



Installation
Operation
Commissioning
Maintenance



Index

1. Introduction.....	3
2. Operating limits.....	3
3. Technical characteristics.....	4
4. Transport	5
5. Unit identification	5
6. Safety recommendations.....	5
7. Location and assembly.....	6
Choosing the installation site	6
Anchors for anti-vibratory supports	6
Sound level	6
Minimum necessary space for the commissioning and maintenance.....	7
8. Before commissioning	7
Electrical connections	7
Air duct connections.....	8
Fans check-ups.....	8
Condensates drain connection.....	9
Hydraulic connections.....	10
9. Safety elements.....	11
High pressure pressostat	11
Low pressure pressostat.....	11
Magnetothermals for line protection.....	11
Anti-fire safety	11
Control circuit automatic switch.....	11
Door general switch	11
Fans safeties.....	12
Water flow control	12
10. Options	12
Two rows hot water coil.....	12
Water anti-freeze protection	12
Anti-freezing safety	12
Condensing pressure control	12
11. Commissioning.....	13
Checks prior to commissioning.....	13
Operational checks	13
Possible problems at commissioning.....	13
12. Maintenance.....	14
Air filter extraction	15
Condensates drain connection.....	15
Access to electrical panel.....	15
Access to centrifugal fans	16
Access to electrical heaters	16
Change of air return panel	16
13. Control and faults analysis	17



Water-air packaged units

IXH



Cooling capacity: 6,9 to 41,3 kW
Heating capacity: 8,2 to 48,4 kW

1. INTRODUCTION

Heat pumps and Cooling units **RXH / IXH Series** are Water-Air compact construction units.

They are designed for the air-conditioning of different premises, offering a discreet solution in centralized installations with closed water loop.

- **RXH Series:** Water-condensed cooling unit, horizontal compact.
- **IXH Series:** Reversible water-air heat pump horizontal compact.

After their manufacture, all units are charged with refrigerant and are tested in factory, checking the correct operation of all their components.

In this manual are described the actions and safety standards to follow for a correct manipulation of the unit.

2. OPERATING LIMITS

Series	Operating mode	Air		Water	
		Max.	Min.	Max.	Min.
IXH / RXH	Cooling	21°C WB	14°C WB	50°C ①	25°C ①③
IXH	Heat pump	27°C	10°C	25°C ②	10°C ②

① Water outlet

② Water inlet

③ For units with condensing pressure control (optional) operating up to +5°C.

3. TECHNICAL CHARACTERISTICS

XH		25	30	40M	40	50	65	80	95	120	155
Cooling capacities	Cooling Capacity ① (kW)	6,9	7,7	10,5	10,5	12,4	16,0	20,9	25,2	32,7	41,3
	Power input ③ (kW)	2,0	2,3	3,3	3,3	3,7	4,8	6,6	7,5	9,9	13,4
	EER performance	3,5	3,3	3,2	3,2	3,3	3,3	3,2	3,4	3,3	3,1
Heating capacities	Heating capacity ② (kW)	8,2	9,0	12,8	12,8	16,0	19,5	24,9	29,1	38,6	48,4
	Power input ③ (kW)	2,0	2,4	3,4	3,4	3,9	5,1	6,7	8,0	10,7	13,8
	COP performance	4,1	3,7	3,8	3,8	4,1	3,8	3,7	3,6	3,6	3,5
Outdoor circuit	Nominal water flow (m³/h)	1,5	1,7	2,3	2,3	2,7	3,5	4,6	5,5	7,2	9,2
	Pressure drop (m.w.c)	4,9	5,3	9,8	9,8	3,5	5,7	4,4	5,7	4,5	7,3
	Water inlet connection	3/4"	1"	1"	1"	1"	1"	1 1/4"	1 1/4"	1 1/2"	1 1/2"
	Water outlet connection	3/4"	1"	1"	1"	1"	1"	1 1/4"	1 1/4"	1 1/2"	1 1/2"
Indoor centrifugal fan circuit	Nominal air flow (m³/h)	1.300	1.500	2.000	2.000	2.500	3.100	4.000	4.600	6.000	7.000
	Avail. static pressure (mm.a.c.)	6,0	5,5	5,0	5,0	5,0	8,0	10,0	7,0	9,0	6,5
	Number	1									
	Power input (kW)	0,15	0,42	0,42	0,42	0,37	0,55	1,1	1,1	1,1	1,5
	r.p.m.	900	800	800	800	726	910	1.027	867	640	695
Compressor	Type	Piston hermetic									
	Number compressors	1									
	Number circuits	1									
Maximum absorbed current	230 V / I ph / 50 Hz (+/-5%) (A)	18,6	24,6	34,8	--	--	--	--	--	--	--
	230 V / III ph / 50 Hz (+/-5%) (A)	--	--	--	23,6	19,9	25,8	33,7	39,7	47,7	57,1
	400 V / III ph / 50 Hz (+/-5%) (A)	--	--	--	13,1	16,1	16,6	25,7	24,7	29,7	39,6
Refrigerant	Type	R-407C									
	Global warming potential (GWP) ④	1.774									
	Charge RXH (kg)	1,1	1,1	1,2	1,2	1,2	1,4	2,7	3,0	3,2	3,5
	Charge IXH (kg)	2,3	3,0	3,3	3,3	3,6	4,1	4,6	4,7	5,8	6,5
Dimensions	Length (mm)	1.024	1.162	1.162	1.162	1.408	1.408	1.825	1.825	2.457	2.457
	Width (mm)	866	790	790	790	946	946	1.445	1.445	1.911	1.911
	Height (mm)	431	536	536	536	587	587	701	701	820	820
Weight	RXH (kg)	120	129	146	146	200	205	309	356	431	471
	IXH (kg)	125	134	152	152	209	217	323	371	443	484

① Cooling capacity for inlet/outlet water conditions 30/35 °C and internal temperature 27 °C and 50% of R.H.

② Heating capacity for inlet/outlet water conditions 16/11 °C and internal temperature 21 °C.

③ Total power input by compressor and motorfans under previous conditions.

④ Climate warming potential of one kg of greenhouse-effect fluored gas relative to one kilogram of carbon dioxide over a period of 100 years.



Water-air packaged units

4. TRANSPORT

The unit should be handled with care in order to avoid damages in its transport. For this reason it is advisable:

- Use appropriate transports for bigger units until the installation site.
- For transport with container, select the right container for an easy

loading/unloading of the unit to the installation site.



- Do not remove the unit from its pallet and packing until it has been transported to its final location.
- Transport the units by a lifting truck.

5. UNIT IDENTIFICATION

Each unit has a nameplate located on a visible place, in a readable and indelible form, with the following information:



IMPORTANT: Manufacturing number should be included in all correspondence relating to the unit.

Ref. Produit\Item Nbr	Designation\Description	
Order Nbr	Model	
An.Year	No Serie\Serial Nbr \ No Produit	
	Manufacturing Nbr	
Refrigerant	kW Absorbee\Input kW	Poids\Weight
Refrigerant type		Weight in operation
Refrigerant kg	Tension\Voltage	Temperature Maxi C
	Line voltage	
BP Mini PSM/MOP	Intensité\Current A	IP
Low pressure		
HP Maxi PSM/MOP	Int.. Kit Elect.	No CE
High pressure	Electrical kit current	
		
30, av JeanFalconnier 01350 CULOZ Tel : 33(0)4 79 42 42 42		
 Made in Spain		

6. SAFETY ADVICE

To avoid accidents during installation, commissioning or maintenance, it is required to take into consideration the units specifications: refrigerated circuits under pressure, refrigerant presence, voltage presence and implantation.

Because of all of this, only qualified and experienced personnel can perform maintenance tasks or unit repairs.



It is required to follow the recommendations and instructions in the maintenance brochures, the labels, and the specific instructions. It is necessary to comply with the norms and regulations in effect.



The compressor and line surfaces can reach temperatures above 100°C causing burns to the body. In the same fashion, under certain conditions these surfaces can reach very cold temperatures that can cause freezing risks.



Use safety gloves and gloves whilst working. Be careful with sharp parts or elements in the unit.



Caution: Before intervening in the unit, verify that the main power to the unit is cut off. An electric shock can cause personal damage.



Note: In order to recycle these units follow the stipulations of (EC) Directives No.96/2002 and No.108/2003 regarding electrical and electronic equipment and the management of the resulting waste.

Refrigerant leaks:

A periodical check must be performed for refrigerant gas leaks as per Regulation (CE) N°842/2006 over certain greenhouse effect fluoride gases.

These units work with refrigerant gas **R 407C**

Components	R-32	R-125	R-134a
Chemical formula	CH2F2	CHF2CF3	CH2FCF3
Weight ratio	23%	25%	52%
Unitary global warming potential (GWP)	675	3.500	1.430
Global warming potential (GWP)	1.774		

The climate warming potential (GWP) is the capacity of warming of one kg of greenhouse-effect fluored gas relative to one kilogram of carbon dioxide over a period of 100 years.

Refrigerant leaks can cause:

- Displacement of available oxygen, its inhalation can cause arrhythmias (work must be undertaken in well-ventilated areas).
- Eye irritations can result from contact as well as burns (suitable safety goggles must be worn).



Note: Repair any leak immediately, using a specific recovery unit for R-407C that avoids the transmission of gas to the atmosphere. It is necessary to drain all the installation and load at 100%, since it is possible that the mixture has been decomposed. Charge always in liquid phase.

7. LOCATION AND ASSEMBLY

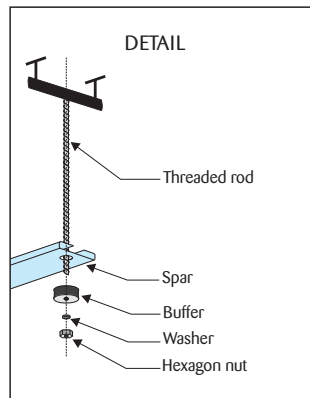
Choosing the installation site

Before moving the unit, make sure that all panels are fixed in their place. Lift and lower carefully.

For the choice of the location, whatever it is the chosen form, it should be taken into account the following points:

- It is imperative to fulfill UNE-EN 378-3 Standard about Environmental and Safety Requirements. Part 3: Installation in situ” and people protection.
- Make sure that the structure is strong enough for supporting the weight of the unit (see weight in chart of technical characteristics).
- The area where the unit is located should be perfectly accessible for cleaning and maintenance (consult minimum space for maintenance).
- Provide for anti-vibratory supports in all the installation, in order to avoid the transmission of noises and vibrations.
- For being a unit designed to operate indoor with ducted air return, the following aspects should be taken into account:
 - All models can be installed on the floor or over a mount or steel profile.
 - Also it is possible to be fixed to the ceiling by means of spiral rod:

- Insert in the forged 4 threaded rods of M8.
- Introduce the rods by the drills that the unit has in its base.
- Put the buffers, introduce a washer and thread the nuts until the unit is well fixed.
- If there is sufficient space between the forged and the unit, some rubber plate or neoprene can be put.



IMPORTANT: In any case, check that the unit remains perfectly levelled.

If in the internal circuit the air return is not ducted, it is necessary to provide a plenum composed by the roof, forged and walls, grilles of appropriate sizes for the return air suction.

Sound level

These units have been designed for operating at a low sound level. However, from the conception of the installation, the effect on the external environment of sound waves and vibrations in the building must be considered.

A study by an acoustic expert may be advisable.

A) The **sound power level** in the discharge of **internal fan**, should be taken into account for the silencer calculation:

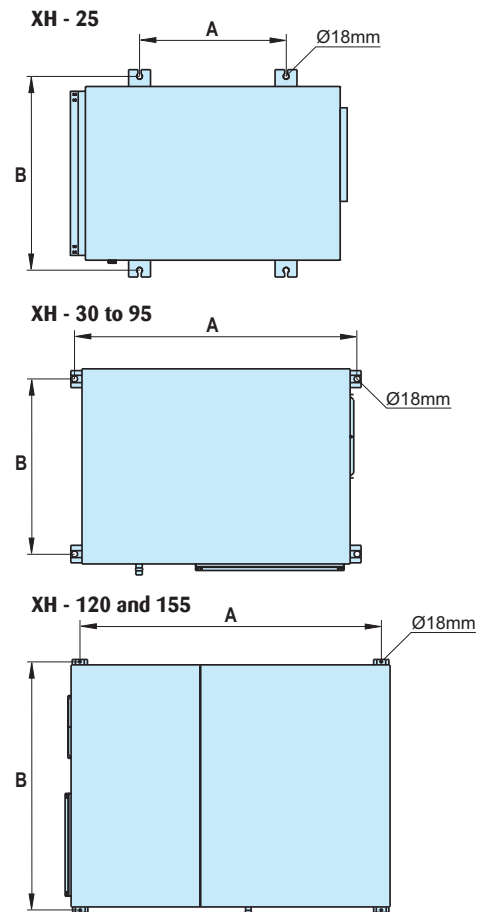
XH	25	30	40	50	65	80	95	120	155
dB(A)	70,5	75,5	77,0	70,0	75,3	80,3	77,3	73,7	76,6

B) The **sound pressure level** of the unit, with the ducted discharge and return intakes, measured from 5m of distance, on free field, directivity 2 and at 1,5 m from floor is:

XH	25	30	40	50	65	80	95	120	155
dB(A)	49,9	53,4	55,1	60,0	62,7	65,3	64,2	62,4	64,5

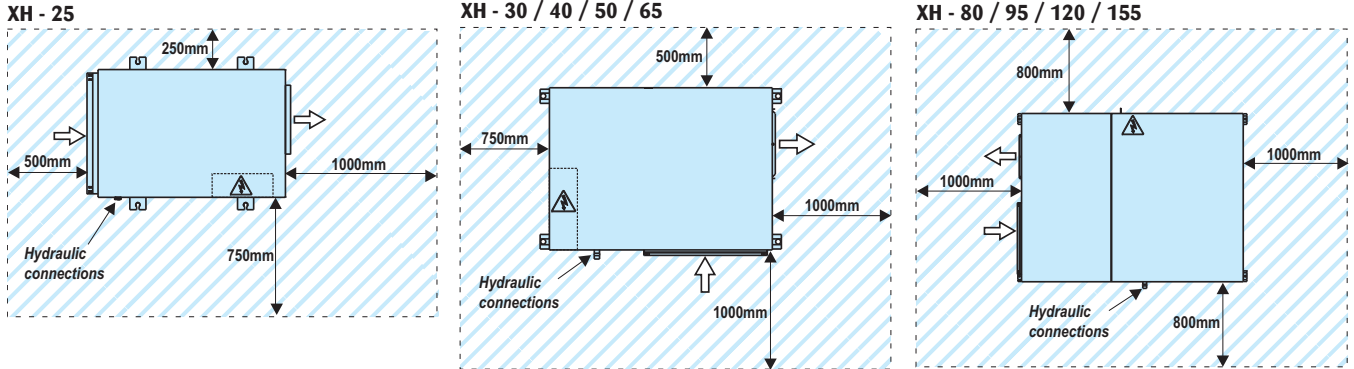
NOTE: The sound pressure level depends on the conditions of the installation and therefore it is indicated for purely orientative purpose.

Anchors for anti-vibratory supports



XH SERIES	A (mm)	B (mm)
25	516,5	822,5
30 / 40	1134	710
50 / 65	1380	872
80 / 95	1797	1366
120 / 155	2291	1876

Minimum necessary space for commissioning and maintenance



8. BEFORE COMMISSIONING

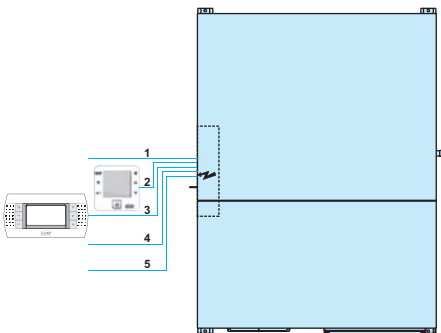


Note: Under no circumstance should the unit be started without having read the brochure completely.

Electrical connections

Pinboard

The necessary indications for the electrical wiring are pointed out in the electrical schemes that are attached to the unit. These connections are carried out according to the applicable regulations. The electrical panel and the remote control are completely wired.



① The same power supply used for powering the control board must also be used for powering the terminal.

Nº	XH	25	30	40M	40	50	65	80	95	120	155
1	Main power supply	230 I	2 + T		--						
		230 III	--		3 + GND						
		400 III	--		3 + N + GND						
2	TCO user terminal connection ①	2 wires for supplying 230V + 1 shielded cable for AGW20/22 communication 1 braided pair + drainwire + shielding)									
3	pGD1 maintenance terminal connection (optional)	telephone cable 6 wires standard (RJ12 connector)									
4	Remote off/on (optional)	2 wires									
5	Main failure signal (opti.)	2 wires									

Installation norms

To carry out the power supply of the unit: wires inlet, wires section and calculation of the same ones, protections, etc..., consult the information provided in this document (see technical characteristics), the electrical scheme which is sent with the unit and effective regulations which regulate the installation of air-conditioners and electrical receiver.

Verify that the power supply corresponds to the nameplate and that the voltage keeps constant.



Revise that the electrical connections are correct and are well tight (with each unit the electrical scheme is attached together with its legend).



In order to prevent electrical shocks, all electrical wirings should be carried out before feeding the unit. Check that the automatic switch is closed in order to avoid personal damages. Make the earthed base connection before any other electrical wiring.



Important: All electrical wirings in the work are responsibility of the installer.



It is necessary that the wiring of the installation fulfills with the effective legislation. The installer should put elements of line protection according to the effective legislation.

Electronic control

• AVANT electronic control

All XH units have an AVANT electronic control as standard from the factory comprised of a main board and a TCO user terminal.

Optionally, this control can have a terminal for pGD1 maintenance that facilitates the initial scheduling of the unit, the modification of the operating parameters and the description of the alarms produced.

Recommendations for the TCO thermostat installation

From the thermostat some of the unit operation aspects are controlled: operation modes, setpoint, differential, timings... Because of this, it is very important to choose an appropriate location within the room since in it is where the unit's control probe is located. This probe must report about the environmental conditions of the occupied area.

The thermostat must be fixed at a height of 1.5 metres from the ground and all possible interferences must be avoided: sun, outdoor air, internal heat sources... Mount the thermostat to the wall using the bracket, do not leave it hanging from the wire or embedding it in the wall.

Note: See the specific brochures of AVANT control to get more detailed information.

Electrical heater (optional)

The electrical heaters provided with the unit, will be incorporated to the same one modifying the electrical panel in factory, so that it is compatible with the control that includes the unit.

The electrical heaters requested for units already supplied will be sent in kit, being necessary the assembly on the part of the installer of the necessary elements for their adjustment to the operation of the unit in which they are going to be installed, and for the fulfillment of the prescribed safety rules which are applicable to the modified unit.

NOTE: The available capacities can be consulted in the technical brochure of XH Series.

Air ducts connections

Air discharge and return ducts of the internal circuit should be calculated depending on the nominal flow and the unit available pressure (see technical characteristics table). The calculation and design of ducts should be carried out by qualified technical personnel.

It is recommendable to take into account the following recommendations:

- The curves must be avoided in the discharge inlet(s). It is advisable a straight duct tract of 1 m approx. If it is not possible, these will be the softest possible, using inner baffle plates when the duct has big dimensions.

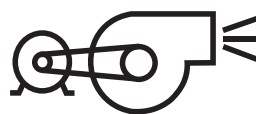

- Abrupt changes of direction should be avoided while manufacturing ducts, because they can produce punctual pressure drops that affect the available pressure and flow. The location of discharge and intake grilles should be carefully studied to avoid air recirculation and noise transmission.
- Flexible connections between the ducts and the unit should be carried out in order to avoid noise transmission and vibrations.
- No ducts used must comprise materials that propagate fire or emit toxic gases in the case of fire. The internal walls must be smooth and must not pollute the air circulating inside. It should be respected in any case the official legislation on this point.



Caution: These units are designed to be connected to a ducts work. In the case of the discharge fan of the internal circuit is accessible from some point of the network, the installer should put in the discharge a protection mesh according to the official legislation.

Fans check-ups

- Before the start-up, check the turn direction of the blades and that the axis rotates without blows or vibrations.
- When the fan is operating, check the operating conditions: pressures, flows and consumptions.
- The joining of the characteristic curves of the fan and of the room it is very important, so that the flows and pressures supplied to the duct work will be the required ones.

ACHTUNG: VOR DER ÖFFNUNG DIESER PANEEL STROM ABSCHALTEN UND 2 MIN. WARTEN.

WARNING: BEFORE OPENING THIS PANEL SWITCH OFF THE ELECTRIC SUPPLY AND WAIT FOR 2 MIN.

ATTENTION: AVANT L'OUVERTURE DE CE PANNEAU COUPER L'ALIMENTATION ÉLECTRIQUE ET ATTENDRE 2 MIN.

ATTENZIONE: PRIMA DE APRIRE QUESTA PARETE INTERROMPERE L'ALIMENTAZIONE ELETTRICA E ASPETTARE 2 MIN.

ATENCIÓN: ANTES DE ABRIR LA PUERTA CORTAR LA ALIMENTACIÓN ELÉCTRICA Y ESPERAR 2 MIN.

V220086



Water-air packaged units

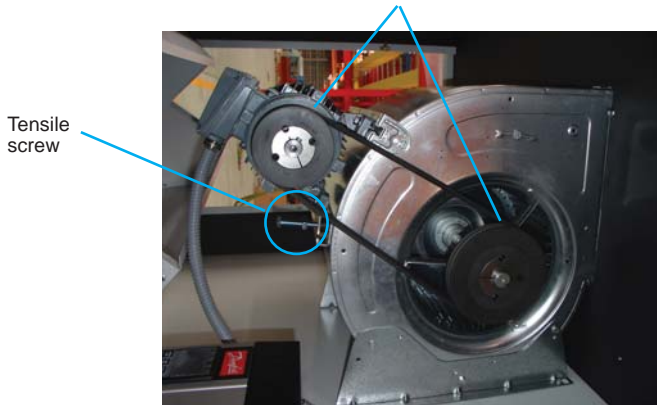
Belts and pulleys setting

The motorfans of the internal circuit from models 50 to 155, are driven by belts and pulleys.

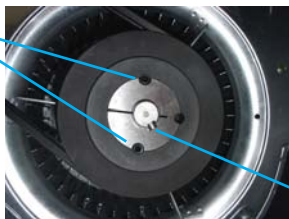
With this type of fans it should be taken into account:

- Pulleys should be on the same centreline axis, check by laying a ruler flat or a laser aligning tool.
- If they are not lined up, the screws of the pulley and the pulley will be removed, and after the moyu screw will be removed, this can slide on the axis (this action can be carried out both in the motor and in the fan).
- After pulleys alignment, the tension of the belt is carried out tightening the tensile screw.
- Belt tension should be checked after 24 running hours of the motor.

Keep the pulleys on the same plane



Tensile screw



Pulley screws

Taper key

Condensates drain connection

All models are provided of an internal condensates drain pan.

- Models 25: The pan incorporates a drain copper pipe of 22 mm outside diameter.
- Models 30 to 155: The pan incorporates a draining pipe, in bronze, M3/4" gas thread.

**CONNECT SIPHON
METTRE SIPHON
PONER SIFON**
V220014



Installation norms

- Check that the condensates outlet is not obstructed.
- All water drain pipes should be provided with a siphon to avoid bad odours and water overflows.

Carry out the assembly of the same one following the attached principle scheme:

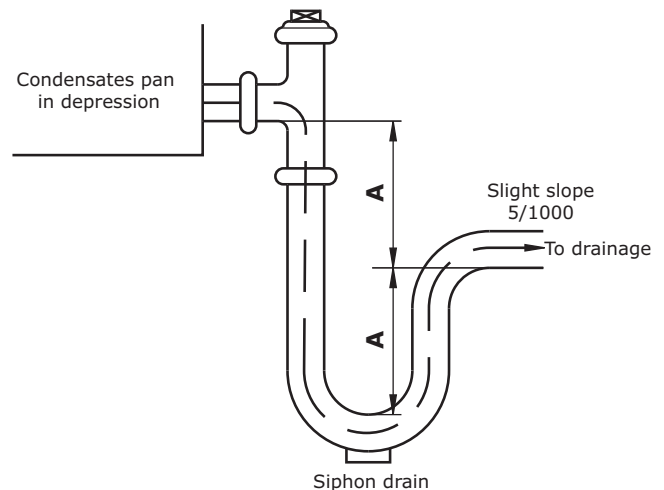
Pan in overpressure:

- It is installed to avoid the access for the pipe of bad odours.

Pan in depression:

- Besides the previous application, the water must be sucked from the pan.
- For the correct design of the siphon, the dimension "A" should be at least, the double of the depression (mm.w.g.) to which is the condensates pan.
- The drain pipe should be slightly inclined to facilitate the circulation toward the drainage.
- To control the drain it is recommended to insert a funnel in the pipelines toward the drainage.

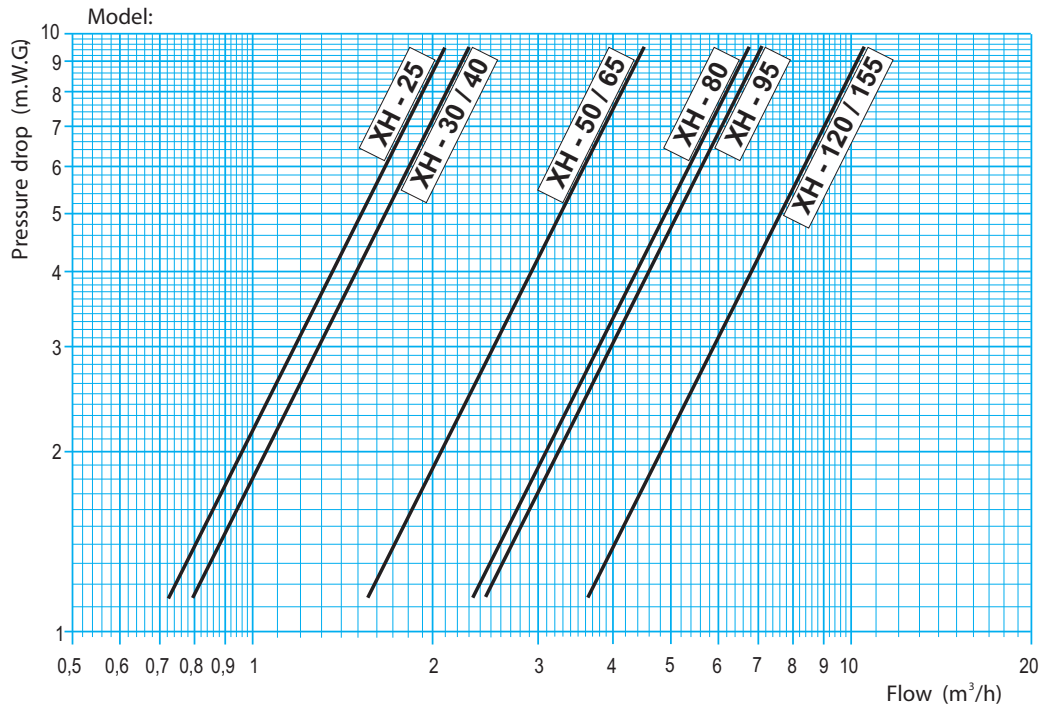
NOTE: The original diameter of the pipe should be respected. Reductions should not be carried out.



IMPORTANT: Check the watertightness of the connections.

Hydraulic connections

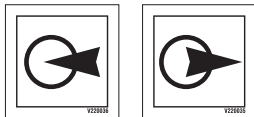
The hydraulic circuit design must respect the operating conditions (flows - pressure drops).



Installation hydraulic scheme:

Follow these recommendations:

- Respect the water flow direction indicated on the unit. The diameters of hydraulic connections can be consulted in the technical characteristics table.



- Pipes must be measured with the smaller number of curves to diminish pressure drops and must be adequately fitted to avoid force excessively the exchanger connections.
- Carry out a preliminar control to check that there are not pressure drops in the installation, before insulating pipes and load the system.
- Pipework must be carefully insulated to avoid condensation and waste. Be sure that it is a vapor barrier material. Otherwise cover the insulator with an appropriate protection.
- Avoid the possible transmission of vibrations or efforts of the pipes to the water exchanger.
- Flexible couplings are recommended for connecting pipework to the unit, in order to avoid possible transmission of vibrations, breakages and efforts in the unit or in the pipes. These couplings are compulsory when the unit is mounted on a frame or on antivibratory supports.

- Provide the necessary accessories for all hydraulic circuits: circulation pump, air vents, tapping at low points for draining, expansion vessel, safety valve, etc.
- Cut-off valves must be installed, near the components subject to maintenance, to isolate the component in maintenance phase and allow its substitution without having to unload the installation.
- Install, or at least anticipate the incorporation of thermomanometers at the inlet and outlet of the unit, that allow the supervision of the installation.
- **A filter must be mounted in the hydraulic fitting to the unit (for particles of $\varnothing > 1$ mm), to avoid the fouling of the plates exchanger (it can produce a decreasing of flow and consequently freezing problems and the breakage of the exchanger).**
- Water must be analyzed and the circuit must be made based on the results (consult with a specialist in water treatment) (see the section of reaction to corrosion).
- In installations of open circuit, if it is not possible to keep the water conditions within the values indicated on the corrosion reaction chart, it is necessary to install a exchanger that frees the circuit of the circuit of the treated water circuit, using compatible materials with those characteristics, stainless steels or titanium.
- The hydraulic circuits must be protected against freezing temperatures.

Reaction to corrosion

In the hydraulic circuit and specially in the plates exchangers, some corrosion problems can appear due to the water characteristics and its variation.

It is recommended that the filling water of the hydraulic circuits is filtered and treated.

The hydraulic circuit of the units is of copper tube. The exchanger plates are of AISI-316 stainless steel and copper the material used for plates welding.

The following table shows the reaction to corrosion for copper and AISI-316 stainless steel against water with different compositions:

Water content	Concentration (mg/l)	AISI 316	Copper
Organic substances		+	0
Electrical conductivity	< 500 µS/cm	+	+
	> 500 µS/cm	+	-
NH3	< 2	+	+
	2 - 20	+	0
	> 20	+	-
Chlorides *	< 300	+	+
	> 300	0	+
Sulphites, free of chlorides	< 5	0	+
	> 5	0/-	0
Iron in solution	< 10	+	+
	> 10	+	0
Free carbonic acid	< 20	+	0
	20 - 50	+	-
	50	+	-
Manganese in solution	< 1	+	+
	> 1	+	0
pH Value	< 6	0	+
	6 - 9	0/+	+
	> 9	+	0
Oxygen	< 2	+	+
	> 2	+	+
Sulphates	< 70	+	+
	70 - 300	+	0
	> 300	-	-

* Max. 60°C

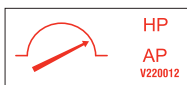
+ Good resistance under normal conditions.

0 There may be corrosion problems, particularly if another factors participate.

- Not advisable.

9. SAFETY ADVICES

High pressure pressostat



Connected in the compressor discharge, this will stop the compressor when the pressure on this point reaches the set point value. This pressostat disconnects at 29 bar. Automatic reset.



Caution: It goes threaded and without Schrader valve.

Low pressure pressostat



Connected in the compressor intake, this will stop the compressor when the pressure on this point decreases under the measured value (caused by cloggings in the circuit, excessive soiling in the filters, fan stop or frost in the evaporator). It disconnects at 0,5 bar. Automatic reset.

Magnetothermals for line protection

They are installed at the beginning of compressors (in models 50 to 155) and motor fans lines for their protection.

Anti-fire safety

The electronic control can activate an anti-fire safety device (in units with a return air probe) that detains the unit when the return air surpasses a temperature of 60°C. It cannot return to operation until the temperature has dropped to below 40°C.

Control circuit automatic switch

Magnetothermal switch which protects the circuit so much against continuous overcurrents as high short currents (shortcircuits).

Main door switch

By means of a mechanical locking it stops the access to the electrical panel when the unit is with voltage. Available in models 30 to 155.



Fans safeties

The fans have a built-in motor thermal protection device. This device protects the motor against overheating due to an overcurrent.

Water flow control

This device is installed in the water return to the unit (exchanger inlet), and its function is stop the unit when no water flow is detected (IXH models).

In model 25 the assembly of pressostat is made outside the unit.



Water anti-freeze protection

This safety is included in the electronic control.

The water anti-freeze fault takes place when the temperature of the outlet probe of plates exchanger is lower than the set value as safety 4°C. The manual reset is enabled if the temperature of this probe is higher than the set value as reset (7°C).

Anti-freezing safety

Electronic control with built-in safety, when the unit is operating in COOLING mode.

This safety is activated when, the internal freon temperature is lower than -1°C for a higher time than 10 minutes. It produces the stop of compressor and well pump. If the anti-short-cycle timing has lapsed, the reset is produced when the set safety T is reached (10°C).

10. OPTIONS

Two rows hot water coil

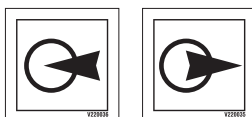
RXH - IXH		30	40M	40	50	65	80	95	120	155
Nominal air flow	(m ³ /h)	1.500	2.000	2.000	2.500	3.100	4.000	4.600	6.000	7.000
Heating capacity (water 80/60°C and air 21°C)	(kW)	17	20	20	21	23	33	35	51	56
Air pressure drop	(mm.W.G.)	4,5	7,0	7,0	3,2	4,5	3,7	4,6	3,5	4,5
Water pressure drop	(m.W.G.)	1,5	2,1	2,1	0,4	0,5	1,0	1,2	1,2	1,4

The assembly is carried out in the interior in models 30 to 65 and in duct for the rest of models.

- Coil filling:

- Coil filling should be carried out with the air vent open, until the water leaks, moment of closing it.
- Cut the water supply and thus the generated bubbles rise to the highest point of the coil, coincident with the air vent, and eliminate opening it.
- Introduce water in the circuit again and repeat the previous steps.
- Drive the water pump (provided by the installer) and repeat the previous steps until air noises are not listened in the pipe, at that moment the filling of the installation will have been completed correctly.

Note: Water flow direction must be correct for that it is convenient to follow these indications:



The installation of this hot water coil generates air pressure drops, for that reason it should be taken into account in the selection of fans (optional) or in the substitution of the standard pulleys kit by a new kit with a higher turn speed to the wheel.

Condensing pressure control

Condensing pressure control The condensing pressure control is carried out by a pressostatic valve, placed at the inlet of water to the plates exchanger and connected by a capillary tube to the compressor ischarge (high pressure).

For reversible units, it is necessary to install in parallel a solenoid valve for operating as heat pump. The assembly is carried out inside the unit, except in model 25.

This valve controls the water flow that accedes to the exchanger, to maintain the condensing pressure in the set point value. The manufacturing control is of 17 Bar.

11. COMMISSIONING

Checks prior to commissioning

- It is advisable to make a complete sketch of the installation including the location of the unit and all the components used. This will be very helpful for maintenance and repairs to the installation.
- Verify the absence of any leaks of the refrigerant.
- Check that the electrical power supply matches the unit voltage and that its value lies within acceptable limits.
- It must also be verified that the electric installation has been carried out according to the electric wiring diagram provided with the unit (consult the chapter on "Checking before commissioning").
- Once the above verifications have been carried out, the control circuit is supplied with voltage by the automatic control switch. It is necessary to leave with voltage the compressor crankcase heater for 24 hours before starting the compressor.

WICHTIG: WIEDERBEHEIZUNG DER OLWANNE

BEIDER ERSTEN INBETRIEBSETZTRUNZ ODER NACH EINER LANGEN STROMUNTER-BRECHUNG BRINGEN SIE DIE MASCHINE UNTER SPANNUNG 24 STRUNDE LANG BEVOR SIE DEN(DIE) KOMPRESSOR(EN) EINSCHALTEN KOENNEN.

IMPORTANT: CRANKCASE HEATING

FOR THE FIRST START OR AFTER A LONG TIME OUT OF VOLTAGE PUT THE MACHINE ON LIVE 24 HOURS BEFORE TO ALLOW THE COMPRESSOR(S) STARTING

IMPORTANT: SURCHAUFFE CARTER D'HUILE

AU PREMIER DÉMARRAGE OU APRÈS UNE ABSCENCE DE COURANT PROLONGÉE, METTRE LA MACHINE SOUS TENSION 24 HEURES AVANT D'AUTORISER LE DÉMARRAGE DU(DES) COMPRESSEUR(S).

IMPORTANTE: RISCALDARE IL CARTER DELL'OLIO

AL PRIMO AVVIAMENTO O DOPO UNA INTERRUZIONE PROLONGATA DELLA ALIMENTAZIONE ELETTRICA, LASCIARE LA MACCHINA SOTTO TENSIONE PER 24 ORE PRIMA DI AUTORIZZARE L'AVVIAMENTO DEL(DEI) COMPRESSORE(I).

IMPORTANTE: RECALENTAMIENTO DE ACEITE DEL CARTER

ANTES DEL PRIMER ARRANQUE O DESPUÉS DE UNA AUSENCIA DE CORRIENTE POR UN LARGO PERIODO DE TIEMPO, CONVIENE QUE LA UNIDAD ESTÉ CONECTADA UN MÍNIMO DE 24 HORAS.

V220084

- The filling of the hydraulic circuit is then carried out:
 - Open the water circuit valves and ensure that the water circulates around the exchanger with the pump in service.
 - Bleed the air in the hydraulic circuit.
 - Verify the operation of the water circulation controller and the cold/hot water control.
- When starting the compressor(s), check the undercooling and overcooling and thus verify is the refrigerant charge is appropriate to the operation conditions. To adjust the refrigerant charge, a schrader valve is available on the liquid line.

R 407C

V 220056
- When putting the hydraulic circuit into operation the water flow must be checked, verifying that the inlet and outlet water temperatures measured are within operating limits (see table of permitted temperature variations). Factory configuration:
 - Thermal jump: 5°C
 - COOLING mode operation: 30°C / 35°C
 - HEATING mode operation: 16°C / 11°C

Operational checks

Check the unit operation by verifying the electronic control and the safety devices.

It is also recommendable to create a report, taking note of the date, which includes the following information: the nominal voltage, current absorbed by the compressors, fans and other electrical components, significant temperatures in the cooling circuit (see table below) and other aspects considered interesting such as alarms detected by the electronic control of the unit.

Cooling MODE			Heating MODE		
Compressor	Suction pressure	bar	Compressor	Suction pressure	bar
	Suction temp. (1)	°C		Suction temp. (1)	°C
	Condens. pressure	bar		Condens. pressure	bar
	Condens. temp. (2)	°C		Condens. temp. (2)	°C
Water condenser	Gas inlet temperature	°C	Water evaporator	Liquid inlet temp.	°C
	Liquid outlet temp. (3)	°C		Gas outlet temp. (4)	°C
	Water inlet temp.	°C		Water inlet temp.	°C
	Outdoor temperature	°C		Outdoor temperature	°C
Air evaporator	Water outlet temp.	°C	Air condenser	Water outlet temp.	°C
	Air inlet temperature	°C		Air inlet temperature	°C
	Air outlet temperature	°C		Air outlet temperature	°C
	Liquid inlet temp.	°C		Gas inlet temperature	°C
	Evap. outlet temp. (4)	°C		Liquid outlet temp. (3)	°C
	Subcooling (2) - (3)	°C		Subcooling (2) - (3)	°C
Overheating (4) - (1)		°C	Overheating (4) - (1)		°C

The recording of these parameters whilst the unit is running allows controlling the installation performance and it is the best possible way to avoid breakdowns since the analysis of these data makes early detection of anomalies possible or the provision of the necessary means available to ensure that they do not take place.

Possible problems at commissioning

All indications given in this brochure must be respected and complied with to guarantee a correct operation of the units.

Next, several possible operation problems are stated which could happen if the conditions of the commissioning are not appropriate.

- Insufficient water flow. Very high temperature differences between water inlet into and outlet from the unit caused by:
 - Insufficient air bleeding.
 - Small water circulation pump or anti-clockwise rotation.
 - Other situations which may prevent correct water circulation.
- Air flow lack: very high temperature differences between inlet and outlet, originated by a high pressure drop in the ducts, or by other causes that impede the correct air circulation.
- Air recirculation in the unit, originated by some obstacle in the air aspiration or outlet.
- Noise problems because of excessive air flow in the grille.
- Water overflowing to the pan problems, originated by an excessive flow, an incorrect siphon installation or because a defective unit level.

12. MAINTENANCE

The minimal maintenance operations and their periodicity will be made according to the national regulations.

Any intervention on the electric cooling components must be made by a qualified and authorized technician.



Caution: Before intervening in the unit, cut off main power.

Recommendations:

In general, a corrosion control must be performed on the metallic parts of the unit (frame, bodywork, exchangers, electric panel, etc.). The electric connection states must also be checked as well as the air tightness of the different circuits.

Some recommendations are given below for the cleaning and maintenance of the unit components:

Air coil

- Check that the coil is free from dust and grease.
- Cleaning the accumulated dust on the coil can be performed with a vacuum cleaner perpendicular to the fins or with a low-pressure water cleaner. Grease can be removed with water with degreaser. Do not put stress on the fins as they could deform.

Condensates drain pan

- Check that the condensates pan is clean. There should be no stagnant water.
- Check that the drain is not clogged.
- Cleaning of the pan can be done with water and non-abrasive detergent.

Centrifugal fan

- Verify that the turbine and the motor remain clean.
- Foresee having a spare belt set for the fans.
- The motors and the fans have bushings that have been lubricated and sealed and, thus, do not need further lubrication.

Dehydrant filter

- The filter function is to preserve the cooling circuit clean and without humidity, neutralizing the acids that can be found in the cooling circuit. Verify dirt measuring the difference in temperature at the tubing level, at the inlet and at the outlet of the dehydrant.
- If necessary, replace.

Oil

Both the oil type as well as the volume needed for each model are stated in the characteristics table in chapter 3.

- Check the oil level and aspect. In case of a colour change, check the oil quality using a contamination test.
- In the case of the presence of acid, water or metallic particles, replace the affected circuit oil, as well as the dehydrant filter.
- In the event of an oil charge change, only new oil will be used, which will be identical to the original oil and taken from a can tightly closed until the moment of the charge.

Refrigerant

Qualified personnel must perform a periodic control to air tightness depending on the refrigerant charge, in accordance with the regulation (CE) N° 842/2006.

Note: Never forget that the cooling systems contain liquids and vapours under pressure.

- All necessary precautions must be taken during the partial opening of the cooling circuit. This opening entails the discharge of a certain amount of refrigerant to the atmosphere. It is essential to limit to its minimum this amount of lost refrigerant by pumping and isolating the charge in some other part of the circuit.
- The liquid refrigerant at low temperature can cause inflammatory injuries similar to burns when contacting the skin or eyes. Always use protection glasses, gloves, etc. when opening ducts that may contain liquids.
- The refrigerant in excess must be stored in appropriate containers and the amount of refrigerant stored at the technical rooms must be limited.
- Refrigerant barrels and deposits must be handled with precaution and visible warning signs must be placed to attract attention over the risks of intoxication, fire and explosion linked to the refrigerant.
- At the end of its useful life, the refrigerant must be retrieved and recycled as per the current regulations.

Plates exchanger

- The exchangers are fitted with thermal insulation. Check that the foam is not unstuck or broken.
- The water quality and the pressure drop must be verified at the exchanger level. After verifying the mesh filter condition, if necessary, the exchanger must be cleaned. To this end, a weak solution of phosphoric acid 5% must be circulated using the high pressure pump. During optimum cleaning, the cleaning solution flow must, as a minimum, be 1.5 times the working flow preferably in the inverse circulation mode. This must be followed by thorough rinsing with water to remove any acidic residues. It is advisable to circulate a solution 1%-2% of sodium hydroxide prior to the last rinsing in order to ensure that the acid has been neutralised.
- Any repair or modification to the plate exchanger is prohibited. It can only be replaced by an original part.



Water-air packaged units

Follow these steps to accede to the different elements of units for cleaning and maintenance operations:

Air filter extraction

- Firstly, put the door switch in O position (in models 30 to 155).
- In these units, the extraction of filter for maintenance operation is lateral. Simply, it is carried out the unblocking of the stop-pieces that fit the filter and it is removed.



Recommendations:

- Clean it regularly. Depending on the installation conditions, the state of the filter should be checked to define cleaning periodicity.
- Clean the filter with a vacuum cleaner or wash with water.

Condensates drain pan

All models are provided of an internal condensates drain pan. Over the pan outlet the following sticker appears:

**CONNECT SIPHON
METTRE SIPHON
PONER SIFON**
V220014



Recommendations:

- Check that the condensates drain pan is clean and that there is not stagnant water.
- Revise that the drainage is not obstructed.
- Wash the pan with water and non abrasive detergent.

Access to electrical panel

- Firstly, put the door switch in O position (in models 30 to 155).
- Later, unscrew the screws that fix the door of the electrical panel, in which the following sticker appear:

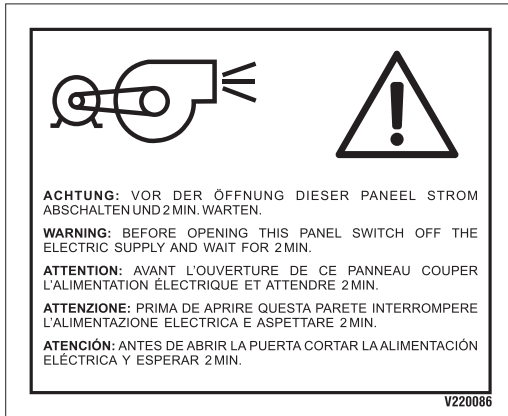


- Remove the door with the help of a handle (in models 80 to 155):



Access to centrifugal fans

- Firstly, put the door switch in O position (in models 30 to 155).
- Later, unscrew the screws that fix the door in which the following sticker appear:



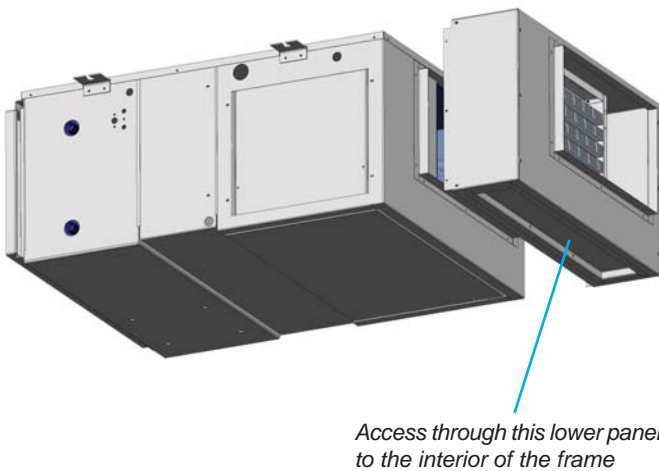
Recommendations:

- Verify that the turbine and that the motor are clean.
- For models 50 to 155, provide a spare belt set for fans.
- The motors and fans have bearings that have been lubricated and sealed and therefore they do not need more lubrication.

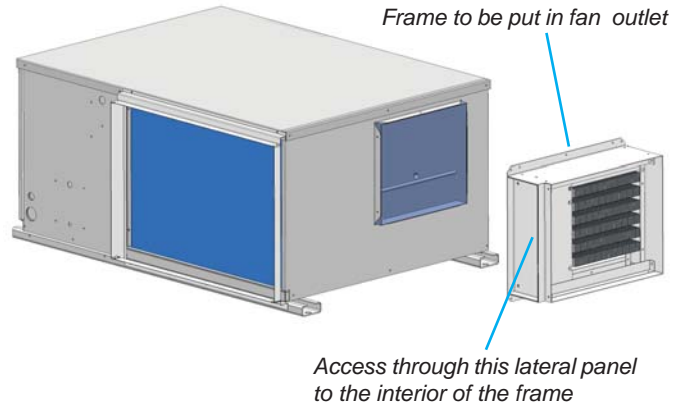
Access to electrical heaters

An optional electrical heater can be connected in the discharge for XH units, as the following drawings show:

Model XH - 25

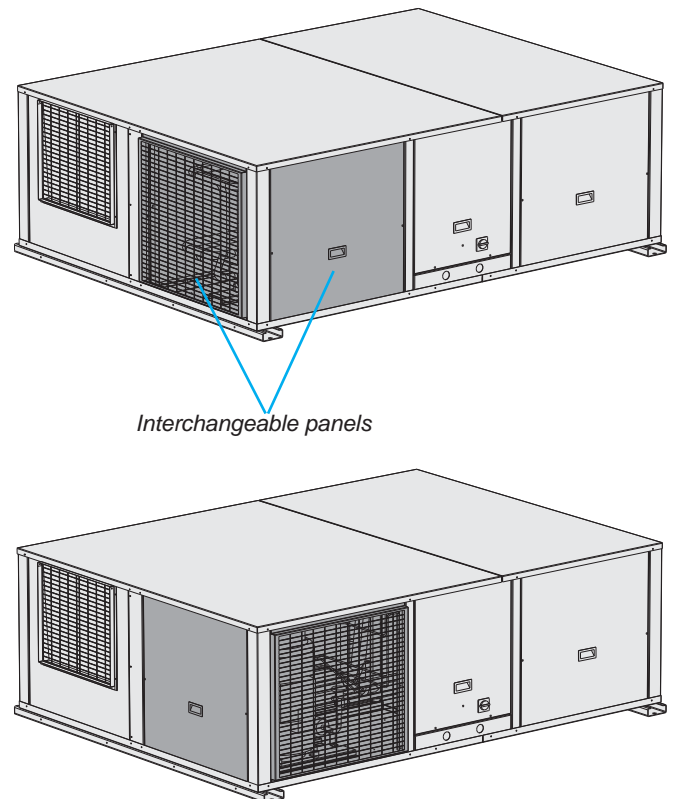


Models XH - 30 to 155



Change of location of the air return panel

For models 80 to 155, the return panel can be located in any of the two positions indicated in the following drawings, since both panels are easily interchangeable, with the purpose of leaving it in work for whatever installation.



13. CONTROL AND ANALYSIS OF BREAKDOWNS

Symptom	Cause	Solution
Evaporation pressure very high in relation with the air or water inlet	<ul style="list-style-type: none"> a) Charge excess b) Elevated air or water temperature c) Compressor suction not air tight d) Cycle reversing valve in middle position 	<ul style="list-style-type: none"> a) Collect refrigerant b) Verify overheating c) Verify compressor state and replace d) Check that the valve is not clogged. Replace if necessary
Very low condensation pressure	<ul style="list-style-type: none"> a) Gas lack b) Compressor suction not air tight c) Cycle inversion valve in middle position d) Liquid circuit plugging 	<ul style="list-style-type: none"> a) Search for leaks, complete charge b) Verify compressor state and replace c) Check that the valve is not clogged. Replace if necessary d) Verify the dehydrating filter and expansion valve
Condensation pressure very high in relation to the air or water outlet, high pressure pressostat cut-off	<ul style="list-style-type: none"> a) Air or water flow insufficient b) Air or water inlet temperature very high c) Dirty condenser (does not exchange) d) Much refrigerant load (flooded condenser) e) The pump or condenser fan is broken down f) Air in the cooling circuit 	<ul style="list-style-type: none"> a) Verify the air or water circuits (flow, filter cleanliness etc.) b) Verify the control thermostat readjustment c) Clean it d) Collect refrigerant e) Repair f) Make vacuum and load
Evaporation pressure too low (low pressostat cut-off)	<ul style="list-style-type: none"> a) Low flow in evaporator. Air or water recirculation b) Liquid line as different temperatures at filter inlet and outlet c) Gas lack d) Very low condensation pressure e) Evaporator fan broken down 	<ul style="list-style-type: none"> a) Verify the air circuits (flow, filter cleanliness...) b) Replace filter c) Search for leaks, complete charge d) Temperature of air or water in condenser very low (air or water flow very high), adjust flow e) Repair
Compressor does not start, does not make noise (humming)	<ul style="list-style-type: none"> a) No power b) The contacts of a control element are open c) Timing of anti cycle short does not allow the starting d) Open contact e) Contactor coil burnt f) Indoor Klixon open 	<ul style="list-style-type: none"> a) Check differential, fuses b) Verify the safety chain of the electronic control c) Verify electronic control d) Replace e) Replace f) Wait for reactivation, verify intensity absorbed
Compressor does not start, motor sounds intermittently	<ul style="list-style-type: none"> a) Electrical power supply very low b) Power cable disconnected 	<ul style="list-style-type: none"> a) Control line voltage and locate voltage drop b) Verify connections
Repeated compressor starts and stops	<ul style="list-style-type: none"> a) Because of high pressure b) Control differential too short (short cycle) c) Insufficient gas, cut-off because of low pressure d) Dirty or frosted evaporator e) The evaporator fan or pump does not work, cuts off the low pressostat f) Expansion valve damaged or clogged by impurities (cuts off low pressostat) g) Dehydrating filter clogged (cuts off low safety) 	<ul style="list-style-type: none"> a) Verify charge b) Increase differential c) Search for leak, reload unit d) Clean, verify evaporator air circuit e) Replace or repair f) Replace, as well as filter g) Replace
The compressor makes a noise	<ul style="list-style-type: none"> a) Loose attachment b) Oil lack c) Compressor noise 	<ul style="list-style-type: none"> a) Fix b) Add oil to recommended level c) Replace
Noisy operation	<ul style="list-style-type: none"> a) Unit installed without antivibration protection 	<ul style="list-style-type: none"> a) Place base over shock absorbers
Cycle reversing is not carried out	<ul style="list-style-type: none"> a) Electrical fault b) Inversion valve coil defective c) Cycle inversion valve in middle position d) Control fault 	<ul style="list-style-type: none"> a) Locate and repair b) Replace c) Tap with running compressor Replace if necessary d) Locate and repair
Alarm or reading error in the humidity probe (with AVANT PRO enthalpic electronic control)	<ul style="list-style-type: none"> a) Dirt in the humidity sensor 	<ul style="list-style-type: none"> a) Disassembly the probe capsule b) Proceed to clean the sensor with some soft cotton element and non-abrasive fluid, without pressing it c) Reassemble the casing, checking that the cable is in contact externally with the metallic mesh

