Chiller & Heat Pumps

RDZ
invisible heating and cooling

UMHPI

High-efficiency air-to-water reversible heat pumps

TECHNICAL / INSTALLATION MANUAL

INDUSTRIAL INVERTER AIR/WATER HEAT PUMPS WITH AXIAL FANS

USER'S AND INSTALLER'S MANUAL

Models

UMHPI 25 / UMHPI V 25
UMHPI 35 / UMHPI V 35
UMHPI 50 / UMHPI V 50
UMHPI 60

10-2017	- Aggiornamento schemi UMHPI 35-50kW InverterFanf.REV03 E6801-09 - E6800-06
Date	**Notes**

Serie / Series / Serie / Serie / Série
UMHPI INDUSTRIAL INVERTER AIR/WATER HEAT PUMPS WITH AXIAL FANS

Possible wasted electrical or electronic devices/products should not be located together with normal domestic waste, but disposed according to the current WEEE law in compliance with the European Directive 2002/96/EC and following modifications 2003/108/EC. Please inform yourself at your local Administration or at your reseller in case the product will be replaced with a similar one.

INDEX

The UMHPI manual contains all the necessary information for the better use of the appliance under safety conditions for the operator thus meeting the requirements listed in the 2006/42/CE Equipment Directive and following amendments.

1 AIM AND CONTENTS OF THIS MANUAL

This manual provides the basic information as for the selection, installation, operation and maintenance of the UMHPI units. It is addressed to the installer and the user of the appliance and it includes the necessary indications allowing the user to operate the unit efficiently, even without any previous specific knowledge of it.
The manual describes the characteristics of the appliance at the time of its marketing; therefore, it must be considered adequate respecting the state of the art in terms of potentiality, ergonomics, safety and functionality.
RDZ S.p.A. introduces also technological improvements and is not constrained to update the manuals for previous versions of appliances that could not be compatible. So make sure to use, for the installed unit, the supplied manual.
It's recommended that, the user must follow the instructions contained in this booklet, especially those concerning the safety and routine maintenance.

1.1 HOW TO KEEP THIS MANUAL

The manual has to be always kept with the unit it refers to. It has to be stored in a safe place, away from the dust and moisture. It has to be accessible to all users who shall consult it any time they are in doubt on how to operate the equipment.
RDZ S.p.A. reserves the right to modify its products and related manuals without necessarily updating previous versions of the reference material. It declines also any responsibility for possible inaccuracies in the manual if due to printing or transcription errors.
The customer shall store any updated copy of the manual or parts of it delivered by the manufacturer as an attachment to this manual.
RDZ S.p.A. is available to give any detailed information about this manual and to give information regarding the use and the maintenance of its own units.

1.2 GRAPHIC SYMBOLS

	***Indicates operations that can be dangerous for people and/or disrupts the correct operation of the equipment.***
	***Indicates prohibited operations.***
	***Indicates important information that the operator has to follow in order to guarantee the correct operation of the equipment in complete safety.***

2 SAFETY LAWS

Every unit have been designed in accordance with the following directives and harmonised standards:

- EU Directives 97/23/EC, 2006/42/EC, 2014/35/UE, 2014/30/EU, 2011/65/EU, 2012/19/EU
- UNI EN 378-1, 378-2, EN 12735-1
- UNI EN ISO 12100, EN 60204-1, UNI EN ISO 13857
- CEI EN 61000-6-3, IEC 61000-6-2.

3 PERMITTED USES

- RDZ S.p.A. excludes any contractual and extracontractual liabilities for damages caused to persons, animals or objects, by incorrect installation, setting and maintenance, improper use of the equipment, and the partial or superficial reading of the information contained in this manual.
- These units have been designed only for heating and/or cooling of water. Any other use not expressly authorized by the manufacturer is considered improper and therefore not allowed.
- The location of the plant, the hydraulic and electrical circuits must be established by the planting designer and must take into account both technical requirements as well as any applicable local laws and authorized specifications.
- The execution of all works must be performed by skilled and qualified personnel, competent in the existing rules in different countries.
  The execution of all works must be performed by skilled and qualified personnel and competent in the existing rules in the contry in which the appliance will be installed.

4 GENERAL SAFETY GUIDELINES

Before beginning to operate on UMHPI units every user has to be perfectly knowledgeable about the functions of the equipment and its controls and has to have read and understood the information listed in this manual.

	***It's strictly forbidden to remove and/or tamper with any safety device.***
	Children or unassisted disabled persons are not allowed to use the appliance.
	Do not touch the appliance when barefoot or parts of the body are wet or damp.
	Do not clean the unit when the power supply is 'ON'.
	Do not pull, remove or twist the electrical cables coming out from the unit, even if it is disconnected from the main power supply.
	Do not step with your feet on the appliance, sit down and/or place any type of object.
	Do not spray or pour water directly on the unit.
	Do not dispose of, abandon or leave within reach of children packaging materials (cardboard, staples, plastic bags, etc) as they may represent an environmental and life hazard.
	***Any routine and/or not-routine maintenance operation shall be carried out when the equipment has been shut down, disconnected from electric and pneumatic power sources and after its pneumatic system has been discharged.***
	***Do not put neither your hands nor insert screwdrivers, spanners or other tools into moving parts of the equipment.***
	***The equipment supervisor and the maintenance man has to receive suitable training for the performance of their tasks in safety.***
	***Operators have to know how to use personal protective devices and have to know the accident-prevention guidelines contained in national and international laws and norms.***

4.1 WORKERS' HEALTH AND SAFETY

The European Community has adopted a number of directives on workplace's health and safety, including **89/391/CEE**, **89/686/CEE, 89/655/CEE, 2009/104/CE, 86/188/CEE** and **77/576/CEE** directives. Every employer shall implement such norms and ensure that workers to respect them. It points out that:

	***Do not tamper with or replace parts of the equipment without the specific consent of the manufacturer. The manufacturer shall have no responsibility whatsoever in case of unauthorised operations.***
	***Using components, expendable materials or spare parts that do not correspond to those recommended by the manufacturer and/or listed in this manual may be dangerous for the operators and/or damage the equipment***
	***The operator's workplace has to be kept clean, tidy and free from objects that may prevent free movements. Appropriate lighting of the work place shall be provided so as to allow the operator to carry out the required operations safely. Poor or too strong lighting can cause risks.***
	***Ensure that work places are always adequately ventilated and that aspirators are working, in good condition and in compliance with the requirements of the laws in force.***

4.2 PERSONAL SAFETY EQUIPMENTS

When operating and maintaining the UMHPI units, use the following personal protective equipments.

		***Protective clothing: Maintenance men and operators has to wear protective clothing that complies with the basic safety requirements currently in force. In case of slippery floors, users have to wear safety shoes with non-slip soles.***
		***Gloves: During maintenance or cleaning operation protection gloves have to be used***
		***Mask and goggles: Respiratory protection (mask) and eye protection (goggles) should be used during cleaning and maintenance operations.***

4.3 SAFETY SYMBOLS

The unit features the following safety signs, which has to be complied with:

	***General hazards***
	**Electric *shock* hazard**
	***Presence of moving organs***
	***Presence of surfaces that may cause injures***
	***Presence of hot surfaces that can cause burns***

4.4 REFRIGERANT SAFETY DATA SHEET

Name:	R410A (50% Difluoromethane (R32); 50% Pentafluoroethane (R125).
	RISKS INDICATIONS
Major risks:	Asphyxia
Specific risks:	The rapid evaporation may cause freezing.
	FIRST AID
General informations:	Never give anything by mouth to an unconscious person.
Inhalation:	Move to fresh air. Oxygen or artificial respiration if necessary. Do not administer adrenaline or similar drugs.
Eyes contact:	Rinse carefully with water for at least 15 minutes and consult a doctor.
Contact with skin:	Wash immediately with plenty of water. Take off immediately the contaminated clothing.
	FIRE PREVENTION
Extinguishing Media:	Whatever.
Specific risks:	Increase in pressure.
Specific methods:	Use water spray to cool containers
	ACCIDENTAL RELEASE ACTIONS
Personal precautions:	Evacuate personnel to safe areas. Provide adequate ventilation. Use personal protective equipment.
Environmental	Evaporate.
Cleaning method:	Evaporate.
	HANDLING AND STORAGE
Manipulation Action/technical	Provide sufficient air exchange and/or suction in work places.
Recommendations for safe	Do not breathe vapors or aerosol.
Storage:	Close tightly and store in a cool, dry and well ventilated place. Store in original container. Incompatible products: explosive, flammable materials, Organic
	EXPOSURE CONTROL / PERSONAL PROTECTION
Control parameters:	AEL (8-h e 12-h TWA) = 1000 ml/m³ for each of the two components.
Respiratory protection:	For rescue and maintenance operation in storage tanks use self-contained respirator The vapors are heavier than air and can cause suffocation by reducing oxygen available for
Eyes protection:	Safety glasses.
Protection of hands:	Rubber gloves.
Hygiene measures:	Do not smoke.
	PHYSICAL AND CHEMICAL PROPERTIES
Colour:	Colourless.
Odor:	Light.
Boiling point:	-52.8°C at atmospheric pressure.
Lighting point:	It does not ignite.
Density:	1.08 kg/l at 25°C.
Solubility in water:	Negligible.
	STABILITY AND REACTIVITY
Stability:	No reactivity when used with the appropriate instructions.
Materials to avoid:	Highly oxidizing materials. Incompatible with magnesium, zinc, sodium, potassium and The incompatibility is more serious if the metal is present in powdered form or if the surfaces were, recently, unprotected.
Decomposition products Risks:	These products are halogenated compounds, hydrogen fluoride, carbon oxides (CO, CO2),
	TOXICOLOGICAL INFORMATION
Acute toxicity:	(R32) LC50/ inhalation /4 hours/on rat >760 ml/l (R125) LC50/ inhalation /4 hours/on rat >3480 mg/l
Local effects:	Concentrations substantially above the TLV may cause narcotic effects. Inhalation of decomposed products of high concentrations may cause respiratory failure
Long term toxicity:	Did not show carcinogenic, teratogenic or mutagenic effects in animal experiments.
	ECOLOGICAL INFORMATION
Global warming potential GWP (R11=1):	1730
Potential depletion Ozone ODP (R11=1):	0
Disposal considerations:	usable with reconditioning.

5 TECHNICAL CHARACTERISTICS

The UMHPI water chillers and heat pumps series are designed for applications in residential and industrial areas, these units are extremely versatile and can operate in heat pump mode with the ability of hot water production at a temperature up to 65°C for environmental heating and sanitary applications with the utilization of electric heaters.
The use of brushless inverter compressor technology, matched with the electronic expansion valve and to the pump and the variable speed blower are generally used for optimizing the power consumption and the operative efficiency of the refrigerating components of the whole system.

5.1 FRAME

All UMHPI units are made up of hot-galvanised thick sheet metal, painted with polyurethane powder enamels at 180°C to ensure the best resistance against atmospheric agents. The front panel is hinged to the lift side to allow access to the internal components for inspection and maintenance. The screws and the inserts are made up of galvanized steel.

5.2 REFRIGERANT CIRCUIT

The refrigerant circuit has been manufactured according to the UNI EN 13134 directive concerning welding procedures. The refrigerant gas employed in these units is R410A type. The refrigerant circuit includes in its basic version: 4-way reversing cycle valve, electronic expansion valve, liquid separator, liquid receiver, check and maintenance valves, pressure safety device according to PED regulation (high pressure switch), pressure transducers to accurately adjust the evaporating and condensing pressures, filters for expansion valve to prevent its clogging. The versions with vapour injection also include heat exchanger to produce vapour, electronic injector valve, the ON-OFF valves of injection in case of two compressors.

5.3 COMPRESSORS

The compressors are scroll type DC inverter designed for use with R410A refrigerant, and are mounted on a rubber material acting as a shock absorber. The compressors of the injection versions are designed to optimize the efficiency of the refrigerant cycle under low ambient temperatures conditions and are supplied with connection for vapour injection.
The crankcase heater operates when the compressor remains off for at least 30 minutes and if the discharge temperature is below 20°C (with hysteresis of 2.0°C). When the compressor restarts, the crankcase heater will stop operation. We recommend to turn on the unit and to put it in standby mode at least 6 hours before the first startup.
The checking of the compressors is possible through the front panel of the unit that allows the maintenance of the compressors even if the unit is in operation.

5.4 AIR-SIDE EXCHANGER

The air-side heat exchanger is made up of copper pipes and aluminium fins. The copper pipes diameter is 7,94 mm, the thickness of the aluminium fins is 0,12 mm. The pipes are mechanically expanded into the aluminium fins in order to improve the heat transfer coefficient. The geometry of this heat exchanger ensures a low value air-side pressure drop and then it allows the use of fans with low number of revolutions (with the advantage of reducing the unit noise level).

5.5 FAN MOTOR

The fan motor is axial type with plastic aerofoil blades. It is statically and dynamically balanced and supplied with a safety fan guard. The fan motor is a modulated brushless type, directly coupled and equipped with an integrated thermal overload protection. The protection class of the motor is IPX4 according to CEI EN 60529.

5.6 USER-SIDE HEAT EXCHANGER

The user-side heat exchanger is made up of AISI 316 stainless steel braze-welded plates type, and is factory insulated with flexible close cell material and is equipped with an antifreeze electric heater (optional accessory: KA). Each evaporator is equipped with a temperature sensor for antifreeze protection that activates the circulator, even in the case where the unit is turned off when meeting the setting parameters by controller.

5.7 ELECTRICAL CONTROL PANEL BOARD

The electrical control panel board is manufactured according to European Union directives currently in force. To access to the electrical control panel board, put the disconnect switch in the Off position, (presence of a door lock system) and wait until fan blades have come to a complete stop, open the front panel by removing the three screws with a flat-head screwdriver, turn to open quarter-turn the two locks of the electric controL panel board. The protection degree is IP34. The electric box is supplied with a terminal block completed with free contacts for remote ON-OFF, winter/summer change over, auxiliary heater, sanitary water temperature sensor, management of external 3-way valve and contacts for remote control panel. The addition of the optional module GI enables the management of further functions of the plant.

5.8 CONTROL SYSTEM

The UMHPI units are equipped with a microprocessor adopting an overheating control logic program through the electronic thermostatic valve managed by the pressure transducers signals and temperature sensor. The CPU also manages the following functions: water temperature regulation, antifreeze protection, compressors' time setting, alarm reset, alarms management and operation LED. Upon request, the microprocessor can be connected to a BMS remote control system and to the simpler HNS system with our terminal units. The control system together with the INVERTER technology and the on board sensors can continuously monitor and adapt the performance of the inverter compressor, of the circulator pump and of the fan motor.
The INVERTER system allows to reduce the plant's water content to its minimum from the usual value 12-15 liters/kW to 75 liters for the model UMHPI 25, 105 liters for the model UMHPI 35, 150 liters for the model UMHPI 50 and 180 liters for the model UMHPI 60 in ABSOLUTE. Because of the reduced water content, the UMHPI units can be also installed in plants without water tank with advantages of the reduced size of the appliance, the installation spaces, heat losses and installation and maintenance costs of the plant.

5.9 MONITORING AND PROTECTION DEVICES

The units are standard equipped with the following control and protection devices: return water temperature sensor installed on the return water pipe line from the plant, operating and antifreeze sensor installed on the outlet water pipe to the plant, high pressure transducer, low pressure transducer, compressor's inlet and outlet temperature sensors, thermal protection device for fan motors, water side water flow switch to protect the evaporator, high pressure HP flow switch.

⚠	***CAUTION: The INVERTER control system is able to manage minimum water contents in the plant up to a value of 75 liters for the model UMHPI 25, of 105 liters for the model UMHPI 35, of 150 liters for the model UMHPI 50 and of 180 liters for the model UMHPI 60. This value makes reference to the liters absolute value and not to any kW of installed power.***

5.10 HYDRAULIC CIRCUIT

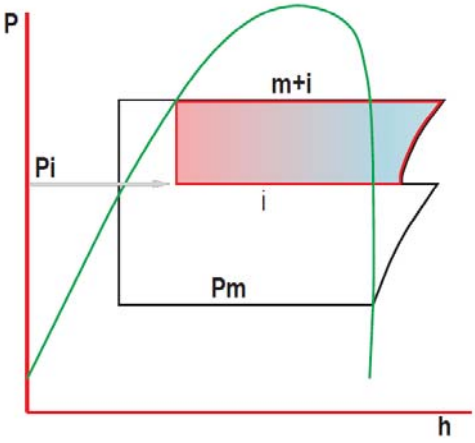
The heap pump chillers of UMHPI series are supplied with an integrated hydronic kit including: plate heat exchanger, a pressure gauges at the inlet and outlet of the heat exchanger for evaluating the load losses, service valve and flow switch for protection, automatic air release valve and safety valve (6 bar) to be connected to the collection system. The version with an integrated modulating type circulator pump adopting a brushless motor with high efficiency (EEI≤0,23), suitable for the utilization of chilled water and directly managed by the controller on board.

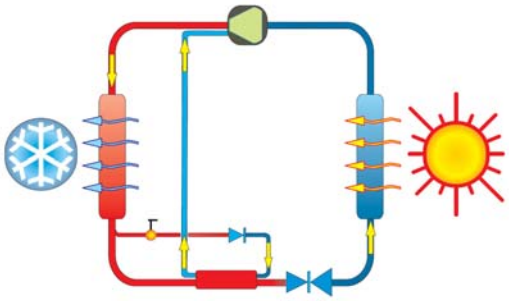
5.11 FAN SPEED CONTROL

This type of regulation, performed by the microprocessor, is necessary for optimizing the evaporation/condensation pressure during summer/winter operation in order to allow the correct operation of the appliance.

5.12 ENHANCED VAPOUR INJECTION (EVI) TECNOLOGY

The heat pumps series UMHPI V are equipped with scroll compressors with vapor injection (EVI technology) provide maximum efficiency regarding the standard units with scroll compressors. The EVI technology consists of injecting the refrigerant vapour at the intermediate stage of the compression process which can significantly increase the capacity and the efficiency of the compressor.
Each scroll compressor installed in the heat pumps of the series UMHPI V is comparable to a two-stage compressor but with an intermediate stage of cooling the refrigerant. The diagram shows the main stages of the refrigeration cycle of the unit with EVI technology. The stage of high pressure is consisting of the extraction of a part of the liquid refrigerant coming out of the condenser and then expands through an injection valve, in a heat exchanger which functions as a sub-cooler.
The generated superheated vapour is then injected into the E.V.I. compressor in the middle of the compression cycle (through a special pipe inside the compressor itself).
The additional sub-cooling of the liquid thus obtained could greatly increase the capacity of the evaporator.
A higher ratio between the condensation and evaporation pressures will significantly increase the performance of this system with respect to all the traditional technologies of gas compression.
This system allows the air/water heat pump of the series UMHPI V to generate hot water up to 60°C and capable of operating in temperatures up to -25°C.





6 AVAILABLE VERSIONS, SIZES AND ACCESSORIES

Model	Description
UMHPI 25	Size 25 kW without injection
UMHPI 35	Size 35 kW without injection
UMHPI 50	Size 50 kW without injection
UMHPI 60	Size 60 kW without injection
UMHPI V 25	Size 25 kW with injection
UMHPI V 35	Size 35 kW with injection
UMHPI V 50	Size 50 kW with injection

* L'iniezione di vapore permette di aumentare l'efficienza del compressore soprattutto in condizioni critiche (aria <7°C o >35°C).
Con il sistema di codifica è possibile configurare ulteriormente la UMHPI su misura (vedi listino RDZ s.p.a.)

6.1 OPTIONAL ACCESSORIES

7028097	EVO-touch remote control	Touch screen control panel, suitable for web server. Remote control for UMHPI
7028098	Rubber mounts	Anti-vibration rubber supports for the basement
7028081	Y-shaped filter Ø 2''	Water inlet filter

7 INSTALLATION

⚠	***WARNING: All the operation described in next chapters MUST BE DONE BY TRAINED PEOPLE ONLY. Before any operation on the unit, be sure that the electric supply is disconnected.***

7.1 GENERALITY

When installing or servicing the unit, it is necessary to strictly follow the rules listed in this manual, to conform to all the specifications of the labels on the unit, and to take any possible precautions. Not observing the rules reported on this manual can create dangerous situations.

ℹ	**After receiving the unit, immediately check its integrity. The unit left the factory in perfect condition; any eventual damage has to be questioned to the carrier and recorded on the Delivery Note before signing it.**

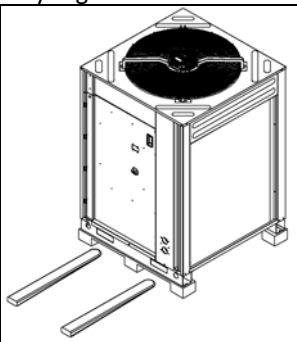
RDZ S.p.A. has to be informed, within 8 days, of the extent of the damage. The Customer should prepare a written statement of any severe damage.

⚠	***WARNING: The UMHPI units are designed for outdoor installation and for places not directly accessible to unqualified personnel. The place of installation must be entirely far away from fire risk. All the necessary measures should be adopted in order to prevent the fire risk in the place of installation. The outdoor ambient temperature shall not exceed 46°C. Above this value, the unit is no longer covered by the directives in force in the area of pressure equipment.***
⚠	***WARNING: The unit should be installed so that adequate clearance is available for maintenance and repairation. The warranty does not cover costs related to platforms or handling equipment necessary for any maintenance.***
⚠	***All maintenance and testing operations should be carried out only by QUALIFIED PERSONNEL.***
⚠	***Before any operation on the unit, make sure the power supply is disconnected.***
⚠	***WARNING: MOVING PARTS, RISK OF DEATH.*** ***Disconnect the power supply and ensure that the fan is stopped before opening the front panel.***
⚠	***The top part and discharge pipes of the compressor operates at high temperatures. Be sure to let the unit to become cool before beginning any maintenance work.***
⚠	***Be careful when working near condensing coils.*** ***The aluminum fins are very sharp and can cause serious injuries.***
⚠	***After the maintenance operations, close the panels tightly with the fastening screws.***

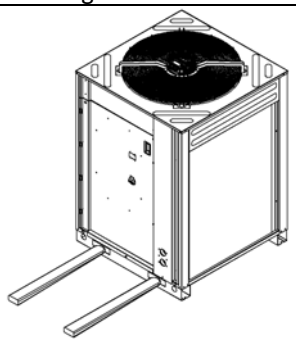
7.2 LIFTING AND HANDLING

The handling must be performed by qualified personnel, properly equipped with appropriate equipments to the weight and the encumbrance of the unit, in compliance with safety regulations of accident preventing.

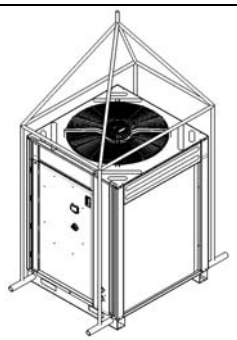
When the unloading and the placement of the unit, it is highly recommended to avoid any sudden or violent motion in order to protect the inner components and the frame. The units can be lifted by mean of a forklift or, otherwise by mean of belts, making sure to damage the lateral panels and the cover of the unit using a structure of spacers as shown in the drawing. In this context, it is necessary to hook indirectly the unit to the basement but on two steel pipes of adequate dimension that to pass into the appropriate holes situated in the same basement of the unit. It is important to keep the unit horizontal during these operations.



1) Handling with forklift under the pallet



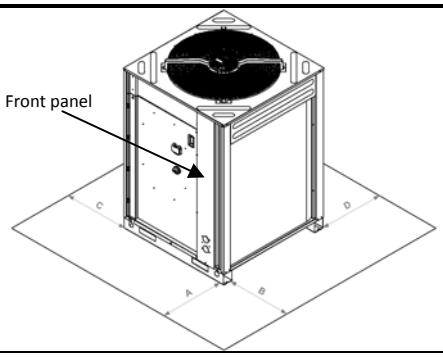
2) Handling with forklift under the unit using the appropriate windows of passing forks



3) Handling by mean of belts

7.3 LOCATION AND MINIMUM TECHNICAL CLEARANCES

All UMHPI models are designed for outdoor installations; any cover over the unit or locating near trees (even if they partially cover the unit) has to be avoided in order to allow the air recirculation. It is advisable to realize a supporting basement, with adequate size similar to unit foot-print. The unit vibration level is very low: it is advisable however, to fit a rigid rubber band between basement and unit base-frame. It is also possible to install anti-vibration supports (springs or rubbers) to keep vibrations at a very low level. An absolute care has to be taken to ensure adequate air volume to the condenser. The re-circulation of discharge air has to be avoided; failure to observe this point will result in poor performance or activation of safety controls. For these reasons it is necessary to observe the following clearances:



MOD.	A	B	C	D
UMHPI 25 / UMHPI V 25	1500	500	1000	850
UMHPI 35 / UMHPI V 35	1500	500	1000	850
UMHPI 50 / UMHPI V 50	1500	500	1000	850
UMHPI 60	1500	500	1000	850

* The recommended minimum distance for installation, maintenance and operation.

N.B. Avoid suspended installations. If you cannot, use your common sense and follow local regulations, and in the case of doubt, contact your authorized service center.

7.4 HYDRAULIC CONNECTIONS

The hydraulic connections have to be installed in accordance with national and local regulations; pipes can be made up of steel, galvanized steel or PVC. Pipes have to be designed depending on the nominal water flow and on the hydraulic pressure drops of the system. All the hydraulic connections must to be insulated with closed-cell material of adequate thickness. Chillers have to be connected to piping by means of flexible joints. The hydraulic circuit should include the following components:

- Hole thermometers for monitoring the hydraulic circuit's temperature.
- Manual gate valves to separate the chiller from the hydraulic circuit.
- Y-shaped metallic filter (to be mounted on the return pipe from the plant) with a metallic mesh not larger than 1mm.
- Loading group and discharge valve, where it's necessary.

WARNING: Make sure that, when designing the pipe length and diameter do not exceed the maximum head loss on the plant side, please see the technical data given in the table of Paragraph 14 (available head pressure).

WARNING: In the models of UMHPI series, the expansion vessel is not integrated on the plant side. The actual capacity of plant circuit should be checked by the installer in order to provide an expansion tank with adequate

WARNING: Connect the pipes to the attacks by using always key against key system.

WARNING: Unit water inlet pipe have to be in correspondence with the connection labelled: "WATER INLET", otherwise the evaporator may freeze.

WARNING: It is compulsory to install on the WATER INLET connection a metallic filter with a mesh not larger than 1mm. Should the water flow switch be altered or should the filter not be installed, the warranty will no longer be valid. The filter have to be kept clean, so make sure it is clean after the unit has been installed, and then check it periodically.

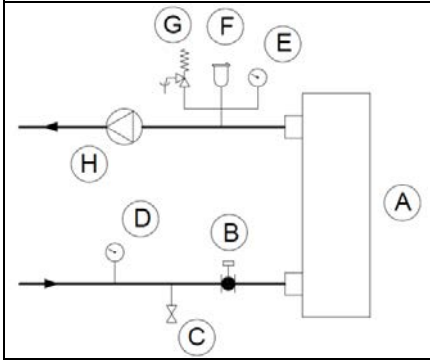
All units are standard supplied with the water flow switch (factory installed). Should the water flow switch be altered, removed, or should the water filter not be installed on the unit, the warranty will be invalidated. Please refer to the wiring diagram for the water flow switch electric connections.

The water on the filling/replenishment pipe must be opportunely pre-filtered from any suspended particles and impurities through the use cartridge filter (washable, wrapped wire, etc.) of at least 100 microns.

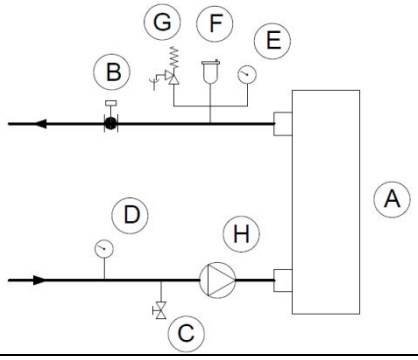
Check the water hardness with which you load and top up the plant circuit. With particularly hard water, in this case it is necessary to utilize a water softener. For treating water for the plant, please refer to UNI 8065.

7.4.1 Hydraulic circuit

UMHPI 25 / UMHPI V 25
UMHPI 35 / UMHPI V 35



UMHPI 50 / UMHPI V 50
UMHPI 60



A	Plate heat exchanger
B	Water flow switch
C	Service valve
D	Inlet pressure gauge
E	Outlet pressure gauge
F	Air vent valve
G	Safety valve
H	Circulating pump

At the highest point of the plant circuit it is necessary to install an automatic air vent valve.
Provide an auxiliary expansion tank (not supplied) in order to control the volume changes in the plant side.

7.4.2 Drainage connection

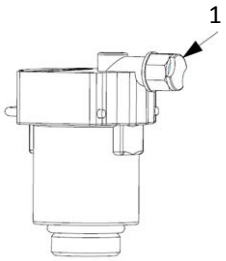
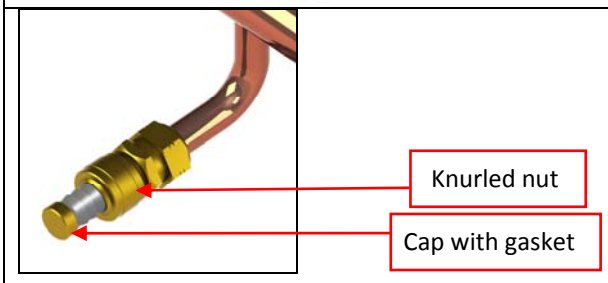
All UMHPI units are adopt drain holes on the basement for the discharge of the condensate that may leach from the pipes of the hydraulic and refrigerant circuits, and to discharge the water generated during defrosting cycles.

7.4.3 Plant circuit filling

WARNING: Verify all the filling/replenishment operations.

WARNING: Before beginning the filling/replenishment operation of the plant circuit, disconnect the unit from the

	electric power supply.
	WARNING: The filling/replenishment of the plant circuit must always be done under controlled conditions of pressure (max 1 bar). Make sure that you have installed on the line of filling/replenishment a pressure reducer and a relief valve.
	WARNING: The water on the filling/replenishment pipe must be suitably pre-filtered from any impurities and suspended particles. Make sure that you have installed a cartridge filter removable.
	WARNING: Before beginning the filling /replenishment operation, unscrew the plugs of the air vent valve. Tighten the plugs after finishing the operation of filling/replenishment of the plant circuit system.

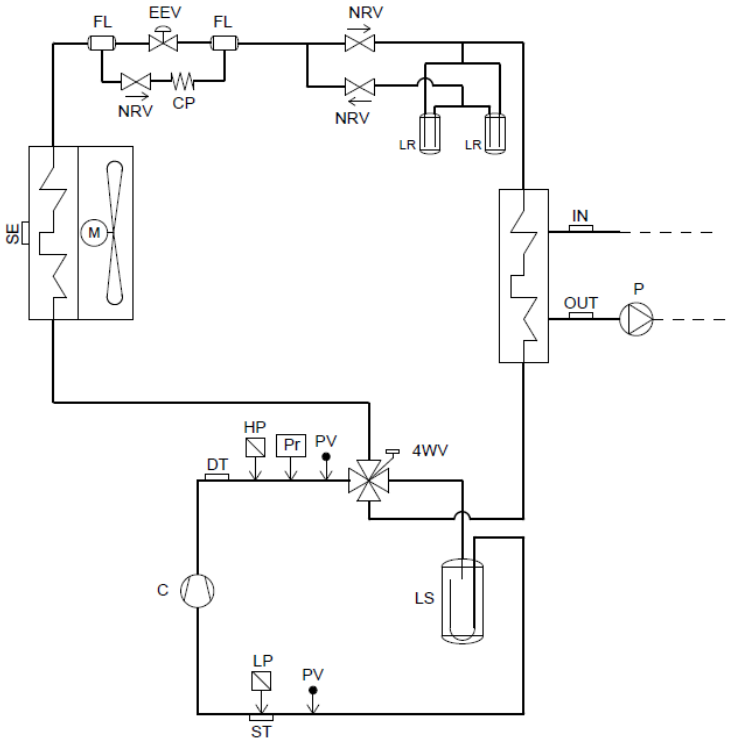
	During the operations of filling/replenishment, the plugs of the air vent valves must be partially unscrewed to allow air to flow freely out of the valves. Refer to the Paragraph 26. (1) Plug of the air vent valve
	You can use the service valve, when it is necessary to refill the plant or adapt the concentration of glycol. Unscrew the plug (cap) of the service valve and connect to the hose a pipe of 14 mm (inner diameter) connected to the water network, and then fill the system by unscrewing the knurled nut. When the operation is concluded, retighten the knurled nut and screw on the plug. In any case, we recommend you to use for the water loading of the plant an external tap whose arrangement is by the installer.

7.4.1 Plant drainage system

In the case when it is necessary to unload the plant, close at first the inlet and outlet manual gate valves (not supplied) and then remove the pipes that are disposed externally on the water inlet and on the water outlet in order to spill away the liquid contained in the unit (in order to make easy the operation, it is recommended to install externally two draining valves, on the water inlet and on the water outlet, between the unit and the manual gate valves).

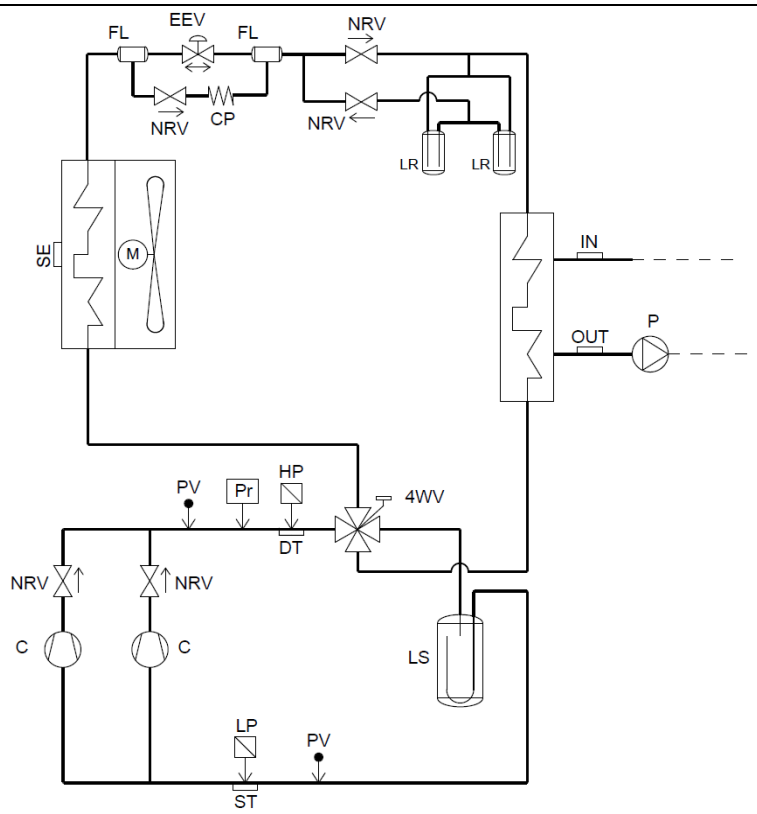
7.5 REFRIGERANT DIAGRAMS

7.5.1 Refrigerant diagram of the model UMHPI 25



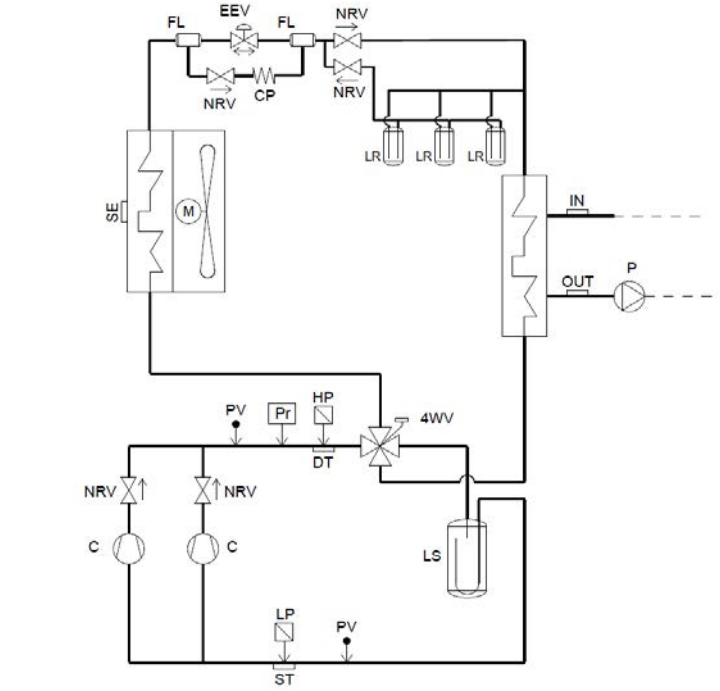
C	COMPRESSOR
ST	COMPRESSOR INLET TEMPERATURE
DT	COMPRESSOR OUTLET TEMPERATURE
HP	HIGH PRESSURE TRANSDUCER
Pr	HIGH PRESSURE FLOW SWITCH
LP	LOW PRESSURE TRANSDUCER
LS	LIQUID SEPARATOR
4WV	CYCLE REVERSING VALVE
LR	LIQUID RECEIVER
EEV	ELECTRONIC EXPANSION VALVE
FL	FILTER
M	AXIAL FAN
SE	OUTDOOR AIR TEMPERATURE SENSOR
P	CIRCULATOR ON BOARD UNIT
IN	WATER INLET TEMPERATURE
OUT	WATER OUTLET TEMPERATURE
CP	CAPILLARY
NRV	NO RETURN VALVE
PV	PRESSURE CHECK VALVE

7.5.2 Refrigerant diagram of the model UMHPI 35



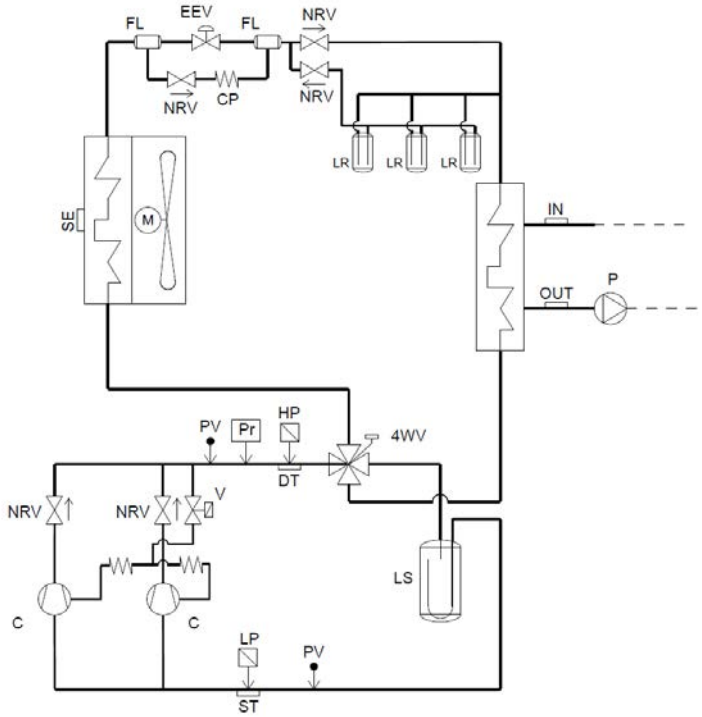
C	COMPRESSOR
ST	COMPRESSOR INLET TEMPERATURE
DT	COMPRESSOR OUTLET TEMPERATURE
HP	HIGH PRESSURE TRANSDUCER
Pr	HIGH PRESSURE FLOW SWITCH
LP	LOW PRESSURE TRANSDUCER
LS	LIQUID SEPARATOR
4WV	CYCLE REVERSING VALVE
LR	LIQUID RECEIVER
EEV	ELECTRONIC EXPANSION VALVE
FL	FILTER
M	AXIAL FAN
SE	OUTDOOR AIR TEMPERATURE
P	CIRCULATOR ON BOARD UNIT
IN	WATER INLET TEMPERATURE
OUT	WATER OUTLET TEMPERATURE
CP	CAPILLARY
NRV	NO RETURN VALVE
PV	PRESSURE CHECK VALVE

7.5.3 Refrigerant diagram of the model UMHPI 50



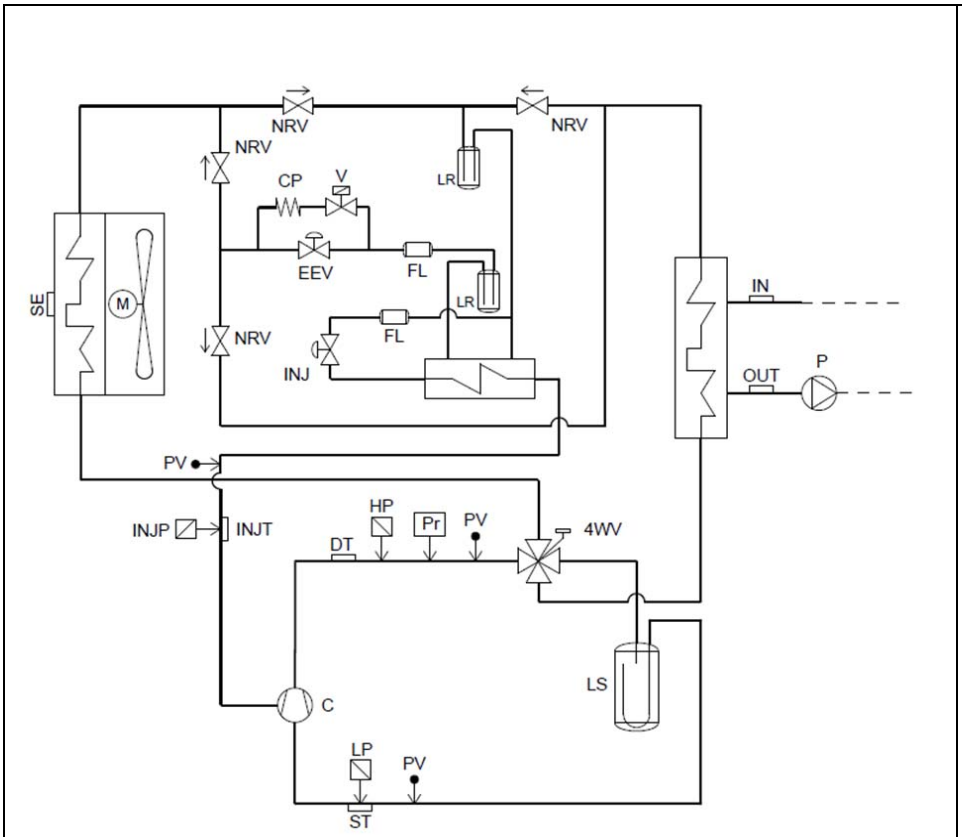
C	COMPRESSOR
ST	COMPRESSOR INLET TEMPERATURE
DT	COMPRESSOR OUTLET TEMPERATURE
HP	HIGH PRESSURE TRANSDUCER
Pr	HIGH PRESSURE FLOW SWITCH
LP	LOW PRESSURE TRANSDUCER
LS	LIQUID SEPARATOR
4WV	CYCLE REVERSING VALVE
LR	LIQUID RECEIVER
EEV	ELECTRONIC EXPANSION VALVE
FL	FILTER
M	AXIAL FAN
SE	OUTDOOR AIR TEMPERATURE SENSOR
P	CIRCULATOR ON BOARD UNIT
IN	WATER INLET TEMPERATURE
OUT	WATER OUTLET TEMPERATURE
CP	CAPILLARY
NRV	NO RETURN VALVE
PV	PRESSURE CHECK VALVE

7.5.4 Refrigerant diagram of the model UMHPI 60



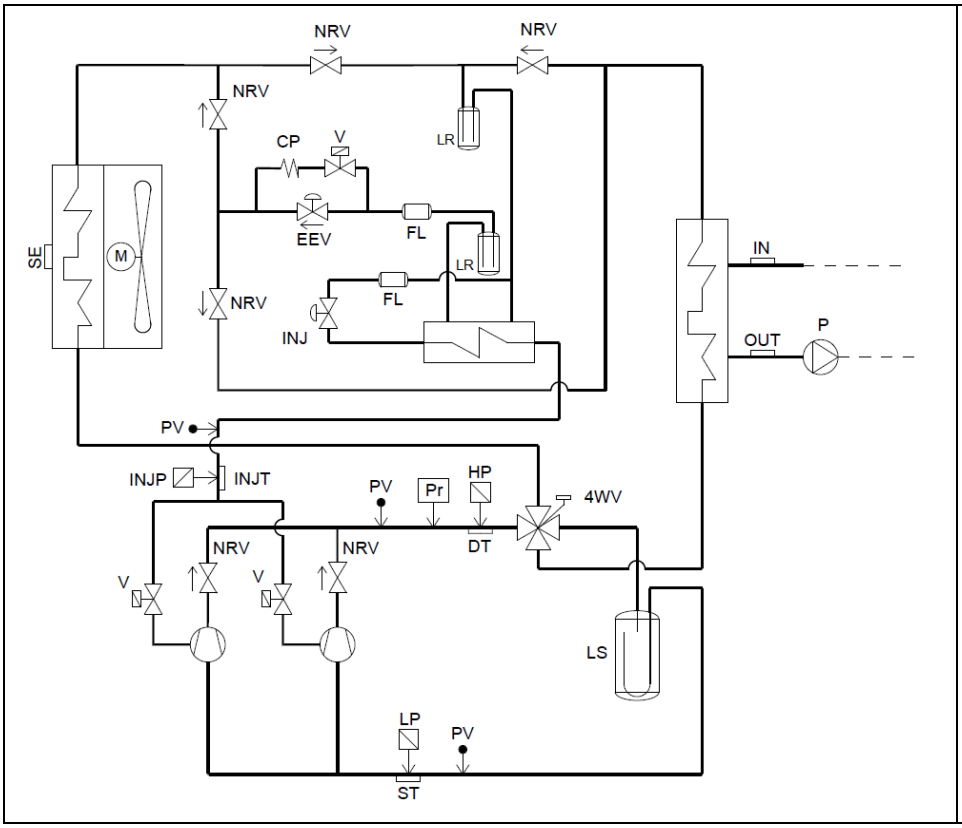
C	COMPRESSOR
ST	COMPRESSOR INLET TEMPERATURE
DT	COMPRESSOR OUTLET TEMPERATURE
HP	HIGH PRESSURE TRANSDUCER
Pr	HIGH PRESSURE FLOW SWITCH
LP	LOW PRESSURE TRANSDUCER
LS	LIQUID SEPARATOR
4WV	CYCLE REVERSING VALVE
LR	LIQUID RECEIVER
EEV	ELECTRONIC EXPANSION VALVE
FL	FILTER
M	AXIAL FAN
SE	OUTDOOR AIR TEMPERATURE SENSOR
P	CIRCULATOR ON BOARD UNIT
IN	WATER INLET TEMPERATURE
OUT	WATER OUTLET TEMPERATURE
CP	CAPILLARY
NRV	NO RETURN VALVE
PV	PRESSURE CHECK VALVE

7.5.5 Refrigerant diagram of the model UMHPI V 25



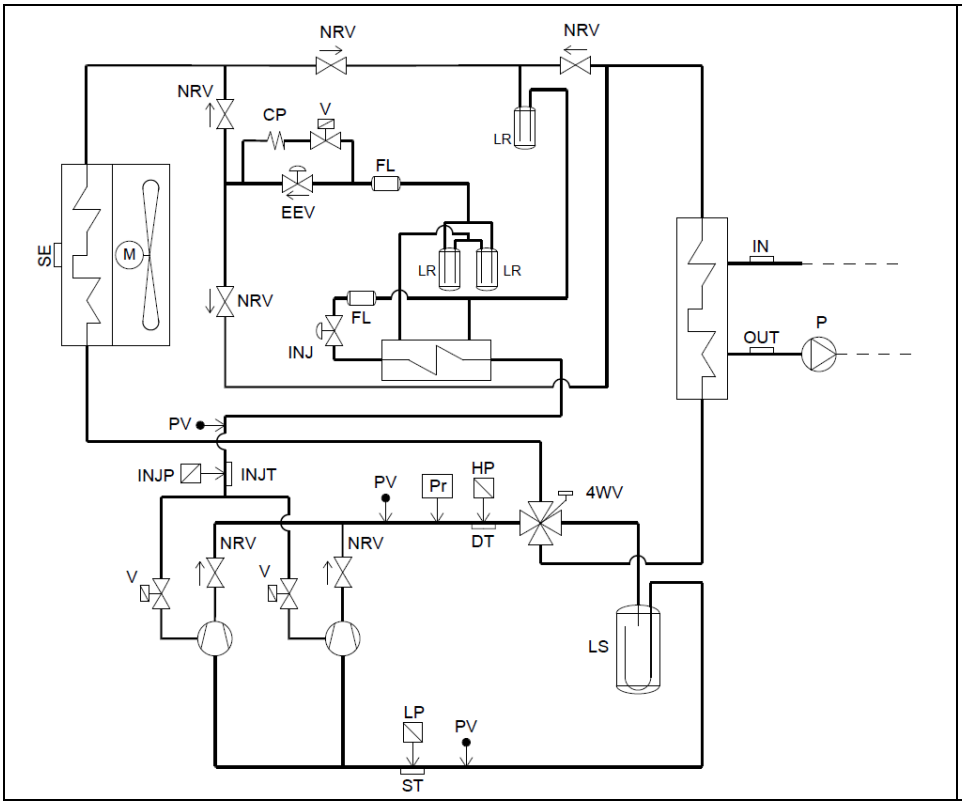
C	COMPRESSOR
ST	COMPRESSOR INLET TEMPERATURE
DT	COMPRESSOR OUTLET TEMPERATURE
HP	HIGH PRESSURE TRANSDUCER
Pr	HIGH PRESSURE FLOW SWITCH
LP	LOW PRESSURE TRANSDUCER
LS	LIQUID SEPARATOR
4WV	CYCLE REVERSING VALVE
LR	LIQUID RECEIVER
EEV	ELECTRONIC EXPANSION VALVE
FL	FILTER
M	AXIAL FAN
SE	OUTDOOR AIR TEMPERATURE
P	CIRCULATOR ON BOARD UNIT
IN	WATER INLET TEMPERATURE
OUT	WATER OUTLET TEMPERATURE
NRV	NO RETURN VALVE
INJ	INJECTION VALVE
V	ON/OFF VALVE WITH SOLENOID
PV	PRESSURE CHECK VALVE
INJT	INJECTION TEMPERATURE
INJP	INJECTION PRESSURE TRANSDUCER

7.5.6 Refrigerant diagram of the model UMHPI V 35



C	COMPRESSOR
ST	COMPRESSOR INLET TEMPERATURE
DT	COMPRESSOR OUTLET TEMPERATURE
HP	HIGH PRESSURE TRANSDUCER
Pr	HIGH PRESSURE FLOW SWITCH
LP	LOW PRESSURE TRANSDUCER
LS	LIQUID SEPARATOR
4WV	CYCLE REVERSING VALVE
LR	LIQUID RECEIVER
EEV	ELECTRONIC EXPANSION VALVE
FL	FILTER
M	AXIAL FAN
SE	OUTDOOR AIR TEMPERATURE
P	CIRCULATOR ON BOARD UNIT
IN	WATER INLET TEMPERATURE
OUT	WATER OUTLET TEMPERATURE
NRV	NO RETURN VALVE
INJ	INJECTION VALVE
V	ON/OFF VALVE WITH SOLENOID
PV	PRESSURE CHECK VALVE
INJT	INJECTION TEMPERATURE
INJP	INJECTION PRESSURE TRANSDUCER

7.5.7 Refrigerant diagram UMHPI V 50



C	COMPRESSOR
ST	COMPRESSOR INLET TEMPERATURE
DT	COMPRESSOR OUTLET TEMPERATURE
HP	HIGH PRESSURE TRANSDUCER
Pr	HIGH PRESSURE FLOW SWITCH
LP	LOW PRESSURE TRANSDUCER
LS	LIQUID SEPARATOR
4WV	CYCLE REVERSING VALVE
LR	LIQUID RECEIVER
EEV	ELECTRONIC EXPANSION VALVE
FL	FILTER
M	AXIAL FAN
SE	OUTDOOR AIR TEMPERATURE
P	CIRCULATOR ON BOARD UNIT
IN	WATER INLET TEMPERATURE
OUT	WATER OUTLET TEMPERATURE
NRV	NO RETURN VALVE
INJ	INJECTION VALVE
V	ON/OFF VALVE WITH SOLENOID
PV	PRESSURE CHECK VALVE
INJT	INJECTION TEMPERATURE
INJP	INJECTION PRESSURE TRANSDUCER

7.6 ELECTRICAL CONNECTIONS

Check if the power supply circuit meets the unit's electric nominal data (tension, phases, frequency) reported on the label sticked on the right-side panel of the unit. The wiring must be done in accordance to the wiring diagram attached to the unit and in conformity with the national and international norms in force (attempting to provide a general magneto-thermic circuit breaker, differential circuit breakers for each electric line, proper grounding for the plant, etc.). Power cables, electric protections and line fuses have to be sized according to the specifications listed in the wiring diagram enclosed with the unit and in the electrical data contained in the table of technical characteristics.

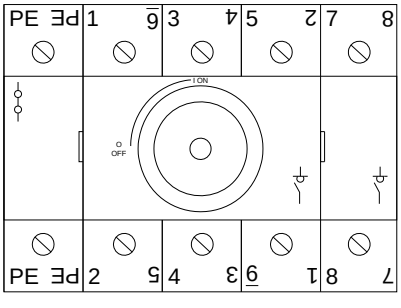
⚠	***Because of the presence, inside the machine, of EMC filters for compliance with EMC limits (interference emission and interference immunity), earth fault currents up to 250 mA of intensity can be detected.*** ***For proper installation, electrically connect the unit with a dedicated line; if you use a residual current circuit breaker, choose a four-pole one, with a trigger threshold of 300 mA and delayed triggering (super-resistant, characteristic K).*** ***The machine must be installed in TN-S/TT power supply earthing systems.*** ***The electrical installation must be carried out in accordance with norms in force.***
⚠	***WARNING: The supply voltage's fluctuations can not exceed ±5% of the nominal value. Should this tolerance not be respected, please contact our technical department.***
⚠	***WARNING: The power supply have to respect the listed limits: failing this, warranty will terminate immediately. Before any operation on the unit, be sure that the power supply is disconnected.*** ***WARNING: The water flow switch (B component in the previous hydraulic circuit and factory installed) have ALWAYS to be connected following the indications listed in the wiring diagram. Never bridge the water flow switch connections in the terminal board. Should the water flow switch connections altered or not properly made, the guarantee will be invalidated.***
⚠	***Install upstream of each unit an adequate protection and disconnection device of the electric power with delayed characteristic curve, with at least 3 mm contact opening and with an adequate capacity of breaking and differential protection.*** ***A good grounding is required; the manufacturer is not responsible for damage caused in case of lack of good grounding.*** ***Use cables that meet the regulations in force in different countries.***
⚠	***WARNING: The opening of the separating plate between the 1st and 2nd level of the electrical box is permitted only to qualified personnel. When lowering the separating plate, be careful not to damage the wiring harness that connects the inverter boards. Before lowering the separating plate, unplug the communication cables of the inverter boards (see the wiring drawings "Power supply", section*** *Errore. L'origine riferimento non è stata trovata., Errore. L'origine riferimento non è stata trovata., Errore. L'origine riferimento non è stata trovata., Errore. L'origine riferimento non è stata trovata.*; ***these cables are marked in the drawings with the words: I-, I +, GND, I2 +, I2-, GND2).***
⚠	***WARNING: The remote control panel is connected to the water chiller by means of no.4 wires having a 1,5 mm^2 section. The power supply cables have to be separated from the remote control wires. The maximum distance is 50m.***
⚠	***WARNING: The remote control panel can not be installed in areas with strong vibrations, corrosive gases, and excess of dirtiness or high humidity levels. Leave free the area near the cooling openings.***

7.6.1 Wiring terminal block

⚠	***Electrical wiring have to be done only by qualified personnel.***

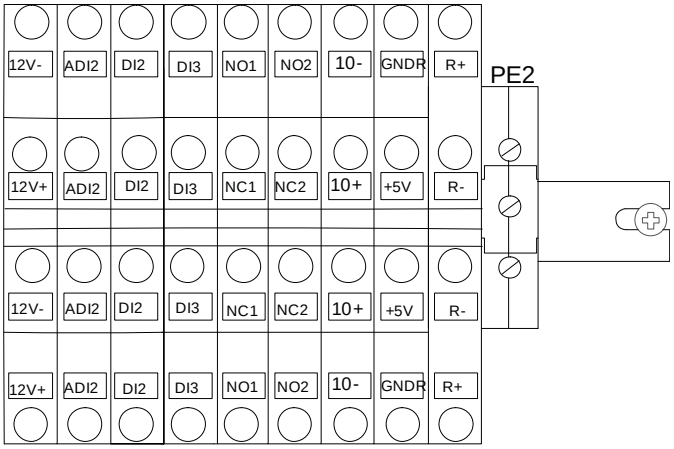
The electrical connections have to be realized by qualified personnel.

The power supply of the units is 3-Ph/N/PE 400V, 50Hz. The power cables should be brought inside the electrical panel of the unit and connected to the disconnecting switch inside the electric panel itself, in the bottom at the left, as shown in the following figure:



Do the connections of the power supply cables to the disconnecting switch in order from left to right as: protective earth (PE), conductor L1 for phase 1, conductor L2 for phase 2, conductor L3 for phase 3, conductor N for neutral line.

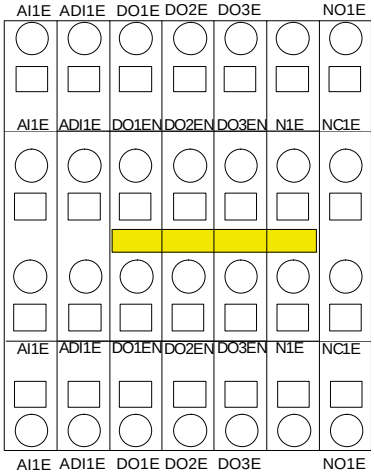
The user terminal block (UTB) is located inside the electrical panel. The terminal must be connected according the notes indicated below (the drawing is indicative only).



The connections indicated below are standard. Other connections are reported in the manual of the controller (table of configurations that are allowed to user and installer).

TERMINAL	TYPE	CONNECTION
12V-	Power supply 12 Vac	Power supply for remote keyboard CRH/double set point humidistat kit/Evo Touch
12V+	Power supply 12 Vac	Power supply for remote keyboard CRH/double set point humidistat kit/Evo Touch
ADI2	Analogue input NTC ST8/digital DI7	Sanitary temperature probe inlet/ sanitary call from digital input
ADI2	Analogue input NTC ST8/digital DI7	Sanitary temperature probe inlet/ sanitary call from digital input
DI2	Digital input DI2	Remote ON/OFF input (close=power ON unit / open=power OF unit)
DI2	Digital input DI2	Remote ON/OFF input (close=power ON unit / open=power OF unit)
DI3	Digital input DI3	Summer/winter input from remote call (close=summer mode / open=winter mode)
DI3	Digital input DI3	Summer/winter input from remote call (close=summer mode / open=winter mode)
NC1	Digital output 230 Vac with changeover contact	NC terminal power supply (230V AC) 3-way valve for sanitary storage tank (to be used only in the case of 3-way valve with 3-point turn power plant side)
N1	Digital output 230 Vac with changeover contact	Neutral power supply terminal (230V AC) 3-way valve for sanitary water tank
NO1	Digital output 230 Vac with changeover contact	NO power supply terminal (230V AC) 3-way valve for sanitary water tank (to turn the valve tank side)
NC2	Digital output 230 Vac with changeover contact	NC power supply terminal (230V, 50Hz, 5A resistive, 1 A inductive) alarm. (Not available for V VERSION)
N2	Digital output 230 Vac with changeover contact	Neutral power on terminal (230V, 50Hz, 5A resistive, 1 A inductive) alarm. (Non disponibile per la versione LT)
NO2	Digital output 230 Vac with changeover contact	NO power supply terminal (230V, 50Hz, 5A resistive, 1 A inductive) alarm. (Non disponibile per la versione LT)
AI10	Analogue input (ST10)	0-10V signal input terminal to change the set point/ratiometric input signal
AI10	Analogue input (ST10)	0-10V signal input terminal to change the set point/ratiometric input signal
+5V	Power supply 5V dc	power supply terminal for ratiometric signal
GNDR	serial communication	Modbus ground reference terminal connection for CRH remote keyboard / Evo Touch
R+	serial communication	Modbus + signal terminal connection for CRH remote keyboard / Evo Touch
R-	serial communication	Modbus - signal terminal connection for CRH remote keyboard / Evo Touch

The user's terminal for system manage (GITB), if present, it is located inside the electrical panel, as an extension of terminal block. The terminal must be connected according the notes below (the drawing is indicative).



The following are present the standard connections. Other connections and configurations are shown in the manual control (the permissible configurations tables for user and installer).

TERMINAL	TYPE	CONNECTION
AI1E	Analogue input NTC ST3E	Terminal input for remote plant temperature probe (optional)
AI1E	Analogue input NTC ST3E	Terminal input for remote plant temperature probe (optional)
AID1E	Digital input DI6E expansion board	Input terminal for double set-point consent (only if Evo Touch not presents)
AID1E	Digital input DI6E expansion board	Input terminal for double set-point consent (only if Evo Touch not presents)
DO1EN	Digital output 230 Vac (DO1E) expansion board	Neutral terminal (230V, 50Hz, 5A resistive, 1 A inductive) for power on the contactor coil of sanitary integrative heater (not supplied)
DO1E	Digital output 230 Vac (DO1E) expansion board	Neutral terminal (230V, 50Hz, 5A resistive, 1 A inductive) for power on the contactor coil of sanitary integrative heater (not supplied)
DO2EN	Digital output 230 Vac (DO2E) expansion board	Neutral terminal (230V, 50Hz, 5A resistive, 1 A inductive) for power on the contactor coil of sanitary integrative heater (not supplied)
DO2E	Digital output 230 Vac (DO2E) expansion board	Neutral terminal (230V, 50Hz, 5A resistive, 1 A inductive) for power on the contactor coil of sanitary integrative heater (not supplied)
DO3EN	Digital output 230 Vac (DO3E) expansion board	Neutral terminal (230V, 50Hz, 5A resistive, 1 A inductive) for boiler consent (voltage output, use a relay)
DO3E	Digital output 230 Vac (DO3E) expansion board	Neutral terminal (230V, 50Hz, 5A resistive, 1 A inductive) for boiler consent (voltage output, use a relay)
NO1E	Digital output 230 Vac (NO contact) expansion board	Power supply phase NO terminal (230V, 50Hz, 5A resistive, 1 A inductive) double setpoint 3 way valve for radiant panels (optional) (if the contact is active the valve must be turn to floor side)
N1E		Neutral terminal power supply (230V AC) double setpoint 3 way valve for radiant panels (optional)
NC1E	Digital output 230 Vac (NC contact) expansion board	Power supply phase NC terminal (230V, 50Hz, 5A resistive, 1 A inductive) double setpoint 3 way valve for radiant panels (optional) (if the contact is active the valve must be turn to fancoil side)

8 START UP

Before start-up:

- Check out the availability of the supplied wiring diagrams and manuals of the installed appliance.
- Check out the availability of the electrical and hydraulic diagrams of the plant in which the unit is installed.
- Check that the shut-off valves of the hydraulic circuits are open.
- Verify that the hydraulic circuit has been charged under pressure and air vented.
- Check out that all hydraulic connections are properly installed and all indications on unit labels are respected.
- Check if all power cables are properly connected and all terminals are tightly fixed.
- Check if the electrical connections are performed according to the norms in force including the grounding connection.
- Check if the voltage is that shown in the unit labels.
- Make sure the voltage is within the limits (±5%) of tolerance range.
- Check if the electric heaters of the compressors are powered correctly.
- Make sure that there is no refrigerant leak.
- Be sure that all the cover panels are installed in their proper positions and locked with fastening screws before start up.
- If the first start-up of the machine does not turn the display on of the controller, you must reverse the phase sequence of the power supply cable.

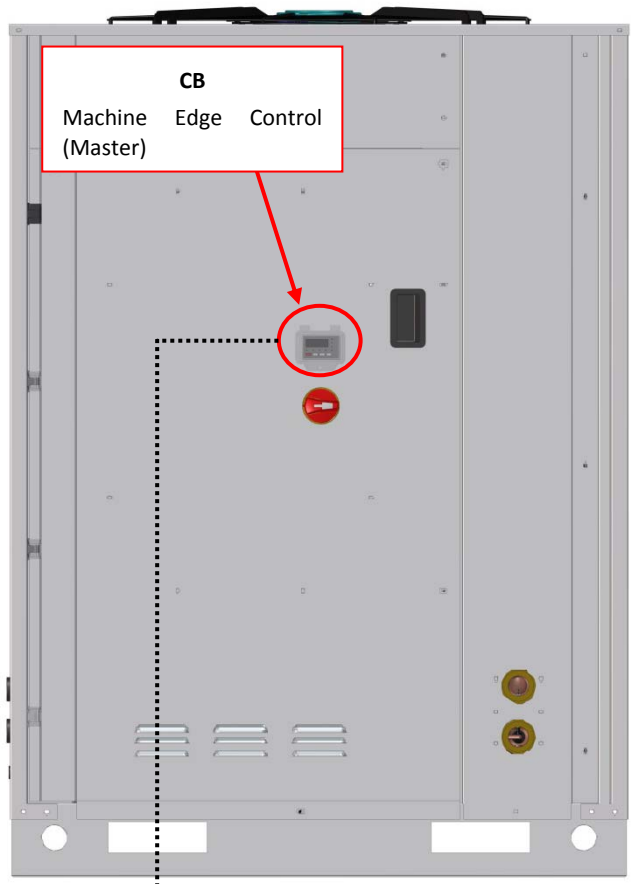
	***WARNING: The unit must be connected to the electrical network and should be in STAND-BY mode (powered) closing the general switch in order to operate the crankcase heaters of the compressor for a minimum of 12 hours before start up. (the heaters are automatically powered when the main switch is switched off). The crankcase heaters are working properly if, after some minutes, the temperature of crankcase's compressor is about 10°C ÷ 15°C higher than ambient temperature.***
	WARNING: Never switch off the unit (for a temporary stop) by switching off the main switch: this component should be used to disconnect the unit from the power supply only for lengthy stoppages (e.g. seasonal stoppages). Besides, failing the power supply, the crankcase's heaters are not supplied thus resulting in a possible breakdown of the compressors once the unit is switched on.
	WARNING: Do not modify the internal wiring of the unit otherwise the warranty will terminate immediately. ***WARNING: The summer/winter operating mode have to be selected at the beginning of the related season. Frequent and sudden changes of this seasonal operating mode have to be avoided in order to prevent severe damages to compressors.***
	WARNING: When you first install and start-up the unit make sure that the unit is working properly in both cooling and heating modes.

8.1 POWER-ON OF THE UNIT

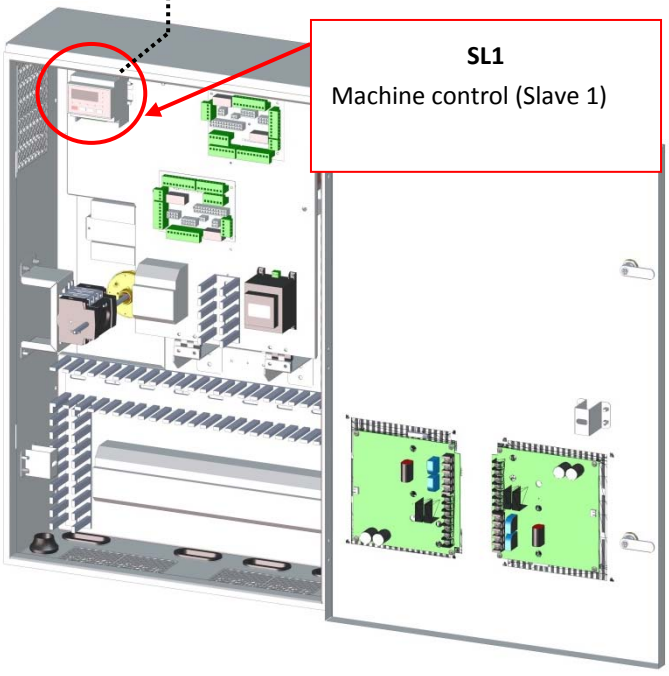
For powering on the appliance, rotate the outer handle of the disconnector to the ON position (indicated with "I").
The display on the machine is turned on only if the phase sequence is correct (verification to be done during initial startup).
Between a shutdown and subsequent power on, wait a minimum time of 1 minute.

9 SYSTEM ARCHITECTURE

The UMHPI system consists of an electronic control:
a) CB = Machine Edge Control (Master) visible on the front panel of the unit.
In the UMHPI V models and if present the optional kit mod. GI in the UMHPI models. The system consists of an additional check:
b) SL1 = Machine control (Slave 1), not visible, inside the electrical panel of the unit.
The CB control of the indoor unit manages the ModBUS communication of the entire system and is defined as MASTER, because it decides which one
operation must be performed and at what moment of time, while the SL1 control, if present, is considered SLAVE, because governed by the MASTER control.
N.B. This manual describes the logics and functions that can be enabled by the CB (MASTER) control of the unit.



FRONT PANEL



INTERNAL ELECTRIC PANEL

ModBus CB – SL1 COMMUNICATION

10 INDICATIONS FOR THE USER

It's important to take note of the identification data of the unit in order to provide them to the Technical assistance Service in case of assistance request.

	The identification plate fixed on the unit shows the technical specifications and the performance of the equipment. In case of manumission, removal or deterioration, please ask a duplicate to the Technical Assistance Service.
	The manumission, removal or damaging of the nameplate makes difficult any operazioni of installation, maintenance and spare parts request.

It is recommended to keep track of assistance operations done on the unit, this will make easy searching any troubleshooting.
In case breakdown or malfunction situations:

- check the type of alarm to communicate it to the service center;
- contact an authorized service center;
- if required by the service center, turn off the unit immediately without resetting the alarm;
- require the use of original spare parts.
- the use of original spare parts is necessary

11 SHUTDOWNS FOR LONG PERIODS

• Turn off the unit by placing the switch of each unit to "OFF" position.
• Close the water valves.
• Place the general differential circuit breaker to "OFF" position.

	If the temperature drops below 0°C there is serious danger of frost: add a mixture of water and glycol in the plant, otherwise drain the hydraulic circuits of the plant and of the heat pump.
	WARNING: if the ambient temperature becomes lower than -20°C (value that is permitted only on UMHPI V series), in case the unit is turned off and powered down also for short periods, it's compulsory to drain the plant and the hydraulic circuit of the unit by the mixture of water and glycol. Otherwise, the circulator may be irreversibly damaged.
	WARNING: the operation, although it was transient, with water temperatures below +5°C is not guaranteed on the basis of the limits set out in Paragraph 23.4. Before you turn the unit on after a long off period, make sure that the temperature of the mixture of water and glycol is higher than or at least equal to +5°C.

12 MAINTENANCE AND PERIODICAL CONTROLS

	***If the temperature drops below 0°C there is serious danger of frost: add a mixture of water and glycol in the plant, otherwise drain the hydraulic circuits of the plant and of the heat pump.***
	***WARNING: if the ambient temperature becomes lower than -20°C (value that is permitted only on UMHPI V series), in case the unit is turned off and powered down also for short periods, it's compulsory to drain the plant and the hydraulic circuit of the unit by the mixture of water and glycol. Otherwise, the circulator may be irreversibly damaged.***
	***WARNING: the operation, although it was transient, with water temperatures below +5°C is not guaranteed on the basis of the limits set out in Paragraph 23.4. Before you turn the unit on after a long off period, make sure that the temperature of the mixture of water and glycol is higher than or at least equal to +5°C.***
	***WARNING: All the operations described in this chapter HAVE TO BE CARRIED OUT BY TRAINED STAFF ONLY. Before any operation or before entering the inner components of the unit, be sure that the power supply is disconnected. The compressor's heads and discharge pipes are usually at high temperature levels. Be very careful when operating in their surroundings. Aluminium coil fins are very sharp and can cause serious wounds. Be very careful when operating in near them. After maintenance operations, re-install the cover panels, and fix them by means of screws.***
	***The refrigerant circuits must not be filled with different gas other than that indicated on the nameplate. The use of a different refrigerant can cause severe damage to the compressor.***
	***It's forbidden to use oils other than those specified in this manual. The use of a different oil can cause serious damage to the compressor.***
	***WARNING: MOVING PARTS, RISK OF DEATH.*** ***Disconnect the power supply and ensure that the fan is stopped before opening the front panel.***
	***The temperatures of heads and exhaust piping of the compressor are usually high.*** ***Pay attention to the surfaces of the driver boards heat sinks (see Chapter 26), which can become very hot.***
	***Be careful when working near condensing coils.*** ***The aluminum fins are very sharp and can cause serious injuries.***

It is a good rule to carry out periodic checks in order to verify the proper operation of the unit.

OPERATION	1 month	4	6 month
Filling the water circuit.	x		
Presence of bubbles in the water circuit.	x		
Check if the safety and control devices work correctly	x		
Check if there is oil leakage from compressor.	x		
Check if there is water leakages from the hydraulic circuit.	x		
Check the proper working of the flow switches.	x		
Check that the crankcase electric heaters are properly supplied and functioning.	x		
Clean the metallic filters of the hydraulic circuit.	x		
Clean the finned coil by means of compressed air or water jet.	x		
Check if all the terminals on the electric board as well as on the terminals of the compressor are properly fixed.		x	
Check the tightening of water connections.		x	
Check the tightening and the balancing of the fan blades.		x	
If the voltage is correct.			x
Check the Correct absorption.			x
Check the refrigerant charge.			x
Check the operating pressure, and superheat and subcooling			x
Check of the efficiency of circulation pump.			x
Check the expansion tank.			x
If the unit should be out of service for a long period, discharge water from the piping and from heat exchanger. This operation is necessary if, during seasonal stoppages, ambient temperature is expected to go down below the freezing point of the employed fluid.			x

12.1 ENVIRONMENTAL PROTECTION

According to the norms dealing with the use of depleting stratospheric ozone substances, it is forbidden to disperse refrigerants fluids in the atmosphere. They have to be collected and delivered to the seller or to proper gathering points at the end of their operating life. Refrigerant R410A is mentioned among controlled substances and for this reason it has to be subjected to the mentioned norms. **A particular care is recommended during service operations in order to reduce as much as possible any refrigerant loss.**

13 WHEN THE UNIT GOES OUT OF SERVICE

Once the unit comes to the end of its life cycle and needs to be removed or replaced, the following operations are recommended:

- the refrigerant has to be recovered by trained people and sent to proper collecting centre;
- compressors' lubricating oil has to be collected and sent to proper collecting centre;
- the frame and the various components, if not serviceable any longer, have to be dismantled and divided according to their nature, particularly copper and aluminium, which are present in conspicuous quantity in the unit. These operations allow easy material recover and recycling process, thus reducing the environmental impact.

14 TECHNICAL DATA

14.1 STANDARD VERSION

TECHNICAL CHARACTERISTICS		Unit	Model UMHPI							
			25	25 Integrated circulator	35	35 Integrated circulator	50	50 Integrated circulator	60	60 Integrated circulator
Electric data	Power supply		400V/3P+N+T/50Hz		400V/3P+N+T/50Hz		400V/3P+N+T/50Hz		400V/3P+N+T/50Hz	
	Maximum power input	kW	14,83	15,14	19,16	19,47	28,62	29,09	31,19	31,92
	Maximum starting	A	13,9	14,2	17,9	18,2	26,8	27,3	28,9	29,5
	Maximum current input	A	21,4	21,9	27,7	28,1	41,4	42,1	45,1	46,1
Cooling	Cooling capacity (1)	kW	30,50(33,5*)	30,45(33,5*)	36,41(39,3*)	36,37(39,3*)	49,11(52,1*)	48,86(51,8*)	57,16(60,6*)	57,20(60,6*)
	Power input (1)	kW	6,77	6,82	8,87	8,91	12,27	12,52	14,01	13,97
	E.E.R. (1)	W/W	4,50	4,46	4,11	4,08	4,00	3,90	4,08	4,09
	Cooling capacity (2)	kW	21,02(23,1*)	21,04(23,1*)	26,88(29,0*)	26,90(29,1*)	36,21(38,4*)	36,10(38,3*)	43,05(45,6*)	43,00(45,6*)
	Power input (2)	kW	6,48	6,46	9,12	9,10	12,79	12,90	13,72	13,77
	E.E.R. (2)	W/W	3,24	3,26	2,95	2,96	2,83	2,80	3,14	3,12
	ESEER (5)	W/W	5,34		5,47		5,04		6,07	
Heating	Heating capacity (3)	kW	24,72(27,2*)	24,72(27,2*)	32,50(35,1*)	32,50(35,1*)	48,46(51,4*)	48,70(51,6*)	52,01(55,1*)	52,00(55,1*)
	Power input (3)	kW	5,62	5,62	7,98	7,98	11,63	11,87	12,60	12,59
	C.O.P. (3)	W/W	4,40	4,40	4,07	4,07	4,17	4,10	4.13	4,13
	Heating capacity (4)	kW	22,18(24,4*)	22,16(24,4*)	32,50(35,1*)	32,50(35,1*)	41,26(43,7*)	41,40(43,9*)	49,30(52,3*)	49,30(52,3*)
	Power input (4)	kW	6,46	6,44	9,97	9,97	12,26	12,40	15,12	15,12
	C.O.P. (4)	W/W	3,43	3,44	3,26	3,26	3,37	3,34	3,26	3,26
	SCOP (6)	W/W	3,83		3,88		3,82		3,82	
Compressor	Brand		Mitsubishi		Mitsubishi		Mitsubishi		Mitsubishi	
	Type		Scroll DC Inverter		Scroll DC Inverter		Scroll DC inverter		Scroll DC inverter	
	Number		1		2		2		2	
	Refrigerant oil (type, quantity)	mL	FV50S, 2300		FV50S, 3400 total		FV50S, 4600 total		FVC68D, 4600 total	
Fan motor	Type		DC Brushless Motor		DC Brushless Motor		DC Brushless Motor		DC Brushless Motor	
	Number		1		1		1		1	
	Rated power input (2)	kW	0,60		0,72		1,10		1,58	
	Max power input	kW	1,45		1,50		1,78		1,95	
	Max current input	A	2,10		2,17		2,57		2,85	
	Speed	r/min	540		580		670		770	
	Rated air flow	m^3/s	5,00		5,56		6,94		7,72	
Refrigerant	Type		R410A		R410A		R410A		R410A	
	Refrigerant quantity	kg	9,7		10,2		15,7		16,2	
	Design pressure (high/low)	MPa	4,15/2,7		4,15/2,7		4,15/2,7		4,15/2,7	
Hydraulic circuit	Water flow rate (2)	L/s	1,00	1,01	1,28	1,29	1,73	1,72	2,06	2,05
	Available head pressure	kPa	/	88	/	81	/	70	/	90
	Internal head loss (2)	kPa	30		34		48		60	
	Pump rated power input	kW	/	0,27	/	0,31	/	0,44	/	0,73
	Pump max power input	kW	/	0,31	/	0,31	/	0,55	/	0,73
	Pump max current input	A	/	1,37	/	1,37	/	2,05	/	3.20
	Hydraulic connections	inch	2"F		2"F		2"F		2"F	
	Minimum volume of	L	75		105		150		180	
Noise level	Sound pressure (7)	dB(A)	54,4 / SL 52,4 / SSL 50,7		56,5 / SL 54,7 / SSL 53,0		59,7 / SL 58,7 / SSL 56,5		61,6 / SL 60,8 / SSL 58,6	
Dimensions and weight	Dimensions (L×H×W)	mm	1198x1673x1198		1198x1673x1198		1198x1741x1198		1198x1741x1198	
	Max. Packing dimensions (L×H×W)	mm	1200x1860x1200		1200x1860x1200		1200x1860x1200		1200x1860x1200	
	Operating weight	kg	357	363	414	420	422	436	438	462
	Net/Gross weight	kg	349/369	355/375	406/426	412/432	414/434	428/448	430/450	454/474

Operating conditions:

(1) Cooling: Outdoor air temperature 35°C; inlet/outlet temperature 23/18°C.

(2) Cooling: Outdoor air temperature 35°C; inlet/outlet temperature 12/7°C.

(3) Heating: Outdoor air temperature 7°C DB 6°C WB; inlet/outlet temperature 30/35°C.

(4) Heating: Outdoor air temperature 7°C DB 6°C WB.; inlet/outlet temperature 40/45°C.

(5) Cooling: water temperature inlet/outlet 23/18°C.

(6) Heating: normal climatic condition; Tbiv=-7°C; eater temperature inlet/outlet 30/35°C.

(7) Sound pressure level measured at 1m from the unit, in free field, according to ISO 3744. Also the values with installed accessories SL or SSL have been reported.

(*) With Hz max operation already enabled by factory default, can be disabled only with the optional control panel Evo Touch

N.B. The performance data are indicative and could be subject to change. In addition, the performances declared in apex (1), (2), (3) and (4) refer to the instantaneous power according to EN 14511. The declared data stated in the apex (6) is determined according to the UNI EN 14825.

	***WARNING: The minimum temperature allowed for storing the unit is 5°C.***

14.2 V VERSION

TECHNICAL CHARACTERISTICS		Unit	Models UMHPI V					
			25	25 Circulator integrated	35	35 Circulator integrated	50	50 Circulator integrated
Electric data	Power supply		400V/3P+N+T/50Hz		400V/3P+N+T/50Hz		400V/3P+N+T/50Hz	
	Maximum power input	kW	14,83	15,14	19,16	19,47	28,62	29,09
	Maximum starting current	A	13,9	14,2	17,9	18,2	26,8	27,3
	Maximum current input	A	21,4	21,9	27,7	28,1	41,4	42,1
Cooling	Cooling capacity (1)	kW	30,72 (33,8*)	30,67 (33,7*)	36,41 (39,3*)	36,37 (39,3*)	47,78 (50,6*)	47,56 (50,4*)
	Power input (1)	kW	7,29	7,34	8,87	8,91	12,30	12,52
	E.E.R. (1)	W/W	4,21	4,18	4,11	4,08	3,88	3,80
	Cooling capacity (2)	kW	22,47 (24,7*)	22,50 (24,8*)	26,88 (29,0*)	26,90 (29,1*)	37,71 (40,0*)	37,60 (39,9*)
	Power input (2)	kW	7,29	7,26	9,12	9,10	12,72	12,83
	E.E.R. (2)	W/W	3,08	3,10	2,95	2,96	2,97	2,93
	ESEER (5)	W/W	5,28		5,47		5,30	
Heating	Heating capacity (3)	kW	25,80 (28,4*)	25,80 (28,4*)	32,50 (35,1*)	32,50 (35,1*)	49,01 (51,9*)	49,26 (52,2*)
	Power input (3)	kW	6,17	6,17	7,98	7,98	12,68	12,93
	C.O.P. (3)	W/W	4,18	4,18	4,07	4,07	3,87	3,81
	Heating capacity (4)	kW	25,67 (28,2*)	25,65 (28,2*)	32,50 (35,1*)	32,50 (35,1*)	47,04 (49,9*)	47,26 (50,1*)
	Power input (4)	kW	7,29	7,27	9,97	9,97	14,18	14,40
	C.O.P. (4)	W/W	3,52	3,53	3,26	3,26	3,32	3,28
	SCOP (6)	W/W	4,02		4,03		3,82	
Compressor	Brand		Mitsubishi		Mitsubishi		Mitsubishi	
	Type		Scroll DC Inverter		Scroll DC Inverter		Scroll DC inverter	
	Number		1		2		2	
	Refrigerant oil (type, quantity)	mL	FV50S, 2300		FV50S, 3400 total		FV50S, 4600 total	
Fan motor	Type		DC Brushless Motor		DC Brushless Motor		DC Brushless Motor	
	Number		1		1		1	
	Rated power input (2)	kW	0,60		0,72		1,10	
	Max power input	kW	1,45		1,50		1,78	
	Max current input	A	2,10		2,17		2,57	
	Speed	r/min	540		580		670	
	Rated air flow	m^3/s	5,00		5,56		6,94	
Refrigerant	Type		R410A		R410A		R410A	
	Refrigerant quantity	kg	10,4		11,2		16,7	
	Design pressure (high/low)	MPa	4,15/2,7		4,15/2,7		4,15/2,7	
Hydraulic circuit	Water flow rate (2)	L/s	1,07	1,07	1,28	1,29	1,80	1,80
	Available head pressure (2)	kPa	/	84	/	81	/	65
	Internal head loss (2)	kPa	33		34		51	
	Pump rated power input (2)	kW	/	0,28	/	0,31	/	0,45
	Pump max power input	kW	/	0,31	/	0,31	/	0,55
	Pump max current input	A	/	1,37	/	1,37	/	2,05
	Hydraulic connections	inch	2"F		2"F		2"F	
	Minimum volume of water	L	75		105		150	
Noise level	Sound pressure (7)	dB(A)	54,4 / SL 52,4 / SSL 50,7		56,5 / SL 54,7 / SSL 53,0		59,7 / SL 58,7 / SSL 56,5	
Dimensions and weight	Dimensions (L×H×W)	mm	1198x1673x1198		1198x1673x1198		1198x1741x1198	
	Max. Packing dimensions	mm	1200x1860x1200		1200x1860x1200		1200x1860x1200	
	Operating weight	kg	363	369	420	426	428	442
	Net/Gross weight	kg	355/375	361/381	412/432	418/438	420/440	434/454

Operating conditions:

(1) Cooling: Outdoor air temperature 35°C; inlet/outlet temperature 23/18°C.

(2) Cooling: Outdoor air temperature 35°C; inlet/outlet temperature 12/7°C.

(3) Heating: Outdoor air temperature 7°C DB 6°C WB; inlet/outlet temperature 30/35°C.

(4) Heating: Outdoor air temperature 7°C DB 6°C WB; inlet/outlet temperature 40/45°C.

(5) Cooling: water temperature inlet/outlet 23/18°C.

(6) Heating: normal climatic condition; Tbiv=-7°C; eater temperature inlet/outelt 30/35°C.

(7) Sound pressure level measured at 1m from the unit, in free field, according to ISO 3744. Also the values with installed accessories SL or SSL have been reported.

(*) With Hz max operation already enabled by factory default, can be disabled only with the optional control panel Evo Touch

N.B. The performance data are indicative and could be subject to change.In addition, the performances declared in apex (1), (2), (3) and (4) refer to the instantaneous power according to EN 14511. The declared data stated in the apex (6) is determined according to the UNI EN 14825.

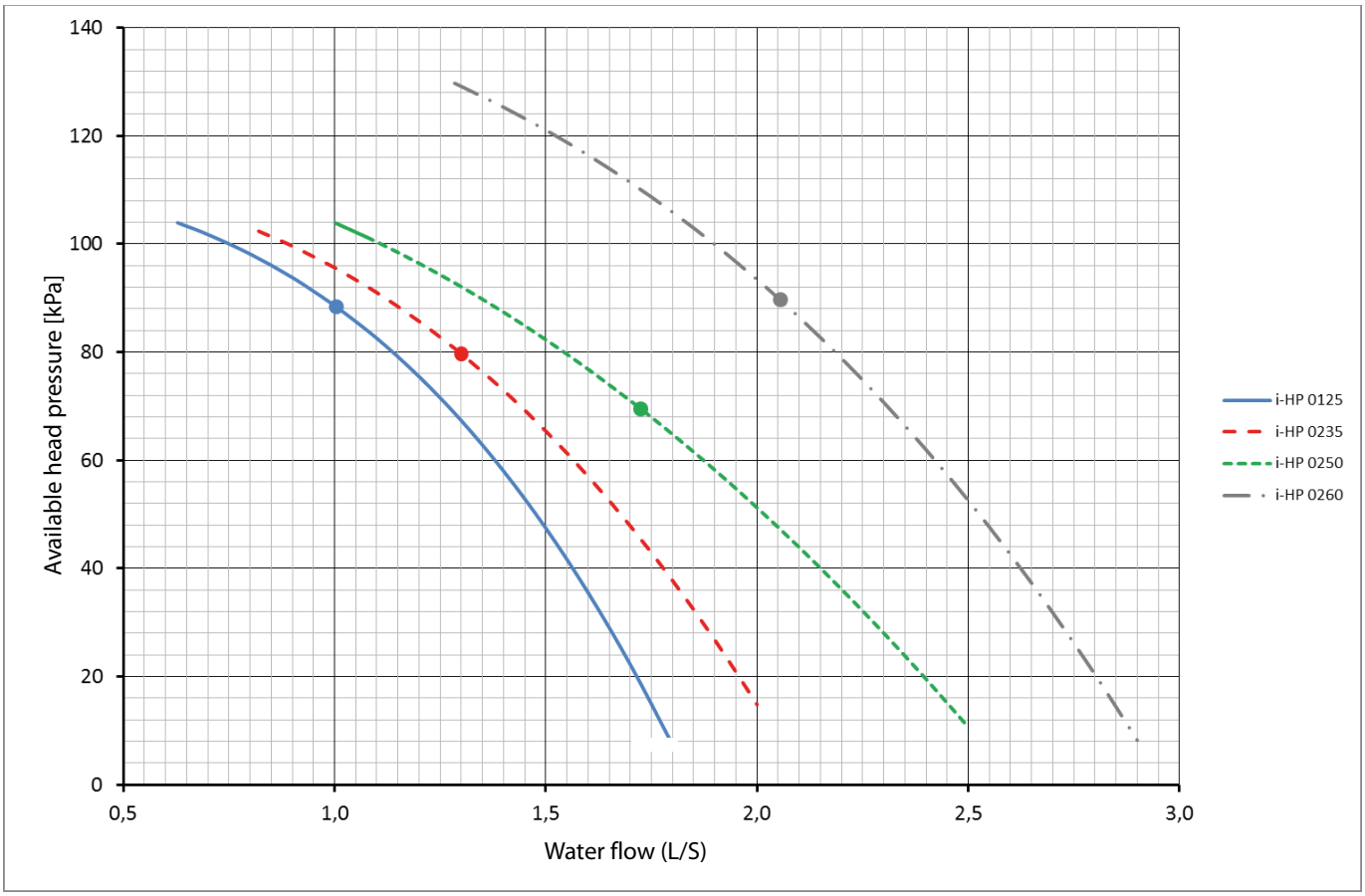
15 ELECTRIC DATA OF THE UNIT AND AUXILIARIES

Power supply of the unit	V/~/Hz	400/3/50	**Remote control circuit**	V/~/Hz	12/1/50
Control board circuit	V/~/Hz	12/1/50	**Fans power supply**	V/~/Hz	230/1/50

Note: Electric data may change for updating. It is therefore necessary to refer always to the technical data label sticked on right-side panel of the unit.

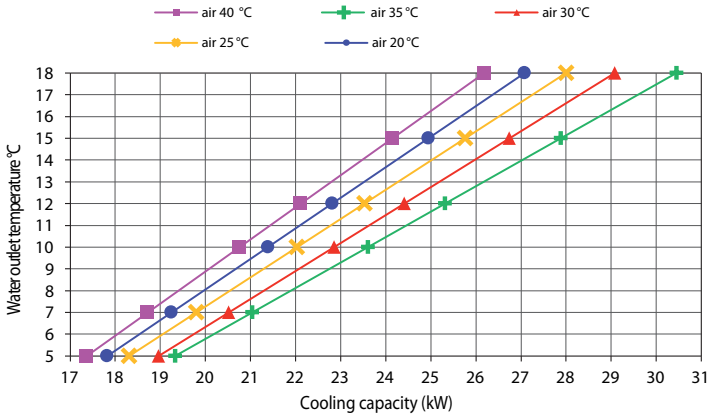
16 HEAT PUMPS AVAILABLE HEAD PRESSURE WITH INTEGRATED CIRCULATOR

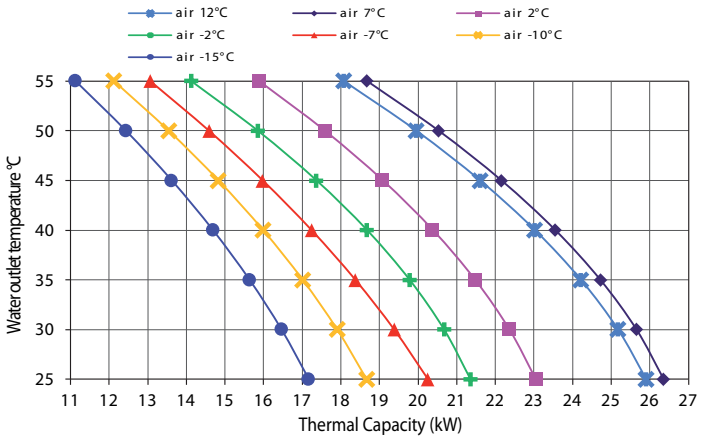
Below the characteristic curves corresponding to Head pressure-Water flow without head losses of the hydronic kit (which is composed of the components describe in the Paragraph 5.10)at the maximum speed of the circulator. The optimal operating point is shown on each curve under the specified conditions at the apex (1) p. 25. The circuit's plant must be designed so as to ensure the nominal water flow rate corresponding to the operating points indicated below. For operating points of V VERSION, refer to water flow rates that are reported in the table on Paragraph 14.2.

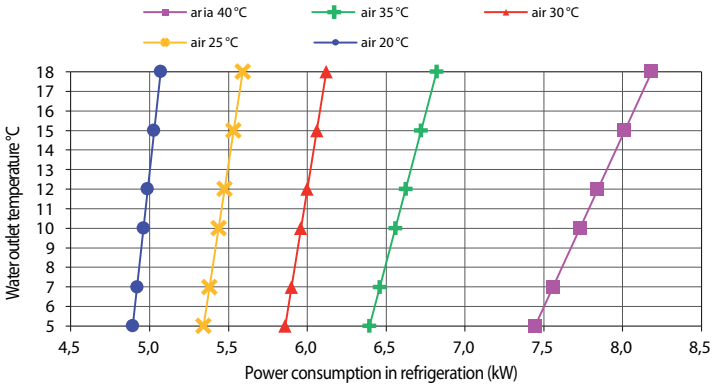


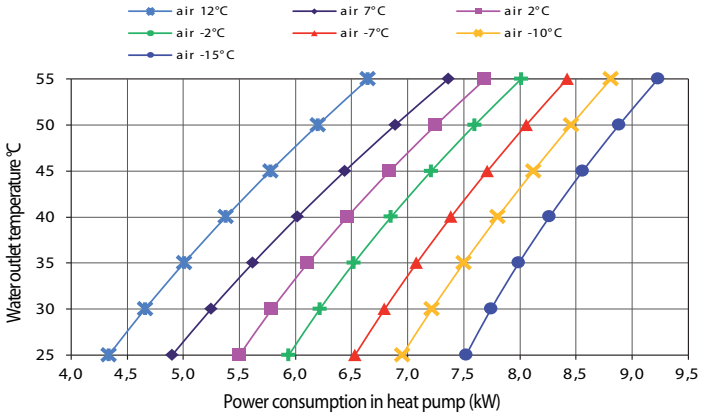
17 PERFORMANCE

17.1 MODELS UMHPI 25

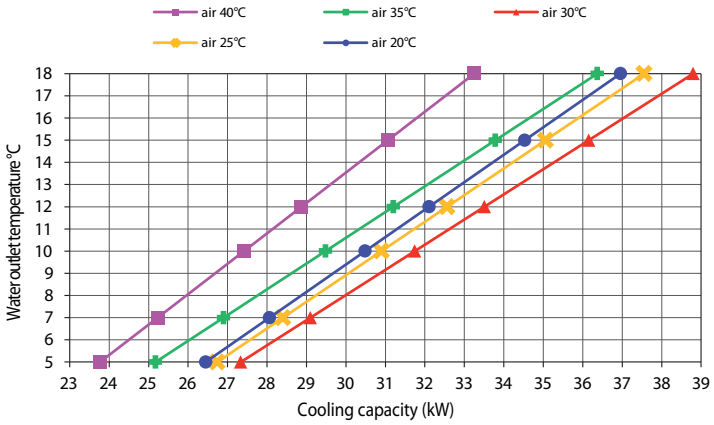


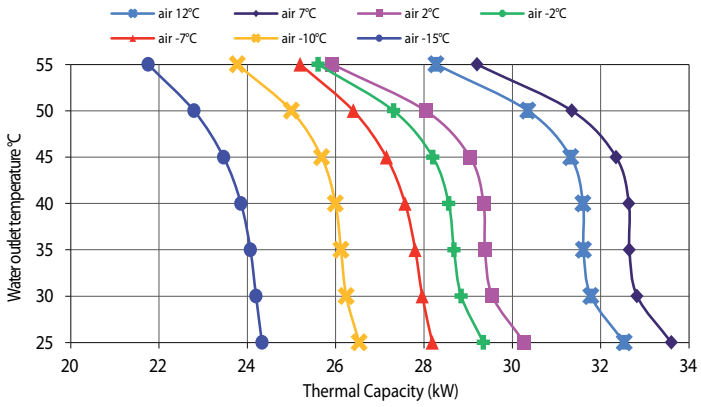


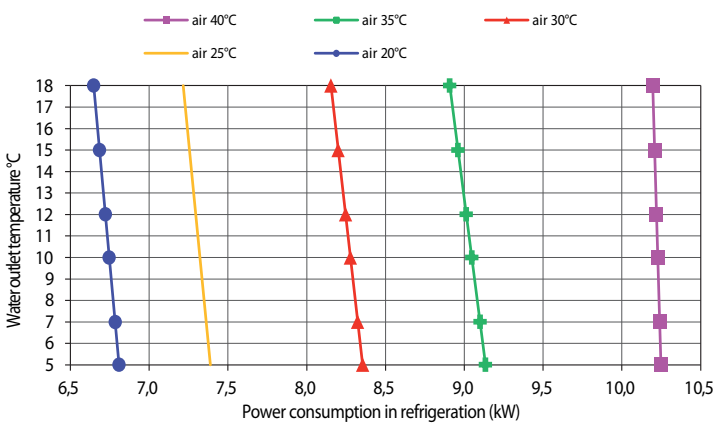


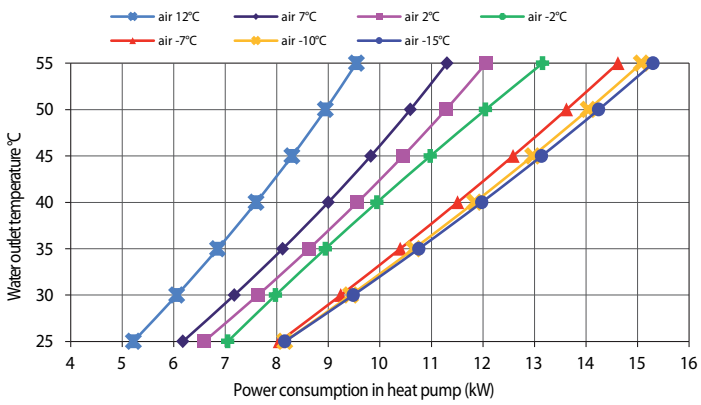


17.2 MODELS UMHPI 35

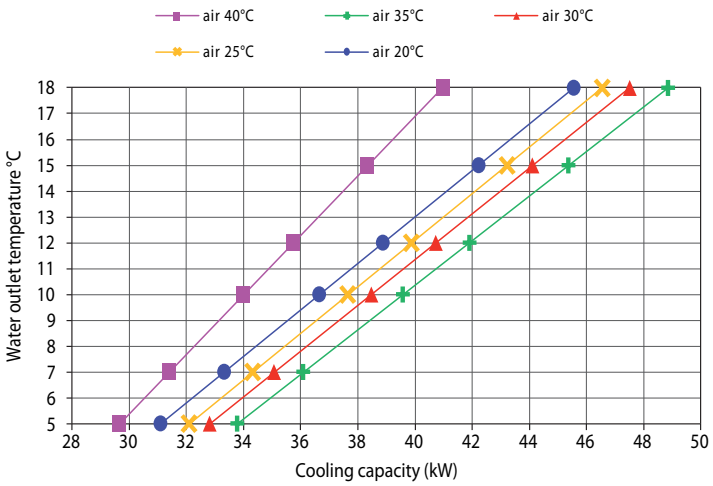


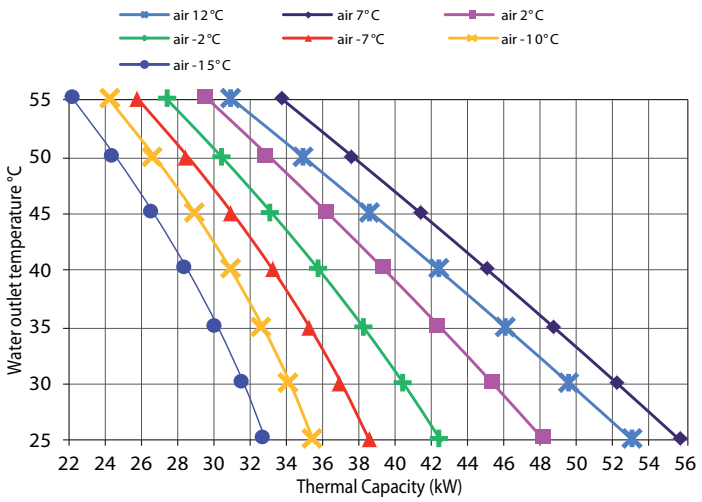


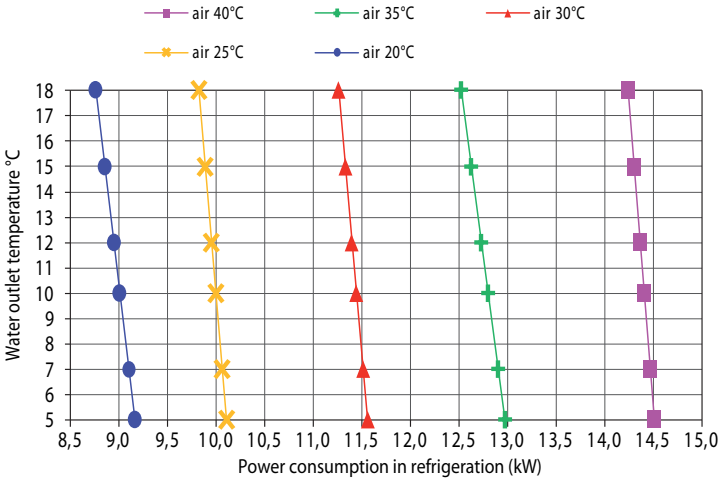


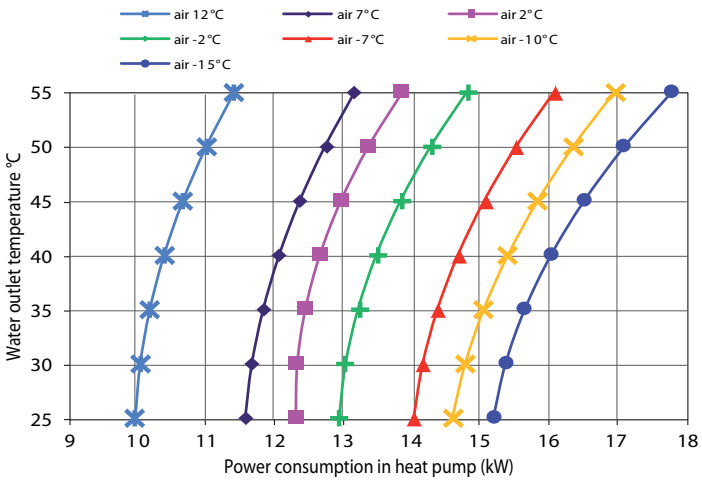


17.3 MODELS UMHPI 50

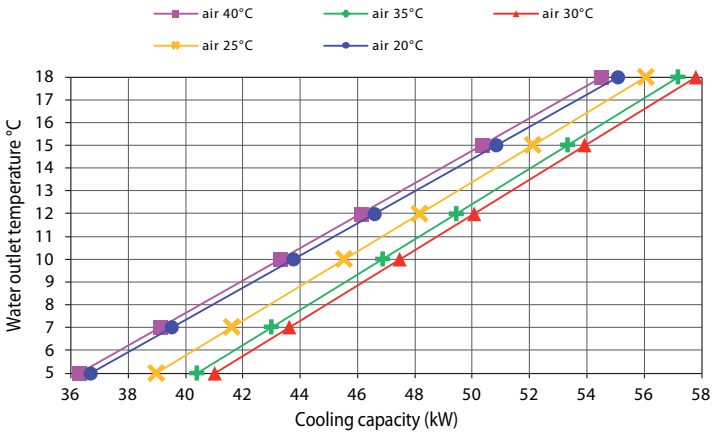


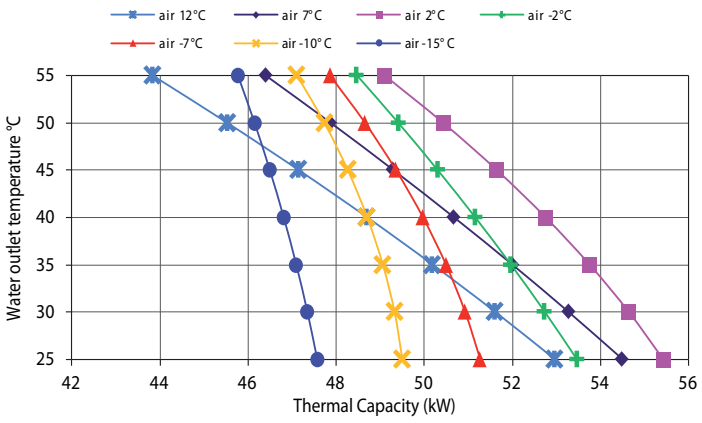


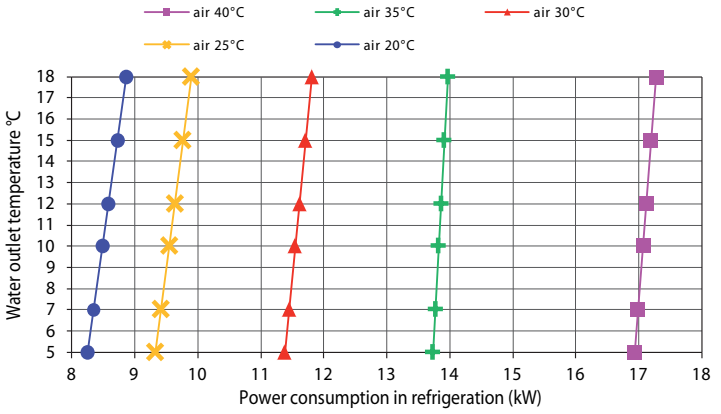


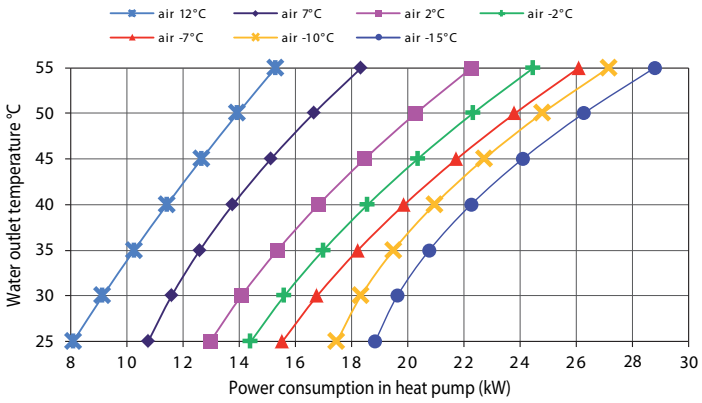


17.4 MODELS UMHPI 60

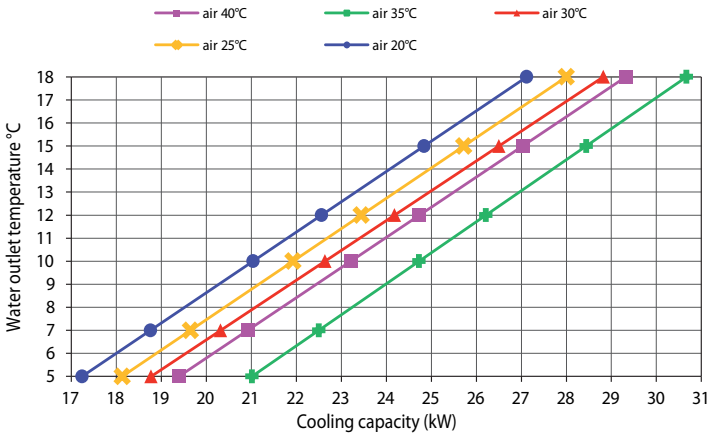


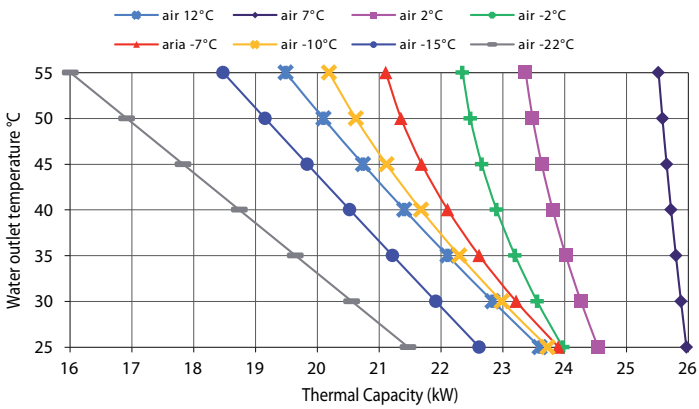


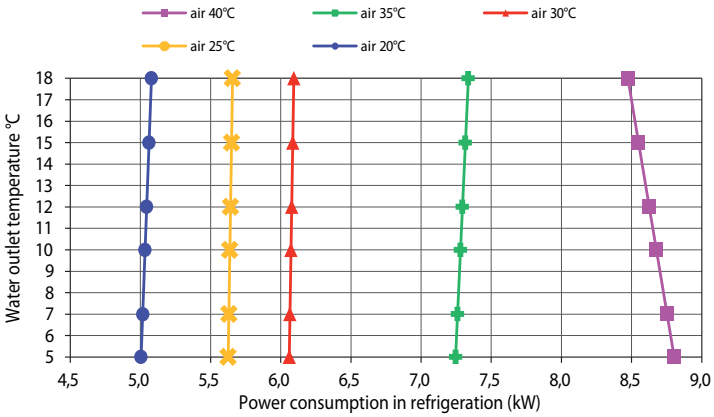


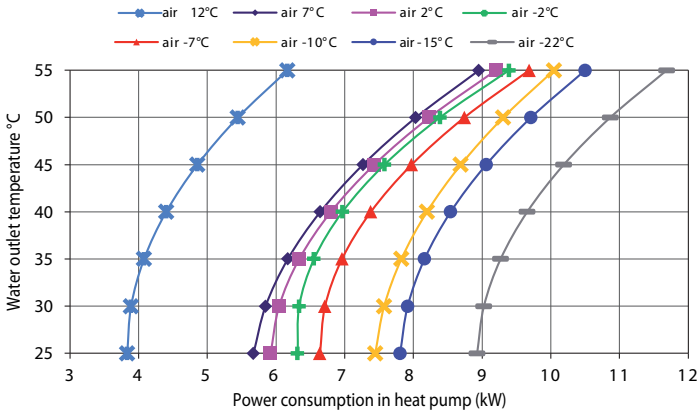


17.5 MODELS UMHPI 25 V

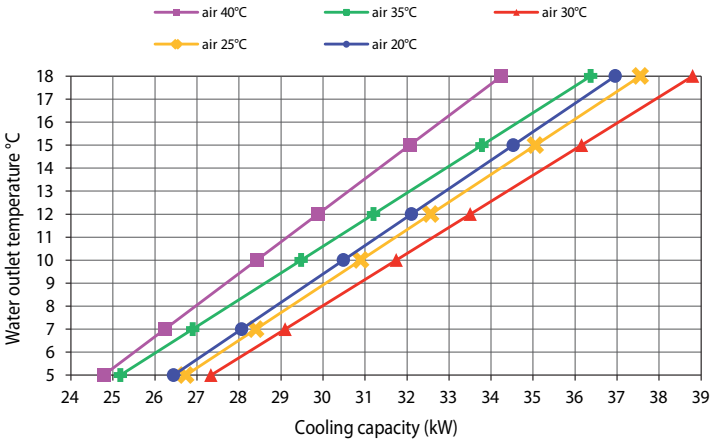


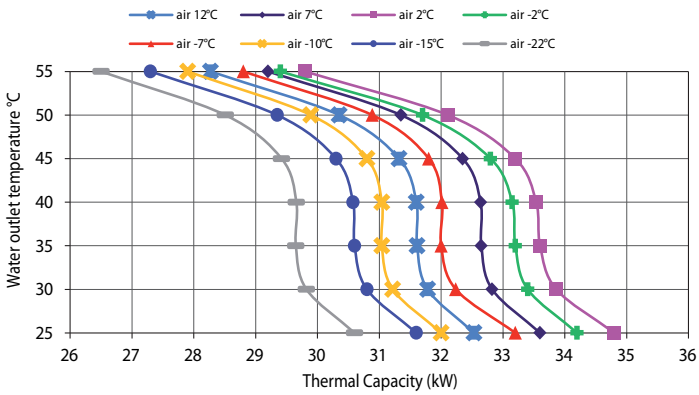


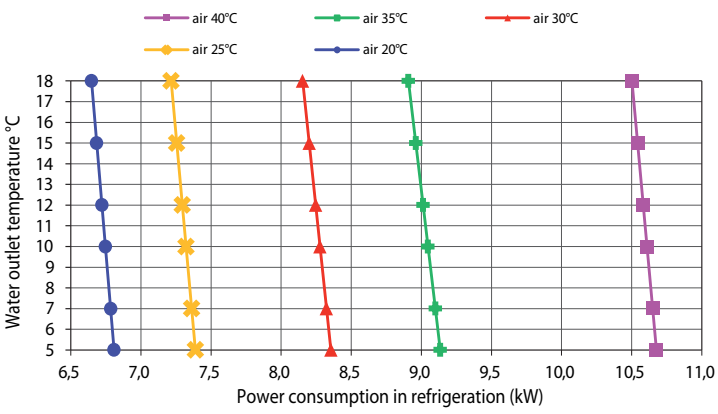


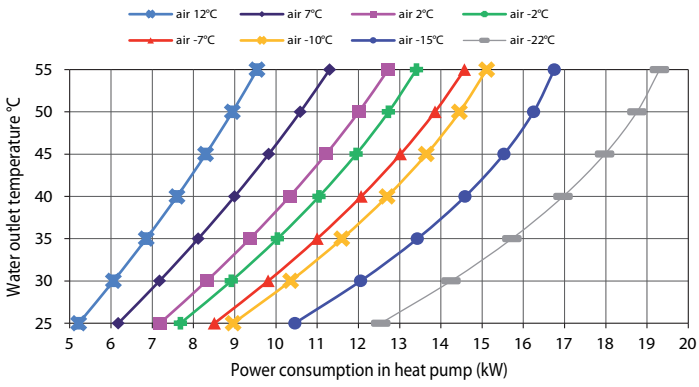


17.6 MODELS UMHPI 35 V

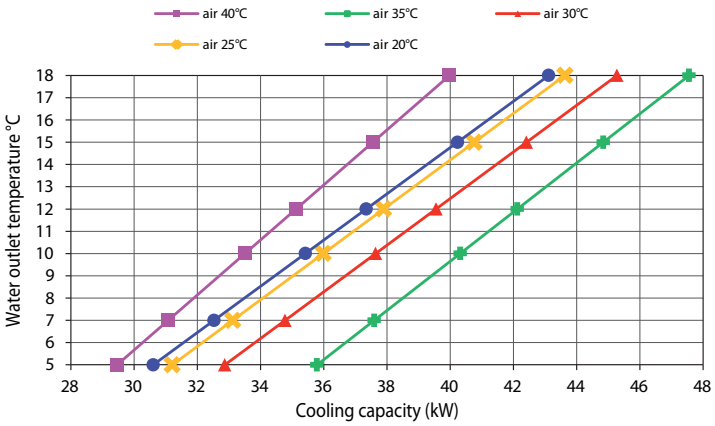


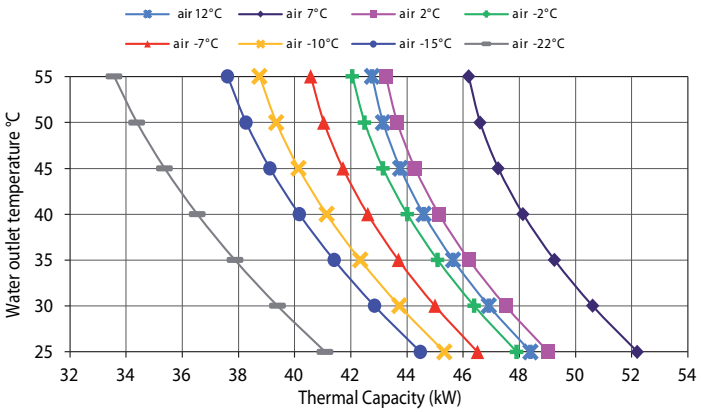


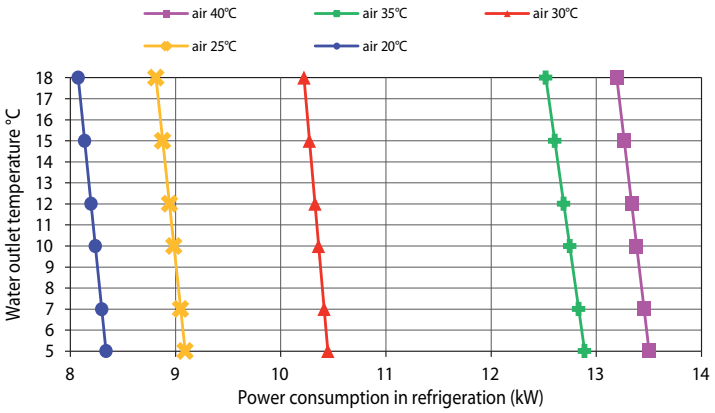


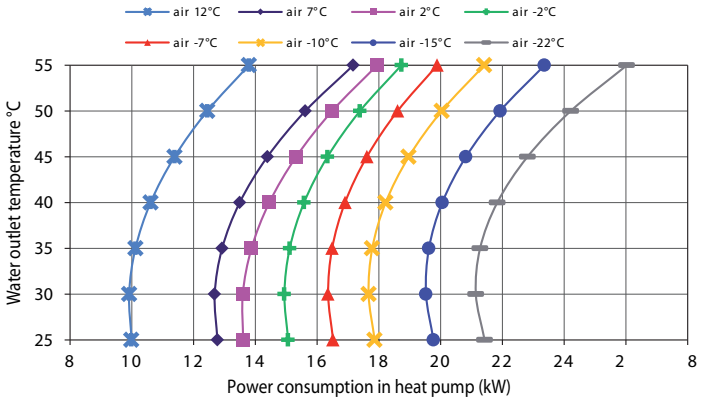


17.7 MODELS UMHPI 50 V





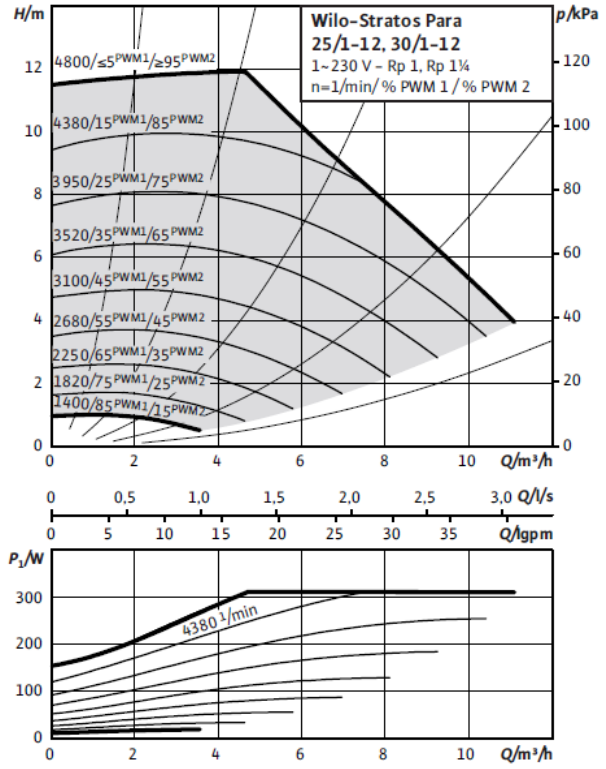




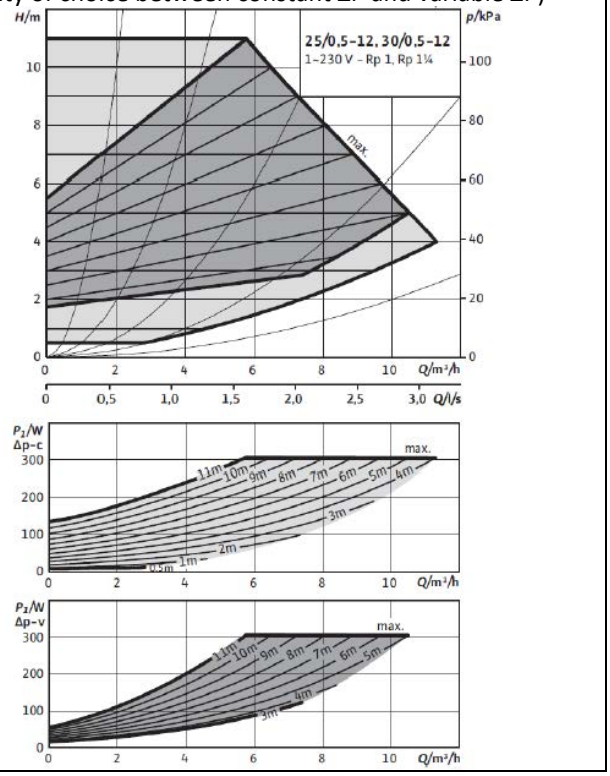
18 CIRCULATOR PERFORMANCE

18.1 MODELS UMHPI 25 - 35

Configuration with integrated circulator, control via PWM1 signal

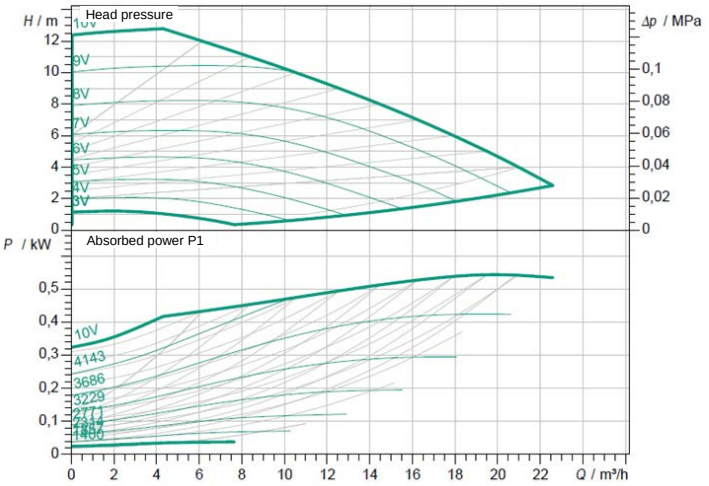


Configuration with auto-adaptive circulator (with the possibility of choice between constant ΔP and variable ΔP)

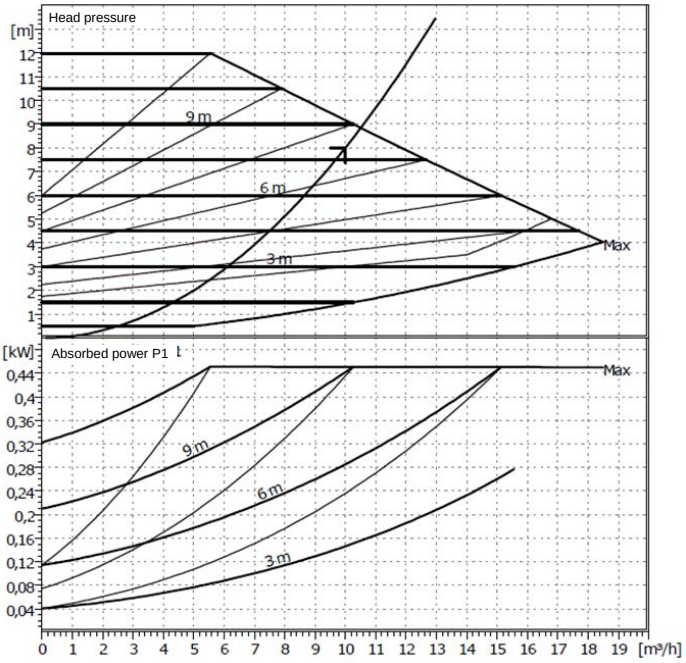


18.2 MODEL UMHPI 50

Configuration with integrated circulator, control via 0-10 volt analogic signal

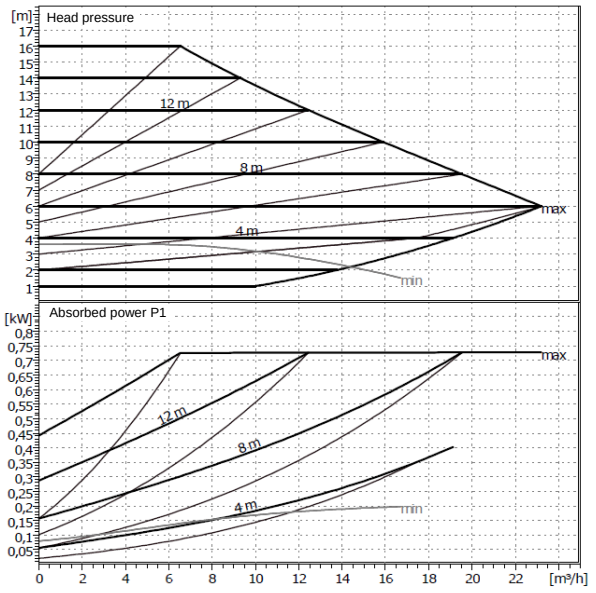


Configuration with auto-adaptive circulator (with the possibility of choice between constant ΔP and variable ΔP)

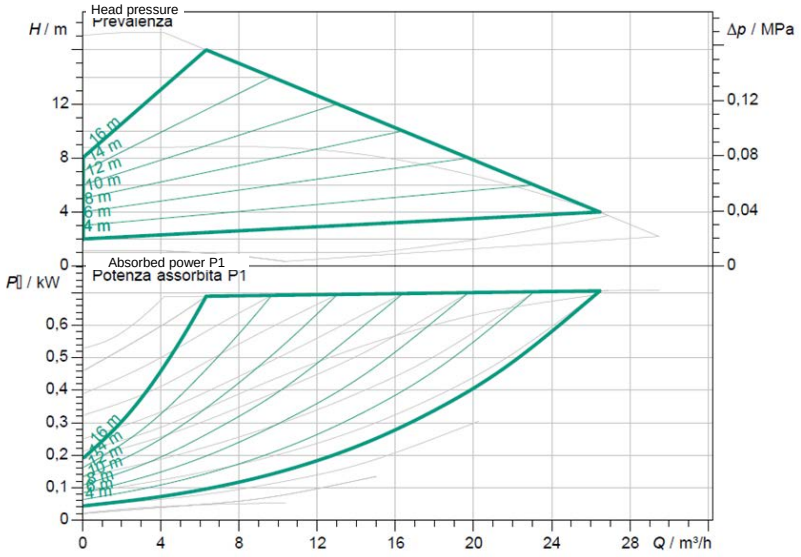


18.3 MODEL UMHPI 60

Configuration with integrated circulator, control via 0-10 volt analogic signal



Configuration with auto-adaptive circulator (with the possibility of choice between constant ΔP and variable ΔP)



18.4 CIRCULATOR CHARACTERISTICS

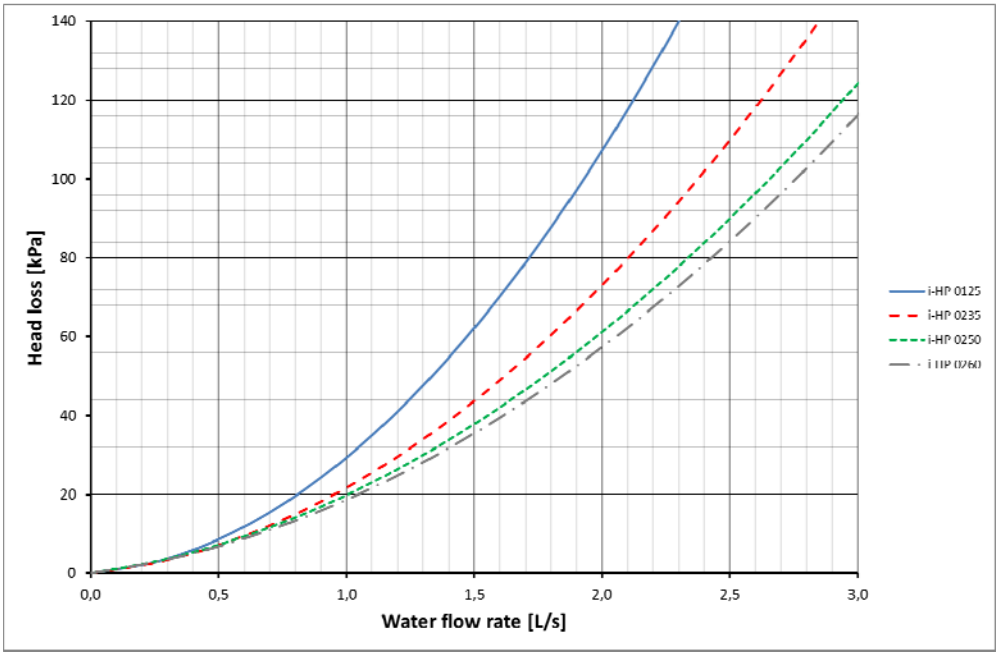
Model:	UMHPI 25		UMHPI 35		UMHPI 50		UMHPI 60	
Configuration:	Integrated	Auto adaptive	Integrated	Auto adaptive	Integrated	Auto adaptive	Integrated	Auto adaptive
Max absorbed power [kW]	310	305	310	305	550	450	730	710
Max absorbed current [A]	1,37	1,33	1,37	1,33	2,05	2	3,2	3,15
EEI (energy efficiency index)	≤ 0,23	≤ 0,23	≤ 0,23	≤ 0,23	≤ 0,20	≤ 0,23	≤ 0,23	≤ 0,23

Because of the circulators have got similar prevalence curves to those integrated, please refer to Paragraph 16 for plant designing.

It's advisable to use:
- the adjustment scale on the right of the knob (constant ΔP) in the case of use of thermostatic valves on the plant
- the adjustment scale on the left of the knob (variable ΔP) in the case of use of 3-way valves on the plant

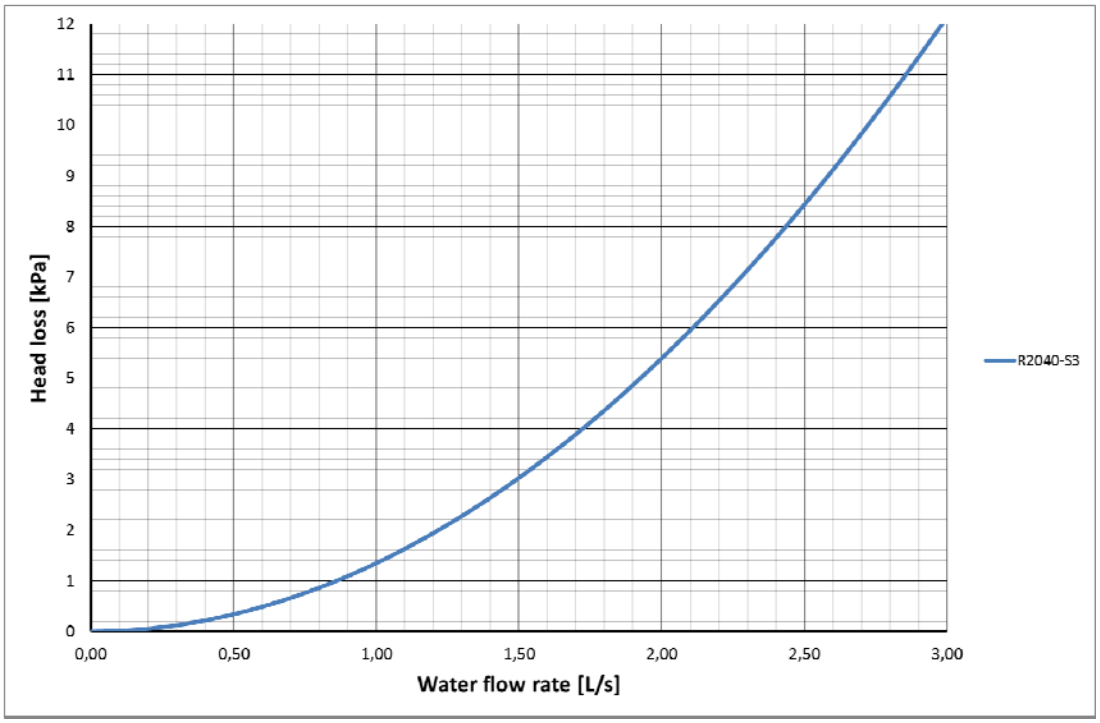
19 HEAD LOSS CURVES OF THE HYDRONIC CIRCUIT

We obtain the pressure head of the circulating pump from the sum of the head losses of the hydronic circuit and the available head pressure.
For example: for the model UMHPI 25 with nominal water flow 1,01 L/s we obtain: 30 kPa (head loss) + 88 kPa (available head pressure)=118 kPa (circulator head pressure).



20 CHARACTERISTIC CURVE OF THE CONTROL VALVE FOR UNIT IN PARALLEL

If the hydronic configuration (CI) is installed on the unit with the variant "shut off valve" (2), the head losses of the ON / OFF motorized valve should be added to those given in the curves of Paragraph 19.
For example: for the model UMHPI 25 with nominal water flow 1,01 L/s it's obtained: 1,4 kPa (valve head loss) + 30 kPa (hydronic circuit head loss)=34,9 kPa (total internal head loss).



21 ACCESSORIES TO REDUCE THE NOISE LEVEL

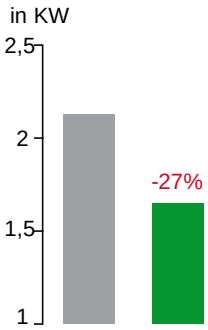
21.1 SL

The silenced unit (with SL accessory) is provided with innovating thermo-acoustic shells on compressors. These shells allow a noise reduction up to 10% at specific compressor rotation frequencies. The special multi-layer structure generates a thermal insulation which reduces, at very low outside temperatures, the heat losses of 2% compared to a standard insulation.

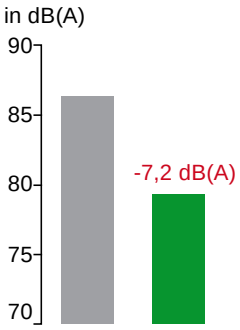
21.2 SSL

The super silenced unit (with SSL accessory) is provided not only with the thermo-acoustic shells on compressors but also with a special diffuser installed on the fan. The diffuser structure improves the air flow efficiency and allows a fan speed reduction, lowering the acoustic pressure by up to 7,2 dB(A) and energy consumption by up to 27% with unchanged airflow. That could lead to a saving up of a lot of money in energy costs per fan per year. Alternatively, you could make use of the greater efficiency to boost air performance by up to 9% with comparable energy consumption.

AxiTop Diffuser

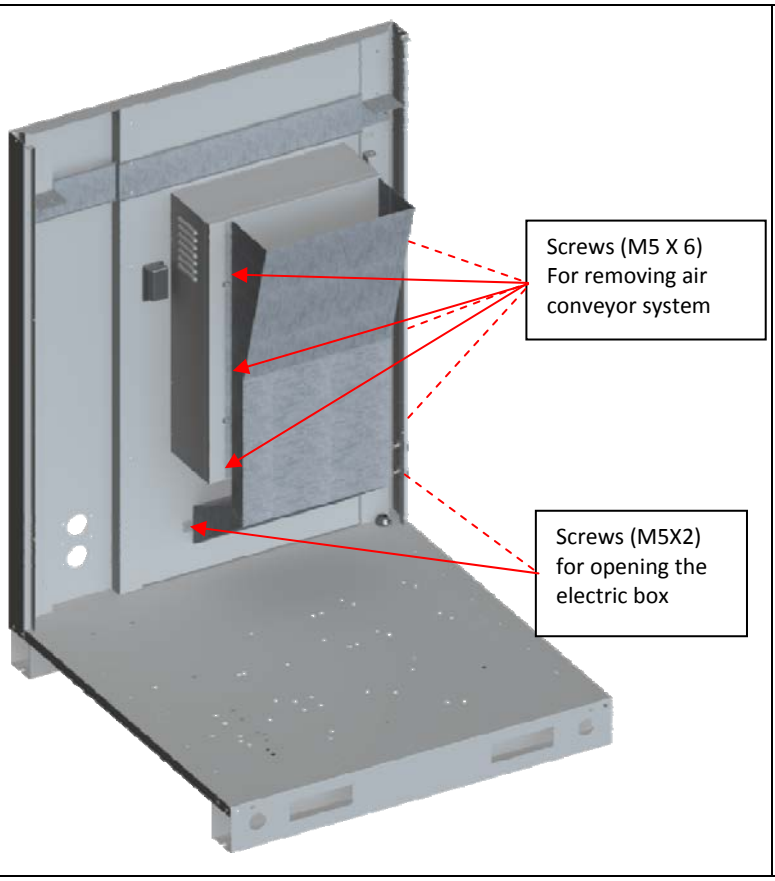


Less energy consumption
at same air volume



Reduced noise
at same air volume

22 AIR CONVEYOR SYSTEM FOR THE VERSIONS WITH INJECTION



For injection versions (dUMHPI V), the air conveyor system is installed behind the electrical box for optimizing the cooling of the driver boards.
To open the electric panel, it is necessary to remove the air conveyor system by removing the 2 fixing screws (M5) to the front panel.
To remove completely the air conveyor system for maintenance operations, remove the additional 6 screws (M5) on the sides.

23 OPERATING LIMITS

23.1 EVAPORATOR WATER FLOW RATE

The nominal water flow rate is referred to a ΔT equal to 5°C, between the evaporator's inlet and outlet temperatures. The allowed maximum flow rate is corresponding to ΔT=3°C. Higher values may produce too high pressure drops. The allowed minimum water

flow rate is corresponding to ΔT=8°C. Insufficient values of water flow may produce too low evaporating temperatures according to the operating status with the intervention of safety devices which would stop the unit and, in some particular cases, the water can freeze in the evaporator coil which can breakdown the refrigeration circuit or causes the increasing of the condensing pressure with the shutdown risk of the appliance and the compressor could be damaged.
We enclosed below a most accurate table showing the minimum water flow that should be ensured for the plate heat exchanger in order to have the proper operation of unit as a function of the model (**note:** the water flow switch is used for preventing the freezing sensor from failure in the case of insufficient water flow but it does not ensure the minimum flow rate required in order the unit can work properly)

Models	UMHPI			
	25	35	50	60
Cooling capacity for reference [kW]	30,45	36,37	48,86	57,20
Minimum water flow rate that to ensure [L/s]	0,91	1,09	1,46	1,71

As a first approach, and in the absence of other detection systems, the proper flow rate for getting the best performance from your unit can be found at maximum speed of the circulator, using the pressure gauges for controlling the pressure difference between the return and the delivery water on the outside water connections of the unit and make sure that such value is equal or less than the static pressure indicated on the curves shown in paragraph 16 for the respective models and if it's necessary change the settings (for the related circulator) that are reported in the USER manual.

23.2 COLD WATER TEMPERATURE (SUMMER OPERATION)

The minimum temperature that is allowed at the evaporator's outlet is 5°C: for more lower temperatures the unit should undergo some necessaries structural modifications and different setting parameters of the controller with micro-processor. In this case please contact our company for the feasibility study and evaluation of changes to be made according to your requests. The maximum temperature that can be maintained at the outlet of the evaporator is 25°C. Higher temperatures (up to a maximum of 40°C) can anyway be tolerated during transitions and start-up phases of the system.

23.3 HOT WATER TEMPERATURE (WINTER OPERATION)

Once the system is working at the right temperature, the inlet hot water temperature should not to be lower than 25°C; the lowest values that are not related to transitional or start-up stages may cause system's malfunction and possible compressor breakdowns. The maximum outlet water temperature should not exceed 60°C. At this temperature, the power consumption and performance in terms of C.O.P. are enhanced if the outdoor temperature is higher than 5°C, even if the unit is still able to work up to the limit of -15°C (-25°C for versions with injection).
For higher temperatures than those pointed out, especially if have a concomitant with the reduction of the water flow rate, it may cause abnormalities to the normal operating of the unit, or the safety devices act in critical cases.

The maximum power consumption of the heat pump alone will take place during the operation with outlet water temperature of 60°C and outdoor temperature of -15°C(-25°C for versions with injection)

23.4 AMBIENT AIR TEMPERATURE

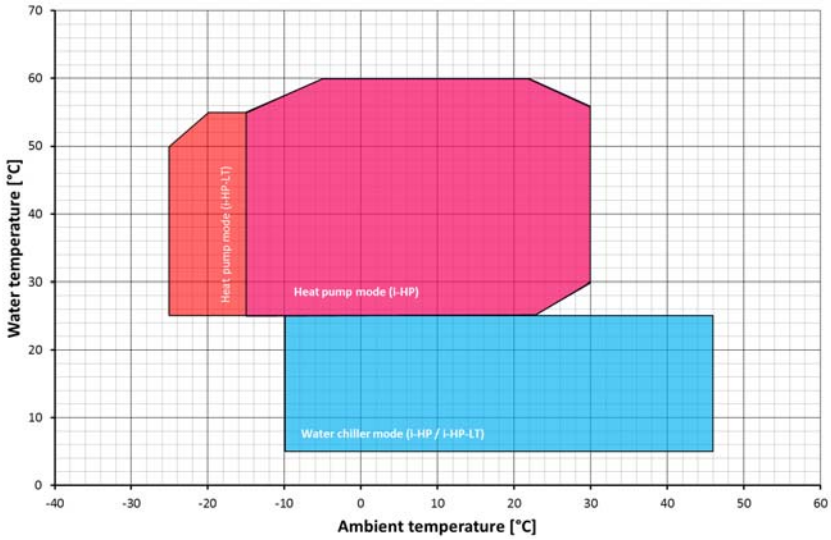
The units are designed and manufactured to operate, in summer operation, with the condensate control, with outdoor air temperatures ranging between -10°C and 46°C. While operating as a heat pump, the allowed range of the outdoor temperature goes from -15°C (-25°C for versions with injection) to 40°C as a function of the water outlet temperature as indicated in the below table.

Operation limits

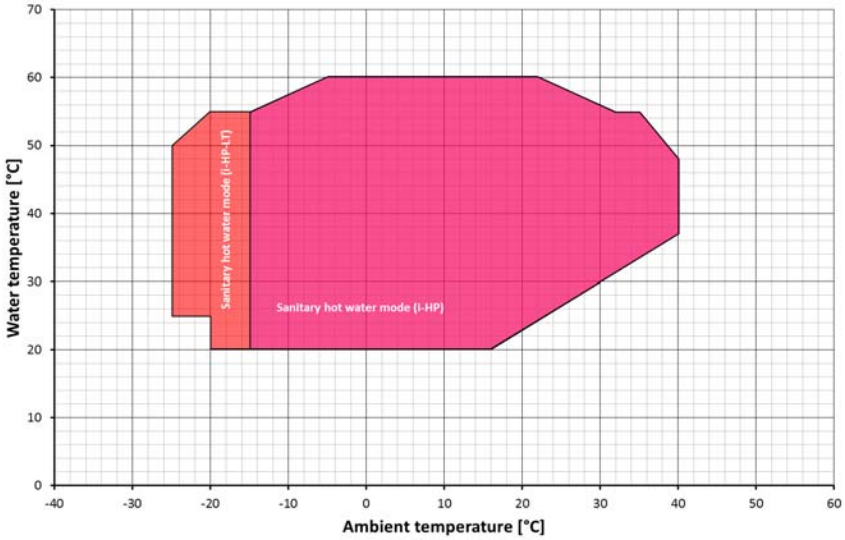
Water chiller mode	
Ambient temperature	Min.-10°C Max. +46°C
Water outlet temperature	Min. +5°C Max. +25°C
Heat pump mode	
Ambient temperature (standard/injection version)	Min. -15/-25°C Max. +30°C
Water outlet temperature (standard/injection version)	Min. +25°C Max. +60°C/+65°C
Heat pump mode for sanitary hot water	
Ambient temperature with maximum water temperature 48°C (standard/injection version)	Min. -15 / -25°C Max. +40°C
Ambient temperature with maximum water temperature 55°C (standard/injection version)	Min. -15 / -25°C Max. +35°C
Water outlet temperature (standard/injection version)	Min. +20°C Max. +60°C/+65°C

(*) With additional electric heater (not supplied)
Below the operation limits are graphed, in the case of air conditioning and sanitary hot water production.

WATER CHILLER/HEAT PUMP MODE



SANITARY HOT WATER MODE



24 CORRECTION FACTORS FOR USE OF GLYCOL

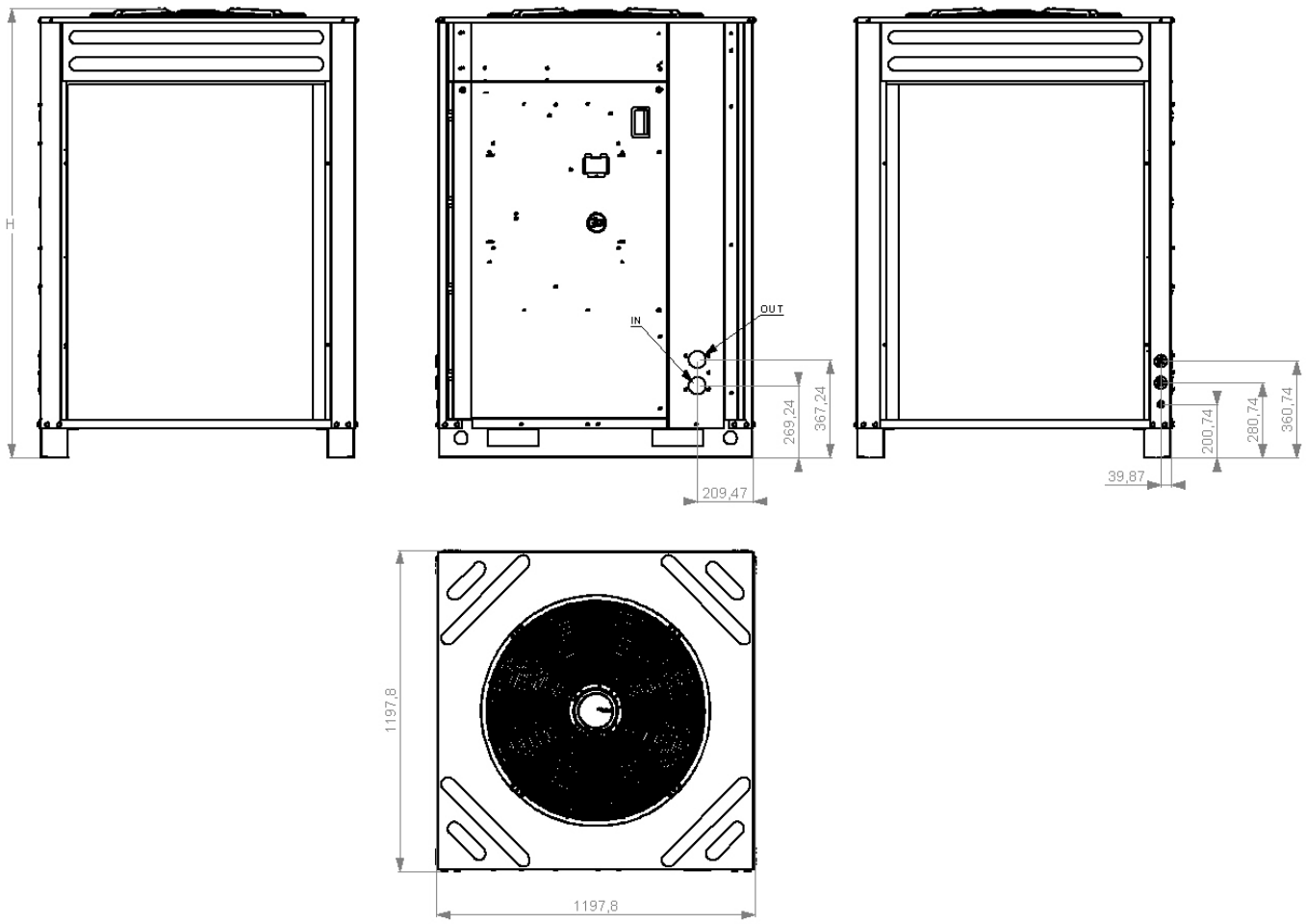
Glycol rate	Freezing point (°C)	CCF	IPCF	WFCF	PDCF
10%	-3,2	0,985	1	1,02	1,08
20%	-7,8	0,98	0,99	1,05	1,12
30%	-14,1	0,97	0,98	1,10	1,22
40%	-22,3	0,965	0,97	1,14	1,25
50%	-33,8	0,955	0,965	1,2	1,33

CCF: Capacity correction factor
IPCF: Input power correction factor
WFCF: Water flow rate correction factor
PDCF: Pressure drops correction factor.

The water flow rate and pressure drop correction factors are to be applied directly to the values given for operation without glycol. The water flow rate correction factor is calculated in order to get the same temperature's difference that would be obtained without glycol. The pressure drops' correction factor takes into account the different water flow rate obtained from the application of the water flow rate correction factor.

25 DIMENSIONS

IN/OUT: 2”F

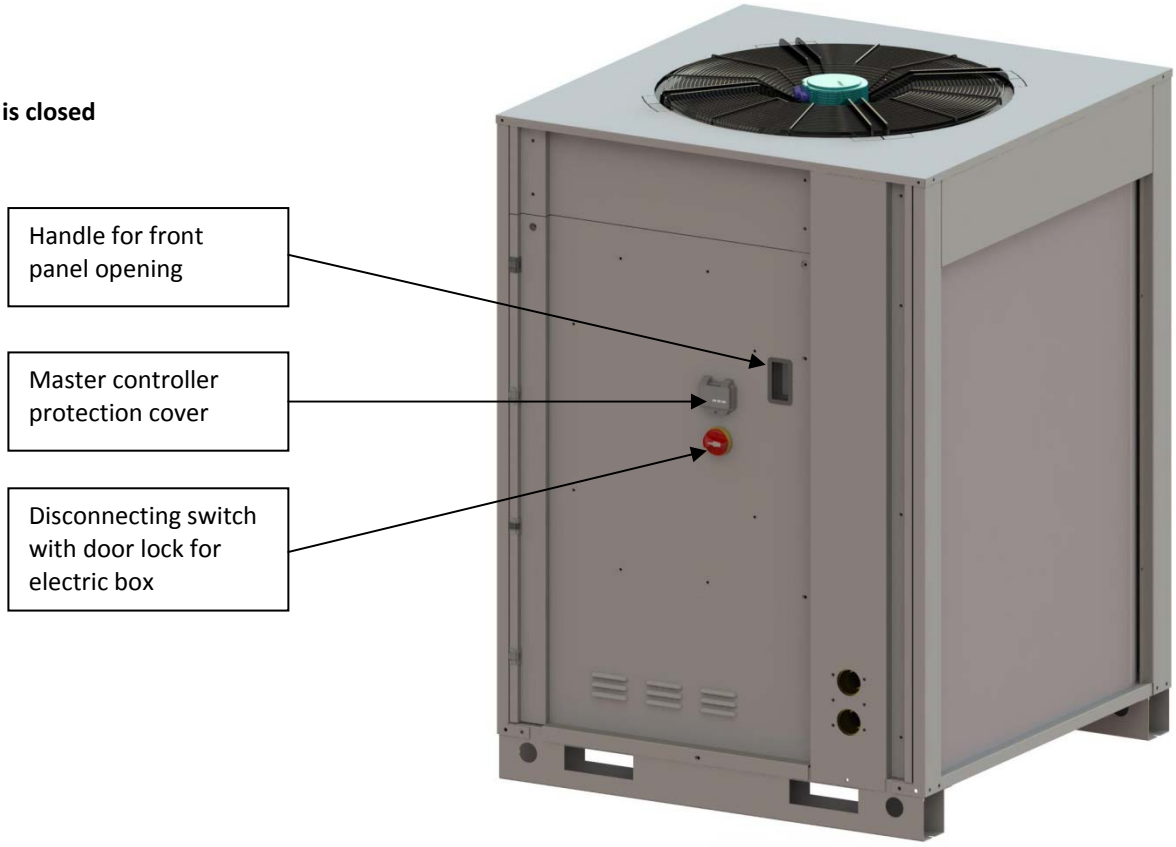


Model	Presence of AxiTop accessory	Height H [mm]	Max Packing height [mm]
UMHPI 25 / UMHPI 35	no	1673	1860
	si	1906	2006
UMHPI 50 / UMHPI 60	no	1741	1860
	si	1906	2006

26 INTERNAL VIEWS

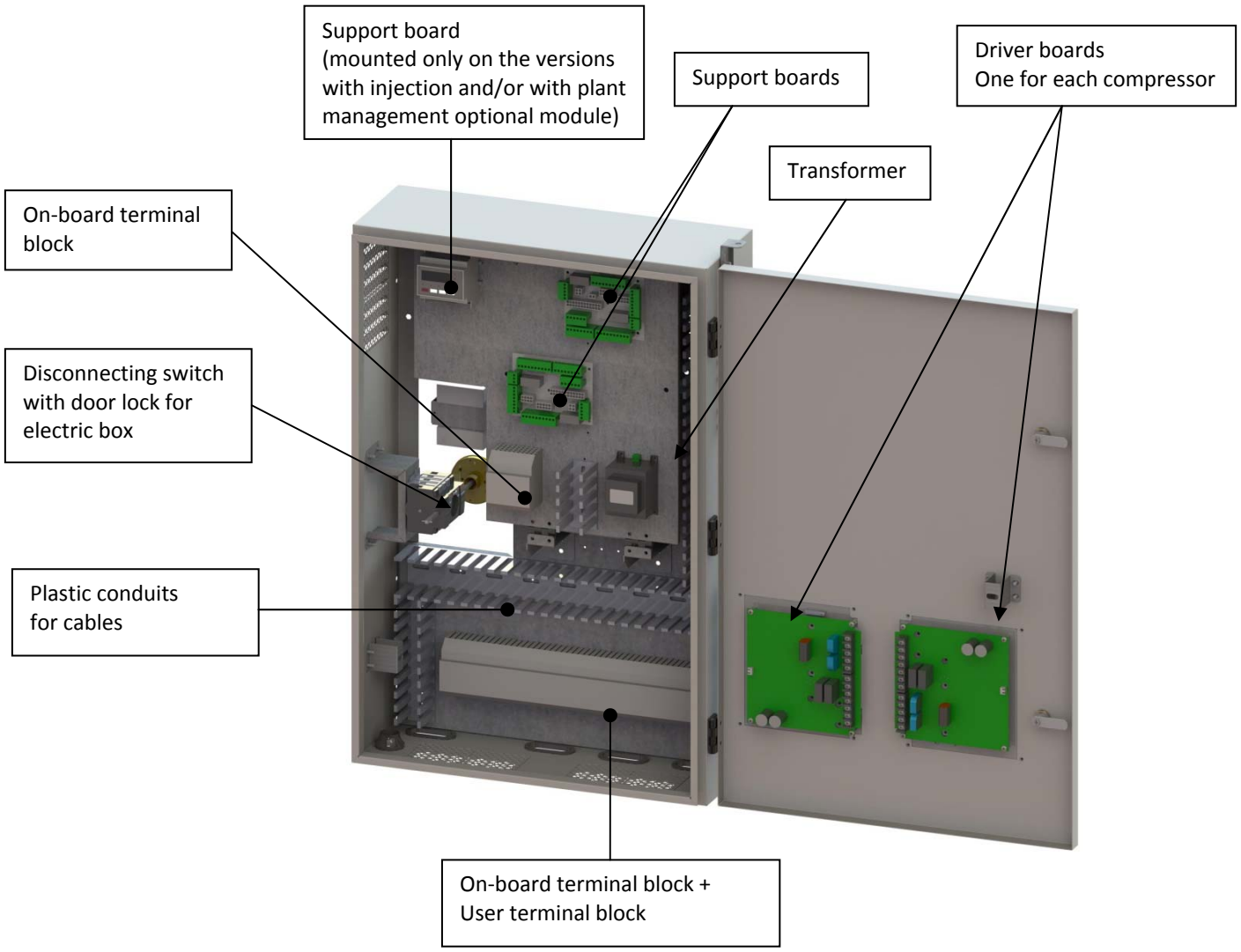
N.B. The number of components indicated can vary depending on the model
The representation of the units is indicative and useful to present the main components and can therefore vary From it's available.

The front panel is closed

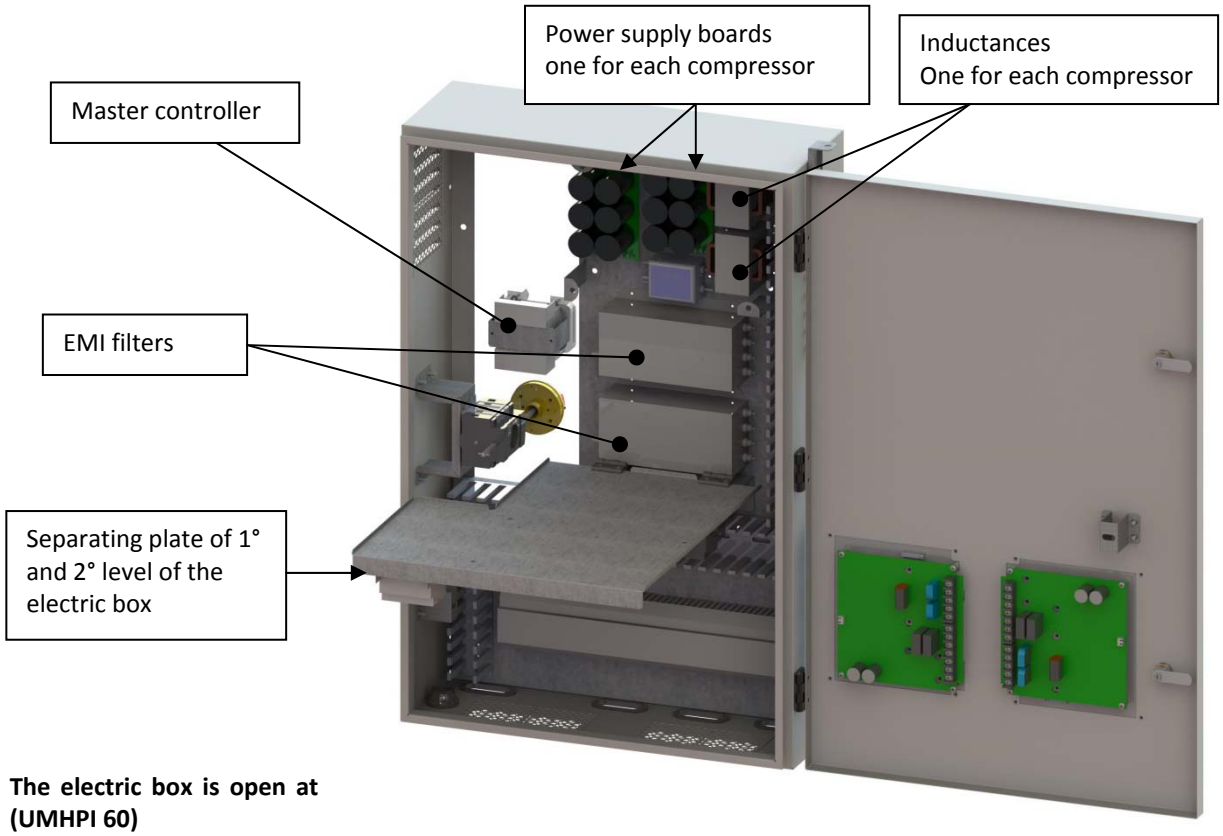


The front panel is open at an angle of 180°, electric box closed

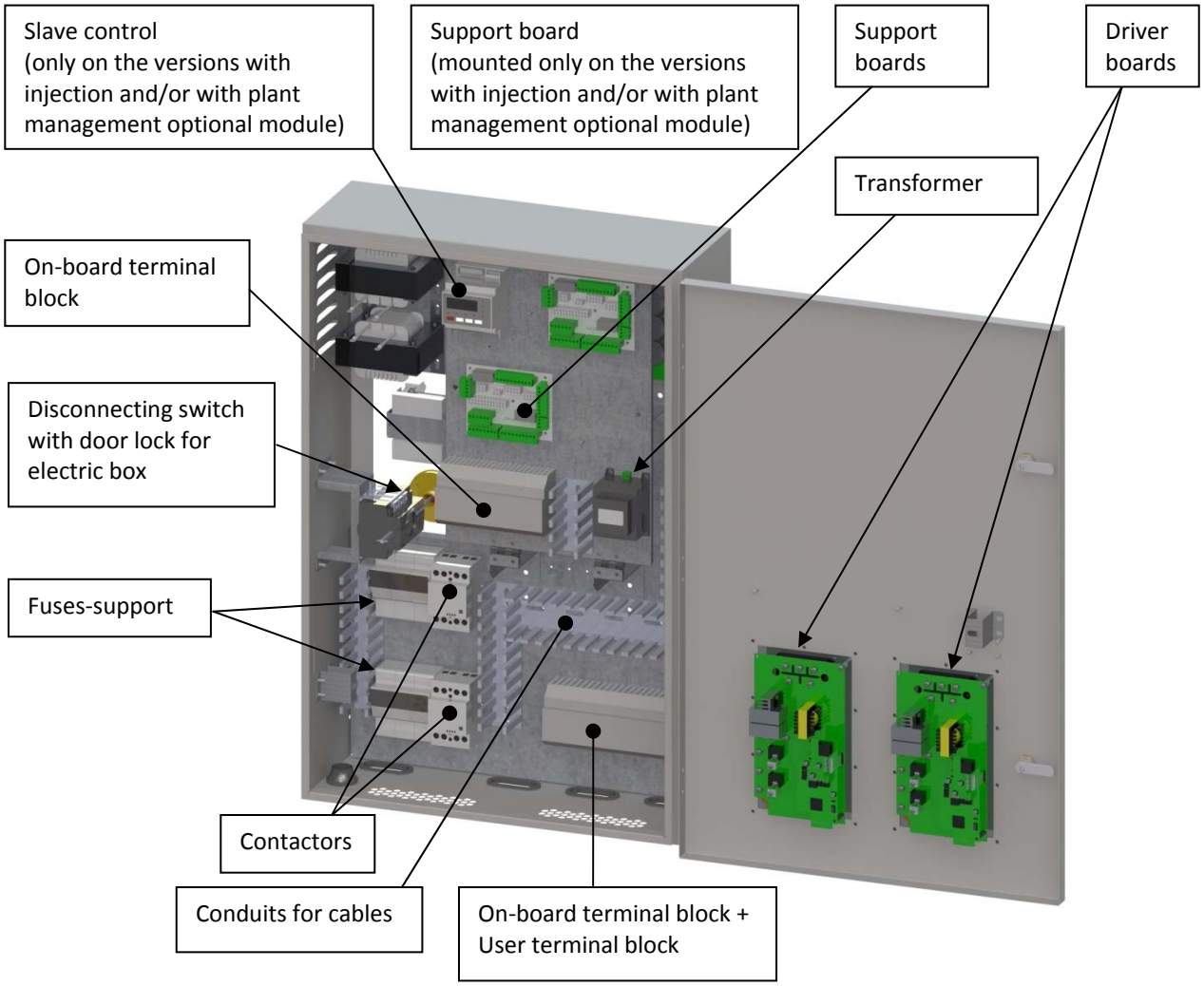
The electric box is open at the first level (UMHPI 25 / UMHPI 35 / UMHPI 50)



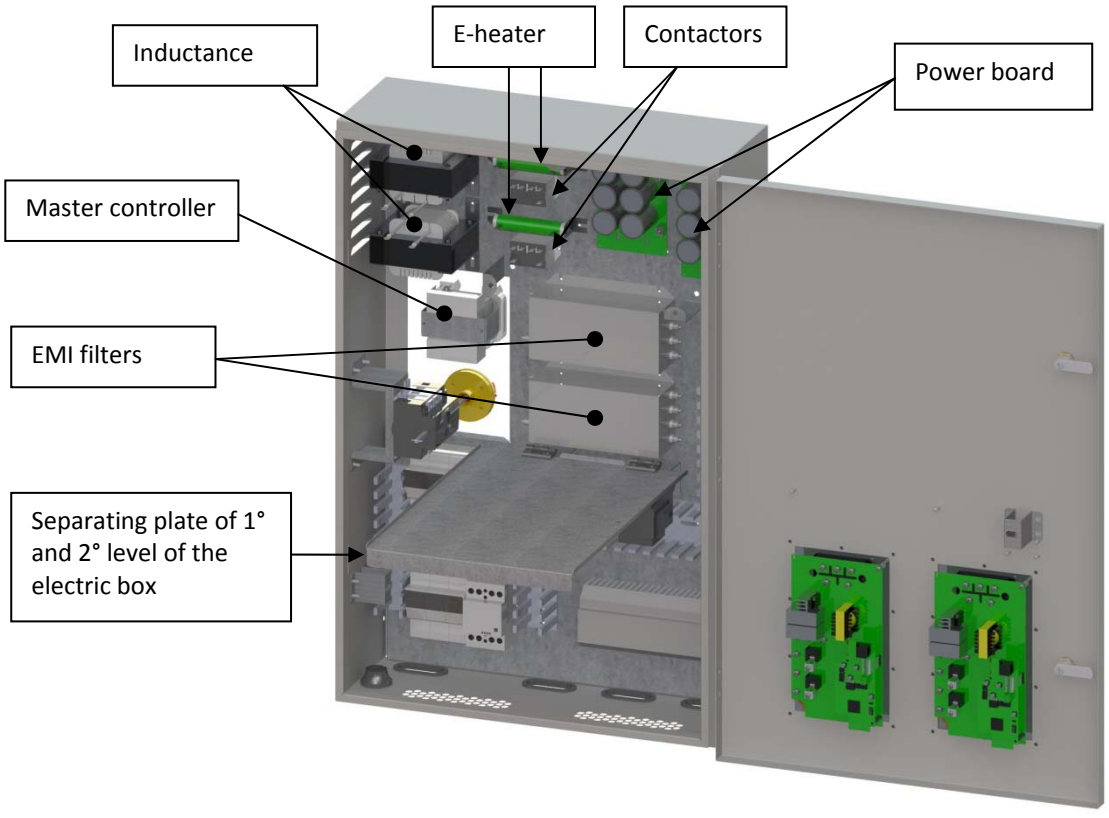
The electric box is open at the second level (UMHPI 25 / UMHPI 35 / UMHPI 50)



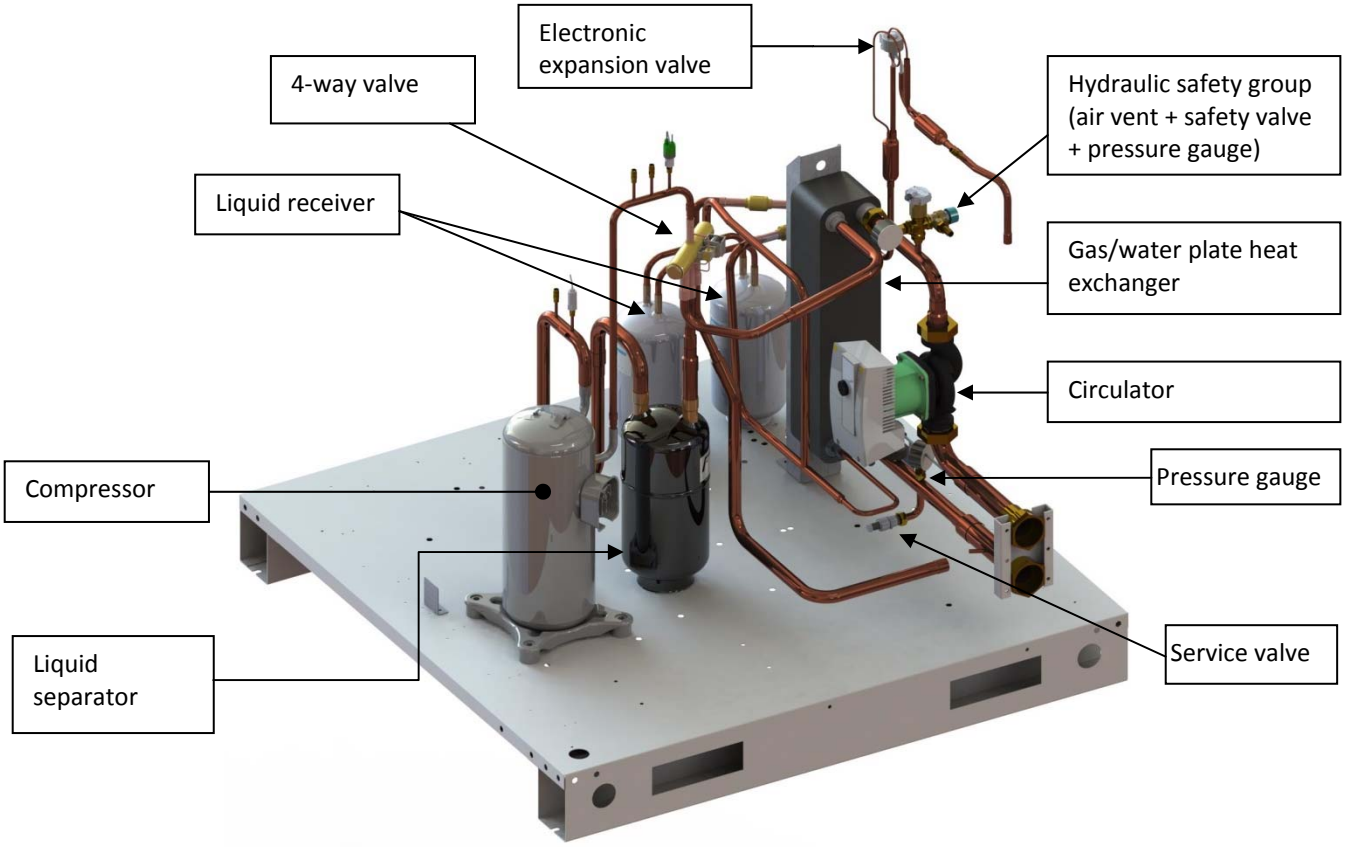
The electric box is open at the first level (UMHPI 60)



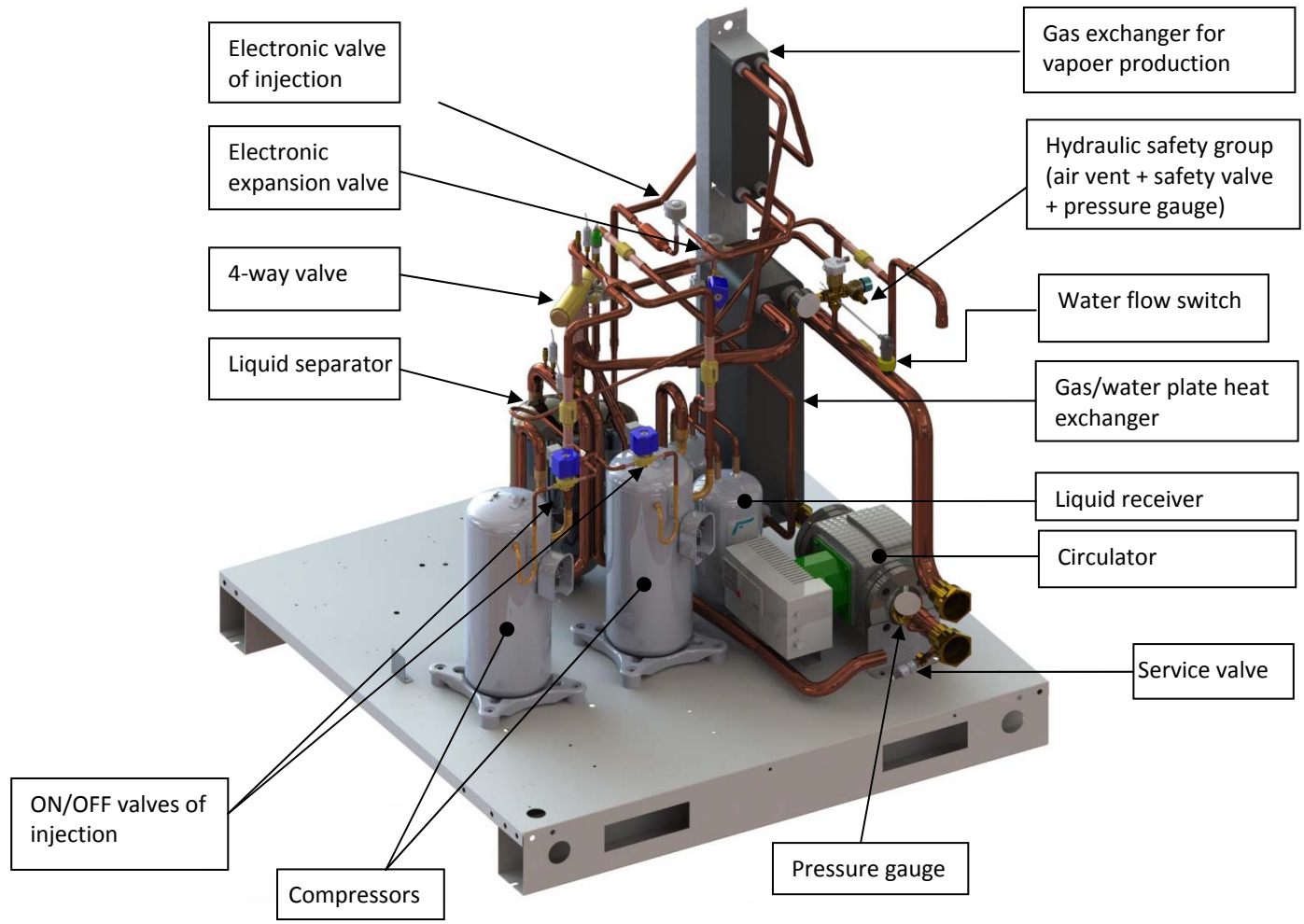
The electric box is open at the 2°level (UMHPI 60)



Internal views of the model UMHPI 25 with integrated circulator (in the models UMHPI 35 and 50 the compressors are two)



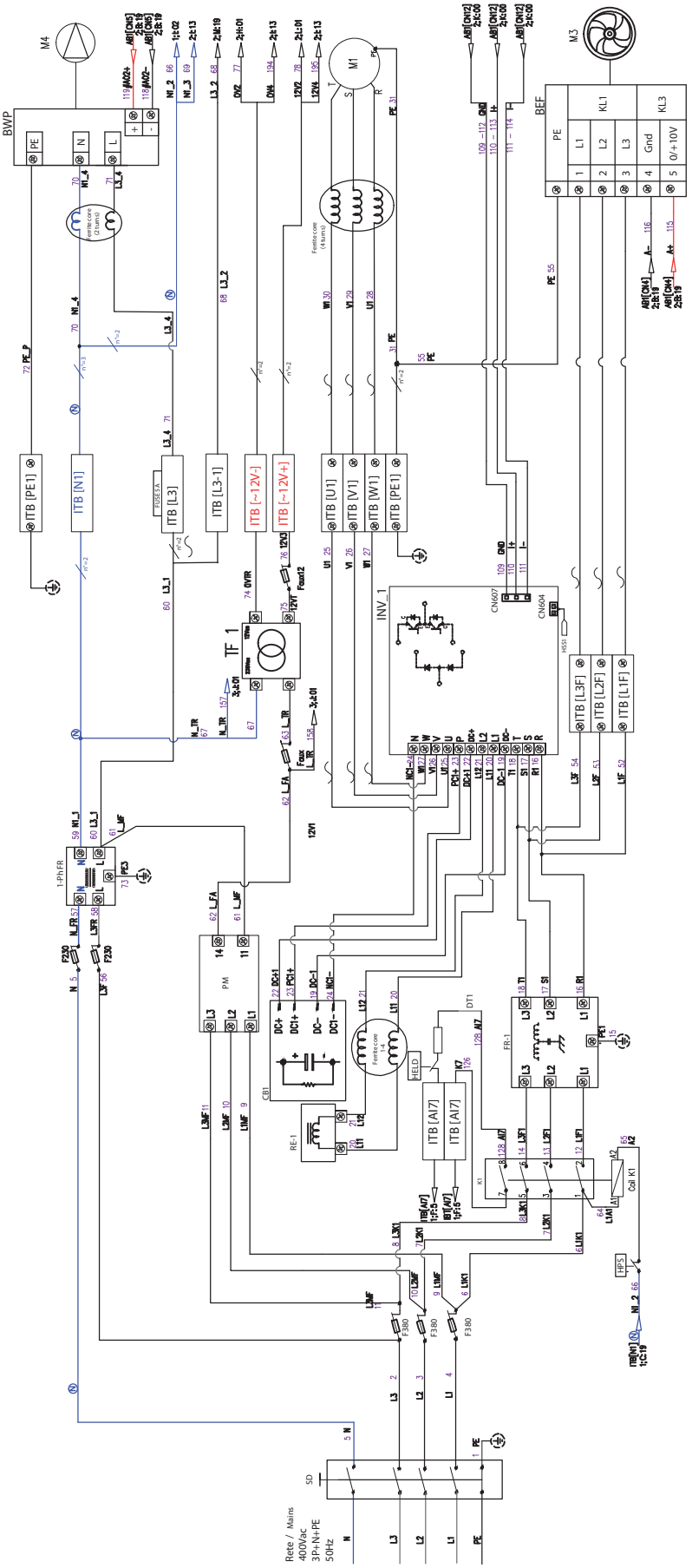
Internal views of the model UMHPI V 50 with integrated circulator



27 WIRING DIAGRAMS

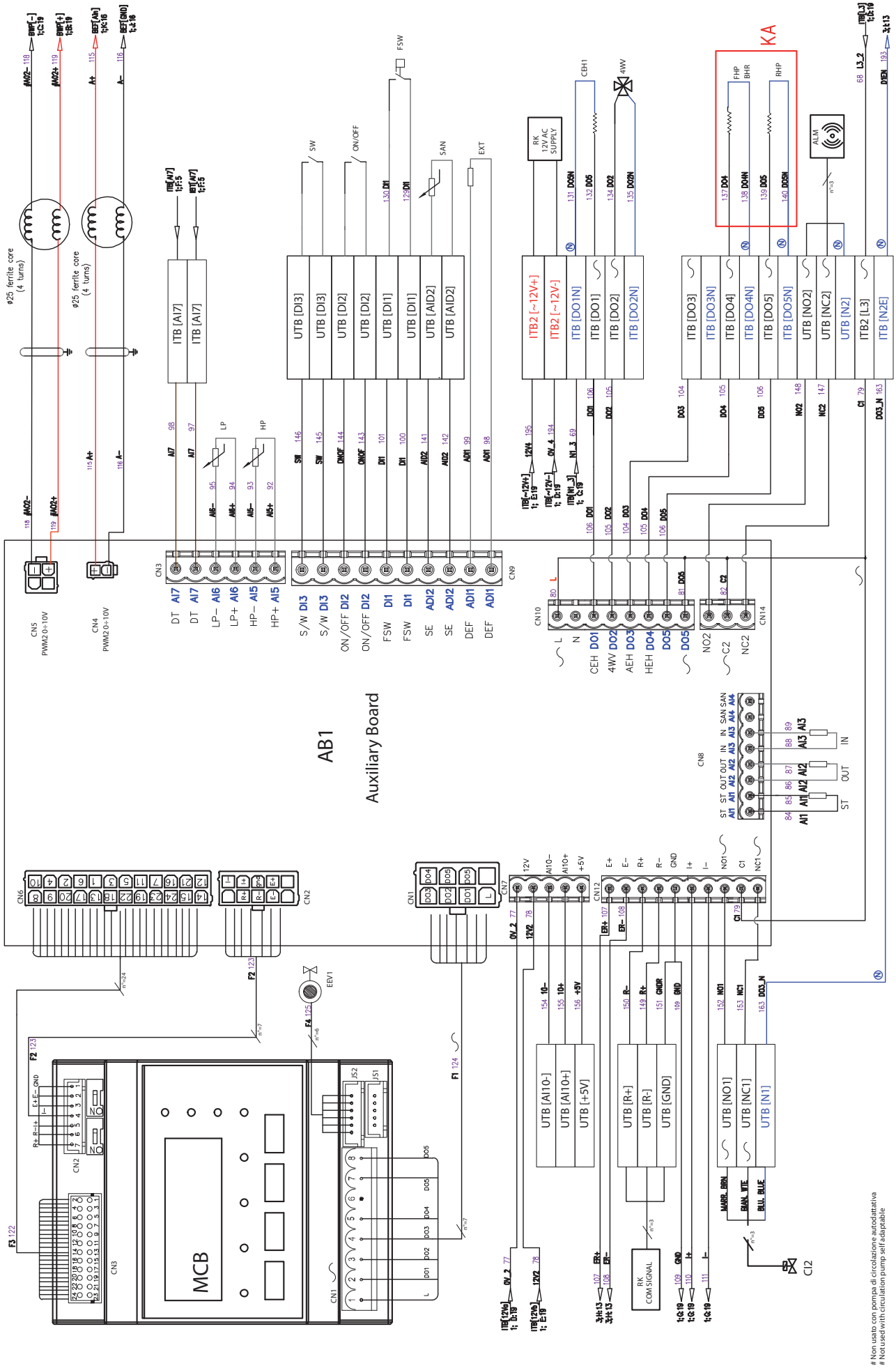
27.1 UMHPI 25

27.1.1 UMHPI 25 (Power supply)

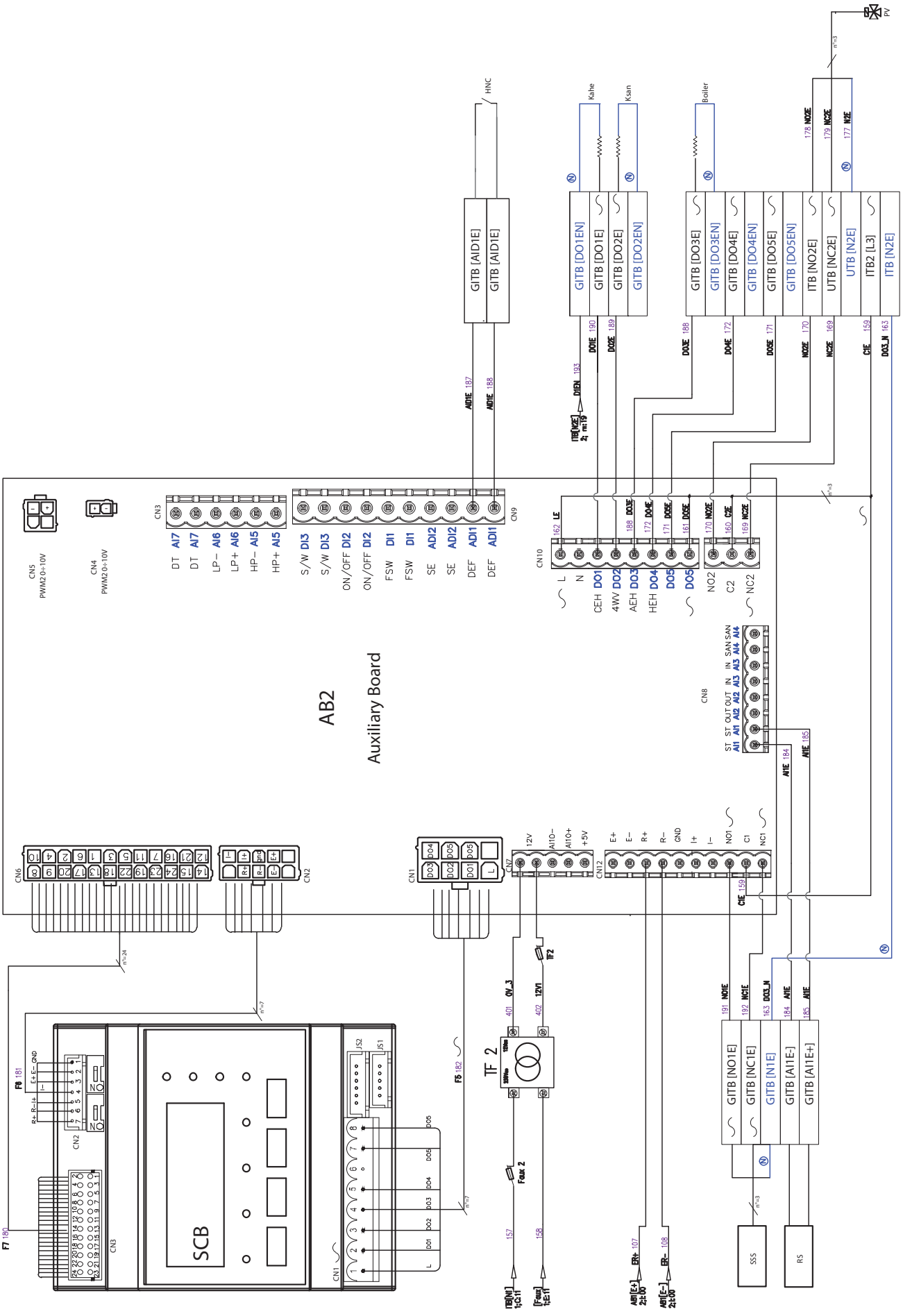


Non usato con pompa di circolazione autoadattativa
Not used with circulation pump self adaptable

27.1.2 UMHPI 25 (Control signals 1)



27.1.3 UMHPI 25 (GI optional module control signals)



27.1.4 UMHPI 25 (Key)

INDICE MORSETTIERA / INDEX TERMINAL BLOCK	
XXX	Identifica morsettiera / Identify the type of the terminal
[YYY]	Identidfica morsetto / Identify the label clamp reference
	Fase 230Vac/ Phase conductor 230Vac
	Conduttore neutro/ Neutral conductor
xxx [yyy]	Terminale a molla / Spring terminal
xxx [yyy]	Terminale a vite / Screw Terminal
ITB	Internal Terminal Block
UTB	User Terminal Block
GITB	Gi-KIT Terminal Block
INDICE CABLAGGIO / INDEX WIRING	
Morsa n° pagxy	Partenza / Departing
PS pagxy Morsa n°	Arrivo / Comming
Name	Nome cavo / Name of calbe
n°	Numero cavo / Number of cable
pag	Pagina di rif. / Reference page
x	Ordinata / Ordered
y	Ascissa / Abscissa
PS	Pnt di partenza / Starting point

INDICE SIMBOLI / INDEX SYMBOLS	
	Sezionatore / Disconnector
	Fusibile / Fuse disconnector
	Trasduttore / Transducer
	Sensore / Sensor
	Bobina / Coil Contactor
	Fase / Phase conductor
	GND
	Riscaldatore / Heater
	Allarme / Alarm
	Valvola solenoide / Solenoid valve
	Valvola 3 vie / 3 Way Valve
	Valvola 4 vie / 4 Way Valve
	Ferrite / Core
	Compressore / Compressor
	Ventilatore / Fan motor
	Pompa / Pump
	Cavo schermato / Shielded wire

DISPOSITIVI DI PROTEZIONE / PROTECTIVE DEVICES	
SD	Sezionatore / Disconnector
K1	Contattore / Contactor
PM	Monitore di fase / Phases Monitor Realy
F230	Fusibile / Fuse 10.3x38
F380	Fusibile / Fuse 14x51; i-HP125 = 32A; 500V i-HP235 = 40 A 500V; i-HP250 = 50A; 500V.
Faux	Fusibile / Fuse 5x20
Faux12	Fusibile / Fuse 5x20
DISPOSITIVI ELETTRICI / ELECTRIC DEVICES	
INV_1	Inverter 1
INV_2	Inverter 2
1-Ph FR	Filtro EMI / EMI Filter 1-Ph
FR1-FR2	Filtro EMI / EMI Filter 3-Ph
RE1 -RE2	Induttanza / Reactor
TF	Trasformatore / Transformer 230 Vac-12 Vac
CB1-CB2	Banco condensatori / Capacitors board
MCB	Controllo principale / Master Control Board
AB1	Scheda ausiliaria 1 / Auxiliary Board 1
SCB2	Controllo secondario / Slave Control Board
AB2	Scheda ausiliaria 2 / Auxiliary Board 2
BEF	Terminale ventola / Electric fan Terminal Block
BWP	Terminale pompa / Water pump terminal Block
RESISTENZA / RESISTANCES	
CEH1	Resistenza carter compressore 1 / Inverter Compressor 1 Carter Resistance
CEH2	Resistenza carter compressore 2 / Inverter Compressor 2 Carter Resistance

KITS OPZIONALI / OPTIONAL KITS		
KA	FHP	Piastra riscaldante frontale / Front heating plate
	BHR	Piastra riscaldante inferiore / Bottom heating plate
Gi Kit*	PV	Valvola di intercettazione idronica / Hydronic Shut-off valve
	RS	Sensore temp. acqua remota / Remote sensor for water temperature
	HNC	Contatto umidostato NC / Humidistat NC contact
	Kahe	Contatore per riscaldamento supplementare / Contactor for auxiliary heater
	Ksan	Contatore per riscaldamento supplementare sanitario / Contactor for sanitary auxiliary heater
	Boiler	Riscaldamento Bollitore / Heating Boiler
	SSS	Sistema di segnalazione stagione / Signaling system season
	DSV	Valvola doppio set-point / Double set-point valve
CI2	Valvola di intercettazione / Interception valve [ove previsto / where expected]	

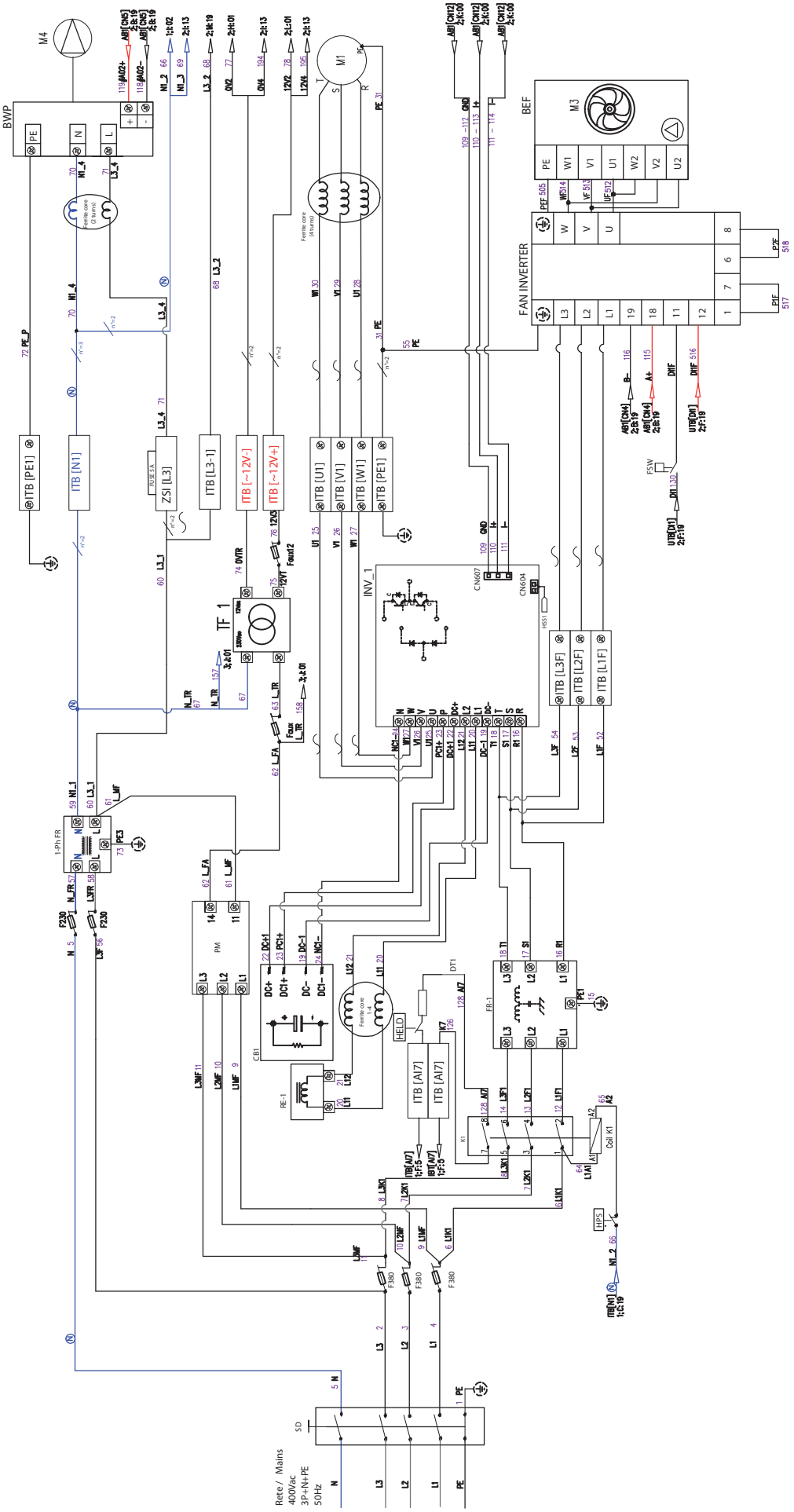
MOTORI / ENGINES	
M1	Compressore 1 / Compressor 1
M2	Compressore 2 / Compressor 2
M3	Ventilatore / Fan motor
M4	Pompa / Water pump motor
VALVOLE / VALVES	
EEV	Valvola d'espansione elettronica / Electronic expansion valve
SV	Valvola solenoide / Solenoid valve
3WV	Valvola 3 vie / 3 Way Valve
4WV	Valvola 4 vie / 4 Way Valve
SAV	Valvola sanitaria 3 vie / Sanitary 3 way valve
OEV	Valvola equalizzazione olio / Oil equalization valve [ove previsto / where expected]
SENSORI / SENSORS	
ST	Sensore temperatura aspirazione / Suction temperature sensor
OUT	Sensore temperatura acqua uscita / Water outlet temperature sensor
IN	Sensore temperatura acqua ingresso / Water inlet temperature sensor
DT1	Sensore temp. scarico compressore1 / Discharge Temp. Sensor Compressor1
DT2	Sensore temp. scarico compressore2 / Discharge Temp. Sensor Compressor2
HP	Trasduttore di alta pressione / High pressure transducer
LP	Trasduttore di bassa pressione / Low pressure transducer
EXT	Sensore temp. esterna / Air temperature sensor
HSS	Sensore temp. dissipatore Inverter / Heat sink temperature sensor
SAN	Sensore temp. sanitario / Sanitary temperature sensor
IT	Sensore temp. iniezione / Injection temperature sensor
HPE	Trasduttore di alta pressione per circuito ad iniezione / High pressure transducer for injection circuit

DISPOSITIVI / DEVICES	
HPS	Interuttore alta pressione / High pressure switch
FSV	Interuttore di portata / Flow switch
ON OFF	On -Off remoto / Remote On / Off
SW	Estate - Inverno / Summer - winter mode
RK	Tastiera remota / Remote Keyboard
AL	Allarme / Alarm
HELD	Ritenuta teleruttore / Held contactor

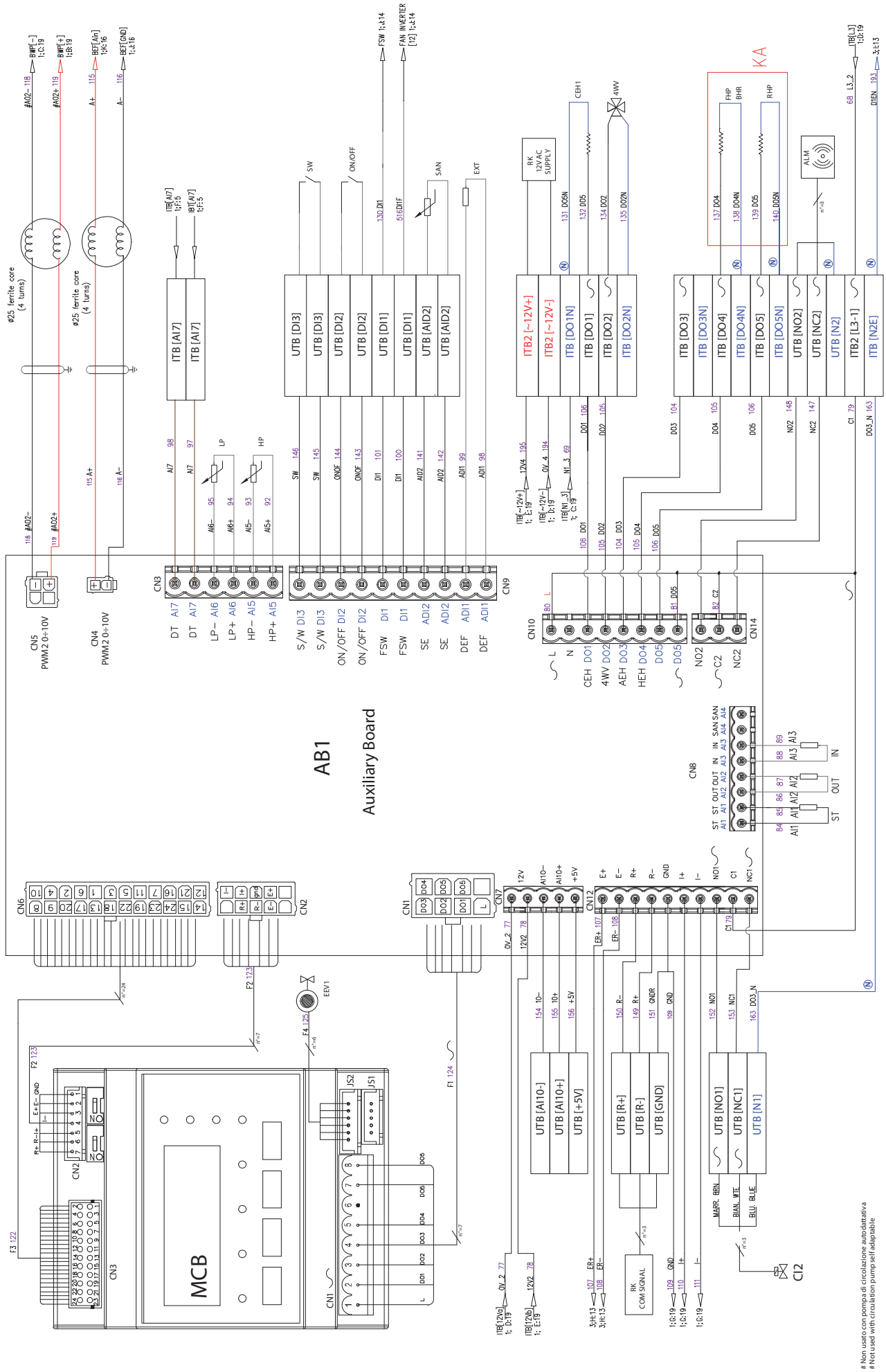
(*) Di serie su versione V
La legenda riporta simboli non necessariamente presenti nel seguente schema elettrico
The legend shows symbols not necessarily present in the schematic

27.2 UMHPI 25 with AC Inverter fan

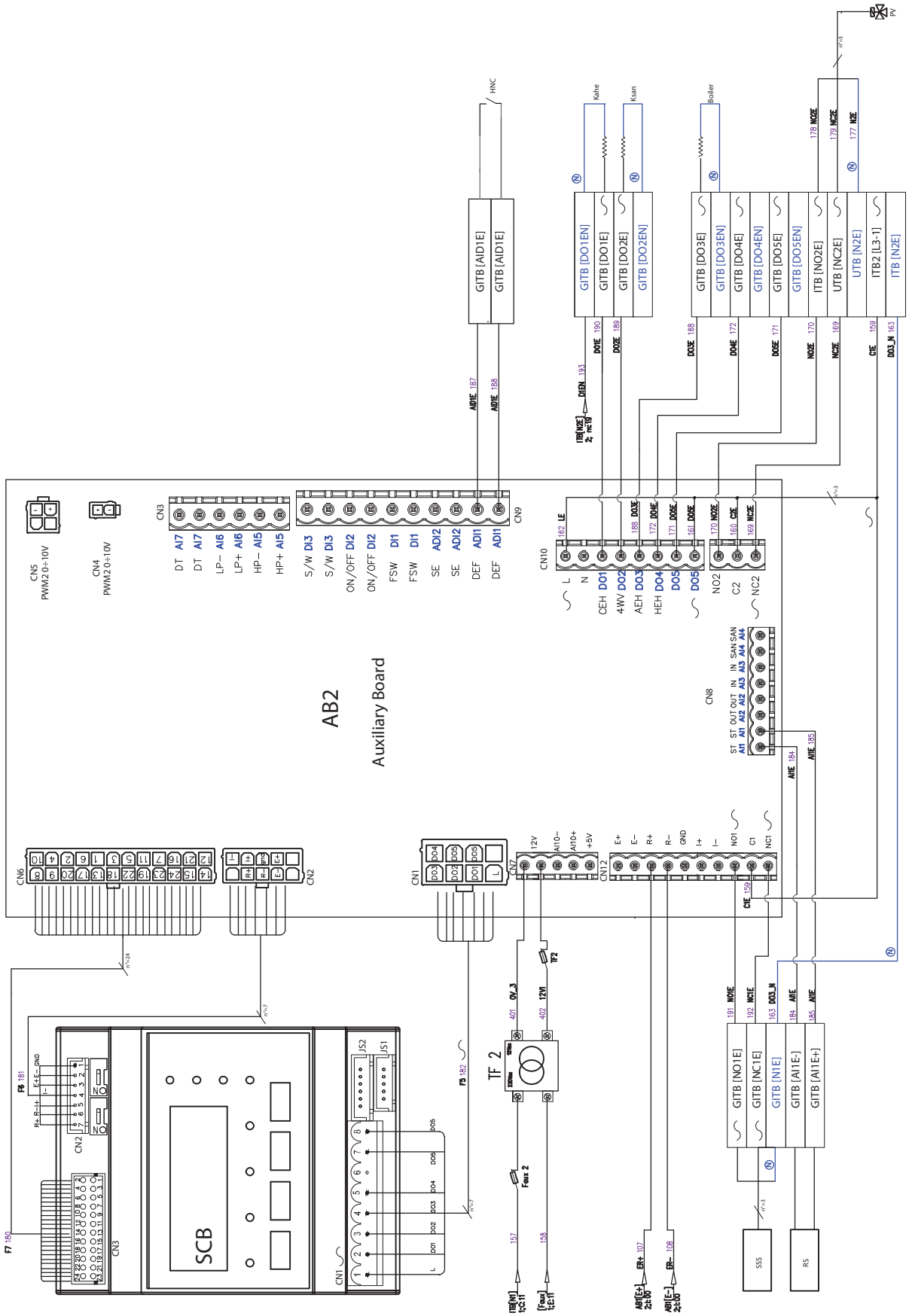
27.2.1 UMHPI 25 with AC fan (power supply)



27.2.2 UMHPI 25 With AC fan (Control signals 1)



27.2.3 UMHPI 25 with AC fan (GI optional module control signals)



INDICE MORSETTIERA /	INDEX TERMINAL BLOCK
XXX	Identifica morsettiera / Identify the type of the terminal
[YYY]	Identidfica morsetto / Identify the label clamp reference
	Fase 230Vac/ Phase conductor 230Vac
N	Conduttore neutro/ Neutral conductor
xxx [yyy]	Terminale a molla / Spring terminal
xxx [yyy]	Terminale a vite / Screw Terminal
ITB	Internal Terminal Block
UTB	User Terminal Block
GITB	Gi-KIT Terminal Block
INDICE CABLAGGIO /	INDEX WIRING
Name n° pag;x;y	Partenza / Departing
PS pag;x;y Name n°	Arrivo / Comming
Name	Nome cavo / Name of calbe
n°	Numero cavo / Number of cable
pag	Pagina di rif. / Reference page
x	Ordinata / Ordered
y	Ascisa / Abscissa
PS	Pnt di partenza / Starting point

INDICE SIMBOLI /	INDEX SYMBOLS
	Sezionatore / Disconnector
	Fusibile / Fuse disconnector
	Trasduttore / Transducer
	Sensore / Sensor
	Bobina / Coil Contactor
	Fase / Phase conductor
	GND
	Riscaldatore / Heater
	Allarme / Alarm
	Valvola solenoide / Solenoid valve
	Valvola 3 vie / 3 Way Valve
	Valvola 4 vie / 4 Way Valve
	Ferrite / Core
T S M R PE	Compressore / Compressor
	Ventilatore / Fan motor
	Pompa / Pump
	Cavo schermato / Shielded wire

DISPOSITIVI DI PROTEZIONE /	PROTECTIVE DEVICES
SD	Sezionatore / Disconnector
K1	Contattore / Contactor
PM	Monitore di fase / Phases Monitor Realy
F230	Fusibile / Fuse 10.3x38
F380	Fusibile / Fuse 14x51; i-HP125 = 32A; 500V i-HP235 = 40 A 500V; i-HP250 = 50A; 500V.
Faux	Fusibile / Fuse 5x20
Faux12	Fusibile / Fuse 5x20
DISPOSITIVI ELETTRICI /	ELECTRIC DEVICES
INV_1	Inverter 1
INV_2	Inverter 2
1-Ph FR	Filtro EMI / EMI Filter 1-Ph
FR1-FR2	Filtro EMI / EMI Filter 3-Ph
RE1 -RE2	Induttanza / Reactor
TF	Trasformatore / Transformer 230 Vac-12 Vac
CB1-CB2	Banco condensatori / Capacitors board
MCB	Controllo principale / Master Control Board
AB1	Scheda ausiliaria 1 / Auxiliary Board 1
SCB2	Controllo secondario / Slave Control Board
AB2	Scheda ausiliaria 2 / Auxiliary Board 2
BEF	Terminale ventola / Electric fan Terminal Block
BWP	Terminale pompa / Water pump terminal Block
RESISTENZA /	RESISTANCES
CEH1	Resistenza carter compressore 1 / Inverter Compressor 1 Carter Resistance
CEH2	Resistenza carter compressore 2 / Inverter Compressor 2 Carter Resistance

KITS OPZIONALI /	OPTIONAL KITS	
KA	FHP	Piastra riscaldante frontale / Front heating plate
	BHR	Piastra riscaldante inferiore / Bottom heating plate
Gi Kit*	PV	Valvola di intercettazione idronica / Hydronic Shut-off valve
	RS	Sensore temp. acqua remota / Remote sensor for water temperature
	HNC	Contatto umidostato NC / Humidistat NC contact
	Kahe	Contatore per riscaldamento supplementare / Contactor for auxiliary heater
	Ksan	Contatore per riscaldamento supplementare sanitario / Contactor for sanitary auxiliary heater
	Boiler	Riscaldamento Bollitore / Heating Boiler
	SSS	Sistema di segnalazione stagione / Signaling system season
	DSV	Valvola doppio set-point / Double set-point valve
CI2	Valvola di intercettazione / Interception valve [ove previsto / where expected]	

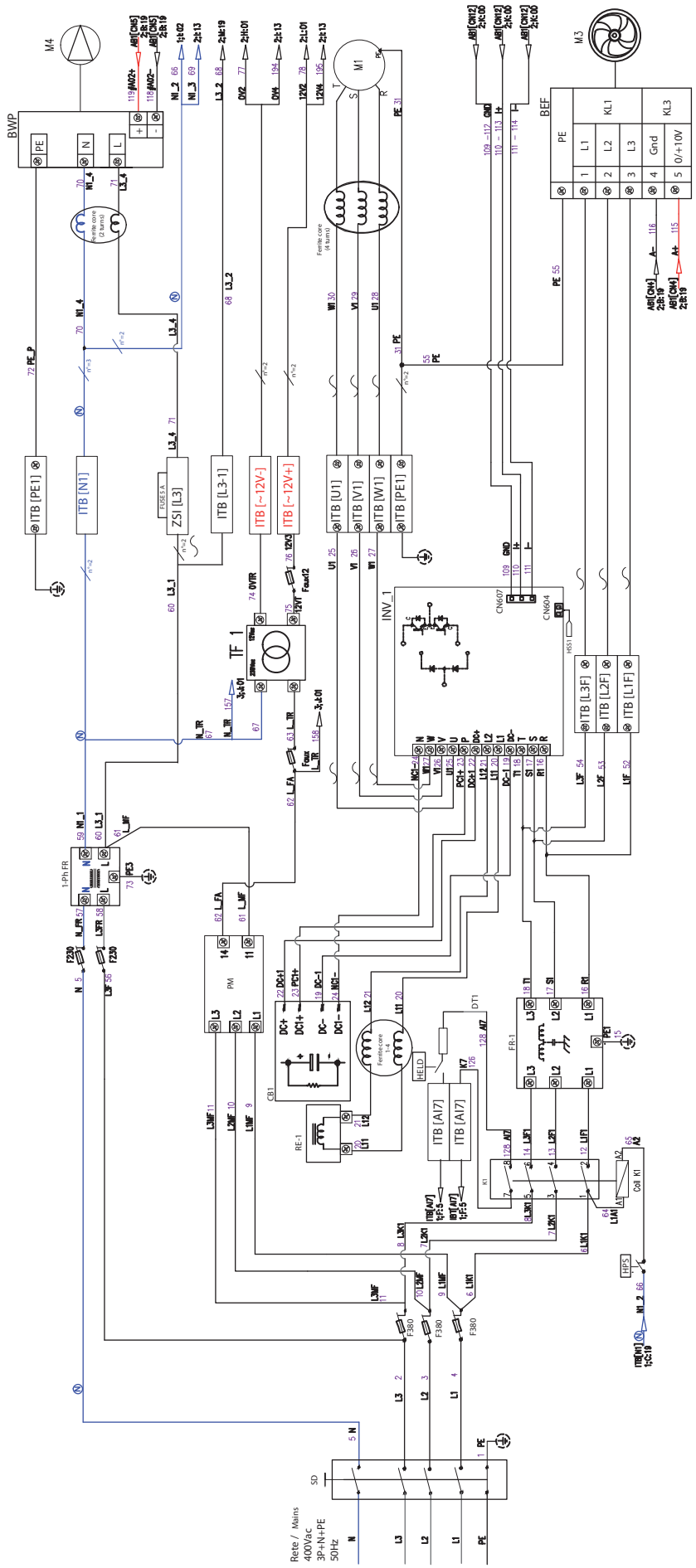
MOTORI / ENGINES	
M1	Compressore 1 / Compressor 1
M2	Compressore 2 / Compressor 2
M3	Ventilatore / Fan motor
M4	Pompa / Water pump motor
VALVOLE /	VALVES
EEV	Valvola d'espansione elettronica / Electronic expansion valve
SV	Valvola solenoide / Solenoid valve
3WV	Valvola 3 vie / 3 Way Valve
4WV	Valvola 4 vie / 4 Way Valve
SAV	Valvola sanitaria 3 vie / Sanitary 3 way valve
OEV	Valvola equalizzazione olio / Oil equalization valve [ove previsto / where expected]
SENSORI /	SENSORS
ST	Sensore temperatura aspirazione / Suction temperature sensor
OUT	Sensore temperatura acqua uscita / Water outlet temperature sensor
IN	Sensore temperatura acqua ingresso / Water inlet temperature sensor
DT1	Sensore temp. scarico compressore1 / Discharge Temp. Sensor Compressor1
DT2	Sensore temp. scarico compressore2 / Discharge Temp. Sensor Compressor2
HP	Trasduttore di alta pressione High pressure transducer
LP	Trasduttore di bassa pressione Low pressure transducer
EXT	Sensore temp. esterna Air temperature sensor
HSS	Sensore temp. dissipatore Inverter Heat sink temperature sensor
SAN	Sensore temp. sanitario Sanitary temperature sensor
IT	Sensore temp. iniezione Injection temperature sensor
HPE	Trasduttore di alta pressione per circuito ad iniezione High pressure transducer for injection circuit

DISPOSITIVI /	DEVICES
HPS	Interuttore alta pressione / High pressure switch
FSV	Interuttore di portata / Flow switch
ON OFF	On -Off remoto Remote On / Off
SW	Estate - Inverno Summer - winter mode
RK	Tastiera remota / Remote Keyboard
AL	Allarme / Alarm
HELD	Ritenuta teleruttore / Held contactor

(*) Di serie su versione V
La legenda riporta simboli non necessariamente presenti nel seguente schema elettrico
The legend shows symbols not necessarily present in the schematic

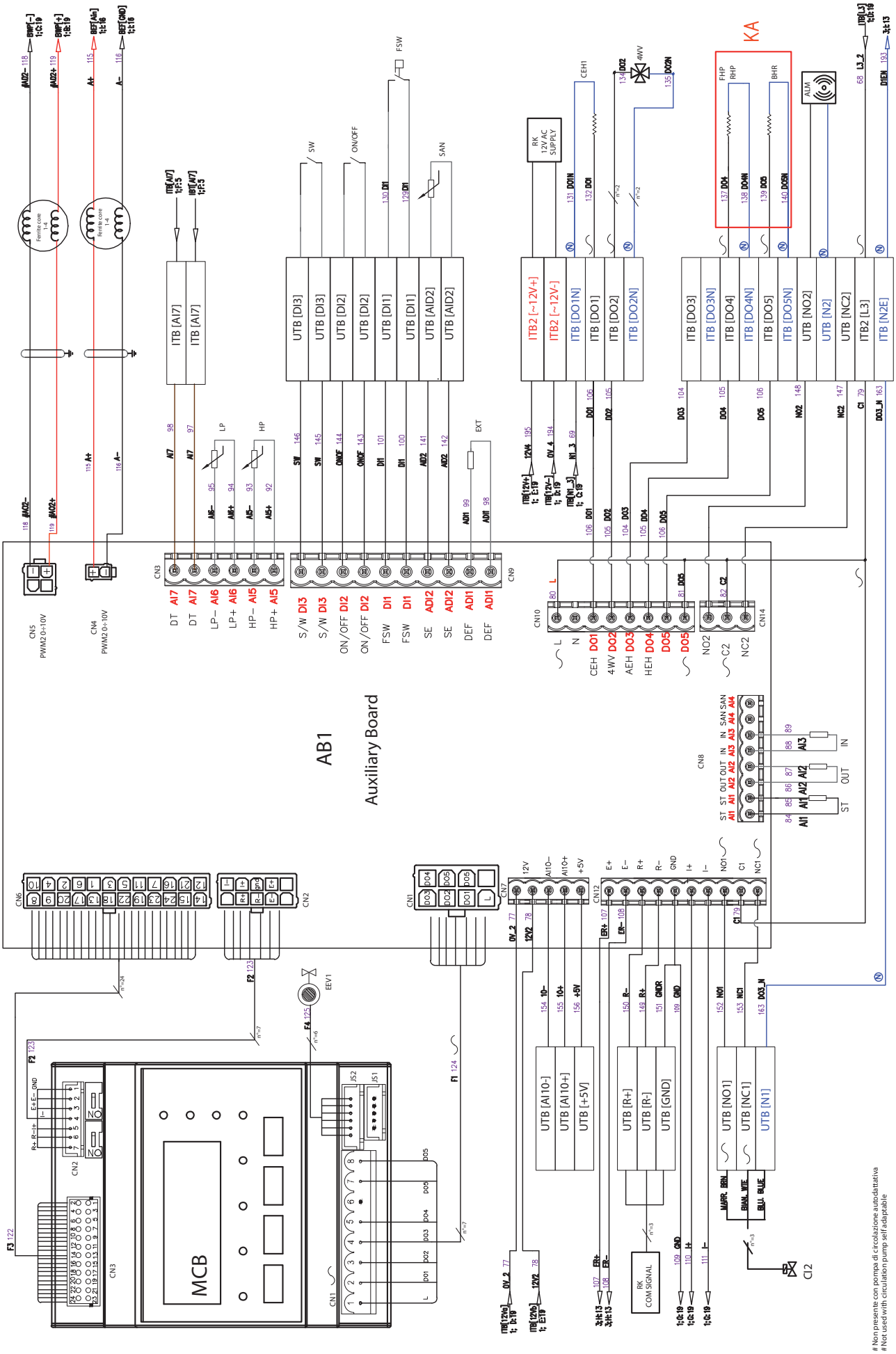
27.3 UMHPI 25 V

27.3.1 UMHPI 25 V (Power supply)

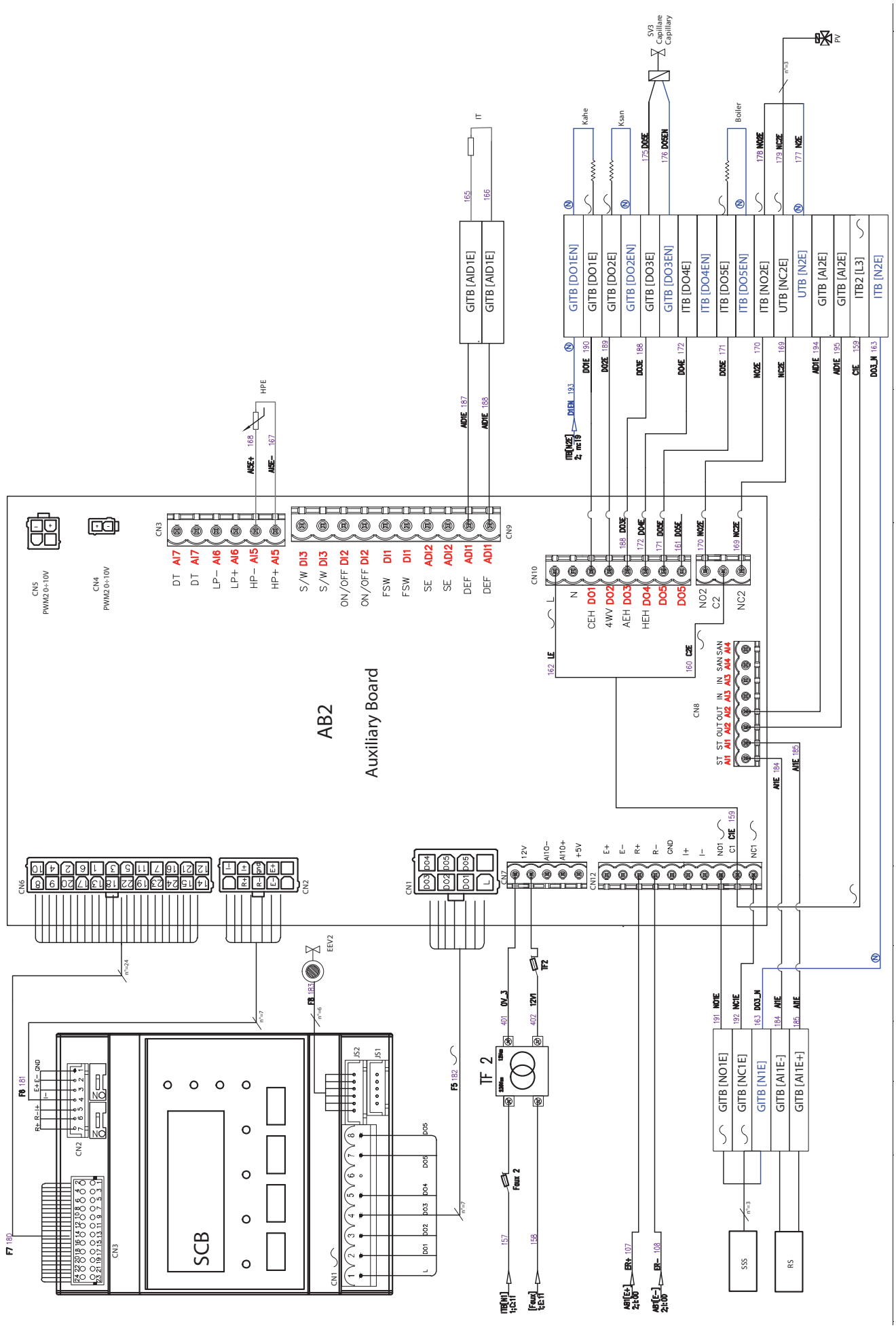


Non presente con pompa di circolazione autodattativa
Not used with circulation pump self adaptable

27.3.2 UMHPI 25 V (Control signals 1)



27.3.3 UMHPI 25 V (Control signals 2)



INDICE MORSETTIERA / INDEX TERMINAL BLOCK	
XXX	Identifica morsettiera / Identify the type of the terminal
[YYY]	Identidfica morsetto / Identify the label clamp reference
	Fase 230Vac/ Phase conductor 230Vac
N	Conduttore neutro/ Neutral conductor
xxx [yyy]	Terminale a molla / Spring terminal
xxx [yyy]	Terminale a vite / Screw Terminal
ITB	Internal Terminal Block
UTB	User Terminal Block
GITB	Gi-KIT Terminal Block
INDICE CABLAGGIO / INDEX WIRING	
Name n° pag;x;y	Partenza / Departing
PS pag;x;y Name n°	Arrivo / Comming
Name	Nome cavo / Name of calbe
n°	Numero cavo / Number of cable
pag	Pagina di rif. / Reference page
x	Ordinata / Ordered
y	Ascissa / Abscissa
PS	Pnt di partenza / Starting point

INDICE SIMBOLI / INDEX SYMBOLS	
	Sezionatore / Disconnector
	Fusibile / Fuse disconnector
	Trasduttore / Transducer
	Sensore / Sensor
	Bobina / Coil Contactor
	Fase / Phase conductor
	GND
	Riscaldatore / Heater
	Allarme / Alarm
	Valvola solenoide / Solenoid valve
	Valvola 3 vie / 3 Way Valve
	Valvola 4 vie / 4 Way Valve
	Ferrite / Core
	Compressore / Compressor
	Ventilatore / Fan motor
	Pompa / Pump
	Cavo schermato / Shielded wire

DISPOSITIVI DI PROTEZIONE / PROTECTIVE DEVICES	
SD	Sezionatore / Disconnector 32A
K1	Contattore / Contactor 40A; 500V
PM	Monitore di fase / Phases Monitor Realy
F230	Fusibile / Fuse 10.3x38 10A; 500V
F380	Fusibile / Fuse 14x51; i-HP125 = 32A; 500V i-HP235 = 40 A 500V; i-HP250 = 50A; 500V.
Faux	Fusibile / Fuse 5x20; 500mA; 250V
Faux12	Fusibile / Fuse 5x20; 1A 250V
DISPOSITIVI ELETTRICI / ELECTRIC DEVICES	
INV_1	Inverter 1
INV_2	Inverter 2
1-Ph FR	Filtro EMI / EMI Filter 1-Ph
FR1-FR2	Filtro EMI / EMI Filter 3-Ph
RE1 -RE2	Induttanza / Reactor
TF	Trasformatore / Transformer 230 Vac-12 Vac
CB1-CB2	Banco condensatori / Capacitors board
MCB	Controllo principale / Master Control Board
AB1	Scheda ausiliaria 1 / Auxiliary Board 1
SCB2	Controllo secondario / Slave Control Board
AB2	Scheda ausiliaria 2 / Auxiliary Board 2
BEF	Terminale ventola / Electric fan Terminal Block
BWP	Terminale pompa / Water pump terminal Block
RESISTENZA / RESISTANCES	
CEH1	Resistenza carter compressore 1 / Inverter Compressor 1 Carter Resistance
CEH2	Resistenza carter compressore 2 / Inverter Compressor 2 Carter Resistance

KITS OPZIONALI / OPTIONAL KITS		
KA	FHP	Piastra riscaldante frontale / Front heating plate
	BHR	Piastra riscaldante inferiore / Bottom heating plate
Gi Kit*	PV	Valvola di intercettazione idronica / Hydronic Shut-off valve
	RS	Sensore temp. acqua remota / Remote sensor for water temperature
	HNC	Contatto umidostato NC / Humidistat NC contact
	Kahe	Contatore per riscaldamento supplementare / Contactor for auxiliary heater
	Ksan	Contatore per riscaldamento supplementare sanitario / Contactor for sanitary auxiliary heater
	Boiler	Riscaldamento Bollitore / Heating Boiler
	SSS	Sistema di segnalazione stagione / Signaling system season
	DSV	Valvola doppio set-point / Double set-point valve
CI2	Valvola di intercettazione / Interception valve [ove previsto / where expected]	

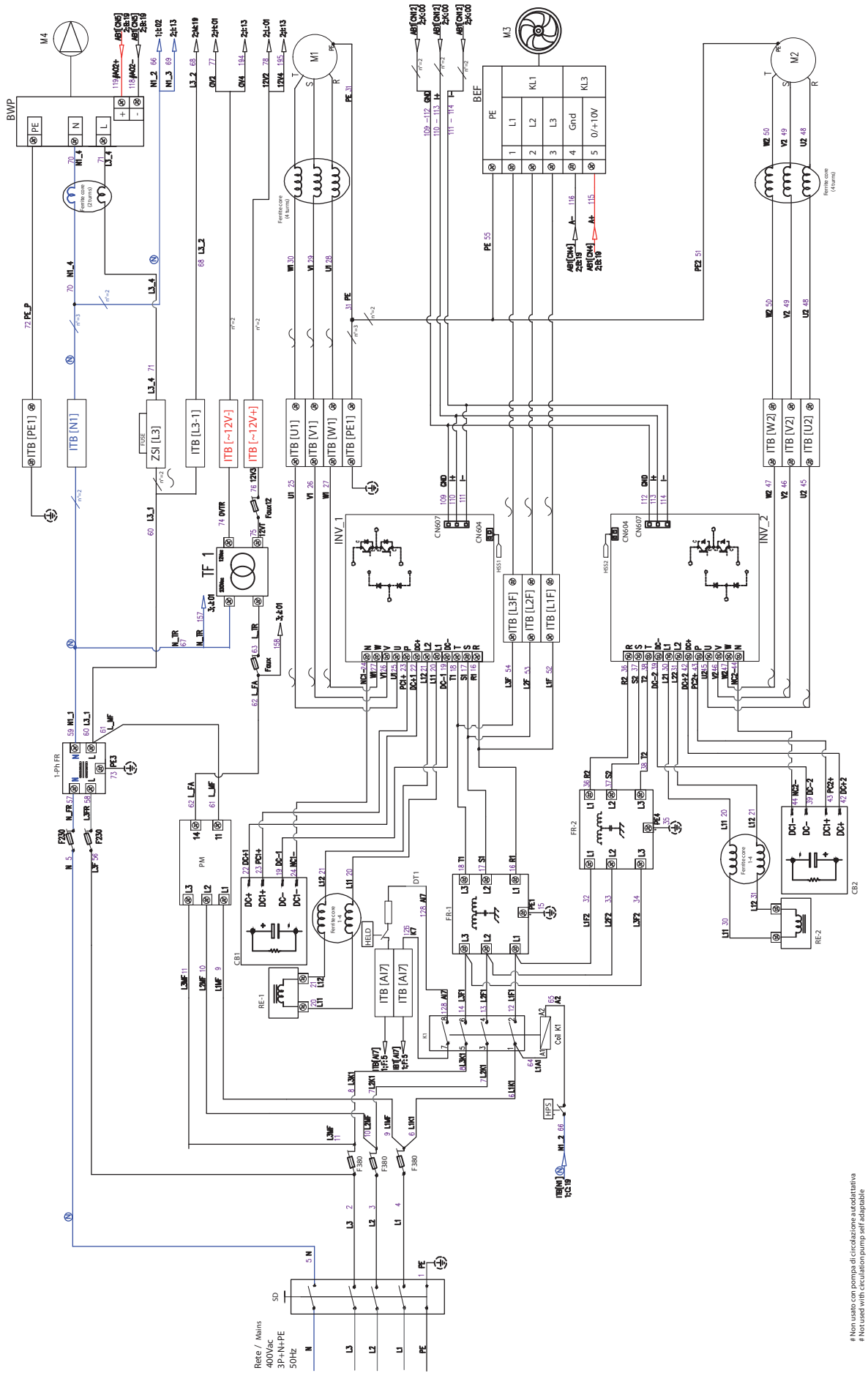
MOTORI / ENGINES	
M1	Compressore 1 / Compressor 1
M2	Compressore 2 / Compressor 2
M3	Ventilatore / Fan motor
M4	Pompa / Water pump motor
VALVOLE / VALVES	
EEV	Valvola d'espansione elettronica / Electronic expansion valve
SV	Valvola solenoide / Solenoid valve
3WV	Valvola 3 vie / 3 Way Valve
4WV	Valvola 4 vie / 4 Way Valve
SAV	Valvola sanitaria 3 vie / Sanitary 3 way valve
OEV	Valvola equalizzazione olio / Oil equalization valve [ove previsto / where expected]
SENSORI / SENSORS	
ST	Sensore temperatura aspirazione / Suction temperature sensor
OUT	Sensore temperatura acqua uscita / Water outlet temperature sensor
IN	Sensore temperatura acqua ingresso / Water inlet temperature sensor
DT1	Sensore temp. scarico compressore1 / Discharge Temp. Sensor Compressor1
DT2	Sensore temp. scarico compressore2 / Discharge Temp. Sensor Compressor2
HP	Trasduttore di alta pressione High pressure transducer
LP	Trasduttore di bassa pressione Low pressure transducer
EXT	Sensore temp. esterna Air temperature sensor
HSS	Sensore temp. dissipatore Inverter Heat sink temperature sensor
SAN	Sensore temp. sanitario Sanitary temperature sensor
IT	Sensore temp. iniezione Injection temperature sensor
HPE	Trasduttore di alta pressione per circuito ad iniezione High pressure transducer for injection circuit

DISPOSITIVI / DEVICES	
HPS	Interuttore alta pressione / High pressure switch
FSV	Interuttore di portata / Flow switch
ON OFF	On -Off remoto Remote On /Off
SW	Estate - Inverno Summer - winter mode
RK	Tastiera remota / Remote Keyboard
AL	Allarme / Alarm
HELD	Ritenuta teleruttore / Held contactor

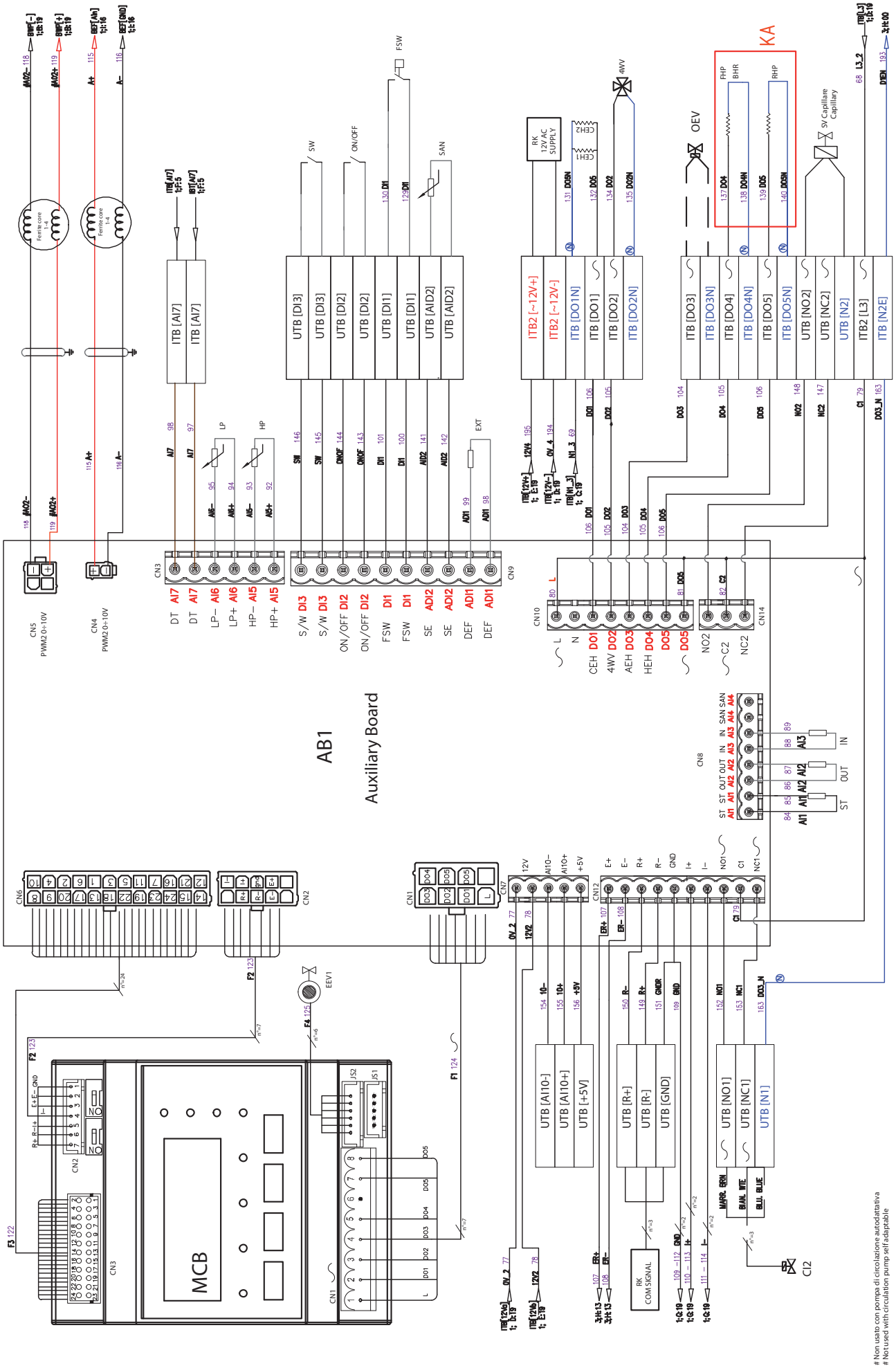
(*) Di serie su versione V
La legenda riporta simboli non necessariamente presenti nel seguente schema elettrico
The legend shows symbols not necessarily present in the schematic

27.4 UMHPI 35-50

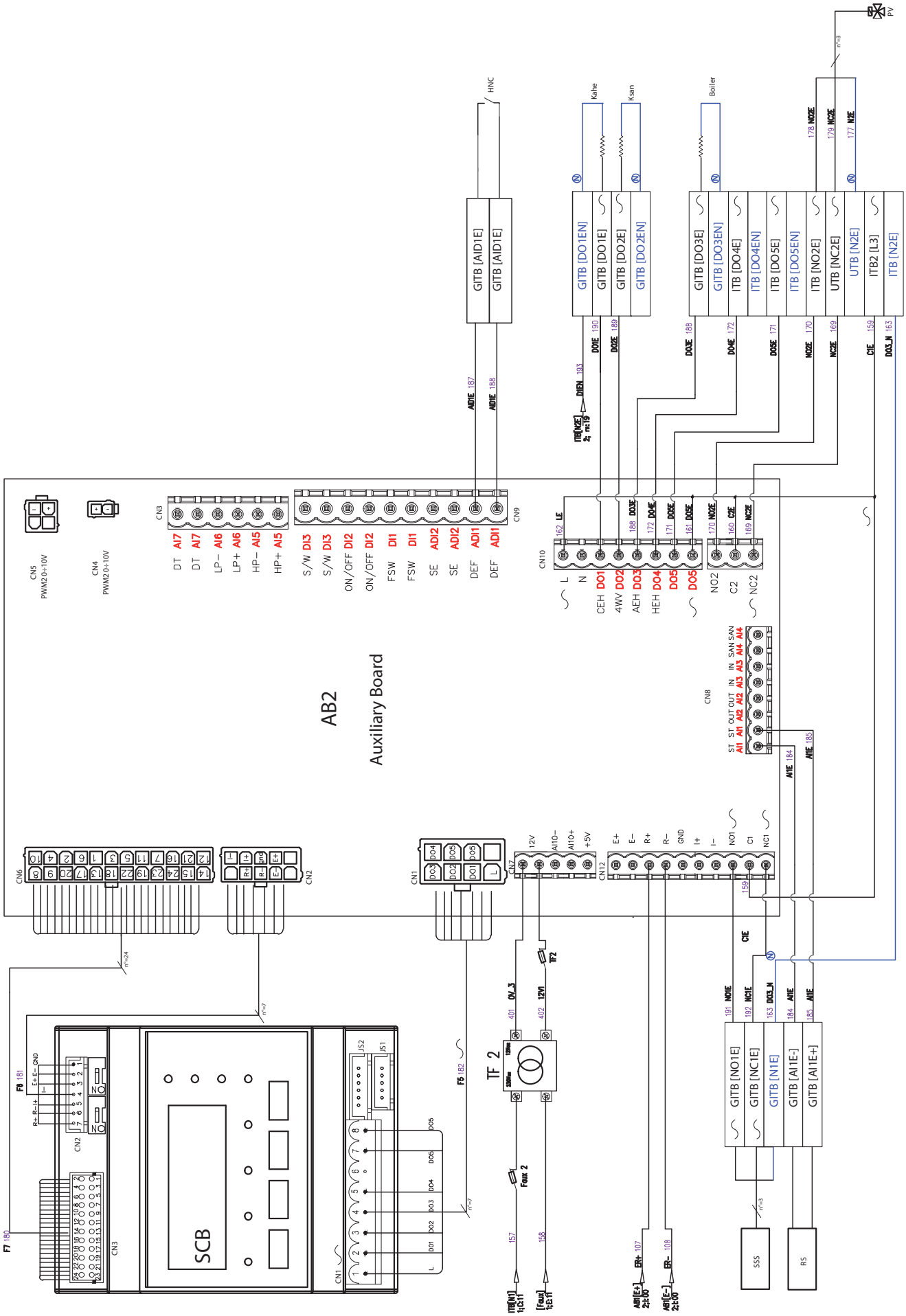
27.4.1 UMHPI 35-50 (P ower supply)



27.4.2 UMHPI 35-50 (Control signals 1)



27.4.3 UMHPI 35-50 (GI optional module control signals)



INDICE MORSETTIERA / INDEX TERMINAL BLOCK	
XXX	Identifica morsettiera / Identify the type of the terminal
[YYY]	Identidfica morsetto / Identify the label clamp reference
	Fase 230Vac/ Phase conductor 230Vac
N	Conduttore neutro/ Neutral conductor
xxx [yyy]	Terminale a molla / Spring terminal
xxx [yyy]	Terminale a vite / Screw Terminal
ITB	Internal Terminal Block
UTB	User Terminal Block
GITB	Gi-KIT Terminal Block
INDICE CABLAGGIO / INDEX WIRING	
Name n° pag;x;y	Partenza / Departing
PS pag;x;y Name n°	Arrivo / Comming
Name	Nome cavo / Name of calbe
n°	Numero cavo / Number of cable
pag	Pagina di rif. / Reference page
x	Ordinata / Ordered
y	Ascissa / Abscissa
PS	Pnt di partenza / Starting point

INDICE SIMBOLI / INDEX SYMBOLS	
	Sezionatore / Disconnector
	Fusibile / Fuse disconnector
	Trasduttore / Transducer
	Sensore / Sensor
	Bobina / Coil Contactor
	Fase / Phase conductor
	GND
	Riscaldatore / Heater
	Allarme / Alarm
	Valvola solenoide / Solenoid valve
	Valvola 3 vie / 3 Way Valve
	Valvola 4 vie / 4 Way Valve
	Ferrite / Core
T S M R PE	Compressore / Compressor
	Ventilatore / Fan motor
	Pompa / Pump
	Cavo schermato / Shielded wire

DISPOSITIVI DI PROTEZIONE / PROTECTIVE DEVICES	
SD	Sezionatore / Disconnector
K1	Contattore / Contactor
PM	Monitore di fase / Phases Monitor Realy
F230	Fusibile / Fuse 10.3x38
F380	Fusibile / Fuse 14x51; i-HP125 = 32A; 500V i-HP235 = 40 A 500V; i-HP250 = 50A; 500V.
Faux	Fusibile / Fuse 5x20
Faux12	Fusibile / Fuse 5x20
DISPOSITIVI ELETTRICI / ELECTRIC DEVICES	
INV_1	Inverter 1
INV_2	Inverter 2
1-Ph FR	Filtro EMI / EMI Filter 1-Ph
FR1-FR2	Filtro EMI / EMI Filter 3-Ph
RE1 -RE2	Induttanza / Reactor
TF	Trasformatore / Transformer 230 Vac-12 Vac
CB1-CB2	Banco condensatori / Capacitors board
MCB	Controllo principale / Master Control Board
AB1	Scheda ausiliaria 1 / Auxiliary Board 1
SCB2	Controllo secondario / Slave Control Board
AB2	Scheda ausiliaria 2 / Auxiliary Board 2
BEF	Terminale ventola / Electric fan Terminal Block
BWP	Terminale pompa / Water pump terminal Block
RESISTENZA / RESISTANCES	
CEH1	Resistenza carter compressore 1 / Inverter Compressor 1 Carter Resistance
CEH2	Resistenza carter compressore 2 / Inverter Compressor 2 Carter Resistance

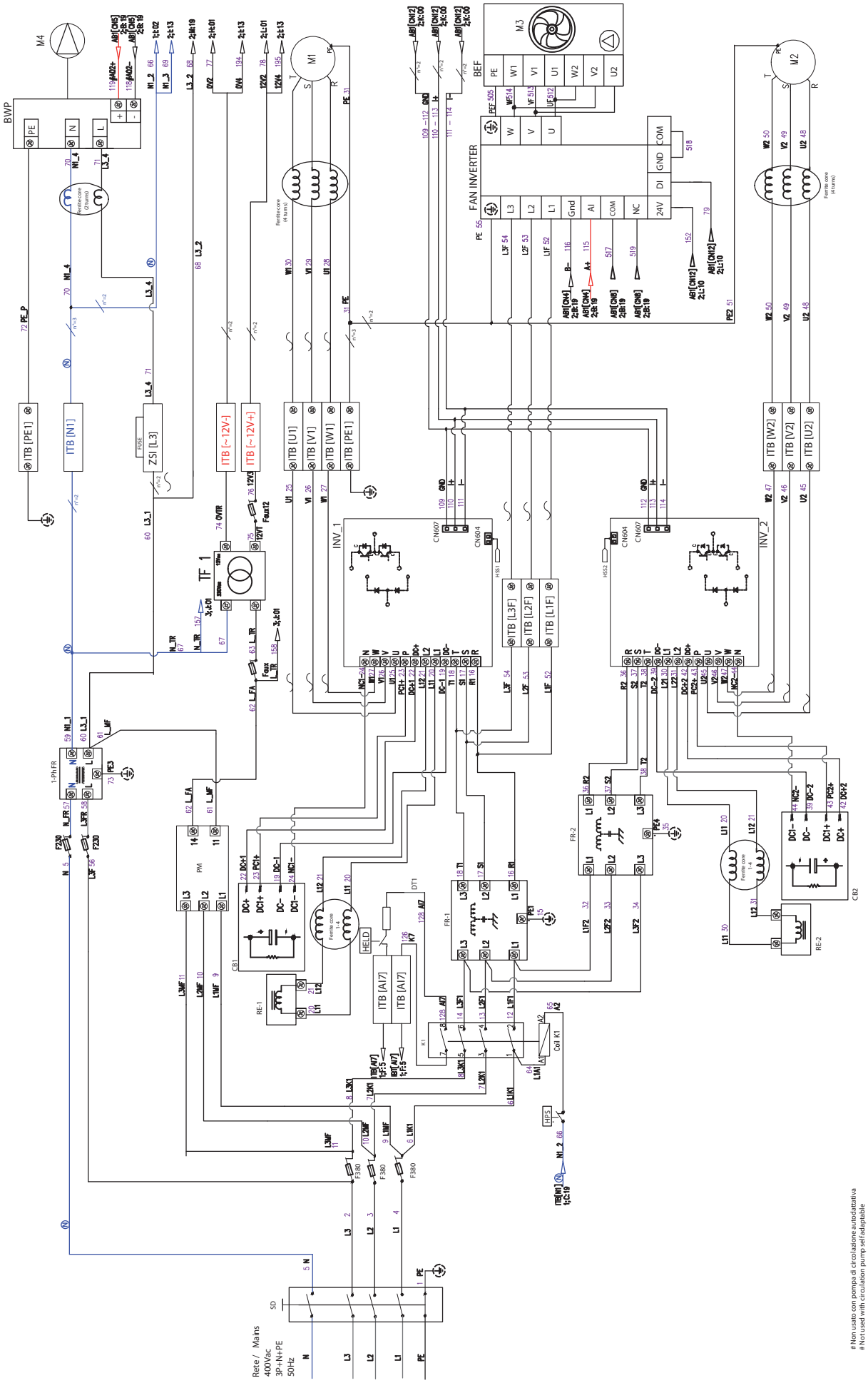
KITS OPZIONALI / OPTIONAL KITS		
KA	FHP	Piastra riscaldante frontale / Front heating plate
	BHR	Piastra riscaldante inferiore / Bottom heating plate
Gi Kit*	PV	Valvola di intercettazione idronica / Hydronic Shut-off valve
	RS	Sensore temp. acqua remota / Remote sensor for water temperature
	HNC	Contatto umidostato NC / Humidistat NC contact
	Kahe	Contatore per riscaldamento supplementare / Contactor for auxiliary heater
	Ksan	Contatore per riscaldamento supplementare sanitario / Contactor for sanitary auxiliary heater
	Boiler	Riscaldamento Bollitore / Heating Boiler
	SSS	Sistema di segnalazione stagione / Signaling system season
	DSV	Valvola doppio set-point / Double set-point valve
CI2	Valvola di intercettazione / Interception valve [ove previsto / where expected]	

MOTORI / ENGINES	
M1	Compressore 1 / Compressor 1
M2	Compressore 2 / Compressor 2
M3	Ventilatore / Fan motor
M4	Pompa / Water pump motor
VALVOLE / VALVES	
EEV	Valvola d'espansione elettronica / Electronic expansion valve
SV	Valvola solenoide / Solenoid valve
3WV	Valvola 3 vie / 3 Way Valve
4WV	Valvola 4 vie / 4 Way Valve
SAV	Valvola sanitaria 3 vie / Sanitary 3 way valve
OEV	Valvola equalizzazione olio / Oil equalization valve [ove previsto / where expected]
SENSORI / SENSORS	
ST	Sensore temperatura aspirazione / Suction temperature sensor
OUT	Sensore temperatura acqua uscita / Water outlet temperature sensor
IN	Sensore temperatura acqua ingresso / Water inlet temperature sensor
DT1	Sensore temp. scarico compressore1 / Discharge Temp. Sensor Compressor1
DT2	Sensore temp. scarico compressore2 / Discharge Temp. Sensor Compressor2
HP	Trasduttore di alta pressione High pressure transducer
LP	Trasduttore di bassa pressione Low pressure transducer
EXT	Sensore temp. esterna Air temperature sensor
HSS	Sensore temp. dissipatore Inverter Heat sink temperature sensor
SAN	Sensore temp. sanitario Sanitary temperature sensor
IT	Sensore temp. iniezione Injection temperature sensor
HPE	Trasduttore di alta pressione per circuito ad iniezione High pressure transducer for injection circuit
DISPOSITIVI / DEVICES	
HPS	Interuttore alta pressione / High pressure switch
FSV	Interuttore di portata / Flow switch
ON OFF	On -Off remoto Remote On / Off
SW	Estate - Inverno Summer - winter mode
RK	Tastiera remota / Remote Keyboard
AL	Allarme / Alarm
HELD	Ritenuta teleruttore / Held contactor

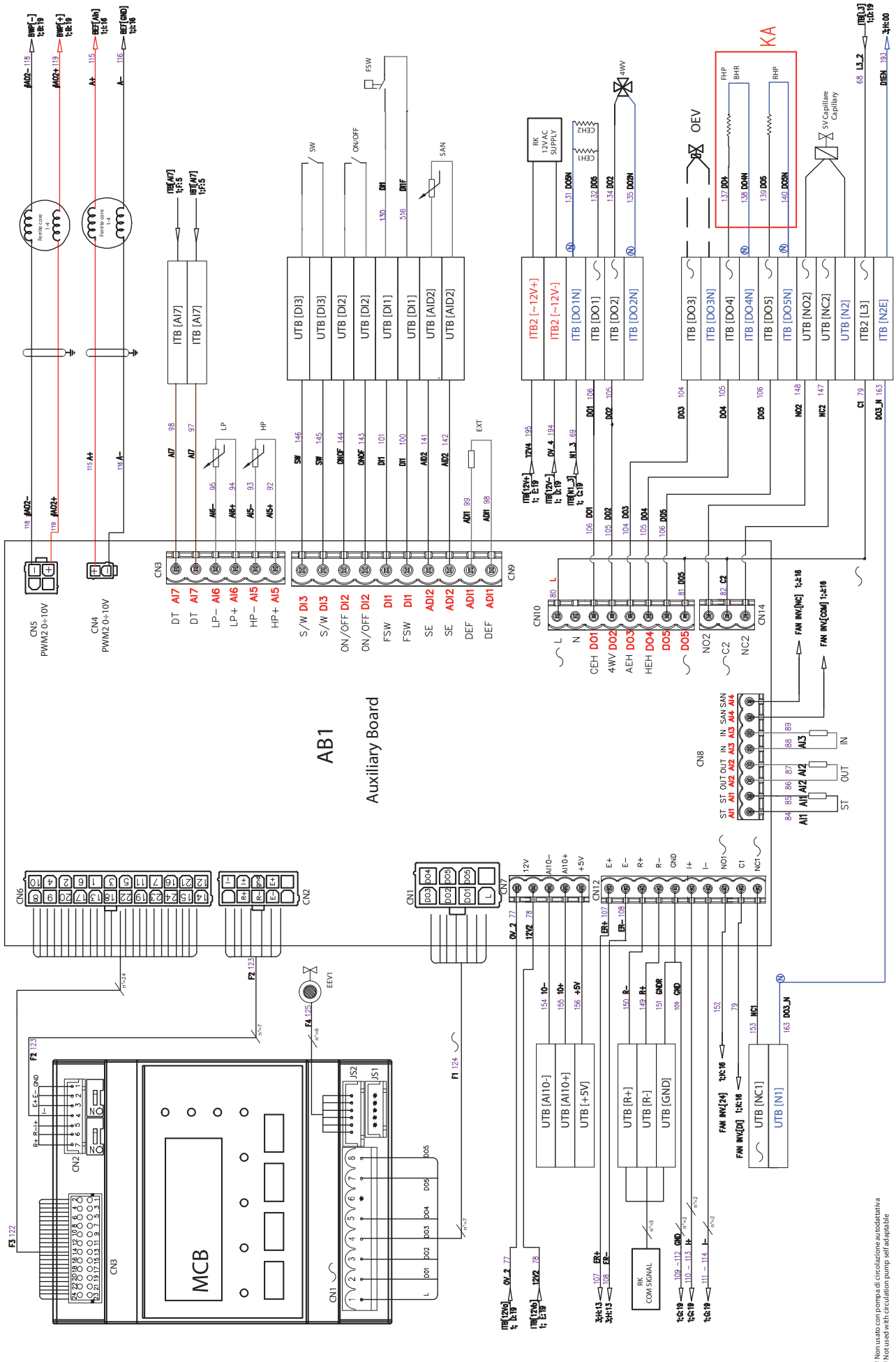
(*) Di serie su versione V
La legenda riporta simboli non necessariamente presenti nel seguente schema elettrico
The legend shows symbols not necessarily present in the schematic

27.5 UMHPI 35-50 with AC fan

27.5.1 UMHPI 35-50 with AC fan (power supply)

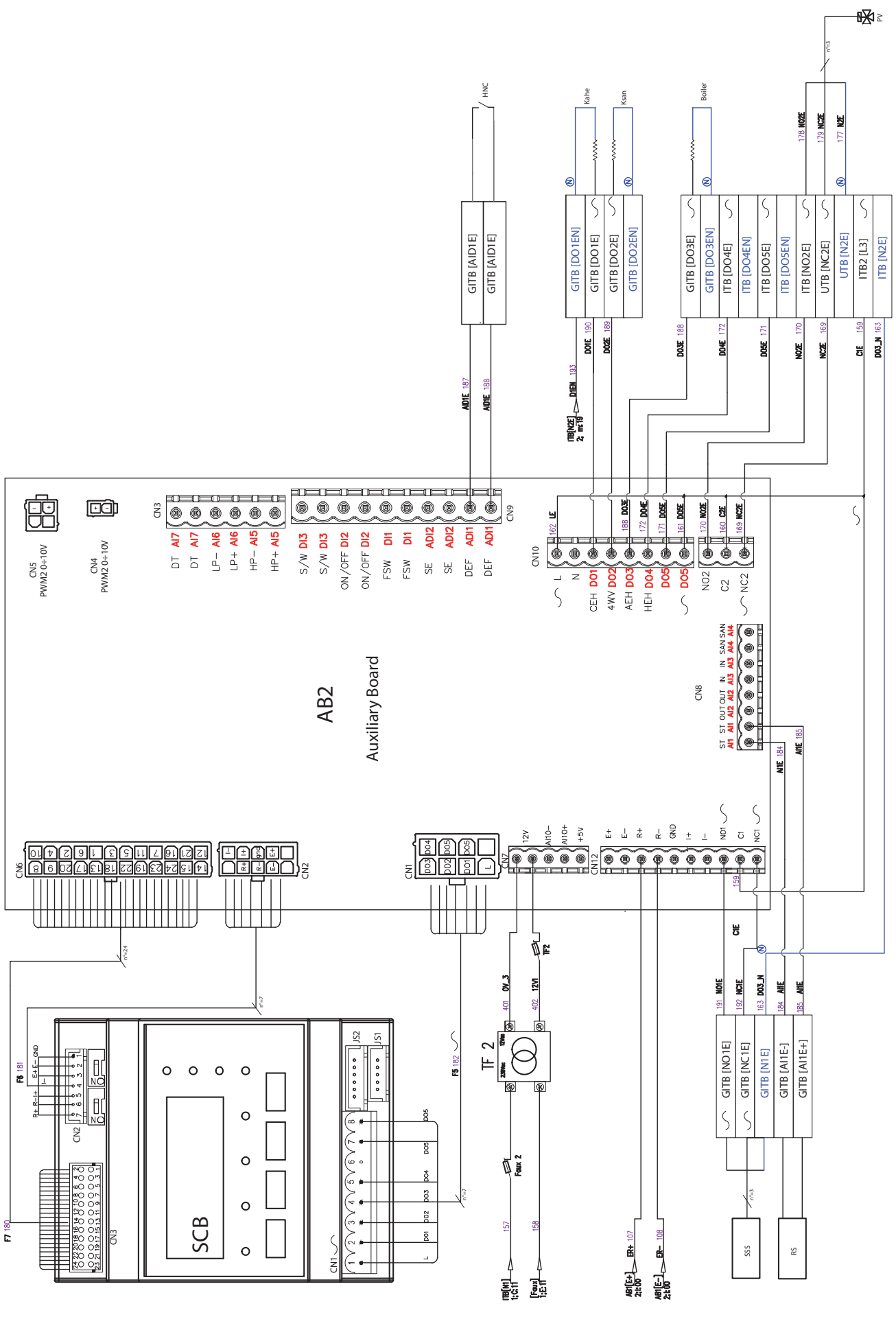


27.5.2 UMHPI 35-50 With AC fa n (Control signals 1)



Non usato con pompa di circolazione autodattativa
Not used with circulation pump self adaptable

27.5.3 UMHPI 35-50 with AC fan (GI optional module control signals)



27.5.4 UMHPI 35-50 with AC fan (Key)

INDICE MORSETTIERA / INDEX TERMINAL BLOCK	
XXX	Identifica morsettiera / Identify the type of the terminal
[YYY]	Identidfica morsetto / Identify the label clamp reference
~	Fase 230Vac/ Phase conductor 230Vac
N	Conduttore neutro/ Neutral conductor
xxx [yyy]	Terminale a molla / Spring terminal
⊗ xxx [yyy] ⊗	Terminale a vite / Screw Terminal
ITB	Internal Terminal Block
UTB	User Terminal Block
GITB	Gi-KIT Terminal Block
INDICE CABLAGGIO / INDEX WIRING	
Morsa n° ▷ pag;x;y	Partenza / Departing
PS pag;x;y ▷ Morsa n°	Arrivo / Comming
Name	Nome cavo / Name of calbe
n°	Numero cavo / Number of cable
pag	Pagina di rif. / Reference page
x	Ordinata / Ordered
y	Ascissa / Abscissa
PS	Pnt di partenza / Starting point

INDICE SIMBOLI / INDEX SYMBOLS	
	Sezionatore / Disconnector
	Fusibile / Fuse disconnector
	Trasduttore / Transducer
	Sensore / Sensor
	Bobina / Coil Contactor
	Fase / Phase conductor
	GND
	Riscaldatore / Heater
	Allarme / Alarm
	Valvola solenoide / Solenoid valve
	Valvola 3 vie / 3 Way Valve
	Valvola 4 vie / 4 Way Valve
	Ferrite / Core
	Compressore / Compressor
	Ventilatore / Fan motor
	Pompa / Pump
	Cavo schermato / Shielded wire

DISPOSITIVI DI PROTEZIONE / PROTECTIVE DEVICES	
SD	Sezionatore / Disconnector
K1	Contattore / Contactor
PM	Monitore di fase / Phases Monitor Realy
F230	Fusibile / Fuse 10.3x38
F380	Fusibile / Fuse 14x51; i-HP125 = 32A; 500V i-HP235 = 40 A 500V; i-HP250 = 50A; 500V.
Faux	Fusibile / Fuse 5x20
Faux12	Fusibile / Fuse 5x20
DISPOSITIVI ELETTRICI / ELECTRIC DEVICES	
INV_1	Inverter 1
INV_2	Inverter 2
1-Ph FR	Filtro EMI / EMI Filter 1-Ph
FR1-FR2	Filtro EMI / EMI Filter 3-Ph
RE1 -RE2	Induttanza / Reactor
TF	Trasformatore / Transformer 230 Vac-12 Vac
CB1-CB2	Banco condensatori / Capacitors board
MCB	Controllo principale / Master Control Board
AB1	Scheda ausiliaria 1 / Auxiliary Board 1
SCB2	Controllo secondario / Slave Control Board
AB2	Scheda ausiliaria 2 / Auxiliary Board 2
BEF	Terminale ventola / Electric fan Terminal Block
BWP	Terminale pompa / Water pump terminal Block
RESISTENZA / RESISTANCES	
CEH1	Resistenza carter compressore 1 / Inverter Compressor 1 Carter Resistance
CEH2	Resistenza carter compressore 2 / Inverter Compressor 2 Carter Resistance

KITS OPZIONALI / OPTIONAL KITS		
Gi Kit*	KA	FHP — Piastra riscaldante frontale / Front heating plate
		BHR — Piastra riscaldante inferiore / Bottom heating plate
		PV — Valvola di intercettazione idronica / Hydronic Shut-off valve
		RS — Sensore temp. acqua remota / Remote sensor for water temperature
		HNC — Contatto umidostato NC / Humidistat NC contact
		Kahe — Contatore per riscaldamento supplementare / Contactor for auxiliary heater
	Ksan	Contatore per riscaldamento supplementare sanitario / Contactor for sanitary auxiliary heater
	Boiler	Riscaldamento Bollitore / Heating Boiler
	SSS	Sistema di segnalazione stagione / Signaling system season
	DSV	Valvola doppio set-point / Double set-point valve
CI2	Valvola di intercettazione / Interception valve [ove previsto / where expected]	

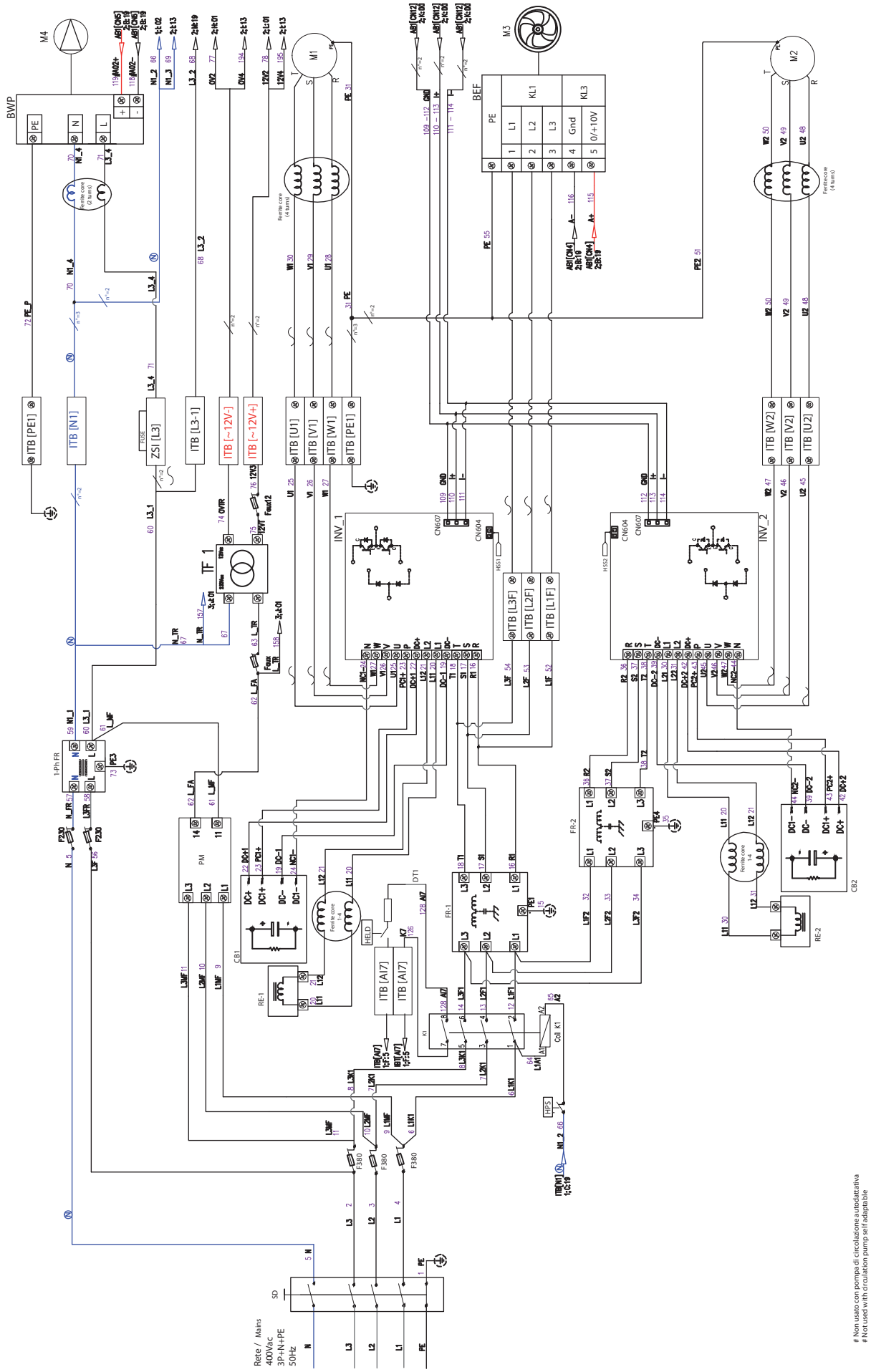
MOTORI / ENGINES	
M1	Compressore 1 / Compressor 1
M2	Compressore 2 / Compressor 2
M3	Ventilatore / Fan motor
M4	Pompa / Water pump motor
VALVOLE / VALVES	
EEV	Valvola d'espansione elettronica / Electronic expansion valve
SV	Valvola solenoide / Solenoid valve
3WV	Valvola 3 vie / 3 Way Valve
4WV	Valvola 4 vie / 4 Way Valve
SAV	Valvola sanitaria 3 vie / Sanitary 3 way valve
OEV	Valvola equalizzazione olio / Oil equalization valve [ove previsto /where expected]
SENSORI / SENSORS	
ST	Sensore temperatura aspirazione / Suction temperature sensor
OUT	Sensore temperatura acqua uscita / Water outlet temperature sensor
IN	Sensore temperatura acqua ingresso / Water inlet temperature sensor
DT1	Sensore temp. scarico compressore1 / Discharge Temp. Sensor Compressor1
DT2	Sensore temp. scarico compressore2 / Discharge Temp. Sensor Compressor2
HP	Trasduttore di alta pressione High pressure transducer
LP	Trasduttore di bassa pressione Low pressure transducer
EXT	Sensore temp. esterna Air temperature sensor
HSS	Sensore temp. dissipatore Inverter Heat sink temperature sensor
SAN	Sensore temp. sanitario Sanitary temperature sensor
IT	Sensore temp. iniezione Injection temperature sensor
HPE	Trasduttore di alta pressione per circuito ad iniezione High pressure transducer for injection circuit

DISPOSITIVI / DEVICES	
HPS	Interuttore alta pressione / High pressure switch
FSV	Interuttore di portata / Flow switch
ON OFF	On -Off remoto Remote On / Off
SW	Estate - Inverno Summer - winter mode
RK	Tastiera remota / Remote Keyboard
AL	Allarme / Alarm
HELD	Ritenuta teleruttore / Held contactor

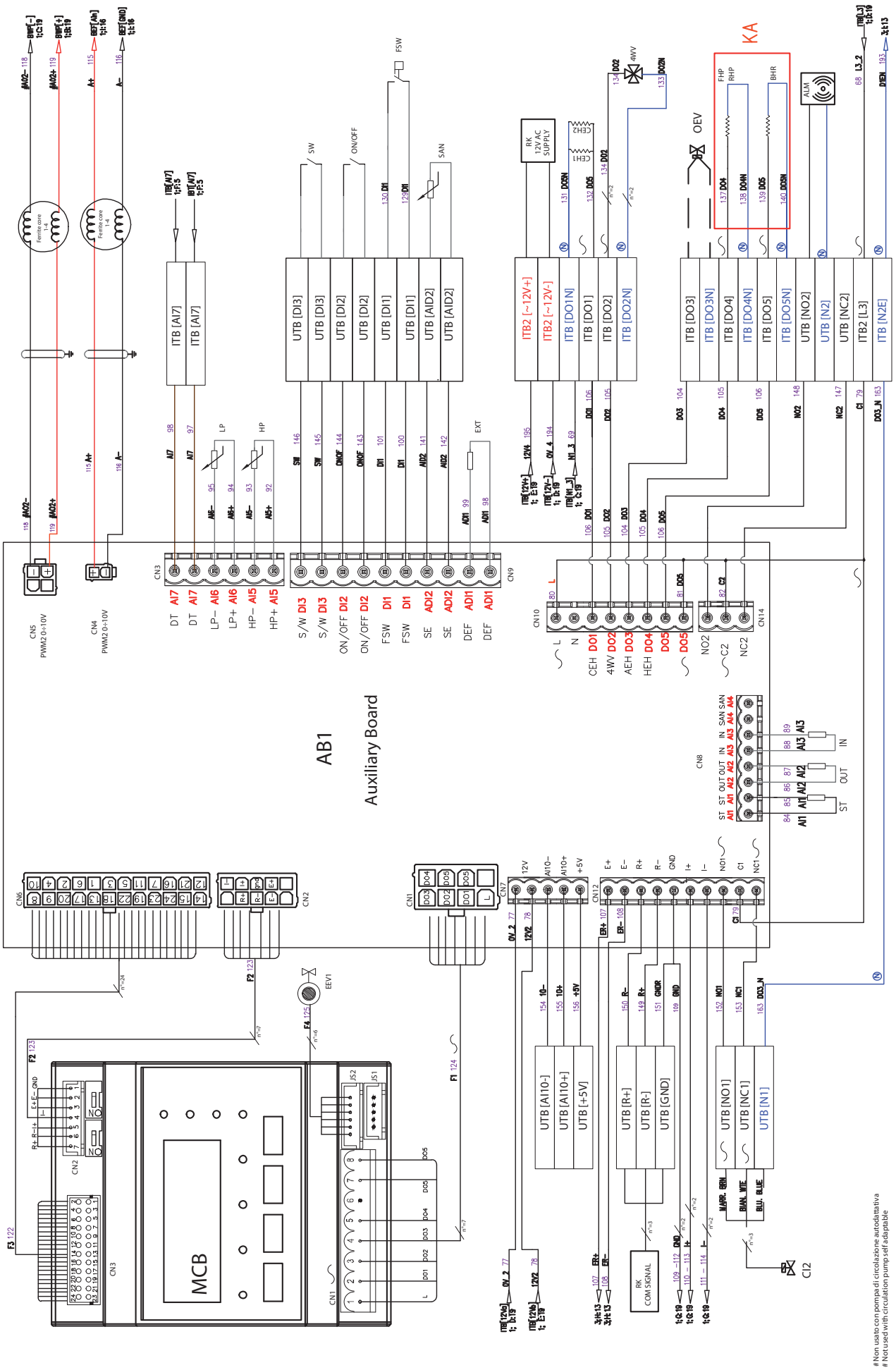
(*) Di serie su versioneV
La legenda riporta simboli non necessariamente presenti nel seguente schema elettrico
The legend shows symbols not necessarily present in the schematic

27.6 UMHPI 35-50 V

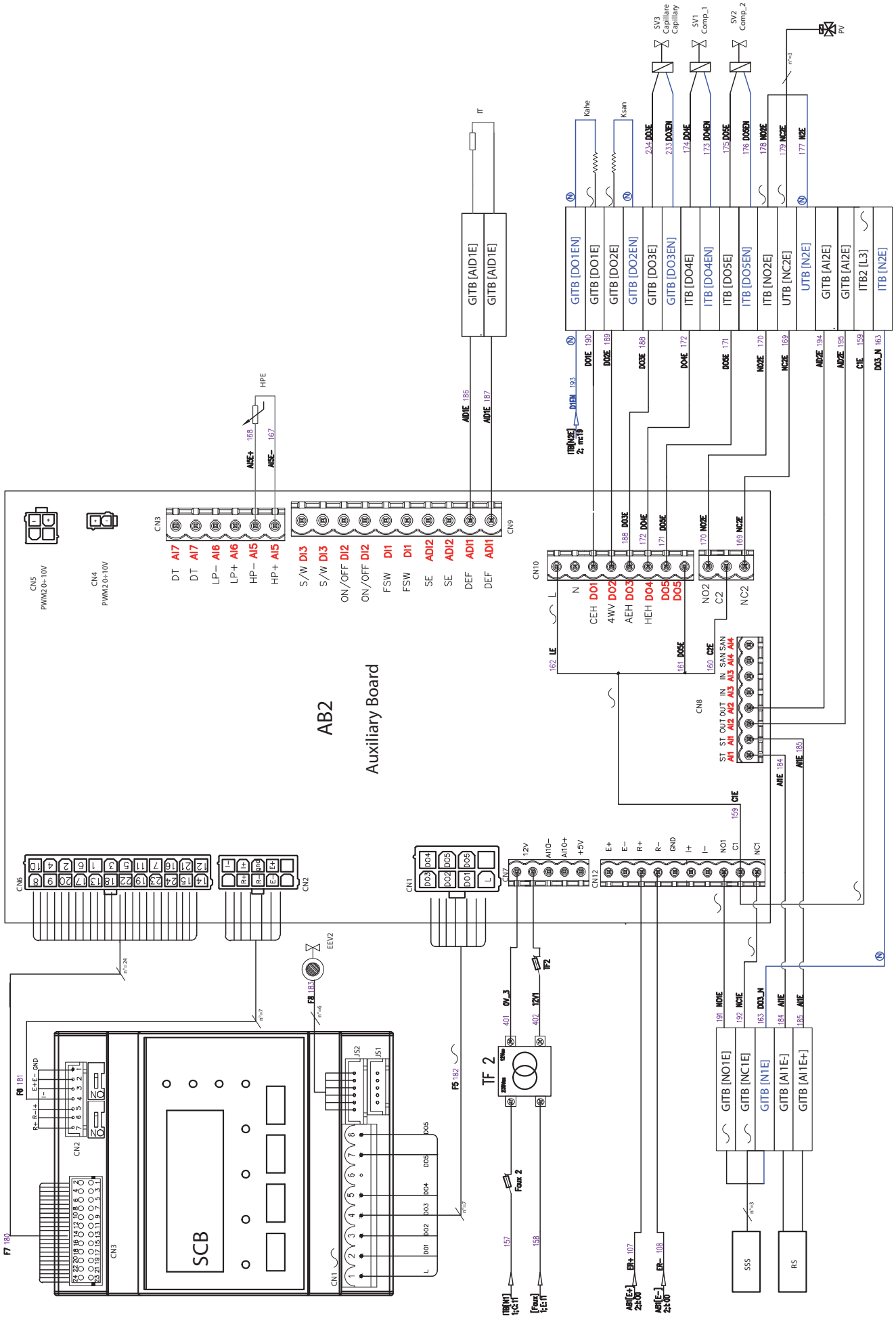
27.6.1 UMHPI 35-50 V (Power supply)



27.6.2 UMHPI 35-50 V (Control signals 1)



27.6.3 UMHPI 35-50 V (Control signals 2)



INDICE MORSETTIERA / INDEX TERMINAL BLOCK	
XXX	Identifica morsettiera / Identify the type of the terminal
[YYY]	Identidfica morsetto / Identify the label clamp reference
	Fase 230Vac/ Phase conductor 230Vac
N	Conduttore neutro/ Neutral conductor
xxx [yyy]	Terminale a molla / Spring terminal
xxx [yyy]	Terminale a vite / Screw Terminal
ITB	Internal Terminal Block
UTB	User Terminal Block
GITB	Gi-KIT Terminal Block
INDICE CABLAGGIO / INDEX WIRING	
Name n° pag;x;y	Partenza / Departing
PS pag;x;y Name n°	Arrivo / Comming
Name	Nome cavo / Name of calbe
n°	Numero cavo / Number of cable
pag	Pagina di rif. / Reference page
x	Ordinata / Ordered
y	Ascissa / Abscissa
PS	Pnt di partenza / Starting point

INDICE SIMBOLI / INDEX SYMBOLS	
	Sezionatore / Disconnector
	Fusibile / Fuse disconnector
	Trasduttore / Transducer
	Sensore / Sensor
	Bobina / Coil Contactor
	Fase / Phase conductor
	GND
	Riscaldatore / Heater
	Allarme / Alarm
	Valvola solenoide / Solenoid valve
	Valvola 3 vie / 3 Way Valve
	Valvola 4 vie / 4 Way Valve
	Ferrite / Core
T S M R PE	Compressore / Compressor
	Ventilatore / Fan motor
	Pompa / Pump
	Cavo schermato / Shielded wire

DISPOSITIVI DI PROTEZIONE / PROTECTIVE DEVICES	
SD	Sezionatore / Disconnector
K1	Contattore / Contactor
PM	Monitore di fase / Phases Monitor Realy
F230	Fusibile / Fuse 10x38
F380	Fusibile / Fuse 14x51; i-HP125 = 32A; 500V i-HP235 = 40 A 500V; i-HP250 = 50A; 500V.
Faux	Fusibile / Fuse 5x20
Faux12	Fusibile / Fuse 5x20
DISPOSITIVI ELETTRICI / ELECTRIC DEVICES	
INV_1	Inverter 1
INV_2	Inverter 2
1-Ph FR	Filtro EMI / EMI Filter 1-Ph
FR1-FR2	Filtro EMI / EMI Filter 3-Ph
RE1 -RE2	Induttanza / Reactor
TF	Trasformatore / Transformer 230 Vac-12 Vac
CB1-CB2	Banco condensatori / Capacitors board
MCB	Controllo principale / Master Control Board
AB1	Scheda ausiliaria 1 / Auxiliary Board 1
SCB2	Controllo secondario / Slave Control Board
AB2	Scheda ausiliaria 2 / Auxiliary Board 2
BEF	Terminale ventola / Electric fan Terminal Block
BWP	Terminale pompa / Water pump terminal Block
RESISTENZA / RESISTANCES	
CEH1	Resistenza carter compressore 1 / Inverter Compressor 1 Carter Resistance
CEH2	Resistenza carter compressore 2 / Inverter Compressor 2 Carter Resistance

KITS OPZIONALI / OPTIONAL KITS		
KA	FHP	Piastra riscaldante frontale / Front heating plate
	BHR	Piastra riscaldante inferiore / Bottom heating plate
Gi Kit*	PV	Valvola di intercettazione idronica / Hydronic Shut-off valve
	RS	Sensore temp. acqua remota / Remote sensor for water temperature
	HNC	Contatto umidostato NC / Humidistat NC contact
	Kahe	Contatore per riscaldamento supplementare / Contactor for auxiliary heater
	Ksan	Contatore per riscaldamento supplementare sanitario / Contactor for sanitary auxiliary heater
	Boiler	Riscaldamento Bollitore / Heating Boiler
	SSS	Sistema di segnalazione stagione / Signaling system season
	DSV	Valvola doppio set-point / Double set-point valve
CI2	Valvola di intercettazione / Interception valve [ove previsto / where expected]	

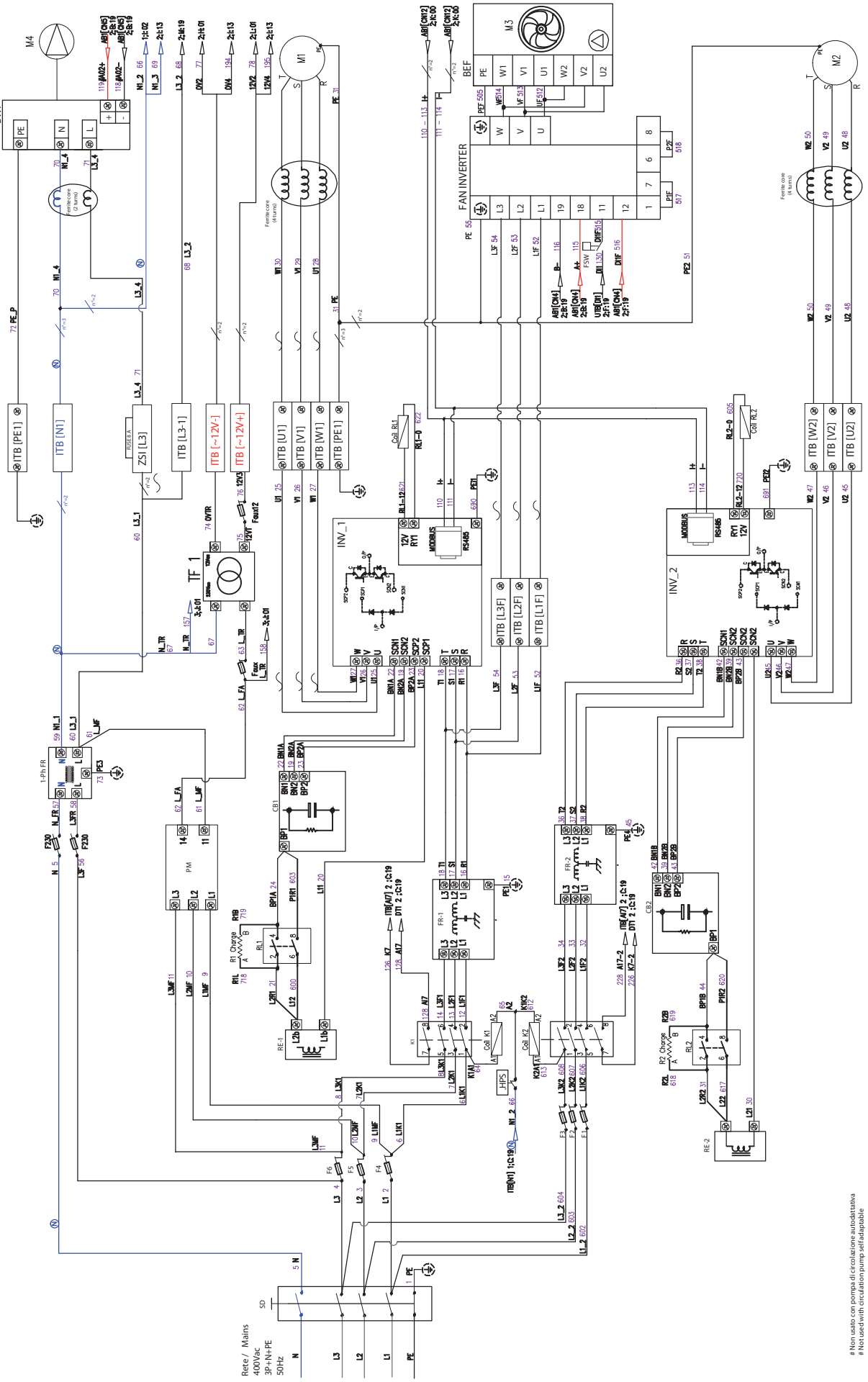
MOTORI / ENGINES	
M1	Compressore 1 / Compressor 1
M2	Compressore 2 / Compressor 2
M3	Ventilatore / Fan motor
M4	Pompa / Water pump motor
VALVOLE / VALVES	
EEV	Valvola d'espansione elettronica / Electronic expansion valve
SV	Valvola solenoide / Solenoid valve
3WV	Valvola 3 vie / 3 Way Valve
4WV	Valvola 4 vie / 4 Way Valve
SAV	Valvola sanitaria 3 vie / Sanitary 3 way valve
OEV	Valvola equalizzazione olio / Oil equalization valve [ove previsto / where expected]
SENSORI / SENSORS	
ST	Sensore temperatura aspirazione / Suction temperature sensor
OUT	Sensore temperatura acqua uscita / Water outlet temperature sensor
IN	Sensore temperatura acqua ingresso / Water inlet temperature sensor
DT1	Sensore temp. scarico compressore1 / Discharge Temp. Sensor Compressor1
DT2	Sensore temp. scarico compressore2 / Discharge Temp. Sensor Compressor2
HP	Trasduttore di alta pressione High pressure transducer
LP	Trasduttore di bassa pressione Low pressure transducer
EXT	Sensore temp. esterna Air temperature sensor
HSS	Sensore temp. dissipatore Inverter Heat sink temperature sensor
SAN	Sensore temp. sanitario Sanitary temperature sensor
IT	Sensore temp. iniezione Injection temperature sensor
HPE	Trasduttore di alta pressione per circuito ad iniezione High pressure transducer for injection circuit

DISPOSITIVI / DEVICES	
HPS	Interuttore alta pressione / High pressure switch
FSV	Interuttore di portata / Flow switch
ON OFF	On -Off remoto Remote On / Off
SW	Estate - Inverno Summer - winter mode
RK	Tastiera remota / Remote Keyboard
AL	Allarme / Alarm
HELD	Ritenuta teleruttore / Held contactor

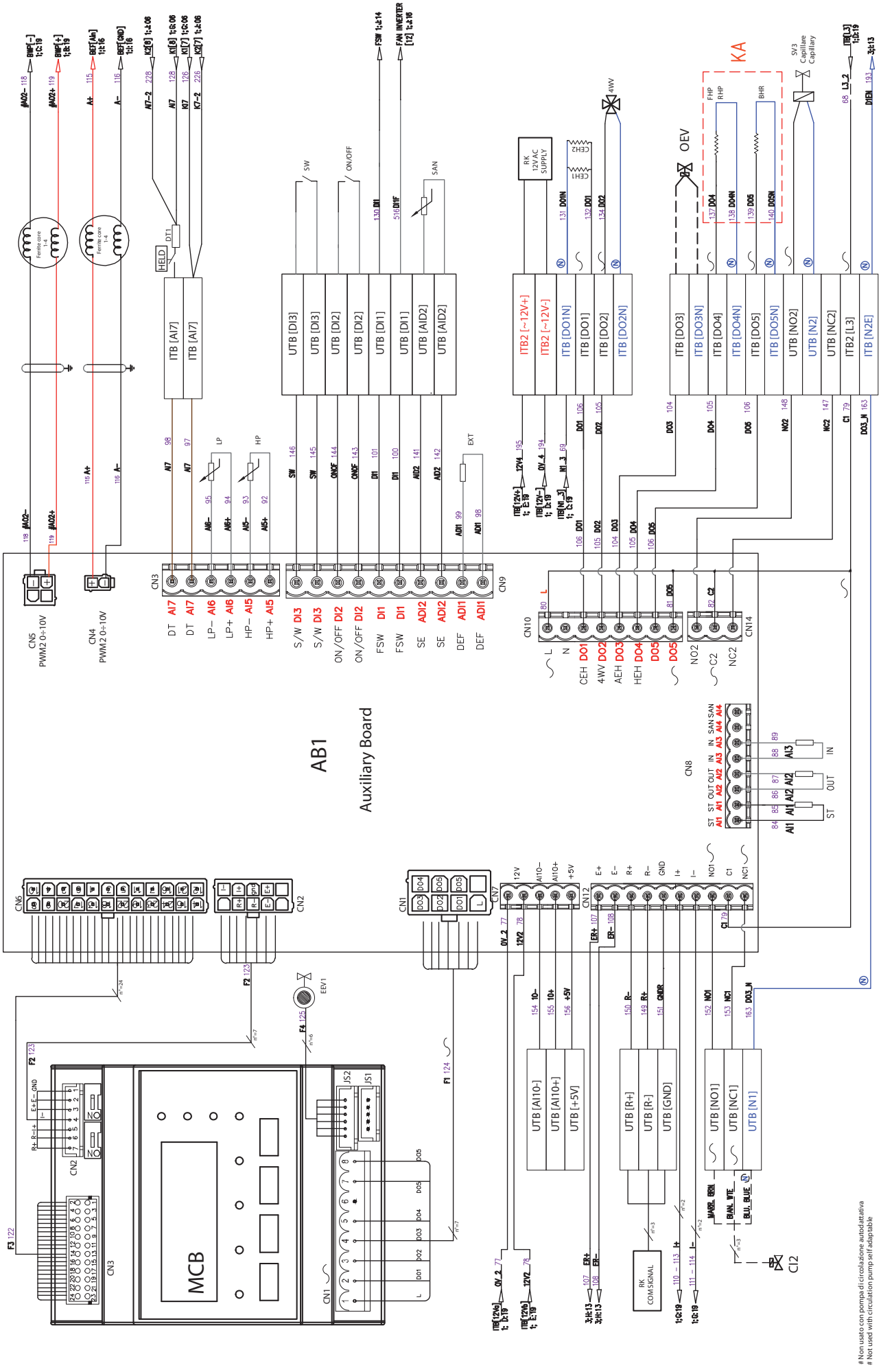
(*) Di serie su versione V
La legenda riporta simboli non necessariamente presenti nel seguente schema elettrico
The legend shows symbols not necessarily present in the schematic

27.7 UMHPI 60 with AC fan

27.7.1 UMHPI 60 with AC fan (power supply)

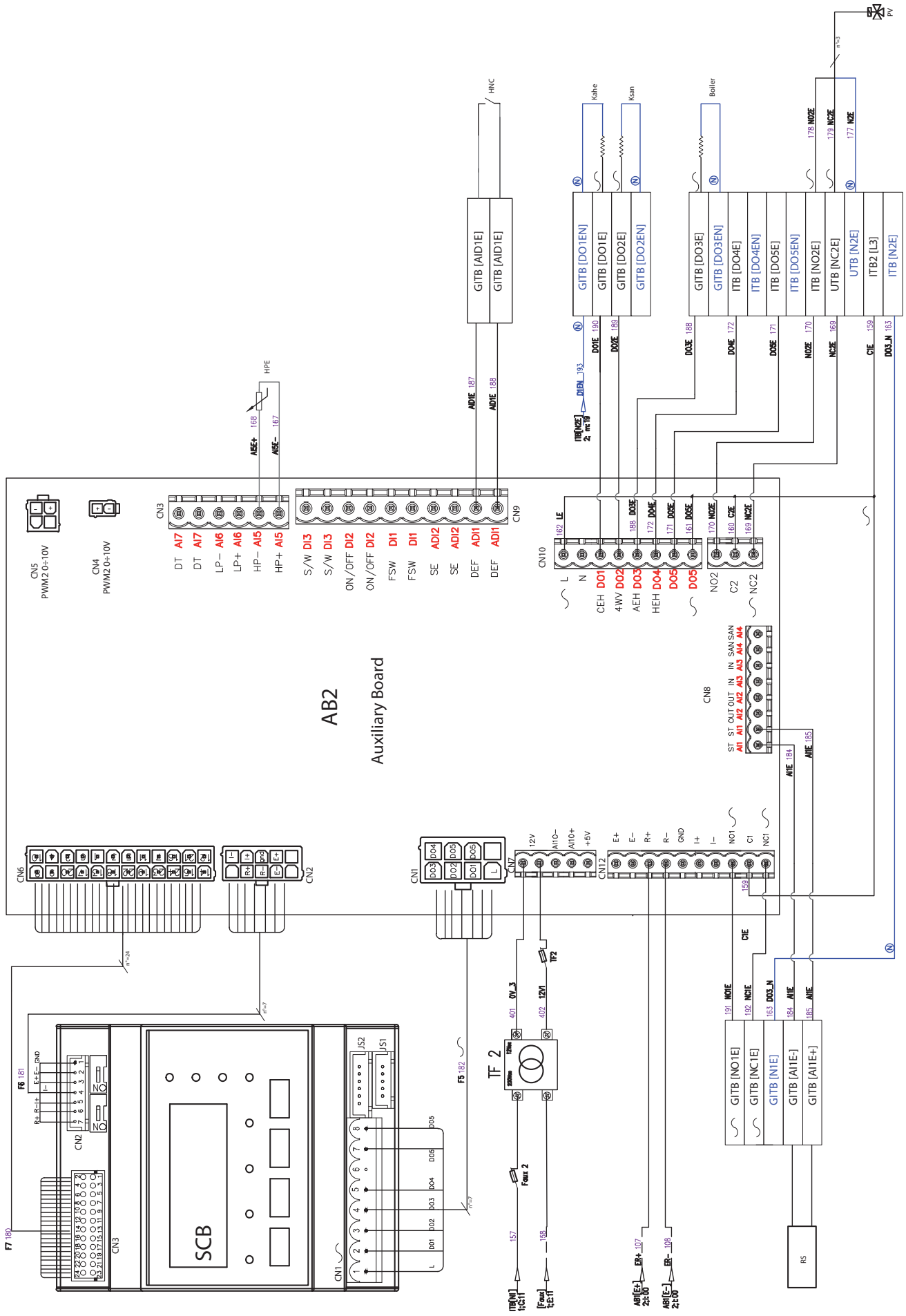


27.7.2 UMHPI 60 With AC fan (Control signals 1)

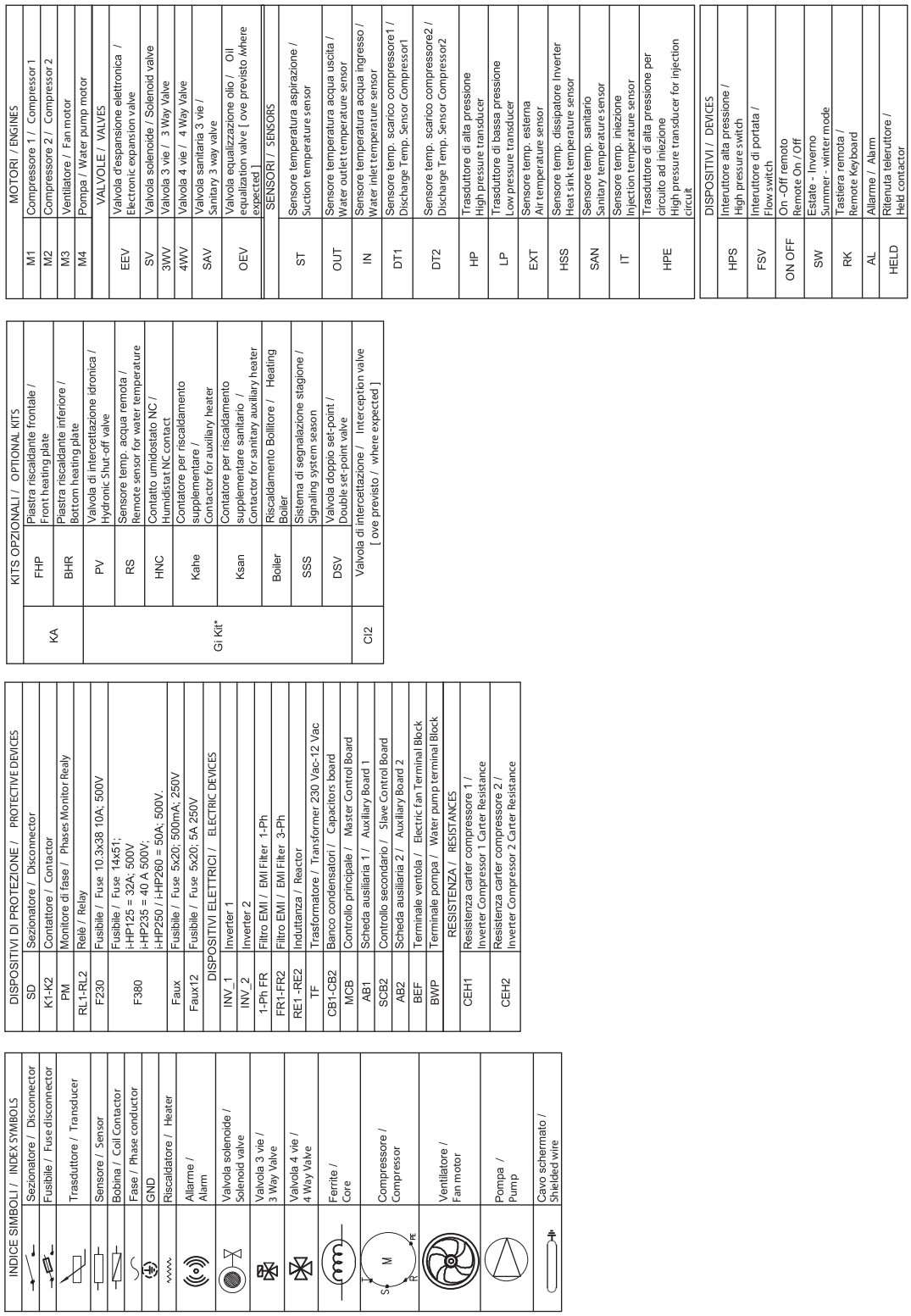


Non usato con pompa di circolazione autoadattativa
Not used with circulation pump self adaptable

27.7.3 UMHPI 60 with AC fan (Control signals 2)



27.7.4 UMHPI 60 with AC fan (Key)



INDICE MORSETTIERA / INDEX TERMINAL BLOCK	
XXX	Identifica morsettiera / Identify the type of the terminal
[YYY]	Identidfica morsetto / Identify the label clamp reference
	Fase 230Vac/ Phase conductor 230Vac
N	Conduttore neutro/ Neutral conductor
xxx [yyy]	Terminale a molla / Spring terminal
@ xxx [yyy] @	Terminale a vite / Screw Terminal
ITB	Internal Terminal Block
UTB	User Terminal Block
GITB	Gi-KIT Terminal Block
INDICE CABLAGGIO / INDEX WIRING	
Norma n° pagxy	Partenza / Departing
PS pagxy Norma n°	Arrivo / Comming
Name	Nome cavo / Name of calbe
n°	Numero cavo / Number of cable
pag	Pagina di rif. / Reference page
x	Ordinata / Ordered
y	Ascissa / Abscissa
PS	Pnt di partenza / Starting point

INDICE SIMBOLI / INDEX SYMBOLS	
	Sezionatore / Disconnector
	Fusibile / Fuse disconnector
	Trasduttore / Transducer
	Sensore / Sensor
	Bobina / Coil Contactor
	Fase / Phase conductor
	GND
	Riscaldatore / Heater
	Allarme / Alarm
	Valvola solenoide / Solenoid valve
	Valvola 3 vie / 3 Way Valve
	Valvola 4 vie / 4 Way Valve
	Ferrite / Core
S M R PE	Compressore / Compressor
	Ventilatore / Fan motor
	Pompa / Pump
	Cavo schermato / Shielded wire

DISPOSITIVI DI PROTEZIONE / PROTECTIVE DEVICES	
SD	Sezionatore / Disconnector
K1-K2	Contattore / Contactor
PM	Monitore di fase / Phases Monitor Realy
RL1-RL2	Relè / Relay
F230	Fusibile / Fuse 10.3x38 10A; 500V
F380	Fusibile / Fuse 14x51; i-HP125 = 32A; 500V i-HP235 = 40 A 500V; i-HP250 / i-HP260 = 50A; 500V.
Faux	Fusibile / Fuse 5x20; 500mA; 250V
Faux12	Fusibile / Fuse 5x20; 5A 250V
DISPOSITIVI ELETTRICI / ELECTRIC DEVICES	
INV_1	Inverter 1
INV_2	Inverter 2
1-Ph FR	Filtro EMI / EMI Filter 1-Ph
FR1-FR2	Filtro EMI / EMI Filter 3-Ph
RE1 -RE2	Induttanza / Reactor
TF	Trasformatore / Transformer 230 Vac-12 Vac
CB1-CB2	Banco condensatori / Capacitors board
MCB	Controllo principale / Master Control Board
AB1	Scheda ausiliaria 1 / Auxiliary Board 1
SCB2	Controllo secondario / Slave Control Board
AB2	Scheda ausiliaria 2 / Auxiliary Board 2
BEF	Terminale ventola / Electric fan Terminal Block
BWP	Terminale pompa / Water pump terminal Block
RESISTENZA / RESISTANCES	
CEH1	Resistenza carter compressore 1 / Inverter Compressor 1 Carter Resistance
CEH2	Resistenza carter compressore 2 / Inverter Compressor 2 Carter Resistance

KITS OPZIONALI / OPTIONAL KITS		
KA	FHP	Piastra riscaldante frontale / Front heating plate
	BHR	Piastra riscaldante inferiore / Bottom heating plate
Gi Kit*	PV	Valvola di intercettazione idronica / Hydronic Shut-off valve
	RS	Sensore temp. acqua remota / Remote sensor for water temperature
	HNC	Contatto umidostato NC / Humidistat NC contact
	Kahe	Contatore per riscaldamento supplementare / Contactor for auxiliary heater
	Ksan	Contatore per riscaldamento supplementare sanitario / Contactor for sanitary auxiliary heater
	Boiler	Riscaldamento Bollitore / Heating Boiler
	SSS	Sistema di segnalazione stagione / Signaling system season
	DSV	Valvola doppio set-point / Double set-point valve
CI2	Valvola di intercettazione / Interception valve [ove previsto / where expected]	

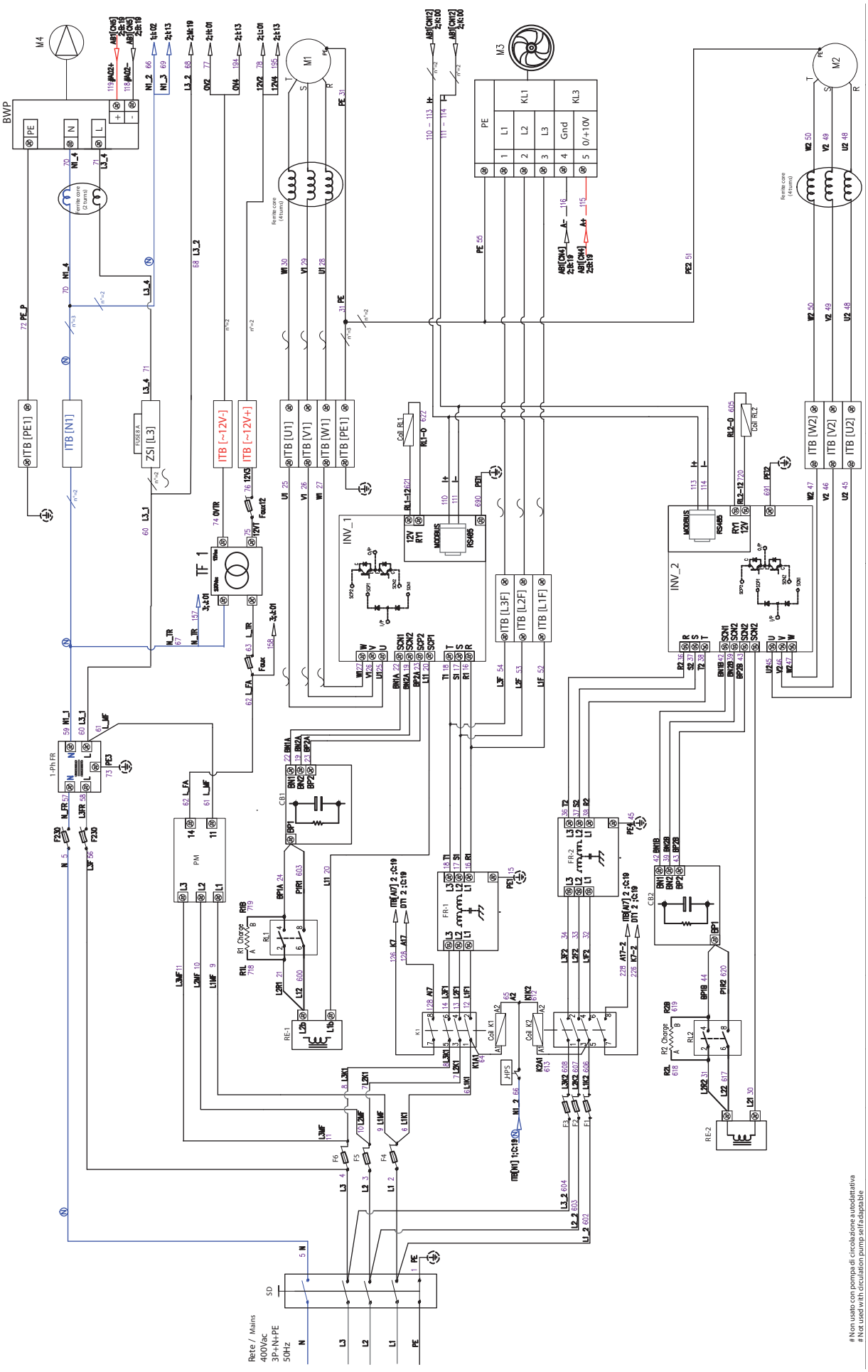
MOTORI / ENGINES	
M1	Compressore 1 / Compressor 1
M2	Compressore 2 / Compressor 2
M3	Ventilatore / Fan motor
M4	Pompa / Water pump motor
VALVOLE / VALVES	
EEV	Valvola d'espansione elettronica / Electronic expansion valve
SV	Valvola solenoide / Solenoid valve
3WV	Valvola 3 vie / 3 Way Valve
4WV	Valvola 4 vie / 4 Way Valve
SAV	Valvola sanitaria 3 vie / Sanitary 3 way valve
OEV	Valvola equalizzazione olio / Oil equalization valve [ove previsto /where expected]
SENSORI / SENSORS	
ST	Sensore temperatura aspirazione / Suction temperature sensor
OUT	Sensore temperatura acqua uscita / Water outlet temperature sensor
IN	Sensore temperatura acqua ingresso / Water inlet temperature sensor
DT1	Sensore temp. scarico compressore1 / Discharge Temp. Sensor Compressor1
DT2	Sensore temp. scarico compressore2 / Discharge Temp. Sensor Compressor2
HP	Trasduttore di alta pressione High pressure transducer
LP	Trasduttore di bassa pressione Low pressure transducer
EXT	Sensore temp. esterna Air temperature sensor
HSS	Sensore temp. dissipatore Inverter Heat sink temperature sensor
SAN	Sensore temp. sanitario Sanitary temperature sensor
IT	Sensore temp. iniezione Injection temperature sensor
HPE	Trasduttore di alta pressione per circuito ad iniezione High pressure transducer for injection circuit

DISPOSITIVI / DEVICES	
HPS	Interuttore alta pressione / High pressure switch
FSV	Interuttore di portata / Flow switch
ON OFF	On -Off remoto Remote On / Off
SW	Estate - Inverno Summer - winter mode
RK	Tastiera remota / Remote Keyboard
AL	Allarme / Alarm
HELD	Ritenuta teleruttore / Held contactor

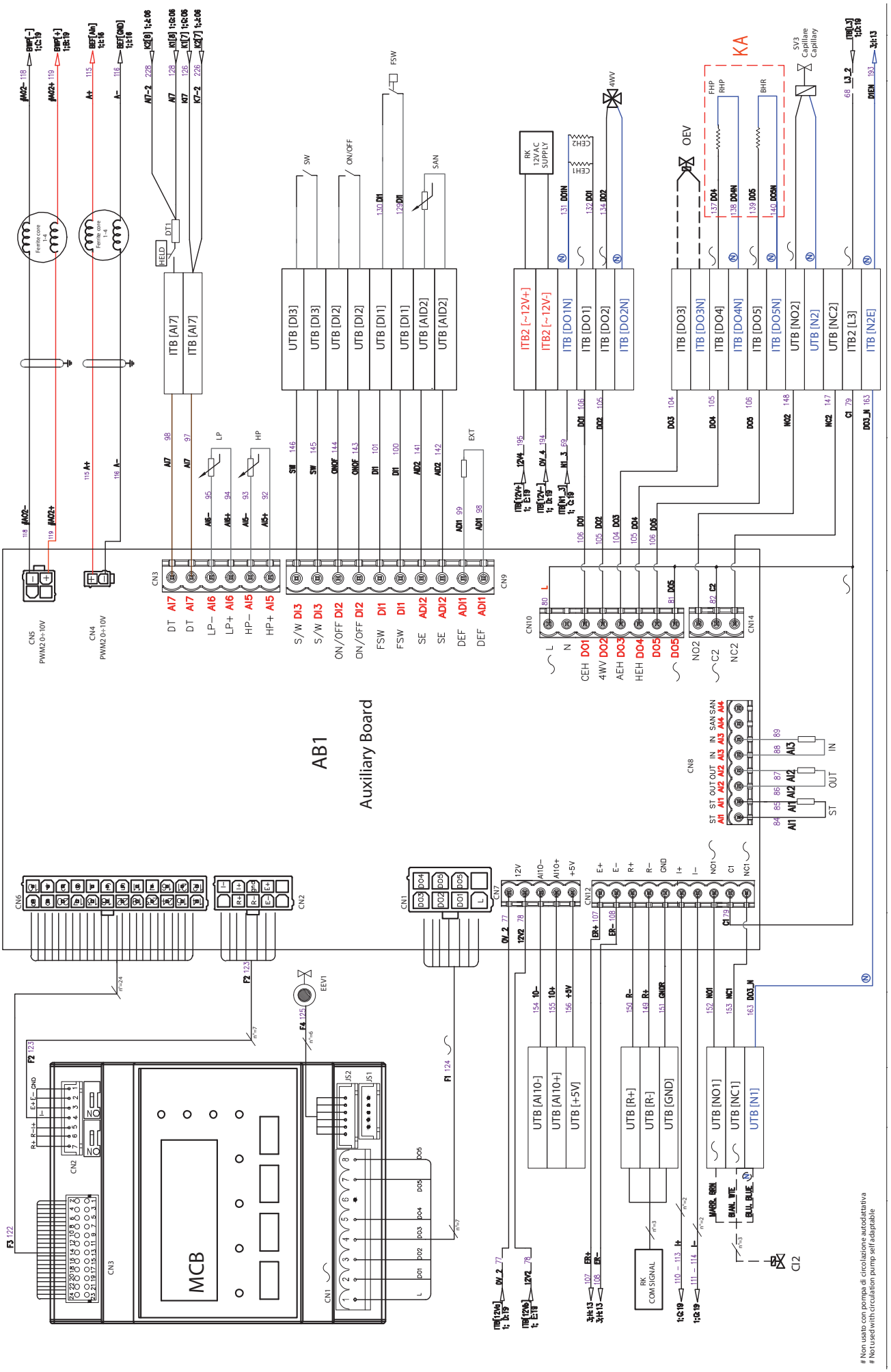
(*) Di serie su versione V.
La legenda riporta simboli non necessariamente presenti nel seguente schema elettrico
The legend shows symbols not necessarily present in the schematic

27.8 UMHPI 60

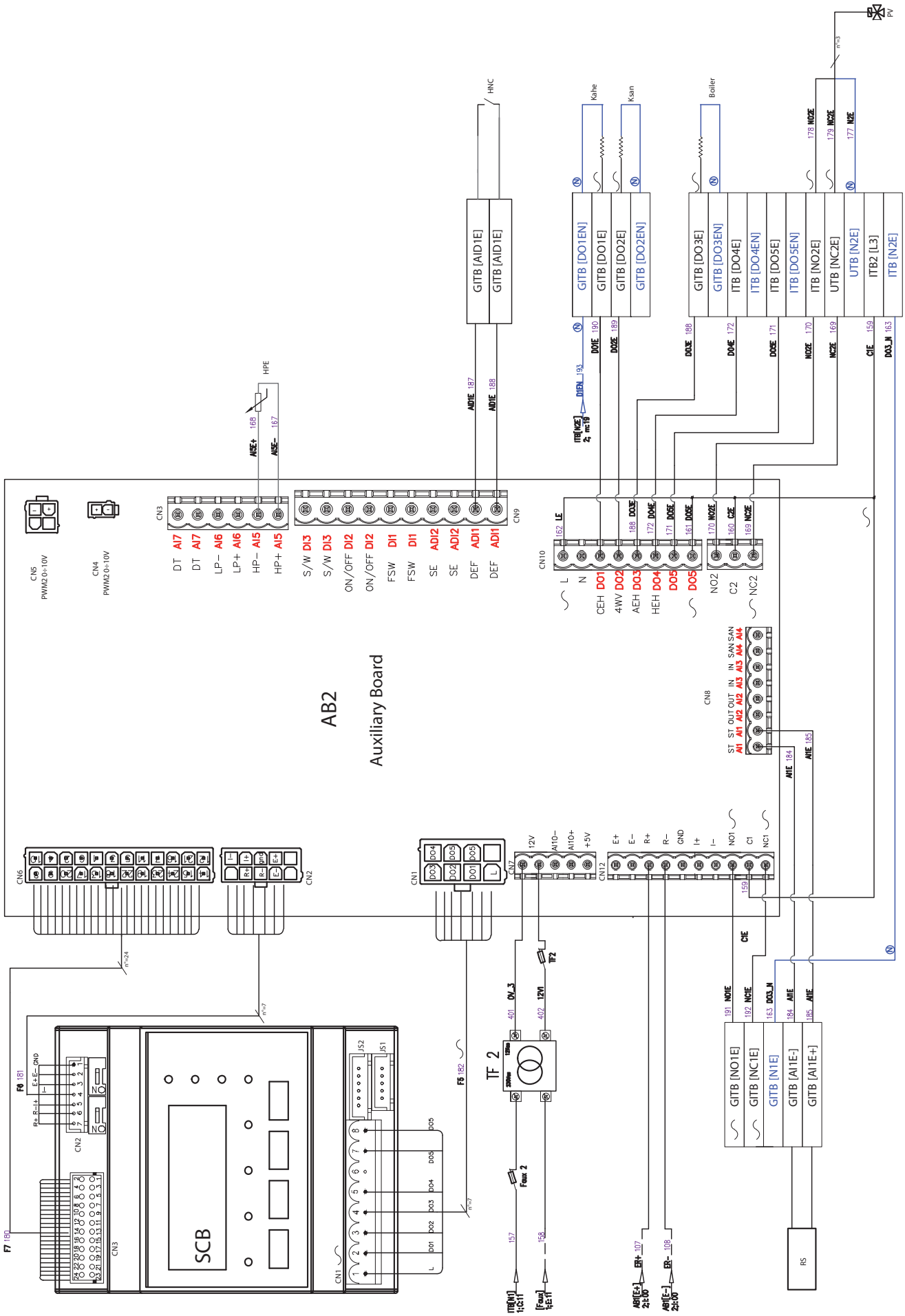
27.8.1 UMHPI 60 (Power supply)



27.8.2 UMHPI 60 (Control signals 1)



27.8.3 UMHPI 60 (Control signals 2)



INDICE MORSETTIERA / INDEX TERMINAL BLOCK	
XXX	Identifica morsettiera / Identify the type of the terminal
[YYY]	Identidfica morsetto / Identify the label clamp reference
	Fase 230Vac/ Phase conductor 230Vac
N	Conduttore neutro/ Neutral conductor
xxx [yyy]	Terminale a molla / Spring terminal
xxx [yyy]	Terminale a vite / Screw Terminal
ITB	Internal Terminal Block
UTB	User Terminal Block
GITB	Gi-KIT Terminal Block
INDICE CABLAGGIO / INDEX WIRING	
Nome n° pag; x; y	Partenza / Departing
PS pag; x; y Nome n°	Arrivo / Comming
Name	Nome cavo / Name of calbe
n°	Numero cavo / Number of cable
pag	Pagina di rif. / Reference page
x	Ordinata / Ordered
y	Ascissa / Abscissa
PS	Pnt di partenza / Starting point

INDICE SIMBOLI / INDEX SYMBOLS	
	Sezionatore / Disconnector
	Fusibile / Fuse disconnector
	Trasduttore / Transducer
	Sensore / Sensor
	Bobina / Coil Contactor
	Fase / Phase conductor
	GND
	Riscaldatore / Heater
	Allarme / Alarm
	Valvola solenoide / Solenoid valve
	Valvola 3 vie / 3 Way Valve
	Valvola 4 vie / 4 Way Valve
	Ferrite / Core
T S M R PE	Compressore / Compressor
	Ventilatore / Fan motor
	Pompa / Pump
	Cavo schermato / Shielded wire

DISPOSITIVI DI PROTEZIONE / PROTECTIVE DEVICES	
SD	Sezionatore / Disconnector
K1-K2	Contattore / Contactor
PM	Monitore di fase / Phases Monitor Realy
RL1-RL2	Relè / Relay
F230	Fusibile / Fuse 10.3x38 10A; 500V
F380	Fusibile / Fuse 14x51; i-HP125 = 32A; 500V i-HP235 = 40 A 500V; i-HP250 / i-HP260 = 50A; 500V.
Faux	Fusibile / Fuse 5x20; 500mA; 250V
Faux12	Fusibile / Fuse 5x20; 5A 250V
DISPOSITIVI ELETTRICI / ELECTRIC DEVICES	
INV_1	Inverter 1
INV_2	Inverter 2
1-Ph FR	Filtro EMI / EMI Filter 1-Ph
FR1-FR2	Filtro EMI / EMI Filter 3-Ph
RE1 -RE2	Induttanza / Reactor
TF	Trasformatore / Transformer 230 Vac-12 Vac
CB1-CB2	Banco condensatori / Capacitors board
MCB	Controllo principale / Master Control Board
AB1	Scheda ausiliaria 1 / Auxiliary Board 1
SCB2	Controllo secondario / Slave Control Board
AB2	Scheda ausiliaria 2 / Auxiliary Board 2
BEF	Terminale ventola / Electric fan Terminal Block
BWP	Terminale pompa / Water pump terminal Block
RESISTENZA / RESISTANCES	
CEH1	Resistenza carter compressore 1 / Inverter Compressor 1 Carter Resistance
CEH2	Resistenza carter compressore 2 / Inverter Compressor 2 Carter Resistance

KITS OPZIONALI / OPTIONAL KITS		
KA	FHP	Piastra riscaldante frontale / Front heating plate
	BHR	Piastra riscaldante inferiore / Bottom heating plate
Gi Kit*	PV	Valvola di intercettazione idronica / Hydronic Shut-off valve
	RS	Sensore temp. acqua remota / Remote sensor for water temperature
	HNC	Contatto umidostato NC / Humidistat NC contact
	Kahe	Contatore per riscaldamento supplementare / Contactor for auxiliary heater
	Ksan	Contatore per riscaldamento supplementare sanitario / Contactor for sanitary auxiliary heater
	Boiler	Riscaldamento Bollitore / Heating Boiler
	SSS	Sistema di segnalazione stagione / Signaling system season
	DSV	Valvola doppio set-point / Double set-point valve
CI2	Valvola di intercettazione / Interception valve [ove previsto / where expected]	

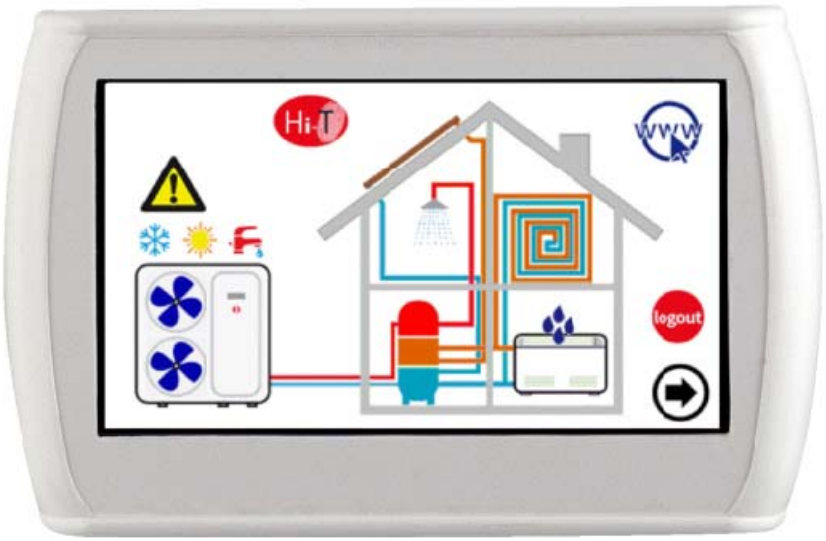
MOTORI / ENGINES	
M1	Compressore 1 / Compressor 1
M2	Compressore 2 / Compressor 2
M3	Ventilatore / Fan motor
M4	Pompa / Water pump motor
VALVOLE / VALVES	
EEV	Valvola d'espansione elettronica / Electronic expansion valve
SV	Valvola solenoide / Solenoid valve
3WV	Valvola 3 vie / 3 Way Valve
4WV	Valvola 4 vie / 4 Way Valve
SAV	Valvola sanitaria 3 vie / Sanitary 3 way valve
OEV	Valvola equalizzazione olio / Oil equalization valve [ove previsto / where expected]
SENSORI / SENSORS	
ST	Sensore temperatura aspirazione / Suction temperature sensor
OUT	Sensore temperatura acqua uscita / Water outlet temperature sensor
IN	Sensore temperatura acqua ingresso / Water inlet temperature sensor
DT1	Sensore temp. scarico compressore1 / Discharge Temp. Sensor Compressor1
DT2	Sensore temp. scarico compressore2 / Discharge Temp. Sensor Compressor2
HP	Trasduttore di alta pressione High pressure transducer
LP	Trasduttore di bassa pressione Low pressure transducer
EXT	Sensore temp. esterna Air temperature sensor
HSS	Sensore temp. dissipatore Inverter Heat sink temperature sensor
SAN	Sensore temp. sanitario Sanitary temperature sensor
IT	Sensore temp. iniezione Injection temperature sensor
HPE	Trasduttore di alta pressione per circuito ad iniezione High pressure transducer for injection circuit

DISPOSITIVI / DEVICES	
HPS	Interuttore alta pressione / High pressure switch
FSV	Interuttore di portata / Flow switch
ON OFF	On -Off remoto Remote On / Off
SW	Estate - Inverno Summer - winter mode
RK	Tastiera remota / Remote Keyboard
AL	Allarme / Alarm
HELD	Ritenuta teleruttore / Held contactor

(*) Di serie su versione V
La legenda riporta simboli non necessariamente presenti nel seguente schema elettrico
The legend shows symbols not necessarily present in the schematic

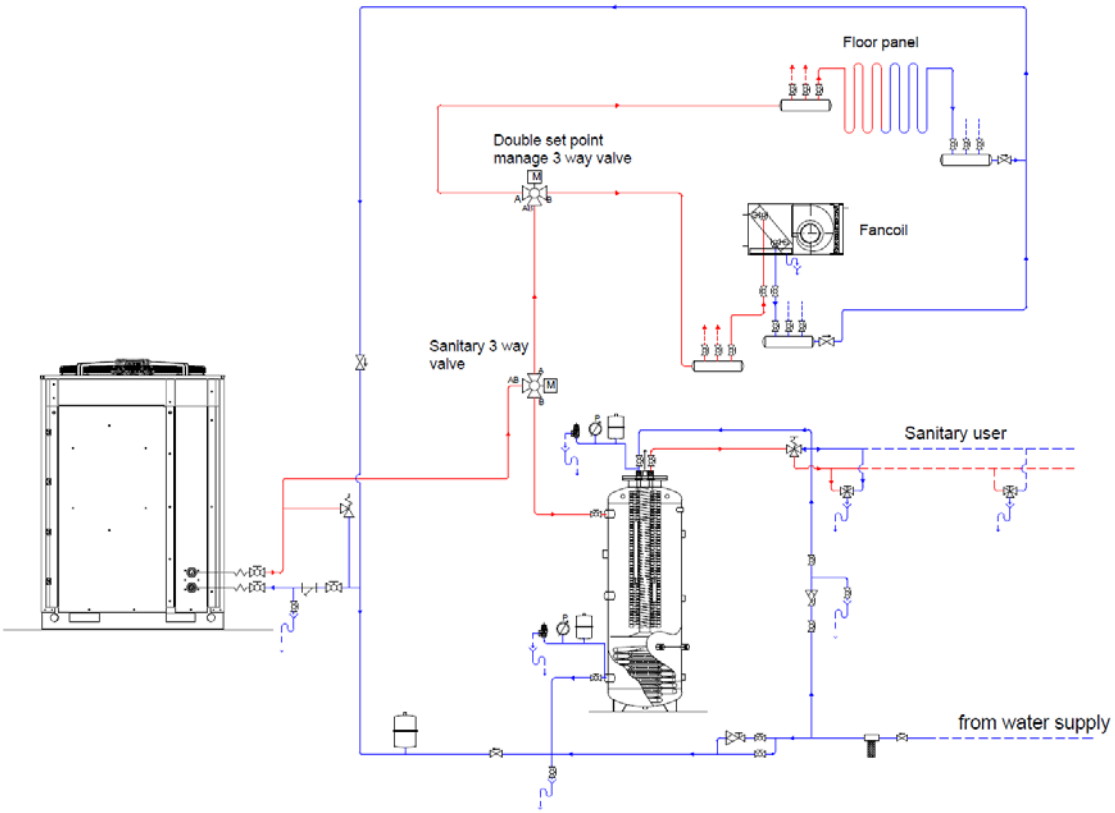
28 TOUCH-SCREEN REMOTE CONTROL PANEL Evo Touch (OPTIONAL ACCESSORY)

The Evo Touch is a touch screen remote control for centralized management using RS485 network of chiller/heat pump and of HNS system. It can also be used for partial functions (ex. as a remote control panel for single chiller/heat pump or as environment thermostat for managing some fan coils).
The network can include a maximum of 7 chillers in cascade and a maximum of 70 fan coil units divided into 9 thermal zone. It integrates humidity and temperature sensors for monitoring the environment and managing the double setpoint for the radiant floor panel that use a dehumidification system. The intuitive interface simplifies its utilization, all the functions are easy to set through the use of synoptic for immediate understanding.
The touch-screen control panel is suitable for hidden fixing in the wall box E503.



For more information, please see the manual of the Evo Touch device.

29 HYDRAULIC DIAGRAM TYPE



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COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL = ISO 9001 =