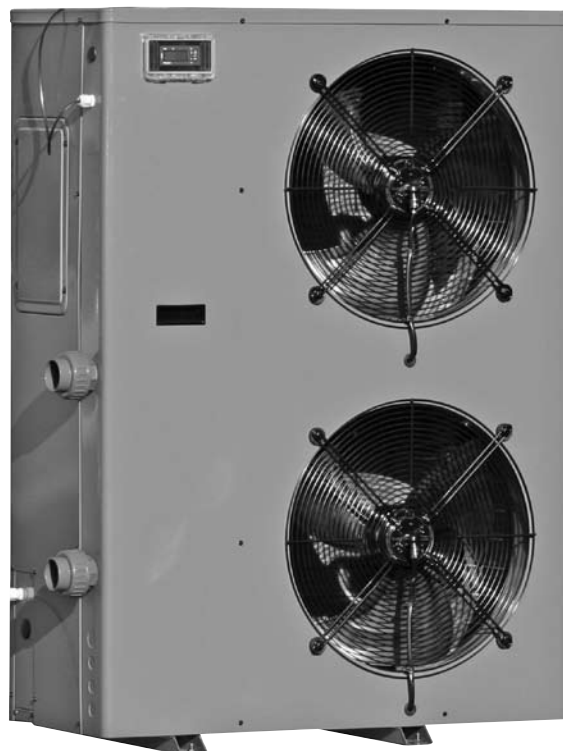

Heat Pumps for Swimming Pools

YPP-A-7M, YPP-A-10M,
YPP-A-14M/YPP-A-14T
YPP-A-17M, YPP-A-22T

Ref.: N-27715 0708M

Technical Information

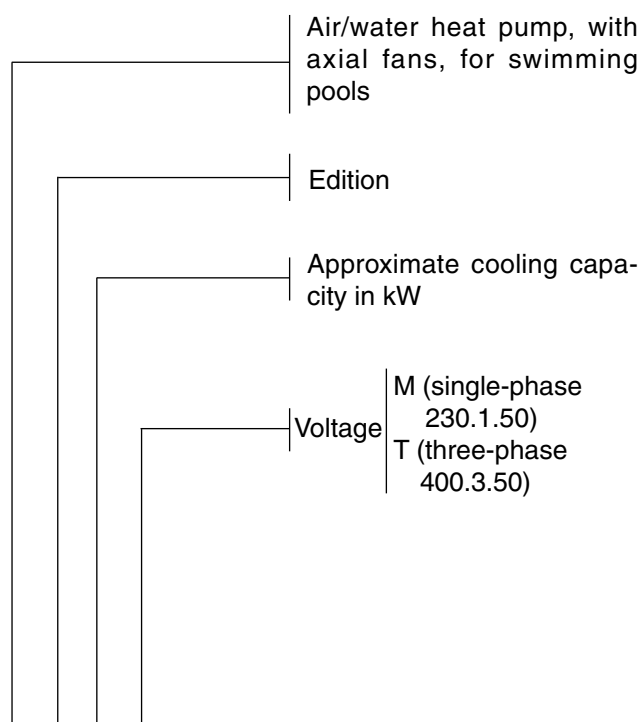


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General information

Nomenclature



YPP A 7 M

General description

The YPP units are high-efficiency air-water heat pumps that use ecological refrigerant R-407C.

These units are designed for applications of heating the water of a swimming pool. They are silent and compact units, equipped with axial fans, and can be installed directly outdoors.

The control system of these units comprises an electronic switch that is specially programmed to be used on air-water heat pumps for swimming pools.

Easy and safe to use, this switch precision-sets the water return temperature of the installation, carries out the defrost cycles and controls the start-up of the compressor, as well as the start-up of the water pump. By reading the control probes and safety elements, this switch protects the entire assembly of the machine against any malfunction.

The YPP units are quality tested and are in compliance with all regulations in force (ISO 9001 certification).

Available models and capacities

Model	YPP-A-7M	YPP-A-10M	YPP-A-14M YPP-A-14T
Heating capacity (kW)	6.3	9.4	14

Model	YPP-A-17M	YPP-A-22T
Heating capacity (kW)	18	20

Heating capacities in kW for an incoming/outgoing water temperature of 27/30° C, and 15° C ambient temperature.

Services and advantages

Services	Advantages
R-407C refrigerant	Does not harm the ozone layer
Limited dimensions	Minimum footprint
Limited height and weight	Space for installing on terraces
Factory-tested units	Operating quality control
Accessibility	Easy maintenance
Control microprocessor and alarms	Operating ease and safety
ISO 9001 certification	High quality level

Technical specifications

These units are delivered fully factory-assembled and with all necessary refrigerant and wiring piping, ready for installation at site. After assembly, these units must go through an operational test with water. Also check for refrigerant leaks during this process.

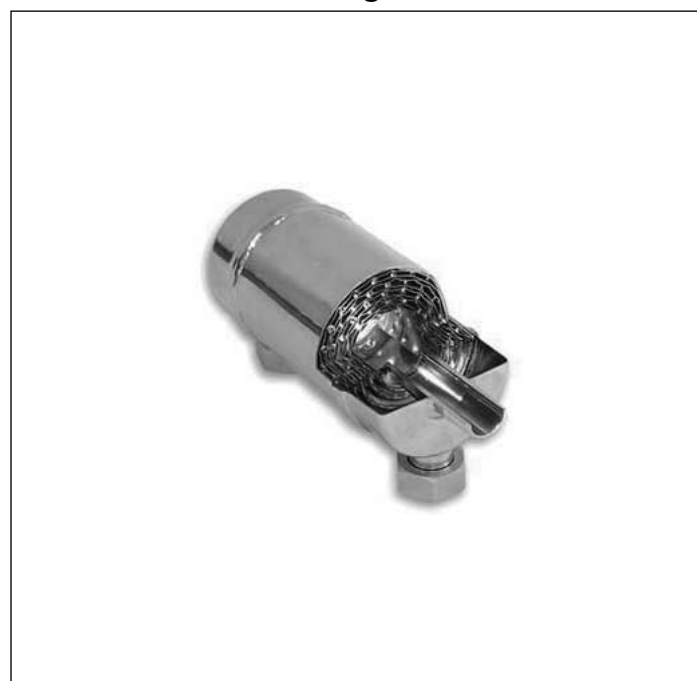
Sheeting casing

These units are made of galvanized steel sheeting and anticorrosive screws and bolts. The panels can be removed to access the internal components. The parts of the chassis are painted with orange colour oven-polymerized enamel.

Compressor

Hermetic Scroll compressors are used and installed on antivibratory supports. These compressors have internal devices that protect them against high operating temperatures.

Indoor titanium exchanger



A cylindrical exchanger with fully welded, no-joint spiral plates; these units are constructed of embossed exchange surfaces. The refrigerant flows in a single-channel circuit with spiral scoring, and the water in another counterflow circuit.

Major advantages:

- Compact
- Compatibility with corrosive fluids
- Resistant to pressure changes
- Robustness
- Operating stability
- Tolerance to ice and resistance to cycle inversions
- Hardly any overheating
- Great heat exchange efficiency

Outdoor exchanger

Made up of notched Gold Fin aluminium fins and grooved copper piping mechanically expanded within the fin assembly.

Fans

Of the axial and low noise level type. They are equipped with single-phase motors and IP54 protection. The fan will remain off during defrosts.

Electric panel

Located inside the machine and with IP44 protection. The operating and control components have been factory assembled, wired and tested. The compressor contactor, the transformer and the connecting strip and are contained within the unit, with the display-keyboard and unit controls on the front.

Operating and control display-keyboard

This device is accessible from the outside, through an airtight plastic cover.

This is a multi-purpose control unit specially programmed to be used on air-water heat pumps for heating swimming pools,

equipped with a compressor and a cooling circuit.

Main functions

- Control outgoing water temperature.
- Manage the defrost cycle.
- Manage system operation and safety characteristics.
- Manage alarms.

Control devices

- Compressor.
- Outdoor fan.
- 4-way valves.
- Water pump.

This control processes the signals from the probes and protection components of the entire system to control its active elements: Compressor, fan, 4-way valve and water circulating pump.

Power supply is 12 Vac.

Also serves for accessing and controlling the system by means of the display, keys and LEDs on same. Allows selecting the heat, cool and off functions. It can also modify operating parameters, as well as supervise the system.

3 NTC probes are used to read the temperatures of the system. One is located at the water intake of the titanium exchanger, and another at the discharge of said exchanger. The third probe is located in the coil to control defrosts.

The set of parameters that compose the operating program of the unit is divided into two levels: User (Pr1) and factory (Pr2), depending upon the function of each parameter and the level of user access to same.

This is accessible in the Pr1 level by a combination of keys, and in the Pr2 level by a factory password.

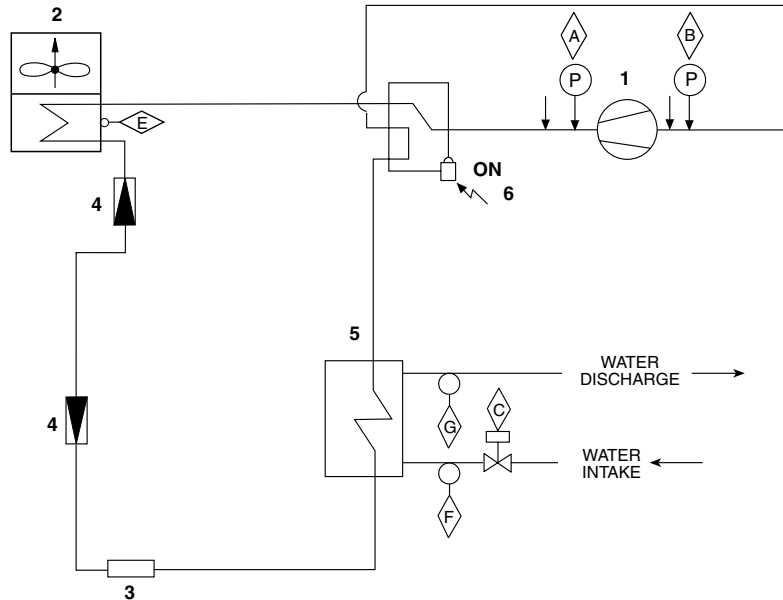
Cooling circuit

Includes high and low pressure switches, filter-dryer, two expansion restrictors, a 4-way valve (activated in heat cycle) and a water flow switch.

Physical data

	YPP-A-7M	YPP-A-10M	YPP-A-14M/ YPP-A-14T	YPP-A-17M	YPP-A-22T
Capacity at 6° C (kW)	5.3	7.1	11.5	15	17
Capacity at 15° C (kW)	6.3	9.4	14	18	20
Absorbed power (kW)	1.6	2.3	3.1	4.4	4.9
COP Performance coefficient	3.9	4.1	4.2	4	3.7
Sound level, SCROLL model (dBA)	44	44	46	48	48
Power supply (V/ph/Hz)	230.1.50	230.1.50	230.1.50 410.3.50	230.1.50 410.3.50	410.3.50
Absorbed amperage (A)	7.1	11.1	15.8 5.6	20 8.5	8.8
Cable section (mm ²)	2.5	4	4 2.5	4 2.5	2.5
Electrical protection (A)	12	16	20 12	25 16	16
Weight (kg)	56	95	118	140	143
Dimensions	Width (mm)	866	905	905	905
	Height (mm)	653	762	965	1 270
	Depth (mm)	373	460	460	460
Swimming pool volume	< 40 m ³	< 50 m ³	< 80 m ³	< 140 m ³	< 160 m ³
No. of compressors	1				
Type	Rotational	Scroll			
No. of coils	1				
Total surface (m ²)	0.40	0.57	0.72	0.96	0.96
Pipe diameter	3/8"				
Fan motor	1				
Nominal capacity (kW)	0.10	0.13	0.13	2 x 0.13	2 x 0.13
Rotational speed (turns/min.)	950	910	910	910	910
Power supply (V/Ph/Hz)	230.1.50				
Nominal air flow (m ³ /h)	700	2 200	3100	6 200	6 200

Operation, cooling and hydraulic diagram



SAFETY/CONTROL DEVICES

- A** High pressure switch
- B** Low pressure switch
- C** Flow switch
- E** Outdoor exchanger temp. sensor (Defrost setting, display)
- F** Water discharge temp. sensor
- G** Water intake temp. sensor (Setting and display)

COMPONENTS

- 1** Compressor
- 2** Air-cooled condensing unit
- 3** Filter-dryer
- 4** Expansion vessel
- 5** Titanium exchanger
- 6** 4-way valve

Heating cycle

The refrigerant (R-407C) flows within the cooling cycle and goes through the following stages:

- 1 Recovery of the ambient air heat going through the fin "**evaporating unit**": The ambient air flows heavily through the fan by means of many aluminium fins that are in contact with the copper pipes through which the fluid flows; the fluid heats and the ambient air cools.
- 2 A high pressure increase and another fluid temperature rise through the compressor (Scroll type compressor for all models, except YPP-A-7M).
- 3 Heat transfer to the swimming pool water while going through the plate exchanger (the "**condensing unit**"): The swimming pool water heats, the refrigerant fluid cools.
- 4 Expansion of the refrigerant as it goes through the restrictor; lowering the pressure and temperature, and back to stage 1 for a new cycle.

Defrost cycle

When the ambient air contains large amounts of humidity (rain, fog...) and the temperature is below 7° C, ice can form quickly on the evaporating unit fins and prevent reheat of the refrigerant fluid. It is then necessary to melt the ice without any further accumulation.

All YPP heat pumps are equipped with an automatic defrost system by inversion of the thermodynamic cycle: When the temperature probe, located at the evaporating intake circuit, detects a severe drop in temperature (-15° C), the control asks a 4-way valve to modify the flow of gas (deactivation of valve coil).

The evaporating and condensing units invert their cycles: The fluid takes heat to the fin exchanger to melt the ice. Once the temperature detected by the probe rises again (+12° C), the defrost cycle is finished and the 4-way valve re-establishes normal operation.

Installation instructions

Inspection

Upon reception, inspect the goods and notify the carrier and the insurance company, in writing, of any possible damage during transportation.

Environmental protection

Packing

Packing is made of recyclable material. Its elimination should be carried out in accordance with local regulations on selective collection of residual material.

Refrigerant

During installation and maintenance, keep in mind that HFC-407C with POE oil is used.

Contains greenhouse effect fluorine gas covered by the Kyoto Protocol.

For the type of gas and amount per system, please see the identification plaque.

GWP (Global Warming Potential): 2107.

Elimination of the unit

Upon disassembly of the unit, the components should be recuperated ecologically. The cooling circuit is full of refrigerant that should be recuperated and returned to the gas manufacturer for recycling.

Oil will remain in the hermetic compressor and, therefore, must be returned with the circuit sealed.

The air conditioning unit will be deposited in an area determined by the local authorities, for its selective recuperation.

Safety

Installation and maintenance servicing of this air conditioning system should be carried out by qualified and expert personnel. Maintenance servicing, such as cleaning coils and air filters, should be carried out regularly to maintain optimum performance of the units.

CAUTION

This unit should be installed and used in compliance with:

- Low voltage electro technical regulations.
- Safety regulations for cooling plants and installations.
- Pressure device regulations.
- Basic building regulations.
- Local regulations.

Transportation

The units should always be transported in vertical position so as to avoid oil leaking out of the compressor. If, for any reason,

this position need be changed sporadically, they will remain in that position a strictly necessary period of time only.

Handling

The unit should be handled using the metal rails supplied for fastening and transportation.

Warning signs

The following signs indicate the existence of potentially dangerous conditions for users or servicing personnel. Whenever found on the unit, take the meaning of each one into account.

This symbol indicates an electrical danger or risk.

Caution: The unit is equipped with a remote control system and can start up automatically. Before accessing the interior, disconnect the power supply so as to avoid any contact with the fan turbine in motion.

Caution: Fan in operation.

Caution: It is obligatory to read the instructions prior to any handling.

Caution: Do not touch hot surfaces.

Caution: Possible gas leak due to inadequate handling.

Location

Before locating the unit, make sure you have received the appropriate product by checking the specifications described on the outside of same.

The YPP heat pumps are located outdoors, at a minimum distance of 3.5 m from the swimming pool, as per regulation C15-100 (France).

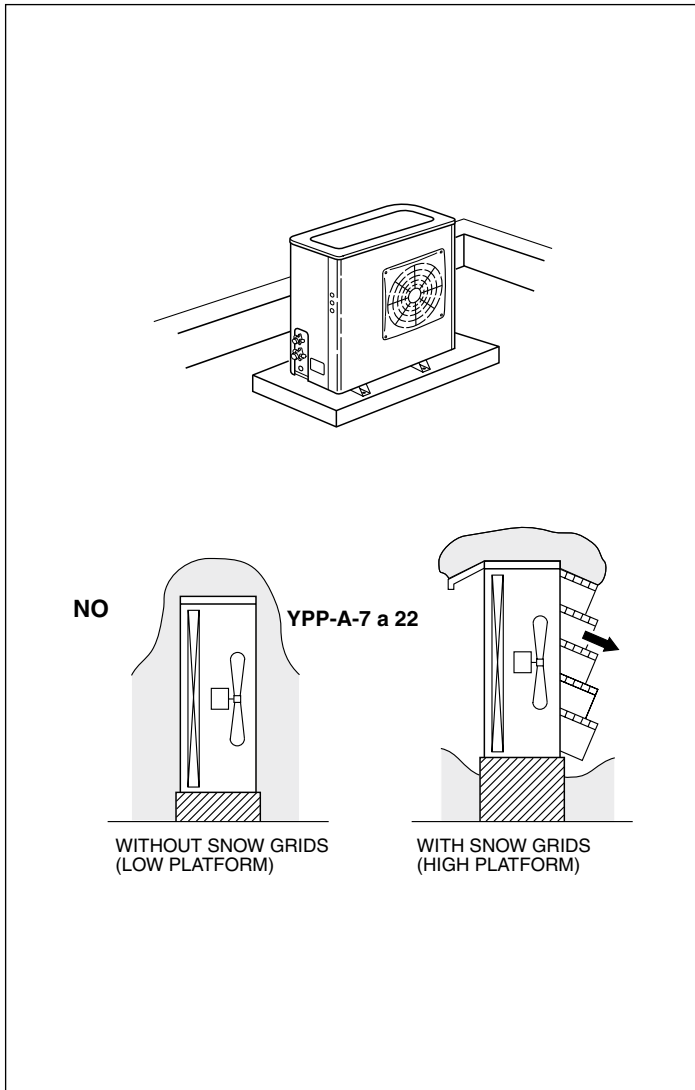
The unit should be placed on a perfectly horizontal plane, making sure the base can support the weight of the unit. If vibration-free operation is required, the unit can be placed on a cork or similar anti-vibratory base, or fastened to the base with anti-vibratory plates or supports.

Fastening the unit

Before installing the unit, make sure the structure can support the weight of same.

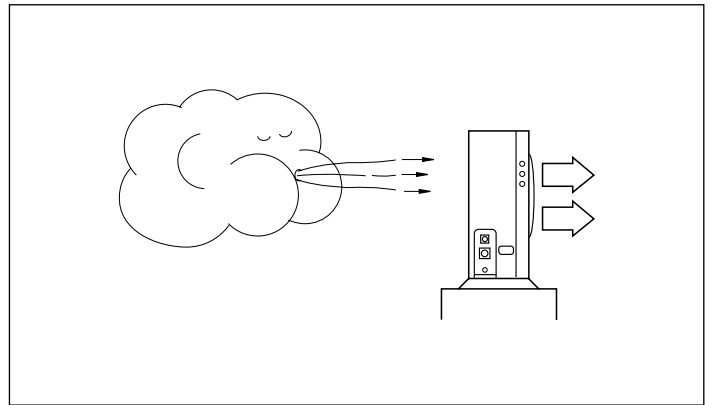
If the unit is to be placed on the floor, a concrete base should be prepared so as to distribute weight evenly.

Place the unit on a firm base and fasten with bolts, using the four trilled holes at the base. **Areas where it normally snows.** If the unit is located outdoors and on ground level, it should be raised by supports to avoid snow blocking air intake. These supports should be above the height the snow usually reaches. It is convenient to install snow grids.



Orientation

Orient the unit in the direction of the predominant wind.



Clearances

When installing each unit, clearances should be left for:

- Air intake and discharge.
- Maintenance servicing.
- Power supply connections.

For proper operation, all minimum clearances shown on the general dimensions diagrams should be respected always with regard to possible obstruction of air circulation of the work of a user.

Wiring

Electrical connections

All **established national regulations** should be complied.

The heat pump power supply line is designed and read for:

- Grounding the unit efficiently.
- Protecting human lives by means of a 30 mA residual current device (differential switch) belonging to the entire swimming pool area, or specifically to the heat pump line (unless the building is equipped with same).
- Protecting the unit against overloads and short circuits with a magneto thermal switch. To avoid the risk of harsh starts when the unit begins to operate, this switch should be of the D or K type.

Water pump electrical connections (pool filtering circuit)

It is possible to maintain swimming pool filtering by means of the heat pump. In this case, filtering will continue to operate permanently until the set point temperature is reached, above all in periods of high temperature.

This has several advantages:

- It makes sure that the heat pump is operating sufficiently for the pool water to reach the set point temperature, above all in periods of high temperature.
- It keeps the water sufficiently warm for swimming at any time of the day, and not only at filtering periods.

For this purpose, an electrical connection should be made between terminals 1 and 2 of the heat pump and the operating control of the water pump. The switch contains an inner relay that switches a supply line between terminals 25 and 26 of the control. (See wiring diagram of the control unit.) Every two hours, the unit starts filtering to test pool water

temperature and check whether it needs heating:

- Should it need heating, the unit will operate until the water reaches the set point temperature; then filtering will end also if not in a filtering cycle, or will continue in normal

operation.

- Should this not be the case, the unit will turn off after five minutes; then filtering will end also if not in a filtering cycle, or will continue in normal operation.

Electrical characteristics

Outdoor units

Model	Power supply V.ph.Hz.		Nominal consumption A			Power supply cable section (2) mm ²	Automatic switch (K curve) (1)
	Compressor	Fan	Compressor		Fan		
			Start	Nominal	Nominal		
YPP-A-7M	230.1.50	230.1.50	40	7.1	0.6	2.5	12
YPP-A-10M	230.1.50	230.1.50	95	11.1	0.6	4	16
YPP-A-14M	230.1.50	230.1.50	124	15.8	0.6	4	20
YPP-A-14T	400.3.50	230.1.50	51	5.6	0.6	2.5	12
YPP-A-17M	230.1.50	230.1.50	136	20	2 x 0.6	4	25
YPP-A-22T	400.3.50	230.1.50	70	8.8	2 x 0.6	2.5	16

Important: The dimensioning of the automatic switch and the power supply and operating lines are orientative and should be corrected in accordance with site conditions, distance between units and the legislation in force. Notes: 1.- K curve (DIN, VDE 0660-104). 2.- Based on copper conductors.

ATTENTION



Your product is marked with this symbol. This means that at the end of its service life it should not be mixed with non-classified household residues, and the elimination of same should be carried out in compliance with the corresponding local and national regulations, in an environment-friendly manner.

Disassembly of the air conditioning unit, as well as the treatment of the refrigerant, oil and other components, should be carried out by a competent contractor and in compliance with the applicable legislation.

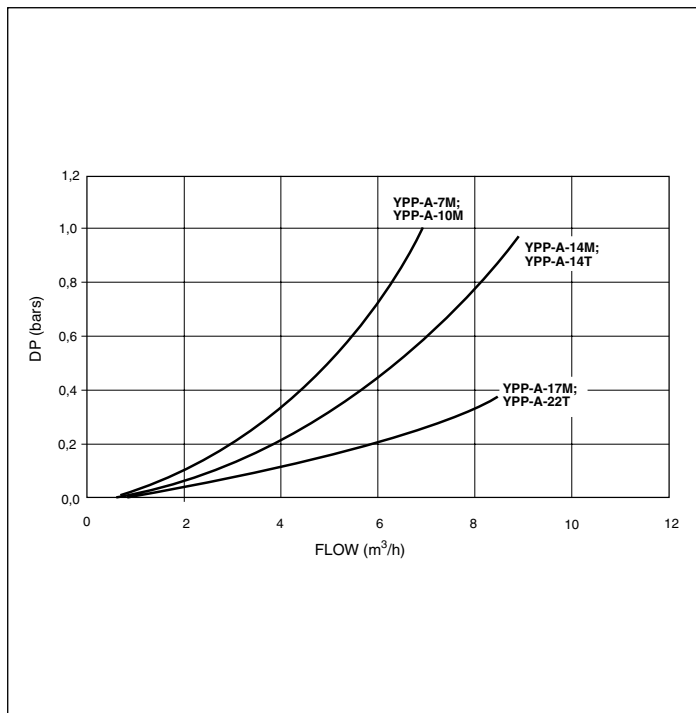
Contact your local authorities for further information.

Hydraulic installation

The YPP heat pump will be connected to the filtering circuit of the swimming pool by means of pipes, valves and high pressure (10 bar) PVC joints. Joint \varnothing 50 supplied. Since the heat pump condensing unit has a maximum flow of about 15 m³/h, the machine will be installed with a by-pass comprised of a flow switch and two isolating valves that will allow disassembly of the machine. Make sure the machine is installed **after the pool filter and before the injection of disinfectants.**

Once all above mentioned connections are made, start the filtering pump up and check for leaks. Also make sure, with a filter pressure gauge, that the pressure drop generated by the condensing unit is not above 0.4 bar.

In the case of a filtering flow of over 15 m³/h, set the by-pass control valve in such a way as to limit this pressure drop and lower the flow through the condensing unit.



Commissioning

Pressure switch control

The YPP heat pump is protected by a flow switch that permanently controls the flow rate and pressure of the water circulating through the condensing unit.

To make sure the pressure is operating correctly, proceed as follows:

- Start filtering and heat pump as indicated above.
- Fully open the by-pass valve and progressively close the "higher" isolation valve to diminish considerably the flow rate of the water circulating through the condenser.
- Before flow rate reaches zero, the heat pump should go off.
- Re-establish water flow by opening the "higher" isolation valve and closing the by-pass valve. The heat pump should restart. The compressor start-up may be timed.
- Repeat this operation 2 or 3 times.

Note: This test can also be carried out by turning the filtering pump off.

First temperature increase:

The temperature recovery rate depends upon 4 factors:

- The volume of the swimming pool.
- The required temperature.
- The outdoor temperature. The colder it is, the longer the temperature will take to rise.
- The use of an isothermal swimming pool cover.

For the first temperature increase, above all at the beginning of the heating season, it is advisable to let the heat pump in operation until the required temperature is reached. This may require several days. Once this temperature is reached, the heat pump will be operative only during the time needed to compensate the daily heat losses.

Daily operating time

As above, the operating time depends upon 4 factors:

- The volume of the swimming pool.
- The required temperature.
- The outdoor temperature. The colder it is, the larger the drops will be.
- The use of an isothermal swimming pool cover.

At the same time, it is also advisable to make sure the filtering operating time is at least equal to the time required by the heat pump to overcome the daily heat losses. Consequently, at the beginning of the heating season, a 24-hour operation of the filtering pump might be advisable.

Isothermal swimming pool cover

It is essential to use an isothermal cover as soon as the pool is heated, whichever heating system is used. Precisely, although the energy needed to heat a swimming pool is lowered considerably by using a heat pump, an isothermal cover allows saving 50% to 80% more on exploitation costs.

Defrost cycle

The "expansion" effect generated by outdoor air circulating through the heat pump evaporator implies a considerable temperature decrease. At low temperatures (between 3° C and 7° C), this temperature can fall to below 0° C, thus freezing the humidity on the evaporator fins and forming ice. The operation of a heat pump at temperatures below 7° C does not hinder it, but performance is lower and defrost cycles will be frequent. This control device has a probe that allows carrying out defrost cycles by activating the 4-way valve.

Safety devices

If the installation and operating recommendations described herein are respected correctly, the heat pump control devices should never activate.

Operating and safety instructions of heat pumps for swimming pools

Start-up

Power the unit. If the model is three-phase, make sure the control *display* lights. If not, check power supply and make sure the phase sequence is correct. The unit is equipped with a phase control that disconnect power supply to the electronic control if power supply values are not correct (YPP-A-22T).

Adjust the *by-pass* and intake valves to the heat pump, without forcing the water pump (approximately +0.2 b bar). Start the unit and let it run for 5 or 10 minutes and check intake and output temperatures of the exchanger, which should have a 3 or 4° C differential. Adjust flow rate to achieve this difference (less flow = larger differential).

Water treatment

The chlorine doses and Ph should be normal; that is to say:

- Chlorine = 1.5 mg/l
- pH = between 7 and 7.5

Do not exceed chlorine doses. Above all for the INOX exchangers that cannot admit the electrolysis of salts. During heavy treatments, turn the heat pump off and close the 2 communication valves to the heat pump.

Exchanger maintenance

The filtering system should be operative at all times, even off season. If, during swimming pool hibernation, filtering is fully turned off, drain the exchanger by closing the outlet valve, and loosen the connector at the bottom of the heat pump.

Precautions

Make sure there is sufficient clearance in front of and behind the heat pump.

If you turn the filter off for over a month, turn main circuit breaker off.

When turning it back on, do not forget to connect the circuit breaker 8 hours prior to starting the heat pump once again. Taking these recommendations into account will extend the service life of the system and assure good performance.

Maintenance

The YPP heat pump is designed to satisfy its owner for many years if, of course, the water flow and chemical treatment recommendations are followed.

The heat pump casing can be cleaned with a mixture of water and soap and a soft rag. Never use abrasive products or solvents.

Dust and particles deposited on the evaporator can be removed by using a water hose or with a soft brush. In this latter case, make sure you do not damage the fins.

Hibernation

If the YPP heat pump is not to be used during the winter season, it is absolutely necessary to proceed with hibernation. These recommendations should receive very special attention if the heat pump is installed in an area subject to regular freezing temperatures. For hibernation, proceed as follows:

- Set heat pump switch to "O".
- Set the differential circuit breaker to "OFF", or cut off power supply to the heat pump.
- Disconnect the heat pump from the filtering circuit and fully drain the water contained in the condenser. Do not plug the unit in all winter long.

Use of chemical products

The incorrect use or installation of products or systems to disinfect swimming pool water can lead to serious damage of the YPP heat pumps, and would cancel application of the warrantee. Below you will find some essential recommendations:

Swimming pool water quality:

- Chlorine concentration: 1.0 to 1.5 ppm. pH value: 7.0 to 7.6.
- Bromine concentration: 1.0 to 1.5 ppm. pH value: 7.0 to 7.6.
- Hydrotimetrics (TH): Indoor at 20° French.
- Tenor in cyanuric acid: Below 80 ppm.

Important:



At the beginning of each season, and before letting water flow through the pump, make sure the swimming pool water is in compliance with the above indicated values.

Example of automatic injection systems:

In all cases, the YPP heat pumps will be installed in by-pass on the filtering circuit, **past the filter and before the injection of neutralising products** such as hydrochloric acid, or disinfectants such as bromine, chlorine, etc.

Introduction of chemical products in the skimmers:

- Make sure the filtering operating time is sufficiently long, above all in the case of "heavy chlorination", to allow adequate dissolution of the chlorine tablets in the skimmers.
- Acidic products used to neutralise water pH should not be poured into the skimmers, but rather, for example, dissolved in a bucket of water and poured directly into the pool.

Trouble shooting

Heat pump is inoperative:

- Switch is set to OFF.
- The heat pump is three-phase mode, and there is a phase inversion.
- A temperature of over 15° C is displayed.
- The requested temperature has been reached. The heat pump restarts automatically as soon as the real temperature of the swimming pool is below the desired value.
- The filtering pump is off. Restart it, if necessary.
- The filter is dirty and water flow is weak. Clean the filter and restore filtering flow.
- Power supply is turned off. Check main circuit breaker and/or fuses.
- Circuit breaker trips upon starting. Make sure the circuit breaker is set to curve D or K.
- Flow switch is faulty. (Heat pump hibernation incorrect, ice.)

The fan is operative, but not the compressor:

- The heat pump has just started but the compressor is timed. The compressor should start after from 2 to 4 minutes.

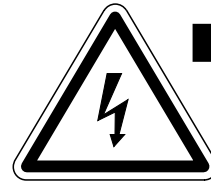
The compressor is operative, but not the fan:

- The heat pump may be defrosting. The fan will restart after the defrost cycle is over.

The heat pump is operative, but the desired temperature is not reached:

- The swimming pool volume is excessive.
- Heat losses are excessive. Use an isothermal swimming pool cover.
- The heat pump is not operating long enough. Increase daily filtering time.
- The evaporator is dirty or obstructed. Clean evaporator.
- Make sure the desired temperature is over the corresponding figure (and no sign is present).
- The heat pump is installed too near an obstacle. Reinstall in a more adequate location.
- Faulty thermostat.
- Loss of refrigerant.

If, despite the above recommendations, your heat pump continues inoperative, contact your Client Service Centre.



WARNING

Loose cables can cause overheating of terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected firmly.

Rotational direction of Scroll compressors

The three-phase Scroll compressors (Model YPP-A-22T) operate correctly in one single rotational direction. Although these units are protected by a phase sequence detector, when commissioning the unit make sure the rotational direction is correct.

If not correct:

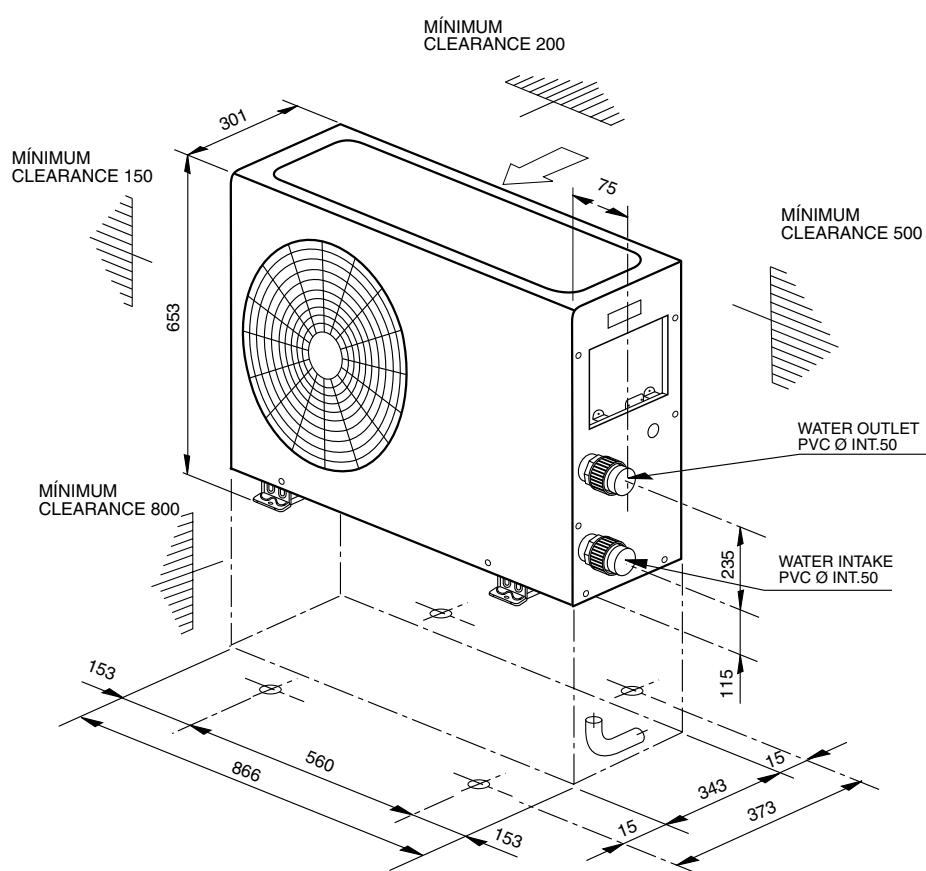
- The compressor is not compressing.
- It is making a strange sound.
- Amperage consumption is low.
- It overheats excessively.

The phase detector should have both LEDs on for operation to be correct.

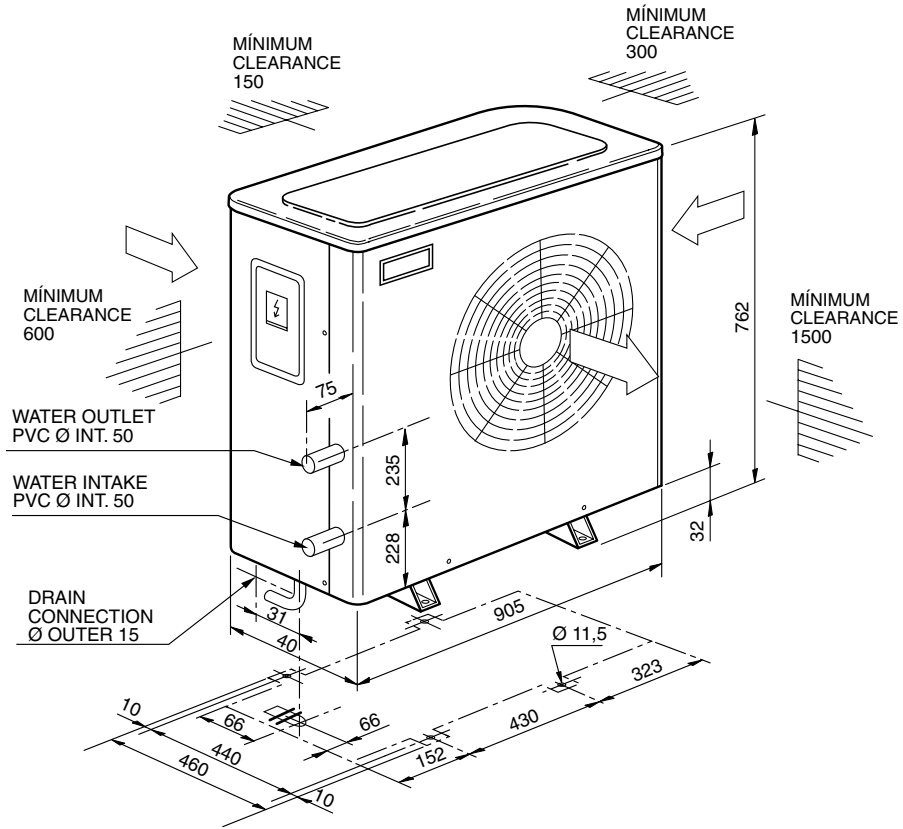
- The green LED on means: Power ON.
- The yellow LED on means: Relay ON.

General dimensions mm

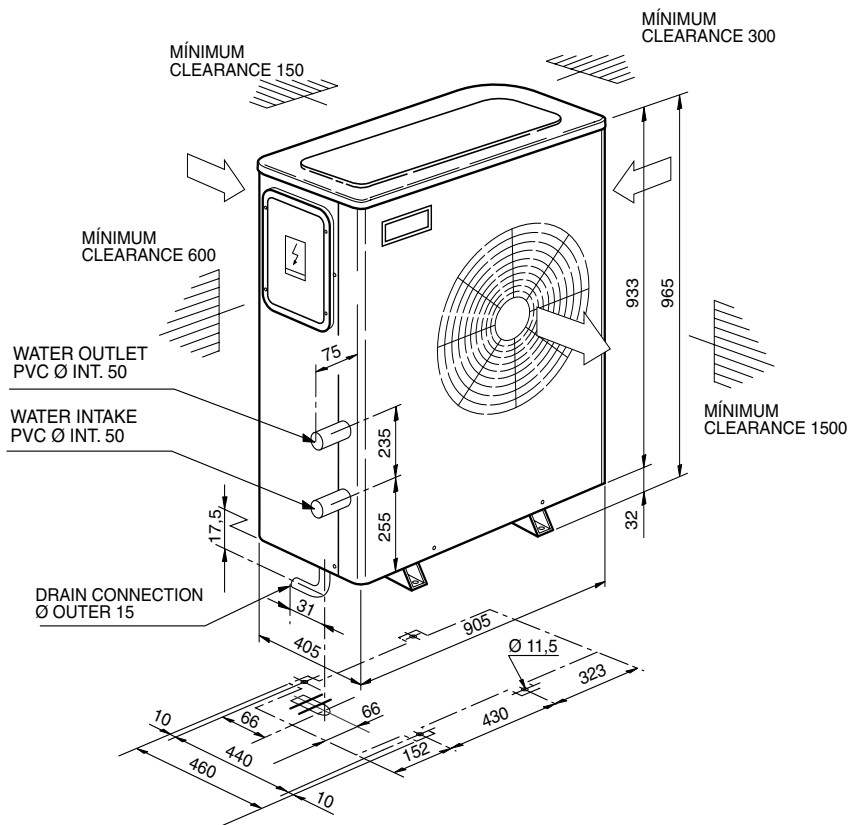
YPP 7



YPP 10

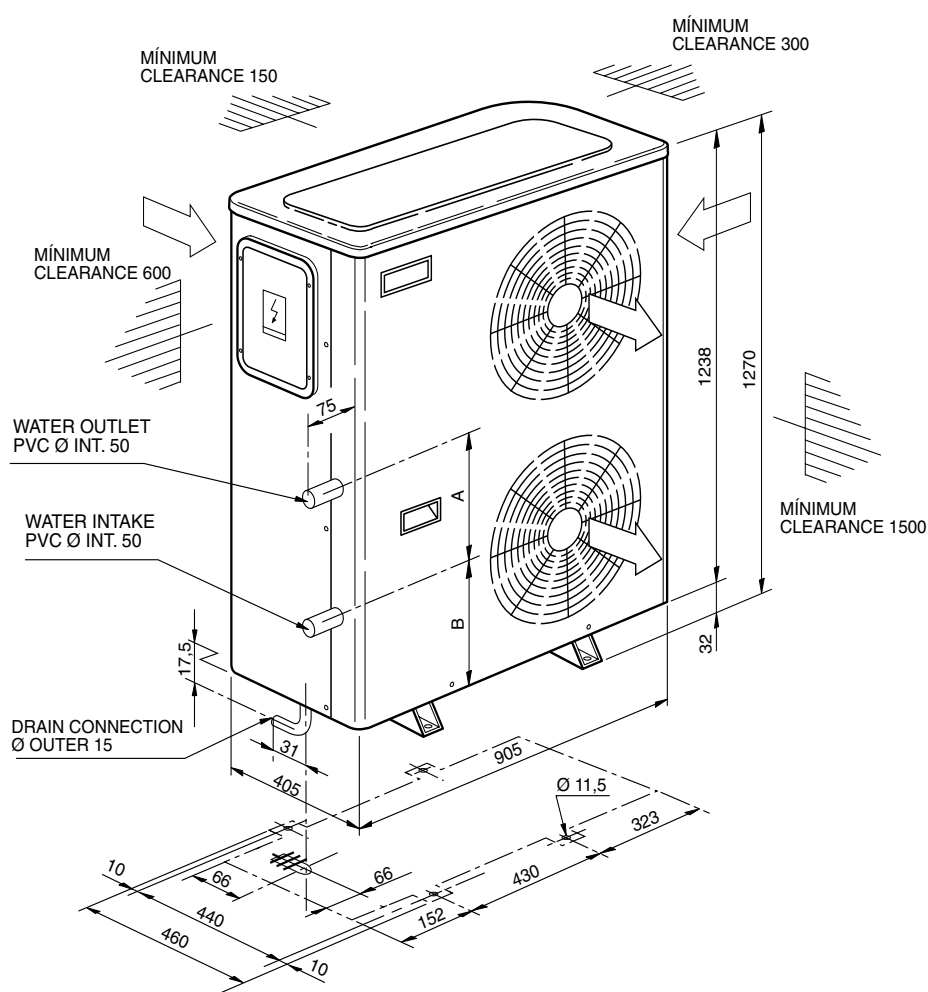


YPP 14



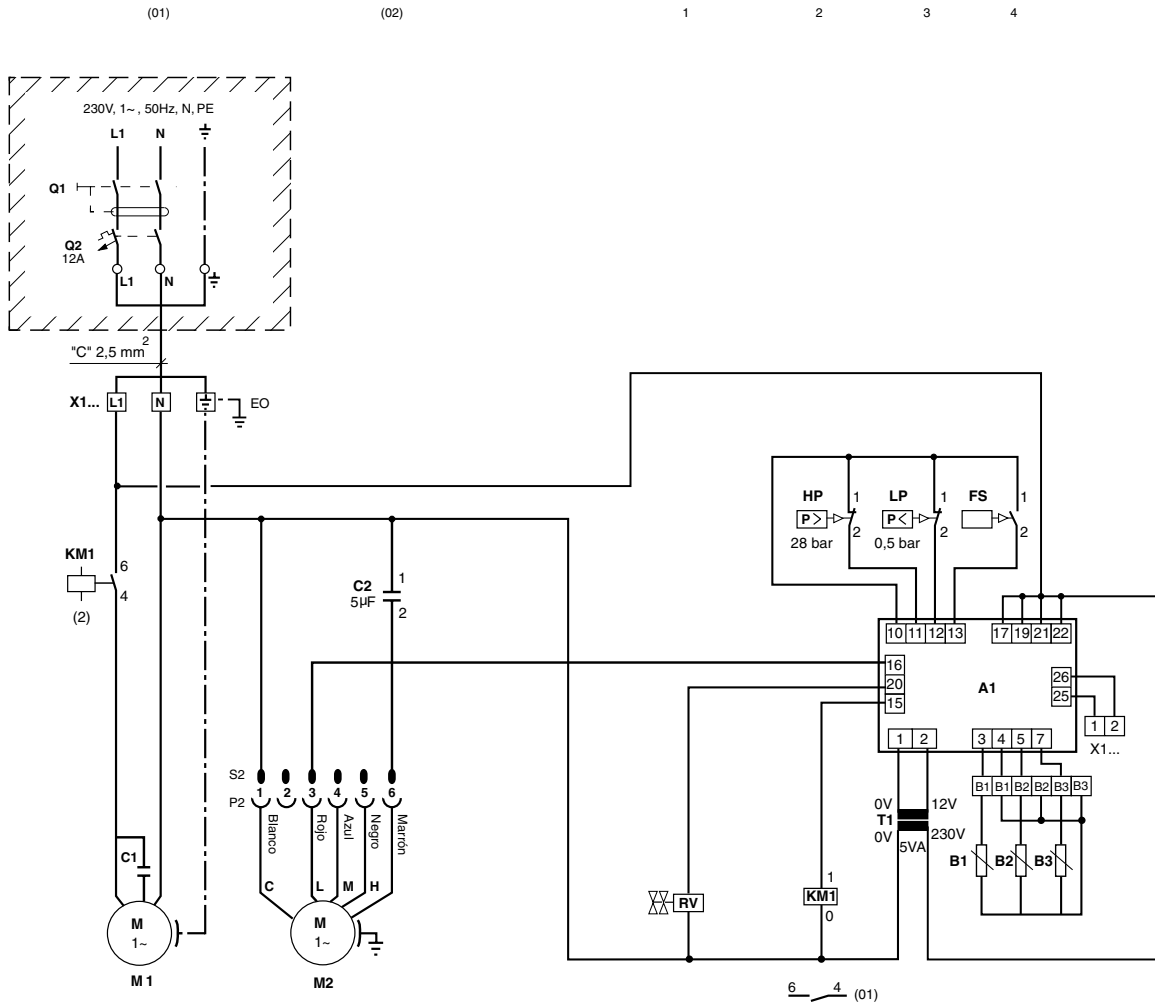
General dimensions mm

YPP 17
YPP 22



	A	B
YPP 17	425	549
YPP 22	425	549

Wiring diagram YPP-A-7M, 230.1.50

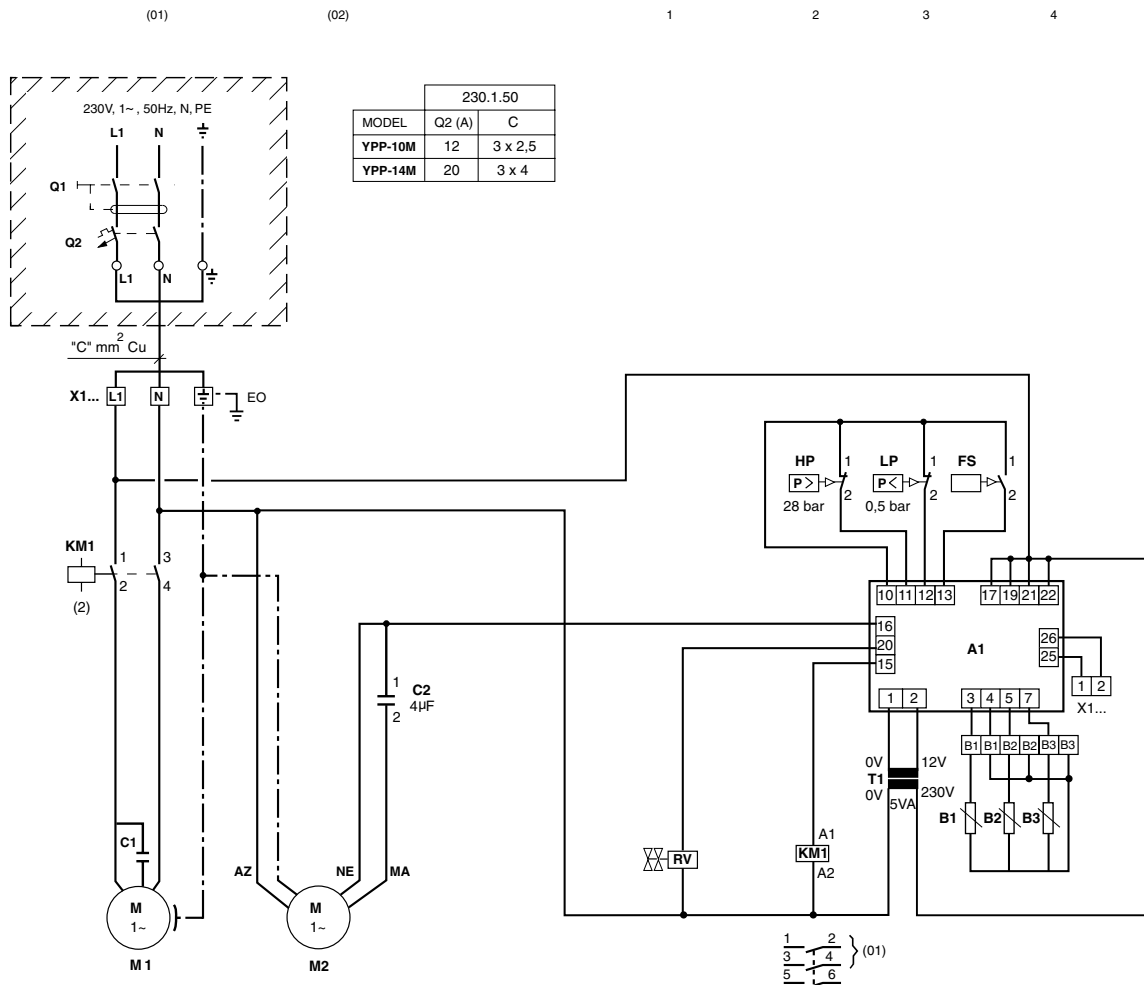


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LES COMPOSANTS INCLUS DANS CES CADRES NE SONT PAS FOURNIS PAR LE FABRICANT. À INSTALLER SUR LE CHANTIER.

- A1: TERMOSTATO / THERMOSTAT / THERMOSTAT
- B1: SONDA ENTRADA / IN PROBE / SONDE ENTRÉE
- B2: SONDA SALIDA / OUT PROBE / SONDE SORTIE
- B3: SONDA DESESCARCHE / DEFROST PROBE / SONDE DÉGIVRAGE
- C: SECCION CABLE ALIMENTACIÓN / POWER MAIN SUPPLY CABLE / SECTION DU CABLE D'ALIMENTATION
- C1, C2: CONDENSADORES / CONDENSERS / CONDENSATEURS
- FS: FLOW SWITCH / FLOW SWITCH / FLOW SWITCH
- HP: PRESOSTATO ALTA / HIGH PRESSURE SWITCH / PRESSOSTAT HAUTE PRESSION
- KM1: CONTACTOR COMPRESOR / COMPRESSOR CONTACTOR / CONTACTEUR COMPRESSEUR
- LP: PRESOSTATO DE BAJA / LOW PRESSURE SWITCH / PRESSOTAT BAISSSE PRESSION
- M1: COMPRESOR / COMPRESSOR / COMPRESSEUR
- M2: VENTILADOR EXTERIOR / OUTDOOR FAN / VENTILATEUR EXTERIEUR
- RV: VALVULA 4 VIAS / REVERSE VALVE / VANNE 4 VOIS
- T1: TRANSFORMADOR / TRNASFORMER / TRANSFORMATEUR
- AZ: AZUL / BLUE / BLEU
- BL: BLANCO / WHITE / BLANC
- NE: NEGRO / BLACK / NOIR
- MA: MARRON / BROWN / MARRON
- RO: ROJO / RED / ROUGE

I-2608a
YPP-A-7M
230.1.50

Wiring diagram YPP-A-10M and 14M, 230.1.50

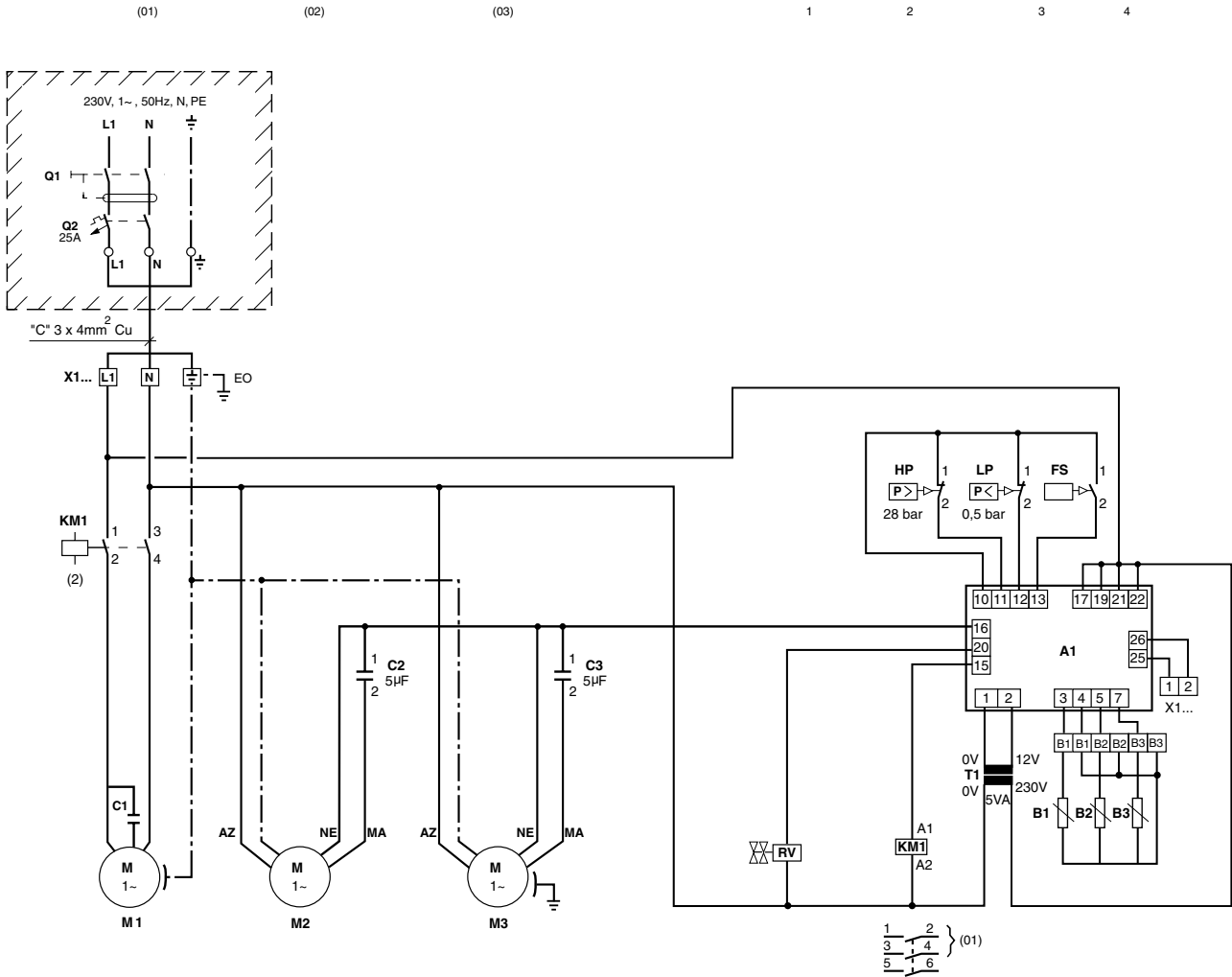


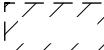
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- B1: SONDA ENTRADA / IN PROBE / ENTRÉE SORTIE
- B2: SONDA SALIDA / OUT PROBE / SONDE SORTIE
- B3: SONDA DESESCARCHE / DEFROST PROBE / SONDE DÉGIVRAGE
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- AZ: AZUL / BLUE / BLEU
- NE: NEGRO / BLACK / NOIR
- MA: MARRON / BROWN / MARRON

I-2609a
 YPP-A-10, 14 M
 230.1.50

Wiring diagram YPP-A-17M, 230.1.50

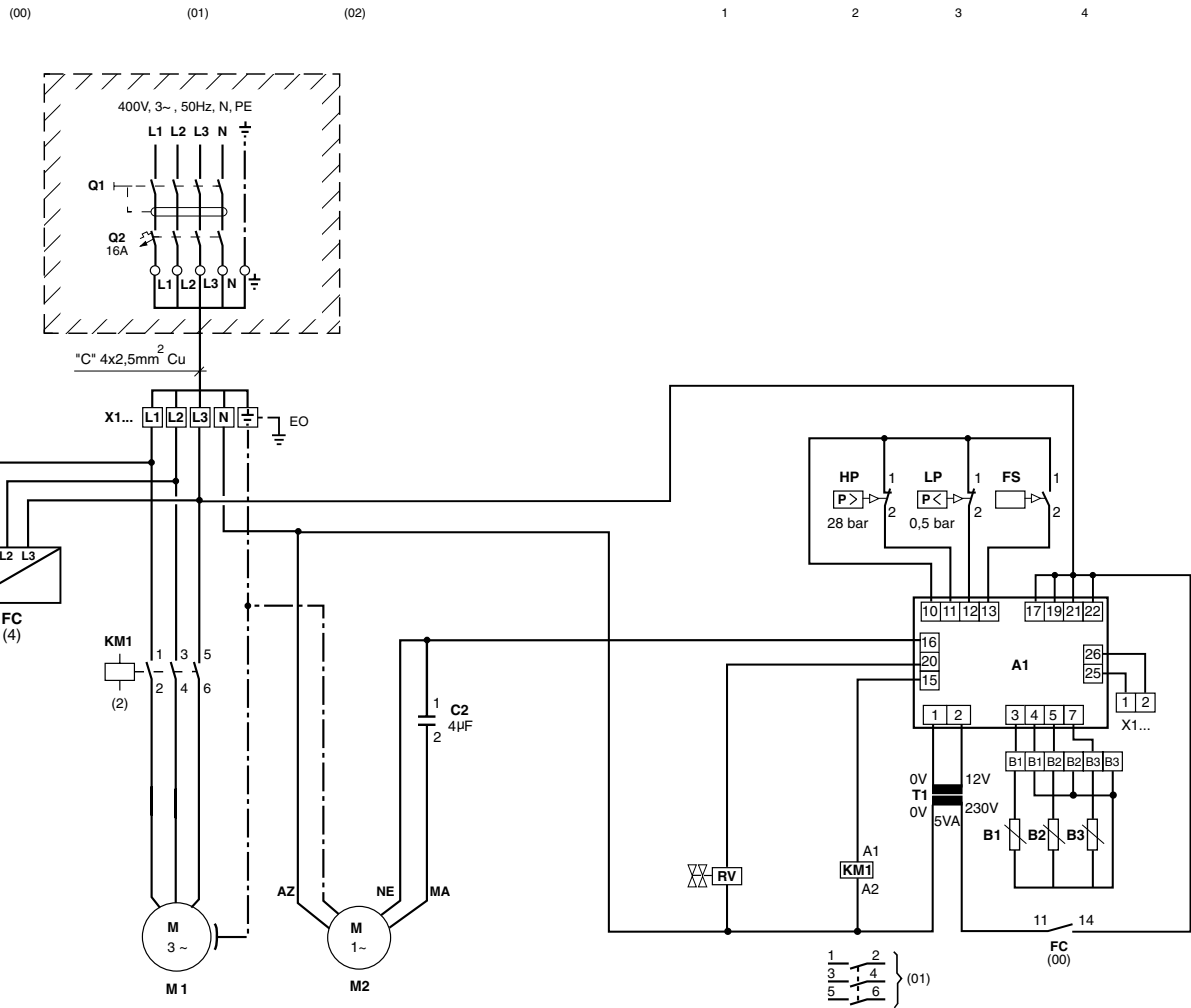



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I-2610a
YPP-A-17 M
230.1.50

- A1:** TERMOSTATO / THERMOSTAT / THERMOSTAT
- B1:** Sonda ENTRADA / IN PROBE / SONDE ENTRÉE
- B2:** Sonda SALIDA / OUT PROBE / SONDE SORTIE
- B3:** Sonda DESESCARCHE / DEFROST PROBE / SONDE DÉGIVRAGE
- C:** SECCION CABLE ALIMENTACIÓN / POWER MAIN SUPPLY CABLE / SECTION DU CABLE D'ALIMENTATION
- C1, C2, C3:** CONDENSADORES / CONDENSERS / CONDENSATEURS
- FS:** FLOW SWITCH / FLOW SWITCH / FLOW SWITCH
- HP:** PRESOSTATO ALTA / HIGH PRESSURE SWITCH / PRESSOSTAT HAUTE PRESSION
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- M1:** COMPRESOR / COMPRESSOR / COMPRESSEUR
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- RV:** VALVULA 4 VIAS / REVERSE VALVE / VANNE 4 VOIS
- T1:** TRANSFORMADOR / TRNASFORMER / TRANSFORMATEUR
- AZ:** AZUL / BLUE / BLEU
- NE:** NEGRO / BLACK / NOIR
- MA:** MARRON / BROWN / MARRON

Wiring diagram YPP-A-14T, 400.3.50

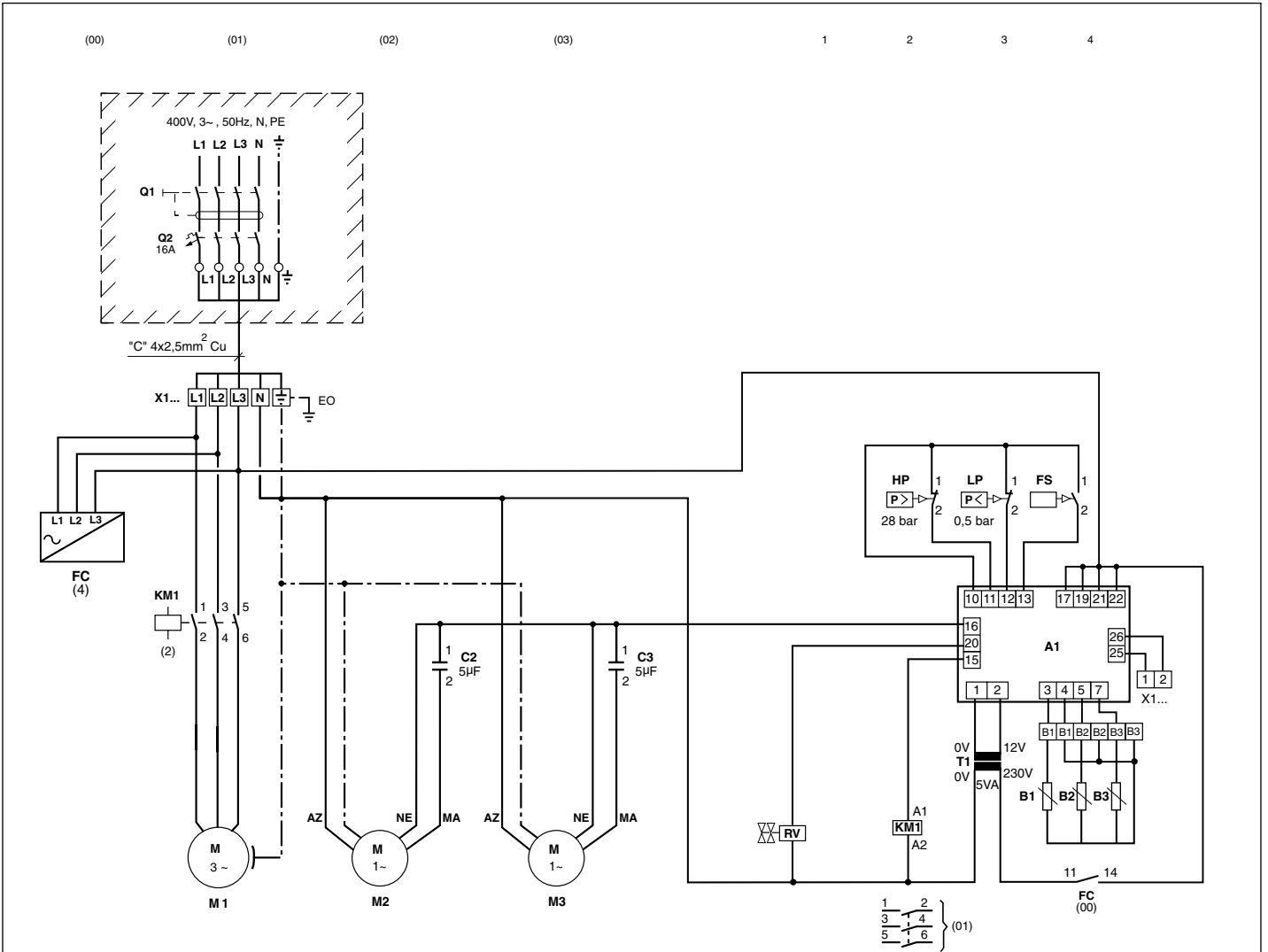


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I-2611a
 YPP-A-14T
 400.3.50

- A1: TERMOSTATO / THERMOSTAT / THERMOSTAT
- B1: Sonda ENTRADA / IN PROBE / SONDE ENTRÉE
- B2: Sonda SALIDA / OUT PROBE / SONDE SORTIE
- B3: Sonda DESESCARCHE / DEFROST PROBE / SONDE DÉGIVRAGE
- C: SECCION CABLE ALIMENTACIÓN / POWER MAIN SUPPLY CABLE / SECTION DU CABLE D'ALIMENTATION
- C2: CONDENSADORES / CONDENSERS / CONDENSATEURS
- FC: CONTROL FASES / PHASE CONTROL / CONTROLEUR DE PHASES
- FS: FLOW SWITCH / FLOW SWITCH / FLOW SWITCH
- HP: PRESOSTATO ALTA / HIGH PRESSURE SWITCH / PRESSOSTAT HAUTE PRESSION
- KM1: CONTACTOR COMPRESOR / COMPRESSOR CONTACTOR / CONTACTEUR COMPRESSEUR
- LP: PRESOSTATO DE BAJA / LOW PRESSURE SWITCH / PRESSOSTAT BAISSSE PRESSION
- M1: COMPRESOR / COMPRESSOR / COMPRESSEUR
- M2: VENTILADOR EXTERIOR / OUTDOOR FAN / VENTILATEUR EXTERIEUR
- RV: VALVULA 4 VIAS / REVERSE VALVE / VANNE 4 VOIS
- T1: TRANSFORMADOR / TRNASFORMER / TRANSFORMATEUR
- AZ: AZUL / BLUE / BLEU
- NE: NEGRO / BLACK / NOIR
- MA: MARRON / BROWN / MARRON

Wiring diagram YPP-A-22T, 400.3.50



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I-2612a
YPP-A-22T
400.3.50

- A1: TERMOSTATO / THERMOSTAT / THERMOSTAT
- B1: SONDA ENTRADA / IN PROBE / SONDE ENTRÉE
- B2: SONDA SALIDA / OUT PROBE / SONDE SORTIE
- B3: SONDA DESESCARCHE / DEFROST PROBE / SONDE DÉGIVRAGE
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- FS: FLOW SWITCH / FLOW SWITCH / FLOW SWITCH
- HP: PRESOSTATO ALTA / HIGH PRESSURE SWITCH / PRESSOSTAT HAUTE PRESSION
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- LP: PRESOSTATO DE BAJA / LOW PRESSURE SWITCH / PRESSOSTAT BAISSSE PRESSION
- M1: COMPRESOR / COMPRESSOR / COMPRESSEUR
- M2, M3: VENTILADOR EXTERIOR / OUTDOOR FAN / VENTILATEUR EXTERIEUR
- RV: VALVULA 4 VIAS / REVERSE VALVE / VANNE 4 VOIS
- T1: TRANSFORMADOR / TRNASFORMER / TRANSFORMATEUR
- AZ: AZUL / BLUE / BLEU
- NE: NEGRO / BLACK / NOIR
- MA: MARRON / BROWN / MARRON

Operating instructions

User interface

Display

The display area is divided into three different parts:

Upper left side: Displays pool entering water temperature.

Lower left side: Displays pool outgoing water temperature.

Right side: The icons.



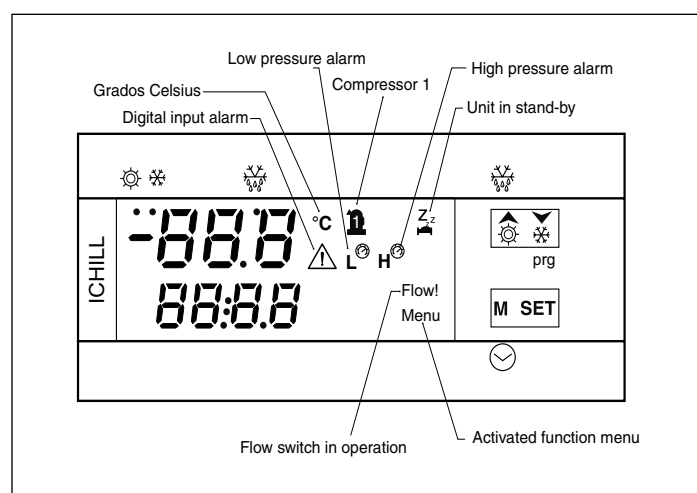
Key functions

KEY	MACHINE STATUS	PRESS MODE
	Pressing the ▲ key activates heating function and starts heat pump.	Press for 5 seconds
	▲ to display entering/outgoing water temperature on upper screen.	Simply press
	This mode allows displaying parameters or increase the value of same.	-
M SET	M to enter clock function menu.	Press for 3 seconds
	DOWN to display entering/outgoing water temperature on upper screen.	Simply press
	Program mode allows displaying parameters or decrease the value of same.	-
	Cooling function activates and deactivates.	Press for 5 seconds
	SET + ▼ to enter program mode.	Simply press
	SET + ▲ to exit program mode.	Simply press
	SET + ▲ starts manual defrost .	Press for 5 seconds

Symbols and LED indicators

Symbol	LED	Function
	On	Heat mode activated
	On	Cool mode activated
	Flashing	Program mode (flashes with led ❄️)
	Flashing	During defrost timing when turned on
	On	Defrost activated
	On	Real time clock installation

Icons



Display

Display in normal conditions



In normal conditions, the display indicates:

- **Upper display:** Incoming water temperature = pool temperature and the corresponding value.
- **Lower display:** Water temperature (water/water heat pump unit), real time and the corresponding value.

Display during an alarm



When an alarm is detected, the display indicates:

- **Lower display:** The alarm code alternated with the pressure or temperature value.
- **Icon area:** If the corresponding alarm icon is present, it goes on.

Note: The control unit memorizes all alarms.

Icon area

The following four icons correspond to the main alarm conditions:



General alarm



High pressure alarm - lower part of the display



Low pressure alarm - upper part of the display

FLOW! Water flow alarm

How to display alarms

Enter the Function menu.

- 1) Select the "**ALM**" code.
- 2) Press and release the **SET** key.
- 3) Use the **▲** and **▼** keys to display the complete list of alarms.

Press the "M" key to exit, or wait 15 seconds.

How to turn buzzer off

The buzzer turns off automatically once the cause of the alarm has disappeared.

To turn the buzzer off manually, press any key.

First installation

At the time of the first installation, the following points are required:

- **Set the clock.**
- **Reset the alarm of possible power shortage.**

How to set the clock

When the unit is powered, the message "rtC" appears on the display, alternated with the temperature. This means it is necessary to set the hour on the clock.

How to proceed:

1. Press the "M" key until the "**Hur**" code appears on the lower display, and the hour in the upper display.
2. Press the SET key. The hour begins to flash.
3. Set the hour with the **▲** and **▼** keys.
4. Set the value by pressing the SET key. The next parameter appears.
5. Repeat operations 2, 3 and 4 for the remaining real time clock parameters.
 - **Min:** minutes (0-60)
 - **UdA:** day of the week (**Sun** = Sunday, **Mon** = Monday, **tuE** = Tuesday, **Ued** = Wednesday, **tHu** = Thursday, **Fri** = Friday, **Sat** = Saturday).
 - **daY:** day of the month (0-31).
 - **Mon:** month (1-12).
 - **yEA:** year (00-99).

Use of the "hot key"

This control device can transfer the list of parameters from the internal E2 memory to the "Hot Key", and vice versa.

Downloading the "Hot Key" to the unit

1. Turn the control off, insert the "**Hot Key**" (programming key) and turn the unit back on.
2. The list of parameters is downloaded from the "**Hot Key**" automatically to the unit memory. The "**doL**" message flashes. After 10 seconds, the unit operates again with the new parameters.
3. Turn the unit off, remove the "**Hot Key**" and turn the unit back on.

After downloading the data, the following messages appear:

- "**end**" for correct programming. The unit works normally again with the new program.
- "**err**" for incorrect programming. In this case, turn the unit off and then back on if you want to confirm the operation, or remove the "**Hot Key**" to cancel the operation.

Uploading the unit to the "Hot Key"

1. With the unit is on, insert the "**Hot Key**" and press the **M**

- key. The message "uPL" appears.
2. Pres the "SET" key to start the upload. The message "uPL" appears.
 3. Turn the unit off, remove the "Hot Key" and turn the unit back on.

After this upload process, the following messages appear:





- "end" for correct programming. The unit works normally again with the new program.
- "err" for incorrect programming. In this case, turn the unit off and then back on if you want to confirm the operation, or remove the "Hot Key" to cancel the operation.

Programming with the keyboard

For greater programming ease, the list of parameters is divided into different categories.

How to enter parameter list "Pr1"

To change parameter values, proceed as follows:

1. Enter the programming mode by pressing the **SET** and **DOWN** keys for 3 seconds ( and  flash). 
2. Select the desired parameter. The name of the parameter appears on the lower display, and its value in the upper display. 
3. Press the "SET" key. The parameter value flashes.
4. Using the ▲ and ▼ keys, change the value.
- 5 Press the "SET" key to memorize the new value and pass on to the following parameter.

To exit: Pres **SET + ▲**, or wait 15 seconds without pressing any key.

NOTE: The value displayed is stored, even in this latter case.

To enter parameter list "Pr2"

To enter the "Pr2" parameters:

1. Enter the "Pr1" level.
2. Select parameter "Pr2" - "PAS" and press the "SET" key.
3. Value "000" appears flashing. If the password is deactivated, press the **SET** key or use the ▲ and ▼ keys to enter the password, and confirm pressing the "SET" key.

NOTE: Each "Pr2" parameter can be deleted or added to "Pr1" (user level) by pressing the "SET" + ▼ key. When a parameter is also present in "Pr1", the decimal point is on.

How to change the value of a parameter

1. Enter the programming mode.
2. Select the desired parameter with the ▲ and ▼ keys.
3. Press the "SET" key. The value flashes.
4. Use the ▲ and ▼ keys to change this value.
5. Press the "SET" key to store the new value before going on to the following.

To exit: Press **SET + ▲**, or wait 15 seconds without pressing any key.

NOTE: The indicated value is saved even in this latter case.

On/off in cool and heat modes

Pressing the ▲ and ▼ keys for 5 seconds allows turning the

unit on and off. When the unit is on, the operating mode depends upon parameter CF31 (logical meaning of the icon).




CF31 = 0: ▲ = heat, ▼ = cool.

CF31 = 1: ▲ = cool, ▼ = heat

The corresponding icons are on (on the display), and the compressor status are also displayed.

Stand-by function

Turning the unit off in COOL or HEAT mode activates the STAND-BY function.

In STANDY-BY, icon  goes on.

N.B.: In STAND-BY, it is still possible to:

- 1) See the temperature on the display.
- 2) Manage the alarm conditions and save them.

During an antifreeze heating alarm of the evaporator, the heating remains off.

Menu of functions

This menu comprises all main functions controlled by the unit. When activated, the message "menu" appears.

Thanks to this menu, it is possible to:

- Delete all alarms stored.
- Display compressor operating hours.
- Display remaining time before the start-up of a new defrost.
- Download the list of parameters and alarms by using an INFRARED port.
- Delete the list of alarms.
- Display the real operating SET POINT.
- **PASS** to activate, modify and deactivate the safety code.

This menu comprises all main functions controlled by the unit. When activated, the "menu" message appears.

- **rSt** to delete all alarms stored. Can be protected by a password.
- **LOt** is low temperature alarm. Can be protected by a password.
- **HIt** is high temperature alarm. Can be protected by a password.
- **Ir**, infrared control.
- **PASS** to activate, modify and deactivate the safety code.

How to enter the functions menu

Press and release the **M** (menu) key.



How to exit the functions menu

Press and release the **M** (menu) key.

N.B.: In the menu Function, some functions are protected by a password.



How to reset an alarm

1. Enter the menu Function.
2. Select the "ALM" code by pressing SET.
3. Use the ▲ and ▼ keys to display all alarms. If the upper display shows "rst", it is possible to rest the alarm by pressing the SET key.
4. To EXIT, press the "M" key.

Displaying the operating hours of the charges

1. Enter the menu Function.
2. Use the ▲ and ▼ keys to display all codes.
3. By pressing the SET key in the following codes, it is possible to show, in the upper display:
 - C1Hr: Operating hours of compressor 1
 - C2Hr: Operating hours of compressor 2
 - PFHr: Operating hours of the pump
4. To EXIT, press the "M" key.

Displaying remaining time prior to start-up of a new defrost

1. Enter the menu Function.
2. Use the ▲ and ▼ keys to display all codes until seeing "DEF" on the upper display.
3. The lower screen displays (in minutes) the remaining time prior to the start-up of the following defrost cycle.
4. To EXIT, press the "M" key.

How to move the alarms, parameters and data through the infrared port

1. Enter the menu Function.
2. Use the ▲ and ▼ keys to display all codes until seeing "IR" on the lower display.
3. Three different options can be selected on the upper display:
 - ALM:** Alarms
 - PAR:** Parameters
 - LOG:** Data saved
4. By pressing the "SET" key you can send and print out all data on an external IPRINT.
5. To EXIT, press the "M" key.

How to reset the list of alarms

1. Enter the menu Function.
2. Use the ▲ and ▼ keys to display all codes until seeing "LrSt".
3. In this code, press the SET key. It is now possible to delete the list of alarms.
4. To EXIT, press the "M" key.

To display the real set point

1. Enter the menu Function.
2. Use the ▲ and ▼ keys to display all codes until seeing "SETr".

3. In this code, press the SET key. It is now possible to display the real set point of the unit.
4. To EXIT, press the "M" key.

N.B.: This function is available in Energy Saving and when the dynamic set point is activated.

To modify the password

1. Enter the "Pr1" level.
2. Select parameter "Pr2" - "PASS" and press the "SET" key.
3. Enter the present password before pressing the "SET" key again to reset the new value.

Other keyboard functions

How to display the set point

1. Press the SET key.
2. The set point value appears on the upper screen.
3. The SetC (cool set point) and SetH (heat set point) appear on the lower display.

How to change the set point

1. Press the SET key for 3 seconds.
2. The set point value appears flashing on the upper display.
3. The SetC (cool set point) and SetH (heat set point) appear on the lower display.
4. Use the ▲ and ▼ keys to modify the values.



How to start a manual defrost

In heat mode, manual defrost is begun by pressing the SET + ▼ keys for 5 seconds.

A manual defrost can be carried out only with the unit in good operating conditions.

Maintenance

It is possible to program a maximum number of operating hours for the compressors and pump.

Once the time is over, the  icon goes on. This function does not change operating status and the  icon can be turned off by deleting the operating hours.

Reset of operating hours

1. Enter the menu Functions.
2. Use the ▲ and ▼ keys to display the codes.
3. Press the SET key to display these on the upper display:
 - C1Hr: Operating hours of compressor 1
 - C2Hr: Operating hours of compressor 2
 - PFHr: Operating hours of the pump
4. Press the SET key for 3 seconds. The number of hours will reset to zero.
5. To EXIT, press the "M" key.

How to disable a compressor manually

A compressor can be disabled manually without changing unit operation.

1. Enter the parameters program.
2. Set **CO12** (Compressor 1) or **CO13** (compressor 2) to 1 (compressor 1 or 2 = deactivated).

3. Press the **SET** key to confirm.
4. To **EXIT** press the "M" key.

Values on the display

The values displayed depend upon the digital input probes and unit programming.

Display of upper and lower screens

The upper display indicates:

Unit	Values
water/water	Pool incoming water temperature

The lower display indicates:

Unit	Values
water/water	Pool outgoing water temperature

Energy saving

This function can be programmed weekly thanks to a real time clock, or activated by digital input.

Flow switch

If the flow switch is activated:

- The alarm relay activates.
- "Flow" appears on the display.

Filtering activation

For the purpose of maintaining the pool temperature, the heat pump can start up the filtering cycle, no matter what filtering time is programmed:

- If the temperature coincides with the set point, the heat pump diminishes filtering and turns off.
- If the temperature does not coincide with the set point, the heat pump keeps filtering in operation so as to reach said set point.
- This function is activated every two hours.

Alarm messages and actions

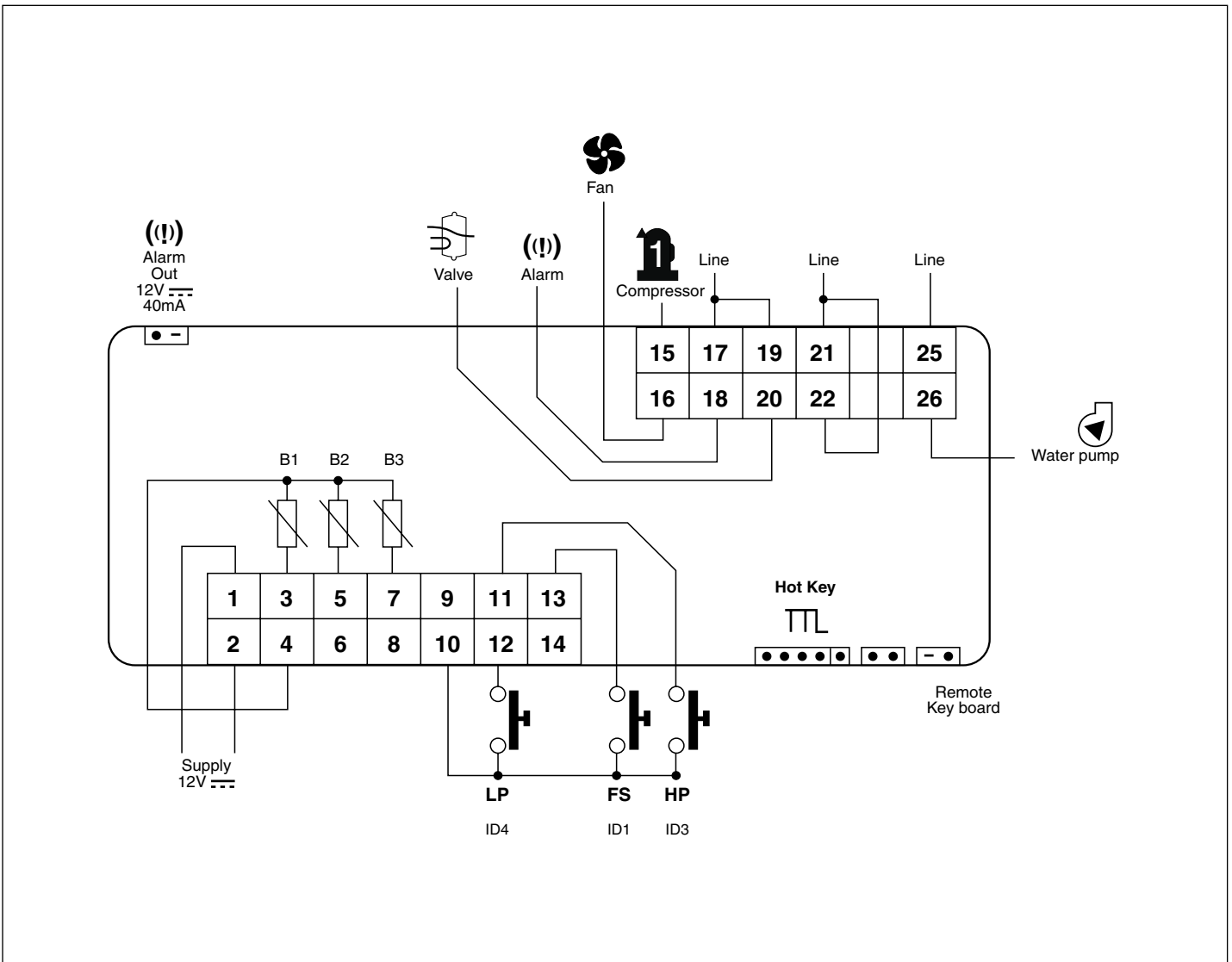
Code	Meaning	Cause	Action	Alarm reset
P1	PB1 probe faulty	A probe problem	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. Alarm code on screen.	Automatic When displayed temp. is within range
P2	PB2 probe faulty	A probe problem	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. Alarm code on screen.	Automatic When displayed temp. is within range
P3	PB3 probe faulty	A probe problem	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. Alarm code on screen.	Automatic When displayed temp. is within range
P4	PB4 probe faulty	A probe problem	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. Alarm code on screen.	Automatic When displayed temp. is within range
A01 HP	Hi pressure alarm switch	Activation of high pressure switch	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. AP code on screen.	Manual See reset procedure
A02 BP	Low pressure alarm switch	Activation of low pressure switch	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. BP code on screen.	Automatic or manual See reset procedure
A03	Low ambient temp. alarm	Low ambient temperature	General alarm icon on. Alarm relay activated. Buzzer activated. Alarm code on screen.	Automatic
A04	TOO COOL alarm	Indoor exchange temp. is too low	General alarm icon on. Alarm relay activated. Buzzer activated. Alarm code on screen.	Automatic
A05 HP	High pressure/high temp. ALARM	Temp. or pressure in condensing unit is too high (PB3 with CF06 = 1, 2)	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. AP code on screen.	Manual See reset procedure
A06 BP	Low pressure/low temp. ALARM	Temp. or pressure in condensing unit is too low (PB3 with CF06 = 1,2)	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. BP code on screen.	Automatic or manual See reset procedure
A05 HP	High pressure/high temp. ALARM	Temp. or pressure in condensing unit is too high (PB4 with CF07 = 1)	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. Alarm code on screen.	Manual See reset procedure

Alarm messages and actions				
Code	Meaning	Cause	Action	Alarm reset
A06 BP	Low pressure/low temp. ALARM	Temp. or pressure in condensing unit too low (PB4 with CF07 = 1)	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. Alarm code on screen.	Automatic or manual See reset procedure
A07	Antifreeze alarm	Temp. too low in outdoor exchanger	All outputs deactivated. Alarm relay activated. Buzzer activated. Antifreeze alarm activated. Antifreeze icon on.	Automatic or manual See reset procedure
A07	Antifreeze alarm in condensing unit	Activation of digital input by temp. too low in outdoor exchanger	All outputs deactivated. Alarm relay activated. Buzzer activated. Antifreeze alarm activated. Antifreeze icon on.	Automatic or manual See reset procedure
A08	Flow alarm (air/water or water/water units). Fan heat alarm (air/air unit) of indoor fan	Activation of digital input	All outputs deactivated. Alarm relay activated. Buzzer activated. Flow alarm icon on.	Automatic or manual See reset procedure
A09	Compressor 1 heat alarm	Activation of digital input	Compressor deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. Alarm code on screen.	Manual See reset procedure
A10	Compressor 2 heat alarm	Activation of digital input	Compressor deactivated. Alarm relay activated. Buzzer activated. General alarm icon on. Alarm code on screen.	Manual See reset procedure
A11	Condenser fan heat alarm	Activation of digital input	All outputs deactivated. Alarm relay activated. Buzzer activated. General alarm icon activated. Alarm code on screen.	Manual See reset procedure
A12	Defrost alarm	End of defrost by timer, not temperature	Alarm code on screen.	Automatic or manual See reset procedure
A13	Compressor 1 maintenance alarm	Operating hours > CO14	Maintenance icon on. Code on screen only.	Manual Reset operating hours
A14	Compressor 2 maintenance alarm	Operating hours > Co15	Maintenance icon on. Code on screen only.	Manual Reset operating hours
A15	Heat pump maintenance alarm (air/air or water/water). Indoor fan alarm (air/air)	Operating hours > CO16	Maintenance icon on. Code on screen only.	Manual Reset operating hours

Alarm messages and actions

Code	Meaning	Cause	Action	Alarm reset
rtC	Time alarm	The time must be set	Alarm code on screen	Automatic Set the time
rtF	Time alarm	Time error	Alarm code on screen	Automatic Change the time
EE	EEPROM alarm	The memory has lost the data	Alarm code on screen	Manual See reset procedure
ACF1	Setting alarm	Heat pump unit without setting inversion valve	Alarm code on screen. Unit in stand-by	Automatic
ACF2	Setting alarm	Air/air or air/water unit without condenser probe setting	Alarm code on screen.	Automatic
ACF3	Setting alarm	Two digital inputs with the same setting	Unit in stand-by	Automatic
ACF4	Setting alarm	Parameter CF28 = 1 and absence of set digital input. Or parameter CF28 = 2 and probe PB4 (parameter CF07 not set to 3)	Alarm code on screen.	Automatic

Wiring diagrams



Parameters

Analogue input settings

PB1 = Display of entering water temperature on the upper display.

PB2 = Display of outgoing water temperature on the lower display.

PB3 = Display of defrost temperature.

Digital input settings

ID1 = Water flow.

ID3 = High pressure

ID4 = Low pressure

Digital output relay settings

RL1 = Compressor 1

RL2 = Fan condenser ON/OFF

RL3 = Alarm

RL4 = 4-way valve

RL5 = Filtering short circuit (water pumps)

Selection of submenus

Code	Meaning
ALL	Full list of parameters
ST	Adjusting parameters
CF	Setting parameters
SD	Dynamic set point parameters
ES	Energy saving parameters
CO	Compressor parameters
FA	Fan parameters
Ar	Antifreeze heat parameters
DF	Defrost parameters
AL	Alarm parameters
LG	Log parameters

Control parameters						
Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
ST01	Cool set point	ST05	ST06	°C/°F	Decimal/whole	30
ST02	Cool differential	0.0 32	25.0 77	°C °F	Decimal Whole	2
ST03	Heat set point	ST07	ST08	°C/°F	Decimal/whole	28
ST04	Heat differential	0.0 32	25.0 77	°C °F	Decimal/whole	1
ST05	Cool set point low value	-40.0 -40	ST01	°C °F	Decimal/whole	10
ST06	Cool set point high value	ST01	110	°C/°F	Decimal/whole	30
ST07	Heat set point low value	-40.0 -40	ST03	°C °F	Decimal/whole	12
ST08	Heat set point high value	ST03	110 230	°C °F	Decimal/whole	32
ST09	Setting range	0.0 32	25.0 77	°C °F	Decimal/whole	20
Pr2	Password	0	999			278

Setting parameters

Parameter	Description	Minimum	Maximum	U. meas.	Value
CF01	Unit config. 0 = air/air chiller 1 = air/air chiller and heat pump 2 = air/water chiller 3 = air/water chiller and heat pump 4 = water/water chiller 5 = water/water chiller and heat pump 6 = condenser 7 = condenser with heat pump	0	7		3
CF02	Setting probe 0 = probe 1 (PB1) setting 1 = probe 2 (PB2) setting	0	1		0
CF03	Display setting (see corresponding section) 0 = PB1/probe (in function of parameters) 1 = PB2/probe (in function of parameters) 2 = PB1/rtC 3 = PB3/rtC	0	3		0
CF04	Probe 1 (PB1) setting 0 = Probe not present 1 = NTC 2 = digital input for starting setting 3 = digital input for starting cool	0	3		1
CF05	Probe 2 (PB2) setting 0 = Probe not present 1 = NTC 2 = digital input for antifreeze alarm 3 = digital input for starting heat	0	3		1
CF06	Probe 3 (PB3) setting 0 = Probe not present 1 = NTC 2 = 4-20mA for condenser pressure 3 = 4-20mA for dynamic set point 4 = NTC temp. alarm for defrost	0	4		1
CF07	Probe 4 (PB4) setting 0 = Probe not present 1 = NTC for condenser 2 = Programmable input 3 = NTC for outdoor temp. 4 = NTC for antifreeze alarm 5 = NTC for defrost	0	5		0
CF08	Digital input (ID1) setting 0 = compressor 1 heat alarm 1 = condenser fan heat alarm 2 = flow/indoor fan alarm 3 = ON/OFF function 4 = cool/heat 5 = compressor 2 heat alarm 6 = Stage/compressor 2 demand 7 = end of defrost 8 = energy saving 10 = flow switch setting	0	10		10
CF09	Digital input (ID2) setting 0 = compressor 1 heat alarm 1 = condenser fan heat alarm 2 = flow/indoor fan alarm 3 = ON/OFF function 4 = cool/heat 5 = compressor 2 heat alarm 6 = Stage/compressor 2 demand 7 = end of defrost 8 = energy saving 9 = Antifreeze alarm 10 = flow switch setting	0	8		4

Setting parameters					
Parameter	Description	Minimum	Maximum	U. meas.	Value
CF10	Digital input (ID5) setting 0 = compressor 1 heat alarm 1 = condenser fan heat alarm 2 = flow/indoor fan alarm 3 = ON/OFF function 4 = cool/heat 5 = compressor 2 heat alarm 6 = Stage/compressor 2 demand 7 = end of defrost 8 = energy saving 9 = Antifreeze alarm 10 = flow switch setting	0	8		6
CF11	PB4 (when set as digital input) setting 0 = compressor 1 heat alarm 1 = condenser fan heat alarm 2 = flow/indoor fan alarm 3 = ON/OFF function 4 = cool/heat 5 = compressor 2 heat alarm 6 = Stage/compressor 2 demand 7 = end of defrost 8 = energy saving 9 = Antifreeze alarm 10 = flow switch setting	0	8		3
CF12	Polarity ID1 0 = ON when closed 1 = OFF when open	0	1		1
CF13	Polarity ID2 0 = ON when closed 1 = OFF when open	0	1		1
CF14	Polarity ID3 0 = ON when closed 1 = OFF when open	0	1		1
CF15	Polarity ID4 0 = ON when closed 1 = OFF when open	0	1		1
CF16	Polarity ID5 0 = ON when closed 1 = OFF when open	0	1		1
CF17	Polarity PB1 0 = ON when closed 1 = OFF when open	0	1		0
CF18	Polarity PB2 0 = ON when closed 1 = OFF when open	0	1		0
CF19	Polarity PB4 0 = ON when closed 1 = OFF when open	0	1		0
CF20	RL4 setting 0 = alarm 1 = compressor 1 2 = compressor 2 3 = condenser fan ON/OFF 4 = chiller/heat pump 4-way valve 5 = 4-way valve for heat pump only 6 = water pump 7 = antifreeze heater 8 = 4-way valve 9 = filtering clock short circuit	0	9		8

Setting parameters

Parameter	Description	Minimum	Maximum	U. meas.	Value
CF21	RL5 setting 0 = general alarm 1 = compressor 1 with capacity stages 2 = compressor 2 3 = condenser fan ON/OFF 4 = chiller/heat pump 4-way valve 5 = 4-way valve for heat pump only 6 = water pump 7 = antifreeze heater 8 = 4-way valve 9 = filtering clock short circuit	0	9		9
CF22	Display 4mA	0.0 30	30.0 435		0
CF23	Display 20mA	0.0 30	30.0 435		30
CF24	PB1 calibration	-12.0 10	12.0 53	°C °F	0
CF25	PB2 calibration	-12.0 10	12.0 53	°C °F	0
CF26	PB3 calibration	-12.0 10 0.0 30	12.0 53 30 435	°C °F	0
CF27	PB4 calibration	-12.0 10	12.0 53	°C °F	0
CF28	Selection cool/heat 0 = keyboard 1 = digital input 2 = analogue	0	2		1
CF29	Automatic change-over set point	-40 -40	110 230	°C °F	30
CF30	Differential for selecting operating mode	0.0 32	25.0 77	°C °F	0.1
CF31	Meaning of logic icons 0 = iron glass (chiller)/sun (heat pump) 1 = iron cristal (heat pump)/sun (chiller)	0	1		0
CF32	Celsius or Fahrenheit selection 0 = ° C/bar 1 = ° F/psi	0	1		0
CF33	Selection of frequency 0 = 50 Hz 1 = 60 Hz	0	1		0
CF35	Remote keyboard 0 = 4 keys 1 = 6 keys 2 = 8 keys	0	2		1
CF36	Display in case of defect	0	7		0
CF37	Factory version number				
CF38	Eeprom-code parameters				
CF39	RL2 setting 0 = alarm 1 = compressor 1 2 = compressor 2 3 = condenser fan ON/OFF 4 = chiller/heat pump solenoid valve 5 = solenoid valve for heat pump only 6 = water pump 7 = antifreeze heater 8 = inversion valve 9 = filtering clock short circuit	0	9		3
CF40	Control model 0 = air/air chiller 1 = air/air chiller with heat pump 2 = air/water chiller 3 = air/water chiller with heat pump 4 = water/water chiller 5 = water/water chiller with heat pump	0	5		3

Dynamic set point						
Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
Sd01	Dynamic SET POINT 0 = Deactivated 1 = activated	0	1			0
Sd02	MAX. cool set point calibration	-15.5 4	15.5 59	°C °F	Decimal/whole	0
Sd03	Mae. cool set point calibration	-15.5 4	15.5 59	°C °F	Decimal/whole	0
Sd04	Outdoor air set point for dynamic cool set point	-40 -40	110 230	°C °F	Decimal/whole	0
Sd05	Outdoor air set point for dynamic heat set point	-40 -40	110 230	°C °F	Decimal/whole	0
Sd06	Outdoor air differential for cool dynamic set point	-15.5 4	15.5 59	°C °F	Decimal/whole	0
Sd07	Outdoor air differential for heat dynamic set point	-15.5 4	15.5 59	°C °F	Decimal/whole	0
Pr2	Password	0	999			278

Energy saving						
Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
ES01	Start (0÷24)	0	23.50		10 minutes	0
ES02	End (0÷24)	0	23.50		10 minutes	0
ES03	Monday 0 = deactivated 1 = activated	0	1			0
ES04	Tuesday 0 = deactivated 1 = activated	0	1			0
ES05	Wednesday 0 = deactivated 1 = activated	0	1			0
ES06	Thursday 0 = deactivated 1 = activated	0	1			0
ES07	Friday 0 = deactivated 1 = activated	0	1			0
ES08	Saturday 0 = deactivated 1 = activated	0	1			0
ES09	Sunday 0 = deactivated 1 = activated	0	1			0
ES10	Increase set point in energy saving (cool)	-30.0 -22	30.0 86	°C °F	decimal whole	0
ES11	Energy saving differential (cool)	0.0 32	25.0 77	°C °F	decimal whole	0.1
ES12	Increase set point in energy saving (heat)	-30.0 -22	30.0 86	°C °F	decimal whole	0.1
ES13	Energy saving differential (heat)	0.0 32	25.0 77	°C °F	decimal whole	0.1
Pr2	Password	0	999	°C °F		278

Compressor parameters

Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
CO01	Minimum time compressor activated	0	250	Seconds	10 seconds	0
CO02	Minimum time compressor deactivated	0	250	Seconds	10 seconds	7
CO03	Timing activation between two compressors/stages	1	250	Seconds		1
CO04	Timing deactivation between two compressors/stages	0	250	Seconds		0
CO05	Timing activation compressor after powering	0	250	Minutes		2
CO06	Timing activation compressor after indoor fan start-up	0	250	Seconds		1
CO07	Timing deactivation compressor after indoor fan start-up	0	250	Seconds		0
CO08	Compressor rotation 0 = activated 1 = deactivated	0	1			0
CO09	Not used					0
CO10	Inversion valve polarity 0 = compressor segmentation activated	0	1			0
CO11	Indoor pump fan operating mode 0 = absent 1 = continuous 2 = in function of compressor demand	0	2			0
CO12	Compressor 1 0 = activated 1 = deactivated	0	1			0
CO13	Compressor 2/stage 2 0 = activated 1 = deactivated	0	1			1
CO14	Compressor 1 operating hours	0	999		10 hours	0
CO15	Compressor 2 operating hours	0	999		10 hours	0
CO16	Indoor pump fan operating hours	0	999		10 hours	0
CO17	Filtering start-up frequency	0	250	Minutes		120
CO18	Filtering start-up timing	0	250	Minutes		0
Pr2	Password	0	999			321

Fan parameters						
Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
FA01	Fan output 0 = present 1 = absent	0	1			1
FA02	Fan control 0 = ON 1 = Control ON/OFF 2 = proportional speed control	0	2			0
FA03	Fan operating mode 1 = in function of compressor demand 2 = independent	0	1			0
FA04	Max. speed time after activation	0	250	Seconds		5
FA05	Substitution of fan phase	0	250			250 μ s-4
FA06	Not used					1
FA07	Pre-ventilation in cool after compressor activation	0	250	Seconds		5
FA08	Min. fan speed in cool mode	30	100	%		30
FA09	Max. fan speed in cool mode	30	100	%		100
FA10	Pressure and temp. parameters for min. speed in cool mode	-40.0 -40 0.0 30	110 230 30 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	15
FA11	Pressure and temp. parameters for max. speed in cool mode	-40.0 -40 0.0 30	110 230 30 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	19
FA12	Fan proportional band in cool mode	0.0 32 0.0 30	25.0 77 30.0 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	4
FA13	CUT-OFF differential in cool mode	0.0 32 0.0 30	25.0 77 30.0 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	1
FA14	CUT-OFF range in cool mode	0.0 32 0.0 30	25.0 77 30.0 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	2
FA15	CUT-OFF timing	0	250	Seconds		5
FA16	Night speed in cool mode	30	100	%		30
FA17	Min. fan speed in heat mode	30	100	%		40
FA18	Max. fan speed in heat mode	30	100	%		100
FA19	Pressure and temp. parameters for min. speed in heat mode	-40.0 -40 0.0 30	110 230 30 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	7
FA20	Pressure and temp. parameters for max. speed in heat mode	-40.0 -40 0.0 30	110 230 30 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	4
FA21	Proportional fan band in heat mode	0.0 32 0.0 30	25.0 77 30.0 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	2
FA22	CUT-OFF differential in cool mode	0.0 32 0.0 30	25.0 77 30.0 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	1
FA23	CUT-OFF range in cool mode	0.0 32 0.0 30	25.0 77 30.0 435	$^{\circ}$ C $^{\circ}$ F bar psi	decimal whole decimal whole	2
FA24	Night speed in heat mode	30	100	%		100

"HOT START"						
Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
FA25	Hot Start set point	-40	110	°C	decimal whole	25
		-40	230	°F		
FA 26	Hot Start differential	0.0	25.0	°C	decimal whole	5
		32	77	°F		
Pr2	Password	0	999			278

Antifreeze heaters						
Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
Ar01	Min. antifreeze set point	-40.0	Ar03	°C	decimal whole	0
		-40		°F		
Ar02	Max. antifreeze set point	Ar03	110	°C	decimal whole	1 (3)
			230	°F		
Ar03	Antifreeze set point	Ar01	Ar02	°C/°F	decimal/whole	3
Ar04	Antifreeze differential	0	25.0	°C	decimal whole	4
		32	77	°F		
Ar05	Antifreeze alarm timing	0	250	Seconds		10
Ar06	Max. no. of activations for antifreeze	0	16			3
Ar07	Antifreeze alarm timing after activation of heat pump	0	250	Seconds		10
Ar08	Antifreeze set point in cool	-40	110	°C	decimal whole	3
		-40	230	°F		
Ar09	Antifreeze set point in heat	-40	110	°C	decimal whole	3
		-40	230	°F		
Ar10	Antifreeze set point (water/water unit)	-40	110	°C	decimal whole	3
		-40	230	°F		
Ar11	Antifreeze differential in cool	0	25.0	°C	decimal whole	4
		32	77	°F		
Ar12	Antifreeze differential in cool	0	25.0	°C	decimal whole	4
		32	77	°F		
Ar13	Antifreeze heat activation 0 = during control 1 = during control and in defrost	0	1			0
Ar14	Antifreeze heat control in cool mode	0	1			1
Ar15	Antifreeze heat control in heat mode 0 = OFF in high pressure 1 = ON in high pressure	0	1			1
Ar16	Selection of antifreeze probe in cool mode 0 = PB1 1 = PB2	0	1			0
Ar017	Selection of antifreeze probe in heat mode 0 = PB1 1 = PB2	0	1			0
Ar18	Control water pump/antifreeze electric heater in stand-by or OFF. 0 = deactivated 1 = activated	0	1			1
Ar19	Control water pump/antifreeze electric heater in case of pump failure. 0 = output OFF 1 = output ON	0	1			1
Ar20	Boiler function 0 = integration control 1 = heating control	0	1			0
Ar21	Outdoor air set point for activating boiler heating	-40	110	°C		-30
		-40	230	°F		
Ar22	Boiler function differential	0	25	°C		2
		0	45	°F		
Ar24	Antifreeze set point alarm in heat pump	Ar01	Ar02	°C/°F		3
Ar25	Antifreeze alarm differential in heat pump mode	0	25	°C		4
		0	45	°F		

Defrost parameters						
Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
DF01	Defrost function 0 = no 1 = yes	0	1			1
DF02	Defrost mode 0 = temp./pressure 1 = time 2 = digital input	0	2			0
DF03	Temp/pressure for defrost start	-40.0 -40 0.0 30	110 230 30 435	°C °F bar psi	decimal whole decimal whole	-13
DF04	Temp/pressure for defrost end	-40.0 -40 0.0 30	110 230 30 435	°C °F bar psi	decimal whole decimal whole	12
DF05	Timing before starting forced defrost	0	250	Seconds		0
DF06	Min. defrost time	0	250	Seconds		10
DF07	Max. defrost time	0	250	Minutes		40
DF08	Timing before defrost start	0	250	Seconds		0
DF09	Timing after defrost end	0	250	Seconds		0
DF10	Timing between 2 defrosts	0	99	Minutes		1
DF11	Defrost start value after DF10	-40 -40	110 230	°C °F	decimal whole	-13
DF12	Defrost end temp.	-40 -40	110 230	°C °F	decimal whole	4
DF13	2nd compressor activated during defrost 0 = deactivated 1 = activated	0	1			0
DF14	Fan activated during defrost 0 = deactivated 1 = activated	0	1			0
DF15	Temp./pressure value to activate fan during defrost	-40.0 -40 0.0 30	110 230 30 435	°C °F bar psi	decimal whole decimal whole	14
DF16	Low pressure alarm during defrost 0 = deactivated 1 = activated	0	1			0
DF17	Low pressure alarm after inverting a cycle	0	250	Seconds		30
DF18	4-way valve operating mode 0 = ON in cool mode 1 = OFF in heat mode	0	1			0
DF19	Temp./pressure parameters for a forced defrost start	-40.0 -40 0.0 30	110 230 30 435	°C °F bar psi	decimal whole decimal whole	-13
DF20	Forced defrost differential	0 32	25.0 77	°C °F	decimal whole	25
Pr2	Password	0	999			278

Alarm parameters						
Parameter	Description	Minimum	Maximum	Unit of measurement	Resolution	Value
AL01	Low pressure switch timing	0	250	Seconds		20
AL02	No. of activations per hour for low pressure switch	0	16			3
AL03	Low pressure alarm with compressor off 0 = deactivated with compressor off 1 = activated with compressor off	0	1			0
AL04	Flow alarm timing after pump start-up	0	250	Seconds		5
AL05	Max. no. of activations per hour of flow switch	0	16			16
AL06	Flow intake time activated	0	250	Seconds		5
AL07	Flow intake time deactivated	0	250	Seconds		5
AL08	Compressor 1-2 heat alarm timing after start-up	0	250	Seconds		0
AL09	Max. no. of activations per hour of flow switch of compressor 1-2	0	16			0
AL10	Heat alarm reset compressor 1-2 after AL09	0	1			0
AL11	Condenser high temp./pressure alarm set point	-40.0 -40 0.0 30	110 230 30 435	°C °F bar psi	decimal whole decimal whole	50
AL12	Condenser high temp./pressure alarm differential	0 32 0 0	25.0 77 30.0 435	°C °F bar psi	decimal whole decimal whole	0
AL13	Low pressure alarm timing with analogue input	0	250	Seconds		0
AL14	Low temp./pressure alarm set point	-40.0 -40 0.0 30	110 230 30 435	°C °F bar psi	decimal whole decimal whole	-30
AL15	Low temp./pressure alarm differential	0 32 0 0	25.0 77 30.0 435	°C °F bar psi	decimal whole decimal whole	1
AL16	Max. no. of activations per hour of low temp./pressure analogue input	0	16			3
AL17	Alarm relay in stand-by 0 = activated 1 = deactivated	0	1			0
AL18	Alarm relay polarity 0 = output active. contact closed 1 = output active. contact open	0	1			0
AL19	High pressure activation time. If 0. immediate alarm activation	0	250	Seconds		0
AL20	Activation time water flow intake	0	250	Seconds		1
AL21	Deactivation time water flow intake	0	250	Seconds		1
Pr2	Password	0	999			278

Data log

Selection of submenus

Code	CF01	0	1	2	3	4	5	6	7
ST		X	X	X	X	X	X		
CF		X	X	X	X	X	X	X	X
SD		X	X	X	X	X	X		
ES		X	X	X	X	X	X		
CO		X	X	X	X	X	X	X	X
FA		X	X	X	X			X	X
Ar		X	X	X	X	X	X	X	X
DF			X		X				X
AL		X	X	X	X	X	X	X	X

Technical specifications

Casing	Self-extinguishable ABS
Dimensions	C: Front panel 32 x 74 mm., depth 60 mm.
	L: Front panel 38 x 185 mm., depth 76 mm.
Assembly	C: Offset 71 x 29 mm.
	L: Offset 31 x 150 mm.
Front protection	IP65.
Display	Upper display: 3 digits + decimal point
	Lower display: 4 digits + decimal point
Connections	Removable connecting strip 12-14 terminals
Power supply	12Vac/cc ± 10%
	24Vac/cc ± 10% 50/60Hz
Probe inputs	5 VA máx.
Digital inputs	4 NTC or 3 NTC + 1 (4...20mA)
Relay outputs	5 configurable
Alarm output	5 SPDT 8(3)A, 250 Vac relays
Analogue output	0 - 12V - 40mA máx.
Data log	4...20mA (fan mode)
	Activation signal (fan ON/OFF mode)
Contamination level	in non-volatile EEPROM memory
Operating temperature	normal
Warehousing temperature	-10/60°C
Relative humidity	-30/85°C
Measuring and control range	20/85% (sin condensación)
Resolution	20/85% (without condensation)
Precision (ambient temp. 25° C)	-40/110° C (-58/230° F) or 0/30 bar
Precisión (temp. ambiente 25°C)	0.1° C or 1° F (configurable)

Temperature tables

The following tables show the ratio between the temperature, and the resistance for incoming and outgoing water probes and defrost.

°C	Resistance (Ohms)
-50	329.5
-49	310.9
-48	293.5
-47	277.2
-46	262
-45	247.7
-44	234.3
-43	221.7
-42	209.9
-41	198.9
-40	188.5
-39	178.5
-38	169
-37	160.2
-36	151.9
-35	144.1
-34	136.7
-33	129.8
-32	123.3
-31	117.1
-30	111.3
-29	105.7
-28	100.5
-27	95.52
-26	90.84
-25	86.43
-24	82.26
-23	78.33
-22	74.61
-21	71.1
-20	67.77
-19	64.57
-18	61.54
-17	58.68
-16	55.97
-15	53.41
-14	50.98
-13	48.68
-12	46.5
-11	44.43
-10	42.47
-9	40.57
-8	38.77
-7	37.06
-6	35.44
-5	33.9
-4	32.44
-3	31.05
-2	29.73
-1	28.48
0	27.28
1	26.13
2	25.03
3	23.99
4	23

°C	Resistance (Ohms)
5	22.05
6	21.15
7	20.3
8	19.48
9	18.7
10	17.96
11	17.24
12	16.56
13	15.9
14	15.28
15	14.69
16	14.12
17	13.58
18	13.06
19	12.56
20	12.09
21	11.63
22	11.2
23	10.78
24	10.38
25	10
26	9.632
27	9.281
28	8.944
29	8.622
30	8.313
31	8.014
32	7.728
33	7.454
34	7.192
35	6.94
36	6.699
37	6.467
38	6.245
39	6.032
40	5.827
41	5.629
42	5.438
43	5.255
44	5.08
45	4.911
46	4.749
47	4.593
48	4.443
49	4.299
50	4.16
51	4.026
52	3.896
53	3.771
54	3.651
55	3.536
56	3.425
57	3.318
58	3.215
59	3.116

°C	Resistance (Ohms)
60	3.02
61	2.927
62	2.838
63	2.751
64	2.668
65	2.588
66	2.511
67	2.436
68	2.364
69	2.295
70	2.228
71	2.163
72	2.1
73	2.039
74	1.98
75	1.924
76	1.869
77	1.816
78	1.765
79	1.716
80	1.668
81	1.621
82	1.577
83	1.533
84	1.491
85	1.451
86	1.411
87	1.373
88	1.336
89	1.3
90	1.266
91	1.232
92	1.2
93	1.168
94	1.137
95	1.108
96	1.079
97	1.051
98	1.024
99	0.9984
100	0.9731
101	0.9489
102	0.9246
103	0.9014
104	0.8789
105	0.8572
106	0.836
107	0.8155
108	0.7956
109	0.7763
110	0.7576

All data subject to change without notice.



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