Installation and maintenance manual

SYSAQUA BLUE

35B

Air Cooled Water Chillers and Heat Pumps

R290

35.4kW

31.7kW

CE UK CA

INSTALLATION INSTRUCTION — English

NOTICE D'INSTALLATION — Français

INSTALLATIONSHANDBUCH — Deutsch

ISTRUZIONI INSTALLAZIONE — Italiano

INSTRUCCIONES DE INSTALACIÓN — Español

English

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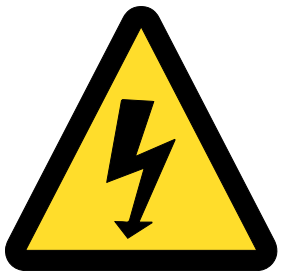


POWER SUPPLY MUST BE SWITCHED OFF BEFORE STARTING WORK IN THE ELECTRIC CONTROL BOX

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/m³ - 8 hours	4000 ppm - 15 minutes 7200 mg/m³ - 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 (CO2), 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 50 °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. TECHNICAL SUPPORT AND AFTER-SALES SERVICE HOTLINE

For technical questions, work under warranty, commissioning, a manufacturer's visit or repair quotations.

Our technical support and after-sales service hotline can be reached on:

- (0)891 700 407 in France
- support@systemair.fr for export customers

5. PRESENTATION

The **SYSAQUA BLUE** units 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 in the factory:

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 the unit outlet at temperatures varying from +5°C to +18°C or chilled water/glycol solution at temperatures varying from +18°C to -15°C.

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

6. CONTENTS OF PACKAGE

1 **SYSAQUA BLUE**

1 Water filter

1 Bag with the documentation

6.1. OPTIONAL ACCESSORIES

Anti-vibration rubber pads

Spring pads

Isolating valve

Lack of water pressure switch

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

Caution

The packaging around the SYSAQUA BLUE unit must be opened in an outdoor area in case any refrigerant has leaked out in transit.

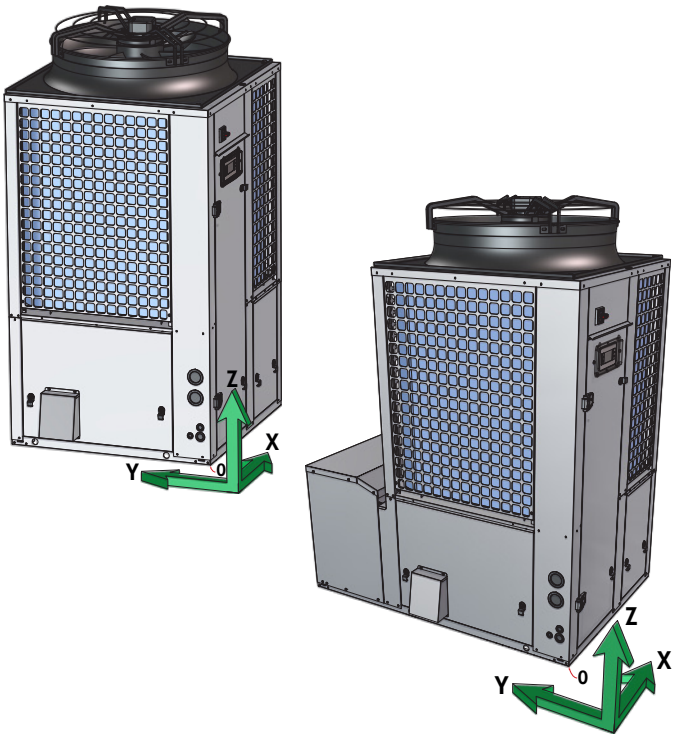
7. DIMENSIONS

SEE APPENDIX

8. HANDLING

8.1. NET WEIGHT

		35B
Without pump	kg	307
1 pump	kg	20
Buffer tank	Kg	65



8.2. GRAVITY CENTER POSITION

8.2.1. WITHOUT BUFFER TANK

		35B
X_G	mm	496
Y_G	mm	498
Z_G	mm	695

8.2.2. WITH BUFFER TANK

		35B
X_G	mm	593
Y_G	mm	681
Z_G	mm	548

8.3. 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

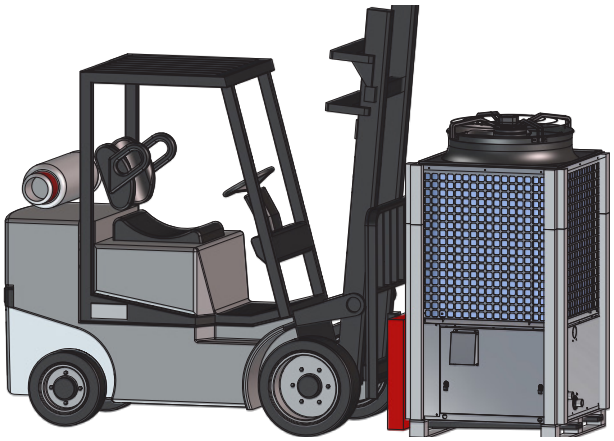
Never move the **SYSAQUA BLUE** on rollers.

Caution

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

8.3.1. HANDLING WITH A FORKLIFT

A forklift can be used to handle the **SYSAQUA 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.

8.3.2. 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.

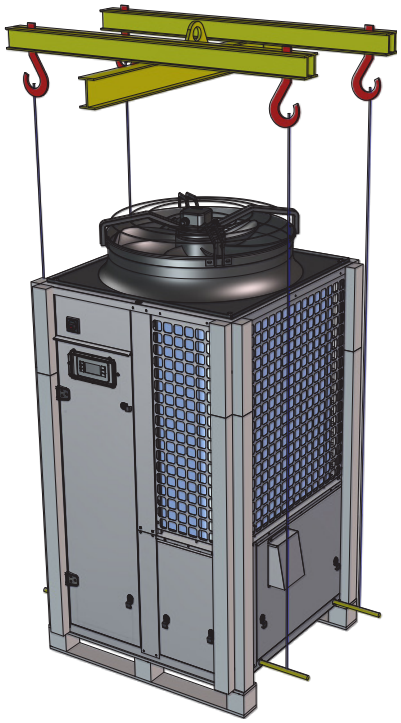
A spreader must be used to prevent damage to the machine edges.

		35B
Hole diameter	mm	30

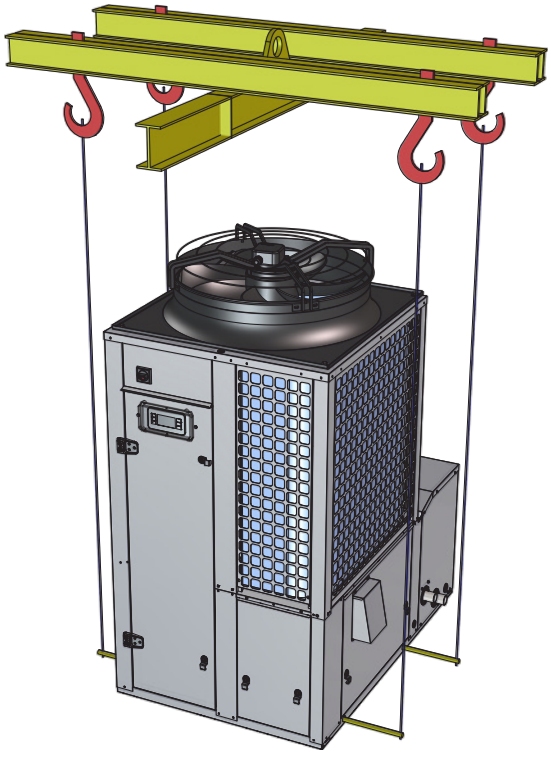
Caution

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

SYSAQUA BLUE 35B



SYSAQUA BLUE 35B
WITH BUFFER TANK



9. TECHNICAL SPECIFICATIONS

9.1. MODELS DESIGNATION

SYSAQUA35B . H . 1P-SP . STD . SYS . AC . + . CG . T

(1) (2) (3) (4) (5) (6) (7) (7)

REP.		Description			
1	Size	**SYSAQUA35B** : size 35			
2	Version	**L** : Cooling only		**H** : Heat pump	
3	Hydraulic circuit	Empty : Without pump		**1P-SP** : Single pump	
4	Regulation	**STD** : Standard		**FSC** : All seasons	
5	Brand	**SYS** : Systemair			
6	Fan type	**AC** : Standard fan AC motor		**HPF** : High pressure fan	
7	Option	**CG** : Outdoor coil protection grid **EPO** : Finned coil treatment - epoxy **WPS** : Low water pressure sensor **AVS** : Spring damper **AVM** : rubber pads **VI** : Water isolation valves **T** : Buffer tank		**SS** : Soft Starter **NORD** : Pack nordic **V2** : Variable pump double speed **VP** : Variable pump constant outlet pressure **4G** : 4G modem	

The product plate on the device shows the full model reference number and should be used to check that the actual unit matches the model ordered. It also provides the following information:

- General information
  - ✔ serial number
  - ✔ year of manufacture
  - ✔ IP index
- Electrical information
  - ✔ supply voltage
  - ✔ maximum operating current
  - ✔ starting current
- Thermodynamic circuit information
  - ✔ type of refrigerant
  - ✔ refrigerant charge in each circuit
  - ✔ Service pressure of refrigeration circuit
  - ✔ refrigeration circuit service temperatures
- Hydraulic circuit information
  - ✔ nominal water flow
  - ✔ maximum water pressure

9.2. PHYSICAL CHARACTERISTICS

					35B
Supply voltage					400V / 3~ N / 50Hz +/- 10%
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	5.55
			minimum		3.50
			maximum		9.27
		Water pressure losses		kPa	19
Heat Pump	Cooling mode	water flow	nominal	m^3/hr	5.55
			minimum		3.50
			maximum		9.27
		Water pressure losses		kPa	19
	Heating mode	water flow	nominal	m^3/hr	6.16
			minimum		3.88
			maximum		10.29
		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 the NF EN ISO 3744 - 2012 method of measurement, using an environmental correction coefficient K_2 of less than 0.5 dB.

9.3. REFRIGERATION SPECIFICATIONS

9.3.1. REFRIGERANT CIRCUIT DIAGRAM

SEE APPENDIX

9.3.2. 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

In compliance with Directive PED 2014/68/EU and harmonized standard EN378 (1 to 4), these **SYSAQUA BLUE** units are classed as category 2.

9.4. ELECTRIC SPECIFICATIONS

9.4.1. SYSAQUA BLUE WITH STANDARD FAN

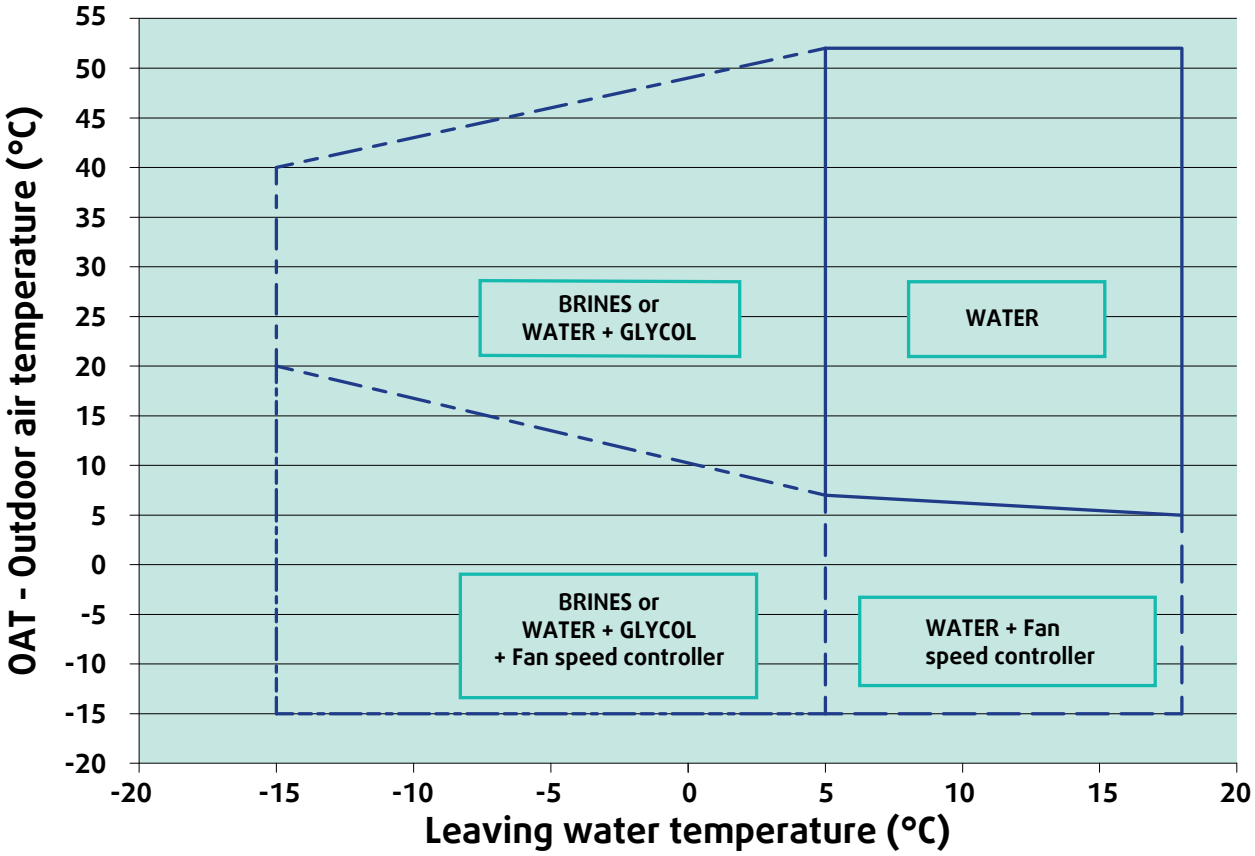
			35B
Power supply			400V / 3~ N / 50Hz +/- 10%
Without pump	Maximum current	A	34.3
	Total starting current (without soft starter)	A	120.4
	Total starting current (with soft starter)	A	55.0
With pump	Maximum current	A	36.9
	Total starting current (without soft starter)	A	123.0
	Total starting current (with soft starter)	A	57.6

9.4.2. SYSAQUA BLUE WITH HIGH-PRESSURE FAN

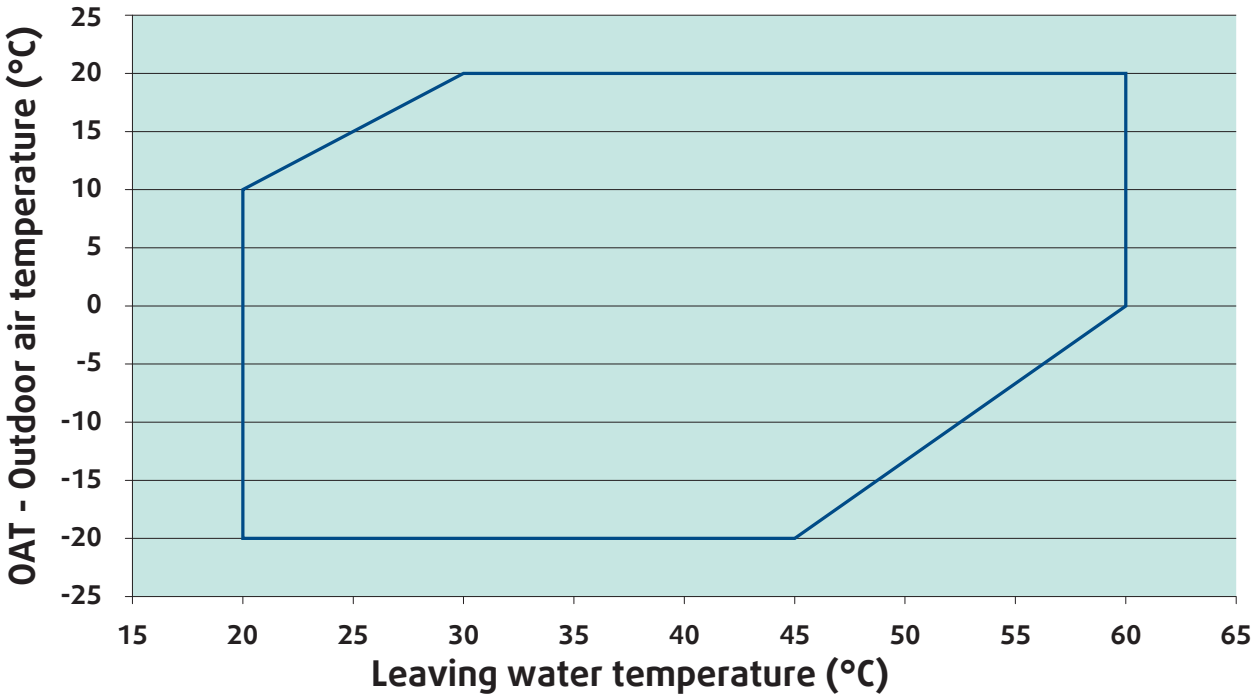
			35B
Power supply			400V / 3~ N / 50Hz +/- 10%
Without pump	Maximum current	A	36.0
	Total starting current (without soft starter)	A	122.1
	Total starting current (with soft starter)	A	56.7
With pump	Maximum current	A	38.6
	Total starting current (without soft starter)	A	124.7
	Total starting current (with soft starter)	A	59.3

9.5. OPERATING LIMITS

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



9.5.2. SYSAQUA BLUE.H HEATING MODE



10. 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.

10.1. 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.

Refrigeration systems installed in the open air must be positioned in such a way that no leak of refrigerant can enter the building or endanger persons or property. The refrigerant must not be able to spread to a ventilation duct, under a door, hatch or similar opening in the event of a leak. When a shelter is provided for refrigerating equipment installed in the open air, that shelter must be equipped with a natural or forced ventilation device.

A room where a least one of the longer walls is open to the outside air by means of louvers with a free area of 75% and occupying at least 80% of the wall (or equivalent, if more than one wall is open to the outside air) is considered to be in the open air.

Information

The **SYSAQUA BLUE** can also be installed in a machine room in accordance with local and national regulations, and subject to the requirements of EN 378-3:2016. This regulation also applies to machines installed outside where any release of refrigerant may stagnate.

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.

10.1.1. 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.

10.1.2. 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°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).

10.1.3. 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:

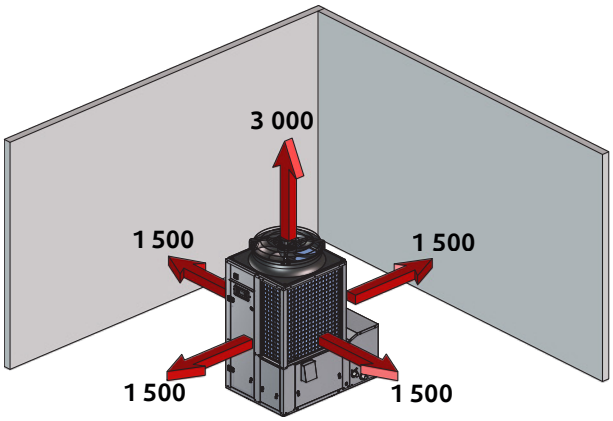
- Do not install the unit in enclosed or confined yards, narrow locations where noise may bounce off walls.
- Install the rubber pads supplied or anti-vibration pads (available as an option) under the appliance.
- Do not join the concrete slab supporting the appliance to the building structure (structure-borne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

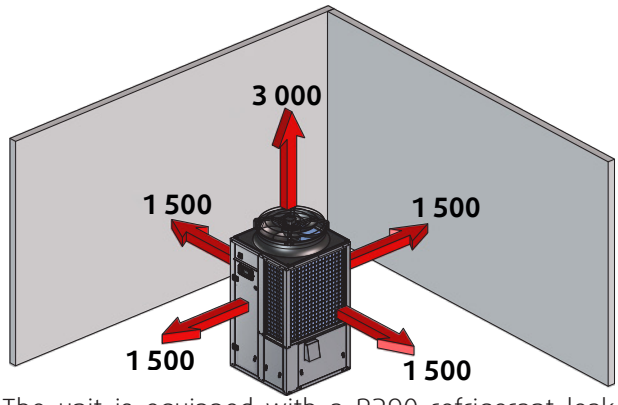
Information

The operator must ensure that hearing protection (PPE and CPE) is properly implemented in the event of prolonged work near the unit.

10.2. 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

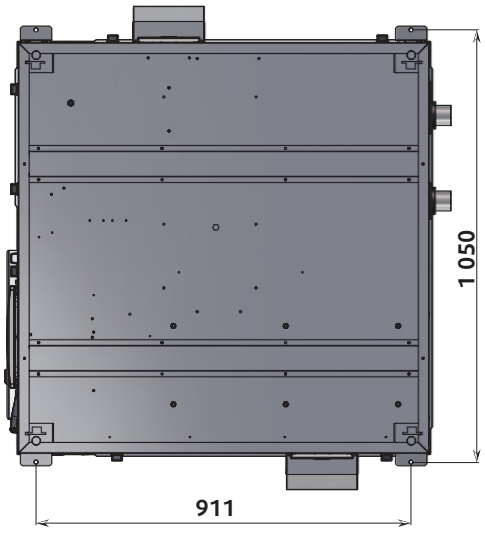
When several **SYSAQUA BLUE** units are installed, ensure proper clearance is implemented around the condensers specific to each machine.

10.3. ANCHORING TO THE GROUND

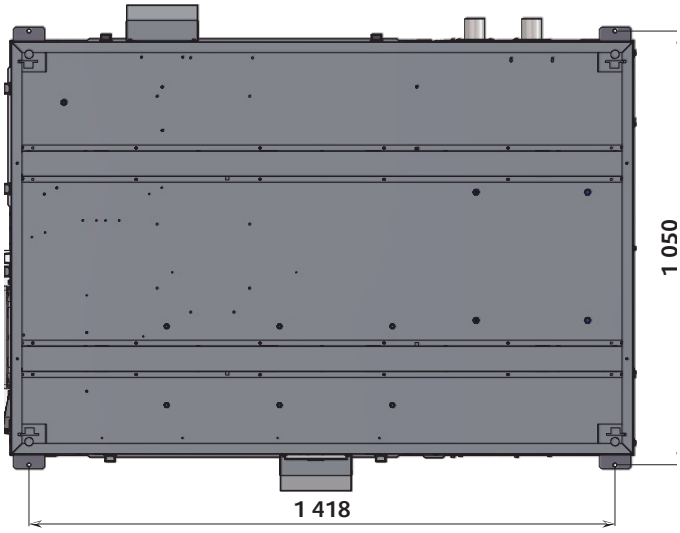
The surface of the floor or structure located under the **SYSAQUA BLUE** must be flat, and strong enough to withstand the unit's weight with its full liquid load, in addition to the occasional presence of maintenance equipment.

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.

11. HYDRAULIC LINKS

Caution

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

11.1. 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 capable of guaranteeing the flow required for **SYSAQUA BLUE** unit operation, in the event that one is not fitted.
- 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

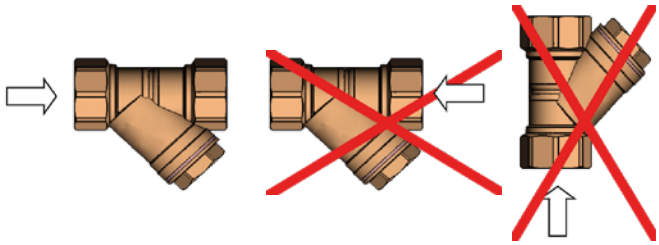
THE WARRANTY DOES NOT COVER DAMAGE DUE TO CORROSION RESULTING FROM ELECTROLYTIC PHENOMENA.

11.2. 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

11.3. 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

11.3.1. 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

11.3.2. SYSAQUA BLUE HEAT PUMP VERSION

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

11.4. 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 option is:

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

11.5. 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...).

11.6. FROST PROTECTION

If the **SYSAQUA BLUE** is exposed to ambient temperatures between 5°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
Mono Ethylene Glycol concentration		%	10	20	30
Correction factor	load loss		1.070	1.160	1.235
	water flow		1.015	1.050	1.085
	thermodynamic power		0.995	0.985	0.970

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

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 30%. 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).

11.7. 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

Correct water treatment is critical, and particular care must be taken to ensure that the type of treatment utilized is appropriate.

The recommendations of a company specializing in such matters must be sought and applied.

The manufacturer or their representative cannot be held liable in the event of the use of water that is untreated or of nonconforming quality.

11.8. 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.

11.9. 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.

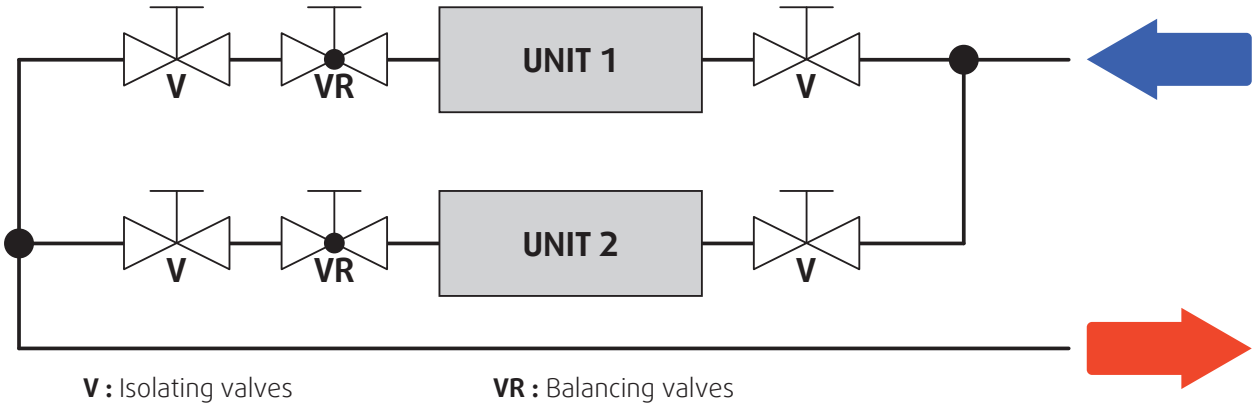
Once the installation is complete and after cleaning and rinsing the circuit network, you must fill the water circuit in accordance with current professional standards until you obtain the service pressure which will be:

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 (Tichcelmann loop) in order to reduce the pressure loss in each unit's circuit.



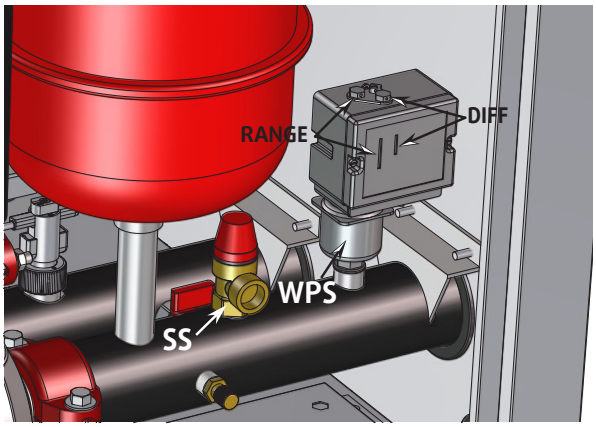
V : Isolating valves **VR :** Balancing valves

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, set to 3bar, (SS) is mounted at the water circuit inlet to prevent overpressure in the circuit. The installer must install a pipe at the safety valve outlet for water evacuation.



The "lack of water" pressure switch (WPS), available as an option, is set as follows:

- RANGE: 1bar
- DIFF: 0.5bar

If the pressure in the circuit drops below 0.5 bar, the machine stops. When the pressure rises above 1.5 bar again, the machine restarts.

Information

In the case of a **SYSAQUA BLUE** without a pump, the "lack of water" pressure switch (WPS) must be fitted to the external pump supply pipes and wired to terminals 24 and 25 on the unit.

12. WIRING DIAGRAM AND SETTING RANGE

12.1. 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%

12.1.1. POWER SUPPLY

The power cable must be connected to the main power supply switch QG (copper cable is recommended).

The power supply must be protected at source by a general fuse holder (FFG) supplied by the installer. It must be fitted next to the unit. Refer to the § **ELECTRIC SPECIFICATIONS**, page 10

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.

12.1.2. WIRING DIAGRAM KEY DESCRIPTIONS

SEE APPENDIX

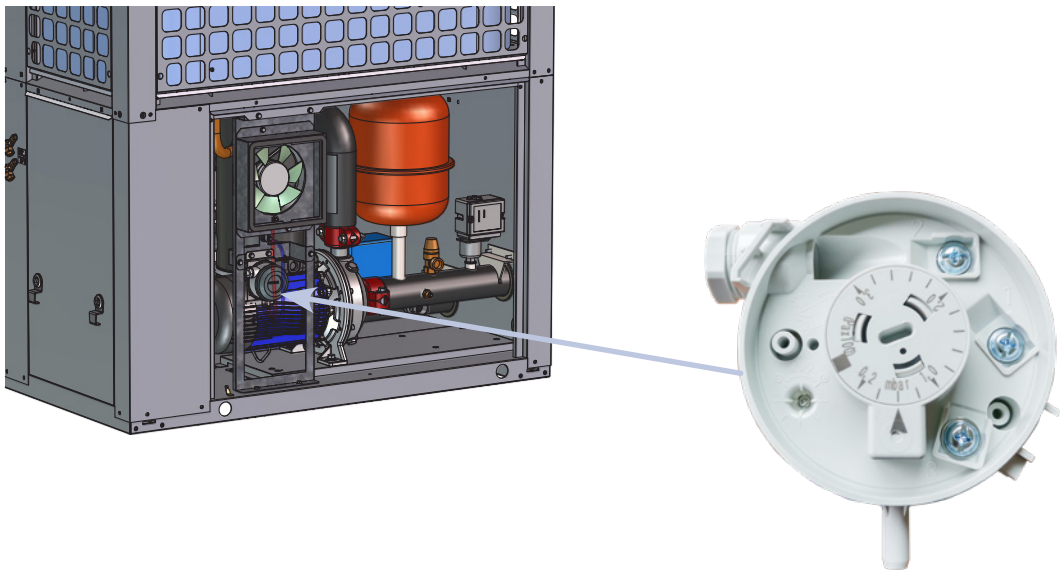
12.2. RANGE AND SETTINGS OF THEMAL PROTECTION

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

MODELS		35B
FTOF-H	Range (STD)	2.5-4A
	Adjustment (STD)	2.5A
	Range (HPF)	2.5-4A
	Adjustment (HPF)	4A
FTWP1	Range	1.6-2.5A
	Adjustment	2.4A

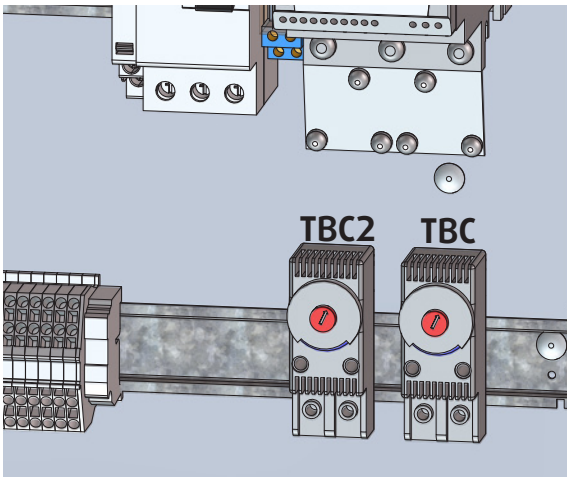
12.3. GAS DETECTION CARD CONTROL RANGE

The fan pressostat is set by default at the factory to a value just below 0.6 mbar.



12.4. CRANKCASE HEATER THERMOSTAT ADJUSTMENT RANGE

The crankcase heater thermostat (TBC2) enables the crankcase heaters to be activated when the compressors are stopped and the outside temperature is below 7 °C (recommended minimum value). That value can be adjusted depending on the installation site.



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

12.5. NORDIC PACK THERMOSTAT ADJUSTMENT RANGE

The Nordic pack thermostat (TBC) enables the strip heater located under the exchanger to be activated when the external temperature is below 5 °C (factory adjustment). That value can be adjusted depending on the installation site.

13. 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.

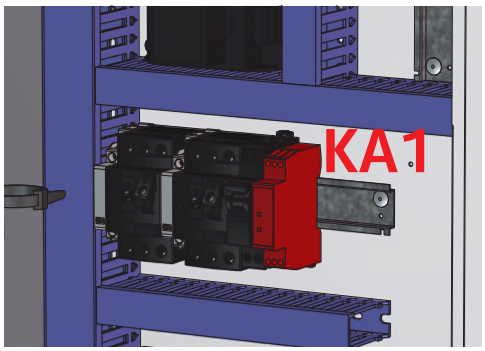
Any modification made without our consent will void the unit's warranty.

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.

It is recommended to provide short circuit protection by means of a type aM fuse or a circuit breaker with high breaking capacity on the distribution board. Protection must be selected according to the current values shown in § **ELECTRIC SPECIFICATIONS**, page 10



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 10).

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

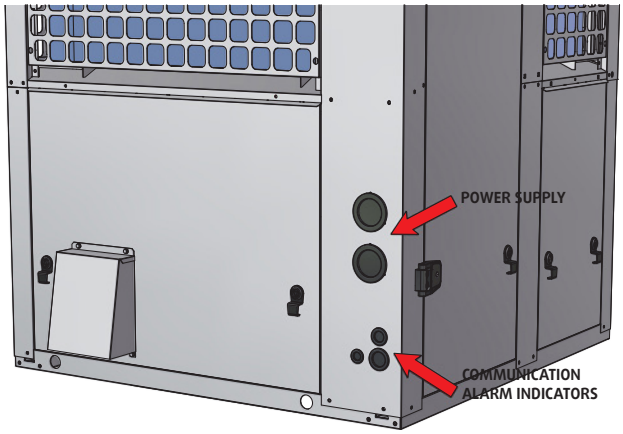
Correction of the excessive centralized power factor (>0.95) may generate transient phenomena dangerous for the unit motors and contactors during the start and stop phases. Check instant voltages during these phases.

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

13.1. UNIT POWER SUPPLY

Unit power supply cables must be routed to the switch through cable glands (not supplied).

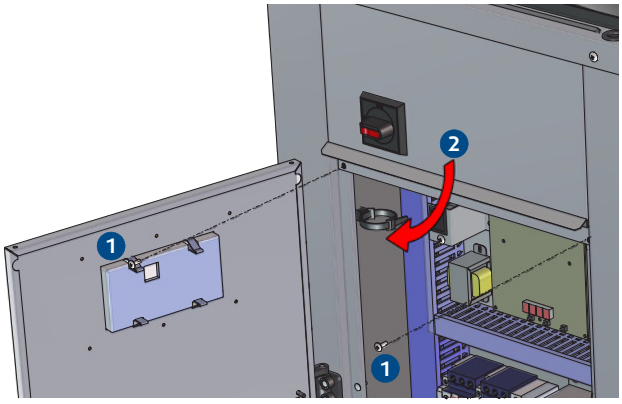
To ensure proper contact, fit the end pieces adapted to the cross-section of the connecting cable.

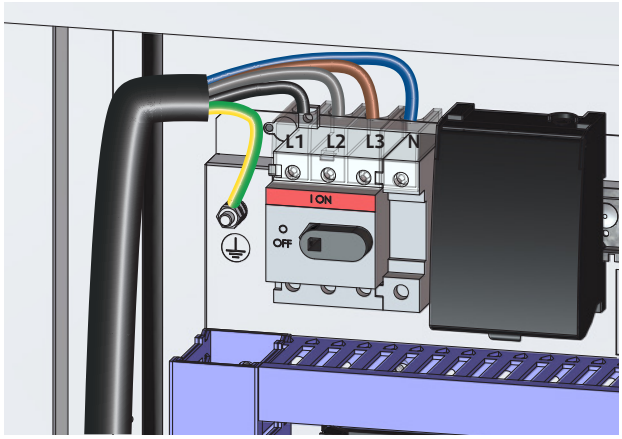


Information

The wire grommets on the front panels of units must be replaced with cable glands for any cable transits to ensure proper sealing.

Maximum cross-section of the power supply cables: 35mm² for copper cable





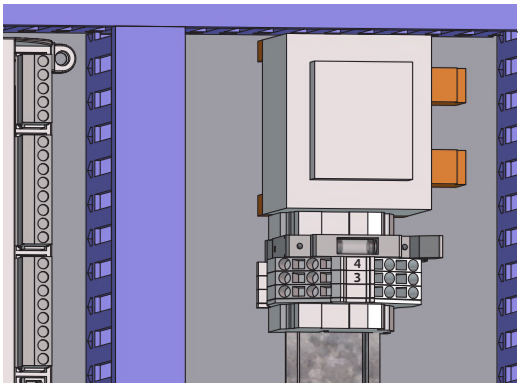
13.2. ALARM INDICATORS

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

- general alarm indicator
- gas detection module alarm indicator

13.2.1. MAIN CONTROLLER

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



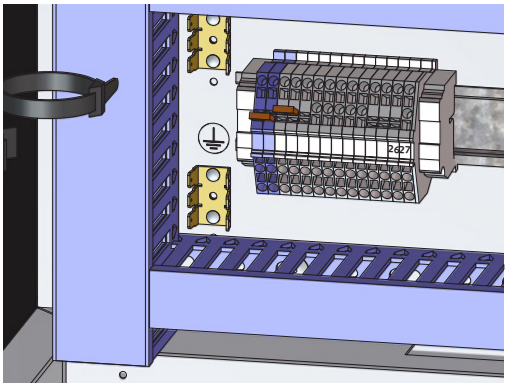
Caution

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

13.2.2. GAS DETECTION MODULE

The **SYSAQUA BLUE** unit is fitted with a gas detection module to ensure the safety of personnel and the machine in the event of a leak of R290.

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

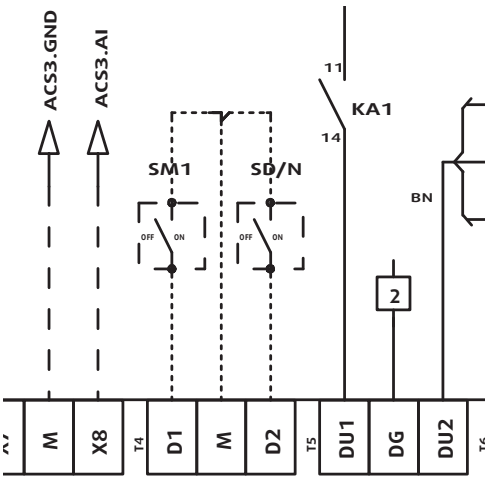
Caution

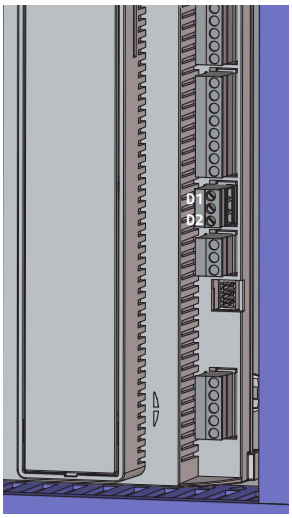
The unit must only be rendered accessible for maintenance if the client cables connected to terminals 26 and 27 are disconnected or rendered inoperative upstream of the unit.

13.3. REMOTE CONTROLS

The **SYSAQUA BLUE** has two remote controls operating via dry contacts (not supplied):

- ON/OFF function (SM1) connected to terminals D1 and M on the controller
- operating mode selection (SD/N) connected to terminals D2 and M on the controller



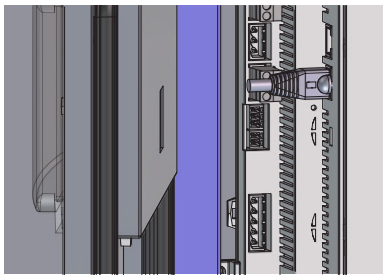


13.4. COMMUNICATION

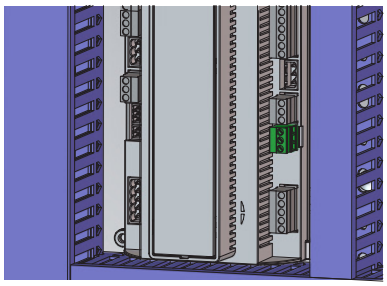
The **SYSAQUA BLUE** has four different communication protocols:

- Modbus TCP/IP
- BACNet IP
- Modbus RTU
- BACNet MS/TP

Modbus TCP/IP or BACNet IP communications are via an RJ45 connector and Ethernet type connector.

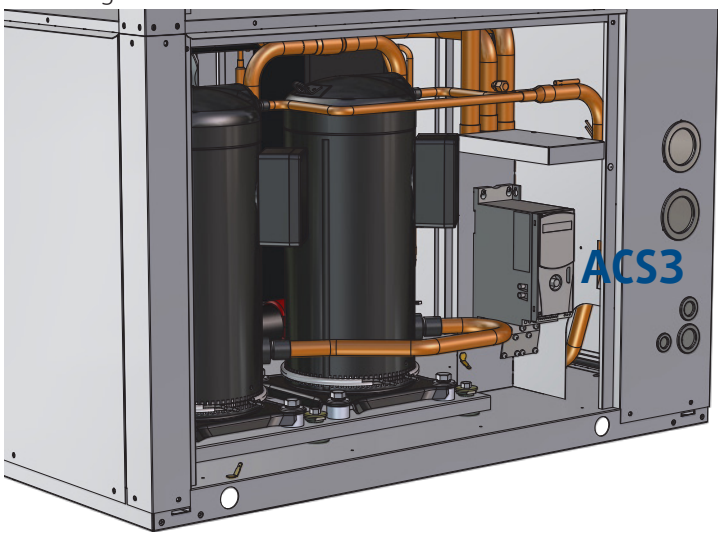


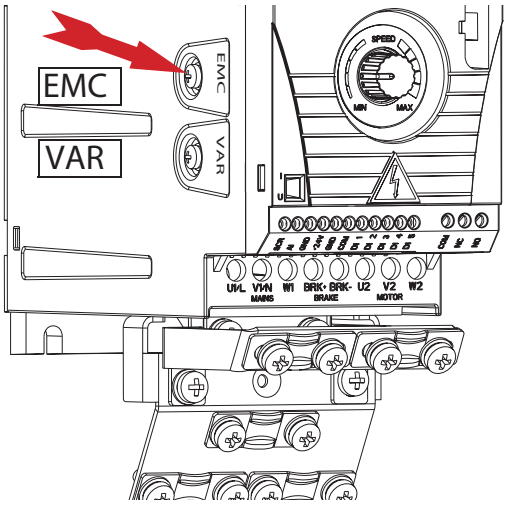
Modbus RTU or BACnet MS/TP communications are via the RS485 connection on the controller (terminals A2 and B2) and a BUS type cable (1 twisted pair, shielded) with a 0.22 mm^2 cross-section.



13.5. 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.

14. CONTROL

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

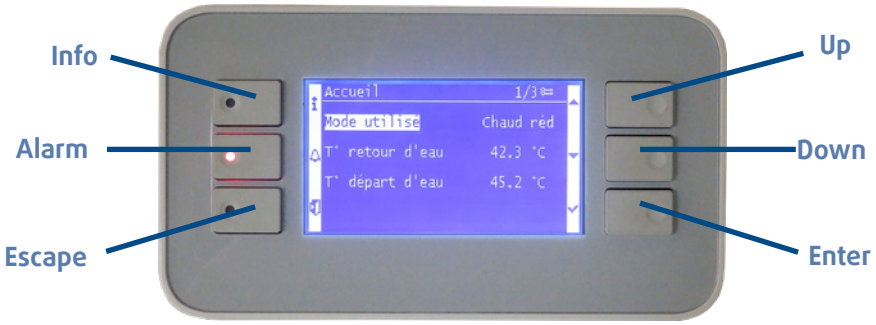
14.1. ORDER OF PRIORITY FOR CONTROL SYSTEMS

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. The HMI: the commands are given by the user directly on the unit (integrated display) or remotely (remote display)
2. 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
3. The BMS : the remote supervision transmits it commands according to the communication protocols
4. Timing programming: this scheduling is integrated in the regulator

14.2. USER INTERFACE

This terminal has a liquid crystal display and 6 buttons.



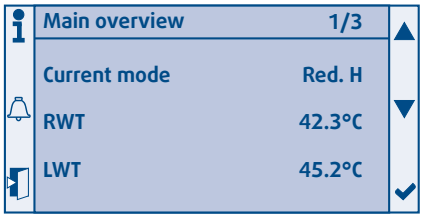
14.2.1. KEYPAD

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. 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 1. It is used to access a submenu 2. Activate the modification of a setting 3. Validate the modification of a setting

14.2.2. HOME PAGE

The home page is used quickly display the state of the unit:

- Current mode
- Water inlet temperature (RWT)
- Water outlet temperature (LWT)



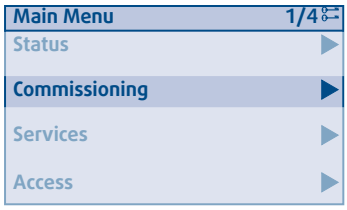
14.2.3. MAIN MENU

Pressing the "Info" button displays this screen directly.

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

Access level	Final user	Installer	Maintenance
"Access" menu	✔	✔	✔
"Status" menu	✔	✔	✔
"Commissioning" menu	✘	✔	✔
"Service" menu	✘	✘	✔
"Alarms" menu	✔	✔	✔

14.2.4. MENUS



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

14.3. 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.

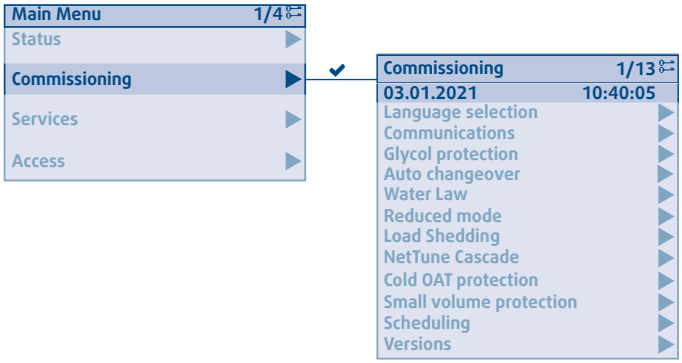
14.3.1. TIME SETTINGS

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.

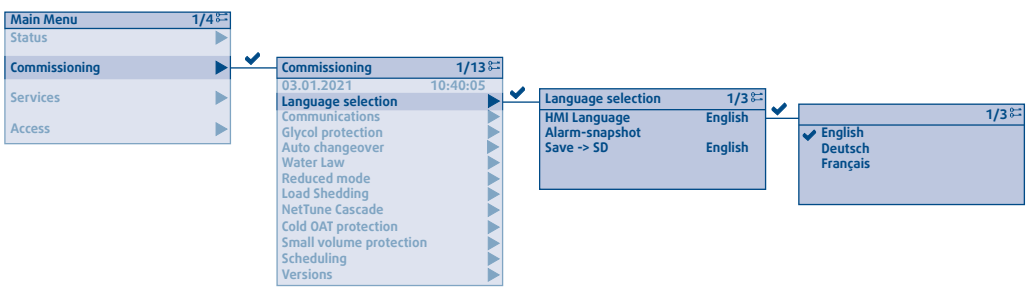
Press once on the ✔ button to approve the defined value and move on to the next setting.

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.

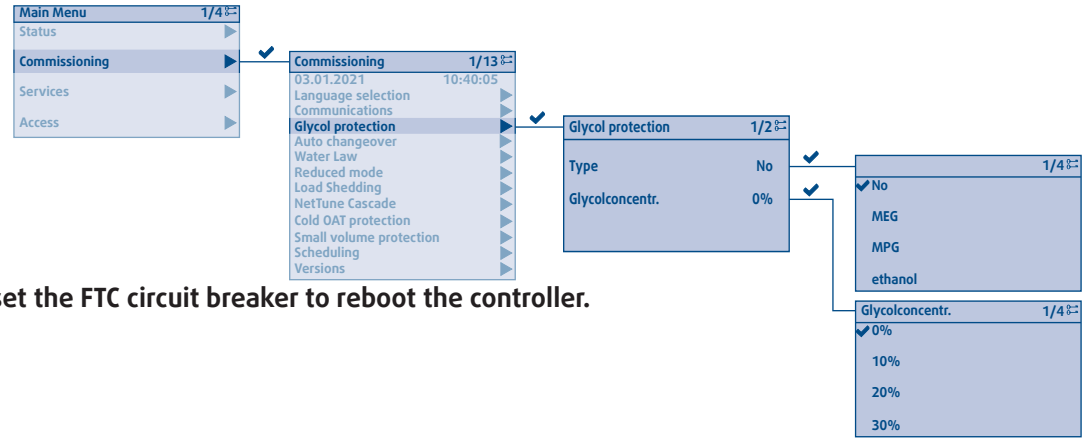
14.3.2. LANGUAGE SETTINGS

Select the languages required according to the application.



14.3.3. 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.

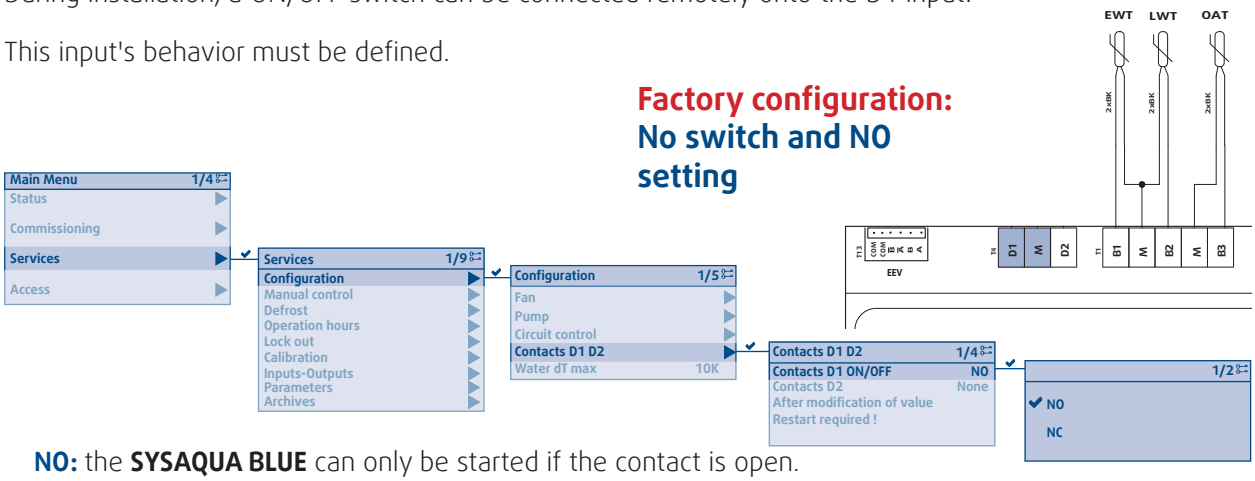
14.4. LAUNCHING THE SYSAQUA BLUE SYSTEM

14.4.1. CONFIGURING INPUT D1

During installation, a ON/OFF switch can be connected remotely onto the D1 input.

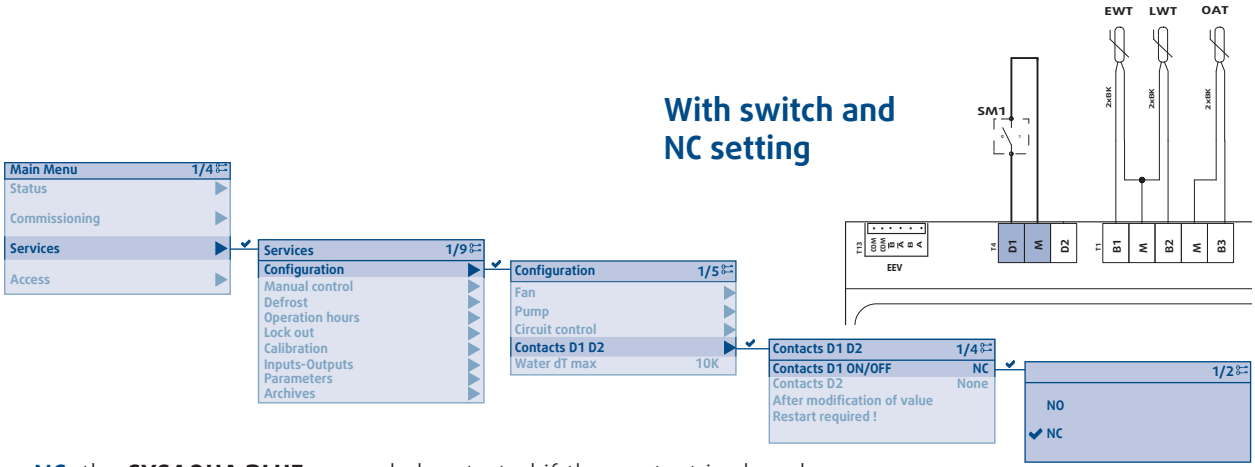
This input's behavior must be defined.

Factory configuration:
No switch and NO setting



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

With switch and NC setting



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

Configuration	Contact open	Contact closed
Normally Open NO	Operation order (ON)	Stop order
Normally Closed NC	Stop order	Operation order (ON)

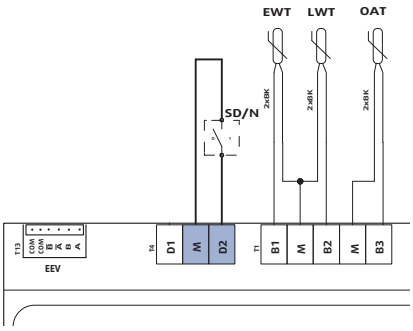
Caution

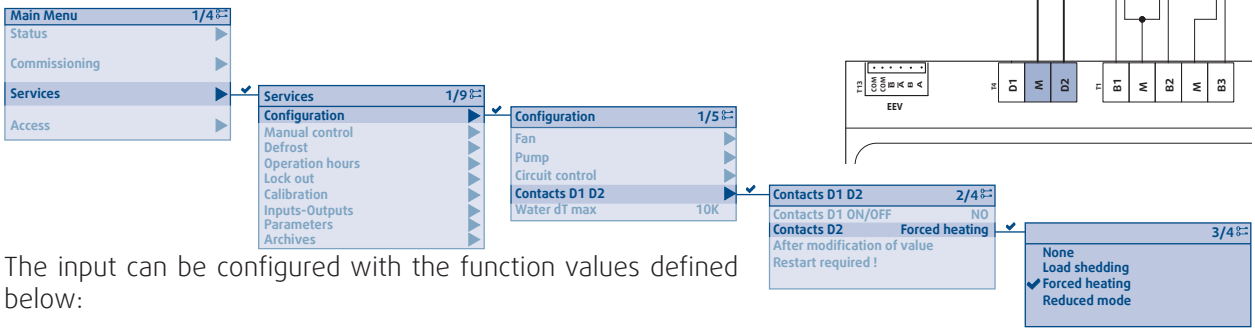
If the settings are changed, open then reset the FTC circuit breaker to reboot the controller.

14.4.2. 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.



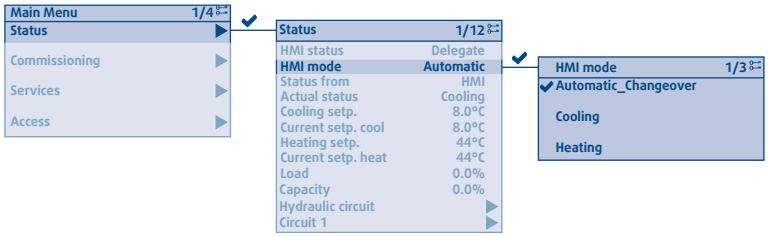


The input can be configured with the function values defined below:

- None
- Load shedding
- Forced Heating
- Reduced mode

Further information regarding this contact's configuration can be found in the in § **CASCADE OF PRIORITIES**, page 28 user manual.

14.4.3. HEAT/COOL SELECTION



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

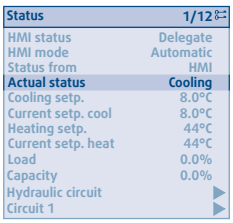
- **Automatic_Changeover:** delegated to the BMS/Auto-change-over (refer to the UM)
- **Cooling:** request for cool mode
- **Heating:** request for heat mode

Information

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

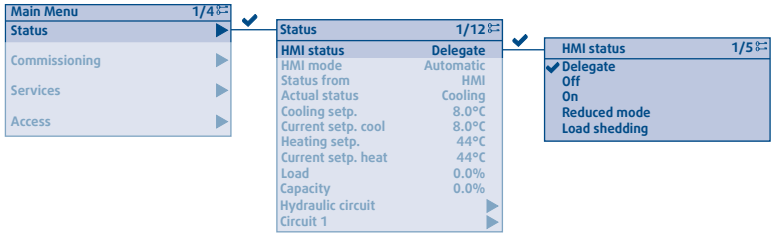
The "Actual status" line states which element requested the current mode:

- **Cooling**
- **Heating**



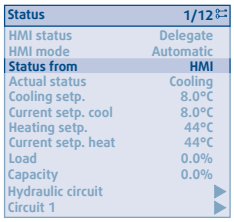
14.4.4. SELECTING THE OPERATING MODE

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 mode:** Refer to the § **REDUCED MODE**, page 37
- **Load shedding:** Refer to the § **LIMITED CAPACITY**, page 37

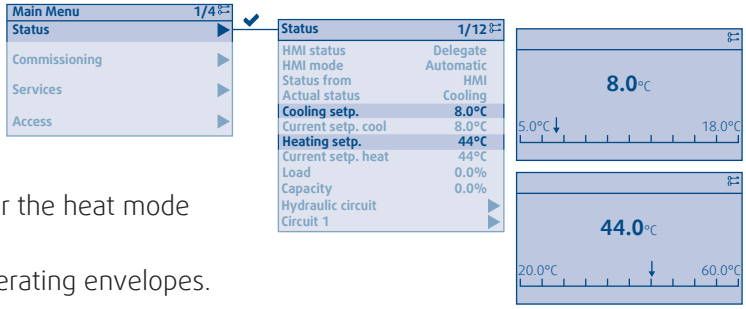
The "Status from" line states which element requested the current status:



- **Cont.off:** on/off digital input
- **Cont.ext: D2** configurable digital input (in "Load shedding", " Forced Heating" or "Reduced mode")
- **HMI:** User interface
- **BMS**
- **Schedule**

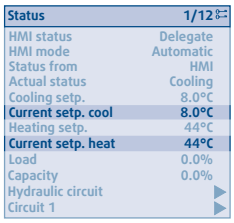
14.4.5. USER TEMPERATURE SETPOINTS AND ACTUAL SETPOINTS

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.



- **Current setp. cool:** current setpoint for cooling mode
- **Current setp. heat:** current setpoint for heating mode

Adjustment by activating the "Water law" or "Reduced mode" options will cause the setpoints to vary automatically according to external conditions.

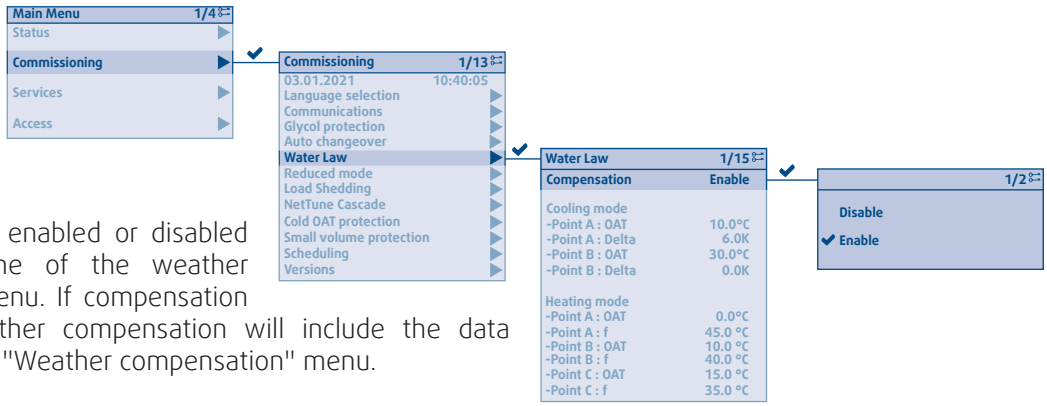
Regardless of the adjustment, the resulting setpoint is restricted to the operating limits to protect the unit.

Actual heating and cooling setpoints match the values utilized in real time for optimal operation of units

14.4.6. 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

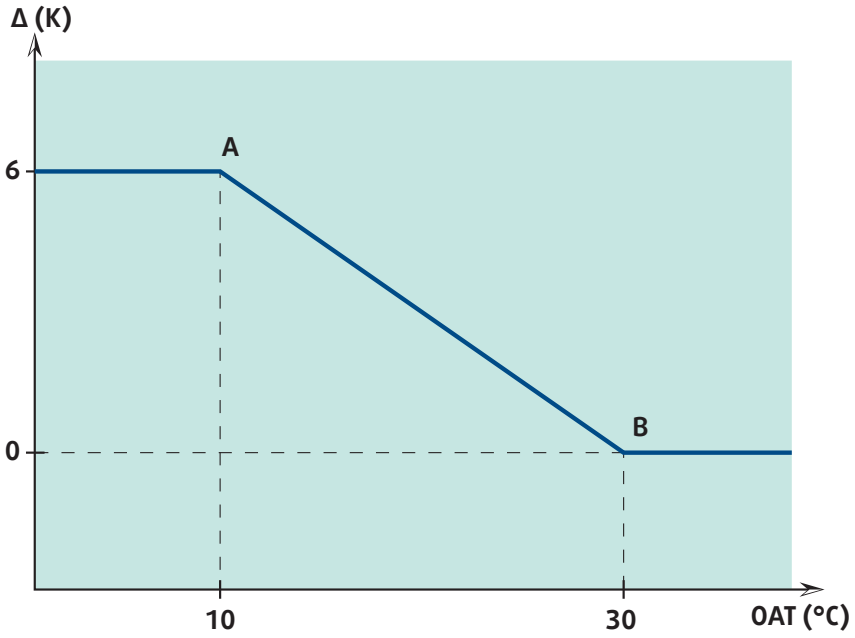
If the automatic heat/cool changeover mode is selected, weather compensation is enabled by default. The default weather compensation values are applied without using the weather compensation menu settings.

14.4.6.1. COOL MODE

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

➢ 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
Cooling mode	
-Point A : OAT	10.0°C
-Point A : Delta	6.0K
-Point B : OAT	30.0°C
-Point B : Delta	0.0K
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

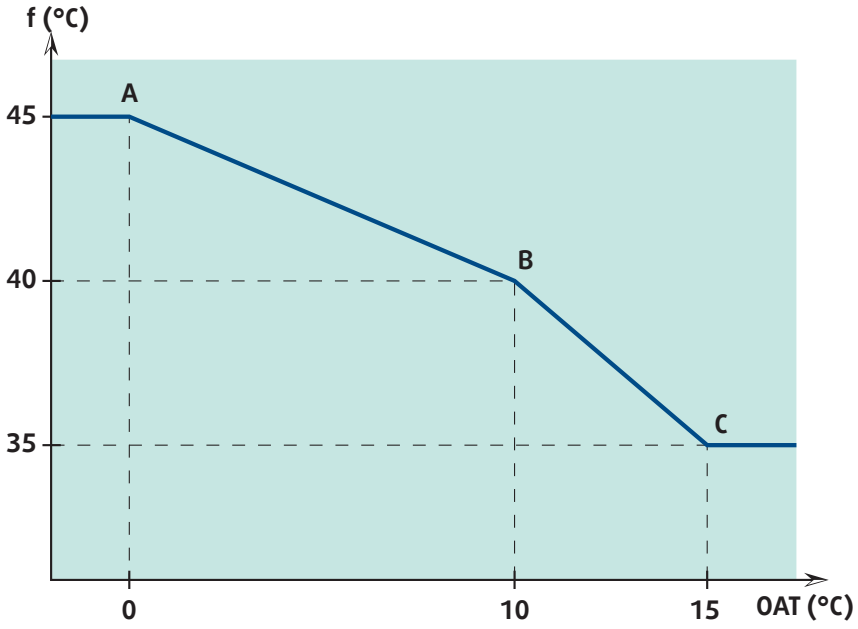
Points	Coordinates	unit	Values		
			Min.	Max.	Default
A	OAT	°C	10	$OAT_A < OAT_B$ $OAT_A \leq 30$	10
	Δ	K	Δ_B	8	6
B	OAT	°C	$OAT_B > OAT_A$ $OAT_B \geq 20$	36	30
	Δ	K	0	Δ_A	0

14.4.6.2. HEAT MODE

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

➢ water law setpoint = f(OAT)

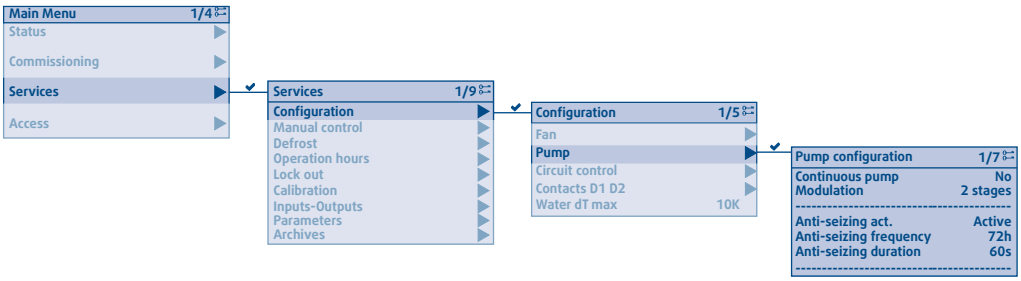
Function f is restricted between 20 and 60°C. It is defined by points A, B and C in the graph below. The values indicated are factory values.



Water Law	1/15
Compensation	**Enable**
Cooling mode	
-Point A : OAT	10.0°C
-Point A : Delta	6.0K
-Point B : OAT	30.0°C
-Point B : Delta	0.0K
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	60	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

14.4.7. FIXED SPEED PUMP



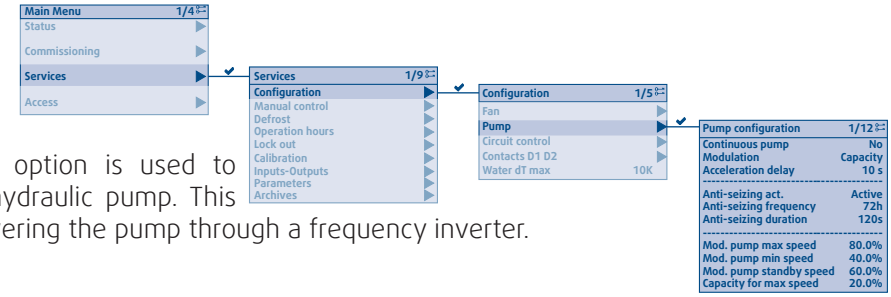
The fixed speed pump installed as standard is activated when a load request arises.

The constant speed setting of the pump allows the circulation of water to be maintained even when there is no load request.

Caution

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

14.4.8. "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. 45Hz) and must ensure a sufficient rate for the unit (Refer to the § PHYSICAL CHARACTERISTICS, page 9).

14.4.8.1. V2 MODE - DOUBLE SPEED

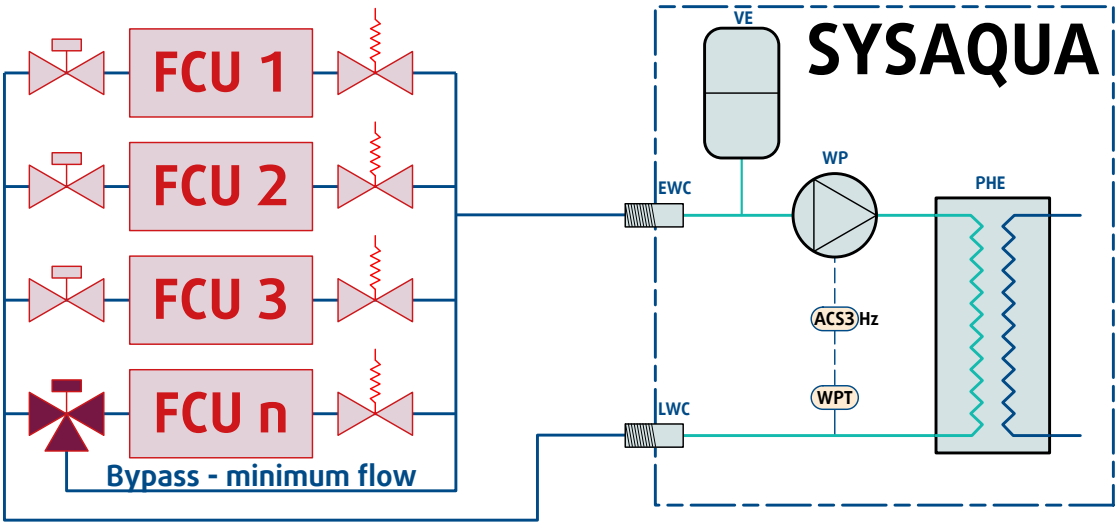
As soon as the load to which the unit must respond is higher than the 1st stage of thermodynamic capacity, the pump operates at maximum speed. That speed is adjustable and must be determined during commissioning to adjust the power of the pump to the load losses of the installation.

When the load is below the 1st stage of thermodynamic capacity, the pump runs at standby speed to limit the consumption of electricity.

Default	setting	min	max
Mod. pump max speed	80%	0%	100%
Mod. pump standby speed	60%	0%	100%

14.4.8.2. VP MODE - CONSTANT OUTPUT PRESSURE

The frequency inverter (ACS3) controls the pump's speed to maintain an even water pressure (WPT) at the output of the unit, regardless of the number of operating terminals (FCU).



Caution

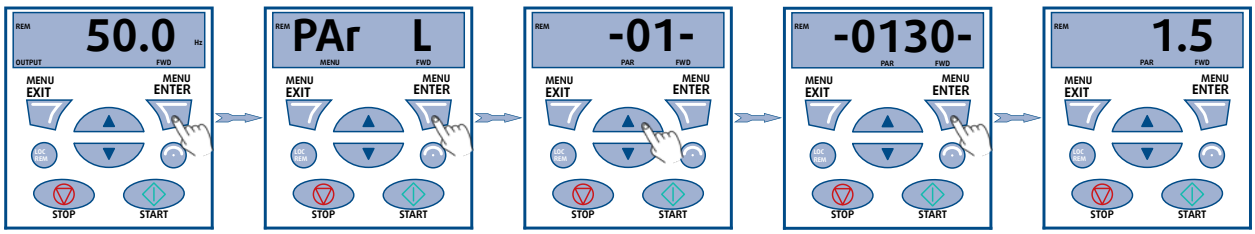
The hydraulic installation must include a system (one or more 3-way valves) that maintains the required minimum water flow when the terminals are bypassed.

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

14.4.8.2.1. DETERMINATION OF THE PRESSURE SETTING

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

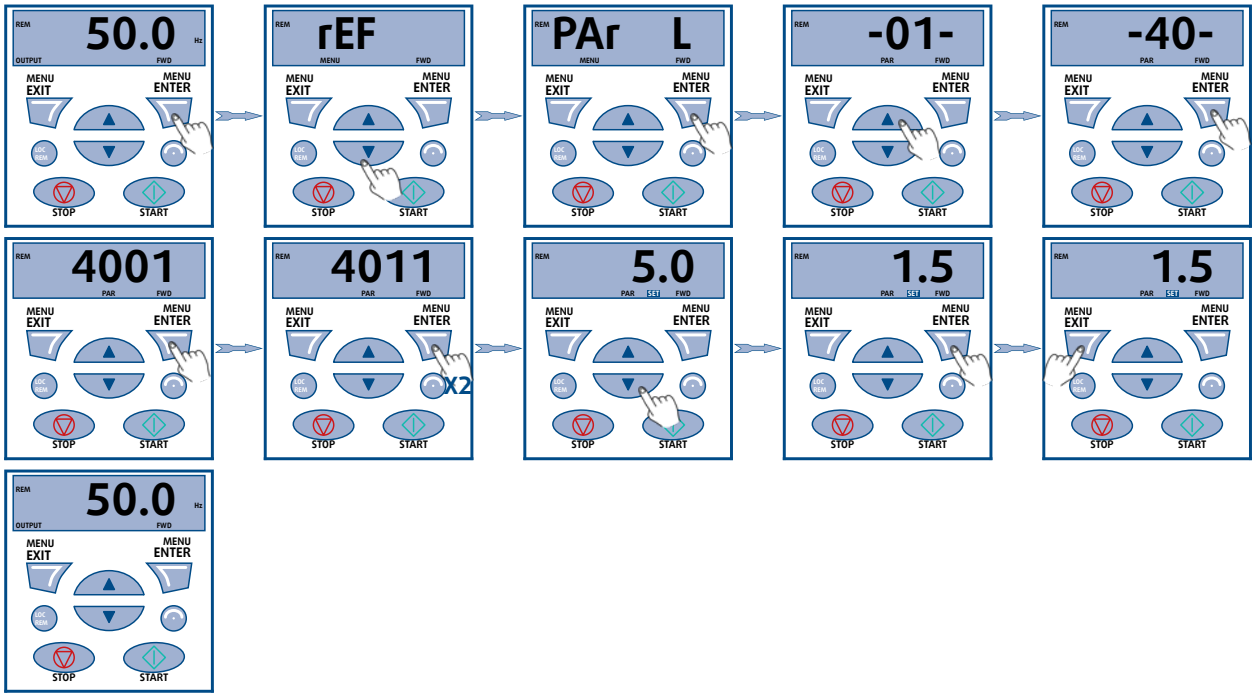
1. Set all units in demand to open all the valves (load = 100%).
2. Check that the output is in line with **SYSAQUA BLUE** requirements.
3. Read the pressure value from the transducer (example: 1.5 bar).



14.4.8.2.2. SETTING THE PRESSURE SETTING

The pressure setting is set as follows:

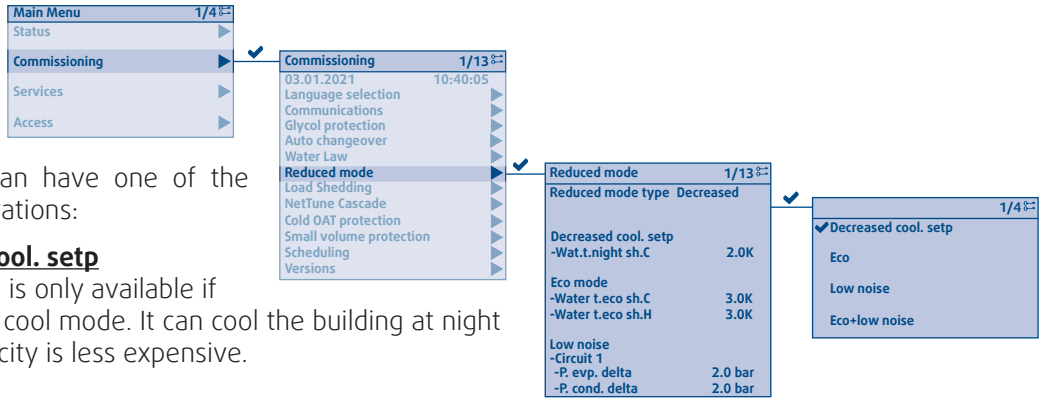
1. Access parameter **4011** then set the required pressure setting (example 1.5 bar).



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

14.4.9. REDUCED MODE



Reduced mode can have one of the following configurations:

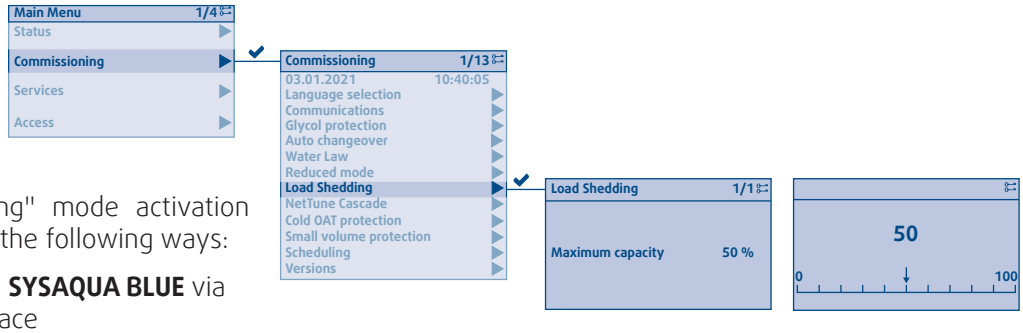
- **Decreased cool. setp**
  This function is only available if the unit is in cool mode. It can cool the building at night when electricity is less expensive.
- **Eco**
  Heat and cool setpoints are respectively lowered and raised to reduce the unit's electrical consumption.
- **Low noise**
  In cool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

14.4.10. LIMITED CAPACITY

Load reduction mode can be used to limit thermodynamic capacity temporarily. Electrical consumption of the **SYSAQUA BLUE** will thus be reduced to prevent exceeding the installation site's electrical power capacity.



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

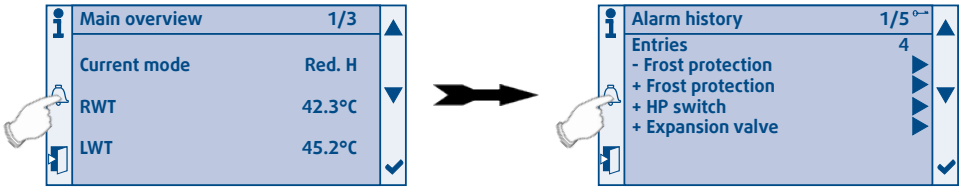
- directly on the **SYSAQUA BLUE** via the user interface
- communication network (Modbus/Bacnet/Cloud)
- external dry contact **D2** if entry configured.

Examples for maximum capacity adjustment:

- between 0% and 49% the unit is stopped
- between 50% and 99% the unit is limited to a single compressor

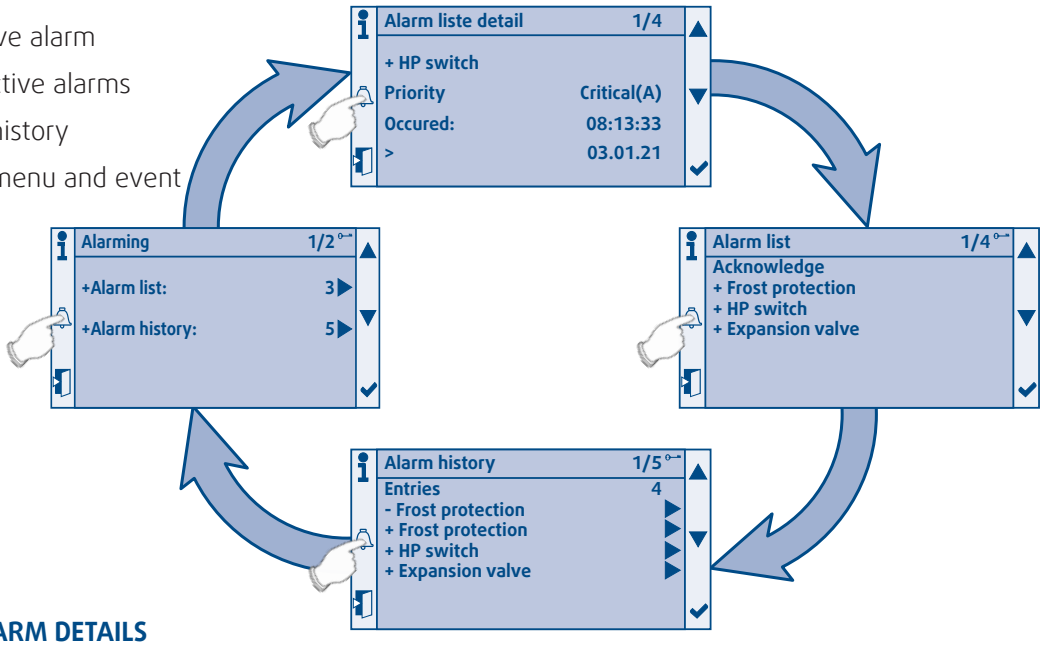
14.5. ALARMS

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



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

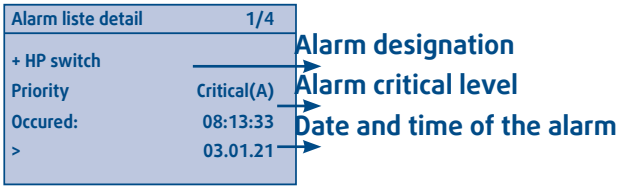
- The last active alarm
- The list of active alarms
- The alarms history
- The alarms menu and event



14.5.1. ALARM DETAILS

This page is displayed :

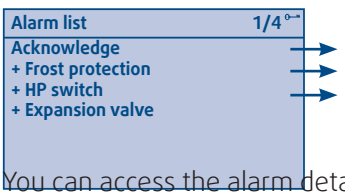
- Details of the last active alarm
- If you request the details of an alarm in the list of active alarms
- If you request the details of an alarm in the alarms history



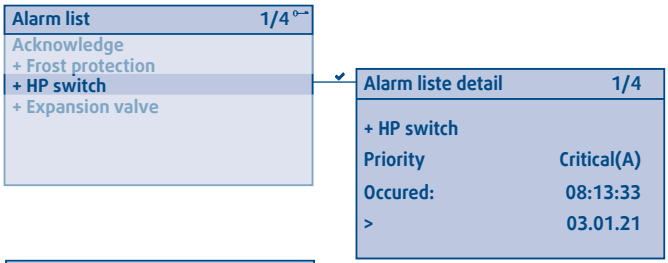
14.5.2. THE LIST OF ACTIVE ALARMS

The list of active alarms allows visualization of current alarms

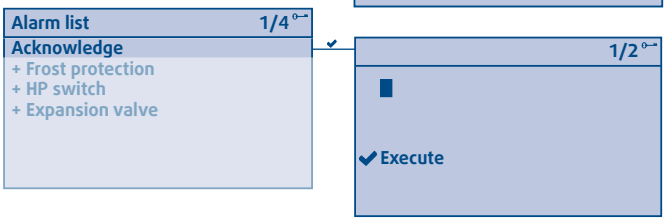
The first line shows the number of active alarms (3 in the example below)



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



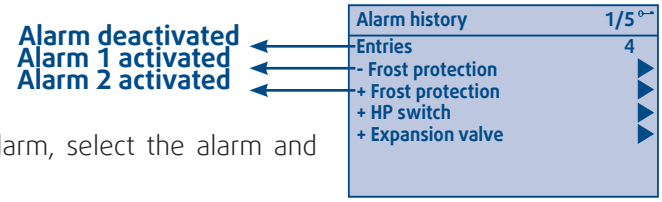
With installation or maintenance level access, you can acknowledge active blocking alarms. To do this select delete, confirm and select "Execute". Only the alarms that are no longer active will be deleted from the list.



14.5.3. ALARMS HISTORY

This history reports the 150 most recent activation or deactivation of alarms:

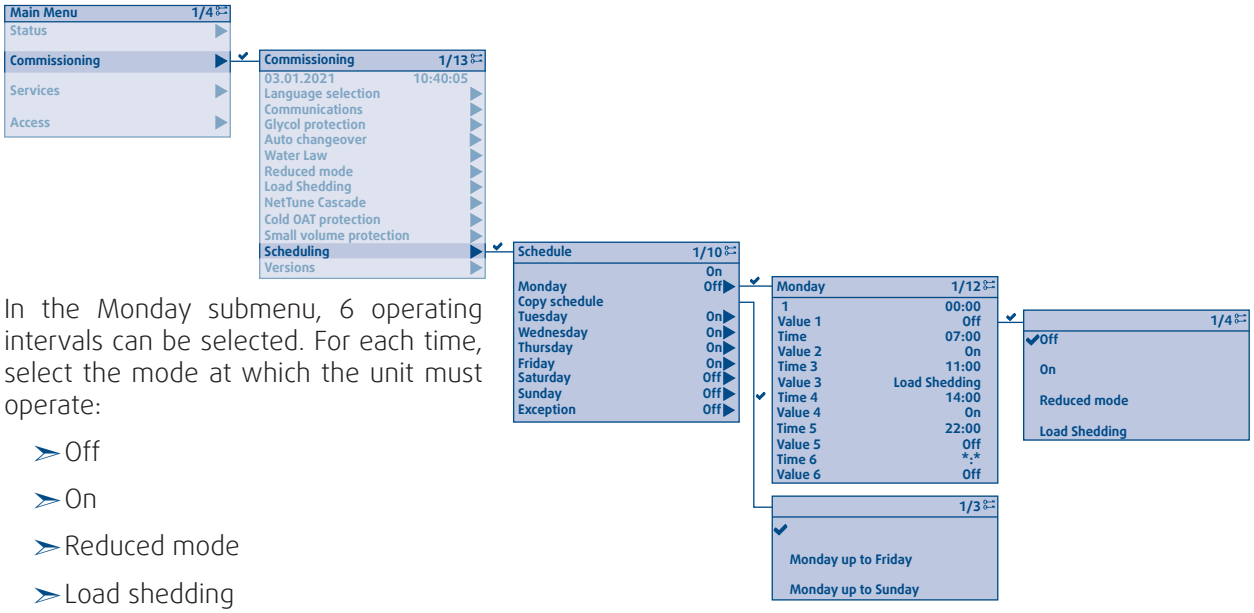
- Activation of an alarm will be indicated by a "**+**"
- Deactivation of an alarm will be indicated by a "**-**"



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

14.6. SCHEDULE

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



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 mode
- Load shedding

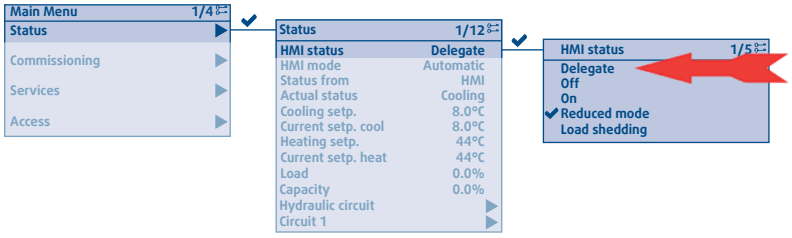
To deactivate an operating interval, configure the corresponding time as follows: *:*.

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.



15. COMMISSIONING

Information

THE COMMISSIONING FORM AVAILABLE IN THE ANNEX MUST BE COMPLETED, HANDED TO THE OPERATOR AND SENT TO THE MANUFACTURER AS A PRIOR CONDITION FOR THE WARRANTY TO APPLY.

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.

15.1. 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, including options, matches the order
6. Check that the oil heating resistors have been energized for at least 12 hours.

15.1.1. 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. Avoid possible recycling of the air evacuated by the fans, high exposure to prevailing winds.
6. In the case of a harsh climate (temperature well below freezing, snow, high humidity), check the unit is raised 10 cm from the ground.
7. For loose or missing bolts or screws.

15.1.2. 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 18).
3. Check the drain plug is properly sealed.
4. Check the air bleed in the unit has actually been opened.

5. **Check the presence, direction and position of the water filter upstream of the appliance (mesh size ≤ 800µm).**
6. Check the presence and position of the stop valves to isolate the unit during maintenance periods.
7. Check the hydraulic circuit is properly filled and that the fluid is circulating freely without any signs of leaks or air bubbles. When glycol antifreeze is used, check it is at the right concentration (in accordance with the intended use).
8. 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.
9. 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.
10. Adjust the water flow in order to comply with the specifications.

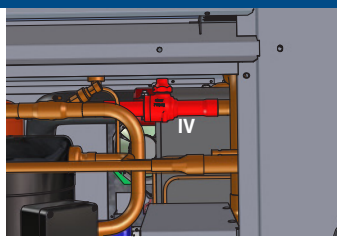
15.1.3. REFRIGERATING CHECKS

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.

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 DURING OPERATION.



15.1.4. 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 no cables are in contact with pipes and/or sharp edges.
6. Check the electrical grounding of the appliance.
7. Check the frequency inverters conform with the installation's neutral system (Refer to the § **ALL SEASONS AND VARIABLE FLOW PUMP OPTIONS**, page 25).

15.2. UNIT START-UP

15.2.1. PHASE ROTATION PROTECTION

If the phase of the power supply is not correct, the phase rotation protection device will prevent the machine from starting (Refer to the § **ELECTRICAL CONNECTIONS**, page 21).

If phase rotation is correct, close all circuit breakers.

15.2.2. FIRST 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.

Information

The panel on the safety fan side must be present to prevent the machine performing a safety shutdown (checking of ΔP of fan MV)

Information

Every time the **SYSAQUA BLUE** is powered up, a 3-minute safety cycle runs to check the gas detection board is working correctly. During that cycle, the extractor fan (MV) is tested and the **SYSAQUA BLUE** cannot start up. The RC Card alert is displayed. At the end of the checking cycle the alarm is canceled automatically and the thermodynamic cycle can start.

Depending on the time of year and the customer requirement:

1. Configure hot/cold mode (Refer to the § **HEAT/COOL SELECTION**, page 30)
2. Start up the unit in manual mode: ON (Refer to the § **SELECTING THE OPERATING MODE**, page 31).

15.2.2.1. OPERATING CHECK LIST

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

2. Leak check of the refrigeration circuit in operation. The desired result is 5g/year maximum.

3. Adjust the water flow according to the desired DT for the water (Refer to the § **HYDRAULIC PUMPS CURVES**, page XI).

- ✔ 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. Take a reading of the currents at the compressor, fan and pump terminals.

5. Check there is no dampness during operation: green fluid indicator

6. Take a temperature reading of the cooling and hydraulic circuits after 20 minutes of stabilization, using the controller display.

- ✔ Check the operating pressures are within normal limits.
- ✔ Check discharge, suction and liquid temperatures
  - Discharge temperature on the cooling cycle should normally not exceed 115°C.
  - Suction superheat should be 6K ±2K.
  - Suction subcooling should be 5K ±2K.

Information

It is very important that the unit should operate with a water flow that conforms to the recommendations shown in § **PHYSICAL CHARACTERISTICS**, page 9. It is dangerous to leave the unit running with a low water flow; this could cause irreparable damage to the components and the plate exchanger. If the unit operates with insufficient flow, its performance will not be optimal.

15.2.3. FINAL CHECK

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

It is the installer's responsibility to complete the "ON-SITE INFORMATION" form provided in the annex and to hand it to the operator. That document explains what to do in the event of an emergency.

The installer must also provide suitably protected documentation that must remain close to the refrigerating system operating site and be clearly legible.

16. 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 (Refer to the § **TECHNICAL SUPPORT AND AFTER-SALES SERVICE HOTLINE**, page 5) 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.

17. 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.

18. MAINTENANCE

Maintenance in accordance with our instructions will prolong the service life of your **SYSAQUA BLUE** :

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

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

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.

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.

18.1. TABLE OF PERIODIC SERVICE AND MAINTENANCE

It is essential to keep an up to date maintenance booklet to record temperature and pressure readings and all checks and maintenance operations performed on the **SYSAQUA BLUE**.

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

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.

The list of checks and verifications is provided as a partial guide only. It is the responsibility of the servicing and maintenance technician to adapt it according to local standards and regulations regarding the in-service monitoring of pressurized refrigerating systems.

TASKS PER COMPONENTS		ACTIONS	6 months	12 months
			Recommended inspection and maintenance interval	
1 - Casing				
1.1	Control possible contaminations, damage and/or corrosion.	Clean and repair if required.		✘
1.2	Check the possible presence of water (condensates, leakages, etc.).	Clean and look for the cause, then repair.	✘	
1.3	Verify the appearance of the thermal insulation	Replace if required.		✘
1.4	Check the state of the anti-vibration pads	Replace if required.		✘
1.5	Check the condition of door gasket.	Replace if required.	At each inspection	
1.6	Check the condition of the markings	Replace if required.		✘
2 - REFRIGERANT CIRCUIT				
2.1	Check there are no gas bubbles in the fluid line		✘	
2.2	Check the lack of humidity in the refrigerating fluid		✘	
2.3	Check the pipes or capillaries do not rub and vibrate.			✘
2.4	Check the compressors do not emit abnormal noise or vibration.		At each inspection	
2.5	Check the backflow temperature.		✘	
2.6	Record the operating pressure	Check it is above or below those recorded when the unit was started up.	✘	
2.7	Check the compressor fastening screws are tight.			✘
2.8	Check the crankcase heater is powered on during the stop cycle.		✘	
2.9	Check the cleanliness of the coil.	Clean if required.	✘	
2.10	Check the filter drier clogging.	Replace if required	✘	
2.11	Check the operation of the high pressure switch.	Replace if required		✘
2.12	Check for the absence of refrigerating fluid leak (image + hydrocarbon detector)	Repair without delay and check after 1 month		✘
2.13	Check the cycle reversal valve			✘
2.14	Check the condition of the anti-vibration studs	Replace if required		✘
2.15	Check and monitor changes in the thickness of tubes and main components (reserve fluid cylinder)	Replace if required		✘
3 - HYDRAULIC CIRCUIT				
3.1	Check the state of the function, check there is no damage nor corrosion.	Clean and repair.		✘
3.2	Check the condition of the exchanger, in terms of corrosion and functionality.	Clean and repair.		✘
3.3	Check the tightening of the pipe connections and fastening	Readjust and repair if necessary.		✘
3.4	Verify the pressure value of the hydraulic circuit		✘	
3.5	Bleed the air.		✘	
3.6	Run the isolation valves			✘
3.7	Check no ice has formed.			✘
3.8	Check the condition of the piping thermal insulation.	Repair and replace if required.		✘
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.		
3.10	Check filter cleanliness.	Clean	✘	
3.11	Check that the hydraulic circuit is filled properly		✘	

TASKS PER COMPONENTS		ACTIONS	6 months	12 months
			Recommended inspection and maintenance interval	
3.12	Check the condition of the expansion tank (presence of excess corrosion, or gas pressure loss)	Replace if required.		✘
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. Replace the pump liner after 15,000 hours running with anti-freeze or 25,000 hours running with water.	✘ ✘	
3.14	Verify that the low water pressure sensor works correctly			✘
3.15	Record the water temperatures at the plate exchanger inlet and outlet.		✘	
3.16	water quality - sampling + water analysis			✘
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.		✘	
4.2	Check that the main supply cable is void of alterations likely to impact the insulation.	Replace if required.		✘
4.3	Check the grounding of the metallic structure	Repair if required.		✘
4.4	Inspect the contacts.	Replace if required.		✘
4.5	Check that all electrical connections of the device are tight	Tighten if required.		✘
4.6	Check the thermal protection relays of the motors	Replace if required.		✘
4.7	Check the nominal intensity and condition of the fuses.			✘
4.8	Check the condition of the condensers.			✘
4.9	Clean the compressed air electrical unit to remove any dust or other contaminants building up.			✘
4.10	Check the motor windings are insulated.			✘
5 - FAN(S)				
5.1	Check for the absence of contamination, corrosion or damage.	Clean if required		✘
5.2	Check proper fastening of the fan.	Tighten if required.		✘
5.3	Check the vanes to guarantee balancing.	Clean if required.		✘
5.4	Check the bearings for noise.	Repair if required.		✘
5.5	Check the condition of the fan motor.			✘
6 - REGULATION				
6.1	Check the condition of the alarms	Acknowledge them after taking them into consideration	✘	
6.2	Check the setting points		✘	
6.3	Check the operation of all probes		✘	
6.4	Check the gas detection module			✘

18.2. MAINTENANCE PROCEDURES

18.2.1. GENERAL

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

ANY BRAZING OPERATION ON THE COOLING CIRCUIT MUST BE PERFORMED WITH CONSTANT FLOWING NITROGEN.

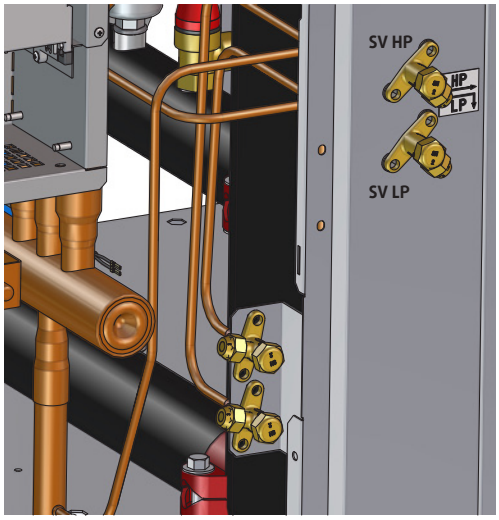
18.2.2. REFRIGERANT DRAINAGE

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 (non-sparking electrical components) until a residual pressure of 0.3 bar absolute is obtained.
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
6. use a detector to check there is no fluid.



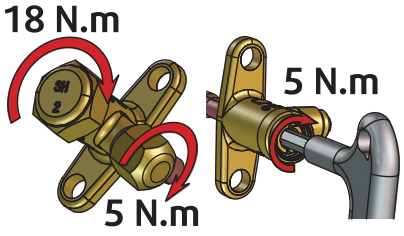
Caution

When opening the refrigeration circuit, be particularly alert to the presence of residual oil in the circuit. That oil may contain dissolved refrigerant and be potentially flammable.

18.2.3. 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: 5N.m
   - ✔ plug tightening torque: 18N.m or 5N.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.
6. Run the unit in refrigerating mode to determine whether the group's charge is correct by checking the sub-refrigeration (Refer to the § **OPERATING CHECK LIST**, page 42)..



18.2.4. REPAIRS

Caution

Only the competent person trained in handling flammable refrigerants (demonstrated by proof of suitable training) is authorized to open or shut off the refrigerant circuit.

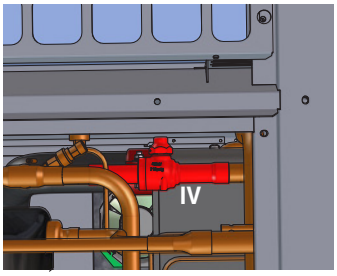
Repairs to components containing refrigerant must be undertaken by a competent person in accordance with the following sequence, if appropriate:

1. carry out a risk assessment and gauge the level of risk for the proposed repair.
2. inform the operator of the unit.
3. obtain authorization to proceed with the repair.
4. drain the fluid (Refer to the § **REFRIGERANT DRAINAGE**, page 47).
5. disconnect and make safe the components which are to be repaired.
6. clean and purge with nitrogen.
7. carry out the repair.
8. subject the repaired component to testing and verification (test with nitrogen at service pressure, leak testing).

Caution

The maximum authorized pressure at the compressor intake (BP) is 17 bar. For all service pressure testing, the pressure should be held at 17 bar, the isolating valve (IV) closed, and finally service pressure attained.

The isolating valve and non-return valve at the compressor exhaust isolate it and protect it as a whole unit.



Caution

The maximum authorized pressure differential at the expansion valve is 21 bar.

9. open the isolating valve (IV).
10. charge with refrigerant (Refer to the § **R290 CHARGING**, page 47).
11. subject the unit to testing and verification (leak test and operating test).

18.2.5. SPECIFIC COMPONENTS

18.2.5.1. COMPRESSORS

Compressors are not fitted with an oil level sight glass. This is to ensure a perfect seal. Therefore no top-up with oil is required during the service life of a compressor.

For any maintenance operation requiring the oil to be topped up or replaced, you must use an oil such as Hatcol 4467, and adhere strictly to the volume indicated on the rating plate. In addition, you must follow the procedures mentioned in § **REFRIGERANT DRAINAGE**, page 47 and in § **R290 CHARGING**, page 47.

18.2.5.2. 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.

18.2.5.3. 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.

18.2.5.4. 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.

18.2.6. WINTER PROTECTION

In cold weather conditions, following a general shutdown of the installation or a control system malfunction, there is a risk that the water contained in the hydraulic circuit may be frozen.

To prevent any problems if the hydraulic circuit is not glycol-protected or trace heated, it is recommended to fully drain any unused circuits and pressurize them with nitrogen, or protect them by the addition of anti-freeze solution or 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).

18.2.7. DISPOSAL

The disposal of refrigerating systems and their component parts must be carried out in accordance with applicable local and national regulations.

Used refrigerant which is not going to be reutilized must be treated as a waste material requiring safe disposal.

The discharge of refrigerants is only permissible when there will be no harm to persons, property or the environment, and provided it is in accordance with legal requirements.

Used oil that cannot be reprocessed must be stored in a suitable separate container and must be treated as a waste material requiring safe disposal.

Other components of the refrigerating system which contain refrigerant and oil must also be disposed of in an appropriate manner.

If necessary, you should seek the advice of a competent person on the disposal of waste refrigerant and oil products.

Information

For additional information on the recovery, reutilization and disposal of refrigerating systems, please see NF EN 378-4, sect. 6.

19. 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.
Excessive noise	Vibrating pipe work	Attach the pipe work correctly.
		Check the pipe work attachments.
	Noisy compressor	Check the condition of the valves.
		Seized bearings. Replace the compressor
		Check the tightness of the compressor attachment nuts.
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 circuit breaker.
	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.
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.
	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	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.

Problem	Probable cause	Solution
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.

CAUTION

BEFORE STARTING WORK ON THE EQUIPMENT, YOU SHOULD ENSURE IT IS LOCKED OUT/TAGGED OUT WHENEVER POSSIBLE.

ON-SITE INFORMATION

OPERATOR:

Company name: .....

Operator's name: .....

.....

.....

Company address: .....

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INSTALLER:

Company name: .....

Installer's name: .....

.....

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Company address: .....

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.....

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TECHNICAL STATION:

Company name: .....

Technician's name: .....

.....

.....

Company address: .....

.....

.....

.....

EMERGENCY SERVICES:

Fire department: .....

Police: .....

Ambulance: .....

Hospital: .....

REFRIGERANT:

Type: .....

Chemical formula: .....

Designation #: .....
EN 378-1:2016 Annex E

Flammability: .....

Toxicity: .....

UNIT:

Maximum pressures: .....

Emergency shutdown instructions:

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APPENDIX
ANNEXE
ANLAGE
ALLEGATO
ANEXO

APPENDIX

ANNEXE

ANLAGE

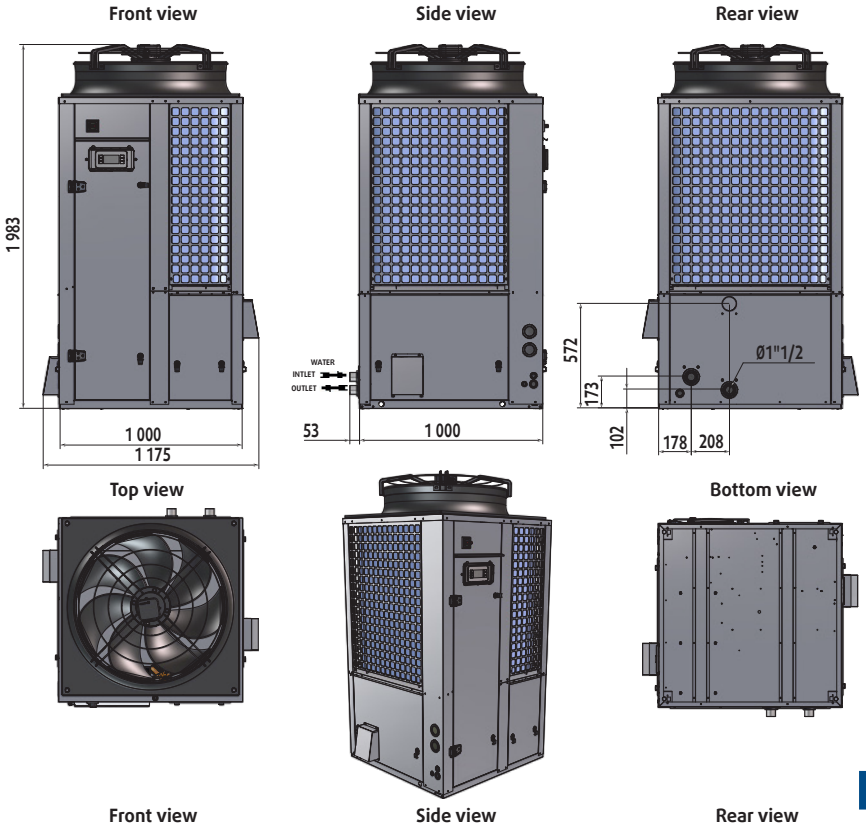
ALLEGATO

ANEXO

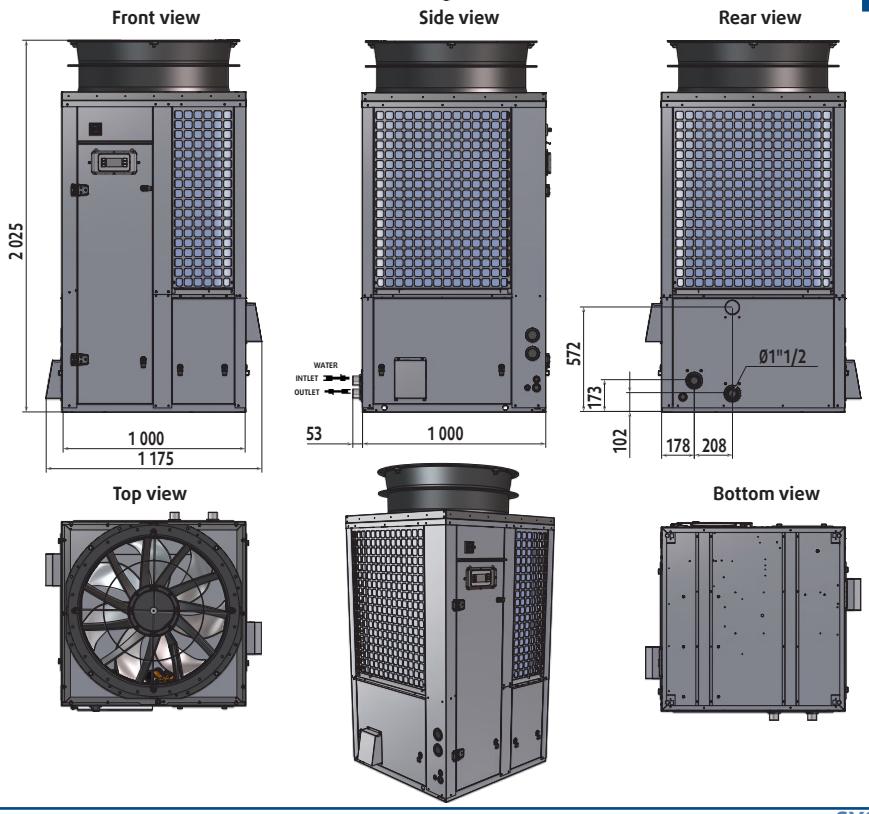
DIMENSIONS
DIMENSIONS
ABMESSUNGEN
DIMENSIONI
DIMENSIONES

SYSAQUA BLUE 35B

FAN STANDARD

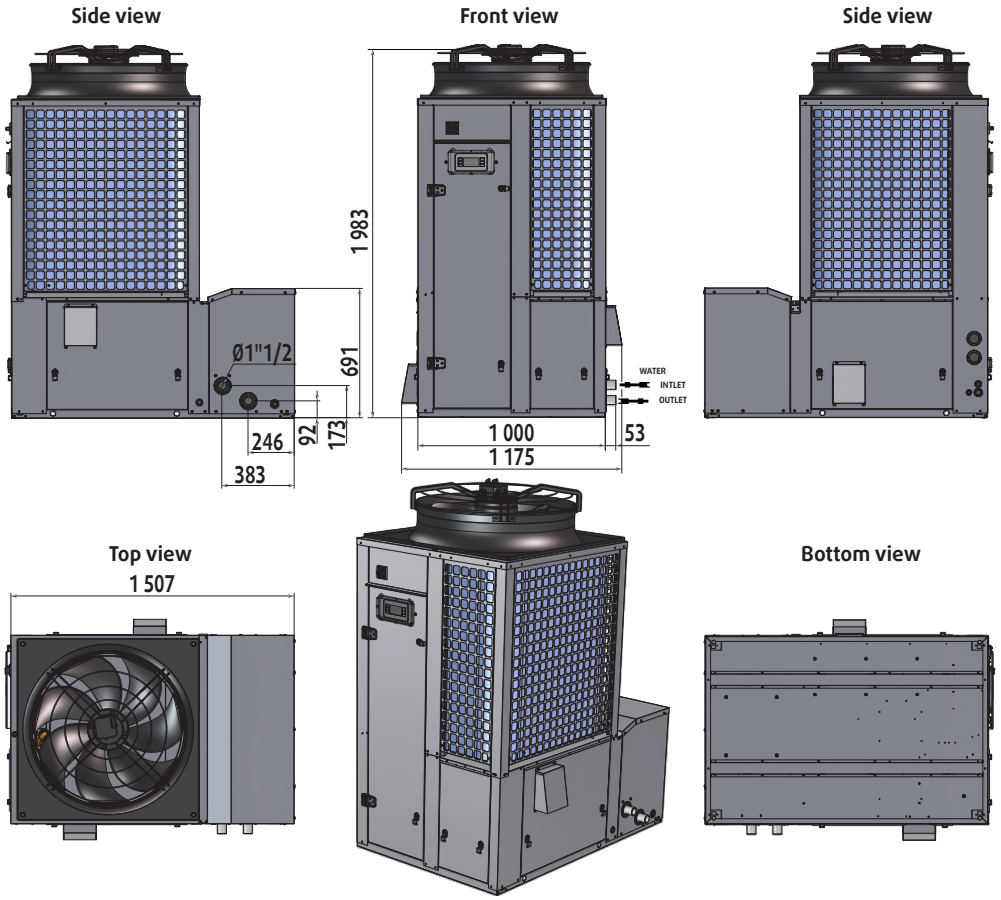


FAN HPF

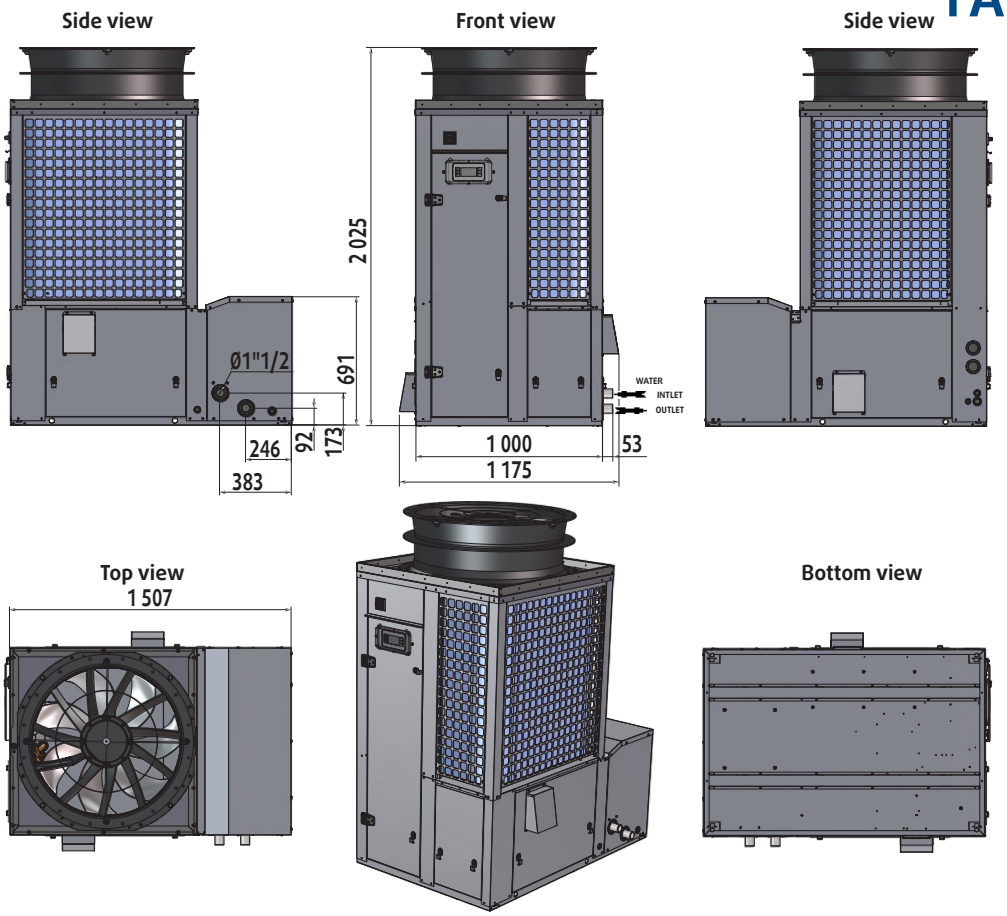


SYSAQUA BLUE 35B WITH BUFFER TANK

FAN STANDARD

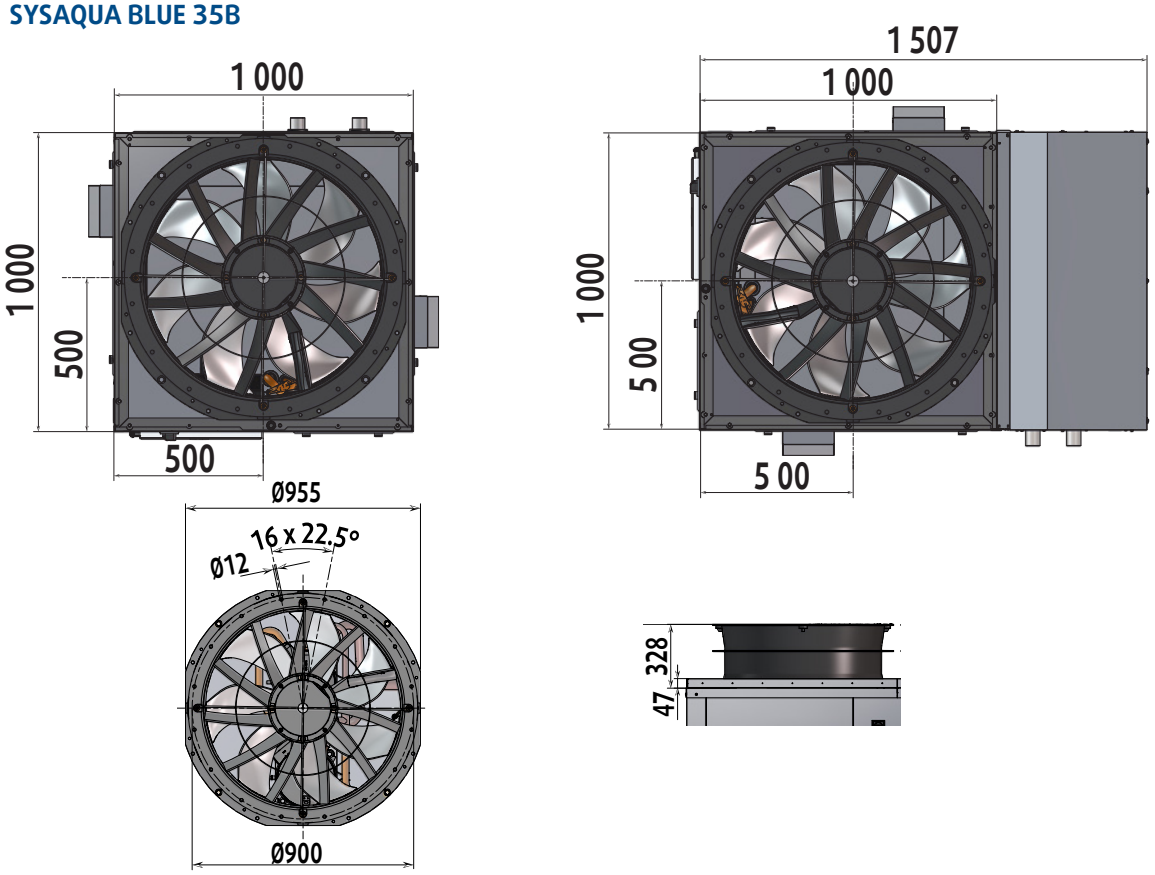


FAN HPF



DUCT OUTLET DIMENSIONS

SYSAQUA BLUE 35B



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
CV	Check valve
5	Sight glass
EEV1	Electronic expansion valve
7	Liquid reservoir
8	Plate heat exchanger
⏚	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	Service valve
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
CV	Clapet antiretour
5	Voyant liquide
EEV1	Détendeur électronique
7	Bouteille accumulation liquide
8	Evaporateur à plaques
⏚	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	Vanne de service
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
CV	Rückschlagventil
5	Schauglas
EEV1	Elektronisches Expansionsventil
7	Sammler
8	Plattenverdampfer
⏚	1/4'' Druckanschluss
FPC	Hochdruckgeber
HP	Überdruckschalter
CDT	Auslass-Temperaturfühler
FPE	Niederdruckgeber
CST	Saug-Temperaturfühler
OAT	Außenlufttemperaturfühler
OCT	Verflüssigeraustritt-Temperaturfühler
SV	Dienstventil
SV HP	Dienstventil Hochdruck
SV LP	Dienstventil Niederdruck
IV	Absperrventil

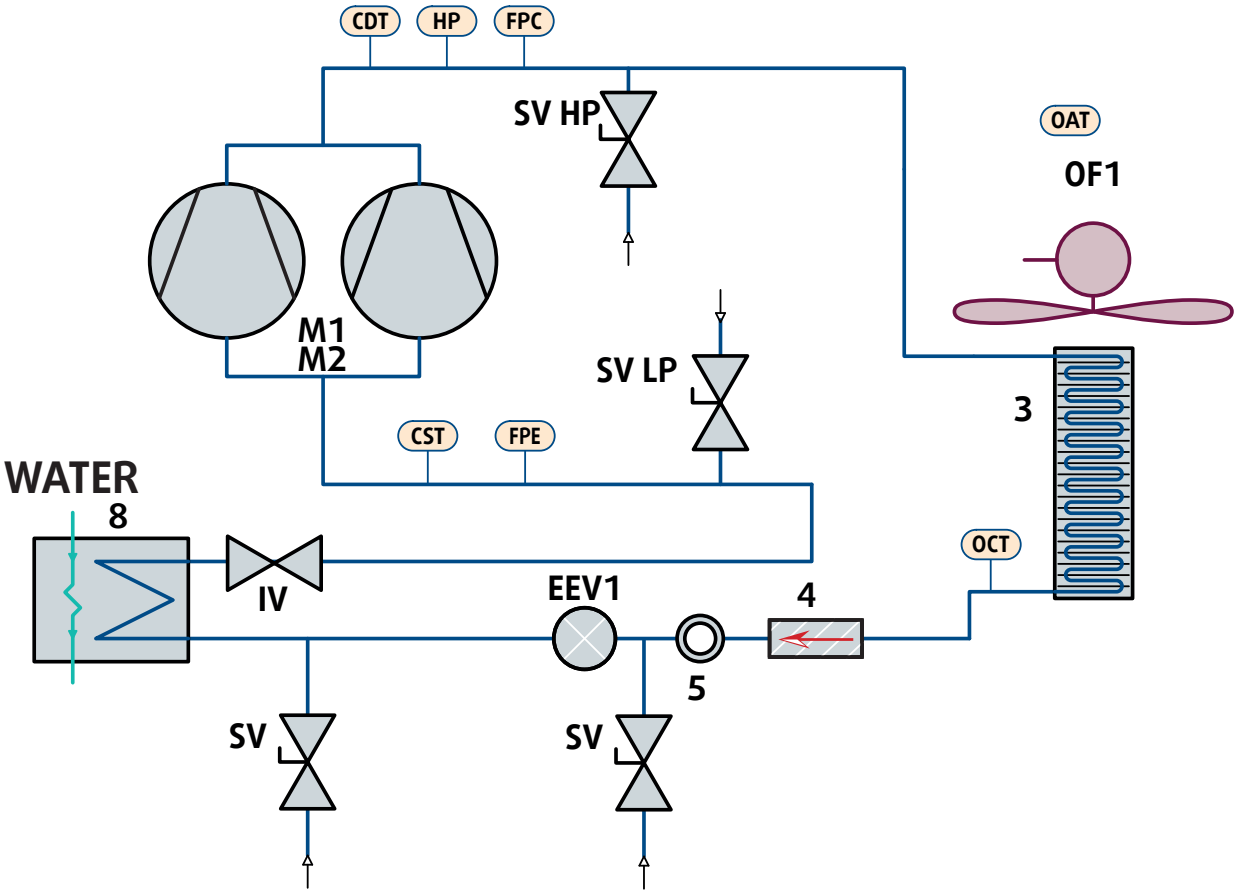
Italiano

M1/2	Compressore 1 e 2
RV1	Valvola di inversione ciclo
OF1	motore della ventilazione esterna
3	Condensatore ad aria
4	Filtro-essiccatore
CV	Valvola di non ritorno
5	Spia di vetro
EEV1	valvola di espansione elettronica
7	Accumulatore di liquido
8	Evaporatore a piastre
⏚	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	Valvola di servizio
SV HP	Valvola di servizio di alta pressione
SV LP	Valvola di servizio di bassa pressione
IV	Valvola di isolamento

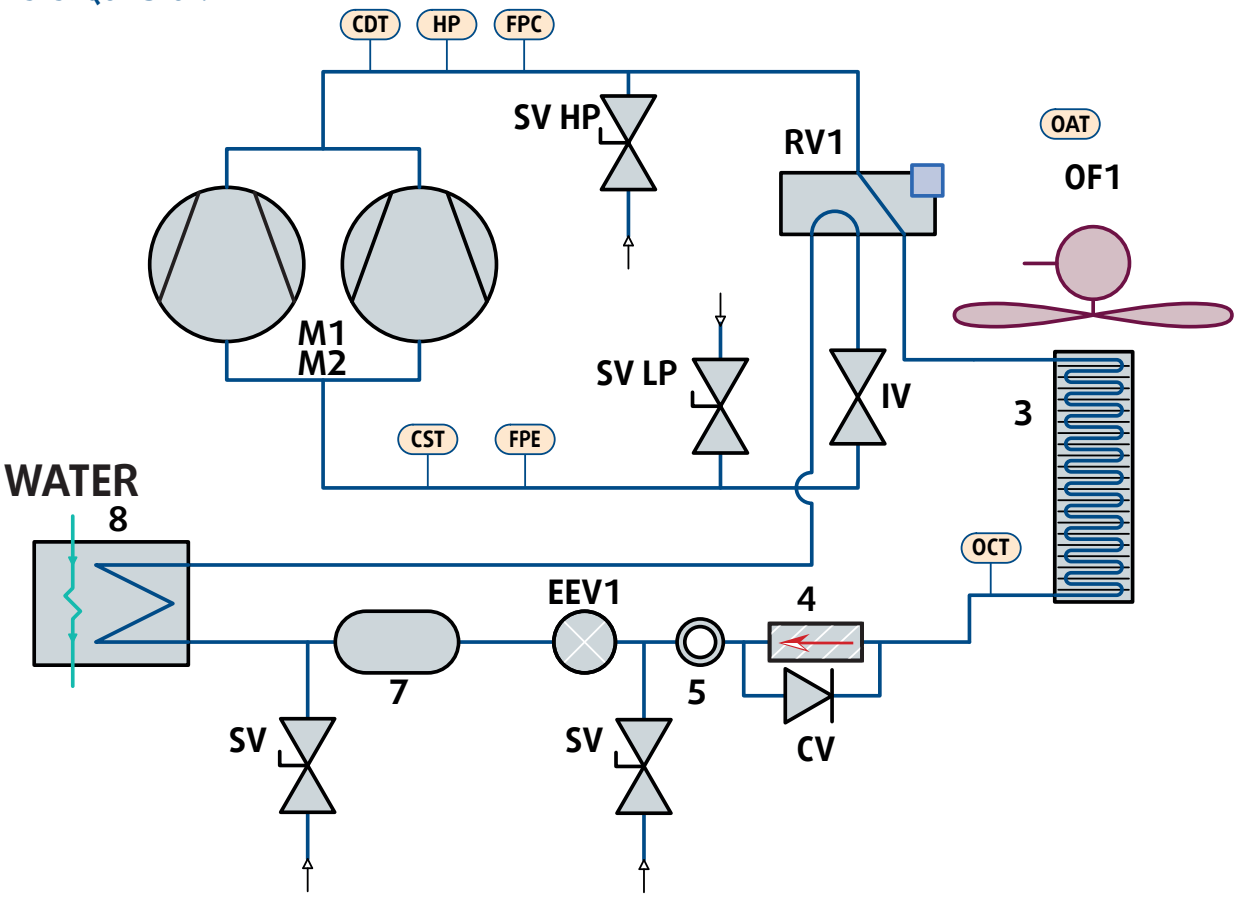
Español

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
CV	Válvula antirretorno
5	Indicador luminoso de líquido
EEV1	Válvula de expansión electrónica
7	Botella de acumulación de líquido
8	Evaporador de placas
⏚	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	Sonda de temperatura de succión
OAT	Sonda de temperatura de aire exterior
OCT	Sonda temperatura salida condensador
SV	Válvula de servicio
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 (option)
VD Drain valve
WPT Pressure transducer (option)

Français

INSTALLATION RECOMMANDEE

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 (option)
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 Plattenwärmeübertrager
RAG Frostschutz-Widerstände
FS Strömungswächter
WT Vorratsbehälter (Option)
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 (opzionale)
VD Valvola di scarico
WPT Trasduttore di pressione idraulica (opzionale)

Español

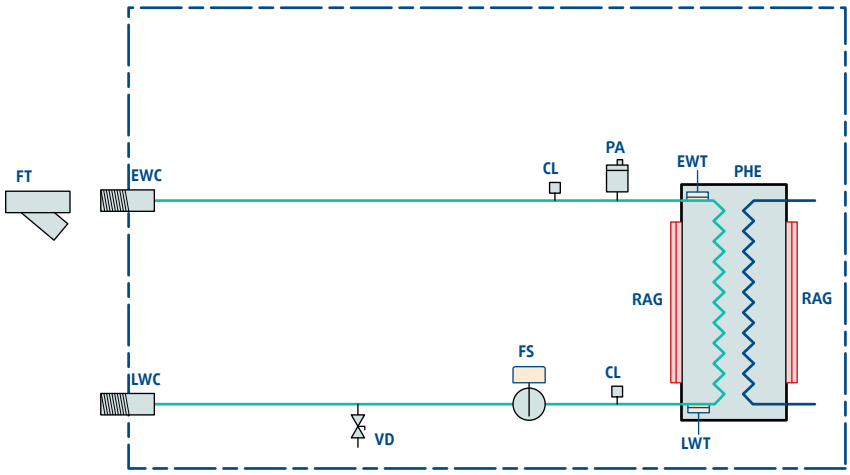
INSTALACIÓN RECOMENDADA

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

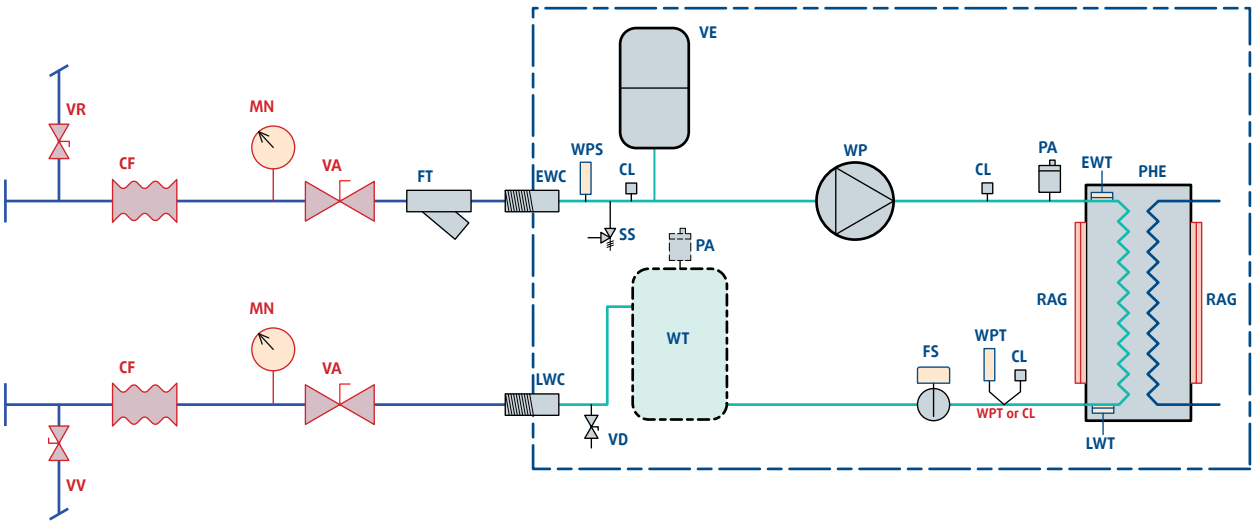
CIRCUITO HIDRÁULICO SYSAQUA BLUE

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 (opcional)
VD Válvula de vaciado
WPT Transductor de presión hidráulica (opcional)

WITHOUT PUMP

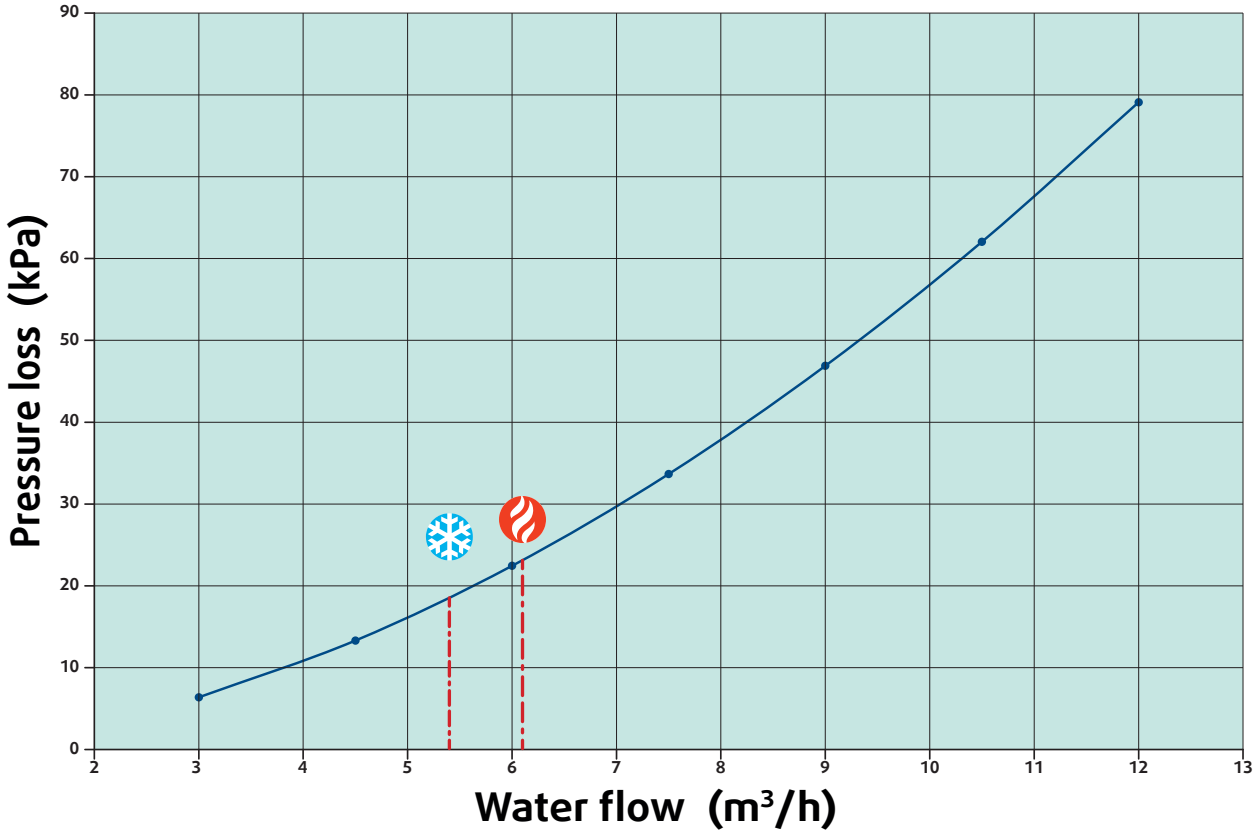


WITH 1 PUMP



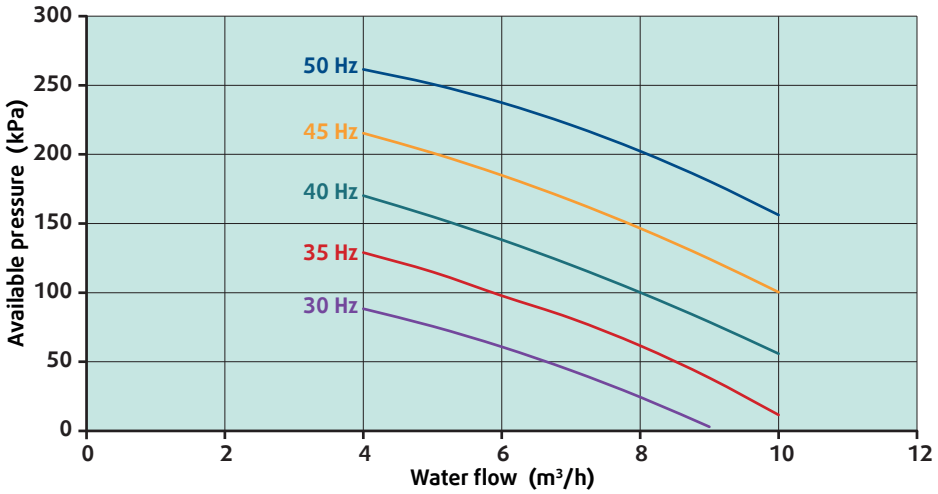
PRESSURE LOSSES OF THE PLATE HEAT EXCHANGER
PERTE DE CHARGE DE L'ECHANGEUR A PLAQUES
DRUCKVERLUST PLATTENWÄRMEÜBERTRAGER
PERDITA DI CARICO SCAMBIATORE A PIASTRE
PÉRDIDA DE CARGA INTERCAMBIADOR DE PLACAS

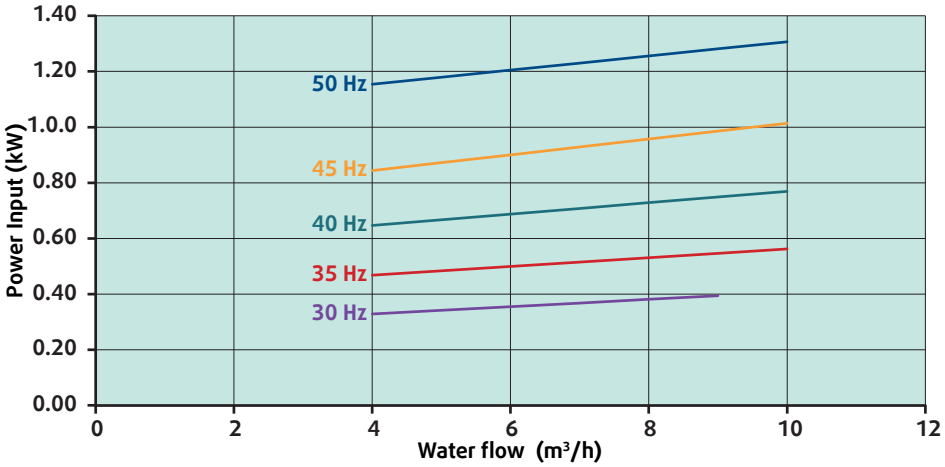
SYSAQUA BLUE 35B



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!

	English	Français	Deutsch	Italiano	Español
	POWER SUPPLY	SCHEMAS DE PUISSANCE	LEISTUNGSPLÄNE	SCHEMI DI POTENZA	ESQUEMAS DE POTENCIA
	DESCRIPTION	DESIGNATION	BEZEICHNUNG	DENOMINAZIONE	DESCRIPCIÓN
QG	main section switch	interrupteur sectionneur principal	Hauptschalter	interruttore principale	interruptor seccionador principal
X	distribution frame	répartiteur	Verteiler	ripartitore	repartidor
KA1	three-phase network control relay (phase sequence and cut-out)	module de contrôle d'ordre et de coupure 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	M1/2 compressors magneto-thermal circuit breaker	disjoncteurs magnétothermiques des compresseurs M1/2	Magnetothermische Schutzschalter der Verdichter M1/2	disgiuntori magnetotermici dei compressori M1/2	disyuntores magnetotérmicos de los compresores M1/2
K1/2	M1/2 compressors power circuit contactor	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	compressors 1 and 2	compresseurs 1 et 2	Verdichter 1 und 2	compressori 1 e 2	compresores 1 y 2
R1/2	M1/2 compressors crankcase heater	résistances de carter des compresseurs M1/2	Ölsumpfheizungen der Verdichter M1/2	resistenze del carter dei compressori M1/2	resistencias de cárter de los compresores M1/2
FTC	control circuit breaker	disjoncteur du circuit de commande	Schutzschalter des Steuerkreises	disgiuntore del circuito di comando	disyuntor del circuito de comando
FTOF-L	outdoor fans magneto-thermal circuit breaker	disjoncteur magnétothermique de la ventilation extérieure	Magnetothermischer Schutzschalter der externen Lüftung	disgiuntore magnetotermico della ventilazione esterna	disyuntor magnetotérmico de la ventilación exterior
FTOF-H	outdoor fans magneto-thermal circuit breaker	disjoncteur magnétothermique de la ventilation extérieure	Magnetothermischer Schutzschalter der externen Lüftung	disgiuntore magnetotermico della ventilazione esterna	disyuntor magnetotérmico de la ventilación exterior
KOF	outdoor fans power contactors	contacteur de puissance de la ventilation extérieure	Leistungsschütz der externen Lüftung	contattore di potenza della ventilazione esterna	contactor de potencia de la ventilación exterior
KOF1	three phase frequency variator command relay of outdoor fan	relais de commande du variateurs de fréquence triphasés du moteurs ventilateurs extérieurs	Steuerrelais der Drehstrom-Frequenzumrichter der Motoren der externen Lüftung	relè di comando dei variatori di frequenza trifase dei motori ventilatori esterni	relé de comando de los variadores de frecuencia trifásicos de los motores de la ventilación exterior
KOF-L	outdoor fans power contactors	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	outdoor fans power contactors	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	outdoor fan motor	moteur de la ventilation extérieure	Motor der externen Lüftung	motore della ventilazione esterna del circuito	motor de la ventilación exterior
TBC2	thermostat crankcase heater	thermostat résistances de carter	Temperaturregler des Ölsumpfheizungen	termostato resistenze del carter	termostato resistencias de cárter

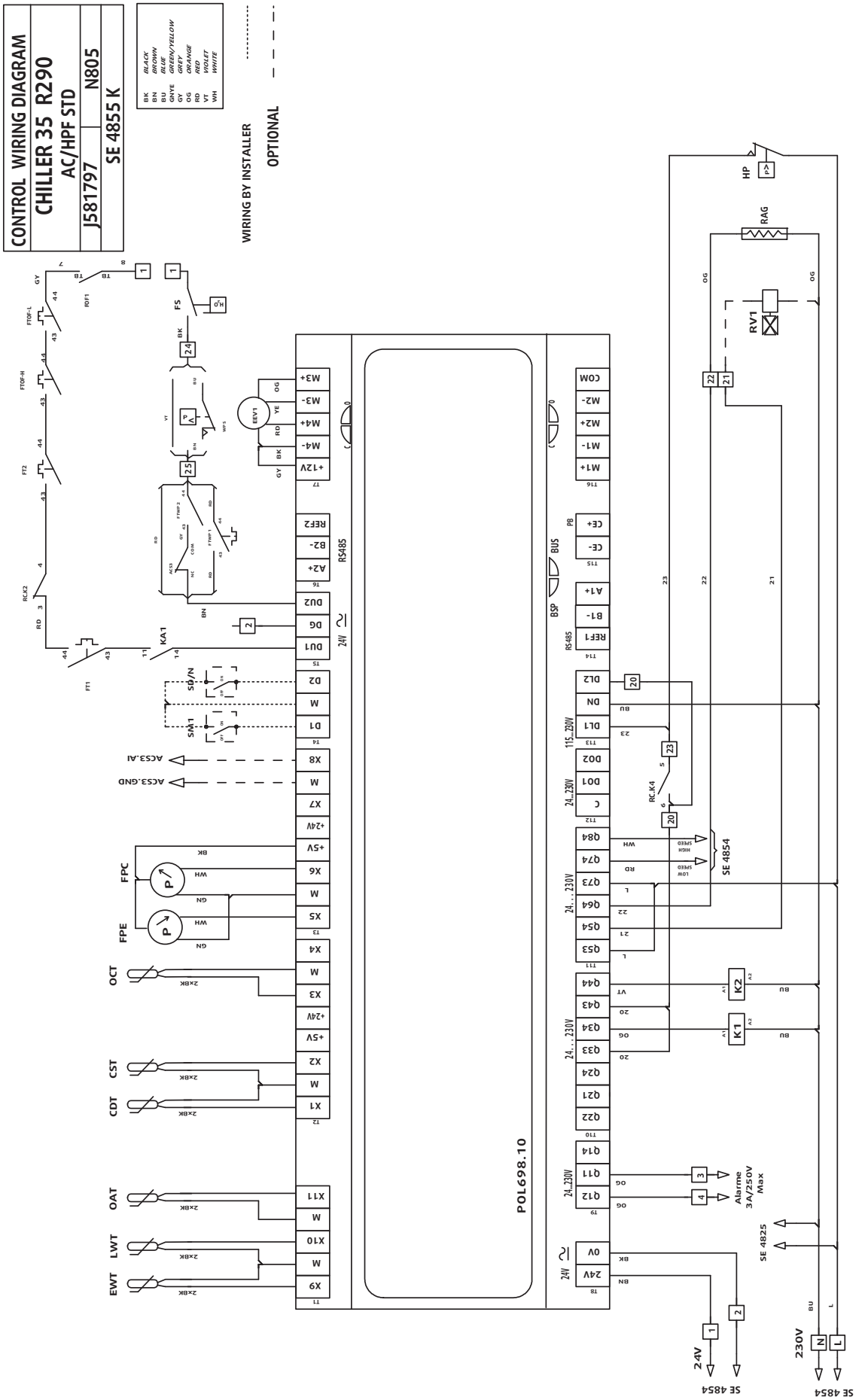
	English	Français	Deutsch	Italiano	Español
	CONTROL AND REGULATION	SCHEMAS DE COMMANDE	STEUERPLÄNE	SCHEMI DI COMANDO	ESQUEMAS DE COMANDO
	DESCRIPTION	DESIGNATION	BEZEICHNUNG	DENOMINAZIONE	DESIGNACIÓN
POL698.10	regulation	régulation	Regelung	regolazione	regulación
T1	transformer 230V/24V-25VA	transformateur 230V/24V-25VA	Transformator 230V/24V-25VA	trasformatore 230V/24V-25VA	transformador 230V/24V-25VA
EEV1	Electronic expansion valve	Détendeur électronique	Elektronisches Expansionsventil	valvola di espansione elettronica	Válvula de expansión electrónica
FFT	fuse terminal + fuse	borne fusible + fusible	Sicherungsklemme + Sicherung	portafusibile + fusibile	terminal de fusible + fusible
FT1/2	1 and 2 compressors additional magneto-thermal circuit breaker	contacts additionnels disjoncteur magnétothermique des compresseurs 1 et 2	Zusätzliche Kontakte des magnetothermischen Schutzschalters der Verdichter 1 und 2	contatti aggiuntivi disgiuntore magnetotermico dei compressori 1 e 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 magnetothermischen Schutzschalters der externen Lüftung	contatto aggiuntivo disgiuntore magnetotermico della ventilazione esterna	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 magnetothermischen Schutzschalters der externen Lüftung	contatto aggiuntivo disgiuntore magnetotermico della ventilazione esterna	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	sicurezza interna del motore della ventilazione esterna	seguridad interna del motor de la ventilación exterior
FS	flow switch	détecteur de débit d'eau (flow switch)	Strömungswächter (flow switch)	sensore di portata di acqua (flussostato)	detector de caudal de agua (flow switch)
WPS	water low pressure switch (option)	pressostat manque d'eau (option)	Wassermangel-Druckwächter (Option)	pressostato mancanza di acqua (opzionale)	presóstato falta de agua (opcional)
HP	automatic reset high-pressure pressostats	pressostat haute pression à réarmement automatique.	Überdruckwächter mit automatischer Wiedereinschaltung	pressostato alta pressione a riarmo automatico.	presóstato 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	contattori di potenza dei compressori M1/2	contactores de potencia de los compresores M1/2
RAG	antifreeze electric heater	résistance anti-gel	Frostschutz-Widerstand	resistenza antigelo	resistencia anticongelación
TBC2	thermostat antifreeze electric heater	thermostat résistance anti-gel	Temperaturregler des Frostschutz-Widerstand	termostato resistenze antigelo	termostato resistencia anticongelación anticongelación
RV1	4-way cycle changeover valves (option)	vanne d'inversion de cycle (option)	Umkehrzyklusventil (Option)	valvole di inversione di ciclo (opzionale)	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	contatto del modulo di controllo d'ordine e di interruzione di fasi	contacto del módulo de control de orden y de corte de fases
FPE	pressure transducer (low pressure)	transducteur de pression (basse pression)	Druckwandler (Niederdruck)	trasduttore di pressione (bassa pressione)	transductor de presión (baja presión)
FPC	pressure transducer (high-pressure)	transducteur de pression (haute pression)	Druckwandler (Hochdruck)	trasduttore di pressione (alta pressione)	transductor de presión (alta presión)
OCT	de-icing temperature probe	sonde de température de batterie ailetée	Temperaturfühler der verrippten Batterie	sonda di temperatura della batteria alettata	sonda de temperatura de batería con aletas
OAT	outdoor temperature probe (air)	sonde de température extérieure (air)	Außentemperaturfühler (Luft)	sonda di temperatura esterna (aria)	sonda de temperatura exterior (aire)

	English	Français	Deutsch	Italiano	Español
	CONTROL AND REGULATION	SCHEMAS DE COMMANDE	STEUERPLÄNE	SCHEMI DI COMANDO	ESQUEMAS DE COMANDO
	DESCRIPTION	DESIGNATION	BEZEICHNUNG	DENOMINAZIONE	DESIGNACIÓN
CDT	high discharge temperature probe	sonde de température de refoulement	Auslass-Temperaturfühler	sonda di temperatura di mandata	sonda de temperatura de descarga
CST	Suction temperature sensor	Sonde température d'aspiration	Saug-Temperaturfühler	Sonda di temperatura di aspirazione	Sonda de temperatura de succión
EWT	inlet water temperature probe	sonde de température d'entrée d'eau	Wassereintritt-Temperaturfühler	sonda di temperatura di ingresso dell'acqua	sonda de temperatura de entrada de agua
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	sensore 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

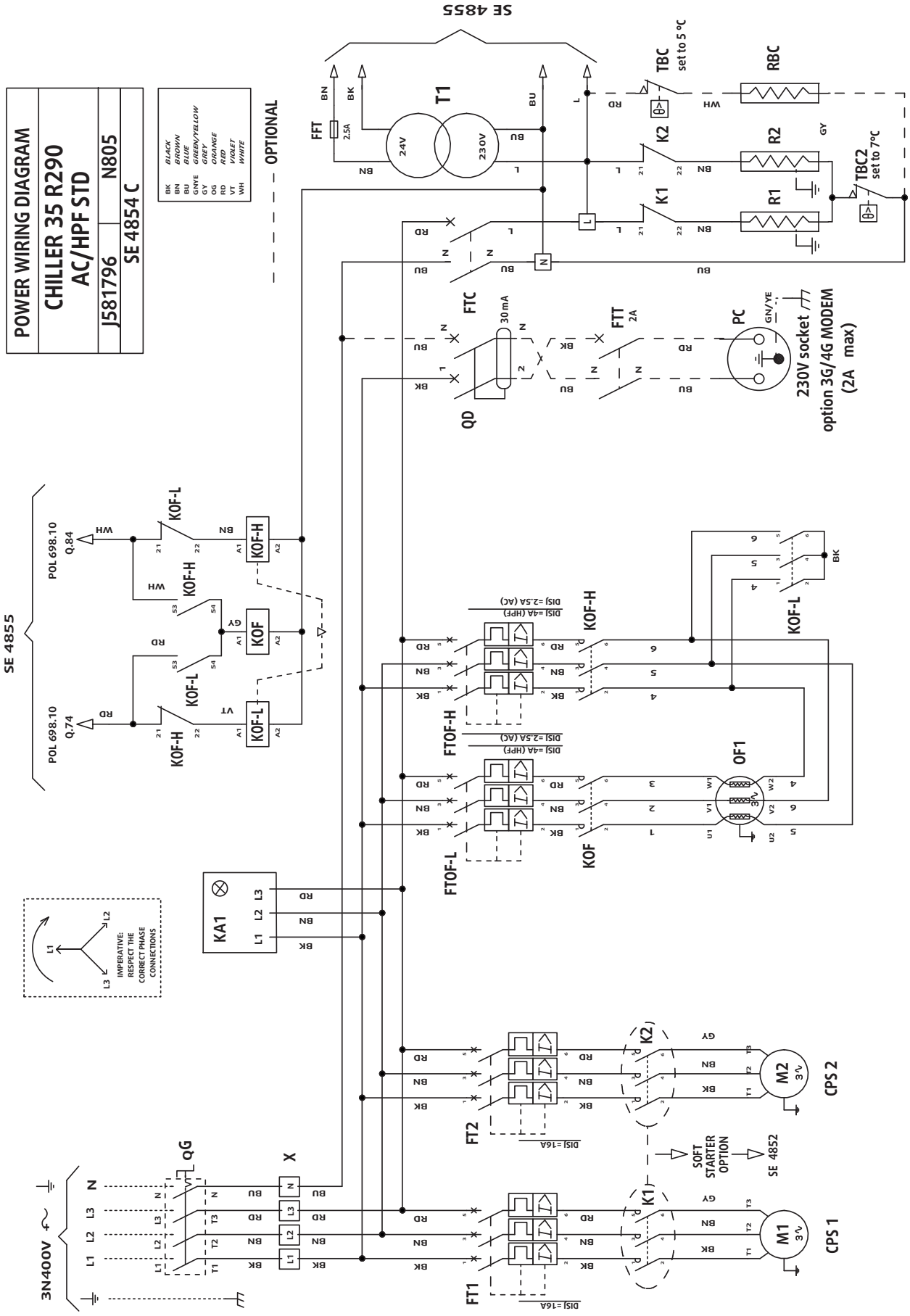
	English	Français	Deutsch	Italiano	Español
	OPTIONS	OPTIONS	OPTIONEN	OPZIONI	OPCIONES
	DESCRIPTION	DESIGNATION	BEZEICHNUNG	DENOMINAZIONE	DESIGNACIÓN
	OPTION PUMP	OPTION POMPE	OPTION PUMPE	OPZIONE POMPA	OPCIÓN BOMBA
WP1	water pump	pompe hydraulique	Wasserpumpe	pompa idraulica	bomba hidráulica
KWP1	water pump motor power contact (option)	contacteur de puissance du moteur de la pompe hydraulique (option)	Leistungsschütz des Wasserpumpenmotors (Option)	contattore di potenza del motore della pompa idraulica (opzionale)	contactor de potencia del motor de la bomba hidráulica (opcional)
FTWP1	water pump motor magnetothermal circuit breaker (option)	disjoncteur magnétothermique du moteur de la pompe hydraulique (option)	Magnetothermischer Schutzschalter des Wasserpumpenmotors (Option)	disgiuntore magnetotermico del motore della pompa idraulica (opzionale)	disyuntor magnetotérmico del motor de la bomba hidráulica (opcional)
FTWP2	water pump motor circuit breaker (option)	disjoncteur du moteur de la pompe hydraulique (option)	Schutzschalter des Wasserpumpenmotors (Option)	disgiuntore del motore della pompa idraulica (opzionale)	disyuntor del motor de la bomba hidráulica (opcional)
ACS3	three phase frequency variator of water pump motor (option)	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	pressure transducer (option)	transducteur de pression hydraulique (option)	Druckwandler (Option)	trasduttore di pressione idraulica (opzionale)	transductor de presión hidráulica (opcional)
	OPTION ALL SEASONS	OPTION TOUTES SAISONS	OPTION GANZJAHRESBETRIEB	OPZIONE TUTTE LE STAGIONI	OPCIÓN TODAS LAS ESTACIONES DEL AÑO
FTOF1/2	magnetothermal circuit breaker	disjoncteur magnétothermique	Magnetothermischer Schutzschalter	disgiuntore magnetotermico	disyuntor magnetotérmico
ACS1/2	three phase frequency variator of outside ventilation	variateur de fréquence triphasé des moteurs de la ventilation extérieure	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	relais de commande des variateurs de fréquence triphasés	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	OPTION SOFT STARTER	OPZIONE SOFT STARTER	OPCIÓN SOFT STARTER
S.ST1/2	Soft Starter	démarreurs «Soft Starter»	Anlasser «Soft Starter»	motorini di avviamento «Soft Starter»	Motor de arranque «Soft Starter»
K1/2	M1/2 compressors relay	relais des compresseurs M1/2	Relais der Verdichter M1/2	relè dei compressori M1/2	relé de los compresores M1/2
	NORDIC OPTION	OPTION PACK NORDIQUE	NORDISCHE OPTION	OPZIONE NORDICA	OPCIÓN NÓRDICO
TBC	thermostat electric heater	thermostat résistance pack nordique	Temperaturregler des Frostschutz-Widerstand	termostato resistenze vasche	termostato resistencia anticongelación
RBC	antifreeze electric heater	résistance pack nordique	Frostschutz-Widerstand	resistenza vasca	resistencia anticongelación
	MODEM OPTION	OPTION MODEM	MODEM OPTION	OPZIONE MODEM	OPCIÓN MODEM
QD	4G modem differential circuit breaker	disjoncteur différentiel du modem 4G	FI-Schutzschalter des 4G-Modems	salvavita del modem 4G	Disyuntor diferencial del módem 4G
FTT	circuit breaker	disjoncteur	Schutzschalter	salvavita	Disyuntor
PC	electrical socket	prise électrique	Steckdose	presa elettrica	toma de corriente

SYSAQUA BLUE 35B

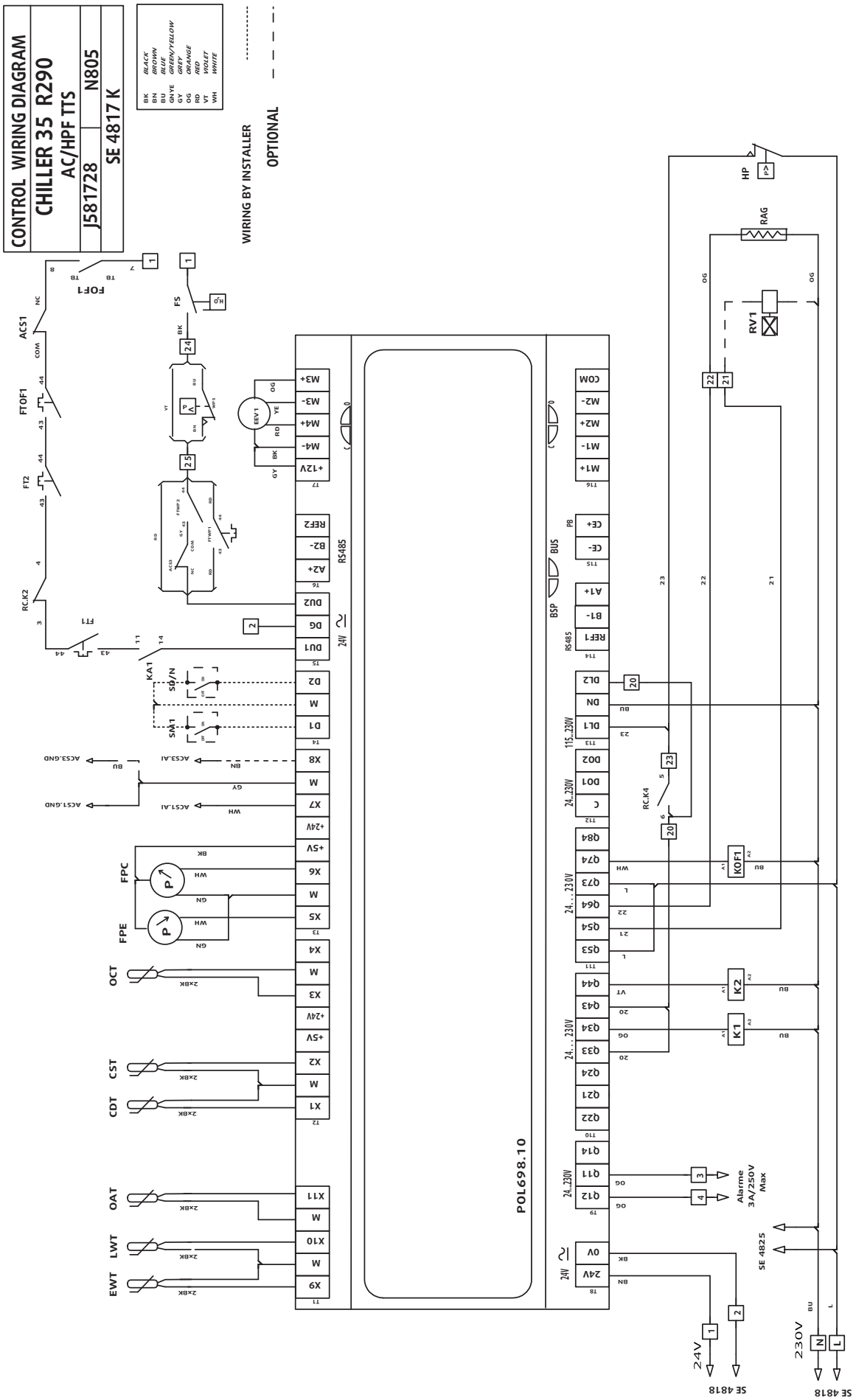
CONTROL



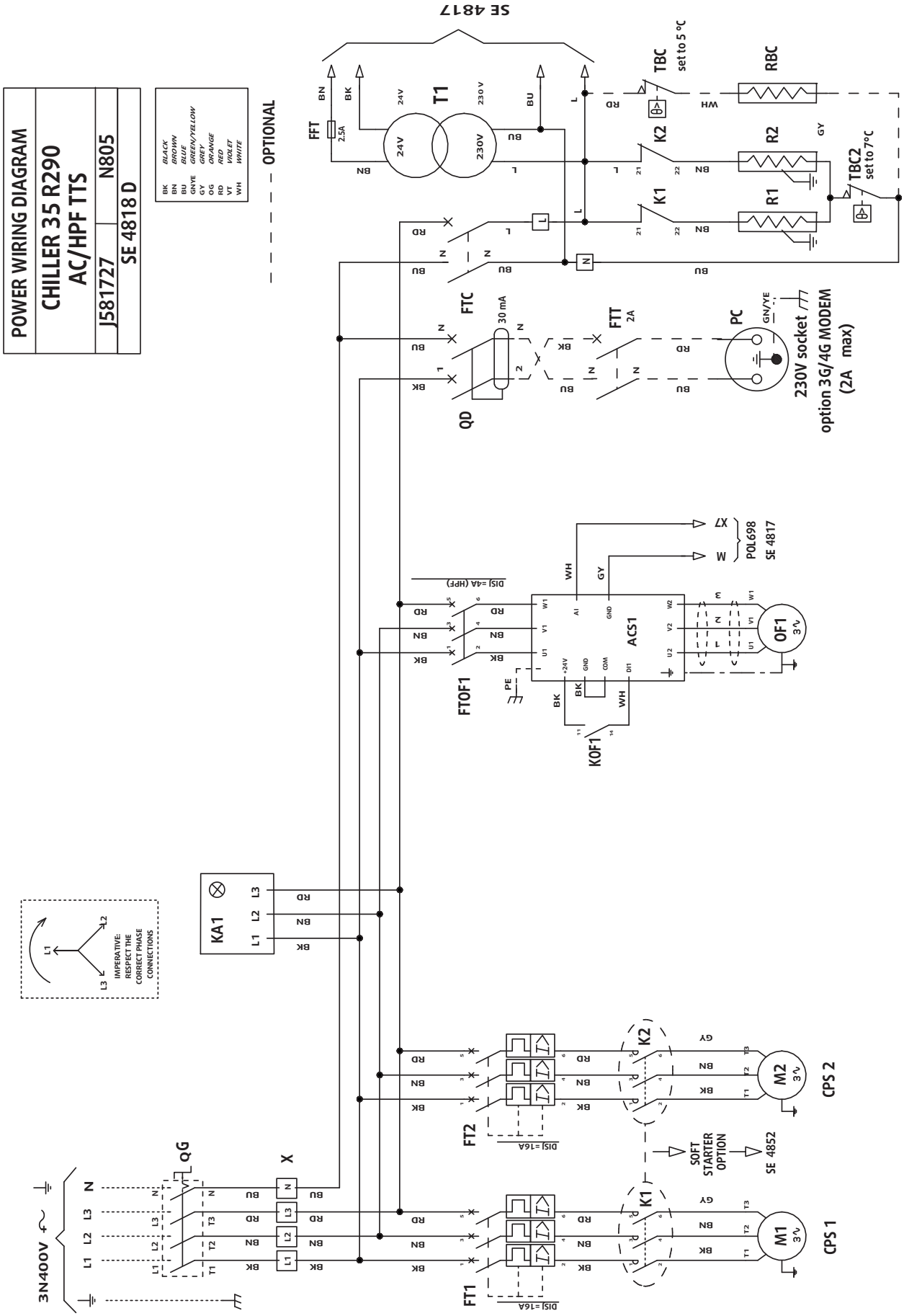
POWER


POWER WIRING DIAGRAM
CHILLER 35 R290
AC/HPF STD
J581796
N805
SE 4854 C
BK BLACK
BN BROWN
BU BLUE
GNYE GREEN/YELLOW
GY GREY
OG ORANGE
RD RED
VT VIOLET
WH WHITE
OPTIONAL
SE 4855
T1
24V
230V
FFT
2.5A
TBC
set to 5°C
RBC
K2
R2
TBC2
set to 7°C
K1
R1
FTC
30 mA
FTT
2A
PC
GN/YE
230V socket
option 3G/4G MODEM
(2A max)
QD
SE 4855
POL 698.10
Q.84
Q.74
KOF-L
KOF-H
KOF
FTOF-H
FTOF-L
DISJ =4A (HPF)
DISJ =2.5A (AC)
OF1
KOF
KA1
IMPERATIVE:
RESPECT THE
CORRECT PHASE
CONNECTIONS
3N400V
QG
X
FT2
FT1
DISJ =16A
K2
K1
M2
M1
CPS 2
CPS 1
SOFT
STARTER
OPTION
SE 4852

TTS - CONTROL


CONTROL WIRING DIAGRAM
CHILLER 35 R290
AC/HPF TTS
J581728
N805
SE 4817 K
BK BLACK
BN BROWN
BU BLUE
GN/YE GREEN/YELLOW
GY GREY
OG ORANGE
RD RED
VT VIOLET
WH WHITE
WIRING BY INSTALLER
OPTIONAL
POL698.10
FOF1
FS
ACS1
FTOF1
FT2
RC.K2
FT1
KA1
SM1
FPC
FPE
OCT
CST
CDT
OAT
LWT
EWT
EEV1
RS485
BUS
HP
RAG
RV1
RC.K4
KOF1
K2
K1
Alarme
3A/250V
Max
SE 4825
24V
230V
SE 4818

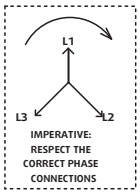
TTS - POWER

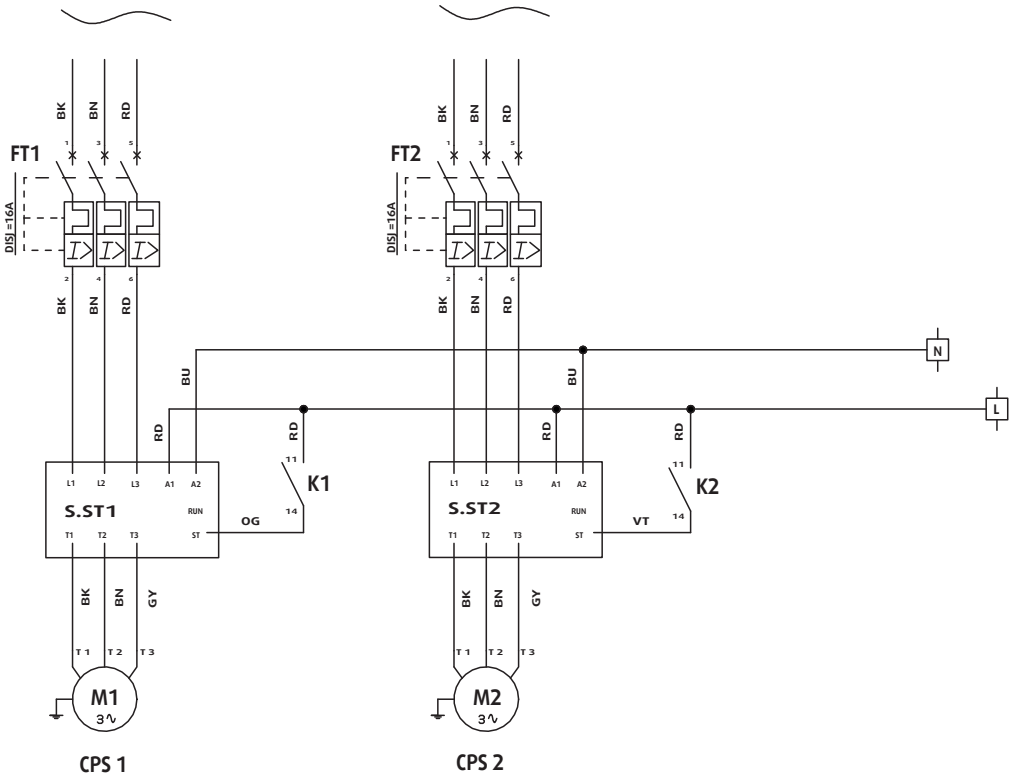

POWER WIRING DIAGRAM
CHILLER 35 R290
AC/HPF TTS
J581727
N805
SE 4818 D
BK BLACK
BN BROWN
BU BLUE
GN/YE GREEN/YELLOW
GY GREY
OG ORANGE
RD RED
VT VIOLET
WH WHITE
OPTIONAL
SE 4817
FFT
2.5A
T1
24V
230V
TBC
set to 5°C
RBC
K2
R2
TBC2
set to 7°C
K1
R1
FTC
30 mA
FTT
2A
PC
GN/YE
230V socket
option 3G/4G MODEM
(2A max)
QD
POL698
SE 4817
DISJ =4A (HPF)
ACS1
OF1
FTOF1
KOF1
PE
KA1
IMPERATIVE:
RESPECT THE
CORRECT PHASE
CONNECTIONS
FT2
FT1
DISJ =16A
M2
M1
CPS 2
CPS 1
SOFT
STARTER
OPTION
SE 4852
QG
X
3N400V

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 B	

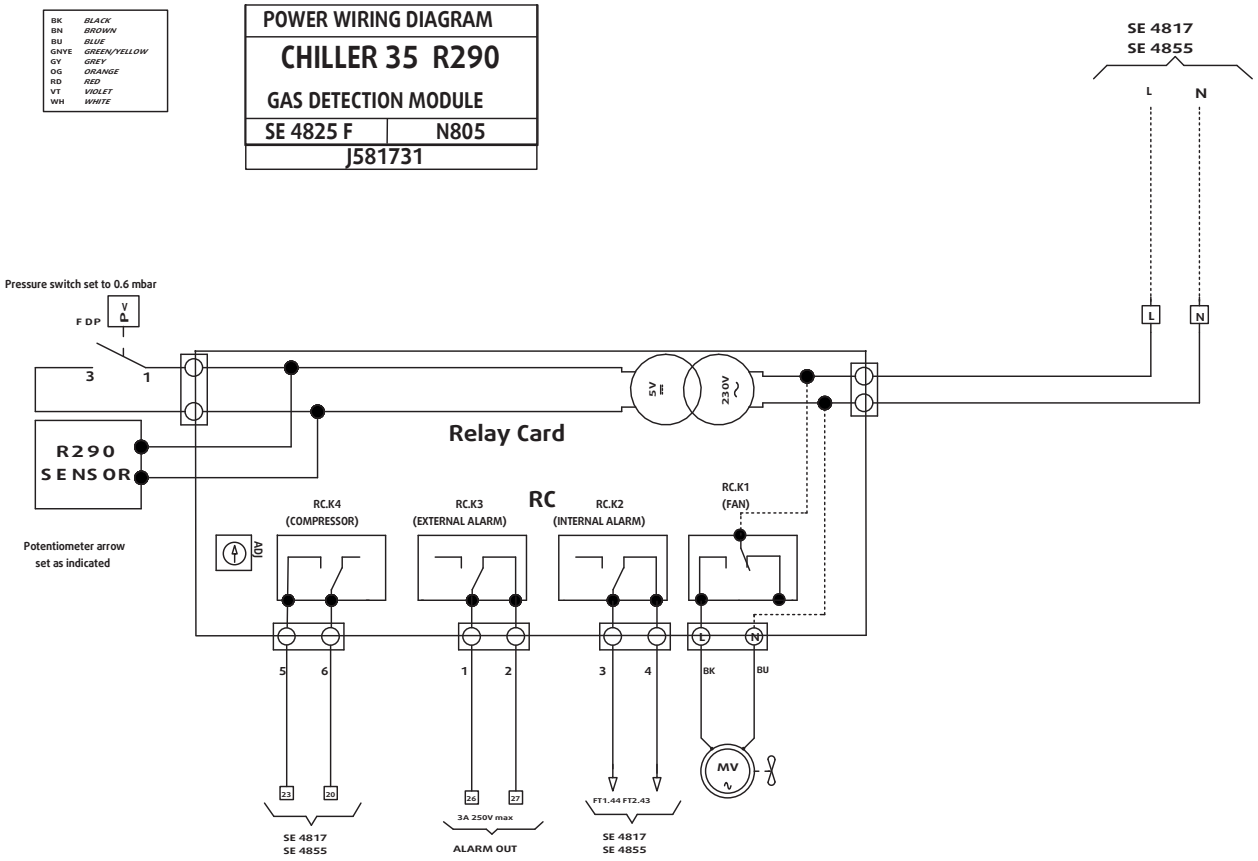




GAS DETECTION MODULE

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

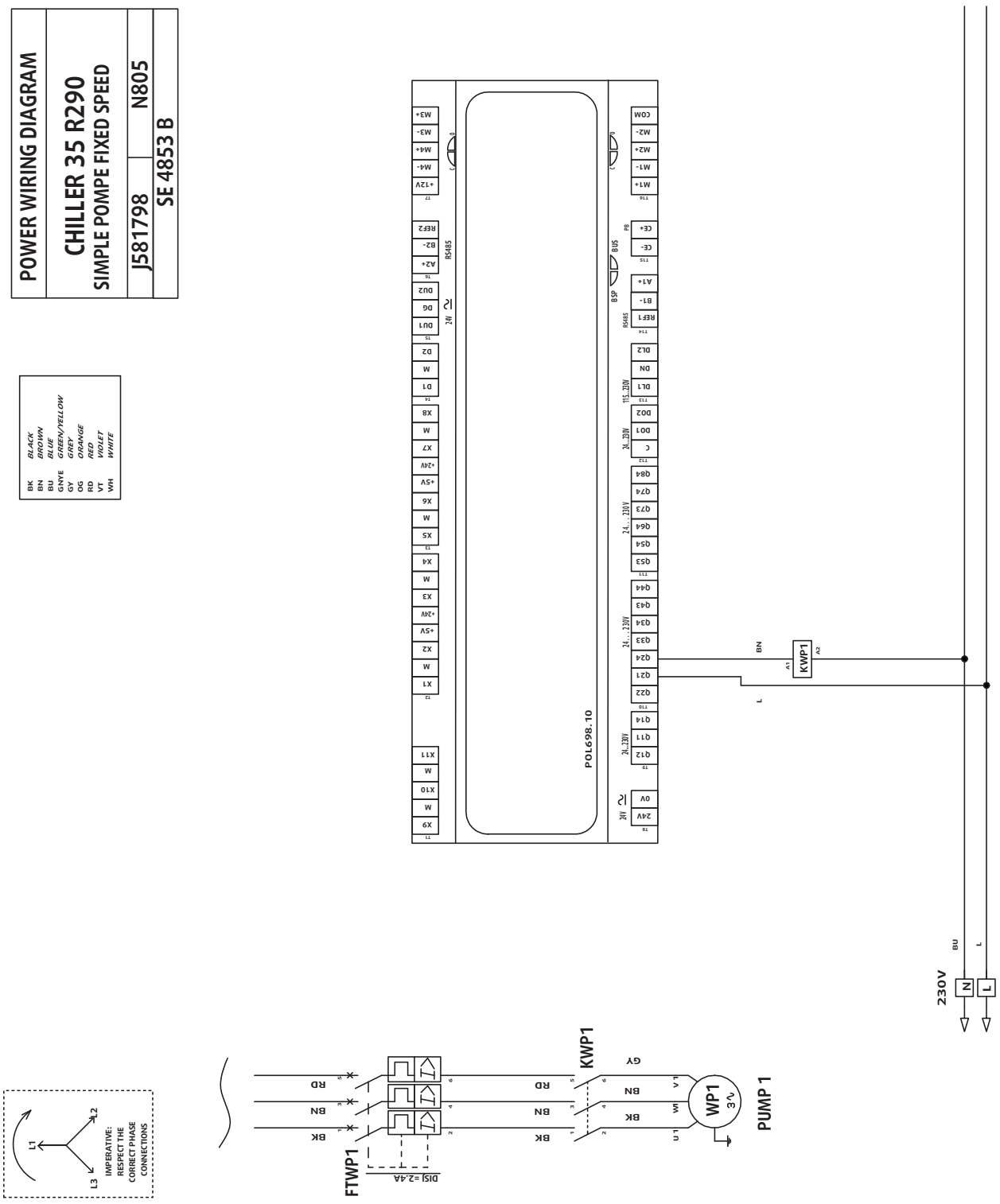
POWER WIRING DIAGRAM	
CHILLER 35 R290	
GAS DETECTION MODULE	
SE 4825 F	N805
J581731	



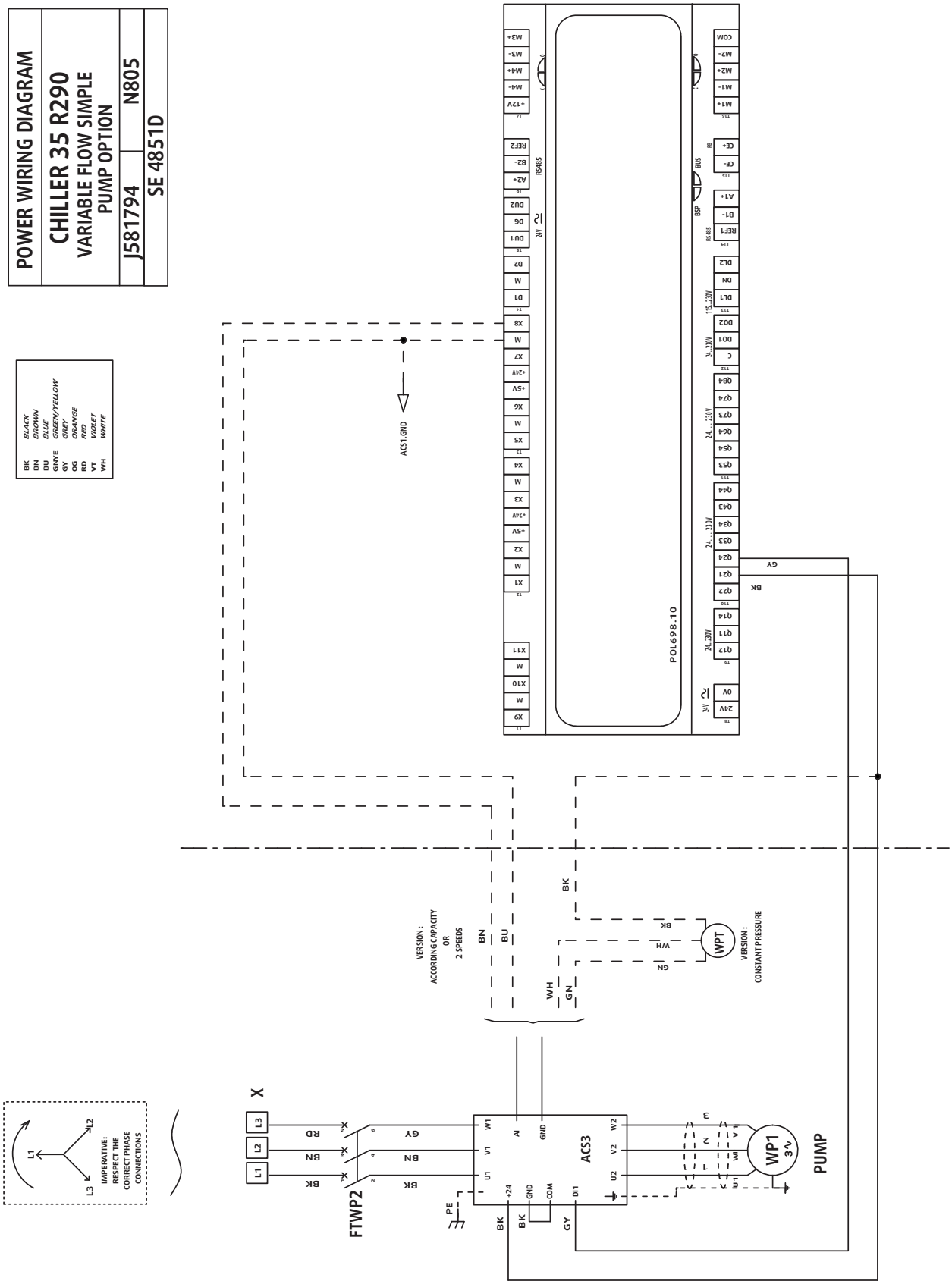
FIXED SPEED SIMPLE PUMP

POWER WIRING DIAGRAM		
CHILLER 35 R290 SIMPLE POMPE FIXED SPEED	J581798	N805
	SE 4853 B	

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



VARIABLE FLOW SIMPLE PUMP



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
Recommanded 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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INSTALLATION MEASUREMENTS:

Ambient temperature: ..... Ambient humidity: .....

.....

ELECTRICAL MEASUREMENTS:

Voltage L1-N: ..... Voltage L1-L2:: .....

Voltage L1-L3: ..... Voltage L2-L3:: .....

.....

	YES	NO
Voltage unbalance less than 2 %	☐	☐

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:

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The installer certifies that the system has been installed in accordance with the design requirements, and reports that the safety and control devices have been adjusted in accordance with the manufacturer's recommendations.

Date:	Date:
TECNICIAN:	CLIENT:
Name:	Name:
Sign-in:	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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🖷 : +33 (0)2 32 32 55 13

J581813GB

IOM AQA 06-N-2GB
Part number : **J581813GB**
Supersedes : **IOM AQA 06-N-1GB**