

EMIBYTE

DIRECT EXPANSION WATER CONDENSED CLOSE CONTROL UNITS

DXi.H

WITH INVERTER COMPRESSORS

DXi.HF

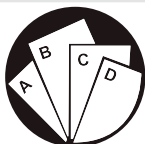
WITH INVERTER COMPRESSORS
AND ADDITIONAL FREE-COOLING COIL
(Dual fluid, indirect free cooling)



USE AND MAINTENANCE TECHNICAL MANUAL

The instructions unit manual is composed by the following:

- Conformity declaration
- Technical Manual



Instructions:
Referring to the specify



Read and understand all
the present Manual before
any intervention.

PRESERVE THE PRESENT FOR FUTURE

The copy, transmission or memorization of the present Manual is forbidden in any form without the written authorisation from the Manufacturer.

The Manufacturer could be contacted to receive any information about his products.

The Manufacturer works in a constant policy of products development and reserves the right to modify his products, the specifics and the instructions about use and maintenance without any prior notice.

Conformity declaration

We declare under our responsibility that the supplied units comply in every part with the directives of the CE marking and the current EN standards. The Conformity declaration is attached to the onboard documentation. Be informed that the unit contains fluorinated greenhouse gases.

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1. INTRODUCTION

1.1 Preliminary information

The copy, transmission or memorisation of the present Manual is forbidden in any form without the written authorisation from the Manufacturer.

The unit which the present Manual refers is designed only for the uses presented in the following pages, comply with their performances and characteristics. Any contractual or extra-contractual liability of the Manufacturer for damages caused to people, animals, things or environment made by installation, regulation, maintenance errors or improper uses are excluded

All the uses not mentioned in the present Manual are not allowed.

The present documentation is an informative support and has not to be considered as a contract with third parts.

The Manufacturer works in a constant policy of products development and reserves the right to modify his products, the specifics, the instructions and also the documentation in any moment without any prior notice

1.2 Instructions content and purpose

The present instructions purpose to give all information concerning the selection, installation, use and maintenance of the units.

The instructions are written in conformity with legislative disposition of UE and to the technical available norms.

The instructions including the indication to avoid reasonably foreseeable improper uses of the units.

1.3 Instruction conservation

The instruction must be posed in a proper place, away from dust, humidity and where every person in charge to use and operate with the unit could find them easily

The instruction has to be always on board and during all the life cycle of the unit, therefore has to be transferred to every subsequent user

1.4 Instruction updating

Is suggested to verify that all the instructions are updated to the last release available.

Any updates sended to the user must be kept attached to the present Manual.

The Manufacturer is available to provide any information about use of his products.

1.5 Instruction use



The present instructions are integral part of the unit which are referred.

The users and operators have to consults mandatory the instructions before any intervention on the units and in every occasion of doubt about the transport, the handling, the installation, the maintenance, the use and the disposal of the unit.



In the following are mentioned all the graphic symbols which indicate all the operation has to be safety done

1.6 Residual risks

The units are designed to reduce at minimum the risk for the people who will use them.

Anyway is impossible to eliminate completely the risk, so is strictly necessary refers to the following prescription in order to avoid them at the maximum.

ELEMENTS CONSIDERED (if presents)	RESIDUAL RISK	MODE	PRECAUTIONS
Exchanger coils	Small cutting wounds	Contact	Avoid the contact, use protective gloves.
Fans and grid fans.	Injury	Insertion of tools through the fans grid during the fans operation	Do not insert any tools throught the fans grid during their operation
Inside unit: compresors and discharge gas pipes	Burns	Contact	Avoid the contact, use protective gloves
Inside unit: metallic components and electrical cables.	Electrocution, several burns	Power supply cables insulation defect, electrical tension on metallic components.	Adequate supply line electrical protection; utmost care making the metallic parts ground connection.
Outside unit: Area around the unit	Intoxicaions, several burns	Fire due to short-circuit or overheating of the power supply line upstream of the unit's electrical panel	Section of the cables and protection system of the power supply line complying with the standard in force
High pressure safety valve (if present)	Intoxications, several burns, hearing loss	High pressure valve intervention with the cooling circuit panel open	Avoid opening the refrigeration circuit compartment as much as possible; carefully check the value of intervention of the condensation pressure valve; use all the high pressure personal protection safety devices required by law. Use all the personal protection devices required by law. PPE must also protect against gas leakage from the safety valve. The discharge of these valve is director to prevent damage to people or things.
Unit	Burst, injuries, burns, poisoning due to external incense.	Fire due to natural disaster or combustion of elemets adjacent to the unit.	Prepare the necessary fire-fighting equipment and / or adequate signals indicating that the uniti s under pressure
Unit	Burst, injuries, poisoning, electrocution due to natural disasters, earthquake	Breaks, sagging for natural disasters or earthquake	Prepare the necessary precautions, both electrical (adequate thermal magnetic circuit breaker and electrical protection of the power supply lines; treatment for maximum calamity when connecting the metal parts to earth, and mechanical (for example special antisismic anchors or anti-vibration dampers to avoid cause accidentals breakages or falls).

1.7 Safety symbols generality

ISO 3864-2 complied safety symbols :



PROHIBITION

Black symbol inside a red circle with red diagonal indicates a forbidden action.



ADVISE

A black graphic symbol inside a yellow triangle with black edges indicates a danger.



MANDATORY ACTION

A white symbol inside in a blue circle indicates a mandatory action to avoid a risk.

ISO 3864-2 complied Combined safety symbols:



The advise graphic symbol is completed with additional safety information (text or many symbols).

1.8 Safety symbols



GENERIC DANGER

Follow strictly all the advises near the symbol.
Failure to follow the indications could generate user health risks.



ELECTRICAL DANGER

Follow strictly all the advises near the symbol.
The symbol indicates unit components or, in the present Manual actions could generate electrical risks.



MOVING COMPONENTS

The symbols indicates unit's moving components could generate risk situations.



HOT SURFACES

The symbols indicates unit's components could be very hot and that could cause several burns.



SHARP SURFACES

The symbol indicates unit components could cause cutting wounds by contact.



GROUND CONNECTION

The symbol indicates the unit's ground connection point.



READ AND UNDERSTAND TEH INSTRUCTIONS

Read and understand the instruction before any intervention on the unit



RECOVERABLE OR RECYCLABLE MATERIAL

1.9 Unit limit and not allowed uses

Units are designed and produced exclusively for the uses described in the paragraph "Use limits" of technical Manual. Any other use is forbidden because could generate user health risks.



The unit is not suitable to operate in environments:

- Excessively dusty or potentially explosive;
- Where are present vibrations;
- Where are present electromagnetic fields;
- Where are present aggressive ambients.

1.10 Unit identification

Every unit has a plate which contains its main information. The plate data could be different from the technical Manual because in the Manual are mentioned the standard unit data without any accessory.

On the Serial number plate is also mentioned the refrigerant charge.

For the non mentioned electrical information refers to the Wiring diagram attached to the present Manual.

Following a FAC-SIMILE of the plate.

TEL.+39 0543495611 FAX+39 0543 495612 Via A.Volta 49 Meldola FC ITALY							
MODELLO MODEL MODÈLE MODEL	<input type="text"/>	ANNO DI COSTRUZIONE / PED CATEGORIA MANUFACTURE YEAR / PED CATEGORY ANR VON KONSTRUKT / PED KATEGORIE ANNI DE FABRICA / CATEGORIE PED					
		2018					
MATRICOLA SERIAL NR N°DE SERIE STAMM NR	<input type="text"/>	CORRENTE MAX. MAX CURRENT INPUT MAXIMALEN STROM AMPÈRES MAXIMALE					
		A					
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C1	C2	Kg. Ton					
C1	C2						
GAS REFRIGERAN REFRIGERANT RFRIGÉRANT KALTEMITTEL	R 410A / 2088	ASSORBIMENTO ELETTRICO NOMINALE PUISSANCE ÉLECTRIQUE NOMINALE NOMINAL ABSORBED POWER NOMINALE LEISTUNGSANNAHME					
		kW					
PESO OPERATIVO OPERATING WEIGHT POIDS OPERATION ARBEITSGEWICHT	Kg.	CORRENTE CORTOCIRCUITO SHORT CIRCUIT CURRENT COURANT COURT-CIRCUIT STROM KURZSCHLUSS					
		10 kA					
LATO BASSA PRESSIONE / LOW PRESSURE SIDE CIRCUIT BASSE PRESSION / NIEDERDRUCKSEITE		LATO ALTA PRESSIONE / HIGH PRESSURE SIDE CIRCUIT HAUTE PRESSION / HOCHDRUCKSEITE					
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- "apparecchiatura che contiene gas fluorurati ad disciplinati dal protocollo di Kyoto"		effetto serra					
- "equipment that contains fluorinated greenhouse covered by the Kyoto protocol"		gases					
- "équipement qui contient des gaz fluorés à effet couverts per le protocole de Kyoto"		de serre					
- "Maschine die enthalt fluorierte Treibhausgase en durch das Kyoto-protokoll fallen"		thalt					



THE PLATE HAS NOT TO BE MOVED FROM THE ORIGINALLY POSITION

2. SAFETY

2.1 Advise about toxic substances potentially dangerous

2.1.1 Used fluid identification: R410A

- Difluoromethan (HFC-32) 50% weight CAS No.: 000075-10-5
- Pentafluoroethan (HFC-125) 50% weight CAS No.: 000354-33-6

2.1.2 Used oil identification:

The oil used into the unit cooling circuit is polyester type. Anyway refers always to the compressor's plate.



For any information about refrigerant or oil characteristics please refers to Safety Schede which is possible to find to their Producers.

Main ecological information about cooling fluids used.



ENVIRONMENT DEFENCE: Read carefully the following ecological information and instructions.

2.1.3 Persistence and degradation

The cooling fluids used decompose at the inferior atmosphere (troposphere) relatively quickly; decomposed they are highly dispersible so the concentration will be really low. They don't influence the photochemical smog and are not included in volatile organic compounds VOC (UNECE agreement).

Used refrigerants don't damage the ozone layer, there are regulated by the Montreal protocol (1992 release) and the CE 2037/200 of 29/06/2000 regulation.

2.1.4 Effects on effluents treatment

The release into the atmosphere of these products do not cause lon-term water contamination

2.1.5 Individual exposing and protection control

Is suggested to use clothes and protective gloves; is reccomended to always protect face and eyes.

2.1.6 Professional limit esposing

R410A

HFC-32 TWA 1000 ppm

HFC-125 TWA 1000 ppm

2.2 First AID and injuries prevention



The users and maintenance technicians has to be well informed about risks of toxic potentially fluids. Failure to observe the mentioned indications could cause damages to people or to unit.

2.2.1 High quantity steam inhalation

The atmospheric refrigerant concentration has to be minimum reduced (lower than overmentioned professional exposition limit). Be informed that the steam is heavier than air so high concentrations can stay near the ground, where the general ventilation is low, it is suggested to ensure an adequate ventilation in order to avoid it.

Avoid contact with free flames and hot surfaces because toxic and irritating decomposition products can be formed.

Avoid contact between the liquid and the skin or the eyes.

2.2.2 Accidental refrigerant leak procedures

During the cleaning operation be sure to have the adequate safety protection (using respiratory breathways protections)

If the conditions are sufficiently safe, isolate the leak source, if the leak is limited leave the evaporation refrigerant free ensuring a good ventilation.

Otherwise if the leak is large ensure a good ventilation, contain spilled material with sand, earth or other suitable absorbent material; prevent that the refrigerant enter into drains, sewers, basements or work holes in order to avoid suffocating vapors formation.

2.3 Toxic information about the refrigerant fluid used

2.3.1 Inhalation

A great atmospheric concentration can cause anesthetic effects combined with loss of consciousness. Long expositions can cause abnormal heart rhythm and even sudden death.

More elevated concentrations can cause asphyxia for reduced oxygen content in the air.

2.3.2 Skin contact

Splashes of sprayed refrigerant can cause frost burns. It is unlikely to be dangerous due to skin absorption; Prolonged and repeated contact may cause removal of skin fat, dryness and dermatitis.

2.3.3 Eyes contact

Splashes of sprayed refrigerant can cause frost burns.

2.3.4 Ingestion

Highly unlikely but can cause frost burns.

2.4 First AID measures



Follow strictly the following advises and the first AID procedures.

2.4.1 Inhalation

Remove injured person from the source of exposure, keep him warm and at rest. If necessary administer some oxygen; practice artificial respiration if breathing has stopped or any signs of stopping occurs.

If there is cardiac arrest perform cardiac massage; request medical assistance

2.4.2 Skin contact

In case of skin contact wash immediately with warm water; if necessary thaw the epidermal tissue with water. Remove contaminated clothing which can stick to skin in case of frost burns. If there is irritation or blistering, request medical assistance.

2.4.3 Eyes contact

Wash immediately with eye washing solution or with clean water, keep eyelids open for at least two minutes; request medical assistance.

2.4.4 Ingestion

Do not induce vomiting, if the injured person is conscious rinse mouth with water and allow 200-300 ml of water to be drunk; request medical assistance.

2.4.5 Further medical treatment

Symptomatic treatment and supportive therapy as indicated; do not administer adrenaline and sympathomimetic drugs as a result of exposure, due to the risk of cardiac arrhythmia.

3. TECHNICAL CHARACTERISTICS

3.1 Unit description

Close control units are designed and produced in compliance with 9001:2015 ISO norms for technological plants of conditioning, data center, for UPS and all the ambients where are needed special conditions and a strictly control.

The units are suitable for internal installation. The units are built with the most advanced industry technology, including variable speed compressors equipped with brushless permanent magnets (BLDC) and fans with electronic commutated motor (EC).

BLDC compressors are driven by an inverter with 0-10V signal sent by the controller; they are able to vary the load continuously and the cooling circuit regulation easily fits to operating conditions required. EC centrifugal fans allow the continue speed regulation using an analogic 0-10V signal sent from the controller; thanks to technology used the fans ensure reduced absorption compared to traditional centrifugal fans allow to adjust the air flow to the system required prevalence.

Emibyte presents the following direct expansion configurations:

- Up configuration (U) (suction air from the front and discharge to the top of the unit);
- Vertical configuration (V) (suction air from the bottom and discharge to the top of the unit);
- Down configuration (D) (suction air from the top and discharge to the bottom of the unit).
- Bottom configuration (B) (suction air from the back and discharge to the top of the unit).

This diversification can satisfy almost every customer's request from management point of view and the air flow rate.

3.1.1 BLDC scroll or rotary hermetic compressor type

All the models are provided with a BLDC hermetic compressor (with brushless permanent magnets motor) rotary or scroll type, suitable for functioning with R410a refrigerant.

Each compressor is installed on a rubber-type vibration dampers and are equipped with:

- Oil carter, where the crankcase heater is installed (only Scroll);
- Thermistor included protection for the overloads;
- Polyester oil charge.

The compressor's terminal board has IP54 protection. Starts and stops of compressors are directly managed by the unit controller which in this way modulates the cooling capacity. For rotary type compressors an equalization pressure valve is provided.

3.1.2 Frame

The modular structure of this equipment is made up of press-formed section in galvanized sheet elements painted with a RAL 9004 epoxy powder cycle. The elements are assembled together to make up a sturdy frame, capable of supporting units parts and to sustain strain which may derive from unit handling and operation. The devices are arranged inside the frame in a way that they are easy to reach from the front, to make necessary handling during unit operation and easier and more safety maintenance.

3.1.3 EC Radial fans

The units are supplied with backward curved blades radial fans in composite material equipped with high efficiency brushless EC motor. The electric motor is suitable to be used at a variable rotation speed managed using the controller with 0-10V signal. The blades, with a backward profile, specifically designed to maximize the efficiency and reduce sound emission, are directly coupled with the electronically commutated motor equipped with internal thermal protection.

For further details on controlling the EC fans (rate calibration and static counter-pressure) please refer to the Microprocessor's Manual.

3.1.4 Direct expansion coil with hydrophilic treatment

The cooling coil has been designed with a great front surface in order to have an high SHR (Sensible Heat Ratio) and a low airflow speed in order to avoid the condensate to detach, to reduce air pressure drop and to guarantee an higher efficiency of the heat exchange both during the cooling and the dehumidification process. The coil is made up of copper tubes mechanically expanded on hydrophilic treated aluminium fins, treatment that allows to reduce the surface tension between water and metal surface, providing a film condensation and avoiding the drain of condensate outside the drip tray. The drip tray is made up of painted and galvanized sheet or in peraluman (aluminium and magnesium alloy). All the coils are factory tested and cleaned before their installation by the Manufacturer.

3.1.5 Direct expansion coil with hydrophilic treatment (Only DXi.HF)

The cooling coil has been designed with a great front surface in order to have an high SHR (Sensible Heat Ratio) and a low airflow speed in order to avoid the condensate to detach, to reduce air pressure drop and to guarantee an higher efficiency of the heat exchange both during the cooling and the dehumidification process.

The coil is made up of copper tubes mechanically expanded on hydrophilic treated aluminium fins, treatment that allows to reduce the surface tension between water and metal surface, providing a film condensation and avoiding the drain of condensate outside the drip tray. The drip tray is made up of painted and galvanized sheet or in peraluman (aluminium and magnesium alloy).

All the coils are factory tested and cleaned before their installation by the Manufacturer.

Indirect Water based Freecooling

Thanks to the double coil (Freecooling water and Direct Expansion) the unit provides the highest saving match with full availability of the DX solution.

The usage of Free cooling coil and the BLDC Inverter compressor allows maximizing the saving in mixed mode operation, so whenever the freecooling is not able to fully take the load the compressors can work just to complete the missing cooling needs.

Therefore Emicon DXI-HF can provide extremely high energy saving granting the highest availability of the application.

3.1.6 Electrical board

The unit electrical board is in compliance with the European regulations in force and has been realised inside a metal compartment:

The main characteristics are the following:

- Three phase power supply 400/3/50+N+PE on all units, unless different special requests are demanded;
- Auxiliary circuit in low voltage 24Vac with isolation transformer;
- Main switch (mechanical interlock is an optional);
- Terminal board for signal and control free contacts;

In this compartment, which access is allowed by a main switch, contains moreover the following main devices:

- Contactors;
- Transformers;
- Numbered conductors;
- Low tension auxiliary circuits;
- Terminal boards;
- Electronic cards to manage and control.

All units undergo a safety cycle with continuity test on protection conductors, insulation resistance and withstanding test. The unit control is managed by controller program installed on the Microprocessor onboard.

3.1.7 Plate Heat Exchanger

The plate heat exchangers are brazed plate type, asymmetrical channels, and made of AISI 316 stainless steel.

The use of this type of exchangers reduces the refrigerant gas charge of the unit in comparison with standard models, allowing a reduced pressure drop at water side and high coefficient of heat exchange. All Emibyte heat exchangers are factory insulated using closed cell material.

3.1.8 Controller

The unit manage electronic controller is installed in the electrical board and it has the cooling capacity regulation control through the air temperature measure (evaporator inlet-outlet double check), operation parameters check, equalizer and hour counte (options), troubleshooting autodiagnosis, alarm log memorization, switch on time and set point value programming, remote control of the unit using the standard communication protocols installed in the Microprocessor.

3.1.9 Frequence converter (inverter)

All the models are provided with an inverter able to manage the compressors with permanent brushless magnets BLDC.

The inverter wollows the CE norm and is equipped with integrated EMC filter C3, control panel and cooling fan.

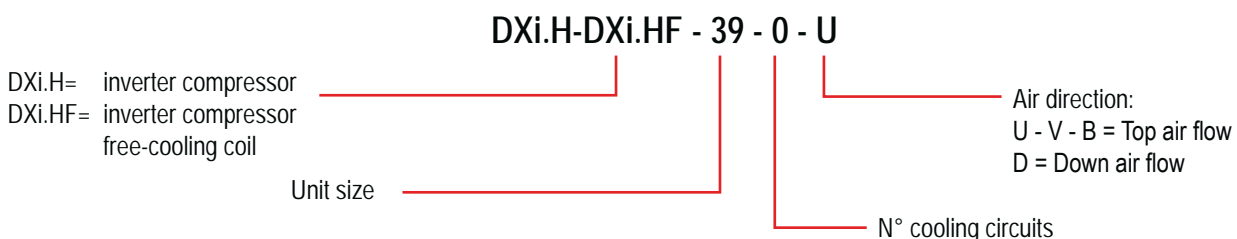
3.1.10 Tests

Once the unit s complete, the cooling circuiti s completely tested (following the Manufacturer Warraty procedures) to a pressure and leak test to find any losses.

Before the delivery the unit is subjects to a complete functional test.

3.1.11 DXi.H and DXi.HF nomenclature

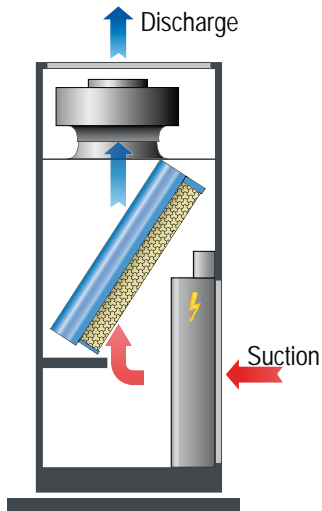
Following is shown the unit name meanings:



3.2 Configurations

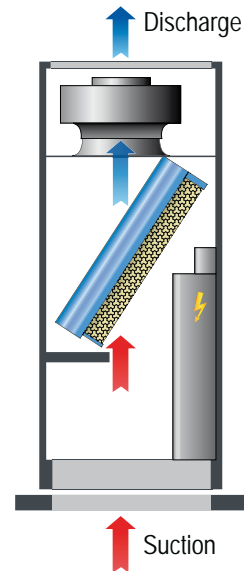
DXi.H-DXi.HF - U

Front suction
Up discharge



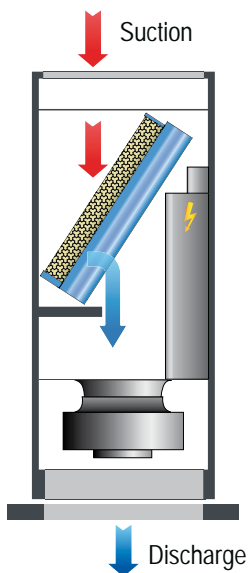
DXi.H-DXi.HF - V

Down suction
Up discharge



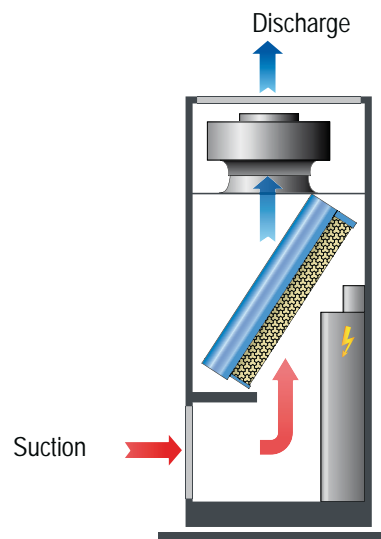
DXi.H-DXi.HF - D

Up suction
Down discharge



DXi.H-DXi.HF - B

Behind suction
Up discharge



3.3 Accessories description

- AA Flooding alarm:** Water sensible probe, is already wired by Manufacturer. This option has to be installed under the unit by the unit installation technicians.
- AE Electrical power supply different from standard:** Manily, 230V three phase, 460V three phase, with 50/60Hz of frequency.
- AL Smoke alarm:** Smoke sensible probe installed inside of the unit which activate an alarm in case of smoke presence which stops the fans and compressors.
- B Basement:** Suitable for installation on raised floors, it can be regulate from 170mm to 600mm. It is provided with adjustable feets.
- BAS Baseframe for lateral connections.**
- BC Hot water coil:** One or two-row water coil, placed after the cooling coil to re-heating and/or the heating of treated air; provided with modulating actuator and with three-way valve and controlled by the on board microprocessor. This option has the priority when requested with the electric heaters (RE option) (not available for DXi.HF).
- BG Hot gas coil:** One pr two-row water coil, placed after the cooling coil to re-heating of treated air; provided with three-way valve (ON/OFF type) and controlled by the onboard microprocessor (not available for DXi.HF).
- DH Dehumidification control system:** Composed by a humidity probe.
- DP Double panels:** Internal panels for closing the compartments affected by the air flow made with profiles in galvanized pre-painted sheet steel, which allow the reduction of the noise transmitted through the paneling and a better air tightness even without external panels; it allows the unit operation also during maintenance operations with the panels removed, such as filter replacement.
- EPM6, EPM7 Air filter options:** Flat efficiency filters ePM10 80% and ePM1 50% supplied as an option as an alternative to standards ones.
- FR Spare filters kit COARSE 60%:** in alternative to to standard ones.
- FRM6 Spare filters kit:** ePM10 80%.
- FRM7 Spare filters kit ePM1 50%.**
- H Humidifier:** Immerse-electrode type for the modulating production of steam; it is made of a steam cylinder, a steam distributor, water inlet and outlet valves and a maximum water level probe. The onboard microprocessor indicates when the steam cylinder needs to be replaced in order to be able to make a maintenance during the unit operation.
- IE Fumigated wooden crate packing:** Available on request for critical transports in order to assure a protection to the unit.
- IH RS485 Protocol serial interface:** Allows the communication between the unit and an external supervision system (the external supervision system and the communication software are not provided with the unit; please contact the Manufacturer in order to have more info about the available communication protocols).
- IH-BAC BACNET Protocol Serial Interface:** Gateway to be connected to the microprocessor to allow the connection between the unit and an external supervision system with BACNET protocol, for a remote control and monitoring of the unit. (Alternative to IH, IH LON and IWG).
- IH-LON LON Protocol serial interface:** Gateway to be connected to the microprocessor to allow the connection between the unit and an external supervision system with LON protocol, for a remote control and monitoring of the unit. (Alternative to IH, IH BAC and IWG).
- IM Seawood packing:** Fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- IP Magnetothermic switches for auxiliary circuits:** Installed instead of fuses for auxiliary circuits protection.
- IS1 Class 1 insulation material:** In conformity to the main European regulations in force.
- IWG SNMP o TCP/IP Protocol serial interface:** Electronic card to be connected to the microprocessor to allow the connection between the unit and an external supervision system with SNMP or TCP/IP protocol, for a remote control and monitoring of the unit. (Alternative to IH, IH BAC and IH LON).
- MF Phase monitor:** Electronic device controlling the correct sequence and/or the eventual lack of one of the three phases switching off the unit if necessary.
- MN Neutral wire lack for 400/3/50 power supply:** Unit general power supply without neutral wire; for IT power supplies the Manufacturer has to release, after a check, the connection authorization.

- MP Advanced microprocessor card:** Contained the Ethernet gateway and Master&Slave
- PB Condensation water pumps:** Micro pump discharging the condensing water produced by the unit provided totally installed.
- PBH Humidifier and condensatcion water pump** Micro pump discharging the condensing water produced by the unit coupled with a humidifier provided in a kit for outdoor installation.
- PL Distribution plenum :** Provided with a frontal grid and a double raw of adjustable fins for a better air distribution (Only for WU series, U and V version).
- PQ Remote display:** Remote terminal which allows to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change the program of the parameters, the sound signals and the display of the present alarms.
- PR Fresh air inlet:** External fresh air inlet with a flat filter, placed on unit side, with circular connection.
- RE Electrical heaters:** Made of aluminium and installed after the cooling coil, suitable for re-heating and/or heating of the treated air in order to compensate for the sensitive cooling of the system during the dehumidification cycle. The heating capacity is split on 3 steps max, so to reduce the energy consumptions. The heaters are managed by the onboard microprocessor meanwhile the electric protections managed by a magnetothermic switch.
- REM Oversized electrical heaters.**
- RV Personalized frame painting in RAL color.**
- SEP Set point compensation card (max 6 mt):** Composed by probes allows the set-point set according to the external air temperature
- STP Air flow stabilisation.**
- TS Touch screen graphic display:** The new settable EMIBYTE electronic display allows to developpe simples and appeal interfaces for the final users; the touch screen dispaly range can combine different colors and levels of transparency using Alpha Blending technology.
- VCP VCP 3-way condensing pressure control gas valve:** as an alternative to the VP, it is fitted at the outlet of plate heat exchanger, on gas line.
- VP VP 2-way condensing pressure control water valve:** as an alternative to the VCP, it is fitted at the outlet of plate heat exchanger and regulates the water flow in accordance with unit condensing pressure (the valve is supplied as spare kit along with unit).

3.4 DXi.H series technical data

DXi.H		61	111	121	151	181	201	251	321
Cooling capacity (Total) ⁽¹⁾ ESP 20 Pa	kW	7,7	10,5	12,1	17,7	20,2	21,7	25,9	35,1
Cooling capacity (Sensible) ⁽¹⁾ ESP 20 Pa	kW	7,7	9,5	11,8	15,4	18,5	21,7	24,8	31,6
Tot. absorbed power ⁽²⁾ ESP 20 Pa	kW	2,1	3,0	3,2	4,5	4,7	4,8	6,4	7,6
SHR		1,00	0,91	0,97	0,88	0,91	1,00	0,96	0,90
Water flow	m ³ /h	1,7	2,3	2,6	3,8	4,3	4,6	5,6	7,3
Pressure drop	kPa	46	35	45	45	33	37	29	27
Air flow	m ³ /h	3900	3900	3900	3900	5700	5700	8150	8150
Fan	n	1	1	1	1	1	1	1	1
Max. ESP	Pa	535	536	512	439	622	575	399	358
EER	W/W	4,0	3,8	4,1	4,2	4,7	4,9	4,4	5,0
Maximum absorbed power	kW	4	6	6	9	11	11	12	15
Maximum absorbed current	A	14	18	18	16	21	21	21	24
starting current	A	4	4	4	4	7	7	6	6
Power supply	V/ph/Hz	400/3/50+N+PE							
Humidifier									
Steam production (nominal)	kg/h	3	3	3	3	5	5	8	8
Steam production (max.)	kg/h	3	3	3	3	8	8	8	8
Max. absorbed power	kW	2,25	2,25	2,25	2,25	3,75	3,75	6,0	6,0
Max. absorbed current	A	10,0	10,0	10,0	10,0	5,5	5,5	8,7	8,7
Specific conductivity at 20°C (min/max)	µS/cm	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250
Total hardness (min/max)	mg/l CaCO ₃	100/400	100/400	100/400	100/400	100/400	100/400	100/400	100/400
Electrical heaters									
Steps	n°	3	3	3	3	2	2	3	3
Power	kW	4,5	4,5	4,5	4,5	6,0	6,0	9,0	9,0
Absorbed current	A	6,5	6,5	6,5	6,5	8,7	8,7	13,0	13,0
Oversized electrical heaters									
Steps	n°	2	2	2	2	3	3	3	3
Power	kW	6,0	6,0	6,0	6,0	9,0	9,0	12,0	12,0
Absorbed current	A	8,7	8,7	8,7	8,7	13,0	13,0	17,3	17,3
Hot water coil									
Heating capacity ⁽³⁾	kW	7,3	7,3	7,3	7,3	10,6	10,6	16,7	16,7
Water flow	m ³ /h	1,3	1,3	1,3	1,3	1,8	1,8	2,9	2,9
Pressure drop (coil + 3 way valve)	kPa	31	31	31	31	48	48	56	56
Coil internal volume	dm ³	1,4	1,4	1,4	1,4	2,1	2,1	3,3	3,3
Compressors									
Circuits / Compressors	n°/n°	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
On / Off Compressors	n°	--	--	--	--	--	--	--	--
Inverter Compressors	n°	1	1	1	1	1	1	1	1
Condensing water pump									
Nominal flow	l/h	390,0	390,0	390,0	390,0	390,0	390,0	390,0	390,0
Max. flow (prevalence = 0m)	l/h	500	500	500	500	500	500	500	500
Max. discharge height (flow=0m ³ /h)	m	5,4	5,4	5,4	5,4	5,4	5,4	5,4	5,4
Condensing water pump + humidifier									
Nominal flow	l/h	-	-	-	-	-	-	600	600
Max. flow (prevalence = 0m)	l/h	-	-	-	-	-	-	900	900
Max. discharge height (flow=0m ³ /h)	m	-	-	-	-	-	-	6,0	6,0
Dimensions and weight									
Frame	n°	2	2	2	2	3	3	4	4
Width	mm	750	750	750	750	980	980	1160	1160
Depth	mm	550	550	550	550	750	750	850	850
Height	mm	1980	1980	1980	1980	1980	1980	1980	1980
Weight (Configuration U)	Kg	201	209	212	223	289	297	339	372
Weight (Configuration V)	Kg	204	212	215	226	293	301	343	376
Weight (Configuration D)	Kg	205	213	217	228	295	303	345	379
Weight (Configuration B)	Kg	204	212	215	226	293	301	343	376

Performances are referred to the following conditions:

- (1) Ambient temperature 24°C, Relative humidity 50%, Water temperature 30/35°C.
- (2) The fans electrical power has to be added to the ambient load.
- (3) Water temperature 40/45°C, Ambient temperature 20°C, Relative humidity 50%.

DXi.H		381	392	472	491	531	532	631	652
Cooling capacity (Total) ⁽¹⁾ ESP 20 Pa	kW	36,4	39,4	48,0	50,9	55,0	53,7	68,1	70,6
Cooling capacity (Sensible) ⁽¹⁾ ESP 20 Pa	kW	37,5	35,0	40,7	45,4	53,4	52,8	65,3	66,2
Tot. absorbed power ⁽²⁾ ESP 20 Pa	kW	8,0	8,0	11,0	11,8	12,2	13,0	14,6	15,5
SHR		1,00	0,89	0,85	0,89	0,97	0,98	0,96	0,94
Water flow	m ³ /h	7,6	8,2	10,1	10,8	11,6	11,5	14,2	14,8
Pressure drop	kPa	21	7	10	33	37	12	28	10
Air flow	m ³ /h	11500	11500	11500	11500	14500	14500	17600	17600
Fan	n	1	1	1	1	2	2	2	2
Max. ESP	Pa	344	399	370	323	389	360	390	361
EER	W/W	4,9	5,4	4,7	4,7	4,9	4,5	5,0	4,9
Maximum absorbed power	kW	16	19	21	23	24	23	28	31
Maximum absorbed current	A	26	38	40	34	37	42	47	48
starting current	A	8	24	25	8	10	27	156	30
Power supply	V/ph/Hz	400/3/50+N+PE							
Humidifier									
Steam production (nominal)	kg/h	8	8	8	8	8	8	8	8
Steam production (max.)	kg/h	8	8	8	8	8	8	8	8
Max. absorbed power	kW	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0
Max. absorbed current	A	8,7	8,7	8,7	8,7	8,7	8,7	8,7	8,7
Specific conductivity at 20°C (min/max)	µS/cm	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250
Total hardness (min/max)	mg/l CaCO ₃	100/400	100/400	100/400	100/400	100/400	100/400	100/400	100/400
Electrical heaters									
Steps	n°	3	3	3	3	3	3	3	3
Power	kW	9,0	9,0	9,0	9,0	15,0	15,0	18,0	18,0
Absorbed current	A	13,0	13,0	13,0	13,0	21,7	21,7	26,0	26,0
Oversized electrical heaters									
Steps	n°	3	3	3	3	3	3	3	3
Power	kW	12,0	12,0	12,0	12,0	18,0	18,0	24,0	24,0
Absorbed current	A	17,3	17,3	17,3	17,3	26,0	26,0	34,6	34,6
Hot water coil									
Heating capacity ⁽³⁾	kW	24,5	24,5	24,5	24,5	31,1	31,1	37,4	37,4
Water flow	m ³ /h	4,3	4,3	4,3	4,3	5,43	5,43	6,5	6,5
Pressure drop (coil + 3 way valve)	kPa	46	46	46	46	53	53	34	34
Coil internal volume	dm ³	4,7	4,7	4,7	4,7	5,8	5,8	7,1	7,1
Compressors									
Circuits / Compressors	n°/n°	1/1	2/2	2/2	1/1	1/1	2/2	1/2	2/2
On / Off Compressors	n°	--	--	--	--	--	--	1	--
Inverter Compressors	n°	1	2	2	1	1	2	1	2
Condensing water pump									
Nominal flow	l/h	390,0	390,0	390,0	390,0	390,0	390,0	390,0	390,0
Max. flow (prevalence = 0m)	l/h	500	500	500	500	500	500	500	500
Max. discharge height (flow=0m ³ /h)	m	5,4	5,4	5,4	5,4	5,4	5,4	5,4	5,4
Condensing water pump + humidifier									
Nominal flow	l/h	600	600	600	600	600	600	600	600
Max. flow (prevalence = 0m)	l/h	900	900	900	900	900	900	900	900
Max. discharge height (flow=0m ³ /h)	m	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0
Dimensions and weight									
Frame	n°	4,5	4,5	4,5	4,5	5	5	6	6
Width	mm	1505	1505	1505	1505	1860	1860	2210	2210
Depth	mm	850	850	850	850	850	850	850	850
Height	mm	1980	1980	1980	1980	1980	1980	1980	1980
Weight (Configuration U)	Kg	428	456	458	435	525	548	627	652
Weight (Configuration V)	Kg	433	462	464	440	531	554	634	660
Weight (Configuration D)	Kg	436	465	466	443	535	558	638	663
Weight (Configuration B)	Kg	433	462	464	440	531	554	634	660

Performances are referred to the following conditions:

- (1) Ambient temperature 24°C, Relative humidity 50%, Water temperature 30/35°C.
- (2) The fans electrical power has to be added to the ambient load.
- (3) Water temperature 40/45°C, Ambient temperature 20°C, Relative humidity 50%.

DXi.H		691	742	761	861	931	952	1021	1142
Cooling capacity (Total) ⁽¹⁾ ESP 20 Pa	kW	72,2	76,4	85,9	87,3	100,3	104,6	107,4	118,9
Cooling capacity (Sensible) ⁽¹⁾ ESP 20 Pa	kW	67,0	75,8	80,1	80,7	96,5	98,0	99,4	104,5
Tot. absorbed power ⁽²⁾ ESP 20 Pa	kW	15,7	16,9	18,7	19,9	21,9	23,5	22,9	26,8
SHR		0,93	0,99	0,93	0,92	0,96	0,94	0,93	0,88
Water flow	m ³ /h	15,1	16,0	18,0	18,4	21,0	22,0	22,4	25,1
Pressure drop	kPa	31	11	29	21	26	12	22	15
Air flow	m ³ /h	17600	20900	20900	20900	25700	25700	25700	25700
Fan	n	2	2	2	2	3	3	3	3
Max. ESP	Pa	390	365	394	394	414	385	414	386
EER	W/W	5,0	4,9	5,0	4,7	4,9	4,8	5,1	4,8
Maximum absorbed power	kW	30	33	36	38	45	49	47	56
Maximum absorbed current	A	50	51	58	61	76	74	79	93
starting current	A	167	33	168	179	185	47	219	203
Power supply	V/ph/Hz	400/3/50+N+PE							
Humidifier									
Steam production (nominal)	kg/h	8	8	8	8	8	8	8	8
Steam production (max.)	kg/h	8	8	8	8	8	8	8	8
Max. absorbed power	kW	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0
Max. absorbed current	A	8,7	8,7	8,7	8,7	8,7	8,7	8,7	8,7
Specific conductivity at 20°C (min/max)	µS/cm	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250
Total hardness (min/max)	mg/l CaCO ₃	100/400	100/400	100/400	100/400	100/400	100/400	100/400	100/400
Electrical heaters									
Steps	n°	3	3	3	3	3	3	3	3
Power	kW	18,0	24,0	24,0	24,0	27,0	27,0	27,0	27,0
Absorbed current	A	26,0	34,6	34,6	34,6	39,0	39,0	39,0	39,0
Oversized electrical heaters									
Steps	n°	3	3	3	3	3	3	3	3
Power	kW	24,0	27,0	27,0	27,0	36,0	36,0	36,0	36,0
Absorbed current	A	34,6	39,0	39,0	39,0	52,0	52,0	52,0	52,0
Hot water coil									
Heating capacity ⁽³⁾	kW	37,4	48,9	48,9	48,9	60,8	60,8	60,8	60,8
Water flow	m ³ /h	6,5	8,5	8,5	8,5	10,6	10,6	10,6	10,6
Pressure drop (coil + 3 way valve)	kPa	34	48	48	48	42	42	42	42
Coil internal volume	dm ³	7,1	10,45	10,45	10,45	12,6	12,6	12,6	12,6
Compressors									
Circuits / Compressors	n°/n°	1/2	2/2	1/2	1/2	1/2	2/2	1/2	2/4
On / Off Compressors	n°	1	--	1	1	1	--	1	2
Inverter Compressors	n°	1	1	1	1	1	2	1	2
Condensing water pump									
Nominal flow	l/h	390,0	390,0	390,0	390,0	390,0	390,0	390,0	390,0
Max. flow (prevalence = 0m)	l/h	500	500	500	500	500	500	500	500
Max. discharge height (flow=0m ³ h)	m	5,4	5,4	5,4	5,4	5,4	5,4	5,4	5,4
Condensing water pump + humidifier									
Nominal flow	l/h	600	600	600	600	600	600	600	600
Max. flow (prevalence = 0m)	l/h	900	900	900	900	900	900	900	900
Max. discharge height (flow=0m ³ h)	m	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0
Dimensions and weight									
Frame	n°	6	7	7	7	8	8	8	8
Width	mm	2210	2565	2565	2565	3100	3100	3100	3100
Depth	mm	850	850	850	850	850	850	850	850
Height	mm	1980	1980	1980	1980	1980	1980	1980	1980
Weight (Configuration U)	Kg	627	749	735	739	900	919	904	995
Weight (Configuration V)	Kg	634	757	743	748	910	929	915	1006
Weight (Configuration D)	Kg	638	761	747	752	915	934	920	1011
Weight (Configuration B)	Kg	634	757	743	748	910	929	915	1006

Performances are referred to the following conditions:

- (1) Ambient temperature 24°C, Relative humidity 50%, Water temperature 30/35°C.
- (2) The fans electrical power has to be added to the ambient load.
- (3) Water temperature 40/45°C, Ambient temperature 20°C, Relative humidity 50%.

3.5 DXi.HF series technical data

DXi.HF		181	251	381	392	531	532
Cooling capacity (Total) ⁽¹⁾ ESP 20 Pa	kW	18,9	23,1	34,7	37,9	47,8	45,5
Cooling capacity (Sensible) ⁽¹⁾ ESP 20 Pa	kW	16,5	23,0	32,8	33,5	42,7	42,6
Tot. absorbed power ⁽²⁾ ESP 20 Pa	kW	4,35	5,67	4,55	8,48	10,9	10,9
SHR		0,87	0,99	0,94	0,88	0,89	0,93
Water flow	m ³ /h	3,99	4,96	6,88	8,01	10,11	9,73
Air flow	m ³ /h	5777	8260	11656	11656	14696	14696
Fan	n	1	1	1	1	2	2
Max. ESP	Pa	570	361	375	376	398	398
EER	W/W	4,34	4,07	7,63	4,47	4,39	4,17
Maximum absorbed power	kW	10,6	11,5	16,4	18,6	24,3	23,0
Maximum absorbed current	A	21,0	21,2	25,6	37,6	36,9	42,4
Starting current	A	17,8	17,8	21,6	34,4	32,0	39,0
Power supply	V/ph/Hz	400/3/50+N+PE					
Free-cooling data							
Cooling capacity (Total) ⁽³⁾ ESP 20 Pa	kW	18,8	25,9	36,3	37,9	48,9	48,7
Tot. absorbed power ⁽²⁾ ESP 20 Pa	kW	0,85	1,12	0,88	1,56	1,88	1,82
SHR		0,84	0,87	0,88	0,84	0,84	0,84
Water flow	m ³ /h	3,98	4,94	6,85	7,98	10,07	9,69
Pressure drop (water coil+condenser+valve)	kPa	55	42	41	32	65	43
Total pressure drops	kPa	48,3	50,5	39,3	36,0	74,3	52,6
Humidifier							
Steam production (nominal)	kg/h	5	8	8	8	8	8
Steam production (max.)	kg/h	8	8	8	8	8	8
Max. absorbed power	kW	3,75	6,0	6,0	6,0	6,0	6,0
Max. absorbed current	A	5,5	8,7	8,7	8,7	8,7	8,7
Specific conductivity at 20°C (min/max)	µS/cm	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250
Total hardness (min/max)	mg/l CaCO ₃	100/400	100/400	100/400	100/400	100/400	100/400
Electrical heaters							
Steps	n°	2	3	3	3	3	3
Power	kW	6,0	9,0	9,0	9,0	15,0	15,0
Absorbed current	A	9,12	13,7	13,7	13,7	22,8	22,8
Oversized electrical heaters							
Steps	n°	3	3	3	3	3	3
Power	kW	9,0	12,0	12,0	12,0	18,0	18,0
Absorbed current	A	13,7	18,2	18,2	18,2	27,3	27,3

Hot water coil							
Heating capacity ⁽⁴⁾	kW	10,6	16,7	24,5	24,5	31,1	31,1
Water flow	m ³ /h	3,98	4,94	6,85	7,98	10,08	9,69
Pressure drop (coil + 3 way valve)	kPa	48	56	46	46	53	53
Coil internal volume	dm ³	2,1	3,3	4,7	4,7	5,8	5,8
Compressors							
Circuits / Compressors	n°/n°	1/1	1/1	1/1	2/2	1/1	2/2
On / Off Compressors	n°	--	--	--	--	--	--
Inverter Compressors	n°	1	1	1	2	1	2
Condensing water pump							
Nominal flow	l/h	390,0	390,0	390,0	390,0	390,0	390,0
Max. flow (prevalence = 0 m)	l/h	500	500	500	500	500	500
Max. discharge height (flow = 0 m ³ /h)	m	5,4	5,4	5,4	5,4	5,4	5,4
Condensing water pump + humidifier							
Nominal flow	l/h	-	600	600	600	600	600
Max. flow (prevalence = 0 m)	l/h	-	900	900	900	900	900
Max. discharge height (flow = 0 m ³ /h)	m	-	6,0	6,0	6,0	6,0	6,0
Dimensions and weight							
Frame	n°	3	4	4,5	4,5	5	5
Width	mm	980	1160	1505	1505	1860	1860
Depth	mm	750	850	850	850	850	850
Height	mm	1980	1980	1980	1980	1980	1980
Weight (Configuration U)	Kg	302	357	455	484	573	596
Weight (Configuration V)	Kg	306	361	461	490	579	603
Weight (Configuration D)	Kg	308	363	464	493	583	606
Weight (Configuration B)	Kg	306	361	461	490	579	603

Performances are referred to the following conditions:

- (1) Ambient temperature 24°C, Relative humidity 50%, water temperature 30/35°C.
- (2) The fans electrical power has to be added to the ambient load.
- (3) Free cooling: Ambient temperature 24°C, Relative humidity 50%, water inlet temperature 7°C, constant water flow
- (4) Water temperature 40/45°C, Ambient temperature 20°C, Relative humidity 50%.

DXi.HF		631	652	742	761	931	952
Cooling capacity (Total) ⁽¹⁾ ESP 20 Pa	kW	61,3	59,1	64,7	73,2	86,9	86,4
Cooling capacity (Sensible) ⁽¹⁾ ESP 20 Pa	kW	51,4	51,4	60,5	61,9	77,4	77,2
Tot. absorbed power ⁽²⁾ ESP 20 Pa	kW	13,9	13,2	14,6	16,6	19,9	19,7
SHR		0,83	0,87	0,93	0,84	0,89	0,89
Water flow	m ³ /h	12,97	12,48	13,67	15,47	18,41	18,33
Air flow	m ³ /h	17838	17838	21183	21183	26048	26048
Fan	n	2	2	2	2	3	3
Max. ESP	Pa	356	356	401	401	434	434
EER	W/W	4,41	4,48	4,43	4,41	4,37	4,39
Maximum absorbed power	kW	45,7	48,8	56,7	59,9	45,0	49,0
Maximum absorbed current	A	73,9	75,7	87,7	94,4	76,0	74,0
Starting current	A	184,0	71,7	83,7	204,0	185,0	47,0
Power supply	V/ph/Hz	400/3/50+N+PE					
Free-cooling data							
Cooling capacity (Total) ⁽³⁾ ESP 20 Pa	kW	59,4	59,0	68,7	71,1	87,1	86,9
Tot. absorbed power ⁽²⁾ ESP 20 Pa	kW	2,43	2,31	2,66	2,81	3,25	3,02
SHR		0,85	0,84	0,84	0,84	0,84	0,84
Water flow	m ³ /h	12,92	12,43	13,62	15,41	18,33	18,25
Pressure drop (water coil+condenser+valve)	kPa	13,0	12,5	13,7	15,6	18,6	18,5
Total pressure drops	kPa	62,6	45,8	37,3	56,6	52,3	30,4
Humidifier							
Steam production (nominal)	kg/h	8	8	8	8	8	8
Steam production (max.)	kg/h	8	8	8	8	8	8
Max. absorbed power	kW	6,0	6,0	6,0	6,0	6,0	6,0
Max. absorbed current	A	8,7	8,7	8,7	8,7	8,7	8,7
Specific conductivity at 20°C (min/max)	µS/cm	300/1250	300/1250	300/1250	300/1250	300/1250	300/1250
Total hardness (min/max)	mg/l CaCO ₃	100/400	100/400	100/400	100/400	100/400	100/400
Electrical heaters							
Steps	n°	3	3	3	3	3	3
Power	kW	18,0	18,0	24,0	24,0	27,0	27,0
Absorbed current	A	27,3	27,3	36,5	34,6	39,0	39,0
Oversized electrical heaters							
Steps	n°	3	3	3	3	3	3
Power	kW	24,0	24,0	27,0	27,0	36,0	36,0
Absorbed current	A	36,5	36,5	41,0	39,0	52,0	52,0

Hot water coil							
Heating capacity ⁽⁴⁾	kW	37,4	37,4	48,9	48,9	60,8	60,8
Water flow	m ³ /h	12,92	12,43	13,62	8,5	10,6	10,6
Pressure drop (coil + 3 way valve)	kPa	34	34	48	48	42	42
Coil internal volume	dm ³	7,1	7,1	10,5	10,5	12,6	12,6
Condensing water pump							
Nominal flow	n°/n°	1/2	2/2	2/2	1/2	1/2	2/2
Max. flow (prevalence = 0 m)	n°	1	--	--	1	1	--
Max. discharge height (flow = 0 m ³ /h)	n°	1	2	1	1	1	2
Condensing water pump + humidifier							
Nominal flow	l/h	390,0	390,0	390,0	390,0	390,0	390,0
Max. flow (prevalence = 0 m)	l/h	500	500	500	500	500	500
Max. discharge height (flow = 0 m ³ /h)	m	5,4	5,4	5,4	5,4	5,4	5,4
Dimensions and weight							
Frame	l/h	600	600	600	600	600	600
Width	l/h	900	900	900	900	900	900
Depth	m	6,0	6,0	6,0	6,0	6,0	6,0
Height							
Weight (Configuration U)	n°	6	6	7	7	8	8
Weight (Configuration V)	mm	2210	2210	2565	2565	3100	3100
Weight (Configuration D)	mm	850	850	850	850	850	850
Weight (Configuration B)	mm	1980	1980	1980	1980	1980	1980
	Kg	686	711	833	819	1003	1022
	Kg	693	718	841	828	1014	1032
	Kg	696	722	845	832	1019	1037
	Kg	693	718	841	828	1014	1032

Performances are referred to the following conditions:

(1) Ambient temperature 24°C, Relative humidity 50%, water temperature 30/35°C.

(2) The fans electrical power has to be added to the ambient load.

(3) Free cooling: Ambient temperature 24°C, Relative humidity 50%, water inlet temperature 7°C, constant water flow

(4) Water temperature 40/45°C, Ambient temperature 20°C, Relative humidity 50%.

3.6 Refrigerant charge

3.6.1 R410A Refrigerant charge (GWP=2088) - unit DXi.H

DXi.H		61	111	121	151	181	201	251	321
Frame		2	2	2	2	3	3	4	4
Circuits	n°	1	1	1	1	1	1	1	1
Refrigerant charge	Kg	3,5	3,5	3,7	4,2	4,3	4,7	6,3	7,3
Equivalent CO ₂ charge	t	7,3	7,3	7,7	8,8	9,0	9,8	13,2	15,2

DXi.H		381	392	472	491	531	532	631	652
Frame		4,5	4,5	4,5	4,5	5	5	6	6
Circuits	n°	1	2	2	1	1	2	1	2
Refrigerant charge	Kg	7,6	10,4	11,0	8,5	9,8	11,6	15,9	18,2
Equivalent CO ₂ charge	t	15,9	21,7	23,0	17,7	20,5	24,2	33,2	38,0

DXi.H		691	742	761	861	931	952	1021	1142
Frame		6	7	7	7	8	8	8	8
Circuits	n°	1	2	1	1	1	2	1	2
Refrigerant charge	Kg	15,9	21,8	21,2	21,5	32,1	33,5	32,6	33,7
Equivalent CO ₂ charge	t	33,2	45,5	44,3	44,9	67,0	69,9	68,1	70,4

3.6.2 R410A Refrigerant charge (GWP=2088) - unit DXi.HF

DXi.HF		181	251	381	392	531	532
Frame		3	4	4,5	4,5	5	5
Circuits	n°	1	1	1	2	1	2
Refrigerant charge	Kg	4,4	7,3	8,0	9,6	8,6	10,4
Equivalent CO ₂ charge	t	9,2	15,2	16,7	20,0	18,0	21,7

DXi.HF		631	652	742	761	931	952
Frame		6	6	7	7	8	8
Circuits	n°	1	2	2	1	1	2
Refrigerant charge	Kg	14,6	16,0	17,4	15,1	16,0	18,0
Equivalent CO ₂ charge	t	30,5	33,4	36,3	31,5	33,4	37,6

3.7 Operation limits



The unit is designed and built for air conditioning technological environments and must be used exclusively for this purpose within its characteristics. All the other uses are not allowed and dissolve the Manufacturer from any liability for damages caused to the peoples, animals, environment or things.



In case of different uses from the overmentioned please contact the Manufacturer.



The minimum temperature of the ambient to be cooled has to be of 18°C.
The maximum temperature of the ambient to be cooled has to be of 35°C.



The units in standard configuration are not suitable for marine installations.

Operation limits		
Indoor air conditions	Temperature	From 18°C ± 1°C to 35°C ± 1°C
	Relative humidity	From 20% ± 5% to 60% ± 5%
Hot water circuit	Water inlet temperature	Max. 85°C
	Water pressure	Max. 8.5 bar
Storage conditions	Temperature	From -20°C to 50°C
	Specific humidity	Maximum relative humidity percentage accepted is 90% to prevent condensation on surfaces
Power supply tolerances		V ± 10%, Hz ± 2



In order to have a homogenous ambient temperature, the installer must grant a suitable insulation and take into consideration any possible heat source inside the ambient itself. The manufacturer declines any responsibility for any performance or tolerance different from the ones declared for units installed in a non-compliant ambient.



Lower heat load will not ensure precise temperature and humidity control than causing frequent compressor start & stop.
The room heat load cannot be less than 20% of the sensible cooling capacity of the precision air conditioner.

3.8 Sound data DXi.H



Here below are the sound data for units with canalized discharge and supply (except U version); the data refer to standard ambient conditions and to design prevalence/air flow (20 Pa).

DXi.H - Configuration D											
Mod.	63	125	250	500	1K	2K	4K	8K	Lw	Lp1	Lp10
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
61	44	55	62	66	71	72	67	59	76	56	45
111	41	52	62	67	73	73	69	63	77	57	46
121	41	52	62	67	73	73	69	63	77	57	46
151	41	52	62	67	73	73	69	63	77	57	46
181	45	62	65	70	73	73	71	62	78	58	47
201	46	63	66	71	74	74	72	63	79	59	48
251	46	63	66	73	75	72	70	62	79	59	48
321	48	65	68	74	76	75	72	64	81	61	50
381	41	63	67	75	76	75	74	64	81	61	50
392	40	63	67	73	74	75	73	63	80	60	49
472	42	64	68	76	77	76	74	65	82	62	51
491	43	64	68	76	78	77	74	65	83	63	52
531	51	71	72	76	78	77	75	67	83	62	52
532	50	70	72	76	77	76	74	67	82	61	51
631	66	72	75	79	80	80	76	68	85	64	54
652	66	72	75	79	80	80	76	68	85	64	54
691	66	72	75	79	80	80	76	68	85	64	54
742	57	70	72	79	79	80	77	68	85	64	54
761	57	70	72	79	79	80	77	68	85	64	54
861	56	69	71	78	78	79	76	67	84	63	53
931	57	70	73	79	78	78	77	66	84	63	53
952	57	70	73	79	78	78	77	66	84	63	53
1021	57	70	73	79	78	78	77	66	84	63	53
1142	58	71	73	79	79	79	78	67	85	64	54

Lw: Sound power level according to ISO 3744.

Lp1: Sound pressure level measured at 2 mt from the unit in free field conditions according to ISO 3744.

Lp10: Sound pressure level measured at 10 mt from the unit in free field conditions according to ISO 3744.

DXi.H - Configuration V and B											
Mod.	63	125	250	500	1K	2K	4K	8K	Lw	Lp1	Lp10
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
61	41	52	62	67	73	73	69	63	77	57	46
111	42	51	62	67	73	73	70	63	78	58	47
121	42	51	62	67	73	73	70	63	78	58	47
151	42	51	62	67	73	73	70	63	78	58	47
181	46	63	66	71	74	74	72	63	79	59	48
201	47	64	67	72	75	75	73	64	80	60	49
251	47	64	67	74	76	74	71	63	80	60	49
321	50	70	70	76	78	75	73	67	82	62	51
381	42	64	68	76	77	76	74	65	82	62	51
392	41	63	67	75	76	75	74	64	81	61	50
472	43	64	68	76	78	77	74	65	83	63	52
491	47	70	71	79	80	79	77	69	84	64	53
531	51	71	72	77	79	78	75	67	84	63	53
532	51	71	72	76	78	77	75	67	83	62	52
631	66	72	75	79	81	81	76	68	86	65	55
652	66	72	75	79	81	81	76	68	86	65	55
691	66	72	75	79	81	81	76	68	86	65	55
742	59	71	73	81	81	79	78	69	86	65	55
761	59	71	73	81	81	79	78	69	86	65	55
861	57	70	72	79	79	80	77	68	85	64	54
931	58	71	73	79	79	79	78	67	85	64	54
952	58	71	73	79	79	79	78	67	85	64	54
1021	58	71	73	79	79	79	78	67	85	64	54
1142	59	71	73	80	80	81	78	69	86	65	55

DXi.H - Configuration U											
Mod.	63	125	250	500	1K	2K	4K	8K	Lw	Lp1	Lp10
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
61	42	51	62	67	73	73	70	63	78	58	47
111	45	57	65	69	74	75	71	63	79	59	48
121	45	57	65	69	74	75	71	63	79	59	48
151	45	57	65	69	74	75	71	63	79	59	48
181	47	64	67	72	75	75	73	64	80	60	49
201	48	64	68	73	76	76	74	65	81	61	50
251	48	65	68	74	76	75	72	64	81	61	50
321	50	70	71	76	78	76	74	67	83	63	52
381	43	64	68	76	78	77	74	65	83	63	52
392	42	64	68	76	77	76	74	65	82	62	51
472	47	70	71	79	80	79	77	69	84	64	53
491	48	67	70	78	80	80	77	67	85	65	54
531	58	73	73	78	80	78	77	70	85	64	54
532	51	71	72	77	79	78	75	67	84	63	53
631	66	72	75	80	83	81	77	68	87	66	56
652	66	72	75	80	83	81	77	68	87	66	56
691	66	72	75	80	83	81	77	68	87	66	56
742	61	72	74	80	82	82	77	69	87	66	56
761	61	72	74	80	82	82	77	69	87	66	56
861	59	71	73	81	81	79	78	69	86	65	55
931	59	71	73	80	80	81	78	69	86	65	55
952	59	71	73	80	80	81	78	69	86	65	55
1021	59	71	73	80	80	81	78	69	86	65	55
1142	60	71	74	80	82	81	77	69	87	66	56

Lw: Sound power level according to ISO 3744.

Lp1: Sound pressure level measured at 2 mt from the unit in free field conditions according to ISO 3744.

Lp10: Sound pressure level measured at 10 mt from the unit in free field conditions according to ISO 3744.

3.9 Sound data DXi.HF



Here below are the sound data for units with canalized discharge and supply (except U version); the data refer to standard ambient conditions and to design prevalence/air flow (20 Pa).

DXi.HF - Configuration D											
Mod.	63	125	250	500	1K	2K	4K	8K	Lw	Lp1	Lp10
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
181	46	63	66	71	74	74	72	63	79	59	48
251	47	64	67	74	76	73	71	63	80	60	49
381	42	64	68	76	77	76	75	65	82	62	51
392	41	64	68	74	75	76	74	64	81	61	50
531	52	72	73	77	79	78	76	68	84	63	53
532	51	71	73	77	78	77	75	68	83	62	52
631	67	73	76	80	81	81	77	69	86	65	55
652	67	73	76	80	81	81	77	69	86	65	55
742	58	71	73	80	80	81	78	69	86	65	55
761	58	71	73	80	80	81	78	69	86	65	55
931	58	71	74	80	79	79	78	67	85	64	54
952	58	71	74	80	79	79	78	67	85	64	54
DXi.HF - Configuration V and B											
Mod.	63	125	250	500	1K	2K	4K	8K	Lw	Lp1	Lp10
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
181	47	64	67	72	75	75	73	64	80	60	49
251	48	65	68	75	77	75	72	64	81	61	50
381	43	65	69	77	78	77	75	66	83	63	52
392	42	64	68	76	77	76	75	65	82	62	51
531	52	72	73	78	80	79	76	68	85	64	54
532	52	72	73	77	79	78	76	68	84	63	53
631	67	73	76	80	82	82	77	69	87	66	56
652	67	73	76	80	82	82	77	69	87	66	56
742	60	72	74	82	82	80	79	70	87	66	56
761	60	72	74	82	82	80	79	70	87	66	56
931	59	72	74	80	80	80	79	68	86	65	55
952	59	72	74	80	80	80	79	68	86	65	55
DXi.HF - Configuration U											
Mod.	63	125	250	500	1K	2K	4K	8K	Lw	Lp1	Lp10
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
181	48	65	68	73	76	76	74	65	81	61	50
251	49	66	69	75	77	76	73	65	82	62	51
381	44	65	69	77	79	78	75	66	84	64	53
392	43	65	69	77	78	77	75	66	83	63	52
531	59	74	74	79	81	79	78	71	86	65	55
532	52	72	73	78	80	79	76	68	85	64	54
631	67	73	76	81	84	82	78	69	88	67	57
652	67	73	76	81	84	82	78	69	88	67	57
742	62	73	75	81	83	83	78	70	88	67	57
761	62	73	75	81	83	83	78	70	88	67	57
931	60	72	74	81	81	82	79	70	87	66	56
952	60	72	74	81	81	82	79	70	87	66	56

Lw: Sound power level according to ISO 3744.

Lp1: Sound pressure level measured at 2 mt from the unit in free field conditions according to ISO 3744.

Lp10: Sound pressure level measured at 10 mt from the unit in free field conditions according to ISO 3744.

4. INSTALLATION

4.1 General advices and symbols use



Before to operate any intervention the technicians has to know perfectly the unit functioning and all its components, also for having read the present Manual.



The maintenance operations has to be performed by well trained technicians in compliance with national legislation in the country of destination.



The unit installation and maintenance has to be performed following the regulation and norms in force.



Do not approach or insert any object into moving parts.

4.2. Workers health and safety



The operator's workplace must be kept clean, tidy and free of objects that mas restrict free movement; the workplace must be adequately lit for the intended operations. Inadequate or excessive lighting can pose risks.



Ensure that excellent ventilation of the work rooms is always guaranteed and that the extraction systems are always functional, in excellent condition and in compliance with the provisions of the law.

4.3 Individual protection devices



The technicians in charge for unit installation and maintenance has to wear mandatory, following the laws in force, the below mentioned protection devices.



Protection shoes.



Eyes's protections.



Protection gloves.



Respiratory protection.



Ears protections.

4.4 Receipt and inspection

During the installation or any intervention it is mandatory to follow strictly any norms reported on the present Manual, to follow the onboard indications and apply every precaution in order to avoid any dangerous situation. At the unit receipt it is necessary to make a visual inspection; the unit left the Manufacturer in perfect conditions, damages occurs during transport has to be immediately disputed with the carrier noticing on the delivery sheet before signing in. The Manufacturer has to be informed about the damages within days from receiving of the unit. The unit owner must to complete a written report in the event of significant damage.

Before to accept the delivery check carefully::

- The unit has not be damaged during the transport;;
- The delivered unit corresponds to the ones indicated on the transport document.

If any damage or fault occurs:

- Note immediately the damage on delivery document;
- Inform Manufacturer or supplier, within 8 days from receipt, about the damage type; reports after 8 days from receipt are not valid;
- In case of significant damage, complete a written report.

4.5 Storage and transport

If it was necessary to storage the unit, ensure to leave it in a closed and dry place; if the unit is already unpacked please follow the hereafter indications to avoid a possible corrosion, damage or deterioration:

- Be sure about every opening is well plugged or sealed;
- Dot use steam or aggressive detergents to clean the unit;
- Take out the control cabinet keys (if presents) and entrust them to the site manager.



The unit can be stocked to temperature between -10° to +65°C; during the stops it is recommended to be sure about those temperatures in order to avoid refrigerant's leak from the safety valves.

The transport has to be done by authorized carriers and the truck characteristics must be such by to not damage the units during the load and during the transport. Il trasporto If the road are bumpy, the truck must have suspension suitable to protect the unit from any damage.

4.6 Unpacking



The packaging could create risks for the operators

Is suggest to leave the packaged unit during the handling and remove it just before the installation. Be careful to remove the packaging in order to avoid unit damages and operators dangers.

The materials which compose the packaging could be from different nature (wood, nylon, cardboard, etc.)



The packaging materials has to be separately preserved and delivered for disposal or eventually for recycle to the responsible companies in order to reduce the environmental impact.
Keep out the material of reach of childrens.

4.7 Lifting and handling

When unloading the unit, it is strongly recommended that sudden movements are avoided in order to protect internal components; unit can be lifted by using a forklift (1) or, in alternative using belts (2). Take care that the method of lifting does not damage the side panels or the cover; It is important to keep the unit vertical in order to avoid any risk of damage.



The fins of the coil are sharp; is suggested to use protective gloves.



The weight of some models could be unbalanced, before to start the handling verify the unit stability in order to avoid problems during the operations.

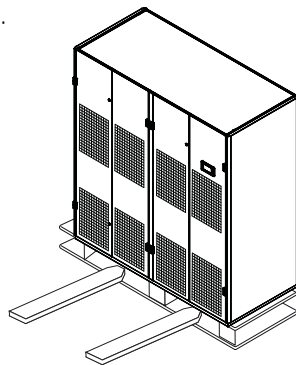


IS forbidden to put one unit over other also if are packed. If the unit is stored after receipt, must be away from the elemets even if packed.

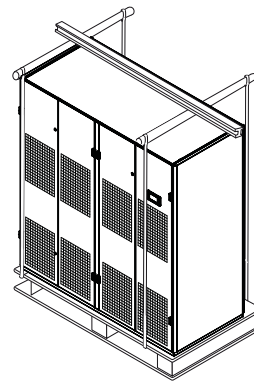


The handling devices, cables, belts has to be in compliance with laws and local norms.

1.



2.



4.8 Location and minimum technical clearances

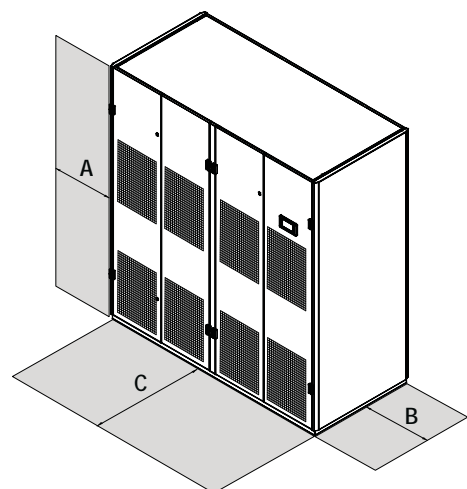
All models are designed for internal installation; Unit vibration level is very low. It is vital to avoid recirculation from discharge and suction in order to avoid poor performances or even the normal operation stops. For these reason it is necessary to observe the following clearance. The unit doesn't need a special fundations, as it can simply be placed on the installation site to work.



Pay attention to respect the clarences in order to allow ordinary and extraordinary maintenance. The guarantee does not costs related to platforms or handling equipment necessary for any repairs.



The installation site should be chosen in accordance with EN 378-1 and 378-3 standards; when choosing the installation site, all risks caused by accidental refrigerant leakage should be taken into consideration.



A	B	C
500 mm	500 mm	750 mm

4.9 Hydraulic connections

4.9.1 Hydraulic circuit realisation

The unit is designed to be connected to a chilled water cooling system. The pipes installation must be accomplished by an expert installer.



The fluid to be cooled has not to contain aggressive substances, or not compatibles with copper, carbon steel, aluminium and every material which unit is composed. For any doubt will be necessary send to Manufacturer a chemical analysis about the fluid in order to find the necessary solutions.

The hydraulic system must be sized by a qualified designer and accomplished by qualified workers, appointed by the Owner, in conformity with the local current regulations.



The diameters of the hydraulic connections are indicated on the table in dedicated section of this manual. The diameters of the hydraulic system pipes must be sized in order to contain the pressure losses in the circuit within acceptable limits.

Below, some general indications, which are best practices for the installation of the hydraulic system to be complying with, are summed up.

- The pipes way must be designed in order to contain the pressure losses in the circuit as low as possible.
- The pipes must be stirred and installed adequately, in order to allow inspection and maintenance.
- The materials used for the realization of the system must have a nominal pressure not lower than PN10.
- During the realization of the system, dirt and foreign particles must not go into the pipes.
- The water circulation pump must maintain the adequate flow with the required pressure to prevail the pressure losses of the system in every possible operation conditions.
- The chilled water system must be coated with insulating closed-cells material, with the following characteristics: thermal insulation, steam-proof and diameters fitting with the worst foreseeable conditions, both in operation and in stop.
- The system must be protected with a safety valve of adequate size and with maximum pressure lower than 10 bar.
- Along the circuit and, in particular, in the highest points and everywhere air pocket could form, specific devices for air discharge must be placed.
- The system must be fitted out, in adequate points, with connections for emptying.
- The system must be equipped with connections for filling up with water and, if required, with nonfreezing substances.
- Once the system has been accomplished, you must wash it with adequate substances to avoid that dirt or foreign particles could be left in, causing anomalies or damages during operation.

4.9.2 Connecting the unit to the hydraulic circuit

The connection of the unit to the hydraulic circuit must be accomplished by a skilled and qualified technician, in conformity with the local current regulations.

- Shut-off valves on inlet and outlet of the unit are recommended, to get simplest and fastest the extraordinary service operation. It's also recommended to connect the unit to the system using 3-pieces joint, that make interventions on hydraulic circuit simplest.
- It's recommended to install on the inlet of the unit a water filter with a mesh size lower than 1 mm.
- The pre-fitted connections indicated in the dimensional drawing must be used to connect the unit to the hydraulic system.
- Once accomplished the making of the circuit and installed the unit, before filling up and starting-up, it's necessary to do a watertight test of the whole system, in order to identify possible leaks and repair them.



During the leaks searching, the system must NOT undergo a pressure higher than 10 bar



Using nonfreezable mixtures compatible with the materials used in the unit and in the system, subsequent variations of cooling capacity and of pressure losses of the unit must be considered.



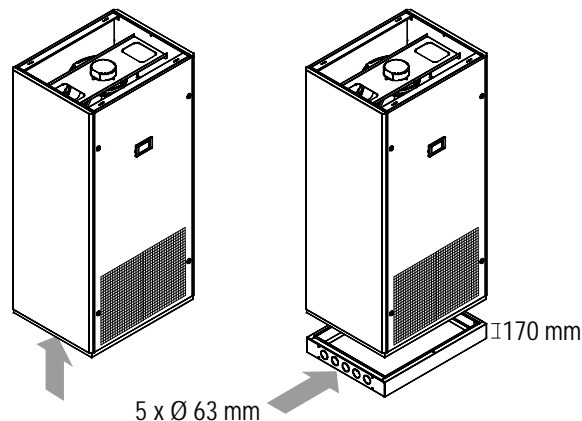
After the watertight check of the system, if it's expected that the system will be started after a long lapse or, however, that the ambient temperature could drop to values near or lower than 0°C, it will be necessary to discharge the water from the circuit or fill up with an adequate quantity of nonfreezing fluid.

4.9.4 Hydraulic connection areas

Per la connessione dell'unità al circuito idraulico utilizzare le zone predisposte; i diametri delle connessioni idrauliche delle varie unità sono elencate nelle tabelle dedicate.



The connections are planned on the bottom for all the unit.
The option **BAS** can be requested in order to raise the unit (lateral connections base frame). The accessory **BAS** will be fitted to the base of the unit at factory.



For connection diameters bigger than 1"½, it's not possible to use the side outlet fitted on the base frame.

4.9.4 Filling in the hydraulic circuit

Once accomplished the hydraulic system and fulfilled the connection of the unit, it's necessary to fill in the circuit in the following way:

- Open all the air bleed valves in the circuit.
- Connect, if possible in a permanent way, the circuit to a water supply system, through an automatic filling unit with pressure gauge, equipped with check valve, adequate to the foreseen temperature levels and to the system volume.



If the circuit operates with a nonfreezing mixture, insert in the circuit the appropriate quantity of pure nonfreezing fluid, on the basis of the system volume and of the concentration to be realized.

- Start loading the system with water.
- Close all the air bleed valves in the system when the air doesn't come out anymore, but only water comes out.
- Keep on loading water in the system until the system reaches a pressure between 1,5 and 3,5 bar (recommended operation pressure).

In case of manual filling, stop loading water and start circulation pumps in order to gather the air in the system, if present, in the highest points equipped with air vent.

After 2 hours, switch off the pumps and discharge the air, if present, gathered in the air vents placed in the system. Load again water in the circuit in order to restore the previous pressure.

Repeat the operation until the air doesn't come out anymore from the air vents.



Keep water pressure in the circuit between 1,5 and 3,5 bar. Install one or more membrane expansion vessel with adequate volume and charge pressure.

4.10 Pipeline diameters

4.10.1 Hydraulic connections diameters

DXi.H	Plate condenser		Hot water coil		Humidifier		Drain water outlet		
	IN (inch GAS)	OUT (inch GAS)	IN (inch GAS)	OUT (inch GAS)	IN (inch GAS F)	mm	mm	(*) mm	(**) mm
61	1x 1/2" GAS M	1x 1/2" GAS M	1/2" M	1/2" M	3/4"	22	22	12	-
111	1x 1/2" GAS M	1x 1/2" GAS M	1/2" M	1/2" M	3/4"	22	22	12	-
121	1x 3/4" GAS M	1x 3/4" GAS M	3/4" M	3/4" M	3/4"	22	22	12	-
151	1x 3/4" GAS M	1x 3/4" GAS M	3/4" M	3/4" M	3/4"	22	22	12	-
181	1x 1" GAS M	1x 1" GAS M	3/4" M	3/4" M	3/4"	22	22	12	-
201	1x 1" GAS M	1x 1" GAS M	3/4" M	3/4" M	3/4"	22	22	12	-
251	1x 1" GAS M	1x 1" GAS M	3/4" M	3/4" M	3/4"	22	22	12	10
321	1x 1" GAS M	1x 1" GAS M	3/4" M	3/4" M	3/4"	22	22	12	10
381	1x 1"1/4 GAS M	1x 1"1/4 GAS M	3/4" M	3/4" M	3/4"	22	22	12	10
392	1x 1"1/4 GAS M	1x 1"1/4 GAS M	3/4" M	3/4" M	3/4"	22	22	12	10
472	1x 1"1/4 GAS M	1x 1"1/4 GAS M	3/4" M	3/4" M	3/4"	22	22	12	10
491	1x 1"1/4 GAS M	1x 1"1/4 GAS M	3/4" M	3/4" M	3/4"	22	22	12	10
531	1x 1"1/4 GAS M	1x 1"1/4 GAS M	1" GAS F	1" GAS F	3/4"	22	22	12	10
532	1x 1"1/4 GAS M	1x 1"1/4 GAS M	1" GAS F	1" GAS F	3/4"	22	22	12	10
631	1x 1"1/2 GAS M	1x 1"1/2 GAS M	1" 1/4 GAS F	1" 1/4 GAS F	3/4"	22	22	12	10
652	1x 1"1/2 GAS M	1x 1"1/2 GAS M	1" 1/4 GAS F	1" 1/4 GAS F	3/4"	22	22	12	10
691	1x 1"1/2 GAS M	1x 1"1/2 GAS M	1" 1/4 GAS F	1" 1/4 GAS F	3/4"	22	22	12	10
742	1x 2" GAS M	1x 2" GAS M	1" 1/4 GAS F	1" 1/4 GAS F	3/4"	22	22	12	10
761	1x 2" GAS M	1x 2" GAS M	1" 1/4 GAS F	1" 1/4 GAS F	3/4"	22	22	12	10
861	1x 2" GAS M	1x 2" GAS M	1" 1/4 GAS F	1" 1/4 GAS F	3/4"	22	22	12	10
931	1x 2" GAS M	1x 2" GAS M	1" 1/2 GAS F	1" 1/2 GAS F	3/4"	22	22	12	10
952	1x 2" GAS M	1x 2" GAS M	1" 1/2 GAS F	1" 1/2 GAS F	3/4"	22	22	12	10
1021	1x 2" GAS M	1x 2" GAS M	1" 1/2 GAS F	1" 1/2 GAS F	3/4"	22	22	12	10
1142	1x 2" GAS M	1x 2" GAS M	1" 1/2 GAS F	1" 1/2 GAS F	3/4"	22	22	12	10

(*) Option PB

(**) Option PBH

DXi.HF	Plate condenser / Hot water coil		Humidifier		Drain water outlet		
	IN (inch GAS)	OUT (inch GAS)	IN (inch GAS F)	mm	mm	(*) mm	(**) mm
181	1x 1" GAS F	1x 1" GAS F	3/4"	22	22	12	-
251	1x 1"1/4 GAS F	1x 1"1/4 GAS F	3/4"	22	22	12	10
381	1x 1"1/2 GAS F	1x 1"1/2 GAS F	3/4"	22	22	12	10
392	1x 1"1/2 GAS F	1x 1"1/2 GAS F	3/4"	22	22	12	10
531	1x 1"1/2 GAS F	1x 1"1/2 GAS F	3/4"	22	22	12	10
532	1x 1"1/2 GAS F	1x 1"1/2 GAS F	3/4"	22	22	12	10
631	1x 2" GAS F	1x 2" GAS F	3/4"	22	22	12	10
652	1x 2" GAS F	1x 2" GAS F	3/4"	22	22	12	10
742	1x 2" GAS F	1x 2" GAS F	3/4"	22	22	12	10
761	1x 2" GAS F	1x 2" GAS F	3/4"	22	22	12	10
931	1x 2" GAS F	1x 2" GAS F	3/4"	22	22	12	10
952	1x 2" GAS F	1x 2" GAS F	3/4"	22	22	12	10

4.11 Plate condenser hydraulic connections

The units are designed to work with tower water. It is necessary that the refill water for the evaporating tower is adequately treated in order to avoid corrosion problems, limestone deposit and algae microorganism proliferation.



In DXi.HF units, use of glycol is always recommended.

It is also possible to use water from water city systems adequately treated.

In these cases, the water condenser is equipped with a pressostatic valve as optional (VP or VCP accessories): when calculating the circulation pump size, the pressure drop of this component must be also kept into account.

On demand, the condensers can be sized to be able to employ a water and ethylene glycol mixture in a closed circuit cooled by a forced ventilation coil exchanger (dry-cooler) which dispels the heat into the atmosphere. The use of glycolated water allows the cooling circuit to also work at low outdoor temperatures. The percentage of ethylene glycol to be used is indicated in the following table.

Percentage of ethylene glycol (vol %)	Freezing temperature	Percentage of propylene glycol (vol %)	Freezing temperature
5%	-1,72	5%	-1,70
10%	-3,63	10%	-3,43
15%	-6,10	15%	-5,30
20%	-8,93	20%	-7,44
25%	-12,10	25%	-9,98
30%	-15,74	30%	-13,08
35%	-19,94	35%	-16,86
40%	-24,79	40%	-21,47
45%	-30,44	45%	-27,04
50%	-37,10	50%	-33,72

When employing this mixture, the condenser must be equipped with a temperature control device of the anti-freeze mixture.



If the anti-freeze mixture contains a lower ethylene glycol percentage than above recommended, there could be risks of freezing, while a higher percentage can reduce the unit performance.



At the beginning of every winter, it is recommended to check the correct concentration of glycol in the system; please only use inhibited ethylene glycol in order to avoid rusting of the hydraulic circuit.



Do not use anti-freeze liquids unsuited to copper, stainless steel and to all other materials present in the system.

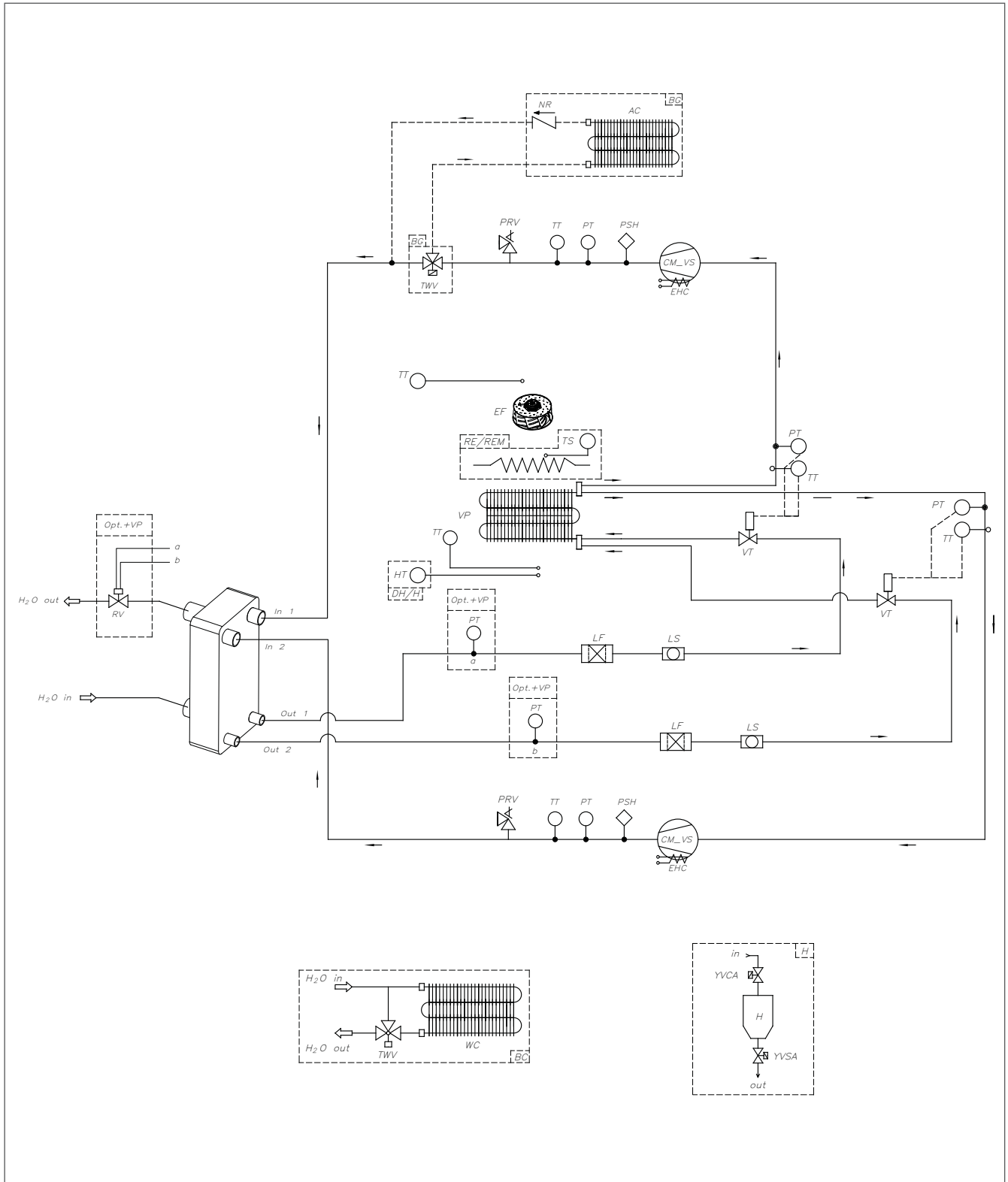
It is recommended to install a filter with grid not larger than 1mm on the condenser water inlet.

It is also advisable to install a ball check valve on the condenser inlet and outlet so that it is possible to shut off the conditioning unit in case of special maintenance operations: the installation of a three-piece joint between the valves and the conditioning unit will ease these operations.

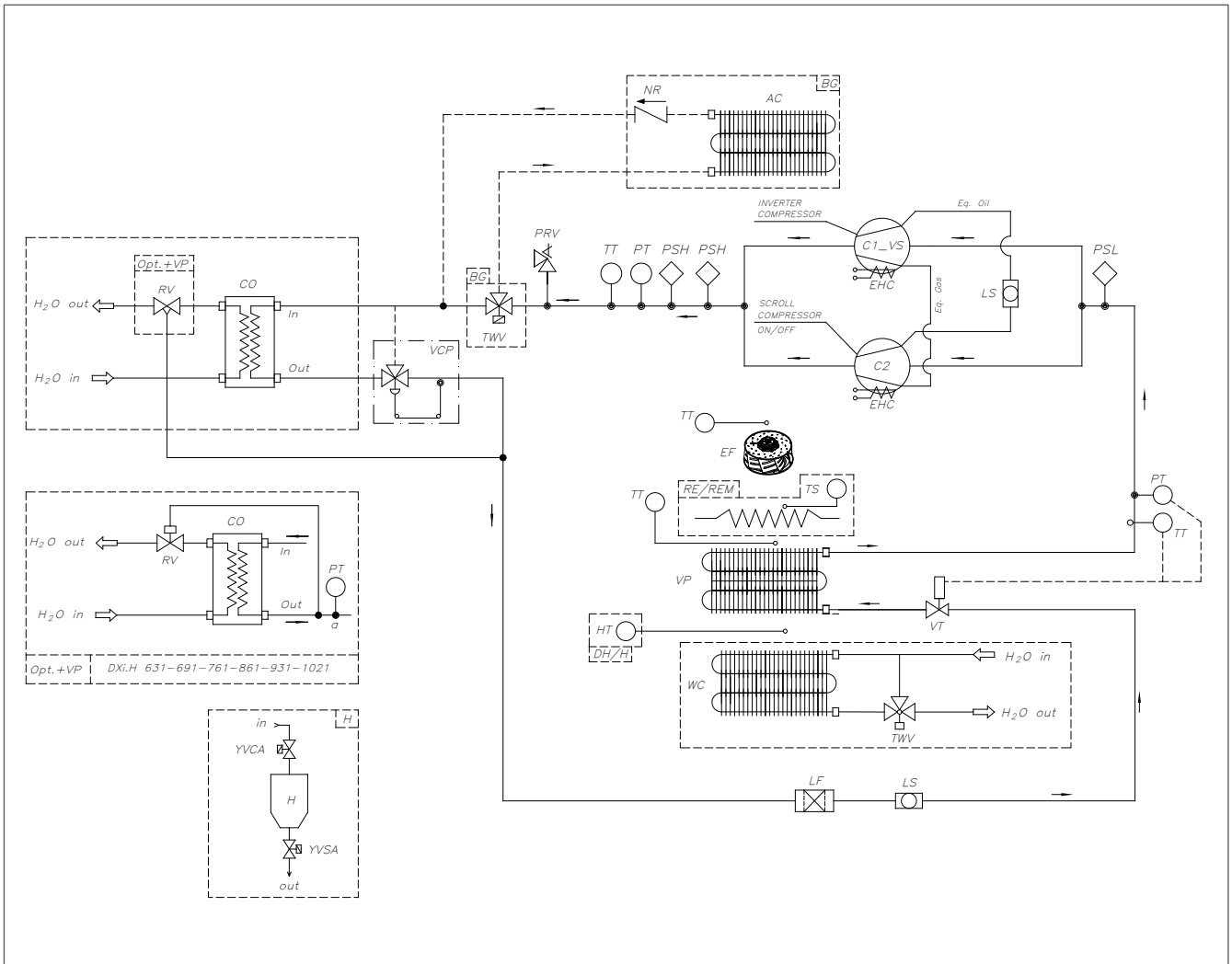


The water system pressure must range between 1,5 and 3,5 bar.

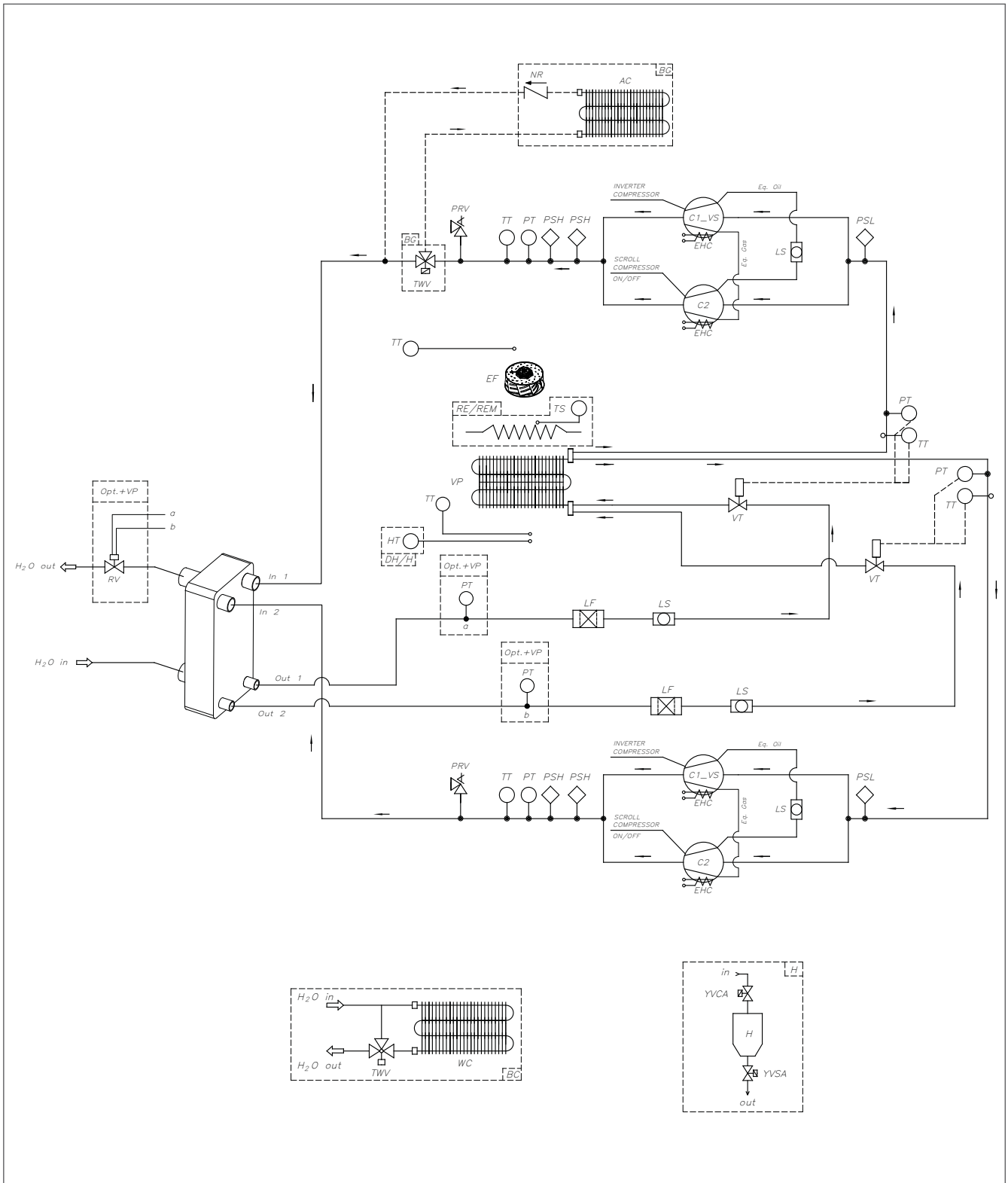
4.12.2 DXi.H Refrigerant circuit layout - 2 Circuits / 2 Compressors



4.12.3 DXi.H Refrigerant circuit layout - 1 Circuit / 2 Compressors



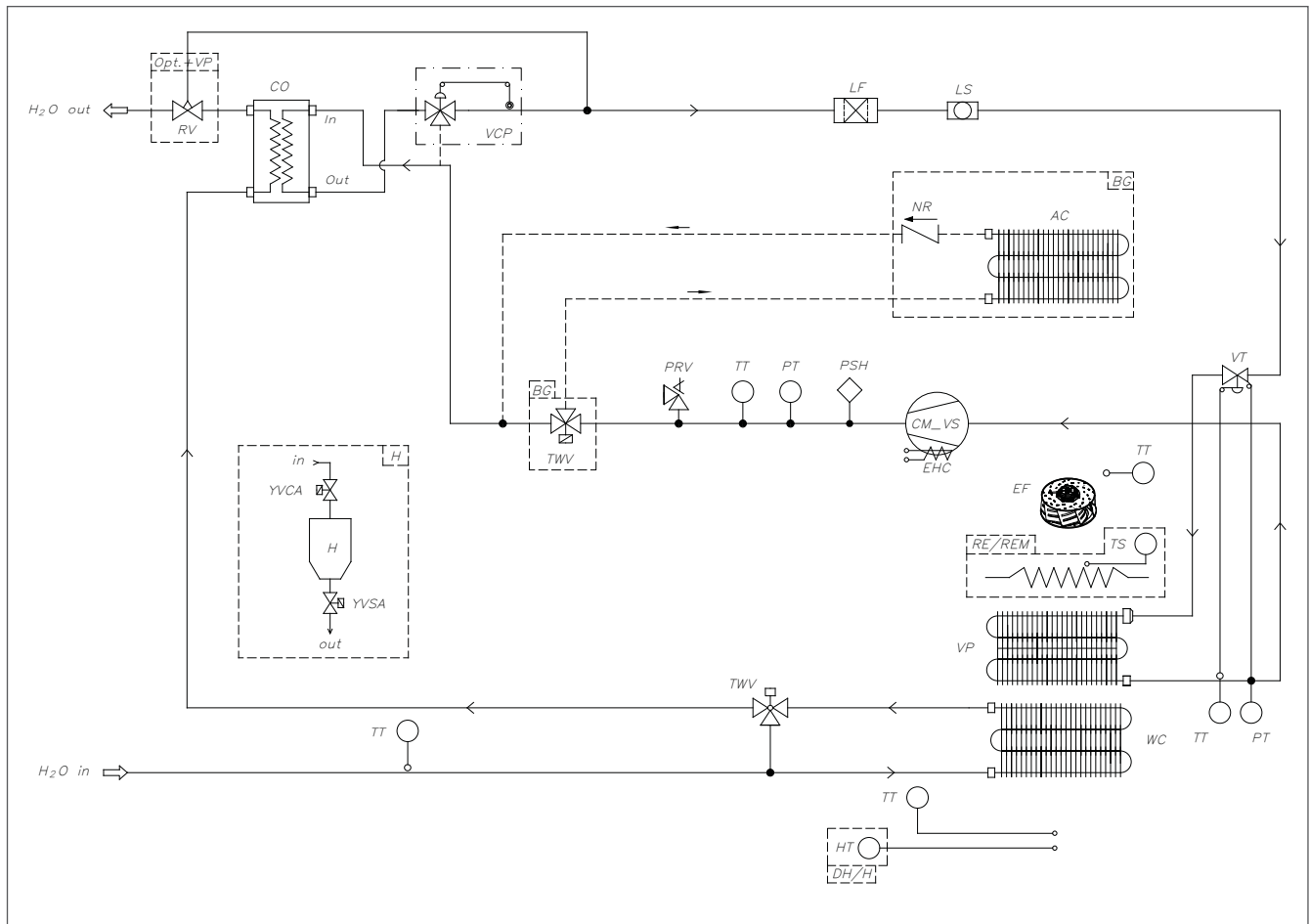
4.12.4 DXi.H Refrigerant circuit layout - 2 Circuits / 4 Compressors



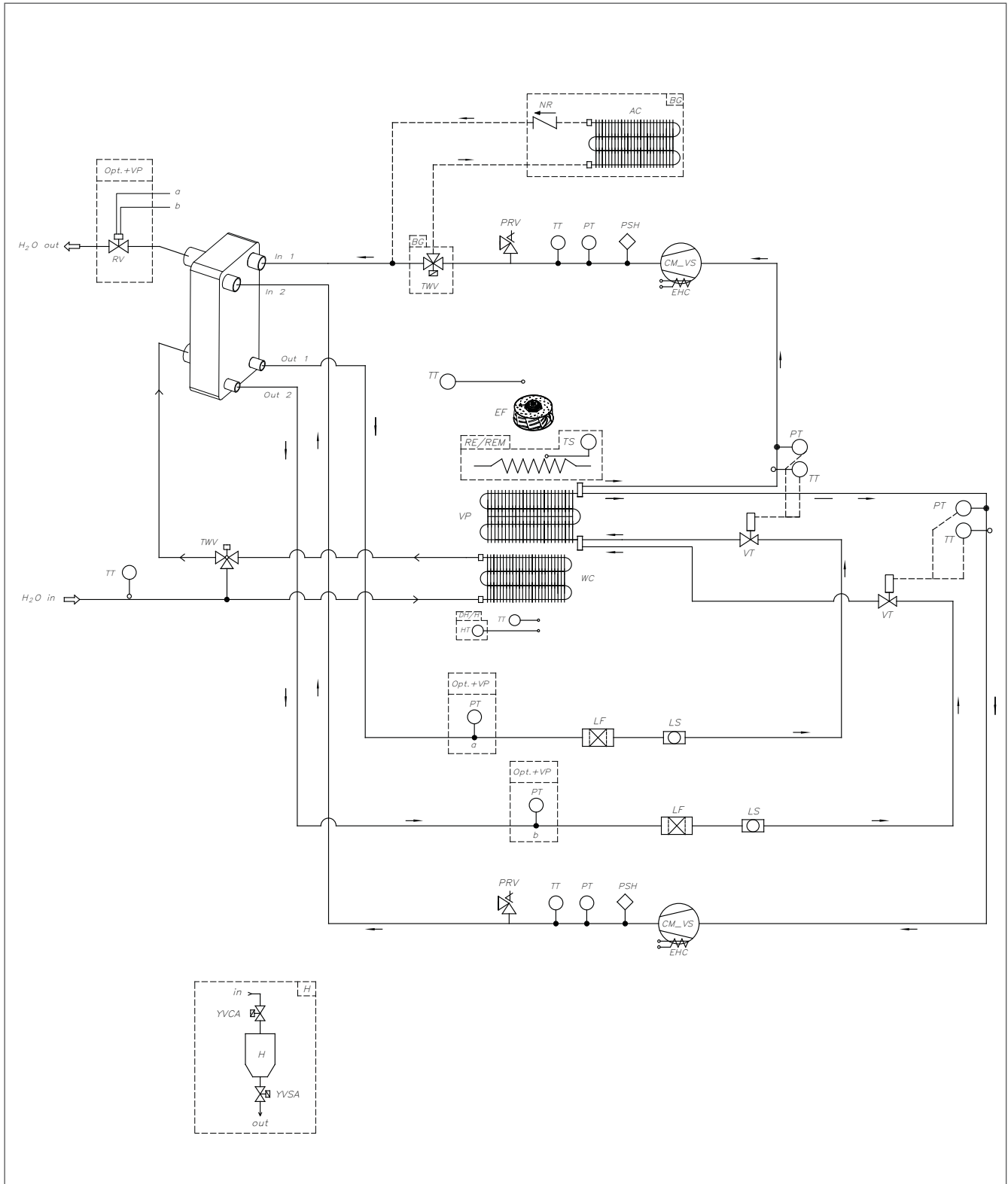
4.13 DXi.HF Refrigerant circuit layout

AC	Air heat exchanger	PRV	Safety valve
BC	Hot water coil	PSH	High pressure switch
BG	Hot gas coil	PSL	Low pressure switch
BW	Low temp. Operation up to -40°C	PT	Pressure transducer
CM	Compressor	RE	Electric heaters
DH	Dehumidifier	RV	Modulating valve
EF	Fan	REM	Oversized electric heaters
EHC	Crank-case heater	SV	Shut-off valve
EV	Solenoid valve on liquid line	TS	Safety thermostatic valve
FSR	Fan speed regulator	TT	Temperature probe
H	Humidifier	TWV	3-Way valve
HG	Hot gas	VP	Evaporator
HT	Humidity probe	VT	Thermostatic expansion valve
LF	Dehydrating filter	WC	Water coil
LS	Sight glass	YVCA	Humidifier fill valve
LT	Liquid receiver	YVSA	Humidifier drain valve
NR	Non-return valve	-----	Optional

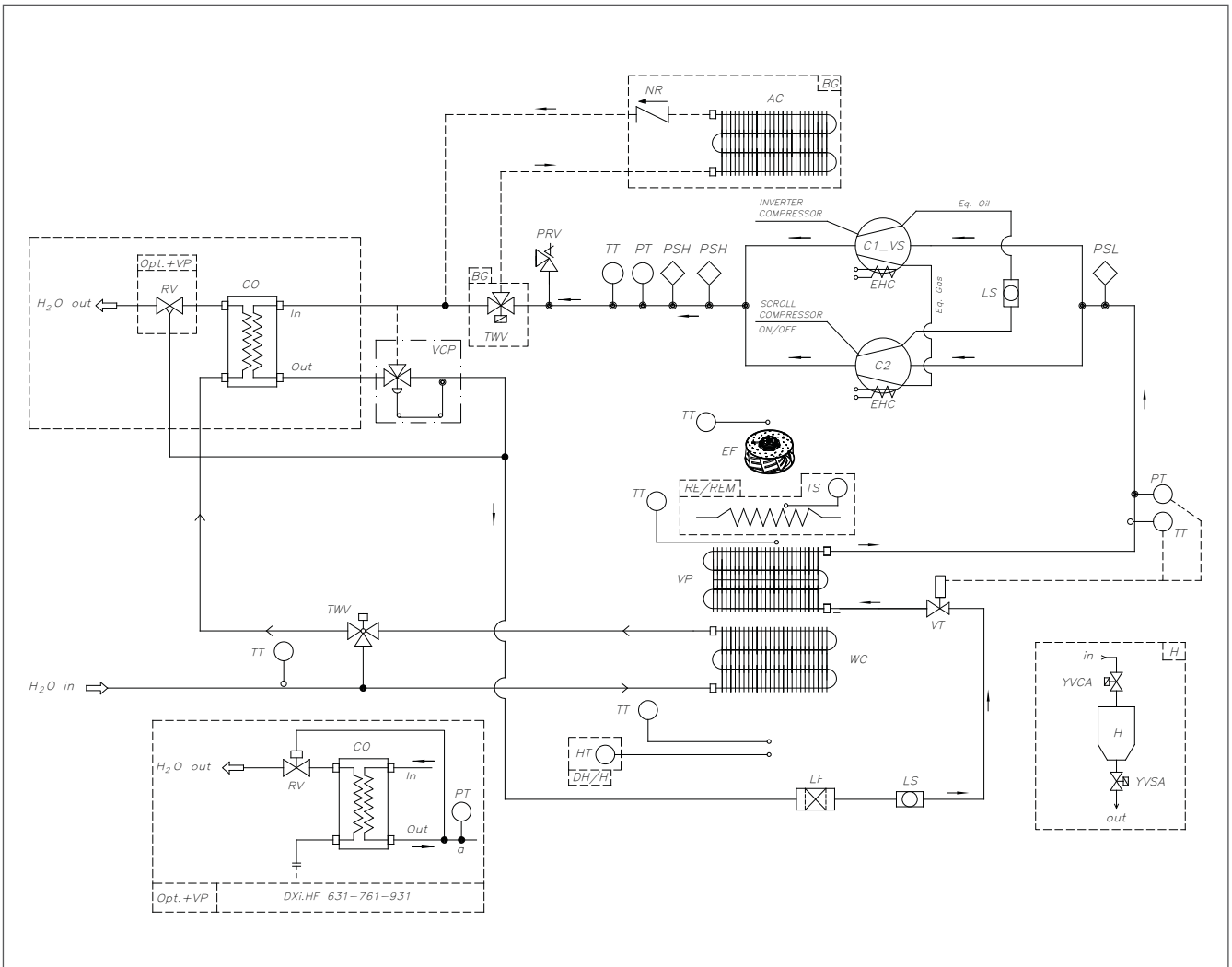
4.14.1 DXi.HF Refrigerant circuit layout - 1 Circuit / 1 Compressor



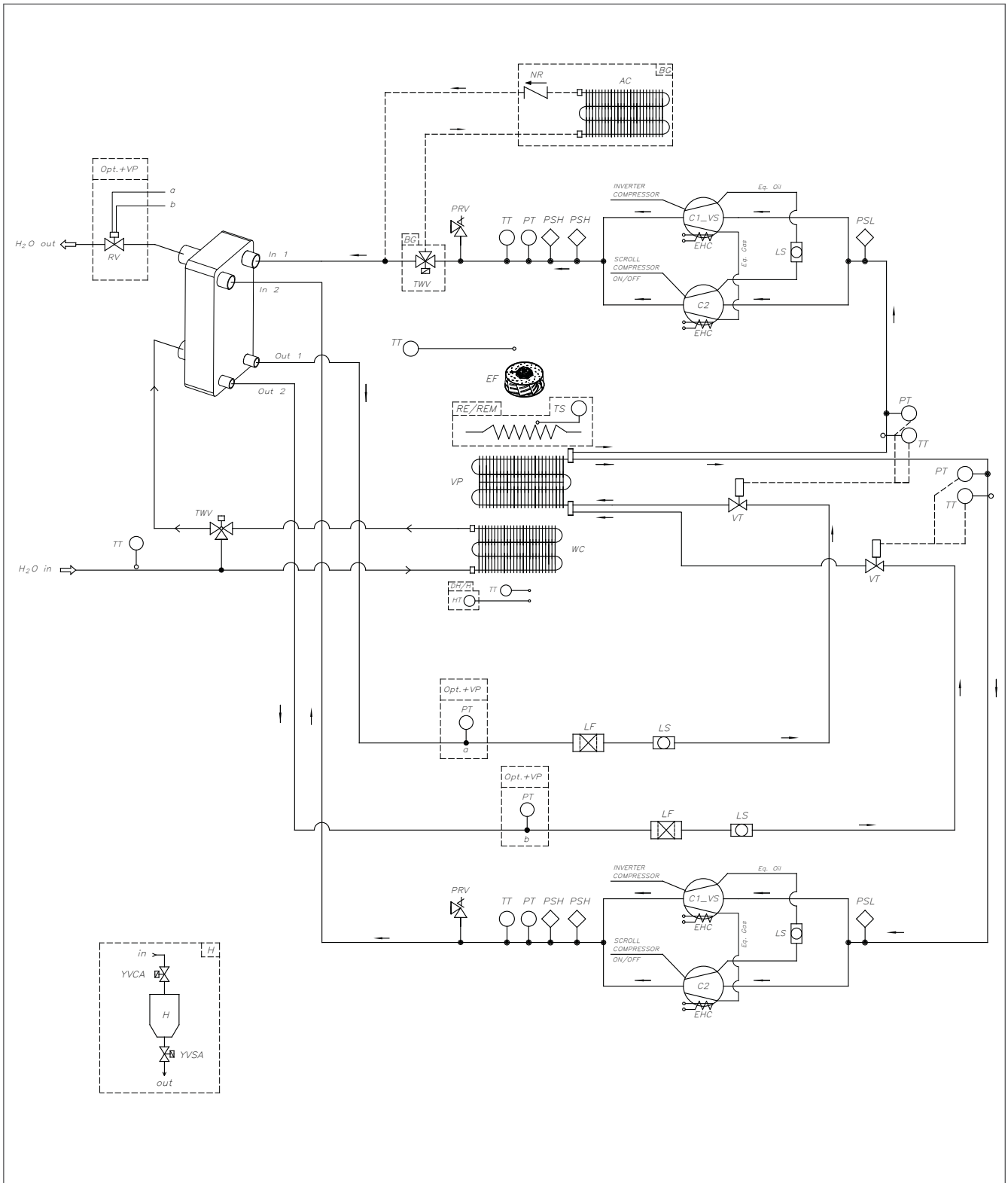
4.13.2 DXi.HF Refrigerant circuit layout - 2 Circuits / 2 Compressors



4.13.3 DXi.HF Refrigerant circuit layout - 1 Circuit / 2 Compressors



4.13.4 DXi.HF refrigerant circuit layout - 2 Circuits / 4 Compressors



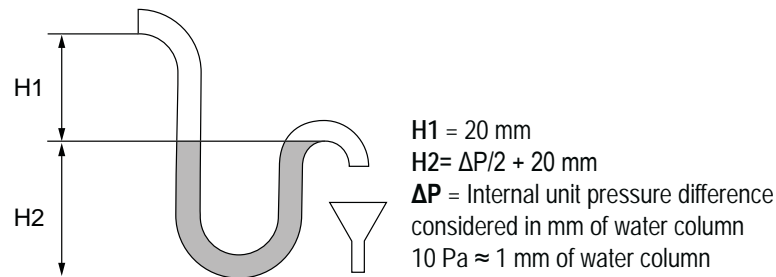
4.14 Condensing water connection

4.14.1 Condensing water connection

The unit is provided with a painted material basin for condensate collection situated under the coil, connected through a flexible plastic tube (fornito con l'unità) with syphon (with internal diameter of 19mm) to the drain collector which has to respect a small downward slope (around 1%) to exhaust direction



In the discharge line a siphon must be made with a minimum head equal to the prevalence in fan's suction, in any case never less than 35mm.



4.15 Renewal air intake connection (Optional) (PR)

This option is installed inside of the unit on the left side, on request on the right one.

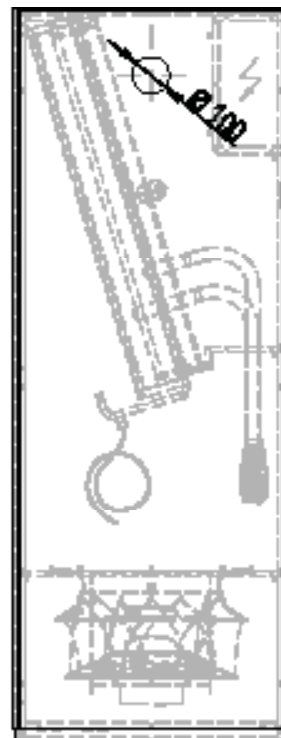
The renewal air duct coming from the nearest outlet has to be fixed to the collar located on the unit lateral panel.

The module of this option is provided with a flat filter, easily removable for his cleaning or replacement (moving the special catch).

Vers. U/V/B



Vers. D

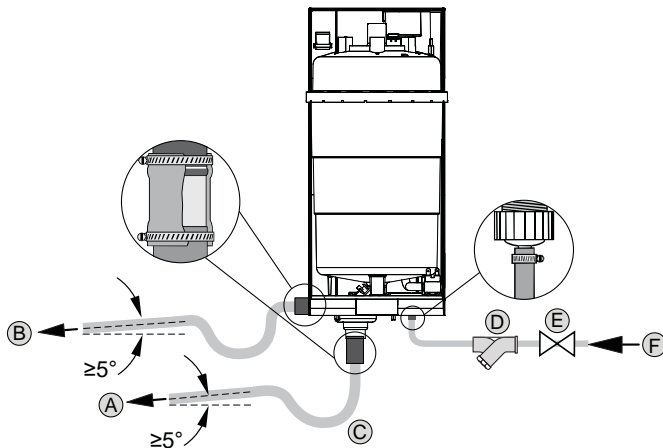


4.16 Humidifier (optional) (H)

4.16.1 Humidifier connection (optional)

The unit is designed to be supplied with water, sanitary preferably, using a suitable conduit provided with a interception shut-off valve, which has to be connected also to drain pipe in order to collect the condensation and excessive water.

Is recommended to use clean water to supply the unit (impurity has to be not bigger than 100micro) even if the humidifier is provided with a filter.



A	Exhaust
B	Steam production exhaust ≥ 25 kg/h
C	Siphon
D	Filter
E	Shut-off valve
F	Power supply



Is recommended to add a mechanical filter and a shut-off valve to hold back solid impurities.



The exhaust pipe has to be free, without backpressure and provided with a siphon immediately under humidifier connection.

4.16.2 Exhaust

Exhaust max. flow	~ 4 l/min
Exhaust water connection	32 mm
Exhaust min. interna Ø	45 mm

4.16.3 Power supply

Supply max. flow	~ 4 l/min
Supply water connection	¾" G M
Charge min. internal Ø (rigid or flexible pipe)	45 mm

The connection of drain water is realized using a plastic/rubber pipe (resistant up to 100°C), with internal section suggested of 32 or 40mm (DIN 19535, UNI 8451/8452 compliant).

The discharge junction is suitable for hot blade welder with discharge pipes in Polypropilene



Is suggest to limit to 4mt the steam transport pipe, in order to correct operation. The steam condensate pipe siphon has to be filled with water before start up the humidifier.

4.16.3 Steam production regulation

The steam production must be limited to 60-70% of maximum humidifier capacity to guarantee a longer lifetime of the device. To the access or modify the operating parameters refer to the humidifier manual, attached.

4.17 Electric connections: safety preliminary advices

The electrical cabinet is located inside on the front of the unit where are placed also the cooling circuit components. To access please remove the frontal panel.



The electric connection has to be performed following the electrical diagram attached to the unit following the local and international norms.



Ensure that the power supply line is sectioned upstream of it.
Ensure that the sectioning device is locked and that on the drive handle is positioned the advice to not operate.



Verify the power supply corresponds to the unit nominal datas (tension, phases, frequency) provided on the wiring diagram and on the Identification Tag attached on the unit.



The power supply cables must be protected upstream against the effect of short circuits and overload by a suitable device complying with the regulations and norms in force.



Ensure that the power supply cable section are suitable to the capacity of the unit and safety devices taking into consideration all the factors can influence it (temperature, isolation type, length, etc.)



The electrical power supply has to respect the mentioned limits; otherwise the warranty will be immediately decay.



Make all the ground connections required by the legislation and norms in force.



Before to starts any operation ensure the power supply is disconnected.



The electrical line and unit external safety devices has to be dimensioned in order to guarantee the power supply tension to the maximum operation conditions provided to the wiring diagram.



In presence of IT power supply lines the Manufacturer has to release, after checking, the connection authorization.

4.18 Electrical data



Refer to the electrical data provided on the wiring diagram.



The supply voltage cannot suffer variations higher than $\pm 10\%$ and the unbalance between phases less then 1% (EN 60204 norm). If those tolerances are not respected please contact the technical department of the Manufacturer. The unit use with voltage different that designed will make decay the warranty.

4.18.1 DXi.H electrical data

Model		61	111	121	151	181	201	251	321
Power supply	V/~ /Hz	400/3/50+N+PE							
Control circuit	V/~ /Hz	24/1/50							
Auxiliary circuit	V/~ /Hz	24/1/50							
Compressor's supply	V/~ /Hz	400/3/50							
Line section	mm ²	2,5	2,5	2,5	2,5	4	4	6	6
PE section	mm ²	2,5	2,5	2,5	2,5	4	4	6	6

Model		381	392	472	491	531	532	631	652
Power supply	V/~ /Hz	400/3/50+N+PE							
Control circuit	V/~ /Hz	24/1/50							
Auxiliary circuit	V/~ /Hz	24/1/50							
Compressor's supply	V/~ /Hz	400/3/50							
Line section	mm ²	10	10	10	10	16	16	16	16
PE section	mm ²	10	10	10	10	16	16	16	16

Model		691	742	761	861	931	952	1021	1142
Power supply	V/~ /Hz	400/3/50+N+PE							
Control circuit	V/~ /Hz	24/1/50							
Auxiliary circuit	V/~ /Hz	24/1/50							
Compressor's supply	V/~ /Hz	400/3/50							
Line section	mm ²	16	25	25	25	25	35	25	35
PE section	mm ²	16	25	25	25	25	35	25	35

4.18.2 DXi.HF electrical data

Model		181	251	381	392	531	532
Power supply	V/~ /Hz	400/3/50+N+PE					
Control circuit	V/~ /Hz	24/1/50					
Auxiliary circuit	V/~ /Hz	24/1/50					
Compressor's supply	V/~ /Hz	400/3/50					
Line section	mm ²	4	6	10	10	16	16
PE section	mm ²	4	6	10	10	16	16

Model		631	652	742	761	931	952
Power supply	V/~ /Hz	400/3/50+N+PE					
Control circuit	V/~ /Hz	24/1/50					
Auxiliary circuit	V/~ /Hz	24/1/50					
Compressor's supply	V/~ /Hz	400/3/50					
Line section	mm ²	16	16	25	25	25	35
PE section	mm ²	16	16	25	25	25	35



The electrical data could change without any advice; It is necessary refers always to the wiring diagram provided with the unit.

4.19 Power supply connection

The unit must be powered with a 5-poles cable (3phases+N+PE) if the power supply is 400V/3ph/50Hz; on request is possible to provide the unit with special power supply (refer to Identification Tag and wiring diagram).

Connect three phases and the neutral to prepared terminals of the main switch and the earth wire to its corresponding terminal; use a power supply cable of adequate section and as short as possible in order to avoid voltage drops.

Protect the power supply cable with an automatic switch of appropriate size and features. The Power supply cable section and the size of automatic switch can be detected on the wiring diagram attached to the present Manual.

The entrance of power supply cable is indicated on the technical drawing of the unit attached to the present Manual, the entrance must be adequately protected in accordance with local norms in force.



If the power supply cable comes from the top of the unit is advisable to make a bend break before plugging it into the connection.

Perform a visual check before to make any intervention on the electric circuit in order to avoid a transport damage; Particularly check every terminal screw, their tightening and the integrity of every cable isolation.

The conductors for the phases of the power supply cable must be connected to the free terminal in input to the general switch of the unit; the earth conductor must be fixed to the corresponding terminal or bar (identified with PE).

4.19.1 User's terminal board connection

A user terminal board is available with free contacts designed for:

- Generic alarm mode;
- Unit remote ON/OFF.

Inside of the electrical board are available a terminal where are available the digital and analogic signals for the unit operation.

The terminal configuration could change unit by unit so refer to the one represented on the wiring diagram attached to the present Manual.

4.19.2 Phases sequence in the power supply check

The unit's device rotation (compressors, fans, pumps, etc.) are checked and harmonized during the factory test performed by the Manufacturer (except for the unit with a special power supply or the units cannot be starts). Once the connection is made it is necessary to check if the phases are rightly connected, on this purpose make sure all electric devices rotation is in right side.

For three phases units if one component rotation is wrong it must be assumed that every component rotation is wrong, so two phases must be inverted in the main switch terminal.



To avoid connection errors other conductors belonging to the main switch must not be disconnected, in addition to the two involved in the operation.

4.19.3 IT systems compatibility (without ground connection) and TN systems with ground connection



Disconnect the internal EMC filter if a IT system converter has to be installed (supply system without ground connection or with ground connection to high resistance [higher than 30ohm]), otherwise the system will be connected to ground potential using the EMC filter condensers; this could be dangerous for the people and unit.

Disconnect the internal EMC filter if a TN system with a ground connection has to be installed otherwise the converter will be damaged

When the internal EMC filter is disconnected if is not installed an external filter, the frequency converter do not meets the electromagnetic compatibility requirements.

To EMC disconnection remove the EMC screw.

4.19.4 Supply cable connection

- 1) Connect to ground the PE conductor on distribution schede.
- 2) Use an additional ground connection wire if the shielding is inadequate (lower than conductivity of phase conductor) and there is not a simmetric ground conductor inside the wire.

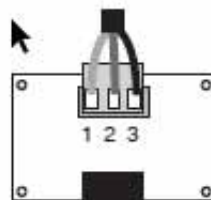
4.20 RS485 Serial interface

Supervision system connection (MODBUS-RS485 only suprevision system available).

This system allows control all the unit operation parameters by remote and allows also the possibility to change them.

It is necessary to respect the wiring polarity how shown below; The polarity inversion could cause a unit malfunction. The supervision system cable should be twisted type and shelded with 2 wire AWG20/22.

Unit is factory settled with serial address 1; if MODBUS protocol is used there is the possibility to ask the variables list to the Manufacturer.



pin	significato meaning
1	GND
2	RX+/TX+
3	RX-/TX-

5. START UP

5.1 Preliminary checks

Before to start up the unit has to be necessary perform some electric, hydraulic and cooling checks.



Commissioning operations has to be performed following the previous mentioned indications.



Do not switch off the unit (temporary stop) using the main switch; this device has to be used only to disconnect the unit when a current is absent, for example when the unit is in OFF. Moreover, when the power supply is off the crankcase heaters are not powered with consequent danger of compressor rupture when the unit will be powered.

5.1.1 Before to start up



Malfunctions or damage can derive also by lack of attention during shipping and installation; before installing or starting up the unit check about refrigerant leak presence caused by capillaries rupture or gauges connections, cooling circuit pipes, transport vibrations, manumission or mistreatments on site.

- Check the right unit installation in accordance with advices in the present Manual;
- Check the electric connection and the terminal screw connections;
- Check the phases voltage (R S T) and the compliance with the Identification Tag;
- Check the unit ground connection;
- Check the refrigerant leaks, eventually using an apposite device;
- Check the oil leaks near the compressors or along the cooling circuit;
- Check the pressure of the cooling circuit using the gauges installed (if presents) or service gauges;
- Check the closing of all service outlets;
- Check the correct supply of the crankcase heaters (if presents);
- Check that all the hydraulic connection are performed correctly and that all the indications on the plates are respected;
- Check that the system has been properly vented;
- Check the unit internal fluid temperature, they must respect the operation limits;
- Before to start up the unit check that every panel is in right position and well closed;
- Check the opening of all the circuit shut-off valve.



Do not modify any unit connection, otherwise the warranty immediately decay.



If present, the crankcase heaters must be switch on at least 12 hours before unit starts (preheating period) closing the main switch (the heaters are automatically supplied when the switch is closed). The heaters are working correctly if after few minutes the carte temperature will be 10/15°C higher than ambient temperature.



In case of crankcase heaters presence, during the preheating period is important to check if on the unit display is present the word OFF or if the unit is in stand-by mode. In case of accidental start (before of preheating time) the compressors could be seriously damaged and the warranty immediately decay.

5.2 First start up

Before the first unit start up or after a loang break it is necessary to check the consistency of the microprocessor setting values with the planned operation conditions.

To switch ON the unit rotate the main switch in ON position in order to supply it.



Ensure the unit is Switched OFF from the keyboard.



Wait at least 12 hours before to switch on the unit so as to allow the crankcase heater to heat the oil in the compressors.

Once powered the unit, after a short controller auto-test period, it is necessary to press ON/OFF key switching into ON; afer that in accordance with settled parameters and thermally-hygro thermic conditions detected, all the unit devices will switch on.



Check the fans and compressors rotation if the power supply is of three phases; if the rotation is wrong will be necessary to invert two of three phases on the main switch terminals.

Once the unit reaches a nominal operation, the technician in charge must detects the operating parameters. The data must be registered on the First Start Up Report, attached to the present Manual.



A copy of First Start Up report fulfilled has to be transmitted to the Manufacturer in order to make the Warranty valid.



During first start up operations the technician in charge must verify that control and safety devices properly work.



The unit first start up must be performed by an expert cooling technician authorized by the manufacturer.

5.3 Operation checks

Checks the fans rotation; if is wrong turn off immediately the main switch and invert two of three phases of the main switch in order to invert the motor rotation.

After few hours of nominal working check the sight glass, it must be of green color, in case of the glass is yellow humidity could be present inside the circuit; it will be necessary to dehydrating the circuit (operation performed by expert technicians).

Checks also if on the sight glass air bubbles are presents, if yes it means that the refrigerant charge is insufficient; put some refrigerant inside the circuit.

However, the presence of some steam bubble is permitted.

5.4 Safety valves

The external safety valves output connections installed on the unit are provided with a threaded connection in order to be connected to an exhaust duct, when the project or the local regulations and norms expect.

If expected, the valves must be individually conveyed using metallic pipes, up to an area where the discharged refrigerant cannot cause damage to people or things.



The safety valves output refrigerant has high temperature and pressure if fast discharged; the flow could be dangerous for person or thing directly invested.



The valve opening is accompanied by a noise whose intensity could cause damages, also permanent, to the people immediately near the unit.

The tubes must be a diameter not smaller than safety valves discharge connection; the refrigerant pressure drop must be as low as possible to avoid the valves discharge flow reduction.

The valve discharge must be done to an adequate distance from other equipment, systems or ignition sources; the discharged refrigerant must not accidentally enter into buildings.

In any case the safety valve discharge must be done in accordance with regulations and laws in force.

5.5 Safety devices calibration

	OFF (barg)		ON (barg)
High pressure safety valve			43,4 (open)
High pressure gauge	Unit with Rotary compressor	39,1	33
	Unit with Scroll compressor	42	35
Low pressure gauge	4		6

6. USE

6.1 Electronic microprocessor control description and use

The controller is composed by:

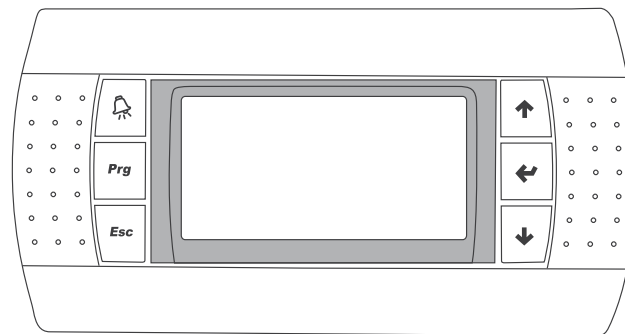
- A control electronic card with the terminals for transmission of functioning parameters and the drive of control devices;
- User interface card with programming keys and graphic display to check the operation modes and the alarm messages; the card manages the different devices which are installed in the unit, following the operation variables values; In this way the card cans realizes the following main functions:

- Unit ON/OFF from the keyboard or remote;
- Alarm and risk situation management;

The use interface display of controller cans shows also the folowing information:

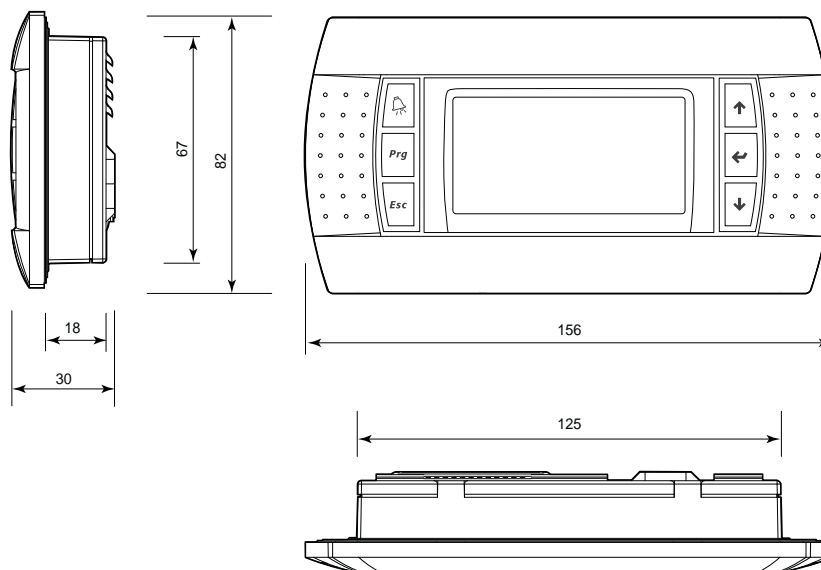
- Regulation parameters values settled;
- Operating variables values;
- Analogic and digital inputs and outputs conditions;
- Unit operation mode
- Alarm and risk indication.

Possibility to interfacing with BMS system.



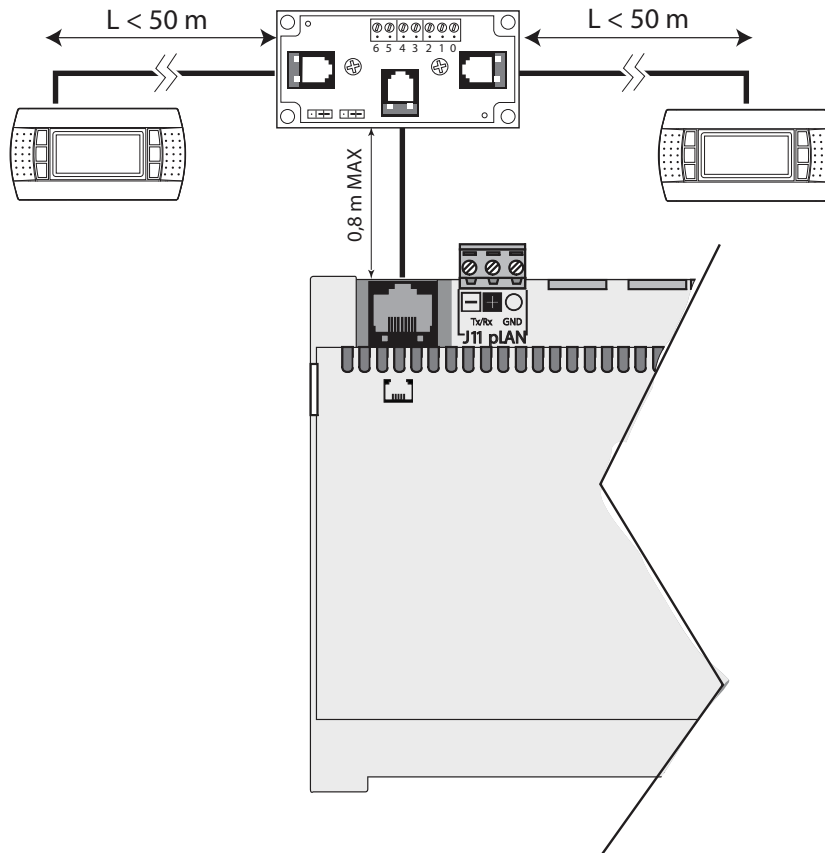
6.2 Remote control description

6.2.1 Dimensions



6.2.2 Electrical connection

Connect the phone wire is coming from the card to the back terminal suitable connector.



For the control panel electrical connection refer to the wiring diagram provided with the unit.



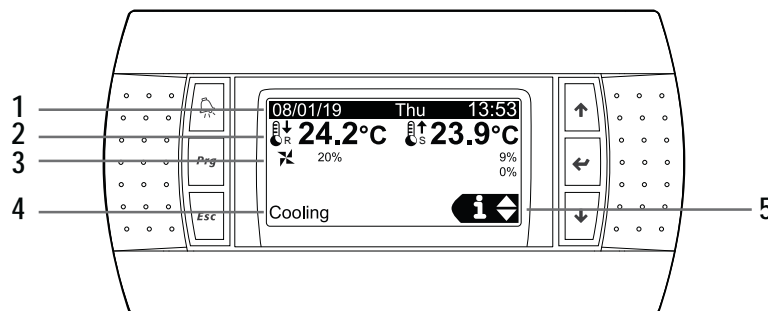
If a wiring Controller/terminal trouble occurs, the failure communication between the controller and remote terminal will be displayed with "noL" (no Link) error message.

6.3 Keys function

	Allows the entrance to alarm display with manually reset possibility.
Prg	Allows the entrance to main Menu.
Esc	Back to the previous or standby mask.
	Scrolling the Menu or the values to be modified.
	Enter: Allows to enter in the parameter to be modified or the entrance to the selected menu.
	Scrolling the Menu or the values to be modified.

6.4 User interface

The below picture is the standby visualisation.



1	Date and hour																																												
2	Regulation probes (SUction air "R" and discharge air "S"). In case of humidity enabled, the temperature value is alternated to humidity one.																																												
3	Compressors mode; thermoregulation request and actual discharge fan speed.																																												
4	<table border="1"> <tr> <td colspan="2">Unit mode:</td> </tr> <tr> <td>Stand by</td> <td>Only fan active, no cooling required.</td> </tr> <tr> <td>Off by alarm</td> <td>Unit OFF for serious alarm</td> </tr> <tr> <td>Off by BMS</td> <td>Unit OFF from supervision control</td> </tr> <tr> <td>Off by sched</td> <td>Off by sched</td> </tr> <tr> <td>Off by DI</td> <td>Unit OFF by digital input</td> </tr> <tr> <td>Off by keyboard</td> <td>Unit OFF by keyboard</td> </tr> <tr> <td>Manual mode</td> <td>Unit with at least one device in manual mode</td> </tr> <tr> <td>Start-up</td> <td>BLDC compressor ON with start-up speed</td> </tr> <tr> <td>Shutdown</td> <td>Power decrease after switch OFF request</td> </tr> <tr> <td>Safety off</td> <td>Off safety</td> </tr> <tr> <td>High Delta P</td> <td>BLDC compressor wait about pressure reduction for start</td> </tr> <tr> <td>Cooling</td> <td>Cooling ON unit</td> </tr> <tr> <td>Restarting</td> <td>BLDC compressor trying to restart</td> </tr> <tr> <td>Wait timings</td> <td>Waiting, compressors OFF for timing</td> </tr> <tr> <td>Oil recovering</td> <td>BLDC oil recovery function enabled</td> </tr> <tr> <td>Off by network</td> <td>Unit OFF by duty-standby function</td> </tr> <tr> <td>Destabilization</td> <td>Oil recovery function enabled using destabilisation system</td> </tr> <tr> <td>Dehumidification</td> <td>Dehumidification enabled</td> </tr> <tr> <td>Pump down</td> <td>Pump down enabled mode</td> </tr> <tr> <td>Heating</td> <td>Heating ON unit</td> </tr> <tr> <td>Freecooling</td> <td>Freecooling ON unit</td> </tr> </table>	Unit mode:		Stand by	Only fan active, no cooling required.	Off by alarm	Unit OFF for serious alarm	Off by BMS	Unit OFF from supervision control	Off by sched	Off by sched	Off by DI	Unit OFF by digital input	Off by keyboard	Unit OFF by keyboard	Manual mode	Unit with at least one device in manual mode	Start-up	BLDC compressor ON with start-up speed	Shutdown	Power decrease after switch OFF request	Safety off	Off safety	High Delta P	BLDC compressor wait about pressure reduction for start	Cooling	Cooling ON unit	Restarting	BLDC compressor trying to restart	Wait timings	Waiting, compressors OFF for timing	Oil recovering	BLDC oil recovery function enabled	Off by network	Unit OFF by duty-standby function	Destabilization	Oil recovery function enabled using destabilisation system	Dehumidification	Dehumidification enabled	Pump down	Pump down enabled mode	Heating	Heating ON unit	Freecooling	Freecooling ON unit
Unit mode:																																													
Stand by	Only fan active, no cooling required.																																												
Off by alarm	Unit OFF for serious alarm																																												
Off by BMS	Unit OFF from supervision control																																												
Off by sched	Off by sched																																												
Off by DI	Unit OFF by digital input																																												
Off by keyboard	Unit OFF by keyboard																																												
Manual mode	Unit with at least one device in manual mode																																												
Start-up	BLDC compressor ON with start-up speed																																												
Shutdown	Power decrease after switch OFF request																																												
Safety off	Off safety																																												
High Delta P	BLDC compressor wait about pressure reduction for start																																												
Cooling	Cooling ON unit																																												
Restarting	BLDC compressor trying to restart																																												
Wait timings	Waiting, compressors OFF for timing																																												
Oil recovering	BLDC oil recovery function enabled																																												
Off by network	Unit OFF by duty-standby function																																												
Destabilization	Oil recovery function enabled using destabilisation system																																												
Dehumidification	Dehumidification enabled																																												
Pump down	Pump down enabled mode																																												
Heating	Heating ON unit																																												
Freecooling	Freecooling ON unit																																												
5	Quick access Menu																																												

6.5 Password settings

There are three different password levels:

- User: allows only to read all the parameters;
- Service: allows to read all the parameters and to modify some;
- Manufacturer: allows to read and modify any parameter.




In this Manual is describe the only user password use.




6.5.1 Masks loop and organization

Inside every menu the masks are arranged in loop; with  and  keys is possible to switch through them. Every mask is characterized by a 4-digit code to the top right of the screen and it is composed as:

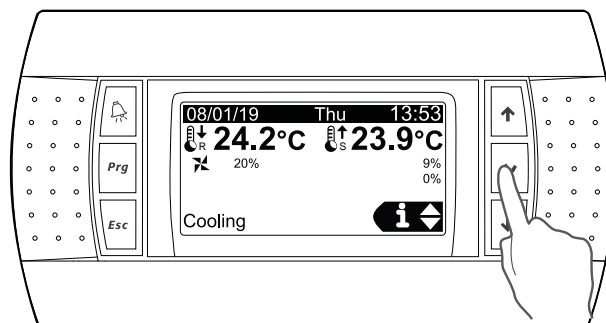
- 1° digit: Main Menu code
- 2° digit: Secondary Menu code
- 3° e 4° digits: Mask code

6.6 Quick access Menu

From main screen, using  and  keys is it possible to slide the areas of quick access Menu. PTo enter on the area press  key. Is it possible to display the parameters without any password. The quick menu areas are:

	INFO: Contains the actual unit operating functions in synoptic form, inputs state and outputs, serial devices and software information.
	ON/OFF: Allows to switch ON/OFF the unit.
	SET POINT: Allows to change the temperature, humidity and fan set points.

6.6.1 Menu INFO



<p>Info - Inv.circl1 Z001</p> <p>Out: 0 0.0 DAR 0.0 T.disp: 0.0 DeltaP: 0.0 T.suc : 0.0 0.0 DAR 0.0</p> <p>STATUS: OFF</p>		Compressor circ.1 condition (with inverter): intake and exhaust temperature, low and high pressure.
<p>Info - Circuit 1 Z002</p> <p>Safety Timing Inverter comp.1 On-On: (0s) Min.On: (0s)</p>		Compressor safety timing circ.1 (inverter).
<p>Info - Inv.circl2 Z003</p> <p>Out: 0 0.0 DAR 0.0 T.disp: 0.0 DeltaP: 0.0 T.suc : 0.0 0.0 DAR 0.0</p> <p>STATUS: OFF</p>		Compressor circ.2 condition (with inverter): intake and exhaust temperature, low and high pressure.
<p>Info - Circuit 2 Z004</p> <p>Inverter comp.3 Req 0% --> 0% On-> On: (0s) Min.On: (0s) Compressor 4 Req.: OFF -> Status: ALARM</p>		Compressor safety timing circ.2 (inverter).
<p>Info - EEV 1 Z005</p> <p>0%</p> <p>Ostp</p> <p>STATUS: 0.0°C Set: 0.0°C Suction SH: 0.0°C</p>		Thermostatic valve condition - circ.1
<p>Info - EEV 1 Z006</p> <p>Suct.P.: 0.0 bar Suct.T.: 0.0 °C</p> <p>Suction SH: 0.0 °C Dscg .P. : 0.0 bar Dscg .T. : 0.0 °C</p>		Overheating condition circ.1
<p>Info - EEV 2 Z007</p> <p>0%</p> <p>Ostp</p> <p>STATUS: 0.0°C Set: 0.0°C Suction SH: 0.0°C</p>		Thermostatic valve condition - circ.s
<p>Info - EEV 2 Z008</p> <p>Suct.P.: 0.0 bar Suct.T.: 0.0 °C</p> <p>Suction SH: 0.0 °C Dscg .P. : 0.0 bar Dscg .T. : 0.0 °C</p>		Overheating condition circ.2
<p>Info - Source 2 Z009</p> <p>PREVENT ACTIVE</p> <p>Disc.press: 19.9 bar Setpoint: 18.0 bar Source: 0.0%</p>		Shown when the PREVENT function is activated.
<p>Info - Source 2 Z010</p> <p>Disc.press: 19.9 bar Setpoint: 18.0 bar Source: 0.0%</p>		Shown when the PREVENT function is activated.
<p>Info - Humid. Z012</p> <p>Rich. attuale : 0 % Corrente: 0.0 A Conducib.: 0µs Prod.Vapore: 0.0kg/h Stato cilindro: Ness.prod.</p>		It shows the Humidifier status (demand, absorbed current, steam production).

<p>Info - Humid. Z013 Curr.request : 0 % Dehum.Running: <input type="checkbox"/> Rel. Abs. [gH2O/kg] Hum. 21.4 3.32 Set. 5.0 0.92</p>	<p>It allows to consult the information on the dehumidification mode.</p>
<p>Info - Freecool. Z014 Damper/valve on: <input type="checkbox"/> Freec.temp.: 23.1 °C Freec.request: 0.0%</p>	<p>Shown when the FREECOOLING function is activated.</p>
<p>Info - Hot Req. Z017 Request heaters: 81%</p>	<p>It allows to consult the information on the heating mode.</p>
<p>Info - Heater. Z018 Heater 1 : <input type="checkbox"/> Heater 2 : <input type="checkbox"/></p>	<p>It allows you to check whether the digital outputs of the heaters are active.</p>
<p>Unit Conf. Z101 Return temperature (U01) Value: 24.2 ° C Offset: 0.0 ° C Type: NTC</p>	<p>Provides information on the input temperature of the machine.</p>
<p>Unit Conf. Z102 Supply temperature (U02) Value: 23.2 ° C Offset: 0.0 ° C Type: NTC</p>	<p>Provides information on the output temperature of the machine.</p>
<p>Unit Conf. Z103 Return humidity (U04) Value: 48.4% Offset: 0.0% Type: 0-10V Mimum: 10.0% Maximum: 90.0%</p>	<p>Provides information on the input humidity value of the machine. It can be enabled by the Ga10 mask.</p>
<p>Unit Conf. Z105 Freecool. temperature (U06) Value: 23.1 ° C Offset: 0.0 ° C Type: NTC</p>	<p>Provides information on freecooling settings. It can be enabled by the Ga07 mask.</p>
<p>Unit Conf. Z106 Fan diff. press. (U05) Value: 7166.9 m3/h Mimum: 0.0 m3/h Maximum: 7589.5 m3/h</p>	<p>Provides information on the differential pressure level of the fans. It can be enabled by the Ga10 mask.</p>
<p>Unit Conf. Z121 External temperature for compensation (U07) Value: 20.8 ° C Offset: 0.0 ° C Type: NTC</p>	<p>Provides information on temperature set point compensation settings.</p>
<p>Conf. unita' Z122 Setpoint esterno (U08) Valore: -9,9 ° C Offset: 0.0 ° C Tipo: 0-1 V Minimo: -9,9 ° C Massimo: 9,9 ° C</p>	<p>It provides information on the external set point setting.</p>

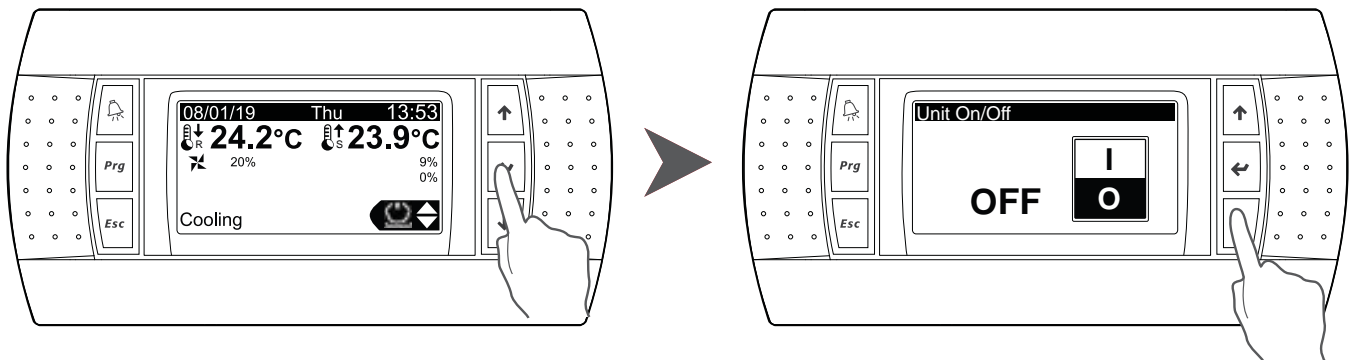
<p>Info - IO Z201 Start/Stop (ID01) Value: Active Logica: NC HW valve: Closed</p>	<p>On/Off digital input condition</p>
<p>Info - IO Z207 Pressostato LP circ.1 (ID09) Valore: Attivo Logica: NC Valore HW: Aperto</p>	<p>Pressure Switch digital input status.</p>
<p>Info - IO Z209 Pressostato LP circ.2 (ID10) Valore: Attivo Logica: NC Valore HW: Aperto</p>	<p>Pressure Switch digital input status.</p>
<p>Info - IO Z210 Humidifier Alarm (ID07) Value: Not Active Logica: NC HW valve: Closed</p>	<p>Digital input condition of humidifier alarm.</p>
<p>Info - IO Z211 Heaters overload (ID04) Value: Not Active Logica: NC HW valve: Closed</p>	<p>Thermal state electrical heaters 1 and 2. Possibility to enable them with sigital input from Ga10 mask.</p>
<p>Info - IO Z123 Air filter (ID03) Value: Active Logica: NC HW Value: Open</p>	<p>Provides information on filter cleaning status.</p>
<p>Info - IO Z223 Air flw./Ovld.main fan (ID02) Value: Not Active Logica: NC HW valve: Closed</p>	<p>Display the condition of the air flow switch & main fan thermostat.</p>
<p>Info - IO Z224 Term.comp.1/2 circ 1 o HPS 2 (ID04) Valore: Attivo Logica: NO Valore HW: Aperto</p>	<p>Compressor overload protection digital input status.</p>
<p>Info - IO Z225 Smoke/Fire detector (ID06) Value: Active Logica: NO HW valve: Open</p>	<p>It shows the fire/smoke alarm status (from digital input). It can be enabled from the mask Ga09 and can have the same input of the flooding detector.</p>
<p>Info - IO Z226 Term.comp.1/2 circ 2 o HPS 2 (ID08) Valore: Attivo Logica: NO Valore HW: Aperto</p>	<p>Compressor overload protection digital input status.</p>
<p>Info - IO Z302 Comp.1 Circ.1 OnOff (N005) Valore: Non attivo Logica: NO Valore HW: Aperto</p>	<p>Display of Compressor 1 Circuit 1 status digital output (On/Off type).</p>
<p>Info - IO Z304 Comp.1 Circ.2 OnOff (N012) Valore: Non attivo Logica: NO Valore HW: Aperto</p>	<p>Display of Compressor 1 Circuit 2 status digital output (On/Off type).</p>

<p>Info - IO Z309 Valv.eq.olio circi.2 (NO10) Valore: Non attivo Logica: NO Valore HW: Aperto</p>	<p>Display of oil equalization valve circuit 2 digital output.</p>
<p>Info - IO Z323 Open hot valve (NO02) Value: Not Active Logic: NO HW valve: Opened</p>	<p>Display of the digital outputs condition of the hot valve or the electrical heater.</p>
<p>Info - IO Z324 Close hot valve (NO03) Value: Active Logic: NO HW valve: Closed</p>	<p>Display of the condition of the digital outputs of the hot valve or the electrical heater.</p>
<p>Info - IO Z325 All.grave (NO06) Valore: Attivo Logica: NO Valore HW: Chiuso</p>	<p>Display of serious Alarm/ general alarm digital output.</p>
<p>Info - IO Z326 Warning (NO07) Valore: Attivo Logica: NO Valore HW: Aperto</p>	<p>Display of Warning/ minor alarm digital output</p>
<p>Info - IO Z329 Supply fan (NO01) Value: Active Logic: NO HW valve: Closed</p>	<p>Display of the condition of the main fan</p>
<p>Info - IO Z330 On/Off analogic hum. (NO08) Value: Active Logic: NO HW valve: Closed</p>	<p>Display of the digital output condition for the humidifier on/off</p>
<p>Info - IO Z331 Freecooling (NO09) Value: Not Active Logic: NO HW valve: Opened</p>	<p>Display of the freecooling digital output. It can be enabled by the Ga11 mask.</p>
<p>Info - IO Z332 On/Off dehumidifier (NO10) Value: Active Logic: NO HW valve: Closed</p>	<p>Display of On/Off for external dehumidifier output.</p>
<p>Info - IO Z333 On/Off source (NO11) Value: Active Logic: NO HW valve: Closed</p>	<p>Display of On/Off for remote condenser output.</p>
<p>Info - IO Z334 Inverter comp.1 (NO04) Valore: Non attivo Logica: NO Valore HW: Aperto</p>	<p>Display of compressor 1 inverter digital output.</p>
<p>Info - IO Z335 Equaliz.olio circ.1 (NO08) Valore: Non attivo Logica: NO Valore HW: Aperto</p>	<p>Display of oil equalization valve circuit 1 digital output .</p>

<p>Info - IO Z336 Inverter comp.2 (NO11) Valore: Non attivo Logica: NO Valore HW: Aperto</p>	<p>Display of compressor 2 inverter digital output.</p>
<p>Info - IO Z337 Equaliz.olio circ.2 (NO08) Valore: Non attivo Logica: NO Valore HW: Aperto</p>	<p>Display of oil equalization valve circuit 2 digital output.</p>
<p>Info - IO Z413 Inverter comp.1 (Y03) Valore: 0.0% Tipo: 0-10V</p>	<p>Display of compressor 1 inverter analogue output.</p>
<p>Info - IO Z413 Inverter comp.2 (Y04) Valore: 0.0% Tipo: 0-10V</p>	<p>Display of compressor 2 inverter analogue output.</p>
<p>Info - IO Z414 Supply vent (Y01) Valore: 0.0% Tipo: 0-10V</p>	<p>Display of main fan analogue output.</p>
<p>Info - IO Z415 Freecooling (Y02) Valore: 0.0% Tipo: 0-10V</p>	<p>Display Freecooling analogue output.</p>
<p>Info - IO Z408 Humidifier (Y02) Value: 100.0% Type: 0-10V</p>	<p>Display the conditions of the analogical humidifier</p>
<p>Info - IO Z409 Hot Valve (Y03) Value: 0.0% Type: 0-10V</p>	<p>Display the conditions of the hot valve</p>
<p>Info - IO Z410 Freecooling (Y03) Value: 0.0% Type: 0-10V</p>	<p>Display analogical freecooling output</p>
<p>Working hours Z500 Inv.comp,circ.1 Hours: 0h Next thresh.: 30000h Reset hours: NO Dev.Status: OFF N.Start: 45 Reset N.start: NO</p>	<p>Compressor counter circuit 1.</p>
<p>Ore lavoro Z501 Inv.comp,circ.1 (OnOff) Hours: 0h Next thresh.: 30000h Reset hours: NO Dev.Status: OFF N.Start: 45 Reset N.start: NO</p>	<p>Contaore compressore circuito 1.</p>
<p>Working hours Z503 Inv.comp,circ.2 Hours: 0h Next thresh.: 30000h Reset hours: NO Dev.Status: OFF N.Start: 25 Reset N.start: NO</p>	<p>Compressor counter circuit 2</p>

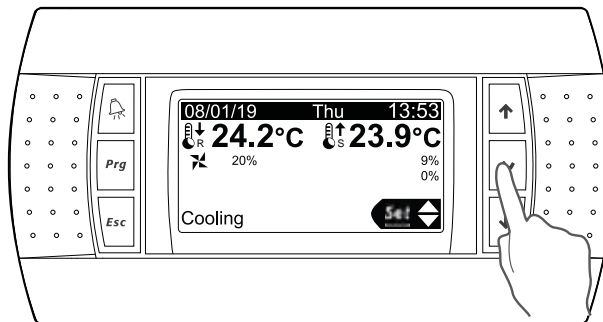
Working hours Z504 Inv.comp,circ.2 (OnOff) Hours: 0h Next thresh.: 30000h Reset hours: NO Dev.Status: OFF N.Start: 25 Reset N.start: NO	Contaore compressore circuito 2.
Working hours Z506 Heaters 1 Hours: 0h Next thresh.: 99000h Reset hours: NO Dev.Status: OFF	Heater 1 hour counter
Working hours Z507 Heaters 2 Hours: 0h Next thresh.: 99000h Reset hours: NO Dev.Status: OFF	Heater 2 hour counter
Ore lavoro Z509 Vent.Source. 1 Ore: 0h Soglia succ.: 99000h Reset ore: NO Stato dispos.: OFF	Condenser fan 1 Hour Counter.
Ore lavoro Z510 Vent.Source. 2 Ore: 0h Soglia succ.: 99000h Reset ore: NO Stato dispos.: OFF	Condenser fan 2 Hour Counter.
Working hours Z512 Unit working Hours: 6h Next thresh.: 99000h Reset hours: NO Dev.Status: ON	Unit operation hour counter.
Info Z530 Info blackout Ora attuale: 01/03/21 13:28:59 PowerOff temp: 27/02/21 01:56:05 Durata ultimo spegnim: 2Giorni 10Ore 24Min	Information Power On / Power Off.
Info Z531 Info Sist. Scheda type: uPC3 Scheda size: Medium Scheda temp: 0° C Ret mem writes: 131 Funz.princ.: 182ms 5.5Ciclo/s	Information H.W type.
Info Z532 Code: EMP8 SW ver: 2.2.001 Data: 15/12/2020 OS: 4.8.000 Boot: 4.8.000	information F.W.

6.6.2 Menu ON/OFF



To switch ON/OFF the unit enter to ON/OFF Menu and using and keys move the cursor Press to confirm.

6.6.3 Menu SET

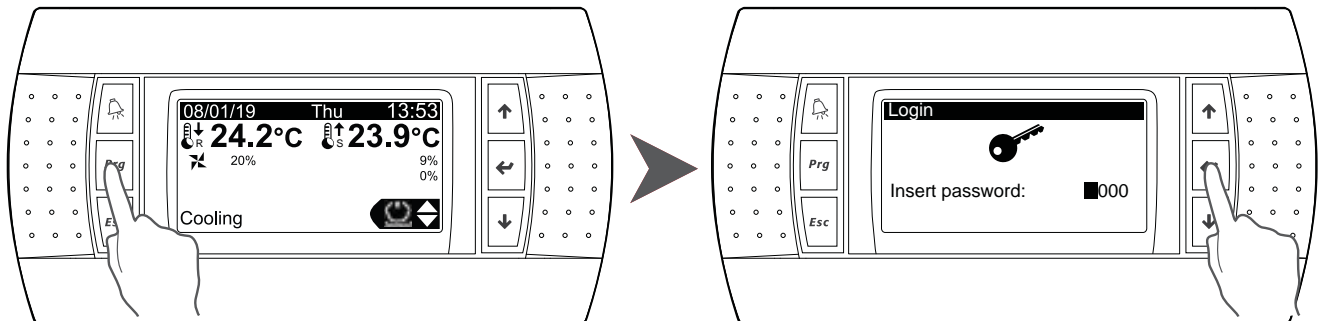


To enter in SET menu use and l'icona e premere key to confirm.
Can be displayed some set-point masks move through the masks using and keys.

SCHEDULER SET POINT ACTIVE	ST00	
Supply : 20.0°C Return : 23.0°C Humidif. : 30.0 % Dehumidif. : 70.0 % Diff. press. : 300.0 Pa		Displaying of scheduler enable set-point.
Set point Return regulation Setpoint:	ST03 23.0°C	Return temperature set-point setting.
Set point Supply air low limit Setpoint:	ST04 20.0°C	Discharge temperature set-point setting.
Set point Fan speed:	ST05 AUTO	Fan speed regulation setting.
Set point Humidification Setpoint:	ST07 30%	Humidity set-point setting.

6.7 Main Menu

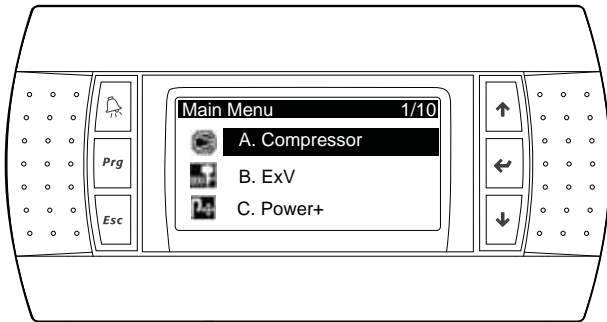
Regardless of the mask you are in, pressing **Prg** key is possible to enter to Main menu using the password.



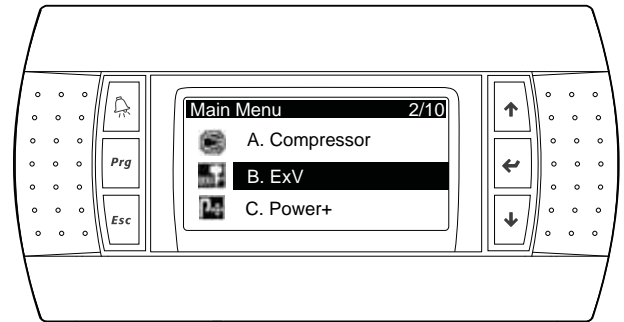
Select the value using **↑** and **↓**, keys than pres **↵** to confirm.

6.7.1 Main menu icons

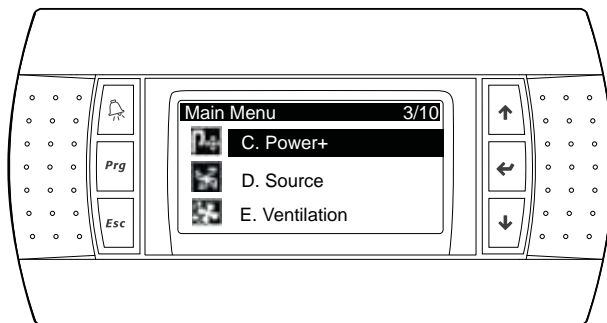
	A. Compressor (Not available)
	B. ExV (Not available)
	C. Power+ (Not available)
	D. Source (Not available)
	E. Ventilation
	F. CPY
	G. Unit settings
	<ul style="list-style-type: none"> Configuration Regulation
	H. Alarm logs
	I. Other settings
	<ul style="list-style-type: none"> Date / Time Language Network Pwd Change Inizialization
	L. Logout



Compressor parameters setting (manufacturer password)



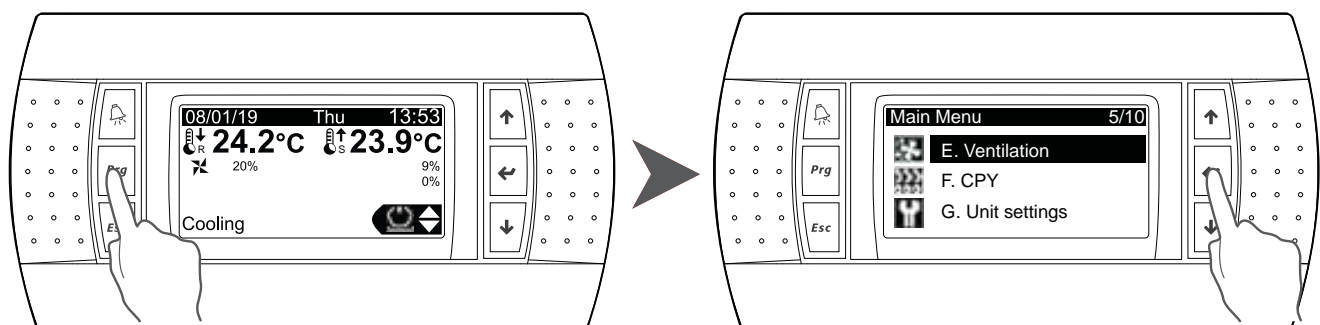
Thermostatic parameters setting (manufacturer password)



Inverter connected in serial line parameter setting (manufacturer password)

6.7.2 Menu Ventilation

To enter in fans menu use **Prg**, than, using **↑** and **↓** s keys is possible to select E.Fans menu, than press **←** to confirm.

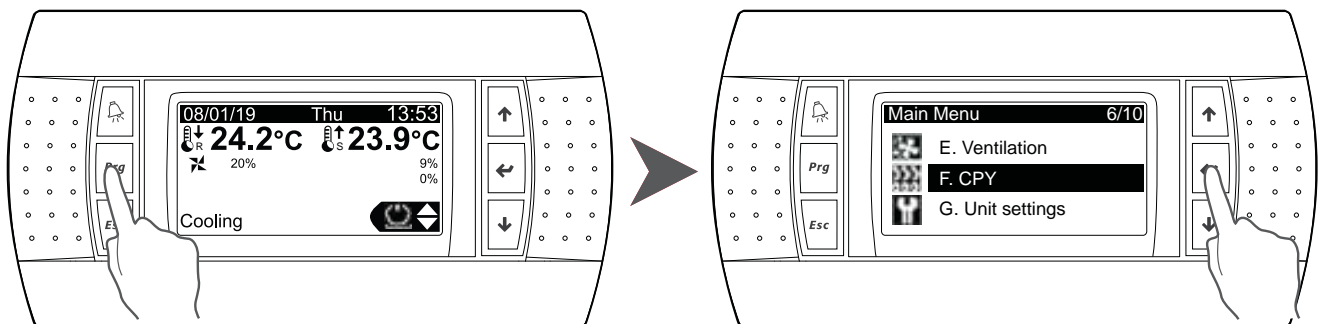


It will be possible the visualization of some masks referred to the fans and their parameters.

Supply fan Type: E001 Min speed(%) : 40.0% Max speed(%) : 70.0% Manual/Dehum.speed: 20.0%	EC	Displaying the fans speed (min e max) and the dehumidification mode.
Supply fan Limit speed Min speed(%) : 20.0% Time startup : 60 s Time shutdown : 30 s	E002	During the switch ON and OFF the fans are maintained to a constant speed for a settable time; in this masks is possible to visualize the set time.
Supply fan Fan enabled : [v] Num.of fans: 2 Fan 1 online : [] Fan 1 online : []	E008	Displaying the enabled fans, it is possible to enable to 4 fans in serial mode.

6.7.3 Menu CPY

To enter in CPY menu press **Prg** key, then **↑** and **↓** to select the F.CPY menu and press **←** to confirm.

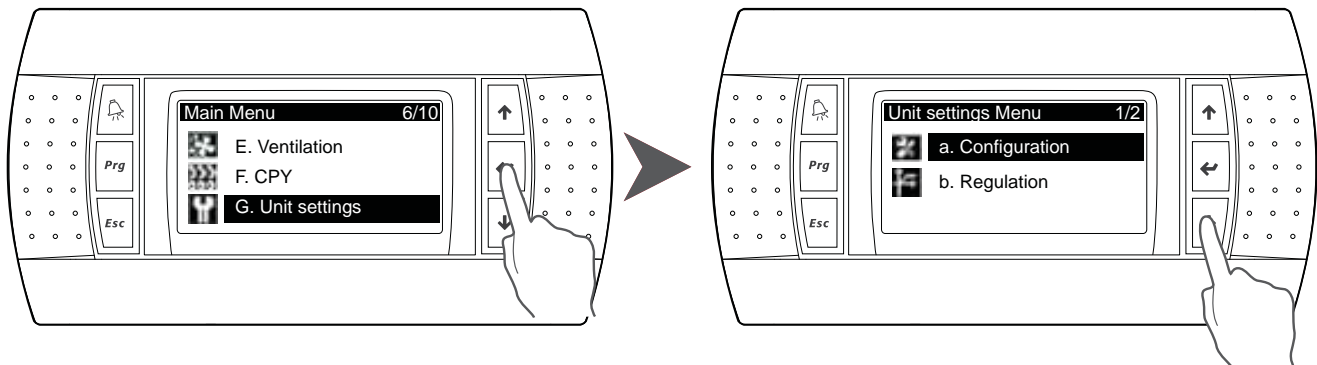


CPY CPY Enable: [] Only if the humidity probe is enabled	F001	Allows the visualization to check if the humidifier management card is enabled.
---	------	---

6.7.4 Menu Unit settings

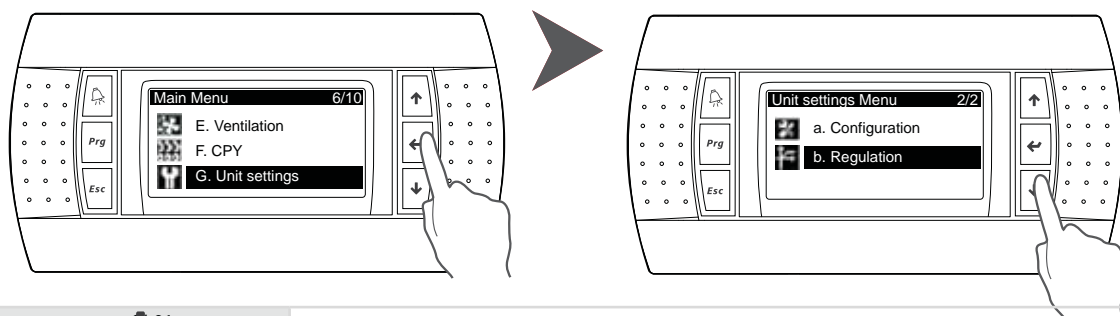
Inside of the menu "Unit settings" there are two submenu: "configuration" e "regulation".

To enter in these menus, from "Unit settings" using **↑** and **↓** keys select the desire one than press **←** key to confirm.



Unit config. Unit Configuration:	Ga00	Indicates the cooling type. In this case Chilled Water, water cooled units.
DX Unit config. Compressors/circuits configurations: DX UNITMEDIUM TWO CIRCUITS C1: INV+ON/OFF C2: INV+ON/OFF	Ga01	
Unit conf.funct.	Ga07	Allows some functions enable. Using the user password allows the visualization of those enabled.
Freecooling : Source : Humidification : Dehumidification : Heating: REHEAT+INTEGR	[] [] [v] []	
Unit conf.funct.	Ga08	Allows the visualization of some information of set point compensation.
External setpoint : Compensation sp. : Control delta T. :	[] [] []	
Unit conf.en.IO Ecternal setpoint : Return humidity: Diff.pressure: Freecooling temp.: Overload heater: Al.fire/smoke: Al.water flooding:	Ga09 [] [v] [] [] [v] [v] [v]	Allows to configure the enabled functions management.
Unit conf.en.IO	Ga12	Allows to enable the digital inputs with the shown functions.
Al. fire/smoke serius: Al. w.flooding serius:	[v] [v]	
Unit conf.en.IO	Ga13	Heaters digital outputs status configuration.
Open hot vlv./heater1: Close hot vlv./heater2: Type dout heat.: Heater	[v] [v] Heater	
Unit conf.en.IO Ext.air compens.: Warning: Freecool.On/Off: Hot vlv/Cold viv/Hum: Type analogic output: Cold valve	Ga14 [] [] [] [v]	Analog or digital outputs enabled configuration.

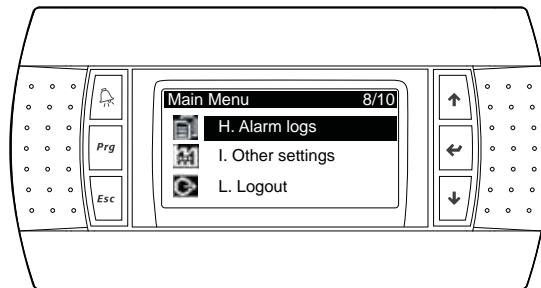
Unit conf.en.IO (Y03) Hot viv/Cold viv/FC Cold valve Unit conf.en.IO	Ga16 Ga20	Analog outputs configuration as selected function.
Dehumi. On/Off: Unit conf.en.IO	[] Ga23	Digital output enabling as dehumidification.
Emergency Ventilation Enable: Unit config.	[] Ga24	Enabling "emergency ventilation" function.
Main mask info: Supply temp./Ret.Hum. Time change: Unit config.	 7 s Ga25	Selection the probe type on the main mask.
Serial probe Enable serial probe for return air temp. and humidity: Unit config.	 [] Ga28	Temperature serial probe configuration.
Floating valve running time: Unit config.	180s Ga44	Floating valve opening timing setting (2 or 3 points).
Air filter switch alarm delay: Unit config.	60s Ga56	Filter alarm lag setting.
Enable On/Off by supervisor: Status: Unit config.	NO Off Ga99	Supervision ON/OFF enabling.
Import/Export: IMPORT Memory type: INTERNAL FLASH MEMORY File name: Confirm:	 EXPORT_00 NO	Configuration of parameter file import/export.



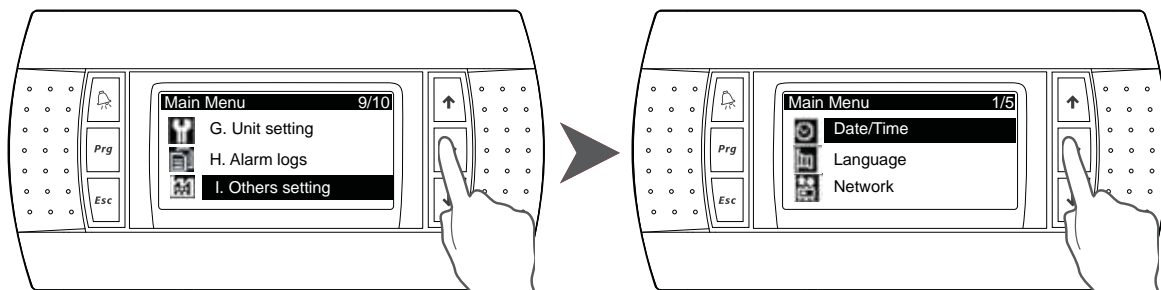
Unit regulation Temp.Regulation: RETURN + SUP.LIM	↓ Cb01	Regulation mode setting.
Start unit delay: Unit regulation Return Regulation Min.setpoint: Max.setpoint: Supply Regulation Min.setpoint: Max.setpoint:	10s Gb02 10.0°C 40.0°C 0.0°C 35.0°C	Set point min/max limits configuration.

Unit regulation	Gb12	
Fan Regulation		PI fan displaying / settings.
Kp:	6.0	
Ti:	120s	
Unit regulation	Gb17	PI fans neutral zones displaying / settings.
DZ Fan:	0.0 °C	
Unit regulation	Gb20	
Comps./cooling coil		PI cold valve regulator displaying / settings.
Kp:	8.0	
Ti:	120s	
Unit regulation	Gb21	PI cooling neutral zones displaying / settings.
DZ Cooling:	0.0 °C	
Unit regulation	Gb22	
Supply air low limit regulation		PI discharge temperature regulation displaying / settings.
Kp:	6.0	
Ti:	80s	
Unit regulation	Gb23	
Limit max. dead zone		PI neutral zones limit settled displaying / settings.
Fan:	0.5 °C	
Cooling:	0.5 °C	
Unit regulation	Gb24	
Humidification		Allows to display / set the parameters for humidifier function regulation.
Kp:	6.0	
Ti:	80s	
Unit regulation	Gb32	
Rehating heaters		Heaters regulation type displaying / settings.
Rehating:	2 STEPS	
Setpoint offset:	5.0 °C	
Current set:	Return	
Step delay:	60s	
Unit regulation	Gb36	
Rehating PID heaters		Heaters PID displaying / settings.
Kp:	8.0	
Ti:	60s	
Td:	0s	
Unit regulation	Gb40	
Temperature alarms		High and low suction temperature values displaying / settings.
High return temp:		
Setpoint:	30.0 °C	
Differential:	1.0 °C	
Low return temp:		
Setpoint:	5.0 °C	
Differential:	1.0 °C	
Unit regulation	Gb44	
Temperature alarms		High and low discharge temperature values displaying / settings.
High supply temp:		
Setpoint:	30.0 °C	
Differential:	1.0 °C	
Low supply temp:		
Setpoint:	5.0 °C	
Differential:	1.0 °C	
Unit regulation	Gb46	
Humidity alarms		High and low suction pressure values displaying / settings.
High return hum.:		
Setpoint:	95.0%	
Differential:	5.0%	
Low return hum.:		
Setpoint:	5.0%	
Differential:	5.0%	

Unit regulation Temperature and humidity alarm	Gb48	High and low humidity or temperature delay alarm displaying / settings.
Delay time:	600s	
Unit regulation overload fan	Gb49	Main fans thermal alarm delay displaying / settings.
Delay time:	10s	
Unit regulation Number alarm/hour	Gb50	High or low pressure alarm delay number (per hour) displaying / settings.
LP:	3	
HP/Overload Comp.:	1	
Unit regulation Number alarm/hour	Gb51	Heaters thermal alarm delay number (per hour) displaying / settings.
Overload Heater:	3	
Unit regulation	Gb56	Possibility to set integral time = 0 or not.
Disable Ti:	[v]	
Unit regulation	Gb57	Air flow regulation enabling.
En.Reg.Flow:	[v]	



6.7.5 Menu Other settings

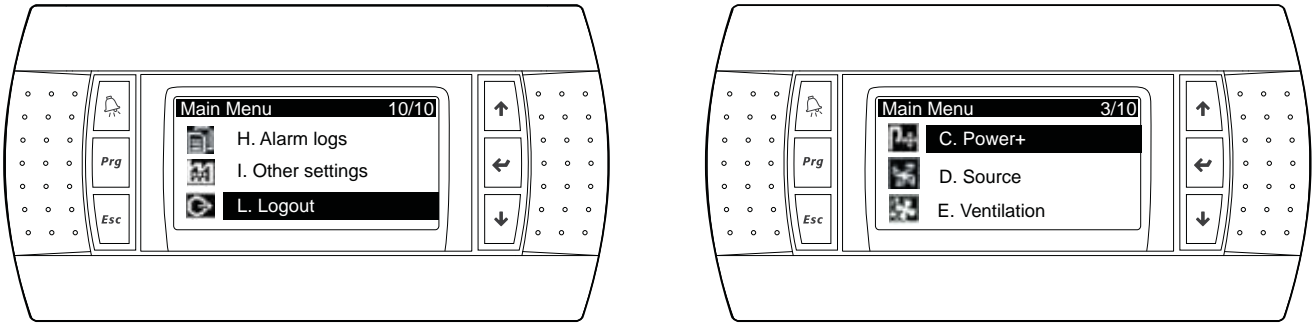


Data/Time

Date/Time change	IA01	Date and hour format settings.
Format:	DD/MM/YY	
Date:	05/04/19	
Hour:	10:52:02	
Day:	Friday	
Timezone	IA02	Time zone activation.
Current timezone:	GMT	
Change to:	GMT	
Update Timezone:	NO	

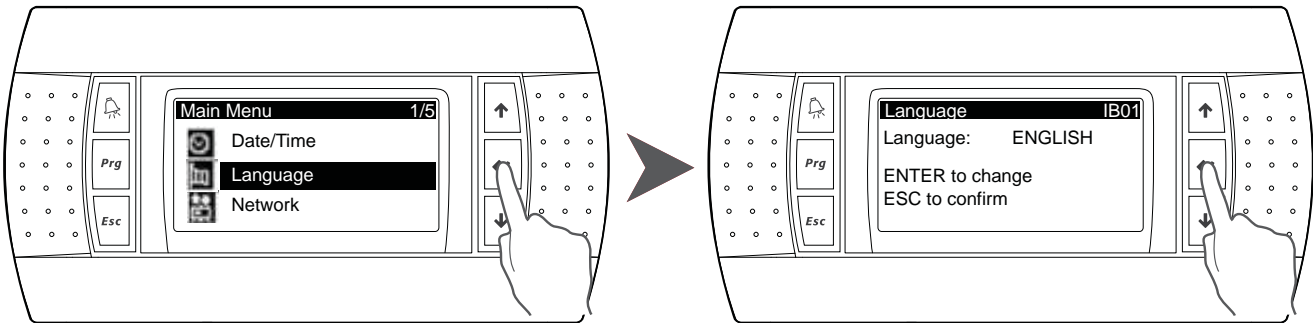
SCHEDULER IA03 Enable? Yes 10:55 FRI 05/04/2019 Sched. is not running Unit status: COMFORT	Scheduler enablement.
SCHEDULER IA04 ECONOMY SETPOINT Supply : 20.0°C Return : 20.0°C Humidif. : 30.0 % Dehumidif. : 70.0 % Diff.press. : 300 Pa	Economy type set point scheduler setting.
SCHEDULER IA05 PRE-COMF SETPOINT Supply : 20.0°C Return : 23.0°C Humidif. : 30.0 % Dehumidif. : 70.0 % Diff.press. : 300 Pa	Pre-comfort type set point scheduler setting.
SCHEDULER IA06 COMFORT SETPOINT Supply : 20.0°C Return : 23.0°C Humidif. : 30.0 % Dehumidif. : 70.0 % Diff.press. : 300 Pa	Comfort type set point scheduler setting.
DAILY EVENTS IA07 Day: Sunday Copy to: ALL Ok? No <input type="checkbox"/> 1 --:-- --- <input type="checkbox"/> 2 --:-- --- <input type="checkbox"/> 3 --:-- --- <input type="checkbox"/> 4 --:-- --- Save data? No	Daily scheduler setting.
VACATIONS PERIOD IA08 Start End Status <input type="checkbox"/> --/-- --/-- --- <input type="checkbox"/> --/-- --/-- --- <input type="checkbox"/> --/-- --/-- ---	Vacation scheduler setting.
SPECIAL DAYS IA09 <input type="checkbox"/> 1 --:-- --- <input type="checkbox"/> 2 --:-- --- <input type="checkbox"/> 3 --:-- --- <input type="checkbox"/> 4 --:-- --- <input type="checkbox"/> 5 --:-- --- <input type="checkbox"/> 6 --:-- ---	Daily scheduler setting.

Parameters output



In order to access the menus again, it is necessary to re-enter the password.

Language



Press  key to select language desired and then press **Esc** to confirm.

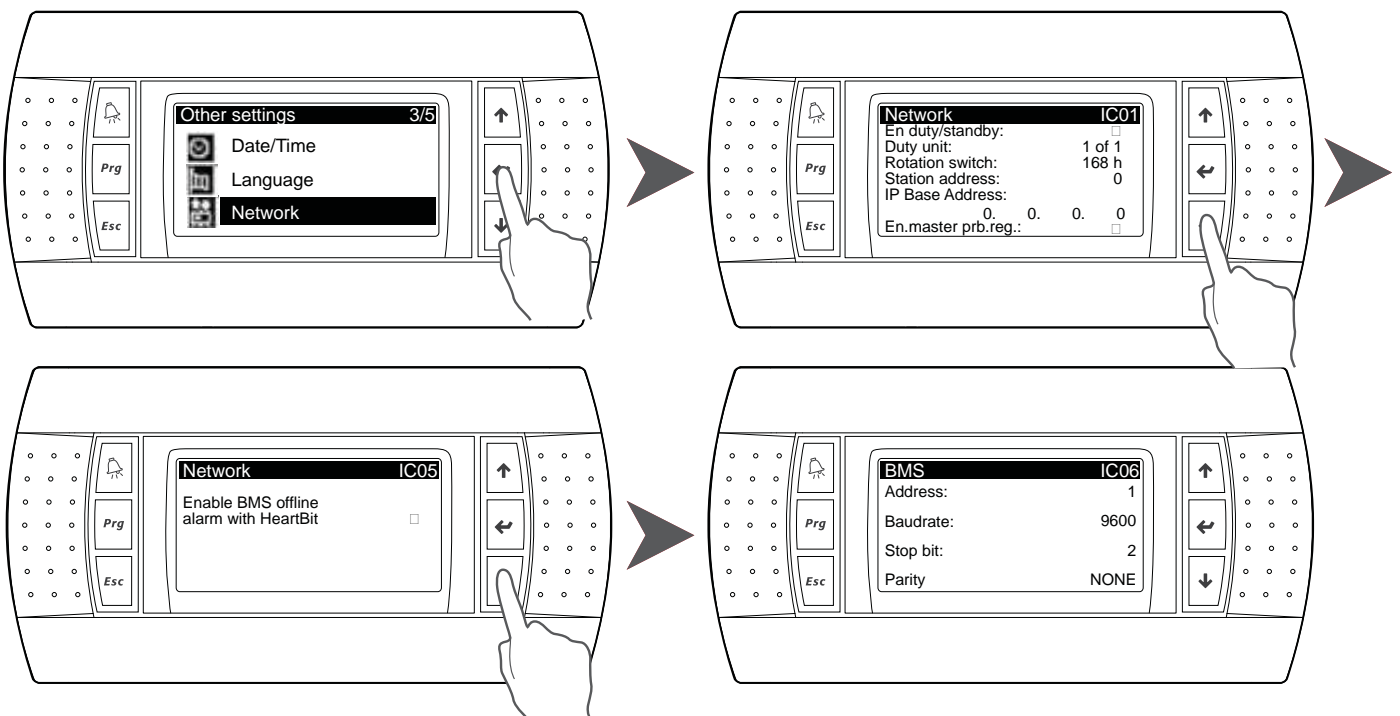
Are available the following languages: Italian, English, German, Spanish and French.

Network

Is possible to manage till 16 units using multimaster network; the duty/stand-by rotation allows to exclude some units meanwhile the others are in backup mode, ready to start in case any alarm or issue occurs.

To maintain always operative the stand-by units a planned rotation is performed; the unit with more hours worked will switch OFF meanwhile the one with fewer hour worked switched ON.

Is possible to enable the regulation of all the network units on the master return probe.



7. UNIT MAINTENANCE

7.1 General advices



Starting from 01/01/2016 the new European Regulation 517_2014, "Obligations concerning the containment, use, recovery and destruction of fluorinated greenhouse gases used in stationary refrigeration, air conditioning and heat pumps", became effective. This unit is subject to the following regulatory obligations, which have to be fulfilled by all operators:

- (a) Keeping the equipment records
- (b) Correct installation, maintenance and repair of equipment
- (c) Leakage control
- (d) Refrigerant recovery and disposal management
- (e) Presentation to the Ministry of the Environment of the annual declaration concerning the atmospheric emissions of fluorinated greenhouse gases.

Maintenance allows to:

- Keep the unit efficient;
- Prevent any failure;
- Extend the unit lifetime.



It is advisable to have a unit booklet with a purpose to sign any intervention performed helping the troubleshooting.



The maintenance operations must be performed in accordance with all the overmentioned prescriptions.



To perform any intervention pay attention to use any individual protection devices in accordance with local norms.



In case of winter stop, the water contained in the circuit can freeze harming the unit; is advisable to remove carefully all the water contained checking that all the circuit, all the internal/external siphons is empty.



Before to perform any electrical intervention is necessary to switch off the power supply turning the main switch to OFF position.

7.2 Unit access

Once the unit is installed, the access is allowed only to trained and expert technicians; the unit owner is the company legal representative, entity or natural person owner of the plants where it is installed. He is responsible to enforce all the safety norms indicated on the present Manual and the local norms

7.3 Scheduled maintenance

The unit owner has to be sure to make an adequate maintenance following the instructions on the present Manual, based on type, size, age of the unit and in accordance with the regulations and local norms.



If are installed leak sensors devices, these must be inspected once a year in order to ensure they work properly.

During his lifetime the unit must be subjected to inspections following the local norms in force; particularly, more strictly specifics don't exists, it is necessary refer to the following table (EN378-4, all.D) paying attention to the situations described.

CASE	Visual Inspection	Pressure Test	Search for leaks
A	X	X	X
B	X	X	X
C	X		X
D	X		X

A	Inspection after an intervention with possible effects on the mechanical strength or after use change or in case the machine has not being working for more than two years. Replace all the components which are not suitable any more. Do not carry out checks at a higher pressure than the one indicated in the project.
B	Inspection after a repair, or significant adjustment of the system, or its components. The check may be limited to the interested parts, but if a leakage of refrigerant is detected, a leakage search must be carried out on the entire system.
C	Inspection after installation in a different position than the original one. Refer to point A when mechanical strength could have been affected by the change.
D	Leak search, following a well-founded suspicion of refrigerant leakage. It is recommended examined the system for leakage, either directly (use of leak detection systems) or indirectly (deduction of leakage based on analysis of operating parameters), focusing on the parts most prone to leakage (e.g. joints).



If a fault is detected could endangers the reliable unit operation, it's necessary to rectified it before restart the unit.

7.3.1 Leaks test

If more restrictive norms not existing, on the unit a pressure test should be performed generally every 3 months, if during the test there is a leak suspect (for example after a capacity reduce or after a change in overheating / sub-cooling parameters), will be necessary to find the leak using suitable instruments, repair it and perform again the pressure test in accordance with national legislation in force.

Il risultato delle verifiche ed i provvedimenti adottati devono essere riportati sul Registro.

The staff busy in the leak test must not use free flames or ignition sources.

The refrigerant leaks must be find and repaired as soon as possible, any intervention must be performed by authorized personnel in conformity with the law and regulations in force.

7.3.2 Safety pressure switch check

If more restrictive norms not existing, the safety high pressure switches has to be inspected at least every 12 months, to verify the operation, the settings in case of manual restart switch and the correct installation.

7.3.3 Safety check

If more restrictive norms not existing, the external safety valves must be inspected at least every 6months to verify the operation. If a leak is detected the valve must be replaced.

Anyway every 5 years of using must be inspected in order to verify the set pressure s readable (on the valve), the installation and the characteristics in order to guarantee the system safety in accordance with the regulations in force.

7.3.4 Noise and vibration check

It is necessary to verify at least monthly the unit sound emissions and that the piping is not subject to abnormal vibrations can cause a breakage.

7.3.5 Sight glass check

The sight glass, installed on the refrigerant line immediately after the drier filter, allows to verify:

1) Basing on the sensible material color in the indicator is possible to understand if the humidity inside the circuit is acceptable; normally the indicator is light green if the humidity i slow, otherwise the color change into yellow (anyway follow the indication on the sight glass).

If the humidity is higher than excepted should be necessary to replace the drier filter, or, in more serious cases all the refrigerant in the circuit.



After a long operation break the sight glass color check must be performed at least after 1 hour of nominal operation in order to allow the drier filter to extract some humidity from the refrigerant.

2) Using the sight glass is also possible to understand if the refrigerant charge is adequate; normally the charge is good if after 10' of nominal functioning there are not steam bubbles on the glass.

7.3.6 Refrigerant overheating check

To measure the refrigerant overheating on the evaporator outlet during the nominal unit operation must be measured:

- Evaporation pressure with a gauge connected to a suitable valve installed on the suction line;
- Suction temperature with a contact thermometer placed on the low pressure line, about 20cm from the evaporator.



If it is necessary to measure the temperature, move partially the isolation material from the suction line; the thermometer must be placed in a horizontal section using a suitable paste if necessary in order to improve the measure.

The refrigerant overheating is the difference between suction temperature, measured using the thermometer and the saturation one (dew value) corresponding to evaporation pressure, measured using the gauge.



All the units are of direct expansion with finned coil. The overheating values are factory settled into controller ($5 \div 7 \text{ }^\circ\text{C}$)

If the overheating value is lower than 5K or higher than 7K will be necessary act on the thermostatic valve parameters (refers to the cap. Dedicated) in order to stabilize the value around a $5 \div 7 \text{ K}$.

7.3.7 Refrigerant sub-cooling check

To measure the refrigerant sub-cooling to the condenser outlet during the nominal unit operation must be measured:

- Condensation pressure using a gauge connected to a suitable valve installed on the liquid line;
- The liquid refrigerant temperature, with a contact thermometer placed to the refrigerant line, on the unit.



The contact between the probe and the surface could be improved using a suitable paste.

The refrigerant sub-cooling is the difference between saturation temperature (bubble value) corresponding to condensation pressure, measured using a gauge, and the temperature of the liquid refrigerant, measured using a thermometer.

Se il valore del sotto-raffreddamento misurato risulta inferiore a 3 K o superiore a 10 K, potrebbe essere necessario modificare la quantità di refrigerante caricato nel circuito per fare in modo che esso si stabilizzi attorno a $5 \div 7 \text{ K}$.

7.3.8 Over currents protection devices check

The protection devices against the overcurrents must be controlled in order to verify their operating and integrity.



It is forbidden to by-pass the fuses on the unit or replace them with more powerful ones.



Fuses can reach very high temperatures and they can cause burns if not handled with the due precautions.



In case of adjustable devices (thermal relays or motor overload protections), the set absorption value must not be higher than the one on the Identification Tag of the component to be protected.

7.3.9 Contactors check

The contactors used to electrical charges drive must be checked to verify the integrity and the spool operating. Moreover will be necessary verify the electrical cables are correctly fixed to the suitable terminals.. If is necessary the dirty and the dust must be removed because they could cause a noisy and inefficient unit operation.

7.4 Periodical checks



The commissioning operations must be performed following all the overmentioned indications.



All the operation mentioned in this part of the Manual **MUST BE PERFORMED BY QUALIFIED AND TRAINED TECHNICIANS**. Before any unit intervention be sure to disconnect it from the power supply. Pay attention when the operation involves the coil; the aluminium fins are particularly sharp and could cause serious injuries. After the maintenance operations be sure to close well all the panels using the apposite screwa.

7.4.1 Electrical system and control devices

Operations to perform	Timing						
	Daily	Monthly	Every 2 months	Every 6 months	Once year	Every 5 years	If needed
Unit operation and alarm presence check	X						
Unit visual inspection		X					
Unit noise and vibration check		X					
Safety devices and interlocks operation check				X			
Unit performances check				X			
Unit devices electrical absorptio check (fans, etc...)				X			
Unit power supply check				X			
Check every cable is correctly fixed in the correct terminal				X			
Check the insulation integrity of electrical cables					X		
Contactors operation and state check					X		
Controller and display operation check			X				
Check the controller settled parameters and values					X		
Clean all the electrical components from the dust (if present)				X			
Check the operation and the calibration of the probes and transducers					X		

7.4.2 Cooling circuit, coil and fans

Operations to perform	Timing						
	Daily	Monthly	Every 2 months	Every 6 months	Once year	Every 5 years	If needed
Visual inspection of the coil		X					
Cleaning operation of finned coil				X			
Cleaning operation of finned coil of outdoor unit (if present) ⁽¹⁾				X			
Air filter ⁽¹⁾ cleaning operation / replacement			X				
Cleaning operation of the condensate tray			X				
Humidifier cylinder ⁽¹⁾ cleaning operation			X				
Water flow check (F series)		X					
Fans noise and vibration check		X					
Fans power supply check				X			
Fans electrical connections check					X		
Check the operation and the calibration of the fans speed regulation system					X		
3way valve operation check (if BC option is present)					X		
Check the presence of air inside the hydraulic circuit (F series)		X					

7.4.3 Inverter/Compressors

Inverter and compressors visual inspection		X					
Compressors noise and vibration check			X				
Compressors and inverter power supply check				X			
Compressors and inverter electrical connections check					X		
Check the electrical cables of the compressors and inverter and that are regularly fixed to the terminals					X		



⁽¹⁾ If the unit is installed in strongly windy areas, near coasts or deserts or in areas subjects to wind and/or sand storms, or near airports, industries or in places with high levels of air pollution in general inspect the unit more frequently (**every three months or more**) to check the real condition of the surface protection.



⁽¹⁾ The filter and the humidifier cylinder clean situation depending by installation type

7.5 Straordinary maintenance

The unit's repairs must be performed by a qualified personnel informed about the system and equipped with individual protection devices in conformity with regulations and laws in force.

Besides if the interventions also concerning the welding or brazing in refrigerant present the technicians must wear also a mask with a protection filter specific against decomposition material could be created.



The cooling circuit contains refrigerant to an high pressure; It is necessary to discharge completely and with care the pressure before to perform any intervention on the cooling circuit.



If necessary, for the refrigerant transportation should follow the national regulations and laws in force.



It is forbidden to modify the unit or the components without a explicit authorization by the Manufacturer.

The intervention performed by technicians with different qualifications (such as welders, brazers, electricians, programmers, etc.) must be supervised by expert refrigeration technicians.

Welding and brazing operations must be performed by trained and expert technicians, following qualified procedures, only after the refrigerant is totally discharged from the circuit and the same is fluxed with azote.



During the welding and brazing operations all the heat sensitive devices must be removed or covered with wet clothes.



If the intervention requires a shut-off valve or interception valve must be removed, it is suggested to replace the seals with new ones.

If more restrictive norms not existing the intervention on the cooling circuit must be performed following the hereafter indication:

- a) Intervention risk valuation and analysis;
- b) Maintenance team training;
- c) Uninstallation and protection of devices to be repaired;
- d) Refrigerant recovery and vacuum execution;
- e) Cooling circuit fluxing and cleaning with anhydrous hydrogen;
- f) Intervention authorisation;
- g) Intervention execution;
- h) Repaired devices test (pressure test, leak test, functional test);
- i) Devices re-installation, vacuum execution and refrigerant charge;

8. DECOMMISSIONING

8.1 Disconnect the unit



All the disposal operations must be performed by expert technicians following the national legislation (destination county).

- Do not dissipate the refrigerant in the environment.
- Before the unit disconnection recovery (if present):
- All the refrigerant gas;
- All the antifreeze solutions contained in the hydraulic circuit;
- Lubricant oil from the compressors.

Waiting the disposal unit could be storage also to outdoor if all the circuits (electrical, cooling and hydraulic) closed and undamaged.

8.2 Disposal, recovery and recycling

If the frame and devices are unusable must be demolish and divide them for the recycling; particularly attention on the copper and aluminium.

All the materials must be recovered and disposed in accordance with the regulations and norms in force.



Recovery, reusing, recycle, regeneration and disposal of refrigerant must be performed by authorized personnel, expert and well equipped and informed, in accordance with the local regulations.



The refrigerant pressure in the cooling circuit can be high, discharge it with caution.



The refrigerant released in sudden way can cause freezing burns if it comes in contact with the skin.



The refrigerant filters used can contains a residual fluid parts which have to be eliminated before to proceed to disposal.



It is forbidden to release the refrigerant in teh environment.

8.2 RAEE Directive (UE members only)



The barred bin symbol, on the unit label, indicates the correspondence of the unit to electric and electronic device norm about the garbage.
The abandonment of the unit or the abusive disposal are punished by law.

All the unit this Manual refers complying with 2012/19/UE norm concerning the electric and electronic waste management (RAEE). The unit must not be recycling with home waste because is composed by different material suitable to disposal only to recycling centers. Ask to authorities where these centers are located in order to delivery all the different material a well recycling. The system is potentially dangerous for human and animal health and the environment, also if any dangerous substance is contained (as 2011/65/UE (RoHS) Directive) is abandoned could create a serious pollution risk. Read carefully the instructions before the first use of the system. Any use not clearly mentioned in the present Manual is forbidden, also for electrical shock risk for improper use.

9. DIAGNOSIS AND TROUBLESHOOTING

9.1 Fault finding

The controller manages all the troubles could verifying during the unit operation, segnaling the alarm situations and displaying the inconveniences type.

In the following table are listed the most common troubles could occur to the unit and for each the more probable causes and the possible solutions.

Before any intervention if an alarm occurs verify that:

- The operating conditions are the same of excepted, compatibles with the unit's operation limits;
- All the electrical cables and components are well fixed to their terminals;
- The set values for the involved parameters are coherent with the operative conditions.



IS RECCOMENDED TO RESET ANY ALARM ONLY AFTER CAUSE OF IT REMOVED; REPEATED RESET COULD CAUSE SEVERAL DAMAGES TO THE UNIT AND ALSO MISS THE WARRANTY IMMEDIATELY.

Malfunction	Main Causes	Suggested actions
1. The unit doesn't work	a. The electrical panel is not powered	Check the voltage of each phase of the main supply line Check the main switch is closed (I position)
	b. The auxiliary circuit is not powered	Check the fuses of the auxiliary circuit (refer to the attached wiring diagram)
	c. The microprocessor doesn't start the unit	Check the electrical connections of the microprocessor Check the set values of the temperature
	d. The external impulse fails at the unit starting	Check the remote ON/OFF switch is closed (refer to the attached wiring diagram) Enable the external impulse from the user terminal (display) when the unit starts
2. Room temperature too high (high temperature alarm signal)	a. The unit doesn't work	Refer to point 1
	b. The control system setting is incorrect	Check the control system calibration
	c. The air flow is insufficient	Refer to point 6
	d. The compressor doesn't work	Refer to point 10
	e. The compressor capacity is insufficient	Refer to point 13
		Refer to point 14 Refer to point 15
	f. The reheating system doesn't work properly (if present)	Refer to point 7 and 16
	g. The control system doesn't work	Refer to the attached Controller Manual
h. Thermal load higher than estimated	Check the room thermal load	
3. Room temperature too low (low temperature alarm signal)	a. The control system setting is incorrect	Check the control system calibration
	b. The reheating system doesn't work properly (if present)	Refer to point 7 and 8
	c. The control system doesn't work	Refer to the attached Controller Manual
	d. Thermal load higher than estimated	Check the thermal loss value
4. Room humidity too high (high humidity alarm signal)	a. The control system calibration is incorrect	Check the control system calibration
	b. Latent load higher than estimated	Check the room latent load
	c. The compressor doesn't work when the unit is in dehumidification mode	Refer to point 10
	d. The control system doesn't work (if DH option is installed)	Refer to the attached Controller Manual

5. Room humidity too low (low humidity alarm signal)	a. Check the humidifier is present	Install the humidifier if is not present
	b. The humidity set-point is set at too low value	Increase the humidity set-point value
	c. The humidifier doesn't work	Refer to the attached Humidifier Manual
6. Low or no air flow capacity (air flow or fans alarm signal)	a. The fans are not powered	Check the fans electric circuit
	b. Clogged filter	Clean or replace the filters
	c. Obstruction presence in the air duct or pressure drop to high	Check the total pressure drop and compare it with the unit available pressure
	d. The fan thermal protection is active	Check the fans winding resistance (after reset, check the voltage and the electrical absorption)
7. The 3-way valve doesn't work (present in case of BC / BG option installed)	a. The control system doesn't work	Refer to the attached Controller Manual
	b. The valve servomotor doesn't work	Check the electrical connections and eventually replace the servomotor, if defective
	c. The valve is locked mechanically	Try to unlock manually the valve or replace it
8. High pressure switch is enabled	a. The system of condensation pressure control is doesn't work properly (if present)	Check the condensing control system is properly set and is working
	b. One or more condensing fans are not working	Check the intervention of thermal protection fan/s, if necessary replace the fan/s defective
	c. High pressure switch is not properly set	Replace the high pressure switch
	d. Discharge pressure too high	Refer to point 14
9. Low pressure switch is enabled	a. Low pressure switch is not properly set	Replace the low pressure switch
	b. Suction pressure too low	Refer to point 13
10. The compressor doesn't work	a. Automatic switch intervention	Riarmare l'interruttore automatico, verificare la pausa del cortocircuito
	b. Compressor internal protection intervention	Check the compressor winding resistance (after reset, check the voltage and electrical absorption) Check the operational parameters return to the nominal values
	c. The contactor doesn't work	Check the contacts and the contactor coil
11. The compressor is noisy	a. Liquid return to the compressor	Check the operating and the overheating of the expansion valve
	b. Compressor is damaged	Replace the compressor
12. Compressor high suction pressure	a. Thermal load higher than estimated	Check the room thermal load value

12. Compressor high suction pressure	b. Discharge pressure too high	Refer to point 14
	c. Return of liquid refrigerant to compressor's suction	Check that overheating of thermostatic valve is correct Check that the pressure transducer and the temperature probe of the thermostatic valve are well placed, fixed and insulated
13. Compressor suction low pressure (possible frost on the coil)	a. Ambient temperature too low	Refer to point 3
	b. Air flow too low or absent	Refer to point 6
	c. Clogged refrigerant filter	Check the refrigerant filter
	d. The electronic thermostatic valve parameters are not set correctly	Check the setting of the electronic valve parameters, in particular the integrity of the thermostatic device
	e. Insufficient refrigerant charge	Check a possible leak presence, if is detected repair it as soon as possible
	f. Discharge pressure too low	Refer to point 15
14. Compressors high discharge pressure	a. The control system of the condensation pressure is not working properly (if present)	Check the setting and functioning of the condensation control system
	b. Suction pressure too high	Refer to point 12
	c. Non condensable air or gas in the circuit	The flow sight glass presents gas bubbles; the compressor discharge temperature is too high, the cooling circuit must be discharged and re charged after the vacuum execution
15. Compressor discharge low pressure	a. The control system of the condensation pressure is not working properly	Check the setting and functioning of the condensation control system
	b. Suction pressure too low	Refer to point 13
16. Electrical heater doesn't work (if present)	a. Set-point temperature is too low	Increase the set-point temperature
	b. Magnetohermic switch disconnected	Check for any short-circuit; Reset the switch; Check the current absorption
	c. Safety thermostat enabled	Air flow too low, refer to point 5; Check the safety thermostat is working and, if necessary, replace it.
	d. The contactor doesn't work	Check the contact and contactors coil
17. Hot water coil does not work (if present BC optional)	a. Hot water flow is insufficient	Check the hot water source Check the duct and make sure there is no leak or obstructions
	b. Hot water discharge temperature too low	Check the hot water distributor
	c. Set-point temperature too low	Increase the set-point temperature

18. Probe alarm	a. The corresponding probe is defective or disconnected	Check the probe connection and its operation, if necessary replace it
19. The fan does not start	a. Current interruption / black out	Check the main switch and the power cable
	b. Protection switch open	Reset the protection switch and check the motor current and absorption
	c. Transformer protection activated	Check for any auxiliary short-circuit
	d. Contactor defective	Repair or replace the contactor
	e. The fans are not powered	Check the fans electric power supply
	f. The fan thermal protection block its operation	Check if the rotors are locked or if the power supply is insufficient or if there is a phase loss
	g. Controller not powered (display OFF)	Check for any auxiliary short-circuit
	h. Unit switched off (OFF position)	Turn ON on the keyboard



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