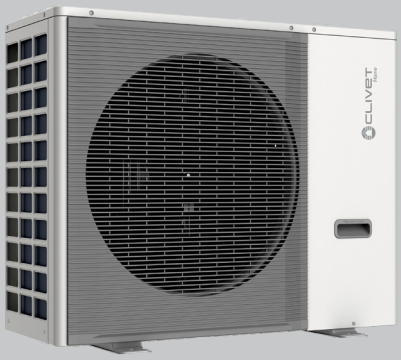
Two section air-water heat pump for heating, cooling and DHW production

SPHERA EVO 2.0 Box

SQKN-YEE 1 BC + MiSAN-YEE 1 S 2.1-8.1

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 is a specialised autonomous heat pump system for single- and multi-family homes with medium/low and high power consumption.
Is an air-water heat pump system for cooling and producing/storing domestic hot water.
The SPHERA EVO 2.0 system is composed of a latest generation high efficiency outdoors moto-condensing unit connected via refrigerant connections to an indoors unit.
It is the second generation of heat pumps for residential use.

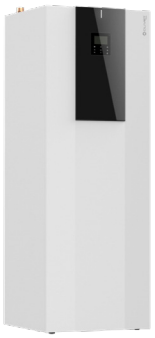
SPHERA EVO 2.0 Box

- Box Version
- Integrated 3-way valve for DHW
- Compact dimensions
- Class A+++ Low temperature
- Built-in WiFi for connection to the dedicated APP
- Also available in the hybrid version with 24 kW or 34 kW gas boiler

R-32

SPHERA EVO 2.0 Tower

- Tower Version
- Two volumes of DHW 190 and 250-litres
- Class A++ Average temperature
- Class A+ Domestic hot water production
- Built-in WiFi for connection to the dedicated APP
- Also available in the hybrid version with 24 kW or 34 kW gas boiler



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SPHERA EVO 2.0 Invisible

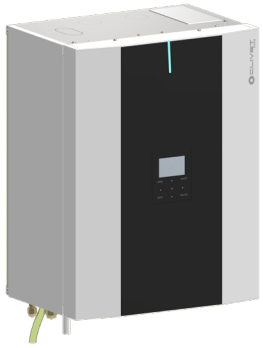
- Version for built-in installation
- 50-litre DHW storage can be expanded up to 300-litres
- Compact dimensions for easy installation in walls
- Also available in the hybrid version with 24 kW gas boiler
- Built-in WiFi for connection to the dedicated APP

R-32

SPHERA EVO 2.0 - 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
- Safety flow switch for water flow
- 3-way switching valve of installation or domestic hot water
- Water side safety valve 3bar
- Magnetic dirt separator
- Sustem purge valve
- 8 liter system expansion tank, 1 bar pre-charge
- ABS drain pan

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:
- remote microprocessor control with single-area thermostat function;
- BMS management;
- daily, weekly temperature set point and start-up/shutdown scheduler;
- anti-legionella function scheduling;
- management busters two zones;
- solar thermal management;
- management for auxiliary heaters;
- antifreeze protection water side;
- no water flow-rate protection with flow switch;
- remote interface terminal with graphic display;
- cascade operation.

Inside the electrical panel there are:
- T5 temperature probe for temperature control in DHW storage tanks (length 4.5m and 6mm bulb);
- T1B temperature probe for low temperature area control in the 2 area kit (length 4.5m and 6mm bulb);
- T1 temperature probe for external boiler connection kit (1.6m length and 6mm bulb).
- Wi-Fi per connessione all'APP dedicata alla gestione dell'unità.

The immersion heater in the DHW storage tanks must not exceed 4 kW.

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
- Cover cap for remotely controlled keypad

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

EH024
EH3
EH6
EH9

Integration electric heater

Integration electric heater in STAINLESS STEEL with 2-3 and 4 kW single-phase or 6-9 kW three-phase capacities.
The electric heater can operate both for the system and for the production of domestic hot water in two different modes:

- as an integration, when the heat pump capacity is not enough to fulfil the required set point;
- as a safety element if the heat pump fails;

⚠ The additional electric heater is not an accessory supplied separately, but a construction configuration.
⚠ The configuration with additional electric heater excludes the external boiler connection kit.
⚠ Selection of the additional three-phase electric heater changes the voltage of the indoor unit only. The outdoor unit remains with single phase power supply.

1PUM

Single pump with larger available head

Configuration involving a pump with a head higher than the standard one.
The circulator, with a head of 10.5 m and a direct current power supply, has a variable flow rate and adapts perfectly to the internal logic of the unit.

⚠ Single pump with increased head is not an accessory supplied separately, but a construction configuration.

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.

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

KCSX

Secondary circuit kit (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:

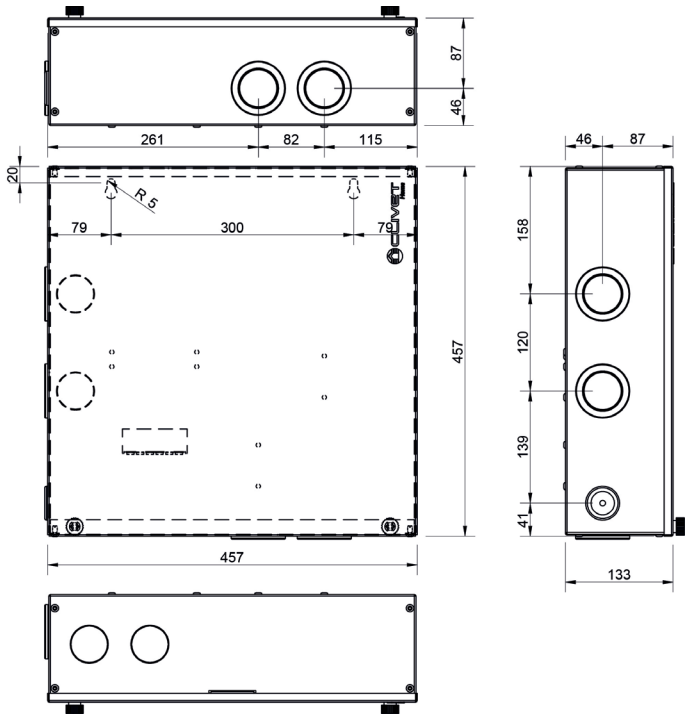
- makes the connected hydraulic circuits independent;
- ensures effective operation of the secondary circulator that provides the hydraulic demand of air conditioning systems
- air extraction system;
- thermally insulated black EPP
- zone manifold connection kit

The kit is comprised of:

- 1 1-litre circuit breaker;
- 2 copper pipes;
- 1 circulator;
- closing plates

Dimensions:
Length 457 mm
Height 457 mm
Depth 133 mm

DIMENSIONAL



DIX **1 l hydraulic circuit breaker**

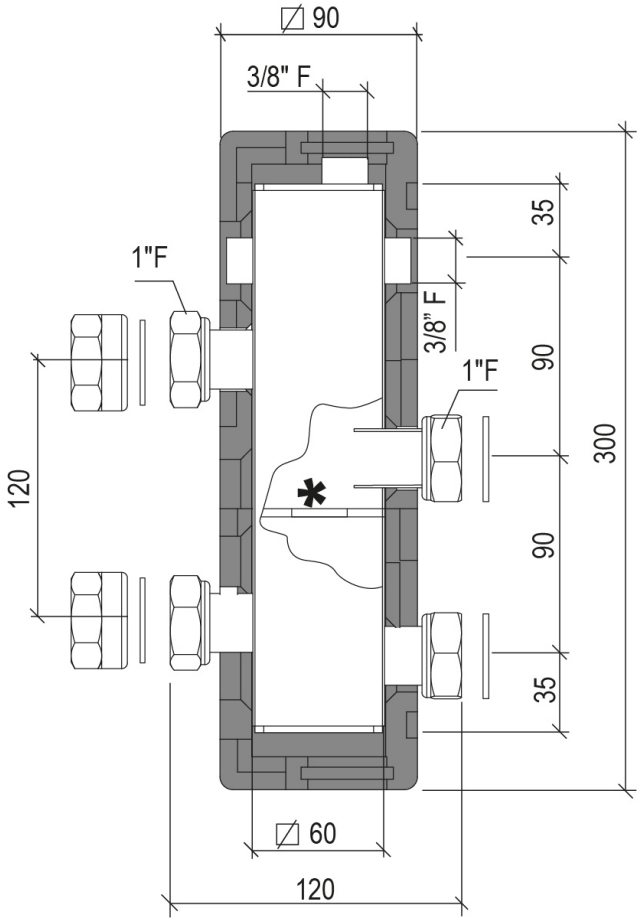
The CP60 hydraulic separator is a compensation chamber designed to make connected hydraulic circuits independent.
It is used when the circulator of the primary circuit interacts with one or more parts of the secondary circuit in the same system.
Furthermore, the separator performs the function of a deaerator.
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



Accessories separately supplied

DI50X **50-litre circuit breaker**

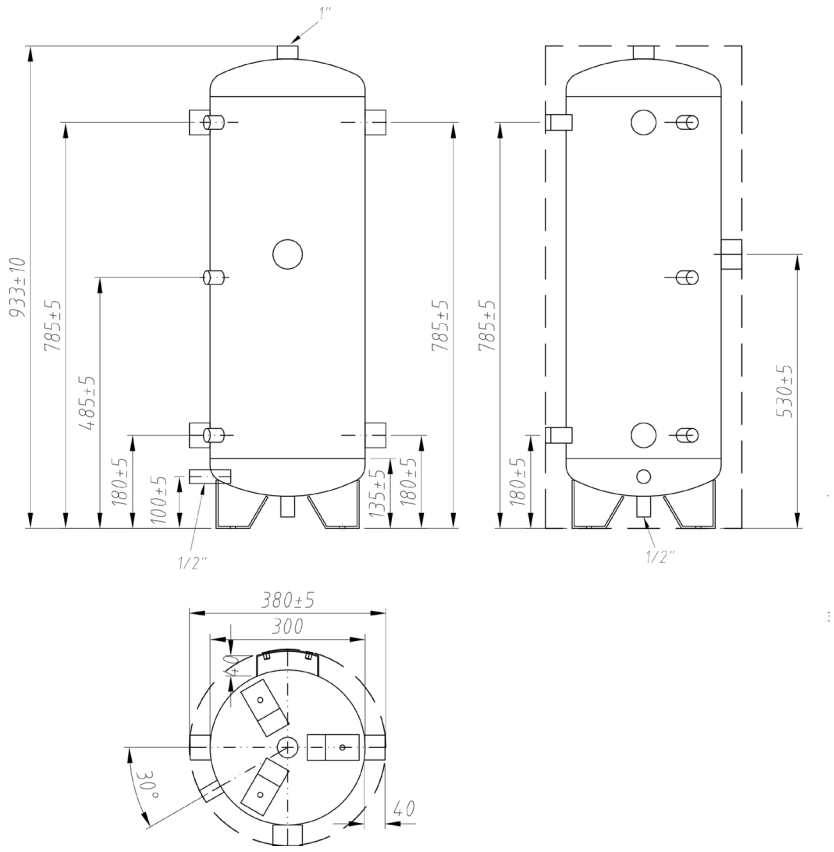
ACI60X **60 L system inertial storage tank**

Technical 50-litre storage tank with the function of a hydraulic separator and inertial tank ensures effective operation of the secondary circulators that provide the hydraulic demand of air conditioning systems.

Technical data:
Circuit breaker diameter 380 mm
Circuit breaker height 933 mm
Connections 1"1/4 F
Max temperature 95°C
Max pressure 6 bar
Circuit breaker material S235JR steel
Circuit breaker capacity 57 litres
Circuit breaker weight 25 kg
Insulation material Polyurethane foam
Insulation thickness 40 mm
Energy class B
Specific heat loss 0.76 W/K

The kit is supplied with brackets for wall mounting.

DIMENSIONAL



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

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

ACI40X **40L system inertial storage tank**

Inertial storage tank to be installed outside the unit. Extremely compact, supplied with air vents and support brackets for wall installation. Suitable for all SPHERA EVO 2.0 sizes, it facilitates operation and helps to fulfil the heat requirement, guaranteeing optimal modulation.
It can be installed next to or behind the unit, as shown in the figure.
Kit consisting of:
- 1 40-litre ST37.1 steel storage tank for ACI40X
- 1 2-metre flexible hose
- Extremely compact:
  LENGTH: 440 mm
  DEPTH: 220 mm
  HEIGHT: 887 mm
- Maximum working temperature: 100°C
- Maximum operating pressure: 6 bar
- Thermally-isolated with EPP 40 g/l
- Insulation thickness 30 mm
- Automatic air vent

KCCEX **External boiler connection kit**

Kit offering the option to connect the water circuit to an external boiler.
The latter, to be provided by the customer, must have a clean ON/OFF contact.
The internal logics of SPHERA EVO 2.0 permit use of the boiler both together with or instead of the heat pump for greater comfort even at the coldest temperatures.
Kit composed of:
- 1 three-way valve with microswitch for ON/OFF activation of the boiler;
- copper pipes for connection;
- plastic seals;
- terminals and cables for electrical connections;
- kit installation manual.

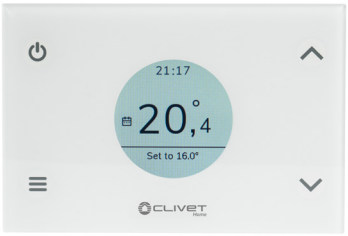
⚠ The external boiler connection kit excludes configuration with additional electric heater.
⚠ Check that the boiler pressure drops are compatible with the head of the unit.
⚠ Not required for SPHERA EVO 2.0 BOX Hybrid version

Accessories separately supplied

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: 122x82x15mm

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

SFCSTX **Additional probe for cascade function**
Temperature sensor to manage the setpoint for units connected in cascade

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**

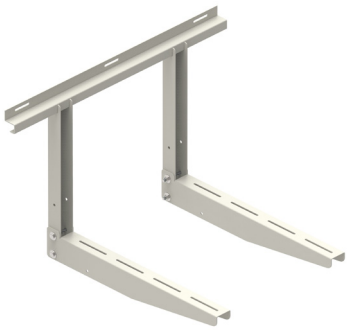
The antivibration mounts for floor installation reduce the vibrations of the compressor during its operation. They are secured to the feet of the base plate.

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.



Accessories separately supplied

HYSO24 - HYSO34

Hybrid solution with 24kW 4-pipe boiler
Hybrid solution with 34kW 4-pipe boiler

SPHERA EVO 2.0: hybrid version consisting of the SPHERA EVO 2.0 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 kit includes:

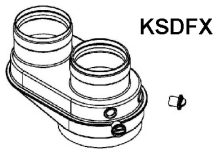
- 24kW condensing boiler;
- 10 m long T1 temperature probe.

⚠ The hybrid solution excludes the additional heaters, the external boiler connection kit and the solar integration

KSDFX

Splitter for boiler smoke discharge

The KSDFX kit consists of a splitter (Ø 80/80) that can be connected to a boiler for air intake and smoke exhaust.
Connection to the flue must be made in compliance with the current technical regulations.
The unit is provided with a dedicated drain for the condensate coming from the boiler; this condensate with high acidity in residential use can be introduced in the waste water drain of the home (UNI 11071).



Split drain Ø 80/80
Accessory supplied separately

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.

KITKX
KITAK50X

Coaxial system for adjustable smoke discharge and intake (ø 60/100)
Coaxial system for adjustable smoke discharge and intake (ø 80/125)

It allows the combustion gases to be discharged and the air to be drawn in for the combustion stage by means of two coaxial ducts: the external one for the air intake, the internal one in plastic to discharge fumes.

- 60/100 mm diameter for HYSO24 boiler
- 80/125 mm diameter for HYSO34 boiler

KAS80X

Smoke intake and discharge fittings, 80 mm diameter

The boiler is supplied with flanged connections for discharge/intake (Ø 80).
The KAS80X kit consists of 2 fittings (Ø 80) for splitting the air intake and smoke exhaust directly from the boiler body.

KTCGPLX

Kit to convert boiler from methane to LPG

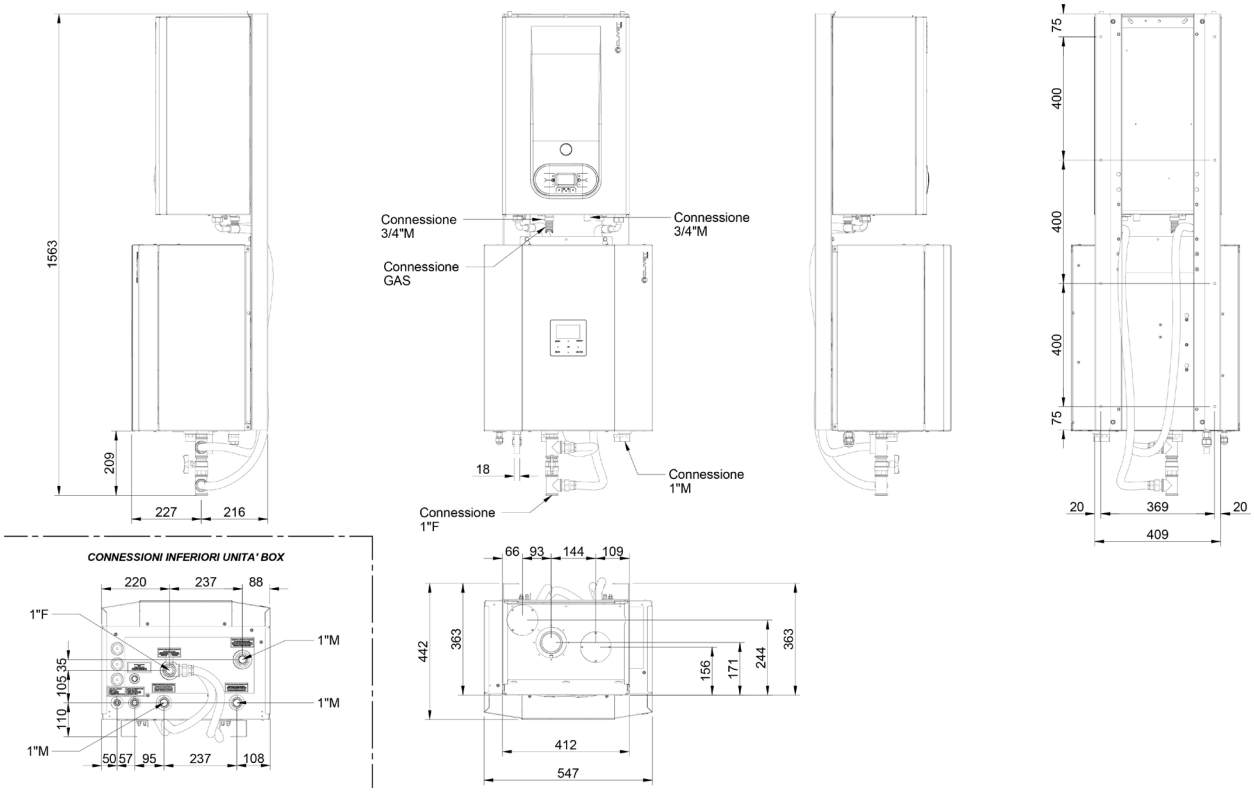
The boiler is supplied as STANDARD with methane gas operation.
To convert from methane gas to LPG, the accessory is supplied separately; its use will require recalibration following the instructions given in the documentation provided with the unit.

KISX **Simplified installation kit with fittings for Sphera EVO Box Hybrid**

The kit allows to facilitate the installation of the indoor unit and the boiler, making them a single element. As the hydraulic connections between the two are also included.

Technical data:
2 fixing brackets in painted steel
2 flexible hoses (ø 1")
2 1" F-F-F TEE fittings
1 1" water valve

SQKN-YEE 1 BC Hybrid dimensional with installation kit



General technical data

Performance

SIZE			2.1	3.1	4.1	5.1	6.1*	7.1*	8.1*
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 95	62 90	47 83	31 76	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 94	64 91	58 88	49 84	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 95	63 90	51 85	31 76	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 98	70 96	69 94	63 91	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 94	61 89	51 85	32 76	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	8,67 / 9,10	11,16 / 11,80	11,72 / 12,86	12,88 / 14,2
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 95	64 91	56 87	43 82	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.

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*
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									
Load profile declared	10	-	L XL	L XL	L XL	L XL	XL	XL	XL
ηwh	10	%	120 123	120 123	116 125	116 125	124	124	124
Sanitary water energy class	10	-	A+ A+	A+ A+	A+ A+	A+ A+	A+	A+	A+

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.

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 CO2 (*)		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									
Operation (L x P x A)		mm	986x426x712	986x426x712	1104x523x866	1104x523x866	1104x523x866	1104x523x866	1104x523x866
Packaging (L x P x A)		mm	1065x485x800	1065x485x800	1180x560x890	1180x560x890	1180x560x890	1180x560x890	1180x560x890
Operation weight 230M / 400TN	2	kg	58	58	77	77	96/112	96/112	96/112
Shipping weight 230M / 400TN	2	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.
2. Power supply 220-240V ~ 50Hz / Power supply 380-415V 3N~ 50Hz.

(*) It contains fluorinated greenhouse gases.

Construction - Indoor unit

SIZE			A	B
Characteristics				
Maximum system 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''
Dimensions				
Operation (L x P x A)		mm	547 x 386 x 604	547 x 386 x 604
Packaging (L x P x A)		mm	720 x 600 x 550	720 x 600 x 550
Operation weight		kg	50	53
Shipping weight		kg	58	61

1. Sufficient volume up to a maximum of 60 litres of system water content.

Configuration compatibility table SPHERA EVO 2.0 Box

INDOOR UNIT		SQKN-YEE 1 BC A	SQKN-YEE 1 BC A	SQKN-YEE 1 BC B	INTEGRATION ELECTRIC HEATER			
	Pump	Std	1PUM	STd	EH024	EH3	EH6	EH9
OUTDOOR UNIT								
MiSAN-YEE 1 S 2.1		✓	✓	-	✓		✓	✓
MiSAN-YEE 1 S 3.1		✓	✓	-	✓		✓	✓
MiSAN-YEE 1 S 4.1		✓	✓	-	✓		✓	✓
MiSAN-YEE 1 S 5.1		✓	✓	-	✓		✓	✓
MiSAN-YEE 1 S 6.1		-	-	✓		✓	✓	✓
MiSAN-YEE 1 S 7.1		-	-	✓		✓	✓	✓
MiSAN-YEE 1 S 8.1		-	-	✓		✓	✓	✓

Condensing boiler technical data

Boiler model			R2K 24	R2K 34
Max. nominal heat capacity for heating		kW	23,50	34,00
Max. nominal heat capacity for domestic hot water		kW	23,50	34,00
Minimum nominal heat capacity		kW	2,90	4,10
Available nominal heating capacity 60/80°C		kW	22,94	33,35
Available minimum nominal heating capacity 60/80°C		kW	2,75	3,94
Available nominal heating capacity 30/50°C		kW	24,79	36,19
Available nominal heat yield 60/80°C		%	97,60	98,08
Available nominal heat yield 30/50°C		%	105,50	106,43
Partial load heat yield 30%		%	107,00	108,60
Seasonal environment heating energy efficiency ηs		%	94,00	94,00
Domestic hot water energy class		-	A	A
Declared load profile		-	XL	XL
Specific capacity in continuous service Δt 30°C		l/ min	11,50	16,00
Water heating energy efficiency wh		%	81,00	83,00
Chimney losses with burner ON at nom Pow		%	2,60	2,40
Chimney losses with burner ON at min Pow		%	2,20	2,10
Chimney losses with burner OFF		%	0,02	0,01
Casing losses with burner ON at nom Pow		%	-0,20	-0,48
Casing losses with burner ON at min Pow		%	-	1,84
Casing losses with burner OFF		%	-	0,04
Smoke temperature at nominal heat capacity		°C	80,26	69,40
NOx Class		class	VI	VI
Auxiliary electricity consumption at full load		kW	0,04	0,04
Auxiliary electricity consumption at partial load		kW	0,02	0,02
Sound power level		dB	52	52
Width		mm	410	410
Depth		mm	307	350
Height		mm	642	642
Shipping weight		kg	35	44

Hydraulic 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	B	B
Characteristics									
Minimum system water content	1	l	40	40	40	40	60	60	60
Minimum water flow rate allowed		l/s	0,16	0,16	0,16	0,16	0,16	0,16	0,16
Maximum water flow rate allowed		l/s	0,61	0,61	0,61	0,61	0,92	0,92	0,92

1. Consider the water content of the area with less volume

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	B
Power supply 220-240V ~ 50Hz			
F.L.A. - Full load current at max admissible conditions	A	0,50	0,90
F.L.I. - Full load power input at max admissible conditions	kW	0,10	0,20
M.I.C - Maximum inrush current	A	0,50	0,90

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335 and EN 60335-2-40
(*) The electrical consumptions relating to the electric heater refer to that in the DHW storage tank.

⚠ Important: when rating the unit, check that the absorptions are conforming to the utility contract in the country of installation

Unit configured with oversized pump

SIZE		1PUM
Power supply 220-240V ~ 50Hz		
F.L.A. - Current absorbed by the unit with increased head circulator	A	0,90
F.L.I. - Power input of the unit with increased head circulator	kW	0,20
M.I.C. - Unit maximum starting current of the unit with increased head circulator	A	0,90

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.

Integration electric heaters - EH024/EH3/EH6/EH9

SIZE		2 KW	3 KW	4 KW
Power supply 220-240V ~50Hz				
F.L.A. - Full load current at max admissible conditions	A	8,70	13,1	17,4
F.L.I. - Full load power input at max admissible conditions	kW	2,00	3,00	4,00

Power supply 220-240V ~50Hz +/- 10%
Size 2kW and 4kW available only for indoor unit A, size 3kW available only for indoor unit B

SIZE		6 kW	9 kW
Power supply 380-415V 3N ~50Hz			
F.L.A. - Full load current at max admissible conditions	A	8,60	13,0
F.L.I. - Full load power input at max admissible conditions	kW	6,00	9,00

Power supply 380-415V 3N ~50Hz +/- 6%
*Data to be added to the values of the standard unit without DHW electric heater

⚠ The additional electric heater is not an accessory supplied separately, but a construction configuration.

External 2 zone kit

SIZE		KIRE2HX - KIRE2HLX
Power supply 220-240V ~50Hz		
F.L.A. - Full load current at max admissible conditions	A	0,45
F.L.I. - Full load power input at max admissible conditions	kW	0,10

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
Power supply 220-240V ~50Hz				
F.L.A. - Current absorbed by the electric heater	A	8,70	8,70	8,70
F.L.I. - Power input of the electric heater	kW	2,00	2,00	2,00
M.I.C. Unit maximum starting current	A	8,70	8,70	8,70

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 electric heater.

Auxiliary 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.

Hybrid solution condensing boiler electrical data

SIZE				
Power supply 220-240V ~50Hz			**R2K 24**	**R2K 34**
F.L.A. - Full load current at max admissible conditions		A	0,72	0,98
F.L.I. - Full load power input at max admissible conditions		kW	0,78	0,78

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 leve
	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:
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 leve
	dB(A)	dB(A)
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)

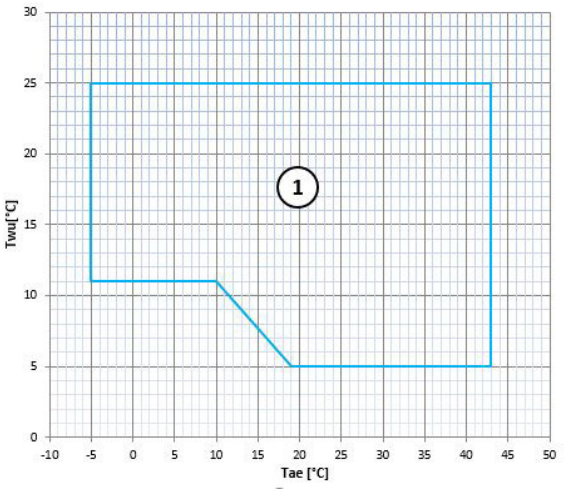
Super-silenced mode

SIZE	Sound pressure level	Sound power leve
	dB(A)	dB(A)
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

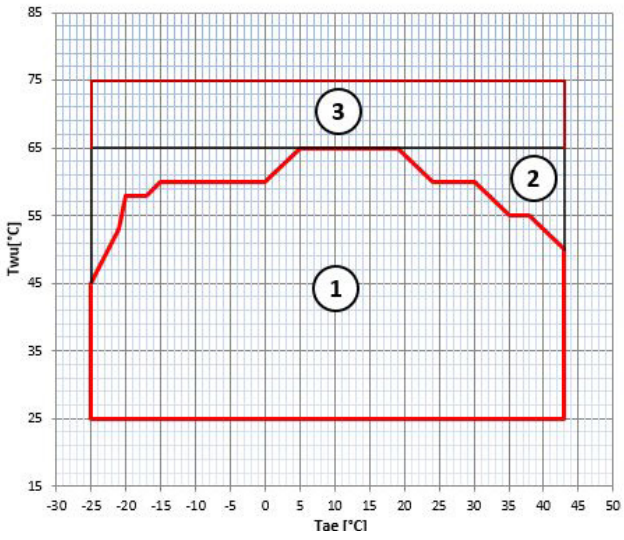
Cooling



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

1. Normal operating range

Heating

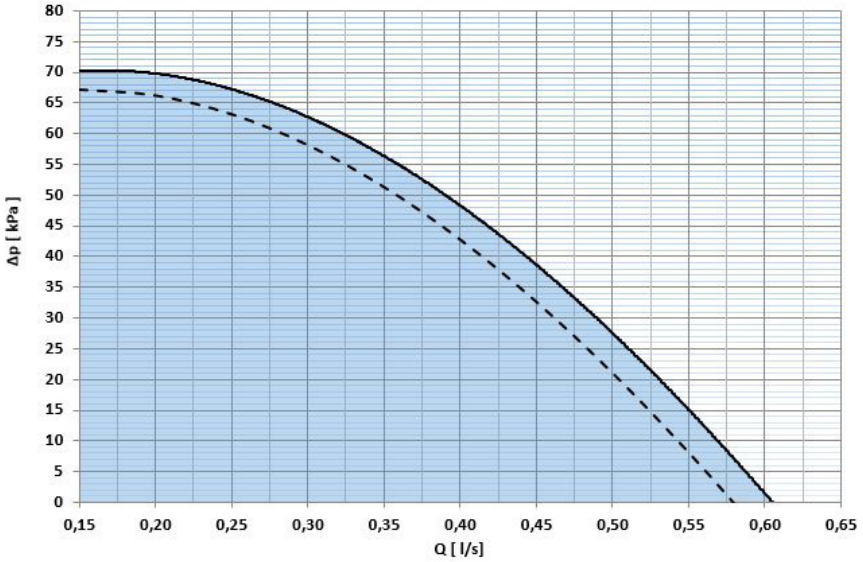


Twu [°C] = Exchanger water outlet temperature
Tae [°C] = Outdoors exchanger air inlet temperature

1. Normal operating range
2. Operating range with additional electric heater option
3. Hybrid system operating range

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

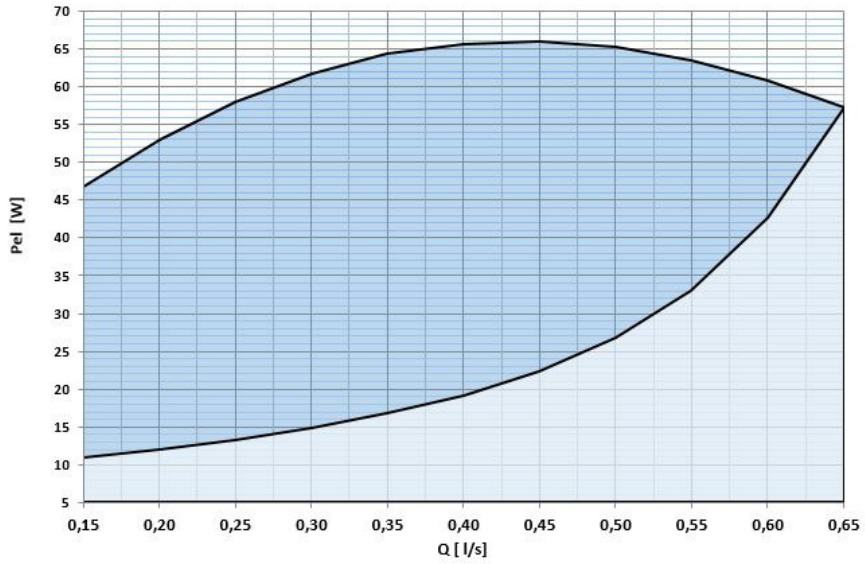
Available pressure of the standard circulator at the unit A connections



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

-------- Maximum head of the circulator with configuration of integration electric heater
Circulator operating field

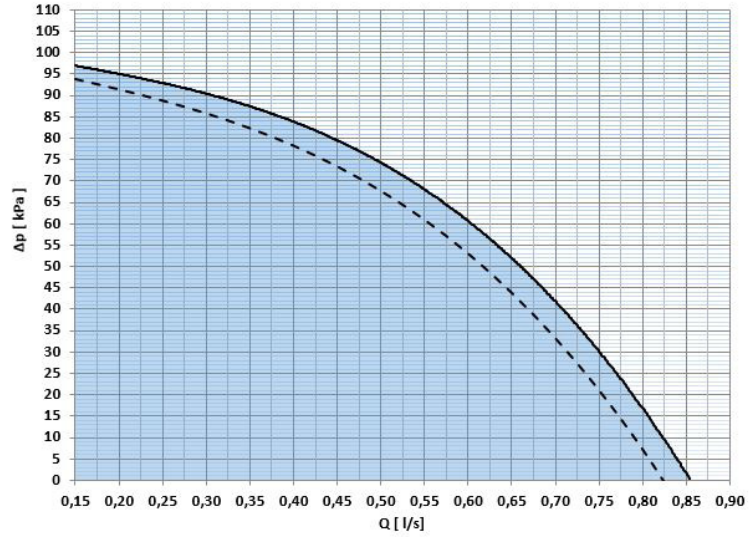
Absorption of the standard circulator at the unit 190 L A



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

Circulator operating field

Head of the circulator with increased pump at the unit A connections

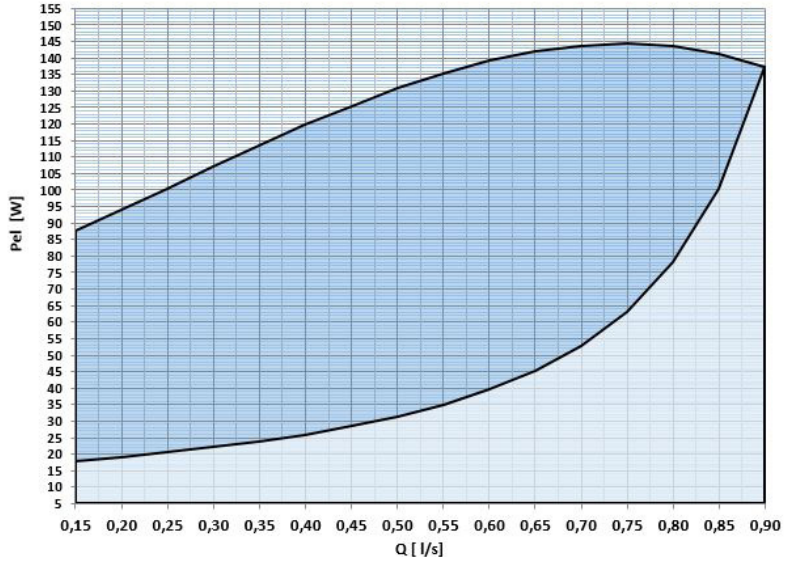


ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

-------- Maximum head of the circulator with configuration of integration electric heater

Circulator operating field

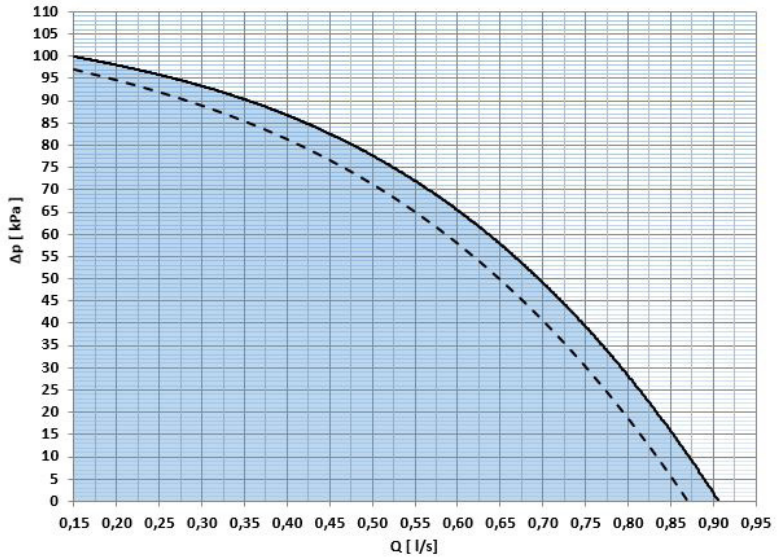
Absorption of the circulator increased at the unit 250 L A



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

Circulator operating field

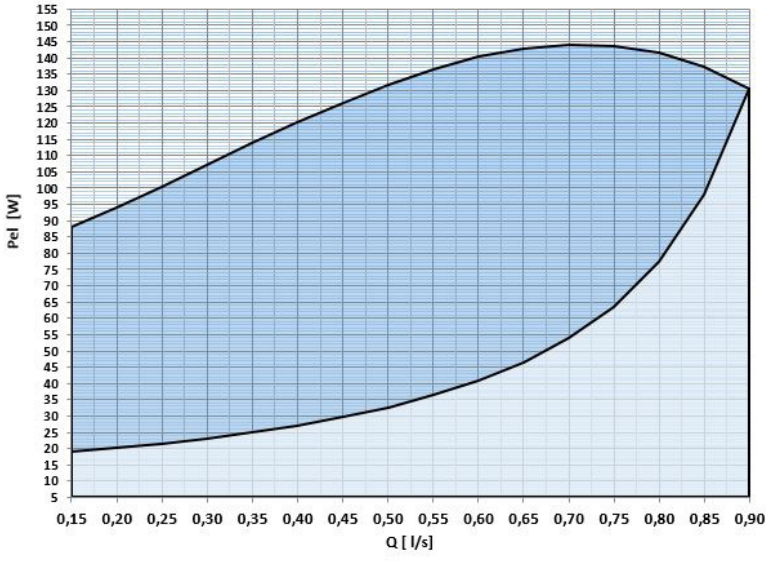
Head of the circulator with increased pump at the unit B connections



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

-------- Maximum head of the circulator with configuration of integration electric heater.
Circulator operating field

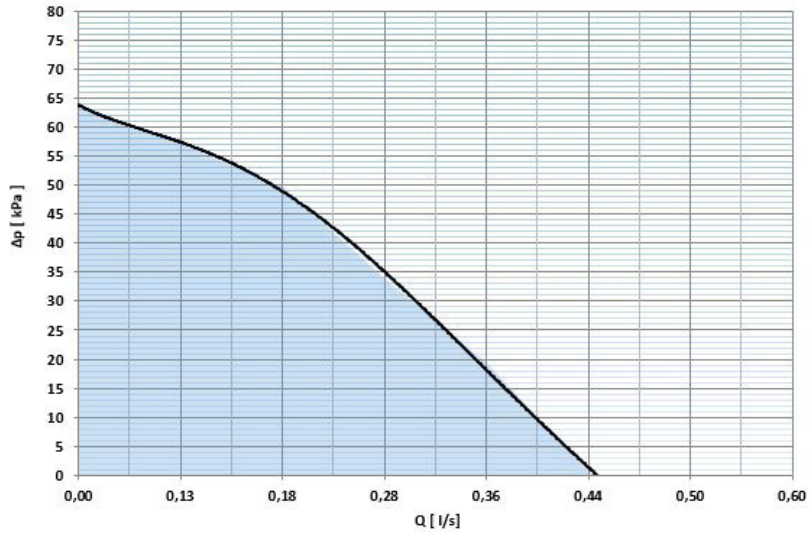
Absorption of the circulator increased at the unit 250 L B



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

Circulator operating field

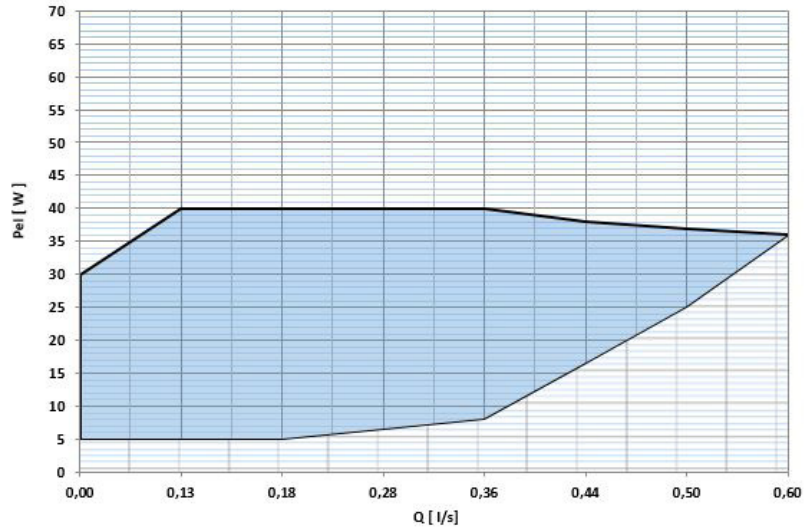
Boiler circulator available pressure



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

Circulator operating field

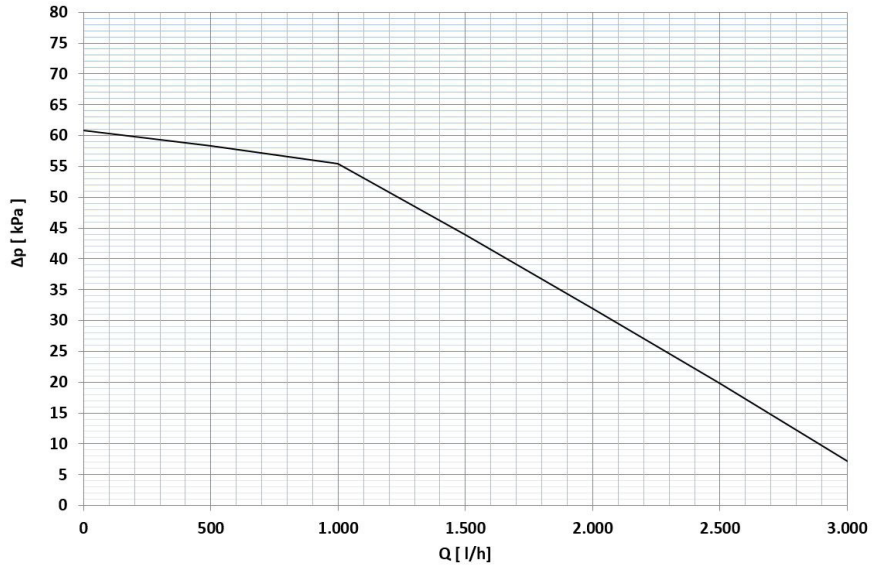
Boiler circulator absorption



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

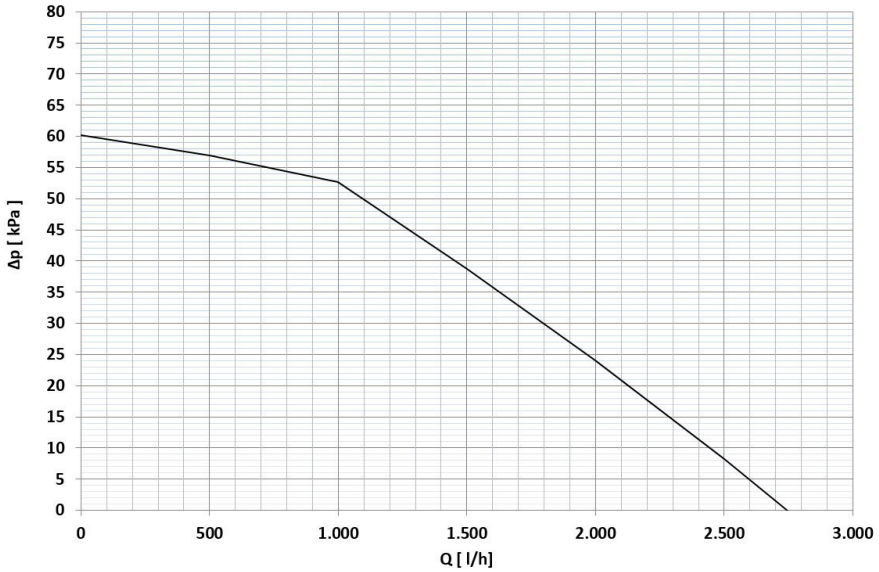
Circulator operating field

Pressure drop for direct booster system circulator



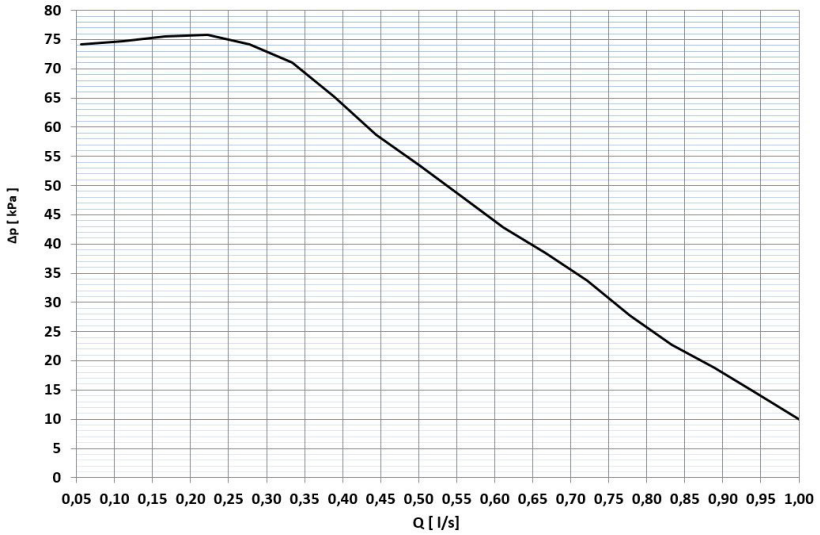
ΔP [kPa] = Available pressure
Q [l/h] = Water flow-rate

Available head for mixed booster system circulator



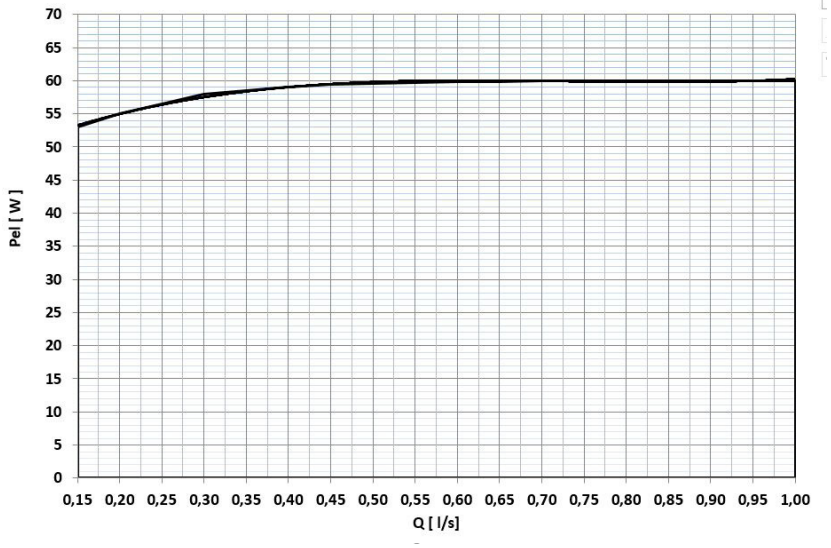
Pel [W] = Electrical power input
Q [l/h] = Water flow-rate

KCSX secondary circuit kit available pressure



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

KCSX secondary circuit kit absorption



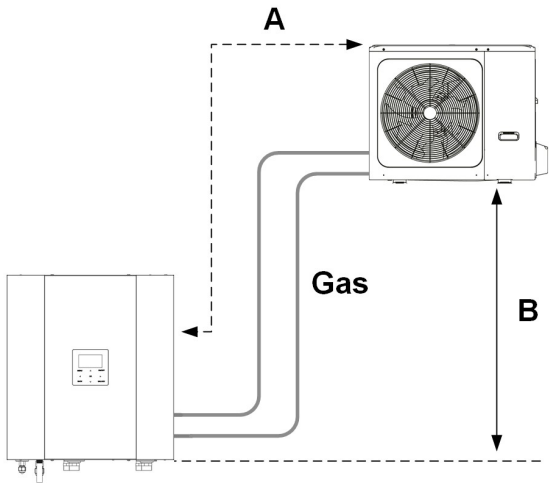
Pel [W] = Electrical power input
Q [l/s] = Water flow-rate

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.

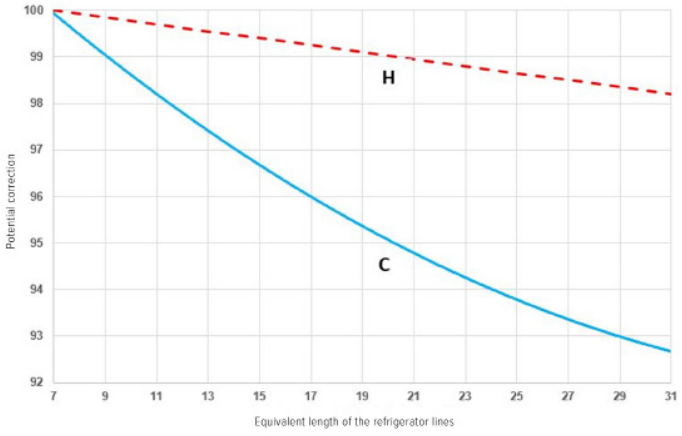
⚠ To correctly install the refrigerant pipes and charge the refrigerant gas, refer to the SPHERA EVO 2.0 MANUAL



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
C - Maximum level difference of refrigerant piping with external unit above internal unit	m	25	25	25	25	25	25	25
C - 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

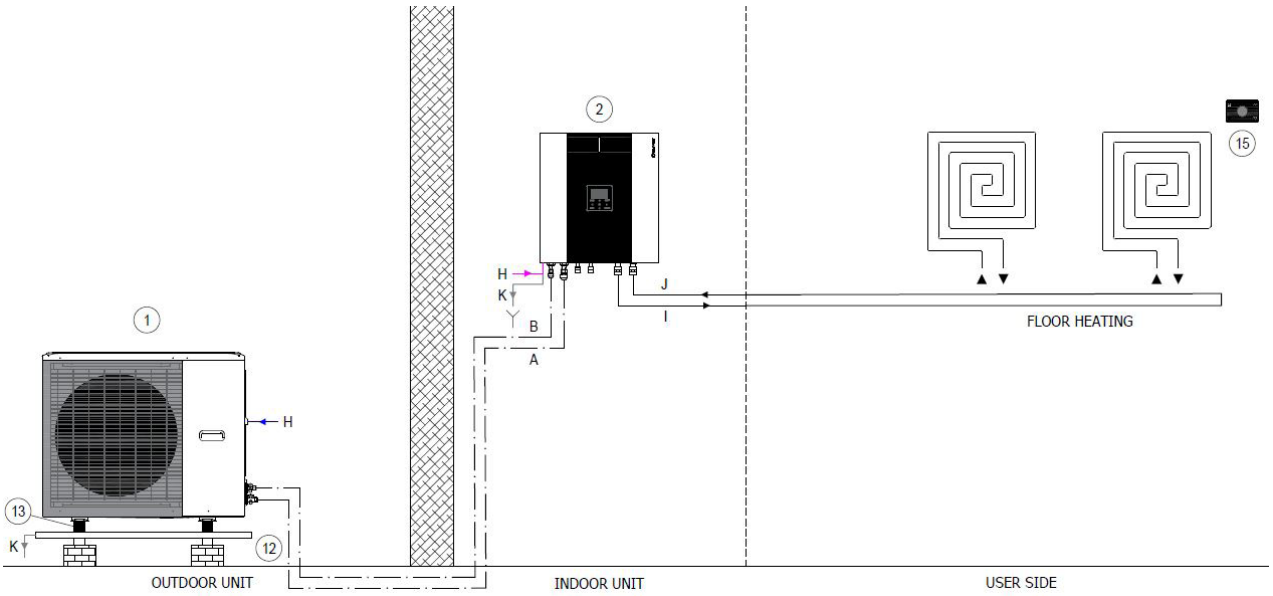
Determination of cooling and heating power loss

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.



1. Outdoor unit
2. Indoor unit
3. 2 zone kit (KIRE2HX-KIRE2hXL)
4. Single zone kit (KCSX)
5. Integration electric heater (EH024 - EH3 - EH6 - EH9)
6. Integrazione solare per sanitario (SOLX) --> solo nel tower
7. Solar panel
8. Hybrid solution (HYSO24 - HYSO34)
9. 40L inertial storage tank (ACI40X)
10. 1-litre circuit breaker (DIX)
11. 50-litre circuit breaker- 60L inertial storage tank (DI50X - ACI60X)
12. Condensate drain pan (DTX)
13. Anti-vibration mount (APAVX - ASTFX)
14. Brackets wall (KSIPX)
15. Chronothermostat (HID-TCXB - HID-TCXN)
16.DHW storage (ACS200X- ACS300X - ACS500X + SCS08X - SCS12X)
17. ElfoControl[3] EVO

A. Liquid line
B. Gas line
C. DHW outlet
D. Ingresso ricircolo ACS
E. Aqueduct inlet
F. Solar outlet
G. Solar inlet
H. Power input
I. System return
J. System supply
K. Condensate drain

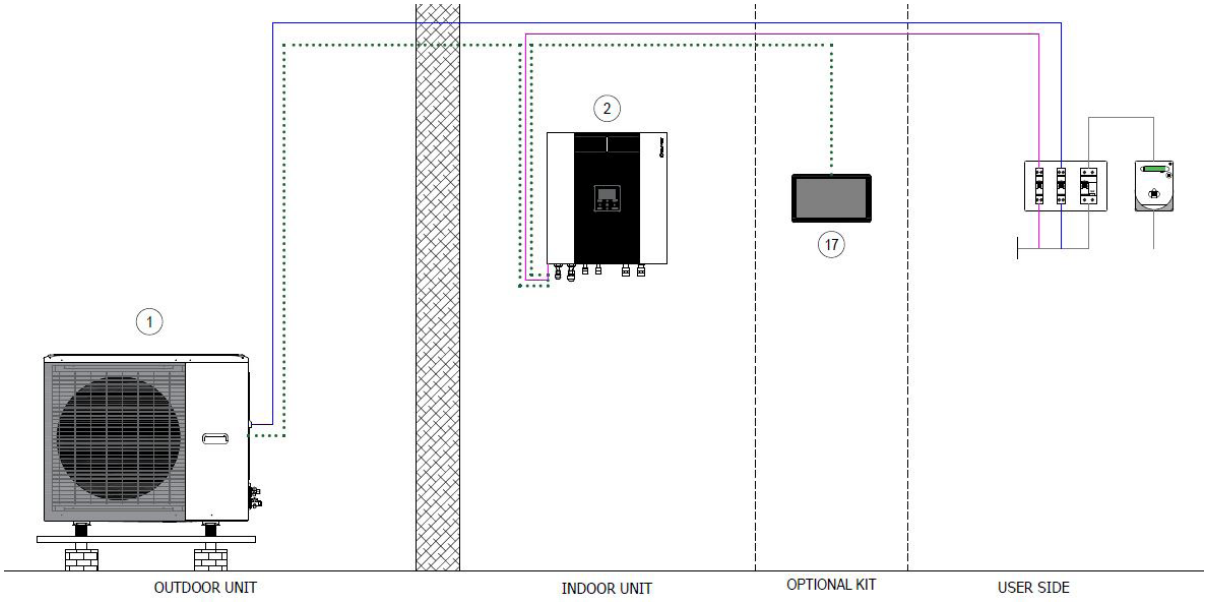
220-240V~50Hz
380-415V 3N ~50HZ con EH3 - EH6 - EH9

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 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. 2 zone kit (KIRE2HX-KIRE2hXL)
4. Single zone kit (KCSX)
5. Integration electric heater (EH024 - EH3 - EH6 - EH9)
6. Integrazione solare per sanitario (SOLX) --> solo nel tower
7. Solar panel
8. Hybrid solution (HYSO24 - HYSO34)
9. 40L inertial storage tank (ACI40X)
10. 1-litre circuit breaker (DIX)
11. 50-litre circuit breaker- 60L inertial storage tank (DI50X - ACI60X)
12. Condensate drain pan (DTX)
13. Anti-vibration mount (APAVX - ASTFX)
14. Brackets wall (KSIPX)
15. Chronothermostat (HID-TCXB - HID-TCXN)
16.DHW storage (ACS200X- ACS300X - ACS500X + SCS08X - SCS12X)
17. ElfoControl[3] EVO

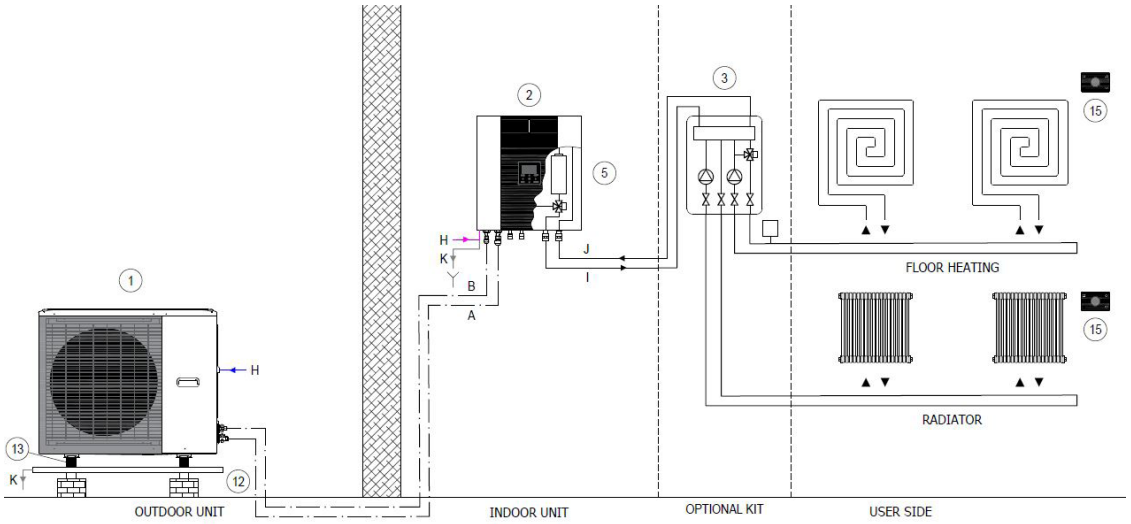
A. Liquid line
B. Gas line
C. DHW outlet
D. Ingresso ricircolo ACS
E. Aqueduct inlet
F. Solar outlet
G. Solar inlet
H. Power input
I. System return
J. System supply
K. Condensate drain

220-240V~50Hz
380-415V 3N ~50HZ con EH3 - EH6 - EH9

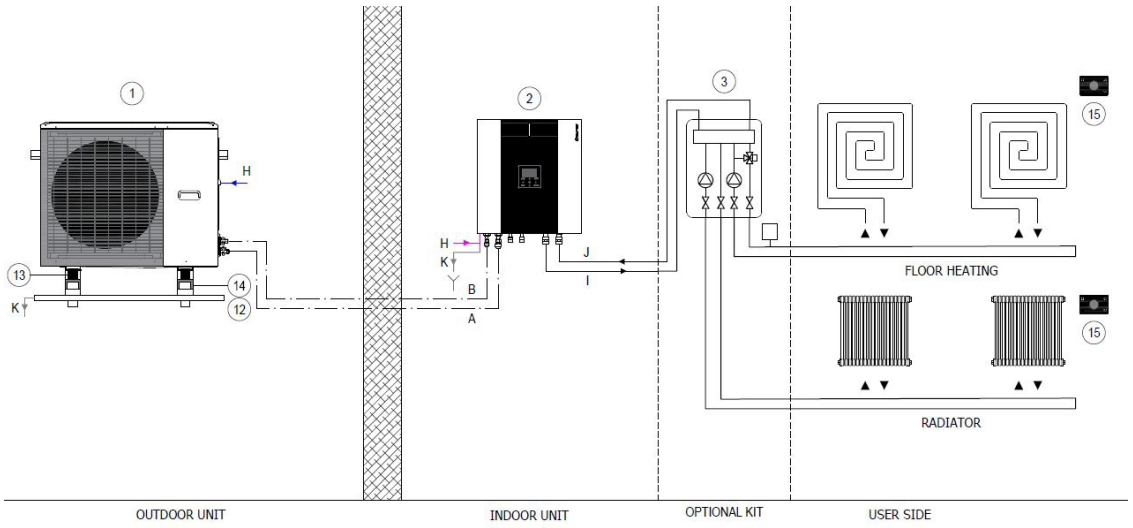
2.1 - 5.1 single phase 220-240V ~50Hz
6.1 - 8.1 single phase 220-240V ~50Hz
6.1 - 8.1 three-phase 380415V 3N~50Hz

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

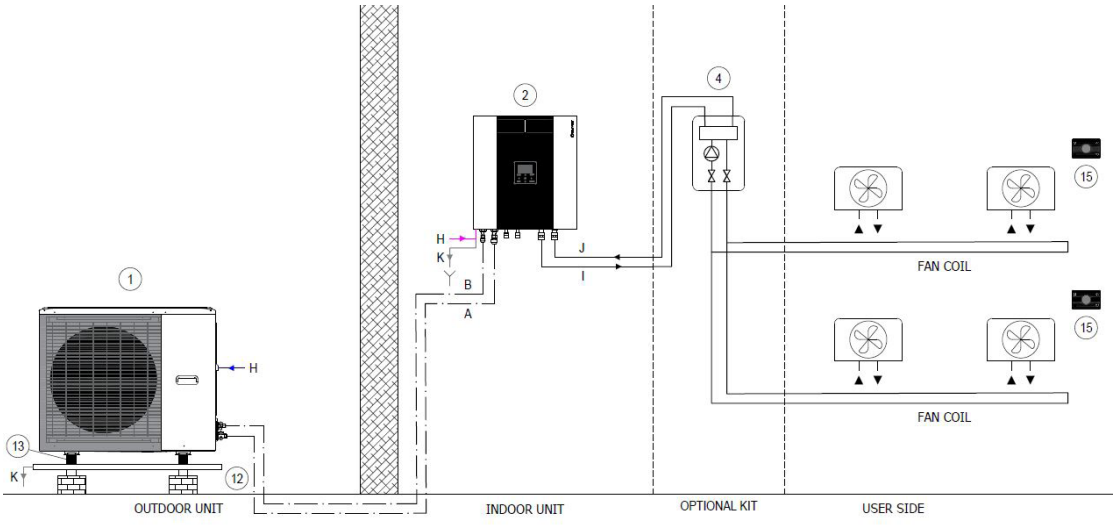
General description of the system and possible connections



Additional electric heater

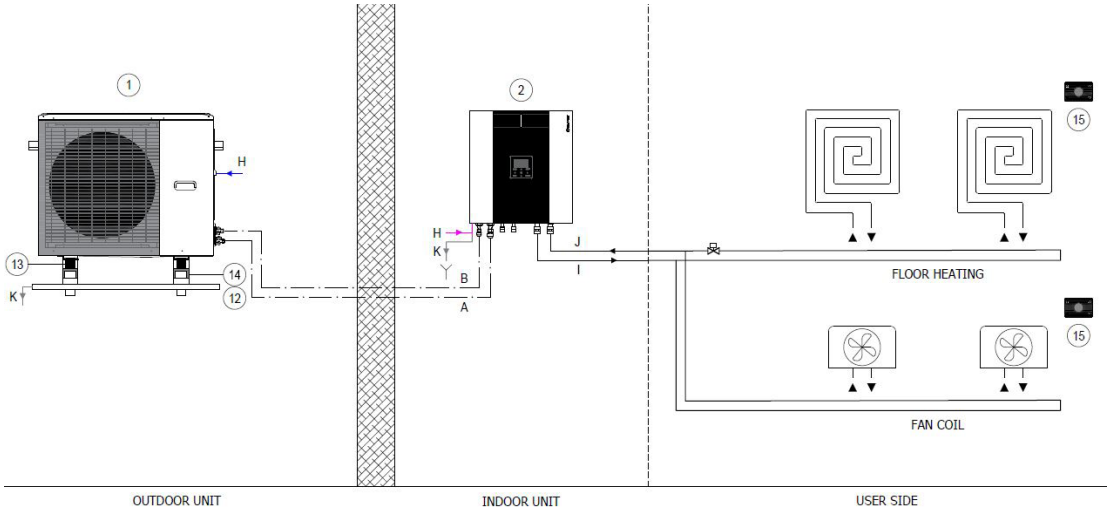


2 zone kit

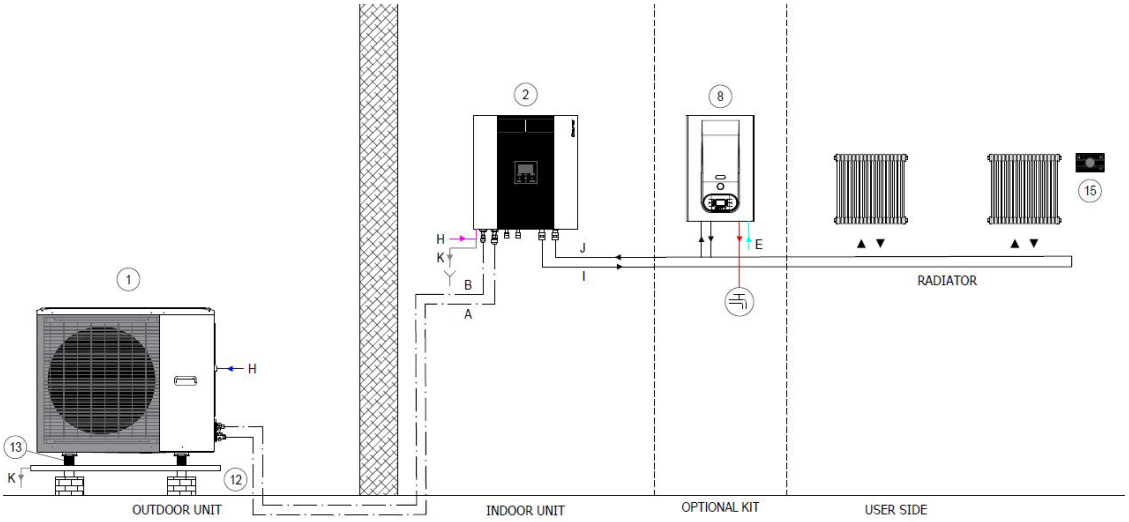


Single zone kit

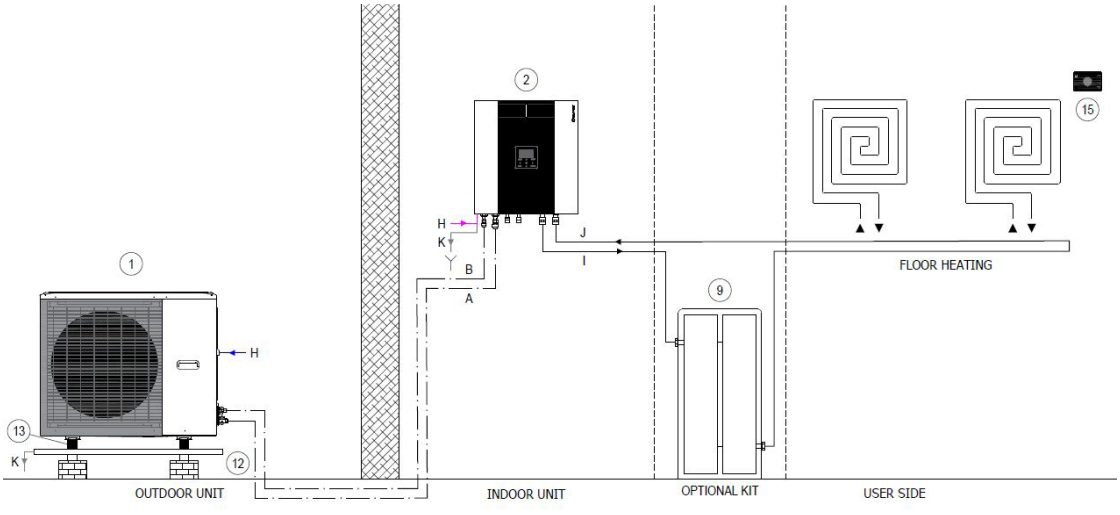
General description of the system and possible connections



Single Zone

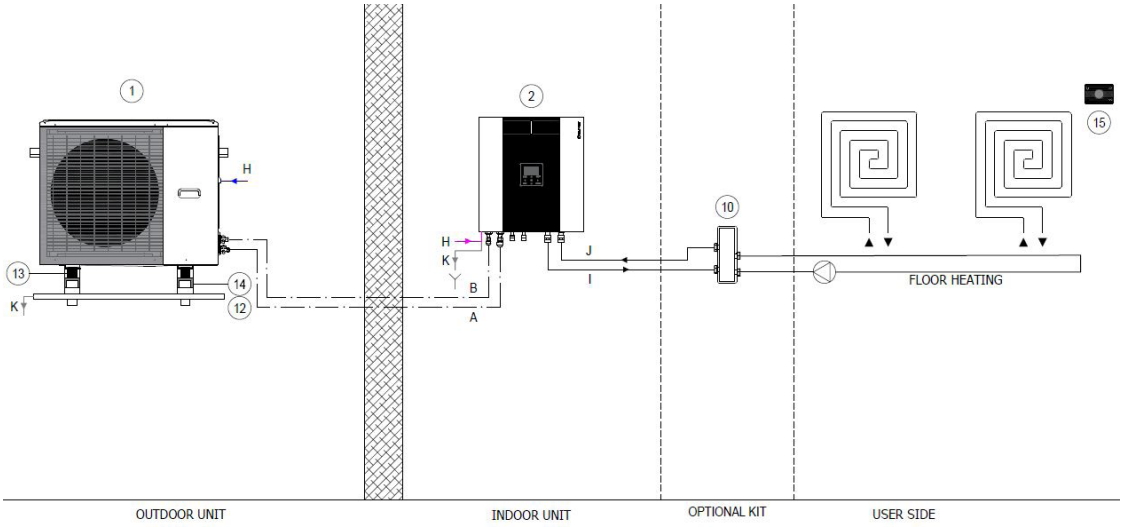


Hybrid solution

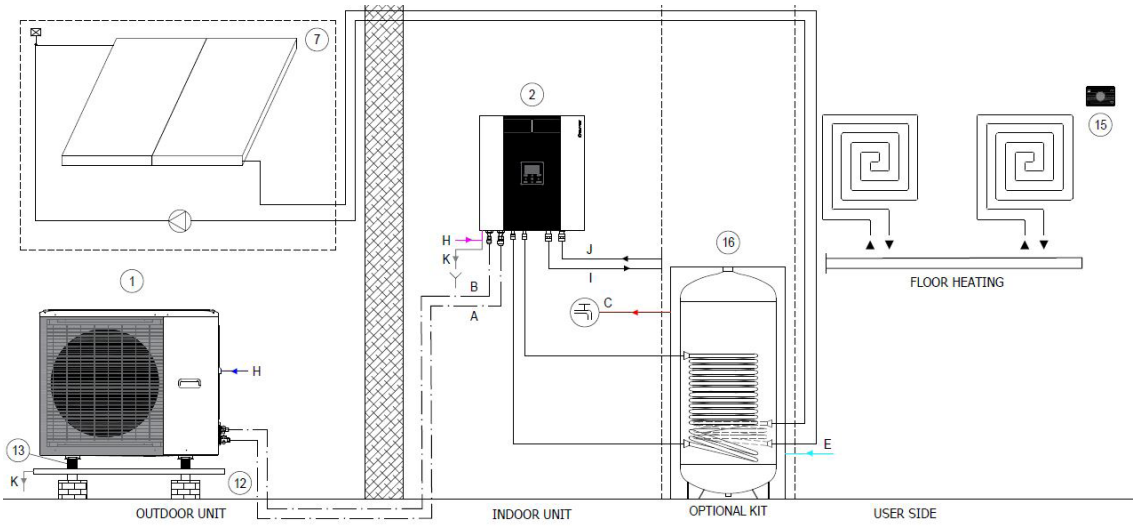


Inertial storage 40 L

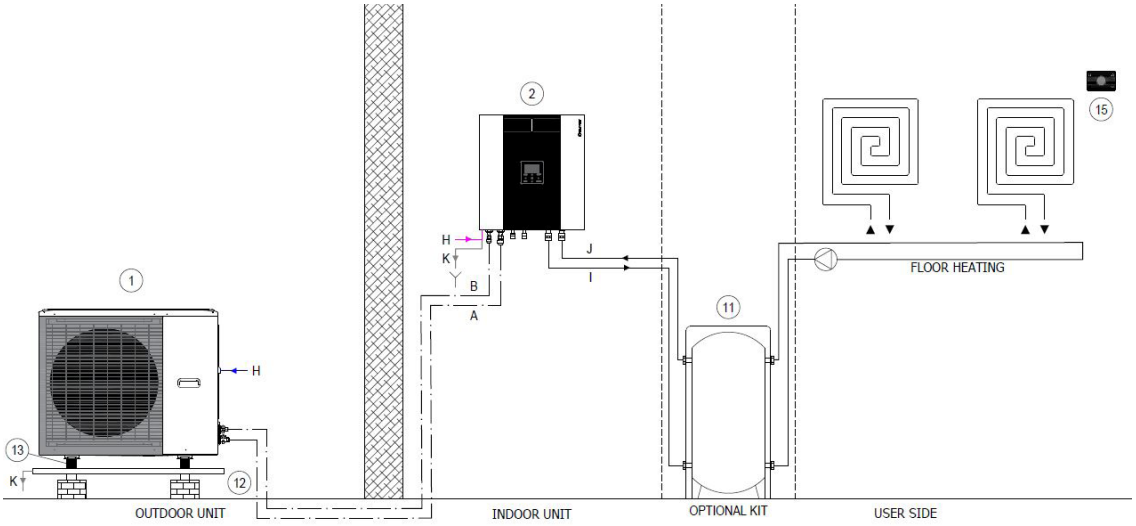
General description of the system and possible connections



1 L circuit breaker



DHW storage



circuit breaker 50L - inertial storage 60L

Data for the UNI/TS 11300 calculation

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

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

Data for the UNI/TS 11300 calculation

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

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

Data for the UNI/TS 11300 calculation

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

UNI/TS 11300 Part 3

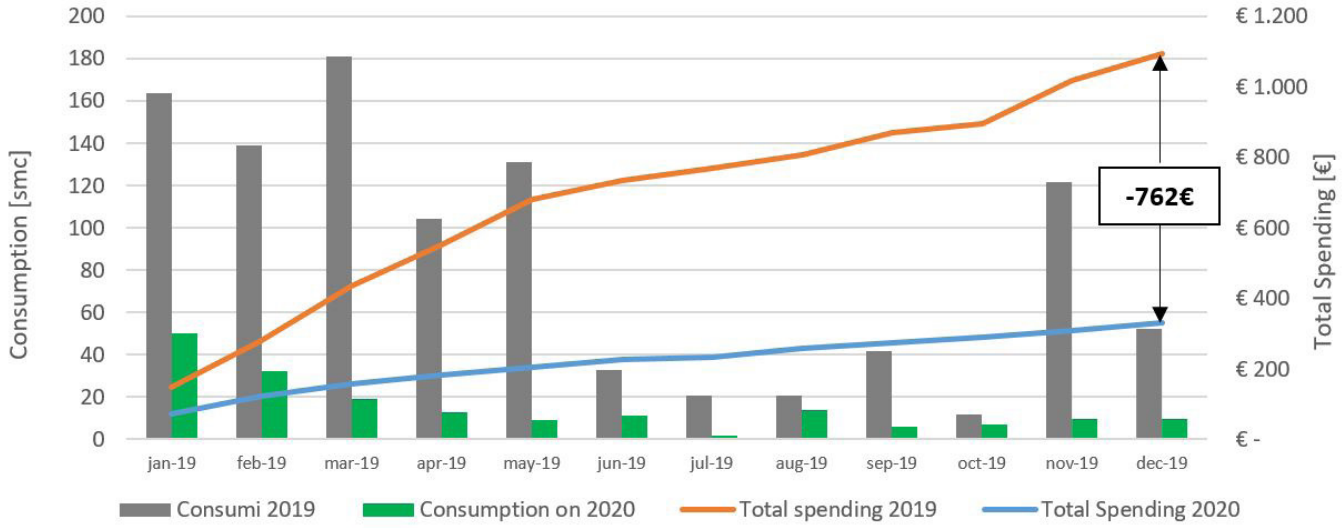
SIZE	Cooling capacity kW				EER			
Test	1	2	3	4	1	2	3	4
	100%	75%	50%	25%	100%	75%	50%	25%
220-240V N 50Hz								
2.1	4,26	3,20	2,05	0,90	3,50	4,71	5,84	5,81
3.1	6,25	4,59	2,96	1,35	3,09	4,43	6,17	7,40
4.1	7,46	5,20	3,51	1,63	3,33	4,48	6,67	9,30
5.1	9,10	6,43	4,25	1,94	3,09	4,26	6,73	10,48
6.1	11,80	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:

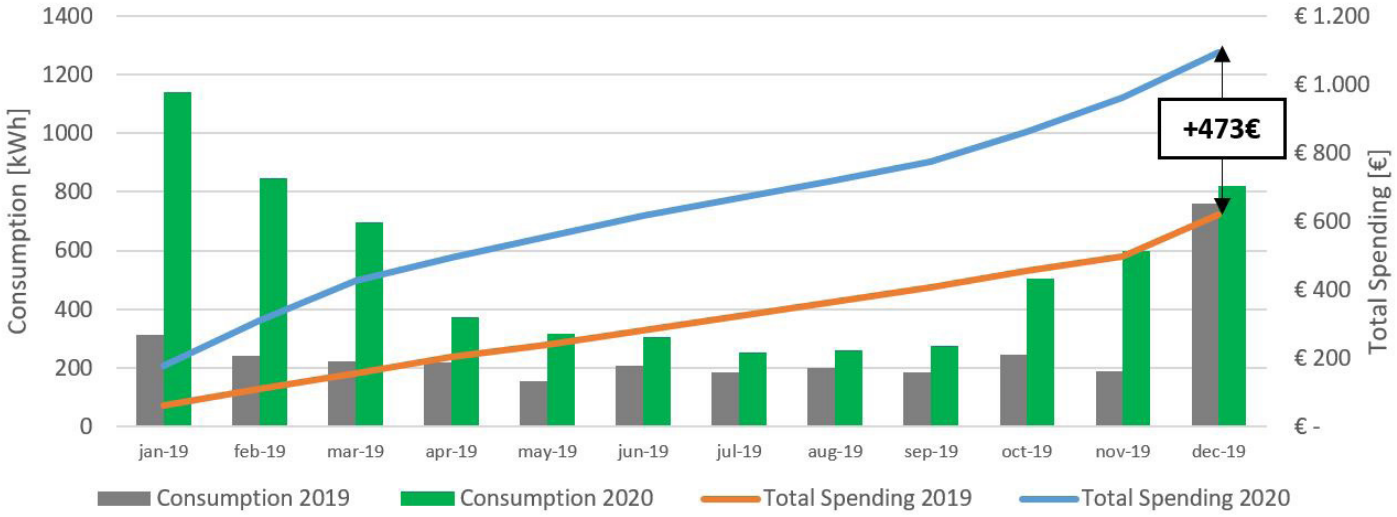
1. External air temperature B.S. 35°C Refrigerated water temperature at the fancoil inlet/outlet 12/7 °C
2. External air temperature B.S. 30°C Refrigerated water temperature at the fancoil outlet /7 °C
3. External air temperature B.S. 25°C Refrigerated water temperature at the fancoil outlet /7 °C
4. External air temperature B.S. 20°C Refrigerated water temperature at the fancoil outlet /7 °C

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).

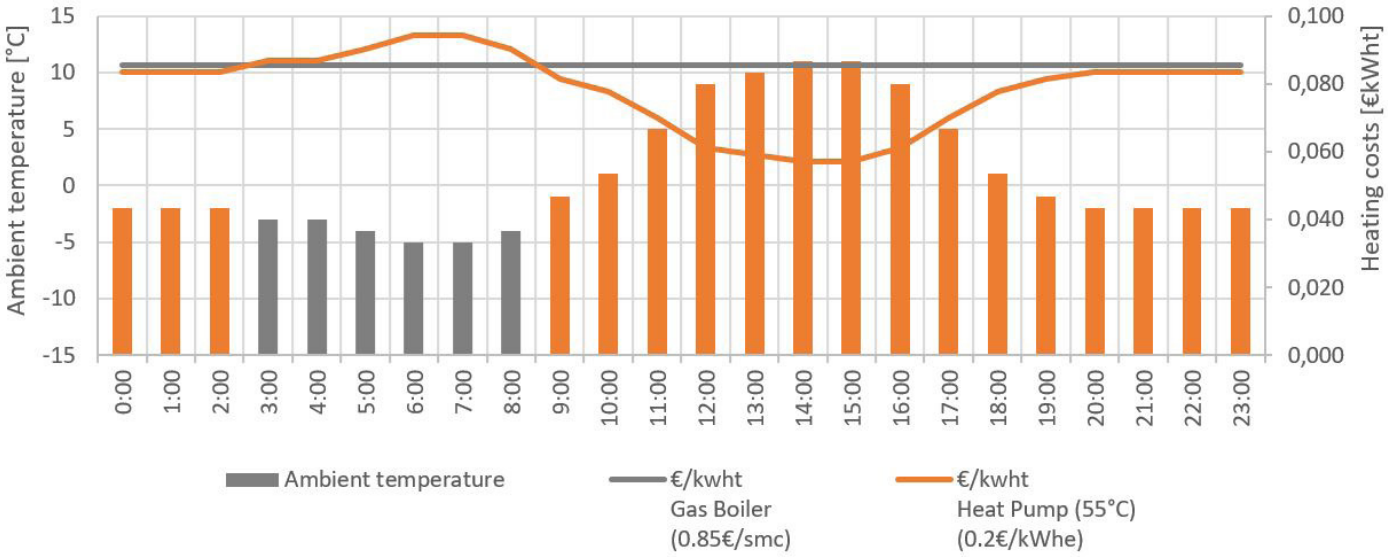
Year	Natural gas cost	Electricity cost	Total cost	Savings	
2019	1092 €	620 €	1712 €	289 €	-20%
2020	330 €	1093 €	1423 €		

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.

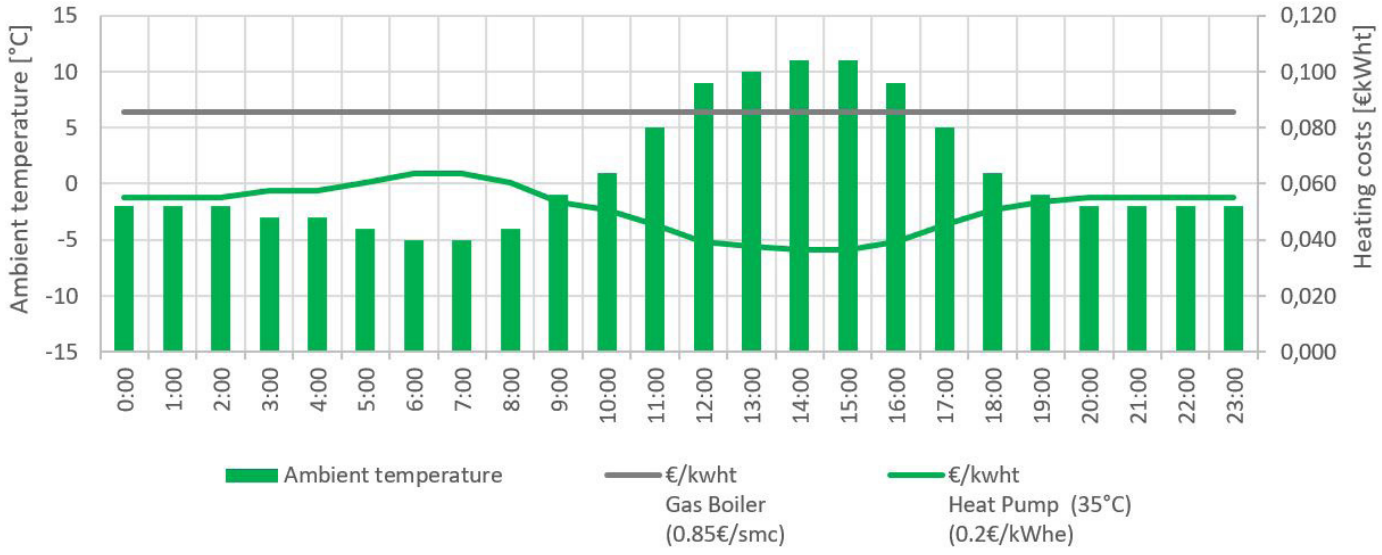
EuroSwitch Function

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.

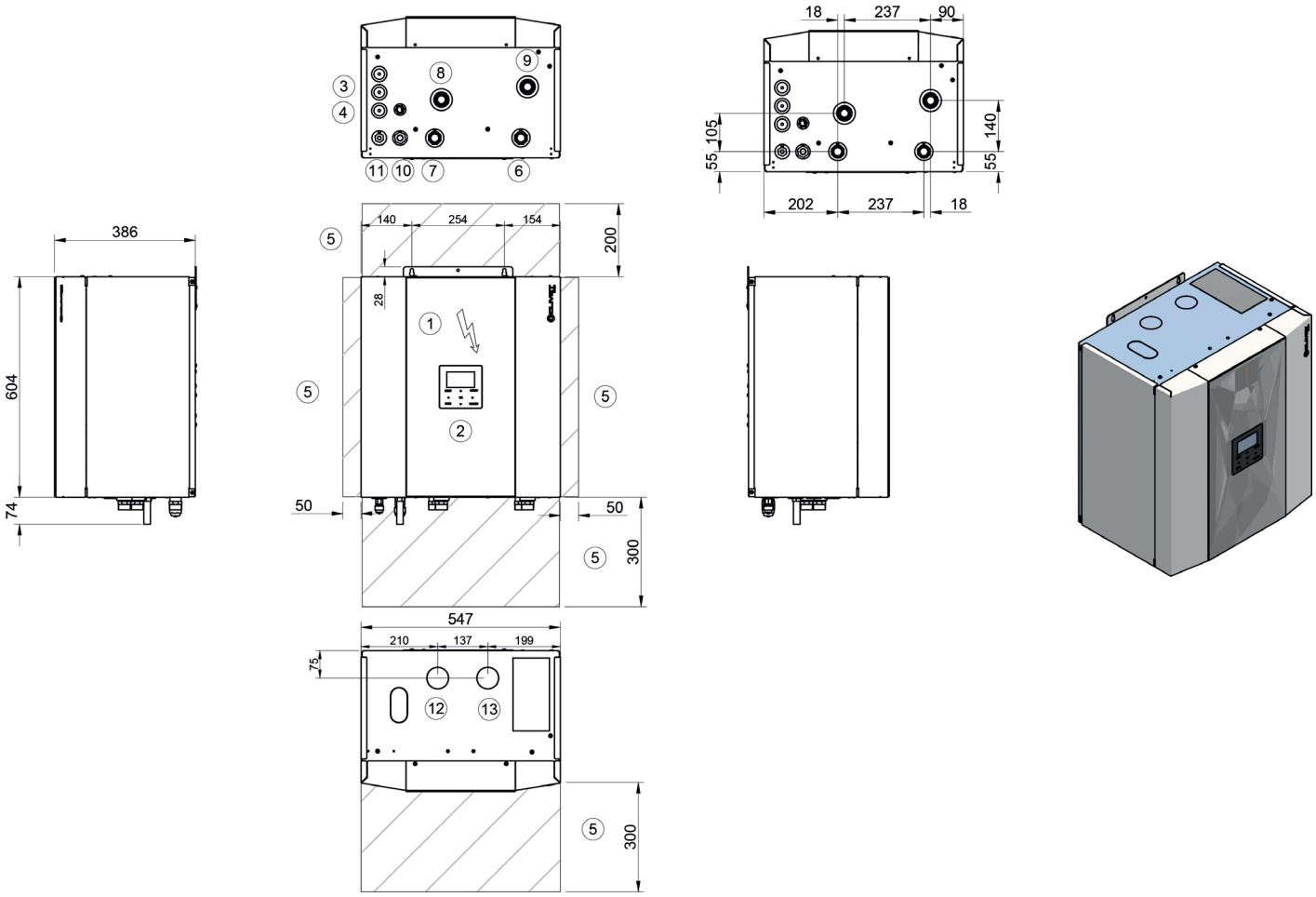


Case 2 - Typical day in January - Radiant floor (supply temperature = 35°C)

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.

SPHERA EVO 2.0 BOX (indoor unit)

DAAGM0001_00
DATA/DATE 07/06/2021



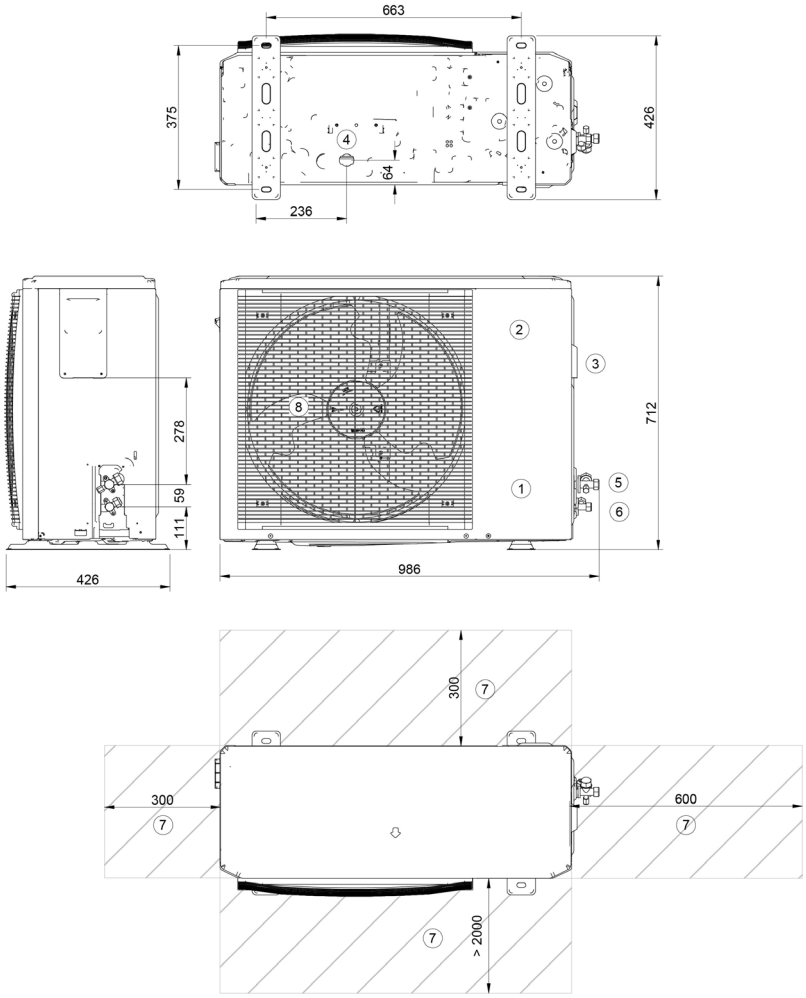
1. Electrical panel
2. Unit control keypad
3. Power input
4. Condensate drain
5. Functional spaces
6. DHW exchanger supply
7. DHW exchanger return
8. System outlet
9. System return
10. 5/8" SAE intake connection
11. 3/8" SAE liquid connection
12. Gas boiler inlet (optional)
13. Gas boiler outlet (optional)

SIZE		GABC	GBBC
Operation weight	kg	52	54
Shipping weight	kg	60	62

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



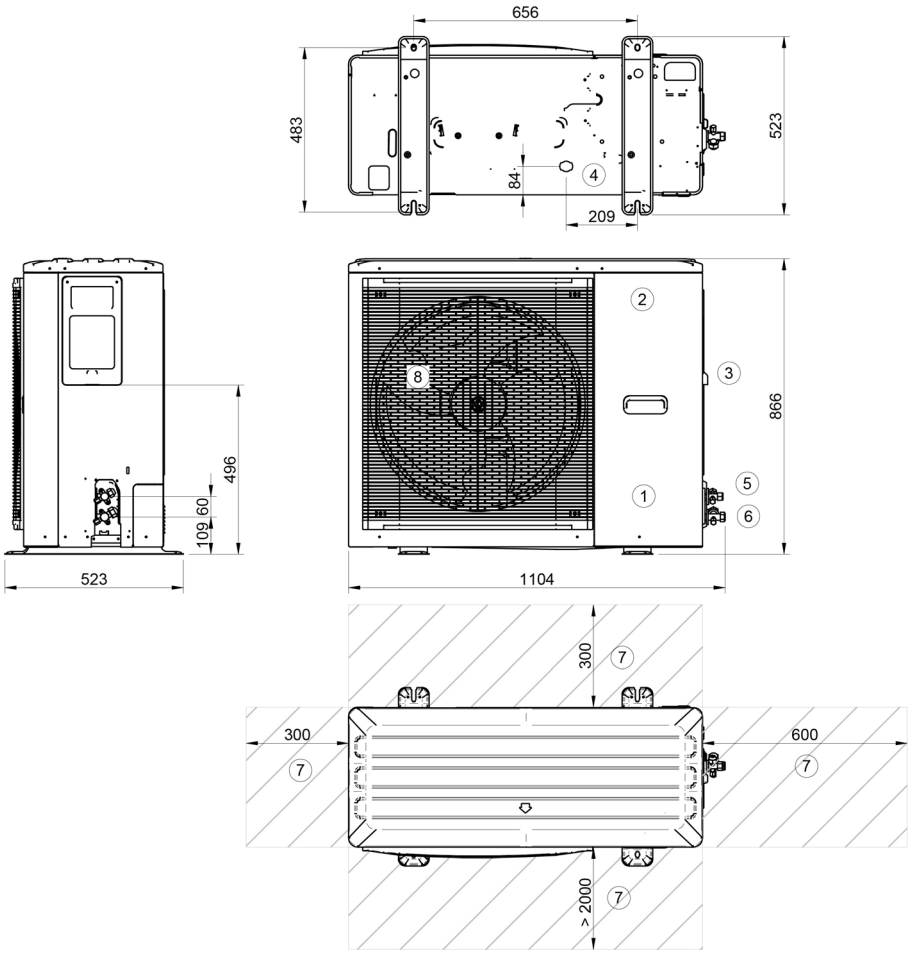
1. Compressor enclosure
2. Electrical panel
3. Power input
4. Condensate drain
5. Gas connections (1/4")
6. Gas connections (5/8")
7. Functional spaces
8. Electrical fan

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.

SPHERA EVO 2.0 (outdoor unit) - 4.1 ÷ 8.1

DAAQ80001_REV01
DATA/DATE 29/01/2021



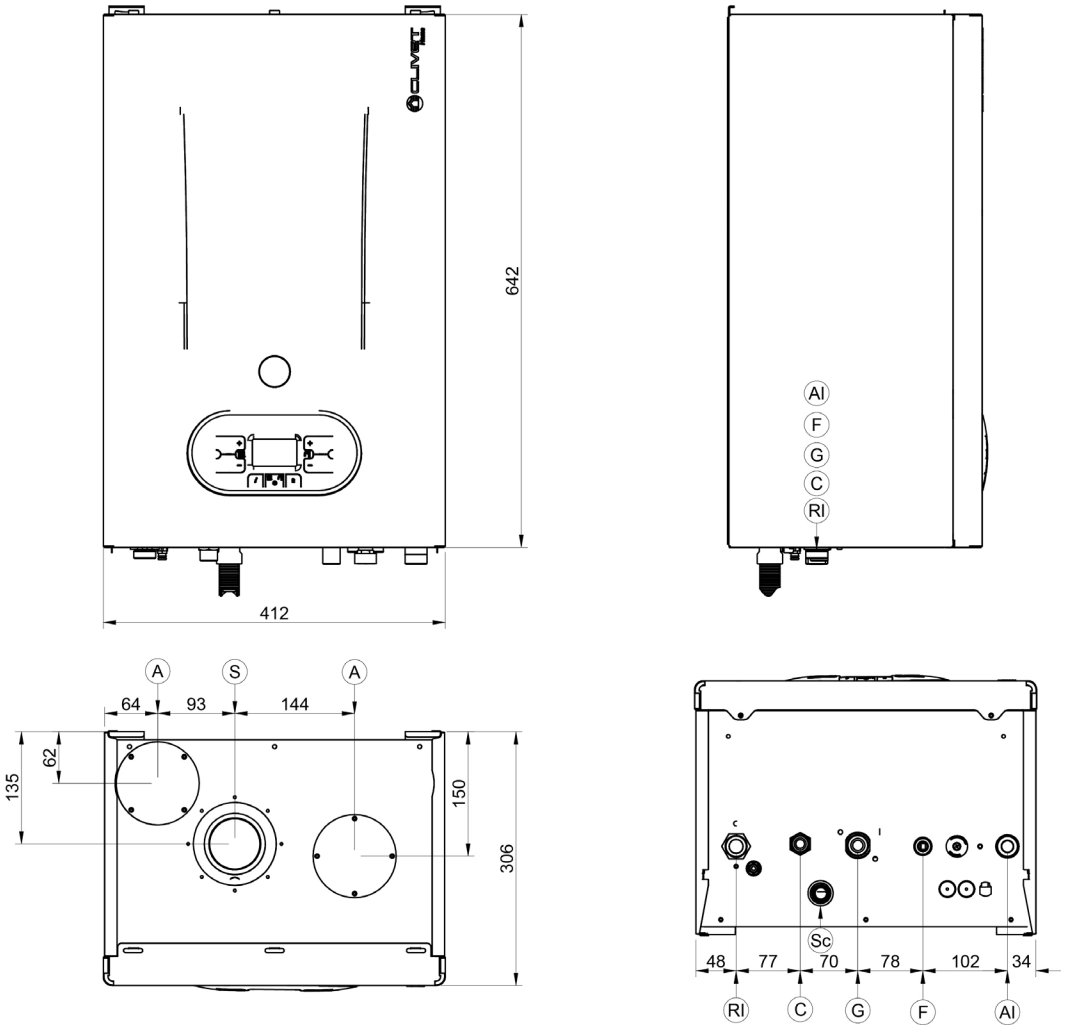
1. Compressor enclosure
2. Electrical panel
3. Power input
4. Condensate drain
5. Gas connections (3/8")
6. Gas connections (5/8")
7. Functional spaces
8. Electrical fan

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.

Dimensional drawings

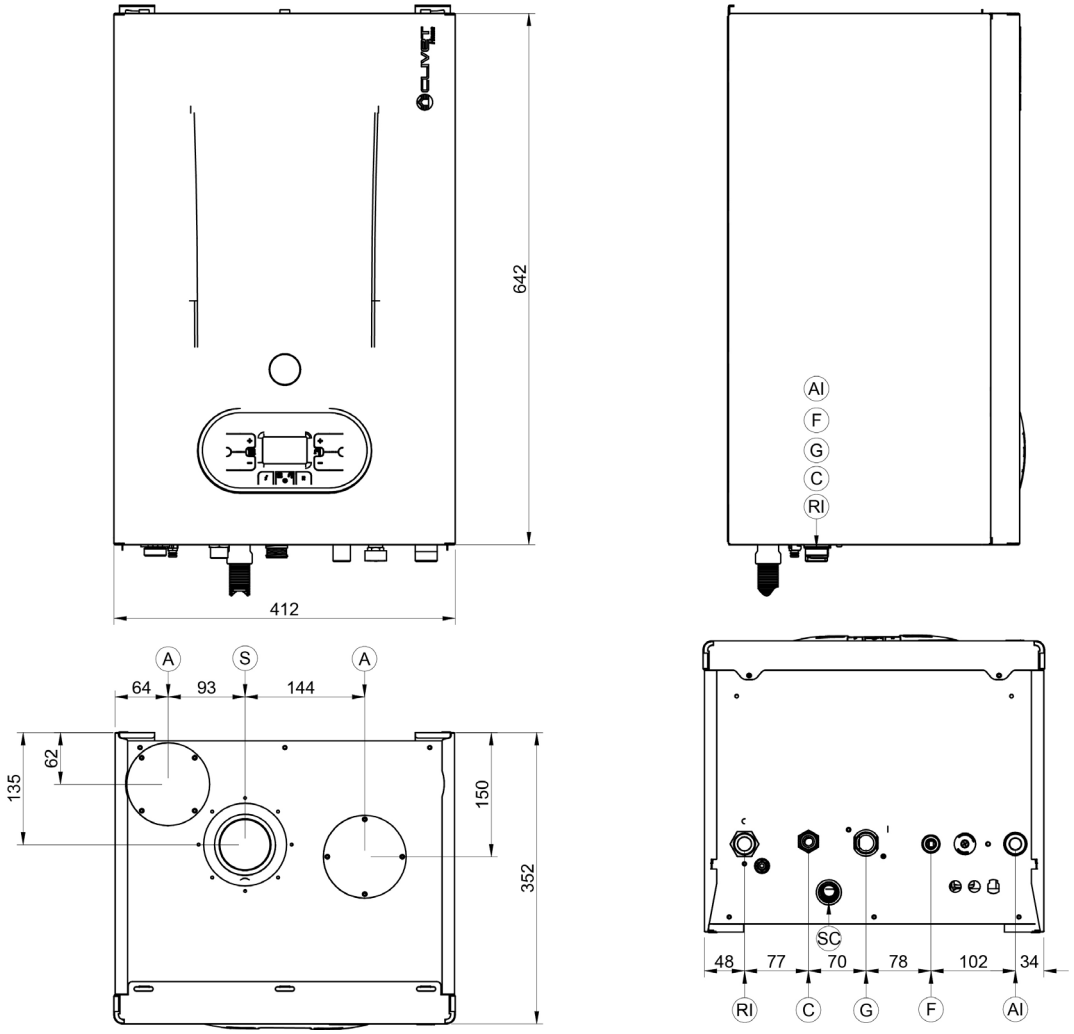
Methane gas boiler dimensions - COMBI-TECH R2K 24 - 24kW



AI = System flow Ø3/4"
RI = System return Ø3/4"
G = Gas Ø3/4"
F = Domestic hot water inlet Ø1/2"
C = Domestic hot water outlet Ø1/2"
SC = Condensate drain Ø25
A = Air intake Ø80
S = Smoke discharge Ø80

FLUE	
DISTANCE BETWEEN UPPER CASING LINE AND ELBOW AXIS	
Horizontal concentric Ø60/100	100
Horizontal concentric Ø80/125	117
Horizontal split Ø80/80	129
Horizontal split Ø60/60	192

Methane gas boiler dimensions - COMBI-TECH R2K 34 - 34kW



AI = System flow Ø3/4"
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G = Gas Ø3/4"
F =Domestic hot water inlet Ø1/2"
C = Domestic hot water outlet Ø1/2"
SC = Condensate drain Ø25
A = Air intake Ø80
S = = Smoke discharge Ø80

FLUE	
DISTANCE BETWEEN UPPER CASING LINE AND ELBOW AXIS	
Horizontal concentric Ø60/100	100
Horizontal concentric Ø80/125	117
Horizontal split Ø80/80	129
Horizontal split Ø60/60	192

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