

INSTALLATION, USE AND MAINTENANCE MANUAL



Evaporator units with
remote condensers.

eco
R407C

HE FF
NHCR
0011÷0121

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The following symbols are used in this publication and in the unit:



User



Important



Danger moving blades



Installer



Prohibition



Danger high temperatures



Assistance



Danger voltage



Eurovent certification program.

The manufacturer reserves the right to modify the data in this manual without warning.

⚠ These appliances have been designed to chill and/or heat water and must be used in applications compatible with their performance characteristics; these appliances are designed for residential or similar applications.

Incorrect installation, regulation and maintenance or improper use absolve the **manufacturer** from all liability, whether contractual or otherwise, for damage to people, animals or things.

Only those applications specifically indicated in this list are permitted

Read this manual carefully. All work must be carried out by qualified personnel in conformity with legislation in force in the country concerned.

The warranty is void if the above instructions are not respected and if the unit is started up for the first time without the presence of personnel authorised by the Company (where specified in the supply contract) who should draw up a “start-up” report.

The documents supplied with the unit must be consigned to the owner who should keep them carefully for future consultation in the event of maintenance or service. When the items are consigned by the carrier, check that the packaging and the unit are undamaged.

If damage or missing components are noted, indicate this on the delivery note. A formal complaint should be sent via fax or registered post to the After Sales Department within eight days from the date of receipt of the items.

All repair or maintenance work must be carried out by the Company's Technical Service or qualified personnel following the instructions in this manual.

Do not modify or tamper with the appliance as this may create situations of danger; in such cases the manufacturer of the appliance is not liable for any damage caused.

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Read this document carefully.

All work must be performed, components selected and

materials used professionally and in complete accordance with the legislation in force in material in the country concerned, and considering the operating conditions and intended uses of the system, by qualified personnel.

When operating equipment involving the use of electricity and water, a number of fundamental safety rules must be observed, namely:

- ⊖ The unit must not be used** by children or by unfit persons without suitable supervision.

Do not touch the unit with bare feet or with wet or damp parts of the body.

Never perform any cleaning operations before having disconnected the unit from the mains power supply.

Do not modify safety or control devices without authorisation and instructions from the manufacturer.

Do not pull, detach or twist the electrical cables coming from the unit, even when disconnected from the mains electricity supply.

Do not open doors or panels providing access to the internal parts of the unit without first ensuring that the mains switch is in the off position.

Do not introduce pointed objects through the air intake and outlet grills.

Do not dispose of, abandon or leave within reach of children packaging materials (cardboard, staples, plastic bags, etc.) as they may represent a hazard.

Power supply to the unit must be disconnected using a switch with suitable characteristics, to be supplied and installed by the installer.

- ⚠ Respect safety distances** between the unit and other equipment or structures. Guarantee adequate space for access to the unit for maintenance and/or service operations (see the figure on page 5).

Power supply: the size of the electrical cables must be adequate for the power of the unit and the power supply voltage must correspond with the value indicated on the respective units. All units must be earthed in conformity with legislation in force in the country concerned.
- ⚠ Some terminals in the electrical panel** may be powered even after the unit is disconnected. Make sure power is not connected before proceeding.

Water connections should be carried out as indicated in the instructions to guarantee correct operation of the unit.

Add glycol to the water circuit if the unit is not used during the winter or the circuit is not emptied.

Handle the unit with the utmost care (see weight distribution table) to avoid damage.

The chillers are supplied accompanied by:

- installation, user and maintenance manual;
- CE declaration;

CHOICE OF INSTALLATION SITE

Before installing the unit, agree with the customer the site where it will be installed, taking the following points into consideration:

- Check that the fixing points are adequate to support the weight of the unit;
- Pay scrupulous respect to safety distances between the unit and other equipment or structures to ensure that air entering the unit and discharged by the fans is free to circulate.

HANDLING AND POSITIONING

The unit should always be handled by qualified personnel using equipment adequate for the weight of the chiller.

- Before handling the unit, check the capacity of the lift equipment used, respecting the instructions on the packaging.
- To move the unit horizontally, make appropriate use of a lift truck or similar, bearing in mind the weight distribution of the unit.

To lift the unit, insert tubes long enough to allow positioning of the lifting slings and safety pins in the special feet on the unit.

For the sizes of these tubes, see the figures shown in the corresponding section.

- To avoid the slings damaging the unit, place protection between the slings and the unit.

Position the unit in the site indicated by the customer. Place either a layer of rubber (min. thickness 10 mm) or vibration damper feet (optional) between the base and support surface.

Fix the unit, making sure it is level and that there is easy access to water and electrical components.

If the site is exposed to strong winds, fix the unit adequately using tie rods if necessary.

If a heat pump unit is being installed, make sure the condensate is drained using the drain hose supplied as standard.

Prevent leaves, branches or snow from accumulating around the unit. These could reduce the efficiency of the unit.

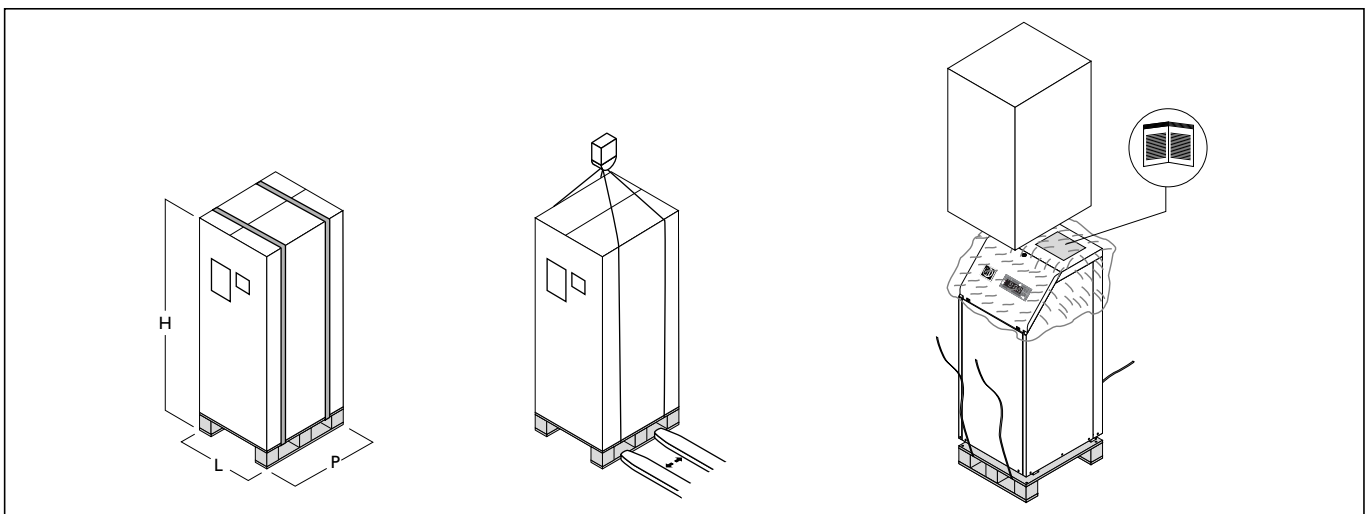
⚠ The installation, user and maintenance manual is an integral part of the unit and should therefore be read and kept carefully.

It is recommended that the packaging should not be removed until the unit is located in the installation site.

During transport, the chiller should be kept in a vertical position

The weight of the chiller is biased towards the compressor side (side of the packaging with the barcode, see the figure at the foot of the page).

⊘ Do not dispose of packaging materials in the environment or leave them within reach of children as they may represent a hazard.



Dimension	0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121	
L	420	420	420	420	420	420	420	650	650	650	650	mm
P	560	560	560	560	560	560	560	730	730	730	730	mm
H	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	mm
Net weight	64	65	68	69	80	81	85	167	169	212	215	kg

The water-cooled evaporator units operate with R407C refrigerant are suitable for indoor installation. The units conform to the essential requisites established in EC directive 89/392.

They are factory tested and on site installation is limited to water, electrical and refrigerant connections, with a maximum distance of 50m between the evaporator unit and the remote condenser.

All testing is performed in the factory.

STRUCTURE

Panels and base are made from galvanised steel plate painted with **epoxy powder** to ensure total resistance to atmospheric agents.

Standard rubber vibration damper kit.

COMPRESSORS

Scroll compressor with sump heater and thermal cut-out.

EVAPORATOR

AISI 316 steel plate exchanger. Externally insulated with closed cell neoprene anti-condensation lagging.

The plate exchanger is complete with frost-protection temperature sensor and **differential pressure switch**.

REFRIGERANT CIRCUIT

The unit features a refrigerant circuit with the following components: gas gate valves with pressure taps, filter, liquid flow gauge, thermostatic expansion valve with external equaliser. Safety pressure switches to control delivery and suction pressure. Unit supplied complete with non-freezing oil and refrigerant charge, **factory tested**.

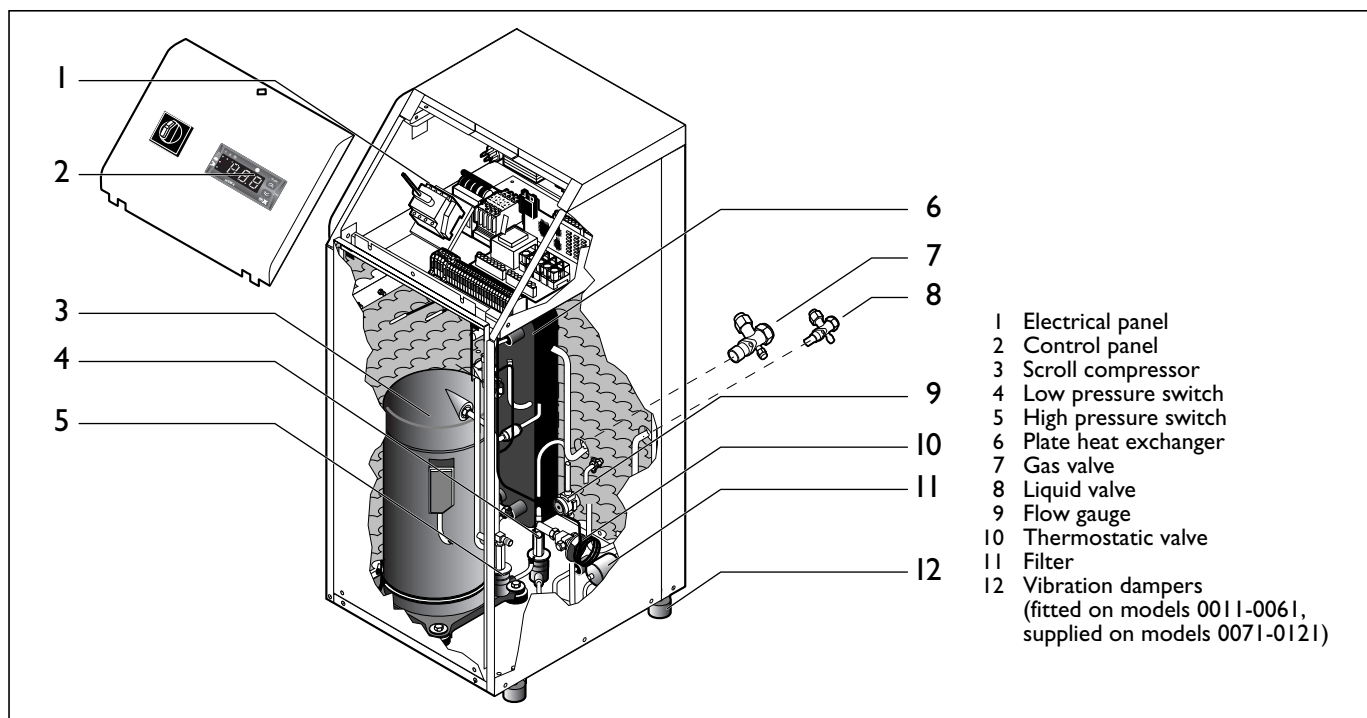
POWER AND CONTROL ELECTRICAL PANEL

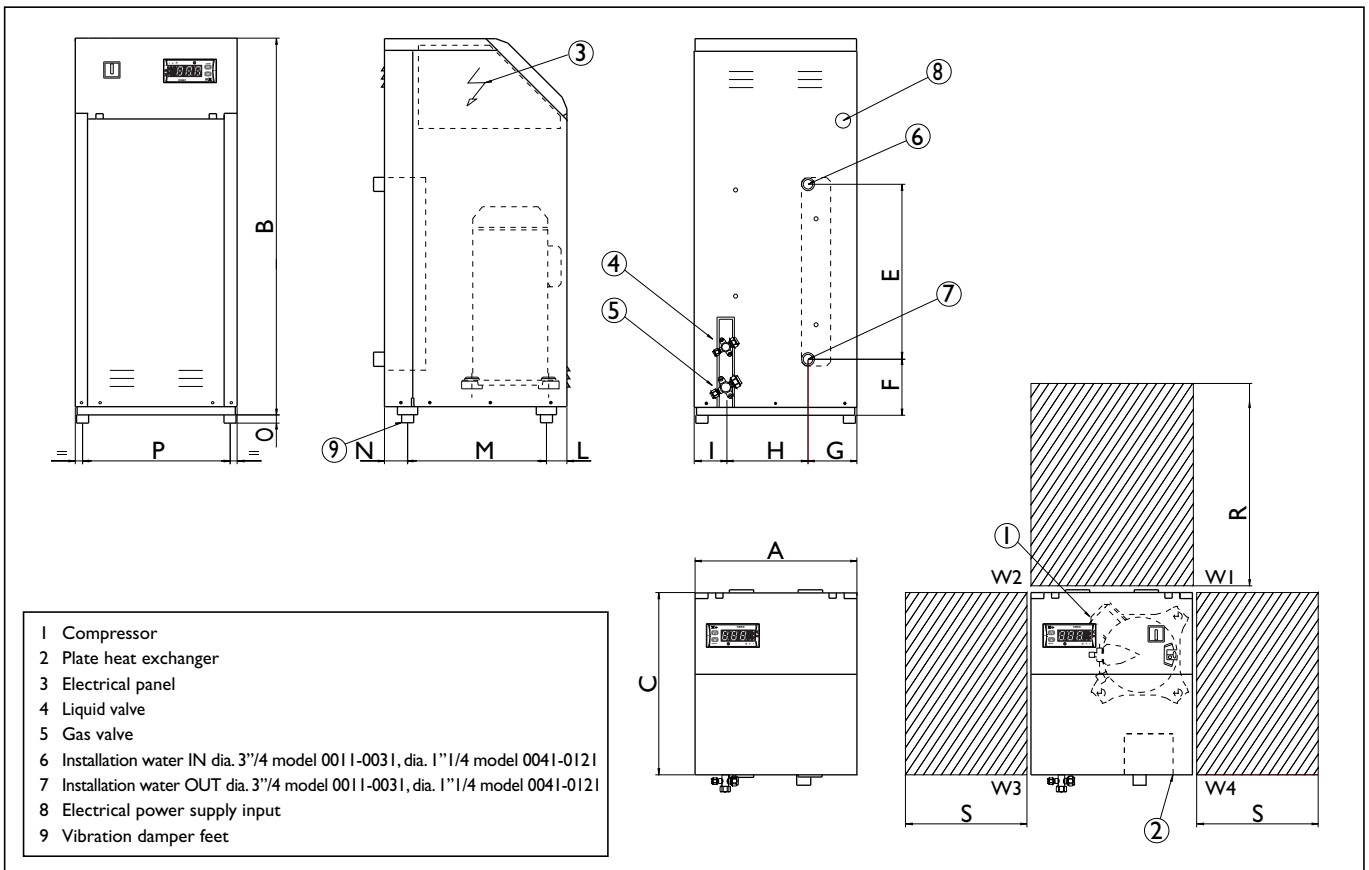
Power and control electrical panel constructed in accordance with IEC 204-1/EN60204-1, complete with compressor contactor, thermal overload switch and **door lock safety device**. **Built-in control and adjustment via "HSW15" control panel.**

OPTIONAL ACCESSORIES

- Remote condenser.
- Removable metal mesh filter.
- Storage tank complete with pump, safety valve, filling assembly, air vent valve, expansion tank, pressure gauge and drain valve.
- Hydronic kit complete with pump, safety valve, filling assembly, air vent valve, expansion tank, pressure gauge and drain cock.
- Pump modulation board kit.
- Remote keyboard kit.
- Serial interface kit.

The above accessories are optional. Consult the relative documentation for assembly instructions and technical data.





Unit connections	0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Liquid connection	3/8"	3/8"	3/8"	3/8"	1/2"	1/2"	1/2"	5/8"	5/8"	3/4"	3/4"
Gas connection	1/2"	1/2"	5/8"	5/8"	3/4"	3/4"	3/4"	7/8"	7/8"	7/8"	7/8"

Dimension	0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
A	400	400	400	400	400	400	400	600	600	600	600
B	930	930	930	930	930	930	930	930	930	930	930
C	450	450	450	450	450	450	450	600	600	600	600
E	432	432	432	432	470	470	470	470	470	470	470
F	138	138	138	138	120	120	120	130	130	130	130
G	120	120	120	120	130	130	130	105	105	105	105
H	200	200	200	200	200	200	200	200	200	200	200
I	80	80	80	80	70	70	70	295	295	295	295
L	50	50	50	50	50	50	50	78	78	78	78
M	343	343	343	343	343	343	343	438	438	438	438
N	57	57	57	57	57	57	57	84	84	84	84
O	20	20	20	20	20	20	20	30	30	30	30
P	364	364	364	364	364	364	364	546	546	546	546
Q	20	20	20	20	20	20	20	30	30	30	30

Functional distances	0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
R	500	500	500	500	500	500	500	500	500	500	500
S	300	300	300	300	300	300	300	300	300	300	300

Weight distribution	0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
W1	20	21	22	22	25	26	27	53	54	56	57
W2	14	14	14	15	18	18	18	36	36	38	38
W3	14	14	14	15	17	17	18	35	36	37	38
W4	20	21	21	22	25	26	27	53	54	56	57
Tot.	68	70	71	74	85	87	90	177	180	187	190

CHOICE OF INSTALLATION SITE

Before installing the unit, agree the site where it will be installed with the customer, taking the following points into consideration:

- check that the fixing points are adequate to support the weight of the unit;
- heed the safety distances between the unit and other equipment or structures.
- The unit must be installed in a space designed to house technical installations dimensioned according to legislation in force in the country concerned and large enough to allow access for maintenance.

POSITIONING

Before handling the unit, check the capacity of the lift equipment used, respecting the instructions on the packaging.

To move the unit in the horizontal, make appropriate use of a fork lift or similar, bearing in mind the weight distribution of the unit. Fix the unit, making sure it is completely level; make sure there is easy access to water, refrigerant and electrical components.

HYDRAULIC CONNECTIONS

The choice and installation of components is the responsibility of the installer who should follow good working practice and current legislation. Construction of a bypass is recommended to enable the pipes to be washed through without having to disconnect the unit (see drain valves).

The connection piping should be supported in such a way as to avoid it weighing on the unit.

The following devices must be installed on the water circuit:

1. Two pressure gauges with a suitable scale (intake and outlet);
2. Two vibration damper joints (intake and outlet);
3. Two shut off valves (normal in intake and calibrating in outlet);
4. **Flow switch (inlet) in the system section of the circuit.**
5. Two thermometers (intake and outlet).
6. **An intake filter must be installed as close as possible to the evaporator and positioned to allow easy access for routine maintenance. 500 micron filter mesh.**

sible to the evaporator and positioned to allow easy access for routine maintenance. 500 micron filter mesh.

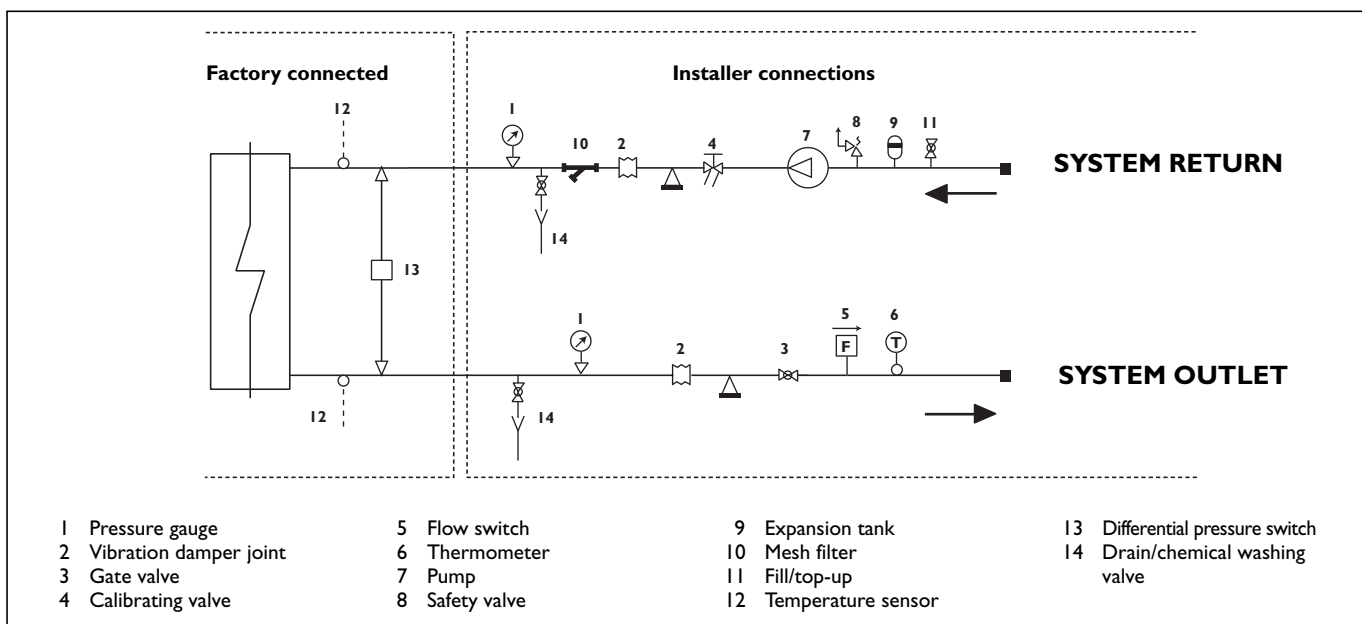
Failure to install the flow switch will mean the heat exchanger is not protected in the event of no flow of liquid. Climaveneta cannot be held liable for any damage to the unit and/or the system following the failure to install these devices or the filter. The correct operation of the components that help ensure the safety of the appliance and the system should be checked regularly.

Specifically, this involves cleaning the filters and checking the operation of the flow switches installed.

Water flow to the chiller unit must conform to the values shown in the section on "General Technical Data".

The flow of water must be maintained constant during operation. The water content of the unit must be such as to avoid disturbing operation of the refrigerant circuits.

Diagram of water connections to the installation circuit



⚠ **The evaporator unit** must be fitted with a fill/top-up system in the return line, and a drain cock in the lowest part of the installation. **Installations containing antifreeze** or covered by specific legislation must be fitted with hydraulic disconnectors.

The manufacturer is not liable for obstruction, breakage or noise resulting from **the failure to install filters** or vibration dampers.

Particular types of water used for filling or topping up must be treated with appropriate treatment systems. Reference values are given in the table below.

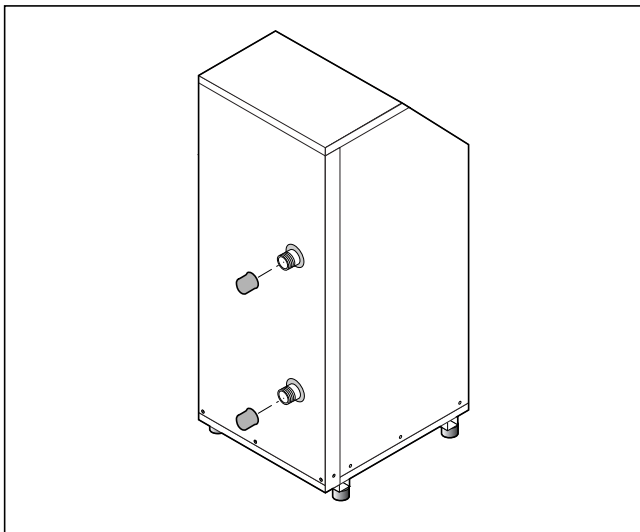
PH	6-8
Electrical conductivity	less than 200 mV/cm (25°C)
Chlorine ions	less than 50 ppm
Sulphuric ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 50 ppm
Sulphur ions	none
Ammonia ions	none
Silicon ions	less than 30 ppm

To connect:

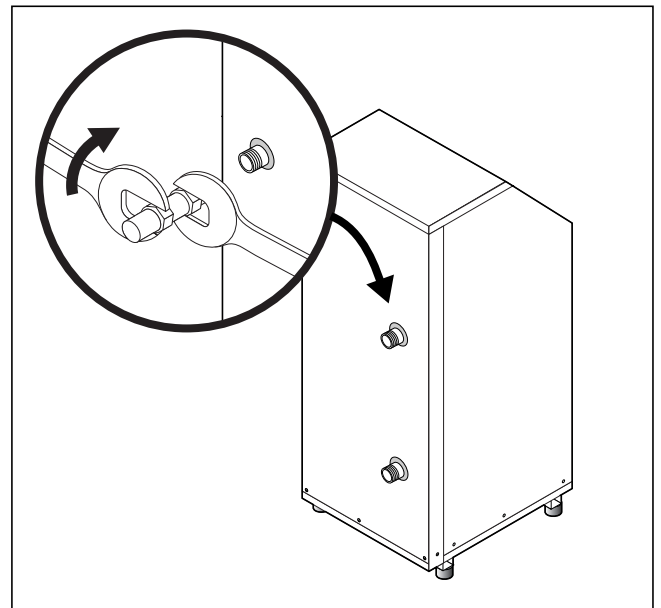
- Remove the plastic protection caps from the water connections

Connect the installation according to the diagram in page 6.

⚠ To seal the threads, it is recommended to use hemp and jointing paste. Teflon should not be used in the presence of anti-freeze fluid.



⚠ Before connecting the pipes, make sure they do not contain stones, sand, rust, dross or other foreign bodies that may damage the installation.



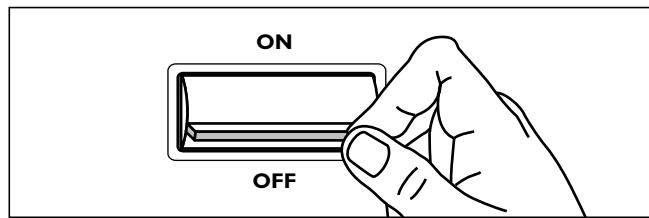
FILLING THE INSTALLATION

- Before starting to fill, place the mains switch in the “off” position
- Make sure the drain cock is closed
- Open all installation and terminal air vent valves
- Open the installation gate valves
- Begin filling by slowly opening the water filling cock outside the appliance.
- When water starts leaking from the terminal air vent valves, close them and continue filling until the pressure specified for the installation is reached.

EMPTYING THE INSTALLATION

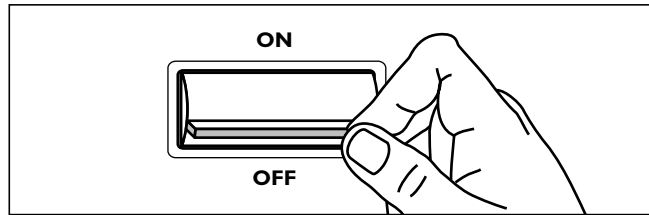
- Before emptying, place the mains switch in the “off” position
- Make sure the installation fill/top-up water cock is closed.
- Open the drain cock outside the unit and all the installation and terminal air vent valves.

⚠ If the fluid in the circuit contains anti-freeze, it should not be allowed to drain freely as it is pollutant. It should be collected for possible reuse.



⚠ Check the junctions for water tightness.

⚠ It is recommended that this operation be repeated after the unit has been operating for a number of hours. The pressure of the installation should be checked regularly. Top-up with the unit off (pump off).



POWER CONNECTIONS



The evaporators leave the factory fully wired. Installation is limited to connection to the mains electrical supply and connection of the flow switch, remote (ON/OFF) switch and pump to the terminals provided.

For all electrical work, refer to the electrical wiring diagrams in this manual.

You are also recommended to check that:

- The characteristics of the mains electrical supply is adequate for the power values given in the following electrical characteristics table, bearing in mind the possibility of other equipment operating at the same time

⚠ **Power to the unit** should be turned on only when installation has been completed (water, electrical and refrigeration connections).

Respect instructions for connecting phase, neutral and earth conductors.

Voltage must be within a tolerance of $\pm 10\%$ of the rated power supply voltage for the unit (for three phase units, the unbalance between the phases must not exceed 3%).

If this is not the case, contact the electricity supply company.

For electrical connections, use double insulation cable in conformity with current legislation in the country concerned.

Install, if possible near the unit, an appropriate protection device to isolate the unit from the mains supply. This should have a delayed characteristic curve, contacts opening by at least 3 mm and an adequate interruption and differential protection capacity.

If this device is not visible from the unit, it should be lockable.

An efficient earth connection is obligatory. Failure to earth the appliance absolves the manufacturer of all liability for damage.

In the case of three-phase units, make sure the phases are connected correctly, respecting the cyclical sequence of the phases.

⚠ **Do not use** water pipes to earth the unit.

ELECTRICAL DATA

Size	Power supply (V-Ph-Hz)	Rated values (1)					Glass fuses 5x20mm 250V			
		Compressor			Max values (2)		FU1	FU2	FU3	FU6
		F.L.I. (kW)	F.L.A. (A)	L.R.A. (A)	F.L.I. (kW)	F.L.A. (A)				
0011	230/1/50	1,65	7,67	47,0	2,36	11,40	1A	1A	1,6A	1,25A
0021	230/1/50	2,11	9,81	61,0	3,06	14,80	1A	1A	1,6A	1,25A
0025	230/1/50	2,5	11,62	76,0	3,58	17,30	1A	1A	1,6A	1,25A
0031	230/1/50	2,94	13,66	100,0	4,78	23,10	1A	1A	1,6A	1,25A
0021	400/3/50+N	2,07	3,77	40,0	2,82	5,10	1A	1A	1,6A	1,25A
0025	400/3/50+N	2,45	4,56	40,0	3,43	6,20	1A	1A	1,6A	1,25A
0031	400/3/50+N	2,86	5,22	46,0	3,88	7,00	1A	1A	1,6A	1,25A
0041	400/3/50+N	3,43	6,23	50,0	5,54	10,00	1A	1A	6,3A	2A
0051	400/3/50+N	4,21	7,98	66,0	6,86	12,40	1A	1A	6,3A	2A
0061	400/3/50+N	4,88	8,65	74,0	7,47	13,50	1A	1A	6,3A	2A
0071	400/3/50+N	6,31	12,04	101,0	8,36	15,10	1A	1A	6,3A	4A
0091	400/3/50+N	7,77	14,13	123,0	9,96	18,00	1A	1A	6,3A	4A
0101	400/3/50+N	8,93	16,23	127,0	11,48	20,70	1A	1A	6,3A	4A
0121	400/3/50+N	10,93	18,92	167,0	14,17	25,60	1A	1A	6,3A	4A

F.L.I. power input

F.L.A. current input

L.R.A. compressor start-up current

(1) installation water IN/OUT 12/7°C - well water IN/OUT 14/30°C

(2) use these values when dimensioning protection switches and power cables.

* rating of the pump protection fuse fitted as standard in the electrical panel. Take care when connecting the unit to the storage kit or hydronic kit

Bringing electrical power cables into the unit and external connections

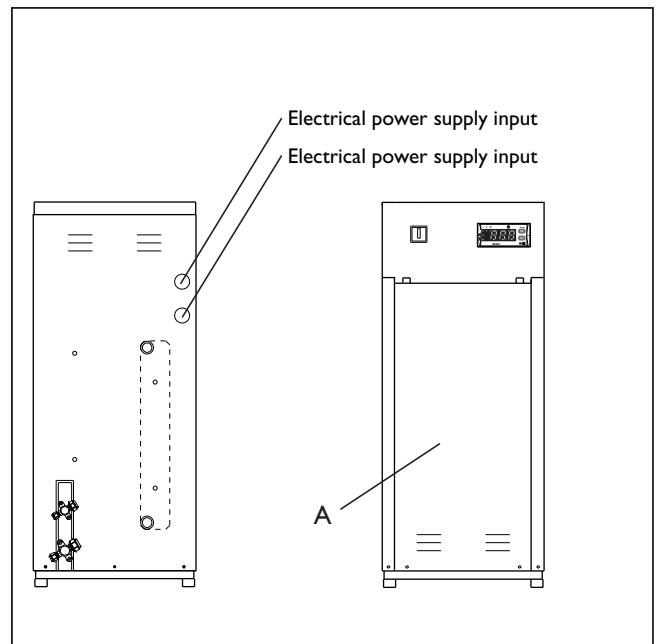
The unit is provided with cable grips for bringing electrical power cables and other external connections into the appliance. Thread the wires from outside, guiding them in the direction of the electrical panel.

⚠ The cable grips are positioned near the compressor and fastened by a clamp.

Remove the clamp and fasten them to the structure after having removed the panel A.

Electrical cables may enter the appliance **ONLY** in the positions specifically described in this manual.

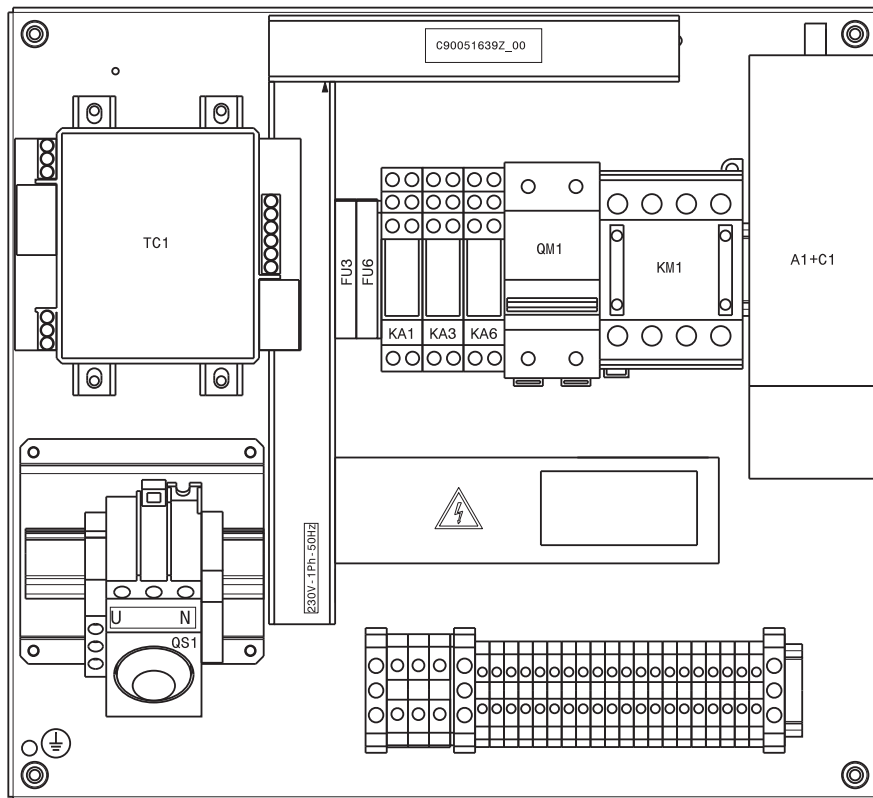
⚡ Avoid direct contact with non-insulated copper piping and the compressor.



The condensing units come complete with an electrical panel consisting of the following components:

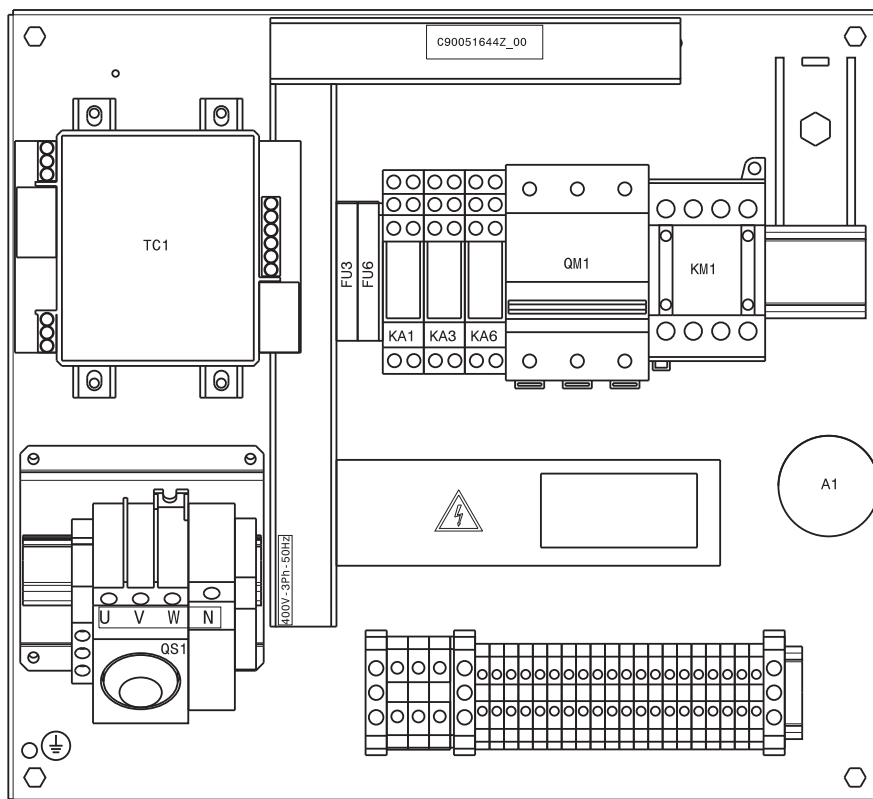
HE 0011 ÷ 0031 FF SINGLE-PHASE

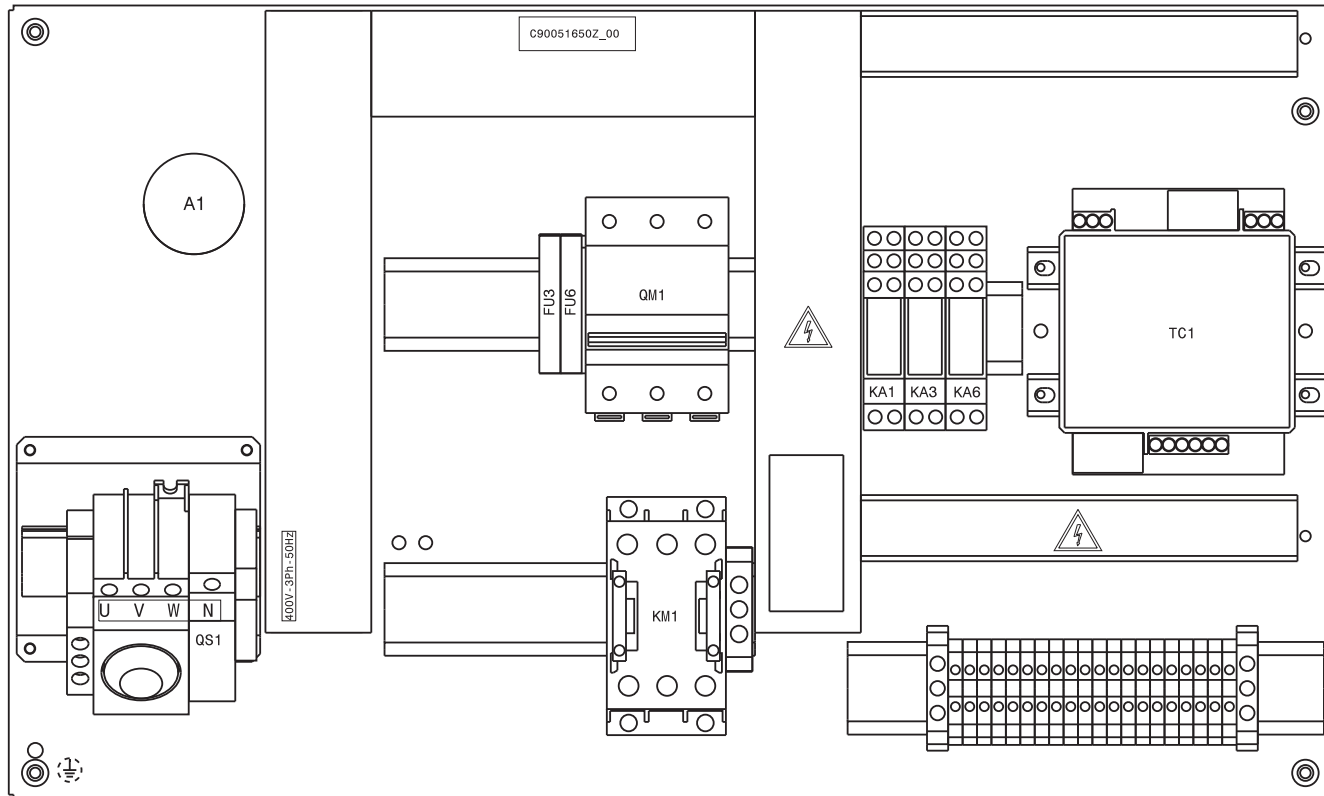
- A1 Radio interference suppresser
- C1 Compressor start capacitor
- FU3 System water pump protection fuse
- FU6 Fan protection fuse
- KA1 High pressure switch relay
- KA3 Alarm relay
- KA6 Installation water pump control relay
- KM1 Compressor contactor
- QM1 Compressor thermal overload switch
- QS1 Door lock disconnect switch
- TC1 230/24/12 VAC transformer



HE 0021 ÷ 0061 FF THREE-PHASE

- A1 Radio interference suppresser
- FU3 System water pump protection fuse
- FU6 Fan protection fuse
- KA1 High pressure switch relay
- KA3 Alarm relay
- KA6 Installation water pump control relay
- KM1 Compressor contactor
- QM1 Compressor thermal overload switch
- QS1 Door lock disconnect switch
- TC1 230/24/12 VAC transformer



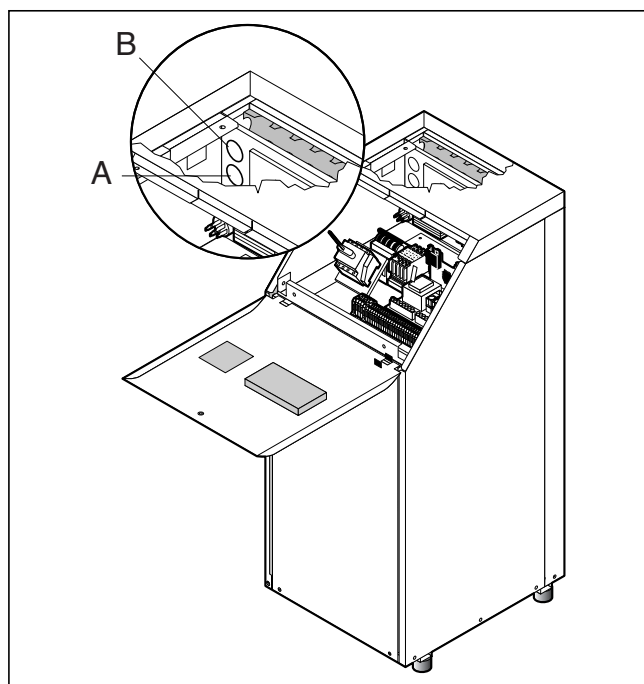
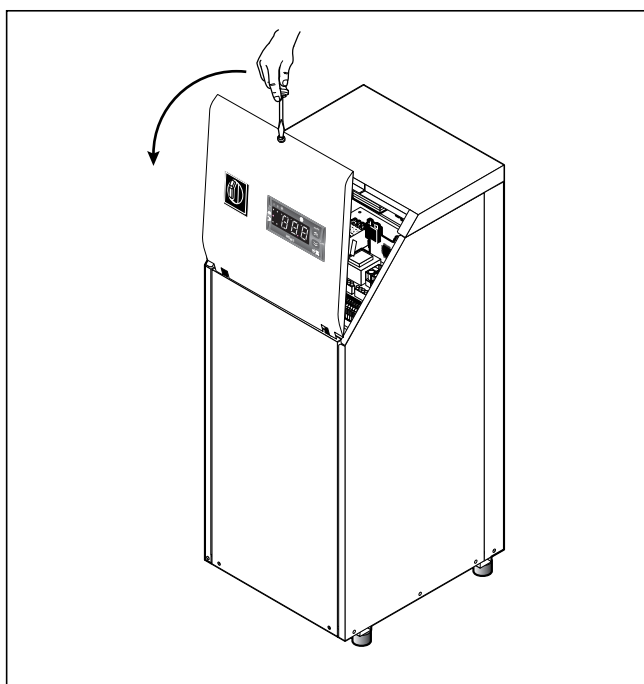


- A1 Radio interference suppresser
- FU3 System water pump protection fuse
- FU6 Fan protection fuse
- KA1 High pressure switch relay
- KA3 Alarm relay

- KA6 Installation water pump control relay
- KM1 Compressor contactor
- QM1 Compressor thermal overload switch
- QS1 Door lock disconnect switch
- TC1 230/24/12 VAC transformer

To connect the unit electrically:

- Open the door of the electrical panel, as shown in the figure.
- Use cable grip **A** for the main electrical power cable and cable grip **B** for other external connection cables.
- Remove the protective cover from the main switch.



POWER CONNECTIONS

For the functional connection of the unit, bring the power supply cable to the electrical panel inside the unit and connect it to terminals U-N and PE, respecting the (U) phase, (N) neutral and (PE) earth in the case of single phase units or U-V-W phases, N neutral and PE earth in three phase units (400V-3N~ 50Hz).

AUXILIARY CONNECTIONS

All terminals referred to in the explanations below are to be found on the terminal block inside the electrical panel and described as "installer terminals".

REMOTE ON/OFF

To use a remote on/off device, an external contactor must be connected to installer terminals I4 and I5, setting parameter CL42 to -I (CL42=-I).

For timed operation, connect a daily or weekly timer between terminals I4 and I5.

REMOTE ALARM

For remote display of unit shut-down, an audible or visual alarm warning device can be connected between terminals I0 and I1.

Connect the phase to terminal I0 and the alarm signal device between terminal I1 and the neutral (max load applicable 500mA at 24V).

REMOTE KEYPAD KIT

The remote keypad kit can be used to display all unit functions and access the parameters of the electronic board from a point located at some distance from the unit itself. It consists of a remote control module.

To install the kit, proceed as follows:

- access the unit's electrical panel after having disconnected the power supply (using the door lock disconnect switch QSI);
- connect the remote control module with 3 wires to terminals 22, 23 and 24 on the installer terminal block:
- terminal 22 connected to the GND terminal on the module;
- terminal 23 connected to the Signal terminal on the module;
- terminal 24 connected to the +12V terminal on the module;

FLOW SWITCH CONNECTION

The system flow switch must be connected to terminals I8 and I9.

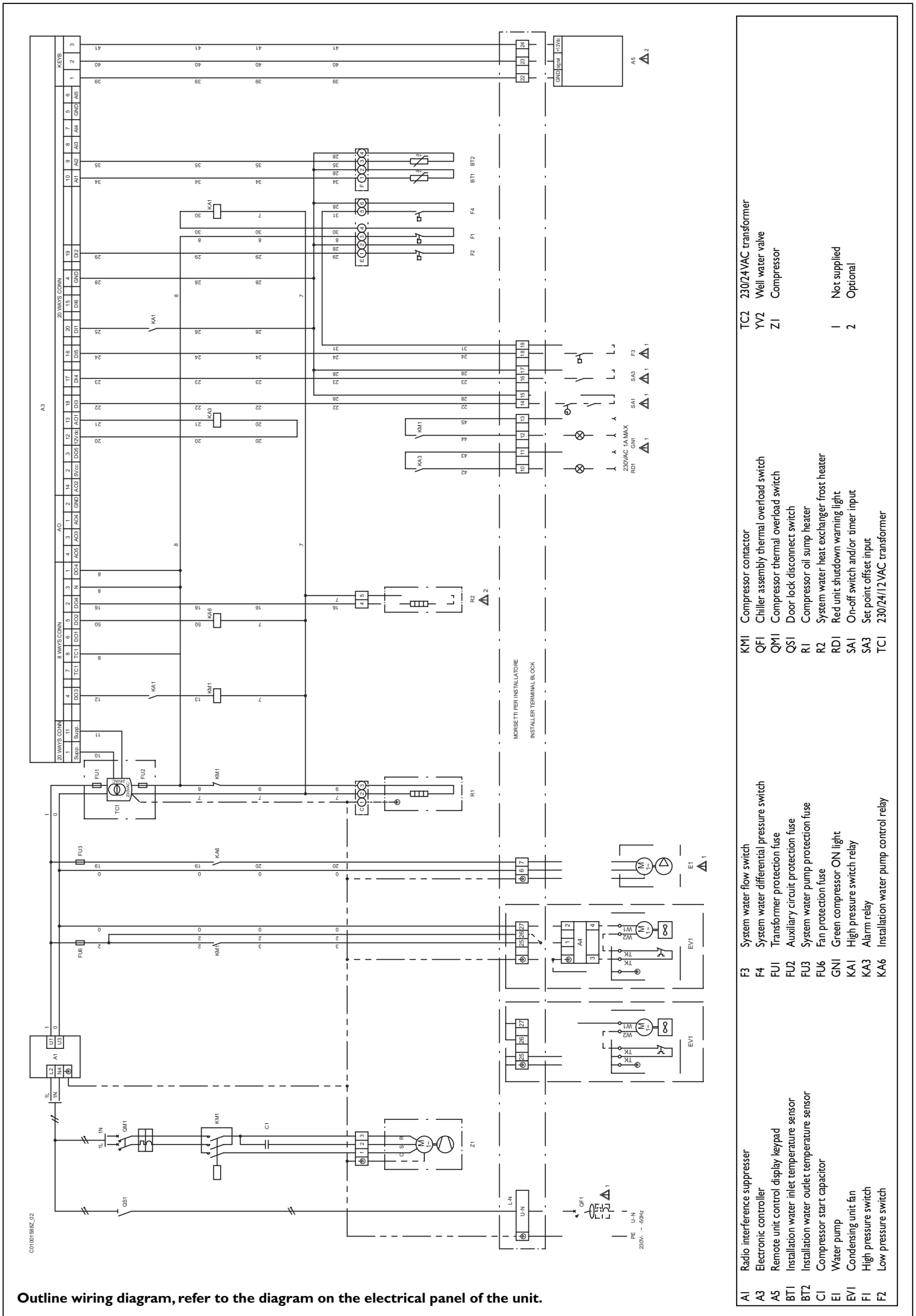
If this is not connected, the unit will not be able to operate and the controller will display alarm code ER20 (see "Displaying alarms").

DIGITAL INPUT FOR THE ECONOMY FUNCTION

To enable the ECONOMY function connect an external contactor to installer terminals I6 and I7, and set the following parameters

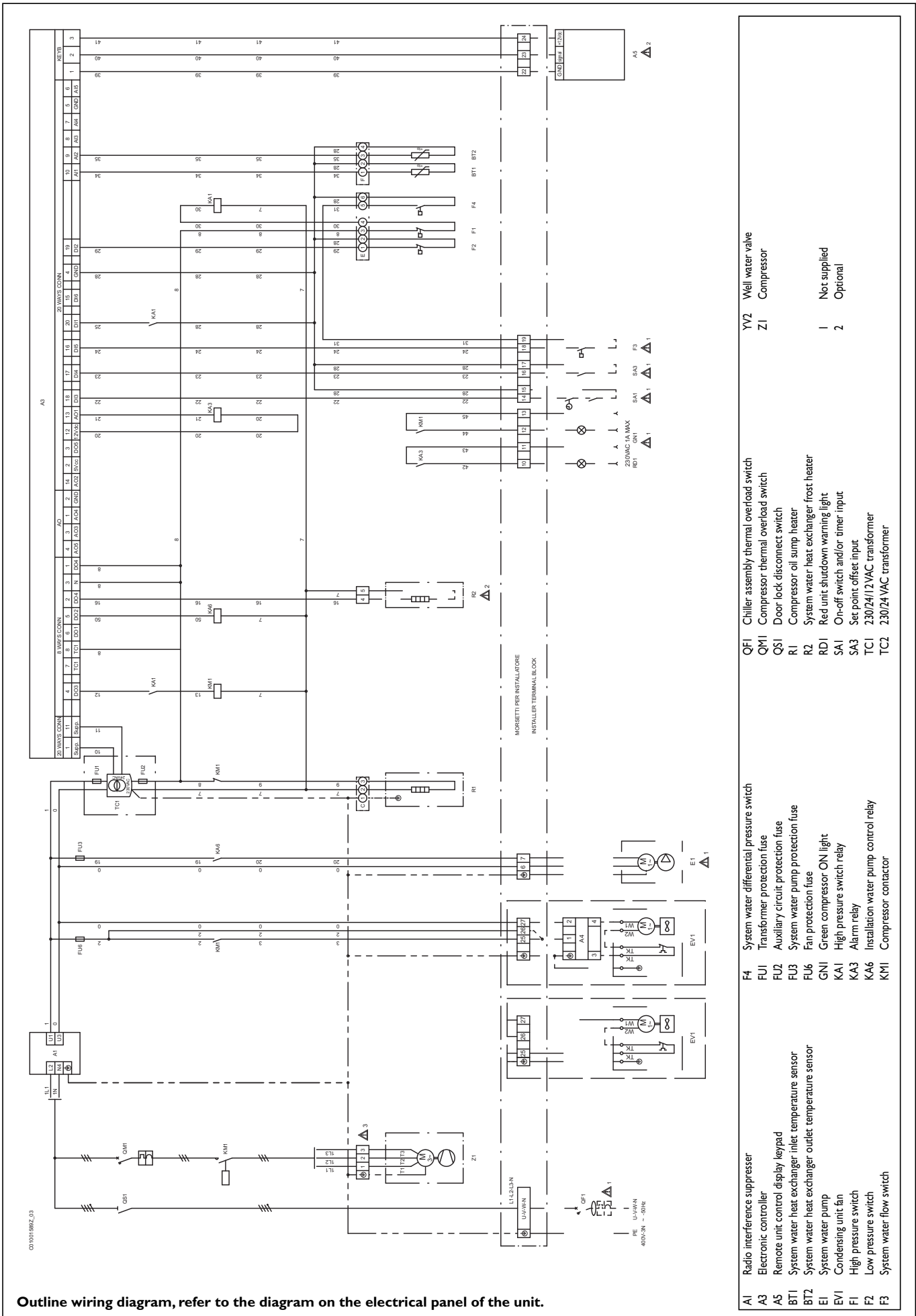
- CL43 to 22
- Tr I5 to the desired offset in COOL mode
- Tr25 to the desired offset in HEAT mode

SINGLE PHASE ELECTRICAL WIRING DIAGRAM 001 | ÷ 003 | FF



A1	Radio interference suppressor	F3	System water flow switch	KM1	Compressor contactor	TC2	230/24VAC transformer
A3	Electronic controller	F4	System water differential pressure switch	QF1	Chiller assembly thermal overload switch	YV2	Well water valve
A5	Remote unit control display keypad	FU1	Transformer protection fuse	QM1	Compressor thermal overload switch	Z1	Compressor
BT1	Installation water inlet temperature sensor	FU2	Auxiliary circuit protection fuse	QS1	Door lock disconnect switch		
BT2	Installation water outlet temperature sensor	FU3	System water pump protection fuse	R1	Compressor oil sump heater		
C1	Compressor start capacitor	FU6	Fan protection fuse	R2	System water heat exchanger frost heater		
E1	Water pump	GNI	Green compressor ON light	RD1	Red unit shutdown warning light	1	Not supplied
EVI	Condensing unit fan	KA1	High pressure switch relay	SA1	On-off switch and/or timer input	2	Optional
F1	High pressure switch	KA3	Alarm relay	SA3	Set point offset input		
F2	Low pressure switch	KA6	Installation water pump control relay	TC1	230/24/12VAC transformer		

THREE PHASE ELECTRICAL WIRING DIAGRAM 0011 ÷ 0121 FF



Outline wiring diagram, refer to the diagram on the electrical panel of the unit.

EQUIVALENT CORRESPONDING LENGTH, 90° CURVE AND COMPLETE SIPHON

Pipe diameter	Øi / Øe	8/10	10/12	14/16	16/18	20/22	26/28	33/35	39/42
90° curve	m eq.	0,40	0,42	0,48	0,50	0,60	0,80	1,00	1,20
Siphon	m eq.	1,60	1,68	1,92	2,00	2,40	3,20	4,00	4,80

DIMENSIONING REFRIGERANT PIPES IN RELATION TO EQUIVALENT LENGTH

Model		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Type of pipe	0-10 m eq.											
Discharge	Ø mm	12	12	16	16	18	18	18	22	22	22	22
Liquid	Ø mm	10	10	10	10	12	12	12	16	16	18	18
Type of pipe	10-20 m eq.											
Discharge	Ø mm	16	16	16	16	18	18	18	22	22	28	28
Liquid	Ø mm	10	10	10	10	12	12	12	16	16	18	18
Type of pipe	20-30 m eq.											
Discharge	Ø mm	-	-	16	16	18	22	22	28	28	28	28
Liquid	Ø mm	-	-	12	12	12	12	16	16	16	18	18
Type of pipe	30-40 m eq.											
Discharge	Ø mm	-	-	-	18	22	22	22	28	28	28	28
Liquid	Ø mm	-	-	-	12	12	16	16	16	16	18	18
Type of pipe	40-50 m eq.											
Discharge	Ø mm	-	-	-	-	22	22	22	28	28	35	35
Liquid	Ø mm	-	-	-	-	16	16	16	16	16	18	18

R407C CONTENT PER LINEAR METRE OF PIPE

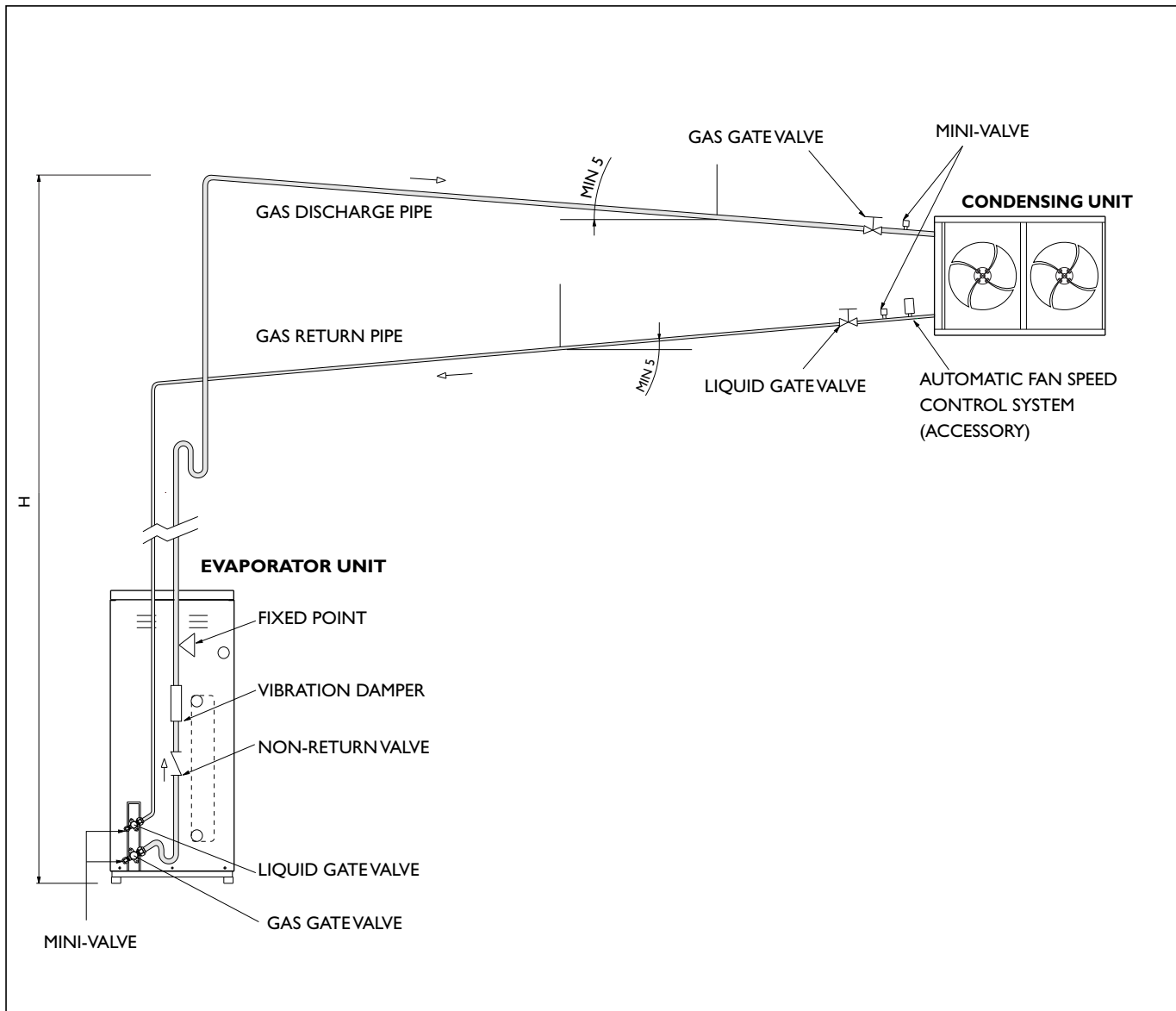
Pipe diameter		10	12	16	18	22	28	35	42
Type of pipe									
Discharge	gr/m	-	19	33	43,5	70	115	-	-
Liquid	gr/m	63	96	170	222	347	-	-	-

NB: Important - when gas is added, lubricating oil must also be added in a proportion of 10% weight.

IMPORTANT WARNINGS

Before proceeding with installation, observe the following warnings scrupulously:

- use copper pipes for refrigerant use;
- before installing the remote condenser, read the corresponding installation instructions;
- when installing piping, refer to the diagram;
- respect the pipe diameters indicated in the table below in relation to the distance between the evaporator unit and the remote condenser (the maximum distances indicated are in equivalent metres. When calculating pipe lengths, pressure drops must therefore be subtracted);
- if there is a difference in level above or in multiples of 6m, install a siphon in the gas pipe between the evaporator unit and remote condenser;
- follow good working practice when connecting the two units (tight joints, clean piping, efficient venting and verification of circuit tightness);
- electrically connect the remote condenser fan in accordance with current legislation;
- guarantee: the guarantee is invalidated if the above instructions are not respected and if the unit is started up for the first time without the presence of personnel authorised by the Company (where specified in the supply contract) who should draw up a "start-up report".



Size		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Rated cooling capacity (1)	kW	4,7	6,1	7,0	8,2	10,5	12,5	15,0	19,1	22,2	26,8	32,4
Max. total power input (1)	kW	2,1	2,6	3,1	3,5	4,6	5,8	7,6	8,1	10,3	11,1	13,3
Max. total current input (1)	A	11,1	14,1	16,5	19,0	8,4	10,5	13,5	15,3	18,6	20,0	23,7
Evaporator water flow (1)	m ³ /h	0,9	1,1	1,3	1,5	1,9	2,3	2,8	3,4	4,1	4,8	5,9
Evaporator pressure drop (1)	kPa	22	24	26	27	19	20	20	23	22	23	23
Type of evaporator Plate		Piastre	Piastre	Piastre	Piastre	Piastre	Piastre	Piastre	Piastre	Piastre	Piastre	Piastre
Compressor type Scroll		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Number of compressors	N°	1	1	1	1	1	1	1	1	1	1	1
Number of circuits	N°	1	1	1	1	1	1	1	1	1	1	1
Capacity steps	N°	1	1	1	1	1	1	1	1	1	1	1
Refrigerant R407C (models HE)	Kg	0,55	0,57	0,67	0,75	1,10	1,20	1,40	1,55	1,80	2,20	2,60
Oil Mobil EAL Arctic 22 cc *	kg	1,00	1,00	1,10	1,10	1,00	1,10	1,10	2,00	2,00	1,65	4,00
Maximum allowable pressure PS (3)	H	22,5	22,5	22,5	22,5	22,5	22,5	22,5	22,5	22,5	22,5	22,5
	L	28,0	28,0	28,0	28,0	28,0	28,0	28,0	28,0	28,0	28,0	28,0
Unit operating weight	Kg	68	70	71	74	85	87	90	177	180	187	190
Dimension (A)	mm	400	400	400	400	400	400	400	600	600	600	600
Dimension (B)	mm	930	930	930	930	930	930	930	930	930	930	930
Dimension (C)	mm	450	450	450	450	450	450	450	600	600	600	600
Hydraulic connections in/out	Gas	3/4"	3/4"	3/4"	3/4"	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4
Sound pressure level (2)	dB(A)	43	43	48	48	52	52	52	52	52	53	53

(1) installation water IN/OUT 12/7°C - outside air 35°C

(2) measurement at 1m in open field

Size	0011							Size	0021							Size	0025							Size
	Ta	Tw	5	6	7	8	9		10	Ta	Tw	5	6	7	8		9	10	Ta	Tw	5	6	7	
40	Pf	4,9	5,1	5,2	5,4	5,5	5,7	40	Pf	6,3	6,5	6,7	6,9	7,1	7,3	40	Pf	7,3	7,5	7,8	8,0	8,2	8,5	
	Pa	1,3	1,3	1,3	1,3	1,3	1,3		Pa	1,6	1,6	1,6	1,6	1,6	1,6		Pa	1,8	1,8	1,8	1,8	1,8	1,8	
	Qev	0,8	0,9	0,9	0,9	1,0	1,0		Qev	1,1	1,1	1,2	1,2	1,2	1,3		Qev	1,3	1,3	1,3	1,4	1,4	1,5	
	ΔPev	20,6	22,0	23,4	24,9	26,5	28,1		ΔPev	25,4	27,1	28,9	30,7	32,7	34,7		ΔPev	27,1	28,9	30,8	32,7	34,8	36,9	
45	Pf	4,7	4,8	5,0	5,1	5,3	5,5	45	Pf	6,0	6,2	6,4	6,6	6,8	7,0	45	Pf	7,0	7,2	7,4	7,7	7,9	8,1	
	Pa	1,4	1,4	1,4	1,4	1,4	1,4		Pa	1,8	1,8	1,8	1,8	1,8	1,8		Pa	2,0	2,0	2,0	2,0	2,0	2,0	
	Qev	0,8	0,8	0,9	0,9	0,9	0,9		Qev	1,0	1,1	1,1	1,1	1,2	1,2		Qev	1,2	1,2	1,3	1,3	1,4	1,4	
	ΔPev	18,8	20,1	21,4	22,8	24,3	25,8		ΔPev	23,3	24,9	26,5	28,2	30,0	31,9		ΔPev	24,7	26,4	28,2	30,0	31,9	33,8	
50	Pf	4,4	4,6	4,7	4,9	5,1	5,2	50	Pf	5,7	5,9	6,1	6,3	6,5	6,7	50	Pf	6,6	6,8	7,1	7,3	7,5	7,8	
	Pa	1,6	1,6	1,6	1,6	1,6	1,6		Pa	2,0	2,0	2,0	2,0	2,0	2,0		Pa	2,2	2,2	2,2	2,2	2,2	2,2	
	Qev	0,8	0,8	0,8	0,8	0,9	0,9		Qev	1,0	1,0	1,1	1,1	1,1	1,2		Qev	1,1	1,2	1,2	1,3	1,3	1,3	
	ΔPev	17,0	18,2	19,4	20,7	22,1	23,5		ΔPev	21,2	22,6	24,2	25,8	27,4	29,2		ΔPev	22,4	23,9	25,5	27,2	29,0	30,8	

Size	0031							Size	0041							Size	0051							Size
	Ta	Tw	5	6	7	8	9		10	Ta	Tw	5	6	7	8		9	10	Ta	Tw	5	6	7	
40	Pf	8,6	8,9	9,2	9,5	9,7	10,0	40	Pf	10,7	11,1	11,4	11,8	12,1	12,5	40	Pf	13,2	13,6	14,1	14,5	14,9	15,4	
	Pa	2,0	2,0	2,0	2,0	2,0	2,0		Pa	2,7	2,7	2,7	2,7	2,7	2,7		Pa	3,3	3,3	3,3	3,3	3,3	3,3	
	Qev	1,5	1,5	1,6	1,6	1,7	1,7		Qev	1,8	1,9	2,0	2,0	2,1	2,1		Qev	2,3	2,3	2,4	2,5	2,6	2,6	
	ΔPev	30,9	32,9	35,0	37,3	39,6	42,0		ΔPev	16,7	17,8	18,9	20,1	21,3	22,6		ΔPev	19,0	20,3	21,6	22,9	24,3	25,8	
45	Pf	8,2	8,5	8,8	9,0	9,3	9,6	45	Pf	10,2	10,6	10,9	11,3	11,6	12,0	45	Pf	12,6	13,0	13,4	13,9	14,3	14,7	
	Pa	2,3	2,3	2,3	2,3	2,3	2,3		Pa	3,0	3,0	3,0	3,0	3,0	3,0		Pa	3,6	3,6	3,7	3,7	3,7	3,7	
	Qev	1,4	1,5	1,5	1,6	1,6	1,7		Qev	1,8	1,8	1,9	1,9	2,0	2,1		Qev	2,2	2,2	2,3	2,4	2,5	2,5	
	ΔPev	28,2	30,1	32,1	34,2	36,3	38,6		ΔPev	15,2	16,2	17,3	18,4	19,6	20,8		ΔPev	17,3	18,5	19,7	21,0	22,3	23,7	
50	Pf	7,8	8,1	8,4	8,6	8,9	9,2	50	Pf	9,7	10,0	10,3	10,7	11,0	11,4	50	Pf	11,9	12,3	12,7	13,2	13,6	14,0	
	Pa	2,6	2,6	2,6	2,6	2,6	2,6		Pa	3,3	3,3	3,3	3,3	3,3	3,3		Pa	4,0	4,0	4,0	4,0	4,0	4,1	
	Qev	1,3	1,4	1,4	1,5	1,5	1,6		Qev	1,7	1,7	1,8	1,8	1,9	2,0		Qev	2,1	2,1	2,2	2,3	2,3	2,4	
	ΔPev	25,5	27,3	29,1	31,0	33,0	35,1		ΔPev	13,6	14,5	15,5	16,6	17,7	18,8		ΔPev	15,5	16,6	17,7	18,9	20,1	21,4	

Size		006I						Size		007I						Size		009I						Size									
Ta	Tw	5	6	7	8	9	10	Ta	Tw	5	6	7	8	9	10	Ta	Tw	5	6	7	8	9	10	Ta	Tw	5	6	7	8	9	10		
40	Pf	15,8	16,3	16,8	17,3	17,8	18,3	40	Pf	19,5	20,2	20,8	21,5	22,1	22,8	40	Pf	23,4	24,2	25,0	25,8	26,6	27,4	40	Pf	23,4	24,2	25,0	25,8	26,6	27,4		
	Pa	3,9	3,9	3,9	3,9	3,9	3,9		Pa	4,8	4,8	4,8	4,8	4,8	4,8		Pa	5,7	5,6	5,6	5,6	5,6	5,6		5,6	Pa	5,7	5,6	5,6	5,6	5,6	5,6	5,6
	Qev	2,7	2,8	2,9	3,0	3,1	3,2		Qev	3,4	3,5	3,6	3,7	3,8	3,9		Qev	4,0	4,2	4,3	4,4	4,4	4,6		4,7	Qev	4,0	4,2	4,3	4,4	4,6	4,7	
	ΔPev	21,1	22,5	23,9	25,4	26,9	28,4		ΔPev	23,0	24,5	26,2	27,8	29,6	31,4		ΔPev	25,6	27,4	29,2	31,0	33,0	35,0		ΔPev	25,6	27,4	29,2	31,0	33,0	35,0		
45	Pf	15,1	15,6	16,1	16,6	17,1	17,5	45	Pf	18,7	19,3	19,9	20,5	21,2	21,8	45	Pf	22,4	23,1	23,9	24,7	25,4	26,2	45	Pf	22,4	23,1	23,9	24,7	25,4	26,2		
	Pa	4,3	4,3	4,3	4,3	4,3	4,3		Pa	5,4	5,4	5,4	5,4	5,4	5,3		Pa	6,4	6,3	6,3	6,3	6,3	6,3		6,3	Pa	6,4	6,3	6,3	6,3	6,3	6,3	
	Qev	2,6	2,7	2,8	2,9	2,9	3,0		Qev	3,2	3,3	3,4	3,5	3,6	3,8		Qev	3,9	4,0	4,1	4,2	4,4	4,5		Qev	3,9	4,0	4,1	4,2	4,4	4,5		
	ΔPev	19,3	20,6	21,9	23,3	24,7	26,1		ΔPev	21,0	22,4	23,9	25,5	27,1	28,8		ΔPev	23,4	25,0	26,7	28,4	30,2	32,1		ΔPev	23,4	25,0	26,7	28,4	30,2	32,1		
50	Pf	14,4	14,8	15,3	15,8	16,2	16,7	50	Pf	17,7	18,3	19,0	19,6	20,2	20,8	50	Pf	21,3	22,0	22,8	23,5	24,2	25,0	50	Pf	21,3	22,0	22,8	23,5	24,2	25,0		
	Pa	4,8	4,8	4,8	4,8	4,8	4,8		Pa	6,0	6,0	6,0	6,0	6,0	6,0		Pa	7,1	7,1	7,1	7,1	7,1	7,1		Pa	7,1	7,1	7,1	7,1	7,1	7,1		
	Qev	2,5	2,6	2,6	2,7	2,8	2,9		Qev	3,1	3,2	3,3	3,4	3,5	3,6		Qev	3,7	3,8	3,9	4,0	4,2	4,3		Qev	3,7	3,8	3,9	4,0	4,2	4,3		
	ΔPev	17,4	18,6	19,9	21,1	22,3	23,6		ΔPev	19,0	20,3	21,7	23,2	24,7	26,3		ΔPev	21,2	22,7	24,2	25,8	27,5	29,3		ΔPev	21,2	22,7	24,2	25,8	27,5	29,3		

Size		010I						Size		012I						Size							
Ta	Tw	5	6	7	8	9	10	Ta	Tw	5	6	7	8	9	10	Ta	Tw						
40	Pf	27,1	28,0	28,9	29,8	30,7	31,7	40	Pf	33,8	35,0	36,1	37,2	38,4	39,5	40	Pf	33,8	35,0	36,1	37,2	38,4	39,5
	Pa	6,5	6,5	6,5	6,5	6,4	6,4		Pa	8,1	8,1	8,1	8,1	8,0	8,0		Pa	8,1	8,1	8,1	8,1	8,0	8,0
	Qev	4,7	4,8	5,0	5,1	5,3	5,5		Qev	5,8	6,0	6,2	6,4	6,6	6,8		Qev	5,8	6,0	6,2	6,4	6,6	6,8
	ΔPev	26,7	28,5	30,3	32,3	34,3	36,4		ΔPev	29,5	31,5	33,5	35,7	37,9	40,3		ΔPev	29,5	31,5	33,5	35,7	37,9	40,3
45	Pf	25,9	26,8	27,7	28,5	29,4	30,3	45	Pf	32,3	33,4	34,5	35,6	36,7	37,9	45	Pf	32,3	33,4	34,5	35,6	36,7	37,9
	Pa	7,3	7,3	7,3	7,3	7,2	7,2		Pa	9,1	9,1	9,1	9,1	9,0	9,0		Pa	9,1	9,1	9,1	9,1	9,0	9,0
	Qev	4,5	4,6	4,8	4,9	5,1	5,2		Qev	5,6	5,8	5,9	6,1	6,3	6,5		Qev	5,6	5,8	5,9	6,1	6,3	6,5
	ΔPev	24,4	26,0	27,8	29,6	31,5	33,5		ΔPev	26,9	28,8	30,7	32,7	34,8	37,0		ΔPev	26,9	28,8	30,7	32,7	34,8	37,0
50	Pf	24,7	25,5	26,4	27,2	28,1	29,0	50	Pf	30,8	31,8	32,9	34,0	35,0	36,1	50	Pf	30,8	31,8	32,9	34,0	35,0	36,1
	Pa	8,2	8,2	8,2	8,1	8,1	8,1		Pa	10,2	10,2	10,2	10,2	10,2	10,1		Pa	10,2	10,2	10,2	10,2	10,2	10,1
	Qev	4,2	4,4	4,5	4,7	4,8	5,0		Qev	5,3	5,5	5,7	5,8	6,0	6,2		Qev	5,3	5,5	5,7	5,8	6,0	6,2
	ΔPev	22,0	23,6	25,2	26,9	28,6	30,5		ΔPev	24,4	26,1	27,9	29,7	31,7	33,7		ΔPev	24,4	26,1	27,9	29,7	31,7	33,7

Ta [°C] condensing temperature
Tw [°C] evaporator outflow water
Pf [kW] cooling capacity
Pa [kW] compressor power input
Qev [m³/h] evaporator water flow
dPev [kPa] evaporator pressure drop

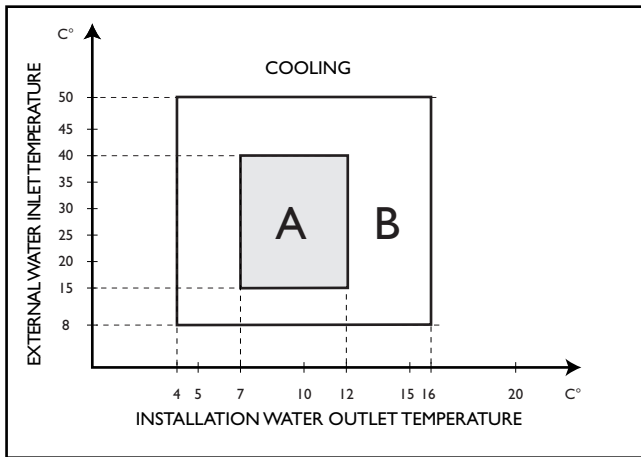
RECOMMENDED OPERATING CONDITIONS



For optimum performance, the unit must be operated inside area "A".

△ By modifying operating parameters, the unit can also be operated inside curve "B".

● The unit must not be used outside area "B".



limits		MIN	MAX
Evaporator	Inflow water	6	23
	Outflow water	3(1)	15
	Water thermal head	3	8
Condensing air temperature		20	60

(1) For water and glycol mixtures T min. = -9°C

ETHYLENE GLYCOL SOLUTIONS

Water and ethylene glycol solutions used as a thermal vector in the place of water reduce the performance of the unit. Multiply the performance figures by the values given in the following table.

Freezing point (°C)						
	0	-5	-10	-15	-20	-25
Percentage of ethylene glycol by weight						
	0	12%	20%	28%	35%	40%
cPf	1	0,985	0,98	0,974	0,97	0,965
cQ	1	1,02	1,04	1,075	1,11	1,14
cdp	1	1,07	1,11	1,18	1,22	1,24

cPf: cooling capacity correction factor cdp: pressure drop correction factor
cQ: flow rate correction factor

FOULING FACTORS

The performance data given refer to conditions with clean evaporator plates (fouling factor=1). For different fouling factors, multiply the figures in the performance tables by the coefficient given in the following table.

Fouling factors (m ² °C/W)	Evaporator		
	fl	fkI	fxI
4,4 × 10 ⁻⁵	-	-	-
0,86 × 10 ⁻⁴	0,96	0,99	0,99
1,72 × 10 ⁻⁴	0,93	0,98	0,98

fl capacity correction factor fxI total power input correction factor
fkI compressor power input correction factor

SOUND PRESSURE LEVEL

Size	Octave band (Hz)								Total dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level (dB)								
0011	51	41	40	39	36	33	27	30	43
0021	51	41	40	39	36	33	27	30	43
0025	56	46	45	44	41	37	31	33	48
0031	56	46	45	44	41	37	31	33	48
0041	62	52	51	50	47	43	37	39	52
0051	62	52	51	50	47	43	37	39	52
0061	62	52	51	50	47	43	37	39	52
0071	62	52	51	50	47	43	37	39	52
0091	62	52	51	50	47	43	37	39	52
0101	64	54	52	51	49	44	38	40	53
0121	64	54	52	51	49	44	38	40	53

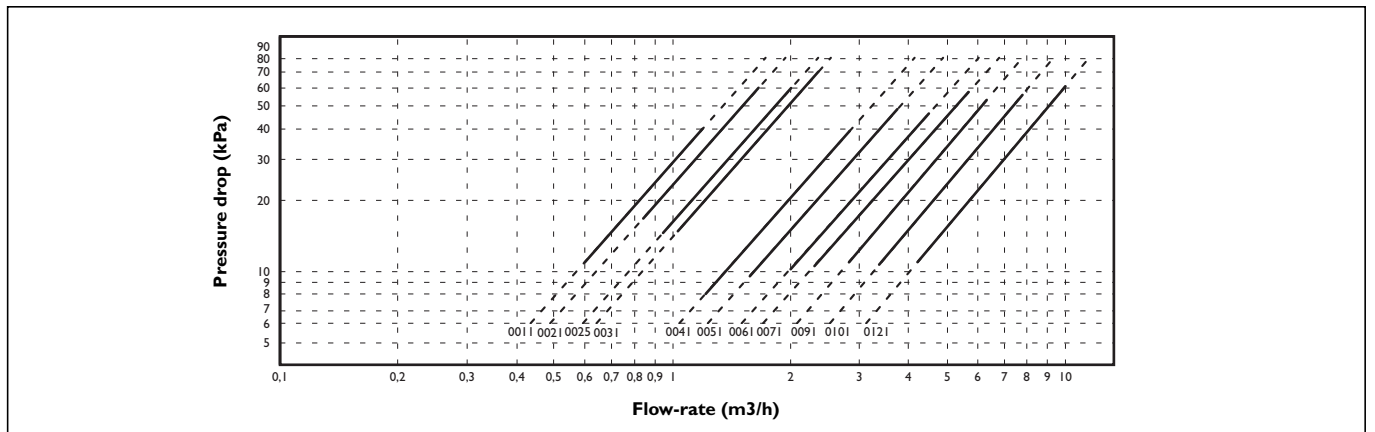
Reference point: compressor side at 1m from the external surface of the unit and 1m above the support surface.

I A HYDRAULIC DATA

WATER CONTENT IN THE INSTALLATION

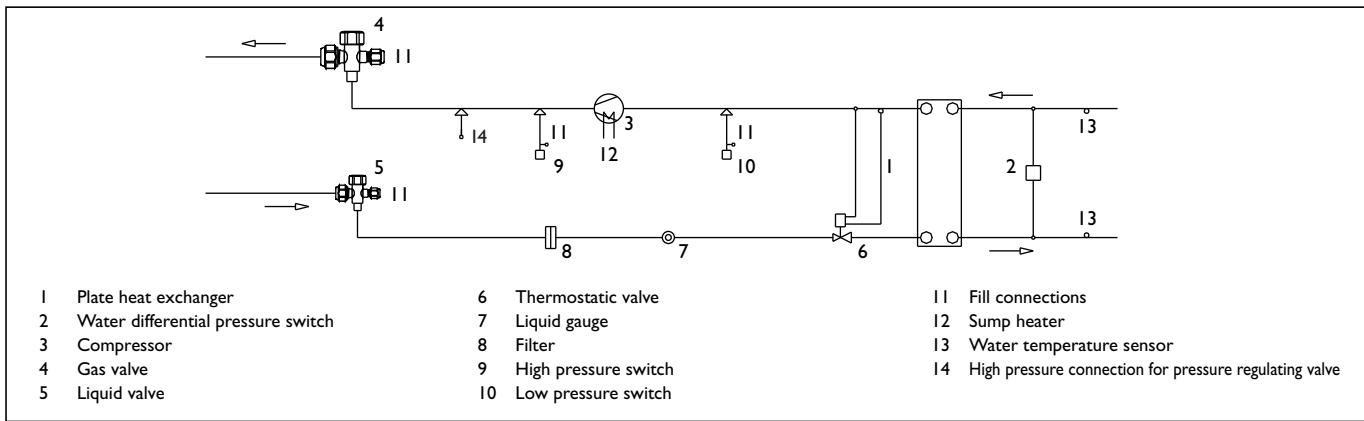
Size	0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121	
Minimum water content	1	14	18	20,3	24	30,5	36	43,5	55	65	78	94

GRAPH OF EXCHANGER FLOW-RATE - PRESSURE DROP, INSTALLATION SIDE



— For water deriving from tower

⊗ Do not operate in the dashed section of the curves



CHECKING AND STARTING UP THE UNIT

PREPARING FOR FIRST START UP

or restarting after shutting down for long periods

The evaporating unit must be started the first time by the Service Department. Before starting the condensing unit, check that:

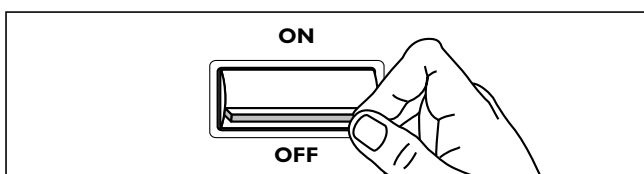
- All safety conditions have been respected;
- the chiller is adequately fixed to the surface it rests on;
- there functional distances have been respected;
- there are no gas leaks from the connections on the unit and the remote condenser;
- the valves on the evaporator unit are open;
- the hydraulic connections have been carried out according to the instruction manual;
- the hydraulic circuit is filled and vented;
- the hydraulic circuit valves are open;
- electrical connections have been carried out correctly
- the voltage is within a tolerance of 10% of the rated voltage of the unit.
- the unit is correctly earthed;
- all electrical connections are tight and all hydraulic connections have been carried out correctly.

⚠ The unit must be started up for the first time with standard settings. Set point values may be modified only after testing has been completed. Before starting up, power up the unit for at least two hours by positioning QF1 and QS1 to ON and setting the control panel "HSW15" to OFF to allow the oil in the compressor sump to heat up.

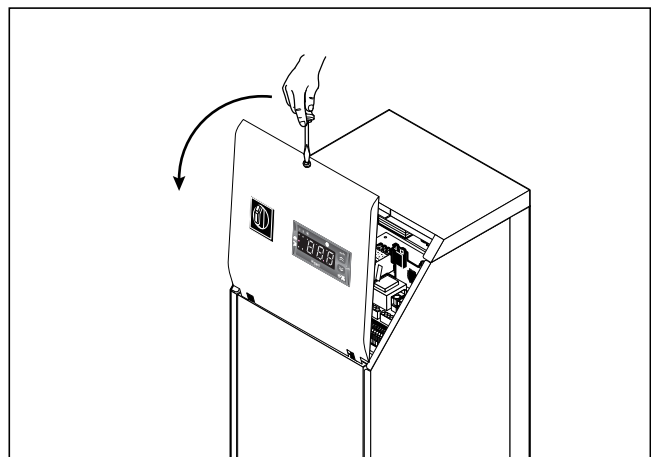
STARTING UP FOR THE FIRST TIME (after two hours)

Before activating the unit:

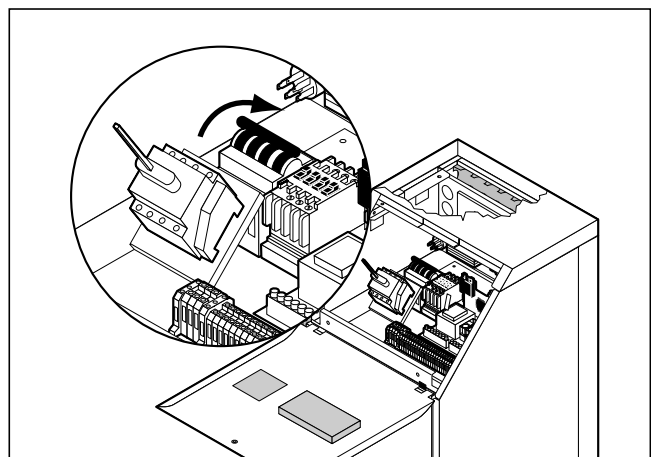
- Make sure the remote mains switch QF1 is in the OFF position;



- Make sure the remote secondary switch SA1 (if present) is in the OFF position
- Make sure the remote keyboard "A6" (if present) is set to OFF
- Open the door of the electrical panel, as shown in the figure

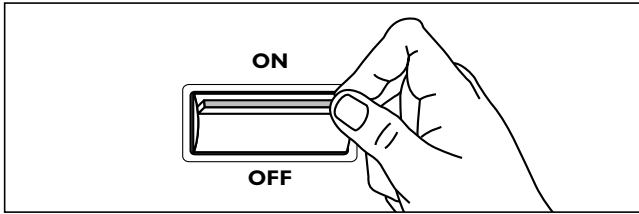


- Raise the lever of the compressor thermal overload switch QM1



ACTIVATING AND DEACTIVATING THE UNIT

- Place the remote switch SA1 (if present) in the ON position.



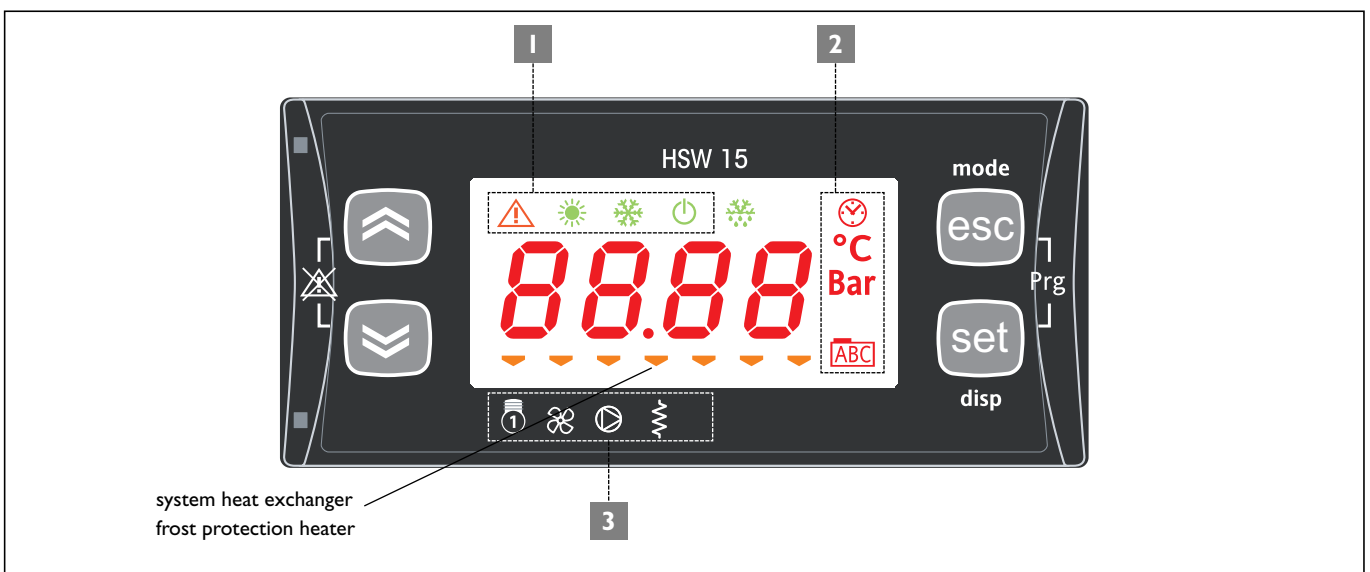
- Set the remote keyboard "A6" (if present) to ON.
- To ACTIVATE and DEACTIVATE operation, use the "HSW15" control panel or the remote keyboard "A6", if present.

⚠ During this phase, if the following indications appear on the display, follow the instructions:

- E41 check the water flow-rate and the connection (14 and 15) of the flow switch or differential pressure switch.

A

LEDS AND DISPLAY



1 STATUS AND OPERATING MODE LEDES

	Alarm
	Not used
	Cooling
	Standby
	Not used

2 VALUE AND UNIT OF MEASURE LEDES

	Not used
°C	Degrees centigrade
Bar	Pressure (Bar)
ABC	Menu (ABC)

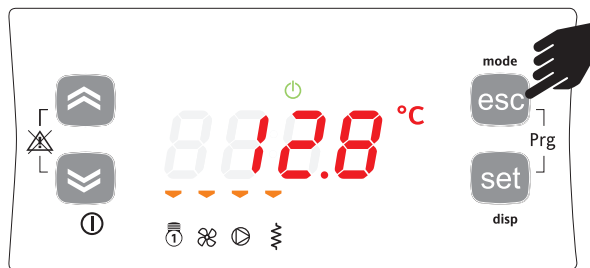
3 UTILITY LEDES

	Compressor
	Not used
	System pump
	Frost protection heater

SELECTING THE OPERATING MODE

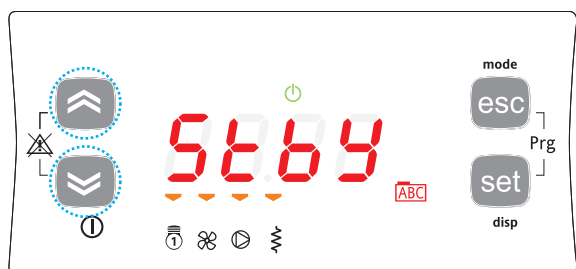
There are three different modes:

- Standby mode (StbY)
- Cooling mode (COOL)



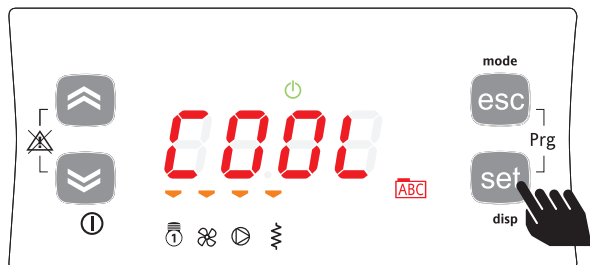
For example, to switch operation from StbY to COOL.

To change the operating mode, press and hold the mode button for at least 2 seconds.

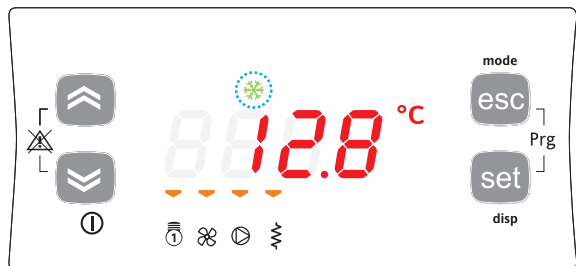


A scroll menu will start flashing with the values StbY (standby) and COOL (cool).

Use the up and down buttons to select the desired operating mode.



The unit will automatically return to the main display and the StbY LED, previously on, will now be off and the COOL LED will be on.

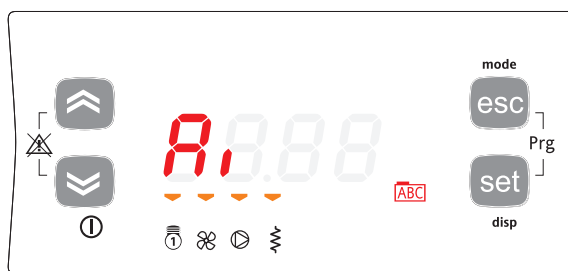


SETTING THE SET POINTS

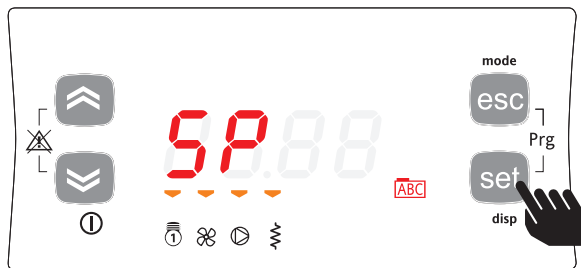
As an example, the Set Point in COOL mode will be changed from 12.0 degrees centigrade to 12.5 degrees centigrade.



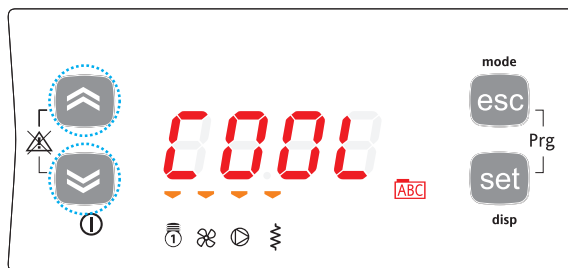
To change the set point, starting from the main display, press the set button.



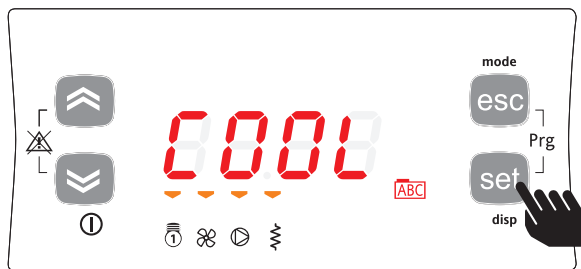
Pressing the set button once displays the various directories. Scroll the menu using the up and down buttons until reaching the SP directory.



To enter the SP directory press the set button.



The active mode will be displayed (COOL).



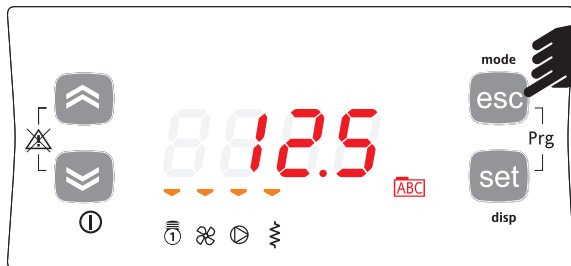
Taking the example of changing the set point for the operating mode. Press the SET button.



The instrument will display the current set point (in this case 12.0 degrees centigrade).
To increase or decrease the value, use the up and down buttons.
For example, to change the set point to 12.5 degrees, press the up button until the desired value is displayed.



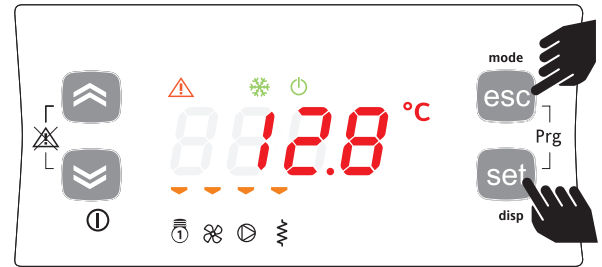
Once having reached the desired set point, press the set button. In this way, the instrument will save the value 12.5.



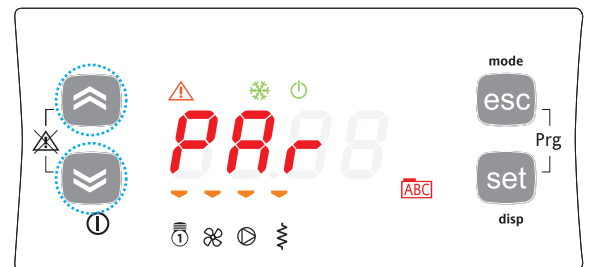
To return to the main display, press esc or wait for the menu timeout to expire (15 seconds).

SETTING THE PARAMETERS

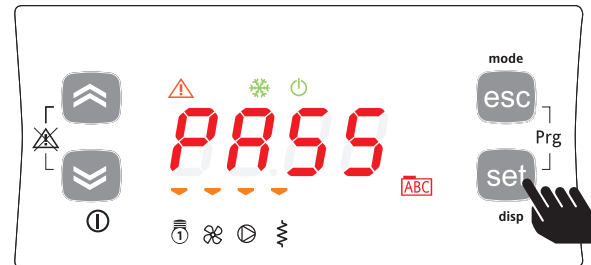
Accessing the PASS directory (from the main display, pressing the esc and set buttons together [esc+set] and scrolling to the directory with up / down) and setting the PASS accesses the parameters visible for the password entered.



To access the PASS directory from the main display, press esc and set together [esc+set].



Pressing the two buttons accesses the menu listing the directories.
Scroll using the up and down buttons to the PASS directory.



To enter the PASS directory press the set button.
Then enter the password (installer or manufacturer), press set and exit.
Access the parameters to display or change the values.



Press the up and down buttons to select the Par submenu.
Press the set button to display the desired directory.



The first directory displayed by the instrument will be the CF directory (configuration).
To set the individual CF parameters, simply press set again.

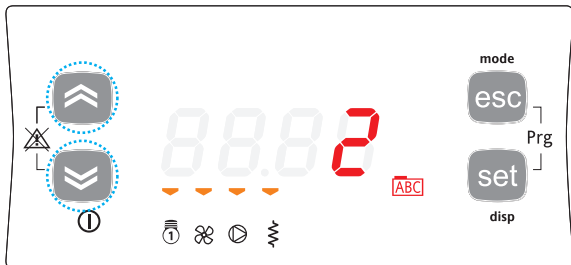


The instrument will display parameter CF00 (default factory settings). To scroll the various parameters, simply press the up button to go to the next parameter (in this case CF01) or the down button to go to the previous parameter (in this case CF47).
CF00->CF01->CF02->...->CF47->CF00
CF47<-CF00<-CF01->...<-CF46<-CF47

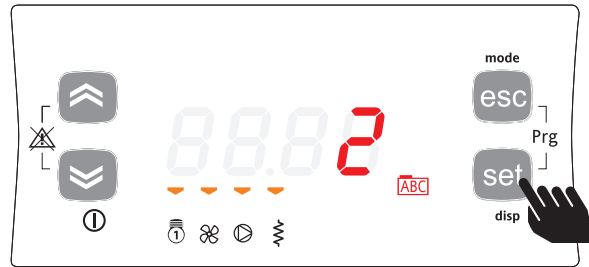
NOTE: -> UP, <-DOWN



To display the value of the parameter (in this case CF00), press the set button.



For parameter CF00, the value displayed will be 2.
To change the value of the parameter, press the up or down button.

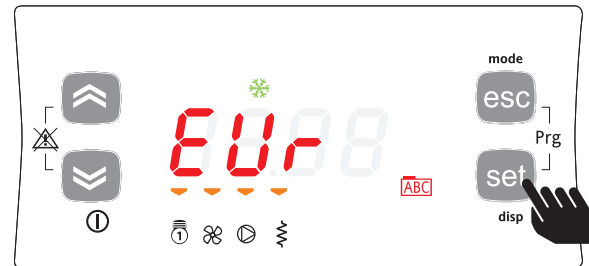


When having selected the value, press the set button.**
To exit the display and return to the previous level, press esc.

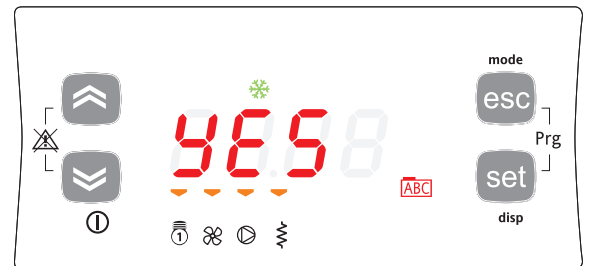
**NOTE: pressing the set button confirms the new value; pressing the esc button returns to the previous level without changing the existing value.

RESETTING THE ALARM LOG

From the main display press "esc + set", the display will show "Par". Scroll using the UP and DOWN buttons until displaying the label "FnC". Press the SET button, the display will show "dEF". Scroll using the UP and DOWN buttons until displaying "EUr".

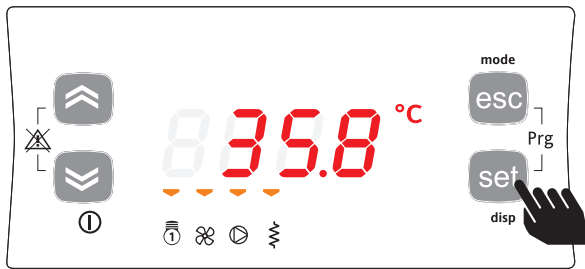


Press the SET button for 3 seconds.

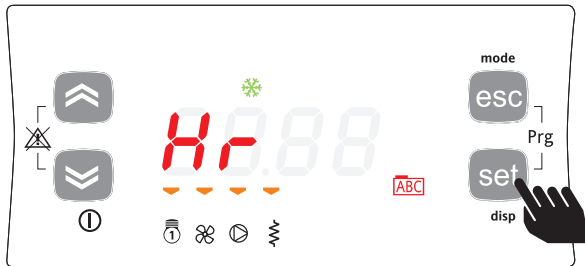


The display shows YES, to confirm that the alarm log has been reset.

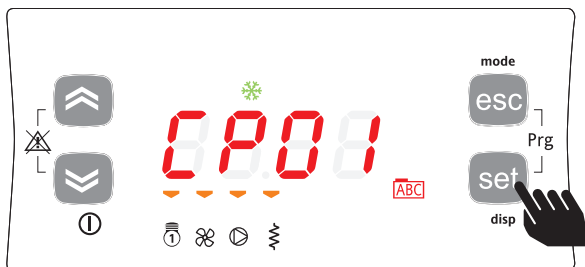
DISPLAYING AND RESETTING COMPRESSOR / PUMP HOURS



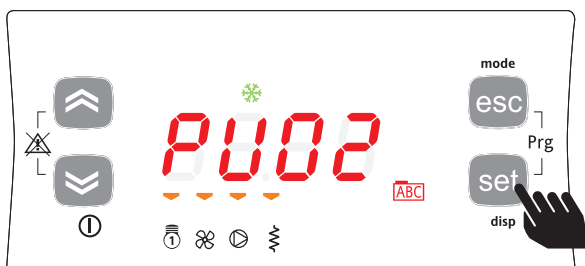
Example of displaying and resetting (tens) the Pump operating hours.
From the main display, press the set button.



The display will show label Ai. Scroll the labels using the UP and DOWN buttons until reaching label Hr.

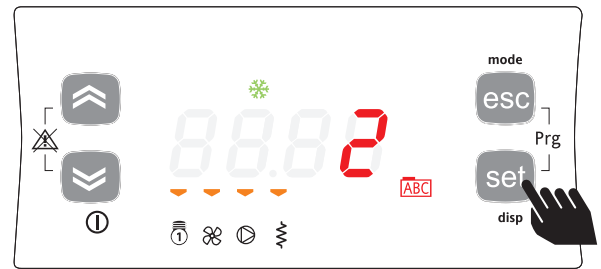


Press the set button to display the first label, in this case the operating hours for compressor 1 (CP01).



Scroll using the UP and DOWN buttons until displaying (if featured among the resources) the operating hours for compressor 2 (CP02) and the operating hours for the pump (PU02).

Press the set button to display the operating hours for the pump PU02.



The tens of operating hours are equal to 2.
(The hours are expressed in tens: 2 indicates 20 operating hours).
To reset the operating hours for the pump PU02, press and hold [set].

Note: to reset the operating hours for the other resources, repeat the procedure described.

To exit the menu, press esc until returning to the main display.

LIST OF ACCESSIBLE PARAMETERS

	Directory label	Parameters	Parameters for:
	CF	CF00... CF77	Configuration
	Ui	UI00... UI18	User interface
	tr	tr00... tr20	Temperature control
	St	St00... St04	Operating status
	CP	CP00... CP10	Compressor
Primary pump	PI	PI00... PI24	Primary water circuit pump
Electric heater	HI	HI00... HI15	System heat exchanger electric heater
	dS	dS00... dS07	Dynamic set point
	Ad	Ad00... Ad07	Adaptive
	AF	AF00... AF03	Frost protection
	AL	AL00... AL48	Alarms
	CL	C00... CL97	Local I/O configuration

Note 1: when setting the parameters the **COMPRESSOR** and **HEATER LEDs** will flash alternating with the **DEFROST LED**.

Note 2: the above table shows a list of parameters that are all or partly available only on entering the password.

DISPLAYING ALARMS



FAULT	CAUSE	SOLUTION
Values display indication Er01	High pressure switch tripped, manual reset after 3 activations in one hour, incorrect connection of power supply phases (three-phase models only)	Check fault (see high discharge pressure) Reset manually Change the position of two phases.
Values display indication Er05	Low pressure switch tripped manual reset after 4 activations per hour	Check fault
Values display indication Er 10	Fan circuit breaker tripped Manual reset if active for more than 30 seconds	Check fan circuit breaker Check compressor circuit breaker Check correct sequence of power supply phases (versions 0071-0121)
Values display indication Er20	Differential pressure switch or flow switch tripped Manual reset if active for more than 30 seconds	Check inadequate water flow Check for air in water circuit Check electrical connection (see unit wiring diagram)
Values display indication Er30	System frost prevention alarm (manual reset)	Check water outlet temperature Check water flow Check temperature set point Check correct positioning of sensor BT2
Display indication Er47	HSW15 communication error with remote keypad (only if remote keypad featured)	Check electrical connection
Values display indication Er60	Faulty BT1 system water return sensor (automatic reset)	Check electrical connections Replace component

FAULT	CAUSE	SOLUTION
Values display indication Er61	Faulty BT2 system water outlet sensor (auto- matic reset)	Check electrical connections Replace component
Display indication Er75	Pressure transducer malfunction	Check electrical connection (see unit wiring dia- grams) Replace component
Display indication Er81	Compressor maintenance interval	Check operating pressure Check condition of the compressor Reset the clock
Display indication Er85	Water pump maintenance interval	Check condition of the water pumps Reset the clock
Display indication Er90	Maximum alarm log size exceeded	Reset alarm log

Cooling set point

(factory set) = 12°C, Hysteresis = 3°C.

The compressor starts with water temperatures above 12°C+3°C (15°C)

The compressor shuts down with water temperatures of less than 12°C.

In the event of temporary power failure, when the power returns, the mode set previously will be retained in the memory.

COMPRESSOR START DELAY

Two functions prevent the compressor from starting too frequently:

- Minimum time since last shut-down 180 seconds;
- Minimum time since last start-up 300 seconds.

PUMP

The electronic board includes a pump control output. The pump starts when the assembly is powered up and at least 60 seconds before the compressor starts up and stops 60 seconds after the assembly shuts down.

After the first 60 seconds of pump operation when the water flow is at full speed, the water flow alarm functions are activated (differential pressure switch and flow switch).

FROST PREVENTION ALARM

To prevent the water freezing and damaging the plate heat exchanger, the microprocessor shuts down the compressor if the temperature measured by the heat exchanger outlet temperature sensor is less than +3°C. The frost prevention temperature set point can be modified by an authorised service centre only and only after verifying that the hydraulic circuit contains antifreeze. Tripping of this alarm shuts down the compressor, but not the pump which remains active. To reset normal functions, the outlet water temperature must rise to more than +7°C. Reset is manual.

WATER FLOW ALARM

The microprocessor provides for the management of a water flow alarm controlled by a differential pressure switch fitted as standard on the appliance and a flow switch to be installed on the water delivery piping.

This safety device may trip after the first 60 seconds of pump operation when the water flow is up to speed.

Tripping of this alarm shuts down the compressor, but not the pump which remains active.

To reset normal functions, the alarm contact must be deactivated for at least five seconds.

SHUTTING DOWN FOR LONG PERIODS

After deactivating the evaporator unit:

- Make sure the remote switch SAI (if present) is in the "OFF" position.
- Make sure the remote keyboard (if present) is set to "OFF".
- Place QFI and QSI in the OFF position
- Deactivate the internal terminal units by placing the switch of each unit in the "OFF" position.
- Close the water valves.

⚠ If there is a possibility that the **outside temperature may drop below zero**, there is a risk of freezing.

The hydraulic circuit **MUST BE EMPTIED AND CLOSED** or antifreeze must be added in the proportion recommended by the manufacturer.

If the mains switch is turned to "off" for more than four hours, after turning it on and before reactivating the unit, leave the power on but the unit deactivated for at least two hours to preheat the oil in the compressor sump.

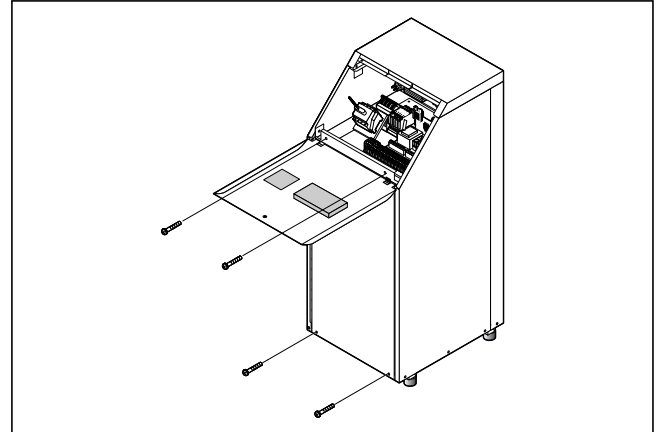
Regular maintenance is fundamental to maintain the efficiency of the unit both in terms of operation and energy consumption.

The Technical Service maintenance plan must be observed, with an annual service which includes the following operations and checks:

- Filling of the water circuit
- Presence of air bubbles in the water circuit
- Efficiency of safety devices
- Power supply voltage
- Power input
- Tightness of electrical and hydraulic connections
- Condition of the compressor contactor
- Operating pressure, superheating and subcooling
- Efficiency of compressor heater
- Condition of the remote condenser

To carry out maintenance, it may be necessary to remove the chiller inspection panel. If this is the case, proceed as follows:

- Open the door of the electrical panel (page 11)
- Undo the screws as shown in the figure
- Remove the inspection panel



To replace the inspection panel, repeat the procedure in reverse.

EXTRAORDINARY MAINTENANCE

A

CHEMICAL WASHING

You are recommended to chemically wash the plate heat exchanger after every 3 years of operation. For instructions on how to carry out this operation, contact De'Longhi Spa.

REFRIGERANT GAS CONTENT

The chillers are filled R407C refrigerant gas and tested in the factory. In normal conditions, there should be no need for the Technical Assistance Service to intervene to check the refrigerant gas. However, over time, small leaks may develop at the joints leading to loss of refrigerant and draining of the circuit, causing the unit to function poorly. In this case, the leaks of refrigerant must be identified and repaired and the refrigerant circuit refilled. Proceed as follows:

- Empty and dry the entire refrigerant circuit using a vacuum pump connected to the low and high pressure tap until the vacuum gauge reads about 10 Pa. Wait a couple of minutes and check that this value does not rise to more than 50 Pa.
- Connect the refrigerant gas cylinder or a filling cylinder to the low pressure line pressure gauge connection
- Fill with the quantity of refrigerant gas indicated on the rating plate of the unit;
- Always check the superheating and subcooling values, which should be between 5 and 10°C and 4 and 8°C.

- After a couple of hours operation, check that the liquid indicator indicates circuit dry (dry-green)

⚠ In the event of partial leaks, the circuit must be completely emptied before being refilled
The R407C refrigerant must only be filled in the liquid state.

Operating conditions other than nominal conditions may produce considerably different values.

Seal testing or identification of leaks must only be carried out using R407C refrigerant gas, checking with a suitable leak detector.

- **The refrigerant circuit must not be filled** with a refrigerant other than that indicated on page 17. The use of a different refrigerant may cause serious damage to the compressor.

Oxygen, acetylene or other inflammable or poisonous gases must never be used in the refrigerant circuit as they may cause explosion or poisoning.

Oils other than those indicated on pages 17 must not be used. The use of a different oil may cause serious damage to the compressor.

FINNED COIL

- Coil with aluminium fins and copper pipes
- Coil side panels in 2.0 mm thick aluminium
- Air intake dividers in 2.0 mm thick aluminium inserted in the coil as structural reinforcing elements (one per fan).

FANS

- Fans with 230V~50Hz electric motor suitable for electronic speed regulation via triac.
- Electric motor with a minimum of 6 poles;
- Fan with IP55 junction box and accident prevention grill.

INTERNAL STRUCTURE AND EXTERNAL PANELS

- Internal structure comprising finned coil with riveted aluminium reinforcements and hexagonal inserts for cover panel attachment
- Cover panels in galvanised steel on two sides and painted steel on one side.
- Fan draught tubes
- Flared profile draught tube painted to prevent rust forming on the exposed side
- Galvanised iron brackets to mount the unit with horizontal air flow

REFRIGERANT CIRCUIT

- Finned condensing coil
- Copper manifolds with connections for welding
- 1/4" SAE pressure tap with SCHRADER valve and cap
- Manifold closure caps
- Nitrogen content at a pressure of 0.5 bars

OPERATING CONDITIONS

- Condensing temperature 50°C
- Outside air temperature 35°C
- Subcooling 5°C.

ELECTRICAL WIRING

- Capacitors in fan junction boxes
- Junction boxes with fan terminal board and wiring in the manifold compartment

ACCESSORIES

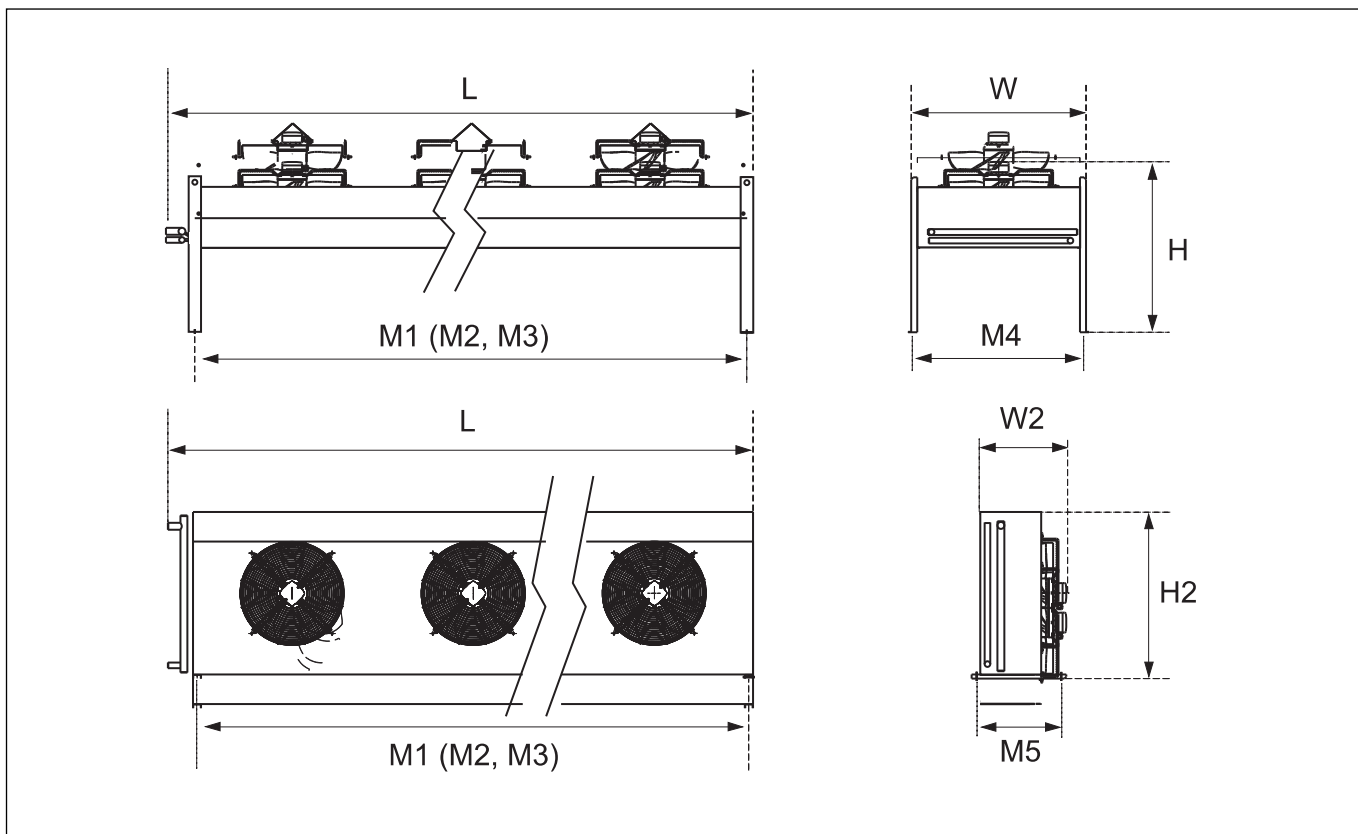
- Pressure switch type condensing control

TECHNICAL DATA NHCR

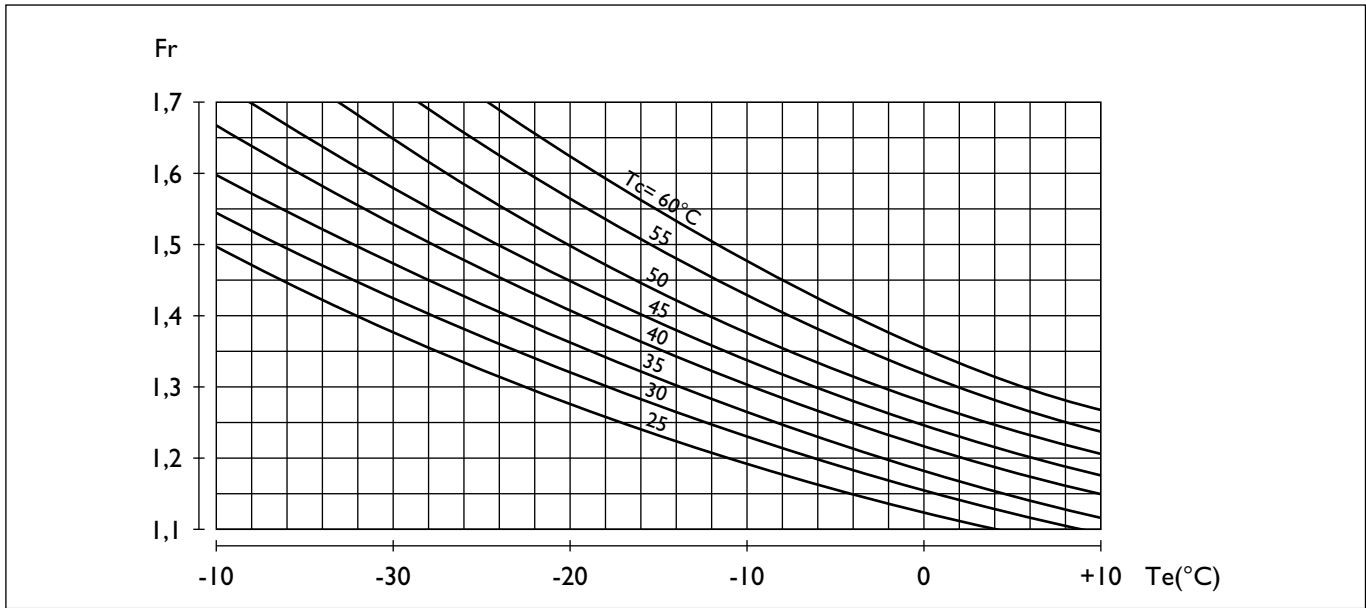
Size		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Heating capacity	l kW	7,9	7,9	15,9	15,9	15,9	16,3	24	25,5	25,5	32,7	40,1
No. Fans	N.	1	1	2	2	2	1	3	2	2	2	3
Diameter Fan	Ø mm	400	400	400	400	400	500	400	500	500	500	500
Air flow	m³/h	2267	2267	4535	4535	4535	4899	6802	10330	10330	9798	15500
RPM	n°/min	940	940	940	940	940	915	940	915	915	915	915
Total power consumption	l n°xkW	1x0,16	1x0,16	2x0,16	2x0,16	2x0,16	1x0,27	3x0,16	3x0,18	3x0,18	2x0,27	3x0,27
Current input	n°xA	1x0,70	1x0,70	2x0,70	2x0,70	2x0,70	1x1,20	3x0,70	3x0,80	3x0,80	2x1,20	3x1,17
Current input at maximum conditions	n°xA	1x0,80	1x0,80	2x0,85	2x0,85	2x0,85	1x1,40	3x0,83	3x0,93	3x0,93	2x1,40	3x1,40
Power supply	V-Ph~Hz	230V-1~50Hz										
Inlet connections	mm	16	16	22	22	22	22	28	28	28	28	35
Outlet connections	mm	14	14	18	18	18	20	22	22	22	22	28
Pressure tap connection	inch	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
Sound pressure	2 dB(A)	33	33	36	36	36	35	38	38	38	38	40
DIMENSIONS												
L	mm	780	780	1380	1380	1380	1105	1980	2005	2005	2005	2905
H	mm	555	555	555	555	555	828	555	828	828	828	828
P	mm	362	362	362	362	362	428	362	428	428	428	428
Operating weight	kg	20	20	38	38	38	43	51	76	76	84	111

(1) Rated capacity at $\Delta=15^{\circ}\text{C}$

(2) Sound pressure level at 10 m in open field



Dimensions											
Size	Fans	L	H	W	H2	W2	M1	M2	M3	M4	M5
0011-0021	1	780	712	596	555	362	630	-	-	591	215
0025-0031-0041	2	1380	712	596	555	362	1230	-	-	591	215
0061	3	1980	712	596	555	362	1830	-	-	591	215
0051	1	1105	846	868	828	428	940	-	-	868	420
0071-0091-0101	2	2005	846	868	828	428	1840	-	-	868	420
0121	3	2905	846	868	828	428	2740	-	-	868	420



The rated capacity values given in the catalogue refer to a difference of 16°C between condensing temperatures and ambient air at sea level and with noise levels in dB(A) measured at a distance of 10m in an open field. For other conditions and for rated condensing capacity Q_c derived from the cooling capacity Q_f , the capacity selection method is given below:

$$Q_c = Q_f \times Fr \times F1 \times F2 \times F3$$

Fr = heating capacity factor obtained from DIAG. I, function of evaporating temperature "T" and condensing temperature "Tc"

$F1$ = compressor type coefficient

$F1 = 1$ for open compressor

$F1 = 1.08$ for semi-hermetic compressor

$F1 = 1.14$ for hermetic compressor

$F2 = \Delta T$ coefficient:

ΔT °C	7	8	9	10	11	12	13	14	15	16	17	18	19
F2	2,17	1,89	1,69	1,52	1,37	1,27	1,16	1,07	1	0,93	0,87	0,82	0,77

$F3 =$ Altitude coefficient:

m	0	500	1000	1500	2000	2500	3000
F3	1	1,028	1,06	1,09	1,12	1,15	1,18

The table below gives the dB(A) values to be added to or subtracted from the catalogue value for different distances from the unit:

Distanza m	4	5	6	7	8	10	15	20	30	50
dB(A)	+8	+6	+4,5	+3	+2	0	-3,5	-6	-9,5	-14

Example:

- Cooling capacity $D_f = 20$ kW with $T_e = -5^\circ\text{C}$ and $T_c = 40^\circ\text{C}$
- Semi-hermetic compressor
- Ambient temperature 27°C , unit installed at an altitude of 1000m.
- The condenser must operate with a $\Delta T = 40 - 27 = 13^\circ\text{C}$ and with a maximum sound pressure level of 55 dB(A) at a distance of 5m. The selection method gives us:

$$Q_c = 20 \times 1.25 \times 1.08 \times 1.27 \times 1.06 = 36.3 \text{ kW}$$

The following will satisfy the required conditions: model ACCS 48 axial flow air condenser with motors with "Y" connection, from the table at 5 m distance, guaranteeing a sound pressure level of $48 + 6 = 55$ dB(A).

MALFUNCTION	CAUSE	REMEDY
<p>The evaporating unit does not start up</p>	<p>No voltage</p>	<p>- Check for presence of voltage - Check safety systems upstream of unit</p>
	<p>Mains switch in OFF position Remote switch (if present) in OFF position Control panel set to OFF Main unit switch in OFF position Compressor thermal overload switch OFF</p>	<p>Turn ON</p>
	<p>Supply voltage too low</p>	<p>Check power line</p>
	<p>Contactor coil faulty Electronic board faulty Start-up capacitor faulty (if present) Compressor faulty</p>	<p>Replace component</p>
<p>Insufficient output</p>	<p>Insufficient refrigerant Undersized unit Operation outside recommended limits</p>	<p>Check</p>
<p>Compressor noisy</p>	<p>Liquid returning to compressor Inadequate fixing</p>	<p>Check</p>
	<p>Reversed phase (three phase units only)</p>	<p>Reverse one phase</p>
<p>Noise and vibrations</p>	<p>Contact between metal bodies</p>	<p>Check</p>
	<p>Weak foundations</p>	<p>Repair</p>
	<p>Loose screws</p>	<p>Tighten screws</p>
<p>Protection devices trip and shut down the compressor</p>	<p>Excessive discharge pressure Low suction pressure Low voltage Electrical connections not sufficiently tight Operation outside permitted limits</p>	<p>Check</p>
	<p>Faulty operation of pressure switches</p>	<p>Replace component</p>
	<p>Thermal cut-out tripped</p>	<p>Check supply voltage Check electrical insulation of windings</p>

MALFUNCTION	CAUSE	REMEDY
High discharge pressure (greater than 23 bars)*	High outside air temperature High water inlet temperature	Check
	Insufficient air flow	Check fan operation
	Faulty fan control	Check
	Excessive refrigerant charge	Check
Low discharge pressure (less than 12 bars)*	Low outside air temperature Low water inlet temperature	Check
	Moisture in refrigerant circuit (flow gauge - moisture yellow)	Empty and refill
	Faulty fan control	Check
	Air in hydraulic circuit	Vent
	Insufficient gas charge	Check
High suction pressure (greater than 10 bars)*	High outside air temperature High water inlet temperature Thermostatic expansion valve faulty or excessively open	Check
Low suction pressure (less than 3.2 bars)*	Low water inlet temperature Low air inflow temperature Thermostatic expansion valve faulty or blocked Clogged water filter Blocked plate heat exchanger	Check

*Indicative values only

For information on technical assistance and obtaining spare parts, contact

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