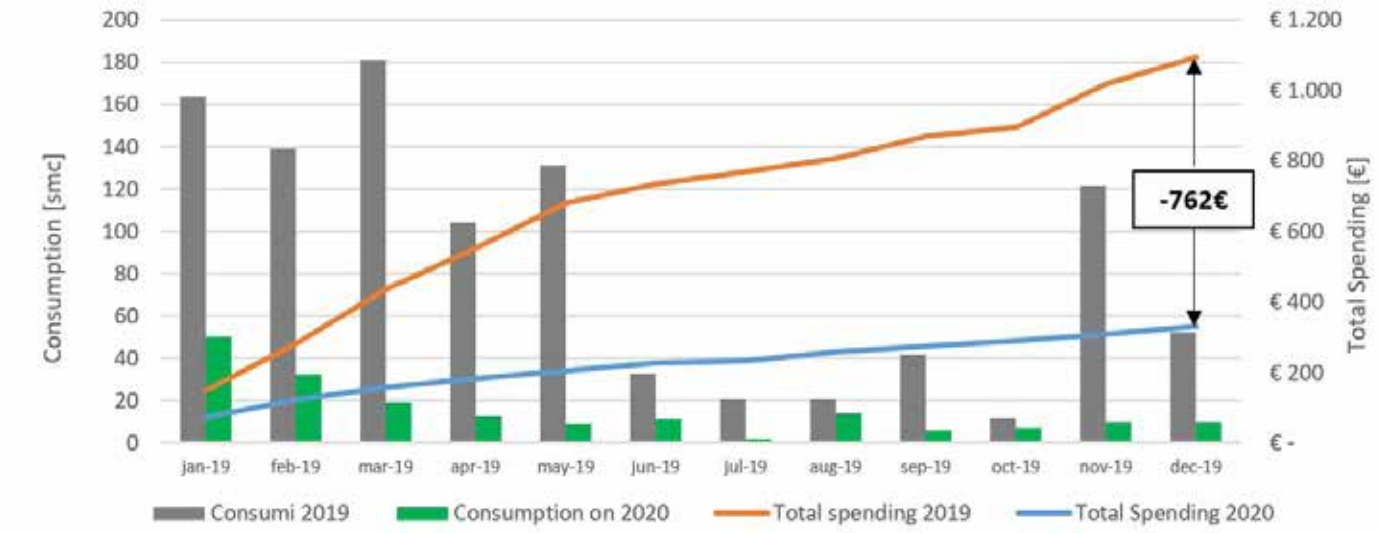
- **Heating mode:** priority is given as standard to the heat pump which modulates the power supplied according to the demand of the system.
  If the demand is not met, the boiler runs automatically until it reaches the required set point.
  The Euroswitch function described in the specific chapter takes precedence over these logics.
- **Cooling Mode:** the heat pump modulates the load depending on the demand of the system.
- **DHW mode without storage:** the boiler instantly produces domestic hot water (DHW).
- **DHW mode with storage:** the heat pump finishes heating or cooling the system and then heats the domestic hot water (DHW) in the storage tank up to the set point. This limits the changes in cycle in the summer and constantly fulfils the demand of the system.
  The boiler instantly integrates the water leaving the storage tank when the temperature is not sufficient.
  The boiler carries out the anti-legionella function with non-potable water.
  (The storage tank and 3-way valve for the production of DHW with heat pump are optional components)



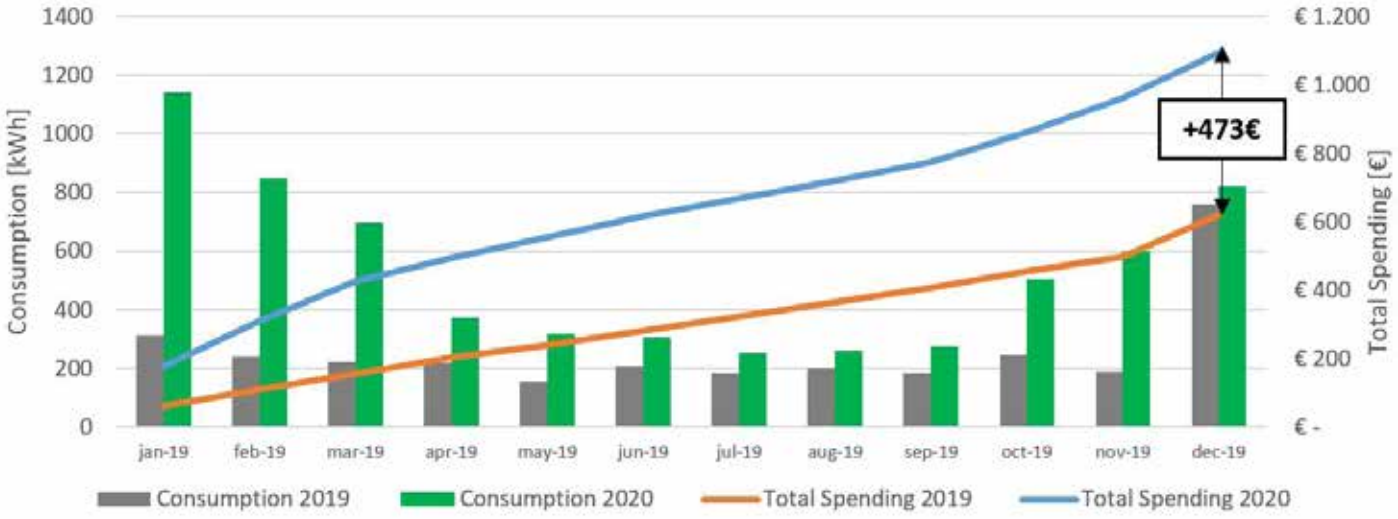
Energy requalification

Compared to traditional systems, SPHERA EVO 2.0 provides numerous advantages from an economic point of view and in terms of energy. Below is a real case in a domestic system before and after replacing a gas boiler with a SPHERA EVO 2.0 solution.

Natural gas



Electricity



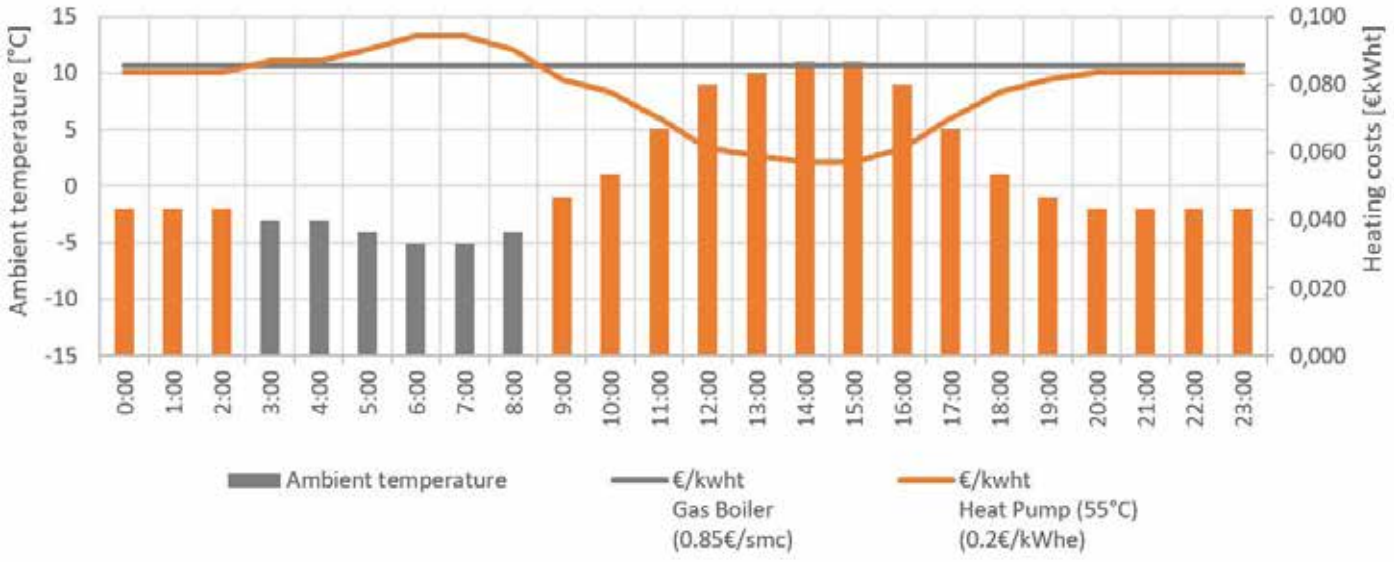
The graphs show the consumption and cost of natural gas and electricity for 2019 and 2020 (heat pump installed at the end of December 2019).

Year	Natural gas cost	Electricity cost	Total cost	Savings	
2019	1092 €	620 €	1712 €	289 €	-20%
2020	330 €	1093 €	1423 €		

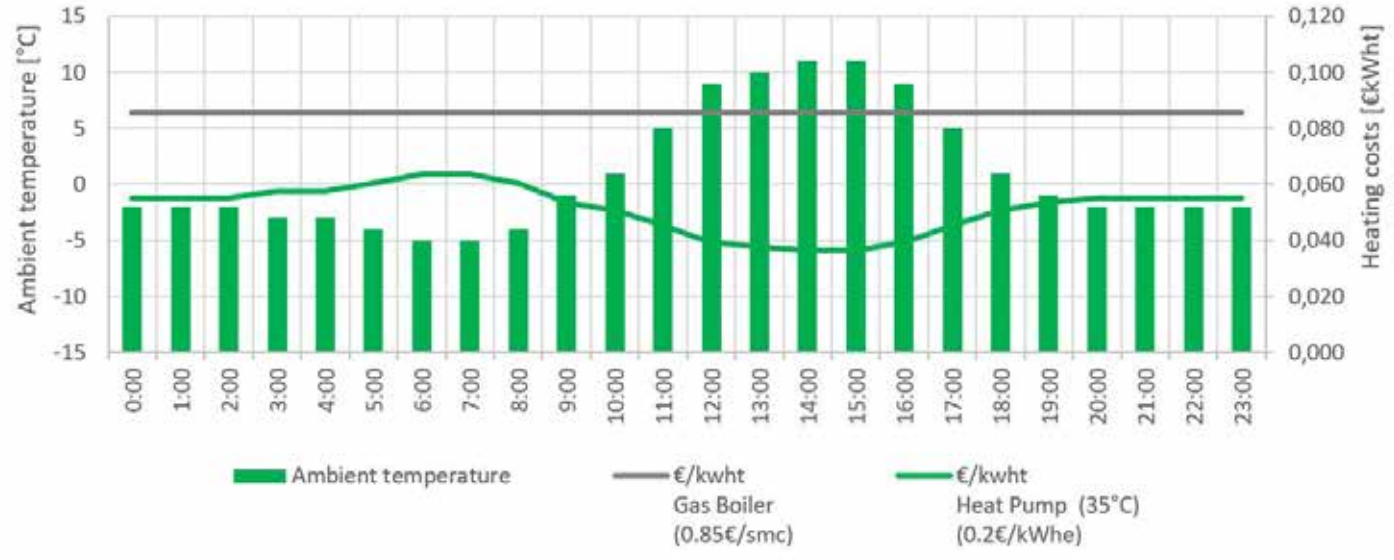
The savings were obtained without changings any aspect of the previous system except for the heat generator.
The heating terminals are radiators with an operating temperature of 55°C. The use of low temperature terminals (underfloor heating) would allow for double the amount of savings.

SPHERA EVO 2.0 provides a useful instrument for maximising savings, for hybrid systems with a gas boiler, through the EuroSwitch function. Based on the set price of natural gas and electricity, the heat pump will assign priority to its own operation rather than that of the boiler depending on its efficiency. The aim is to always use the most cost-effective heat source.

Case 1 - Typical day in January - Radiators (supply temperature = 55°C)



From 03:00am to 08:00am, heat will be produced by the boiler, while during other time slots, it will be produced by the heat pump.



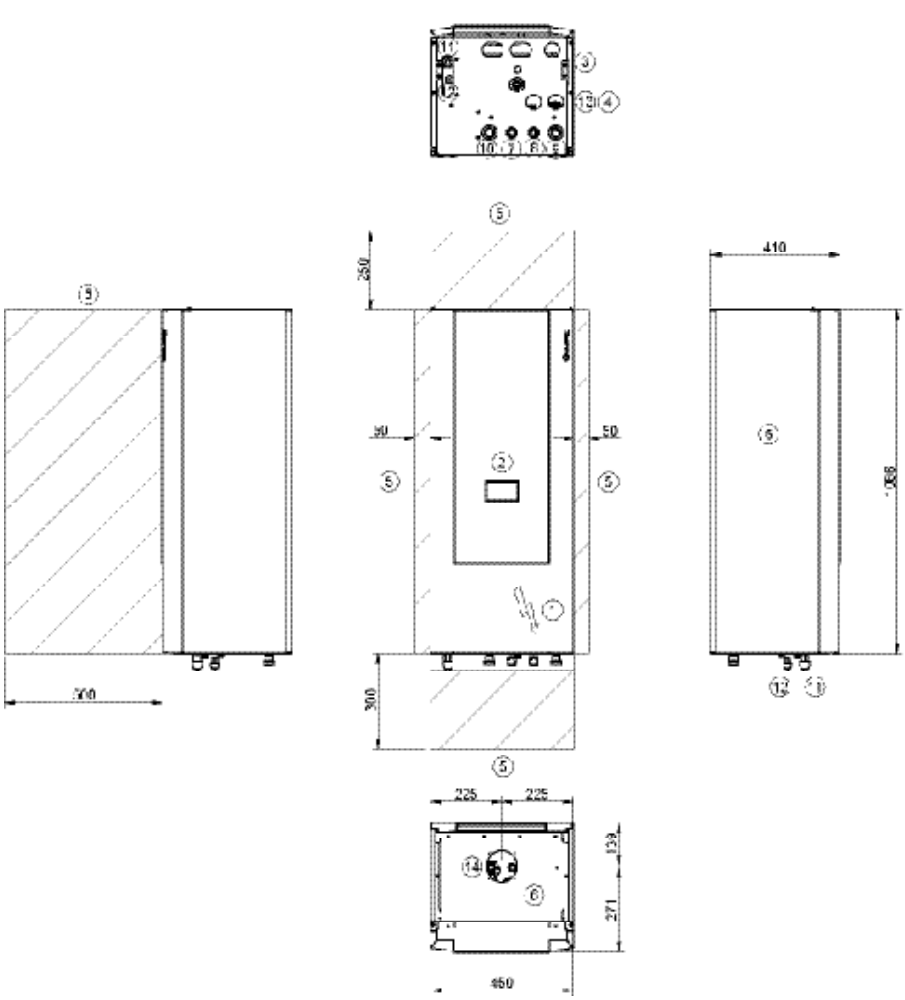
Case 2 - Typical day in January - Radiant floor (supply temperature = 35°C)

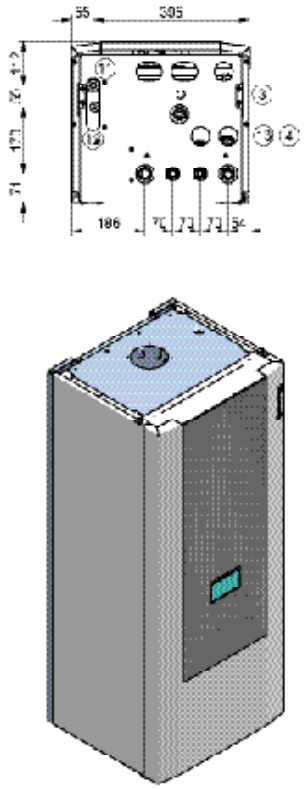
Heat will be produced by the heat pump during the whole day.
The graphs show the trend of the daily temperature and of the cost for thermal energy. The heat pump's efficiency varies according to the outdoor temperature and the water temperature, while the boiler has a fixed efficiency. The calculations consider an average cost of natural gas equal to 0.85 €/SCM and of electricity equal to 0.2 €/SCM.

Dimensional drawings

SPHERA EVO 2.0 BOX EASYHybrid (indoor unit)

DAAGQ0001_00
DATA/DATE 18/11/2021





1. Electrical panel
2. Unit control keypad
3. Power input
4. Condensate drain
5. Functional spaces
6. Gas boiler
7. DHW boiler supply 3/4"M
8. DHW boiler return 3/4"M
9. System outlet 1"M
10. System return 1"M
11. 5/8"SAE intake connection (*)
12. 3/8"SAE liquid connection (*)
13. Gas boiler inlet
14. Gas boiler outlet

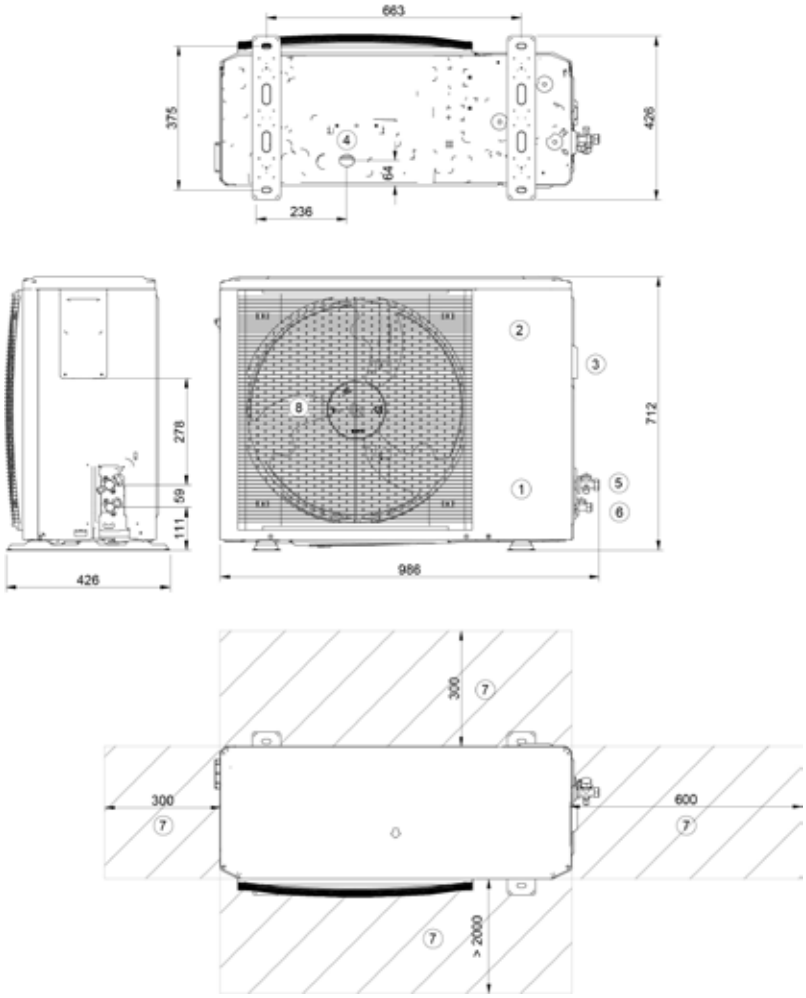
(*) See kit instructions RGGQ00004

SIZE		GAGH A	GBGH B - C - D
Hydronic group weight + structure	kg	37	39
Shipping weight	kg	42	44
Boiler weight 24 kW	kg	33	-
Boiler weight 34 kW	kg	42	42
Operation weight	kg	70/79	81

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SPHERA EVO 2.0 (outdoor unit) - 2.1 ÷ 3.1

DAAQ80002_REV00
DATA/DATE 29/04/2021



1. Compressor enclosure
2. Electrical panel
3. Power input
4. Condensate drain
5. Gas connections (1/4")
6. Gas connections (5/8")
7. Functional spaces
8. Electrical fan

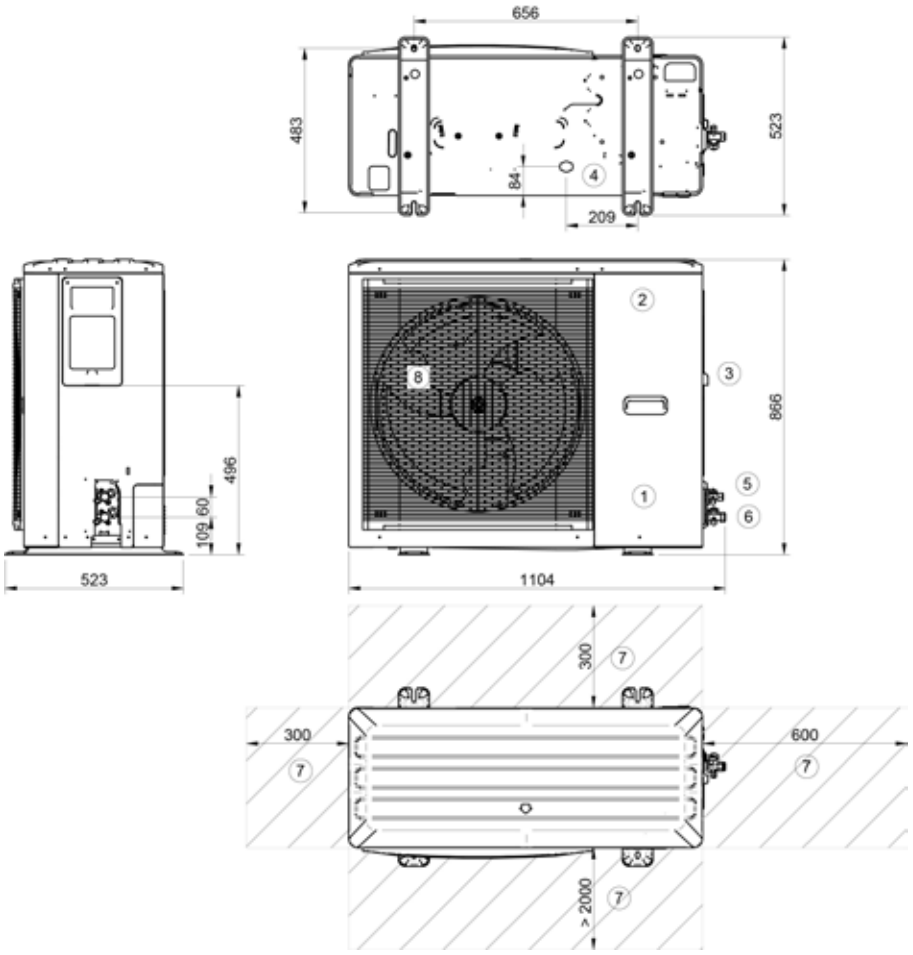
SIZE			2.1	3.1
Operation weight		kg	58	58
Shipping weight		kg	64	64

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

SPHERA EVO 2.0 (outdoor unit) - 4.1 ÷ 8.1

DAAQ80001_REV01
DATA/DATE 29/01/2021



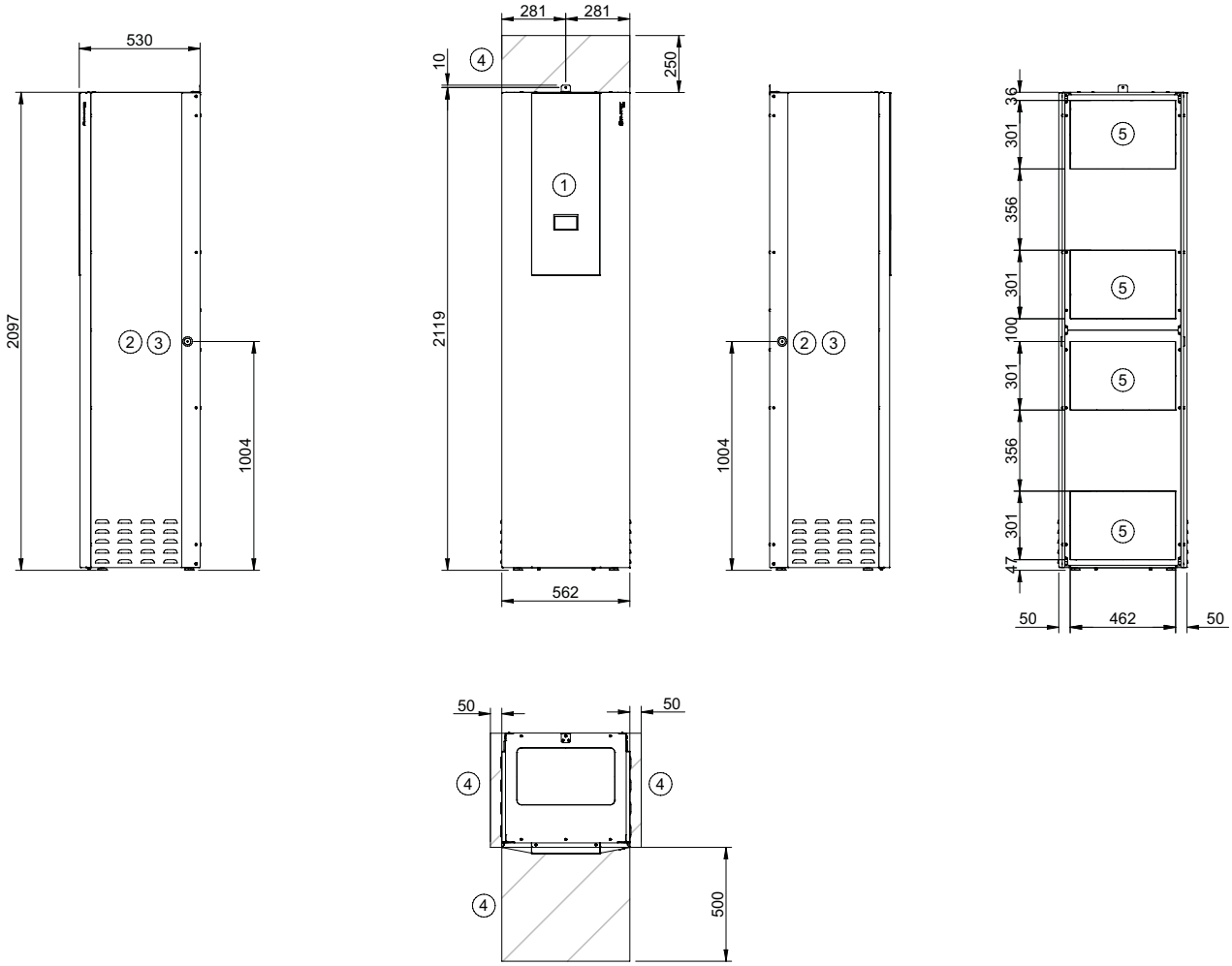
1. Compressor enclosure
2. Electrical panel
3. Power input
4. Condensate drain
5. Gas connections (3/8")
6. Gas connections (5/8")
7. Functional spaces
8. Electrical fan

SIZE			4.1 / 1Ph	5.1 / 1Ph	6.1 / 1Ph	6.1 / 3Ph	7.1 / 1Ph	7.1 / 3Ph	8.1 / 1Ph	8.1 / 3Ph
Operation weight		kg	77	77	96	112	96	112	96	112
Shipping weight		kg	88	88	110	125	110	125	110	125

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T1

DAAGQ0001_T1_02
DATA/DATE 18/11/2021



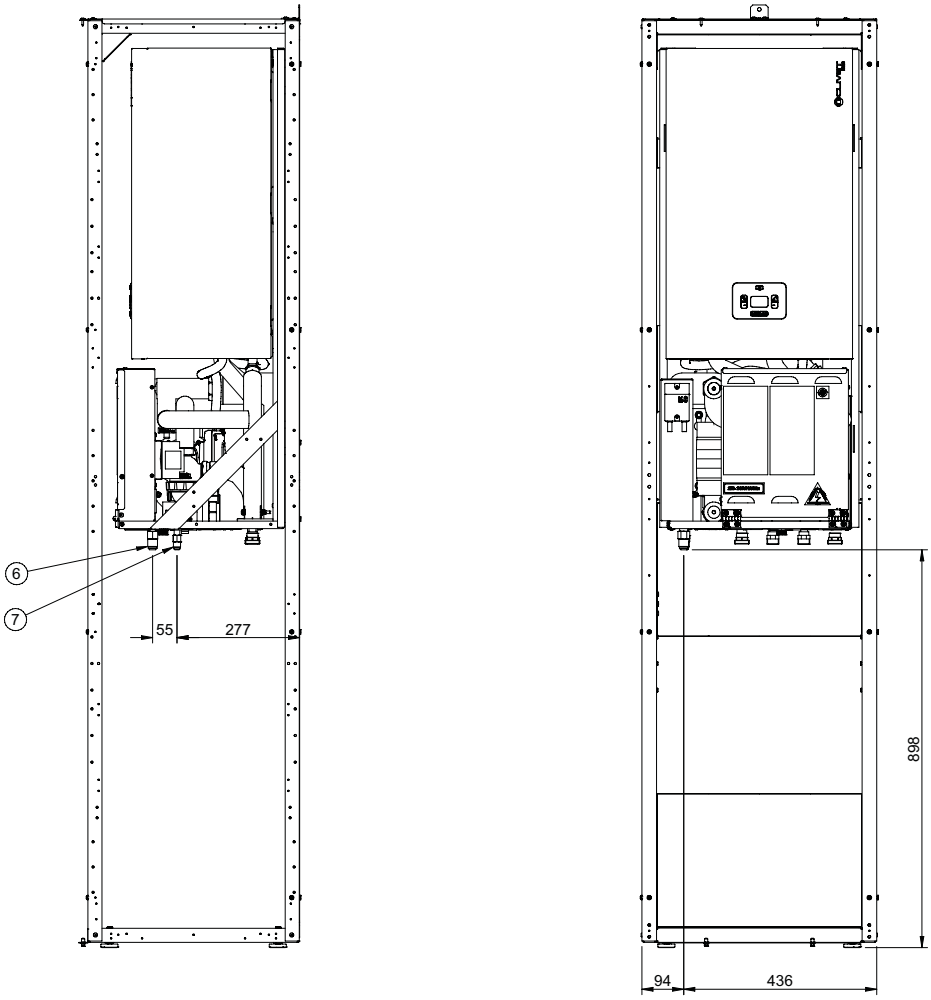
1. Unit control keypad
2. Power input
3. Condensate drain
4. Functional spaces
5. Pre-cut holes

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

SQKN-YEE 1 BH - A-B T1

DAAGQ0001_T1_02
DATA/DATE 18/11/2021



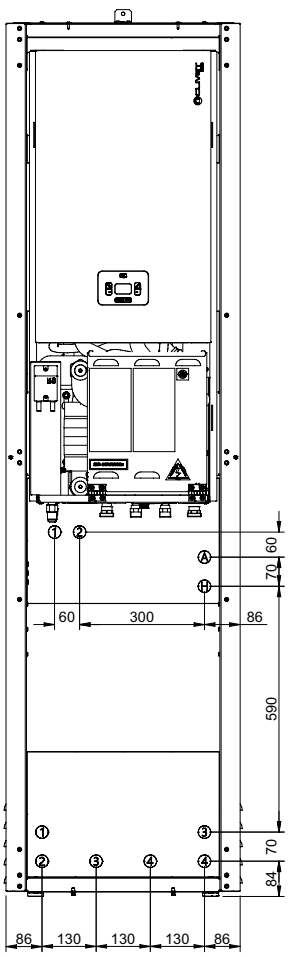
6. GAS suction line M 5/8"
7. Liquid GAS line M 3/8"

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

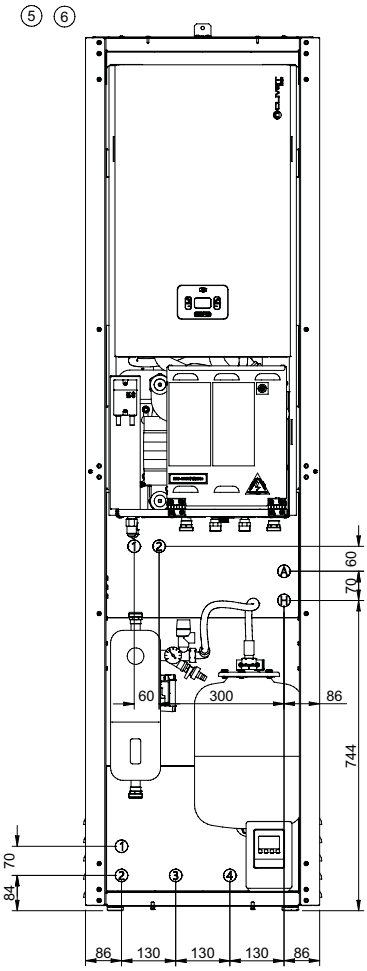
SQKN-YEE 1 BH - A-B T1

DAAGQ0001_T1_02
DATA/DATE 18/11/2021

Unita' STD



Kit Solare



1. GAS suction line M 5/8"
2. Liquid GAS line M 3/8"
3. System supply F 1"
4. System return F1"
5. Solar system inlet
6. Solar system outlet

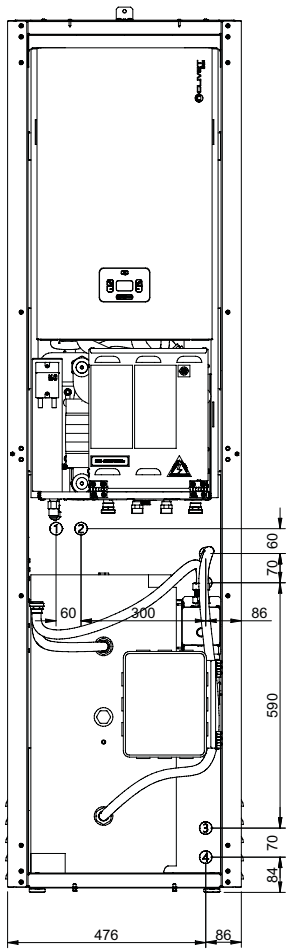
(A) Aqueduct inlet
(H) DHW Intake

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

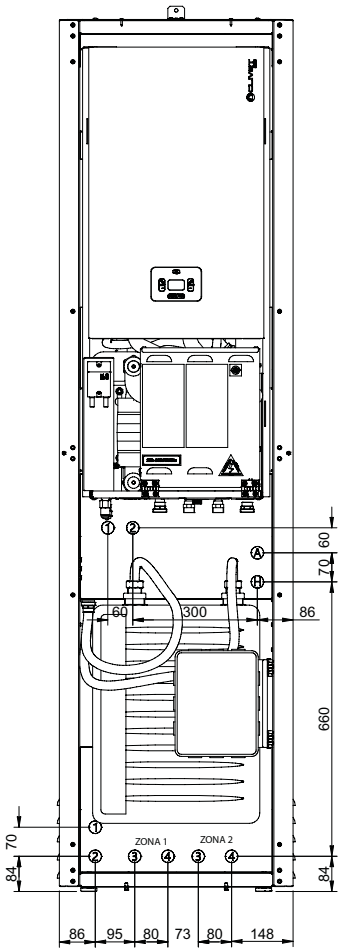
SQKN-YEE 1 BH - A-B T1

DAAGQ0001_T1_02
DATA/DATE 18/11/2021

Serbatoio Inerziale + Kit Monozona



Kit Rilanci 2 Zone



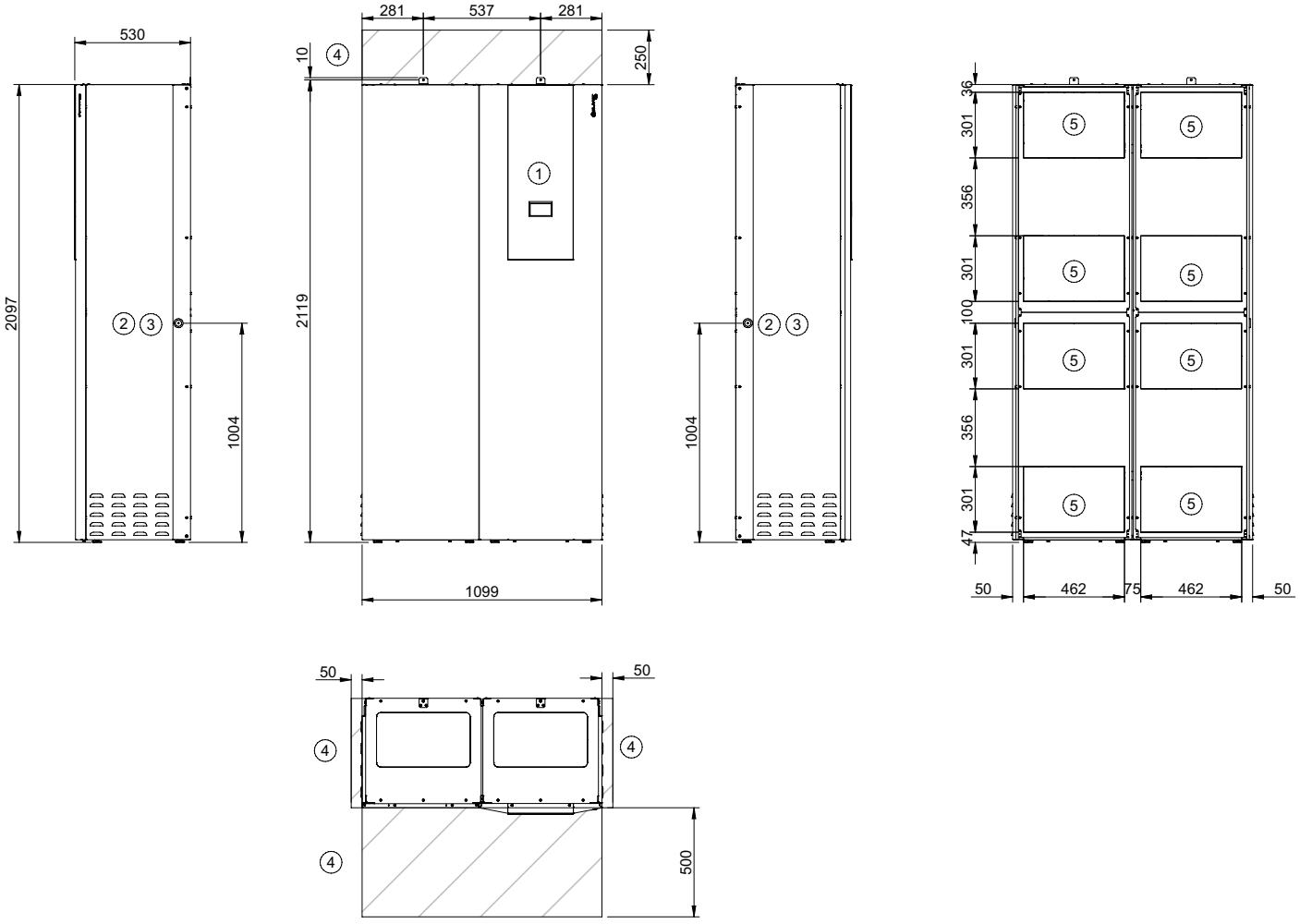
1. GAS suction line M 5/8"
2. Liquid GAS line M 3/8"
3. System supply F 1"
4. System return F1"

(A) Aqueduct inlet
(H) DHW Intake

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T2

DAAGQ0001_T2_02
DATA/DATE 18/11/2021

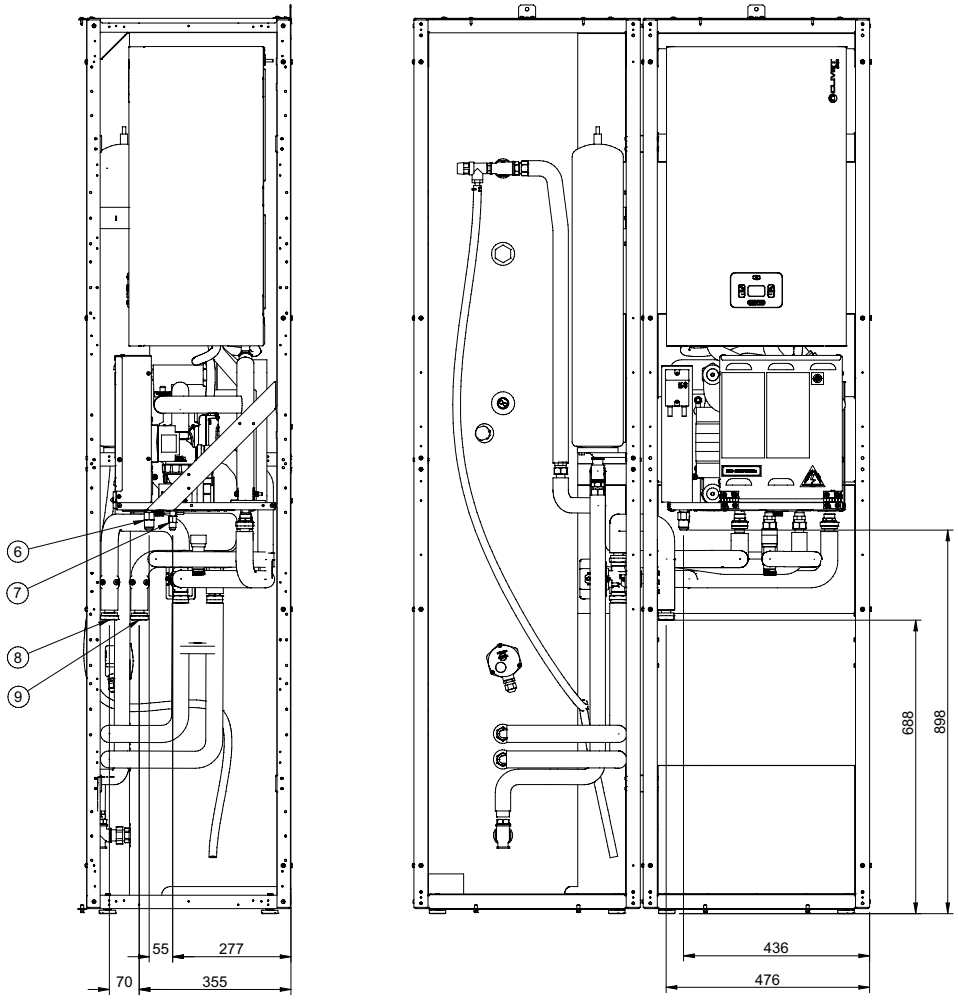


1. Unit control keypad
2. Power input
3. Condensate drain
4. Functional spaces
5. Pre-cut holes

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T2

DAAGQ0001_T2_02
DATA/DATE 18/11/2021



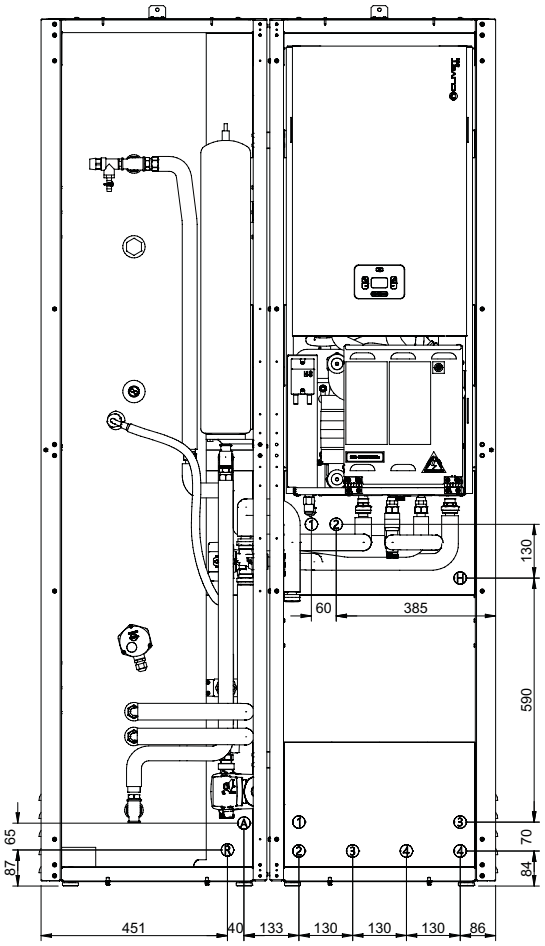
6. GAS suction line M 5/8"
7. Liquid GAS line M 3/8"
8. System supply F 1"
9. System return

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

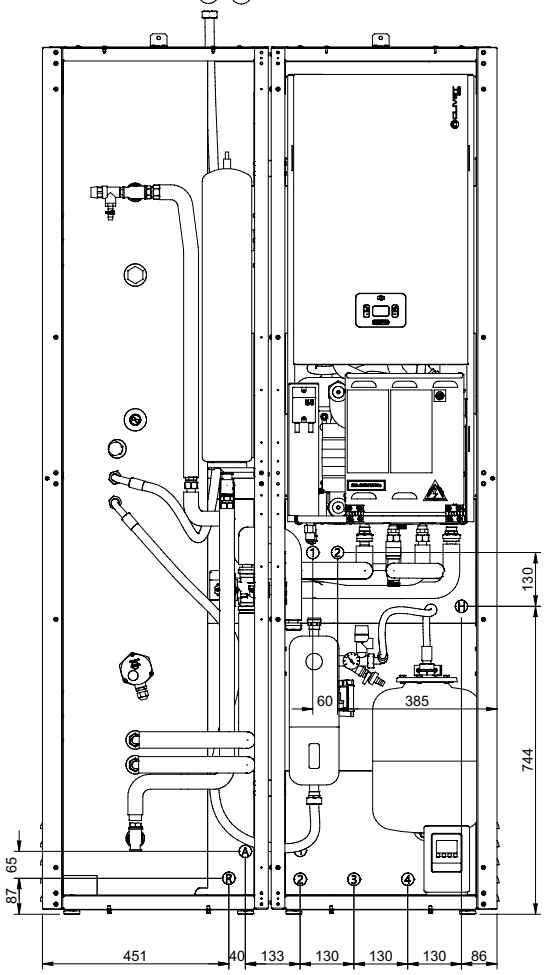
SQKN-YEE 1 BH - A-B T2

DAAGQ0001_T2_02
DATA/DATE 18/11/2021

Ricircolo Sanitario



⑤ ⑥ *Kit Solare*



1. GAS suction line M 5/8"
2. Liquid GAS line M 3/8"
3. System supply F 1"
4. System return F1"
5. Solar system inlet
6. Solar system outlet

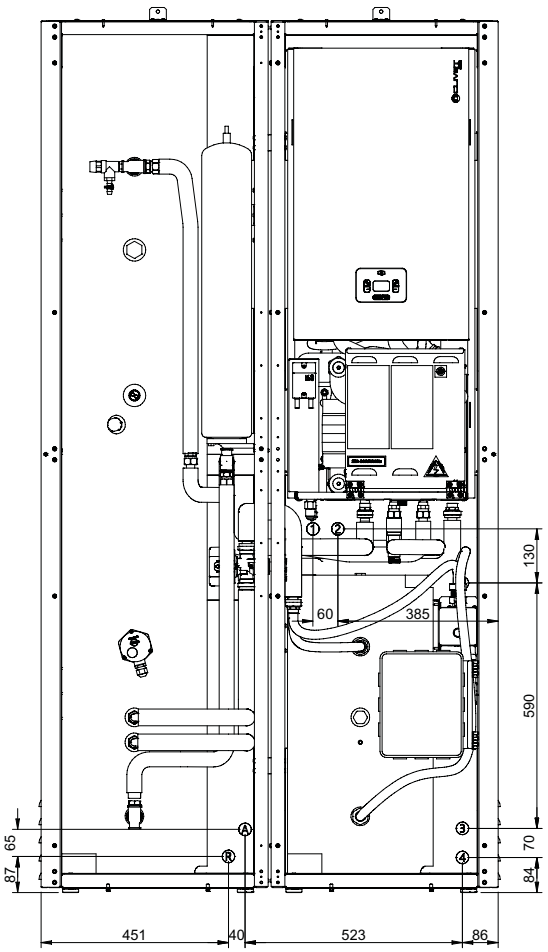
(A) Aqueduct inlet
(R) Sanitary recirculation
(H) DHW Intake

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

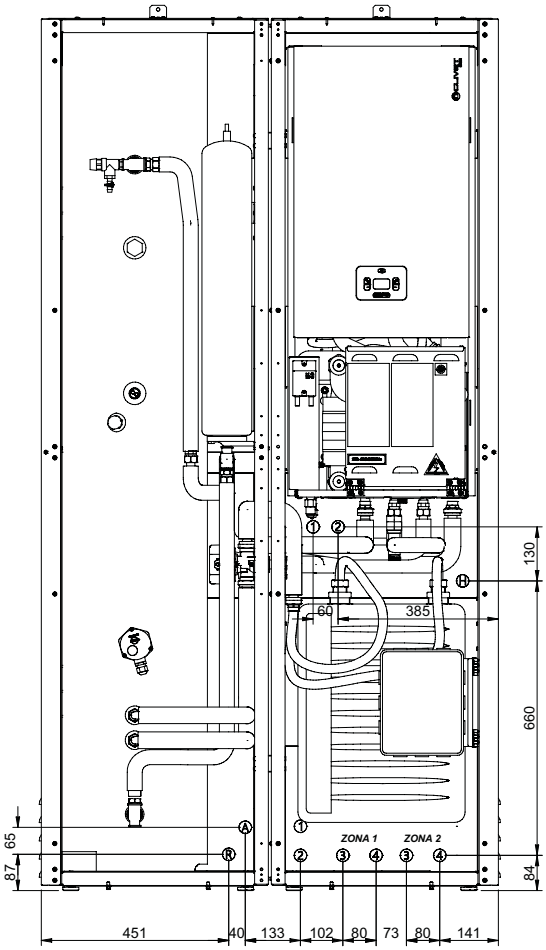
SQKN-YEE 1 BH - A-B T2

DAAGQ0001_T2_02
DATA/DATE 18/11/2021

Serbatoio Inerziale + Kit Monozona



Kit Rilanci 2 Zone



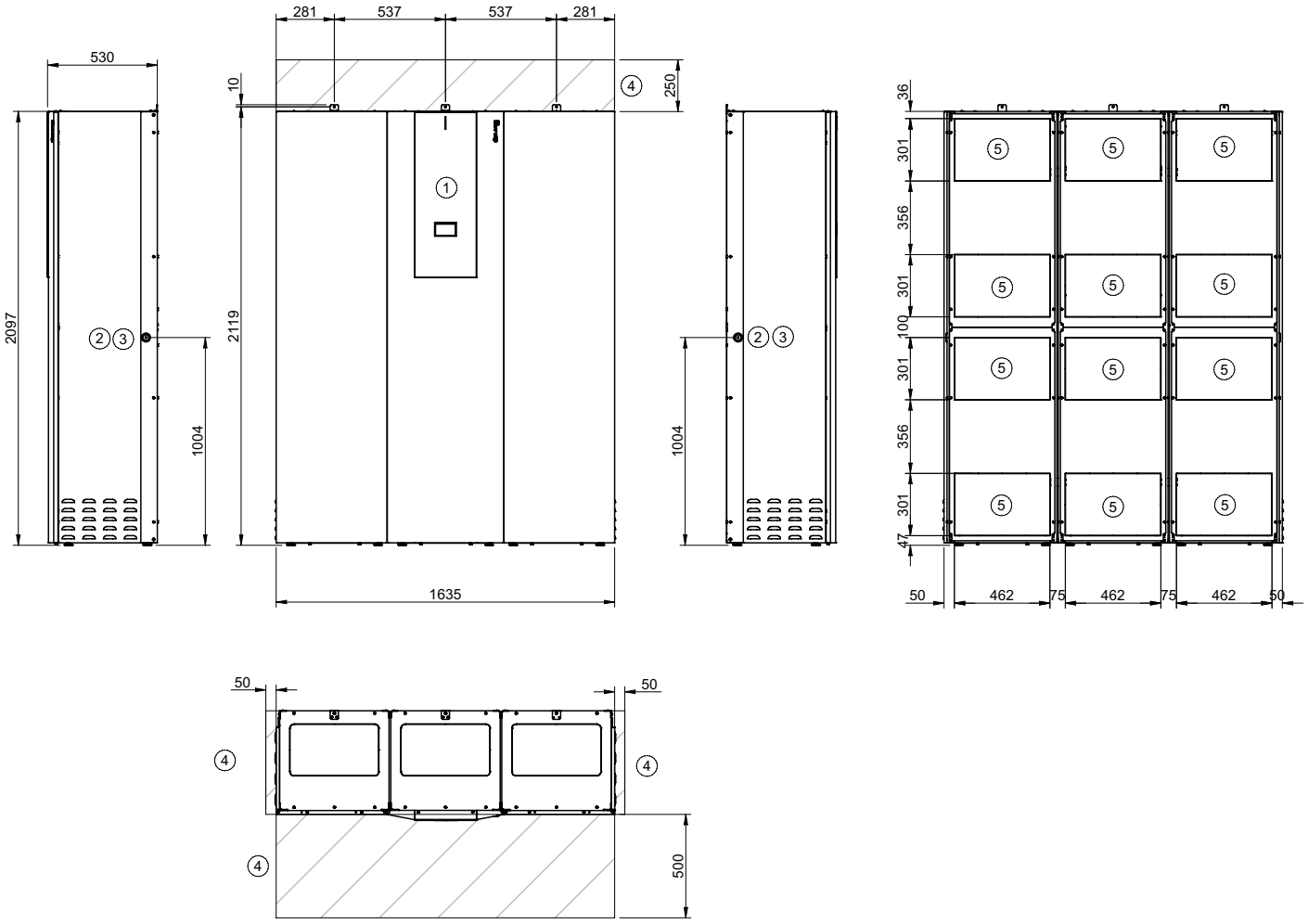
1. GAS suction line M 5/8"
2. Liquid GAS line M 3/8"
3. System supply F 1"
4. System return F1"

(A) Aqueduct inlet
(R) Sanitary recirculation
(H) DHW Intake

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T3

DAAGQ0001_T3_02
DATA/DATE 18/11/2021

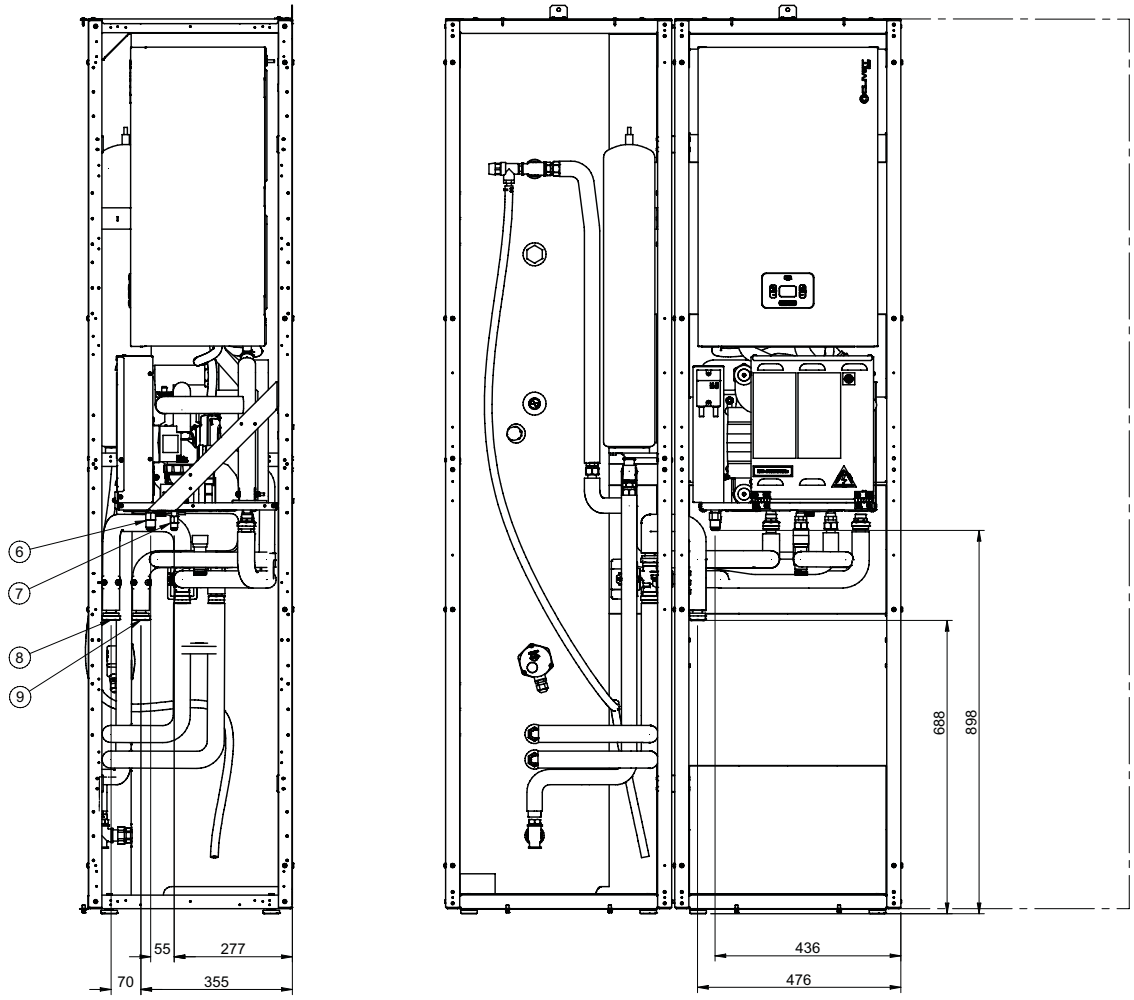


1. Unit control keypad
2. Power input
3. Condensate drain
4. Functional spaces
5. Pre-cut holes

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T3

DAAGQ0001_T3_02
DATA/DATE 18/11/2021



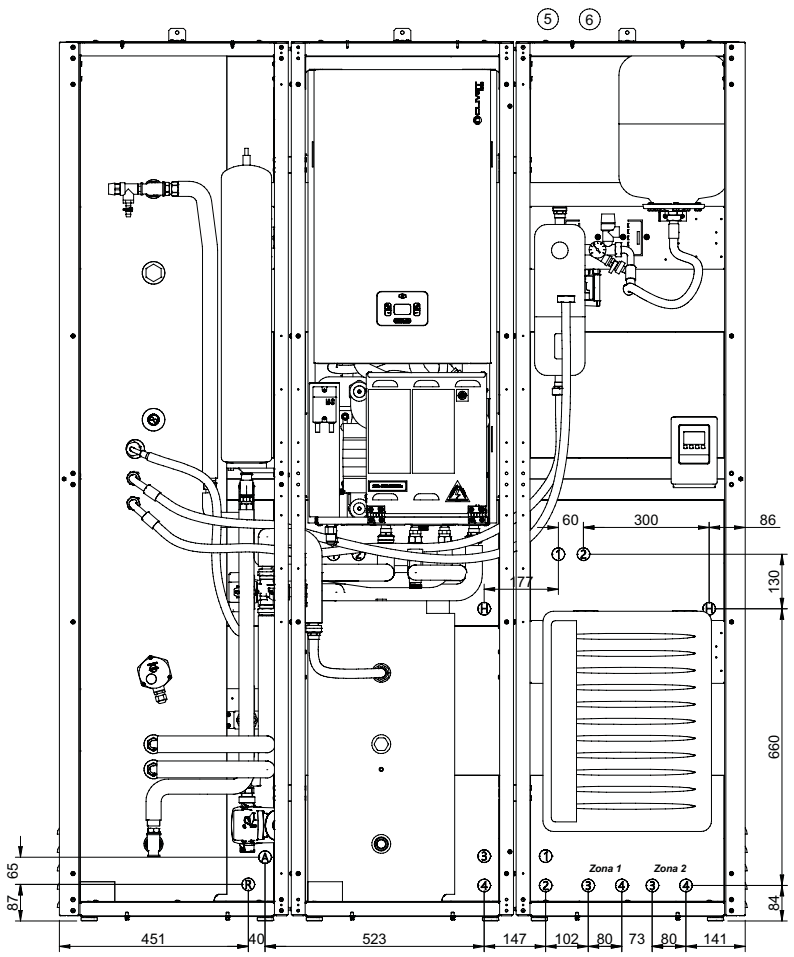
6. GAS suction line M 5/8"
7. Liquid GAS line M 3/8"
8. System supply F 1"
9. System return F1"

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T3

DAAGQ0001_T3_02
DATA/DATE 18/11/2021

Serbatoio Inerziale + Kit Solare + Rilanci 2 Zone + Ricircolo Sanitario



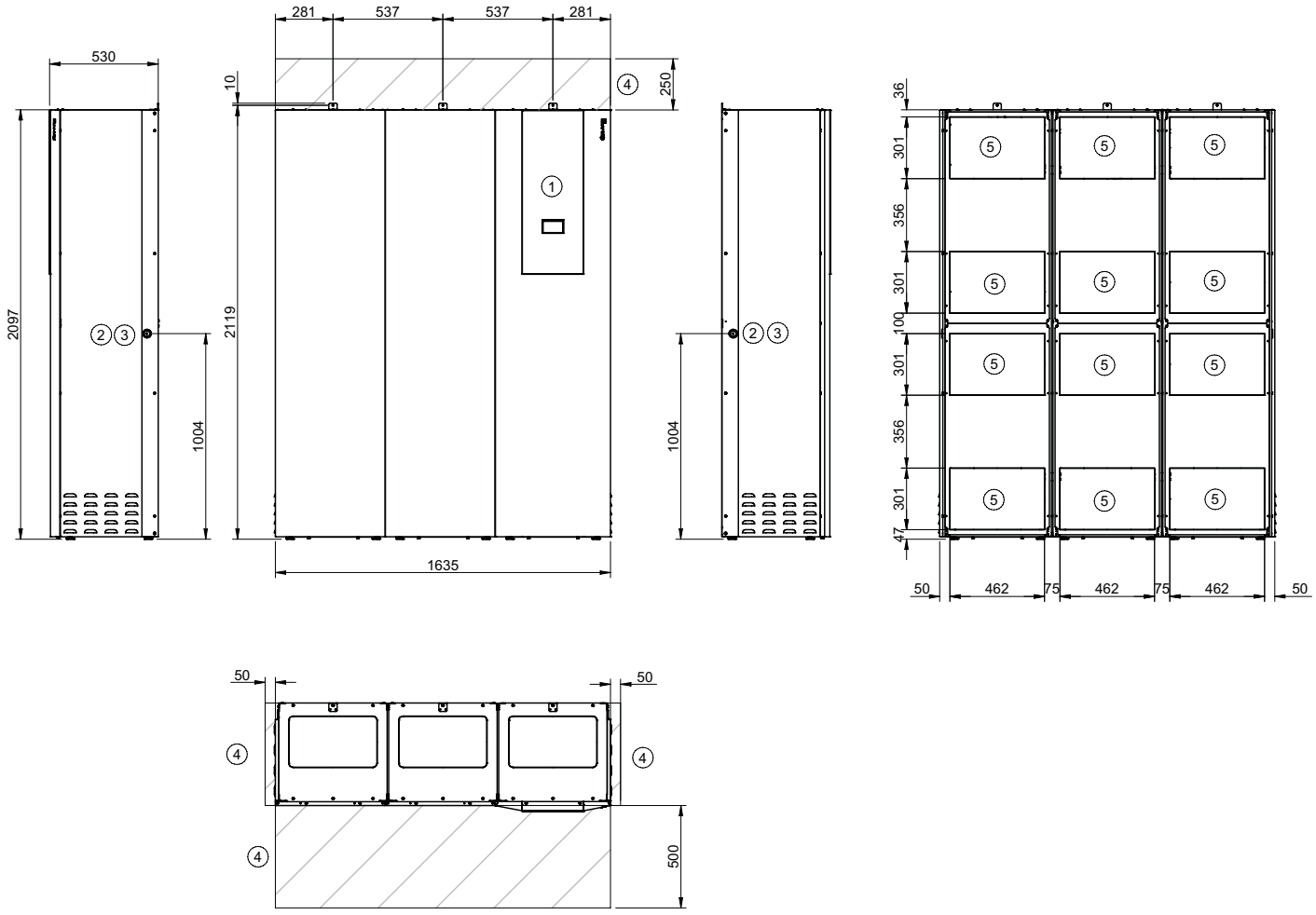
1. GAS suction line M 5/8"
2. Liquid GAS line M 3/8"
3. System supply F 1"
4. System return F1"
5. Solar system inlet
6. Solar system outlet

(A) Aqueduct inlet
(R) Sanitary recirculation
(H) DHW Intake

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T3 ACC. AGG.

DAAGQ0001_T3 ACC. AGG_02
DATA/DATE 18/11/2021

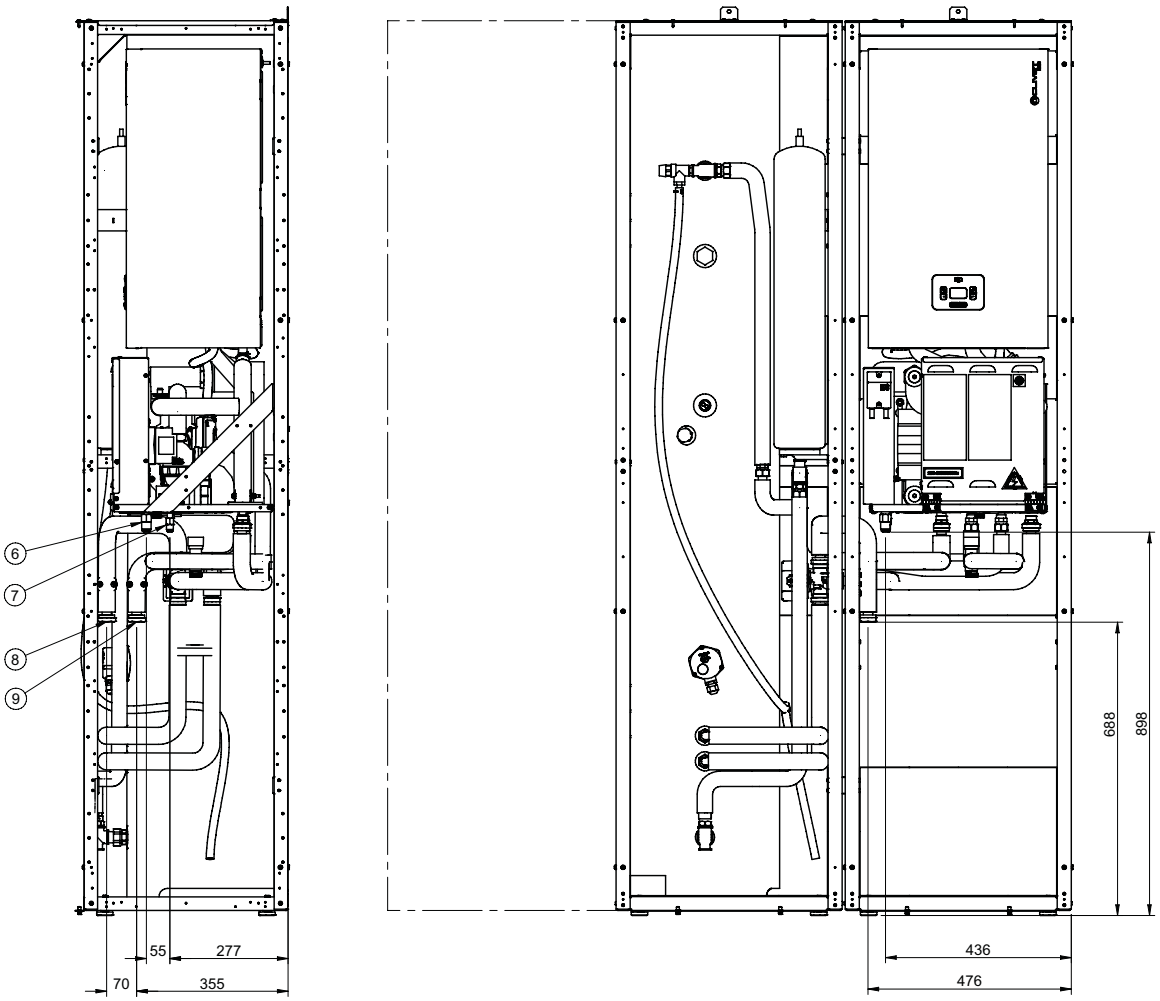


1. Unit control keypad
2. Power input
3. Condensate drain
4. Functional spaces
5. Pre-cut holes

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T3 ACC. AGG.

DAAGQ0001_T3 ACC. AGG_02
DATA/DATE 18/11/2021



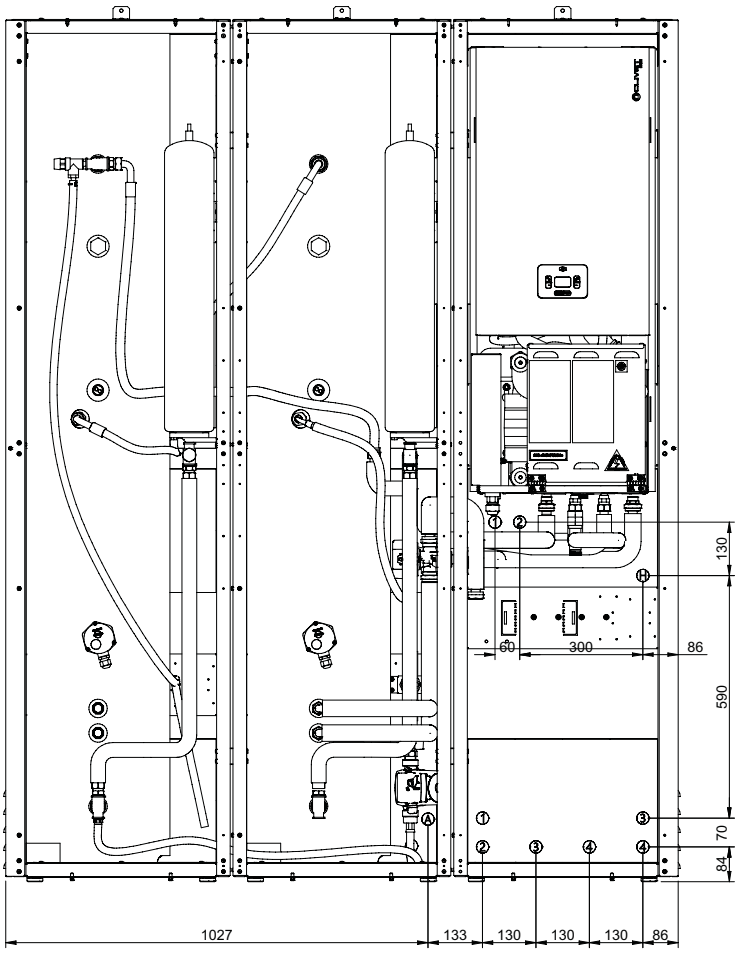
6. GAS suction line M 5/8"
7. Liquid GAS line M 3/8"
8. System supply F 1"
9. System return F1"

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SQKN-YEE 1 BH - A-B T3 ACC. AGG.

DAAGQ0001_T3 ACC. AGG_02
DATA/DATE 18/11/2021

Accumulo Aggiuntivo



1. GAS suction line M 5/8"
2. Liquid GAS line M 3/8"
3. System supply F 1"
4. System return F1"

(A) Aqueduct inlet
(R) Sanitary recirculation
(H) DHW Intake

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

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