Installation and operating manual

AIR COOLED INVERTER HEAT PUMP FOR OUTDOOR INSTALLATION

WSAN-XIN 21-141

Dear Customer,

We congratulate you on choosing these product

Clivet is being working for years to offer systems able to assure the maximum comfort for long time with high reliability, efficiency, quality and safety.

The target of the company is to offer advanced systems, that assure the best comfort, reduce the energy con-sumption, the installation and maintenance costs for all the life-cycle of the system.

With this manual, we want to give you information that are useful in all the phases: from the reception, to the installation and use until the disposal so that a system so advanced offers the best procedure of installation and use.

Best regards and have a nice reading.

CLIVET Spa

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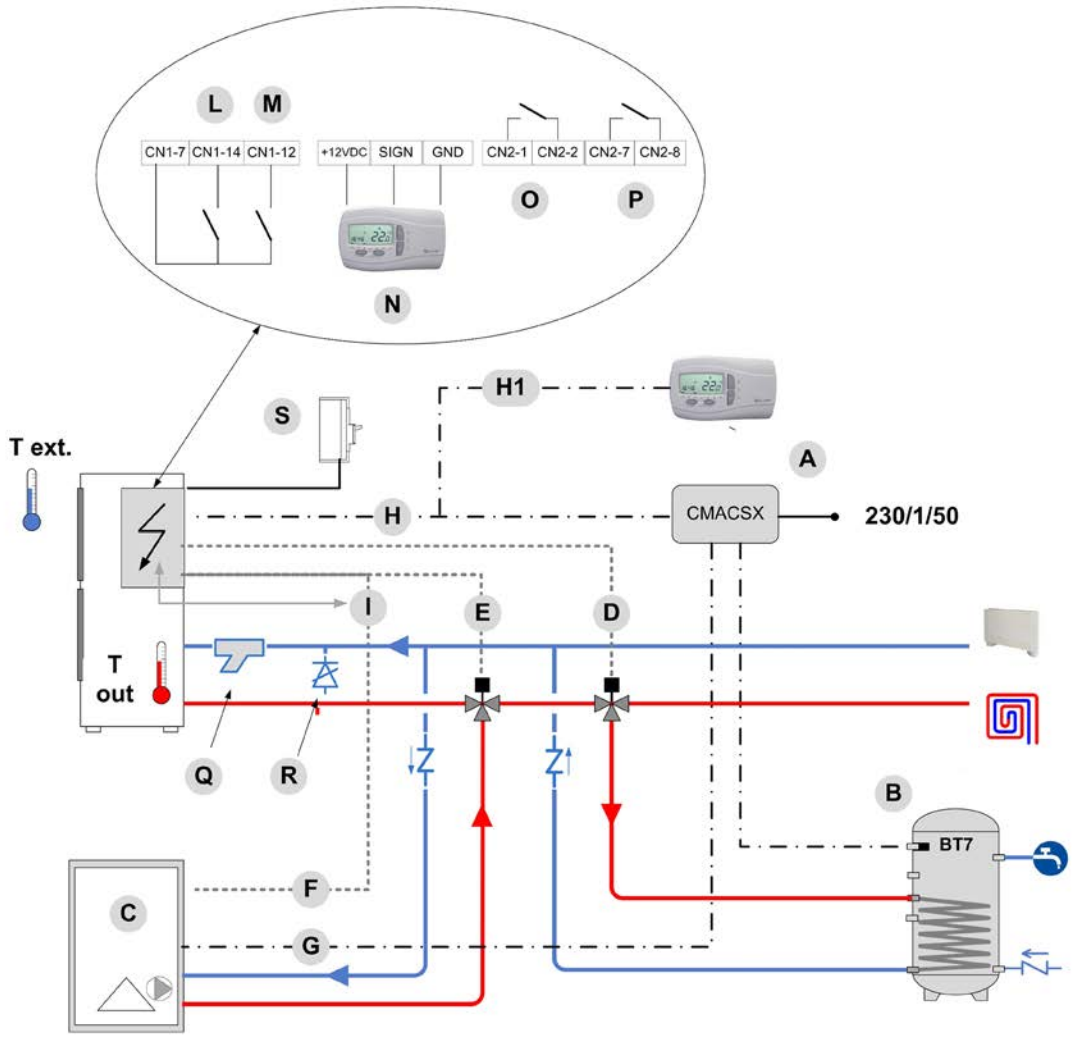
1 Installation quick guide



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2 General description

2.1 Manual

The manual provides correct unit installation, use and maintenance.

Pay particolar attention to:

⚠ Warning, identifies particularly important operations or information.

⃠ Prohibited operations that must not be carried out, that compromise the operating of the unit or may cause damage to persons or things.

- 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.

2.2 Preliminaries

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

2.3 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.

2.4 Intended use

Use the unit only:

- for cooling/heating water or a water and glycol mix for air-conditioning only
- attenendosi ai limiti previsti dal bollettino tecnico e dal presente manuale

Any use other than intended does not involve the manufacturer in any commitment or obligation.

2.5 Installation

⚠ The positioning, hydraulic system, refrigerating, electrics and the channelisation 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.

2.6 Maintenance

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

⚠ Turn the machine off before any operation.

2.7 Modification

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

2.8 Breakdown/Malfuction

Disable the unit immediately in case of breakdown or malfunction.

Contact a constructor certified assistance service.

Use original spares parts only.

Using the unit in case of breakdown or malfunction:

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

2.9 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

2.10 Data update

Continual product improvements may imply manual data changes.

Visit manufacturer web site www.clivet.it for updated data.

2.11 Indications for the user

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

Note the unit lable data so you can provide them at the assistance centre in case of intervention (see "Unit identification" section).

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

In case of breakdown or malfunction:

- Immediately deactivate the unit
- Contact a assistance service centre authorized by the manifacturer

⚠ Ask the installer to format on:

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

2.12 Unit indentification

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

⃠ It has not to be removed for any reason.

It reports the regulations indications such as:

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

2.13 Serial number

It identifies uniquely each unit.

It identifies specific spare parts for the unit.

2.14 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.

Series
Size
Serial number
Year of manufacture
Electrical wiringdiagram

3 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"
- Contest by fax and registered mail with advice of receipt to supplier and the carrier.

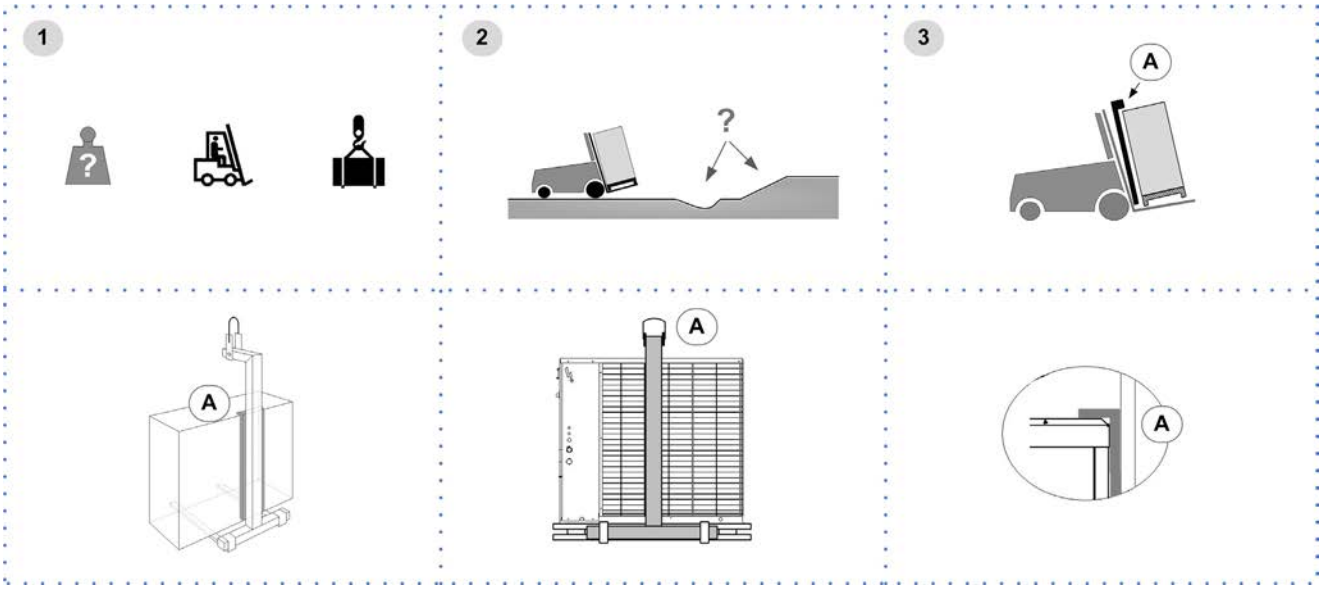
⚠ Any disputes must be made within the 8 days owing the delivery. Complaints after this period are invalid.

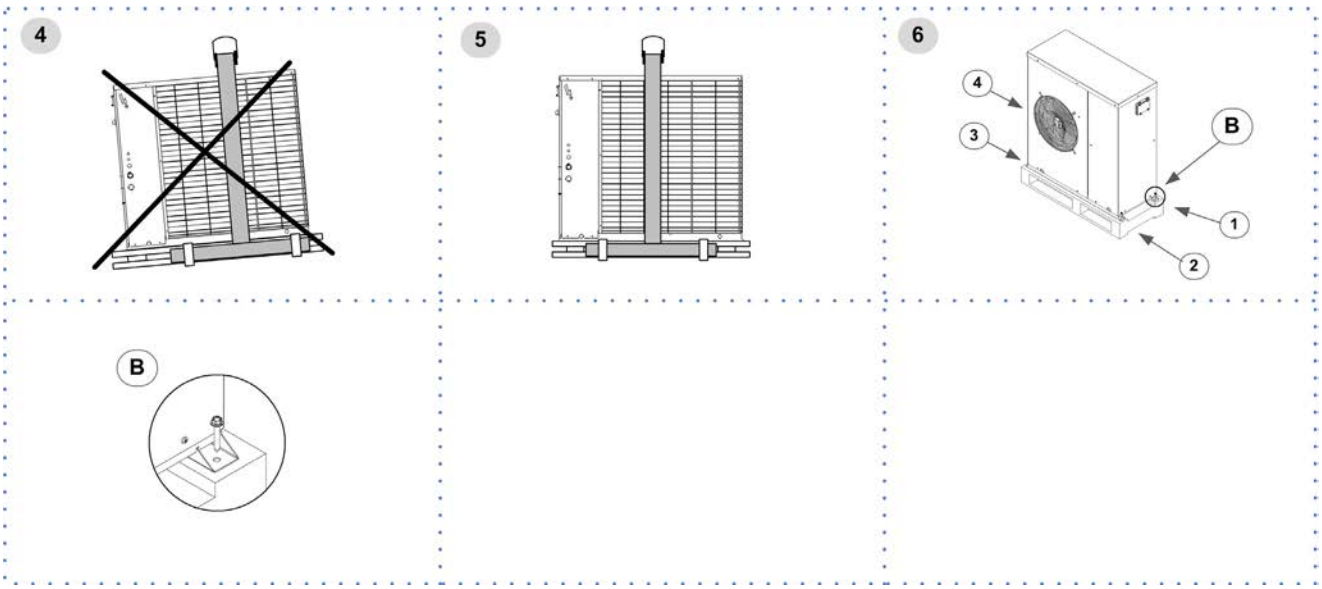
3.1 Storage

Observe external packaging instructions.

3.2 Handling

1. Verify unit weight and handling equipment lifting capacity.
2. Identify critical points during handling (disconnected routes, flights, steps, doors).
3. Use protections not to damage the unit.
4. Before starting the handling, make sure that the unit is stable.
5. Start hoisting the unit.
6. Remove screws





3.3 Packaging removing

Be careful not to damage the unit.

Keep packing material out of children's reach it may be dangerous.

Recycling and disposing the packaging material in conformity with local regulations.

4 Positioning

During positioning consider these elements:

- Shafts required by the unit
- Electrical connections
- Water connections
- Spaces for air exhaust and intake

4.1 Functional spaces

Functional spaces are designed to:

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

Respect all functional spaces indicated in the DIMENSIONS section.

Double all functional spaces if two or more unit are aligned.

4.2 Positioning

⚠ Units are designed to be installed:

- EXTERNAL
- in fixed positions

Limit vibration transmission:

- use antivibration devices on unit bearing points
- install flexible joints on the hydraulic

Choose the installation place according to the following criteria:

- Customer approval
- safe accessible position
- technical spaces requested by the unit
- spaces for the air intake/exhaust
- avoid flood-prone places
- verify unit weight and bearing point capacity
- verify that all bearing points are aligned and leveled
- install the unit raised from the ground
- max. distance allowed by the electrical connections
- condensate water draining

Prefer places where the unit doesn't disturb the neighbours.

⃠ Avoid installations next to bedrooms or windows.

Avoid snow accumulations on batteries.

A correct circulation of the air is indispensible to guarantee the good working order of the machine.

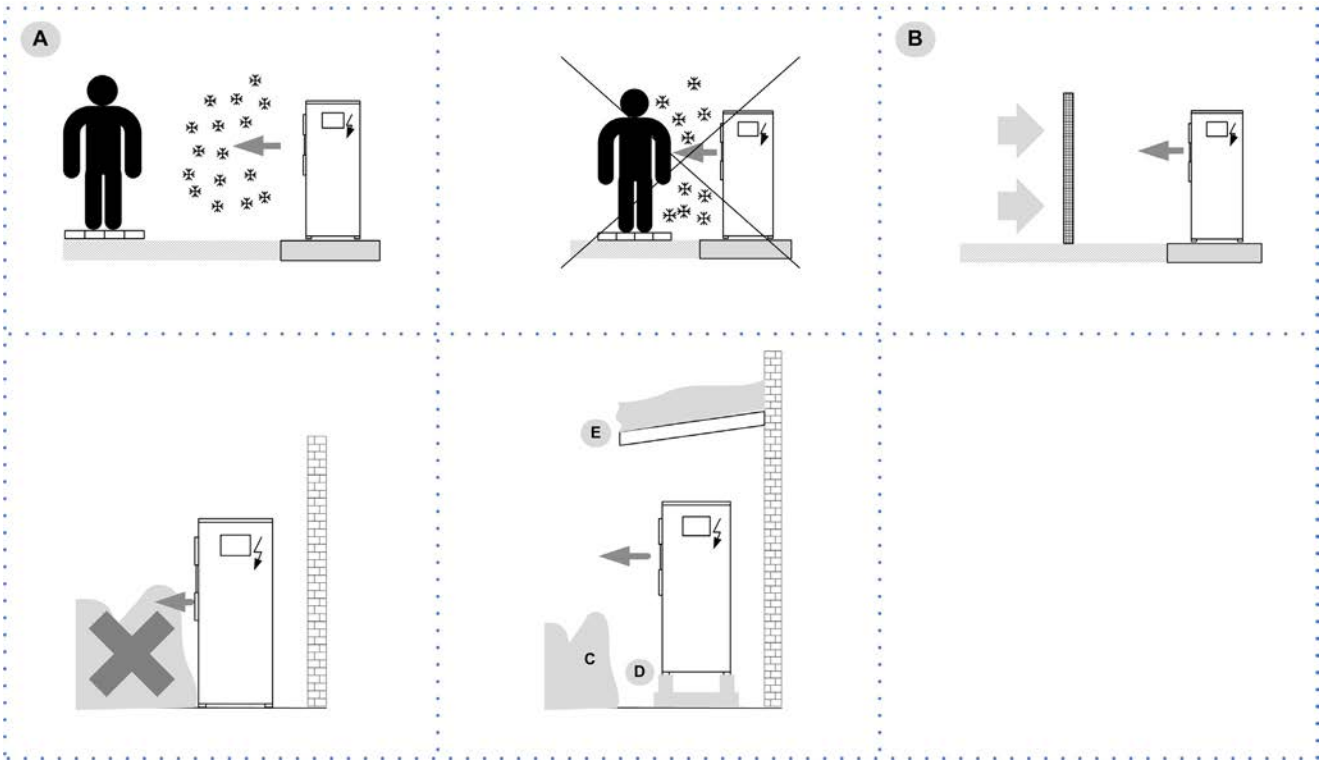
⃠ Avoid therefore:

- obstacles to the airflow
- exchange difficulties
- leaves or other foreign bodies that can obstruct the exchange batteries
- winds that hinder or favour the airflow
- heat or pollution sources close to the unit (chimneys, extractors etc..)
- stratification (cold air that stagnates at the bottom)
- recirculation (expelled air that is sucked in again)
- positioning below the level of the threshold, close to very high walls, attics or in angles that could give rise to stratification or recirculation phenomenons

Ignoring the previous indications could:

- energy efficiency decrease
- blocks due to HIGH PRESSURE (in summer) or LOW PRESSURE (in winter)

A. Keep the min. distances from the podestrian areas.
B. Provide windbreaks in locations with strong winds.
C. Avoid snow accumulations on batteries.
D. Install the unit lifted from the ground.
E. Provide a protection.



4.3 Condensate water

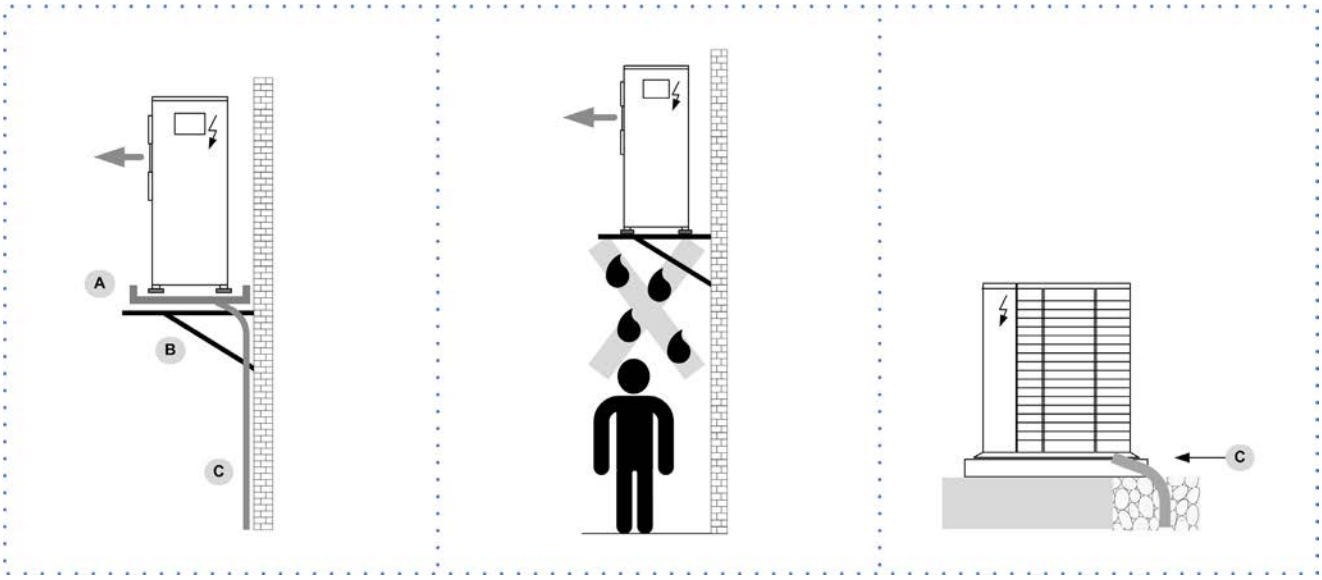
When a heat pump is running it produces a considerable amount of water due to the defrosting cycles of the external coil.

The condensation must be eliminated in a manner to avoid wetting pedestrian areas.

The unit anti-freeze electric resistance prevents the ice from forming inside the tray.

With extensive very cold outdoor temperatures, condensation could freeze outside the unit blocking the flow and causing a slow build-up of ice; therefore special attention must be paid to eliminating condensation, raising the unit off the ground and evaluating whether antifreeze elements should be installed.

A. Condensation collection basin
B. Unit support
C. Condensate discharge connection Ø 13



5 Water connections

5.1 Water quality

The water quality can be checked by qualified personnel.

Water with inadequate characteristics can cause:

- pressure drop increase
- energy efficiency decrease
- corrosive symptom increase

Acceptable water quality values:

PH	7,5 ÷ 9,0	
SO_4^{--}	< 100	ppm
HCO_3^- / SO_4^{--}	> 1	
Total Hardness	4,5 ÷ 8,5	dH
Cl-	< 50	ppm
PO_4^{3-}	< 2,0	ppm
NH3	< 0,5	ppm
Free Chlorine	< 0,5	ppm
Fe_3^+	< 0,5	ppm
Mn^{++}	< 0,05	ppm
CO_2	< 50	ppm
H_2S	< 50	ppb
Temperature	< 65	°C
Oxygen content	< 0,1	ppm

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

5.2 Risk of freeze

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

5.3 Anti-freeze solution

Consider that the use of anti-freeze solution determines an increase in a pressure drop.

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

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

5.4 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).

5.5 Operation sequence

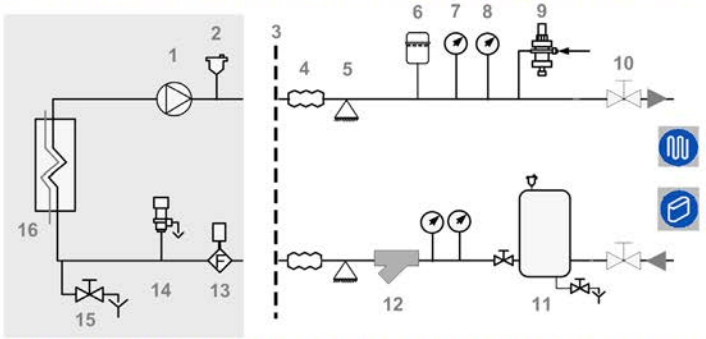
1. Carefully wash the system with clean water: fill and drain the system several times.
2. Apply additives to prevent corrosion, fouling, formation of mud and algae.
3. Fill the plant
4. Execute leakage test.
5. Isolate the pipes to avoid heat dispersions and formation of condensate.
6. Leave various point of service free (wells, vent-holes etc).

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

5.6 Racommended connection

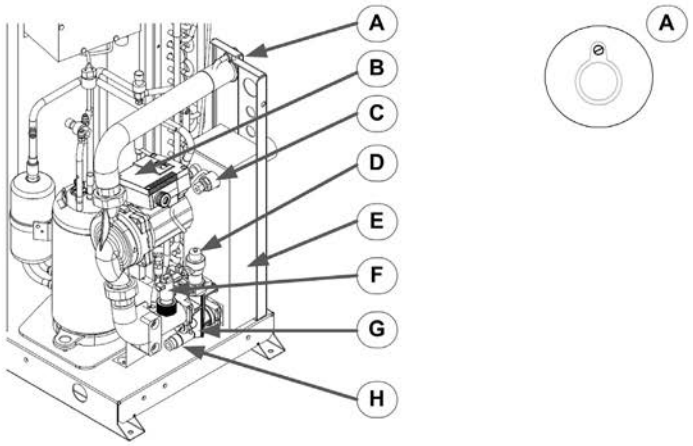
⚠ The installer must to defined:

- component type
- position on system



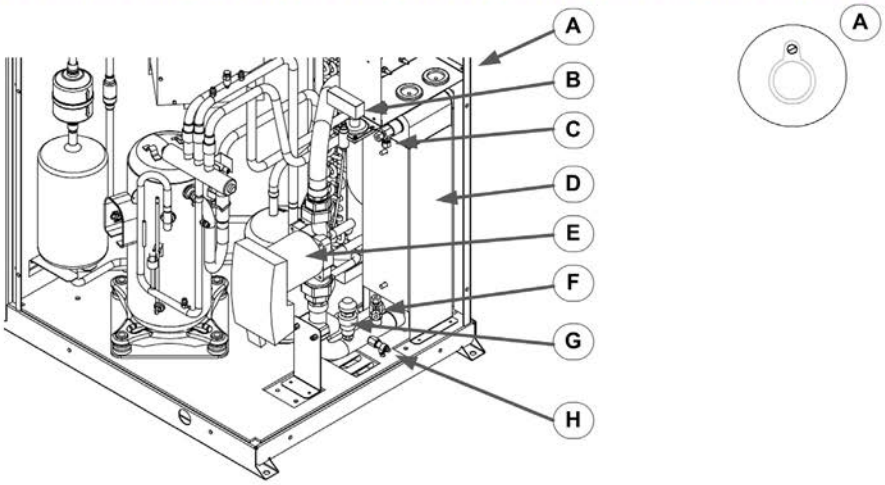
1	Pump / circulating pump	9	filling valve
2	vent	10	shut-off valve
3	limit unit	11	Internal storage tank
4	antivibration joints	12	filter
5	piping support	13	Flow Switch
6	expansion vessel	14	safety valve
7	pressure gauge	15	Drain valve
8	thermometer	16	utility side exchanger

(sizes 21÷71)



A.	vent	E.	plate exchanger
B.	pump	F.	Flow Switch
C.	input probe	G.	input probe
D.	Safety valve (6 Bar)	H.	water outlet

(size 81÷141)

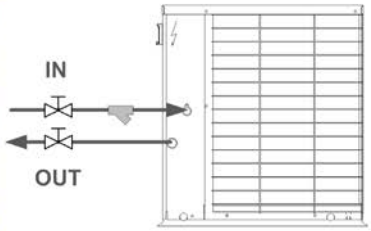


A. vent
B. Differential pressure switch
C. input probe
D. plate exchanger
E. pump
F. input probe
G. Safety valve (6 Bar)
H. water outlet

5.7 Water filter

If not present on-board the machine, must be installed immediately in the water input of the unit, in a position that is easily accessible for cleaning.

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



6 Electrical connections

The characteristics of the electrical lines must be determined by specialized 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 the presumed short circuit current, whose value must be determined in function of 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 requirements by the regulations in force and being informed about the risks relevant to these activities.

Operate in compliance with safety regulations in force.

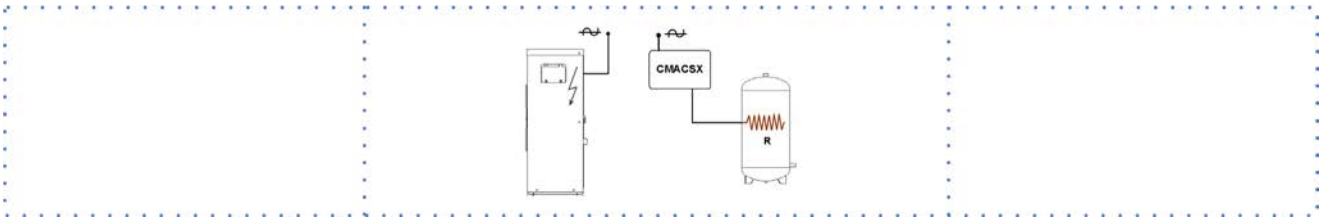
6.1 Electrical data

⚠ 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.

It reports the regulations indications such as:

- 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.



⚠ If the DHW module is present, consider the electric resistance absorption in the power supply line dimensionino.

6.2 Connections

1. Refer to the unit electrical diagram (the number of the diagram is shown on the serial number label).
2. Verify that the network has characteristics conforming to the data shown on the serial number label.
3. Before starting work, verify that the sectioning device at the start of the unit power line is open, blocked and equipped with cartel warning.
4. Primarily you have to realize the earthing connection.
5. Shelter the cables using adequate measure fairleads.
6. Before power the unit, make sure that all the protections that were removed during the electrical connection work have been restored.

6.3 Signals / data lines

Do not overpass 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.

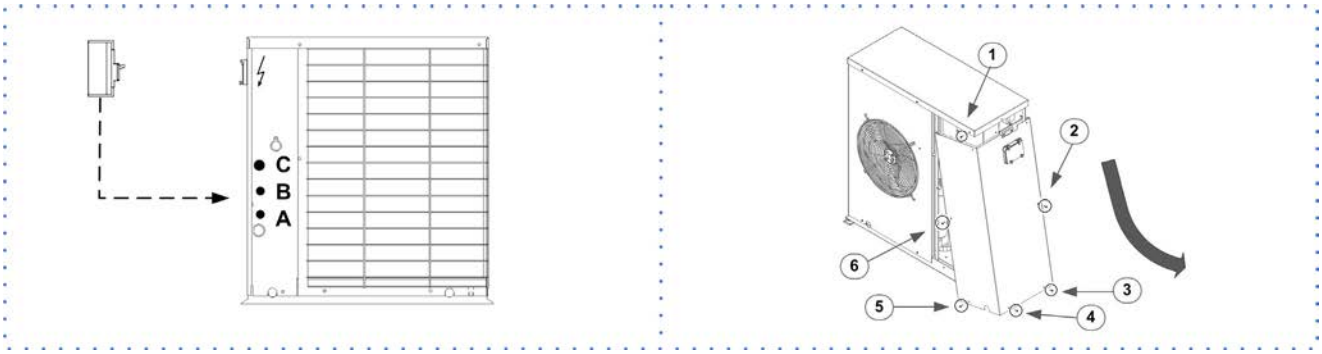
Do not lay the cables parallel to other cables, cable crossings are possible, only if laid at 90°.

Connect the screen to the ground, only if there aren't disturbances.

Guarantee the continuity of the screen during the entire extension of the cable.

Respect impendency, capacity and attenuation indications.

6.4 Power input



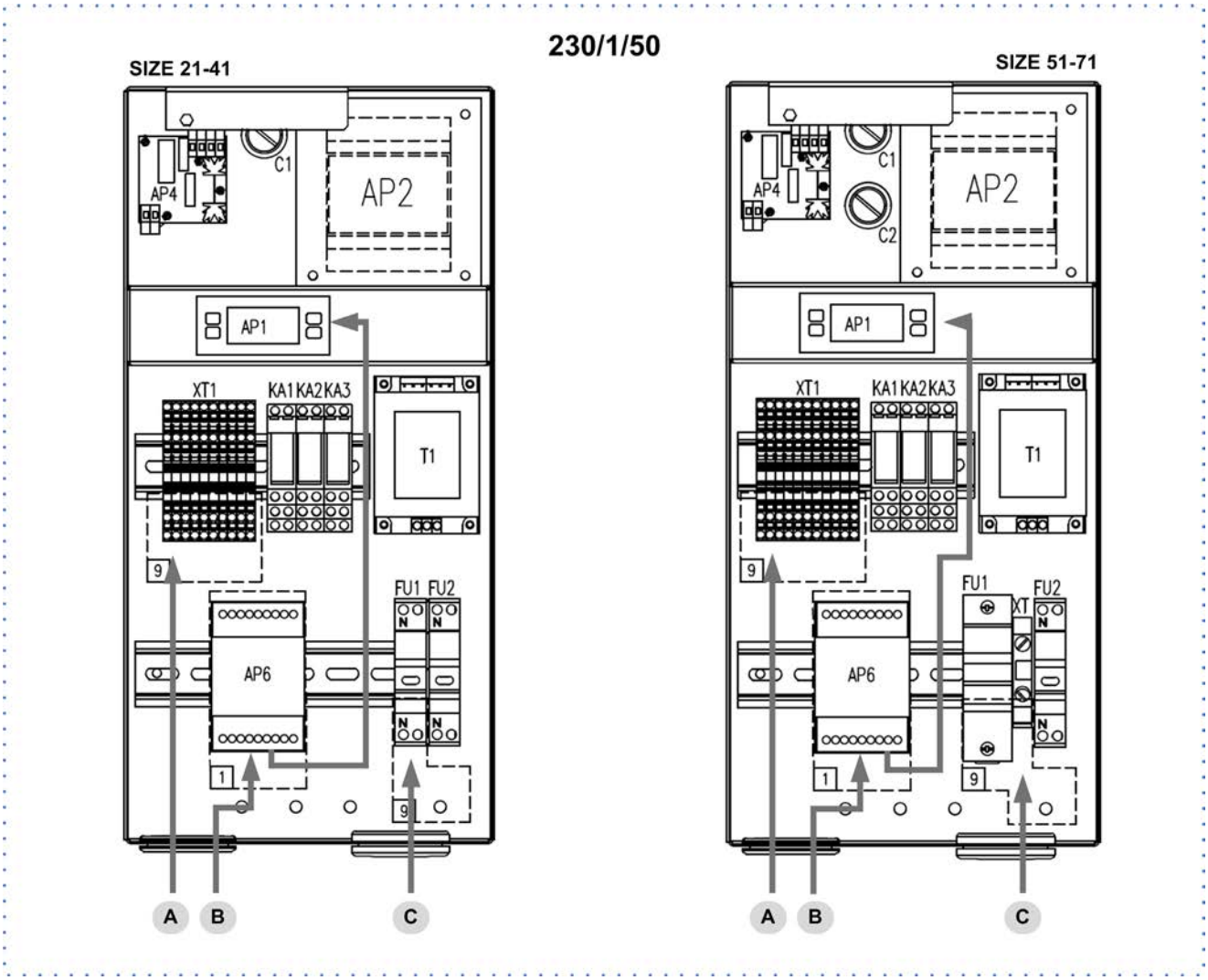
A, B: Ø 22 mm
C: Ø 34 mm

⚠ Install the isolator switch near the unit.

⚠ Fix the cables: if vacated may be subject to tearing.

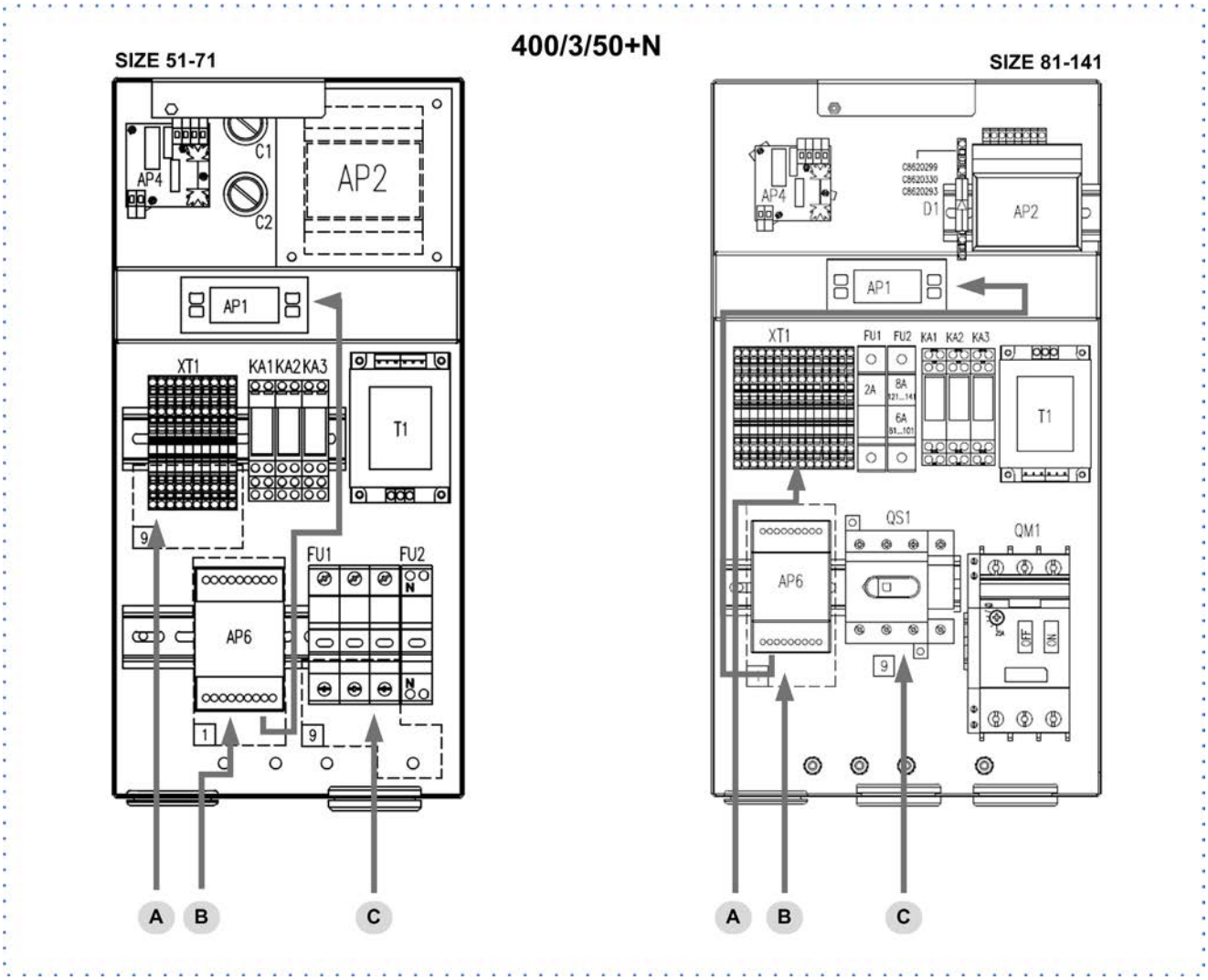
⊘ The cable don't have to touch the compressor and the refrigerant piping (they reach high temparatures).

6.5 Electrical panel



A Signals **B** RS485 **C** Power supply

AP1	Main control module	FU1	Fuse
AP2	Electronic thermostatic management	FU2	230V aux. cicuit fuse
AP4	Fan control module	KA1	Inverter alarm auxiliary relay
AP6	RS 485 module (OPTIONAL)	KA2	Compressor control relay
C1 C2	Fan capacitor	KA3	Ciculation pump control relay
T1	Transformer	XT1	Terminal block of the customer connections

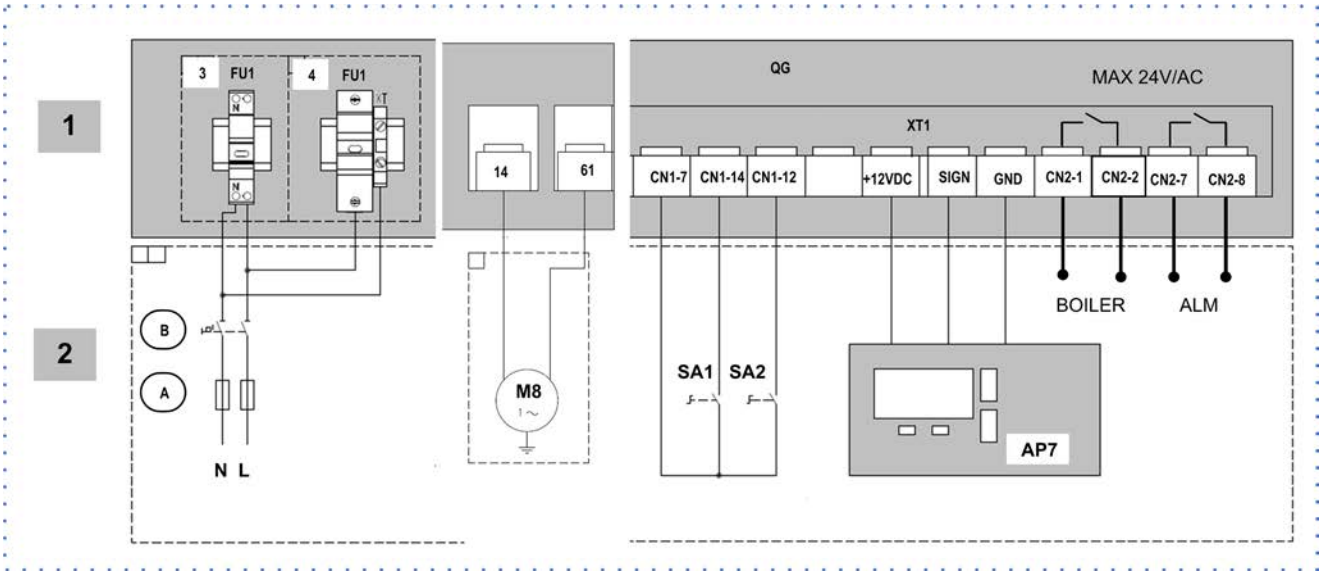


A Signals **B** RS485 **C** Power supply

AP1	Main control module	FU1	230V aux. cicuit fuse
AP2	Electronic thermostatic management	FU2	compressor overload protection and timer
AP4	Fan control module	QS1	Main isolator switch
AP6	RS 485 module (OPTIONAL)	QM1	Compressor line protection
C1 C2	Fan capacitor	KA1	Inverter alarm auxiliary relay
T1	Transformer	KA2	Compressor control relay
FU1	compressor overload protection and timer Size 51-71	KA3	Ciculation pump control relay
FU2	230V aux. cicuit fuse Size 51-71	XT1	Terminal block of the customer connections

6.6 Connections performer by customer

Electrical panel
(sizes 21÷71)



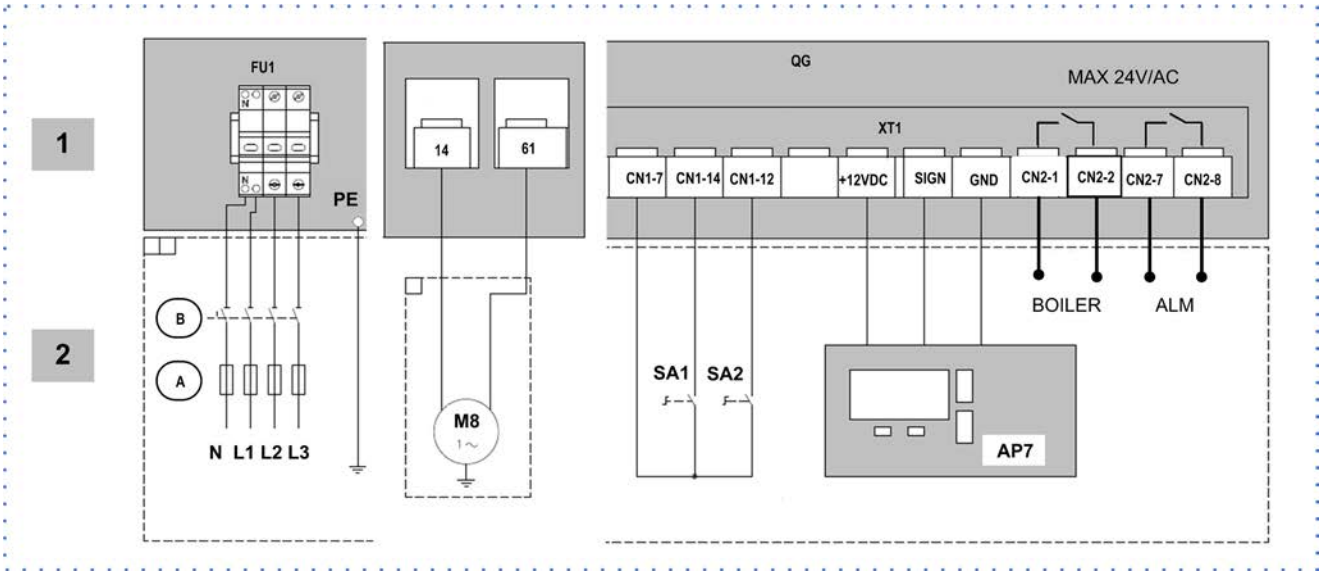
1 Unit
2 Connections perfomer by customer
3 Only for sizes 21-41
4 Only for sizes 51-71

A Fuses
Provided by the customer

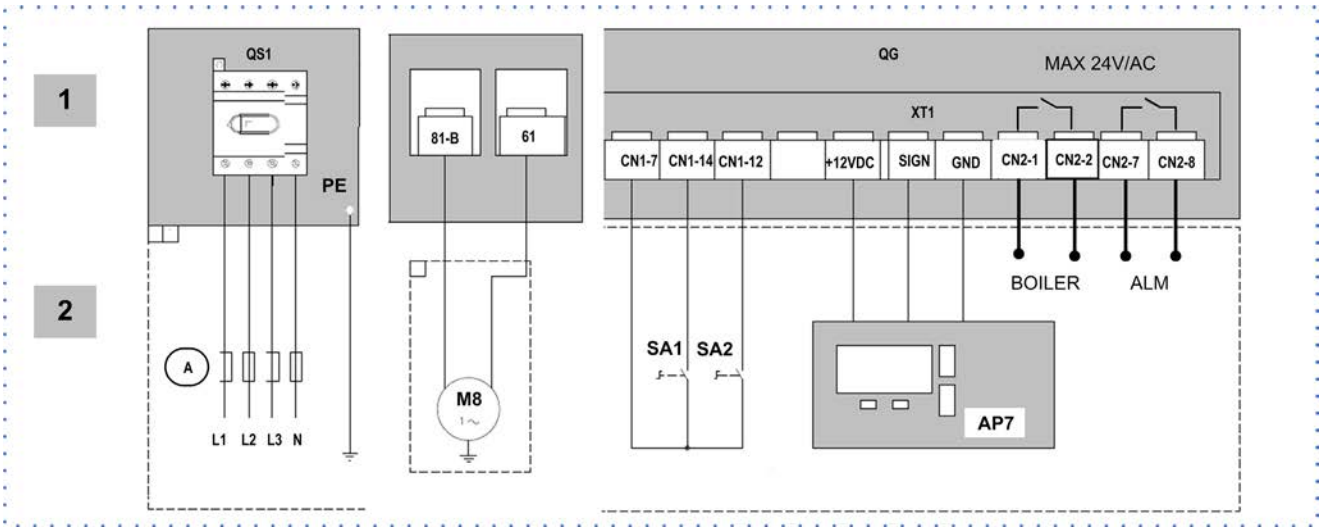
B Isolating switch
Provided by the customer

FU1 Fuse

QG Electrical panel
AP7 Room keypad
SA2 Remote summer/winter
6.8 SA2 = Summer - Winter remote → 20
SA1 Remote ON-OFF
6.7 SA1 = ON-OFF remote → 20
M8 Pump use
Provided by the customer
XT1 Terminal block of the customer connections



Electrical panel
(size 81÷141)



1 Unit
2 Connections perfomer by customer
A Fuses
Provided by the customer
QS1 Isolating switch
QG Electrical panel
SA1 Remote ON-OFF
SA2 Remote summer/winter
AP7 Room keypad
M8 Pump use
Provided by the customer
XT1 Terminal block of the customer connections

6.7 SA1 = ON-OFF remote

Set parameter CL43 as shown in the table

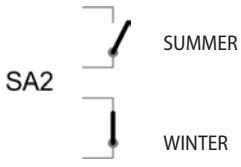
CL43	ON/OFF	Standby	Time bands	only DHW
-2	SA1 = ON-OFF remote	from menu	YES	from menu
-1	ON/OFF only by keypad	SA1 = remote standby	NO	from menu
0	ON/OFF only by keypad (SA1 disabled)	Menu standby (SA1 disabled)	YES	from menu
28	from keypad	from menu	YES	SA1 = only Domestic Hot Water remote

OFF: emergency stop, not active the antifreeze safeties etc.
Standby: assisted stop, are active the antifreeze safeties etc.

6.8 SA2 = Summer - Winter remote

Set parameter CL44

CL44	Summer/Winter change	
0	from keypad	SA2 = disabled
-3	by SA2	change from keyboard disabled



6.9 Remote control with room thermostat

For details see: 14.1 RCTX - Remote control → 65

6.10 Domestic hot water module

For details see: 14.3 AMACSX - Domestic hot water module → 67

6.11 Serial communication module with RS485 serial converter kit

For details see: 14.2 CMSC2X - Serial communication module with RS485 serial converter kit → 66

7 Start-up

7.1 General description

The indicated operations should be done by qualified technician with specific training on the product.
Upon request, the service centres performing the start-up.
The electrical, water connections and the other system works are by the installer.
Agree upon in advance the star-up data with the service centre.
Before checking, please verify the following:

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

7.2 Preliminary checks

For details refer to the different manual sections.

Unit OFF power supply

1. safety access
2. functional spaces
3. air flow: correct return and supply (no bypass, no stratification)
4. structure integrity
5. fans run freely
6. unit on vibration isolators
7. unit input water filter + shut-off valves for cleaning
8. vibration isolators on water connections
9. expansion tank (indicative volume = 5% system content)
10. cleaned system
11. loaded system + possibile glicole solution + corrosion inhibitor
12. under pressure system
13. vented system
14. refrigerant circuit visual check
15. earthing connection
16. power supply features
17. electrical connections provided by the customer

7.3 Start-up sequence

For details refer to the different manual sections.

Unit ON power supply

1. compressor carter resistances operating at least since 8 hours
2. off-load voltage measure
3. phase sequence check (unit only 400/3/50)
4. unit ON
5. load voltage measure and absorptions
6. check of all fan operating
7. measure of return and supply water temperature and flow valutation
8. super-heating and sub-cooling measure and discharge temperature
9. check no anomalous vibrations are present
10. climatic curve personalization
11. set date and time
12. personalise scheduling
13. personalise DHW *
14. climatic curve personalization
15. set ambient keypad *
16. complete and available unit documentation

*If present

7.4 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 cocks of the refrigerant circuit, if there are any.

7.5 Refrigerant circuit

1. Before realizing the unit connection make sure that the hydraulic system has been cleaned up and the clearing water has been drained.
2. Check that the water circuit has been filled and pressurized.
3. Check that the shut-off valves in the circuit are in the "OPEN" position.
4. Check that there isn't air in the circuit, if required, evacuate it using the air bleed valve placed in the system high points.
5. When using antifreeze solutions, make sure the glycol percentage is suitable for the type of use envisaged.

Weight of glycol (%)	10	20	30	40
Freezing temperature (°C)	-3.9	-8.9	-15.6	-23.4
Safety temperature (°C)	-1	-4	-10	-19

7.6 Electric Circuit

⚠ Verify that the unit is connected to the ground plant.

Check the conductors tightening: the vibrations caused by handling and transport might cause loosing.

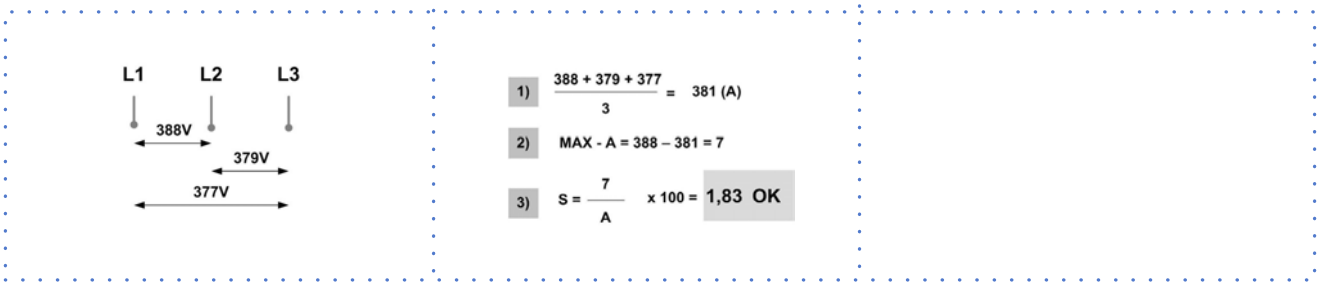
Feed the unit by closing the sectioning device, but leave it on OFF.

Controllare i valori di tensione e frequenza di rete, che devono essere entro i limiti:

- 400/3/50 +/-10%
- 230/1/50 +/-10%

Control the unbalancing of the phases: it must be lower than 2%

Example:



⚠ The working out of the limits can cause irreversible damages and voids the warranty.

7.7 Compressor crankcase resistances

Connect the oil resistances on the compressor crankcase at least 8 hours before the compressor is to be starter:

- at the first unit start-up
- after each prolonged period of inactivity

1. Supply the resistances switching off the unit isolator switch.
2. To make sure that hte resistances are working, check the power input.
3. At start-up the compressor crank-case temperature on the lower side must be higher at least of 10°C than the outside temperature.

⊘ Do not start the compressor with the crankcase oil below operating temperature.

7.8 Voltages

Check that the air and water temperatures are included in the operating limits.

Start-up the unit.

With operating unit, i.e. in stable conditions and next to the operating ones, check:

- Voltage
- Total absorption of the unit
- Absorption of the single electric loads

7.9 Remote controls

Check that the remote controls (ON-OFF etc) are connected and, if necessary, enabled with the respective parameters as indicated in the "electrical connections" section.

Check that probes and optional components are connected and enabled with the respective parameters ("electrical connections" section and following pages).

7.10 Water set point compensation with external temperature

It is possible to automatically change the set-point according to the outside temperature.

Enable the function:

Par: dS00 set-point compensation of the outside temp.

0 = Disabled

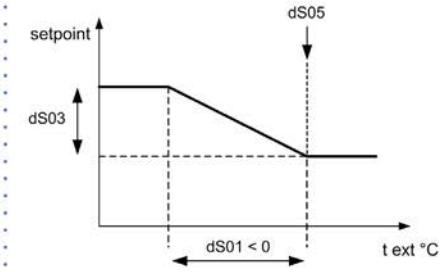
1 = Proportional

2 = Fixed (by step)

Cooling

With low ext. temperature the refrigerant requirements are reduced.

The internal comfort can also be obtained with a set-point higher than standard.



Example:

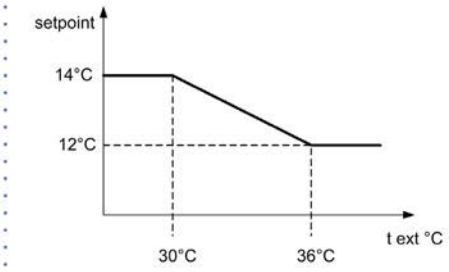
dS01 = - 6°C

dS03 = 4°C

dS05 = 36°C

setpoint = 10°C

compensated setpoint = 14°C



Parameter modification

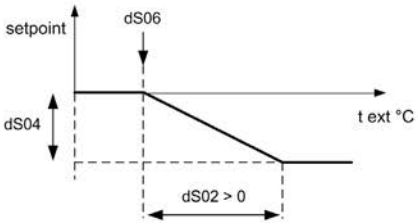
Main menu→Parameters→dS→dS00

Cool	Description
dS01	Temperature controller dynamic differential proportional band in Cool
dS03	Maximum temperature controller dynamic differential in Cool
dS05	Temperature controller dynamic differential setpoint in Cool

Heating

With outside mild temperatures the thermal requirements are reduced.

The internal comfort can also be obtained with a lower setpoint.



Example:

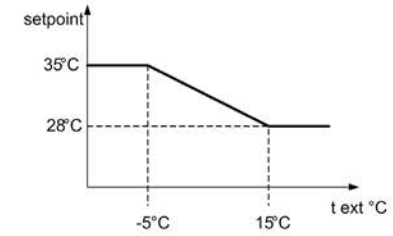
dS02 = 20°C

dS04 = - 7°C

dS06 = -5°C

setpoint = 35°C

compensated setpoint = 28°C



Heat	Description
dS02	Temperature controller dynamic differential proportional band in Heat
dS04	Maximum temperature controller dynamic differential in Heat
dS06	Set point dynamic differential of external air

7.11 Water set point compensation with ambient temperature

Only with ambient keyboard option.

Function and parameters are the same of paragraph "Water set point compensation with external temperature"

On the ambient keyboard set parameter Cr 30 = 10

It is possible enable ambient compensation OR external compensation, not ambient AND external compensation.

7.12 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.

7.13 97/23 CE PED directive

97/23 CE PED DIRECTIVE gives instructions for installers, users and maintenance technicians as well.

Refer to local actuation norms; 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 Control

8.1 Display

Icon	Fixed on	Flashing	Icon	
⚠	Alarm on progress	Silenced alarm	①	Compressor
☀	Heating mode	Antifreeze with active heat pump, remote heating mode		Ventilation
❄	Remote cooling	Remote cooling mode	LAMP TEST	At the start-up is performed a board automatic test: all the led flash for some seconds
⏻	Standby from keypad	Remote standby		Primary circuit water pump
	Clock Active scheduling	Clock setting Scheduling	②	Heater ON - D.H.W.
	Defrosting Automatic	Manual defrosting activated	③	ON: Domestic hot water Flashing: D.H.W. mode - standby
①	Not used		④	Boiler activation request

8.2 Keys

Symbol	Name	Action	Function (3 sec.)	
	Up	Increases the value Next voice		Silenced alarm
	Down	Decreases the value Previous voice		On / Off *
esc	Esc	Esc WITHOUT SAVING MODIFICATIONS Previous level	mode	Heat / cool / stdby / as
set	Set	Confirm Esc WITH MODIFICATION SAVING Go to the next level STATA menu		Inputs / clock / active alarms / setpoint
+		Activate / disactivate the time bands		
esc + set		Access to the SETTING menu		Parameters / function / password / alarms

* Unit in OFF the antifreeze function is not active.

8.3 Navigation

esc Press 2 sec.	**OPERATING MODE**	**Heat**	Heating
		Cool	Cooling
		StdBY	Standaby - off
		AS	Domestic hot water The unit switches to ACS mode, only by Heat mode

set	**STATA**	**Ai, di, AO, dO**	Inputs, outputs
		AO	Digital inputs
		of	Analogical outputs
		dO	Digital outputs
		CL	Clock
		AL	Active alarms
		HR	Compressor operating hours
		SP	Setpoint

esc + set	**SCHEDULING**	**PAR - parameters**	Configuration
		Fnc - functions	dEF - manual defrosting* tA - alarm reset St - on / off CC - copy card EUr - alarm log reset
		PASS - password	
		EU - alarms	Alarm log

*Manual defrosting: possible only under certain conditions.

Use for qualified technicians reserved.

8.4 ON/OFF

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press 3 sec.			OFF	
2	**OFF**	Press 3 sec.			ON	

8.5 Change the operating mode

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press 2 sec.	esc		Cool	*
2	**Cool**	Select			Choose standby, off: STBY cool: COOL heat: HEAT DHW: AS	
3	**Heat**	Confirm	set			

* Off the unit is immediately stopped without respecting any timing.
Stanby the antifreeze function is active (pump ON for water temperature < 4°C).
The circulator anti-blocking function is active (pump ON at predefined intervals).

8.6 Clock setting

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		Ai	
2	**Ai**	Select			CLOCK menu	
3	**CL**	Access	set		Hour	
4	**Hour**	Select			Choose hour: HOUR date: DATE year: YEAR	
5	**YEAR**	Press 3 sec.	set		Confirm ! Value flashing !	
6	**! 2012 !**	Press			Set the value	
7	**! 2013 !**	Confirm	set		2013	
8		Press	esc		Back to step 4	

8.7 Water setpoint modification

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		Ai	
2	**Ai**	Select			SP	
3	**SP**	Access	set		Cool	
4	**Cool**	Select			Choose Cool Heat AS	
5	**AS**	Confirm	set		50	
6	**50**	Press			Set the value 55	
7	**55**	Confirm	set		55	
8		Press	esc		Back to the previous menu	

8.8 Display of inputs - outputs

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		Ai	
2	**Ai**	Choose menu	⌄⌄	⌄⌄	Ai: analogical inputs di: digital inputs AO: analogical outputs dO: digital outputs	
3	**of**	Access	set		diL1	
4	**diL1**	Scroll the list	⌄⌄	⌄⌄	Choose diL4	
5	**diL4**	Press to see the value	set		For digital inputs: 0 = input not active - open 1 = input active - closed	
6		Press	esc		Back to the previous menu	

For details see:
15.4 Stata → 71

8.9 Silenced alarm

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Er01**				The alarm code is flashing	
2	**13.5°C**				Alternated to temperature	
3	⚠				Fixed ALARM led	
4		Press any button	⌃⌃	esc / set		
5	! ⚠ !				ALARM led is flashing	

For details see:
8.27 Alarms → 38

8.10 Alarms

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		Ai	
2	**Ai**	Select	⌃⌃	⌄⌄	ALARM menu Al	
3	**Al**	Press	set		Access 1° active alarm	
4	**Er01**	Scroll	⌃⌃	⌄⌄	Other active alarms	
5		Press	esc		Back to the previous menu	

8.11 Alarm reset

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		PAr	
2	**PAr**	Select	⌃⌃	⌄⌄	FnC	
3	**FnC**	Press	set		dEF	
4	**dEF**	Select	⌃⌃	⌄⌄	tA	
5	**tA**	Press	set			
6		Press	esc		Back to the previous menu	

8.12 Alarm log

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	esc + set		PAr	
2	**PAr**	Select	⌃	⌄	EU	
3	**EU**	Press	set		Last registered alarm EU00	
4	**EU00**	Press	set		Access to alarm code info Er01	
5	**Er01**	Select	⌃	⌄	Hour of the alarm 20:01	
6	**20:01**	Select	⌃	⌄	Date of the alarm 27.10	
7	**27.10**	Select	⌃	⌄	Alarm output hour Example: alarm still active --:--	
8	**--:--**	Select	⌃	⌄	Alarm output date Example: alarm still active --:--	
9	**--:--**	Select	⌃	⌄	Type of alarm: AUto (automatic) MAnu (manual)	
10	**AUto**	Press	set			
11		Press	esc		Back to the previous menu	

8.13 Alarms log reset

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		PAr	
2	**PAr**	Select	⌃	⌄	FnC	
3	**FnC**	Press	set		dEF	
4	**dEF**	Select	⌃	⌄	EUr	
5	**EUr**	Press 3 sec.	⌃	⌄	YES	
6		Press	esc		Back to the previous menu	

8.14 Setting menu

SETTING menu - PAR (configuration parameters)		
Label	**Acronym meaning (label)**	**Parameters of:**
CL	Configuration Local	Local I/O Configuration
CE	Configuration Expansion	Expansion I/O Configuration
Cr	Configuration Remote terminal	Remote terminal I/O Configuration
CF	ConFiguration	Configuration
Ui	User interface	User interface
tr	thermoregulation	Thermoregulation
St	Stati (Operating modes)	Operating stata
CP	ComPressori	Compressor
PI	Pump (Internal)	Primary circuit water pump
FI	Fan (Internal)	Not used
FE	Fan (External)	Fans (external) of the disposable exchanger
PE	Pump (External)	Not used
Hi	Electric Heaters (Internal)	Electric heaters of the primary exchanger
HE	Electric Heaters (External)	Not used
HA	Auxiliary Output	Not used
br	Boiler	Boiler
dF	deFrost	Defrosting
dS	dynamic Setpoint	Dynamic Setpoint
Ad	Adaptive	Adaptive (adaptive function)
AF	AntiFreeze	Anti-ice
AS	Domestic hot water, Anti-Legionella	Domestic hot water, Anti-Legionella
HP	Heat Pump	Heat pump
PL	Power Limitation	Not used
tE	Time Events	Time bands
AL	ALarm	Alarms

8.15 Scheduling management

It is possible to set 3 different schedulings.
To each scheduling is possible to associate 4 events.
To each day of the week is possible to associate a scheduling.
In the example the schedulings have been assigned:

Scheduling 1	Monday	Tuesday	Wednesday
Scheduling 2	Thursday	Friday	
Scheduling 3	Saturday	Sunday	

Day	Scheduling 1	Scheduling 2	Scheduling 3
Monday	tE01 = 1	-	-
Tuesday	tE02 = 1	-	-
Wednesday	tE03 = 1	-	-
Thursday	-	tE04 = 2	-
Friday	-	tE05 = 2	-
Saturday	-	-	tE06 = 3
Sunday	-	-	tE07 = 3

To enable the hour scheduling set the parameters tE00 and CL43:
Par tE00 hour scheduling
0 = disabled, 1 = enabled
Par CL43 = -2

Parameter modification
Main menu→Parameters→tE→tE00

In the following example the scheduling 1 schedules:
at 07:00 changes the cooling set-point
at 12:00 changes the cooling set-point
at 16:30 changes the cooling set-point
at 22:00 changes the cooling set-point

Scheduling 1				
Description	**Event 1**	**Event 2**	**Event 3**	**Event 4**
Time	tE10 = 07	tE17 = 12	tE24 = 16	tE31 = 22
Minutes	tE11 = 00	tE18 = 00	tE25 = 30	tE32 = 00
Mode 0= on 1= standby	tE12 = 0	tE19 = 0	tE26 = 0	tE33 = 0
*Cooling temperature	tE13 = -	tE20 = -	tE27 = -	tE34 = -
*Heating temperature	tE14 = 20	tE21 = 22	tE28 = 22	tE35 = 18
DHW temperature	tE22 = 45	tE22 = 45	tE29 = 55	tE36 = 45

* If the unit is in Cooling is used the cooling temperature.
* If the unit is in Heating is used the heating temperature.

		Sched. 1 (par.)	**Sched. 2 (par.)**	**Sched. 3 (par.)**
Event 1	Time	tE10	tE38	tE66
	Minutes	tE11	tE39	tE67
	Mode 0= on 1= standby	tE12	tE40	tE68
	Cooling temperature	tE13	tE41	tE69
	Heating temperature	tE14	tE42	tE70
	DHW temperature	tE15	tE43	tE71

Event 2	Time	tE17	tE45	tE73
	Minutes	tE18	tE50	tE74
	Mode 0= on 1= standby	tE19	tE47	tE75
	Cooling temperature	tE20	tE48	tE76
	Heating temperature	tE21	tE49	tE77
	DHW temperature	tE22	tE50	tE78

Event 3	Time	tE24	tE52	tE80
	Minutes	tE25	tE53	tE81
	Mode 0= on 1= standby	tE26	tE54	tE82
	Cooling temperature	tE27	tE55	tE83
	Heating temperature	tE28	tE56	tE84
	DHW temperature	tE29	tE57	tE85

Event 4	Time	tE31	tE59	tE87
	Minutes	tE32	tE60	tE88
	Mode 0= on 1= standby	tE33	tE61	tE89
	Cooling temperature	tE34	tE62	tE90
	Heating temperature	tE35	tE63	tE91
	DHW temperature	tE36	tE64	tE92

8.16 Sanitary water

To enable the DHW function:

Par AS00 DHW operating

1 = Enable the heat pump for DHW + DHW 3-way valve

3 = Enable the heat pump for DHW + electric heater + DHW 3-way valve

Parameters to setting:

CL 90 = 9	CE 50 = 11	AS = 1
CE 00 = 2	CE 60 = 0	AS = 5
CE 30 = 11		AS = 5
		AS = 20

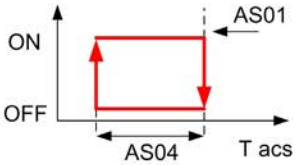
Parameter modification

Main menu→Parameters→tE→AS00

Parameter:

AS01 DHW setpoint

AS04 DHW hysteresis



DHW scheduling

To enable the hour scheduling:

Par tE00 hour scheduling

0 = disabled, 1 = enabled

Parameter modification

Main menu→Parameters→tE→tE00

Antilegionella scheduling

The scheduling can be programmed for each day of the week.

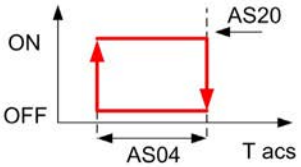
Parameter:

AS20 antilegionella set-point

AS04 DHW hysteresis

Parameter modification

Main menu→Parameters→tE→AS20



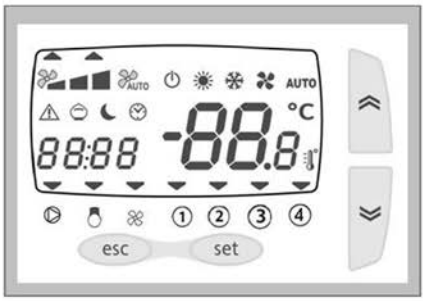
In the following example the antilegionella cycle is scheduled:

Wednesday	duration	1	starting at 23:00
Sunday	duration	2	starting at 22:30

Day	Cycle duration (0= OFF from 1 to 24 hours)	Time	Minutes
Monday	AS25 = 0	AS26	AS27
Tuesday	AS28 = 0	AS29	AS30
Wednesday	**AS31 = 1**	**AS32 = 23**	**AS33 = 00**
Thursday	AS34 = 0	AS35	AS36
Friday	AS37 = 0	AS38	AS39
Saturday	AS40 = 0	AS41	AS42
Sunday	**AS43 = 2**	**AS44 = 22**	**AS45= 30**

8.17 Ambient keyboard - option

The keyboard repeats all the built-in control functions.



8.18 Display

Icon	Fixed on	Flashing	Icon	
⚠	Alarm on progress	Silenced alarm	①	Compressor
☀	Heating mode	Antifreeze with active heat pump, remote heating mode		Ventilation
❄	Remote cooling	Remote cooling mode		Primary circuit water pump
⏻	Standby from keypad	Remote standby	LAMP TEST	At the start-up is performed a board automatic test: all the led flash for some seconds
❄	Defrosting	Manual defrosting activated		Display shows Clock (not related to scheduling)
②	Heater ON - D.H.W.		③	ON: Domestic hot water Flashing: D.H.W. mode - standby
AUTO ☾ AUTO ①④			Not used	

8.19 Keys

Symbol	Name	Action	Function (3 sec.)	
∧	Up	Increases the value Next voice		Silenced alarm
∨	Down	Decreases the value Previous voice	⏻	On / Off *
esc	Esc	Esc WITHOUT SAVING MODIFICATIONS Previous level	mode	Heat / cool / stdby / as
set	Set	Confirm Esc WITH MODIFICATION SAVING Go to the next level STATA menu		Inputs / clock / active alarms / setpoint
∧ + ∨		Activate / disactivate the time bands		
esc + set		Access to the SETTING menu		Parameters / function / password / alarms

* Unit in OFF the antifreeze function is not active.

8.20 Navigation

esc Press 3 sec.	**OPERATING MODE**	**Heat**	Heating
		Cool	Cooling
		StdBY	Standaby - off
		AS	Domestic hot water The unit switches to ACS mode, only by Heat mode

set	**STATA**	**Ai, di, AO, dO**	Inputs, outputs
		AO	Digital inputs
		of	Analogical outputs
		dO	Digital outputs
		CL	Clock
		AL	Active alarms
		SP	Setpoint

esc + set	**SCHEDULING**	**PAR - parameters**	Configuration
		Fnc - functions	dEF - manual defrosting tA - alarm reset St - on / off CC - copy card EUr - alarm log reset
		PASS - password	
		EU - alarms	Alarm log

8.21 ON/OFF

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press 3 sec.	~		OFF	
2	**OFF**	Press 3 sec.	~		ON	

8.22 Change the operating mode

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press 2 sec.	esc		Cool	*
2	**Cool**	Select	^	~	Choose standby, off: STBY cool: COOL heat: HEAT DHW: AS	
3	**Heat**	Confirm	set			

* Off the unit is immediately stopped without respecting any timing.

Stanby the antifreeze function is active (pump ON for water temperature < 4°C).

The circulator anti-blocking function is active (pump ON at predefined intervals).

8.23 Clock setting

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		Ai	
2	**Ai**	Select	^	~	CLOCK menu	
3	**CL**	Access	set		Hour	
4	**Hour**	Select	^	~	Choose hour: HOUR date: DATE year: YEAR	
5	**YEAR**	Press 3 sec.	set		Confirm ! Value flashing !	
6	**! 2012 !**	Press	^	~	Set the value	
7	**! 2013 !**	Confirm	set		2013	
8		Press	esc		Back to step 4	

8.24 Water setpoint modification

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		Ai	
2	**Ai**	Select	^	~	SP	
3	**SP**	Access	set		Cool	
4	**Cool**	Select	^	~	Choose Cool Heat ACS	
5	**ACS**	Confirm	set		50	
6	**50**	Press	^	~	Set the value 55	
7	**55**	Confirm	set		55	
8		Press	^ + ~		Back to the previous menu	

8.25 Display of inputs - outputs

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		Ai	
2	**Ai**	Choose menu	∧	∨	Ai: analogical inputs di: digital inputs AO: analogical outputs dO: digital outputs	
3	**of**	Access	set		diL1	
4	**diL1**	Scroll the list	∧	∨	Choose diL4	
5	**diL4**	Press to see the value	set		For digital inputs: 0 = input not active - open 1 = input active - closed	
6		Press	esc		Back to the previous menu	

For details see:
15.4 Stata → 71

8.26 Silenced alarm

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Er01**				The alarm code is flashing	
2	**13.5°C**				Alternated to temperature	
3	⚠				Fixed ALARM led	
4		Press any button	∧ + ∨	esc + set		
5	**!** ⚠ **!**				ALARM led is flashing	

For details see:
8.27 Alarms → 38

8.27 Alarms

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		PAr	
2	**PAr**	Select	∧	∨	FnC	
3	**FnC**	Press	set		dEF	
4	**dEF**	Select	∧	∨	tA	
5	**tA**	Press	set			
6		Press	esc		Back to the previous menu	

8.28 Alarm reset

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		PAr	
2	**PAr**	Select	∧	∨	FnC	
3	**FnC**	Press	set		dEF	
4	**dEF**	Select	∧	∨	tA	
5	**tA**	Press	set			
6		Press	esc		Back to the previous menu	

8.29 Alarm log

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	esc + set		PAr	
2	**PAr**	Select	∧	∨	EU	
3	**EU**	Press	set		Last registered alarm EU00	
4	**EU00**	Press	set		Access to alarm code info Er01	
5	**Er01**	Select	∧	∨	Hour of the alarm 20:01	
6	**20:01**	Select	∧	∨	Date of the alarm 27.10	
7	**27.10**	Select	∧	∨	Alarm output hour Example: alarm still active --:--	
8	**--:--**	Select	∧	∨	Alarm output date Example: alarm still active --:--	
9	**--:--**	Select	∧	∨	Type of alarm: AUto MAnu (manual)	
10	**AUto**	Press	set			
11		Press	esc		Back to the previous menu	

8.30 Alarms log reset

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	set		PAr	
2	**PAr**	Select	∧	∨	FnC	
3	**FnC**	Press	set		dEF	
4	**dEF**	Select	∧	∨	EUr	
5	**EUr**	Press 3 sec.	∧	∨	YES	
6		Press	esc		Back to the previous menu	

8.31 Ambient temperature display

It is possible to set the keypad to display the ambient temperature.
The probe is not used to perform the ambient thermoregulation.
Follow these steps:

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	esc + set		PAr	
2	**PAr**	Press	set		PAr	
3	**PAr**	Select	∧	∨	Cr	
4	**Cr**	Press	set		Cr..	
5	**Cr..**	Select	∧	∨	Cr00 Anable ambient probe	
6	**Cr00**	Confirm	set		0	
7	**0**	Select	∧	∨	2	
8	**2**	Confirm	set		2	
9		Press	esc		Back to the previous menu	
10		Select	∧	∨	Cr30 Temperature display	
11	Cr30	Confirm	set		0	
12	0	Select	∧	∨	16	
13	16	Confirm	set			
14		Press	esc		Back to the previous menu	

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press	esc + set		PAr	
2	**PAr**	Press	set		PAr	
3	**PAr**	Select	∧	∨	Ui	
4	**Ui**	Press	set		Ui..	
5	**Ui..**	Select	∧	∨	Ui22	
6	**Ui22**	Confirm	set		0	
7	**0**	Select	∧	∨	1	
8	**1**	Confirm	set		1	
9		Press	esc		Back to the previous menu	

Step	Display	Action	Keys		Menu/Variable	Notes
1	**Main menu**	Press 3 sec.	set			
2		Select	∧	∨	Air1	
3	**Air1**	Press	set			

Is it possible to disable the ambient keyboard:
Cr00 = 0
Cr30 = 0
To enable water setpoint compensation with ambient temperature set:
Cr 30 = 10

9 Maintenance

9.1 General description

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

The maintenance allows to:

- maintain the unit efficiency
- reduce the deterioration speed to whom every equipment is subject over time
- assemble information and data to understand the state of the unit efficiency and avoid possible damages

Before checking, please verify the following:

- the electrical power supply line should be sectioned at the beginning
- the line sectionalizing device is open, locked and equipped with the suitable warning
- make sure no tension is present

9.2 Inspections frequency

Perform an inspection every 6 months of unit operating.

The frequency, however, depends on the use.

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

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

9.3 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
- type of intervention effected
- intervention description
- carried out measures etc.

9.4 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 extremely rigid temperatures keep fed heating resistances of the electrical panel (option).

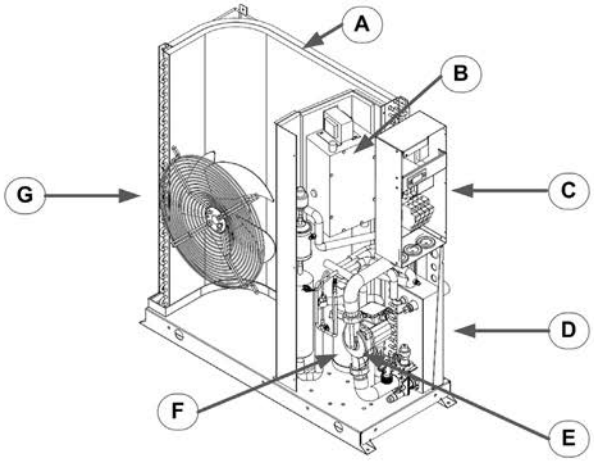
It's recommended that the starting-up after the stopping period is performed by a qualified technician, especially after seasonal stops or seasonal switch.

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

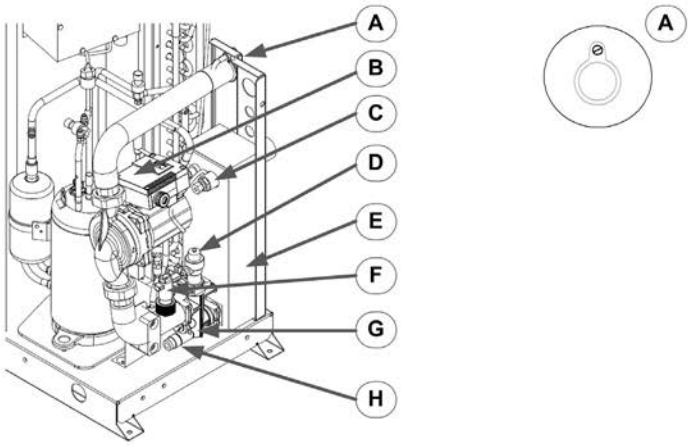
Schedule technical assistance in advance to avoid hitches and to guarantee that the system can be used when required.

9.5 Main components

(sizes 21÷71)

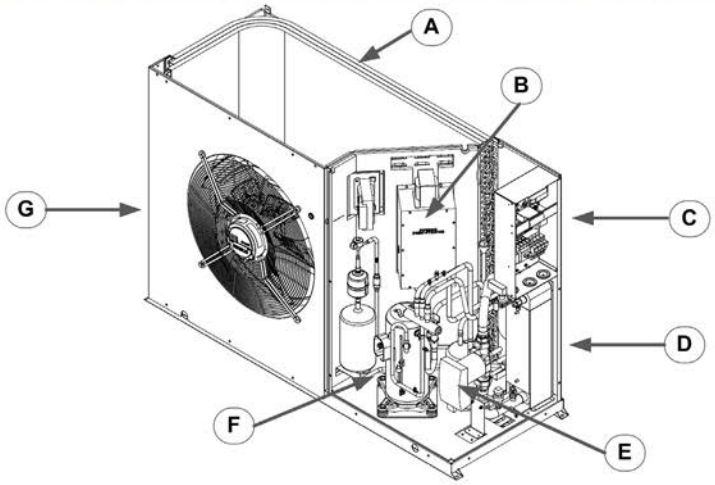


A. Coil
B. Inverter
C. Electrical panel
D. Exchanger
E. pump
F. Compressor
G. Fan

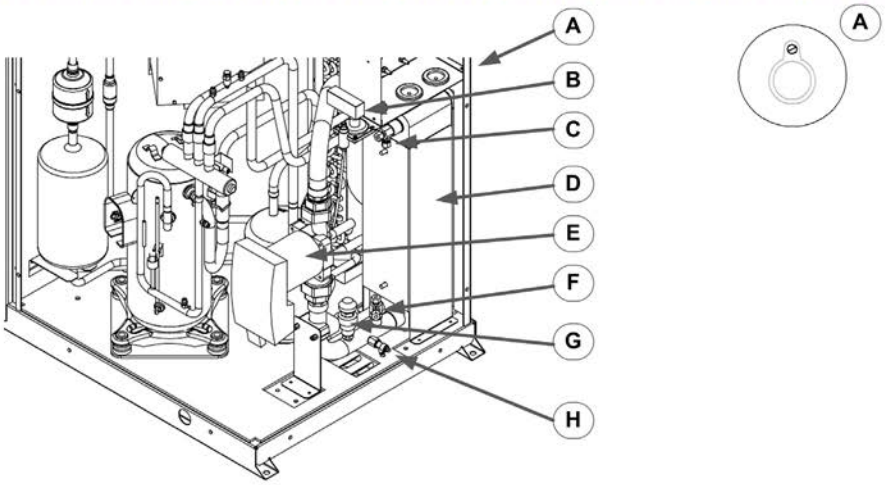


A. vent
B. pump
C. input probe
D. Safety valve (6 Bar)
E. plate exchanger
F. Flow Switch
G. input probe
H. water outlet

(size 81÷141)



A. Coil
B. Inverter
C. Electrical panel
D. Exchanger
E. pump
F. Compressor
G. Fan



A. vent
B. Differential pressure switch
C. input probe
D. plate exchanger
E. pump
F. input probe
G. Safety valve (6 Bar)
H. water outlet

9.6 Control check list

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

* European regulation 303/2008

Refer to the local actuation regulations; in short and just as an indication the regulation order as follow. Companies and technicians that effect interventions of installation, maintenance/repairs, leak control and recovery must be CERTIFIED as expected by the local regulations. The leak control must be effected with annual renewal.

9.7 Air coil

Contact with the exchanger fins can cause cuts: wear protective gloves to perform the above described operations.

It is extremely important that the battery gives the maximum thermal exchange; therefore, its surface must be cleaned from dust and deposits.

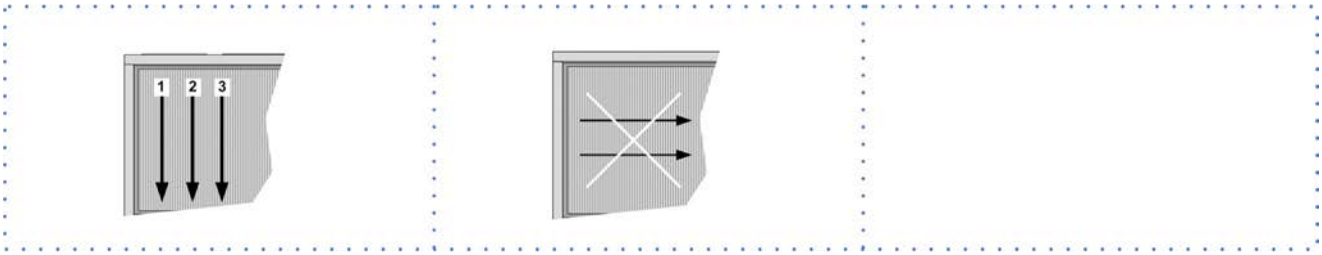
Remove all impurities from the surface.

Using an air pressure gun, clean the aluminum surface of the battery; be careful to direct the air in the opposite direction of the fan air movement.

Hold the gun parallel to the fins to avoid damages.

As an alternative, an aspirator can be used to suck impurities from the air input side.

⚠ Verify that the aluminum fins are not bent or damaged, in the event of damages contact the authorized assistance center and get the battery "ironed out" in order to restore the initial condition for an optimal air flow.



9.8 Water side exchanger

It is very important for the exchanger to be able to provide the maximum thermal exchange, therefore it is essential for the inner surfaces to be clean of dirt and incrustations.

Periodically check the difference between the temperature of the supply water and the condensation temperature: if the difference is greater than 8°C–10°C it is advisable to clean the exchanger.

The clearing must be effected:

- with circulation opposite to the usual one
- with a speed at least 1,5 times higher than the nominal one
- with an appropriate product moderately acid (95% water + 5% phosphoric acid)
- after the cleaning rince with water to inhibe the detergent rests

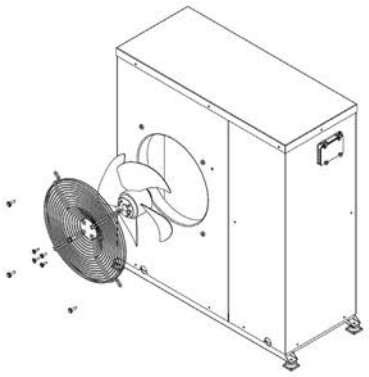
9.9 Water filter

Check that no impurities prevent the correct passage of water.

9.10 Electric fans

Check:

- the fans and the relative protection gridsare well fixed
- the fan bearings (evident by noise and anomalous vibrations)
- the terminal protection covers are closed and the cable holders are properly positioned

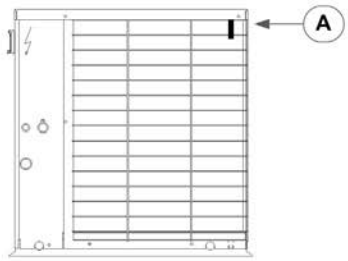


9.11 Circulating pumps

Check:

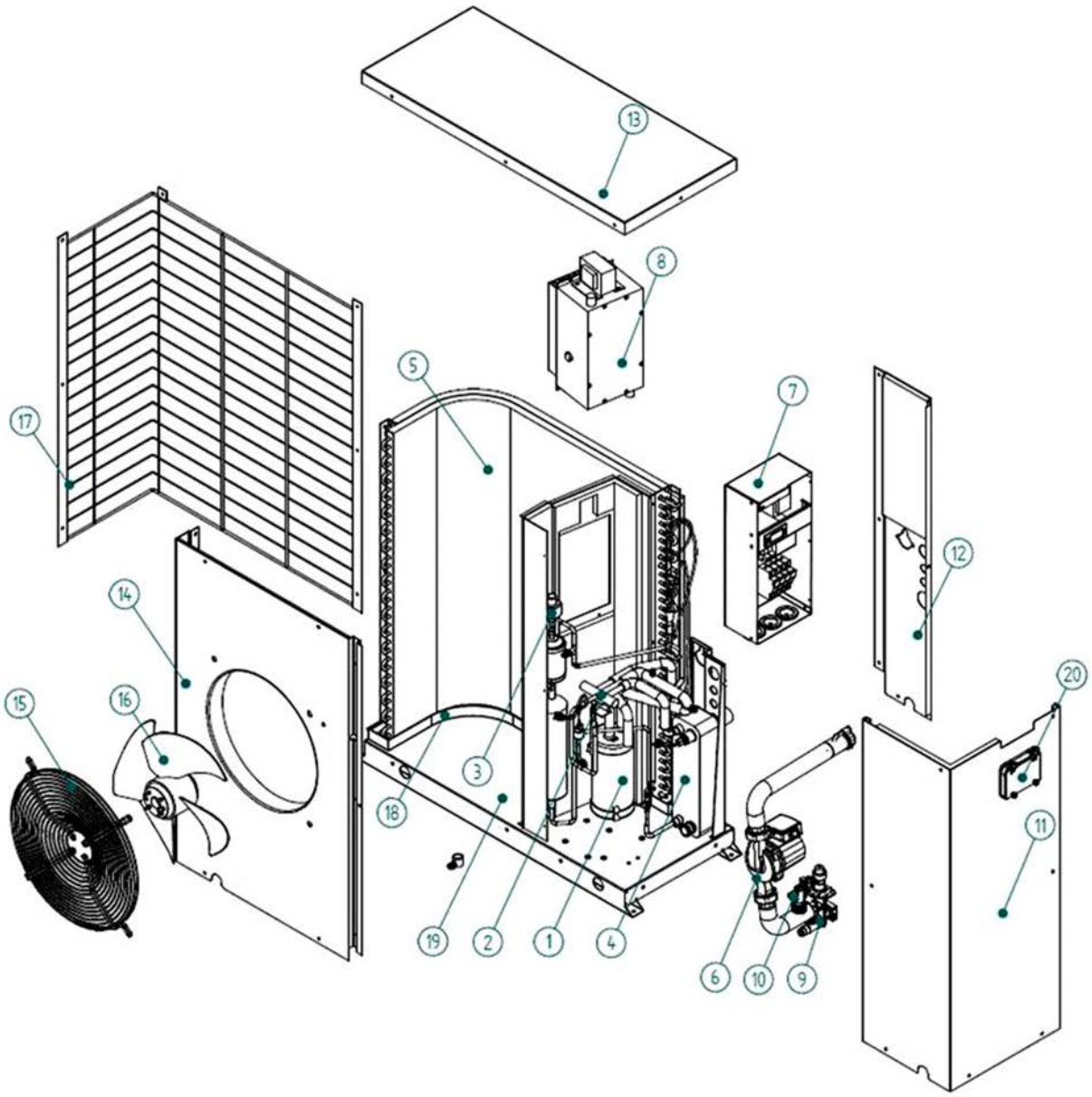
- no leaks
- bearing status (anomalies are highlighted by abnormal noise and vibration)
- the terminal protection covers are closed and the cable holders are properly positioned

9.12 Probe position



A. Fresh air probe

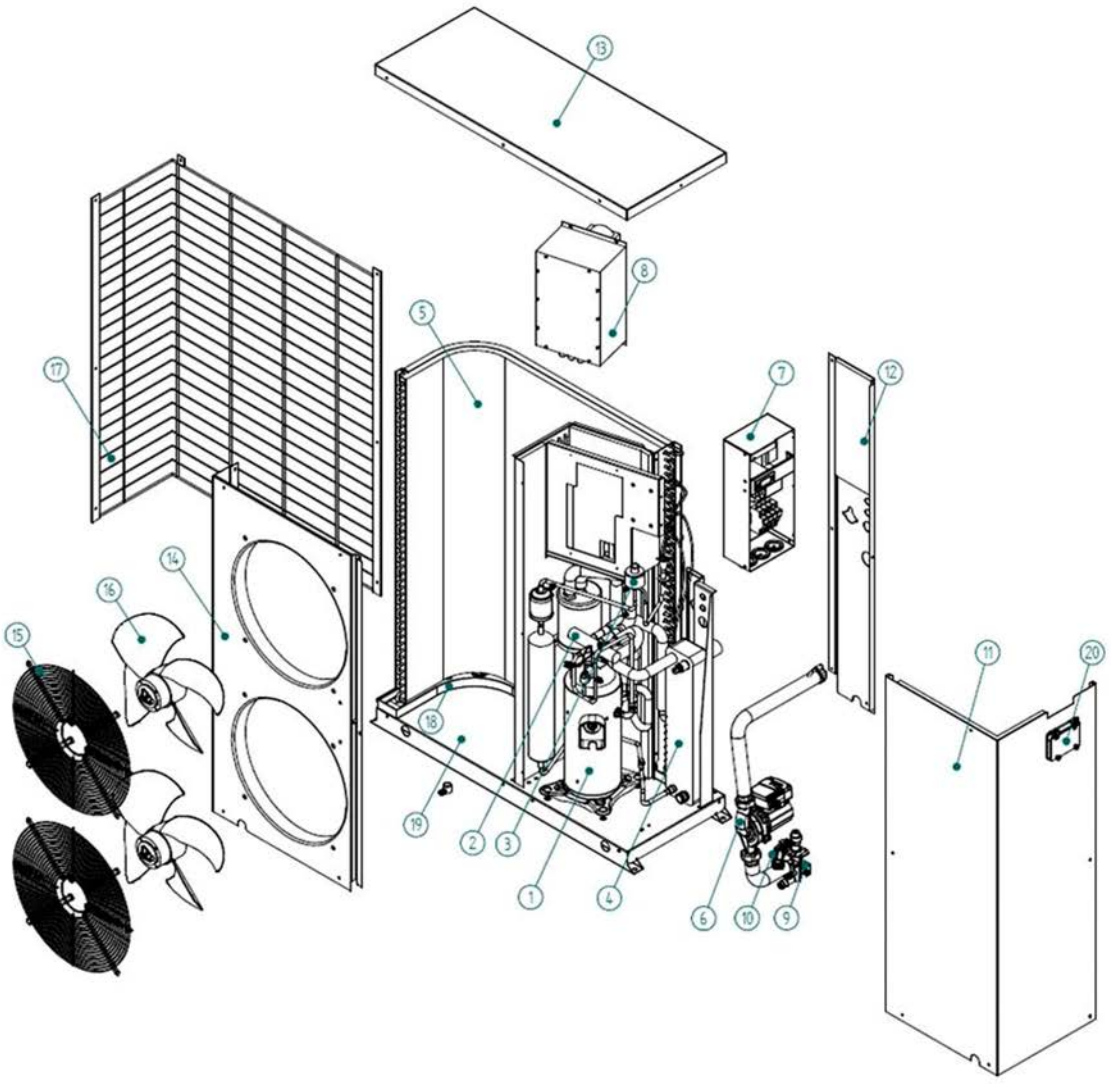
9.13 Spare parts sizes 21-31-41



Ref.	Components
1	Mono-phase compressor
2	Reversing cycle valve
3	Electronic thermostatic valve (Solenoid + Body)
4	Internal plate exchanger
5	External finned exchanger
6	Circulator
	EC circulator (High efficiency)
7 (*)	Mono-phase electrical panel
	Mono-phase electrical panel of EC circulator
8	Mono-phase Inverter
9	Water Kit
10	Flow Switch
11	Rear panel
12	Right panel
13	Roof
14	Flow nozzle
15	Fan grid
16	Fan
17	Grid for the coil protection
18	Tray
19	Base
20	Supervisory control for the keypad protection

(*) Components installed inside each electrical panel
SB655/C Control module
XVD420 driver module for electr. valve
230/12+12+24V mono-phase transformer
Control module of the condensing fans
420v 30.000h/Class A condenser
Condensing air temp. probe
Refrigerant circuit gas temp. probe
Water temperature probe

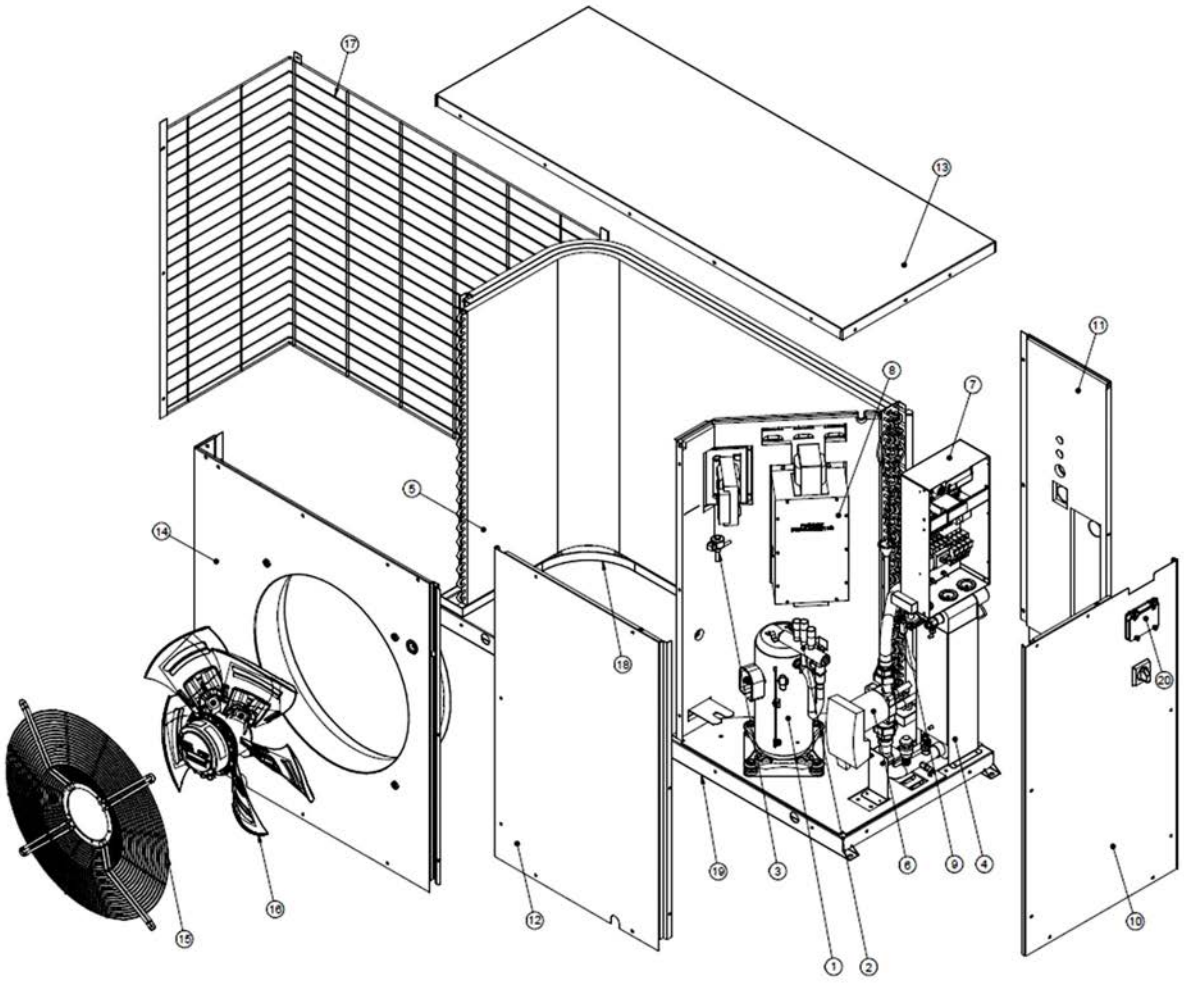
9.14 Spare parts sizes 51-71



Rif	Components
1	Three-phase compressor
2	Reversing cycle valve
3	Thermostatic valve (Solenoid + Body)
4	Internal plate exchanger
5	External finned exchanger
6	Circulator
	EC circulator (High efficiency)
7 (*)	Mono-phase electrical panel
	Mono-phase electrical panel of EC circulator
	Three-phase electrical panel
	Three-phase electrical panel of EC circulator
8	Mono-phase Inverter
	Three-phase Inverter
9	Water Kit
10	Flow Switch
11	Rear panel
12	Right panel
13	Roof
14	Flow nozzle
15	Fan grid
16	Fan
17	Grid for the coil protection
18	Tray
19	Base
20	Supervisory control for the keypad protection

(*) Components installed inside each electrical panel
SB655/C Control module
XVD420 driver module for electr. valve
230/12+12+24V mono-phase transformer
Control module of the condensing fans
420v 30.000h/Class A condenser
Condensing air temp. probe
Refrigerant circuit gas temp. probe
Water temperature probe

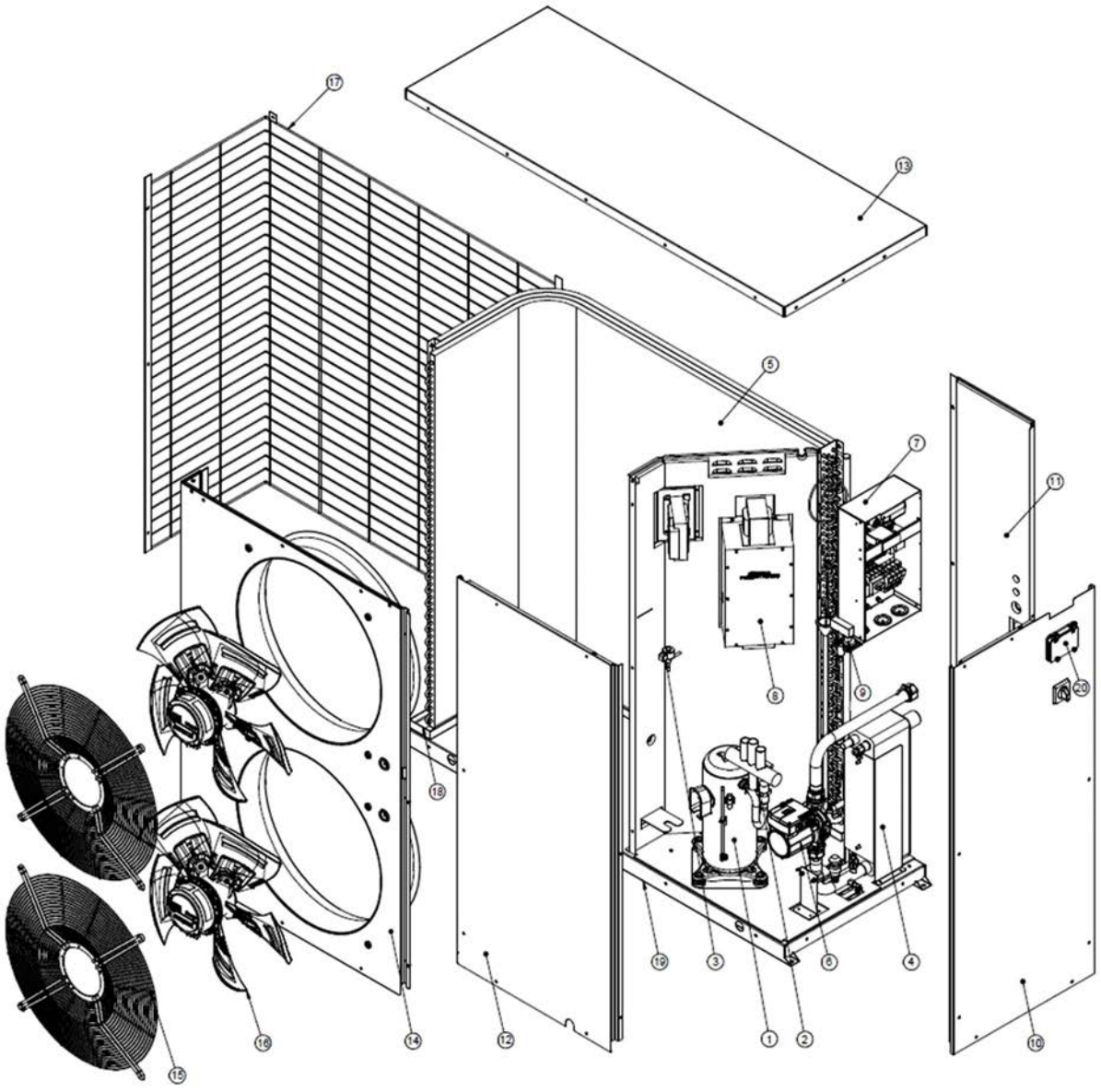
9.15 Spare parts sizes 81-101



Ref.	Components
1	Compressor
2	Reversing cycle valve
3	Electronic thermostatic valve (Solenoid + Body)
4	Internal plate exchanger
5	External finned exchanger
6	Circulator
	EC circulator (High efficiency)
7 (*)	Three-phase electrical panel
	Three-phase electrical panel of EC circulator
8	Three-phase Inverter
9	Differential pressure switch
10	Rear panel
11	Right panel
12	Left panel
13	Roof
14	Flow nozzle
15	Fan grid
16	Fan
17	Grid for the coil protection
18	Tray
19	Base
20	Supervisory control for the keypad protection

(*) Components installed inside each electrical panel
SB655/C Control module
XVD420 driver module for electr. valve
230/12+12+24V mono-phase transformer
Control module of the condensing fans
420v 30.000h/Class A condenser
Condensing air temp. probe
Refrigerant circuit gas temp. probe
Water temperature probe

9.16 Spare parts sizes 121-141



Ref.	Components
1	Compressor
2	Reversing cycle valve
3	Electronic thermostatic valve (Solenoid + Body)
4	Internal plate exchanger
5	External finned exchanger
6	Circulator
	EC circulator (High efficiency)
7 (*)	Three-phase electrical panel
	Three-phase electrical panel of EC circulator
8	Three-phase Inverter
9	Differential pressure switch
10	Rear panel
11	Right panel
12	Left panel
13	Roof
14	Flow nozzle
15	Fan grid
16	Fan
17	Grid for the coil protection
18	Tray
19	Base
20	Supervisory control for the keypad protection

(*) Components installed inside each electrical panel
SB655/C Control module
XVD420 driver module for electr. valve
230/12+12+24V mono-phase transformer
Control module of the condensing fans
420v 30.000h/Class A condenser
Condensing air temp. probe
Refrigerant circuit gas temp. probe
Water temperature probe

10 Decommissioning

10.1 Disconnecting

Only authorised personnel must disconnect the unit.

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 dismantling and disposal, the unit can also be stored outdoors, as bad weather and rapid changes in temperature will not cause damage to the environment, if electric, cooling and hydraulic circuits of the unit are integral and closed.

10.2 Dismantling and disposal

The unit must always be sent to authorised centres for dismantling and disposal.

When dismantling the unit, the fan, the motor and the coil, if operating, may be recovered by the specialist centres for reuse.

All the materials must be recovered or disposed of in compliance with the corresponding national standards in force.

For further information on the decommissioning of the unit, contact the manufacturer.

10.3 Directive EC RAEE

The units covered by the legislation in question are marked with the symbol on the side.

With the aim of protecting the environment, all of our units are produced in compliance with Directive EC on waste electrical and electronic equipment (RAEE).

The potential effects on the environment and on human health due to the presence of hazardous substances are shown in the use and maintenance manual in the section on residual risks.

Information in addition to that indicated below, if required, can be obtained from the manufacturer/distributor/importer, who are responsible for the collection/handling of waste originating from equipment covered by EC-RAEE. This information is also available from the retailer who sold this appliance or from the local authorities who handle waste.

Directive EC-RAEE requires disposal and recycling of electrical and electronic equipment as described therein to be handled through appropriate collection, in suitable centres, separate from collection for the disposal of mixed urban waste.

The user must not dispose of the unit at the end of its life cycle as urban waste, it must instead be handed over to appropriate collection centres as set forth by current standards or as instructed by the distributor.

11 Residual risks

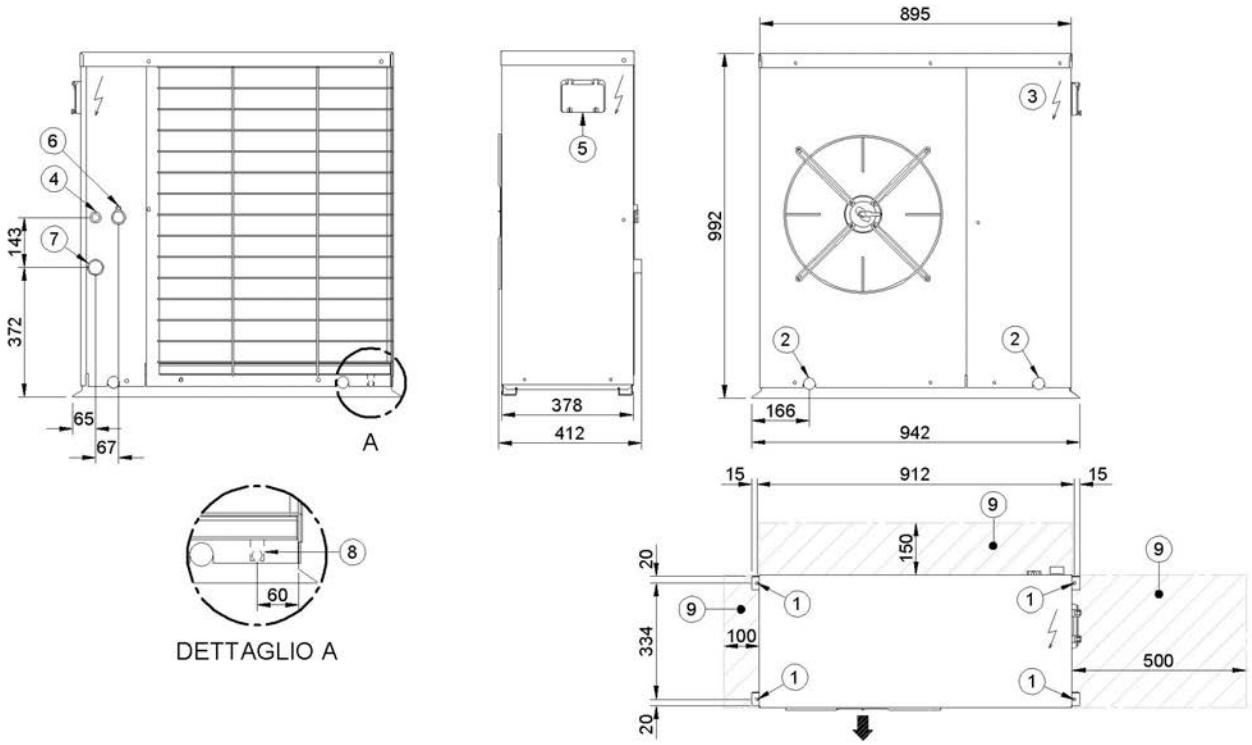
General description
In this section the most common situations are signalled,as these cannot be controlled by the manufacturer these could be a source of risk situations for people or things.
Danger zone
This is an area in which only an authorised operator may work.
The danger zone is the area inside the unit which is accessible only with the deliberate removal of protections or parts thereof.
Handling
The handling operations, if implemented without all of the protection necesssary and without due caution, may cause the fall 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 regarding the packaging and in compliance with the local regulations in force.
Should the gas refrigerant leak please refer to the refrigerant "Safety sheet".
Installation
An incorrect installation of the unit could cause water leaks, condensate accumulation, leaking of the refrigerant, electric shock, bad functioning 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 inflammable 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 cause the fall or the tipping of the unit with the 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.
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 damge 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 increase 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 refrigerating system taps closed.

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 favour the entry of dust, water etc inside and may consequently can 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 shield.
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 shield.
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 connection line of the unit itself, padlock and display the suitable sign.
Contact with the fans can cause incurie.
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.
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 gas 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.
Hydraulic parts
Defects in tubing, the attachments or the cut-off parts may cause a leak or water projection with the consequent damages to peopl, things or shortcircuit the unit.

12 Dimensional drawings

12.1 Size 21-31-41

DAAR921_41_0
Date: 23/09/2011

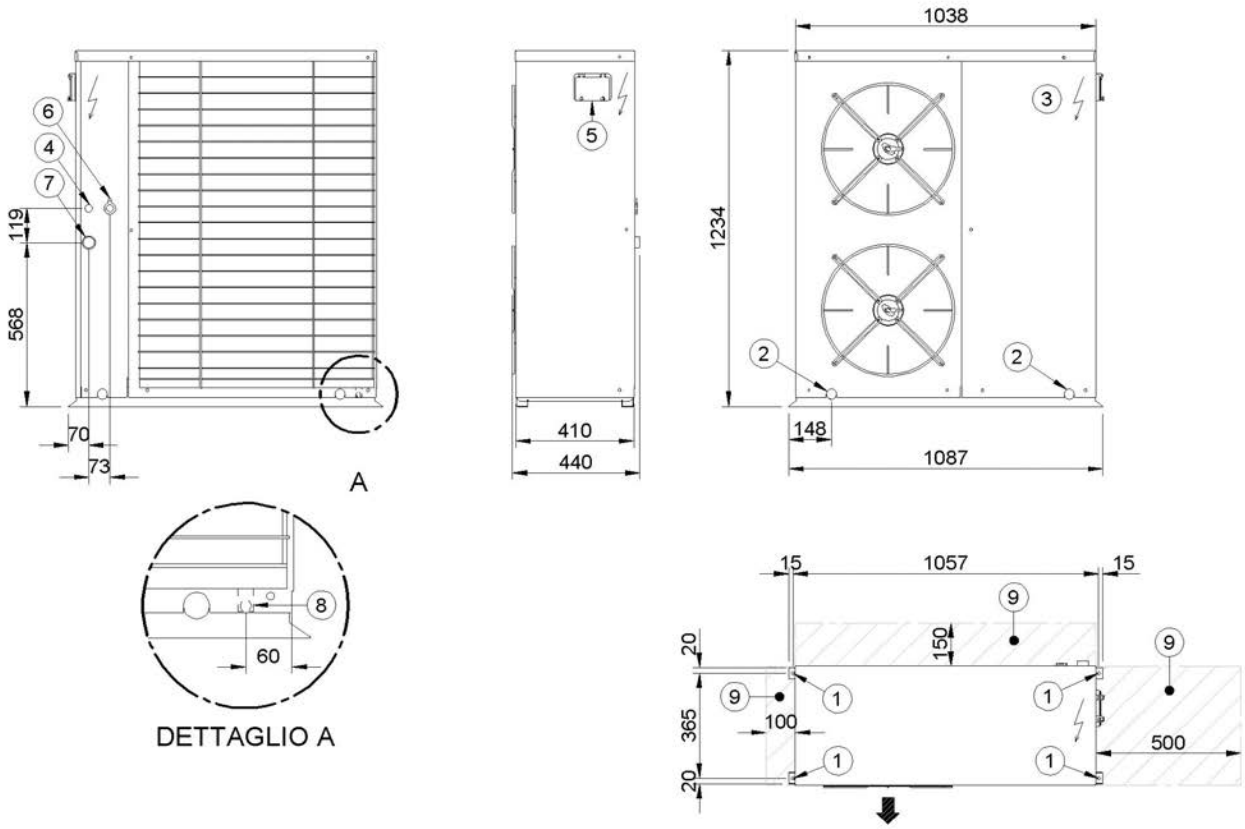


1. Antivibration fixing holes
2. (16)drill holes for lifting
3. GENERAL ELECTRICAL PANEL
4. Power line input
5. control keypad
6. GAS F 1" internal exchanger water inlet
7. GAS F 1" internal exchanger water inlet
8. Condensate discharge
9. Clearance access recommended

Size		21	31	41
Length	mm	895	895	895
Depth	mm	378	378	378
Height	mm	992	992	992
W1	kg	37	38	40
W2	kg	17	18	20
W3	kg	39	40	42
W4	kg	19	20	22
Operating weight	kg	112	116	124
Shipping weight	kg	110	114	122

12.2 Size 51-71

DAAR951_71_0
Date: 23/09/2011

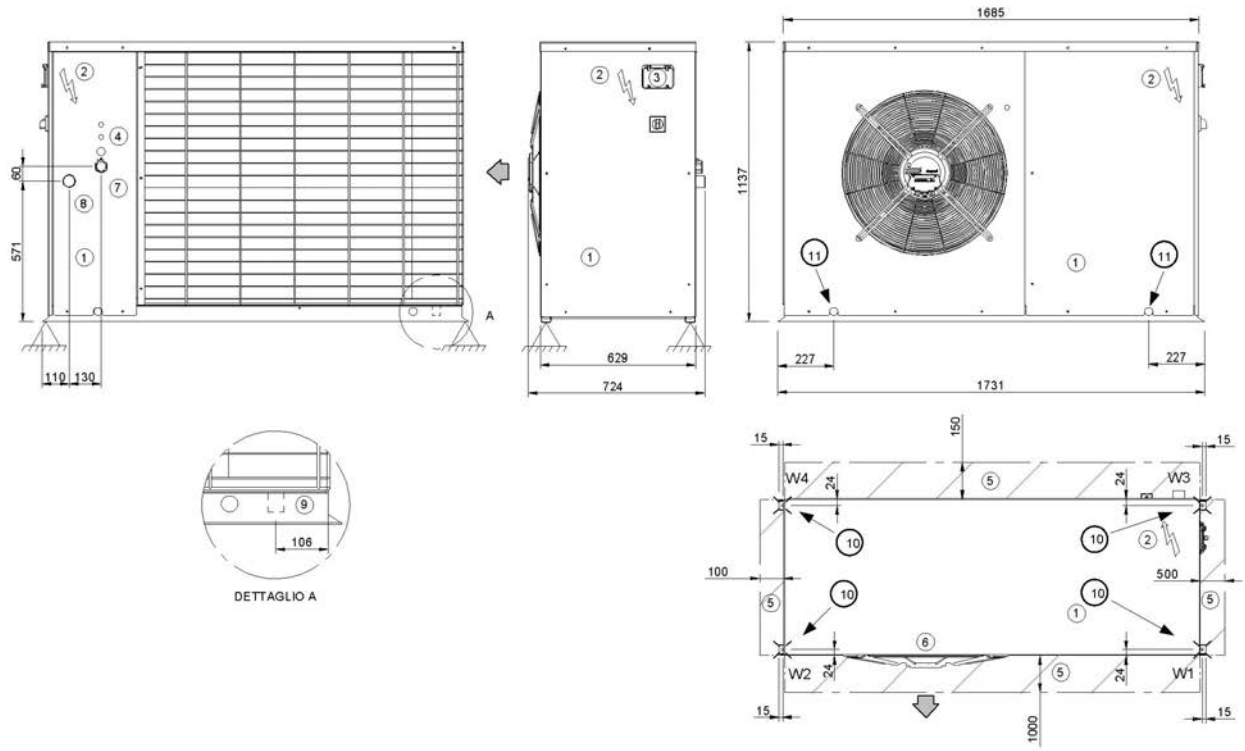


1. Antivibration fixing holes
2. (16)drill holes for lifting
3. GENERAL ELECTRICAL PANEL
4. Power line input
5. control keypad
6. GAS F 1" internal exchanger water inlet
7. GAS F 1" internal exchanger water inlet
8. Condensate discharge
9. Clearance access recommended

Size		51	71
Length	mm	1038	1038
Depth	mm	410	410
Height	mm	1234	1234
W1	kg	51	53
W2	kg	32	33
W3	kg	53	55
W4	kg	34	34
Operating weight	kg	170	175
Shipping weight	kg	168	173

12.3 Sizes 81-91-101

DAAR981_0
Date: 08/05/2013

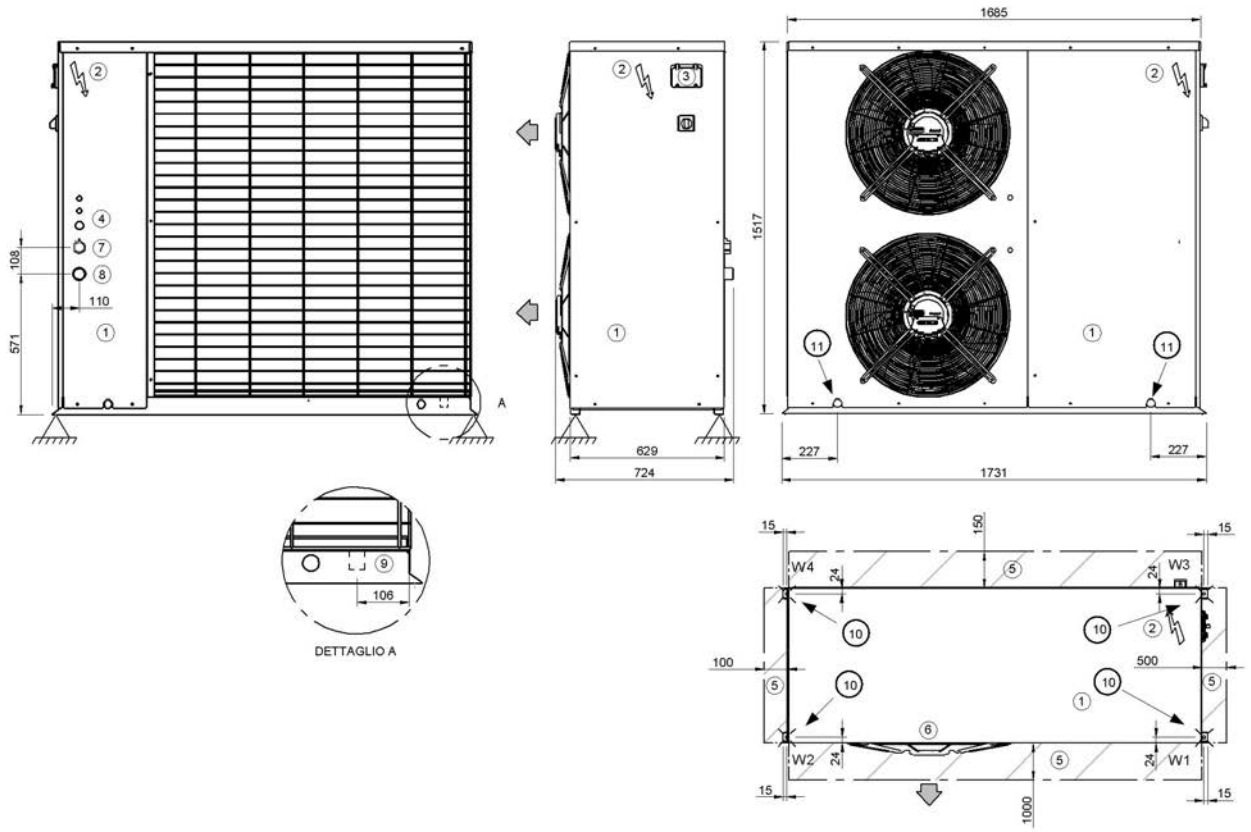


1. Compressor compartment
2. GENERAL ELECTRICAL PANEL
3. control keypad
4. Power line input
5. Clearance access recommended
6. Electric fan
7. GAS F 1" internal exchanger water inlet
8. GAS F 1" internal exchanger water inlet
9. Condensate discharge
10. Antivibration fixing holes
11. (16)drill holes for lifting

Size		81	91	101
Length	mm	1685	1685	1685
Depth	mm	629	629	629
Height	mm	1137	1137	1137
W1	kg	65	65	65
W2	kg	35	35	35
W3	kg	85	85	85
W4	kg	55	55	55
Operating weight	kg	240	240	240
Shipping weight	kg	250	250	250

12.4 Sizes 121-131-141

DAAR9121_0
Date: 08/05/2013



1. Compressor compartment
2. GENERAL ELECTRICAL PANEL
3. control keypad
4. Power line input
5. Clearance access recommended
6. Electric fan
7. GAS F 1" internal exchanger water inlet
8. GAS F 1" internal exchanger water inlet
9. Condensate discharge
10. Antivibration fixing holes
11. (16)drill holes for lifting

Size		121	131	141
Length	mm	1685	1685	1685
Depth	mm	629	629	629
Height	mm	1517	1517	1517
W1	kg	70	70	70
W2	kg	55	55	55
W3	kg	110	110	110
W4	kg	75	75	75
Operating weight	kg	310	310	310
Shipping weight	kg	320	320	320

13 Technical information

13.1 General technical data

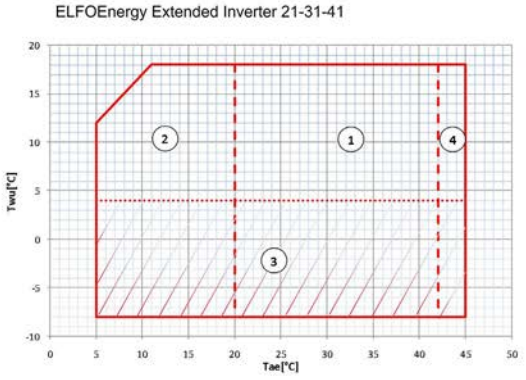
Size			21	31	41	51	71	81	91	101	121	131	141
Radiant panels													
Heating													
Heating capacity	1	kW	5,41	6,81	8,70	11,9	14,3	16,5	18,4	19,6	23,8	26,4	30,3
Total power input	2	kW	1,35	1,71	2,22	2,98	3,61	4,44	4,99	5,22	6,64	7,19	8,31
COP (EN 14511:2011)	3		4,00	3,98	3,93	3,98	3,96	3,72	3,70	3,76	3,58	3,67	3,65
Cooling													
Cooling capacity	6	kW	4,25	6,34	8,07	10,3	13,0	15,9	17,6	19,4	25,4	28,3	32,1
Total power input	2	kW	1,14	1,74	2,16	2,82	3,50	4,53	4,88	5,52	7,41	8,27	9,60
EER (EN 14511:2011)	7		3,73	3,65	3,73	3,67	3,72	3,52	3,62	3,53	3,43	3,43	3,34
ESEER	8		5,14	5,53	5,55	5,28	6,02	5,48	5,73	5,89	5,22	5,24	5,74
Water flow-rate	6	l/s	0,20	0,30	0,38	0,49	0,62	0,75	0,85	0,92	1,20	1,34	1,52
Useful pump discharge head	6	kPa	57	49	56	53	61	79	76	73	84	58	49
elforoom and elfospace terminal units													
Heating													
Heating capacity	4	kW	5,19	6,54	8,25	11,5	13,8	16,2	18,5	20,4	25,8	28,2	31,5
Total power input	2	kW	1,66	2,09	2,65	3,64	4,42	5,43	6,23	7,17	8,91	9,81	11,4
COP (EN 14511:2011)	3		3,12	3,14	3,11	3,15	3,12	2,98	2,97	2,85	2,89	2,88	2,77
Cooling													
Cooling capacity	9	kW	3,88	5,24	6,11	8,84	11,7	15,5	16,8	19,5	24,0	26,6	29,1
Total power input	2	kW	1,52	2,04	2,32	3,35	4,45	5,91	6,37	8,37	10,3	11,5	13,4
EER (EN 14511:2011)	7		2,55	2,57	2,63	2,64	2,63	2,62	2,64	2,33	2,33	2,32	2,18
ESEER	10		3,82	3,71	3,47	4,06	4,43	4,17	4,36	4,3	3,84	4,03	4,23
Water flow-rate	9	l/s	0,18	0,25	0,29	0,42	0,55	0,73	0,82	0,92	1,14	1,26	1,38
Useful pump discharge head	9	kPa	59	54	65	60	71	80	77	73	86	62	56
Radiators													
Heating													
Heating capacity	5	kW	5,05	6,39	8,03	11,0	13,3	15,2	17,7	19,9	24,0	26,6	29,9
Total power input	2	kW	2,01	2,51	3,25	4,42	5,39	6,56	7,56	8,83	11,1	11,8	13,7
COP (EN 14511:2011)	3		2,52	2,55	2,47	2,50	2,47	2,31	2,34	2,25	2,17	2,25	2,18
Water flow-rate	5	l/s	0,12	0,15	0,19	0,27	0,32	0,36	0,42	0,48	0,57	0,64	0,71
Useful pump discharge head	5	kPa	58	54	65	64	94	104	101	99	86	85	82
Compressor													
Type of compressors			Rotary inverter dc			Scroll inverter DC							
Refrigerant			R-410A										
No. of compressors		No	1	1	1	1	1	1	1	1	1	1	1
Oil charge		l	0,35	0,35	0,87	1,7	1,7	1,9	1,9	1,9	1,9	1,9	1,9
Refrigeration circuits		No	1	1	1	1	1	1	1	1	1	1	1
Utility side exchanger													
Type of internal exchanger	11		PHE										
No. of exchangers		No	1	1	1	1	1	1	1	1	1	1	1
Water content		l	0,56	0,64	0,64	1,14	1,8	2,37	2,37	2,37	3,13	3,13	3,13
External Section Fans													
Type of fans	12		AX	AX	AX	AX	AX	AX	AX	AX	AX	AX	AX
No. of fans		No	1	1	1	2	2	1	1	1	2	2	2
Standard air flow		l/s	653	1028	1028	2056	1996	2222	2306	2444	2778	3056	3172
Installed unit power		kW	0,12	0,15	0,15	0,15	0,15	0,45	0,41	0,4	0,5	0,47	0,44

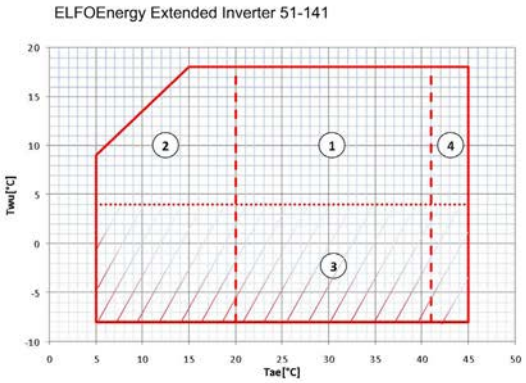
Size			21	31	41	51	71	81	91	101	121	131	141
Hydraulic circuit													
Maximum water side pressure		kPa	550	550	550	550	550	550	550	550	550	550	550
Safety valve calibration		kPa	600	600	600	600	600	600	600	600	600	600	600
Min. installation water contents		l	17	20	25	33	40	50	53	57	63	68	74
Power supply													
Standard power supply			230/1/50			400/3/50+N							

1. Entering/leaving water temperature user side 30/35°C, external exchanger entering air temperature 7 °C (R.H. = 85%)
2. The overall power absorbed is calculated by adding the power absorbed by the compressor + the power absorbed by the fans + the power absorbed by the auxiliary electrical circuit + the percentage value of the pump to overcome pressure drops inside the unit
3. COP (EN 14511:2008) performance coefficient in heating mode. Ratio between heating capacity supplied and absorbed power in accordance with EN 14511:2008. The absorbed power is the sum of the power absorbed by the compressor + electric auxiliary circuit + percentage of power absorbed by the pump to prevent pressure drops inside the unit
4. Entering/leaving water temperature user side 40/45°C, external exchanger entering air temperature 7 °C (R.H. = 85%)
5. Entering/leaving water temperature user side 45/55°C, external exchanger entering air temperature 7°C (R.H. = 85%)
6. User side entering/leaving water temperature 23/18°C, external exchanger entering air 35°C
7. EER (EN 14511:2011) performance coefficient in cooling mode. Ratio between cooling capacity provided and power absorbed in compliance with EN 14511:2011. The absorbed power is the sum of the power absorbed by the compressor + power absorbed by the fans + the power absorbed by the electric auxiliary circuit + the percentage value of the pump to overcome pressure drops inside the unit
8. ESEER calculated by Clivet for radiant systems with water produced at 18°C by taking into account the load conditions and source water temperature as defined by EUROVENT for water at 7°C
9. User side entering/leaving water temperature 12/7 °C, external exchanger entering air 35°C
10. ESEER calculated by EUROVENT, for systems featuring terminal units with water produced at 7°C
11. PHE = plate exchanger
12. AX = axial fan

13.2 Operating range

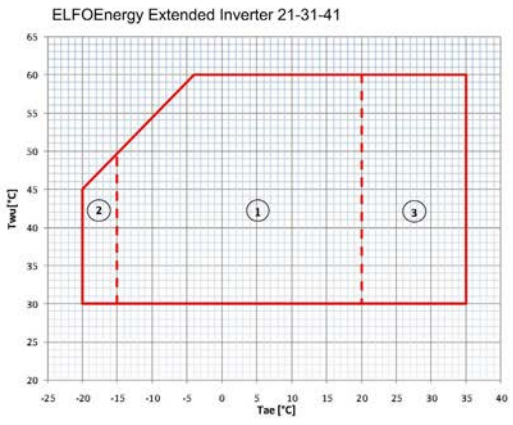
Cooling

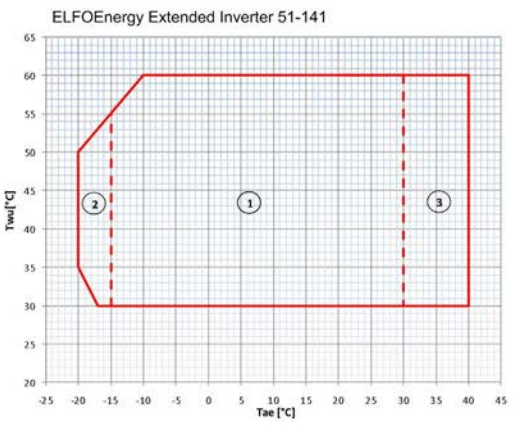




Twu [°C] = exchanger water outlet temperature
Eat [°C]: external exchanger inlet air temperature
1. Normal operating range
2. Operating range with modulating fans
3. Operating range where the use of ethylene glycol is mandatory in relation to the temperature of the water at the outlet of the user side exchanger
4. Operating range with modulating compressor

Heating





Twu [°C] = exchanger water outlet temperature
Eat [°C]: external exchanger inlet air temperature
1. Normal operating range
2. Operating range with modulating compressor
3. Operating range with modulating fans

13.3 Sound levels

Size	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
21	73	73	70	65	63	59	51	36	49	64
31	76	70	65	60	58	53	46	48	49	64
41	76	71	66	61	59	54	47	49	49	64
51	76	71	69	66	63	58	50	39	53	68
71	77	71	69	67	63	59	50	40	54	69
81	83	77	69	61	63	67	60	61	56	72
91	84	79	70	62	64	67	60	61	56	72
101	86	81	72	62	65	67	60	61	57	73
121	81	73	67	61	63	67	61	61	55	71
131	85	76	70	61	64	67	61	61	56	72
141	86	79	72	63	65	68	61	62	57	73

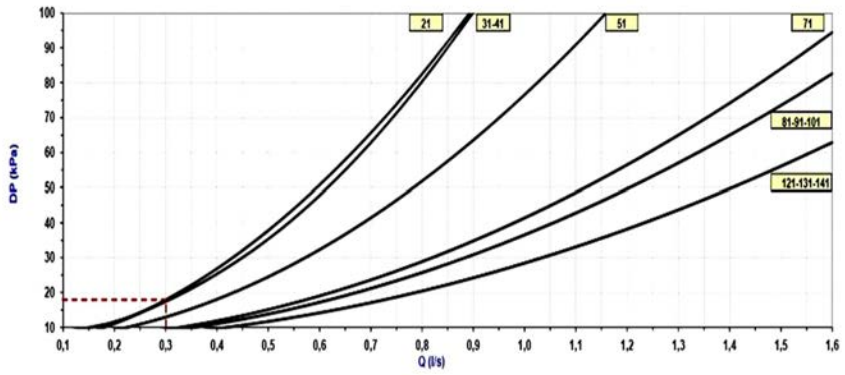
Sound levels refer to units with full load under nominal test conditions.
The sound pressure level refers to a distance of 1m from the outer surface of the unit operating in an open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2)
Data referred to the following conditions:
utility side exchanger water inlet/outlet 12/7°C
source side exchanger water inlet/outlet 30/35

13.4 Admissible water flow rates

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

Size		21	31	41	51	71	81	91	101	121	131	141
Minimum flow	[l/s]	0,15	0,18	0,18	0,23	0,34	0,32	0,32	0,32	0,45	0,45	0,45
Maximum flow-rate	[l/s]	0,90	0,90	0,90	1,10	1,50	1,70	1,70	1,70	1,90	1,90	1,90

13.5 Unit without hydronic system

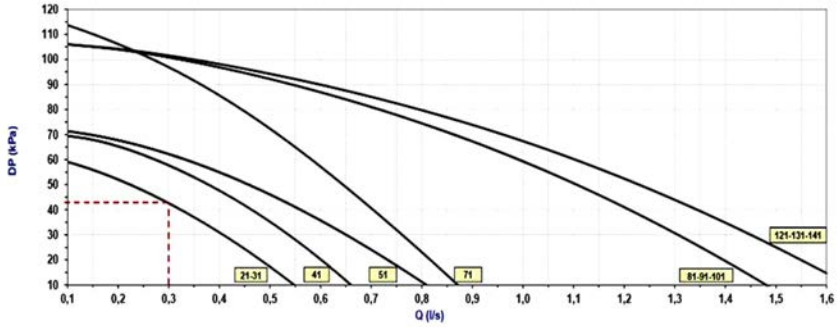


Exchanger pressure drop limit. Warning: don't use over this limit.

unit without hydronic assembly
Dp = pressure drop
Q = water flow

Exchamger pressure drop limit. Warning: don't use below this limit.

13.6 Unit with hydronic system - option



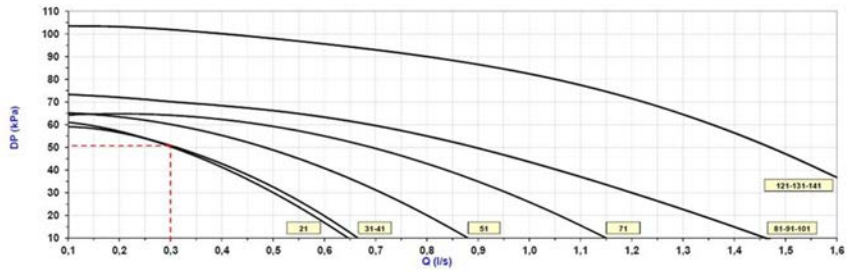
Available pressure curves with hydronic assembly

DP [kPa] = Available pressure
Q [l/s] = water flow rate

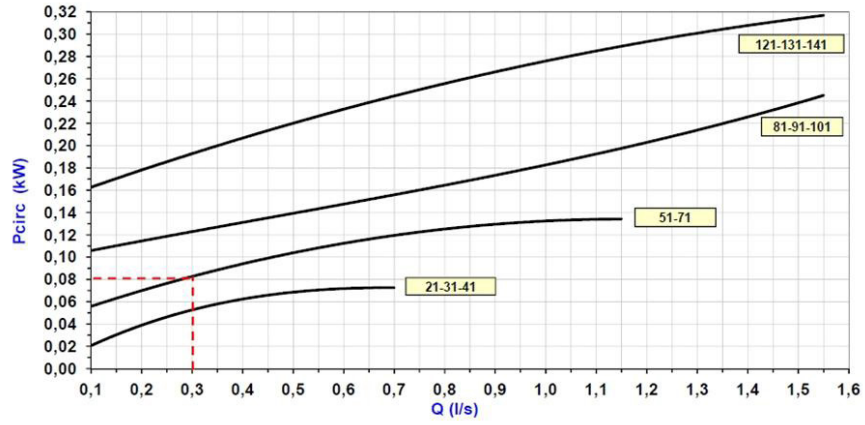
the heads are intended as available at the unit connections

13.7 Unit with EC high efficiency circulating group - optional

Available pressure curves with high-efficiency circulator



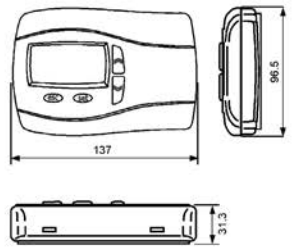
High-efficiency circulator absorption curves

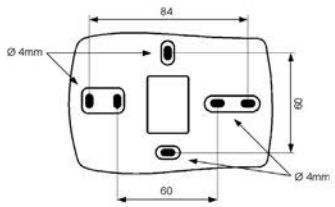


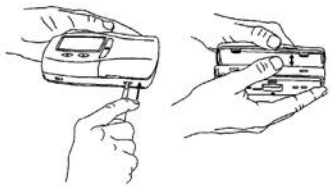
14 Accessories

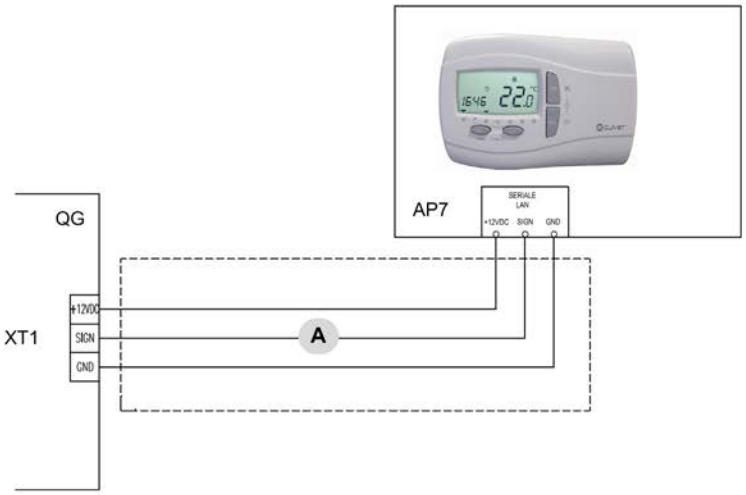
VERSIONS	
H	High energy efficiency
CONFIGURATIONS	
400TN	Supply voltage 400/3/50+N
230M	Supply voltage 230/1/50
HYDRAULIC CIRCUIT	
ACS5SX	500 litres domestic hot water tank with solar coil Accessory separately supplied
ACS300X	300 litres domestic hot water tank Accessory separately supplied
ACS500X	500 litres domestic hot water tank Accessory separately supplied
ACS3SX	300 litres domestic hot water tank with solar coil Accessory separately supplied
3DHWX	Three-way valve for domestic hot water Accessory separately supplied
-	Hydronic group utility side: not required
KSAX	100 litres hydraulic breaker Accessory separately supplied
KTFL2X	Water connection hoses with 1 1/4" connections Accessory separately supplied
KTFL1X	Water connection hoses with 1" connections Accessory separately supplied
CMACSX	Domestic hot water module Accessory separately supplied
SYSTEM ADMINISTRATORS	
CMSC2X	Serial communication module with RS485 serial converter kit Accessory separately supplied
ELECTRIC CIRCUIT	
RCTX	Remote control Accessory separately supplied
INSTALLATION	
AMRX	Rubber antivibration mounts Accessory separately supplied

14.1 RCTX - Remote control



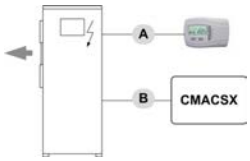




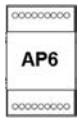


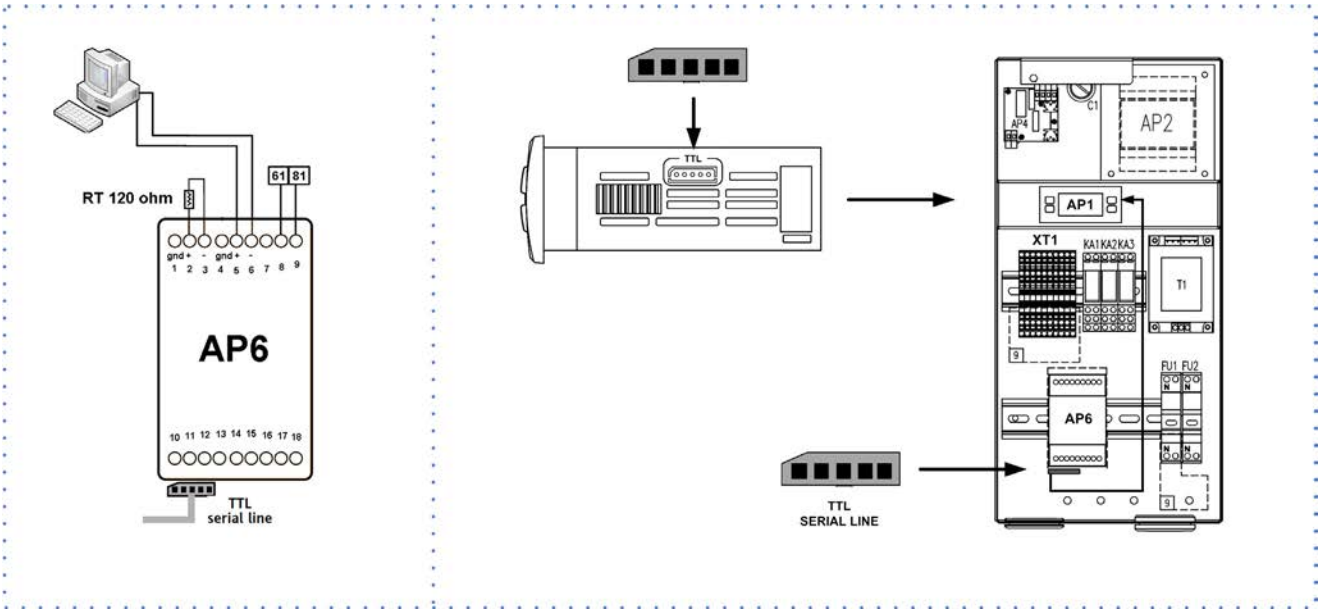
QG Electrical panel
XT1 Terminal block of the customer connections
AP7 Room keypad
A Max. = 100 mt.
Cable section:
Min. 0,35 Max.1 mm2

LAN net: A + B = 100 mt. Max
AMACSX - Domestic hot water module



14.2 CMSC2X - Serial communication module with RS485 serial converter kit

1	Install the AP6 converter	
2	Connect TTL serial	
3	Wire as indicated in the wiring diagram.	



Supervisory

The unit can be connected to an external supervisory system.

Enable the function:

Par: CF01 protocol selection

0 = Disabled

1 = Modbus

Parameter modification

Main menu→Parameters→CF→CF01

Parameter	Description	Range
CF30	address Modbus	1....255
CF31	BaudRate	Baud Rate (0=1200 / 1=2400 / 2=4800 / 3=9600 / 4=19200) supervision serial

Cable characteristics

Couple of conductors twisted and shielded

Section of conductor 0,22mm2…0,35mm2

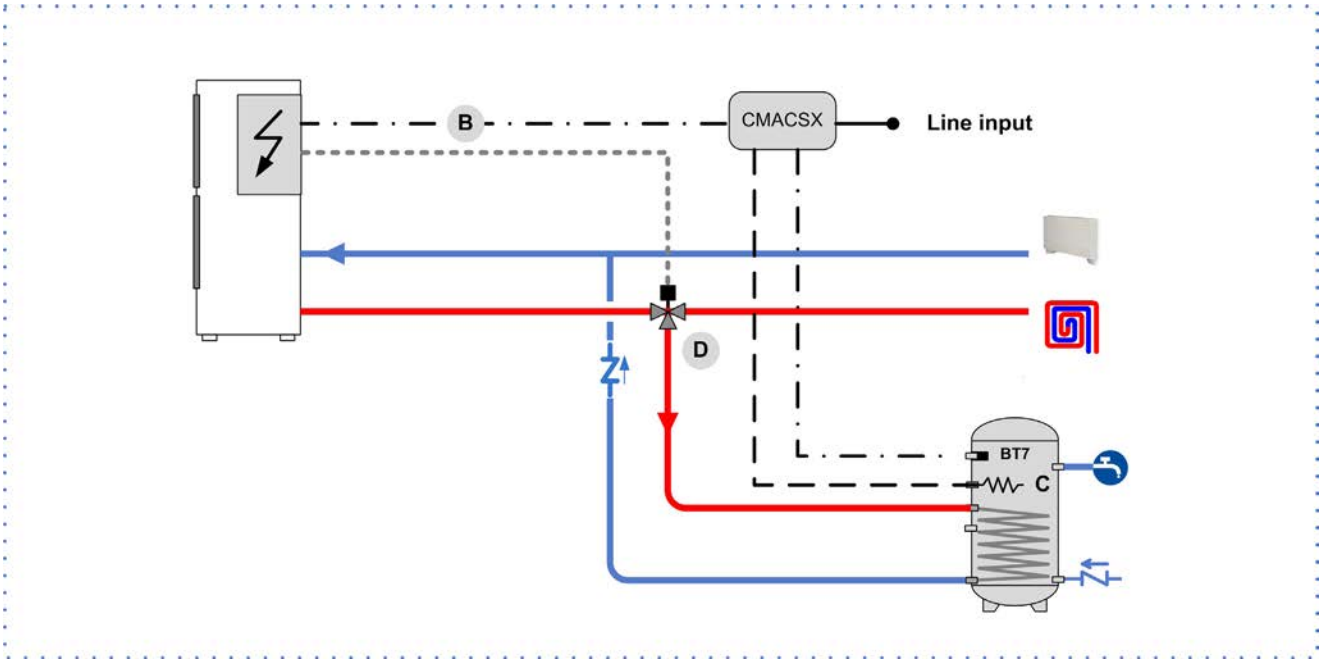
Nominal capacity between conductors < 50 pF/m

Nominal impedance 120 Ω

Recommended cable Belden 3105A or others with equal properties

14.3 AMACSX - Domestic hot water module

1	Domestic hot water module L.300 x P.220 x H.120	CMACSX
2	Water temperature probe cable length 5 mt	BT7

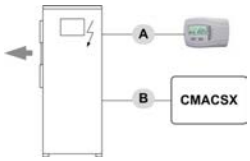


B Max. = 100 mt.
Cable section:
Min. 0,35 Max.1 mm2

C Electric heater provided by the customer

D 3-way valve
(accessory 3DHWX)

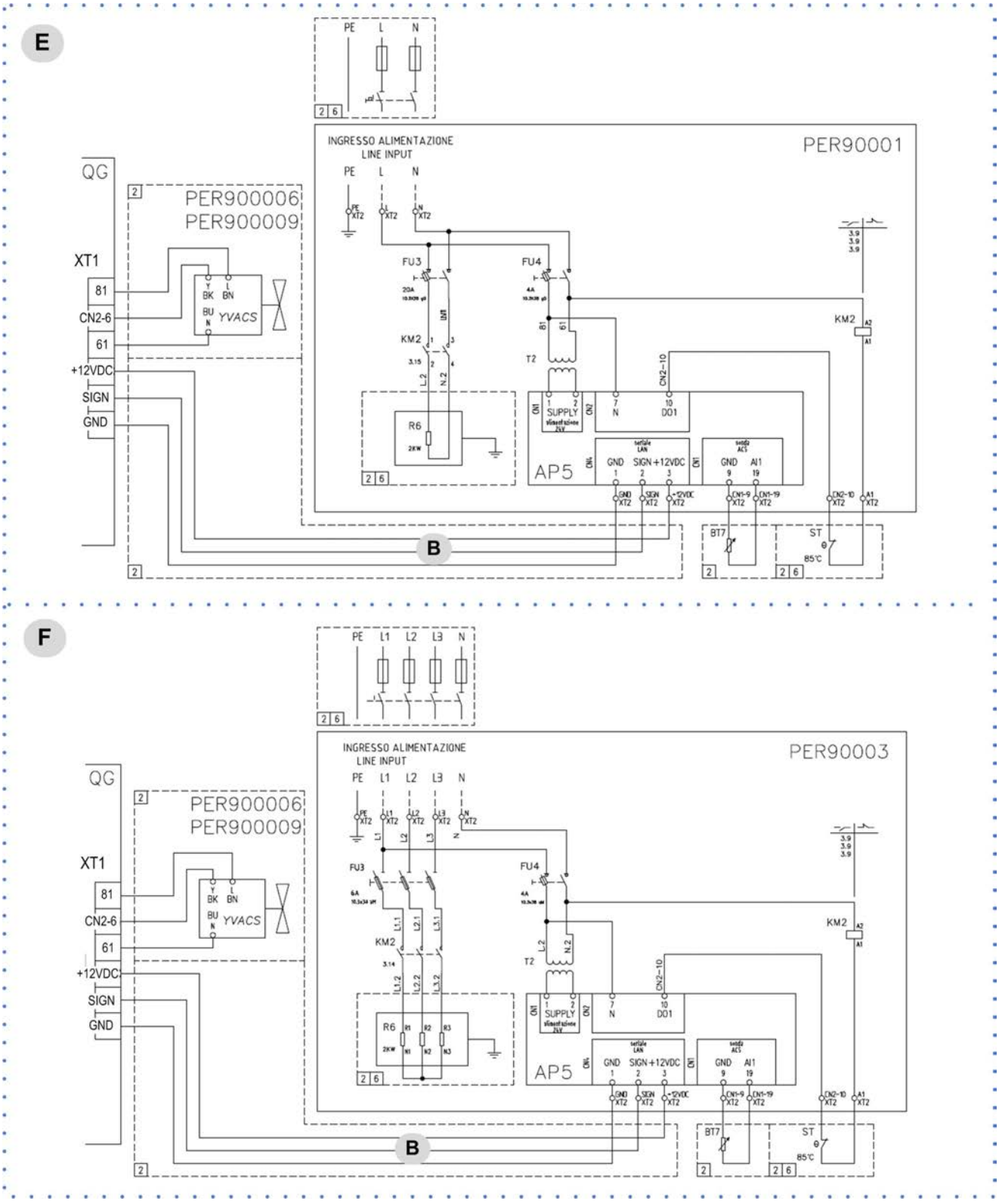
LAN net: A + B = 100 mt. Max
AMACSX - Domestic hot water module



The resistance R can operate simultaneously to the compressor.

For example:

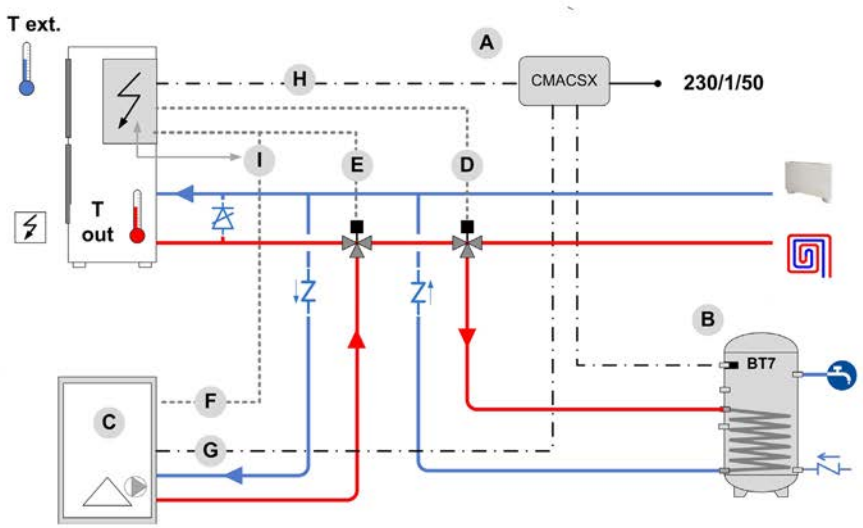
- antilegionella scheduling
- BT7 < (setpoint ACS - 19°C)



E	CMACSX - 230/1/50 - PER90001	**YVACS**	DHW valve (accessory 3DHWX)
F	CMACSX - 400/3/50+N - PER90003	**BT7**	DHW storage probe
QG	Electrical panel Heat pump	**R6**	Electric heaters of the DHW storage (provided by the Customer)
XT1	Terminal block of the customer connections	**ST**	Storange high temperature safety thermostat
B	LAN serial: L max = 100 mt Cable section: Min. 0,35 Max.1 mm2		

14.4 Boiler management

Indicative diagram - see wiring diagram



A	Domestic hot water module	L.300 x P.220 x H.120
B	Temperature probe domestic hot water	cable length 5 mt
C	Boiler	provided by the Customer
D	3-way DHW valve	accessory YVACS
E	3-way valve	accessory YVACS
F	1° setpoint control	On-off (on = 1°setpoint, off = boiler off)
G	2° setpoint control (2 setpoint>1 setpoint)	On-off (on = 2° setpoint)
H	max 100 mt	Min. 0,35 Max.1 mm2
I	Control F delay respect to control E	

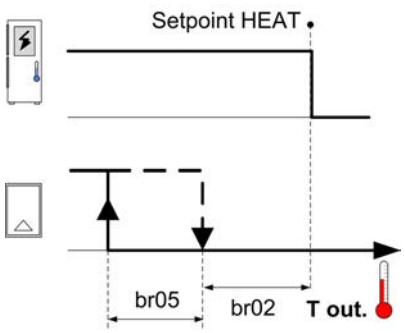
Enable boiler:

- par br00 = 3

Setpoint (C) < heat pump operation range

ON control F = ON control E+ 30 sec.

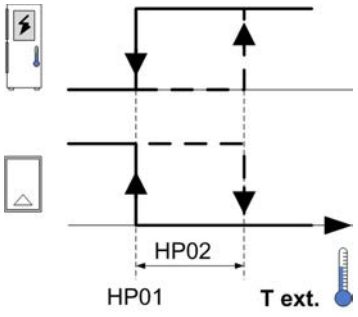
A **Boiler in integration to the heat pump**



Based on the system water temperature / domestic hot water
Br02 = 0 (Factory value)

Main menu → Parameters → br

B **Boiler replacing the heat pump**



Based on the outdoor air temperature
Enable the function:
HP00=1

Main menu → Parameters → HP

15 Alarms - Stata

15.1 Alarms

⚠ Before resetting an alarm identify and remove its cause.
Repeated resets can cause irreversible damage.

Code	Description	Type
E000	General alarm	AUTO
E001	High pressure (digital) circuit 1	*
E003	High pressure (analogical) circuit 1	*
E007	Low pressure (analogical) circuit 1	*
E010	Inverter alarm	*
E020	Primary circuit flow switch	Time
E030	Primary circuit antifreeze	AUTO
E035	Primary circuit output high temperature	AUTO
E045	Faulty clock error	AUTO
E046	Error: Clock to set	AUTO
E047	Error of LAN communication between main module and electronic thermostatic module or ambient keyboard (if present) or DHW module (if present)	AUTO
E048	Anti-legionella	AUTO
E060	Faulty water temperature probe or primary exchanger input	AUTO
E061	Faulty water temperature probe or primary exchanger output	AUTO
E062	Faulty exchanger temperature probe	AUTO
E065	Faulty ambient keyboard temperature probe	AUTO
E066	Faulty DHW temperature probe	AUTO
E068	Faulty external temperature probe	AUTO
E069	Faulty high pressure input circuit 1	AUTO
E071	Faulty compressor discharge temperature probe	AUTO
E080	Configuration error	AUTO
E081	Signalling of compressor operating hour exceeding	Manual
E085	Signalling of primary circuit pump operating hour exceeding	Manual
E090	Signalling of alarm log record exceeding	Manual

A = AUTOMATIC reset
M = MANUAL reset
* after some interventions is necessary the manual reset

15.2 Electronic thermostatic driver alarm

Code	Description	Type
E101	Faulty low pressure trasducer - dAI1	AUTO
E102	Faulty low pressure temperature probe - dAI2	AUTO
E103	Faulty discharge temperature probe - dAI3 probe	AUTO
E106	Saturation output error	AUTO
E107	MOP alarm	AUTO
E108	Signalling of valve max opening	AUTO
E110	NO link alarm	AUTO
E111	Excessive current draw	* Manual
E112	Winding 1 disconnection	* Manual
E113	Winding 1 short circuit	* Manual
E114	Winding 2 disconnection	* Manual
E115	Winding 2 short circuit	* Manual

A = AUTOMATIC reset
* Switch on and off the electronic thermostatic driver

15.3 Led inverter

The access is riserve to the service centres.

⚠ Danger of electrocution.

Led:
ON: normal operating
Slow flashing (ON 1sec.,OFF 0.5 sec.): stanby compressor stopped
Fast flashing (ON 0.2 sec.,OFF 0.2 sec.): in alarm.

15.4 Stata

Main menu→SET→Ai, di, AO, dO→Ai L1

Menu	Code	Description
Ai	AiE1	DHW temperature
	Ai L1	Primary outlet temperature
	Ai L2	Primary inlet temperature
	Ai L3	Coil temperature
	Ai L4	High pressure transducer
	Ai L5	Outside temperature
	1Ai 1	Low pressure transducer (thermostatic sensor on the driver)
	1Ai 2	Return temperature (thermostatic sensor on the driver)
	1Ai 3	Discharge temperature (thermostatic sensor on the driver)
of	di L1	High pressure
	di L2	Compressor Alarm
	di L3	Flow utility side
	di L4	Remote On-Off
	di L5	Remote Heat/Cool
AO	AO L1	Primary pump (it is a digital 0/1)
	AO L2	Fan signal (standard version)
	AO L3	Compressor signal
	AO L4	Primary pump signal (if in variable flow)
	AO L5	Fan signal (High-efficiency version)
dO	dOE1	DHW heater (if present)
	dO L1	DHW valve
	dO L2	Reversing valve refrigerant circuit
	dO L3	Frost Heater
	dO L4	Auxiliary heater
	dO L5	Compressor start
	dO L6	Cumulative alarm
E1	1rE1	Superheating temperature
	1rE2	Condensing saturate temperature
	1rE5	Superheating
	1rE6	Gas pressure (=1Ai1)
	1rE7	Opening percentage electronic thermostatic valve
	1SP4	Superheating Setpoint
Sr		Actual Setpoint: setpoint with compensation / operating limit
Hr	CP01	Hours compressor: dozens
	PU01	Hours utility pump: dozens

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