Hidros
INNOVATION AS ENERGY
AN ENEX TECHNOLOGIES COMPANY

SWIMMING POOL DEHUMIDIFIERS

SRH

SERIES

TECHNICAL MANUAL

Incorporated in this document are the following:
- Declaration of conformity
- Technical manual

TÜVRheinland CERTIFIED
Management System
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018
www.tuv.com
ID 9108638436

CE

Multiple instructions: Consult the specific part

Read and understand the instructions before undertaking any work on the unit

RETAIN FOR FUTURE REFERENCE

Declaration of conformity

We declare under our own responsibility that the below equipment complies in all parts with the CEE and EN directives.
The declaration of conformity is enclosed to the technical booklet enclosed with the unit. The unit contains fluorinated greenhouse gases.

INDEX

1. INTRODUCTION

1.1 Preliminary information

Reproduction, storage or transmission of any part of this publication in any form, without the prior written consent of the Company, is prohibited.
The unit to which these instructions refer, is designed to be used for the the purposes described and to be operated in accordance with these instructions.
The Company will not be liable for claims for damage caused to persons, animals, material goods or property caused by improper installation, adjustment and maintenance or improper use. Any use not specified in this manual is prohibited.
This document is intended to provide information only and does not form a contract with third parties.
The Company pursues a policy of constant improvement and development of its products and therefore reserves the right to change the specifications and the documentation at any time, without notice and without obligation to update existing equipment.

1.2 Aim and content of the manual

These instructions are intended to provide the information required for the selection, installation, use and maintenance of the unit.
They have been prepared in accordance with the European Union laws and with the technical standards in force at the date of issue of the instructions.
The instructions contain all the necessary information to prevent any reasonably foreseeable misuse.

1.3 How to store this manual

The manual must be kept in a suitable place with easy access for users and operators, protected from dust and damp.
The manual must always accompany the unit during the entire life cycle of the same and therefore must be transferred to any subsequent user.

1.4 Manual Update

It is recommended that the manual is updated to the latest revision available.
If updates are sent to the customer they must be added to this manual.
The latest information regarding the use of its products is available by contacting the Company.

1.5 How to use this manual

The manual is an integral part of the unit.

Users or operators must consult the manual before performing any operation and especially so when transporting, handling, installating, maintaining, or dismantling the unit in order to eliminate uncertainty and reduce risk.

In these instructions symbols have been used (described in the following paragraphs) to draw the attention of operators and users to the operations that have a higher risk and which must be performed safely.

1.6 Potential Risks

Whilst the unit has been designed to minimize any risk posed to the safety of people who will interact with it, it has not been technically possible to eliminate completely the causes of risk. It is therefore necessary to refer to the requirements and symbolism below:

LOCATION OF RISK	POTENTIAL RISK	METHOD OF INJURY	PRECAUTIONS
Thermal heat exchangers.	Small stab wounds.	Contact	Avoid any contact, use protective gloves.
Fan and fan grilles.	Cuts, eye damage, broken bones.	Insertion of sharp objects through the grid while the fans are operating.	Never put objects through the protection grilles.
Internal component: compressors and discharge pipes	Burns.	Contact	Avoid any contact, use protective gloves.
Internal component: electric cables and metallic parts	Electrocution, severe burns.	Defect in the supply cable insulation, live metallic parts.	Adequate protection of power cables, ensure correct earthing of all metal parts.
External to unit: unit enclosure	Poisoning, severe burns.	Fire due to short circuit or overheating of the supply cable external to unit.	Size cables and mains protection system in accordance with iee regulations.
Low pressure safety valve.	Poisoning, severe burns.	High evaporating pressure causing a refgrigerant discharge during maintenance.	Carefully check the evaporating pressure during the maintenance operations. Use all personal protective equipment required by the law. PPE must also protect against gas leaks from the safety valve. The outlet of these valves is directed to avoid causing damage to persons or goods.
High pressure safety valve.	Poisoning, severe burns, hearing loss.	Activation of the high pressure safety valve with the refrigerant circuit open.	If possible, do not open the refrigerant circuit valve; carefuly check the condensing pressure; use all the personal protective equipment required by law. PPE must also protect against gas leaks from the safety valve. The outlet of these valves is directed to avoid causing damage to persons or goods.
Entire unit	External fire	Fire due to natural disasters or combustions of elements nearby unit	Provide the necessary fire-fighting equipment
Entire unit	Explosion, injuries, burns, poisoning, folgoramento for natural disasters or earthquake.	Breakages, failures due to natural disasters or earthquake	Plan the necessary precautions both electrical (suitable differential magneto and electrical protection of the supply lines; greatest care during the connections of the metal parts), and mechanical (special anchors or seismic vibrations to prevent breakages or accidental falls).

1.7 General Description of Symbols Used

Safety symbols combined in accordance with ISO 3864-2:

BANNED
A black symbol inside a red circle with a red diagonal indicates an action that should not be performed.

WARNING
A black graphic symbol added to a yellow triangle with black edges indicates danger.

ACTION REQUIRED
A white symbol inserted in a blue circle indicates an action that must be done to avoid a risk.

Safety symbols combined in accordance with ISO 3864-2:

The graphic symbol “warning” is qualified with additional safety information (text or other symbols).

1.8 Safety symbols used

	GENERAL RISK Observe all signs placed next to the pictogram. The failure to follow directions may create a risk situation that may be injurious to the user.
	ELECTRICAL HAZARD Observe all signs placed next to the pictogram. The symbol indicates components of the unit and actions described in this manual that could create an electrical hazard.
	MOVING PARTS The symbol indicates those moving parts of the unit that could create risk.
	HOT SURFACES The symbol indicates those components with high surface temperature that could create risks.
	SHARP SURFACES The symbol indicates components or parts that could cause stab wounds.
	EARTH CONNECTION The symbol identifies Earthing connection points in the unit.
	READ AND UNDERSTAND THE INSTRUCTIONS Read and understand the instructions of the machine before any operations.
	RECOVER OR RECYCLE MATERIAL

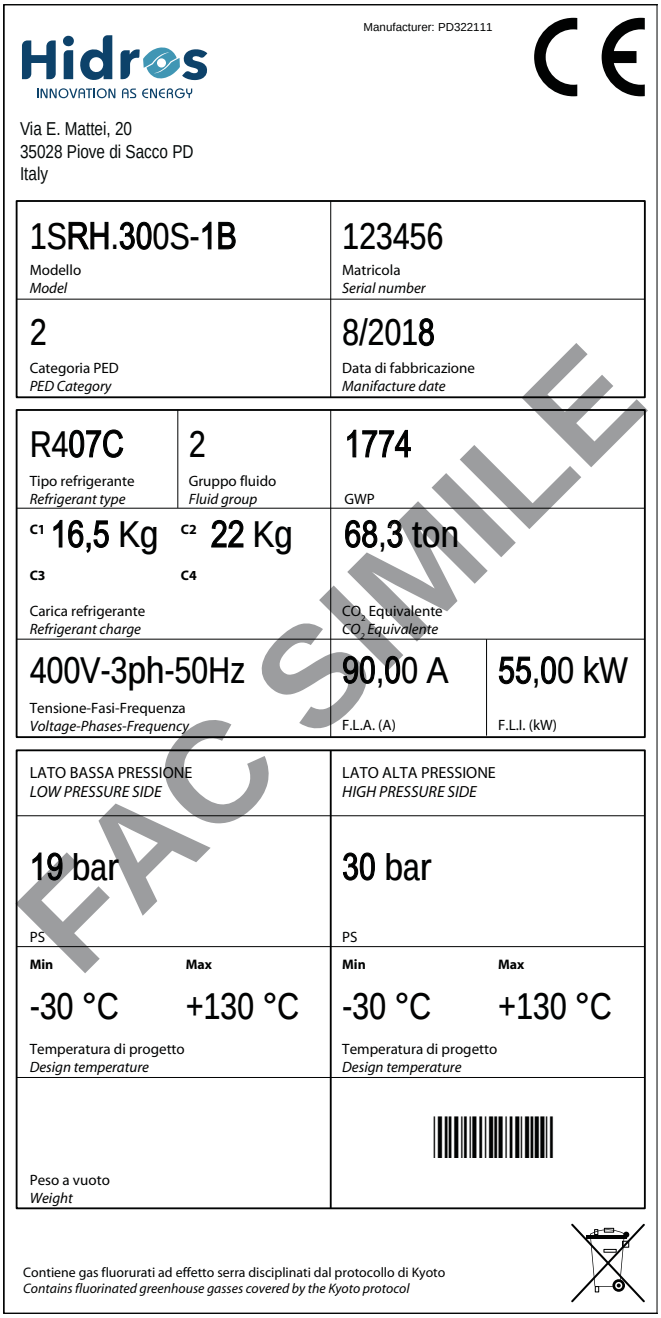
1.9 Limitations and prohibited use

The machine is designed and built exclusively for the uses described in “Limitations of use” of the technical manual.
Any other use is prohibited because it may pose a potential risk to the health of operators and users.

	The unit is not suitable for operations in environments: • excessively dusty or potentially explosive atmospheres; • where there are vibrations; • where there are electromagnetic fields; • where there are aggressive atmospheres

1.10 Unit identification

Each unit has a rating plate that provides key information regarding the machine.
The rating plate may differ from the one shown below as the example is for a standard unit without accessories.
For all electrical information not provided on the label, refer to the wiring diagram.
A facsimile of the label is shown below:



The product label should never be removed from the unit.

2. SAFETY

2.1 Warning re potentially hazardous toxic substances

2.1.1 Identification of the Type of Refrigerant Fluid Used: R407C

- Difluomethane (HFC32) 23% by weight CAS No.: 000075-10-5
- Pentafluoroethane (HFC125) 25% by weight CAS No.: 000354-33-6
- 1,1,1,2 - Tetrafluoroethane (HFC134a) 52% by weight No.: 000811-97-2

2.1.2 Identification of the Type of Oil Used.

The lubricant used is polyester oil. Please refer to the information provided on the compressor data plate.

For further information regarding the characteristics of the refrigerant and oil used, refer to the safety data sheets available from the refrigerant and oil manufacturers.

Main Ecological Information Regarding the Types of refrigerants Fluids used.

ENVIRONMENTAL PROTECTION : Read the ecological information and the following instructions carefully.

2.1.3 Persistence and degradation

The refrigerants used decompose in the lower atmosphere (troposphere) relatively quickly. The decomposed products are highly dispersible and therefore have a very low concentration. They do not influence the photochemical smog which is not among the VOC volatile organic compounds (as stipulated in the guidelines to the UNECE). The constituent refrigerants of R407C (R32, R125 and R134a), do not damage the ozone layer. These substances are regulated under the Montreal Protocol (revised 1992) and regulations EC no. 2037/200 of 29 June 2000.

2.1.4 Effects of discharges

Discharges into the atmosphere of this product does not cause a long-term contamination.

2.1.5 Exposure controls and personal protection

Wear protective clothing and gloves, protect your eyes and face

2.1.6 Professional exposure limits

R407C	
HFC	TWA 1000 ppm
HFC125	TWA 1000 ppm
HFC134a	TWA 1000 ppm - 4240 mg/m3 (OES)

2.2 Refrigerant handling

Users and maintenance personnel must be adequately informed about the possible risks of handling potentially toxic substances. Failure to follow such instructions can cause damage to personnel or to the unit.

2.3 Prevent inhalation of high vapor concentration

Atmospheric concentrations of refrigerant must be minimized and kept to a level that is below the occupational exposure limit. Vapor is heavier than air and can form dangerous concentrations near the ground where the ventilation rate is lower. Always ensure adequate ventilation. Avoid contact with open flames and hot surfaces as this can cause toxic and irritating decomposition products to form. Avoid contact between liquid refrigerant and the eyes or skin.

2.4 Procedures to be adopted in the event of accidental release of refrigerant

Ensure suitable personal protection (especially respiratory protection) during cleaning operations.
If deemed safe, isolate the source of the leak. If the leakage is small and if adequate ventilation is provided, allow the refrigerant to evaporate. If the loss is substantial ensure that measures are taken to adequately ventilate the area.
Contain spilled material with sand, earth or other suitable absorbent material.
Do not allow the refrigerant to enter drains, sewers or basements, as pockets of vapor can form.

2.5 Main Toxicological Information Regarding the Type of refrigerant used

2.5.1 Inhalation

A high atmospheric concentration can cause anaesthetic effects with possible loss of consciousness. Prolonged exposure may lead to irregular heartbeat and cause sudden death. Higher concentrations may cause asphyxia due to the reduced oxygen content in the atmosphere.

2.5.2 Contact with skin

Splashes of nebulous liquid can produce frostbite. Probably not hazardous if absorbed trough the skin. Repeated or prolonged contact may remove the skin's natural oils, with consequent dryness, cracking and dermatitis.

2.5.3 Contact with eyes

Splashes of liquid may cause frostbite.

2.5.4 Ingestion

While highly improbable, may produce frostbite.

2.6 First Aid Measures

Adhere scrupulously to the warnings and first aid procedures indicated below.

2.6.1 Inhalation

Move the person away from the source of exposure, keep him/her warm and let him/her rest. Administer oxygen if necessary. Attempt artificial respiration if breathing has stopped or shows sings of stopping. If the heart stops, perform external heart massage. Seek medical assistance.

2.6.2 Contact with skin

In case of contact with skin, wash immediately with lukewarm water. Thaw tissue using water. Remove contaminated clothing. Clothing may stick to the skin in case of frostbite. If irritation, swelling or blisters appear, seek medical assistance.

2.6.3 Contact with eyes

Rinse immediately using an eyewash or clean water, keeping eyelids open, for at least ten minutes. Seek medical assistance.

2.6.4 Ingestion

Do not induce vomiting. If the injured person is conscious, rinse his/her mouth with water and make him/her drink 200-300ml of water. Seek immediate medical assistance.

2.6.5 Further medical treatment

Treat symptoms and carry out support therapy as indicated. Do not administer adrenaline or similar sympathomimetic drugs following exposure, due to the risk of cardiac arrhythmia.

3. TECHNICAL CHARACTERISTICS

3.1 Unit description

Series of dehumidifier are expressly designed for use in swimming pools where humidity should be closely controlled in order to guarantee optimal comfort. These units are intended to be installed in a technical room close to the swimming pool. A centrifugal fan with high available static pressure allows unit connection to ductworks, both for air suction and discharge. This series comprises 6 basic models which cover a capacity range from 1150 to 3000 l/24h. All the units are fully assembled and wired at the factory.

3.1.1 Frame

All units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. All screws and rivets are in stainless steel. The colour of the units is RAL 9018.

3.1.2 Refrigerant circuit

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. All units are supplied with two circuits, each refrigerant circuit is totally independent from the other. Any incorrect operation of one circuit does not influence the other circuit. The refrigerant circuit includes: the liquid line manual shut-off valve, sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves form maintenance and control, pressure safety device (according to PED regulation).
WZ versions are supplied with one refrigerant circuit identical to the standard version, the second circuit includes: one way valves, solenoid valves, liquid receiver, water heat recovery, liquid line shut-off valve, sight glass, filter drier, thermal expansion valve with externalequalizer, Schrader valves for maintenance and control, pressure safety device.

3.1.3 Compressors

The compressors are scroll type with crankase heater and thermal overload protection by a klixon embedded in the motor winding. The compressors are mounted on rubber vibration dampers and they can be supplied wih sound attenuation jacket to reduce the noise emission (option). The compressor crankcase heater is always powered when the unit is in stand-by. The inspection on the compressors is possible only through the unit front panel.

3.1.4 Condenser and evaporator

Condensers and evaporators are made of copper pipes and aluminium fins. All evaporators are painted with epoxy powders to prevent corrosion problem due to their use in aggressive environments. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these heat exchangers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All units are supplied, standard, with a Stainless steel drip tray and all evaporators are supplied with a temperature sensor used as automatic defrost probe.

3.1.5 Supply fan

The fans are made of galvanized steel, centrifugal type, double inlet with forward curved blades. They are statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. They are mounted on the unit frame by interposition of rubber vibration dampers. The electric motors are 4 poles (about 1500 rpm), three-phase power supply.
The motors are connected to the fans by pulleys and belts. The protection class of the motors is IP 54.

3.1.6 Air filter

Supplied as standard with the unit, it is made of G3 class sysnthetic fibre filtering media (efficiency 85% by weight), 48 mm thickness.

3.1.7 Microprocessors

All units can be supplied with 2 kind of controls:
Basic control: it manages the following features: antifreeze protection, compressor timing, compressor automatic starting sequence, defrost cycle, alarm reset, potential free contact for remote general alarm.
Advanced control: in addition to the basic control it manages a wider range of features as: setting the priority operation mode (WZ only), managing of the main and the secondary set points, display of the alarms with historical list, time band operation, integration with hot water coil and modulating valve. Upon request the advanced control can be connected to a BMS system for the remote control and management. The technical department is available to study, together with the customer, different solutions using MODBUS.

3.1.8 Electronic probe temperature-humidity

This sensor is supplied standard on the/WZ versions supplied with advanced control.
It can be installed either in the room or in the return duct (to be specified before order) and allow the operation of the unit in the following modes:

Dehumidification
Heating (by hot water coil)
Dehumidification + heating
Dehumidification + heat recovery

3.1.9 Electric box

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all units are installed, standard, the compressors sequence relay who disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise).
The following components are also standard installed: main switch, magnetic-thermal switches (as a protection fans and compressors), control circuit automatic breakers, compressor contactors, fan contactors. The terminal board is supplied with voltage free contacts for remote ON-OFF and general alarm.

3.1.10 Control and protection devices

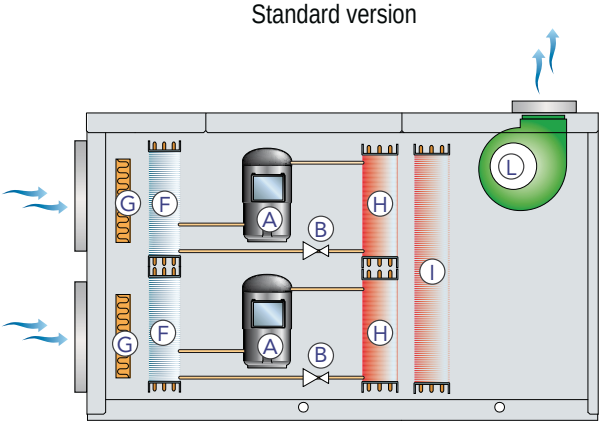
All units are supplied with the following control and protection devices: antifreeze protection sensor, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

3.2 Other versions

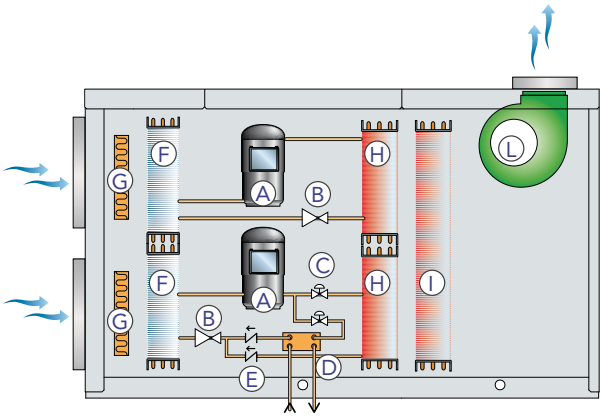
3.2.1 Unit with heat recovery (WZ)

The unit is designed to have one refrigerant circuit condensed by air, the other one condensed both by water and air. If the unit is supplied with the advanced control panel it is possible to set operation priorities (air or water). In the WZ versions the heat recovery is designed to reject on the water about 50% of the total thermal load generated by the unit. When the heat recovery is activated, the supply air temperature of the unit is, basically, the same of the return air, so,in this case, the dehumidification is performed without air temperature increase. This operation mode is suitable during intermediate seasons when the humidity in the swimming pool has to be controlled but also the room air temperature overheating has to be avoided.

Standard version



WZ version



A	Compressor	F	Evaporator
B	Expansion valve	G	Air filter
C	Solenoid valve	H	Condenser
D	Heat recovery	I	Hot watercoil (accessory)
E	One way valve	L	Fan

3.2 Accessories description

3.2.1 Low noise version (LS00)
This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

3.2.2 Hot water coil (HOWA)
The heat exchanger is made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor.

3.2.3 3 **Way modulating valve** (KIVA)
It is used to control the waterflow in the coil. The valve is directly controlled from the unit microprocessor.

3.2.4 3 Way on/off valve (KIVA)
It is used to control the waterflow in the coil. The valve is directly controlled from the unit microprocessor.

3.2.5 Available static pressure 400 Pa (PM)
Supply fan with 400 Pa available static pressure.

3.2.6 **Horizontal air discharge (opposite side coils)** (HORI)
In dieser Version ist der Gehäuserahmen für den horizontalen Luftaustritt montiert.

3.3.7 Pressure gauges (MAML)
These enable the standing charge and the operating pressures to be monitored.

3.3.8 Air filter with frame for ducted installation(FARC)
Complete with G5 efficiency air filter which can be removed by the side and frame for ducted installation.

3.3 Technical data

SRH		1100	1300	1500	1800	2200	3000
Moisture removed (1)	l/24h	1137,0	1289,0	1486,0	1868,0	2314,0	3061,0
Nominal input power (1)	kW	14,1	16,5	19,3	23,6	27,6	37,2
Maximum input power (2)	kW	21,7	23,0	30,5	35,9	42,0	61,0
Nominal input current (2)	A	37,4	37,6	49,8	58,4	81,2	98,8
Peak current	A	116,0	102,0	132,0	136,0	220,0	283,0
Hot water coil (3)	kW	72	88	94	112	125	155
Air flow	m^3/h	9500	10500	13000	15000	17000	25000
Available static pressure	Pa	250	250	250	250	250	250
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C
Global warming potential (GWP)		1774	1774	1774	1774	1774	1774
Refrigerant charge	Kg	13,0	14,0	22,0	25,0	25,0	37,5
Equivalent CO2 charge	t	23,06	24,836	39,03	44,35	44,35	66,52
Sound pressure (4)	dB(A)	79	80	82	82	83	84
Sound power (5)	dB(A)	63	64	65	65	66	66
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50

Performances are referred to the following conditions:
(1)Room temperature 30°C; relative humidity 80%.
(2)Room temperature 35°C; relative humidity 80%
(3) Room temperature 32°C; water temperature 80/70°C.
(4) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614
(5) Sound Power level according to ISO 9614 fan with available static pressure 50 Pa.

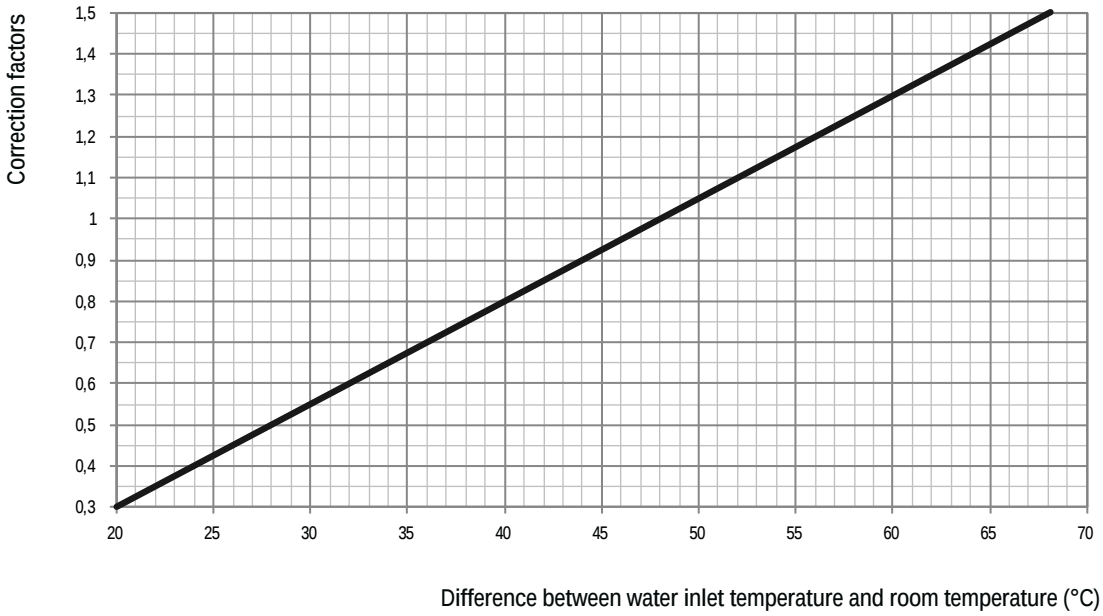
The refrigerant data may change without notice. It is therefore necessary to refer always to the silver label placed on the unit.

3.3.1 Hot water coil (Accessory)(HOWA)

SRH		1100	1300	1500	1800	2200	3000
Hot water coil nominal capacity	kW	72	75	94	110	125	155
Water flow	l/h	6230	6400	7750	9580	10450	12960
Water pressure drops	kPa	18	26	16	12	19	22

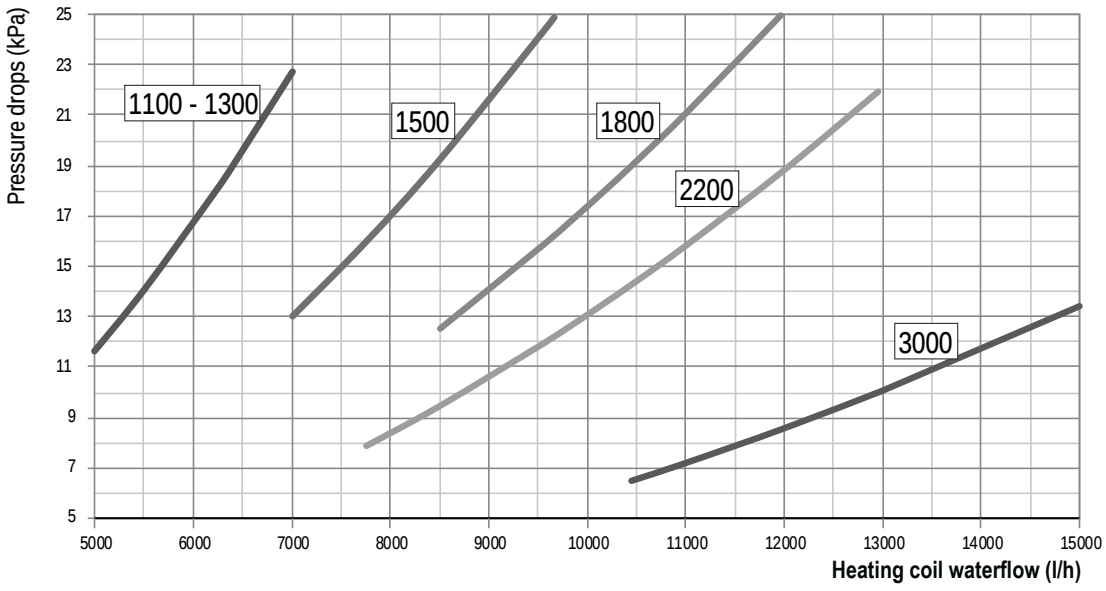
Performances are referred to the following conditions:
Room temperature 32°C; water temperature 80/70°C, compressor switched off.

3.3.2 Hot water coil correction factors (HOWA)

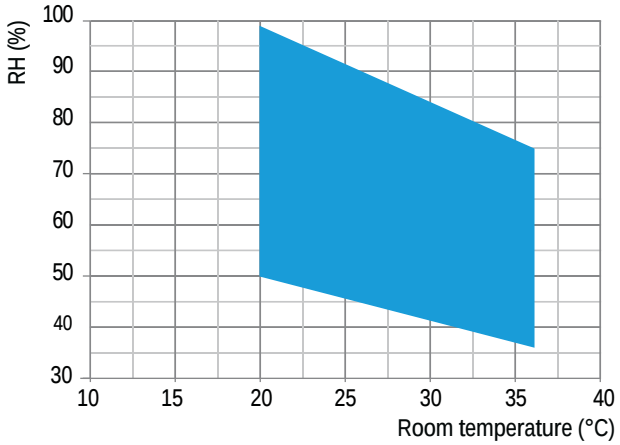


The hot water coil capacity in different conditions can be obtained multiplying the nominal capacity (See above), by the correction factor indicated in the table.

3.3.3 Pressure drops of hot water coil hydraulic circuit



3.4 Operation limits



All the units can run with room humidity or external humidity between 50% and 99% as shown in the chart.

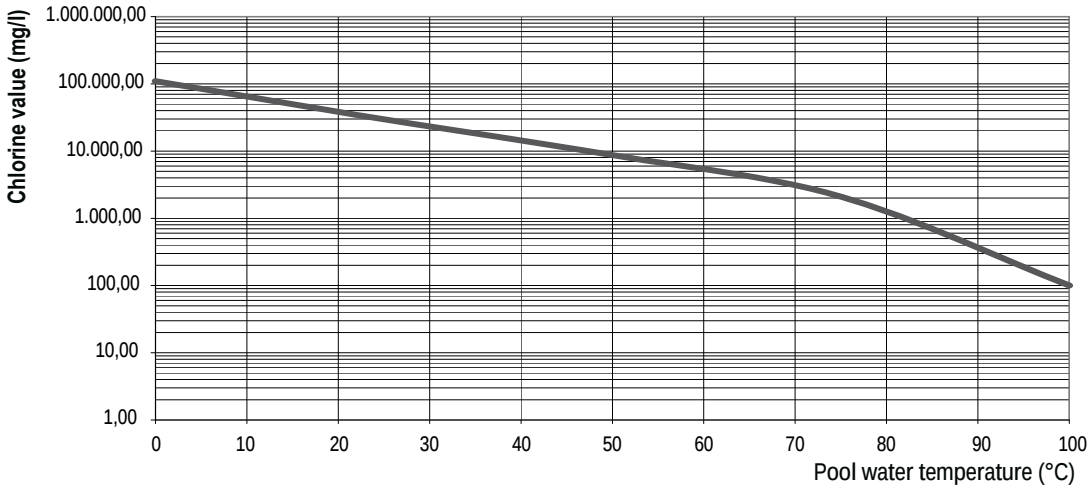
The units MUST be used within the operation limit indicated in the diagrams (see above). the warranty will be invalidated if the units are used in ambient conditions outside the limits reported. If there is the necessity to operate in different conditions, please contact our technical office.

Units are designed to operates with hot water coil supply temperature variables from 55°C to 80°C

The units are designed to operate within false ceiling and/or heated technical room. The units are NOT suitable for outdoor installations and / or technical room w/o heat (attics, rooms communicating with the outside) as it may form condensation on the walls and inside the unit cabinet causing damages.

In the case of HOWA or HOEL accessories, the maximum ambient temperature is limited by 5K.

3.4.1 Maximum pool water chlorine content



The units are designed and manufactured to operate with pool water chlorine values below the limits shown in the graph. Chlorine values above this limit can irreparably damage the unit.

3.5 Sound data

Standard unit										
Modd.	Octave band (Hz)								Lw (A)	Lp (A)
	63	125	250	500	1K	2K	4K	8K	dB(A)	dB(A)
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)		
1100	92,1	83,3	77,2	75,7	74,6	69,2	65,8	56,7	79	63
1300	93,1	84,3	78,2	76,7	75,6	70,2	66,8	57,7	80	64
1500	95,1	86,3	80,2	78,7	77,6	72,2	68,8	59,7	82	65
1800	95,1	86,3	80,2	78,7	77,6	72,2	68,8	59,7	82	65
2200	96,1	87,3	81,2	79,7	78,6	73,2	69,8	60,7	83	66
3000	97,1	88,3	82,2	80,7	79,6	74,2	70,8	61,7	84	66

Low noise version (LS00)										
Modd.	Octave band (Hz)								Lw	Lp
	63	125	250	500	1K	2K	4K	8K	dB(A)	dB(A)
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)		
1100 LS	90,1	81,3	75,2	73,7	72,6	67,2	63,8	54,7	77	61
1300 LS	91,1	82,3	76,2	74,7	73,6	68,2	64,8	55,7	78	62
1500 LS	93,1	84,3	78,2	76,7	75,6	70,2	66,8	57,7	80	63
1800 LS	93,1	84,3	78,2	76,7	75,6	70,2	66,8	57,7	80	63
2200 LS	94,1	85,3	79,2	77,7	76,6	71,2	67,8	58,7	81	64
3000 LS	95,1	86,3	80,2	78,7	77,6	72,2	68,8	59,7	82	64

Lw: Sound power level according to ISO 9614 fan with available static pressure 50 Pa.
Lp: Sound pressure level measured at 1 mt from the unit in free field conditions direction factor Q=2 according to ISO 9614 fan with available static pressure 50 Pa.

3.6 Safety devices

3.6.1 High pressure switch

The high pressure switch stops the unit when the discharge compressor pressure is higher than the set value. The restart is automatic, done when the pressure is under the level set in the differential value.

3.6.2 Low pressure switch

The low pressure switch stops the unit when the suction pressure goes lower than the pre-set value. The reset is automatic and it's possible only when the pressure is over the value indicated by the differential set (see table below).

3.6.3 Defrost sensor

It's a device which signals to the electronic control, the necessity to make the defrost cycle. Once the defrost cycle is activated, the defrost sensor determines also its conclusion.

3.6.4 Defrosting

The frost on the coil, obstructs the air flow, reduces the available exchange area and consequently the unit performances and can seriously damage the system. All the units are supplied, standard, with a control which defrost automatically the heat exchanger if necessary. This control provides a temperature probe (defrost thermostat) on the unit evaporator. When the defrost cycle is required, the microprocessor control (according to set parameters), switches the compressor off, while the fan remains in operation. At the end of the defrost cycle, it is waited for the dripping time to allow the complete cleaning of the coil.

4. INSTALLATION

4.1 General safety guidelines and and use of symbols

Before undertaking any task the operator must be fully trained in the operation of the machines to be used and their controls. They must also have read and be fully conversant with all operating instructions.

All maintenance must be performed by TRAINED personnel and be in accordance with all national and local regulations.

The installation and maintenance of the unit must comply with the local regulations in force at the time of the installation.

Avoid contact and do not insert any objects into moving parts.

4.2 Health and safety Considerations

The workplace must be kept clean, tidy and free from objects that may prevent free movement. Appropriate lighting of the work place shall be provided to allow the operator to perform the required operations safely. Poor or too strong lighting can cause risks.

Ensure that work places are always adequately ventilated and that respirators are working, in good condition and comply fully with the requirements of the current regulations.

4.3 Personal protective equipment

When operating and maintaining the unit, use the following personal protective equipment listed below as required by law.

Protective footwear.

Eye protection.

Protective gloves.

Respiratory protection.

Hearing protection.

4.4 Inspection

When installing or servicing the unit, it is necessary to strictly follow the rules reported on this manual, to conform to all the specifications of the labels on the unit, and to take any possible precautions of the case. Not observing the rules reported on this manual can create dangerous situations. After receiving the unit, immediately check its integrity. The unit left the factory in perfect conditions; any eventual damage must be questioned to the carrier and recorded on the Delivery Note before it is signed. The company must be informed, within 8 days, of the extent of the damage. The Customer should prepare a written statement of any severe damage.

Before accepting the unit check:
- The unit did not suffer any damage during transport;
- The delivered goods are conforming to what shown in the delivery note.

In Case of Damage
- List the damage on the delivery note
- Inform the Company of the extent of the damage within 8 days of receipt of the goods. After this time any claim will not be considered.
- A full written report is required for cases of severe damage.

4.5 Storage

Units should be stored under cover and ideally, should remain in their packaging. The tools that are supplied for opening the electrics box should be formally transferred to the person responsible for the plant.

4.5.1 Shipment

El transporte debe ser realizado por empresas autorizadas y las caracterísitcas del medio utilizado deben cumplir con los requisitos necesarios para no dañar la máquina a transportar tanto en la fase de carga y descarga como durante el transporte. Los vehículos de tranporte deben disponer de todos los elementos de amortiguación y suspensión para absorver los posibles golpes al circular por caminos deficientes y también de paredes internas adecuadas para no dañar la mercancía transportada.

The maximum ambient temperature for storage/shipment is +45°C and the minimum is -20°C,

4.6 Unpacking

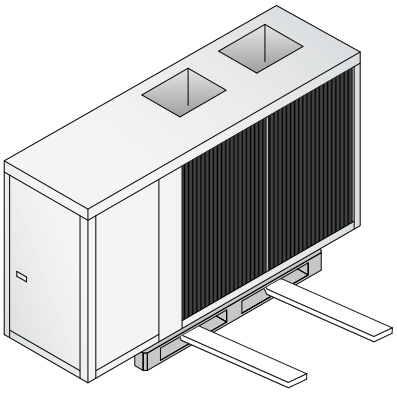
Packaging could be dangerous for the operators.

It is advisable to leave packaged units during handling and remove it before the installation.
The packaging must be removed carefully to prevent any possible damage to the machine.
The materials constituting the packaging may be different in nature (wood, cardboard, nylon, etc.).

The packaging materials should be seperated and sent for disposal or possible recycling to specialist waste companies.

4.7 Lifting and handling

When unloading the unit, it is highly recommended to avoid any sudden move in order to protect refrigerant circuit, copper tubes or any other unit component. Units can be lifted by using a forklift or, in alternative, using belts, being sure that the method of lifting does not damage the lateral panels and the cover. It is important to keep the unit horizontal at all time to avoid damages to the internal components.



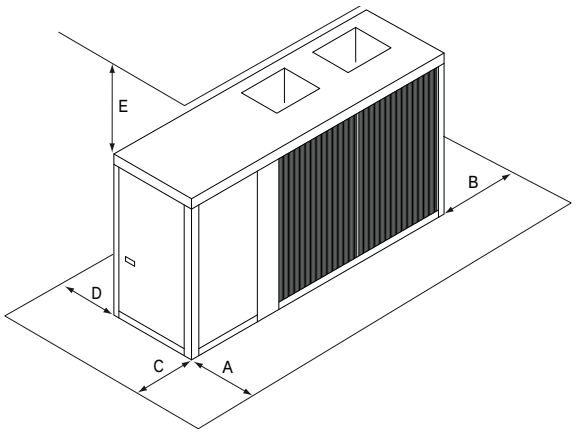
4.8 Location and minimum technical clearances

The unit has to be installed such that maintenance and repair is possible. The warranty does not cover costs for the provision of lifting apparatus, platforms or other lifting systems required to perform repairs during warranty period.

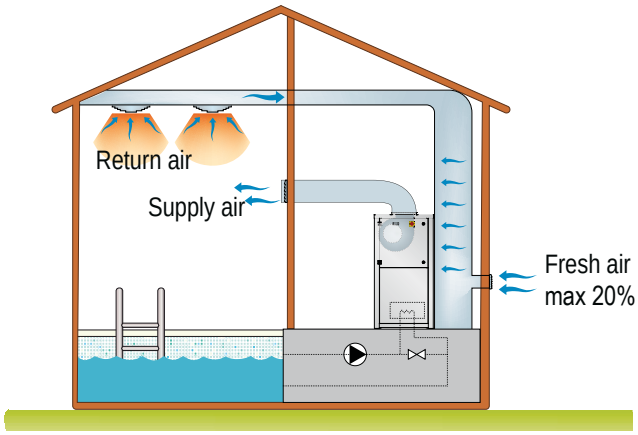
The installation site should be chosen in accordance with EN 378-1 and 378-3 standards. When choosing the installation site, all risks caused by accidental refrigerant leakage should be taken into consideration.

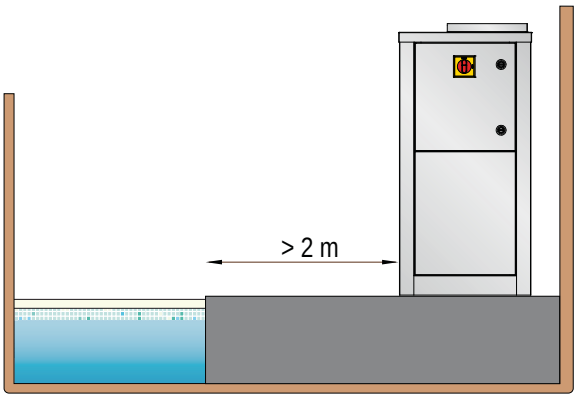
Mod.	A	B	C	D	E *
1100	1000	800	800	800	3000
1300	1000	800	800	800	3000
1500	1500	800	800	800	3000
1800	1500	800	800	800	3000
2200	1500	800	800	800	3000
3000	1500	1000	1000	1000	3000

* Only in case of non-ducted units



4.8.2 Unit installation

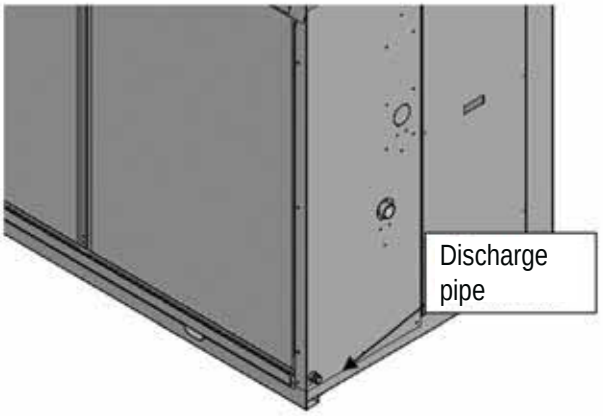


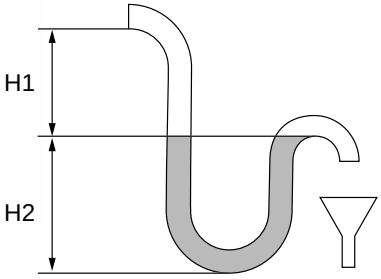


In the main european markets, the minimum distance of electric appliances from water sources (basins, showers, pools, whirlpools) is 2 meters! Before the installation of the unit it is compulsory to check the national or local norms.

4.9 Condensate draining connections

Condensate draining should be done using the flexible rubber pipe supplied together with the unit (about 1mt. long). On the condensate discharge pipe it must be installed a syphon with a minimum height equal to the suction pressure of the fan.



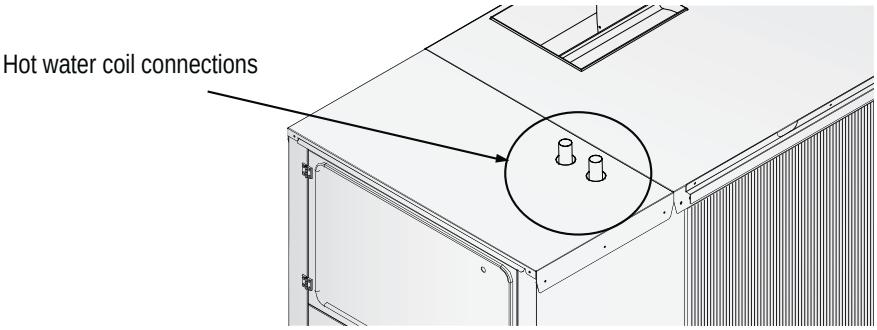


H1 = 20 mm
H2= ΔP/2 + 20 mm
ΔP = pressure difference inside the unit in mm water column
10 Pa ≈ 1 mm water column

The condensate drain line should have a water trap which may have minimum flying height equal to the suction of the fan, in any case never less than 35 mm.

4.10 How to connect the hot water coil (HOWA) + 3 way modulating valve (KIVM) (Accessory)

To install the hot water coil it is necessary to remove the pre-knock out holes on the back panel of the unit; fix the water coil connections to the hot water coil. The hot water coil connections are 1" .
The modulating 3 way valve is installed directly in factory as showed in the picturet. It is controlled directly by the board.



For proper equipment operation, it is recommended powering the unit with a dedicated pump. It is strongly recommended to connect the unit upstream of the collector system to ensure proper water supply (see drawing).

For a correct functioning of the unit, it's advisable to bleed carefully the circuit using the vent valve present in the unit.

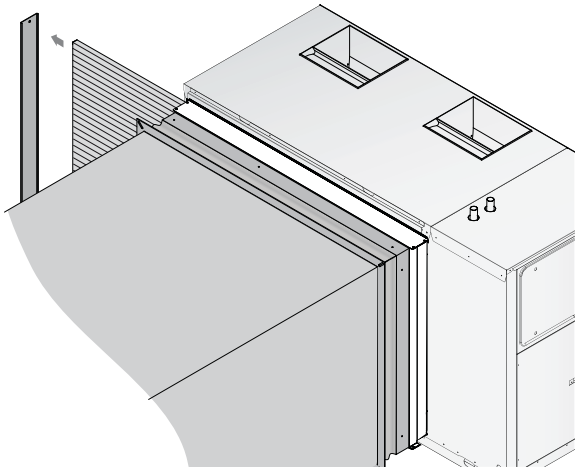
The inlet maximum water temperature allowed is 80°C.
The inlet minimum water temperature allowed is 55°C.

4.11 How to remove filters

Units are factory supplied with a standard filter.
It is important to insert ALWAYS a filter on the suction side. If the filter is not present the unit can have serious operation problems.

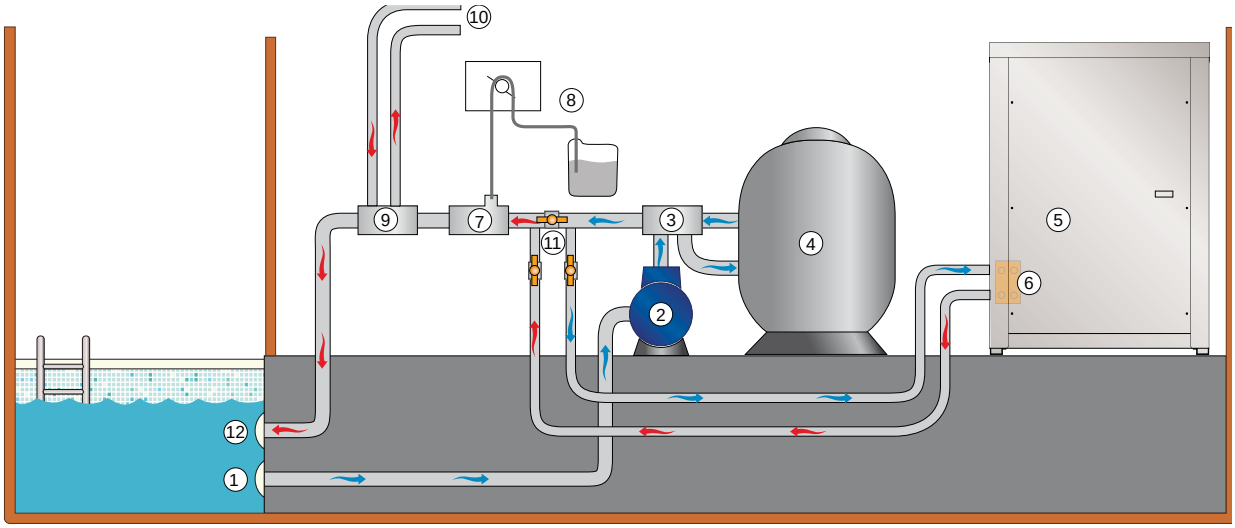
4.11.1 How to remove filter with accessory FARC

In case the unit is supplied with FARC (frame for ducted installation) slide off the air filter as shown below.



4.12 WZ version connections (option)

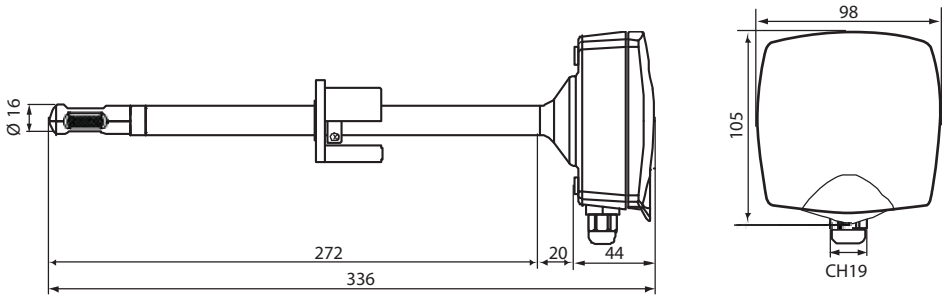
The heat recovery coil must always be installed downstream of the water filter and upstream of the water disinfection treatment in the pools hydraulic circuit. The positioning of the heat recovery upstream of the disinfection treatment is important because prolonged exposure to high concentrations of disinfectants chemicals can cause irreparable damage to the heat recovery coil. Downstream of the disinfection system has generally much higher concentration of disinfectants than in the pool. It's also important for the heat recovery coil to be positioned upstream of the filter, so that any debris from the pool do not pass into the coil. Which can cause poor performance of the coil and damage!



1	Water pool return	7	Pool water disinfection treatment
2	Pool water pump	8	Pool water disinfection dosing system
3	Pool water valve	9	Pool water heating system
4	Pool water filter	10	To the pool water heating system (Boiler, heat pump, etc.)
5	Dehumidifier	11	Pool water valves adjustment set
6	Heat recovery coil	12	Water pool supply

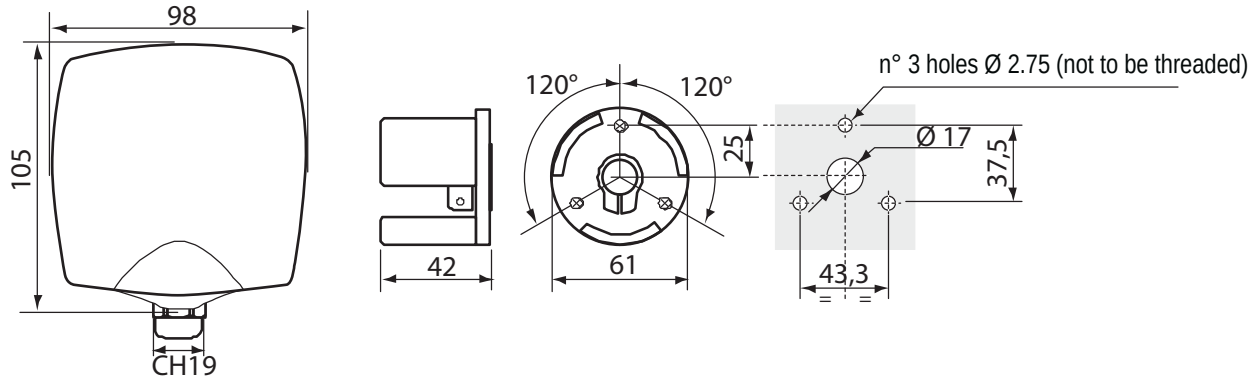
4.13 Electronic temperature and humidity probe to be ducted installed

The temperature and humidity probe to be ducted installed is supplied separately together with the fixing bracket and must be installed by qualified personnel.



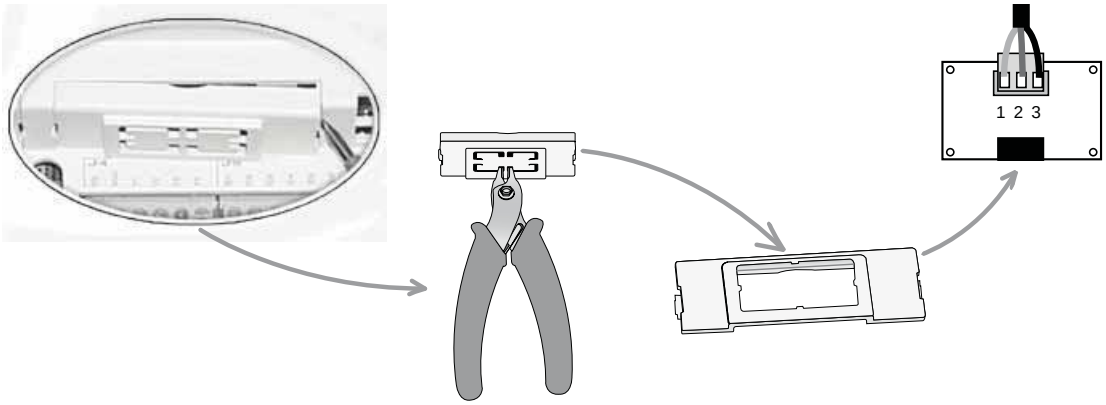
The probe must be connected to the air duct using the fixing bracket provided.
Observe the following instructions for installation:
- Fix the bracket to the air duct;
- Slide the rod onto the bracket at the desired depth;
- Tighten the screw on the bracket for its fixing

For electrical connections, it is necessary to remove the top cover of the probe and refer to the indications given in the “Electrical connections” paragraph.



4.14 Serial interface card RS485 (INSE)

Supervision system interface serial board (MODBUS RS485 available only)The installation of the card will allow the unit to be plugged in and connected to a system with MODBUS protocol. This system allows you to remotely monitor all parameters of the unit and change their values.The serial interface board is normally fitted at the factory, where it is provided separately is necessary to respect the polarity of the wiring as shown in the diagram. Any reversal of polarity will result in the non-functioning unit.
The supervision connectivity cable must be telephone one type 2x0, 25 mm^2.
The unit is configured at the factory with serial address 1. In case of using the MODBUS system, you can request the list of variables by contacting the assistance.



4.15 Connecting the unit to air duct channels

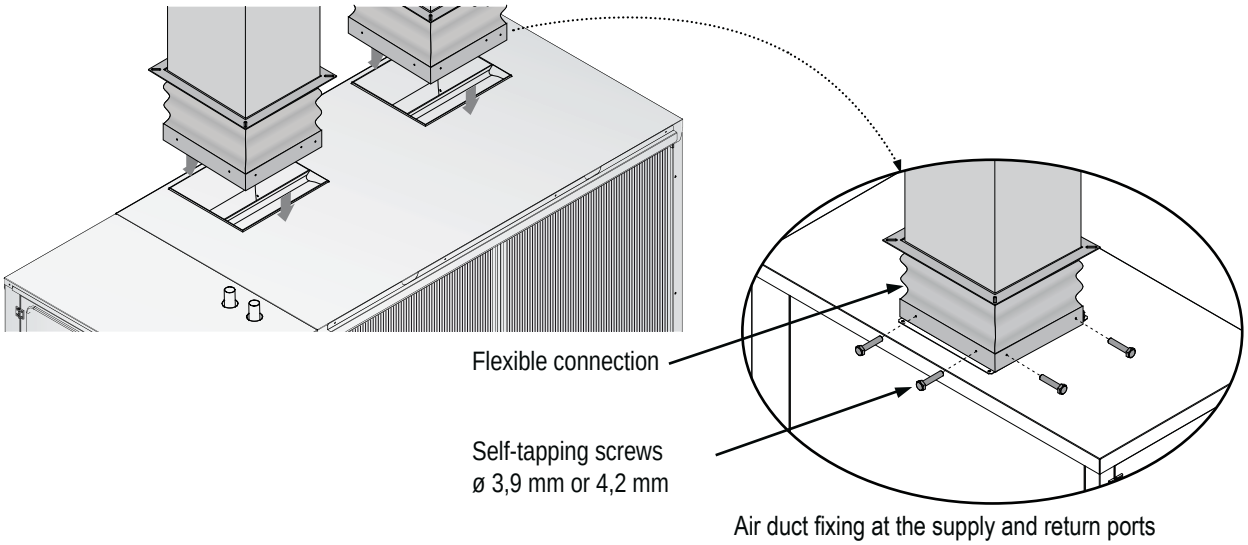
Units can be connected to air ducts channels either form the return and supply side.

4.15.1 Supply duct connection

In order to enable the proper functioning of the unit is important to ensure a constant air flow to the unit close to the nominal stated value. The maximum deviation allowed is 10%.

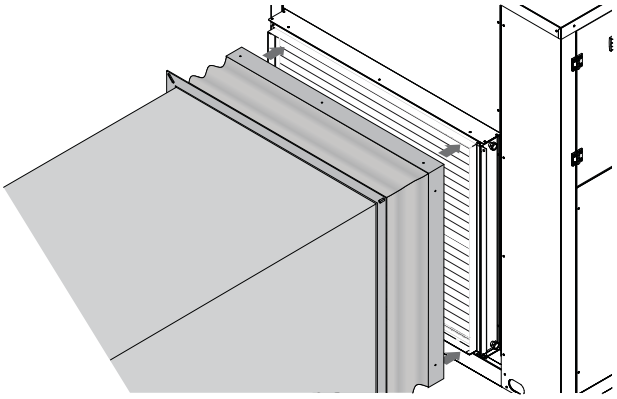
In order to limit the noise, it is necessary that the air speed inside ducts would never exceed 4 m / sec. With crossing high speed, it greatly reduces the dehumidification capacity of the unit and increases the risk of dragging of water condensation in the air ducts with a potential damage to the furniture and / or flooring.

It is always recommended to use a flexible connection between the unit and air distrubution system (duct channel) in order to reduce the transmission of vibrations



Air duct fixing at the supply and return ports

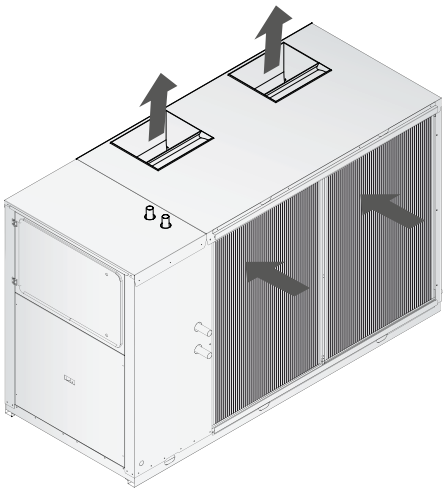
4.15.2 Return duct connection with FARC option



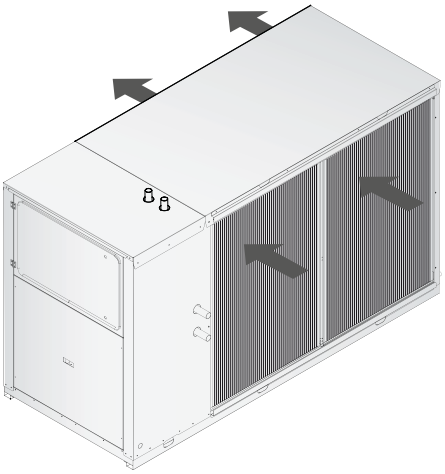
In case of return duct installation it is necessary the use of accessory FARC, a metallic frame that allow the slide off the air filter laterally.

4.16 Fan positioning

In all units the supply fan can be oriented in 3 different directions. The operation has to be carried out exclusively in the factory. Standard configuration is with vertical air discharge.



Vertical Supply (standard)

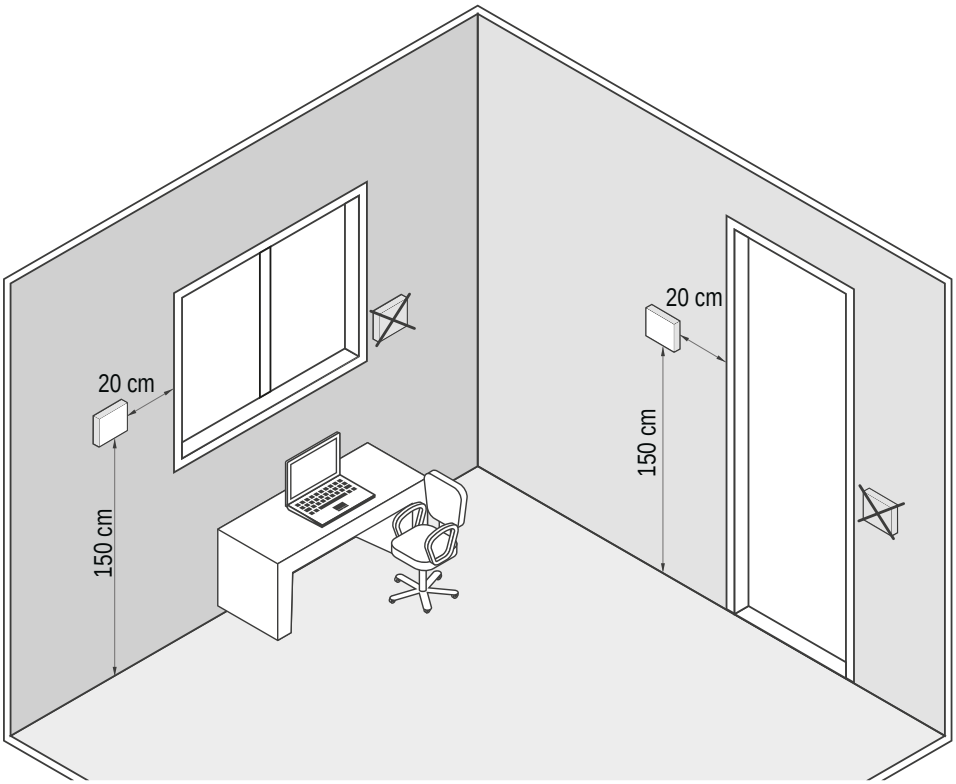


Right hand side Supply

4.17 Accessory installation HYGR

If humidistat or thermohygrostate is used, make sure that it can guarantee a correct reading of humidity and temperature in the environment and that this reading is similar to that in suction side. Under no circumstances can the sensor be placed in an ambient different from the unit's suction, nor can it be installed in areas where air flow is hampered.

To ensure a proper reading of temperature and humidity make sure that the device is not near hot or cold air flows or behind curtains or other obstacles.



4.18 Electric connections: preliminary safety information

The electric panel is located inside the unit at the top of the technical compartment where the various components of the refrigerant circuit are also to be found. To access the electrical board, remove the front panel of the unit:

Power connections must be made in accordance to the wiring diagram enclosed with the unit and in accordance to the norms in force.

Make sure the power supply upstream of the unit is (blocked with a switch). Check that the main switch handle is padlocked and it is applied on the handle a visible sign of warning not to operate.

It must be verified that electric supply is corresponding to the unit electric nominal data (tension, phases, frequency) reported on the label in the front panel of the unit.

Power cable and line protection must be sized according to the specification reported on the form of the wiring diagram enclosed with the unit.

The cable section must be commensurate with the calibration of the system-side protection and must take into account all the factors that may influence (temperature, type of insulation, length, etc.).

Power supply must respect the reported tolerances and limits: If those tolerances should not be respected, the warranty will be invalidated.

Flow switches must be connected following the indication reported in the wiring diagram. Never bridge flow switches connections in the terminal board. Guarantee will be invalidated if connections are altered or not properly made.

Make all connections to ground provided by law and legislation.

Before any service operation on the unit, be sure that the electric supply is disconnected.

The power line and the unit external safety devices must be sized in order to ensure the correct voltage at the maximum operating conditions of the unit reported in the wiring diagram of the unit.

FROST PROTECTION
If opened, the main switch cuts the power off to any electric heater and antifreeze device supplied with the unit, including the compressor crankcase heaters. The main switch should only be disconnected for cleaning, maintenance or unit reparation.

4.19 Electrical data

The electrical data reported below refer to the standard unit without accessories.
In all other cases refer to the data reported in the attached electrical wiring diagrams.

The line voltage fluctuations can not be more than ±10% of the nominal value, while the voltage unbalance between one phase and another can not exceed 1%, according to EN60204. If those tolerances should not be respected, please contact our Company.

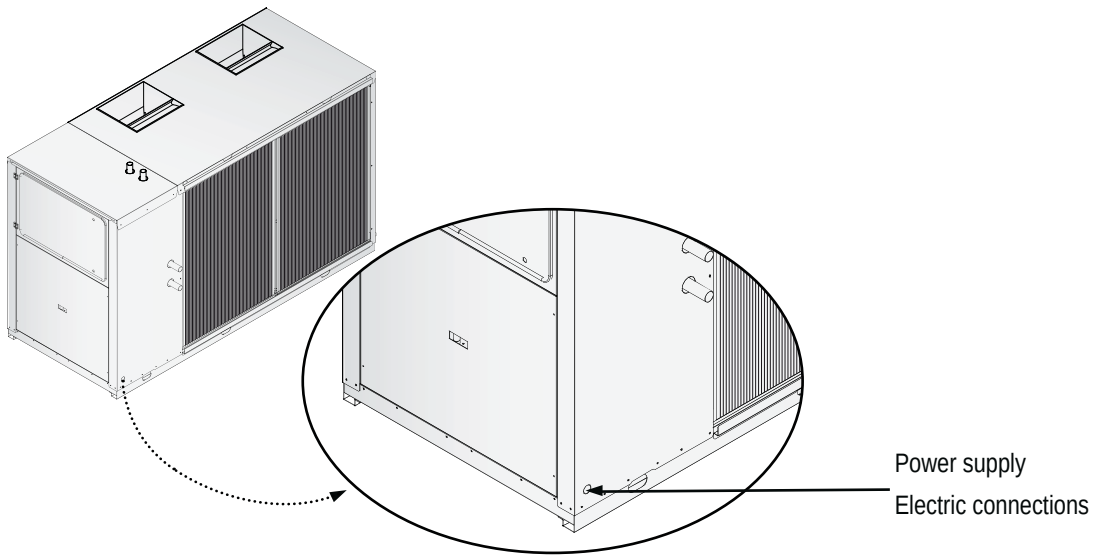
Model		1100	1300	1500	1800	2200	3000
Power supply	V/~/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Control board	V/~/Hz	24	24	24	24	24	24
Auxiliary circuit	V/~/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Fans power supply	V/~/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Line section	mm^2	10	10	10	16	25	35
PE section	mm^2	10	10	10	16	25	35
Line section(1)	mm^2	16	16	16	25	25	35
PE section (1)	mm^2	16	16	16	25	25	35

(1) The data refer to the unit with electric heaters (HOEL)

Electric data may change for updating without notice. It is therefore necessary to refer always to the wiring diagram present in the units.

4.20 How to connect the power supply

For powering the unit remove the front panel; use the appropriate fairlead present in the side panel and connect the power cord to the terminal block in the cabinet. After connecting all cable carefully close the front panel.

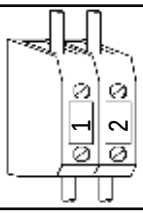


4.21 Electric connections

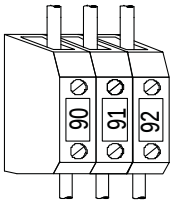
The numbering of the terminals may change without notice. For their connection is mandatory to refer to the wiring diagram supplied along with the unit.

4.21.1 Remote wiring connections

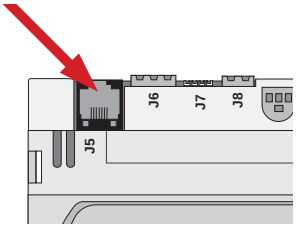
All terminals referred to in the explanations below will be found on the terminal board inside the electrical box. All electric connections mentioned below have to be made by the installer, on site.



REMOTE ON / OFF
To switch the unit on or off from remote control.
Contacts are voltage free.
Le unità sono fornite di serie dalla fabbrica con morsetti ponticellati.
Contact closed, unit ON,
Contact open, unit OFF.

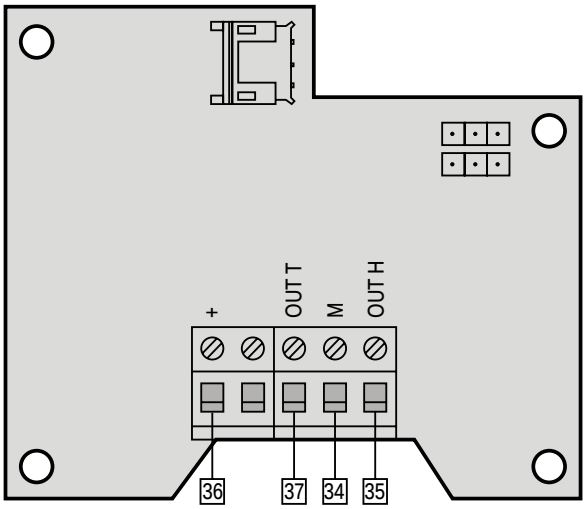


REMOTE GENERAL ALARM
For remote display of a general alarm, connect the visual or audible device between terminals 90-91-92.
Contacts 90/91 NC (Normally closed)
Contacts 91/92 NO (Normally opened)



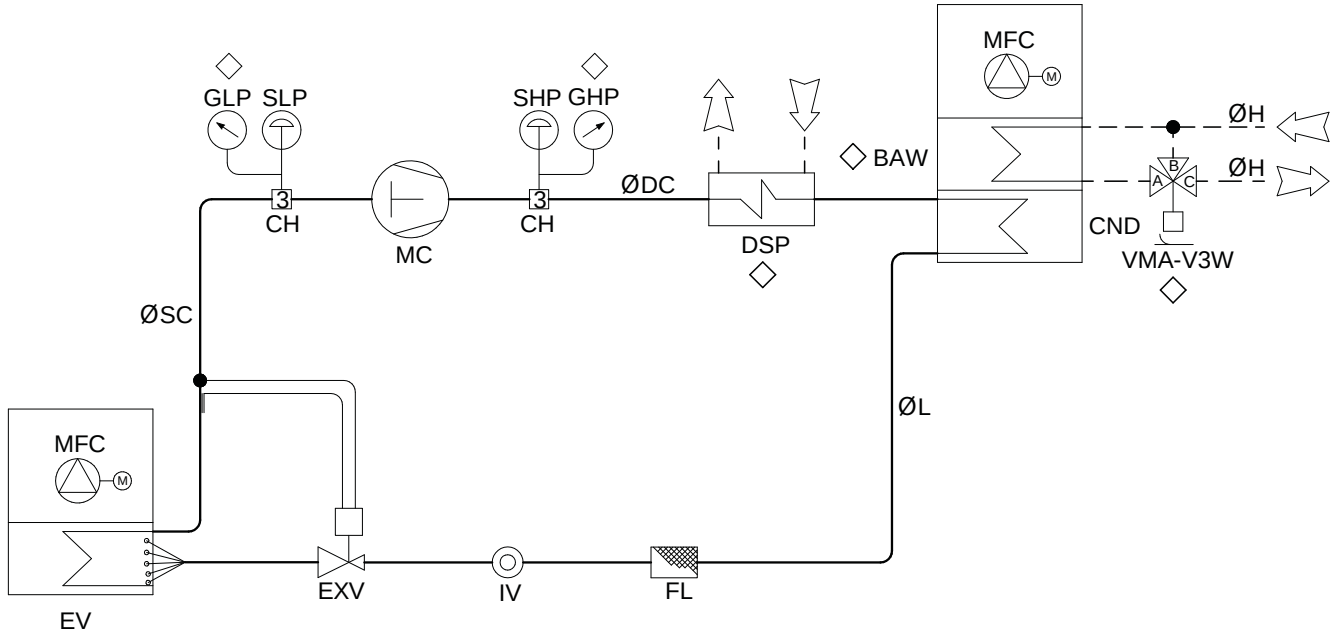
REMOTE CONTROL PANEL
The remote control panel replicates all of the functions on the main controller panel and can be connected up to a maximum distance of 50 meters from the unit. The panel has to be connected to the unit by telephone cable. The power supply cables must be separated from the remote control panel wires, in order to avoid interference.
The control panel cannot be installed in an area subject to excessive vibration, corrosive gases, is a dirty environment or has a high humidity level. The ventilation openings must not be blocked.

ELECTRONIC ROOM PROBE
It is used to measure the temperature and humidity in the room. This probe communicates directly with the microprocessor control of the unit and, depending on the readings made, activates the various operating modes.

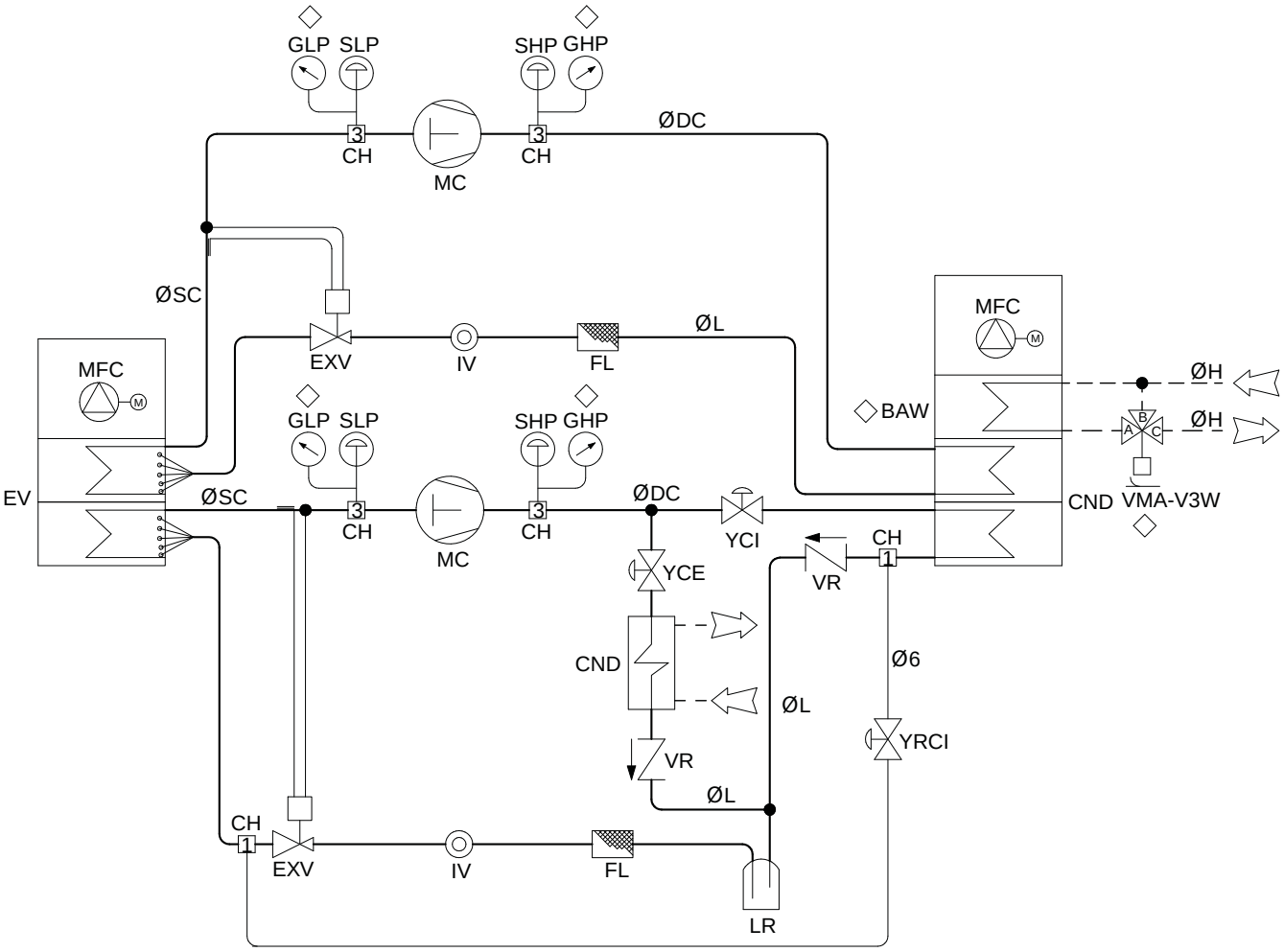


4.22 **Refrigerant circuit layout**

4.22.1 Standard Version



4.22.2 WZ Version



BAW	Water coil	MC	Compressor
CH	Charging plug	MFC	Centrifugal fan
CHR	Charging plug	SHP	High pressure pressostat
CND	Condenser	SLP	Low-high pressure switch
DSP	Desuperheater	SV	Shut off valve
EV	Evaporator	V3W	3-Way modulating valve
EXV	Termostatic valve	VMA	Water modulating valve
FL	Liquid line filter	VR	Check nvalve
GHP	High pressure gauge	YCE	Solenoid valve for external condenser
GLP	Low pressure gauge	YCI	Solenoid valve for internal condenser
IV	Moisture indicator sight glass	YRCI	Internal condenser drain solenoid
LR	Liquid receiver		

5. UNIT START UP

5.1 Preliminary checks

Before starting the unit the checks detailed in this manual of the electric supply and connections, the hydraulic system and the refrigerant circuit, should be performed.

Start-up operations must be performed in accordance with the instructions detailed in the previous paragraphs.

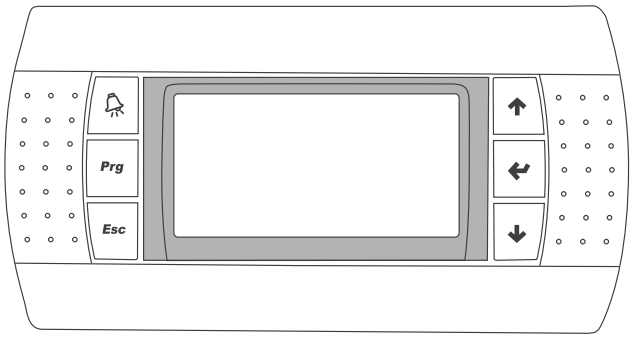
5.1.1 Before start-up

Damage can occur during shipment or installation. It is recommended that a detailed check is made, before the installation of the unit, for possible refrigerant leakages caused by breakage of capillaries, pressure switch connections, tampering of the refrigerant pipework, vibration during transport or general abuse suffered by the unit.

- Verify that the unit is installed in a workmanlike manner and in accordance with the guidelines in this manual.
- Check that all power cables are properly connected and all terminals are correctly fixed.
- The operating voltage the one shown on the unit labels.
- Check that the unit is connected to the system earth.
- Check that there is no refrigerant leakage.
- Check for oil stains, sign of a possible leak.
- Check that the refrigerant circuit shows the correct standing pressure on the pressure gauges (if present) otherwise use external ones.
- Check that the Shrader port caps are the correct type and are tightly closed.
- Check that crankcase heaters are powered correctly (if present).
- Check that all water connections are properly installed and all indications on unit labels are observed.
- The system must be flushed, filled and vented in order to eliminate any air.
- Check that the water temperatures are within the operation limits reported in the manual.
- Before start up check that all panels are replaced in the proper position and locked with fastening screws.

Do not modify internal wiring of the unit as this will immediately invalidate the warranty.

5.2 Description of the control panel

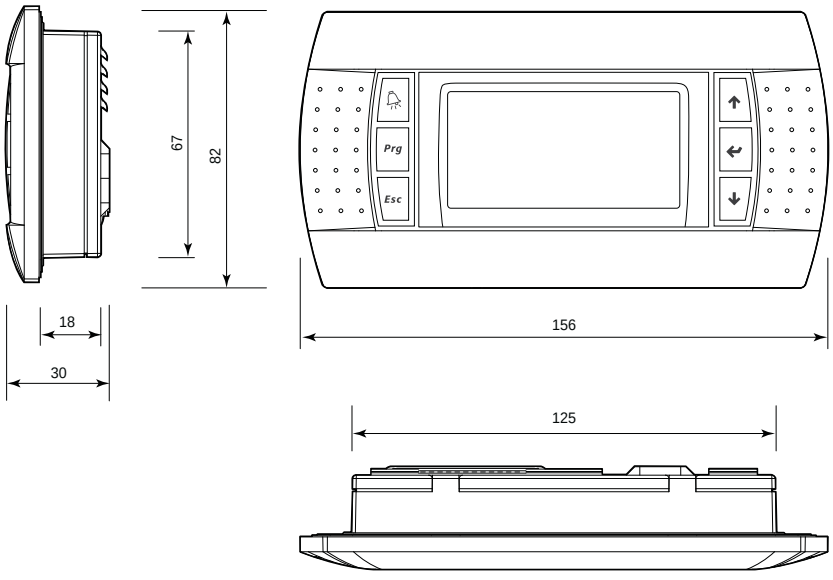


5.2.1 Key function

	It is used to display the alarms, mutes the buzzer.
Prg	It is used to display / program the unit parameters.
Esc	Menu exit.
	Menu Scroll up and/or variable settings.
	Enter
	Menu Scroll down and/or variable settings.

5.3 Description of the remote control panel

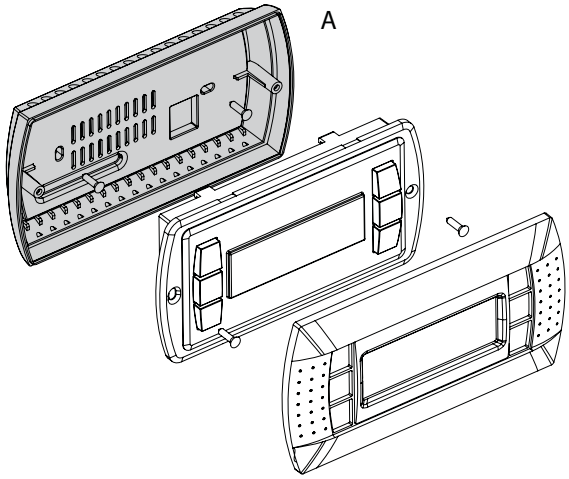
5.3.1 Dimensions



5.3.2 Wall-mounting

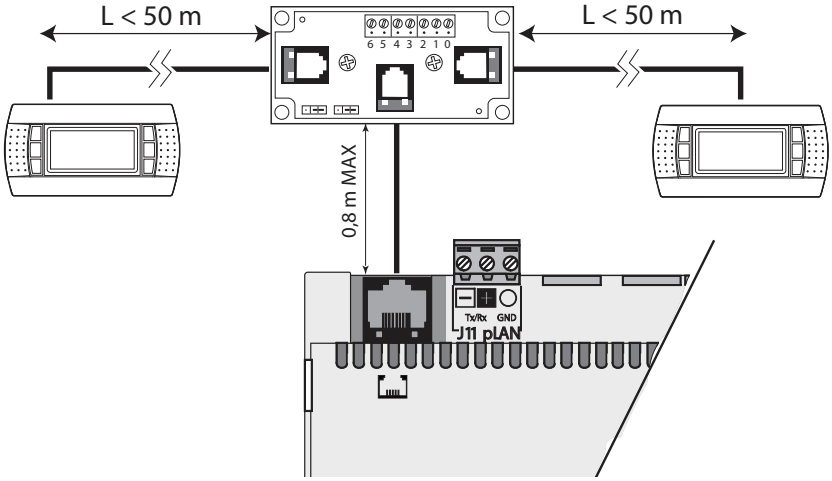
The wall-mounting of the terminal first requires the back piece of the container (A) to be fitted, using a standard three-module switch box.

• Fasten the back piece to the box using the rounded-head screws supplied in the packaging;
• Connect the telephone cable;
• Rest the front panel on the back piece and fasten the parts together using the flush-head screws supplied in the packaging, as shown in figure;
• Finally, fit the click-on frame.



5.3.3 Electrical connection

Connect the telephone cable from the board to the connector provided on the rear of the terminal.



Electric data can be updated without notice. It is therefore necessary to always refer to the wiring diagram provided in the unit.

If there is damage to the remote control or there is a faulty connection, failure of communication will be indicated in the display with the message “noL” (no link).

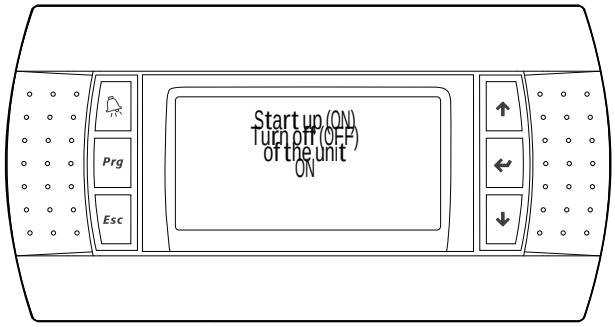
6. USE

6.1 Switch the unit on

Unit On/Off can be done trough
• Keyboard
• Remote ON/OFF

6.1.1 Switching on from Keyboard

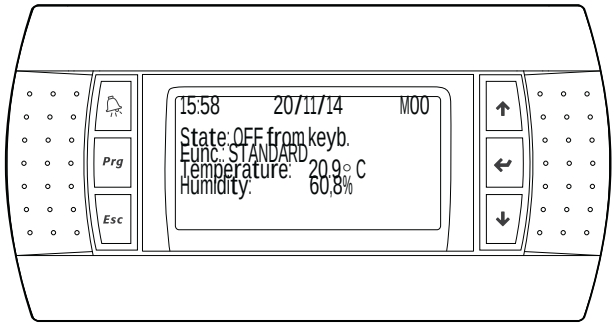
To switch on the unit, press at the same time ↑ and ↓ keys. The display visualization will be the following:



The cursor will be positioned onto On Off. With ↑ and ↓ keys choose the desired modality and then press ↵ key to confirm.

6.1.2 Switching on by remote

To switch on the unit proceed as described in the previous paragraph. Now would be possible to activate and disable unit remotely. The control display would show “Off by remote”



6.1.3 These are the main visualisations:

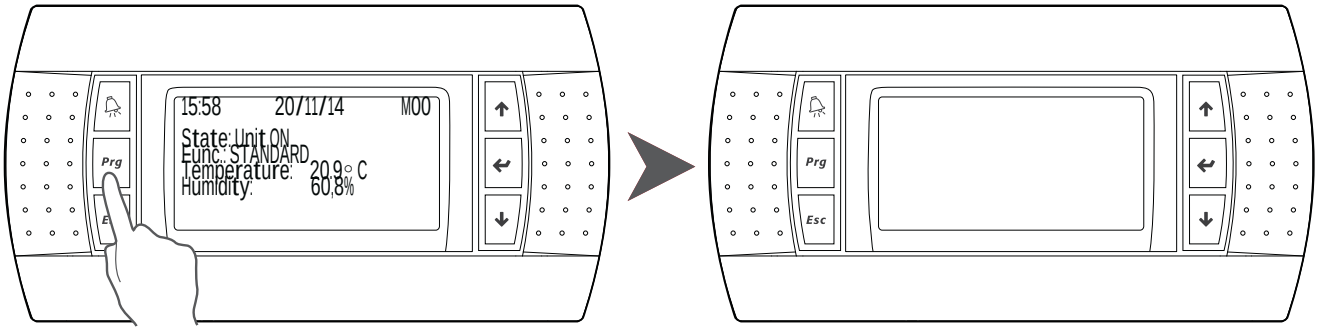
From the main screen by pressing ↓ it is possible to scroll up/down some principal parameters of the system:

00:00 00/00/00 M00 Status: Unit ON Oper.:STANDARD Air temp. : 27.4° C Air humidity : 56.5% Water temp. : 30.3°C Mode: COMFORT	To start the unit, close the main switch; on the display of the microprocessor will appear the following screen. Press at the same time the buttons ↑ and ↓ Press ON to start
00:00 00/00/00 M01 Dew point Temp. : 13.0° C Compressor 1 : ON Compressor 2 : ON Fan : ON Speed fan : 090.0%	Reading only: shows the status of the component.

00:00 00/00/00 M02 Desuperheater : ON Heating valve : 00.0% Heating pump : OFF Heating step : OFF Cond. valve : OFF	Reading only: shows the status of the component.
00:00 00/00/00 M03 Defrost temp.: 14.3° C Ext. temp. : 09.0° C	Videata di sola visualizzazione ; consente di verificare lo stato dei vari componenti dell'unità.

6.2 Main menù

From the main screen by pressing ***Prg*** it is possible to see available menu:



With ↓ and ↑ keys it is possible to navigate inside menu directories. Select the required one then press ↵.

6.2.1 Working modality:

• STANDARD + FRESH AIR: This modality enables the refrigerant system and the fresh air; this mode is used in the periods of medium or high crowding and when it's necessary the integration of fresh air.

• STANDARD: This modality enables the refrigerant system for dehumidification without fresh air. This mode is used when the fresh air is not required.

• VENTILATION + FRESH AIR: This mode allows the unit to operates in ventilation (compressor does not work) with the use of fresh air; in this case the dehumidification is given by fresh air only; This modality is used when the value of humidity to be removed is not very high.

• VENTILATION : This modality allows the unit to work in ventilation (compressor will never start), without fresh air; in this modality dehu-modification will not be possible. This modality is used when the unit works on heating only.

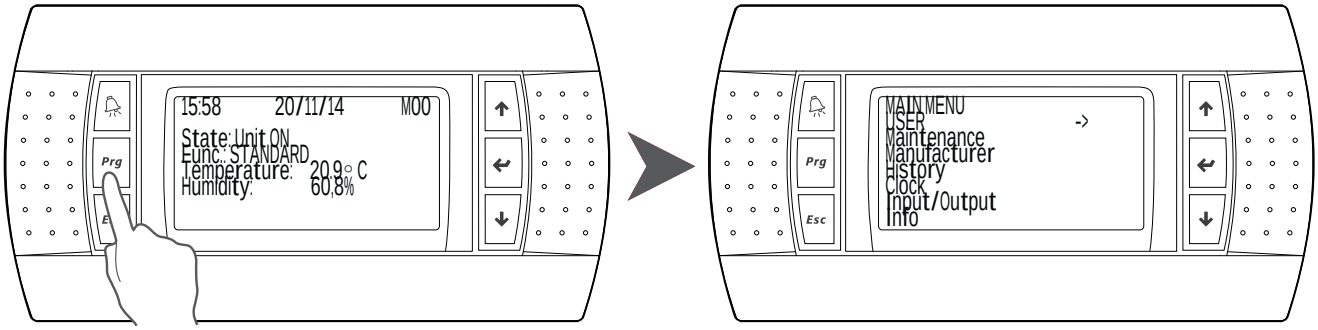
• OFF: In this modality the unit is in stand-by.

MAIN MENU
User
Maintenance
Manufacturer
History
Clock
Input/Output
Info

The combination of the modalities reported above with the choice of the desired set point (MAIN , SECONDARY), determines the various configurations of the unit;

6.3 User menu

From the main screen by pressing ***Prg*** it is possible to show the available menu:



With ↓ and ↑ keys it is possible to navigate inside menu directories. Select the required one then press ↵.

The UTA units can operate with different SET POINT levels (Temperature and humidity):

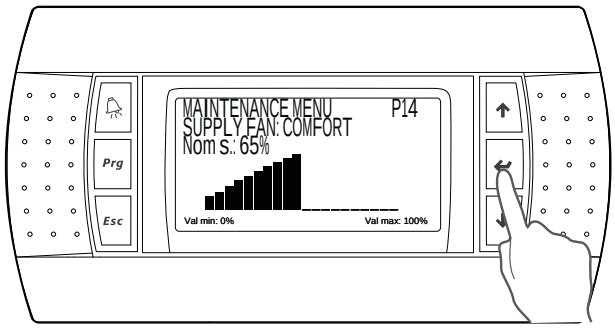
- MAIN Set point: it's used when the swimming pool is normally or over crowded.
- SECONDARY Set point: it's used when the swimming pool is closed or not crowded.

USER MENU P01 MAIN REGULATION Main set-point air temp. : 26.0° C Secondary set-point air temp. : 23.0° C	Set the temperature required. Press ENTER to activate the field. select with ↑ and ↓ and press ENTER to confirm.
USER MENU P02 SECONDARY REGULATION Main set-point water temp. : 26.0° C Secondary set-point water temp. : 23.0° C	Set the temperature required. Press ENTER to activate the field. select with ↑ and ↓ and press ENTER to confirm.
USER MENU P03 HUMIDITY REGULATION Humidity main set-point : 30.2% Humidity secondary set-point : 70.0%	Set the humidity required. Press ENTER to activate the field. select with ↑ and ↓ and press ENTER to confirm.
USER MENU P04 MAIN REGULATION Regulation control priority: Air / Water	Set the priority required (Air or water). Press ENTER to activate the field. select with ↑ and ↓ and press ENTER to confirm.
USER MENU P04 TIME ZONES Enable unit operation with time zones? YES/NO	Enables the operation of the unit by time settings (slots). In this way, the operating mode will be enabled at certain times and set in the subsequent screens. In this case would not be enabled the operation time slot, the unit will be forced to operate "OUT OF RANGE" and only in those one set in the mask A15.
USER MENU P06 .....P12 TIME ZONES OPERATION MONDAY - SUNDAY 09:00 - 12:00 COMFORT 14:00 - 22:00 HEATING 00:00 - 00:00 OFF	Enable the daily and weekly times zones to enable the unit to work. Select ↑ and ↓ and press ENTER to confirm.
USER MENU P18 LANGUAGE SELECTION LANGUAGE: English	Enable language selection; Select ↑ and ↓ and press ENTER to confirm.

6.3.1 Settings the fan speed

If the adaptive primary fan is present, the following screens can be displayed in which the operating speed of the fan can be set in the various operating modes.

To set the speed of the fans , proceed as follows:



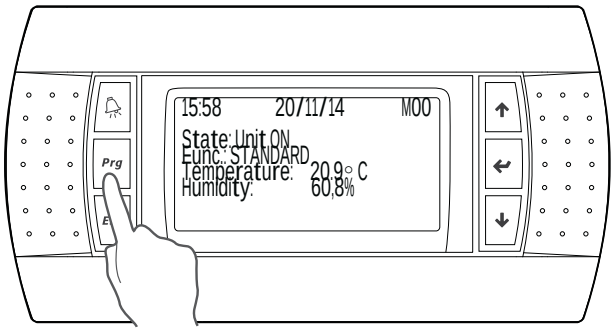
With ↵ key it is possible to select the parameter to edit then press ↓ and ↑ to set the required value.
Press ↵ again to confirm.

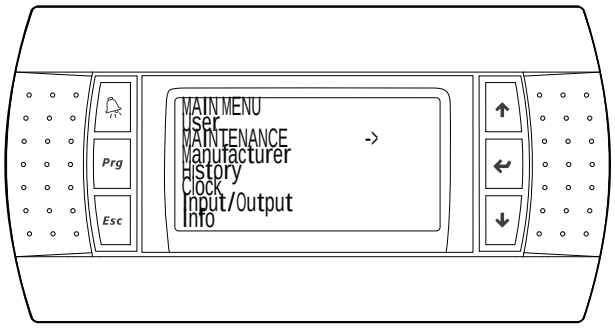
USER MENU PRIMARY FAN: COMFORT Nom s.:065% min:030% max:100%	P13	Enable to set the supply fan speed in the different working modes.
USER MENU PRIMARY FAN: NRG SAVING Nom s.:065% min:030% max:100%	P14	Enable to set the supply fan speed in the different working modes.
USER MENU PRIMARY FAN: HEATING Nom s.:065% min:030% max:100%	P15	Enable to set the supply fan speed in the different working modes.
USER MENU PRIMARY FAN: TEMPERED Nom s.:065% min:030% max:100%	P16	Enable to set the supply fan speed in the different working modes.
USER MENU PRIMARY FAN: N.ZONES Nom s.:065% min:030% max:100%	P17	Enable to set the supply fan speed in the different working modes.

Press ***Esc*** key to back to the main menu.

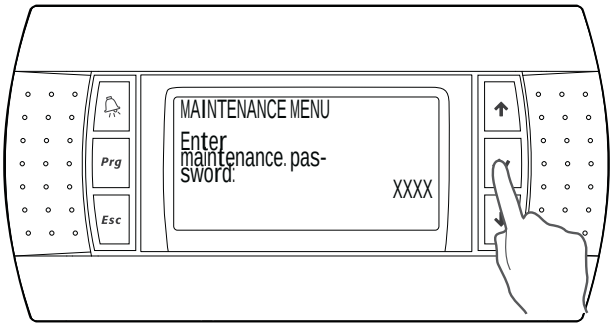
6.4 Maintenance menu

From the main screen press ***Prg*** to display the available menu:





With ↓ and ↑ keys it is possible to navigate inside menu directories. Once chosen the desired one press ↵.



With ↓ and ↑ keys it is possible to select the password. Press ↵ to confirm.

MAINTENANCE MENU A01 SET-POINT LIMITS TEMPERATURE Minimum: 10.0° C Maximum: 35.0° C	Enables the limit values for the temperature set point. The temperature required by the end user can not exceed the values set by the manufacturer.
MAINTENANCE MENU A02 SET-POINT LIMITS HUMIDITY Maximum: 30.0 % Maximum: 90.0 %	Enables the limit values for the humidity set point. The humidity required by the end user can not exceed the values set by the manufacturer.
MAINTENANCE MENU A03 AIR TEMP. REGULATION Main differential: 02.0° C Secondary differential: 03.0° C	Enables the temperature differential values for the main and the secondary operation mode.
MAINTENANCE MENU A04 WATER TEMP. REGUL. Main differential: 02.0° C Secondary differential: 03.0° C	Enables the temperature differential values for the main and the secondary operation mode.
MAINTENANCE MENU A05 HUMIDITY REGULATION Main differential: 05.0% Secondary differential: 08.0%	Enables the relative humidity differential values for the main and the secondary operation mode.

MAINTENANCE MENU A06 TEMPERATURE REGULATION OTHER PARAMETERS Dead zone: 01.0° C	Enables an additional temperature differential value.
MAINTENANCE MENU A07 WATER PROBE Water temperature probe management : Present / Not present	It sets the presence of the water probe enabling so the visualtisation of the water temperature on the display. Select ↑ and ↓ and press ENTER to confirm.
MAINTENANCE MENU A07a WATER PROBE External temperature probe management: Present / Not present	It sets the presence of the external temperature probe enabling so the visualtisation of the water temperature on the display. Select ↑ and ↓ and press ENTER to confirm.
MAINTENANCE MENU A08 DRAIN PUMP Drain pump management: Present / Not present	It sets the presence of the condensate discharge pump. Select ↑ and ↓ and press ENTER to confirm.
MAINTENANCE MENU A09 OUTPUT DELAYS Digital outputs enable delay: 002 s.	It sets the delays of the digital outputs (in seconds).
MAINTENANCE MENU A10 ALARM MANAGEMENT High pressure alarm manual reset after N. cutout/hour: 3	It allows to set the automatic reset number of the high pressure switch before activating the manual reset. Select ↑ and ↓ and press ENTER to confirm.
MAINTENANCE MENU A11 ALARM MANAGEMENT Low pressure alarm delay times STARTUP delay: Default: 060 s FULL LOAD delay: Default:060 s	It allows the setting of the delay of low pressure switch both during the start up and during the normal operation. Select ↑ and ↓ and press ENTER to confirm
MAINTENANCE MENU A12 ALARM MANAGEMENT Low pressure alarm manual reset after N. cutout/hour: 3	It allows to set the automatic reset number of the high pressure switch before activating the manual reset. Select ↑ and ↓ and press ENTER to confirm.
MAINTENANCE MENU A12a ALARM MANAGEMENT Comp. therm.overl. alarm manual reset after N. cutout/hour: 3	It allows to set the automatic reset number of the high pressure switch before activating the manual reset. Select ↑ and ↓ and press ENTER to confirm.
MAINTENANCE MENU A13 ALARM MANAGEMENT Condensate discharge pump delay: :000 s	It allows the setting of the delay of condensate discharge pump alarm (when present) during the normal functioning. Select ↑ and ↓ and press ENTER to confirm
MAINTENANCE MENU A14 ALARM MANAGEMENT Fan thermal protection delay : 000 s.	It allows the setting of the delay of the fan thermal protector during the normal functioning. Select ↑ and ↓ and press ENTER to confirm
MAINTENANCE MENU A15 DEFROST MANAGEMENT Two defrost delay time: 030 min.	It allows to set the period of time between two consecutive defrost cycles. Select ↑ and ↓ and press ENTER to confirm.

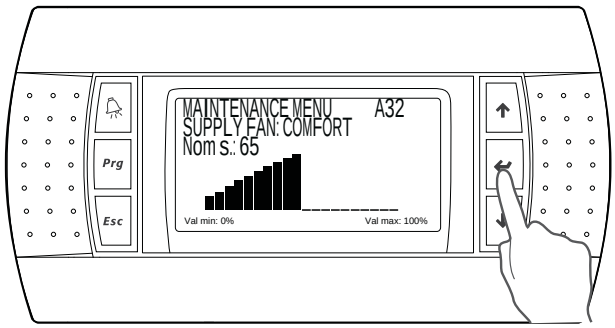
MAINTENANCE MENU A16 DEFROST MANAGEMENT Minimum defrost time: 060 sec. Maximum defrost time: 012 min	It allows to set the minimum and maximum time of defrost. Select ↑ and ↓ and press ENTER to confirm.
MAINTENANCE MENU A17 COMPRESSOR ENABLE Compressor 1 operation enable? YES NO Compressor 2 operation enable? YES NO	It enables the compressors. Select ↑ and ↓ and press ENTER to confirm.
MAINTENANCE MENU A19 PARAMET. OUT OF TIME ZONES Set T: MAIN Set W: MAIN Diff. T: MAIN Diff. W: MAIN	This configuration allows to personalize the working modes out of the time zones already set. set (T:Air temperature; W: water temperature).
MAINTENANCE MENU A20 PARAMET. OUT OF TIME ZONES Set H: MAIN Diff H: MAIN Oper : STANDARD	This configuration allows to personalize the working modes out of the time zones already set. set (H: air humidity).
MAINTENANCE MENU A21 CONFIG.: COMFORT Set T: MAIN Set W: MAIN Diff. T: MAIN Diff. W: MAIN	This operation mode allows the unit to operate at full power with all the enabled resources . This mode of operation is used in periods of average or high occupancy. (T:Air temperature; W: water temperature).
MAINTENANCE MENU A22 CONFIG.: COMFORT Set H: MAIN Diff H: MAIN Oper : STANDARD	This operation mode allows the unit to operate at full power with all the enabled resources . This mode of operation is used in periods of average or high occupancy. (H: air humidity).
MAINTENANCE MENU A23 CONFIG.: ENERGY SAVING Set T: MAIN Set W: MAIN Diff. T: MAIN Diff. W: MAIN	This operation mode allows the unit to operates with the minimum resources, enabled by operating in ventilation only without integration of compressor nor of external air. This operation mode is used in the stand by periods in which the facility is not active. (T:Air temperature; W: water temperature).
MAINTENANCE MENU A24 CONFIG.: ENERGY SAVING Set H: MAIN Diff H: MAIN Oper : STANDARD	This operation mode allows the unit to operates with the minimum resources, enabled by operating in ventilation only without integration of compressor nor of external air. This operation mode is used in the stand by periods in which the facility is not active. (H: air humidity).
MAINTENANCE MENU A25 CONFIG.: HEATING Set T: MAIN Set W: MAIN Diff. T: MAIN Diff. W: MAIN	HEATING: It can be used when there is no need of dehumidification; the unit is set on heating only; compressors will never start. (T:Air temperature; W: water temperature).
MAINTENANCE MENU A26 CONFIG.: HEATING Set H: MAIN Diff H: MAIN Oper : VENTILATION	HEATING: It can be used when there is no need of dehumidification; the unit is set on heating only; compressors will never start. (H: air humidity).

MAINTENANCE MENU CONFIG.: TEMPERATE Set T: MAIN Set W: MAIN Diff. T: MAIN Diff. W: MAIN	A27	Pre-heating: It can be used when there is no need of dehumidification; the unit is set on heating only; compressors will never start. Differently fromthe HEATING mode the unit use the secondary set points and not the main ones. (T:Air temperature; W: water temperature).
MAINTENANCE MENU CONFIG.: TEMPERATE Set H: MAIN Diff H: MAIN Oper : VENTILATION	A28	Pre-heating: It can be used when there is no need of dehumidification; the unit is set on heating only; compressors will never start. Differently fromthe HEATING mode the unit use the secondary set points and not the main ones. (H: air humidity).
MAINTENANCE MENU CONFIG.: OFF Set T: MAIN Set W: MAIN Diff. T: MAIN Diff. W: MAIN	A29	OFF: Unit in stand-by. (T:Air temperature; W: water temperature).
MAINTENANCE MENU CONFIG.: OFF Set H: MAIN Diff H: MAIN Oper : OFF	A30	OFF: Unit in stand-by. (H: air humidity).
MAINTENANCE MENU ALARM LOG MANAG. Alarm log delete? NO	A34	Enables the alarms history deletion.
MAINTENANCE MENU Insert new maintenance password: xxxx	A35	Enables to change the password level “ Maintenance “.

6.4.1 Settings the fan speed

If the variable primary fan is present, the following screens can be displayed in which the user can set the parameters within which the fan speed can be changed in the various modes.

To set the speed of the fans , proceed as follows:



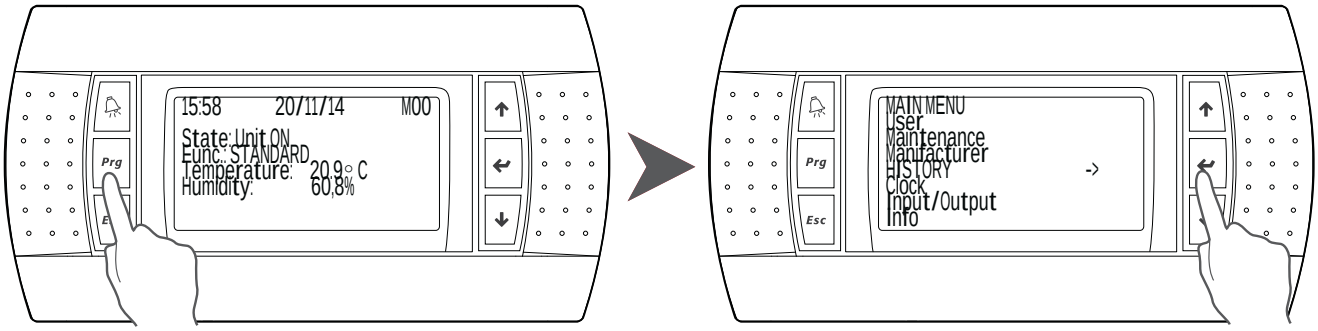
With ↵ key it is possible to select the parameter to edit then press ↓ and ↑ to set the required value.
Press ↵ again to confirm.

MAINTENANCE MENU A31 PRIMARY FAN: COMFORT min:000% max:100% PRIMARY FAN: ENRG SAVING min:000% max:100%	Enables the supply fan speed in the different operation modes. Enables the supply fan speed in the different operation modes.
MAINTENANCE MENU A32 PRIMARY FAN: HEATING min:000% max:100% PRIMARY FAN: TEMPERED min:000% max:100%	Enables the supply fan speed in the different operation modes. Enables the supply fan speed in the different operation modes.
MAINTENANCE MENU A33 PRIMARY FAN: N.ZONES min:000% max:100%	Enables the supply fan speed in the different operation modes.

Press ***Esc*** key to back to the main menu.

6.5 Alarm history menu

From the main screen press ***Prg*** to display the available menu:



With ↓ and ↑ keys it is possible to navigate inside menu directories. Once chosen the desired one press ↵.

ALARM LOG H01 Alarm N°00 Hr. 00:00 of 00/00/00 Th.overl.alarm compressor	It allows the visualisation of all the alarms.

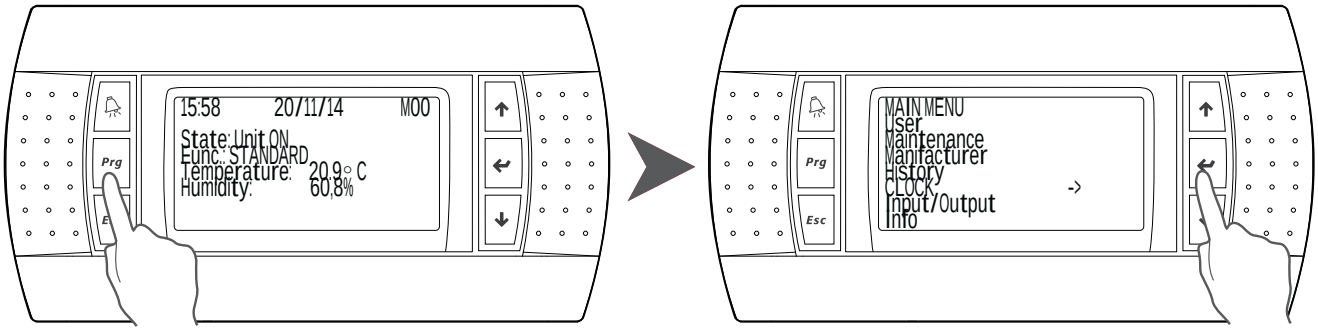
6.5.1 Alarm menu

AL01 Alarm air humidity probe failure	Visualisation air humidity probe failure.
AL02 Alarm air temperature probe failure	Visualisation air temperature probe failure.
AL03 Alarm water temperature probe failure	Visualisation water temperature probe failure.
AL04 Alarm high pressure from presssure switch circuit 1	Visualisation high pressure from presssure switch.
AL05 Alarm low pressure from pressure switch circuit 1	Visualisation low pressure from pressure switch.
AL06 Alarm high pressure from presssure switch circuit 2	Visualisation high pressure from presssure switch.
AL07 Alarm low pressure from pressure switch circuit 2	Visualisation low pressure from pressure switch.
AL08 Alarm condensate discharge pump	Visualisation condensate discharge pump alarm (if present).
AL09 Fan overload alarm	Visualisation fan overload alarm.
AL10 Alarm max. Defrost time	Visualisation maximum defrost time alarm.

Press ***Esc*** key to back to the main menu.

6.6 Clock Menu

From the main screen press ***Prg*** to display the available menu:

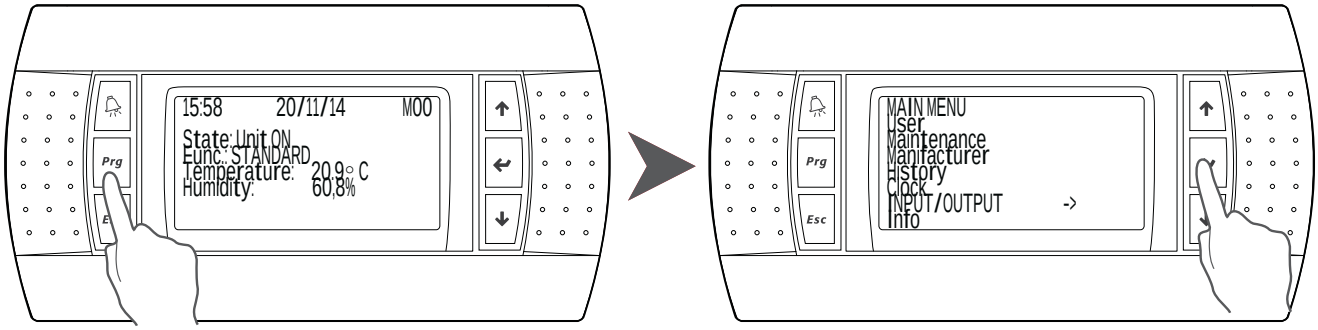


With ↓ and ↑ keys it is possible to navigate inside menu directories. Once chosen the desired one press ↵.

CLOCK & DATE K01 SETTINGS Hour : 16:34 Date : 18/06/21 Day : Friday	Set date and time; Press ENTER to modify, press ENTER to confirm.

Press ***Esc*** key to back to the main menu.

6.7 Info Menu



Application N01 DEHUMIDIFIER Company name Tel. : Fax. : Mail: Web:	It shows the information concerning the Company.
N02 Cod.: SZHIDDE04 Rev.: 00 Date: 17/09/19 BIOS: 06.44 08/25/07 BOOT: 04.10 03/31/00	It shows the information concerning the software .

Press ***Esc*** key to back to the main menu.

7. MAINTENANCE OF THE UNIT

7.1 General warnings

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 owners, operators and technical staff:
(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 can:

- Keep the equipment operating efficiently
- Prevent failures
- Increase the equipment life

It is advisable to maintain a record book for the unit which details all operations performed on the unit as this will facilitate troubleshooting.

Maintenance must be performed in compliance with all requirements of the previous paragraphs.

Use personal protective equipment required by regulations as compressor casings and discharge pipes are at high temperatures. Coil fins are sharp and present a cutting hazard.

7.2 Drive access

Access to the unit once installed, should only be possible to authorized operators and technicians. The owner of the equipment is the company legal representative, entity or person owns the property where the machine is installed.
They are fully responsible for all safety rules given in this manual and regulations.

7.3 Scheduled maintenance

The owner must make sure that the unit is periodically inspected, also on-site, adequately maintained, according to the type, size, age and use of the system, and to the indications contained in the Manual.
Servicing during the unit's operating lifetime and, in particular, scheduled leak detection, on-site inspections and check-ups of safety equipment, must be carried out as provided by local laws and regulations in force.

If leak detection instruments are installed on the system, they must be inspected at least once a year, to make sure that they work properly.

During its operating life, the unit shall be inspected and verified in accordance with applicable local laws and regulations. In particular, when there are no stricter specifications, the indications given in the following table (see EN 378-4, Annex D) must be followed, with reference 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 defect is detected that compromises the reliable operation of the unit, the unit cannot be re-started until it has been repaired.

7.4 Periodical checks and start up

The start-up operations should be performed in compliance with all requirements of the previous paragraphs.

All of the operations described in this chapter MUST BE PERFORMED BY TRAINED PERSONNEL ONLY. Before commencing service work on the unit ensure that the electric supply is disconnected. The top case and discharge line of compressor are usually at high temperature. Care must be taken when working in their surroundings. Aluminium coil fins are very sharp and can cause serious wounds. Care must be taken when working in their surroundings. After servicing, replace the cover panels, fixing them with locking screws.

7.4.1 Electrical system and adjustment

Action to be performed	Frequency					
	Monthly	Every 2 months	Every 6 months	Every year	Every 5 years	As necessary
Check that the unit works properly and that there are no active warnings	X					
Visually inspect the unit	X					
Check noise and vibration level of the unit				X		
Check operation of safety features and of interblocks				X		
Check the unit's performance				X		
Check the current draws of the different parts (compressors, fans, pumps, etc.)				X		
Check the supply voltage of the unit			X			
Check tightness of cables in their clamps			X			
Check the integrity of the insulating coating of power cables				X		
Check the conditions and functioning of the counters				X		
Check functioning of the microprocessor and of the display			X			
Clean the electrical and electronic components of any dust				X		
Check functioning and calibration of probes and transducers				X		

7.4.2 Condensing coils and fans

Action to be performed	Frequency					
	Monthly	Every 2 months	Every 6 months	Every year	Every 5 years	As necessary
Visually inspect the coil	X					
Clean finned coils			X			
Check the water flow and/or any leaks (if HOWA is present)	X					
Clean the metal filter on the external water line [2] (if present)			X			
Check noise and vibration level of the fans				X		
Check the supply voltage of the fans			X			
Check the fans' electrical connections				X		
Check functioning and calibration of the fans' speed adjustment system (if present)				X		
Check air presence in the hydraulic circuit	X					
Check color of moisture indicator on liquid line				X		
Check for freon leaks [1]						X

[1] In order to carry out operations on the refrigerant, it is necessary to observe the European Regulation 517_2014, "Obligations regarding the containment, use, recovery and destruction of fluorinated greenhouse gases used in stationary refrigeration, air conditioning and heat pump equipment".

[2] It can be carried out with a higher frequency (also weekly) depending on the Δt.

7.4.3 Compressors

Action to be performed	Frequency					
	Monthly	Every 2 months	Every 6 months	Every year	Every 5 years	As necessary
Visually inspect compressors				X		
Check noise and vibration level of the compressors				X		
Check the supply voltage of the compressors			X			
Check the compressors' electrical connections				X		
Check oil level in the compressors using the oil fill level indicator (if present)			X			
Check that the crankcase heaters are powered and working properly (if present)				X		
Check the conditions of the compressors' power cables and their tightness in the clamps			X			

Daily and monthly works may be carried out directly by the Owner of the system. All other works must be performed by authorised and trained personnel.

Any kind of cleaning whatsoever is forbidden before disconnecting the device from power supply by turning the master switch to the OFF position. It is forbidden to touch the device while barefooted or with wet or damp body parts.

Works on the cooling line must be carried out by qualified and trained technicians, as provided by local laws and regulations in force.

Before the start-up it is necessary to carry out all the operations described in the previous tables and make the necessary checks provided by the pre-start control module (valid for the italian market) to be requested to the service.

7.5 Refrigerant circuit repair

If the refrigerant circuit is to be emptied, all the refrigerant must be recovered using the correct equipment.

For leak detection, the system should be charged with nitrogen using a gas bottle with a pressure reducing valve, until 15 bar pressure is reached. Any leakage is detected using a bubble leak finder. If bubbles appear discharge the nitrogen from the circuit before brazing using the proper alloys.

Never use oxygen instead of nitrogen: explosions may occur.

Site assembled refrigerant circuits must be assembled and maintained carefully, in order to prevent malfunctions.

Therefore:
- Avoid oil replenishment with products that are different from that specified and that are pre-loaded into the compressor.
- In the event of a gas leakage on machines using refrigerant R134A, R410A even if it is only a partial leak, do not top up. The entire charge must be recovered, the leak repaired and a new refigerant charge weighed in to the circuit.
- When replacing any part of the refrigerant circuit, do not leave it exposed for more than 15 minutes.
- It is important when replacing a compressor that the task be completed within the time specified above after removing the rubber sealing caps.
- When replacing the compressor following a burn out, it is advisable to wash the cooling system with appropriate products including a filter for acid.
- When under vacuum do not switch on the compressor.

8. DECOMMISSIONING

8.1 Disconnect the unit

All decommissioning operations must be performed by authorized personnel in accordance with the national legislation in force in the country where the unit is located.

- Avoid spills or leaks into the environment.
- Before disconnecting the machine please recover:
  - the refrigerant gas;
  - Glycol mixture in the hydraulic circuit;
  - the compressor lubricating oil.

Before decommissioning the machine can be stored outdoors, providing that it has the electrical box, refrigerant circuit and hydraulic circuit intact and closed.

8.2 Disposal, recovery and recycling

The frame and components, if unusable, should be taken apart and sorted by type, especially copper and aluminum that are present in large quantities in the machine.
All materials must be recovered or disposed in accordance with national regulations.

8.3 RAEE Directive (only UE)

The crossed-out bin symbol on the label indicates that the product complies with regulations on waste electrical and electronic equipment.
The abandonment of the equipment in the environment or its illegal disposal is punishable by law.

This product is included in the application of Directive 2012/19/EU on the management of waste electrical and electronic equipment (WEEE).
The unit should not be treated with household waste as it is made of different materials that can be recycled at the appropriate facilities. Inform through the municipal authority about the location of the ecological platforms that can receive the product for disposal and its subsequent proper recycling.
The product is not potentially dangerous for human health and the environment, as it does not contain dangerous substances as per Directive 2011/65/EU (RoHS), but if abandoned in the environment it has a negative impact on the ecosystem.
Read the instructions carefully before using the unit for the first time. It is recommended not to use the product for any purpose other than that for which it was designed, as there is a risk of electric shock if used improperly.

9. DIAGNOSIS AND TROUBLESHOOTING

9.1 Fault finding

All units are checked and tested at the factory before shipment, however, during operation an anomaly or failure can occur.

BE SURE TO RESET AN ALARM ONLY AFTER YOU HAVE REMOVED THE CAUSE OF THE FAULT; REPEATED RESET MAY RESULT IN IRREVOCABLE DAMAGE TO THE UNIT.

Code	Alarm description	Electronic sensor	mechanical thermostat/ hygrostat	Cause	Solution
AhiP	High pressure	Yes	Yes	Too low airfolw or high room temperature.	Check the filters, if necessary replace them. In P versions, check the pressure drop of the ducts.
AloP	Low pressure	Yes	Yes	Refrigerant charge leakage.	Contact the Company
APBa/ APBi	Room temperature probe sensor alarm PBa	Yes	No	Replace faulty sensor	Contact the Company
APBu	Room humidity probe sensor alarmPBu	Yes	No		
Atdf	Defrost time too long.	Yes	Yes	Warning	(Reporting only)
Atlo	Low room temperature.	Yes	No	Replace faulty sensor	Contact the Company
Athi	Hight room temperature.	Yes	No	Replace faulty sensor	Contact the Company

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