# Installation and operating manual

Air cooled condensing unit for outdoor installation

**MSAT-XEE 8.2-30.2**

Dear Customer,

We congratulate you on choosing this product

For many years Clivet has been offering systems that provide maximum comfort, together with high reliability, efficiency, quality and safety.

The aim of the company is to offer advanced systems, that assure the best comfort, reduce energy consumption and the installation and maintenance cost for the life cycle of the system.

The purpose of this manual is to provide you with information that is useful from reception of the equipment, through installation, operational usage and finally disposal so that this advanced system offers the beat solution.

Yours faithfully.

CLIVET Spa

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# 1 General description

## 1.1 Manual

The manual provides correct unit installation, use and maintenance.

Pay particular 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.

## 1.2 Preliminaries

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

## 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 air-conditioning

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

⚠ 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.

## 1.11 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.

In case of breakdown or malfunction:

- Immediately deactivate the unit
- Contact a service centre authorized by the manufacturer

⚠ 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

## 1.12 Unit indentification

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

⃠ The matriculation plate must never be removed.

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
- manufacturer logo and address

## 1.13 Serial number

It identifies uniquely each unit.

Must be quoted when ordering spare parts.

## 1.14 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 |

# 2 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.

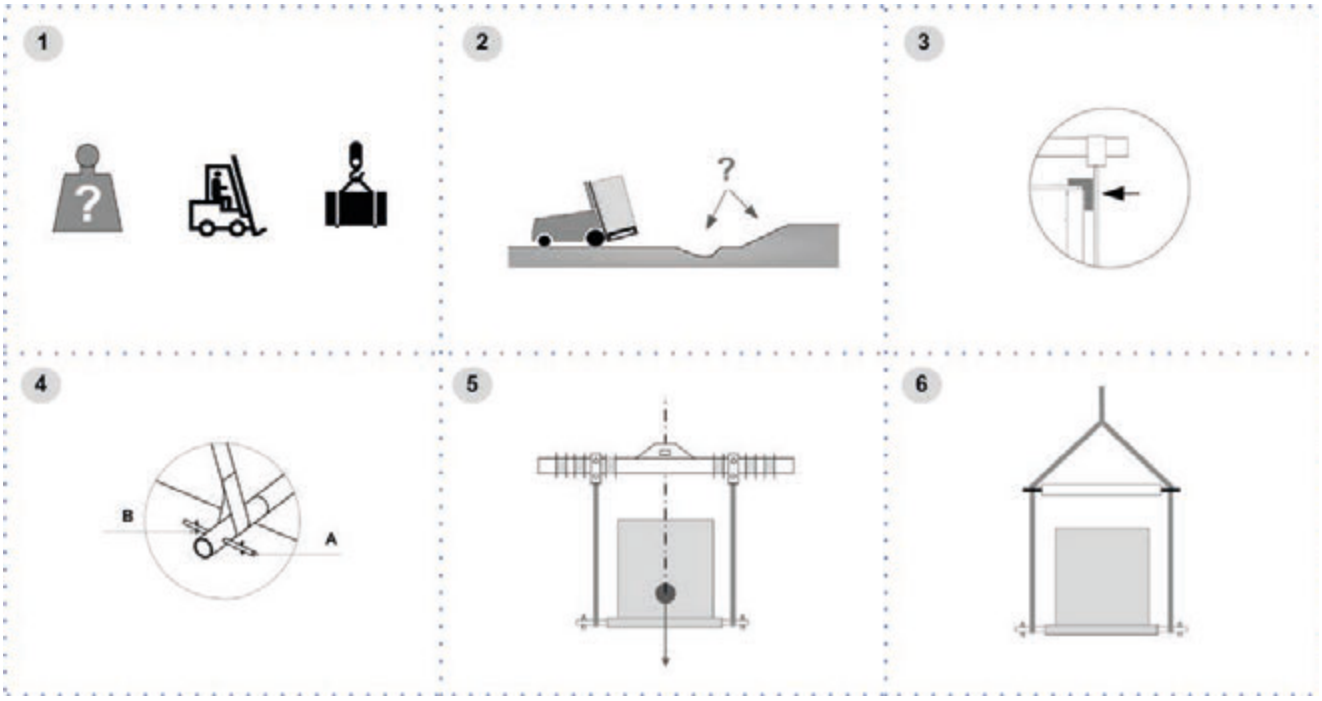
⚠ Any disputes must be made within 8 days from the date of the delivery. Complaints after this period are invalid.

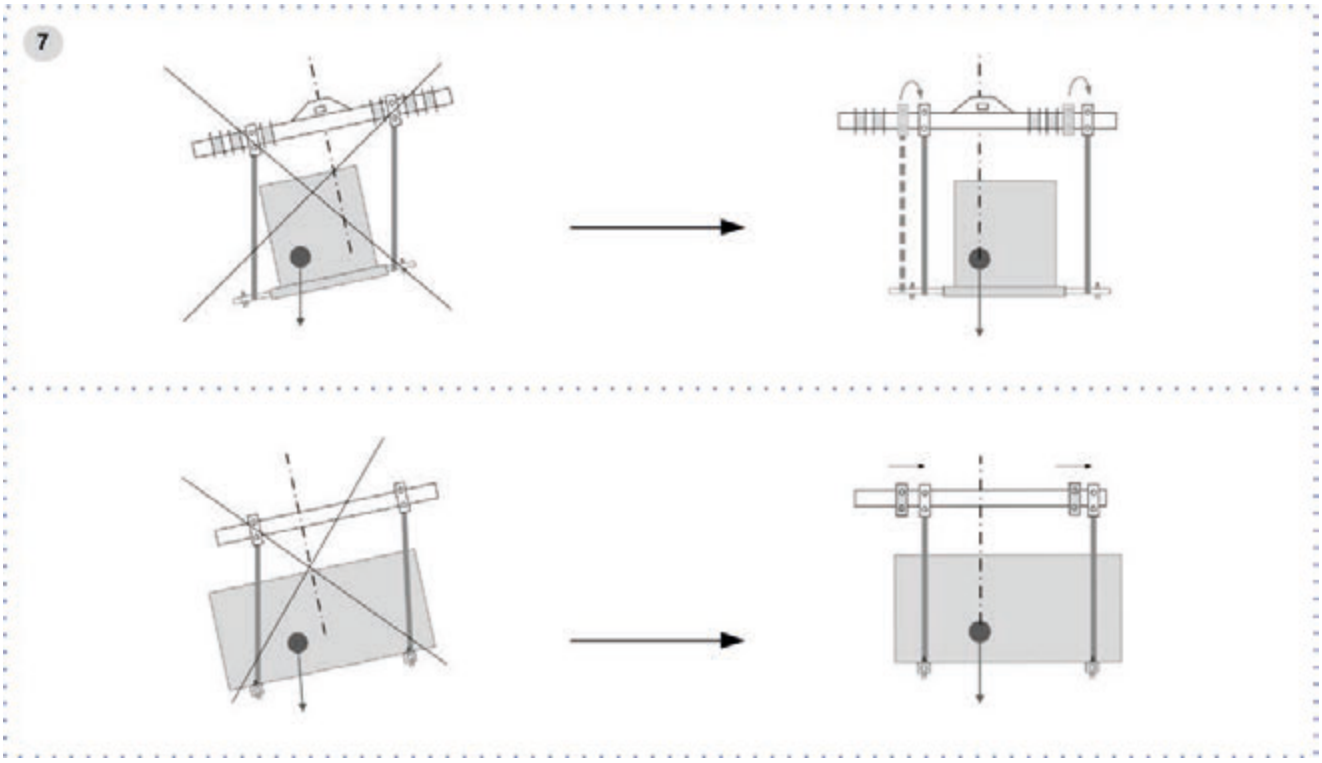
## 2.1 Storage

Observe external packaging instructions.

## 2.2 Handling

1. Verify unit weight and handling equipment lifting capacity.
2. Identify critical points during handling (disconnected routes, flights, steps, doors).
3. Suitably protect the unit to prevent damage.
4. Insert safety pins (A) and split pins (B)
5. Lifting with balance
6. Lifting with spacer bar
7. Align the barycenter to the lifting point
8. Use all the lifting brackets (see the dimensional section)
9. Gradually bring the lifting belts under tension, making sure they are positioned correctly.
10. Before starting the handling, make sure that the unit is stable.






## 2.3 Packaging removing

Be careful not to damage the unit.
Keep packing material out of children's reach it may be dangerous.
Recycle and dispose of the packaging material in conformity with local regulations.

# 3 Positioning

During positioning consider these elements:

- Technical spaces requested by the unit
- Electrical connections
- Water connections
- Spaces for air exhaust and intake

## 3.1 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.

## 3.2 Positioning

⚠ Units are designed to be installed:

- EXTERNAL
- in fixed positions

Limit vibration transmission:

- use antivibration devices on unit bearing points

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
- Standard unit operating range at full load
- 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

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 mandatory to guarantee the good unit operating.

⃠ Avoid therefore:

- obstacles to the airflow
- difficulty of exchange
- leaves or other foreign bodies that can obstruct the air coil
- 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)
- incorrect positioning, close to very high walls, attics or in angles that could give rise to stratification or recirculation phenomenons

Ignoring the previous indications could:

- reduce energy efficiency
- alarm lockout due to HIGH PRESSURE (in summer) or LOW PRESSURE (in winter)

## 3.3 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).

# 4 Refrigeranting connections

⚠ The sizing of the refrigerating connection lines is of extreme importance for the system operating and reliability.

⚠ The diameter of the connection between the two units is function of distances, differences in level and curve number; it has so to be calculated by a qualified technician.

⚠ Incorrect sizing may damage the compressor or affect cooling capacity.

The operations must be performed by an expert refrigerator technician

use only a copper pipe for chiller operating

pipes must not to be too much long and with too much curves

for a good efficiency do not perform curves with a radium too much short and avoid the pipe crushing

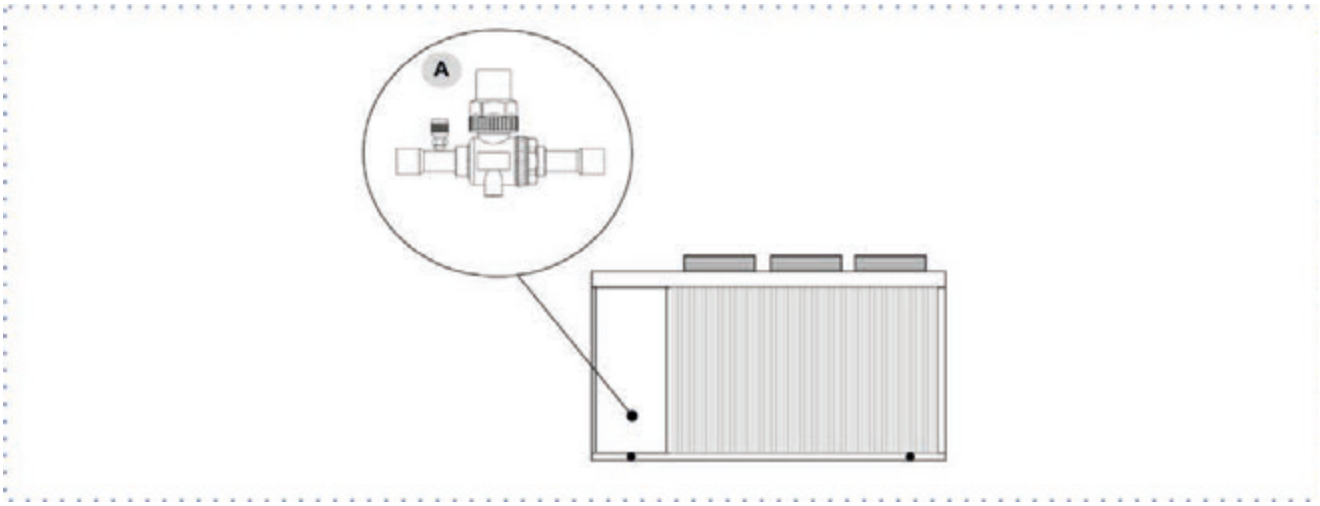
to allow the vacuum and charge operations install service fittings on pipes (if the unit is not fitted with taps with service fittings)

pipes must be perfectly clean (perform a cleaning with nitrogen or dry air before connecting the pipes to the two units) and without humidity to allow a good vacuum operation

⚠ The installation of the pipes may affect the level of noise in the system:

- install flexible joints between the unit and the pipes
- the pipe weight has not to weigh on units but it has to be sustained by anchorage brackets
- Brackets must allow the pipe thermal expansion
- Install antivibration material between the brackets and the pipes so as to prevent the transmission of vibrations

## 4.1 Shut-off valves




A. Shut-off valves

## 4.2 Risk of explosion

⚠ When you install cut-off devices (solenoid valves, taps, etc.), be aware that they may cause traps for refrigerant in the form of closed zones upstream and downstream where the refrigerant cannot freely expand.

⚠ In this situation, if there is an increase in temperature (due to exposure to the sun, proximity of pipes or sources of heat), the expansion of the trapped gas may cause the refrigeration pipes to explode.

⚠ Evaluate whether safety valves can be installed, especially in the liquid pipes that are most exposed to this risk.

## 4.3 Suction line

Slope this towards the compressor in the horizontal sections (0.5%) to ensure the return of oil to the compressor even under minimum load conditions.

For vertical rises, as well as well the socket also fit an oil collection trap every 6 metres.

Carefully insulate the pipe with anti-condensate, closed cell polyethylene, minimum thickness 9 mm.

## 4.4 Liquid line

The liquid line must be insulated if it is exposed to the sunlight or it crosses zones with a temperature higher than the external one, otherwise it can be free.

Avoid excessive diameters to not cause an excessive refrigerant charge.

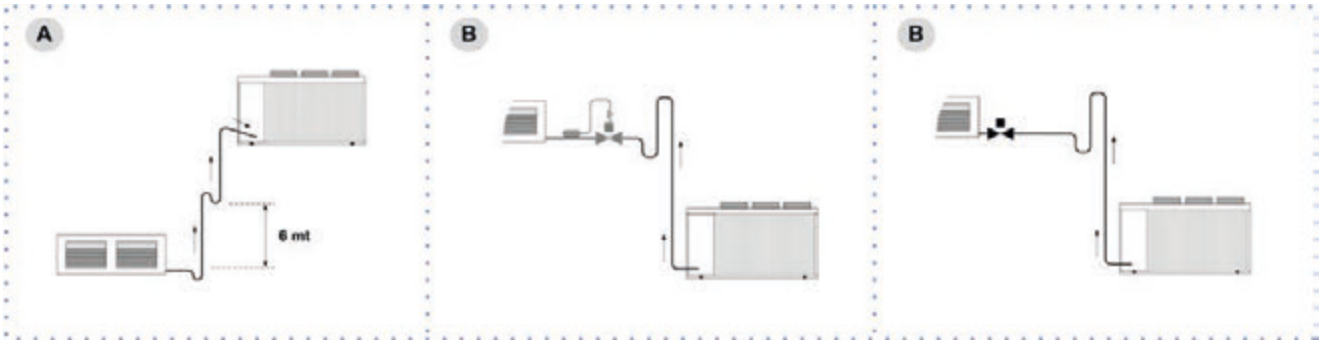
If the condensing unit is lower than the evaporating unit, install a drain trap of equal height to the exchanger coil, so as to prevent the return of liquid to the compressor when the unit is off.

The solenoid valve avoids dangerous gas leaks when the unit is off; the installation is always recommended, above all with pipes particularly long.

It has to be positioned near the thermostatic valve.

If the terminal unit is fitted with a thermostat as well as a drain trap, install a socket as near as possible to the unit.

This will prevent the bulb of the thermostat from remaining in contact with the liquid when the unit is off.




A Suction line
B Liquid line

## 4.5 Liquid receiver

The liquid receiver installation is always recommended, above all when:

- the connecting pipes are longer than 10 metres
- the installation operates in variable climatic conditions (for example fresh air temperature with ranges day/night, summer/winter).

The receiver must have a capacity adequate to the installation and it must be positioned near the evaporating unit.

If the distance is greater than 15 metres and the compressor is located in the lower part of the system, position the receiver near the unit with the compressor.

The liquid receiver can absolve the above described functions:

- it avoids the presence of gaseous freon in the expansion device
- it compensates for the charge variations in the installation when changing the operating conditions
- it avoids an excessive condenser flooding with consequent condensing temperature/pressure raising if the installation charge is performed in anomalous climatic conditions.

Along with the previously mentioned aspects, the liquid recipient compensates for the various volumes of the exchangers as their function changes (evaporator/condenser and vice versa).

Make very sure that the return and supply points are placed at the bottom.

## 4.6 Checking for leaks

1 Check carefully that the evaporator unit taps are closed.
2 Connect the pressure gauges with the service fittings (on the taps or on the connection pipes).
3 Pressurise the system with nitrogen:
mode 1: up to PS (see the label) and wait few hours
mode 2: up to PS x 1,43 law (as according to UNI-EN 378-2)

⚠ **CAUTION: EXPLOSION DANGER**

4 Spray using a leak detector spray taps and pipes and check if bubbles are present (gas leaks).
5 Discharge the nitrogen from the unit.

## 4.7 Vacuum operations

Make sure that all the service outlets are closed with proper caps; if caps are not present a leak of refrigerant can be possible.

With the taps of the motor condenser closed, drain the system.

Using a gauge group, connect the vacuum pump on both connections of the taps, make sure that the solenoid valve or any intermediate taps are open, proceed with the vacuum.

Stop the pump at a pressure of about 100 Pa and leave it under vacuum for a few hours; a slight initial rise of pressure is normal, followed by stabilization.

If the pressure continues to rise, it means there are either small leaks or humidity is present. In the first case, repeat the operations in the paragraph on checking for leaks in the manual for the refrigerant pipes.

In the second case, recharge the system with refrigerant gas up to 100KPa and re-create the vacuum as described above.

Once the pressure is permanently stable, move on to the next phase, which is charging.

## 4.8 Refrigerant charge

⚠ Check the type of refrigerant on the serial number label

The refrigerant charge must to be completed during the start-up phase, based on the type of indoor unit and on the pipe development.

With the system under vacuum, close the taps of the gauge group and disconnect the vacuum pump.

Connect the refrigerant gas tank, venting the air out of the hose for connection to the gauge group.

Open the tap of the liquid line.

Open the taps of the gauge group and let liquid-state refrigerant enter using an appropriate pump.

Once charging is complete, open the gas tap so that the unit is ready to be started.

## 4.9 Adding oil

Consider adding oil if the connection pipes are particularly long.

Check the oil level of the compressor in the indicator or in the Schrader plug.

## 4.10 Weight of refrigerant fluid

This table provides an estimate of that makes it possible to determine in advance how much gas will be needed.

The optimal refrigerant charge must be determined with the unit at normal operating power, in conditions that are near design conditions, measuring and adjusting excessive heating or cooling.

The table does not take into account various thicknesses of pipes, it refers to a unit in operation (Tev = 5°C, Tcond = 45°C).

It is necessary to add to the indicated quantities the amounts required for the two units and for the gas pipes.

| ext diameter mm | 14 | 16 | 18 | 22 | 28 |
|---|---|---|---|---|---|
| R410A *kg | 1.1 | 1.5 | 2.0 | 3.0 | 5.1 |

Note:

* kg of R410A refrigerant for 10 meters of pipe.

To estimate the refrigerant contained in the tubes, consider the Liquid line only.

## 4.11 HGBP - Hot gas by pass

For details see:
4.11 HGBP - Hot gas by pass p. 11

## 4.12 KCX - Connection set

For details see:
4.12 KCX - Connection set p. 11

# 5 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.

## 5.1 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.

## 5.2 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. Before powering up the unit, make sure that all the protections that were removed during the electrical connection work have been restored.

## 5.3 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.

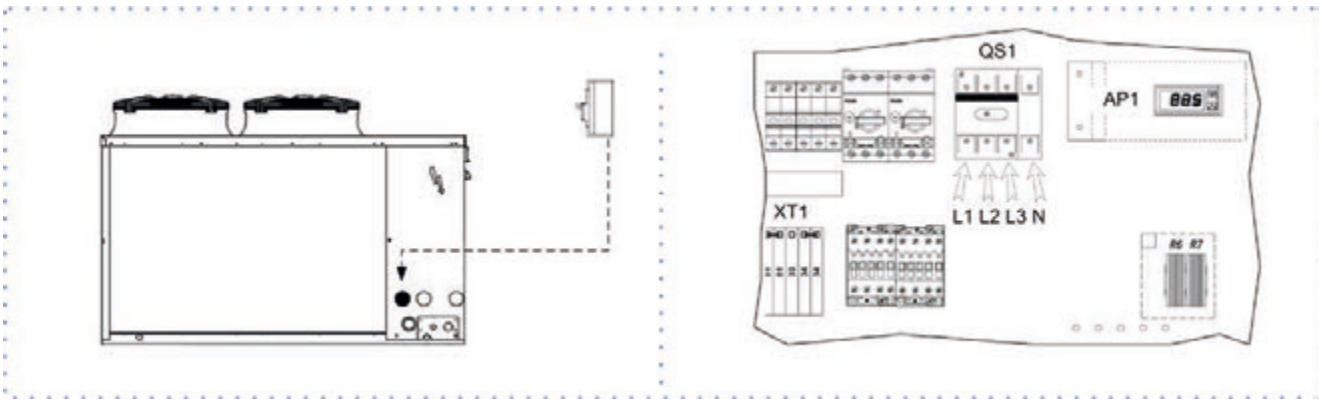
Do not lay the cables parallel to other cables, cable crossings are possible, only if laid at 90°.

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.

## 5.4 Power input



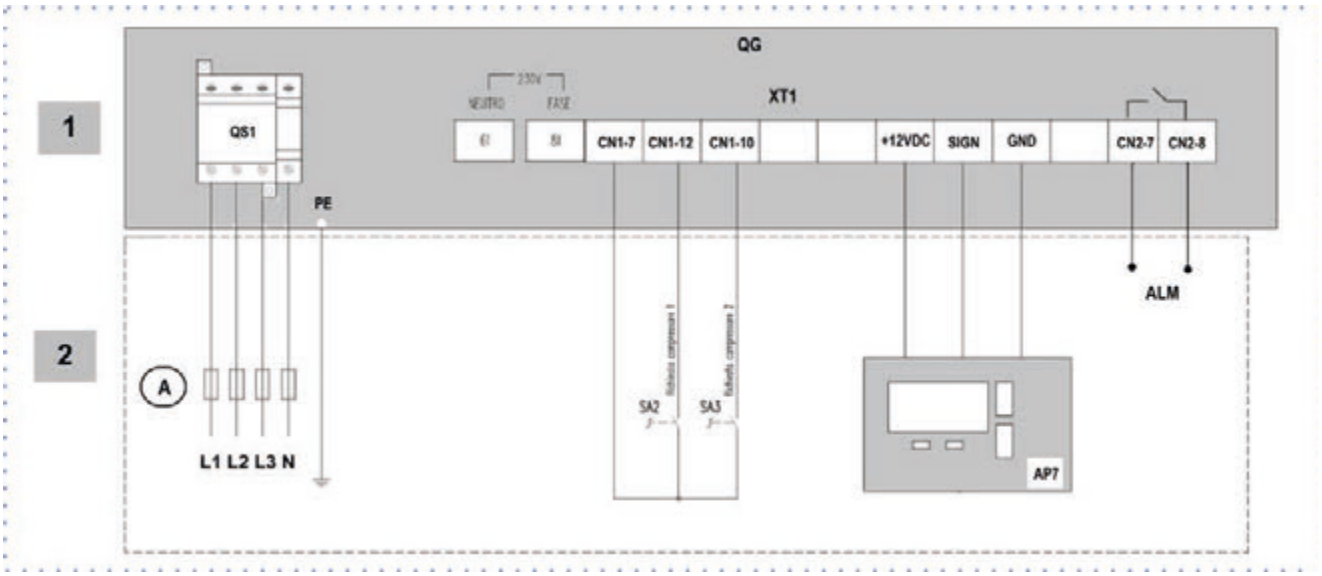

⚠ Fix the cables: if vacated may be subject to tearing.

⊘ The cable must not touch the compressor and the refrigerant piping (they reach high temparatures).

QS1: main isolator switch

XT1: terminal block of the customer connections

## 5.5 Connections performer by customer




1 Unit
2 Connections perfomer by customer
A Fuses
Provided by the customer
**QS1** Isolating switch
**QG** Electrical panel
**SA2** Compressor 1 request
**SA3** Compressor 1 + Compressor 2 request
**AP7** Room keypad
**ALM** Cumulative fault signal,max 24v/AC
**XT1** Terminal block of the customer connections

## 5.6 RCTX - Remote control

For details see:
5.6 RCTX - Remote control p. 13

## 5.7 CMSC2X - Serial communication module with RS485 serial converter kit

For details see:
5.7 CMSC2X - Serial communication module with RS485 serial converter kit p. 13

# 6 Start-up

## 6.1 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 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.

## 6.2 Preliminary checks

For details refer to the different manual sections.

**Unit OFF power supply**

1. safety access
2. functional spaces
3. refrigerant line section
4. length of the refrigerant lines
5. height difference in the cooling < 15 m
6. siphon on the gas line every 6 meter back up
7. vacuum and additional charge
8. visual check for oil / leaks
9. air flow: correct return and supply (no bypass, no stratification)
10. structure integrity
11. fans run freely
12. unit on vibration isolators
13. refrigerant circuit visual check
14. earthing connection
15. power supply features
16. electrical connections provided by the customer

## 6.3 Start-up sequence

For details refer to the different manual sections.

**Unit ON power supply**

1. off-load voltage measure
2. compressor crankcase heaters operating at least since 8 hours
3. phase sequence check
4. shut-off valve refrigerant circuit open
5. unit ON
6. load voltage measure and absorptions
7. liquid sight glass check (no bubbles)
8. check all fan operating
9. measure super-heating and sub-cooling
10. check no anomalous vibrations are present
11. complete and available unit documentation

## 6.4 Refrigeration circuit

### Correct compressor rotation direction

⚠ WARNING EXCESSIVE NOISE INDICATES THAT THE DIRECTION OF ROTATION IS NOT CORRECT

- Connect a pressure gauge on the high pressure side
- Check that the operation of the compressor leads to an increase in pressure on the high pressure side
- No variation in pressure means that the direction of rotation is not correct
- Stop the compressor
- Reverse the connection of a pair of phase wires
- Restart the compressor
- Check the variation in pressure on the high pressure side

Check carefully the refrigerating circuit: the presence of oil stains can mean leakage caused by transportation, movements or other).

Make sure that all the service outlets are closed with proper caps; if caps are not present a leak of refrigerant can be possible.

### Refrigerant circuit parameter

Detecting the operational conditions is useful to control the unit along time: the performed records must be kept and be available during maintenance interventions.

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

1. Compressor diacharge temperature (WARNING – BURN DANGERI)
2. Condensation pressure
3. Liquid temperature
4. Dehydrator filter upstream and downstream temperature
5. Return pressure
6. Return temperature
7. Fresh air temperature (coil input)
8. Air temperature coming out from fans

## 6.5 Electric Circuit

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

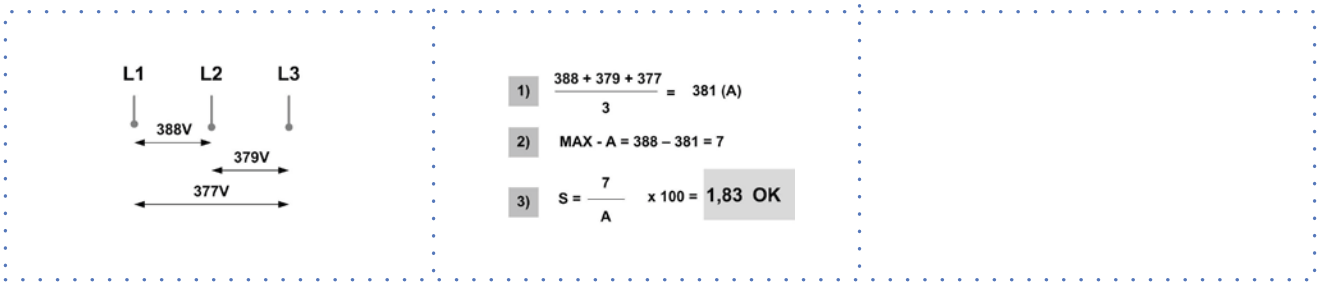
Check the conductors are tightened as: the vibrations caused by handling and transport might cause these to come loose.

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

Check the voltage and line frequency values which must be within the limits: 400/3/50 +/- 10%

Check and adjust the phase balance as necessary: it must be lower than 2%

Example




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

## 6.6 Compressor crankcase heaters

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 heaters 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.

## 6.7 Voltages

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

Start-up the unit.

With unit operating in stable conditions, check:

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

## 6.8 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).

## 6.9 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.

## 6.10 97/23 CE PED directive

97/23 CE PED DIRECTIVE 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)

# 7 Control


## 7.1 Display

| Icon | Fixed on | Flashing | Icon | |
|---|---|---|---|---|
| | Alarm on progress | Silenced alarm | | Not used |
| | Not used | | | Ventilation |
| | Cooling mode | 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 | | | Not used |
| | Not used | | ① | Compressor 1<br>On: fixed |
| | Clock<br>Active scheduling | Clock setting<br>Scheduling | ② | Compressor 2<br>On: fixed |
| ③④ | Not used | | | |

## 7.2 Keys

| Symbol | Name | Action | Function (3 sec.) | |
|---|---|---|---|---|
| | Up | Increases the value<br>Next voice | | Silenced alarm |
| | Down | Decreases the value<br>Previous voice | | On/Standby |
| esc | Esc | Esc WITHOUT SAVING MODIFICATIONS<br>Previous level | mode | Cool / stdby |
| set | Set | Confirm<br>Esc WITH MODIFICATION SAVING<br>Go to the next level<br>STATA menu | | Inputs / clock / stby / active alarms |
| + | | Activate / disactivate the time bands | | |
| esc + set | | Access to the SETTING menu | | Parameters / function / password / alarms |

## 7.3 Stand-by

| Step | Display | Action | Keys | | Menu/Variable | Notes |
|---|---|---|---|---|---|---|
| 1 | **Main menu** | Press 3 sec. | | | Stand-by | |
| 2 | **Stand-by** | Press 3 sec. | | | ON | |

If CL44 = -1 key DOWN not enable

## 7.4 Navigation

| | | | |
|---|---|---|---|
| esc<br>Press 2 sec. | **OPERATING MODE** | **Heat** | Not used |
| | | **Cool** | Cooling |
| | | **StdBY** | On/Standby |
| | | **AS** | not used currently |

| | | | |
|---|---|---|---|
| set | **STATA** | **Ai** | Analogical inputs |
| | | **AO** | Analogical outputs |
| | | **of** | Digital inputs |
| | | **dO** | Digital outputs |
| | | **CL** | Clock |
| | | **AL** | Active alarms |
| | | **HR** | Compressor operating hours |
| | | **Sr** | Setpoint |

| | | | |
|---|---|---|---|
| esc + set | **SCHEDULING** | **PAR - parameters** | Configuration |
| | | **Fnc - functions** | dEF - not used<br>tA - alarm reset<br>St - on / off<br>CC - copy card<br>EUr - alarm log reset |
| | | **PASS - password** | |
| | | **EU - alarms** | Alarm log |

## 7.5 ON/OFF

OFF: Emergency stop, drive stops immediately without observing any timing.

| Step | Display | Action | Keys | | Menu/Variable | Notes |
|---|---|---|---|---|---|---|
| 1 | **Main menu** | Press | esc + set | | PAr | |
| 2 | **PAr** | Select | ^ | v | FnC | |
| 3 | **FnC** | Press | set | | dEF | |
| 4 | **dEF** | Select | ^ | v | St | |
| 5 | **St** | Press | set | | | |
| 6 | **ON/OFF** | Press | set | | | |
| 7 | | Press | esc | | Back to the previous menu | |

## 7.6 Change the operating mode

| Step | Display | Action | Keys | | Menu/Variable | Notes |
|---|---|---|---|---|---|---|
| 1 | **Main menu** | Press 2 sec. | esc | | Cool | * |
| 2 | **Cool** | Select | ^ | v | Choose<br>standby, off: STBY<br>cool: COOL | |
| 3 | **Cool** | Confirm | set | | | |

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

## 7.7 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<br>hour: HOUR<br>date: DATE<br>year: YEAR | |
| 5 | **YEAR** | Press 3 sec. | set | | Confirm<br>! Value flashing ! | |
| 6 | **! 2012 !** | Press | | | Set the value | |
| 7 | **! 2013 !** | Confirm | set | | 2013 | |
| 8 | | Press | esc | | Back to step 4 | |

## 7.8 Display of inputs - outputs

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

For details see:
14.2 Status p. 39

## 7.9 Silenced alarm

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

| 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:
14.1 Alarms p. 39

## 7.10 Alarms

| Step | Display | Action | Keys | | Menu/Variable | Notes |
|---|---|---|---|---|---|---|
| 1 | **Main menu** | Press | set | | Ai | |
| 2 | **Ai** | Select | ^ | v | ALARM menu<br>Al | |
| 3 | **Al** | Press | set | | Access<br>1° active alarm | |
| 4 | **Er01** | Scroll | ^ | v | Other active alarms | |
| 5 | | Press | esc | | Back to the previous menu | |

For details see:
14.1 Alarms p. 39

## 7.11 Alarm reset

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

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

## 7.12 Alarm log

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

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

## 7.13 Alarms log reset

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

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

## 7.14 Setting menu

access to the configuration parameters

Keys Esc + Set → Menu PAr

| 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) | Not used |
| **HE** | Electric Heaters (External) | Not used |
| **HA** | Auxiliary Output | Not used |
| **br** | Boiler | Not used |
| **dF** | Defrost | Not used |
| **dS** | dynamic Setpoint | Not used |
| **Ad** | Adaptive | Not used |
| **AF** | AntiFreeze | Not used |
| **AS** | Domestic hot water, Anti-Legionella | Not used |
| **HP** | Heat Pump | Not used |
| **PL** | Power Limitation | Not used |
| **tE** | Time Events | Time bands |
| **AL** | ALarm | Alarms |

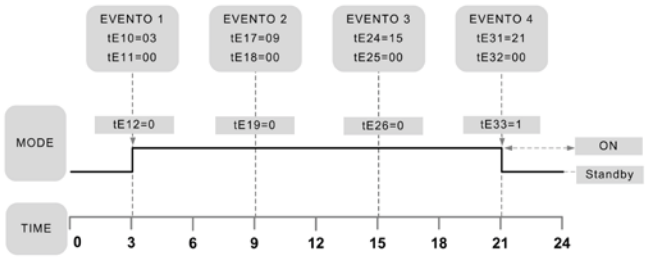
## 7.15 Scheduling management

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:
To enable the hour scheduling set the parameters tE00:

Keys Esc + Set → Menu PAr → Menu

| Set the scheduling | | | | |
|---|---|---|---|---|
| 1 | set the scheduling num.1 | scheduling 1 parameters | scheduling 2 parameters | scheduling 3 parameters |
| 1.1 | set event 1 | Event hour →par. tE10<br>Event minutes →par. tE11<br>Unit mode →par. tE12 (0=On, 1=standby) | tE38<br>tE39<br>tE40 | tE66<br>tE67<br>tE68 |
| 1.2 | set event 2 | Event hour →par. tE17<br>Event minutes →par. tE18<br>Unit mode →par. tE19 (0=On, 1=standby) | tE45<br>tE46<br>tE47 | tE73<br>tE74<br>tE75 |
| 1.3 | set event 3 | Event hour →par. tE24<br>Event minutes →par. tE25<br>Unit mode →par. tE26 (0=On, 1=standby) | tE52<br>tE53<br>tE54 | tE80<br>tE81<br>tE82 |
| 1.4 | set event 4 | Event hour →par. tE31<br>Event minutes →par. tE32<br>Unit mode →par. tE33 (0=On, 1=standby) | tE59<br>tE60<br>tE61 | tE87<br>tE88<br>tE89 |
| 2 | set the scheduling num.2 | column →scheduling 2 parameters | | |
| 3 | set the scheduling num.3 | column →scheduling 3 parameters | | |
| 4 | assign the scheduling to monday | tE01 = 1 scheduling 1 | = 2 scheduling 2 | = 3 scheduling 3 |
| 5 | assign the scheduling to tuesday | tE02 = 1 scheduling 1 | = 2 scheduling 2 | = 3 scheduling 3 |
| 6 | assign the scheduling to wednesday | tE03 = 1 scheduling 1 | = 2 scheduling 2 | = 3 scheduling 3 |
| 7 | assign the scheduling to thursday | tE04 = 1 scheduling 1 | = 2 scheduling 2 | = 3 scheduling 3 |
| 8 | assign the scheduling to friday | tE05 = 1 scheduling 1 | = 2 scheduling 2 | = 3 scheduling 3 |
| 9 | assign the scheduling to saturday | tE06 = 1 scheduling 1 | = 2 scheduling 2 | = 3 scheduling 3 |
| 10 | assign the scheduling to sunday | tE07 = 1 scheduling 1 | = 2 scheduling 2 | = 3 scheduling 3 |

## Example: scheduling 1




## Events parameters

| | | 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 |

| | | | | |
|---|---|---|---|---|
| **Event 2** | Time | tE17 | tE45 | tE73 |
| | Minutes | tE18 | tE50 | tE74 |
| | Mode 0= on 1= standby | tE19 | tE47 | tE75 |

| | | | | |
|---|---|---|---|---|
| **Event 3** | Time | tE24 | tE52 | tE80 |
| | Minutes | tE25 | tE53 | tE81 |
| | Mode 0= on 1= standby | tE26 | tE54 | tE82 |

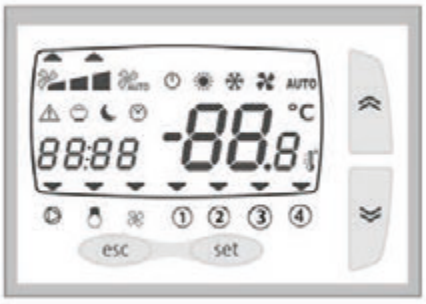
| | | | | |
|---|---|---|---|---|
| **Event 4** | Time | tE31 | tE59 | tE87 |
| | Minutes | tE32 | tE60 | tE88 |
| | Mode 0= on 1= standby | tE33 | tE61 | tE89 |

## 7.16 Remote control - option

The keyboard repeats all the built-in control functions.

For details see:

7 Control p. 17




## 7.17 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<br>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<br>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

# 8 Maintenance

## 8.1 General description

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

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

## 8.2 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)

## 8.3 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.

## 8.4 Voltages

⚠ 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.

## 8.5 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.

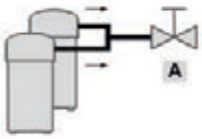
⚠ With lower temperatures keep heaters turned on in of the electrical panel (option).

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.

## 8.6 Compressor supply line shut-off valve




Only if present

A. Supply line shut-off valve

⚠ CAUTION!

Do not remove the seal

Remove only if authorized by the manufacturer.

Please contact the maker for informations.

## 8.7 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 | check of the fixing and the insulation of the power lead | | | X |
| 6 | check of the earthing cable | | | X |
| 7 | electric panel cleaning | | | X |
| 8 | capacity contactor status | | | X |
| 9 | termina closing, cable insulation integrity | | | X |
| 10 | voltage and phase unbalancing (no load and on-load) | | X | |
| 11 | absorptions of the single electrical loads | | X | |
| 12 | test of the compressor crankcase heaters | | X | |
| 13 | leak control* | | | X |
| 14 | survey of the refrigerant circuit operating parameters | | X | |
| 15 | protective device test: pressure switches, thermostats, flow switches etc.. | | X | |
| 16 | control system test: setpoint, climatic compensations, capacity stepping, water / air flow-rate variations | | X | |
| 17 | control device test: alarm signalling, thermometers, probes, pressure gauges etc.. | | X | |

* European regulation 303/2008

Refer to the local regulations; and ensure correct adherance. 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.

## 8.8 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, vacumn cleaner 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 fins straightened in order to restore the initial condition for an optimal air flow.

## 8.9 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 Decommissioning

## 9.1 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 water circuit

Awaiting dismantling and disposal, the unit can also be stored outdoors, if the electrical, cooling and water circuits of the unit have 100% integrity and are isolated, bad weather and rapid change in temperature will not result in any environmental impact.

## 9.2 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.

## 9.3 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.

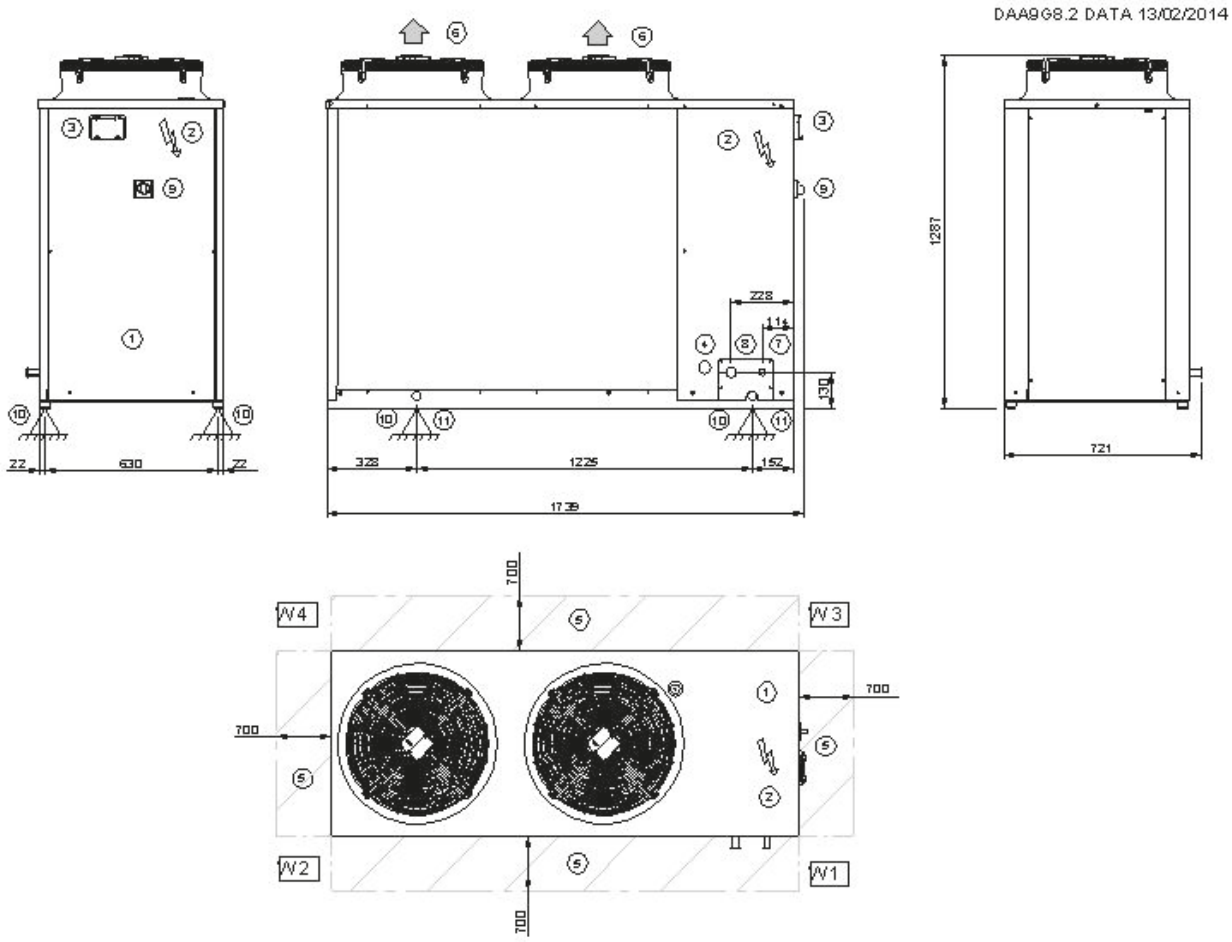
# 10 Residual risks

**General description**
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.
**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 regarding the packaging and in compliance with the local regulations in force.
Should the refrigerant leak please refer to the refrigerant "Safety sheet".
**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 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 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.
**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 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 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.
**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 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.
**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.
**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.

# 11 Dimensional drawings

## 11.1 Size 8.2 - 10.2 - 12.2

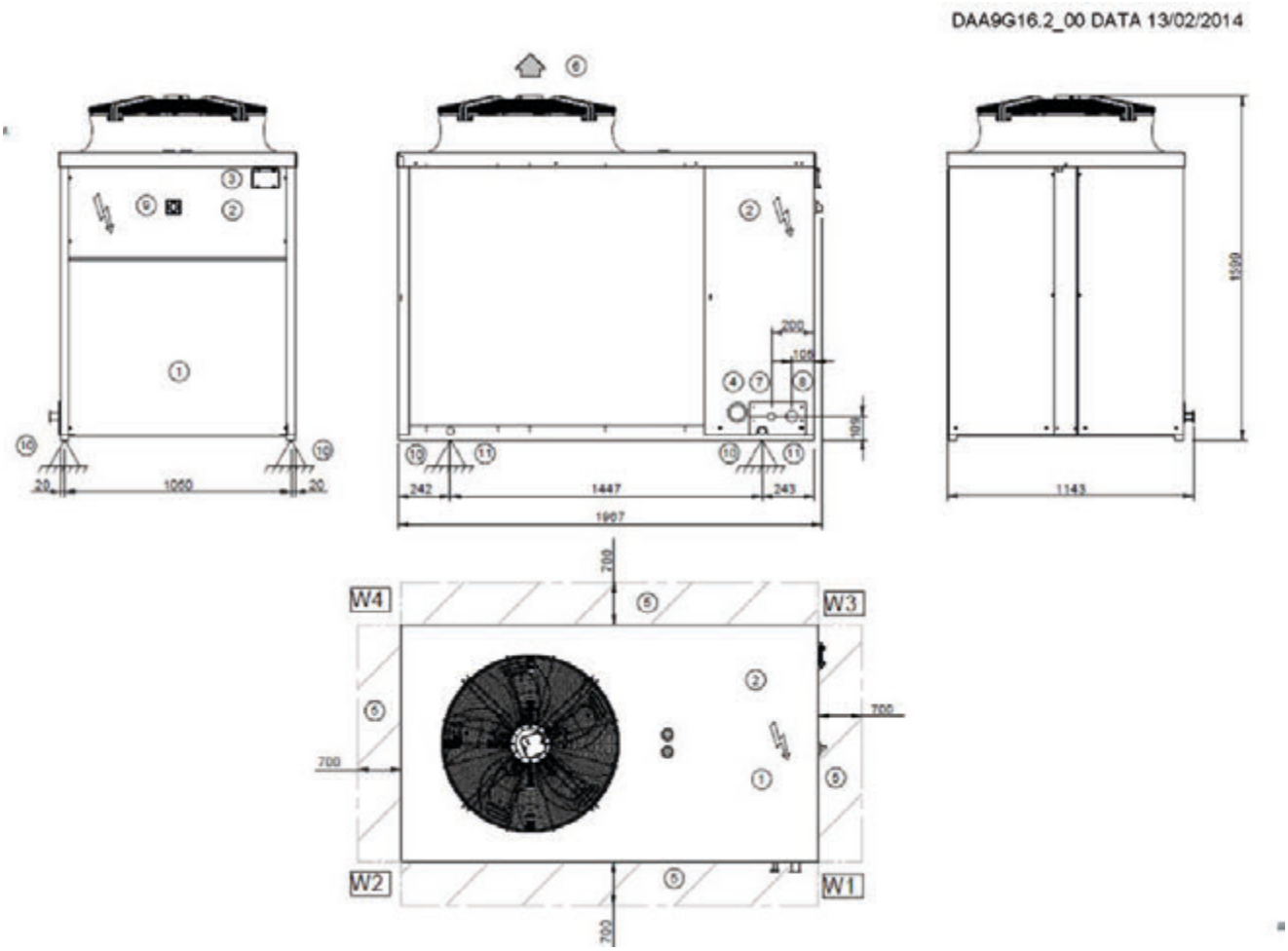



1. Compressor compartment
2. Electrical panel
3. control keypad
4. Power input
5. Functional spaces
6. Air supply
7. liquid line piping d.16 mm.
8. suction line piping d.28 mm.
9. Main isolator switch
10. vibration mounts position
11. lifting holes position

| Size | | 8.2 | 10.2 | 12.2 |
|---|---|---|---|---|
| A - Length | mm | 1739 | 1739 | 1739 |
| B - Width | mm | 721 | 721 | 721 |
| C - Height | mm | 1287 | 1287 | 1287 |
| Shipping weight | kg | 304 | 309 | 328 |
| Operating weight | kg | 298 | 303 | 323 |

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

## 11.2 size 16.2 - 18.2 - 22.2

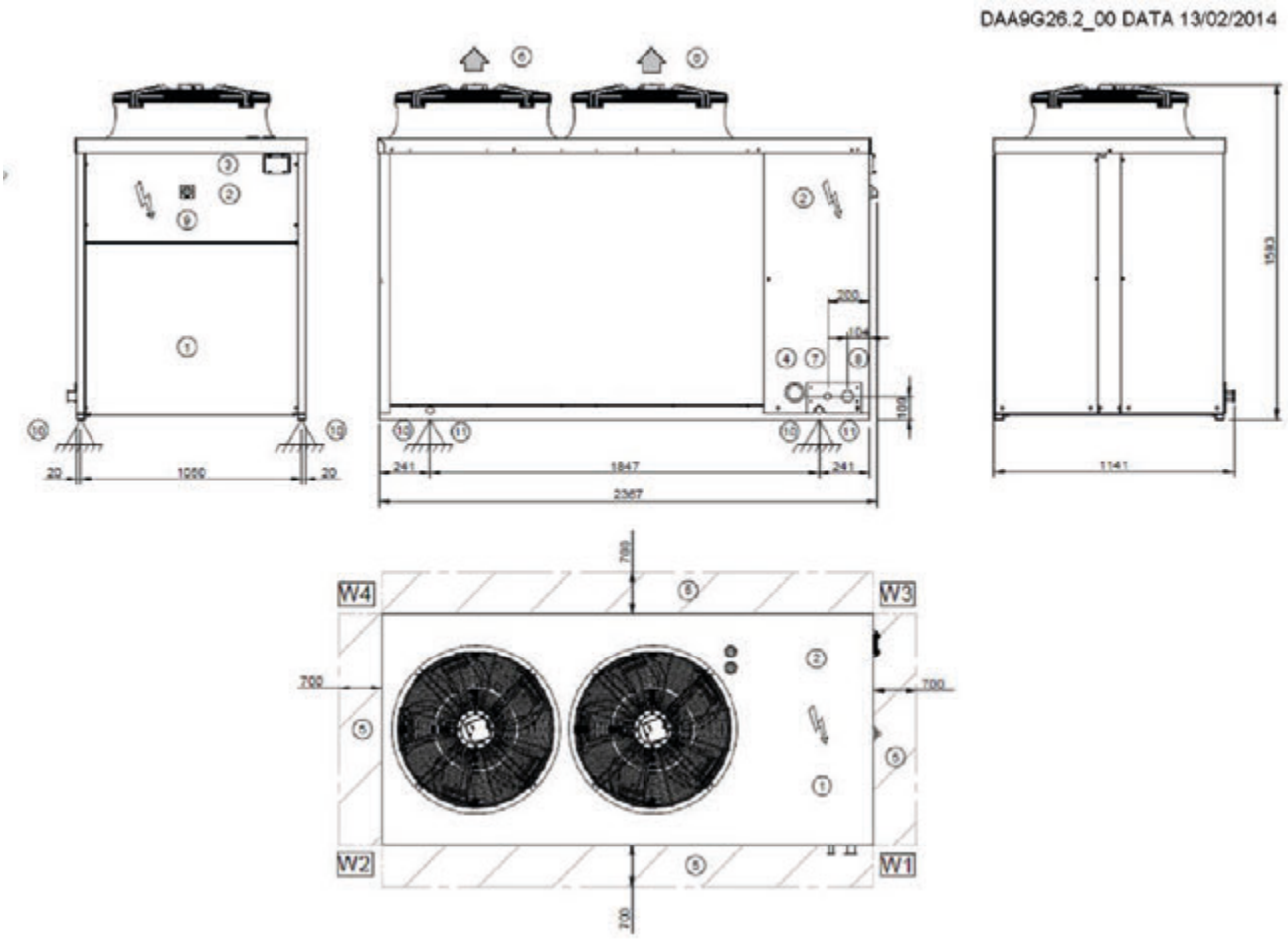



1. Compressor compartment
2. Electrical panel
3. control keypad
4. Power input
5. Functional spaces
6. Air supply
7. liquid line piping d.16 mm.
8. suction line piping d.28 mm.
9. Main isolator switch
10. vibration mounts position
11. lifting holes position

| Size | | 16.2 | 18.2 | 22.2 |
|---|---|---|---|---|
| A - Length | mm | 1197 | 1197 | 1197 |
| B - Width | mm | 1143 | 1143 | 1143 |
| C - Height | mm | 1599 | 1599 | 1599 |
| Shipping weight | kg | 464 | 476 | 497 |
| Operating weight | kg | 456 | 469 | 490 |

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

## 11.3 Size 26.2 - 30.2




1. Compressor compartment
2. Electrical panel
3. control keypad
4. Power input
5. Functional spaces
6. Air supply
7. liquid line piping d.16 mm.
8. suction line piping d.28 mm.
9. Main isolator switch
10. vibration mounts position
11. lifting holes position

| Size | | 26.2 | 30.2 |
|---|---|---|---|
| A - Length | mm | 2367 | 2367 |
| B - Width | mm | 1141 | 1141 |
| C - Height | mm | 1593 | 1593 |
| Shipping weight | kg | 556 | 569 |
| Operating weight | kg | 547 | 561 |

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

# 12 Technical information

## 12.1 General technical data

| Size | | | 8.2 | 10.2 | 12.2 | 16.2 | 18.2 | 22.2 | 26.2 | 30.2 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cooling** | | | | | | | | | | |
| Cooling capacity | 1 | kW | 25.7 | 31.3 | 36.0 | 43.4 | 51.6 | 59.1 | 72.3 | 80.1 |
| Compressor power input | 1 | kW | 8.79 | 9.95 | 12.4 | 14.1 | 16.2 | 20.3 | 22.6 | 26.6 |
| Total power input | 1 | kW | 9.20 | 10.4 | 12.9 | 15.6 | 17.7 | 21.8 | 24.2 | 28.4 |
| EER | 1 | | 2.78 | 3.01 | 2.80 | 2.78 | 2.91 | 2.71 | 2.99 | 2.82 |
| **Compressor** | | | | | | | | | | |
| Type of compressors | | | SCROLL | SCROLL | SCROLL | SCROLL | SCROLL | SCROLL | SCROLL | SCROLL |
| No. of compressors | | No | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Std Capacity control steps | | No | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil charge (C1) | | l | 3.61 | 3.72 | 3.54 | 5.76 | 5.76 | 6.65 | 7.39 | 8.28 |
| Refrigerant charge (C1) | 2 | kg | 6.4 | 9.2 | 9.2 | 8.0 | 11.6 | 11.6 | 14.9 | 14.9 |
| Refrigeration circuits | | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **External Section Fans** | | | | | | | | | | |
| Type of fans | | | AX | AX | AX | AX | AX | AX | AX | AX |
| Number of fans | | No | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 |
| Standard airflow | | l/s | 2553 | 2545 | 2514 | 4965 | 4902 | 4778 | 7196 | 6971 |
| Installed unit power | | kW | 0.25 | 0.25 | 0.25 | 1.72 | 1.72 | 1.72 | 0.90 | 0.90 |
| **CONNECTIONS** | | | | | | | | | | |
| Gas connection | | | 28 | 28 | 28 | 35 | 35 | 35 | 42 | 42 |
| Liquid connection | | | 16 | 16 | 16 | 22 | 22 | 22 | 22 | 22 |
| Power supply | | | | | | | | | | |
| Standard power supply | | V | 400/3/50+N | 400/3/50+N | 400/3/50+N | 400/3/50+N | 400/3/50+N | 400/3/50+N | 400/3/50+N | 400/3/50+N |
| Noise Levels | | | | | | | | | | |
| Sound pressure level (1 m) | 3 | dB(A) | 60 | 60 | 60 | 64 | 64 | 65 | 65 | 65 |
| **Dimensions** | | | | | | | | | | |
| A - Length | | mm | 1739 | 1739 | 1739 | 1967 | 1967 | 1967 | 2367 | 2367 |
| B - Width | | mm | 721 | 721 | 721 | 1143 | 1143 | 1143 | 1141 | 1141 |
| C - Height | | mm | 1287 | 1287 | 1287 | 1599 | 1599 | 1599 | 1593 | 1593 |
| **STANDARD UNIT WEIGHTS** | | | | | | | | | | |
| Shipping weight | | kg | 304 | 309 | 328 | 464 | 476 | 497 | 556 | 569 |
| Operating weight | | kg | 298 | 303 | 323 | 456 | 469 | 490 | 547 | 561 |

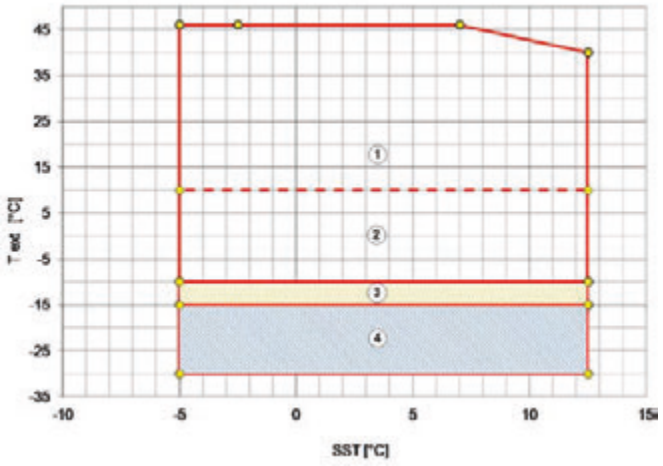
1. saturated suction temperature (SST) = 5 °C. outdoor air temperature 35°C
2. Refrigerant charge relating only to the condensing unit to be integrated according to the installation and to the evaporating internal unit.
3. Sound levels refer to units with full load under nominal test conditions. The sound pressure is measured at 1 m from the external surface of the unit in open field conditions.

## 12.2 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) |
| **8.2** | 80 | 75 | 78 | 73 | 70 | 66 | 58 | 52 | 75 | 60 |
| **10.2** | 79 | 74 | 77 | 73 | 70 | 66 | 60 | 51 | 75 | 60 |
| **12.2** | 79 | 74 | 77 | 72 | 70 | 67 | 61 | 52 | 75 | 60 |
| **16.2** | 89 | 82 | 78 | 80 | 77 | 69 | 64 | 59 | 81 | 64 |
| **18.2** | 89 | 82 | 77 | 79 | 77 | 71 | 66 | 60 | 81 | 64 |
| **22.2** | 89 | 82 | 80 | 81 | 77 | 72 | 64 | 59 | 82 | 65 |
| **26.2** | 89 | 82 | 79 | 80 | 78 | 73 | 67 | 59 | 82 | 65 |
| **30.2** | 89 | 82 | 80 | 81 | 76 | 73 | 64 | 57 | 82 | 65 |

The sound pressure level refers to a distance of 1m from the outer surface of the unit operating in an open field.
Data referred to the following conditions:
internal exchanger water = 12/7°C
outdoor air temperature 35°C

## 12.3 Operating range




SST = saturated suction temperature, corresponding to the compressor suction pressure (°C)
suction gas superheating +5° K

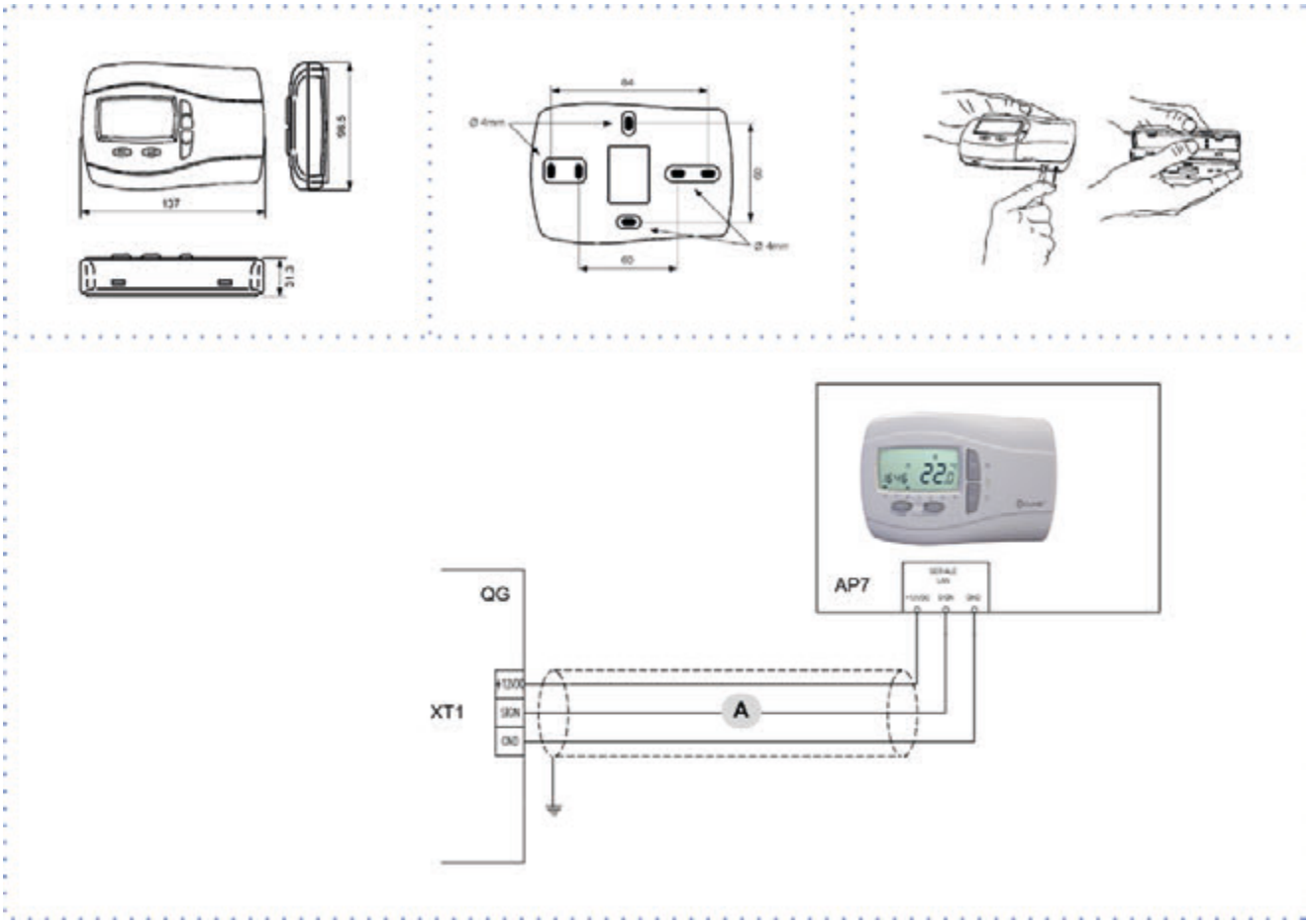
1. Standard operating range
2. Operating range with modulating fans
3. Operating range with option: Min. outdoor temperature -15°C (MEN15)
4. Operating range with option: Min. outdoor temperature -30°C (MEN30)

# 13 Accessories

| | |
|---|---|
| **REFRIGERANT CIRCUIT** | |
| KCX | connection set |
| HGBP | hot gas by pass |
| **ELECTRIC CIRCUIT** | |
| RCTX | Remote control |
| PM | phase monitor |
| PMX | phase monitor |
| **INSTALLATION** | |
| AMMX | Rubber antivibration mounts |
| PGCEX | Coil protection grilles outdoor air side |
| **Various** | |
| MEN30 | Minimum outdoor air temperature down to -30°C |
| MEN15 | Minimum outdoor air temperature down to -15°C |

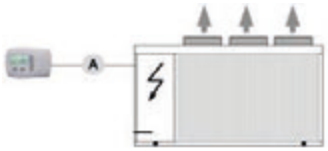
X - When the letter X is placed at the end, this means that the accessory is supplied separately. If there is no X in the code, the accessory is mounted in the factory.

## 13.1 RCTX - Remote control



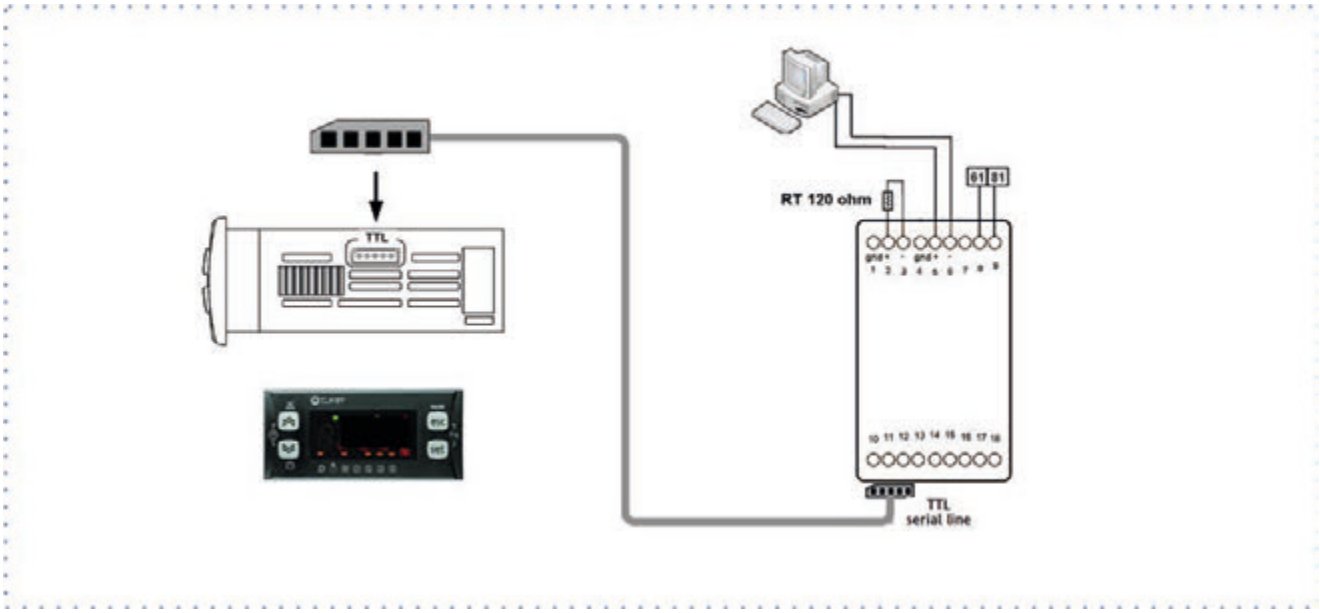

**QG** Electrical panel
**XT1** Terminal block of the customer connections
**AP7** Room keypad
**A** Max. = 100 mt.
Cable section:
Min. 0,35 Max.1 mm2
The cable must be shielded

LAN net: A = 100 mt. Max



## 13.2 CMSC2X - Serial communication module with RS485 serial converter kit

| | | |
|---|---|---|
| 1 | Install the 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

Rated power between conductors < 50 pF/m

Nominal impedance 120 Ω

Recommended cable Belden 3105A or others with equal properties

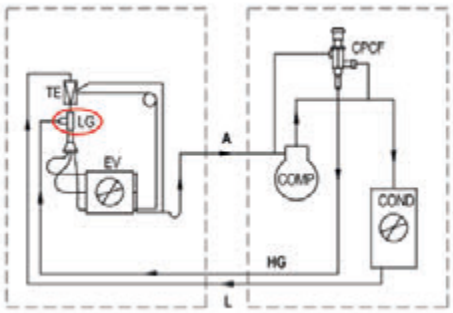
## 13.3 HGBP - Hot gas by pass

This device allows operation with air temperatures on the indoor unit lower than standard.

This functionality is possible thanks to the recovery of part of the outgoing gas from the compressor (hot gas HG) which directly enters the evaporation coil EV, thus preventing the formation of ice on the evaporator.

The option entails the assembly of:

- an LG mixer tap on the evaporator
- a CPCF valve on the condensing unit
- an additional connection pipe for the bypassed hot gas



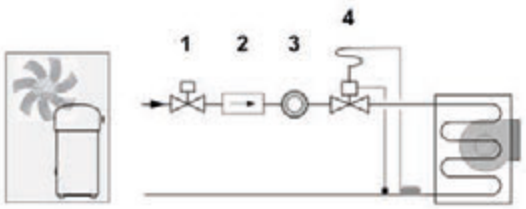

| | |
|---|---|
| | Condensing unit |
| **COND** | Condenser |
| **CPCF** | Hot gas by pass valve |
| **COMP** | Compressor |
| **HG** | hot gas by pass |
| **A** | Suction line |
| **L** | Liquid line |
| | |
| **EV** | Evaporator |
| **TE** | thermostatic valve |
| **LG** | distributor for hot gas by pass |

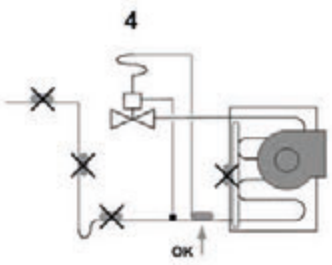
## 13.4 KCX - Connection set

Indicative scheme

Install the components present in to the kit.

It is the responsibility of the designer to define the required components in the system.




1. solenoid valve
2. dryer filter
3. liquid indicator
4. thermostatic valve

# 14 Alarms - Status

## 14.1 Alarms

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

| Code | Description | Type |
|---|---|---|
| **E000** | Alarm phase monitor | AUTO |
| **E001** | High pressure (digital) circuit | * |
| **E005** | Low pressure (digital) circuit | * |
| **E010** | Compressor 1 Alarm | Manual |
| **E011** | Compressor 2 Alarm | Time |
| **E041** | Fan thermal | Manual |
| **E045** | Faulty clock error | AUTO |
| **E046** | Error: Clock to set | AUTO |
| **E047** | Error of LAN communication between main module and ambient keyboard (if present) | AUTO |
| **E062** | Faulty exchanger temperature probe | AUTO |
| **E065** | Faulty ambient keyboard temperature probe | AUTO |
| **E069** | Faulty high pressure input circuit | AUTO |
| **E080** | Configuration error | AUTO |
| **E081** | Signalling of compressor 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

## 14.2 Status

Main menu → SET → Ai, di, AO, dO → Ai L1

| Menu | Code | Description |
|---|---|---|
| **Ai** | **AiE1** | Not used |
| | **Ai L1** | Fan thermal (0= input closed) |
| | **Ai L2** | Phase monitor (0= input closed) |
| | **Ai L3** | Not used |
| | **Ai L4** | High pressure transducer |
| | **Ai L5** | Not used |
| | **AiR1** | ambient air temperature probe<br>Remote control |
| | **1Ai 1** | Not used |
| | **1Ai 2** | Not used |
| | **1Ai 3** | Not used |
| **of** | **di L1** | High pressure |
| | **di L2** | Low pressure switch |
| | **di L3** | Compressor 1 line protection |
| | **di L4** | Compressor 2 line protection |
| | **di L5** | Compressor 1 request |
| | **diL6** | Compressor 2 request |
| **AO** | **AO L1** | Not used |
| | **AO L2** | Not used |
| | **AO L3** | Fan signal |
| | **AO L4** | Not used |
| | **AO L5** | Not used |

| Menu | Code | Description |
|---|---|---|
| d0 | d0E1 | Not used |
| | d0 L1 | Compressor 1 start |
| | d0 L2 | Compressor 2 start |
| | d0 L3 | Fan start |
| | d0 L4 | Not used |
| | d0 L5 | Not used |
| | d0 L6 | Cumulative alarm |
| E1 | 1rE1 | Not used |
| | 1rE2 | Not used |
| | 1rE5 | Not used |
| | 1rE6 | Not used |
| | 1rE7 | Not used |
| | 1SP4 | Not used |
| Sr | | Not used |
| Hr | CP01 | Compressor 1 operating hours: x 10 |
| | CP02 | Compressor 2 operating hours: x 10 |

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