WSHH-LEE1

19.2 - 80.2

Manual
for installation
use and maintenance

en

M0HT00002-01 08-03-2024

Dear Customer,

We congratulate you on choosing these product

Clivet has been working for years to offer systems able to assure the maximum comfort for a long time with highly-reliable, efficient, high-quality and safe solutions.

The target of the company is to offer advanced systems, that assure the best comfort and reduce energy consumption as well as the installation and maintenance costs for the entire life-cycle of the system.

With this manual, we want to give you information that are useful for all phases: from reception, installation and use to disposal - so that such an advanced system can provide the best performances during installation and use.

Best regards and have a good read.

CLIVET Spa

The original instructions are written in Italian.

All other languages are translations of the original instructions.

Summary

1. Safety considerations

1.1 Safety

Operate in compliance with safety regulations in force.

To carry out the operations use protection devices:

gloves, goggles, helmet, headphones, protective knee pads.

All operations must be carried out by personnel trained on possible risks of a general nature, electrical and deriving from operating with equipment under pressure.

Only qualified personnel can operate on the unit, as required by the regulation in force.

1.2 Manual

The manual provides correct unit installation, use and maintenance.

It is advisable to read it carefully so you will save time during operations.

Follow the written indications so you will not cause damages to things and injuries people.

1.3 Risk situations

The unit has been designed and created to prevent injures to people.

During designing it is not possible to plane and operate on all risk situation.

Read carefully “Residual risk” section where all situation which may cause damages to things and injuries to people are reported.

Installation, starting, maintenance and repair required specific knowledge; if they are carried out by inexperienced personnel, they may cause damages to things and injuries people.

1.4 Intended use

Use the unit only:

- for cooling/heating water or a water and glycol mix
- keep to the limits foreseen in the technical schedule and in this manual

The manufacturer accepts no responsibility if the equipment is used for any purpose other than the intended use.

1.5 Installation

▶ **Indoor installation**

The positioning, hydraulic system, refrigerating, electrics and the ducting of the air must be determined by the system designer in accordance with local regulations in force.

Follow local safety regulations.

Verify that the electrical line characteristics are in compliance with data quotes on the unit serial number label.

1.6 Maintenance

Plan periodic inspection and maintenance in order to avoid or reduce repairing costs.

Turn the unit off before any operation.

1.7 Modification

All unit modifications will end the warranty coverage and the manufacturer responsibility.

1.8 Breakdown/Malfuction

Disable the unit immediately in case of breakdown or malfunction.

Contact a certified service agent.

Use original spares parts only.

Using the unit in case of breakdown or malfunction:

- voids the warranty
- it may compromise the safety of the unit
- may increase time and repair costs

1.9 User training

The installer has to train the user on:

- Start-up/shutdown
- Set points change
- Standby mode
- Maintenance
- What to do / what not to do in case of breakdown

1.10 Data update

Continual product improvements may imply manual data changes.

Visit manufacturer web site for updated data.

2. Indications for the User

Keep this manual with the wiring diagram in an accessible place for the operator.

Note the unit data label so you can provide them to the assistance centre in case of intervention (see “Unit identification” section).

Provide a unit notebook that allows any interventions carried out on the unit to be noted and tracked making it easier to suitably note the various interventions and aids the search for any breakdowns.

2.1 In case of breakdown or malfunction:

Immediately deactivate the unit

Contact a service centre authorized by the manufacturer

2.2 The installer must train the user, particularly on:

- Start-up/shutdown
- Set points change
- Standby mode
- Maintenance
- What to do / what not to do in case of breakdown

2.3 Unit indentification

The serial number label is positioned on the unit and allows to indentify all the unit features.

The matriculation plate shows the indications foreseen by the standards, in particular:

- unit type
- serial number (12 characters)
- year of manufacture
- wiring diagram number
- electrical data
- type of refrigerant
- refrigerant charge
- manufacturer logo and address

The matriculation plate must never be removed.

2.4 Serial number

It identifies uniquely each unit.

Must be quoted when ordering spare parts.

2.5 Assistance request

Note data from the serial number label and write them in the chart on side, so you will find them easily when needed.

3. Information on refrigerant gas

WARNING

- **This product contains fluorinated greenhouse gases covered by the Kyoto protocol.**
- **Do not discharge gas into air.**

Refrigerant characteristics	
Type of refrigerant	R134a
Safety class (ISO 817)	A1
GWP	1430
Boiling point (°C)	-26

NOTE

- **The refrigerant quantity is indicated on the unit plate**

4. Before installation

4.1 Reception

You have to check before accepting the delivery:

- That the unit hasn't been damaged during transport
- That the materials delivered correspond with that indicated on the transport document comparing the data with the identification label positioned on the packaging.

In case of damage or anomaly:

- Write down on the transport document the damage you found and quote this sentence: "Conditional acceptance clear evidence of deficiencies/damages during transport"
- Contact by fax and registered mail with advice of receipt to supplier and the carrier.

WARNING

▶ **Any disputes must be made within 8 days from the date of the delivery. Complaints after this period are invalid.**

4.2 Storage

Observe external packaging instructions.

In particolar:

minimum ambient temperature	(A)	-10°C
maximum ambient temperature	(B)	+50°C
maximum relative humidity	(C)	95%

Failure to comply with the above conditions can lead to:

A possible components damages

B possible safety valve opening

C possible damages to electrical components

WARNING

▶ **The unit may not be tilted more than 15° during transport.**

4.3 Packaging removing

Be careful not to damage the unit.

Recycle and dispose of the packaging material in conformity with local regulations.

4.4 Handling

ATTENTION

▶ **Check that all handling equipment complies with local safety regulations (cran, forklifts, ropes, hooks, etc.).**

▶ **Provide personnel with personal protective equipment suitable for the situation, such as helmet, gloves, accident-prevention shoes, etc.**

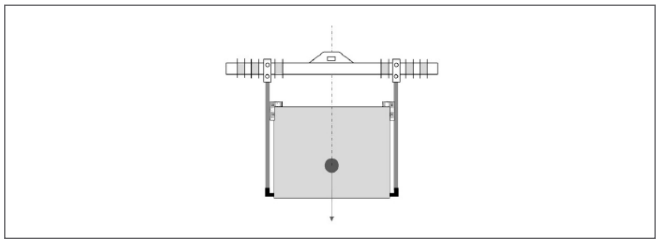
▶ **Observe all safety procedures in order to guarantee the safety of the personnel present and the of material.**

Verify unit weight and handling equipment lifting capacity.

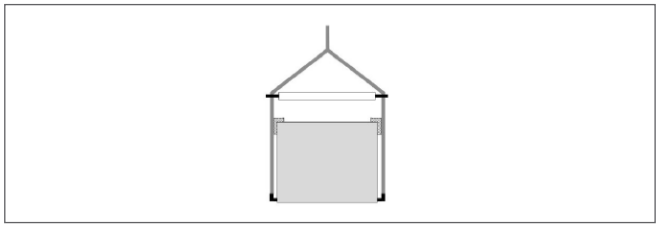
Identify critical points during handling (disconnected routes, flights, steps, doors).

Suitably protect the unit to prevent damage.

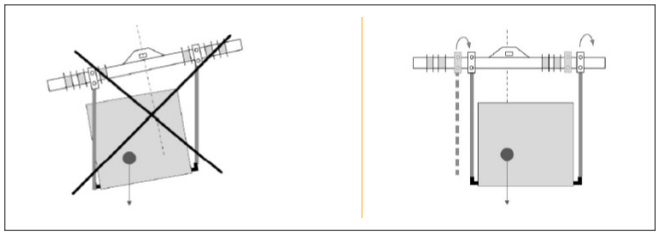
Lifting with balance

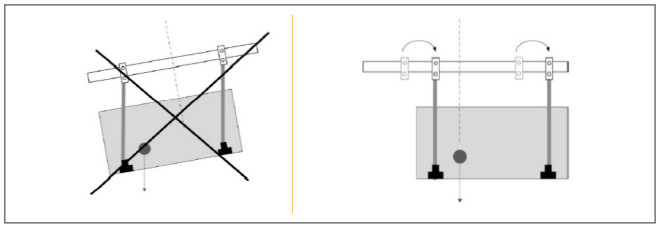


Lifting with spacer bar



Align the barycenter to the lifting point.



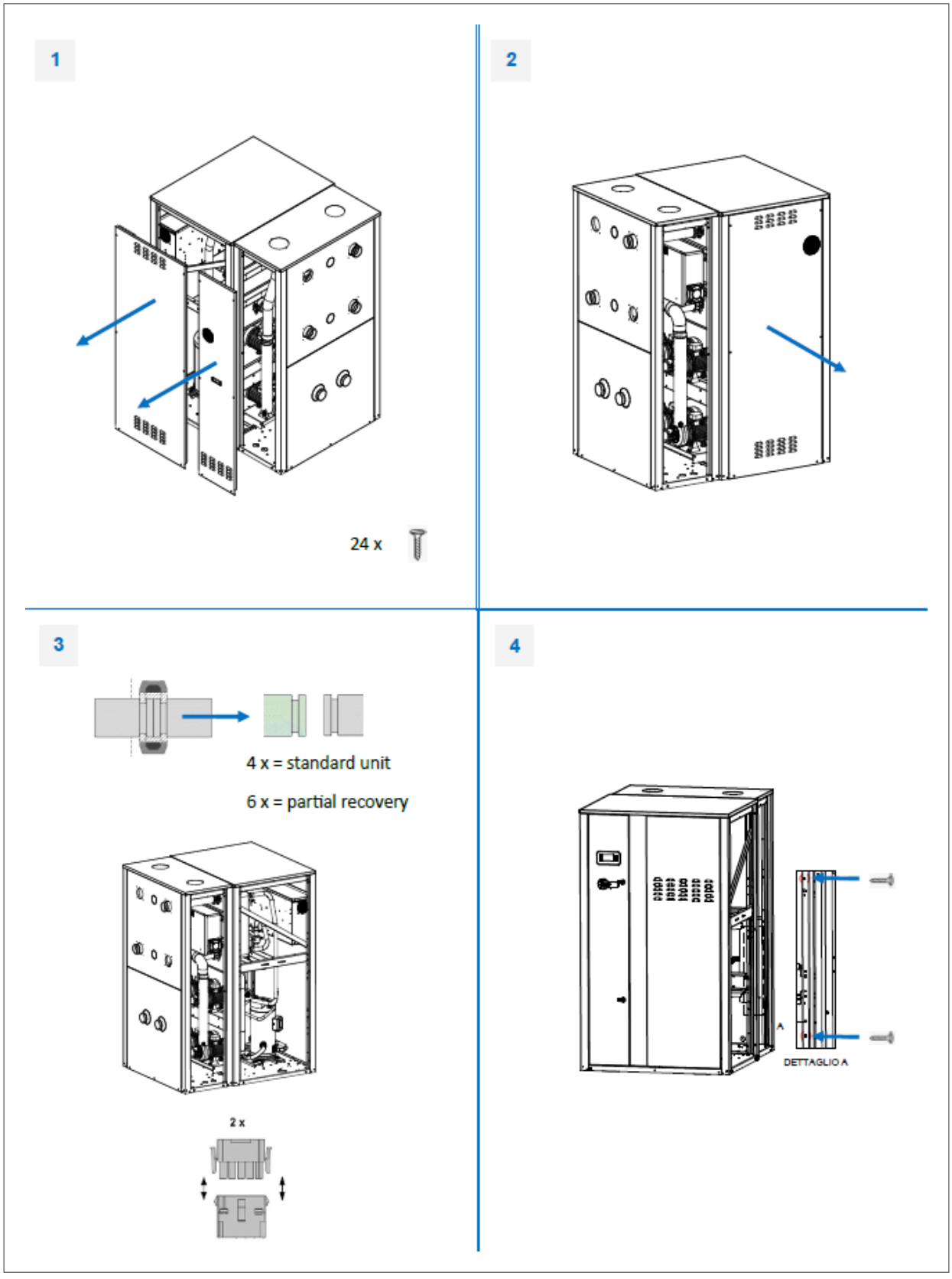


Gradually bring the lifting belts under tension, making sure they are positioned correctly.

Before starting the handling, make sure that the unit is stable.

4.5 Instructions for disassembly

Only with option: MOBMAG



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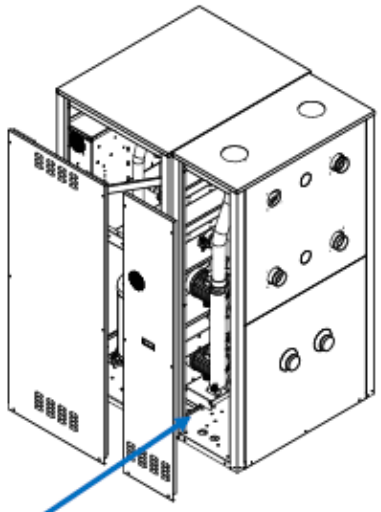

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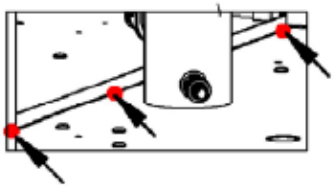

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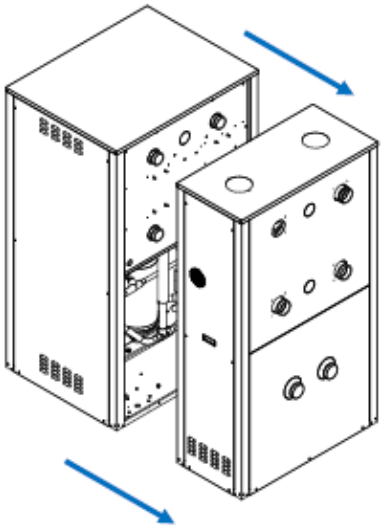
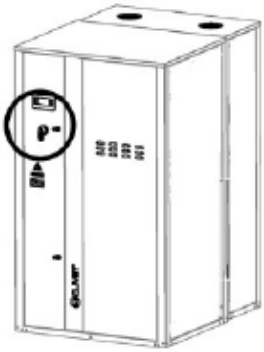
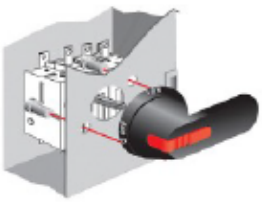
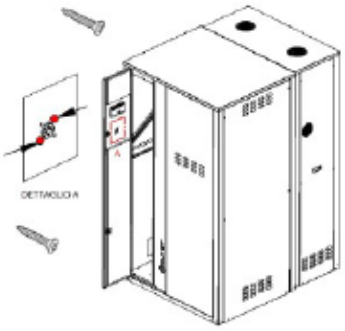








5. Selecting the installation site

5.1 General

Installation must be in accordance with local regulations. If they do not exist, follow EN378 .

During positioning consider these elements:

- customer approval
- unit weight and bearing point capacity
- safe accessible position
- functional spaces
- spaces for the air intake/exhaust
- Electrical connections
- max. distance allowed by the electrical connections
- Water connections

5.2 Functional spaces

Functional spaces are designed to:

- guarantee good unit operation
- carry out maintenance operations
- protect authorized operators and exposed people

ATTENTION

- ▶ **Respect all functional spaces indicated in the DIMENSIONS section.**
- ▶ **Do not smoke or use open flames within this area**

5.3 Positioning

Units are designed to be installed:

- in fixed positions
- level

Put the unit in a position where any leaking gas cannot enter buildings or stagnate in closed areas. In the latter case, observe the rules for machinery rooms (ventilation, leak detection, etc.).

Choose the installation place according to the following criteria:

- install the unit raised from the ground
- bearing points aligned and leveled
- avoid installations in places subject to flooding

Limit vibration transmission:

- use anti-vibration devices or neoprene strips on the unit support points
- install flexible joints on the hydraulic and aeraulic connections

Protect the unit with suitable fence in order to avoid access to unauthorised personnel (children, vandals, etc.)

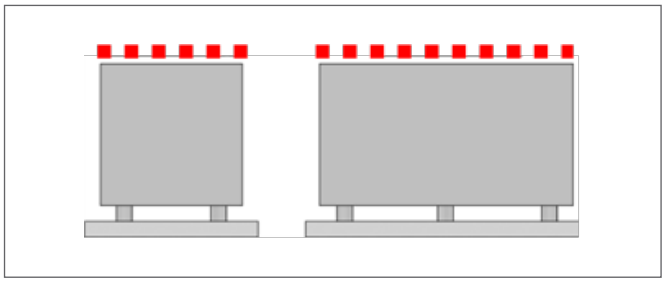
A correct circulation of the air is mandatory to guarantee the good unit operating.

ATTENTION

- ▶ **The unit must be level.**

ATTENTION

- ▶ **Do not go up to the surface**
- ▶ **Do not place heavy loads.**



5.4 Saftey valve gas side

The installer is responsible for evaluating the opportunity of installing drain tubes, in conformity with the local regulations in force (EN 378).

If ducted, the valves must be sized according to EN13136.

6. Water connections

6.1 Hydraulic system

The piping must be designed and manufactured to limit pressure drops as much as possible, i.e. optimise performance of the system.

Keep the following parameters to a minimum:

- overall length
- number of bends
- number of vertical changes of direction

6.2 Water quality

The water quality must be checked by qualified personnel.

Water with inadequate characteristics can cause:

- pressure drop increase
- reduces energy efficiency
- increased corrosion potential

Water features:

- within the limits indicated by table

Provide a water treatment system if values fall outside the limits.

6.3 Cleanliness

Before connecting the water to the unit, clean the system thoroughly with specific products effective to remove residues or impurities that may affect functioning. Existing systems must be free from sludge and contaminants and protected against build-ups.

6.4 New systems

In case of new installations, it is essential to wash the entire installation (with the circulator uninstalled) before commissioning the central installation. This removes residues of the installation process (welding, waste, joint products...).

The system must then be filled with clean high-quality tap water.

6.5 Existing systems

If a new unit is installed on an existing system, the system must be rinsed to avoid the presence of particles, sludge and waste.

The system must be drained before installing the new unit.

Dirt can be removed only with a suitable water flow.

Particular attention must also be paid to “blind spots” where a lot of dirt can accumulate due to the reduced water flow.

If, after rinsing, the quality of the water is still unsuitable, a few measures must be taken to avoid problems.

An option to remove pollutants is to install a filter.

ATTENTION

- **The warranty does not cover damages caused by limestone formations, deposits and impurities from the water supply and/or from failure to clean the systems.**

Water component for corrosion limit on Copper	
PH (25°C)	7,5 ÷ 9,0
SO4--	< 100
HCO3- / SO4--	> 1
Total Hardness	8 ÷ 15 °f
Cl-	< 50 ppm
PO4 3-	< 2,0 ppm
NH3	< 0,5 ppm
Free Chlorine	< 0,5 ppm
Fe3 +	< 0,5 ppm
Mn++	< 0,05 ppm
CO2	< 50
H2S	< 50 ppb
Oxygen content	< 0,1 ppm
Sand	10 mg/L
Ferrite hydroxide Fe3O4 (black)	Dose < 7.5 mg/L 50% of mass diameter < 10 µm
Iron oxide Fe2O3 (red)	Dose < 7.5mg/L Diameter < 1 µm
Electrical conductivity (µS/cm)	<500
Sodium nitrate (mgNaNo3/l)	<100
Alkalinity(mgCaCo3/l)	<100
Copper (mgCu/l)	<1.0
Sulphide ion (S-/l)	None
Ammonium ion (mgNH4+/L)	<1.0
Silica (mgSiO2/l)	50
Max Ethylene, Propylene glycol	50%
Nitrates	<100
Free&aggressive Carbonic Acid	<5

6.6 Risk of freezing

If the unit or the relative water connections are subject to temperatures close to 0°C:

- mix water with glycol, or
- safeguard the pipes with heating cables placed under the insulation, or
- empty the system in cases of long non-use

6.7 Anti-freeze solution

The use of an anti-freeze solution results in an increase in pressure drop.

Make sure that the glycol type utilized is inhibited (not corrosive) and compatible with the water circuit components.

Do not use different glicol mixture (i.e. ethylene with propylene).

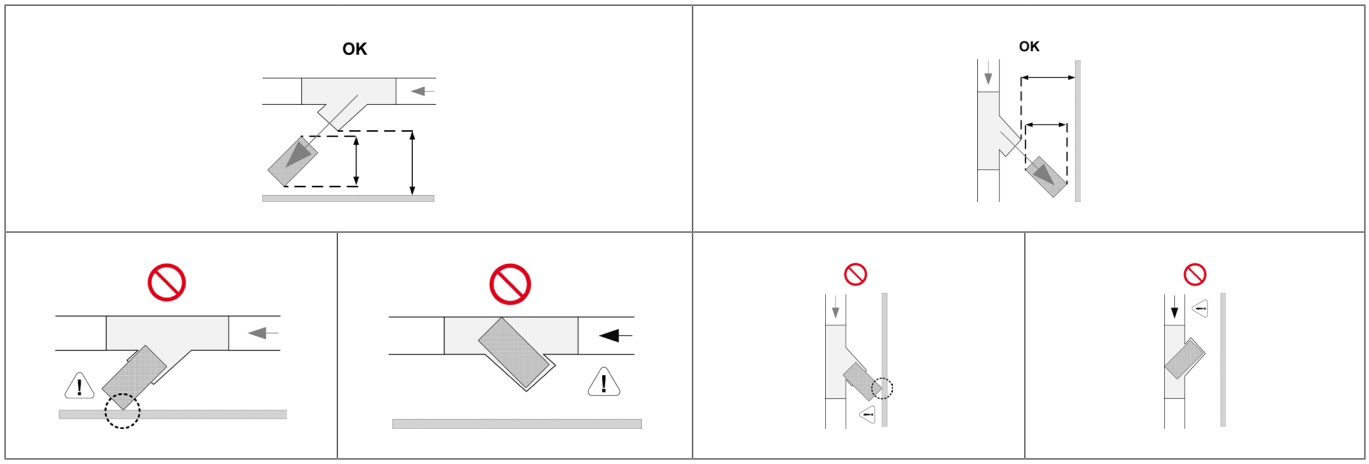
▶ **ATTENTION**

▶ **The unit must always be protected from freeze.**
Otherwise irreversible damage may occur.

% GLYCOL ETHYLENE / PROPYLENE BY WEIGHT		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2	-3.9	-6.5	-8.9	-11.8	-15.6	-19.0	-23.4	-27.8	-32.7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23.8	-29.4

6.8 Water filter

Must be installed immediately in the water input of the unit, in a position that is easily accessible for cleaning.



ATTENTION

▶ **The filter never should be removed, this operation invalidates the guaranty.**

The filter must have an adequate mesh to prevent the entry of particles grater that:

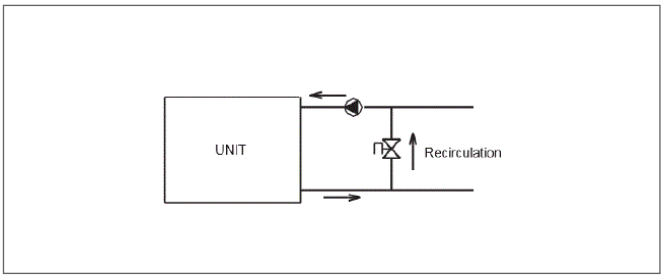
plate exchanger (mm)	1,6

6.9 Water flow-rate

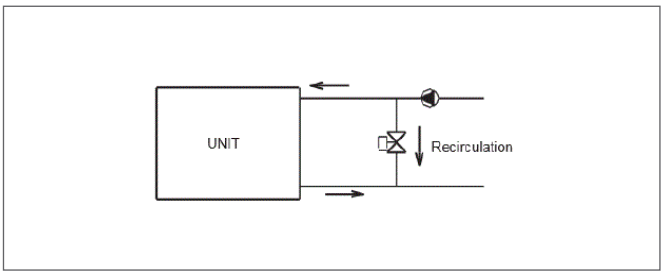
The project water-flow must be:

- inside the exchanger operating limits (see the TECHNICAL INFORMATION section)
- guarantee, also with variable system conditions (for example in systems where some circuits are bypassed in particular situations).

If the system capacity is below the minimum flow, bypass the system as indicated in the diagram.



If the system capacity exceeds the minimum flow, bypass the system as indicated in the diagram.



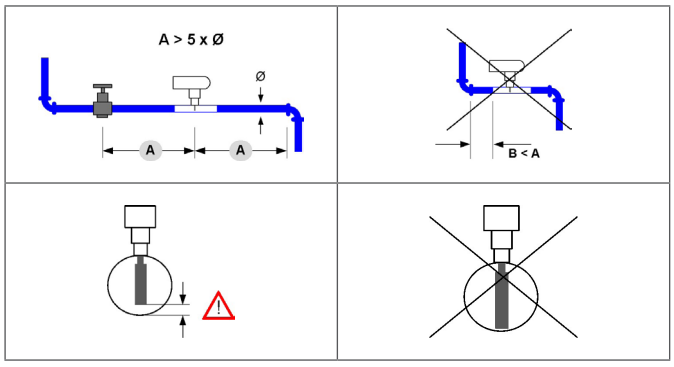
6.10 Minimum system water content

Minimum system water volumes are described within chapter TECHNICAL DATA and they have to be satisfied for a proper functioning of the unit.

6.11 Flow Switch

The flow switch must be present to ensure shutdown of the unit if water is not circulating.

It has to be installed in a duct rectilinear part, not in proximity of curves that cause turbulences.



6.12 Operation sequence

Before starting the unit pump:

1 Close all vent valves in the high points of the unit hydraulic circuit

2 Close all drain shut-off valves in the low points of the unit's water circuit
exchangers
pumps
collectors
storage tanks

3 Carefully wash the system with clean water: fill and drain the system several times.

4 use the bypass to exclude the exchanger from the flow (diagram on the previous page)

5 fill and empty the system multiple times.

6 Apply additives to prevent corrosion, fouling, formation of mud and algae.

7 Fill the plant

8 do not use the unit pump.

9 Execute leakage test.

10 Isolate the pipes to avoid heat dispersions and formation of condensate.
Leave various service points free (wells, vents, etc).

ATTENTION

▶ **Neglecting the washing will lead to several filter cleaning interventions and at worst cases can cause damages to the exchangers and the other parts.**

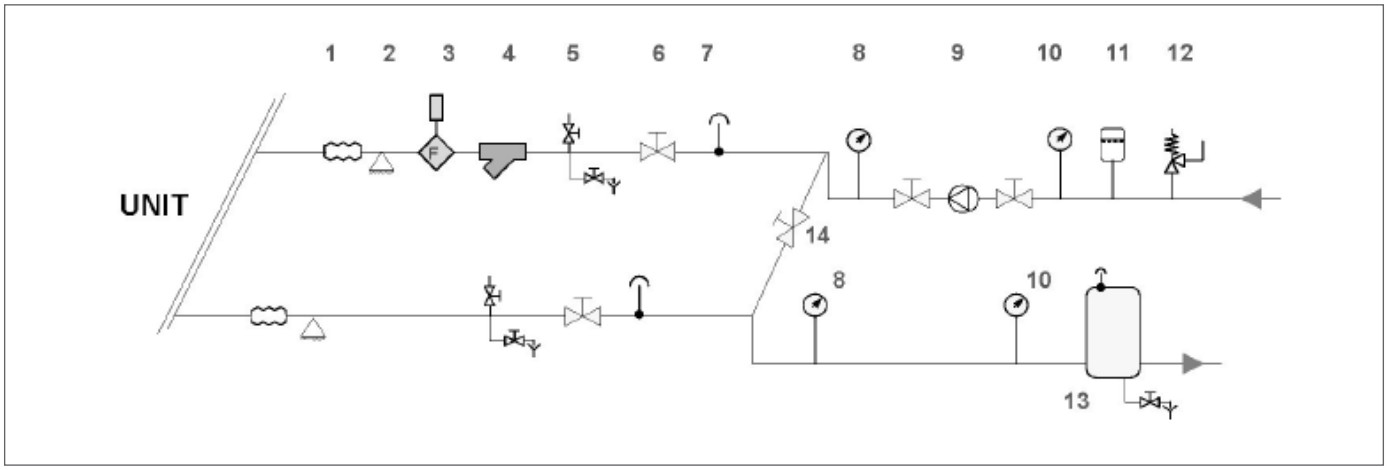
6.13 Racommended connection

The installer must define:

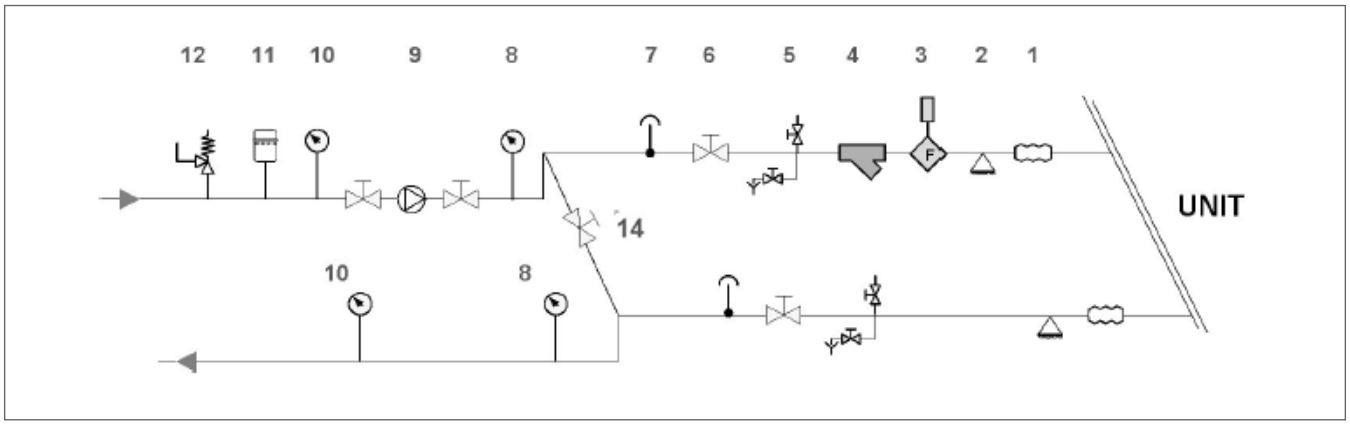
- component type
- position in system.

The schemes are indicative

Evaporator side connection



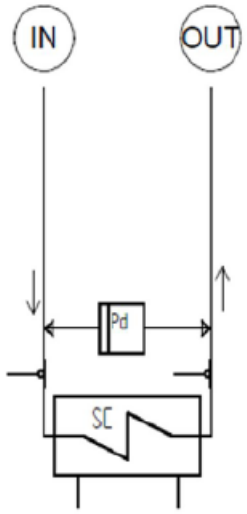
Source side connection



1 flexible couplings
2 piping supports
3 flow switch
4 filter
5 exchanger chemical washing valve + drain valve
6 shut-off valve
7 vent
8 pressure gauge
9 pumping group
10 thermometer
11 expansion vessel
12 safety valve
13 inertial tank
14 exchanger chemical washing valve
Provide the safety lock.
The bypass must not be opened in normal operation. Risk of flow rate reduction to the exchanger.

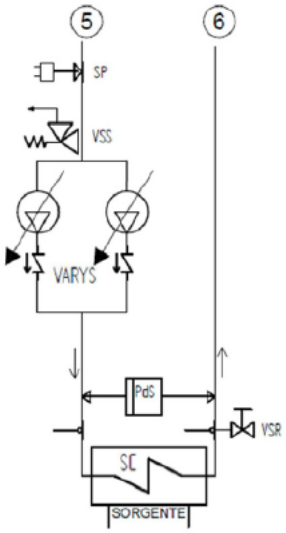
6.14 Heating side hydronic unit configuration

Standard unit



IN	Source side inlet
OUT	Source side outlet
Pd	Differential pressure switch
SC	Plate heat exchangers

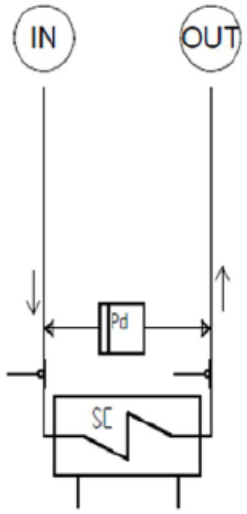
Unit with VARYFLOW+ (VARYS)



5	Source side inlet
6	Source side outlet
SP	Circuit charging pressure switch, calibrated to 0.7 bar
VSS	Safety valve calibrated to 6 bar
VARYS	Hydronic unit VARYFLOW + source side
Pds	Source side differential pressure switch
VSR	Relief valve
SC	Plate heat exchangers

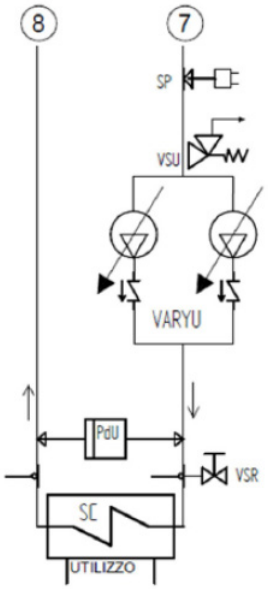
6.15 Cooling side hydronic unit configurations

Standard unit



IN	Source side inlet
OUT	Source side outlet
Pd	Differential pressure switch
SC	Plate heat exchangers

Unit with VARYFLOW+ (VARYU)



The pumps are controlled by the unit in such a way as to reduce the water flow and increase the temperature jump to the used exchanger.

The flow rate variation occurs only if the water outlet temperature on the user side is below 45 ° C.

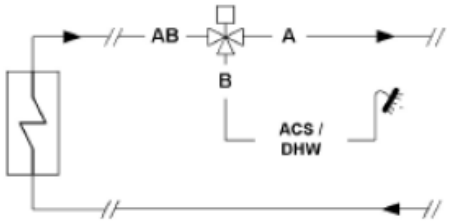
With the two inverter pumps it is possible to obtain a maximum temperature jump on the user side of 10 ° C

7	Source side inlet
8	Source side outlet
SP	Circuit charging pressure switch, calibrated to 0.7 bar
VSU	Safety valve calibrated to 6 bar
VARYU	Hydronic unit VARYFLOW + source side
PdU	Utility side differential pressure switch
VSR	Relief valve
SC	Plate heat exchangers

Valve for Domestic Hot Water

UNIT : user side

SYSTEM : user side



Parameters settings

Par.	Description	Value
23	Enable domestic hot waterl	1
580	Setpoint	

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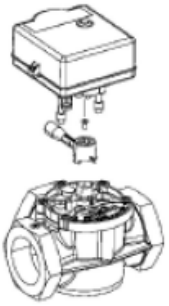

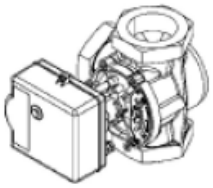

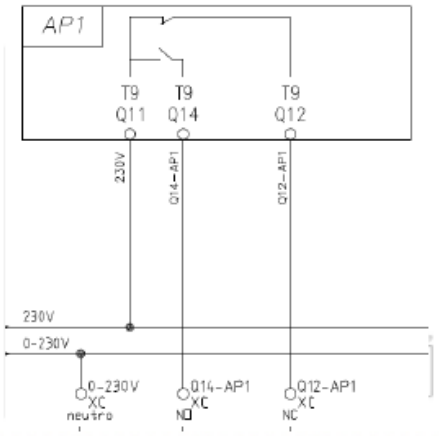

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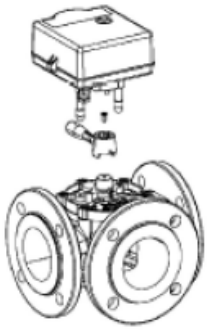
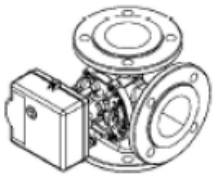
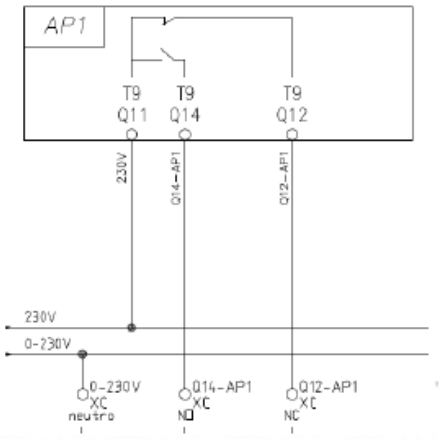






3-way modulating valve

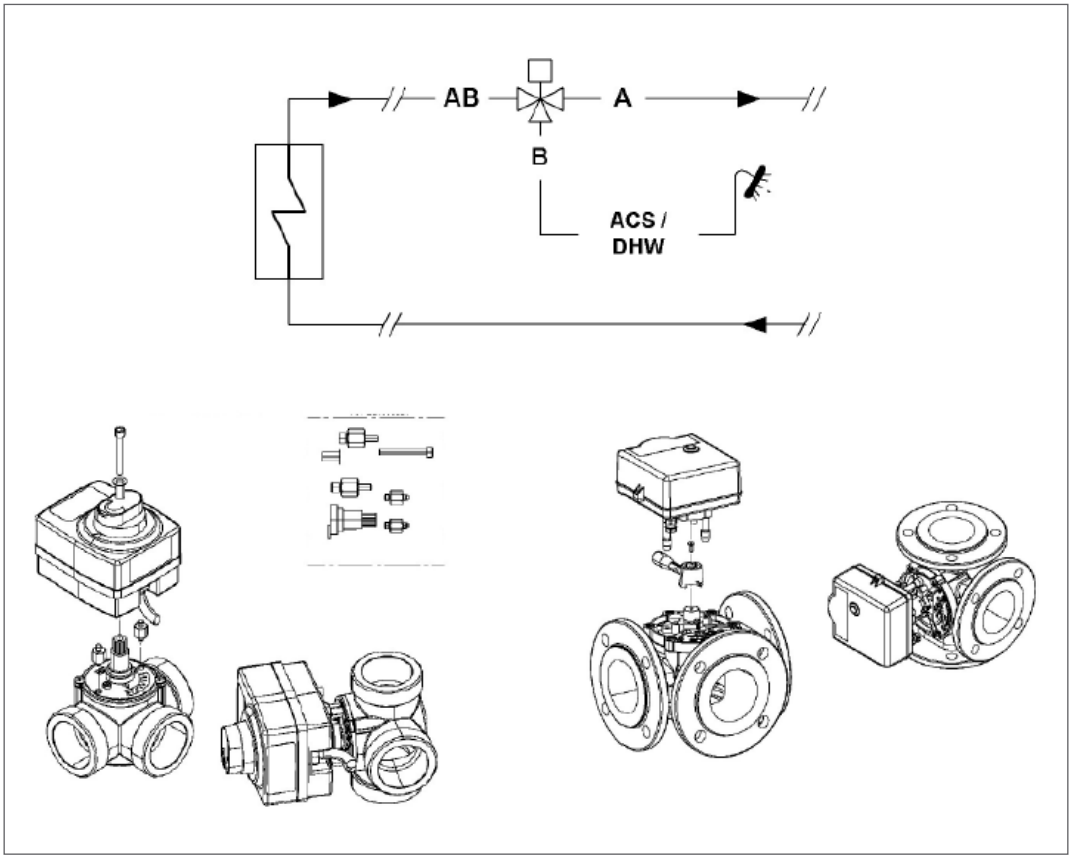
In the case of application with a high temperature source (> 25 ° C) it is advisable to avoid frequent start-ups of the unit with the water temperature on the user side lower than the water temperature on the source side.

To ensure correct operation of the unit in this situation, it is possible to select the option: V3MOL User side modulating 3-way valve for operating limits.

The valve must be mounted on the plant side and is controlled by the unit to reduce the water flow in order to increase the temperature jump to the used exchanger.

The flow rate variation occurs only if the water outlet temperature on the user side is below 45 ° C.

With the modulating valve it is possible to obtain a temperature jump on the user side up to 20 ° C.



Parameters to be changed if the V3MOLX accessory is installed

P0481	BypassFlusso	60 s
P0485	MinSignal	20 %
P0486	MaxSignal	100 %
P0493	TypeRegulation	Valve

7. Electrical connections

The characteristics of the electrical lines must be determined by qualified electrica personnel able to design electrical installations; moreover, the lines must be in conformity with regulations in force.

The protection devices of the unit power line must be able to stop all short circuit current, the value must be determined in accordance with system features.

The power cables and the protection cable section must be defined in accordance with the characteristics of the protections adopted.

All electrical operations should be performed by trained personnel having the necessary qualifications required by the regulations in force and being informed about the risks relevant to these activities.

Operate in compliance with safety regulations in force.

7.1 Electrical data

The serial number label reports the unit specific electrical data, included any electrical accessories.

The electrical data indicated in the technical bulletin and in the manual refer to the standard unit, accessories excluded.

The matriculation plate shows the indications foreseen by the standards, in particular:

Voltage

F.L.A.: full load ampere, absorbed current at maximum admitted conditions

F.L.I.: full load input, full load power input at max. admissible condition

Electrical wiringdiagram Nr.

7.2 Connections

1 Refer to the unit electrical diagram (the number of the diagram is shown on the serial number label).

2 Verify that the electrical supply has characteristics conforming to the data shown on the serial number label.

3 Before starting work, ensure the unit is isolated, unable to be turned on and a safety sign used.

4 Ensure correct earth connection.

5 Ensure cables are suitably protected.

6 Prevent dust, insects or rodents from entering the electrical panel as they can damage components and cables.

7 Prevent noise from escaping from the compressor compartment; seal any openings made.

8 Fix the cables: if vacated, they may be subject to tearing.

9 The cables must not touch the compressor and the refrigerant piping (they reach high temperatures).

10 Do not drill holes in the electrical panel.

11 Alternatively, restore the IP rating with watertight systems.

12 Before power the unit, make sure that all the protections that were removed during the electrical connection work have been restored.

7.3 Power supply network requirements

1 The short circuit capacity of the line must be less than 15 kA

2 The units can only be connected to TN, TT distribution systems

3 Voltage 400-3-50 +/-10%

4 Phase unbalance < 2%

5 Harmonic distortion less than 12% (THDv<12%)

6 Voltage interruptions lasting no longer than 3ms and with at least 1 s between each one

7 Voltage dips not exceeding 20% of the RMS value, lasting no longer than a single period (50Hz) and with at least 1 s between each dip.

8 Earth cable as specified in the table:

Cross-section of the line conductors (mm^2)	Minimum cross-section of the protective conductor (PE) (mm^2)
$S \leq 16$	S
$16 < S \leq 35$	16
$S > 35$	S/2

7.4 Signals / data lines

Do not exceed the maximum power allowed, which varies, according to the type of signal.

Lay the cables far from power cables or cables having a different tension and that are able to emit electromagnetic disturbances.

Do not lay the cable near devices which can generate electromagnetic interferences.

Do not lay the cables parallel to other cables, cable crossings are possible, only if laid at 90°.

The type of cable must be suitable for RS-485 serial data communication.

A 3-pole shielded bus cable is required.

The data transmission bus cable must be verified according to the type of installation in which it will be placed and must comply with local standards.

The bus cable must comply with non-prescribed local electrical standards (e.g. insulation, voltages, flame propagation, etc.).

The cable shield must be grounded at a single point free from disturbances.

In order to ensure correct communication, the earth connection of the shield can also be configured

differently depending on the area and the types of interference.

Allowed topology: daisy-chain (enter and exit).

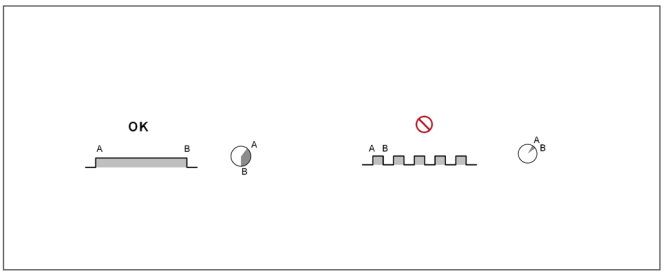
Other types such as “ring” or “star” are not allowed.

Do not use cable lugs on the communication bus.

7.5 Remote ON-OFF

Do not perform short On-Off cycles.

Do not use the remote On-Off with a thermoregulation function.

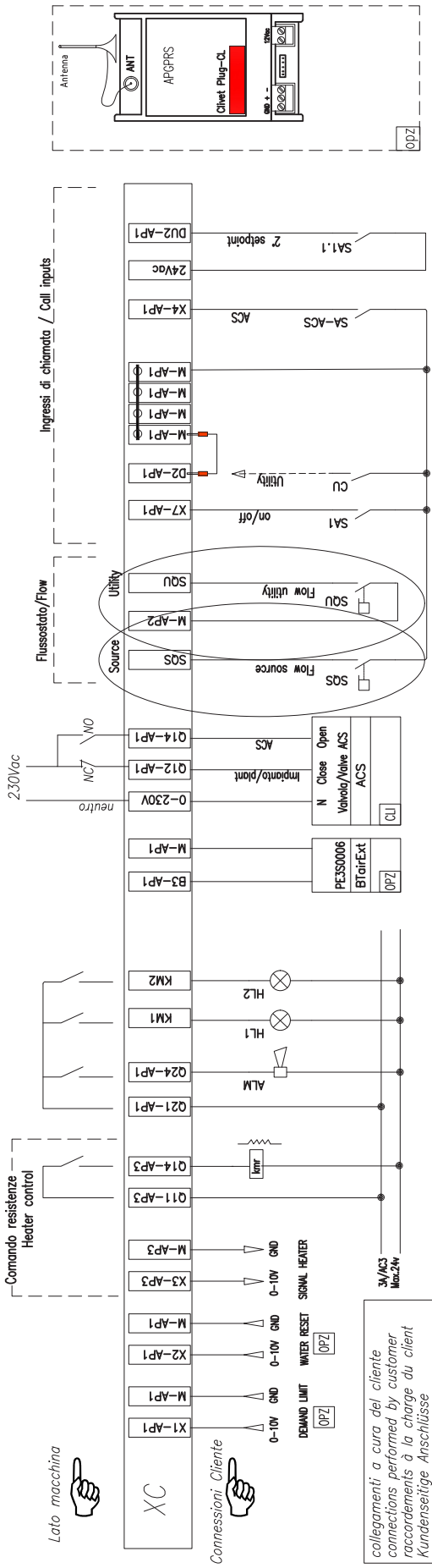


7.6 Controller wiring sections

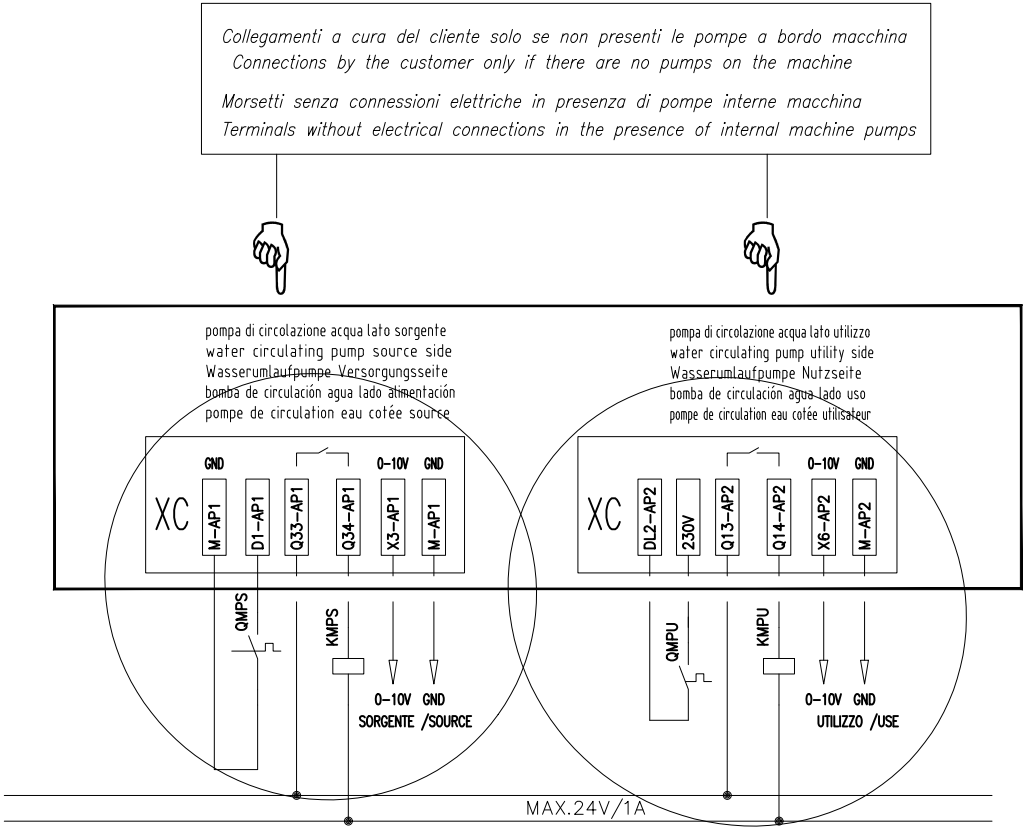
Size	Wires
19.2–22.2	Cable section 10~70mm^2
27.2–80.2	M8X25mm Max bar width 20mm

7.7 Connections performed by Customer

	English	Deutsch	Español	Italiano	Français
DEMAND LIMIT	demand limit	demand limit	demand limit	demand limit	demand limit
WATER RESET	water reset	water reset	water reset	water reset	water reset
BTairExt	outside air temperature probe	Außenlufttemperaturfühler	sonda de temperatura aire externo	sonda di temperatura aria esterna	sonde de température air extérieur
HL1	compressor status signal lamp	Signallampe Verdichterzustand	lámpara de señalización estado compresor	lampada si segnalazione stato compressore	lampe de signalisation état compresseur
HL2	compressor status signal lamp	Signallampe Verdichterzustand	lámpara de señalización estado compresor	lampada si segnalazione stato compressore	lampe de signalisation état compresseur
SA5	remote winter/summer selector	Fernwahlschalter Winter/Sommer	selector remoto "verano/invierno"	selettore remoto estate/inverno	sélecteur déporté "été/hiver"
SA1	remote on/off selector	Fernwahlschalter Ein/Aus	selector on/off remoto	selettore on/off remoto	sélecteur ON/OFF déporté
SQS	Source side exchanger flow switch	Strömungswächter des Wärmetauschers Quellenseite	Flujostato cambiador lado fuente	flussostato scambiatore lato sorgente	Contrôleur de débit de l'échangeur côté source
SQU	utility side exchanger flow switch	Strömungswächter Wärmetauscher auf Verbraucherseite	flujostato intercambiador lado equipo	flussostato scambiatore lato utilizzo	contrôleur de débit échangeur côté utilisateur
–	–	–	–	–	–
CU	use call	Verbrauchanruf	llamadam utilización	Chiamata utilizzo	appel utilisation
–	–	–	–	–	–
SA–ACS	sanitary water cycle selector	Wahlschalter der Brauchwasser	selector solicitud agua sanitaria	selettore richiesta acqua sanitaria	sélecteur demande eau sanitaire
SA1.1	second set-point enabling switch	Wahlschalter 2.Sollwert	selector habilitación segundo set-point	selettore abilitazione secondo set-point	sélecteur validation deuxième consigne
ACS	valve ACS	Hahn ACS	Valvula de ACS	valvola ACS	Valve ACS
ALM	Cumulative alarm block	Signallampe Verdichterzustand	señalización bloqueo cumulativo	segnalazione blocco cumulativo	signalisation alarme
–	–	–	–	–	–
–	–	–	–	–	–



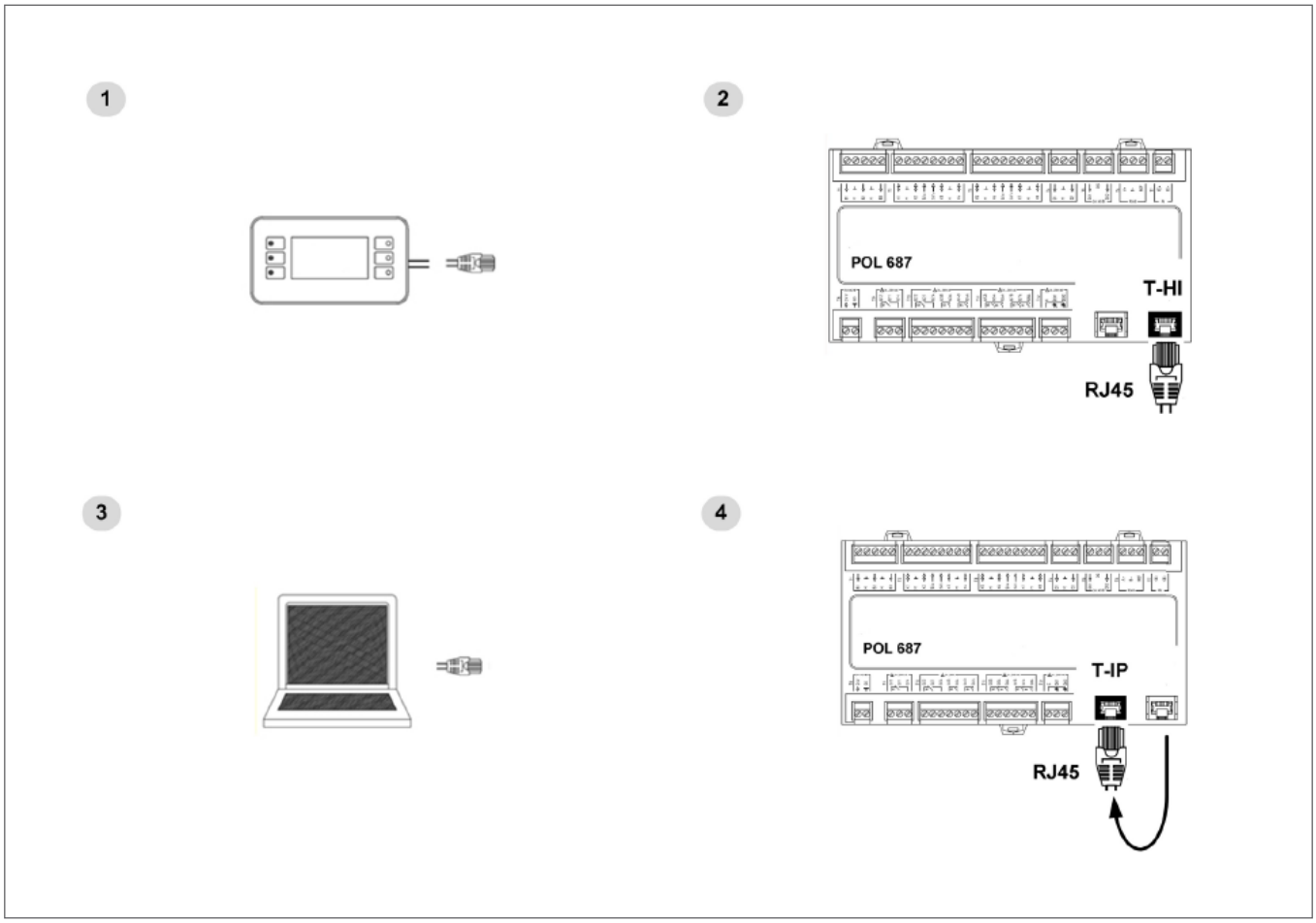
	Italiano	Deutsch	Español	English	Français
QMPU	Interruttore salvamotore pompa lato utilizzo	Motorschutzschalter der Pumpe auf der Nutzseite.	Interruptor cortacircuitos bomba lado utilización.	Overload cutout switch of the pump utility side.	Interrupteur discontacteur pompe côté utilisateur.
KMPU	contattore di comando pompa lato utilizzo	Schaltgeber Pumpensteuerung auf Verbraucherseite	contactor de accionamiento bomba lado equipo	utility side pump control contactor	contacteur commande pompe côté utilisateur
QMPS	protezione termica pompa lato sorgente	Überhitzungsschutz der Pump Versorgungsseite	protección térmica de la bomba lado alimentación	pump thermal overload protection source side	protection thermique de la pompe côté source
KMPS	contattore di comando pompa lato sorgente	Schaltgeber Pumpensteuerung auf Quellseite	contactor de accionamiento bomba lado fuente	source side pump control contactor	contacteur commande pompe côté source



7.8 Computer connection

Configure PC

1 connect PC to electronic module with LAN cable
2 check in the taskbar that the connection is active
3 open Control Panel and select Network and sharing centre
4 select Modify board setting
5 select Local area network (LAN) connection
6 select Internet protocol version 4 (TPC/IPV4) and press the Property button
7 set IP address 192.168.1.100
8 set Subnet mask as 255.255.255.0
9 confirm (OK)
10 press Windows START button
11 write cmd
12 write Ping 192.168.1.42
13 check that a response string is given
14 open a browser (Chrome, Firefox, etc.)
15 write http:/192.168.1.42
16 Userid = WEB
17 Password = SBTAdmin!



1 Standard keypad
2 RJ45: standard connection
3 PC-not supplied
4 PC connection, shift RJ45 from T-HI to T-IP

7.9 Remote control

Option

1 Distance up to 350 m

2 Distance up to 700 m

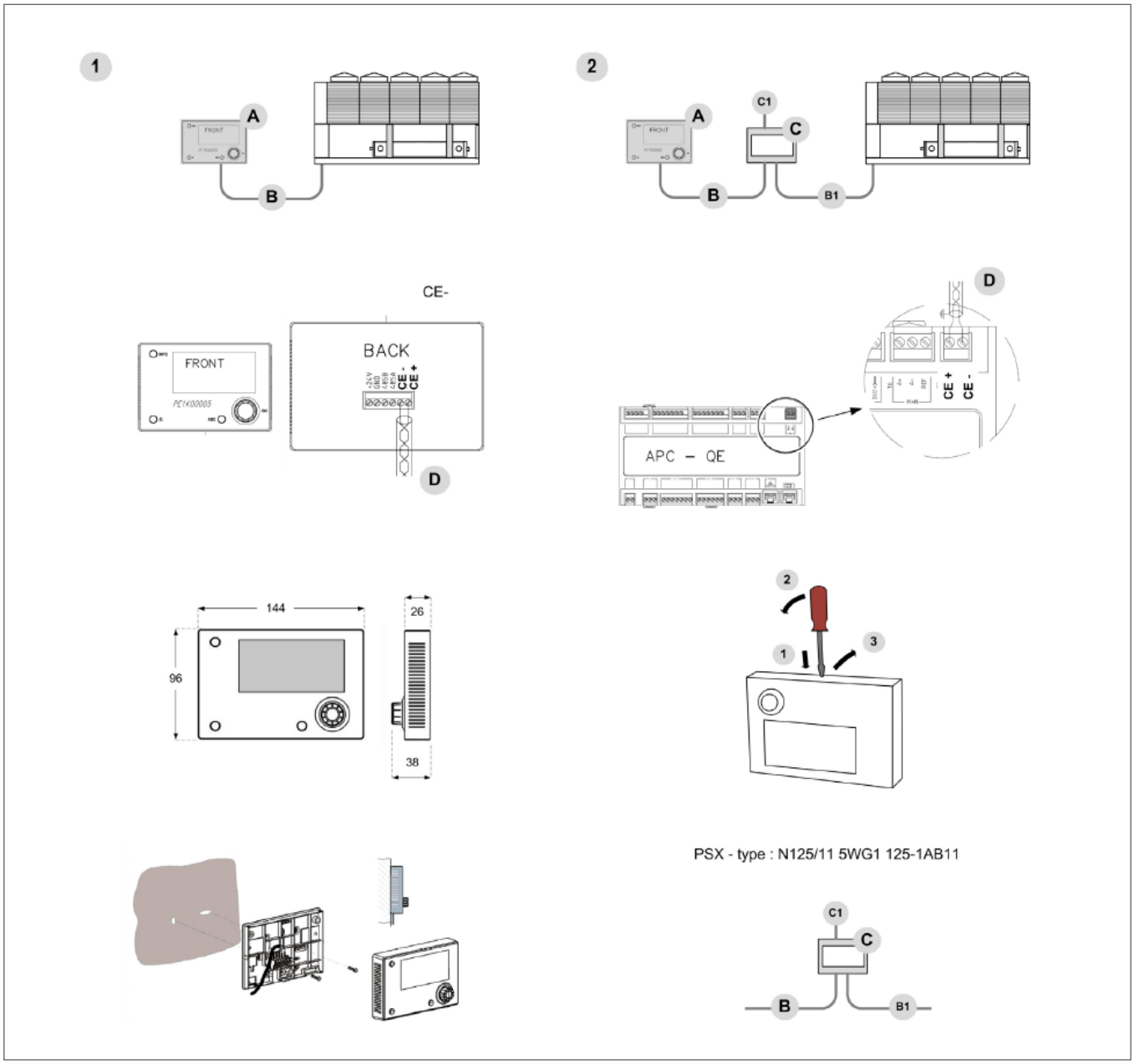
A User interface

B=B1 KNX bus, max 350 m
shielded twisted pair ø 0.8 mm
use an EIB/KNX marked cable

C PSX - Mains power output
power output N125/11 5WG1 125-1AB11

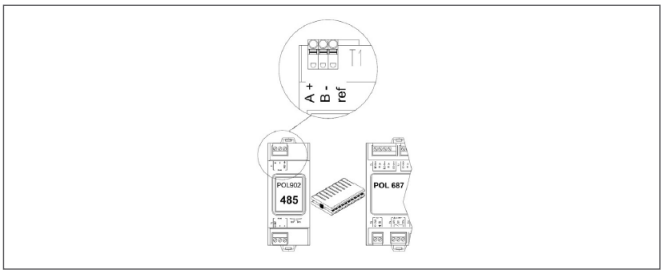
C1 AC 120...230V, 50...60Hz

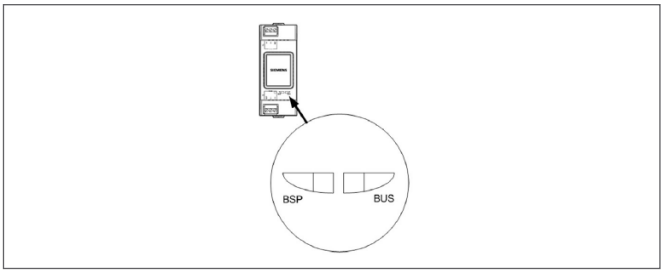
D KNX bus, max 350 m



7.10 Modbus - RS485

Option





BSP LED	communication with AP1 module
green	communication ok
yellow	software ok but communication with AP1 down
red	flashing: software error steady: hardware error
BUS LED	**Modbus communication**
green	communication ok
yellow	startup / 1 canal not communicating
red	communication down

7.10.1 Modbus / LonWorks / cable requirements

Pair of twisted and shielded conductors

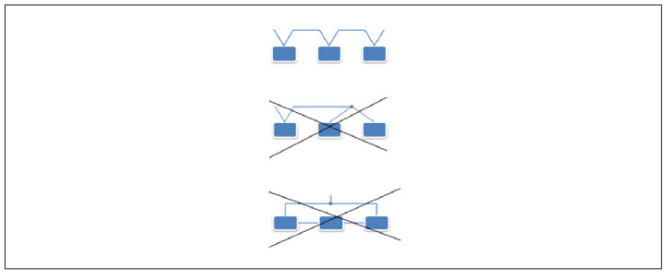
Conductor cross-section 0.22mm2...0.35mm2

Rated power between conductors < 50 pF/m

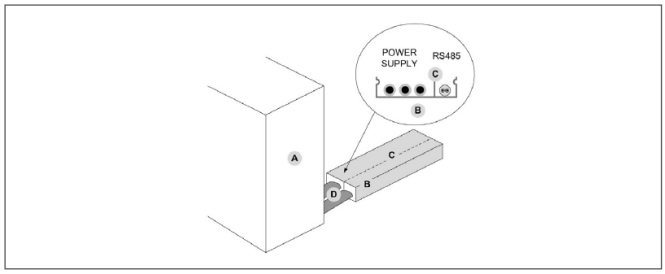
Nominal impedance 120 Ω

Recommended cable BELDEN 3106A

- Every RS485 serial line must be set up using the 'In/Out' bus system.
- Other types are not allowed.



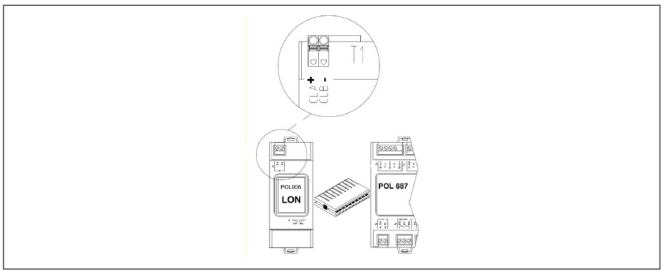
- The difference in potential between the earth of the two RS485 devices that the cable shielding needs to be connected to must be lower than 7 V
- There must be suitable arresters to protect the serial lines from the effects of atmospheric discharges
- A 120 ohm resistance must be fitted on the end of the serial line. Alternatively, when the last serial board is equipped with an internal terminator, it must be enabled using the specific jumper or dip switch.
- The cable must have insulation features and non-flame propagation in compliance with national regulation.
- The RS485 serial line must be kept as far away as possible from sources of electromagnetic interference.

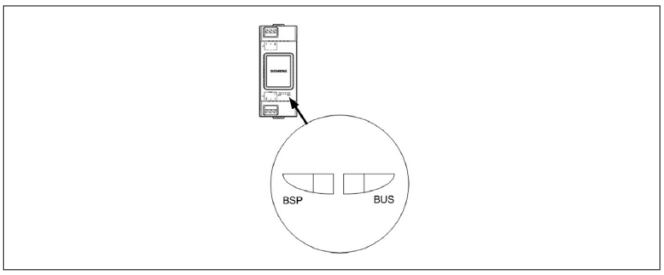


A Unit
B Metal conduit
C Metal septum
D Metal-lined sheath (sleeve)

7.11 LonWorks

Option





BSP LED	communication with AP1 module
green	communication ok
yellow	software ok but communication with AP1 down
red	flashing: software error steady: hardware error
BUS LED	**LonWorks communication**
green	ready to communicate
yellow	startup
red	flashing: communication not possible communication down

LONWORK CABLE TYPE

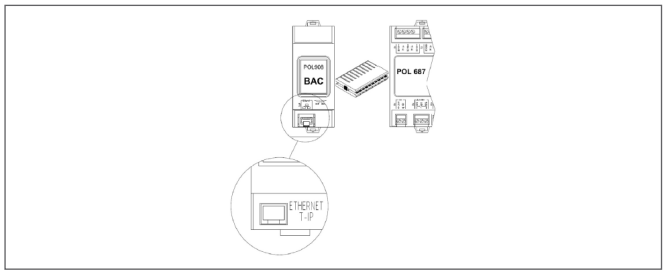
Echelon allows three cable types for channel type TP/FT-10, including the Category 5 network cable used commonly in building automation and control (TIA 568A Cat-5).

CAT-5 SPECIFICATIONS

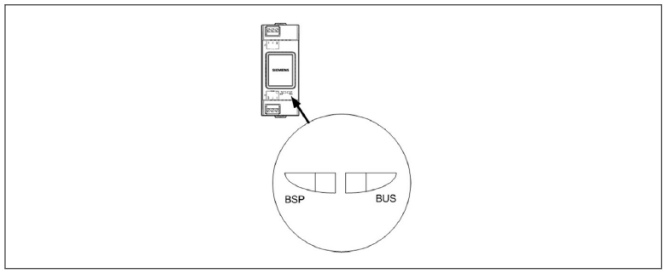
- Unshielded cable, twisted pair with at least 18 beats per meter:
- Cross-sectional area Min 0,5mm, AWG24, 0,22mm2
- Operating capacity between two wires of a pair < 46nF/km
- DC loop resistance < 168 ohm
- Impedance 100 +/- 15% @ f > 1MHz
- Capacity pair to ground, asymmetric. < 3.3 nF/km

7.12 BACnet IP

Option



Ethernet 10/100 Mbit(IEEE 8025.3U)
RJ45, 8 pins



BSP LED	communication with AP1 module
green	communication ok
yellow	software ok but communication with AP1 down
red	flashing: software error steady: hardware error
BUS LED	**BACnet communication**
green	ready to communicate
yellow	startup
red	BACnet server down restart after 3 sec

7.13 Ecoshare

Option

The Master unit (identified by the LNAddress parameter = 1) controls the network.

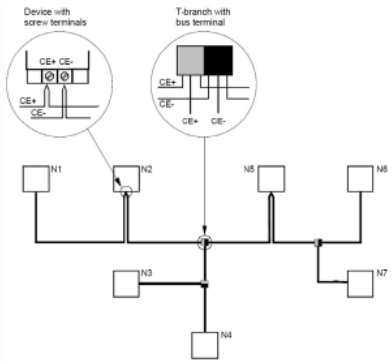
The network can be extended to a maximum of 8 units (1 master – 7 slaves).

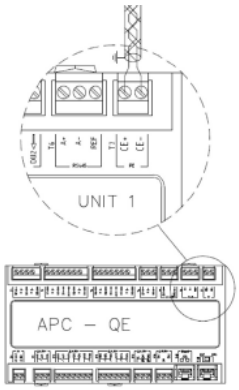
The master manages connected units in order to obtain:

- The coordination of operation (Mode, status, setpoint and signal commands of the DemandLimit function are transmitted from the Master unit to the Slave units).
- The rotation of unit operating priorities based on their wear (total number of hours of operation).
- The management of one or more units on standby. The units put on standby are always the ones showing more wear. The units on standby are rotated with daily frequency or when an alarm is triggered on the units in operation.

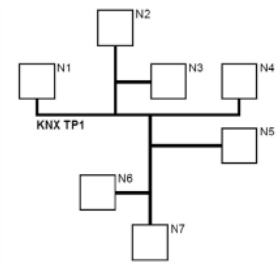
Connection requirements

- Maximum length of the bus line: 700 m
  - Maximum distance between 2 units: 300 m
  - Type of cable: shielded twisted pair, Ø 0.8 mm, use an EIB/KNX marked cable
  - Possible connections: Tree, star, in/out bus, mixed
  - It is not possible to use a loop connection
  - No end-of-line resistance or terminator required
  - There must be suitable arresters to protect the serial lines from the effects of atmospheric discharges
  - The data line must be kept separate from the power conductors or powered at different voltages and away from possible sources of electrical interference

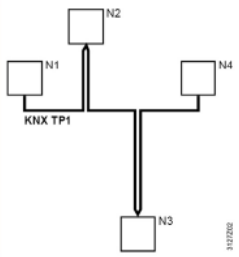




Tree topology (with stub lines)



Line topology (with loops)



Path: Main Menu / Unit parameters / Ecoshare		
Parameters	Short description	Description
P0655	LNInstalledUnits	Number of units installed/connected in Ecoshare 1 – 8
P0656	LNStandByUnits	Number of units on standby 0 – 6
P0657	LNOffset	Temperature Offset to be added to the unit setpoint
P0658	TypeRegMS	Ecoshare adjustment type 0 – 2
P0659	LNAddress	Unit address 1 – 8 (1 = MASTER)
P0664	LNOffsetRec	Offset for setpoint shift recovery side 0 – 15 °C
P0702	KRegMS	Activates eco share new mode (1 only on multifunctional unit)

8. Startup

The operations indicated should be performed by qualified technicians with specific training on the product.

Upon request, the service centres can perform the start-up.

The electric, hydraulic connections and the other work of the system are the responsibility of the installer.

Please agree upon the start-up data with the service centre with sufficient advance.

Before checking, please verify the following:

- the unit should be installed properly and in compliance with this manual
- the electrical power supply line should be isolated at the beginning
- the unit isolator is open, locked and equipped with the suitable warning
- make sure no tension is present

Attention

- ▶ **After turning off the power, wait at least 5 minutes before accessing to the electrical panel or any other electrical component.**
- ▶ **Before accessing check with a multimeter that there are no residual stresses.**

8.1 Start-up sequence

For details refer to the different manual sections.

Unit OFF power supply

1 safety access
2 suitable frame to withstand unit weight + people weight
3 functional spaces
4 structure integrity
5 unit on vibration isolators
6 unit on level ground
7 unit input water filter + shut-off valves for cleaning
8 hydraulic connections as per recommended diagram
9 expansion tank (indicative volume = 5% system content)
10 minimum system water content
11 cleaned system
12 loaded system + possible glycol solution + corrosion inhibitor
13 antifreeze protections: glycol solution + possible heating cable
14 system under pressure + vented
15 refrigerant circuit visual check
16 earthing connection
17 power supply features
18 Customer care connections: electrically connected, configured

8.2 Start-up sequence

For details refer to the different manual sections.

Unit ON power supply

1 compressor crankcase heaters operating at least since 8 hours
2 off-load voltage measure
3 phase sequence check
4 pump manual start-up and flow check
5 shut-off valve refrigerant circuit open
6 unit ON
7 load voltage measure
8 verify the lack of bubbles in the liquid light (if applicable)
9 measure return and supply water temperature
10 measure super-heating and sub-cooling
11 run tests in both heat and cool mode (only for heat pump units)
12 check no anomalous vibrations are present
13 climatic curve personalization
14 scheduling customisation
15 check that all panels are closed and fastened properly
16 complete and available unit documentation

* only if present

8.3 Refrigeration circuit

1 Check carefully the refrigerating circuit: the presence of oil stains can mean leakage caused by transportation, movements or other).
2 Verify that the refrigerating circuit is in pressure: Using the unit manometers, if present, or service manometers.
3 Make sure that all the service outlets are closed with proper caps; if caps are not present a leak of refrigerant can be possible.
4 Open the valves of the refrigerant circuit, if there are any.

8.4 Electric Circuit

1 Verify that the unit is connected to the ground plant.
2 Check the conductors are tightened as: the vibrations caused by handling and transport might cause these to come loose.
3 Connect the unit by closing the sectioning device, but leave it on OFF.
4 Check the voltage and line frequency values which must be within the limits: 400/3/50 +/- 10%
5 Check and adjust the phase balance as necessary: it must be lower than 2%

Attention

▶ **Working outside of these limits can cause irreversible damages and voids the warranty.**

8.5 Options

Menu accessible only after having entered the password.

Access reserved only to specifically trained personnel.

Changing the parameters can cause irreversible damage.

Path: Main menu / Unit parameters / Options		
Parameters	**Short description**	**Description**
P0002	En DemandLimit	Enable Demand Limit enabling: 0 = disabled, 1 = analogue input, 2 = parameter
P0003	En WaterReset	Water reset enabling: 0 = Off, 1 = Cold, 2 = Hot, 3 = hot and cold
P0036	En CompExt	Climatic curve enabling: 0 = Off, 1 = Cold, 2 = Hot, 3 = hot and cold
P0050	En 2SetPoint	2SetPoint enabling: 0 = Off, 1 = On
P0051	PrioritaCmd	Priority of status and unit mode commands: Local [0] = Priority to local commands, BMS [1] priority to commands from system supervisor
P0053	En DIOn-Off	Remote ON-OFF enabling: 0 = Off, 1 = On
P0090	TypeDL	Inlet signal type: 0 = 0-10V; 1 = 4-20mA
P0091	TypeWR	Inlet signal type: 0 = 0-10V; 1 = 4-20mA

8.6 Start-up report

Identifying the operating objective conditions is useful to control the unit over time.

With unit at steady state, i.e. in stable and close-to-work conditions, identify the following data:

- total voltages and absorptions with unit at full load
- absorptions of the different electric loads (compressors, fans, pumps etc)
- temperatures and flows of the different fluids (water, air) both in input and in output from the unit
- temperature and pressures on the characteristic points of the refrigerating circuit (compressor discharge, liquid, intake)

The measurements must be kept and made available during maintenance interventions.

8.7 2014/68/UE PED directive

DIRECTIVE 2014/68/UE PED gives instructions for installers, users and maintenance technicians as well.

Refer to local regulations; briefly and as an example, see the following:

Compulsory verification of the first installation:

- only for units assembled on the installer's building site (for ex. Condensing circuit + direct expansion unit)

Certification of setting in service:

- for all the units

Periodical verifications:

to be executed with the frequency indicated by the Manufacturer (see the "maintenance inspections" paragraph)

8.8 Demand limit

Menu accessible only after having entered the password.

- **Access reserved only to specifically trained personnel.**
- **Changing the parameters can cause irreversible damage.**

The function allows you to limit the unit's power input with an external 0-10Vcc or 4-20mA signal.
The higher the signal, the lower the number of compressors available to fulfil the thermal demand.
Only if P0002 En DemandLimit ≠ 0
Path: Main menu / Unit parameters / Options

Step	Action	Menu - Variable	Buttons		Display
1	Press for 3 sec		√		Password
2	Set	Password	▲	√	
3	Press		i		Main menu
4	Select	Unit parameters	▼	√	Unit parameters
5	Select	Setpoint	▼	√	Setpoint
6	Select	Demand limit	▼	√	
7	Set	Demand limit	▲	▼	
8	Confirm		√		
9	Press for 3 sec		⌜		
10	Select	Local connection	√		

Path: Main menu / Unit parameters / Options		
Parameters	**Short desc.**	**Description**
P0090	TypeDL	Inlet signal type: 0=0-10V; 1=4-20mA
Path: Main menu / Unit parameters / Options		
P0200	set demand limit	Demand limit % value setting parameter

8.9 Climatic TExt

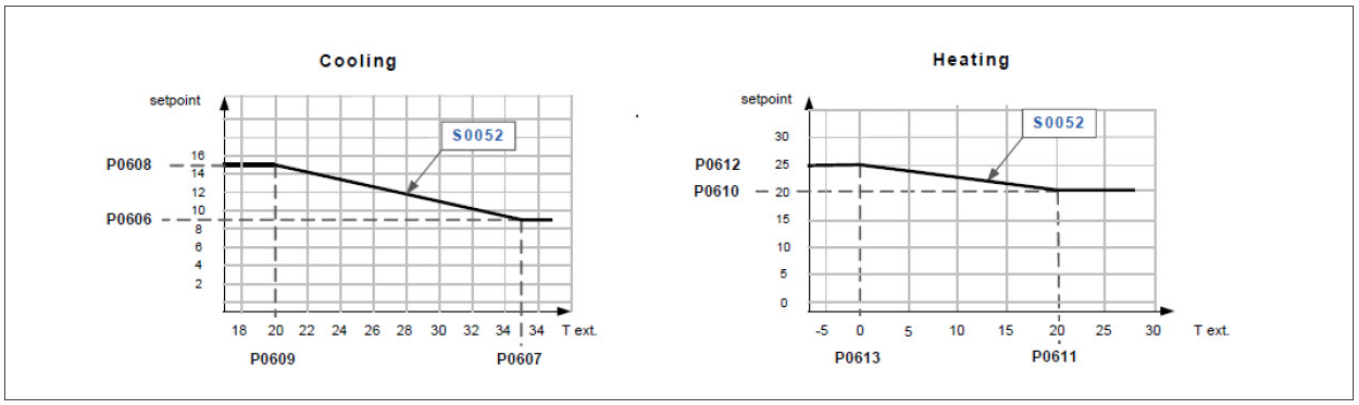
Menu accessible only after having entered the password.

- **Access reserved only to specifically trained personnel.**
- **Changing the parameters can cause irreversible damage.**

The setpoint defined by the climatic curve and Water Reset is displayed

Only if P0036: En Climatica = 1

Path: Main menu / Unit parameters / Options



Step	Action	Menu - Variable	Buttons		Display
1	Press for 3 sec		√		Password
2	Set	Password	▲	√	
3	Press		i		Main menu
4	Select	Unit parameters	▼	√	Unit parameters
5	Select	Climatica TExt	▼	√	Climatica TExt (pwd)
6	Select	Parameter	▼	√	
7	Set	Demand limit	▼	▲	
8	Confirm		√		
9	Press for 3 sec		⌜		
10	Select	Local connection	▼	√	

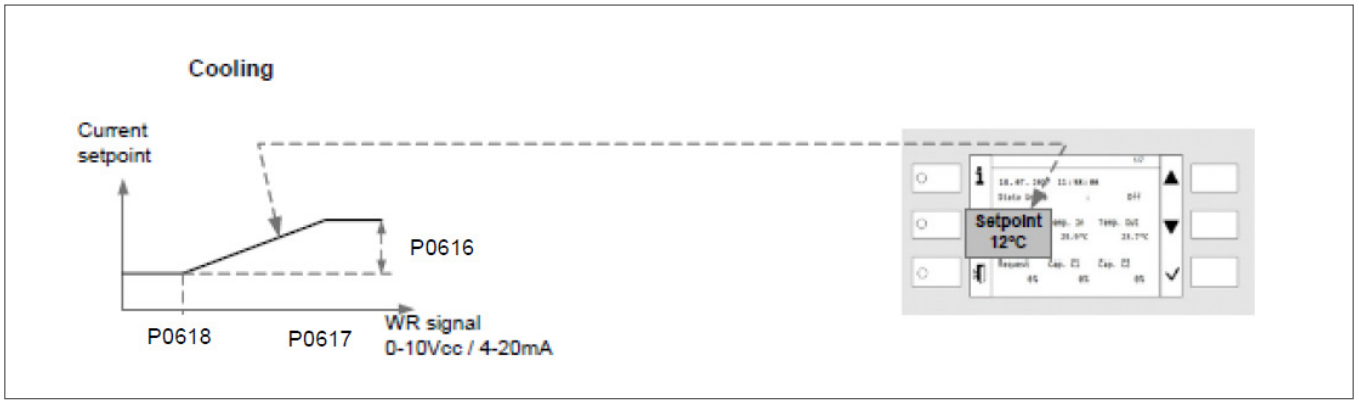
Path: Main menu / Unit parameters / Options		
Parameters	**Short desc.**	**Description**
P0606	CSptLow	value of set Cool for outdoor air greater than P0607
P0607	AirAtSetPointLowC	value of outdoor air for set Cool equal to the parameter P0606
P0608	CSptHigh	value of set Cool for outdoor air lower than P0609
P0609	AirAtSetPointHighC	value of outdoor air for set Cool equal to the parameter P0609
P0610	HSptLow	value of set Heat for outdoor air greater than P0612
P0611	AirAtSetPointLowH	value of outdoor air for set Heat equal to the parameter P0610
P0612	HSptHigh	value of set Heat for outdoor air lower than P0614
P0613	AirAtSetPointHighH	value of outdoor air for set Heat equal to the parameter P0613

8.10 Water reset

Menu accessible only after having entered the password.

- **Access reserved only to specifically trained personnel.**
- **Changing the parameters can cause irreversible damage.**

The function allows you to limit the unit's power input with an external 0-10Vcc or 4-20mA signal.
The setpoint defined by the climatic curve and Water Reset is displayed
Only if P0003: En WaterReset = 1
Path: Main menu / Unit parameters / Options



Step	Action	Menu - Variable	Buttons		Display
1	Press for 3 sec		√		Password
2	Set	Password	▼	√	
3	Press		i		Main menu
4	Select	Unit parameters	▼	√	Unit parameters
5	Select	Water reset	▼	√	Water reset
6	Select	Parameter	▼	√	
7	Set	Demand limit	▼	▲	
8	Confirm		√		
9	Press for 3 sec		⌐		
10	Select	Local connection	√		

Path: Main menu / Unit parameters / Options		
Parameters	**Short desc.**	**Description**
P0091	TypeWR	Inlet signal type: 0=0-10V; 1=4-20mA
Path: Main Menu / Unit parameters / Water reset		
P0616	MaxCWRC	Maximum correction to be added to the COOL setpoint
P0617	SWRMaxC	% value of the WR control signal corresponding to the correction of the maximum Cool setpoint
P0618	SWRMinC	% value of the WR control signal corresponding to the correction of the Cool setpoint equal to 0
P0615	MaxCWRH	Maximum correction to be applied to the setpoint Heat
P0619	SWRMaxH	Value of the WR control signal corresponding to the correction of the set HEAT equal to max
P0620	SWRMinH	Value of the WR control signal corresponding to the correction of the set HEAT equal to 0

8.11 Start-up report

Identifying the operating objective conditions is useful to control the unit over time.

With unit at steady state, i.e. in stable and close-to-work conditions, identify the following data:

- total voltages and absorptions with unit at full load
- absorptions of the different electric loads (compressors, fans, pumps etc)
- temperatures and flows of the different fluids (water, air) both in input and in output from the unit
- temperature and pressures on the characteristic points of the refrigerating circuit (compressor discharge, liquid, intake)

The measurements must be kept and made available during maintenance interventions.

8.12 2014/68/UE PED directive

DIRECTIVE 2014/68/UE PED gives instructions for installers, users and maintenance technicians as well.

Refer to local regulations; briefly and as an example, see the following:

Compulsory verification of the first installation:

- only for units assembled on the installer's building site (for ex. Condensing circuit + direct expansion unit)

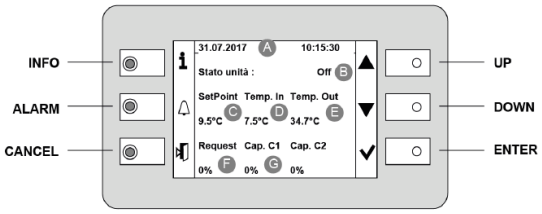
Certification of setting in service:

- for all the units

Periodical verifications:

- to be executed with the frequency indicated by the Manufacturer (see the "maintenance inspections" paragraph)

9. Control



9.1 LED

INFO	Not used
ALARM	Flashing / Steady = alarm present
CANCEL	Not used currently

9.2 Display

Ref.	Variable	description
A		Date - Time
B	Stato Attuale	On / off / eco / pmp On
C	SetPoint	Control temperature
D	Temp. IN	User side water inlet temperature
E	Temp. OUT	User side water outlet temperature
F	Request	Capacity demand from temperature controller (including any Demand Limit restriction)
G	Cap. C1	Capacity demand supplied from compressor 1
	Cap. C2	Capacity demand supplied from compressor 2

9.3 Buttons

Symbol	Name	description
i	Info	Main menu
🔔	Alarm	Displays alarms
↵	Cancel	Exit, Previous level, Keypad settings
▲	Up	Increases value
▼	Down	Decreases value
√	Enter	Confirm, Password

9.4 Change unit status

Step	Action	Menu - Variable	Buttons	Display
1	Press		i	Main menu
2	Select	Local status cmd	▼ √	
3	Set	OFF - ECO - ON - Pump ON	▼ ▲	
4	Confirm		√	
5	Exit		⌜	
ON	Compressors enabled			
OFF	Compressors disabled - Antifreeze protections on user side on			
ECO	Compressors enabled - Pumps switched on periodically - Setpoint = EcoCool setpoint			
PMP_ON	Compressors disabled - Pumps on			

9.5 Change mode

Step	Display	Action	Menu - Variable	Buttons
1	Main menu	Press		i
2		Select	Local mode cmd	▼ √
3		Set	Cool: cooling Heat: heating	▼ ▲
4		Confirm		√
5		Exit		⌜

9.6 Change setpoint

Step	Action	Menu - Variable	Buttons	Display
1	Press		i	Main menu
2	Select	Unit parameters	▼ √	Unit parameters
3	Confirm	Setpoint	√	
4	Select	Setpoint	▼ √	
5	Set	Setpoint	▼ ▲	
6	Confirm		√	
7	Exit		⌜	

Parameters	Short desc.	Description
P0583	SetPointCooling	Cooling setpoint
P0584	2SetPointCooling	2nd Cooling Setpoint - Enabled from remote start-up
P0855	SetPointECOCooling	Economic summer SetPoint
P0577	SetPointHeating	Setpoint Heating
P0578	2SetPointHeating	2° Setpoint Heating - enable by remote switch
P0579	SetPointECOHeating	Economic Heating setpoint

9.7 Display statuses

Step	Action	Menu - Variable	Buttons	Display
1	Press		i	Main menu
2	Select	Unit statuses	▼ √	
3	Select	General, circuit, etc.	▼ √	
4	Exit		⌜	

9.8 Scheduler

It is possible to set 6 status changes (Off, Eco, On, Recirculation) for each week day

Step	Action	Menu - Variable	Buttons	Display
1	Press		i	Main menu
2	Select	Scheduler	▼ √	Scheduler
3	Select	Day	▼ √	
4	Select	Time	▼ √	
5	Set	Event time	▲ ▼	
6	Confirm		√	
7	Select	Value	▼ √	
8	Set	On / Eco ...	▲ ▼	
9	Confirm		√	
10	Exit		⌜	

9.9 Scheduler enabling

Step	Action	Menu - Variable	Buttons	Display
1	Press for 3 sec		√	Password
2	Set	Password	▲ √	
3	Press		i	Main menu*
4	Select	Unit parameters	▼ √	
5	Select	Unit options	▼ √	
6	Set	P0061 = 1	▼ √	
7	Press for 3 sec		⌜	
8	Select	Local connection	▼ √	

* Unit Parameters menu is displayed

9.10 Keypad settings

Step	Action	Menu - Variable	Buttons	Display
1	Press for 3 sec		⌜	
2	Press		√	
3	Select		▼ √	HMI Settings
4	Press		√ ▼	
5	Press		⌜	
6	Select	Local connection	▼ √	

9.11 Alarms

- **Before resetting an alarm, identify and remove its cause.**
- **Repeated resets can cause irreversible damage or malfunction to the system.**

Alarm display: steps 1-3
Alarm reset: steps 4-10
Example:
+ eE001 Phase monitor: Fault = active alarm
- EE003 User P1 faulty: Ok = alarm reset

Step	Action	Menu - Variable	Buttons	Display
1	Press			Alarm list detail
2	Press			Alarm list
3	Select	Alarm	▼ √	Alarm list detail
4	Press for 3 sec		√	Password
5	Set	Enter password	▼ √	Alarm list detail
6	Press		⌜	Alarm list
7	Select	Alarm	▼ √	
8	Select	Reset	▼ √	
9	Press for 3 sec		⌜	
10	Select	Logoff	▼ √	

9.12 General alarms list

The alarm code identifies the refrigerant circuit.
Example: |t1|ee101 TimeOutModCirc = circuit 1
|t1||t1|ee201 TimeOutModCirc = circuit 2

Code	Alarm type
ee, ff, ii	Automatic reset
eE, fF, iI	Automatic reset; after N activations, the alarm becomes manual reset
EE, FF, II	Manual reset

9.13 **Alarm list**

Alarms relating to circuit 2 are not shown in the table.

eE0001	Fault on the phase monitor input
EE0003	Tripping of the protections of pump 1 on the user-side
EE0004	Tripping of the protections of pump 2 on the user-side
EE0005	Tripping of the protections of pump 3 on the user-side
eE0008	Tripping of the protections of the pump inverter on the user-side
ee0010	The Master unit of the ECOSHARE network does not communicate with the Slave units.
ee0011	The Slave unit with address 2 of the ECOSHARE network signals alarms in progress
ee0012	The Slave unit with address 2 of the ECOSHARE network does not communicate
ee0013	The Slave unit with address 3 of the ECOSHARE network signals alarms in progress
ee0014	The Slave unit with address 3 of the ECOSHARE network does not communicate
ee0015	The Slave unit with address 4 of the ECOSHARE network signals alarms in progress
ee0016	The Slave unit with address 4 of the ECOSHARE network does not communicate
ee0017	The Slave unit with address 5 of the ECOSHARE network signals alarms in progress
ee0018	The Slave unit with address 5 of the ECOSHARE network does not communicate
ee0019	The Slave unit with address 6 of the ECOSHARE network signals alarms in progress
ee0020	The Slave unit with address 6 of the ECOSHARE network does not communicate
ee0021	The Slave unit with address 7 of the ECOSHARE network signals alarms in progress
ee0022	The Slave unit with address 7 of the ECOSHARE network does not communicate
ee0023	The Slave unit with address 7 of the ECOSHARE network signals alarms in progress
ee0024	The Slave unit with address 7 of the ECOSHARE network does not communicate
ee0025	Failure of the water temperature sensor at the inlet of the exchange coil on the source side
ee0027	Failure of the water temperature sensor at the inlet of the heat exchanger on the user-side
ee0028	Failure of the water temperature sensor at the outlet of the heat exchanger on the user-side
ee0029	External temperature probe failure
ee0030	Demand Limit fault (Volt input)
ee0031	Water Reset fault (Volt input)
ee0033	Faulty electrical panel temperature sensor
ee0034	Faulty temperature sensor of the second electrical panel
ee0040	Faulty water temperature sensor on FCI circuit
EE0044	FCI Pump 1
EE0045	FCI pump 2
EE0046	FCI pump 3
ee0047	It switches the pump for the flow alarm on the user-side. Only if the alarm is not manual and if there are pumps available that are not active
ee0050	Utility side differential pressure switch
EE0054	Tripping of the protections of pump 1 on the Recovery system side
EE0055	Tripping of the protections of pump 2 on the Recovery system side

EE0056	Tripping of the protections of pump 3 on the Recovery system side
eE0057	Tripping of the protections of the recovery pump inverter
ee0100	POL98U_1 hardware module disconnected from the Process Bus
ee0101	POL98U_2 hardware module disconnected from the Process Bus
ee0102	POL96U hardware module disconnected from the Process Bus
ee0103	TimeOut POL96U_1
ee0104	POL965 hardware module disconnected from the Process Bus
ee0105	TimeOutModPOL94U
ee0106	TimeOutModPOL94U_2
ee0107	POL985_1 hardware module disconnected from the Process Bus
ee0108	POL985_2 hardware module disconnected from the Process Bus
ee0109	POL965_1 hardware module disconnected from the Process Bus
ee0110	POL98U_3 hardware module disconnected from the Process Bus
ee0130	Faulty Demand Limit (mA input)
ee0131	Faulty water reset (mA input)
ee1001	Faulty refrigerant temperature sensor 3
ee1002	Faulty refrigerant temperature sensor 5
ee1003	Faulty pressure sensor on heating low pressure side
ee1004	Expansion valve 1 blocked
ee1005	Expansion valve 2 blocked
EE1006	Tripping of the protections of compressor C1
EE1007	Tripping of the protections of compressor C2
EE1008	Tripping of the protections of compressor C3
EE1009	Tripping of the protections of the source1 pump inverter
ee1010	It switches the pump for the source1 flow alarm. Only if the alarm is not manual and if there are pumps available that are not active
ee1011	EEV 3.1 blockage
EE1013	Tripping of the protections of source pump 1
EE1014	Tripping of the protections of source pump 2
EE1015	Tripping of the protections of source pump 3
EE1018	Fan thermal circuit 1
ee1022	Faulty compressor drain temperature sensor
ee1023	Faulty temperature sensor for discharge of refrigerant to compressor 2
ee1024	Faulty temperature sensor for discharge of refrigerant to compressor 3
ee1026	Failure of the water temperature sensor at the outlet of the exchange coil on the source side
ee1027	Suction temperature (BT11.1)
ee1028	Discharge pressure (BP1.1)
ee1029	Intake pressure (BP2.1)
ee1030	Recovery gas temperature 1.1

ee1031	Recovery pressure
ee1032	Recovery temperature
ee1033	Recovery Out temperature
ee1037	Alarm present on inverter 1 of circuit 1
ee1038	Mobdus communication error with inverter 1 of circuit 1
ee1039	Modbus communication timeout with inverter 1 of circuit 1
ee1040	Alarm present on inverter 2 of circuit 1
ee1041	Mobdus communication error with inverter 2 of circuit 1
ee1042	Modbus communication timeout with inverter 2 of circuit 1
ee1043	Alarm present on inverter 3 of circuit 1
ee1044	Mobdus communication error with inverter 3 of circuit 1
ee1045	Modbus communication timeout with inverter 3 of circuit 1
EE1047	Compressor envelope alarm 1 circuit 1
EE1048	Compressor envelope alarm 2 circuit 1
EE1049	Compressor envelope alarm 3 circuit 1
ee1055	Alarm present on inverter 1 of circuit 1
ee1056	Mobdus communication error with inverter 1 of circuit 1
ee1057	Modbus communication timeout with inverter 1 of circuit 1
ee1058	Alarm present on inverter 2 of circuit 1
ee1059	Mobdus communication error with inverter 2 of circuit 1
ee1060	Modbus communication timeout with inverter 2 of circuit 1
ee1061	Alarm present on inverter 3 of circuit 1
ee1062	Mobdus communication error with inverter 3 of circuit 1
ee1063	Modbus communication timeout with inverter 3 of circuit 1
ee1070	ECV 1.1 (User)
ee1071	ECV 2.1 (Source)
ee1072	ECV 3.1 (Source)
ff0001	Refrigerant Leakage alarm
ff0002	Low outdoor temperature
ff1001	Static defrost 1.1
ff1005	The superheating value of the refrigerant is too low in relation to the driver of the first thermostat (user)
ff1006	The superheating value of the refrigerant is too low in relation to the driver of the second thermostat (source)
ff1007	Minimum superheating EEV 3.1
fF1009	Tripping of the minimum pressure switch
ff1010	Indicates a pressure value, on the low pressure side, close to the circuit block threshold for minimum pressure: Cool mode
ff1011	Indicates a pressure value, on the low pressure side, close to the circuit block threshold for minimum pressure:Heat mode
fF1012	Circuit blocked due to minimum pressure alarm in Heat mode
fF1013	Circuit blocked due to maximum pressure alarm
ff1014	Indicates a pressure value, on the high pressure side, close to the circuit block threshold for maximum pressure

fF1015	Circuit blocked due to maximum pressure alarm
ff1016	Indicates a high compression ratio value close to the circuit blocking threshold
fF1017	Blocking of circuit due to minimum compression ratio alarm
fF1018	Circuit blocked due to minimum pressure alarm in Cool mode
FF1019	Blocking of circuit due to maximum compression ratio alarm
ff1034	Circuit drained of refrigerant alarm
FF1046	Low Pressure limit 1.1
ff1047	Forcing defrosting 1.1
FF1048	Defrosting water temp. 1.1
ff1049	Max defrosting time 1.1
ff1050	HpDisableStart
iI0002	Insufficient hydraulic pressure on the user-side
iI0006	Insufficient water flow rate on the user-side
II0007	Unit blocked due to frost protection on the user-side
ii0008	Activation of the pumps on the user-side for frost protection
II0009	Water outlet temperature on the user-side not in keeping with the current operating mode of the unit
ee0060	Max. temperature Electrical panel
II0010	Recovery freeze
iI1017	Insufficient hydraulic pressure in the source system
iI1020	Insufficient water flow rate on the source side
II1021	Unit blocked due to frost protection on the source side
II0042	FCI Water Pressure
II0043	FCI Freeze
ii0047	FCI Flow
iI0052	Insufficient water flow rate in the recovery system
iI0053	Insufficient water flow rate on the recovery side
ff1060	Compressor max discharge temperature
ff1061	Compressor min discharge temperature

10. Maintenance

10.1 Safety

Operate in compliance with safety regulations in force.

To carry out the operations use protection devices:

gloves, goggles, helmet, headphones, protective knee pads.

All operations must be carried out by personnel trained on possible risks of a general nature, electrical and deriving from operating with equipment under pressure.

Only qualified personnel can operate on the unit, as required by the regulation in force.

10.2 General

Maintenance must be done by authorized centres or by qualified personnel.

The maintenance allows to:

- maintain the unit efficiency
- increase the life span of the equipment
- assemble information and data to understand the state of the unit efficiency and avoid possible damages

Warning

- **before checking, please verify the following:**
- **the electrical power supply line should be isolated at the beginning**
- **the unit isolator is open, locked and equipped with the suitable warning**
- **make sure no tension is present**
- **After turning off the power, wait at least 5 minutes before accessing to the electrical panel or any other electrical component.**
- **Before accessing check with a multimeter that there are no residual stresses.**

10.3 Inspections frequency

Perform an inspection every 6 months minimum.

The frequency, however, depends on the use.

In the event of frequent use it is recommended to plan inspections at shorter intervals:

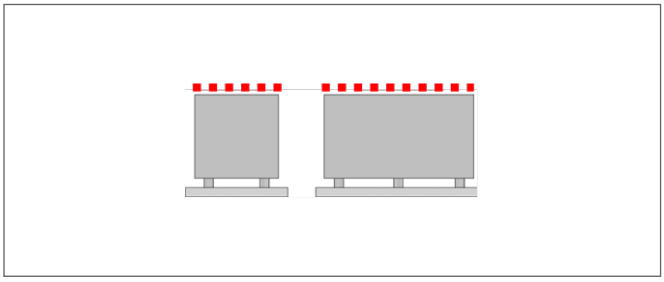
- frequent use (continuous or very intermittent use, near the operating limits, etc)
- critical use (service necessary)

Warning

- **Before performing any work, please read carefully: In|SAFETY WARNINGS FOR OPERATIONS ON UNITS CONTAINING R32**

ATTENTION

- **Do not go up to the surface**
- **Do not place heavy objects.**



10.4 Unit booklet

It's advisable to create a unit booklet to take notes of the unit interventions.

In this way it will be easier to adequately note the various interventions and aid any troubleshooting.

Report on the booklet:

- date
- intervention description
- carried out measures etc.

10.5 Standby mode

If a long period of inactivity is foreseen:

- turn off the power
- avoid the risk of frost (empty the system or add glycol)
- Turn off the power to avoid electrical risks or damages by lightning strikes.
- With lower temperatures keep heaters turned on in of the electrical panel (option).

It's recommended that the re-start after the stopping period is performed by a qualified technician, especially after seasonal stops or seasonal switching.

When restarting, refer to what is indicated in the "start-up" section.

Schedule technical assistance in advance to avoid hitches and to guarantee that the system can be used when required.

10.6 **Recommended periodical checks**

Warning

	intervention frequency (months)	1	6	12
1	presence corrosion			X
2	panel fixing			X
3	water filter cleaning		X	
4	water: quality, ph, weight of glycol (%)		X	
5	check the exchanger efficiency	X		
6	circulating pumps			X
7	check of the fixing and the insulation of the power lead			X
8	check of the earthing cable			X
9	electric panel cleaning			X
10	capacity contactor status			X
11	termina closing, cable insulation integrity			X
12	voltage and phase unbalancing (no load and on-load)			X
13	absorptions of the single electrical loads		X	
14	test of the compressor crankcase heaters		X	
15	Checking for leaks		X	
16	survey of the refrigerant circuit operating parameters			*
17	safety valve		X	
18	protective device test: pressure switches, thermostats, flow switches etc..			*
19	control system test: setpoint, climatic compensations, capacity stepping, air flow-rate variations		X	
20	control device test: alarm signalling, thermometers, probes, pressure gauges etc..		X	

▶ ***Refer to the local regulations. Companies and technicians performing installation, maintenance/repair, leak control and recovery operations must be CERTIFIED as set out by the local regulations.**

10.7 System drain

The system must be drained only if necessary.

Do not drain the system periodically; this can lead to corrosion.

1 empty the system

2 empty the exchanger, use all of the shut-off valves and grub screws present

3 blow the exchanger with compressed air

4 dry the exchanger with hot air; for greater safety, fill the exchanger with glycol solution

5 protect the exchanger from the air

6 take the drain caps off the pumps

Any antifreeze liquid contained in the system should not be discharged freely as it is a pollutant. It must be collected and reused.

Before start-up, wash the system.

It's recommended that the re-start after the stopping period is performed by a qualified technician, especially after seasonal stops or seasonal switching.

When restarting, refer to what is indicated in the "start-up" section.

Schedule technical assistance in advance to avoid hitches and to guarantee that the system can be used when required.

10.8 Compressor crankcase heater

Check:

- closing
- Operation

10.9 Water side exchanger

The exchanger must be able to provide the maximum thermal exchange, therefore its inner surfaces must be cleaned from dirt and incrustations.

Check the difference between the outlet water temperature and the evaporation temperature: if the difference is greater than 8°C–10°C, it is advisable to clean the exchanger.

It must be cleaned:

- with circulation opposite to the usual one
- at least 1.5 times faster than the nominal one
- with an appropriate moderately acid product (95% water + 5% phosphoric acid)
- after washing, rinse with water to remove detergent residues

10.10 Water filter

Check that no impurities prevent the correct passage of water.

10.11 Flow Switch

- check operation
- remove incrustations from the blade

10.12 Circulation pumps

Check:

- there are no leaks
- status of the bearings (anomalies are indicated by abnormal noises and vibrations)
- the terminal protection covers are closed and the cable holders are properly positioned

10.13 Insulations

Check the status of the insulations: if necessary, apply glue and renew the seals.

10.14 Pressure relief valve

The pressure relief valve must be replaced:

- if it is activated
- if there is oxidation
- based on the date of manufacture, in accordance with local regulations.

10.15 Structure

Check the state of the parts constituting the structure.

Treat those parts of the unit subject to oxidation, with paints act at eliminating or reducing the oxidation phenomena.

Check fastening of the unit external panelling.

Bad fastening give rise to anomalous noises and vibrations.

10.16 Refrigerant leak detector

Option

Refer to the component manufacturer's manual for specific information.

10.16.1 Maintenance

The inspection must be carried out by qualified servicing personnel.

- Check correct operation of the LEDs.
- Check correct operation of the buzzer and relay.
- Check signal transmission to the BMS / central controller, if connected.
- Calibrate the sensor or contact the manufacturer to exchange the sensor with a factory-calibrated one.

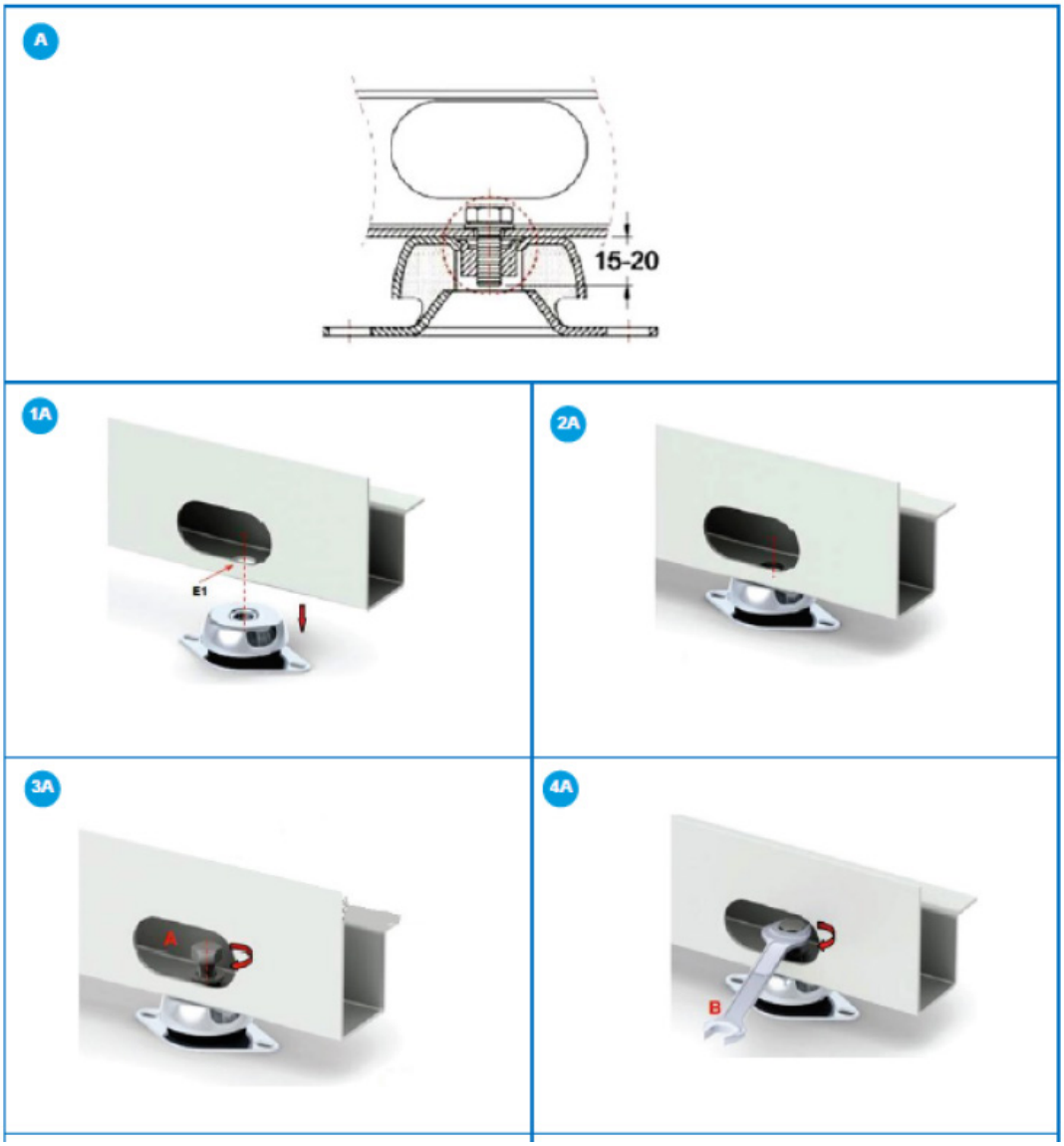
Sensors have an average life of 2 to 5 years, depending on the type, after which they must be replaced.

▶ **Sensors must be checked after exposure to significant gas concentrations, which can reduce the duration of the sensor and/or reduce its sensitivity.**

11. Anti-vibration mounts

	W1	W2	W3	W4
PE8U00005	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00005	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00005	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00005	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00005	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00006	200 60SH	200 60SH	200 60SH	200 60SH
PE8U00006	200 60SH	200 60SH	200 60SH	200 60SH
PE8U00006	200 60SH	200 60SH	200 60SH	200 60SH

	W1	W2	W3	W4	W5	W6
PE8U00033	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00033	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00033	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00033	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00033	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH	200 45SH
PE8U00035	200 70SH	200 70SH	200 45SH	200 70SH	200 70SH	200 45SH
PE8U00035	200 70SH	200 70SH	200 45SH	200 70SH	200 70SH	200 45SH
PE8U00035	200 70SH	200 70SH	200 45SH	200 70SH	200 70SH	200 45SH


A
15-20
1A
E1
2A
3A
A
4A
B

11.1 Anti-seismic anti-vibration mounts

12. Decommissioning

12.1 Disconnection

Warning

▶ **Before performing any work, please read carefully: In|SAFETY WARNINGS FOR OPERATIONS ON UNITS CONTAINING R32**

Avoid leak or spills into the environment.

Before disconnecting the unit, the following must be recovered, if present:

- refrigerant gas
- Anti-freeze solutions in the hydraulic circuit

Awaiting decommissioning and disposal, the unit can also be stored outdoors, as bad weather and rapid changes in temperature do not harm the environment provided that the electric, cooling and hydraulic circuits of the unit are intact and closed.

12.2 WEEE INFORMATION

The manufacturer is registered on the EEE National Register, in compliance with implementation of Directive 2012/19/EU and relevant national regulations on waste electrical and electronic equipment.

This Directive requires electrical and electronic equipment to be disposed of properly.

Equipment bearing the crossed-out wheelie bin mark must be disposed of separately at the end of its life cycle to prevent damage to human health and to the environment.

Electrical and electronic equipment must be disposed of together with all of its parts.

To dispose of “household” electrical and electronic equipment, the manufacturer recommends you contact an authorised dealer or an authorised ecological area.

“Professional” electrical and electronic equipment must be disposed of by authorised personnel through established waste disposal authorities around the country.

In this regard, here is the definition of household WEEE and professional WEEE:

WEEE from private households: WEEE originating from private households and WEEE which comes from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households. Subject to the nature and quantity, where the waste from EEE was likely to have been by both a private household and users of other than private households, it will be classed as private household WEEE;

Professional WEEE: all WEEE which comes from users other than private households.

This equipment may contain:

- refrigerant gas, the entire contents of which must be recovered in suitable containers by specialised personnel with the necessary qualifications;
- lubrication oil contained in compressors and in the cooling circuit to be collected;
- mixtures with antifreeze in the water circuit, the contents of which are to be collected;
- mechanical and electrical parts to be separated and disposed of as authorised.

When machine components to be replaced for maintenance purposes are removed or when the entire unit reaches the end of its life and needs to be removed from the installation, waste should be separated by its nature and disposed of by authorised personnel at existing collection centres.

13. Residual risks

13.1 General

In this section the most common situations are indicated,as these cannot be controlled by the manufacturer and could be a source of risk situations for people or things.

Danger zone

This is an area in which only an authorised operator may work.

The danger zone is the area inside the unit which is accessible only with the deliberate removal of protections or parts thereof.

13.2 Handling

The handling operations, if implemented without all of the protection necesssary and without due caution, may cause the drop or the tipping of the unit with the consequent damage, even serious, to persons, things or the unit itself.

Handle the unit following the instructions provided in the present manual re-garding the packaging and in compliance with the local regulations in force.

Should the refrigerant leak please refer to the refrigerant “Safety sheet”.

13.3 Installation

The incorrect installation of the unit could cause water leaks, condensate accumulation, leaking of the refrigerant, electric shock, poor operation or damage to the unit itself.

Check that the installation has been implemented by qualified technical personnel only and that the instructions contained in the present manual and the local regulations in force have been adhered to.

The installation of the unit in a place where even infrequent leaks of inflam-mable gas and the accumulation of this gas in the area surrounding the area occur could cause explosions or fires.

Carefully check the positioning of the unit.

The installation of the unit in a place unsuited to support its weight and/or guarantee adequate anchorage may result in consequent damage to things, people or the unit itself.

Carefully check the positioning and the anchoring of the unit.

Easy access to the unit by children, unauthorised persons or animals may be the source of accidents, some serious.

Install the unit in areas which are only accessible to authorised person and/or provide protection against intrusion into the danger zone.

13.4 General risks

Smell of burning, smoke or other signals of serious anomalies may indicate a situation which could cause damage to people, things or the unit itself.

Electrically isolate the unit (yellow-red isolator).

Contact the authorised service centre to identify and resolve the problem at the source of the anomaly.

Accidental contact with exchange batteries, compressors, air delivery tubes or other components may cause injuries and/or burns.

Always wear suitable clothing including protective gloves to work inside the danger zone.

Maintenance and repair operations carried out by non-qualified personnel may cause damage to persons, things or the unit itself.

Always contact the qualified assistance centre.

Failing to close the unit panels or failure to check the correct tightening of all of the panelling fixing screws may cause damage to persons, things or the unit itself.

Periodically check that all of the panels are correctly closed and fixed.

If there is a fire the temperature of the refrigerant could reach values that in-crease the pressure to beyond the safety valve with the consequent possible projection of the refrigerant itself or explosion of the circuit parts that remain isolated by the closure of the tap.

Do not remain in the vicinity of the safety valve and never leave the refriger-ating system taps closed.

13.5 Electric parts

An incomplete attachment line to the electric network or with incorrectly sized cables and/or unsuitable protective devices can cause electric shocks, intoxication, damage to the unit or fires.

Carry out all of the work on the electric system referring to the electric layout and the present manual ensuring the use of a system thereto dedicated.

An incorrect fixing of the electric components cover may lead to the entry of dust, water etc inside and may consequently electric shocks, damage to the unit or fires.

Always fix the unit cover properly.

When the metallic mass of the unit is under voltage and is not correctly connected to the earthing system it may be as source of electric shock and electrocution.

Always pay particular attention to the implementation of the earthing system connections.

Contact with parts under voltage accessible inside the unit after the removal of the guards can cause electric shocks, burns and electrocution.

Open and padlock the general isolator prior to removing the guards and signal work in progress with the appropriate sign.

Contact with parts that could be under voltage due to the start up of the unit may cause electric shocks, burns and electrocution.

When voltage is necessary for the circuit open the isolator on the attachment line of the unit itself, padlock it and display the appropriate warning sign.

13.6 Moving parts

Contact with the transmissions or with the fan aspiration can cause injuries.

Prior to entering the inside of the unit open the isolater situated on the con-nection line of the unit itself, padlock and display the appropriate warning sign.

Contact with the fans can cause injury.

Prior to removing the protective grill or the fans, open the isolator on the attachment line of the unit itself, padlock it and display the appropriate warning sign.

13.7 Refrigerant

The intervention of the safety valve and the consequent expulsion of the gas refrigerant may cause injuries and intoxication.

Always wear suitable clothing including protective gloves and eyeglasses for operations inside the danger zone.

Should the refrigerant leak please refer to the refrigerant “Safety sheet”.

Contact between open flames or heat sources with the refrigerant or the heating of the gas circuit under pressure (e.g. during welding operations) may cause explosions or fires.

Do not place any heat source inside the danger zone.

The maintenance or repair interventions which include welding must be carried out with the system off.

13.8 Hydraulic parts

Defects in tubing, the attachments or the removal parts may cause a leak or water projection with the consequent damages to people, things or shortcircuit the unit.

14. Technical information

SIZE			19.2	22.2	27.2	35.2	40.2	45.2	60.2	80.2
Operation Heating-only (W40/45)										
Heating capacity (EN14511:2018)	1	kW	33,8	40,2	46,1	57,1	69,3	87,5	109	134
Total power input (EN14511:2018)	2	kW	8,13	9,07	10,2	13,0	16,2	21,1	26,4	31,8
COP (EN14511:2018)	3	-	4,16	4,43	4,52	4,40	4,28	4,16	4,13	4,23
Water flow-rate (user side)	1	l/s	1,63	1,94	2,22	2,76	3,35	4,23	5,27	6,48
Pressure drop (user side)	1	kPa	20,5	21,7	20,2	19,9	21,2	20,2	28,8	28,7
Water flow-rate (source side)	1	l/s	2,06	2,48	2,86	3,51	4,24	5,30	6,62	8,19
Pressure drop (source side)	1	kPa	47,6	45,1	28,1	31,9	35,9	39,4	46,4	42,7
Operation Heating-only (W50/55)										
Heating capacity (EN14511:2018)	4	kW	32,1	38,0	43,8	54,4	66,5	85,0	106	130
Total power input (EN14511:2018)	2	kW	10,0	11,0	12,3	16,1	19,8	25,5	32,1	38,6
COP (EN14511:2018)	3	-	3,21	3,47	3,55	3,38	3,36	3,33	3,30	3,38
Water flow-rate (user side)	4	l/s	1,56	1,84	2,12	2,63	3,22	4,12	5,14	6,31
Pressure drop (user side)	4	kPa	19,1	19,9	19,0	18,7	20,0	19,3	27,7	27,6
Water flow-rate (source side)	4	l/s	1,76	2,16	2,50	3,05	3,72	4,74	5,91	7,31
Pressure drop (source side)	4	kPa	37,3	36,1	22,6	25,3	29,1	32,8	38,6	35,5
ErP Classe Energetica - Clima MEDIO - W55	6	-	A+++	A+++	A+++	A+++	-	-	-	-
SCOP - Clima MEDIO - W55	7	-	4,48	4,65	4,65	4,61	4,57	4,45	4,45	4,52
Operation Heating-only (W70/78)										
Heating capacity	5	kW	73,4	83,0	96,8	122	144	184	224	278
Total power input (EN14511:2018)	2	kW	16,9	18,1	20,8	28,0	34,3	44,6	54,7	66,8
COP (EN14511:2018)	3	-	4,33	4,60	4,64	4,37	4,21	4,13	4,10	4,16
Water flow-rate (user side)	5	l/s	2,24	2,53	2,95	3,72	4,40	5,62	6,84	8,49
Pressure drop (user side)	5	kPa	33,1	33,9	29,2	30,4	33,1	32,0	44,0	44,0
Water flow-rate (source side)	5	l/s	2,75	3,16	3,69	4,57	5,34	6,78	8,25	10,3
Pressure drop (source side)	5	kPa	75,6	66,2	42,6	49,0	52,4	59,0	66,5	62,1
Compressor										
Type of compressors		-	Scroll							
Refrigerant		-	R-134a							
No. of compressors		Nr	2							
Capacity control steps		Nr	2	2	2	2	2	2	2	2
Oil charge		l	5,4	6,8	6,8	6,8	6,8	9,4	13,6	12,6
Refrigerant charge		kg	7,5	8,0	8,7	9,2	9,8	13,0	16,0	20,0
Refrigeration circuits		Nr	1							
User side exchanger										
Type of exchanger	8		PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
No. of exchangers		Nr	1	1	1	1	1	1	1	1
Source side exchanger										
Type of exchanger	8		PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
No. of exchangers		Nr	1	1	1	1	1	1	1	1
Connections										
Water fittings (Standard units)			1" 1/4	1" 1/4	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
Water fittings (Large units)			2"	2"	3"	3"	3"	3"	3"	3"
Water circuit										
Maximum water side pressure	9	MPa	1	1	1	1	1	1	1	1
Min. installation water contents (user side)		l	670	760	880	1110	1310	1670	2040	2530
Power supply										
Standard power supply		V	400/3/50							

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 811/2013 (rate heat output ≤70 kW at specified reference conditions) and the Commission delegated Regulation (EU) No 813/2013 (rated heat output ≤400 kW at specified reference conditions).
«Contains fluorinated greenhouse gases» (GWP 1430)

1. Data referred to the following conditions: User side exchanger water temperature 40/45°C. Source side exchanger water temperature 10/7°C. Performance data calculated with reference to EN14511:2018
2. The total power draw is calculated by adding the compressor's power draw + the draw required to overcome the internal service and source side pressure drops + the control circuit power draw
3. COP (EN 14511:2018) heating performance coefficient. Ratio between delivered heating capacity and power input in compliance with EN 14511:2018
4. Data referred to the following conditions: User side exchanger water temperature 50/55°C. Source side exchanger water temperature 10/7°C. Performance data calculated with reference to EN14511:2018
5. Data referred to the following conditions: User side exchanger water temperature 70/78°C. Source side exchanger water temperature 45/40°C. Performance data calculated with reference to EN14511:2018
6. Seasonal energy efficiency class of ambient heating according to Commission Delegated Regulation (EU) No. 811/2013. W = Water outlet temperature (°C)
7. Data calculated according to the EN 14825:2018 Regulation
8. PHE = Plate exchanger
9. Conditions for the circuit on the utility side and the circuit on the source side. In configurations with hydronic units, the maximum pressure on the water side is 600 kPa.

Sound levels

SIZE	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
19.2	40	48	54	62	65	65	54	43	70	54
22.2	43	48	55	62	66	66	51	45	70	54
27.2	45	49	55	63	66	67	53	47	71	55
35.2	51	58	61	69	70	68	54	44	74	58
40.2	54	60	63	71	72	70	54	49	76	60
45.2	55	64	63	72	74	72	56	49	78	60
60.2	54	62	63	72	75	73	58	52	78	61
80.2	54	65	65	73	76	76	62	53	80	63

Sound levels refer to units with full load under nominal test conditions.
The sound pressure level refers to a distance of 1 meter from the outer surface of the unit operating in open field.
Noise emission data are declared in accordance with UNI EN ISO 9614-1.
Sound power levels and sound pressure levels are not Eurovent certified.
Data referred to the following conditions:
Entering / leaving exchanger water temperature user side 12/7°C
Entering / leaving exchanger water temperature source side 30/35°C

Operating Range

Twu [°C] = User side water outlet temperature
Tws [°C] = Source side water outlet temperature

Admissible water flow rates

Min. (Qmin) and max. (Qmax) water flow-rates admissibles for the correct unit operation.

		19.2	22.2	27.2	35.2	40.2	45.2	60.2	80.2
User side	Min [l/s]	1,40	1,63	1,94	2,37	2,82	3,68	3,68	4,64
	Max [l/s]	4,66	4,83	7,66	8,76	8,76	11,4	11,4	14,4
Source side	Min [l/s]	1,10	1,39	2,13	2,44	2,73	3,21	3,59	4,69
	Max [l/s]	3,40	4,24	6,56	7,47	8,34	9,87	11,1	14,4

Correction factors for glycol use

% ethylene glycol by weight		5%	10%	15%	20%	25%	30%	35%	40%
Freezing temperature	°C	-2,0	-3,9	-6,5	-8,9	-11,8	-15,6	-19,0	-23,4
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19
Cold side exchanger chiller power factor	-	0,995	0,990	0,985	0,981	0,977	0,974	0,971	0,968
Cold side exchanger compressor power draw factor	-	0,997	0,993	0,990	0,988	0,986	0,984	0,982	0,981
Cold side exchanger glycol solution flow factor	-	1,003	1,010	1,020	1,033	1,050	1,072	1,095	1,124
Cold side exchanger pressure drop factor	-	1,029	1,060	1,090	1,118	1,149	1,182	1,211	1,243

Fouling Correction Factors

	EVAPORATOR		CONDENSER	
m² °C / W	F1	FK1	F2	FK2
0.44 x 10 (-4)	1	1	1	1
0.88 x 10 (-4)	0,97	0,99	0,97	1,08
1.76 x 10 (-4)	0,94	0,98	0,92	1,05

F1 = Cooling capacity correction factors
FK1 = Compressor power input correction factor

Overload and control device calibrations

		INTERVENTION	RESET	VALUE
High pressure switch (gas side)	[kPa]	2880	2110	-
Low pressure alarm (gas side)	[kPa]	150	170	-
Low pressure switch (GEO) (gas side)	[kPa]	200	350	-
Antifreeze protection	[°C]	4	6,0	-
High pressure safety valve (gas side)	[kPa]	3200	-	4500
Low pressure safety valve (gas side)	[kPa]	2000	-	2950
Max no. of compressor starts per hour (gas side)	[n°]	10	-	10
Differential pressure switch (water side)	[kPa]	2,7 (8*)	5 (10,5*)	-
Max. pressure without hydronic assembly (water side)	[kPa]	1000	-	1000
Max. pressure with hydronic assembly (water side)	[kPa]	600	-	600
Safety valve calibration (water side) (1)	[kPa]	600	-	600

(1) Available only with hydronic assembly option

Size 19.2 - 22.2 standard unit configuration

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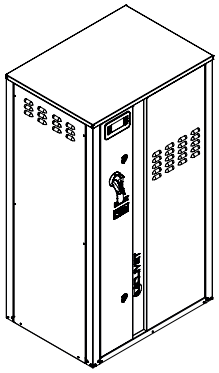

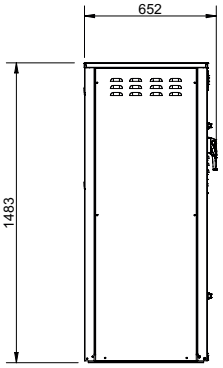

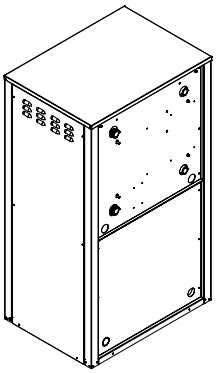

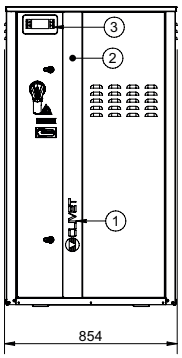

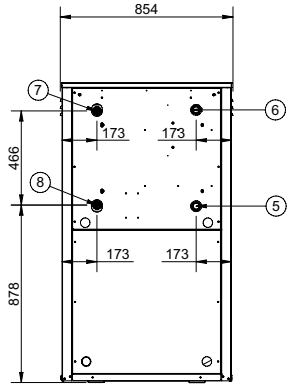

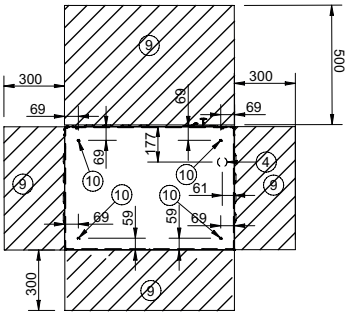

1. Compressor compartment
2. Electrical control box
3. Control keypad
4. Power input
5. User side water return
6. User side water supply
7. Source side water return
8. Source side water supply
9. Functional spaces
10. Vibration damper mounts

SIZE		19.2	22.2
Length	mm	854	854
Height	mm	1483	1483
Depth	mm	652	652
Operating weight	Kg	347	367
Shipping weight	Kg	349	367

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

Size 27.2 ÷ 40.2 standard unit configuration

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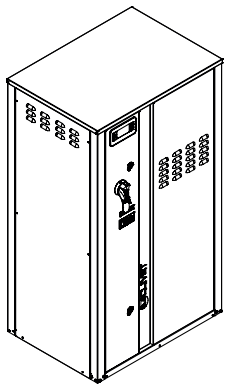

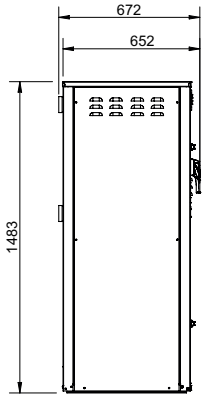

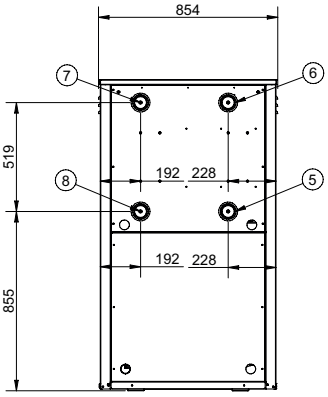

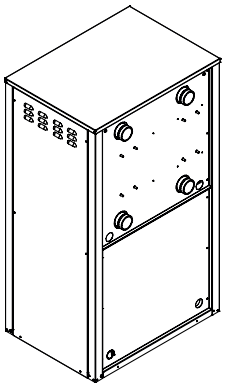

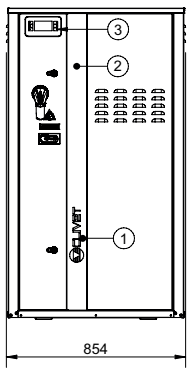

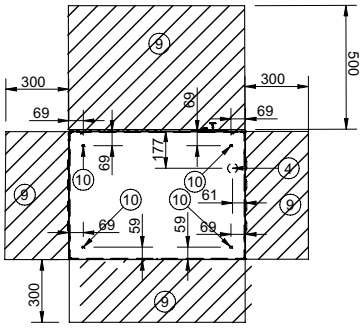

1. Compressor compartment
2. Electrical control box
3. Control keypad
4. Power input
5. User side water return
6. User side water supply
7. Source side water return
8. Source side water supply
9. Functional spaces
10. Vibration damper mounts

SIZE		27.0	35.2	40.2
Length	mm	854	854	854
Height	mm	1483	1483	1483
Depth	mm	652	652	652
Operating weight	Kg	398	417	420
Shipping weight	Kg	394	412	415

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

Size 19.2 ÷ 40.2 unit oversize enclosure configuration

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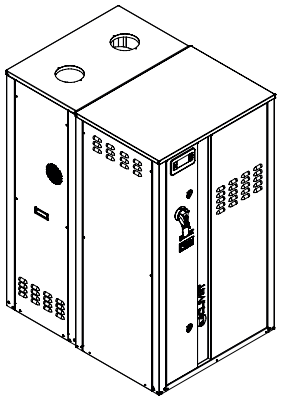
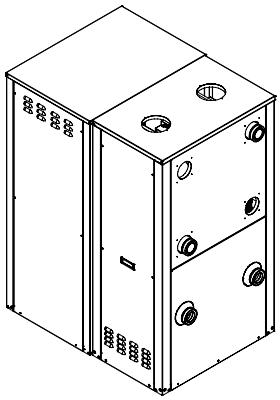
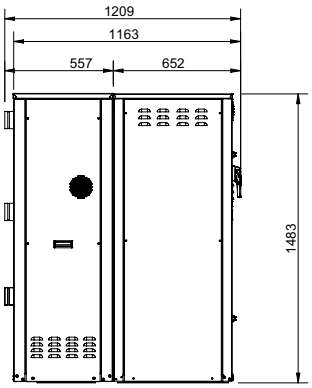
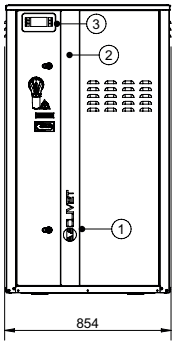
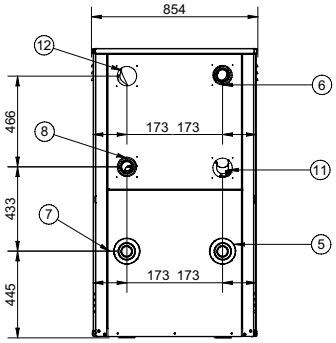
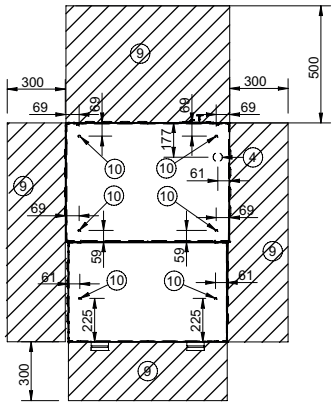












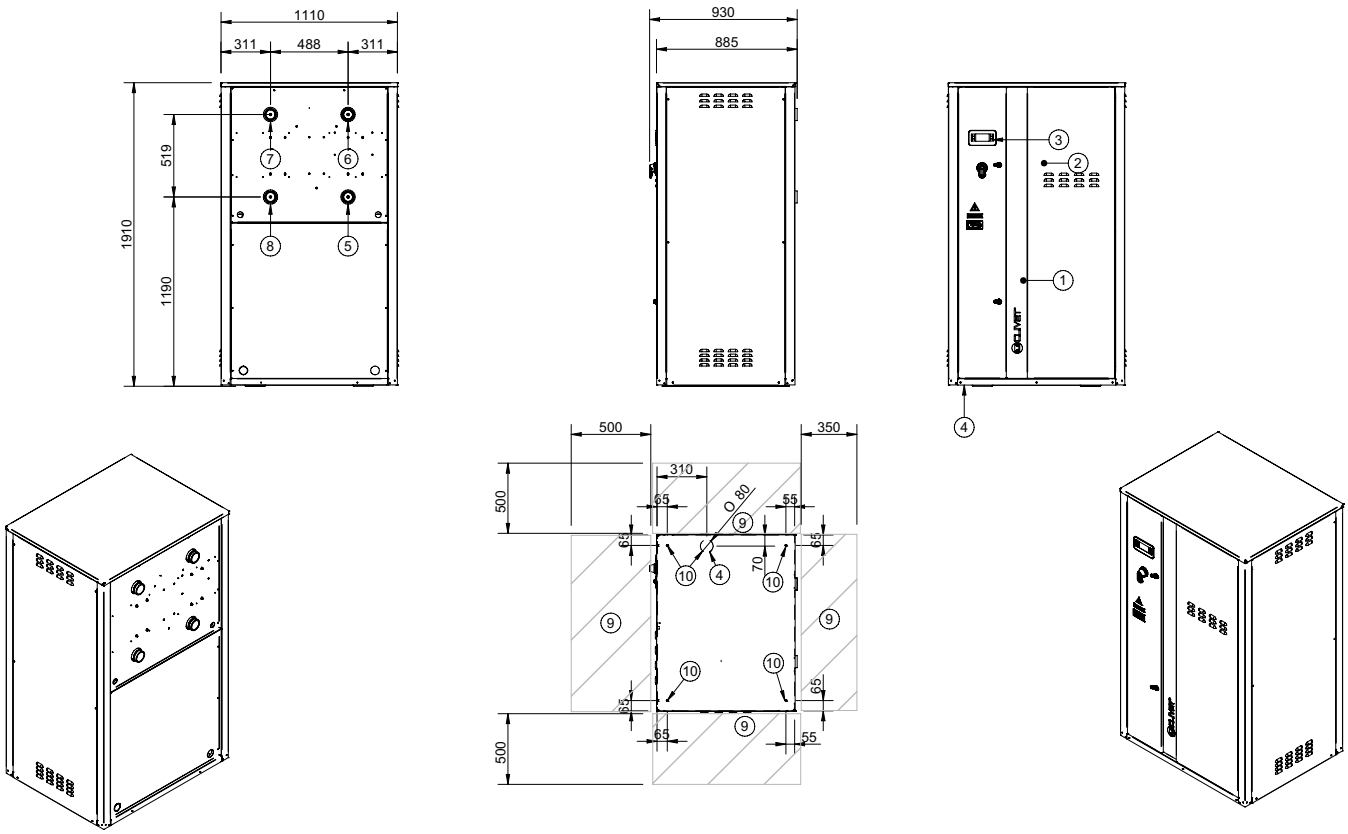
1. Compressor compartment
2. Electrical control box
3. Control keypad
4. Power input
5. User side water return
6. User side water supply
7. Source side water return
8. Source side water supply
9. Functional spaces
10. Vibration damper mounts
11. User side water return without pumps
12. Source side water return without pumps

SIZE		19.2	22.2	27.2	35.2	40.2
Length	mm	854	854	854	854	854
Height	mm	1483	1483	1483	1483	1483
Depth	mm	1209	1209	1209	1209	1209
Operating weight	Kg	516	543	589	608	611
Shipping weight	Kg	478	503	535	553	556

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

Size 45.2 ÷ 80.2 standard unit configuration

DAAHT0005_00 REV00
DATA/DTE 04/04/2022



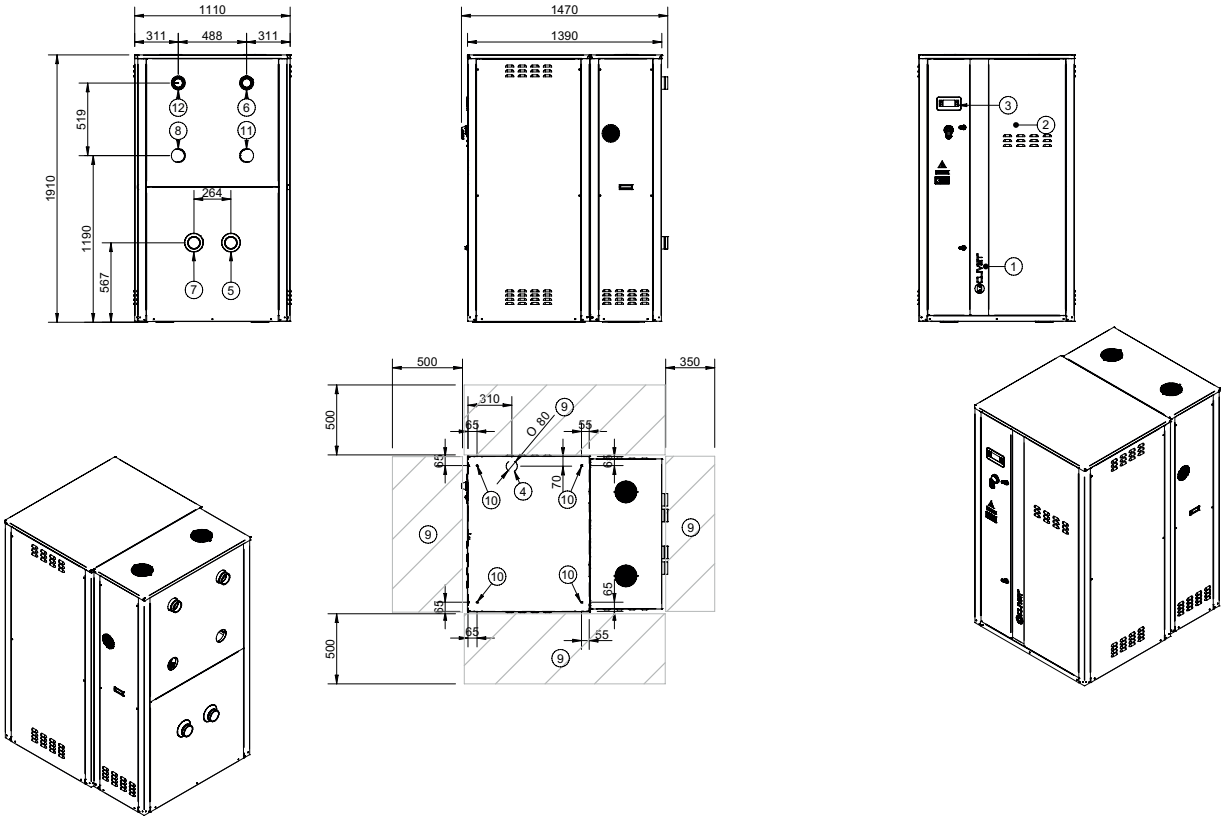
1. Compressor compartment
2. Electrical control box
3. Control keypad
4. Power input
5. User side water return
6. User side water supply
7. Source side water return
8. Source side water supply
9. Functional spaces
10. Vibration damper mounts

SIZE		45.2	60.2	80.2
Length	mm	1110	1110	1110
Height	mm	1910	1910	1910
Depth	mm	930	930	930
Operating weight	Kg	702	754	831
Shipping weight	Kg	702	755	824

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

Size 45.2 ÷ 80.2 unit oversize enclosure configuration

DAAHT0001_00 REV00
DATA/DTE 30/03/2021



1. Compressor compartment
2. Electrical control box
3. Control keypad
4. Power input
5. User side water return
6. User side water supply
7. Source side water return
8. Source side water supply
9. Functional spaces
10. Vibration damper mounts
11. User side water return without pumps
12. Source side water return without pumps

SIZE		45.2	60.2	80.2
Length	mm	1110	1110	1110
Height	mm	1910	1910	1910
Depth	mm	1470	1470	1470
Operating weight	Kg	989	1042	1152
Shipping weight	Kg	917	970	1058

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

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