

SYSAQUA BLUE

35B

Air Cooled Water Chillers and Heat Pumps



R290

35.4kW



31.7kW



INSTALLATION INSTRUCTION

NOTICE D'INSTALLATION

INSTALLATIONSHANDBUCH

ISTRUZIONI INSTALLAZIONE

INSTRUCCIONES DE INSTALACIÓN

English

Français

Deutsch

Italiano

Español

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POWER SUPPLY MUST BE SWITCHED OFF BEFORE STARTING WORK IN THE ELECTRIC CONTROL BOX

1. GENERAL RECOMMENDATIONS

The purpose of this Manual is to provide users with instructions for installing, commissioning, using and maintaining the units. It also contains instructions on starting up the machine as well as recommendations to avoid bodily injury and risks of damage to the device during its operation.

It does not contain the complete description of all the maintenance operations guaranteeing the unit's long life and reliability. Only the services of a qualified technician can guarantee the unit's safe operation over a long service life.

Please read the following safety precautions very carefully before installing the unit.

1.1. SAFETY DIRECTIONS

Follow the safety rules in force when you are working on your appliance.

The installation, commissioning, use and maintenance of these units should be performed by qualified personnel who have a good knowledge of standards and local regulations, as well as experience of this type of equipment.

This appliance has not been designed for use by persons (including children) with reduced physical, sensorial or mental faculties or by persons without any experience or knowledge of heating systems, unless they act under the safety and supervision of a responsible person or have received prior training concerning the use of the appliance.

The unit should be handled using lifting and handling equipment appropriate to the unit's size and weight.

Any wiring produced on site must comply with the corresponding national electrical regulations.

Make sure that the power supply and its frequency are adapted to the required electric current of operation, taking into account specific conditions of the location and the current required for any other appliance connected to the same circuit.

The unit must be EARTHED to avoid any risks caused by insulation defects.

Work must not be carried out on the electrical components if water or high humidity is present at the installation site.

SAFETY SYMBOLS



ELECTRIC
VOLTAGE



ROTATING PART



RISK OF
CUTTING



RISK OF BURNS



RISK OF
ASPHYXIA



PRESSURIZED
EQUIPMENT



FLAMMABLE
GAS

1.2. WARNING

Cut off the power supply before starting work on the appliance.

When forming the hydraulic connections, ensure that no impurities are introduced into the pipe work.

The manufacturer declines any responsibility and the warranty becomes void if these instructions are not complied with.

If you encounter a problem, please call the Technical Department for your area.

If possible, assemble the compulsory or optional accessories before placing the appliance in its final location (see instructions provided with each accessory).

To familiarize yourself fully with the appliance, we recommend that you also read our Technical Instructions.

The information contained in these Instructions is subject to modification without advance notice.

1.3. EQUIPMENT SAFETY DATA

| Safety data | R290 |
|---|---|
| Toxicity level | Acute toxicity |
| In contact with the skin | If the fluid comes into contact with your skin: treat the freeze burns as you would a normal burn. Immediately remove all contaminated clothing and footwear Rinse the affected area immediately with plenty of water If you burn your skin, call a doctor without delay. |
| In case of eye contact | Hold the eyelids open and flush immediately with water for at least 15 minutes. Consult an ophthalmologist without delay, even if there are no immediate visible signs of damage. |
| Ingestion | Not specifically concerned (gas) |
| Inhalation | If inhaled, move to fresh air and give oxygen if necessary. Perform artificial respiration if the patient is no longer breathing or is short of air. In the event of cardiac arrest, perform external CPR. Seek immediate medical attention. |
| Acute symptoms | Coma Convulsions Depression of the central nervous system Headaches Nausea Cardiac disease Vomiting |
| Occupational exposure limits | 1000 ppm - 8 hours 1800 mg/m ³ - 8 hours 4000 ppm - 15 minutes 7200 mg/m ³ - 15 minutes |
| Stability | Stable at ambient temperature and in normal conditions of use |
| Incompatible materials | Strong bases Powerful oxidants Oxidizing materials |
| General precautions | Avoid inhaling high concentrations of vapors. Atmospheric concentrations should be minimized and kept as far as possible below the occupational exposure limit. Steam is heavier than air and concentrates at a low level and in small places. Exhaust ventilation at the lowest levels. Distance ignition possible Risk of explosion if heated in a confined environment |
| Respiratory protection | AX-type rubber mask In the event of inadequate ventilation, insulating self-contained breathing apparatus |
| Storage and handling | The tanks must be located in a dry and cold room that is fireproof, protected from direct sunlight and away from all sources of heat, e.g. radiators. Storage rooms must be well ventilated. When handling, it is necessary to: perform operations with apparatus and equipment designed for use in an explosive atmosphere. prevent the build-up of electrostatic charges. refrain from smoking. work in a well-ventilated room. |
| Protective clothing | Anti-static gloves Safety glasses with side shields Anti-static clothing |
| Procedure in case of spillage or a leak | Evacuate the hazardous area Only qualified personnel wearing the appropriate protective equipment must perform handling operations. Eliminate all sources of ignition if you can safely do so. Prevent the product from penetrating wine cellars, basements, work trenches, etc. Prevent the product from entering the sewers (explosion risk) Mechanically ventilate the spill area Use water spray to disperse vapors Ignited gas leak: Do not switch off if the leak cannot be stopped without risk |
| Waste disposal | Dispose of waste at a specialist waste center |
| Fire fighting data | Keep away from heat / sparks / naked flames / hot surfaces. - Refrain from smoking. Suitable extinguishing agents: Small fire: Carbon dioxide (CO ₂), powders Large fire: Sprinkler |
| Fire protection equipment | In case of fire, wear self-contained breathing apparatus and protective clothing. |

2. INSPECTION AND STORAGE

Upon receipt of the equipment, carefully cross check all the elements against the shipping documents to ensure that all expected crates and boxes have been delivered. Inspect all the units for any visible or hidden damage.

In the event of shipping damage, write precise details of the damage on the shipper's delivery note and send a registered letter to the shipper within 48 hours, clearly stating the damage caused. Forward a copy of this letter to the manufacturer or the latter's representative.

Never store or transport the unit upside down. It must be stored indoors, completely protected from rain, snow etc. The unit must not be damaged by changes in the weather (high and low temperatures). Excessively high temperatures (above 60°C) can harm certain plastic materials and cause permanent damage. Moreover, the performance of certain electrical or electronic components can be impaired.

3. WARRANTY

The appliances are delivered fully assembled, factory tested and ready to operate.

Any modification to the units without the manufacturer's prior approval, shall automatically render the warranty null and void.

The following conditions must be respected in order to maintain the validity of the warranty:

- Commissioning shall be performed by specialized technicians from technical services approved by the manufacturer.
- Maintenance shall be performed by trained maintenance technicians.
- Only Original Equipment spare parts shall be used.
- All the operations listed in the present manual shall be performed within the required time limits.



THE WARRANTY SHALL BE NULL AND VOID IN THE EVENT OF NON-COMPLIANCE WITH ANY OF THE ABOVE CONDITIONS.

4. PRESENTATION

All the models in the **SYSAQUA BLUE** liquid coolers range are produced in compliance with state-of-the-art design and manufacturing standards. This guarantees their high performance and reliability as well as their compatibility with all types of air conditioning installations operating with both chilled water and glycol solutions (and with hot water for the Heat pump units). The unit, designed for an outdoor mounted application, is not suitable for any uses other than those specified in this manual.

Improper usage of the unit or a use for purposes other than those originally intended, without the prior approval of the manufacturer or the latter's agents, could result in the unit functioning outside its safe operating limits and could present risks to both personnel and property.

SYSAQUA BLUE are packaged units, optimized for air conditioning applications.

Following assembly of the units:

1. the electrical circuits are tested.
2. refrigeration circuits receive their operational refrigerant charge and are subject to pressurized leak detection tests.
3. The **SYSAQUA BLUE** units are tested.

These tests are conducted to guarantee the correct operation and quality of our products.

The Cooling only models can produce chilled water at temperatures varying from +18°C to +5°C or chilled water/glycol solution at temperatures varying from +5°C to -15°C.

The Heat pump models can produce hot water at temperatures varying from +20°C to +60°C.

5. CONTENTS OF PACKAGE

- 1 SYSAQUA BLUE
- 1 Water filter
- 1 Bag with the documentation

5.1. OPTIONAL ACCESSORIES

Anti-vibration rubber pads

Spring pads

Isolating valve

On opening the box, check that all of the accessories required for installation are present.

6. DIMENSIONS

SEE APPENDIX

7. HANDLING

7.1. NET WEIGHT

| | | 35B |
|--------------|----|-----|
| Without pump | kg | 307 |
| 1 pump | kg | 20 |
| 2 pumps | kg | / |
| XLN | kg | / |
| Buffer tank | Kg | 65 |

7.2. GRAVITY CENTER POSITION

7.2.1. WITHOUT BUFFER TANK

| | | 35B |
|----------------|----|-----|
| X _G | mm | 496 |
| Y _G | mm | 498 |
| Z _G | mm | 695 |

7.2.2. WITH BUFFER TANK

| | | 35B |
|----------------|----|-----|
| X _G | mm | 593 |
| Y _G | mm | 681 |
| Z _G | mm | 548 |

7.3. GENERAL HANDLING

The handling method depends on the **SYSAQUA BLUE** model and its final destination.

- Take care to avoid any rough handling or impacts when unloading and moving the appliance.
- Before hoisting the appliance into position, perform a test lift to ensure stability and balance. Avoid twisting or uneven lifting of the units.
- The units shall be carefully inspected before unit installation to make sure this has not happened.
- All of these sections are inspected before they leave the factory. Prior to commissioning, it is therefore important to make sure that no bolts, screws or other fastening components are loosened or missing.



Caution

Never subject the metal work (panels, posts) of the **SYSAQUA BLUE** to handling constraints, as only its base is designed for that purpose.



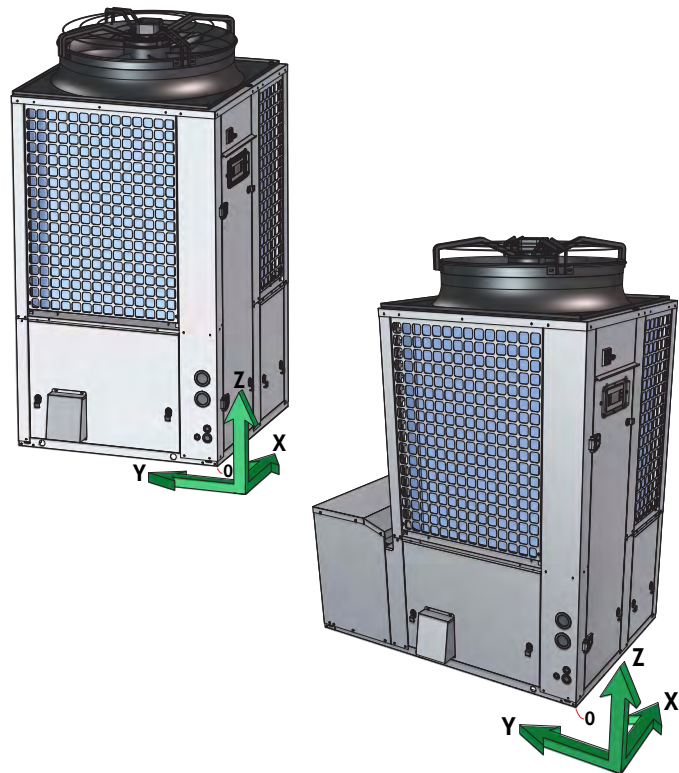
Caution

To avoid irreversible damage, do not tilt the **SYSAQUA BLUE** by more than 45° during handling.



Caution

Never move the **SYSAQUA BLUE** on rollers.





Caution

When handling the **SYSAQA BLUE**, beware not to damage the finned battery pack. Protect it with cardboard or particle panels.

7.3.1. HANDLING WITH A FORKLIFT

A forklift can be used to handle the **SYSAQA BLUE** units when palletized.



Place a safety wedge between the unit base and the fork lift truck to avoid damaging the unit's structure and casing.

7.3.2. HANDLING BY SLINGING

Lifting is also possible by slinging.

Holes are made at each end of the unit to allow the insertion of slinging bars along the chassis width.

A spreader must be used to prevent damage to the machine edges.

Hole diameter

35B

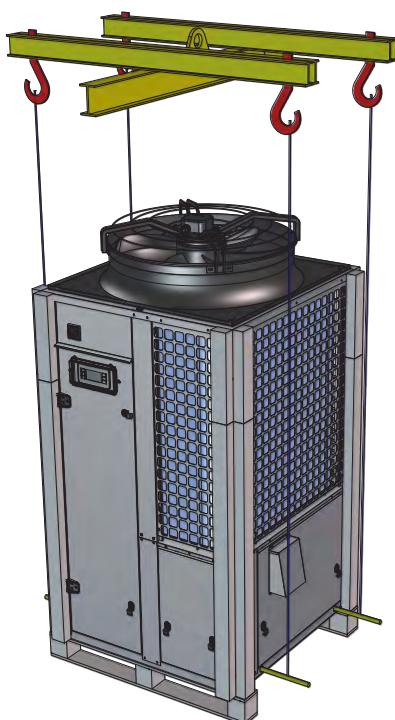
mm 30



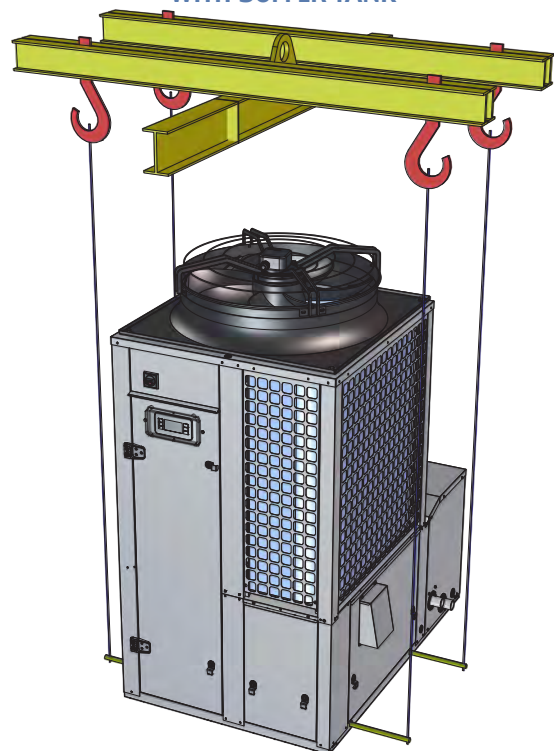
Caution

Slings must never touch the casing of the **SYSAQA BLUE** unit.

SYSAQA BLUE 35B



SYSAQA BLUE 35B
WITH BUFFER TANK



8. TECHNICAL SPECIFICATIONS

8.1. PHYSICAL CHARACTERISTICS

| | | | | 35B | |
|----------------------------------|-----------------|-----------------------|----------|--------------------|-------|
| Supply voltage | | 400V / 3~ N / 50Hz | | | |
| Number of refrigeration circuits | | 1 | | | |
| REFRIGERANT | | | | | |
| Type | | R290 | | | |
| Factory charge | | SEE NAME PLATE | | | |
| COMPRESSORS | | | | | |
| Type | | Scroll | | | |
| Number | | 2 | | | |
| Startup type | | DIRECT | | | |
| Part load steps | | % | 0/50/100 | | |
| Crankcase heater | | W | 2x53 | | |
| EVAPORATOR | | | | | |
| Type | | plates | | | |
| Number | | 1 | | | |
| Water volume | | L | 3:32 | | |
| Cooling Only | | water flow | nominal | m ³ /hr | 5:40 |
| | | | minimum | | 3:40 |
| | | | maximum | | 9:02 |
| | | Water pressure losses | kPa | 18 | |
| Heat Pump | Cooling mode | water flow | nominal | m ³ /hr | 5:40 |
| | | | minimum | | 3:40 |
| | | | maximum | | 9:02 |
| | | Water pressure losses | kPa | 18 | |
| | Heating mode | water flow | nominal | m ³ /hr | 6:10 |
| | | | minimum | | 3.84 |
| | | | maximum | | 10:19 |
| | | Water pressure losses | kPa | 23 | |
| Antifreeze electric heater | | W | 30 | | |
| FANS | | | | | |
| Type | | AXIAL | | | |
| Number | | 1 | | | |
| STD | Speed | rpm | 675 | | |
| | Air flow rate | m ³ /hr | 15,840 | | |
| | Input power | W | 695 | | |
| HPF | Speed | rpm | 874 | | |
| | Air flow rate | m ³ /hr | 15,840 | | |
| | Input power | W | 1,922 | | |
| | Static Pressure | Pa | 170 | | |
| COILS | | | | | |
| Number | | 1 | | | |
| Frontal surface | | m ² | 2.79 | | |
| Number of rows | | 2 | | | |
| HYDRAULIC LINKS | | | | | |
| Type | | Male gas threaded | | | |
| Inlet diameter | | inches | 1" 1/2 | | |
| Outlet diameter | | inches | 1" 1/2 | | |
| BUFFER TANK (OPTION) | | | | | |
| Volume | | L | 100 | | |
| ACOUSTIC DATA | | | | | |
| Sound power level (1) | | STD | dB(A) | 83 | |
| | | HPF | dB(A) | 84 | |
| | | XLN | dB(A) | / | |

(1) according to Eurovent.

8.2. REFRIGERATION SPECIFICATIONS

8.2.1. REFRIGERANT CIRCUIT DIAGRAM

SEE APPENDIX

8.2.2. REFRIGERANT CHARGE



Caution

This equipment contains a hydrocarbon (R290) that belongs to fluid category I as per standard EN378-1. Unlike fluorocarbon fluids, this gas presents no risk to the environment (low GWP, fluid not covered by the Kyoto Protocol).

The type and quantity of refrigerant per circuit is indicated on the product plate.

However, this is an A3 category flammable fluid with a consequent risk of fire or explosion (EN1127-1). It must be handled by skilled personnel who are trained in the use of flammable refrigerants. The installer and the end user must know the local regulations governing the installation, operation and disposal of the equipment, in particular with regards to the retrieval of substances presenting a risk of fire or explosion.



Caution

SYSAQUA BLUE units use R290 refrigerant, which is a group 2 refrigerant as defined in directive 2014/68/EU. Considering the maximum operating pressure of these units (27.2 bar(g)), they integrate category 2 (or lower) components as defined in directive 2014/68/EU. In compliance with Directive PED 2014/68/EU and harmonized standard EN378 (1 to 4), these **SYSAQUA BLUE** units are classed as category 2.

8.3. ELECTRIC SPECIFICATIONS

8.3.1. SYSAQUA BLUE WITH STANDARD FAN

| | | 35B | |
|--------------|---|--------------------|-------|
| Power supply | | 400V / 3~ N / 50Hz | |
| Without pump | Maximum current | A | 34.0 |
| | Total starting current (without soft starter) | A | 120.0 |
| | Total starting current (with soft starter) | A | 54.6 |
| With pump | Maximum current | A | 37.0 |
| | Total starting current (without soft starter) | A | 123.0 |
| | Total starting current (with soft starter) | A | 57.6 |

8.3.2. SYSAQUA BLUE WITH HIGH-PRESSURE FAN

| | | 35B | |
|--------------|---|--------------------|-------|
| Power supply | | 400V / 3~ N / 50Hz | |
| Without pump | Maximum current | A | 36.0 |
| | Total starting current (without soft starter) | A | 122.0 |
| | Total starting current (with soft starter) | A | 56.6 |
| With pump | Maximum current | A | 39.0 |
| | Total starting current (without soft starter) | A | 125.0 |
| | Total starting current (with soft starter) | A | 59.6 |

IMPORTANT

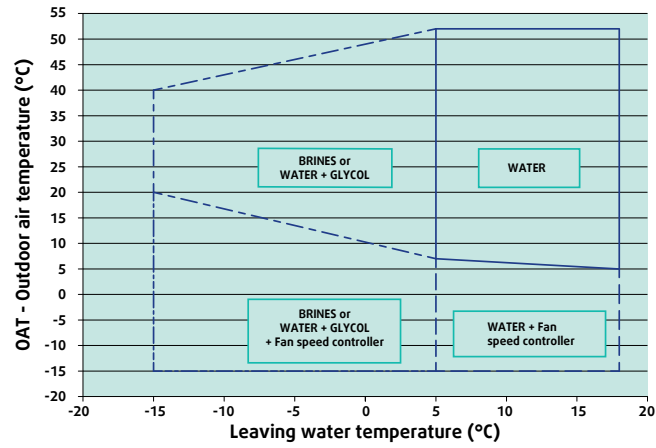
* This data is given for guidance only. It must be checked and adjusted in accordance with prevailing standards. It depends on the installation and the cables used.

A main fuse must be provided on the power supply.

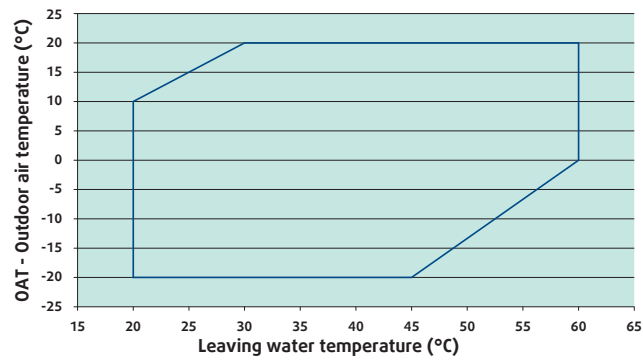
- Fuses not supplied
- Cables not supplied

8.4. OPERATING LIMITS

8.4.1. SYSAQUA BLUE.L/SYSAQUA BLUE.H COOLING MODE



8.4.2. SYSAQUA BLUE.H HEATING MODE



9. INSTALLATION



Caution

The unit is not designed to withstand weights or stresses from adjacent equipment, pipe work or constructions. Any foreign weight or stress on the unit structure could lead to a malfunction or damage, which could prove hazardous to personnel and property. In such an event, the warranty shall be voided.



Caution

The unit base shall be arranged as indicated in the manual. There could be a risk of personal injury or damage to property in the event of the unit being incorrectly supported.

9.1. SITING THE INSTALLATION

As per standard EN378-1 §5.1, the **SYSAQUA BLUE** unit is a category A installation in terms of access and a class III installation in terms of location.

The **SYSAQUA BLUE** must be installed outdoors with sufficient surrounding clearance to enable air to circulate freely through the appliance and to allow access for maintenance work.



Caution

Do not expose the **SYSAQUA BLUE** to rejections from chimneys or vents. Fumes charged with soot or grease as well as acid rejections are likely to permanently clog or damage the condenser. This would void the warranty.

9.1.1. PREVAILING WIND

In the case of the unit being sited in areas exposed to high winds, you must avoid the wind hitting the fan blowing surface areas directly to avoid any risk of recycling cooled air at the finned battery. Exchanger fan operation can be disrupted by strong winds, which can cause de-icing problems and fan malfunctions.



Caution

Unit operation depends on air temperature. Any recycling of air extracted by the fan lowers the air intake temperature across the exchanger fins and alters the standard operating conditions.

9.1.2. CONDENSATE WATER MANAGEMENT IN HEATING MODE

Depending on outdoor temperature and air humidity conditions, water vapor contained in the air can condense on the finned heat exchanger and even form ice at low outdoor temperatures (around $< 5^{\circ}\text{C}$). This condensate water and defrosted water runs off via outlets provided under the exchanger. To aid water run-off and avoid frozen water remaining in the appliance in winter, we recommend that it is mounted at a height of around 10cm off the ground. This will allow the water to run off freely and be absorbed into the ground or channeled to a basin built under the appliance in order to protect the environment.

In areas where outdoor temperatures drop below 1°C , the system can be equipped with a condensate anti-freeze protection system (e.g. a heated pipe sheath, optionally available).

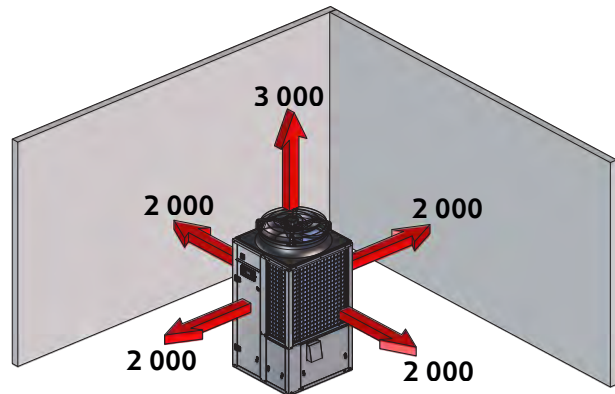
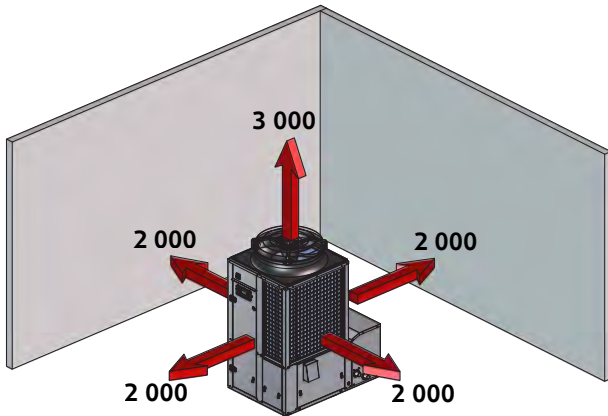
9.1.3. REDUCING NOISE POLLUTION

In order to contain noise levels, we equip our appliances with quiet fans and encase the technical compartment in sound-proofed panels. However, noise levels can be reduced even further by taking a few installation precautions:

- Do not install the appliance near a window.
- Do not install the unit in enclosed or confined yards, narrow locations where noise may bounce off walls.
- Install the rubber pads supplied or anti-vibration pads (available as an option) under the appliance.
- Do not join the concrete slab supporting the appliance to the building structure (structure-borne noise transmission).
- Electrical and hydraulic connections to the unit must be flexible to avoid the transmission of vibrations.

9.2. CLEARANCE

During installation, it is important to leave sufficient clearance around the **SYSAQUA BLUE**.



The unit is equipped with a R290 refrigerant leak detection card enabling it to be shut down and for the hydrocarbon to be expelled into the atmosphere (before reaching the fluid flammability limit). To ensure this, two apertures are present on the frame: the first, equipped with an extractor fan, sucks outside air into the frame and the second expels waste air into the atmosphere.

These minimum clearance dimensions must be complied with to ensure correct operation of the unit, to enable the unit to be accessed and maintained, and, above all, to guarantee the safety of personnel.



Caution

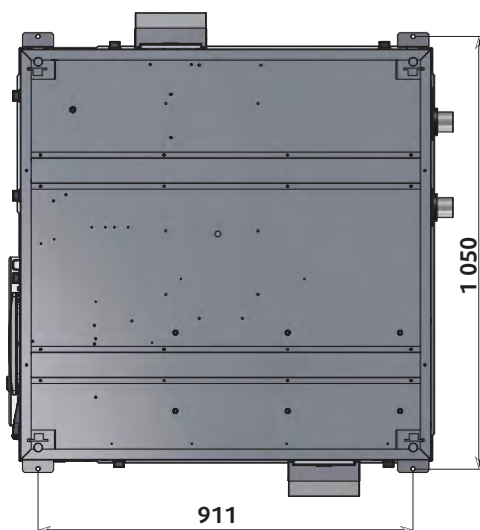
When several **SYSAQUA BLUE** units are installed, ensure proper clearance is implemented around the condensers specific to each machine.

9.3. ANCHORING TO THE GROUND

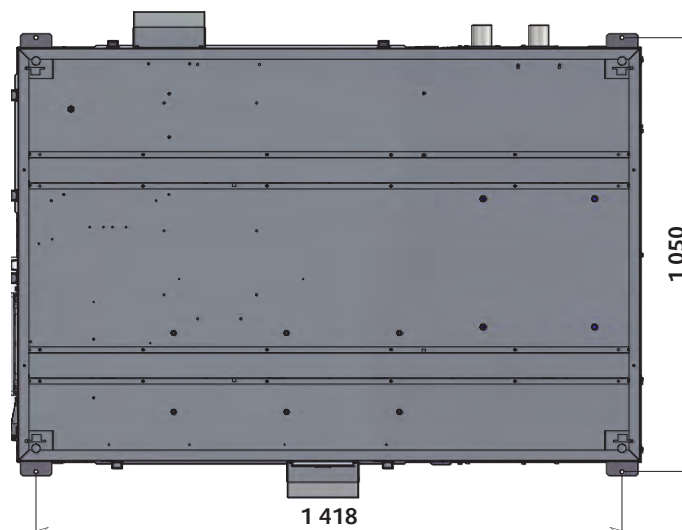
The surface of the floor or structure located under the **SYSAQUA BLUE** must be flat, and strong enough to withstand the unit's weight with its full liquid load, in addition to the occasional presence of maintenance equipment.

The **SYSAQUA BLUE** only needs to be anchored to the foundations in regions exposed to a high earthquake risk or if the appliance is installed at a high level on a steel frame.

SYSAQUA BLUE 35B



SYSAQUA BLUE 35B WITH BUFFER TANK



For normal applications, rigidity of the **SYSAQUA BLUE** and the positions of the supports allow for an installation that minimizes vibrations. However, the installers can use anti-vibration rubber pads (supplied as an option).

When fitting anti-vibration pads, refer to the manual supplied with the kit.

10. HYDRAULIC LINKS



Caution

When choosing and installing water pipes, you must consult and observe all current local standards, regulations and instructions.

10.1. MAIN HYDRAULIC CIRCUIT



Caution

The mains hydraulic circuit will provide a constant water flow on the refrigerating fluid/water plate exchanger and in case of load variation.

You must design the pipe network with the minimum number of bends and keep the number of hydraulic components generating pressure drops to the strict minimum. This will reduce installation costs and ensure optimum system performance. The pipe network must include:

- A vibration elimination system (e.g.: link hoses) on all pipes connected to the appliance in order to reduce vibrations and noise transmitted to the building fabric.
- A balancing valve on the water outlet pipe in order to adjust the water flow.
- Stop cocks to isolate the hydraulic circuit during maintenance.
- Manual or automatic bleed valves at the highest point on the water circuit.
- Draining connectors at all low points to allow complete circuit draining.
- A circulation pump guaranteeing flow necessary for the operation of the **SYSAQUA BLUE** unit.
- A diaphragm expansion tank fitted with a safety and draining valve must be visible.
- A low water pressure sensor to secure the water pump against cavitation if the water pressure in the circuit decreases.
- The installation of thermometers and pressure gages on the heat exchanger inlet and outlet to facilitate day-to-day controls and system maintenance.
- An element ensuring ground continuity of all piping. An unbalance of grounding connection points can cause electrolytic corrosion.



Caution

The expansion tank must be dimensioned to be able to absorb an expansion corresponding to 2% total volume of water contained in the installation (exchanger, piping, installations and buffer tank, if present).



Caution

THE WARRANTY DOES NOT COVER DAMAGE DUE TO CORROSION RESULTING FROM ELECTROLYTIC PHENOMENA.

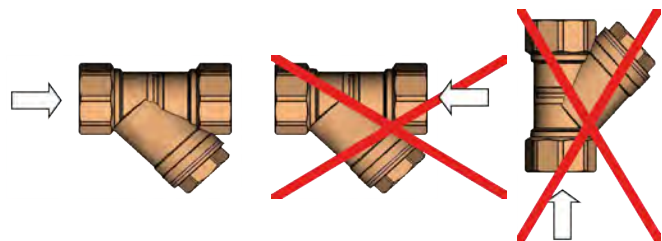
10.2. ANTI-CLOGGING PROTECTION



Caution

To avoid any risk of foreign bodies entering the appliance and to guarantee operating performance, IT IS IMPERATIVE TO INSTALL A WATER FILTER on the SYSAQUA BLUE inlet pipe.

Failure to install a water filter would result in clogging of the **SYSAQUA BLUE's** heat plate exchanger soon after commissioning. Proper operation of the **SYSAQUA BLUE** would be disturbed by a reduced water flow or the partial clogging of certain heat plates. The heat plate exchanger could be **IRREVERSIBLY** damaged in the event of inadequate water flow. A mesh size of smaller than or equal to 800µm is recommended



Caution

THE MANUFACTURER'S WARRANTY IS VOID IF THE FILTER SUPPLIED WITH THE SYSAQUA BLUE IS NOT INSTALLED TO PROTECT THE APPLIANCE

10.3. MINIMUM WATER VOLUME REQUIREMENTS

To ensure that the system operates correctly you must use suitably sized and properly routed pipes for the hydraulic links between the **SYSAQUA BLUE** and the mains network. Proper operation of the regulation and safety devices is ensured only when the water volume is sufficient.

For refrigeration only units, the total volume at the primary water circuit must never be below:

- air conditioning application
 - ✓ 3.5 L/kW refrigeration power
- process application
 - ✓ 10 L/kW refrigeration power

For reversible units, a water volume equal to 12.5 L/kW is recommended, so that energy reserves are full enough to ensure the defrosting cycle without any discomfort for the end user.

If the total volume of the primary hydraulic circuit does not allow these recommendations to be adhered to, a buffer tank must be added to the installation to increase the water volume up to the value required.

If the unit runs with a low volume of water (with air treatment plant...) or if it is used for industrial processes, a buffer tank is compulsory to guarantee sufficient thermal inertia and adequate temperature stability.

Optional internal water tank:

- **SYSAQUA BLUE 35B** ⇨ 100L

10.3.1. SYSAQUA BLUE COOLING ONLY VERSION

| | | | 35B |
|---|---------------------|---|-----|
| Minimum water volume in the air conditioning application system | Without buffer tank | L | 111 |
| | With buffer tank | L | 11 |
| Minimum water volume in the process application system | Without buffer tank | L | 317 |
| | With buffer tank | L | 217 |

10.3.2. SYSAQUA BLUE HEAT PUMP VERSION

| | | | 35B |
|------------------------------------|---------------------|---|-----|
| Minimum water volume in the system | Without buffer tank | L | 443 |
| | With buffer tank | L | 343 |

10.4. MAXIMUM WATER VOLUME REQUIREMENTS

The maximum water volume is limited by the size of the unit's expansion tank and/or the expansion tank present in the installation's hydraulic circuit. Expansion tanks must be sized according to the percentage of glycol in the hydraulic circuit.

The expansion tank should be installed at the pump suction, and its pressure will be adjusted by taking into account the whole hydraulic circuit.

The volume of the expansion tanks selected with single pump and double pump options are:

| | | | 35B |
|--|---|--|-----|
| volume of the expansion tank supplied with hydraulic options | L | | 8 |

10.5. RINSING THE CIRCUIT



Caution

Before filling the installation, check it and remove any contamination such as sand, stones, welding chips and other materials likely to damage the **SYSAQUA BLUE**.

Fully rinse all water pipes before final connection to the **SYSAQUA BLUE**.

When using an off-the-shelf acid rinsing solution, implement a temporary branching around the **SYSAQUA BLUE** to prevent damaging internal components (particularly the plate exchanger, flow switch, pump...).

10.6. FROST PROTECTION

If the **SYSAQUA BLUE** is exposed to ambient temperatures between 1°C and -18°C, protect the water circuit against frost.



Caution

THE USE OF A GLYCOL-BASED SOLUTION IS THE ONLY EFFECTIVE FROST-PROTECTION MEANS

The glycol-based water solution must be sufficiently concentrated to ensure appropriate protection and prevent ice from forming at the minimum outdoor temperatures planned for the installation. Take precautions when using non inert MEG antifreeze solutions (Mono Ethylene Glycol or MPG Mono Propylene Glycol). With this type of antifreeze solution, corrosion may occur in the presence of oxygen.

Contact glycol resellers to ensure that its characteristics are compatible with the environmental directive applicable on site (this is not the manufacturer's responsibility).



Caution

The percentage of glycol in the installation's hydraulic circuit must be entered in the regulation upon start-up. This parameter setting changes the safety and alarm triggering threshold limits. An incorrect value may cause malfunctions and destruction of the unit's heat exchanger.



Warning

- It is advisable to clearly record the type of glycol used, as well as the glycol concentration, on the electric cabinet.

The glycol-based solution slightly modifies the installation's performance, particularly in terms of load loss:

| Minimum outdoor temp. | | °C | 5 > T > 0 | 0 > T > -5 | -5 > T > -10 | -10 > T > -30 |
|------------------------------------|---------------------|----|-----------|------------|--------------|---------------|
| Mono Ethylene Glycol concentration | | % | 10 | 20 | 30 | 45 |
| Correction factor | load loss | | 1.070 | 1.160 | 1.235 | 1.368 |
| | water flow | | 1.015 | 1.050 | 1.085 | 1.169 |
| | thermodynamic power | | 0.995 | 0.985 | 0.970 | 0.949 |

| Minimum outdoor temp. | | °C | 5 > T > 0 | 0 > T > -5 | -5 > T > -10 | -10 > T > -27 |
|-------------------------------------|---------------------|----|-----------|------------|--------------|---------------|
| Mono Propylene Glycol concentration | | % | 10 | 20 | 30 | 45 |
| Correction factor | load loss | | 1.112 | 1.175 | 1.290 | 1.520 |
| | water flow | | 1.005 | 1.030 | 1.067 | 1.162 |
| | thermodynamic power | | 0.991 | 0.977 | 0.945 | 0.894 |

Example for a solution with 20% Mono Ethylene Glycol:

- Increase the pressure drop: with glycol = 1.160 x without glycol
- Increase the flowrate: with glycol = 1.050 x without glycol
- Decrease the capacity: with glycol = 0.985 x without glycol

Draining the water circuit is not recommended for frost protection, for the following reasons:

- The water circuit will rust, which will shorten its service life.
- Water will remain at the bottom of the plate exchangers and freezing may cause damage.



Caution

Never fill the hydraulic circuit with pure glycol. Maximum glycol concentration is 45%. The water and glycol mixture must be precisely prepared before filling the hydraulic circuit. If the mixture is too concentrated, the hydraulic circuit could be damaged and the **SYSAQUA BLUE** unit will not perform normally. **In this case, the unit warranty will be automatically voided.**



Caution

For heatpump models, if the outdoor temperature is likely to fall below +1°C, provide a system to prevent the condensates from freezing (e.g. heating cord).

10.7. WATER QUALITY

The water must be analyzed; the hydraulic network system installed must include all elements necessary for water treatment: filters, additives, intermediate exchangers, drain valves, vents, check valves, etc., according to the results of the analysis.



Caution

The SYSAQUA BLUE must not run on a network with open loops, likely to cause incidents related to oxygenation, or with untreated ground water.

Using improperly treated or untreated water in the **SYSAQUA BLUE** may cause scaling, erosion, corrosion or algae or sludge deposits in the exchangers. Refer to a water treatment expert to determine any treatment required. The manufacturer will not be held liable for damage caused when untreated or improperly treated water, demineralized water, salt water or seawater are used.

Apply the following guidelines:

- No NH_4^+ ammonium ions in the water, highly detrimental to copper. <10mg/l
- Cl⁻ chloride ions are detrimental to copper with a risk of puncture by pitting. <10mg/l.
- SO_4^{2-} sulphate ions may cause pitting corrosion. < 30mg/l.
- No fluoride ions (<0.1 mg/l)
- No Fe^{2+} and Fe^{3+} ions, particularly in the case of dissolved oxygen. Fe < 5mg/l with dissolved oxygen < 5mg/l. The presence of these ions with dissolved oxygen indicates corrosion of steel parts, likely to generate corrosion of copper parts under Fe deposits, particularly in the case of multitubular exchangers.
- Dissolved silica: silica is an acid element of water and may also cause corrosion. Content < 1mg/l.
- Water hardness: Values between 10°fH and 30°fH may be recommended. This facilitates scaling deposits likely to limit copper corrosion. Excess TH values may lead to clogging of the pipes.
- TAC < 100
- Dissolved oxygen: Prevent any sudden change in the water's oxygenation conditions. Also, avoid deoxygenating water by sparging inert gas as well as overoxygenating it by sparging pure oxygen. Disturbing oxygenation conditions destabilizes copper hydroxides and particle salting-out.
- Electrical Resistivity - Conductivity: The higher the resistivity, the slower the corrosion. Values above 3000 ohm/cm are preferred. A neutral environment favors maximum resistivity. For electrical conductivity, values around 200-600 S/cm can be recommended.
- pH: neutral pH at 20°C (7 < pH < 9)



Caution

If the water circuit is to be drained for a period of longer than one month, the circuit must be fully charged with nitrogen to prevent any risk of corrosion by differential venting.



Caution

The manufacturer is not liable for recommendations regarding water treatment (call a specialized company).

However, this matter has a critical nature, and particular care must be taken to ensure that the type of treatment applied is effective.

The manufacturer or the latter's representative will not be held liable when untreated water or non-compliant quality water is used.

10.8. HEAT INSULATION

To guarantee proper energy efficiency and compliance with current standards, water pipes passing through uninhabited zones should be properly lagged to retain heat.

To achieve correct insulation with conductivity of 0.04 W/mK, lag the pipes with insulating material with a radial thickness between 25mm and 30 mm.

10.9. FILLING THE SYSTEM WITH WATER



Caution

THE WATER CIRCUIT MUST BE FILLED AND DRAINED BY SKILLED PERSONS USING THE APPROPRIATE DEVICES PROVIDED ON THE EXTERNAL HYDRAULIC CIRCUIT BY THE INSTALLER.

It is important to ensure that the mains water supply pressure is sufficient to fill the installation.

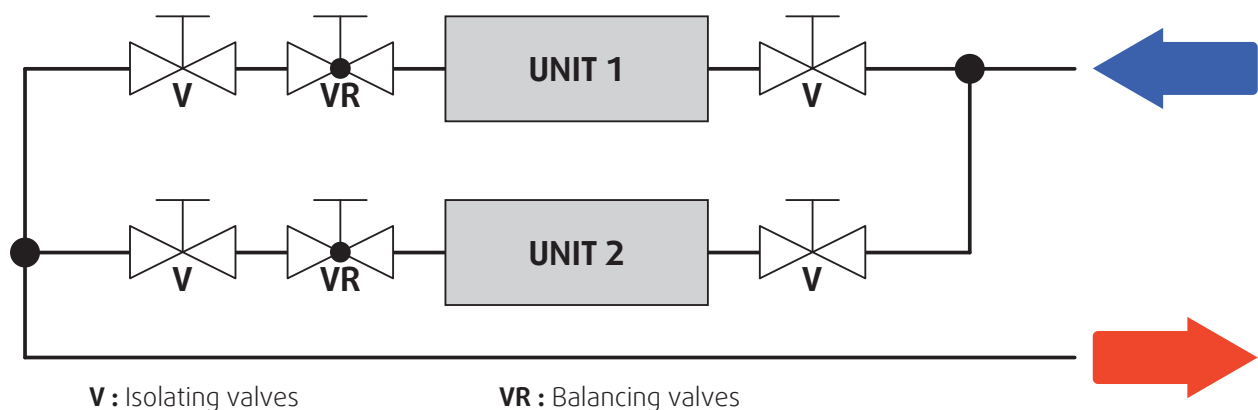
Once the installation is complete and after cleaning and rinsing the circuit network, you must fill the water circuit in accordance with current professional standards until you obtain the service pressure which will be:

0.5 bar < Service Pressure < 2.5 bar

A 3.5-bar safety valve is mounted in the unit when the hydraulic single pump option is selected.

Always check that manual or automatic air drains are installed at all the high points of the hydraulic network.

When two or three units are connected in parallel, it is advisable to reverse the return circuit connections (Tichelmann loop) in order to reduce the pressure loss in each unit's circuit.



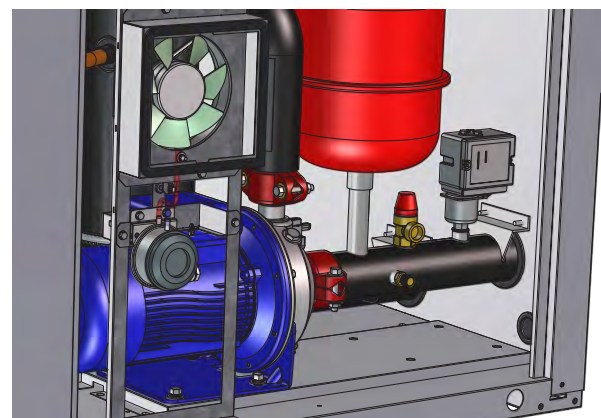
Install a balancing valve on the output pipe to adjust the water flow.



Caution

The water inlets and outlets must be connected as described on the labels affixed near the connections.

When the hydraulic pump option is selected, a safety valve is mounted (factory assembled) at the Aqualogic water inlet to prevent overpressure in the circuit. The installer must install a pipe at the safety valve outlet for water evacuation.



11. WIRING DIAGRAM AND SETTING RANGE

11.1. WIRING DIAGRAM

SEE APPENDIX

| | | | |
|--------|-------------------------------------|---------|-------------------------|
| SE4855 | model 35B | Control | Mono 230V 50Hz +/- 10% |
| SE4854 | model 35B | Power | Tri 400V+N 50Hz +/- 10% |
| SE4817 | model 35B all seasons | Control | Mono 230V 50Hz +/- 10% |
| SE4818 | model 35B all seasons | Power | Tri 400V+N 50Hz +/- 10% |
| SE4852 | model 35B Soft Starter | Power | Tri 400V+N 50Hz +/- 10% |
| SE4825 | Gas detection module | Control | Mono 230V 50Hz +/- 10% |
| SE4853 | model 35B Fixed speed simple pump | Power | Tri 400V+N 50Hz +/- 10% |
| SE4851 | model 35B Variable flow simple pump | Power | Tri 400V+N 50Hz +/- 10% |

11.1.1. POWER SUPPLY

The power cable must be connected to the main power supply switch QG (copper cable is recommended). The supply is protected at the head by an FFG main fuse holder supplied by the installer. It must be fitted next to the unit. Refer to the § **ELECTRIC SPECIFICATIONS**, page 9

The electrical installation and wiring of this unit must comply with local electrical installation standards.

➤ Three phase 400 V~ 50Hz + Neutral + Ground:

- On the L1, L2, L3, N terminals of the QG section switch
- On the ground screw of the earth cable.

11.1.2. WIRING DIAGRAM KEY DESCRIPTIONS

SEE APPENDIX

11.2. RANGE AND SETTINGS OF THERMAL PROTECTION

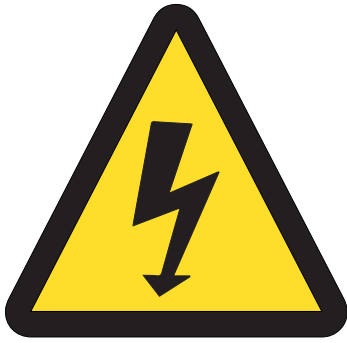
| MODELS | | 35B |
|--------|------------------|----------|
| FTI | Range | 13-18A |
| | Adjustment | 16A |
| FT2 | Range | 13-18A |
| | Adjustment | 16A |
| FTOF-L | Range (STD) | 2.5-4A |
| | Adjustment (STD) | 2.5A |
| | Range (HPF) | 2.5-4A |
| | Adjustment (HPF) | 4A |
| FTOF-H | Range (STD) | 2.5-4A |
| | Adjustment (STD) | 2.5A |
| | Range (HPF) | 2.5-4A |
| | Adjustment (HPF) | 4A |
| FTWP | Range | 1.6-2.5A |
| | Adjustment | 2.4A |

11.3. GAS DETECTION CARD CONTROL RANGE

The fan pressostat is set by default at the factory to a value just below 1 mbar.

A potentiometer, accessible on the circuit board, can be used to control the sensitivity of the detector. The latter also has a factory default setting

12. ELECTRICAL CONNECTIONS



WARNING

BEFORE CARRYING OUT ANY WORK ON THE EQUIPMENT, MAKE SURE THAT THE ELECTRICAL POWER SUPPLY IS DISCONNECTED AND THAT THERE IS NO POSSIBILITY OF THE UNIT BEING STARTED INADVERTENTLY. ALSO MAKE SURE THAT THE ALARM INDICATOR CABLES ARE DISCONNECTED. NON-COMPLIANCE WITH THE ABOVE INSTRUCTIONS CAN LEAD TO INJURY OR DEATH BY ELECTROCUTION.

The electrical installation must be performed by a fully qualified electrician, and in accordance with local electrical standards and the wiring diagram corresponding to the unit model.

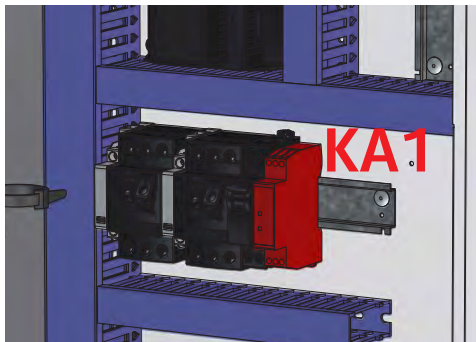
Any modification made without our consent will void the unit's warranty.

The power supply cable section must be sufficient to provide the appropriate voltage to the unit's power supply terminals, both at start-up and under full load operating conditions.

The power supply cable shall be selected in accordance with the following criteria:

1. Power supply cable length.
2. Maximum current draw of unit in operation.
3. Maximum current draw of unit at start-up
4. Installation method of power supply cables.

The use of fuses or a high capacity circuit breaker on the distribution board to protect the units against short circuits is recommended. The recommended fuse sizes are displayed in the table in § **ELECTRIC SPECIFICATIONS**, page 9



VERY IMPORTANT:

3N~400V-50HZ

The outdoor unit is equipped as standard with a phase sequence and cut-out controller located in the electrical box.

THE LEDS INDICATE THE FOLLOWING CONDITIONS:

Green LED = 1

Yellow LED = 1

Power ON

The compressor rotation direction is correct.

Green LED = 1

Yellow LED = 0

Phase inversion or phase absent (L1)

The compressor and the fans do not start.

Green LED = 0

Yellow LED = 0

Phase absent (L2 or L3)

The compressor and the fans do not start.



Caution

Before connecting the supply lines, check that the voltage available is within the limits specified (Refer to the § ELECTRIC SPECIFICATIONS, page 9).

Voltage differences between each phase do not have to exceed 2%.

If the unbalance is unacceptable, call the distribution company to have this anomaly corrected.

**Caution**

Supplying the unit with a line with an unbalance exceeding the acceptable value will void the warranty.

**Caution**

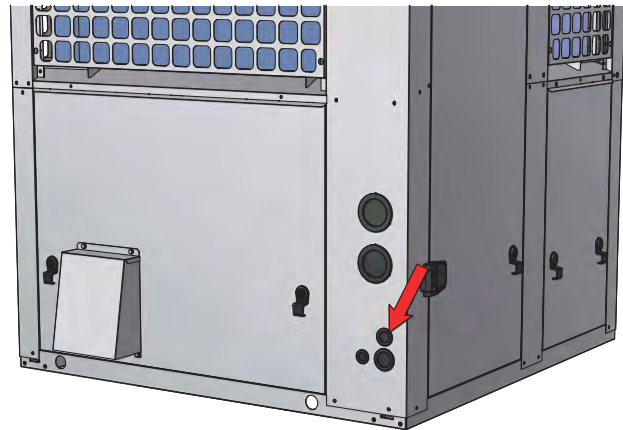
Correction of the excessive centralized power factor (>0.95) may generate transient phenomena dangerous for the unit motors and contactors during the start and stop phases. Check instant voltages during these phases.

These units are equipped as standard with a proximity switch, with a general terminal board.

12.1. UNIT POWER SUPPLY

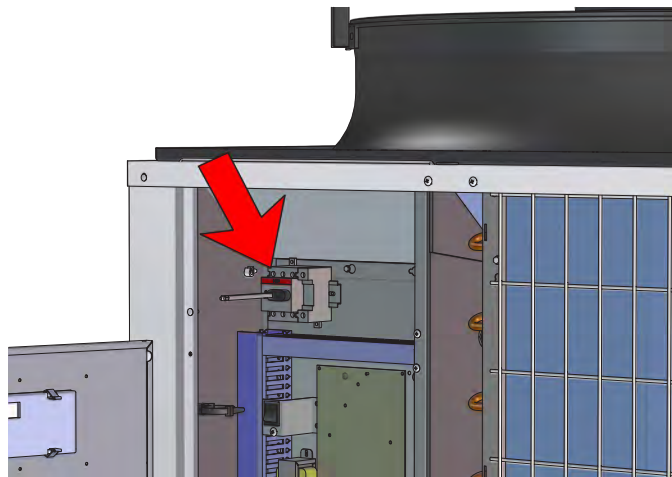
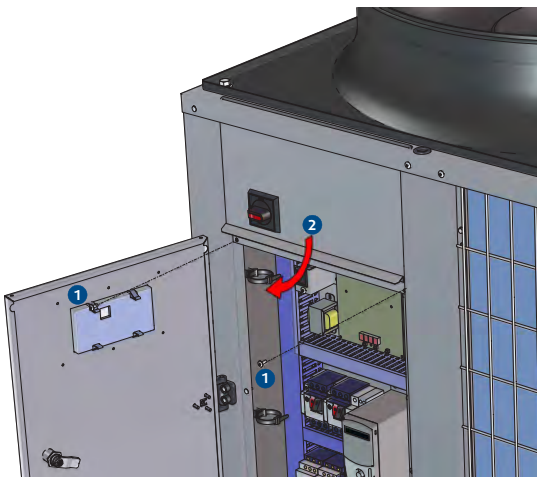
The supply cables of the units must be routed up to the section switch through the grommets on the front panel of the units.

To ensure proper contact, fit the end pieces adapted to the cross-section of the connecting cable.



Maximum cross-section of the power supply cables: 35mm^2

copper cable only



12.2. ALARM INDICATORS

The **SYSAQUA BLUE** unit has two alarm indicators:

- general alarm indicator
- gas detection module alarm indicator

12.2.1. MAIN CONTROLLER

The **SYSAQUA BLUE** control system has a dedicated alarm indicator. This information is available via a dry contact by connecting to the unit's terminals 3 and 4.



Caution

The unit must only be rendered accessible for maintenance if the client cables connected to terminals 3 and 4 are disconnected or rendered inoperative upstream of the unit.

12.2.2. GAS DETECTION MODULE



Caution

The detection system is dependent on the unit's general power supply. When the unit is not powered, detection will therefore also stop.

The gas detection module has a dedicated alarm indicator. This information is available via a dry contact (Normally Closed) by connecting to the unit's terminals 26 and 27.

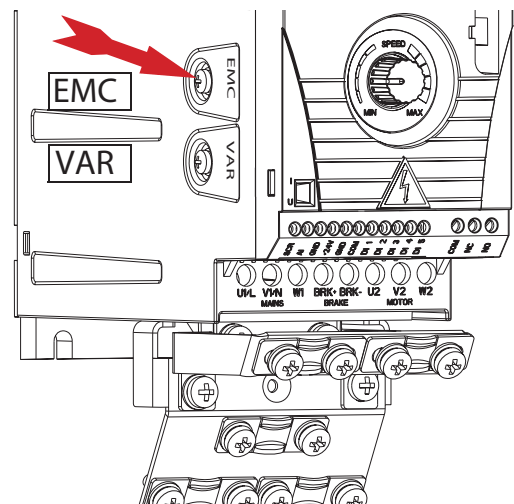
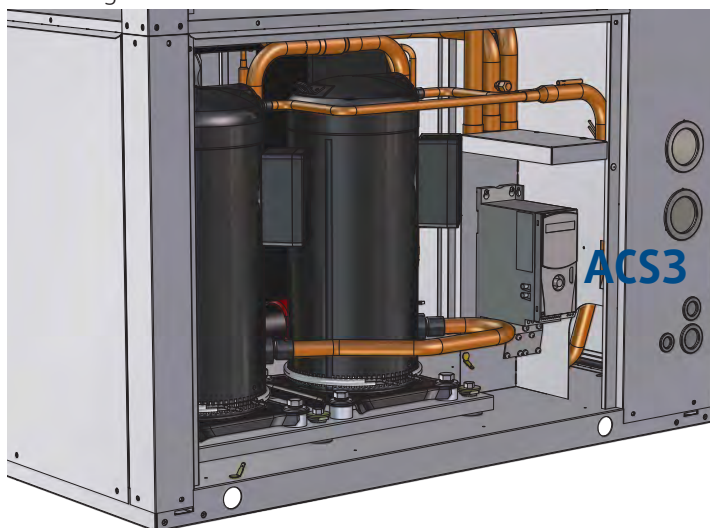


Caution

The unit must only be rendered accessible for maintenance if the client cables connected to terminals 26 and 27 are disconnected or rendered inoperative upstream of the unit.

12.3. ALL SEASONS AND VARIABLE FLOW PUMP OPTIONS

If you have an IT (ungrounded) system or corner-grounded TN system, disconnect the internal EMC filter by removing the EMC screw.



SYSAQUA BLUE 35B "VARIABLE PRIMARY FLOW" OPTION



Caution

Disconnect the internal EMC filter when installing the drive on an IT system (an ungrounded power system or a high-resistance-grounded [over 30ohms] power system), otherwise the system will be connected to the ground potential through the EMC filter capacitors. This may cause danger or damage the drive.

Disconnect the internal EMC filter when installing the drive on a corner-grounded TN system, otherwise the drive will be damaged.

13. CONTROL

SYSAQUA BLUE units are fitted with an electronic control system. It provides the command, control and alarm functions.

13.1. ORDER OF PRIORITY FOR CONTROL SYSTEMS

The integrated regulator in the **SYSAQUA BLUE** can be controlled by various interfaces and systems. The order of priority for each drive system is as follows:

1. Timing programming: this scheduling is integrated in the regulator
2. The BMS: the remote supervision transmits it commands according to the communication protocols
3. The HMI: the commands are given by the user directly on the unit (integrated display) or remotely (remote display)
4. Digital inputs: the client can send commands electromechanically via 2 dry contacts (not supplied) on two controller ports:

- ✓ Input D1: ON/OFF
- ✓ Input D2: configurable



13.2. USER INTERFACE

This terminal has a liquid crystal display and 6 buttons.



13.2.1. KEYPAD

| | |
|----------------|---|
| INFO | From any screen, this button returns the user to the main menu or home screen and, like the ESCAPE button, invalidates a current modification. |
| ALARM | When pressing the alarm button (the red LED flashes if an alarm is active), the alarm management menu is displayed. (see § alarms) |
| ESCAPE | Returns to the previous level in the menu tree. Pressing this button during modification invalidates the change being made and returns the user to the previous menu. This function is very important if a setting is inadvertently modified. |
| UP/DOWN | These buttons have two functions. <ol style="list-style-type: none"> 1. In a menu, they are used to move up and down the list of possible options. 2. They can change the value of a setting when it has been selected. |
| ENTER | This button has three functions <ol style="list-style-type: none"> 1. It is used to access a submenu 2. Activate the modification of a setting 3. Validate the modification of a setting |

13.2.2. HOME PAGE

The home page is used to quickly display the state of the machine by displaying the following information:

- Operating mode
- Water return temperature
- Water flow temperature

| | | | |
|--|----------------------|--------|---|
| | Main overview | 1/3 | ▲ |
| | Current mode | Red. H | ▼ |
| | Entering water T. | 42.3°C | ▼ |
| | Leaving water T. | 45.2°C | ✓ |

13.2.3. MAIN MENU

Pressing the "Info" button displays this screen directly.

The authorized menus are displayed according to the access level selected:

| | | | |
|--|------------------|-----|---|
| | Main Menu | 1/2 | ▲ |
| | Status | ▶ | ▼ |
| | Access | ▶ | ▼ |
| | | | ✓ |

| Access level | Final user | Installer | Maintenance |
|----------------------|------------|-----------|-------------|
| "Access" menu | ✓ | ✓ | ✓ |
| "Status" menu | ✓ | ✓ | ✓ |
| "Commissioning" menu | ✗ | ✓ | ✓ |
| "Service" menu | ✗ | ✗ | ✓ |
| "Alarms" menu | ✓ | ✓ | ✓ |

13.2.4. MENUS

| | | |
|----------------------|-----|---|
| Main Menu | 1/4 | ▶ |
| Status | | ▶ |
| Commissioning | | ▶ |
| Services | | ▶ |
| Access | | ▶ |

The display has several menus. The "Status" menu is freely accessible. The other "Installation" and "Maintenance" menus can be displayed and accessed according to the access level.

To change the access level, go to the "Access" menu and enter the password corresponding to the level.

The first line of all the screens integrates the following information:

- Screen title
- Number of the active line/number of lines of the menu
- Access level

- ✓ Final user
- ✓ Installer
- ✓ Maintenance

13.3. INITIAL SETTINGS

Open the electrical box and check that all circuit breakers are open except for **FTC**.

Before starting up the **SYSAQUA BLUE** for the first time, the "Installation" menu must be configured.

13.3.1. TIME SETTINGS



Caution

If the date and time are not set, the unit will function in degraded mode or may not even be able to start.

Start by configuring the date and time.

To do so, switch to the "Installer" or "Maintenance" profile in the "Installation" section. The first line of the menu is used to set the date and time.



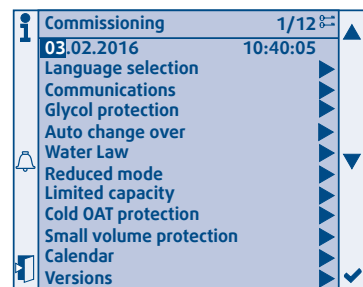
The date and time line will appear as highlighted.

Press the "Enter" button ✓ to activate the change in date.



The ▲ and ▼ buttons are used to change the highlighted setting.

Press once on the ✓ button to approve the defined value and move on to the next setting.

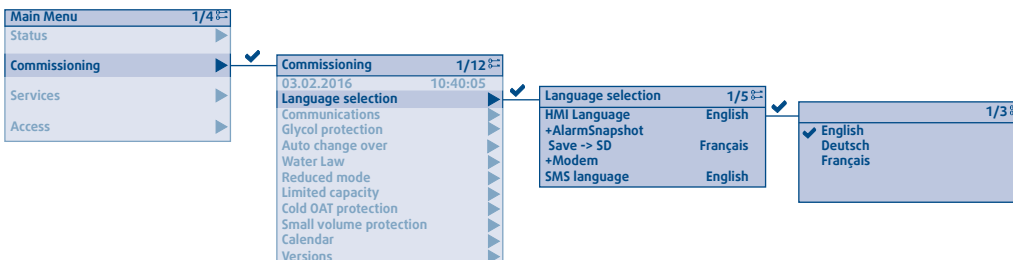


Information

Power outage lasting longer than 8hrs will lead to a loss of the time setting. It is important to set the unit back to the right time after such an event.

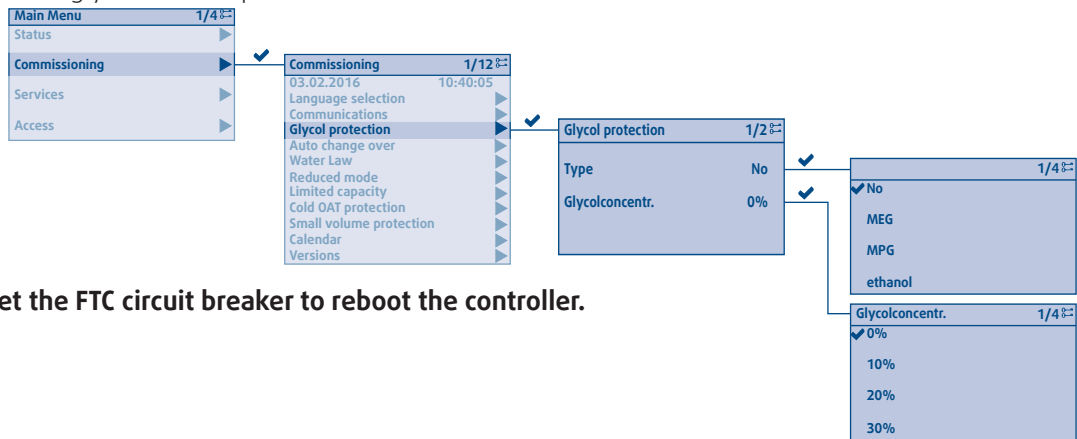
13.3.2. LANGUAGE SETTINGS

Select the languages required according to the application.



13.3.3. DEFINING THE GLYCOL RATE

Define the type and glycol content present in the installation water circuit.



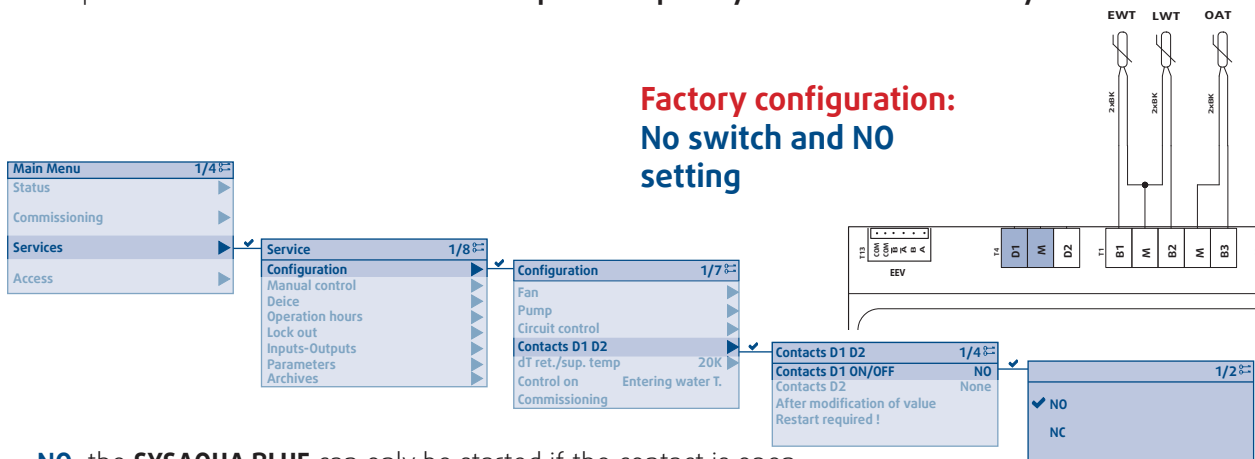
Open then reset the FTC circuit breaker to reboot the controller.

13.4. LAUNCHING THE SYSAQUA BLUE SYSTEM

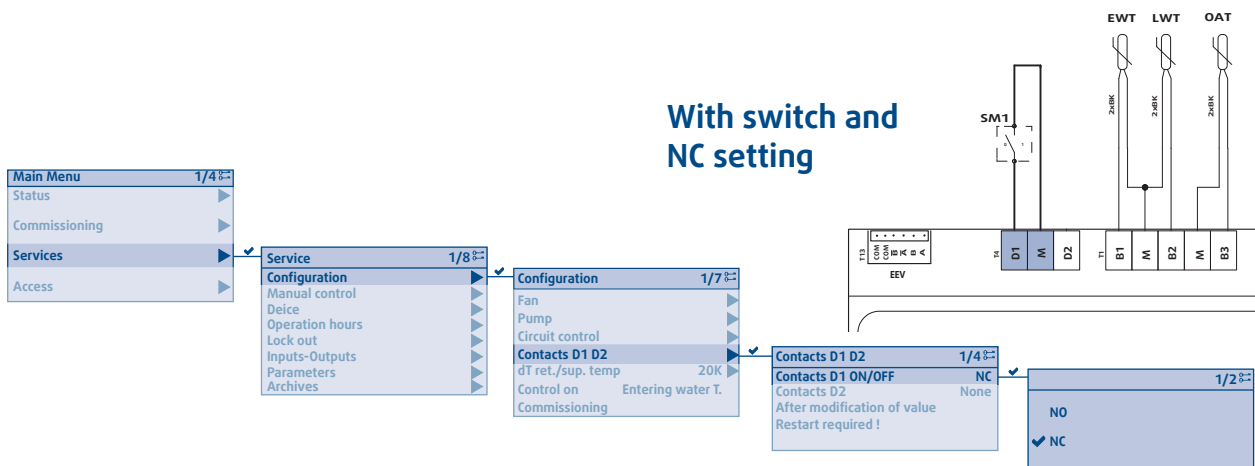
13.4.1. CONFIGURING INPUT D1

During installation, an on/off switch can be connected remotely onto the D1 input.

This input's behavior must be defined. **This input takes priority over all other control systems.**



NO: the SYSAQUA BLUE can only be started if the contact is open.



NC: the SYSAQUA BLUE can only be started if the contact is closed.

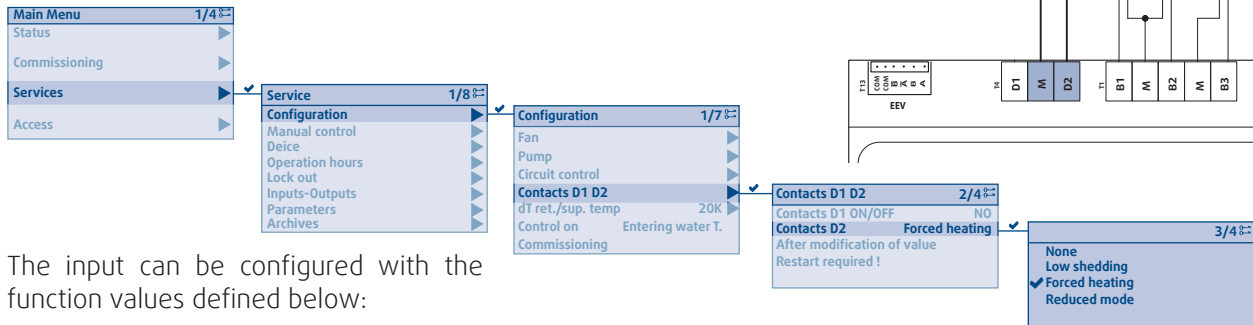


Caution

If the settings are changed, open then reset the FTC circuit breaker to reboot the controller.

13.4.2. CONFIGURING INPUT D2

During installation, a switch can be connected to the D2 digital input. The operating mode defined for this input takes priority over all control systems such as the HML, BMS or calendar.



The input can be configured with the function values defined below:

- None
- Low shedding
- Forced Heating
- Reduced mode

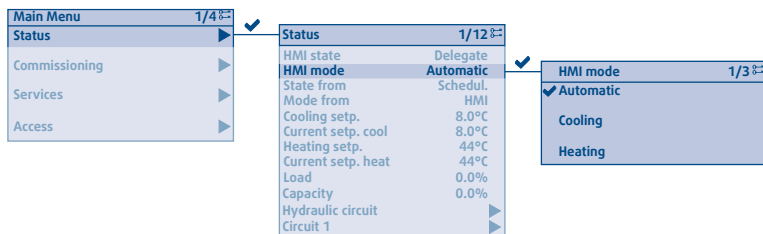
Further information regarding this contact's configuration can be found in their § **CASCADE OF PRIORITIES**, page 31 user manual.

13.4.3. HEAT/COOL SELECTION



Information

Selection of the heat/cool mode is only possible in reversible units. This menu does not exist in the "cool only" versions.



The operating mode can be chosen in the "HMI mode":

- **Automatic:** delegated to the BMS/Auto-change-over (refer to the UM)
- **Cooling:** request for cool mode
- **Heating:** request for heat mode

The "Mode from" line states which element requested the current mode:

- **Contact: D2** configurable digital input
- **HMI:** user interface
- **BMS**
- **Schedule.**

| Status 1/12 | |
|--------------------|------------|
| HMI state | Delegate |
| HMI mode | Automatic |
| State from | Schedul. |
| Mode from | HMI |
| Cooling setp. | 8.0°C |
| Current setp. cool | 8.0°C |
| Heating setp. | 44°C |
| Current setp. heat | 44°C |
| Load | 0.0% |
| Capacity | 0.0% |
| Hydraulic circuit | |
| Circuit 1 | |



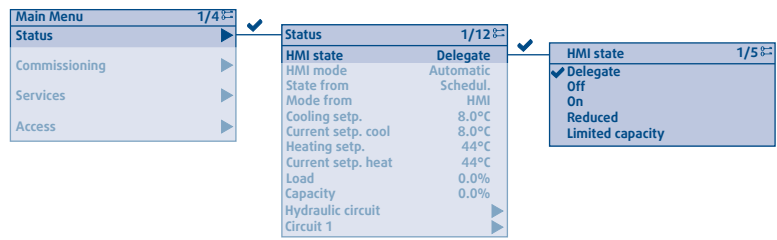
Caution

The automatic change-over mode is activated if the local mode and the BMS mode are set to "Auto".

13.4.4. SELECTING THE OPERATING MODE

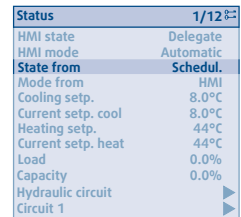
To launch the unit, the user must select the desired mode in the menu:

- **Delegate:** the current mode is determined by the BMS or by default by the calendar (refer to the user manual)
- **Off:** Unit is stopped
- **On:** System is launched
- **Reduced:** Refer to the § **REDUCED MODE**, page 33
- **Limited capacity:** Refer to the § **LIMITED CAPACITY**, page 33



The "State from" line states which element requested the current status:

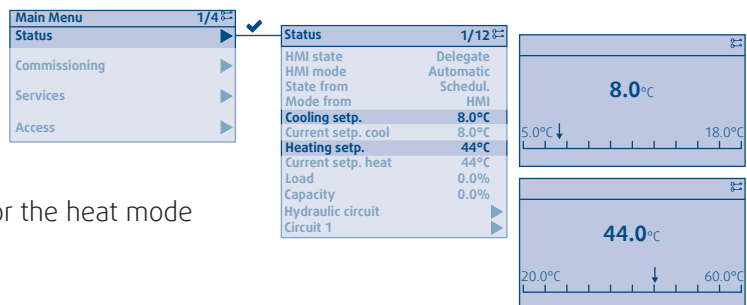
- **Cont.off:** on/off digital input
- **Cont.ext: D2** configurable digital input (in "Reduced mode" or "Limited capacity")
- **HMI:** User interface
- **BMS**
- **Schedule**



13.4.5. USER TEMPERATURE SETPOINTS AND ACTUAL SETPOINTS

In the Status menu, the user can set start or return temperature setpoints, according to the control mode selected:

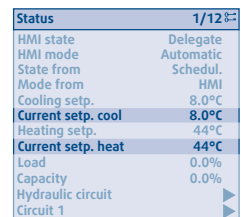
- **Cooling setp:** temperature setpoint for the cool mode
- **Heating setp:** temperature setpoint for the heat mode



These setpoints are limited to the unit's operating envelopes. They can be modified but are not dynamic by default.

To make them dynamic and consequently to be able to vary them automatically as a function of external conditions, you will need to activate the "Water law" or "Reduced mode" functions.

Regardless of the adjustment, the resulting setpoint is restricted to the operating limits to protect the unit.

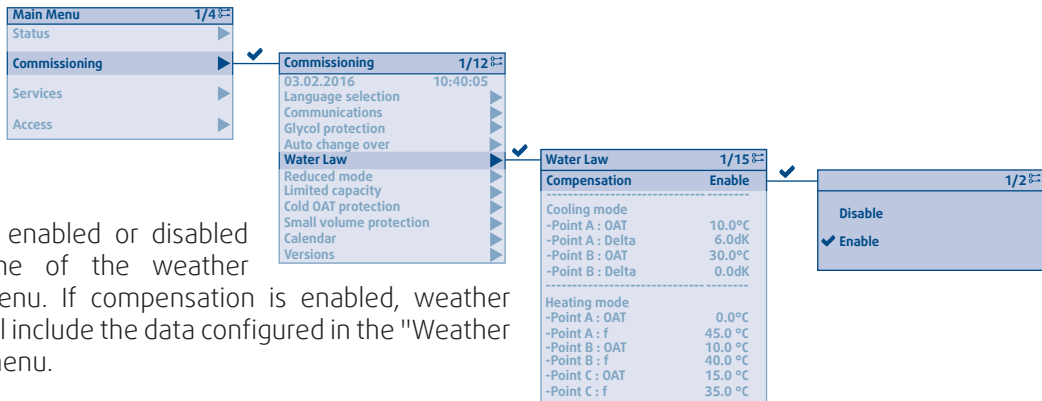


Actual heat and cooling setpoints correspond to values used in real time, account taken of any adjustments and protections.

13.4.6. WATER LAW

The configuration of the different water law settings dynamically matches the setpoint according to the outside temperature.

The different parameters below for the water law can be set in the installation menu and by a GTC.



Compensation is enabled or disabled via the first line of the weather compensation menu. If compensation is enabled, weather compensation will include the data configured in the "Weather compensation" menu.



Caution

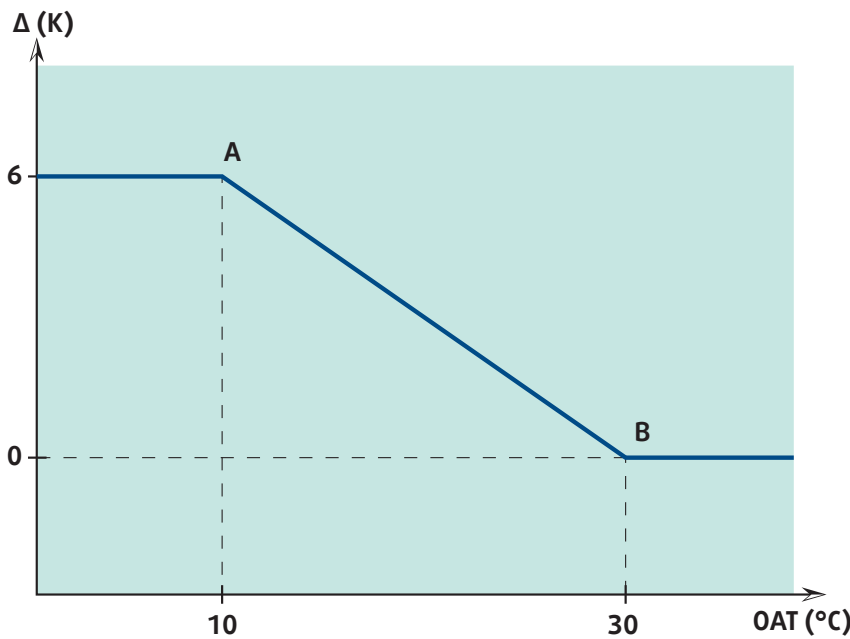
If the automatic heat/cool changeover mode is selected, weather compensation is enabled by default. The default weather compensation values are applied without using the weather compensation menu settings.

13.4.6.1. COOL MODE

The water law introduces correction Δ which depends on the OAT outside temperature:

Δ water law setpoint = cool mode temperature setpoint + Δ (OAT)

Correction Δ is restricted between 0 and 8K. It is defined by points A and B in the graph below. The values indicated are factory values.



| Water Law | | 1/15 |
|------------------|--|---------|
| Compensation | | Enable |
| <hr/> | | |
| Cooling mode | | |
| -Point A : OAT | | 10.0°C |
| -Point A : Delta | | 6.0dK |
| -Point B : OAT | | 30.0°C |
| -Point B : Delta | | 0.0dK |
| <hr/> | | |
| Heating mode | | |
| -Point A : OAT | | 0.0°C |
| -Point A : f | | 45.0 °C |
| -Point B : OAT | | 10.0 °C |
| -Point B : f | | 40.0 °C |
| -Point C : OAT | | 15.0 °C |
| -Point C : f | | 35.0 °C |

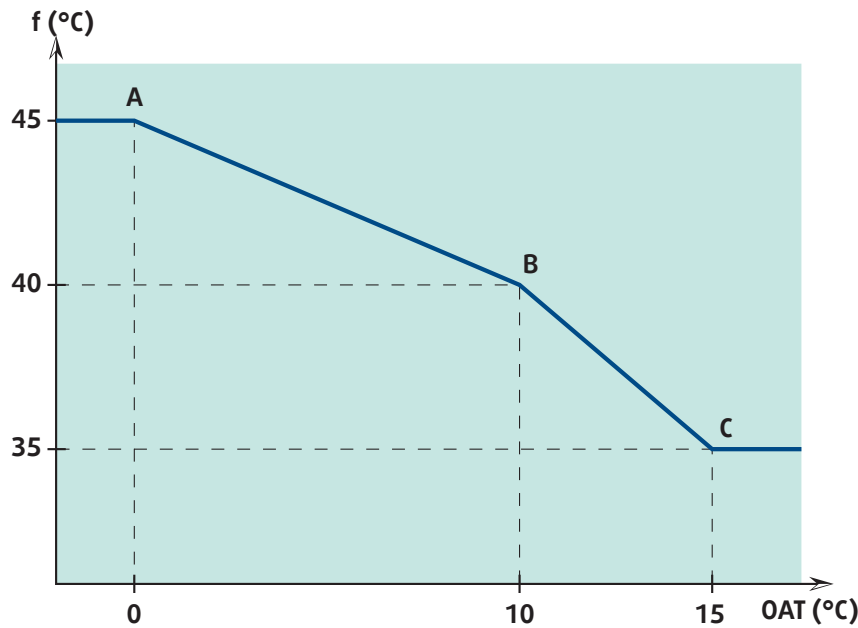
| Points | Coordinates | unit | Values | | |
|--------|-------------|------|-----------------------------|-----------------------------|---------|
| | | | Min. | Max. | Default |
| A | OAT | °C | 10 | OAT_A < OAT_B OAT_A ≤ 30 | 10 |
| | Δ | K | Δ_B | 8 | 6 |
| B | OAT | °C | OAT_B > OAT_A OAT_B ≥ 20 | 36 | 30 |
| | Δ | K | 0 | Δ_A | 0 |

13.4.6.2. HEAT MODE

The water law replaces the heat mode setpoint with the f function of the OAT outside temperature:

➤ water law setpoint = $f(\text{OAT})$

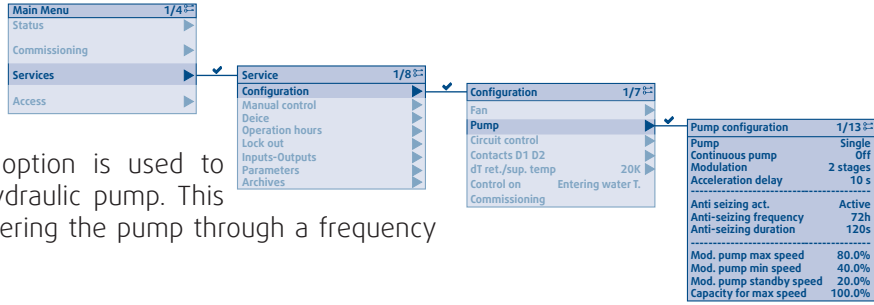
Function f is restricted between 20 and 50°C. It is defined by points A, B and C in the graph below. The values indicated are factory values.



| | |
|---------------------|---------------|
| Water Law | 1/15 |
| Compensation | Enable |
| Cooling mode | |
| -Point A : OAT | 10.0°C |
| -Point A : Delta | 6.0dK |
| -Point B : OAT | 30.0°C |
| -Point B : Delta | 0.0dK |
| Heating mode | |
| -Point A : OAT | 0.0°C |
| -Point A : f | 45.0 °C |
| -Point B : OAT | 10.0 °C |
| -Point B : f | 40.0 °C |
| -Point C : OAT | 15.0 °C |
| -Point C : f | 35.0 °C |

| Points | Coordinates | unit | Values | | |
|--------|-------------|------|------------------|------------------|---------|
| | | | Min. | Max. | Default |
| A | OAT | °C | -20 | OAT _B | 0 |
| | f | °C | f _B | 50 | 45 |
| B | OAT | °C | OAT _A | OAT _C | 10 |
| | f | °C | f _C | f _A | 40 |
| CC | OAT | °C | OAT _B | 50 | 15 |
| | f | °C | 20 | f _B | 35 |

13.4.7. "VARIABLE PRIMARY FLOW" OPTION



The "Variable Primary Flow" option is used to modulate the power of the hydraulic pump. This modulation is obtained by powering the pump through a frequency inverter.



Caution

The minimum frequency of the pump must not be less than the manufacturer's recommendations (e.g. 30Hz) and must ensure a sufficient rate for the unit (Refer to the § PHYSICAL CHARACTERISTICS, page 8).

13.4.7.1. V2 MODE - DOUBLE SPEED

The pump operates at a fixed speed whatever the unit capacity. This speed is determined during commissioning to adjust the power of the pump to the load drops of the installation.



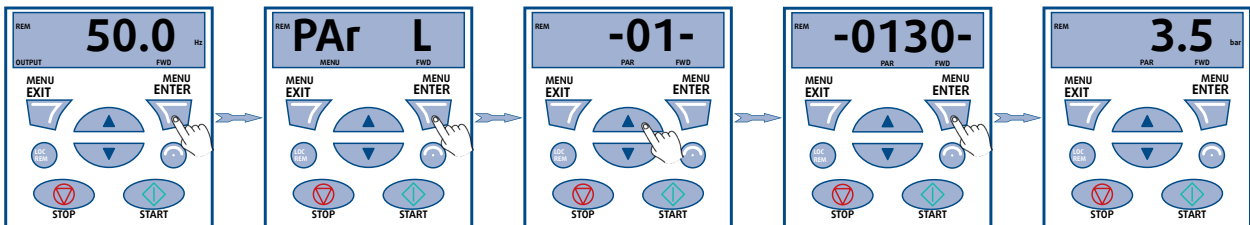
| Default | setting | min | max |
|-------------------------|---------|-----|------|
| Mod. pump max speed | 100% | 0% | 100% |
| Mod. pump standby speed | 60% | 0% | 100% |

It is necessary to determine the pressure setting to be maintained in the system then set the frequency inverter according to this pressure value.

13.4.7.3.1. DETERMINATION OF THE PRESSURE SETTING

The frequency inverter **ACS3** displays the reading via the pressure transducer **WPT**.

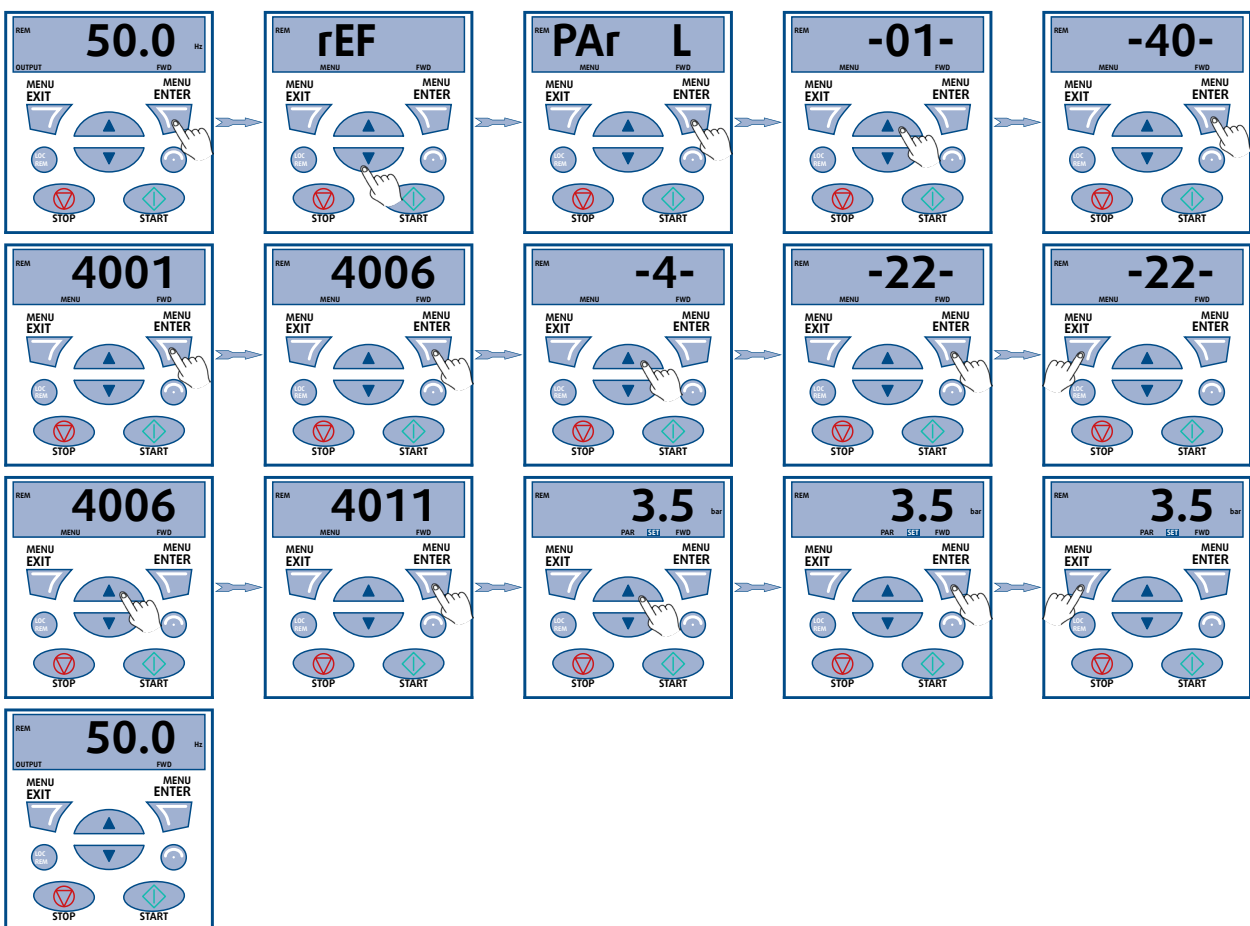
1. Set all units in demand to open all the valves (load = 100%).
2. Check that the output is in line with **SYSAQUA BLUE** requirements.
3. Read the pressure value from the transducer (example: 3.5 bar).



13.4.7.3.2. SETTING THE PRESSURE SETTING

The pressure setting is set in two stages:

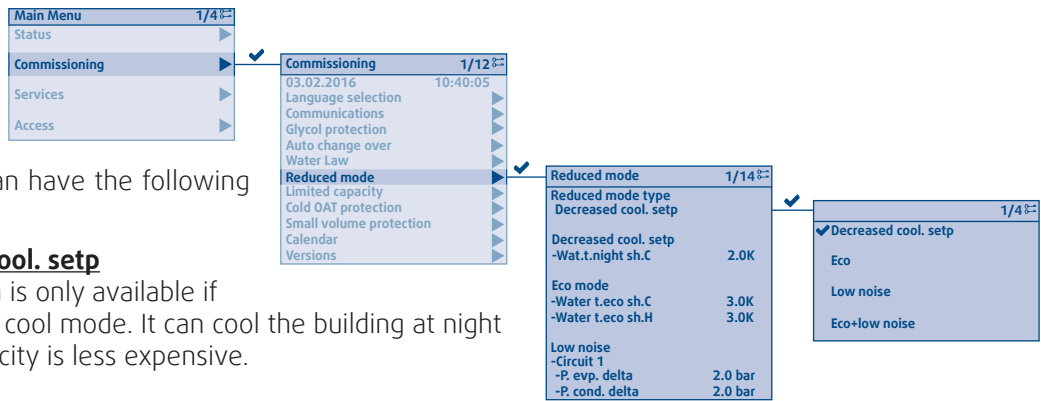
1. Access parameter **4006** and set it to **22** to display units in bar.
2. Access parameter **4011** then set the required pressure setting (example 3.5 bar).



When the pressure setting is set, check that the system is operational in the following conditions:

- when in partial load, the pressure is constant.
- when at zero load (all units off), check that the inverter frequency has dropped to the minimum value and that no water pressure alarm is triggered

13.4.8. REDUCED MODE



Reduced mode can have the following configurations:

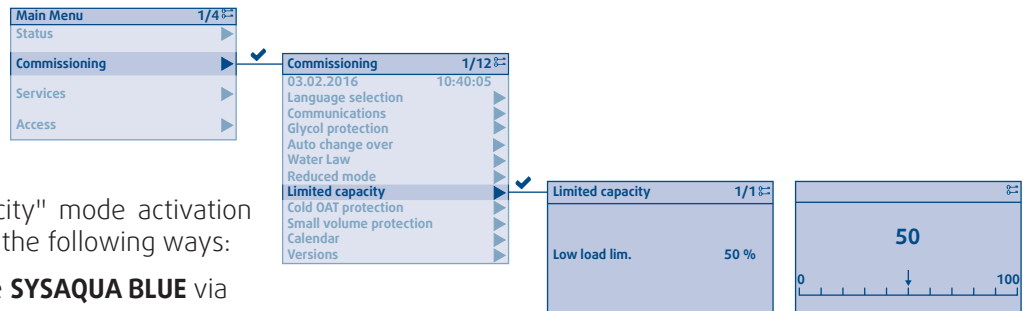
- **Decreased cool. setp**
This function is only available if the unit is in cool mode. It can cool the building at night when electricity is less expensive.
- **Eco**
Heat and cool setpoints are respectively lowered and raised to reduce the unit's electrical consumption.
- **Low noise**
In cool mode, the condensation pressure setpoint is increased to reduce the noise generated by the ventilators.
- **Eco + Low noise**

The "reduced mode" mode activation can be triggered in the following ways:

- directly on the **SYSAQUA BLUE** via the user interface
- communication network (Modbus/Bacnet/Cloud)
- external dry contact D2 if entry configured.

13.4.9. LIMITED CAPACITY

Limited capacity is occasionally used to limit the electricity consumption of the **SYSAQUA BLUE** to avoid exceeding the electric power capacity of the installation site.

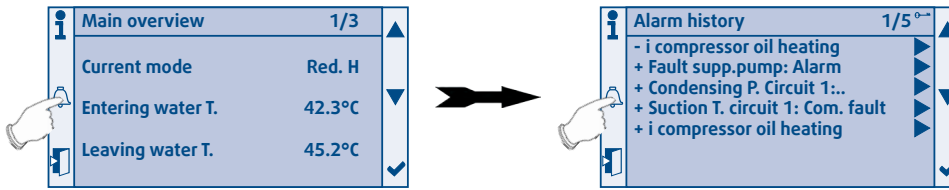


The "limited capacity" mode activation can be triggered in the following ways:

- directly on the **SYSAQUA BLUE** via the user interface
- communication network (Modbus/Bacnet/Cloud)
- external dry contact **D2** if entry configured.

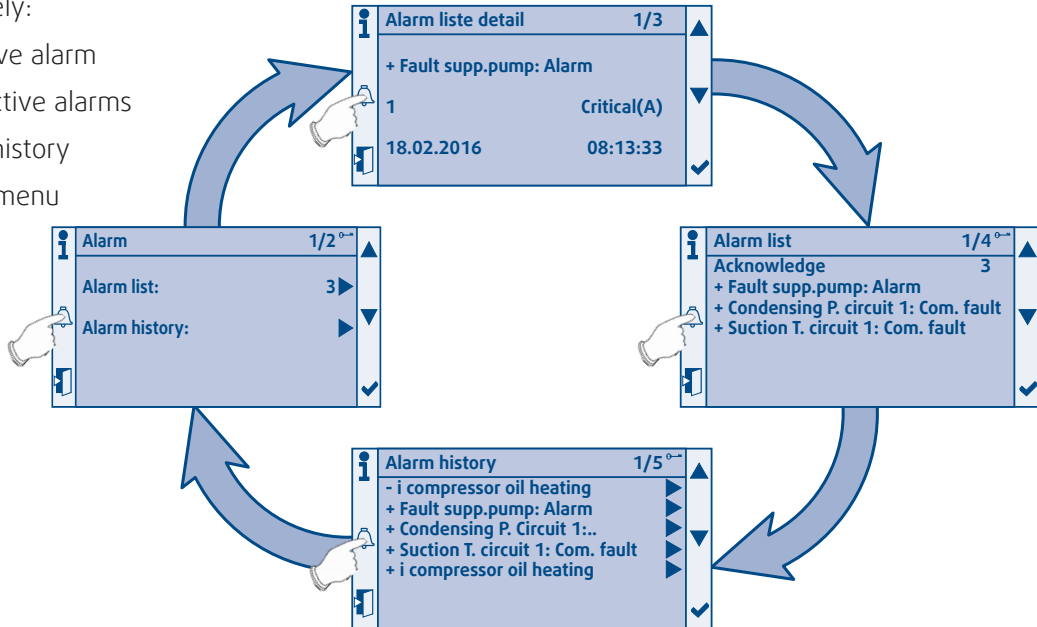
13.5. ALARMS

If no alarm is active, pressing the "Alarm" button takes you to the alarm history



If at least one alarm or warning is active, the alarm button flashes. Pressing the "alarm" button, will display successively:

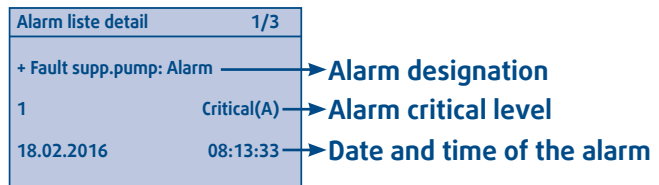
- The last active alarm
- The list of active alarms
- The alarms history
- The Alarms menu



13.5.1. ALARM DETAILS

This page is displayed:

- Details of the last active alarm
- If you request the details of an alarm in the list of active alarms
- If you request the details of an alarm in the alarms history



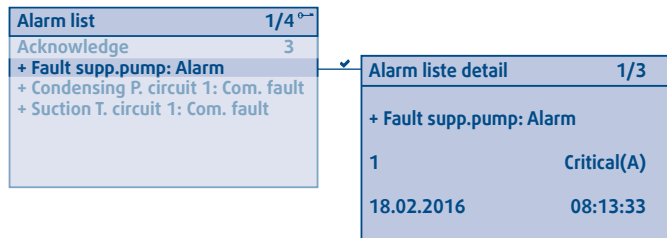
13.5.2. THE LIST OF ACTIVE ALARMS

The list of active alarms displays the current alarms

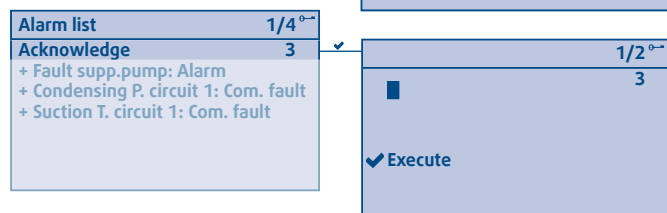
The first line shows the number of active alarms (3 in the example below)



You can access the alarm details by selecting an alarm and pressing the "Enter" button .



With installation or maintenance level access, you can acknowledge active blocking alarms. To do this, select delete, confirm and select "Execute". Only the alarms that are no longer active will be deleted from the list.



13.5.3. ALARMS HISTORY

This history reports the 50 most recent alarm activations and deactivations:

- Activation of an alarm will be indicated by a "+"
- Deactivation of an alarm will be indicated by a "-"

Alarm deactivated

Alarm 1 activated

Alarm 2 activated

Alarm history 1/5

- i compressor oil heating
- + Fault supp.pump: Alarm
- + Condensing P. Circuit 1:..
- + Suction T. circuit 1: Com. fault
- + i compressor oil heating

For the activation and deactivation time of an alarm, select the alarm and press the "enter" button ✓.

13.6. SCHEDULE

The first line displayed shows the current mode at the level of time programming.

The screenshot shows a multi-level menu structure for scheduling. It starts with 'Main Menu' (1/4), then 'Commissioning' (1/12), then 'Small volume protection' (1/10), then 'Calendar' (1/10), then 'Monday' (1/12), then 'Value 1' (1/4), and finally a mode selection screen with options: Off (checked), On, Reduced, and Limited capacity.

In the Monday submenu, 6 operating intervals can be selected. For each time, select the mode at which the unit must operate:

- Off
- On
- Reduced
- Limited capacity

To deactivate an operating interval, configure the corresponding time as follows: *:*.

The "Copy calendar" line copies the configuration made on Monday from Tuesday to Friday or from Tuesday to Sunday.

The configuration of the weekdays can also be changed separately.

Caution

To ensure activation of the mode indicated in the calendar, the unit must operate in "Delegate" mode.

The screenshot shows the 'Status' menu (1/12) with 'HMI state' set to 'Delegate'. A red arrow points to the 'HMI state' menu (1/5) where 'Delegate' is selected, with other options being Off, On, Reduced, and Limited capacity.

14. COMMISSIONING



Caution

When performing startup and service, thorough safety precautions shall always be taken.

Only a skilled person who is trained in the handling of refrigerating systems (as per standard EN13313) and flammable fluids (certified and with proof of relevant training) may carry out this work.

14.1. LIST OF PRELIMINARY CHECKS

Before commissioning the system, you must carry out a certain number of installation checks to ensure that the appliance will operate in the best possible conditions. The following list of checks is not exhaustive and only serves as a minimum reference guide.

1. Make sure that no source of ignition is present in the work area
2. Make sure that the work area is adequately ventilated
3. Make sure that suitable fire extinguishing equipment is available and within reach
4. Make sure that the concentration of R290 in the atmosphere of the work area is continuously controlled in order to be able to warn people of a potentially hazardous situation.
5. Check that the equipment installed matches the order
6. Check that the oil heating resistors have been energized for at least 12 hours.

14.1.1. VISUAL CHECK

1. Check that there is no debris or cardboard in the unit.
2. Check free clearances around the unit:
 - ✓ exchanger air intake
 - ✓ exchanger air outlet
 - ✓ leak extraction fan air intake
 - ✓ leak extraction fan air outlet
 - ✓ access or maintenance work.
3. Unit mounted as specified.
4. Check that the unit is level and that condensates drain freely away from the unit (for heat pump units).
5. Check that there is no possibility of blown air being recycled through the fans due to wind exposure.
6. In arduous climates (sub-zero temperature, snow, high humidity), check that the appliance is raised 10 cm off the ground.
7. For loose or missing bolts or screws.

14.1.2. ELECTRICAL CHECK

1. Electrical installation has been carried out according to the unit wiring diagram and the Supply Authority Regulations in effect.
2. A correctly sized fuse or circuit breaker has been installed at the main switchboard.
3. Supply voltages as specified on the unit wiring diagram.
4. **Check that all of the appliance's electrical connections have been tightened.**
5. Check that the electric motors are planned for the network supply voltage.
6. the cables and wires are clear of or protected from pipework and sharp edges.
7. Check the electrical grounding of the appliance.

14.1.3. HYDRAULIC CHECK

1. Check that the external water circuit components (pumps, user equipment, filters, expansion tank and reservoir if supplied) have been correctly installed in accordance with the manufacturer's recommendations and that the water inlet and outlet connections are correct.
2. Check that the water quality complies with the indicated standards (Refer to the § **WATER QUALITY**, page 16).
3. Check that venting and draining caps are properly closed.
4. **Check the presence, direction and position of the water filter upstream of the appliance (mesh size $\leq 800\mu\text{m}$).**
5. Check the presence and position of the stop valves to isolate the unit during maintenance periods.
6. Check that the hydraulic circuit is filled correctly and that the fluid flows freely without any signs of leaks or air bubbles. When glycol anti-freeze is used, check that the concentration level is correct.
7. Check that the pump liners are not stuck. The shaft of the motor must turn freely "by hand". If necessary, free up the shaft using a tool.
8. Check the direction of rotation of the pump and leave the fluid to circulate for at least 12 hours for each pump. Then clean the pump inlet water filter.
9. Adjust the water flow in order to comply with the specifications.

14.1.4. REFRIGERATING CHECKS

1. Leak test of the refrigeration circuit at the unions and on the various parts. The desired result is 5g/year maximum
2. Check that the fluid indicator is green (set by the factory) indicating absence of humidity.

14.2. UNIT START-UP

When starting up the unit, it is necessary to first energize the compressor casing resistors to evaporate the fluid and oil. The resistors are activated when the unit is switched on (including in standby mode). The controller will prevent start-up if the system is not ready.

Depending on the time of year and the customer requirement:

1. Configure hot/cold mode (Refer to the § **HEAT/COOL SELECTION**, page 26)
2. Start up the unit in manual mode: ON (Refer to the § **SELECTING THE OPERATING MODE**, page 27).

14.3. OPERATING CHECK LIST

14.3.1. GENERAL

Cheek for any unusual noises or vibration in the running components.

14.3.2. PHASE ROTATION PROTECTION

If the phase of the power supply is not correct, the phase rotation protection device will prevent the machine from starting.

14.3.3. ELECTRICAL

14.3.3.1. SET POINTS

1. Compressors circuit breaker settings.
2. Pump Circuit Breaker and Fan Circuit breaker settings.

NOTE: The outdoor fan motor is equipped with an internal safety device with automatic reset.

14.3.3.2. OPERATING VOLTAGE

Recheck the voltage at the unit supply terminals.

14.3.3.3. CONTROL

1. Verify that the on/off switch and pump 1/2 switch work correctly.
 2. Check that the unit is wired for correct control of the unit fan, cooling and heating modes.
 3. Verify all sensor values available with the controller display.
-

14.3.4. HYDRAULIC CIRCUIT

1. Check the filter's cleanliness
2. Check the presence and position of the stop valves to isolate the unit during maintenance periods
3. Adjust the water flow to specifications. (see appended graphs).
 - ✓ Check pressure at the inlet and outlet of the plate exchanger
 - ✓ Determine the water flow using a flowmeter or the load loss of the plate exchanger
4. Check the installation is protected against frost (heat insulation, glycol ethylene percentage of the unit if its presence is necessary, etc.)
5. Check that the bleeder present in the unit has actually been opened.

The unit must work with a water flow rate in agreement with recommended values displayed in the table in § **PHYSICAL CHARACTERISTICS**, page 8. Running the unit with a low water flow is dangerous, as it could result in irreversible damage to the components as well as to the plate exchanger. If the unit is run with insufficient flow, its performance will not be optimum.

14.3.5. COMPRESSOR AND REFRIGERATION SYSTEM

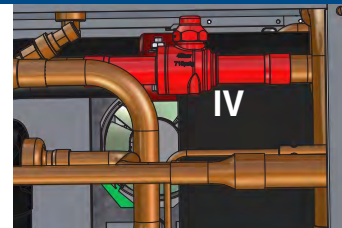
1. Running check: Start the compressor. Check for any unusual noise or vibration.
2. Leak check of the refrigeration circuit in operation. The desired result is 5g/year maximum.
3. Check for the absence of humidity during operation: green fluid indicator
4. Operating Pressures: Operate the unit for at least 20 minutes and ensure that the refrigerant pressures are stabilized, and check that they are within the normal operating ranges.
5. Operating Temperature: Check discharge, suction and liquid temperatures.
6. Discharge temperature on the cooling cycle should normally not exceed 115°C.
7. Suction superheat should be 6K ±2K.
8. Suction subcooling should be 5K ±2K.



Caution

The refrigeration circuit is equipped with a IV isolating valve between the plate exchanger and the compressor.

This valve used during the assembly process is open and MUST NOT BE CLOSED UNDER ANY CIRCUMSTANCES.



14.3.6. FINAL CHECK

1. All panels and fan guards are in place and secured.
2. Unit clean and free of any installation material.

15. WARRANTY CLAIM - MATERIAL RETURN PROCEDURE

Equipment must not be returned without the permission of our After Sales Department.

To return the equipment, contact your nearest sales office and ask for a "return form". The return form shall be sent with the returned equipment and shall contain all necessary information concerning the problem encountered.

A part return does not constitute a replacement order. Therefore, a purchase order must be submitted through your nearest distributor or regional sales office. The order should include the part name, part number, model number and serial number of the unit involved.

Following our personal inspection of the returned part, if it is determined that the failure is due to faulty equipment or workmanship, and the part is still under warranty, credit will be applied to the customer's purchase order. All parts shall be returned to our factory, transportation charges prepaid.

16. ORDERING SERVICE AND SPARE PARTS ORDER

The part number, the order confirmation and the unit serial number indicated on the name plate must be provided whenever services or spare parts are ordered.

For any spare part order, indicate the date of unit installation and date of failure. Use the part number provided by our spare parts department. If the part number is not available, provide a full description of the part required.

17. MAINTENANCE



Caution

The user is responsible for ensuring that the unit is in perfect working order and that the technical installation and **minimum maintenance** operations have been performed by a qualified technician in accordance with the procedures described in this manual.

Depending on actual operational constraints and regulatory changes, the installer might recommend increased maintenance operations and more frequent inspections.

Simple preventive maintenance ensures longevity of your **SYSAQUA BLUE** unit:

- Better refrigeration performance
- Reduced power consumption
- Accidental component breakage prevention
- Prevention of heavy, late, and expensive maintenance work
- Environment protection



Caution

All refrigerating fluid charging, sampling and draining operations must be performed by a skilled technician using equipment adapted to the unit, in agreement with authority regulation in effect on site.

Any inappropriate handling may cause uncontrolled fluid venting into the atmosphere, fires and explosions.



Warning

Isolate the unit from power supply before working on it.



Warning

Opening the refrigeration circuit then involves vacuum drawing, checking the circuit sealing and recharging the refrigerating fluid. For any intervention on the refrigerating fluid circuit, first drain the unit's charge using a refrigerating fluid collection station.

Prior to carrying out any work on the unit, the following precautions should be adhered to:

1. Make sure that no source of ignition is present in the work area
2. Make sure that the work area is adequately ventilated
3. Make sure that suitable fire extinguishing equipment is available and within reach
4. Make sure that the concentration of R290 in the atmosphere of the work area is continuously controlled in order to be able to warn people of a potentially hazardous situation.
5. Make sure that all electrical power sources are switched off.

17.1. WEEKLY CHECK

Inspect the entire running installation, while paying particular attention to:

- any damage on the **SYSAQUA BLUE** housing
- any traces of oil (sign of refrigerating fluid leak)
- any water leak
- the presence of removed protections, doors or lids improperly closed
- the coil's cleanliness.

Check:

- the oil level of the compressors (use a sight glass on the oil equalization pipe of the compressor tandems)
- the humidity rate of the refrigerating fluid using the fluid indicator
- the operating pressure of the installation
- the water temperature at the plate exchanger inlet and outlet.

When the **SYSAQUA BLUE** is running, perform a sound check of the compressors, pump and fans. Also check that no vibration can cause breakage or wear by vibration contact.

17.2. TABLE OF PERIODIC SERVICE AND MAINTENANCE

| TASKS PER COMPONENTS | | ACTIONS | 1 | 3 | 6 | 12 | 24 |
|--------------------------------|--|---|---|--------|--------|--------|--------|
| | | | month | months | months | months | months |
| | | | Recommended inspection and maintenance interval | | | | |
| 1 - Casing | | | | | | | |
| 1.1 | Control possible contaminations, damage and/or corrosion. | Clean and repair if required. | | | | X | |
| 1.2 | Check the possible presence of water (condensates, leakages, etc.). | Clean and look for the cause, then repair. | | | X | | |
| 1.3 | Verify the appearance of the thermal insulation | Replace if required. | | | | X | |
| 1.4 | Check the state of the anti-vibration pads | Replace if required. | | | | X | |
| 1.5 | Check the condition of door gasket. | Replace if required. | At each inspection | | | | |
| 2 - REFRIGERANT CIRCUIT | | | | | | | |
| 2.1 | Verify the oil compressor level with the compressors off | | | X | | | |
| 2.2 | Check there are no gas bubbles in the fluid line | | | X | | | |
| 2.3 | Check the lack of humidity in the refrigerating fluid | | | X | | | |
| 2.4 | Check the pipes or capillaries do not rub and vibrate. | | | | X | | |
| 2.5 | Check the compressors do not emit abnormal noise or vibration. | | | X | | | |
| 2.6 | Check the backflow temperature. | | X | | | | |
| 2.7 | Record the operating pressure | Check it is above or below those recorded when the unit was started up. | X | | | | |
| 2.8 | Check the compressor fastening screws are tight. | | | | X | | |
| 2.9 | Check the crankcase heater is powered on during the stop cycle. | | X | | | | |
| 2.10 | Check the cleanliness of the coil. | Clean if required. | | X | | | |
| 2.11 | Test the oil for contamination. | Change the oil if required. | | | | X | |
| 2.12 | Check the filter drier clogging. | Replace if required | | X | | | |
| 2.13 | Check the operation of the high pressure switch. | Replace if required | X | | | | |
| 2.14 | Check for the absence of refrigerating fluid leak (image + detector as required) | Repair | | | | X | |
| 2.15 | Check the cycle reversal valve | | | | X | | |
| 2.16 | Check the condition of the anti-vibration studs | Replace if required | | | X | | |
| 3 - HYDRAULIC CIRCUIT | | | | | | | |
| 3.1 | Check the state of the function, check there is no damage nor corrosion. | Clean and repair. | | X | | | |
| 3.2 | Check the condition of the exchanger, in terms of corrosion and functionality. | Clean and repair. | | | X | | |
| 3.3 | Check the tightening of the pipe connections and fastening | Readjust and repair if necessary. | | | | X | |
| 3.4 | Verify the pressure value of the hydraulic circuit | | | | | X | |
| 3.5 | Bleed the air. | | | | | X | |
| 3.6 | Run the isolation valves | | | | | | |
| 3.7 | Check no ice has formed. | | | | | X | |
| 3.8 | Check the condition of the piping thermal insulation. | Repair and replace if required. | | | | X | |
| 3.9 | Check the frost protection devices (glycol-based water, thermostat, etc.). | Repair and replace if required. When air temperatures are wintery, and after general stoppage of the installation, the water contained in the plate exchanger may freeze. To prevent such problems, fully drain the unused plate exchanger or protect it by pouring an antifreeze solution into the hydraulic circuit or other devices. ⚠ The manufacturer waives any liability for damage to the plate exchanger caused by water freezing inside the unit. | Whenever there is a risk of freezing | | | | |

| TASKS PER COMPONENTS | | ACTIONS | 1 | 3 | 6 | 12 | 24 |
|---|---|---|-------|--------|--------|--------|--------|
| | | | month | months | months | months | months |
| Recommended inspection and maintenance interval | | | | | | | |
| 3.10 | Check filter cleanliness. | Clean | X | | | | |
| 3.11 | Check that the hydraulic circuit is filled properly | | X | | | | |
| 3.12 | Check the condition of the expansion tank (presence of excess corrosion, or gas pressure loss) | Replace if required. | X | | | | |
| 3.13 | Check the water pump | If the unit has not been used for a long time, manually rotate the pump shaft and check that it turns freely. For a unit equipped with a double pump, it is advisable to switch from one pump to the other every month or to check that the pump shaft turns freely to prevent the liners sticking. | X | | | | |
| | | Replace the pump liner after 15,000 hours running with anti-freeze or 25,000 hours running with water. | | X | | | |
| 3.14 | Verify that the low water pressure sensor works correctly | | X | | | | |
| 3.15 | Record the water temperatures at the plate exchanger inlet and outlet. | | X | | | | |
| 4 - ELECTRIC CIRCUIT | | | | | | | |
| 4.1 | Check the electrical voltage applied to the unit, which must remain stable within the tolerances specified on the information plates. | | | X | | | |
| 4.2 | Check that the main supply cable is void of alterations likely to impact the insulation. | Replace if required. | | X | | | |
| 4.3 | Check the grounding of the metallic structure | Repair if required. | X | | | | |
| 4.4 | Inspect the contacts. | Replace if required. | X | | | | |
| 4.5 | Check that all electrical connections of the device are tight | Tighten if required. | X | | | X | |
| 4.6 | Check the thermal protection relays of the motors | Replace if required. | X | | | | |
| 4.7 | Check the nominal intensity and condition of the fuses. | | X | | | | |
| 4.8 | Check the condition of the condensers. | | X | | | | |
| 4.9 | Clean the compressed air electrical unit to remove any dust or other contaminants building up. | | | X | | X | |
| 4.10 | Check the motor windings are insulated. | | | X | | | |
| 5 - FAN(S) | | | | | | | |
| 5.1 | Check for the absence of contamination, corrosion or damage. | Clean if required | | | X | | |
| 5.2 | Check proper fastening of the fan. | Tighten if required. | | | X | | |
| 5.3 | Check the vanes to guarantee balancing. | Clean if required. | | | | X | |
| 5.4 | Check the bearings for noise. | Repair if required. | X | | | | |
| 5.5 | Check the condition of the grease and greasers (unless permanently lubricated). | Re-grease if required (Lithium soap grease DIN 51825-K3N for fans type K, K1, K2). | | T>70°C | X | | |
| 5.6 | Check the condition of the fan motor. | | | X | | | |
| 6 - REGULATION | | | | | | | |
| 6.1 | Check the condition of the alarms | Acknowledge them after taking them into consideration | X | | | | |
| 6.2 | Check the setting points | | X | | | | |
| 6.3 | Check the operation of all probes | | X | | | | |
| 6.4 | Check the gas detection module | | | | | X | |

17.3. MAINTENANCE PROCEDURES

17.3.1. REFRIGERANT CIRCUIT

This equipment must be submitted for sealing checks **at least once per year, by a professional authorized to perform such an operation**. Refer to national requirements for the frequency of these checks.

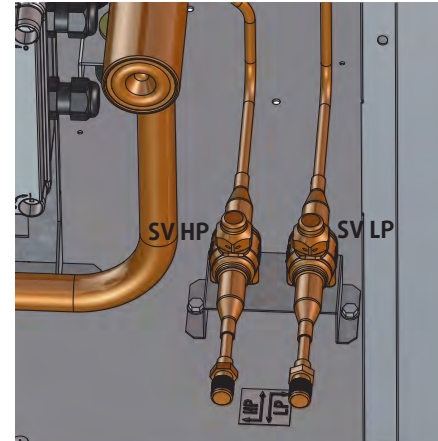


Caution

Never use the compressor as a vacuum pump to drain the installation.

Before opening the refrigeration circuit, use the SV HP/SV LP service valves to:

1. drain the unit's charge using a recovery unit compatible with flammable refrigerants (specify the residual pressure)
2. purge the circuit with nitrogen
3. expel at a pressure of 30 kPa absolute
4. perform a second nitrogen purge
5. open the circuit.



17.3.1.1. REFRIGERATING FLUID CHARGE

Run the unit in refrigerating mode to determine whether the group's charge is correct by checking the sub-refrigeration.

17.3.1.2. COMPRESSOR OIL

Oil for refrigeration equipment is light and transparent. It maintains its color for a long operating period.

As a correctly designed and installed refrigeration circuit will run without any problems, the compressor oil does not require replacement, even after a long operating period.

Blackened oil has been exposed to impurities in the refrigeration piping system, or excess temperatures on the compressor backflow side, which inevitably degrades oil quality. Blackened oil or degradation of its quality may also be caused by humidity in the system. Change the oil when its color changes or when it is degraded.

In this case, before restarting the unit, the refrigeration circuit must be drained.



Caution

Compressors use polyester oil. During maintenance interventions on the compressor, or if the refrigeration circuit has to be opened at any point, do not forget that this type of oil is highly hygroscopic. Therefore it is important to avoid exposing it to the atmosphere for long periods as this would require an oil change.



Warning

- Protect the **SYSAQUA BLUE** frame in order to retrieve oil that could accidentally flow out.

17.3.1.3. FILTER DRIER

Refrigeration circuits are fitted with filter driers.

The fluid indicator is used to check the refrigeration flow and humidity rate of the refrigerating fluid. The presence of bubbles indicates that the filter drier is clogged or that the charge is insufficient.

If you notice that air bubbles remain even after the filter has been replaced, this means the device has lost part of its cooling product in one or several places, which will need to be detected and repaired.

The glass window contains a color indicator. By comparing the indicator color with the scale on the glass window, the humidity rate of the refrigerating fluid can be calculated. If the humidity rate is too high, replace the filter, run the system for one day, then check the humidity rate again.

A humidity rate within the preset limits requires no further intervention. If the humidity rate remains too high, replace the filter drier again, start the unit, and run it for another day.

17.3.1.4. AIR COOLED CONDENSER



Caution

Fin edges are sharp and can cause injury. Avoid contact with them.

Condenser coils are composed of copper tubes and aluminum fins. In case of leaks due to damage or shock, the coils must be repaired by one of the authorized Support Centers. To guarantee the best possible operation of the condenser bank, the condenser surface must be kept as clean as possible, and it must be free of foreign objects (leaves, wires, insects, slag, etc.). A dirty coil will use more electrical power. In addition, condensation pressure could increase and trigger a high pressure alarm.

Clean the air exchanger using a special product for aluminum-copper coils and rinse with water. Do not use hot water or steam, as these may increase the pressure of the refrigerating fluid's.



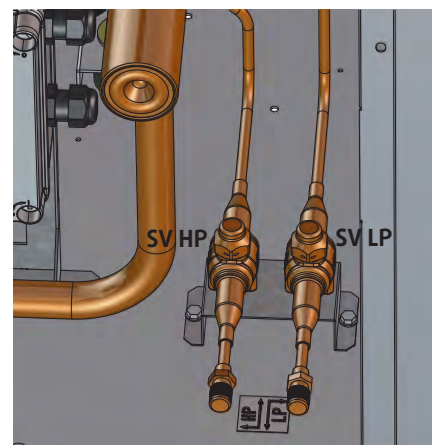
Caution

Avoid damaging the aluminum fins during cleaning. Never use pressurized water without a wide diffuser. Concentrated and/or rotating water jets are strictly prohibited.

17.3.1.5. R290 CHARGING

The R290 charging procedure must be carried out by a qualified technician using the SV HP/SV LP service valves.

1. Create a vacuum in the refrigeration circuit to obtain at least 270Pa.
The time it takes to create the vacuum depends on the person performing the task, as well as choosing the right moment to break the vacuum.
2. Fill with R290 up to the amount indicated on the product plate.
3. Close the SV HP and SV LP valves
 - ✓ valve tightening torque: 7N.m
 - ✓ plug tightening torque: 10N.m
4. Perform a leak check of the refrigeration circuit after charging. The desired result is 5g/year maximum.
5. Check for the absence of humidity: green fluid indicator.



17.3.2. HYDRAULIC CIRCUIT

17.3.2.1. PLATE HEAT EXCHANGER

Verify the pressure difference between the inlet and the outlet of the heat plate exchanger. If the water pressure and flow rate values do not correspond to the pressure loss curves available in § **HYDRAULIC PUMPS CURVES**, page XI, the heat plate exchanger may become clogged with dirt. To clean it, use a non-corrosive solvent to remove calcareous deposits. The equipment used for the external water flow, the quantity of solvent and safety measures applied must be approved by the company supplying the cleaning products, or the one performing these operations.

17.3.3. WINTER PROTECTION

In winter, after a general stoppage of the installation or a regulation malfunction, the water contained in the hydraulic circuit may start to freeze.

To prevent any problems if the hydraulic circuit contains no glycols, it is advisable to fully drain any circuits not used and to pressurize them with nitrogen or protect them by adding an anti-freeze solution or applying other measures.

The concentration of anti-freeze solution must be regularly and carefully checked before each winter season.



Caution

The manufacturer waives any liability for damage of a plate exchanger caused by water freezing of water contained inside (low winter temperature or water start temperature below 5°C in summer mode).

18. TROUBLESHOOTING

| Problem | Probable cause | Solution |
|---|---|---|
| Unit operates continuously but without generating cooling | Insufficient refrigerant fluid charge. | Top up the refrigerant fluid charge. |
| | Clogged dehumidification filter. | Replace the dehumidification filter. |
| | Reduced output from one or both circuits | Check the compressor valves and change them if necessary. |
| Frozen intake line | The overheating setting on the thermostatic pressure relief valve is too low. | Increase the setting. |
| | | Check the refrigerant fluid charge |
| Excessive noise | Vibrating pipe work | Attach the pipe work correctly. |
| | | Check the pipe work attachments. |
| | Whistling noise from the thermostatic pressure relief valve | Top up the refrigerant fluid charge. |
| | | Check and replace the dehumidification filter if necessary. |
| Noisy compressor | Check the condition of the valves. | |
| | Seized bearings. Replace the compressor | |
| | | Check the tightness of the compressor attachment nuts. |
| Low oil level in the compressor | Presence of one or several oil or gas leaks in the circuit | Locate and repair the leaks |
| | Mechanical compressor damage. | Contact an approved Service Center. |
| | Sump oil heater resistance fault. | Check the electrical circuit and the condition of the resistor. Replace defective parts if necessary. |
| One or both compressors do not operate. | Electrical circuit cut. | Check the electrical circuit and seek out any grounding and/or short-circuits. Check the fuses. |
| | High pressure pressostat activated. | Reset the pressostat from the control panel and restart the unit. Identify and eliminate the causes of this activation. |
| | Control circuit fuse blown. | Check the control circuit and seek out any grounding and/or short-circuits. Replace the fuses. |
| | Connection problem | Check the tightness of all the electrical connection terminals. |
| | Electrical circuit thermal protection cuts in. | Check the operation of the control and safety devices. Identify and eliminate the cause of the activation. |
| | Incorrect wiring. | Check the wiring of the control and safety devices. |
| | Mains voltage too low. | Check the power line. Eliminate any possible problems associated with the system. If the problem is due to the network, inform the Electricity Company. |
| | Compressor motor short-circuited. | Check the continuity of the motor winding. |
| Compressor seized | Replace the compressor. | |
| Circuit stoppage following activation of the low pressure thermostat. | Presence of a leak. | Locate and repair the leak. |
| | Insufficient refrigerant fluid charge. | Top up the refrigerant fluid charge. |
| | Pressostat operating fault. | Replace the pressostat. |

| Problem | Probable cause | Solution |
|--|---|---|
| Circuit stoppage following activation of the high pressure thermostat. | Incorrect operation of the high pressure pressostat. | Check the operation of the pressostat. Replace it if required. |
| | Outlet valve partially closed. | Open the valve. Replace it if required. |
| | Non-condensable particles in the circuit. | Bleed the circuit |
| | Condenser fan(s) not operating. | Check the wiring and the motors. Repair and replace if required. |
| Liquid line too hot | Insufficient refrigerant fluid charge. | Locate and eliminate the causes of charge losses and top up the refrigerant fluid charge. |
| Liquid line frozen | Liquid line valve partially closed. | Check the opening of all the valves. |
| | Clogged dehumidification filter. | Replace the filter cartridge. |
| Fans do not operate. | Electrical circuit problems. | Check the connections. |
| | Internal circuit thermal cut-out activated. | Contact an approved Service Center. |
| Reduced output in both Heating and Cooling mode | Compressor operating fault | Contact an approved Service Center. |
| | Dirt in the evaporator water circuit. | Chemical cleaning of the evaporator water circuit. |
| | Condenser battery blocked. | Clean the condenser battery. |
| | Insufficient refrigerant fluid charge. | Top up the refrigerant fluid charge. |
| Evaporator heater is not operating. | No power supply. | Check the main fuse and the auxiliary fuses. |
| | Heater circuit open | Check the heater and replace if required. |
| No/ little control over water temperature. | Incorrect thermostat setting. | Check the temperature setting on the control panel. |
| | Incorrect temperature differential between evaporator inlet and outlet. | Check the water flow and the quantity of liquid in the water circuit. |
| | Electronic control system malfunction. | Contact an approved Service Center. |
| Insufficient water circulation. | Air in the circuit | Bleed the air via the safety valve. |
| | Deposits or impurities in the evaporator. | Wash out the evaporator by back-flushing. |
| Unit not operating, no alarm activation | Water circulation fault | Check the pump. |
| | Flow controller inoperable. | Check the flow controller. |
| | Differential pressostat inoperable. | Check the differential pressostat. |



CAUTION

BEFORE CARRYING OUT ANY OPERATION ON THE EQUIPMENT, CHECK THAT THE ELECTRICAL POWER SUPPLY IS SWITCHED OFF AND THAT IT CANNOT BE SWITCHED ON INADVERTENTLY.

IT IS ADVISABLE TO PADLOCK THE DISCONNECT SWITCH

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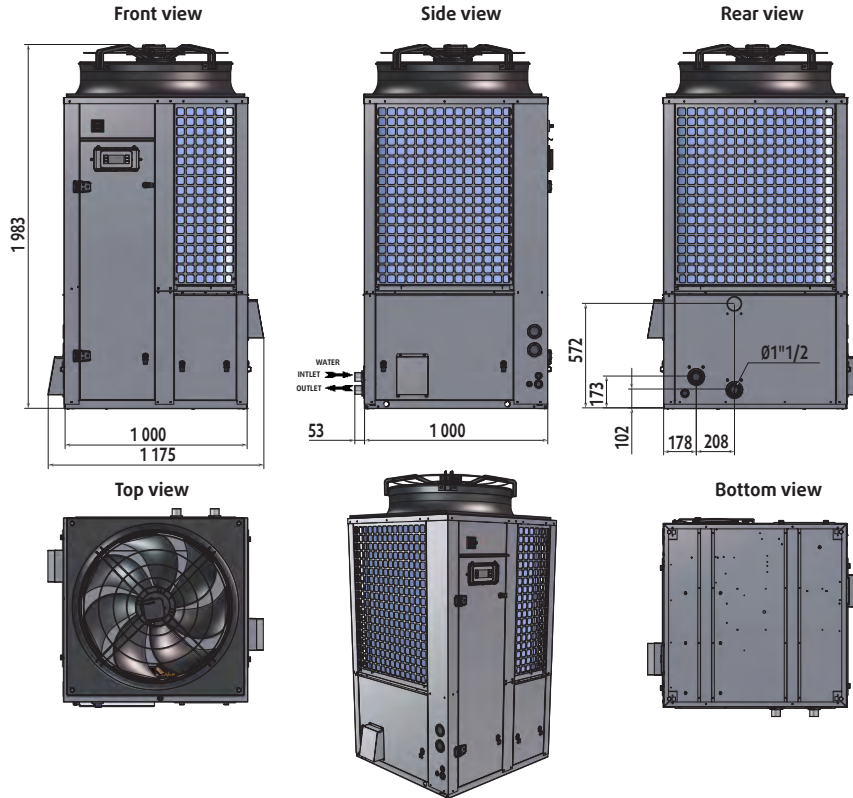
ANEXO

| | | | |
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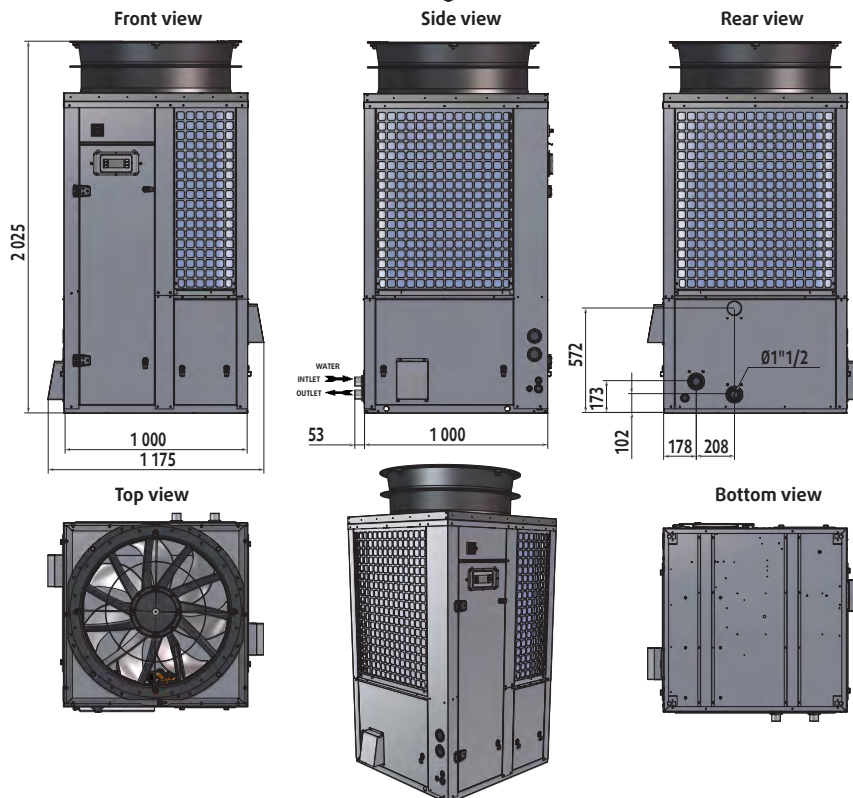
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SYSAQUA BLUE 35B

FAN STANDARD

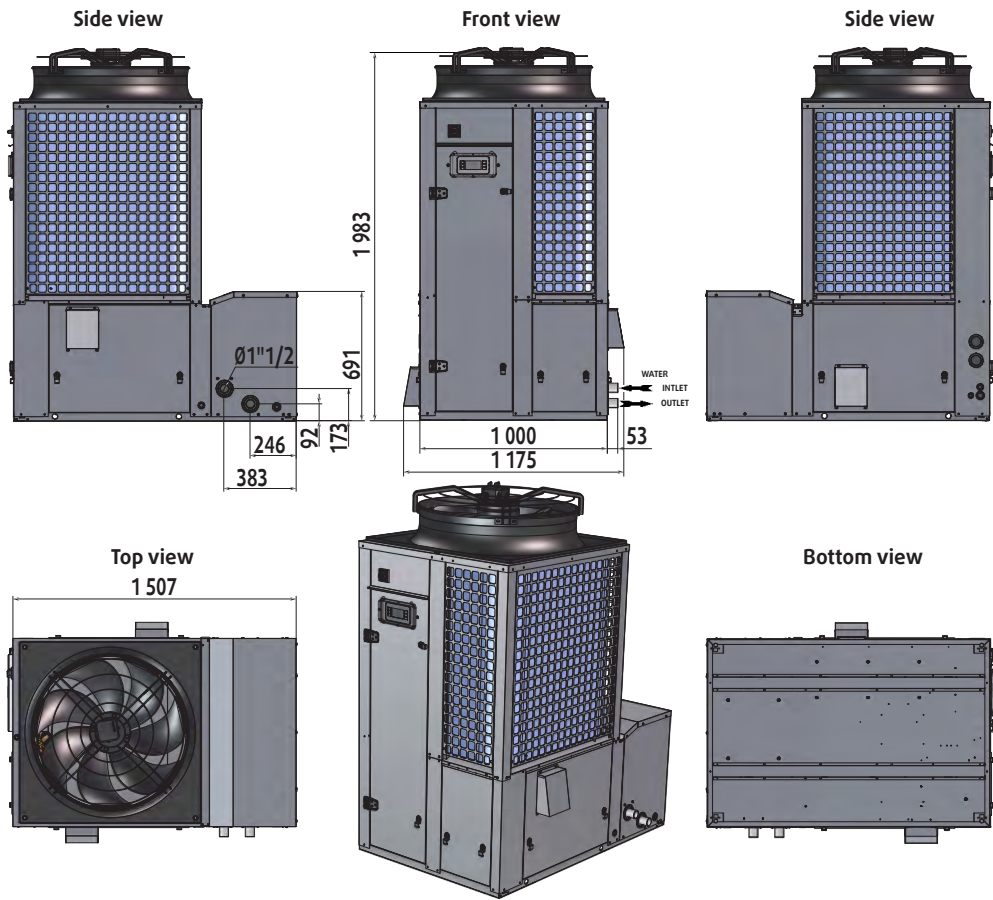


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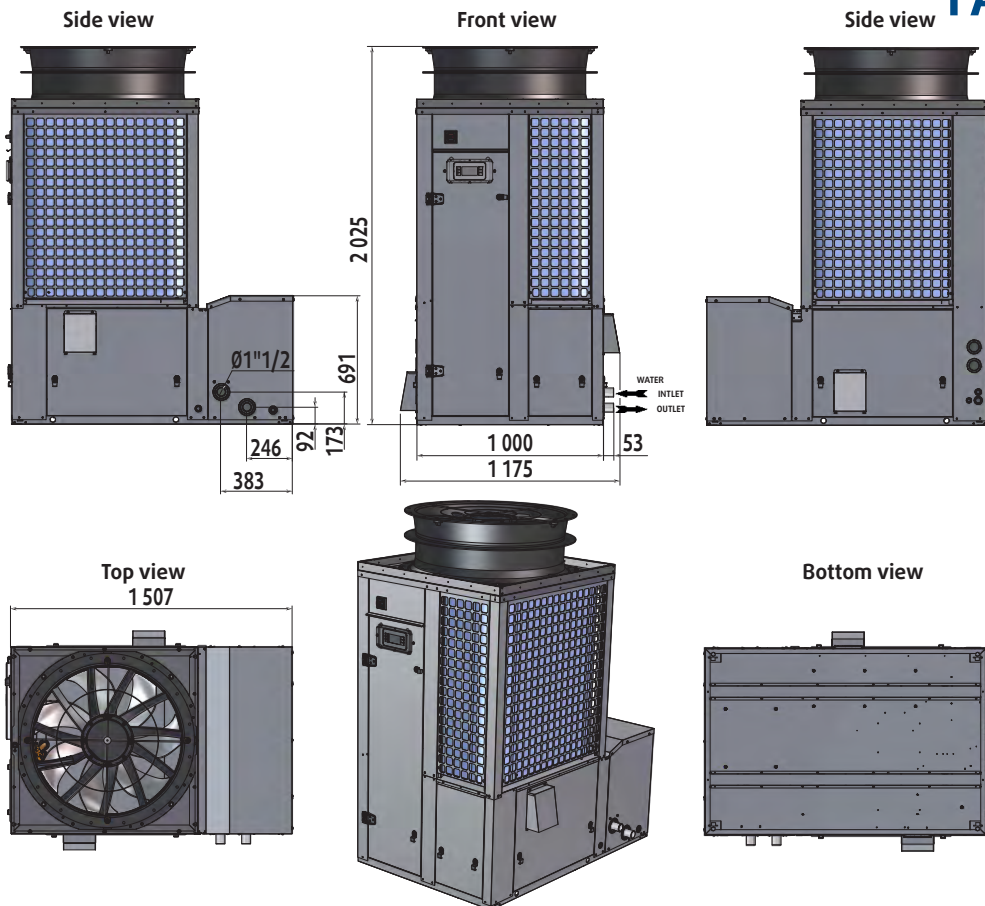


SYSAQUA BLUE 35B WITH BUFFER TANK

FAN STANDARD

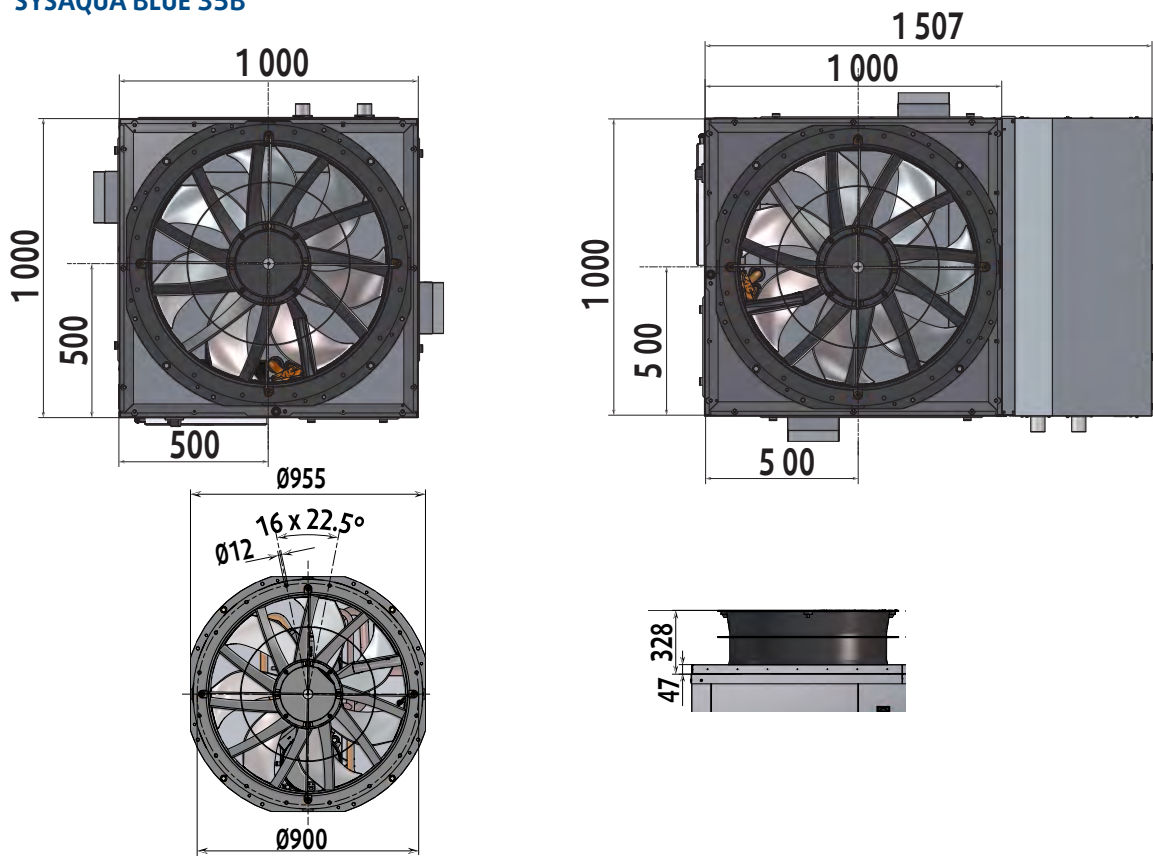


FAN HPF



DUCT OUTLET DIMENSIONS

SYSAQUA BLUE 35B



APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

REFRIGERANT CIRCUIT DIAGRAM SCHEMA DU CIRCUIT FRIGORIFIQUE KÄLTEKREISLAUFDIAGRAMM SCHEMA DEL CIRCUITO REFRIGERANTE ESQUEMA DEL CIRCUITO FRIGORIFÍCO

English

| | |
|--------------|--------------------------------------|
| M1/2 | Compressors 1 et 2 |
| RV1 | Cycle reversal valve |
| OF1 | Outdoor fan motor |
| 3 | Air cooled condenser |
| 4 | Filter drier |
| 5 | Sight glass |
| 6 | Electronic expansion valve |
| 7 | Liquid reservoir |
| 8 | Plate heat exchanger |
| \perp | Pressure tapping point 1/4" |
| FPC | High pressure transducer |
| HP | High pressure switch |
| CDT | Discharge temperature sensor |
| FPE | Low pressure transducer |
| CST | Suction temperature sensor |
| OAT | Outdoor air temperature sensor |
| OCT | Condenser outdoor temperature sensor |
| SV HP | Service valve HP |
| SV LP | Service valve LP |
| IV | Isolating valve |

Français

| | |
|--------------|-------------------------------------|
| M1/2 | Compresseurs 1 et 2 |
| RV1 | Vanne inversion de cycle |
| OF1 | Moteur de la ventilation extérieure |
| 3 | Condenseur à air |
| 4 | Filtre déshydrateur |
| 5 | Voyant liquide |
| 6 | Détendeur électronique |
| 7 | Bouteille accumulation liquide |
| 8 | Evaporateur à plaques |
| \perp | Prise de pression 1/4" |
| FPC | Transducteur haute pression |
| HP | Pressostat haute pression |
| CDT | Sonde température refoulement |
| FPE | Transducteur basse pression |
| CST | Sonde température d'aspiration |
| OAT | Sonde température air extérieur |
| OCT | Sonde température sortie condenseur |
| SV HP | Vanne de service HP |
| SV LP | Vanne de service LP |
| IV | Vanne d'isolement |

Deutsch

| | |
|--------------|---------------------------------------|
| M1/2 | Verdichter 1 und 2 |
| RV1 | Umkehrzyklusventil |
| OF1 | Motor der externen Lüftung |
| 3 | Verflüssigerbündel |
| 4 | Filtertrockner |
| 5 | Schauglas |
| 6 | Elektronisches Expansionsventil |
| 7 | Sammler |
| 8 | Plattenverdampfer |
| \perp | 1/4" Druckanschluss |
| FPC | Hochdruckgeber |
| HP | Überdruckschalter |
| CDT | Auslass-Temperaturfühler |
| FPE | Niederdruckgeber |
| CST | Saug-Temperaturfühler |
| OAT | Außenlufttemperaturfühler |
| OCT | Verflüssigeraustritt-Temperaturfühler |
| SV HP | Dienstventil Hochdruck |
| SV LP | Dienstventil Niederdruck |
| IV | Absperrventil |

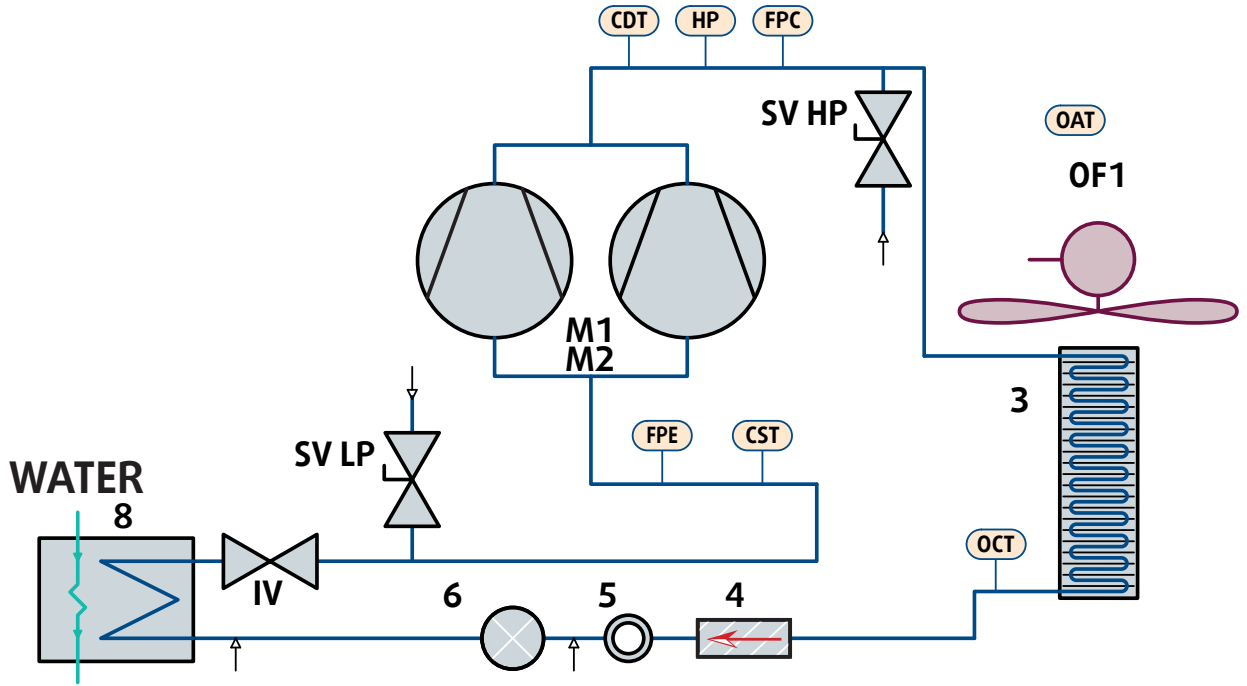
Italiano

| | |
|--------------|--|
| M1/2 | Compressore 1 e 2 |
| RV1 | Valvola di inversione ciclo |
| OF1 | motore della ventilazione esterna |
| 3 | Condensatore ad aria |
| 4 | Filtro-essiccatore |
| 5 | Spia di vetro |
| 6 | valvola di espansione elettronica |
| 7 | Accumulatore di liquido |
| 8 | Evaporatore a piastre |
| \perp | Presa di pressione 1/4" |
| FPC | Trasduttore di alta pressione |
| HP | Pressostato di alta pressione |
| CDT | Sonda temperatura di scarico |
| FPE | Trasduttore di bassa pressione |
| CST | Sonda di temperatura di aspirazione |
| OAT | Sonda di temperatura d'arie esterna |
| OCT | Sonda di temperatura di Condensazione |
| SV HP | Valvola di servizio di alta pressione |
| SV LP | Valvola di servizio di bassa pressione |
| IV | Valvola di isolamento |

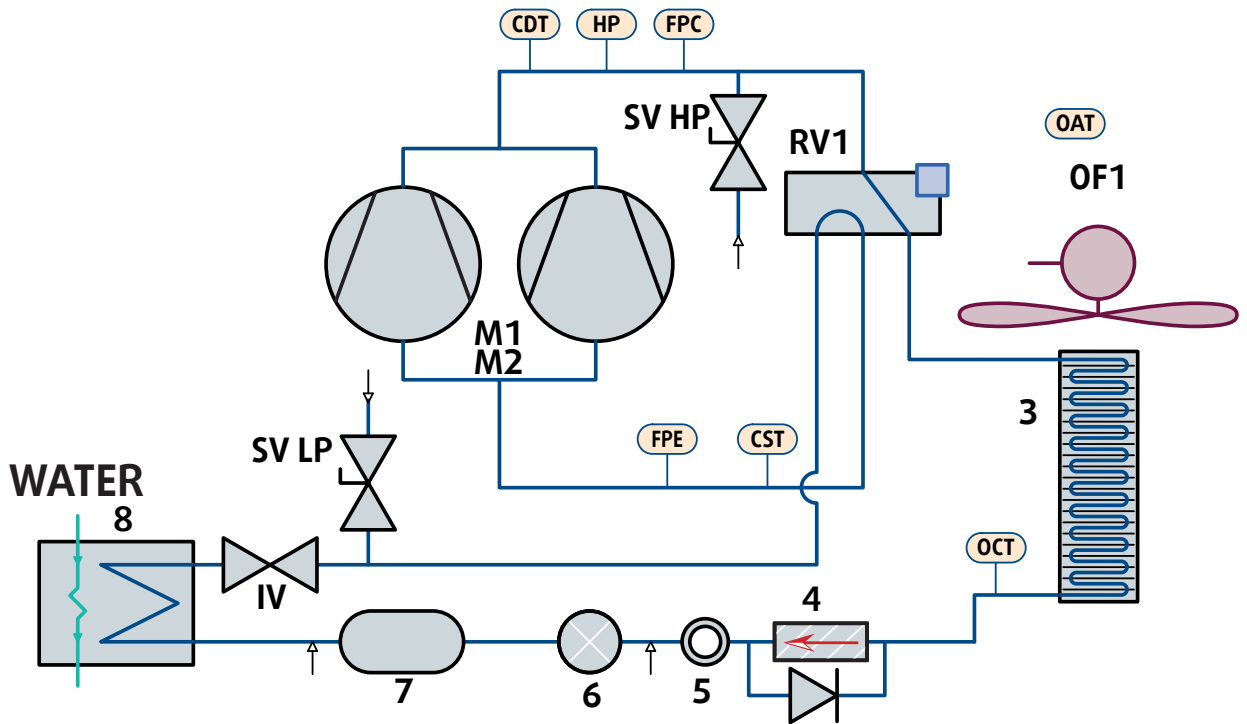
Español

| | |
|--------------|---------------------------------------|
| M1/2 | Compresores 1 y 2 |
| RV1 | Válvula de inversión de ciclo |
| OF1 | Motor de la ventilación exterior |
| 3 | Condensador de aire |
| 4 | Filtro deshidratador |
| 5 | Indicador luminoso de líquido |
| 6 | Válvula de expansión electrónica |
| 7 | Botella de acumulación de líquido |
| 8 | Evaporador de placas |
| \perp | Toma de presión 1/4" |
| FPC | Transductor de alta presión |
| HP | Presóstato de alta presión |
| CDT | Sonda de temperatura descarga |
| FPE | Transductor de baja presión |
| CST | Bulbo reductor |
| OAT | Sonda de temperatura de aire exterior |
| OCT | Sonda temperatura salida condensador |
| SV HP | Válvula de servicio de alta presión |
| SV LP | Válvula de servicio de baja presión |
| IV | Válvula de servicio |

SYSAQUA BLUE.L



SYSAQUA BLUE.H



**HYDRAULIC CIRCUIT DIAGRAM
SCHEMA DU CIRCUIT HYDRAULIQUE
HYDRAULISCHER SCHALTPLAN
SCHEMA CIRCUITALE IDRAULICO
ESQUEMA CIRCULAR HIDRÁULICO**

English

RECOMMENDED INSTALLATION

| | |
|-----------|----------------------|
| CF | Connexion flexible |
| VV | Drain valve |
| VA | Globe valve |
| VR | Water charging valve |
| MN | Manometer |

HYDRAULIC CIRCUIT SYSAQUA BLUE

| | |
|----------------|--|
| FT | Filter (supplied loose) |
| EWC/LWC | Intlet/outlet gas male connection ➤ SYSAQUA BLUE 35B: 1" 1/2" |
| VE | Pressure expansion tank |
| WPS | Lack of water pressure switch (Optional) |
| SS | Safety valve |
| WP | Pump |
| PA | Automatic air vent |
| CL | Pressure tap 1/4" |
| EWT | Intlet water temperature sensor |
| LWT | Outlet water temperature sensor |
| PHE | Plate heat exchanger |
| RAG | Antifreeze heater |
| FS | Flow switch |
| WT | Water tank |
| VD | Drain valve |
| WPT | Pressure transducer (option) |

Français

INSTALLATION RECOMMANDÉE

| | |
|-----------|----------------------|
| CF | Connexion flexible |
| VV | Vanne de vidange |
| VA | Vanne d'arrêt |
| VR | Vanne de remplissage |
| MN | Manomètre |

CIRCUIT HYDRAULIQUE SYSAQUA BLUE

| | |
|----------------|---|
| FT | Filtre à tamis (Livré non monté) |
| EWC/LWC | Connexion entrée /sortie d'eau GAS "M" ➤ SYSAQUA BLUE 35B: 1" 1/2" |
| VE | Vase d'expansion |
| WPS | Pressostat manque d'eau (Option) |
| SS | Soupape |
| WP | Pompe |
| PA | Purgeur automatique |
| CL | Prise de pression 1/4" |
| EWT | Sonde température d'entrée d'eau |
| LWT | Sonde température sortie d'eau |
| PHE | Echangeur à plaques |
| RAG | Résistances antigel |
| FS | Détecteur de débit |
| WT | Ballon tampon |
| VD | Vanne de vidange |
| WPT | Transducteur de pression hydraulique (option) |

Deutsch

EMPFOHLENE INSTALLATION

| | |
|-----------|--------------------|
| CF | Schlauchverbindung |
| VV | Ablassventil |
| VA | Absperrhahn |
| VR | Füllventil |
| MN | Manometer |

WASSERKREISLAUF SYSAQUA BLUE

| | |
|----------------|--|
| FT | Siebfilter (nicht montiert geliefert) |
| EWC/LWC | Verbindung Wassereintritt / -austritt GAS "M" ➤ SYSAQUA BLUE 35B: 1" 1/2" |
| VE | Expansionsgefäß |
| WPS | Wassermangel-Druckwächter (Option) |
| SS | Ventil |
| WP | Pumpe |
| PA | Automatische Entlüftung |
| CL | 1/4" Druckanschluss |
| EWT | Wassereintritt-Temperaturfühler |
| LWT | Wasseraustritt-Temperaturfühler |
| PHE | Plattenwärmetauscher |
| RAG | Frostschutz-Widerstände |
| FS | Strömungswächter |
| WT | Vorratsbehälter |
| VD | Ablassventil |
| WPT | Druckwandler (Option) |

Italiano

INSTALLAZIONE CONSIGLIATA

| | |
|-----------|-------------------------|
| CF | Collegamento flessibile |
| VV | Valvola di scarico |
| VA | Valvola di arresto |
| VR | Valvola di riempimento |
| MN | Manometro |

CIRCUITO IDRAULICO SYSAQUA BLUE

| | |
|----------------|--|
| FT | Filtro fine a rete (Fornito non montato) |
| EWC/LWC | Collegamento ingresso/uscita dell'acqua GAS "M" ➤ SYSAQUA BLUE 35B: 1" 1/2" |
| VE | Vaso di espansione |
| WPS | Pressostato mancanza di acqua (Opzione) |
| SS | Valvola |
| WP | Pompa |
| PA | Sfiato automatico |
| CL | Presa di pressione 1/4" |
| EWT | Sonda temperatura di ingresso dell'acqua |
| LWT | Sonda temperatura di uscita dell'acqua |
| PHE | Scambiatore a piastre |
| RAG | Resistenze antigelo |
| FS | Sensore di portata |
| WT | Serbatoio inerziale |
| VD | Valvola di scarico |
| WPT | Trasduttore di pressione idraulica (opzionale) |

Español

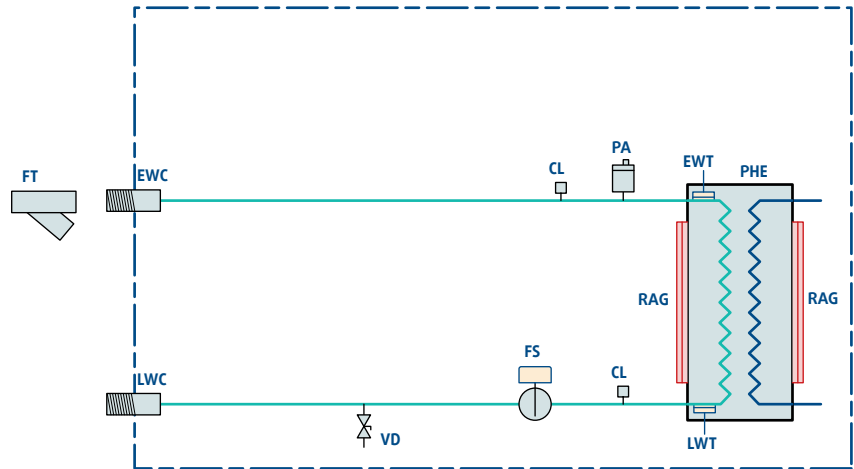
INSTALACIÓN RECOMENDADA

| | |
|-----------|--------------------|
| CF | Conexión flexible |
| VV | Válvula de vaciado |
| VA | Válvula de parada |
| VR | Válvula de llenado |
| MN | Manómetro |

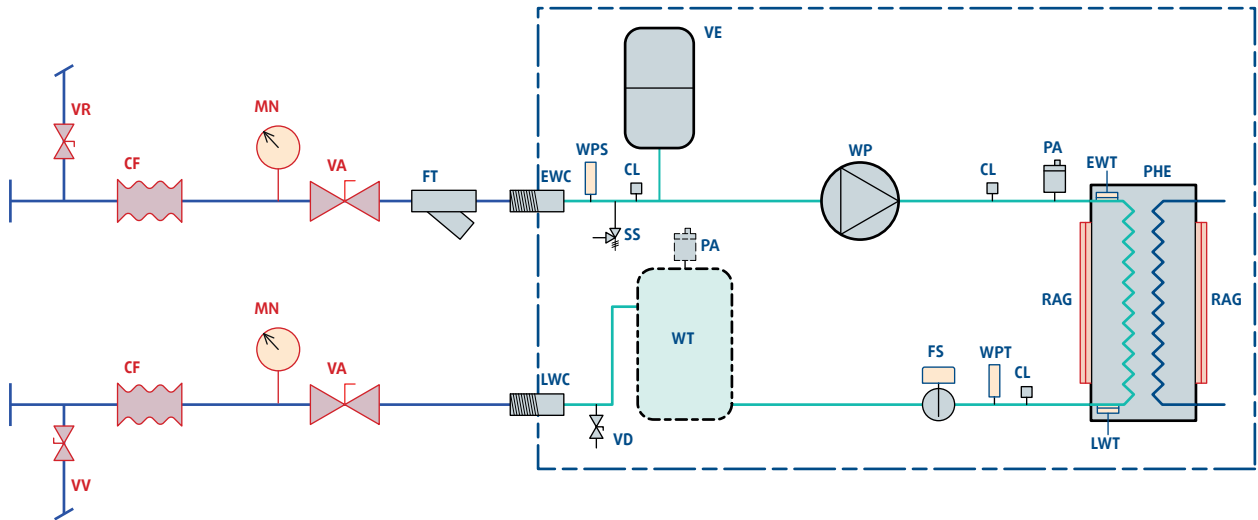
CIRCUITO HIDRÁULICO SYSAQUA BLUE

| | |
|----------------|--|
| FT | Filtro de tamiz (suministrado no montado) |
| EWC/LWC | Conexión entrada/salida de agua GAS "M" ➤ SYSAQUA BLUE 35B: 1" 1/2" |
| VE | Vaso de expansión |
| WPS | Presóstato falta de agua (opcional) |
| SS | Válvula |
| WP | Bomba |
| PA | Purgador automático |
| CL | Toma de presión 1/4" |
| EWT | Sonda de temperatura de entrada de agua |
| LWT | Sonda de temperatura de salida de agua |
| PHE | Intercambiador de placas |
| RAG | Resistencia anticongelación |
| FS | Detector de caudal |
| WT | Balón intermedio |
| VD | Válvula de vaciado |
| WPT | Transductor de presión hidráulica (opcional) |

WITHOUT PUMP



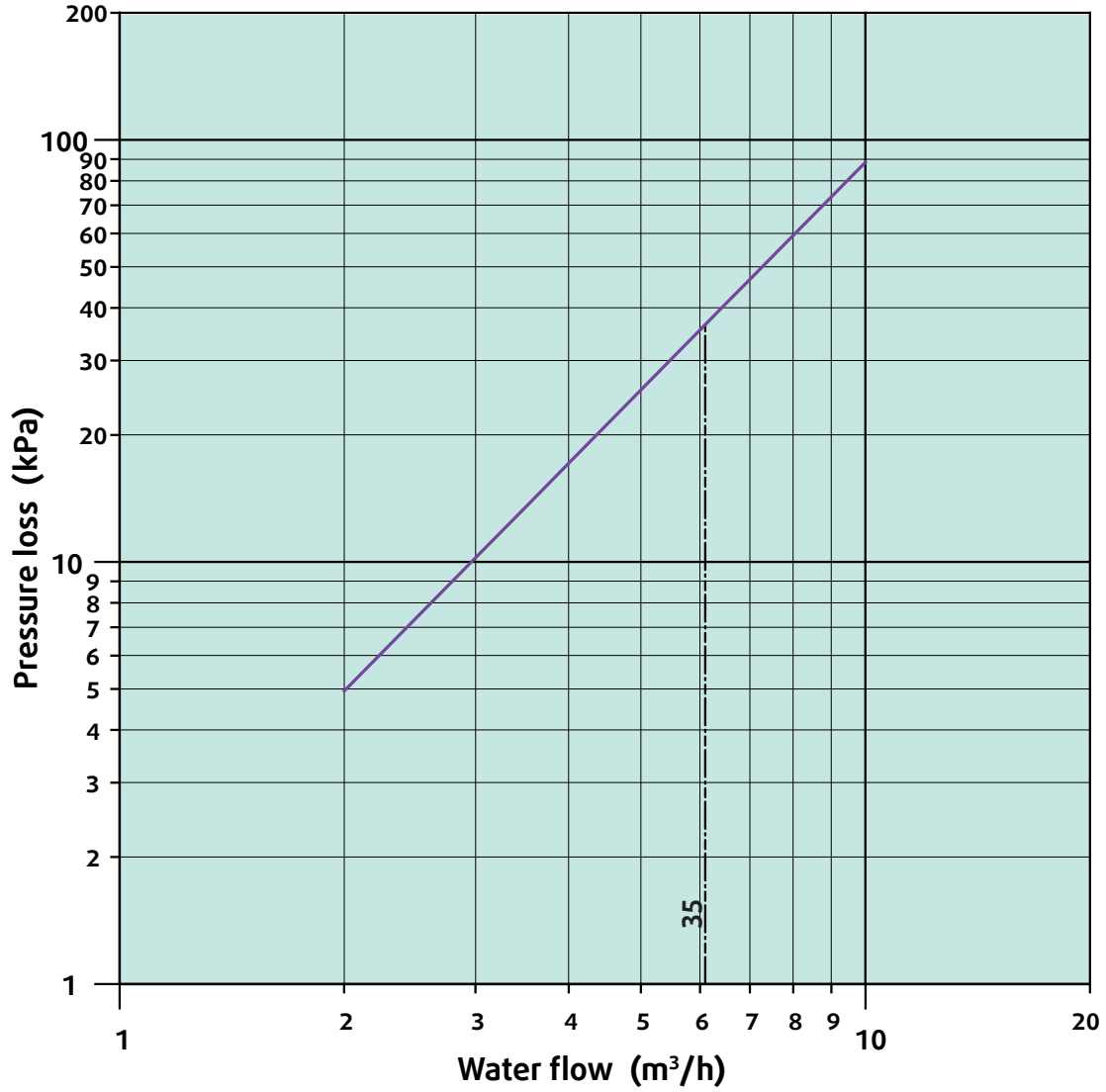
WITH 1 PUMP



APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

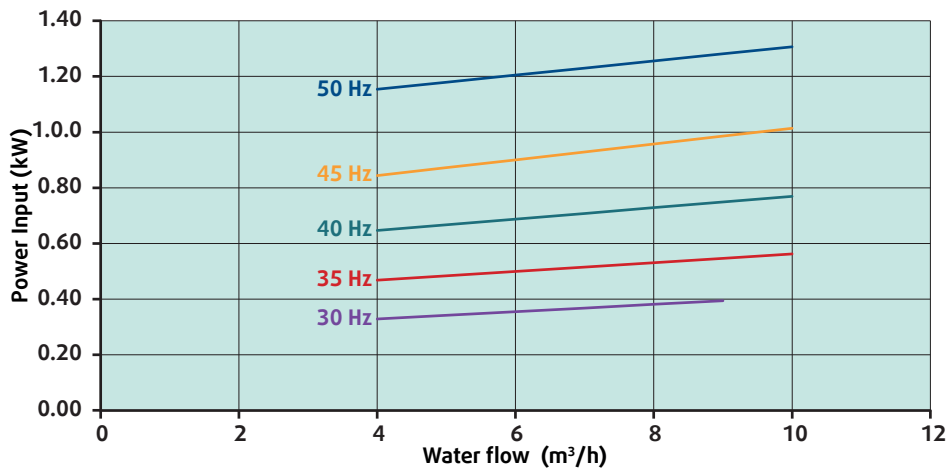
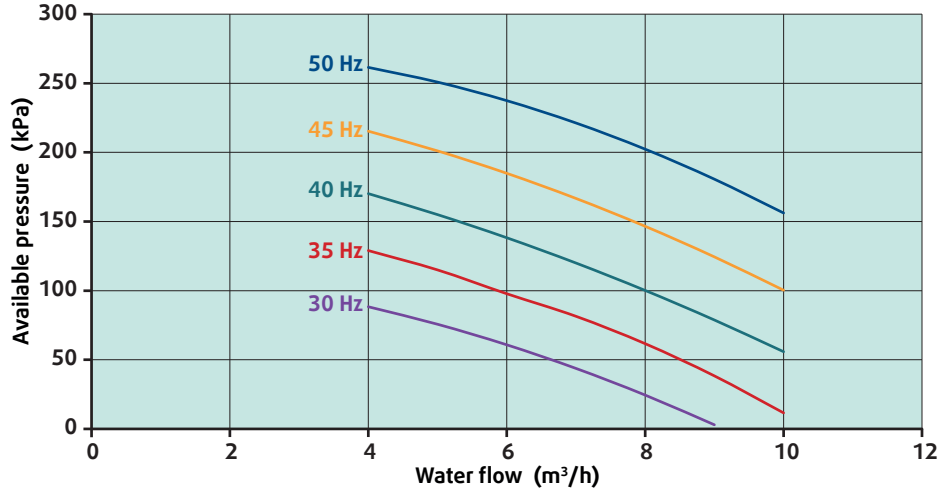
PRESSURE LOSSES OF THE PLATE HEAT EXCHANGER PERTE DE CHARGE DE L'ECHANGEUR A PLAQUES DRUCKVERLUST PLATTENWÄRMETAUSCHER PERDITA DI CARICO SCAMBIATORE A PIASTRE PÉRDIDA DE CARGA INTERCAMBIADOR DE PLACAS

SYSAQUA BLUE 35B



HYDRAULIC PUMPS CURVES
 COURBES DES POMPES HYDRAULIQUES
 KURVEN VON HYDRAULIKPUMPEN
 CURVE DELLE POMPE IDRAULICHE
 CURVAS BOMBAS HIDRÁULICAS

SYSAQUA BLUE 35B



WIRING DIAGRAM SCHEMAS ELECTRIQUES STROMLAUFPLANS SCHEMA ELETRICO ESQUEMA ELECTRICO

TAKE CARE!

These wiring diagrams are correct at the time of publication. Manufacturing changes can lead to modifications. Always refer to the diagram supplied with the product.

ATTENTION

Ces schémas sont corrects au moment de la publication. Les variantes en fabrication peuvent entraîner des modifications. Reportez-vous toujours au schéma livré avec le produit.

ACHTUNG!

Diese Stromlaufplans sind zum Zeitpunkt der Veröffentlichung gültig. In Herstellung befindliche Varianten können Änderungen mit sich bringen. In jedem Fall den mit dem Produkt gelieferten Stromlaufplan hinzuziehen.

ATTENZIONE !

Questi schemi sono corretti al momento della pubblicazione. Le varianti apportate nel corso della fabbricazione possono comportare modifiche. Far sempre riferimento allo schema fornito con il prodotto.

ATENCIÓN !

Esto esquemas son correctos en el momento de la publicación. Pero las variantes en la fabricación pueden ser motivo de modificaciones. Remítase siempre al esquema entregado con el producto.

POWER SUPPLY MUST BE SWITCHED OFF BEFORE STARTING TO WORK IN THE ELECTRIC CONTROL BOXES!

MISE HORS TENSION OBLIGATOIRE AVANT TOUTE INTERVENTION DANS LES BOITIERS ELECTRIQUES.

VOR JEDEM EINGRIFF AN DEN ANSCHLUßKÄSTEN UNBEDINGT DAS GERÄT ABSCHALTEN!

PRIMA DI OGNI INTERVENTO SULLE CASSETTE ELETTRICHE ESCLUDERE TASSATIVAMENTE L'ALIMENTAZIONE !

PUESTA FUERA DE TNESIÓN OBLIGATORIA ANTES DE CUALQUIER INTERVENCIÓN EN LAS CAJAS ELÉCTRICAS!



LEGEND

| English | Français | Deutsch | Italiano | Español |
|--------------|--|--|--|---|
| POWER SUPPLY | SCHEMAS DE PUISSANCE | LEISTUNGSPÄNE | SCHEMI DI POTENZA | ESQUEMAS DE POTENCIA |
| DESCRIPTION | DESIGNATION | BEZEICHNUNG | DENOMINAZIONE | DESCRIPCIÓN |
| QG | interrupteur sectionneur principal | Hauptschalter | interruttore principale | interruptor seccionador principal |
| X | répartiteur | Verteiler | ripartitore | repartidor |
| KA1 | module de contrôle d'ordre et de coupe de phases | Phasenabschaltungs- und reihenfolge Kontrollmodul | modulo di controllo d'ordine e di interruzione di fasi | módulo de control de orden y de corte de fases |
| FT1/2 | disjoncteurs magnétothermiques des compresseurs M1/2 | Magnétothermische Schutzschalter der Verdichter M1/2 | disgiuntori magnetotermici dei compressori M1/2 | disyuntores magnetotérmicos de los compresores M1/2 |
| K1/2 | contacteurs de puissance des compresseurs M1/2 | Leistungsschütze der Verdichter M1/2 | contattori di potenza dei compressori M1/2 | contactores de potencia de los compresores M1/2 |
| M1/2 | compresseurs 1 et 2 | Verdichter 1 und 2 | compressori 1 e 2 | compresores 1 y 2 |
| R1/2 | résistances de carter des compresseurs M1/2 | Ölsumpfeizungen der Verdichter M1/2 | resistenze del carter dei compressori M1/2 | resistencias de cárter de los compresores M1/2 |
| FTC | disjoncteur magnétothermique du circuit de commande | Magnétothermischer Schutzschalter des Steuerkreises | disgiuntore magnetotermico del circuito di comando | disyuntor magnetotérmico del circuito de comando |
| FTOF-L | outdoor fans magneto-thermal circuit breaker | Magnétothermischer Schutzschalter der externen Lüftung | disgiuntore magnetotermico della ventilazione esterna | disyuntor magnetotérmico de la ventilación exterior |
| FTOF-H | outdoor fans magneto-thermal circuit breaker | Magnétothermischer Schutzschalter der externen Lüftung | disgiuntore magnetotermico della ventilazione esterna | disyuntor magnetotérmico de la ventilación exterior |
| KOF | contacteur de puissance de la ventilation extérieure | Leistungsschütz der externen Lüftung | contattore di potenza della ventilazione esterna | contactor de potencia de la ventilación exterior |
| KOF-L | contacteur de puissance de la ventilation extérieure | Leistungsschütz der externen Lüftung | contattore di potenza della ventilazione esterna | contactor de potencia de la ventilación exterior |
| KOF-H | contacteur de puissance de la ventilation extérieure | Leistungsschütz der externen Lüftung | contattore di potenza della ventilazione esterna | contactor de potencia de la ventilación exterior |
| OF1 | moteur de la ventilation extérieure | Motor der externen Lüftung | motore della ventilazione esterna del circuito | motor de la ventilación exterior |
| QD | disjoncteur différentiel du modem 4G | FI-Schutzschalter des 4G-Modems | salvavita del modem 4G | Disyuntor diferencial del módem 4G |
| FTT | disjoncteur | Schutzschalter | salvavita | Disyuntor |
| PC | prise électrique | Steckdose | presa elettrica | toma de corriente |

APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

| English | Français | Deutsch | Italiano | Español |
|------------------------|--|---|--|---|
| CONTROL AND REGULATION | SCHEMAS DE COMMANDE | STUERPLÄNE | SCHEMI DI COMANDO | ESQUEMAS DE COMANDO |
| DESCRIPTION | DESIGNATION | BEZEICHNUNG | DENOMINAZIONE | DESIGNACIÓN |
| POL698.10 | regulation | Regelung | regolazione | regulación |
| T1 | transformer 230V/24V-25VA | Transformator 230V/24V-25VA | trasformatore 230V/24V-25VA | transformador 230V/24V-25VA |
| FFT | fuse terminal + fuse 1A | borne fusible + fusible 1A | Sicherungsklemme + Sicherung 1A | terminal de fusible + fusible 1A |
| FT1/2 | 1 and 2 compressors additional magneto-thermal circuit breaker | contacts additionnels disjoncteur magnétothermique des compresseurs 1 et 2 | Zusätzliche Kontakte des magnétothermischen Schutzschalters der Verdichter 1 und 2 | contactos adicionales disyuntor magnetotérmico de los compresores 1 y 2 |
| FTOF-L | outdoor fans additional magneto-thermal circuit breaker | contact additionnel disjoncteur magnétothermique de la ventilation extérieure | Zusätzlicher Kontakt des magnétothermischen Schutzschalters der externen Lüftung | contacto adicional disyuntor magnetotérmico de la ventilación exterior |
| FTOF-H | outdoor fans additional magneto-thermal circuit breaker | contact additionnel disjoncteur magnétothermique de la ventilation extérieure | Zusätzlicher Kontakt des magnétothermischen Schutzschalters der externen Lüftung | contacto adicional disyuntor magnetotérmico de la ventilación exterior |
| FOF1/2 | outdoor fans motors internal protection | sécurité interne du moteur de la ventilation extérieure | Eingebauter Wärmeschutzschalter des Motors der externen Lüftung | seguridad interna del motor de la ventilación exterior |
| FS | flow switch | détecteur de débit d'eau (flow switch) | Strömungswächter (flow switch) | detectador de caudal de agua (flow switch) |
| WPS | water low pressure switch (option) | pressostat manque d'eau (option) | Wassermangel-Druckwächter (Option) | presostato falta de agua (opcional) |
| HP | automatic reset high-pressure pressostats | pressostat haute pression à réarmement automatique. | Überdruckwächter mit automatischer Wiedereinschaltung | presostato alta presión con rearme automático |
| K1/2 | M1/2 compressors power circuit contactor | contacteurs de puissance des compresseurs M1/2 | Leistungsschütze der Verdichter M1/2 | contactores de potencia de los compresores M1/2 |
| RAG | antifreeze electric heater | résistance anti-gel | Frostschutz-Widerstand | resistencia anticongelación |
| RV1 | 4-way cycle changeover valves (option) | vanne d'inversion de cycle (option) | Umkehrzyklusventil (Option) | válvula de inversión de ciclo (opcional) |
| KA1 | three-phase network control contactor | contact du module de contrôle d'ordre et de coupure de phases | Kontakt des Phasenabschaltungs- und reihenfolge Kontrollmoduls | contacto del módulo de control de orden y de corte de fases |
| FPE | pressure transducer (low pressure) | transducteur de pression (basse pression) | Druckwandler (Niederdruck) | transductor de presión (baja presión) |
| FPC | pressure transducer (high-pressure) | transducteur de pression (haute pression) | Druckwandler (Hochdruck) | transductor de presión (alta presión) |
| OCT | de-icing temperature probe | sonde de température de batterie ailetée | Temperaturfühler der verrippten Batterie | sonda de temperatura de batería con aletas |
| OAT | outdoor temperature probe (air) | sonde de température extérieure (air) | Außentemperaturfühler (Luft) | sonda de temperatura exterior (aire) |
| CDT | high discharge temperature probe | sonde de température de refoulement | Auslass-Temperaturfühler | sonda de temperatura de descarga |
| EWT | inlet water temperature probe | sonde de température d'entrée d'eau | Wassereintritt-Temperaturfühler | sonda de temperatura de entrada de agua |

| | English | Français | Deutsch | Italiano | Español |
|-------------|-----------------------------------|---------------------------------------|---|---|---|
| | CONTROL AND REGULATION | SCHEMAS DE COMMANDE | STEUERPLÄNE | SCHEMI DI COMANDO | ESQUEMAS DE COMANDO |
| | DESCRIPTION | DESIGNATION | BEZEICHNUNG | DENOMINAZIONE | DESIGNACIÓN |
| LWT | outlet water temperature probe | sonde de température de sortie d'eau | Wasseraustritt-Temperaturfühler | sonda di temperatura di uscita dell'acqua | sonda de temperatura de salida de agua |
| SM1 | ON/OFF switch | interrupteur marche/arrêt | Ein-/Aus-Schalter | interruttore on/off | interruptor funcionamiento/parada |
| SD/N | switch day / night (not supplied) | interrupteur jour/nuit (non fourni) | Tag-/Nacht-Schalter (nicht mitgeliefert) | interruttore giorno/notte (non fornito) | interruptor día/noche (no suministrado) |
| RC | gas detection module | module de détection de gaz | Gasdetektionsmoduls | modulo di rilevamento gas | módulo de detección de gas |
| RC-K1 | safety fan relay | relais du ventilateur de sécurité | Relais des Sicherheitsventilators | relè del ventilatore di sicurezza | relé del ventilador de seguridad |
| RC-K2 | internal alarm dry contact | contact sec de l'alarme interne | Potentialfreier Kontakt für interne Alarmmeldung | contatto libero dell'allarme interno | contacto seco de la alarma interna |
| RC-K3 | external alarm dry contact | contact sec de l'alarme externe | Potentialfreier Kontakt für externe Alarmmeldung | contatto libero dell'allarme esterno | contacto seco de la alarma externa |
| RC-K4 | compressor cut-off dry contact | contact sec de la coupure compresseur | Potentialfreier Kontakt zur Abschaltung des Verdichters | contatto libero arresto compressore | contacto seco del corte compresor |
| R290 sensor | R290 detector | capteur de détection R290 | Gaswarnsensor für R290 | senso di rilevamento R290 | sensor de detección R290 |
| ADJ | potentiometer | potentiomètre | Potentiometer | potenziometro | potenciómetro |
| FDP | fan differential pressure | pression différentiel ventilateur | Differenzdruck am Ventilator | pressione differenziale ventilatore | presión diferencial del ventilador |
| MV | safety fan | ventilateur de sécurité | Sicherheitsventilator | ventilatore di sicurezza | ventilador de seguridad |

APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

| English | Français | Deutsch | Italiano | Español |
|-------------|--|--|---|--|
| OPTIONS | OPTIONS | OPTIONEN | OPZIONI | OPCIONES |
| DESCRIPTION | DESIGNATION | BEZEICHNUNG | DENOMINAZIONE | DESIGNACIÓN |
| OPTION PUMP | OPTION POMPE | OPTION PUMPE | OPZIONE POMPA | OPCIÓN BOMBA |
| WP1 | pompe hydraulique | Wasserpumpe | pompa idraulica | bomba hidráulica |
| KWP1 | contacteur de puissance du moteur de la pompe hydraulique (option) | Leistungsschutz des Wasserpumpenmotors (Option) | contattore di potenza del motore della pompa idraulica (opzionale) | contactor de potencia del motor de la bomba hidráulica (opcional) |
| FTWP | disjoncteur magnétothermique du moteur de la pompe hydraulique (option) | Magneothermischer Schutzschalter des Wasserpumpenmotors (Option) | disgiuntore magnetotermico del motore della pompa idraulica (opzionale) | disyuntor magnetotérmico del motor de la bomba hidráulica (opcional) |
| ACS3 | variateur de fréquence triphasé du moteur de la pompe hydraulique (option) | Drehstrom-Frequenzumrichter der Wasserpumpenmotors (Option) | variatore di frequenza trifase del motore della pompa idraulica (opzionale) | variador de frecuencia trifásico del motor de la bomba hidráulica (opcional) |
| WPT | transducteur de pression hydraulique (option) | Druckwandler (Option) | trasduttore di pressione idraulica (opzionale) | transductor de presión hidráulica (opcional) |
| | OPTION TOUTES SAISONS | OPTION GANZJAHRESBETRIEB | OPZIONE TUTTE LE STAGIONI | OPCIÓN TODAS LAS ESTACIONES DEL AÑO |
| FTOF1/2 | magneothermal circuit breaker | Magneothermischer Schutzschalter | disgiuntore magnetotermico | disyuntor magnetotérmico |
| ACS1/2 | three phase frequency variator of outside ventilation | Drehstrom-Frequenzumrichter der Motoren der externen Lüftung | variatore di frequenza trifase della ventilazione esterna | variador de frecuencia trifásico de los motores de la ventilación exterior |
| KOF1 | three phase frequency variator command relay | Steuerrelais der Drehstrom-Frequenzumrichter | relè di comando dei variatori di frequenza trifase | relé de comando de los variadores de frecuencia trifásicos |
| | OPTION SOFT STARTER | OPTION SOFT STARTER | OPZIONE SOFT STARTER | OPCIÓN SOFT STARTER |
| S,ST1/2 | démarreurs «Soft Starter» | Anlasser «Soft Starter» | motorini di avviamento «Soft Starter» | Motor de arranque «Soft Starter» |
| K1/2 | relais des compresseurs M1/2 | Relais der Verdichter M1/2 | relè dei compressori M1/2 | relé de los compresores M1/2 |
| | NORDIC OPTION | NORDISCHE OPTION | OPZIONE NORDICA | OPCIÓN NÓRDICO |
| TBC | thermostat electric heater | Temperaturregler des Frostschutz-Widerstand | termostato resistenze vasche | termostato resistencia anticongelación |
| RBC | antifreeze electric heater | Frostschutz-Widerstand | resistenza vasca | resistencia anticongelación |

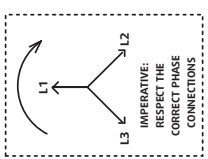
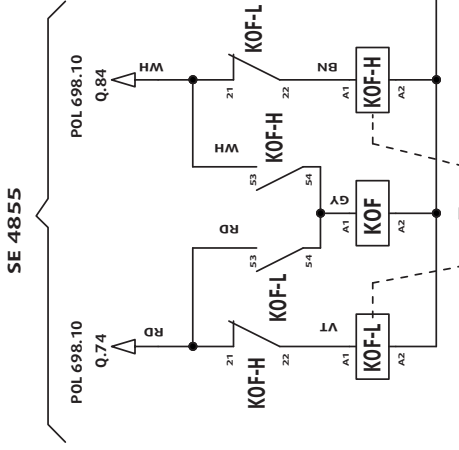
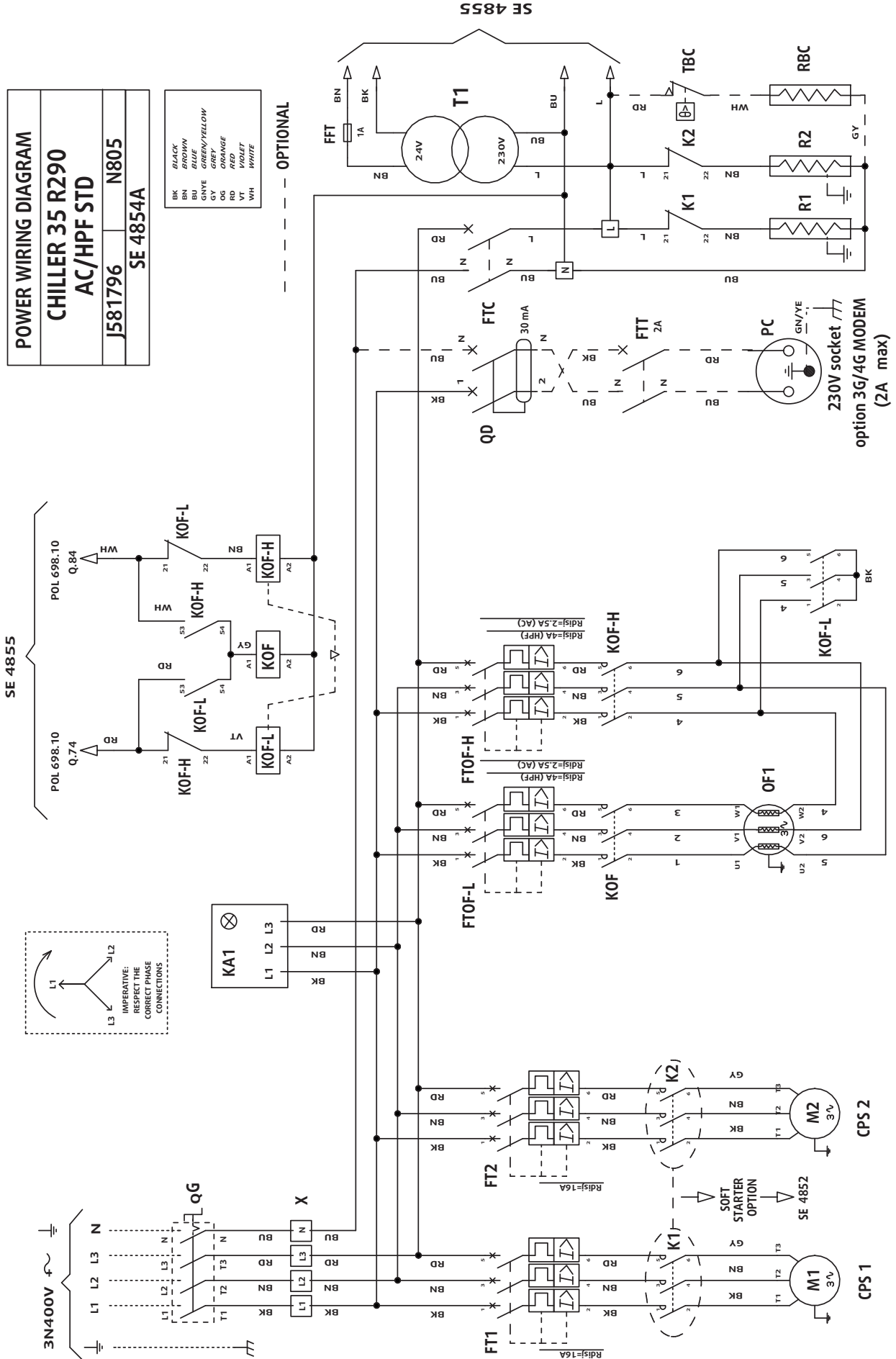
APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

POWER

| | |
|-----------------------------|-------------|
| POWER WIRING DIAGRAM | |
| CHILLER 35 R290 | |
| AC/HPF STD | |
| J581796 | N805 |
| SE 4854A | |

| | |
|------|--------------|
| BK | BLACK |
| BN | BROWN |
| BU | BLUE |
| GNVE | GREEN/YELLOW |
| GY | GREY |
| RD | ORANGE |
| RD | RED |
| VT | VIOLLET |
| WH | WHITE |

OPTIONAL



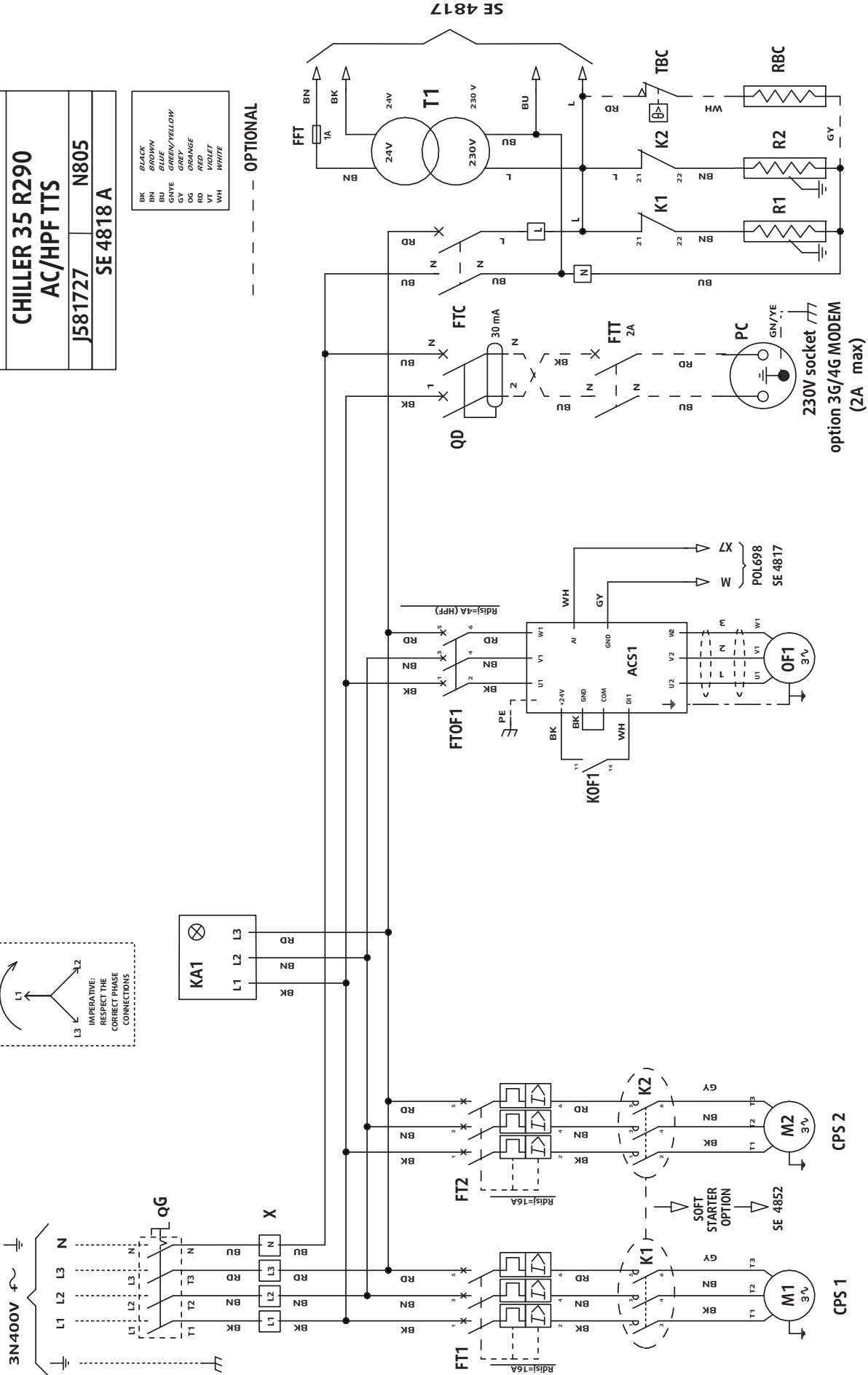
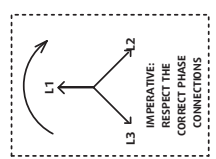
APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

TTS - POWER

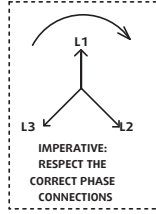
| | |
|-----------------------------|-------------|
| POWER WIRING DIAGRAM | |
| CHILLER 35 R290 | |
| AC/HPF TTS | |
| J581727 | N805 |
| SE 4818 A | |

| | |
|----|--------------|
| BK | BLACK |
| BN | BROWN |
| BU | BLUE |
| GV | GREEN/YELLOW |
| GY | YELLOW |
| OR | ORANGE |
| RD | RED |
| VT | VIOLET |
| WH | WHITE |

OPTIONAL

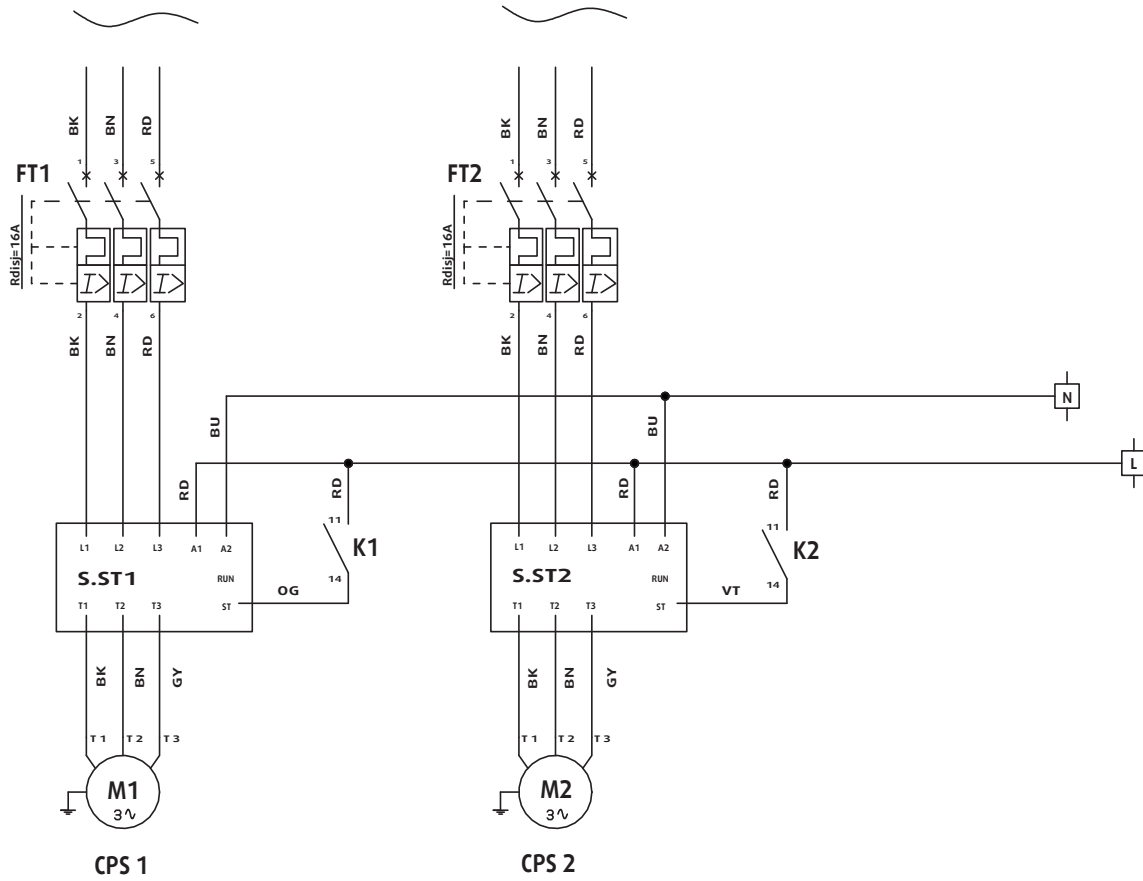


SOFT STARTER



| | |
|------|--------------|
| BK | BLACK |
| BN | BROWN |
| BU | BLUE |
| GNYE | GREEN/YELLOW |
| GY | GREY |
| OG | ORANGE |
| RD | RED |
| VT | VIOLET |
| WH | WHITE |

| | |
|----------------------|------|
| POWER WIRING DIAGRAM | |
| CHILLER 35 R290 | |
| SOFT STARTER OPTION | |
| J581795 | N805 |
| SE 4852 A | |

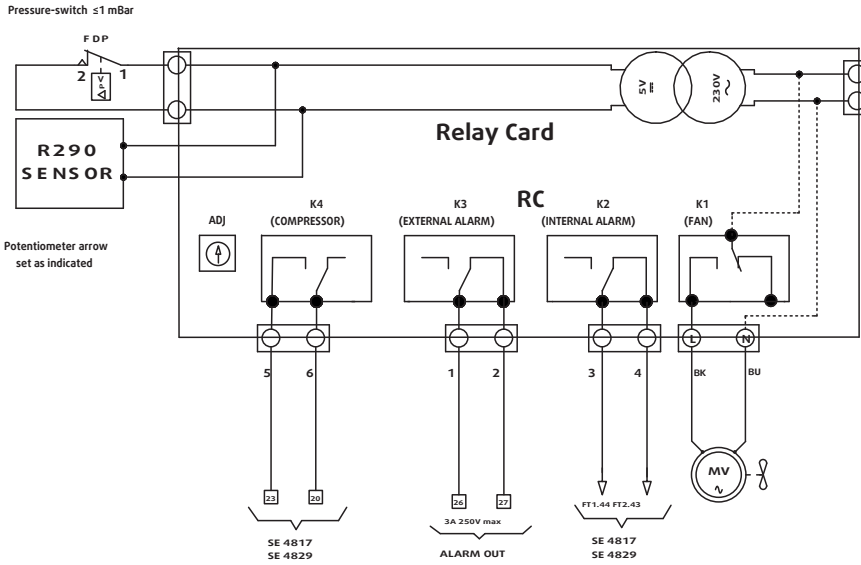
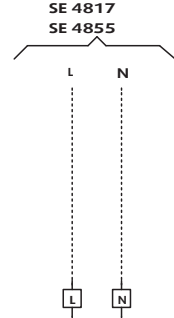


APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

GAS DETECTION MODULE

| | |
|------|--------------|
| BK | BLACK |
| BN | BROWN |
| BU | BLUE |
| GNVE | GREEN/YELLOW |
| GY | GREY |
| OG | ORANGE |
| RD | RED |
| VT | VIOLET |
| WH | WHITE |

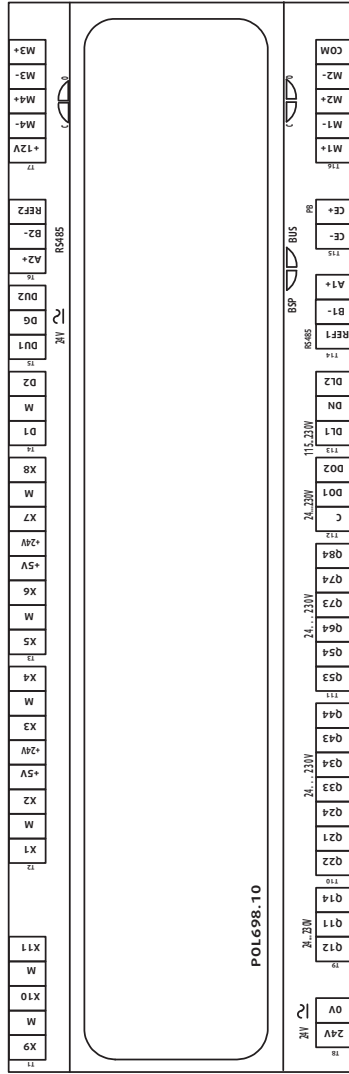
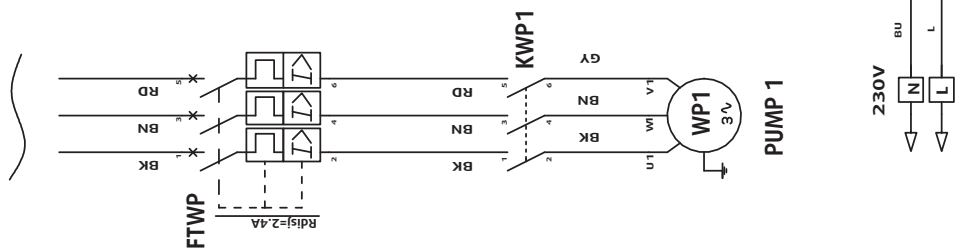
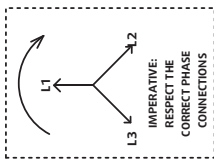
| | |
|----------------------|------|
| POWER WIRING DIAGRAM | |
| CHILLER 35 R290 | |
| GAS DETECTION MODULE | |
| SE 4825 D | N805 |
| J581731 | |



FIXED SPEED SIMPLE PUMP

| | |
|---------------------------------|-------------|
| POWER WIRING DIAGRAM | |
| CHILLER 35 R290 | |
| SIMPLE POMPE FIXED SPEED | |
| J581798 | N805 |
| SE 4853 A | |

| | |
|------|--------------|
| BK | BLACK |
| BN | BROWN |
| BU | BLUE |
| GNYE | GREEN/YELLOW |
| GY | GREY |
| OG | ORANGE |
| RD | RED |
| VT | VIOLET |
| WH | WHITE |

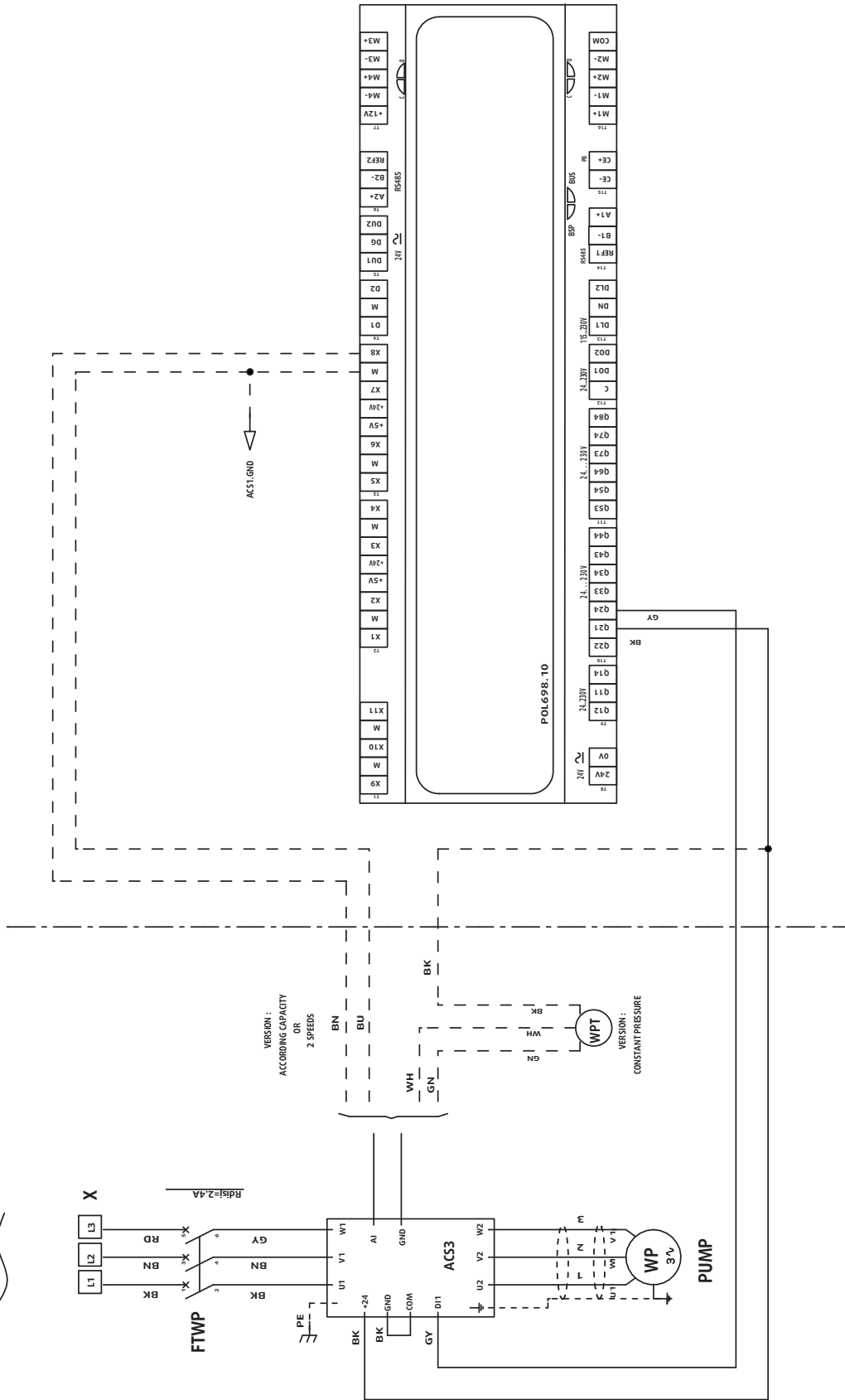
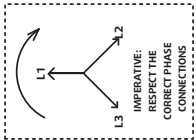


APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

VARIABLE FLOW SIMPLE PUMP

| | |
|-----------------------------|-------------|
| POWER WIRING DIAGRAM | |
| CHILLER 35 R290 | |
| VARIABLE FLOW SIMPLE | |
| PUMP OPTION | |
| J581794 | N805 |
| SE 4851B | |

| | |
|----|--------------|
| BK | BLACK |
| BN | BROWN |
| BN | BROWN |
| GN | GREEN/YELLOW |
| GY | GREY |
| OG | ORANGE |
| RD | RED |
| WH | WHITE |
| WH | WHITE |



APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

START UP FORM / FICHE DE MISE EN SERVICE

CUSTOMER INFORMATION:

Order number: Job name:

Contractor: Installation address:

Contact: ☎:

INSTALLER INFORMATION:

Company: Address:

Contact: ☎:

COMMISSIONING INFORMATION:

Company: Address:

Contact: ☎:

UNIT IDENTIFICATION:

35B

SYSAQUA BLUE.L

SYSAQUA BLUE.H

Unit serial number:

| | | | | | | | | |
|-------------|-----|----|-----------------|-----|----|--------------|-----|----|
| | YES | NO | | YES | NO | | YES | NO |
| Simple pump | | | All seasons kit | | | XLN | | |
| Buffer tank | | | HPF | | | Soft Starter | | |

Compressor 1 serial number: Compressor 2 serial number:

INSTALLATION CHECKING:

| | YES | NO | | YES | NO |
|---|-----|----|---|-----|----|
| Recommended free clearance | | | Water connection, cleaning, rinsing, air bleed | | |
| Level installation | | | Anti-frost protection of the water loop | | |
| Unit correctly mounted on supplied dampers | | | Installation thermal load reaches at least 50% | | |
| Power supply compatible with unit specifications | | | Mesh filter at the inlet of the unit | | |
| State-of-art power cable section and wiring to the unit | | | Minimum water flowrate available | | |
| Ground cable is wired | | | Flowswitch cut-out checked | | |
| Main electrical protection suits the unit | | | Crankcases heaters are energized since 12 hours | | |
| All electrical connections are correctly tightened | | | | | |
| Ground continuity on all pipes | | | | | |

OBSERVATIONS:

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APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

INSTALLATION MEASUREMENTS:

Ambient temperature: Ambient humidity:

ELECTRICAL MEASUREMENTS:

Voltage L1-N: Voltage L1-L2::

Voltage L1-L3: Voltage L2-L3::

Voltage unbalance less than 2 % YES NO

Never start the unit if the voltage unbalance is over 2 %. Please, contact your electricity supplier for help.

| | VOLTAGE | | | NOMINAL CURRENT | | |
|---------|---------|-------|-------|-----------------|----|----|
| | L1-L2 | L1-L3 | L2-L3 | L1 | L2 | L3 |
| Comp. 1 | | | | | | |
| Comp. 2 | | | | | | |
| Fan 1 | | | | | | |
| Pump 1 | | | | | | |

THERMODYNAMICS MEASUREMENTS:

| | | | | |
|------------------------------|-----|-----|-----|-----|
| % of capacity | % | % | % | % |
| Evaporating pressure | bar | bar | bar | bar |
| Evaporating temperature | °C | °C | °C | °C |
| Suction temperature | °C | °C | °C | °C |
| Condensing pressure | bar | bar | bar | bar |
| Condensing temperature | °C | °C | °C | °C |
| Liquid line temperature | °C | °C | °C | °C |
| Discharge temperature | °C | °C | °C | °C |
| High pressure switch cut-out | bar | bar | bar | bar |

HYDRAULICS MEASUREMENTS:

| | | | |
|------------------------|-----|--------------------------------|-----|
| Inlet temperature | °C | Vmax (VARIABLE PRIMARY FLOW) | % |
| Outlet temperature | °C | Vmin (VARIABLE PRIMARY FLOW) | % |
| BPHE inlet pressure | kPa | Vstdby (VARIABLE PRIMARY FLOW) | % |
| BPHE outlet pressure | kPa | Water pressure setpoint | bar |
| Glycol type & contents | % | | |

REMARKS:

.....

| |
|------------|
| Date: |
| TECNICIAN: |
| Name: |
| Sign-in: |

| |
|----------|
| Date: |
| CLIENT: |
| Name: |
| Sign-in: |

As part of our ongoing product improvement programme, our products are subject to change without prior notice. Non contractual photos.

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IOM AQA 06-N-1GB
Part number : **J581813GB**
Supersedes : **None**