

WATER COOLING DEVICE

FRIOJET 300i

SAFETY INSTRUCTIONS FOR USE AND MAINTENANCE

DEVICE N° W000380971 - W000380972



EDITION: EN
REVISION: C
DATE: 03-2020

Instructions for use

REF: **8695 4938**

Original instructions

LINCOLN[®]
ELECTRIC

Thank for the trust you have expressed by purchasing this equipment, which will give you full satisfaction if you follow its instructions for use and maintenance.

Its design, component specifications and workmanship comply with applicable European directives.

Please refer to the enclosed CE declaration to identify the directives applicable to it.

The manufacturer will not be held responsible where items not recommended by themselves are associated with this product.

For your safety, there follows a non-restrictive list of recommendations or requirements, many of which appear in the employment code.

Finally we would ask you kindly to inform your supplier of any error which you may find in this instruction manual.

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INFORMATIONS

DISPLAYS AND PRESSURE GAUGES

The measuring devices or displays for voltage, current, speed, pressure, etc., whether analog or digital, should be considered as indicators

REVISIONS

REVISION B

02/19

DESIGNATION	PAGE
To change logos	

REVISION C

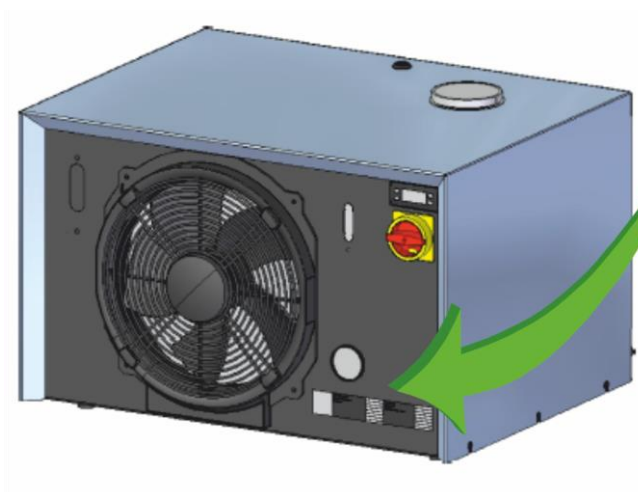
03/20

DESIGNATION	PAGE
Add T5 torch	

A - IDENTIFICATION

Please enter the number of your equipment in the following box.
Quote this information in all correspondence.

N° _____



B - SAFETY INSTRUCTIONS

For general safety instructions, please refer to the specific manual supplied with the equipment.

1 - SPECIAL SAFETY INSTRUCTIONS

GENERAL REMARKS

There are fundamental points in these operating instructions. They must be observed during start-up, operation, and maintenance. It is essential for them to be read and understood by the installer and by all personnel involved before starting up. Ensure that these instructions are available where the installation will be run.

Both the general safety instructions set out below, and the special safety instructions described in the other paragraphs should be observed.

PERSONNEL QUALIFICATION AND TRAINING

Operational, maintenance, and assembly personnel should be fully qualified for this work. Management is responsible for addressing in the greatest detail every matter relating to extent of responsibility, competence, and supervision of personnel.

Failure to observe safety instructions may lead not only to danger to the environment and to the installation but also to individuals. The manufacturer accepts no responsibility should safety instructions not be met and no claim for damages will be considered in such a case.

SAFETY INSTRUCTIONS FOR THE ATTENTION OF MANAGEMENT AND OPERATORS

No protection against contact with moving parts may be removed during operation. Risks linked to electricity (working while current on) should be made impossible. (For further detail, see the instructions in standard EN 60204 / VDE and national regulations).

SAFETY INSTRUCTIONS RELATED TO ASSEMBLY, INSPECTION, AND MAINTENANCE

Cleaning and maintenance should only be carried out when the installation is switched off. All safety and protection devices should immediately be replaced, in good order, as soon as any such operation is completed.

MODIFYING THE INSTALLATION WITHOUT THE MANUFACTURER'S AGREEMENT

No modification or transformation whatsoever of the installation may be made without the manufacturer's prior consent. Original spare parts and accessories approved by the manufacturer are specifically designed with safety in mind. The manufacturer may refuse to accept responsibility if other parts are used.

NON-COMPLYING MODES OF OPERATION

The operational safety of the installation supplied is guaranteed only if it is used for its specific purpose. Failure to observe the limits specified in the technical data is completely forbidden.

COOLING AGENT R407C AND ITS RISKS TO HEALTH

Cooling agent R407C does not have significant harmful effects. From very high concentrations of about 50,000 ppm or more, palpitations or other problems arising from lack of oxygen may be observed.

If there is exposure to high concentrations, respiratory ventilation should be carried out immediately. Take the person into the open air. In the event of splashes, the cooling agent may cause certain skin and mucous membrane irritation, and frostbite is possible.

In the presence of bare flames or red hot metal surfaces, the cooling agent will split up into harmful agents namely hydrofluoric and phosphoric acid. The cooling agent evaporates on contact with air. Its boiling point under atmospheric pressure is 38 - 44°C. There should be no release in any circumstances into the open air.

The refrigerating units should be installed so that they may not be damaged during handling, moving or transport inside the user company.

COOLANT RECOVERY



The cooling loop of the water cooler contains a refrigerant with ozone decomposition capacities of 0%. Before any repair work on the cooling loop of the installation, this refrigerant should be sucked out and disposed of in accordance with regulations. Repair work on the cooling loop of the installation should only therefore be performed by a company specializing in refrigeration.

The cooling agent evaporates, when given off in gas form, on contact with air. There should be no release in any circumstances into the open air.

PROLONGED STOP



When the installation is going to be stopped for a long time, it is advised to drain completely the water circuit.

When starting the installation up again, carry out the same controls as for a first start-up.



Discharging freezcool

« Red »	« Green »
W000010167 (9.6L) (pink heat transfer liquid 285)	W000404005 (9,6L)

FREEZCOOL should not be discharged in large quantities into the natural environment. You should observe local emission standards concerning COD(★).

Before any emission of this product, contact your local water Authority to inquire about the regulations applying to your region.

You should inform them of:

- The COD of the FREEZCOOL (741000 mg/kg)
- The quantity in kg to be discharged

The Water Authority will advise you of the approach to be followed and in particular:

- The location
 - The quantity
 - The timing
- ...for discharging the product.**

★ The COD (Chemical Oxygen Demand) represents the portion of the product requiring oxygen, (e.g. oxidizable mineral salts and the major part of organic compounds).



2 - AIRBORNE NOISE

1 - MEASUREMENT SITE QUALIFICATION

The machine was tested in the
LINCOLN ELECTRIC FRANCE
ZI rue Lavoisier, BP009
79200 PARTHENAY FRANCE.
central assembly building

This site has been qualified by CETIM
(Mechanical Industries Technical Centre)
52, avenue Félix-Louat BP 67
60304 Senlis cedex FRANCE

This qualification was the subject of Report
n°4/028779/492.2A

The site is referenced in engineering grade :
correction factor K < 2dB

2 - SOUND PRESSURE MEASUREMENTS

The values are given in equivalent weighted
sound level (LAeq)

The unit of measurement is the dB (A): weighted
decibel "A"

The measurements were taken at a height of
1.5m above the ground with an ACLAN sound-level
meter, type SIP 95, nbr 934033, checked in
accordance with our Quality Insurance procedures
ISO 9000

3 - MEASUREMENTS

The apparatus alone produces an acoustic
pressure below 70 dB

C - DESCRIPTION

1 - GENERAL

The **FRIOJET** cooling unit is a small chilled water generating station used to cool down, in closed circuit, Nertajet plasma cutting torches.

It can be substituted for a cooling system using unrecoverable water or cooling tower for water cooled welding torches .

ADVANTAGES :

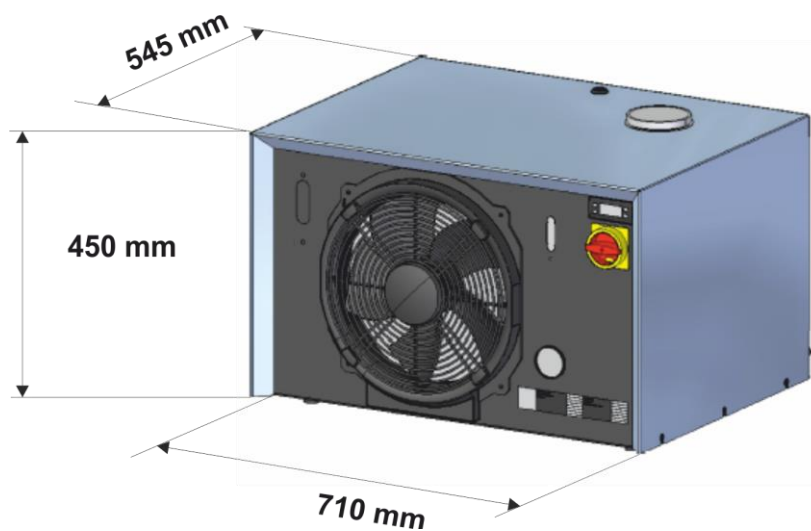
- The circulation of the water in closed circuit makes it possible:
 - to prevent the deposit of boiler scale in conduits and in the torches to be cooled;
 - to save water;
 - to have a constant water flow rate.
- The regulation of water temperature provides a constant production quality and increases significantly the lifetime of the torches and of the expandable parts (steady temperature).

2 - PRESENTATION

This cooling unit is autonomous, compact, and easy to install :

- Body consisting of stainless steel sheet.
- Independent tank in polyethylene with a 20 litre capacity.
- Rotary vane pump.
- Hermetic compressor (without maintenance) with an integrated thermal protection,
- Electronic thermostat for water temperature setting
- Visualization and control system of the return water flow rate.
- Water level outside the cooling unit.

3 - DIMENSIONS OF FRIOJET



4 - CHARACTERISTICS

FRIOJET 300i	W000380971			W000380972		
Fredd frequency on request	50 Hz			60 Hz		
Cooling power for : - ambient temperature of 37°C	0°C	15°C	20°C	0°C	15°C	20°C
	2100 W	2450 W	2810 W	2100 W	2450 W	2810 W
Refrigerating fluid	R407C			R407C		
Air flow rate	1290 m³/h			1290 m³/h		
Nominal water flow rate	0.33 m³/h			0.33 m³/h		
Noise: Leq at 1m	67 dB (A)			67 dB (A)		
Serviceable voltage	230 V / 1 / N / PE			230 V / 1 / N / PE		
Compressor power	1,17 KW			1,17 KW		
Total power requirement	1,8 KW			1,8 KW		
Total intensity	11.6 A.			11.6 A.		
Nominal water pressure	8.0 bar			8.0 bar		
Length	710 mm			710 mm		
Width	545 mm			545 mm		
Height	450 mm			450 mm		
Weight	81 kg			81 kg		

Operating limits

The operating limits of the **FRIOJET 300i** are linked :

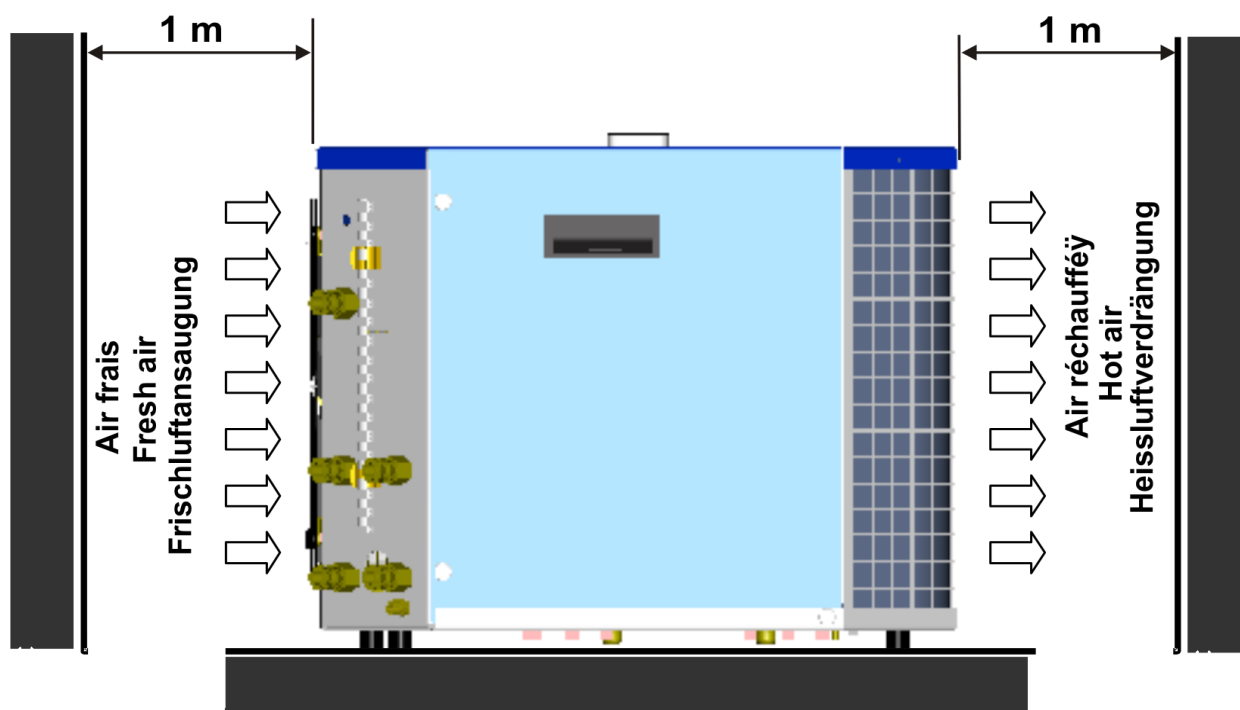
- to the ambient temperature.
- to the operating pressure.

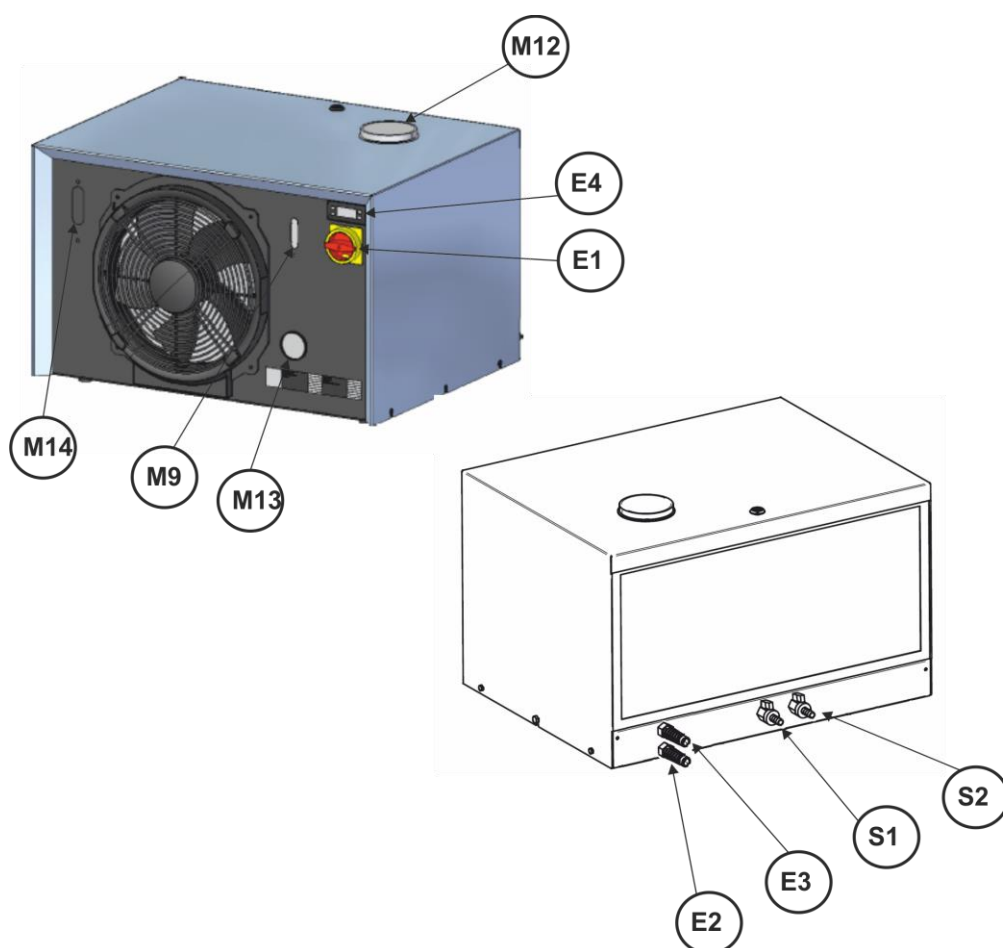
D - ASSEMBLY - INSTALLATION

1 - ASSEMBLY

- The device is supplied on a pallet including:
 - two fittings with a foolproof system and quarter-turn valve.
- Provide for at least 20 litres of FREEZCOOL W000010167 / W000404005 liquid, plus 0.1 litre per metre of piping (out and return).
- The implantation of this cooling unit only requires a small ground surface thanks to the ingenious arrangement of the inside components and the operations of installation are limited to :
 - 1) the electrical connection to the **230 V.50 Hz.**
 - 2) the electrical connection of the water flow rate safety to the power source.
 - 3) the water connection, to and from torch.

- **A space of at least 1 m must be respected around:**
 - 1) the rear part (hot air discharge);
 - 2) the front part (fresh air intake).





DESCRIPTION

- E1** Starting up switch (On/Off)
- E2** Power supply cable
- E3** Water safety cable
- E4** Electronic thermostat
- M9** Visual indicator
- M12** Tank plug
- M13** Pressure gauge
- M14** Water output setting
- S1** Cooling water outlet fitting
- S2** Cooling water return fitting

2 - INSTALLATION



What is never to be done:

- outside installation.
- installation in a small room (lack of aeration).
- installation next to a system that generates hot air, vapor, dust, oil.
- installation under the level of utilization of more than 5 m.
- installation at a distance too far from the point of use.

1. ELECTRICAL CONNECTIONS

a) FRIOJET unit not connected to a power source :

- the power supply cable (black) 3x1mm² of length 3 m is to be equipped with an industrial standard plug 250 V - 16 A 2 poles + ground.
- the water safety cable (grey) 3x1 mm² of length 3 m is delivered without connections. If the installation has been planned to operate with this information, equip the cable with the corresponding connections.

b) FRIOJET unit that equips a NERTAJET HP150 / HP300 installation :

- Fit the feeder cable with terminal P5 observing the following pinout layout:
 - terminal 1: power supply phase (black)
 - terminal 2: power supply neutral (blue)
 - terminal MM : ground (green/yellow)
- Fit the water safety cable with terminal P4 observing the following pinout layout:
 - terminal 1: water safety device
 - terminal 2: water safety device

Terminals P4 and P5 are supplied with the **NERTAJET HP150 / HP300** power sources. Connect them to sockets P4 and P5 on the front panel of the power source.

2. COOLING CIRCUIT CONNECTION

The power supply and the torch return water must be assembled according to the markings and using the quick couplings delivered with the **FRIOJET 300i** unit.

NOTE : We advise the use of a pipe of diameter less than 9 or 10 mm (ref. W000143602).

3. FILLING UP THE TANK

Make sure the tank (20l capacity) is filled with **FREEZCOOL** via the filling plug (M12).

To cool the plasma cutting torches in closed circuit with the **FRIJET 300**, the following coolants may be used :

- either **FREEZCOOL**.

FREEZCOOL

« Red »	« Green »
W000010167 (9.6L) (pink heat transfer liquid 285)	W000404005 (9,6L)

This coolant is ready for use.



NEVER ADD WATER OR ANY OTHER LIQUID OF A DIFFERENT TYPE

This coolant is :

- antifreeze down to -27°C “Red”
- antifreeze down to -5°C “Green”
- anti-algae
- anti-corrosive
- non toxic
- non-flammable.



The coolant level of the tank must be checked at regular intervals.

Coolant losses may occur during use (changing parts of the torch) or by evaporation.

If it is necessary to top up, use :

- **FREEZCOOL** only

4. START-UP

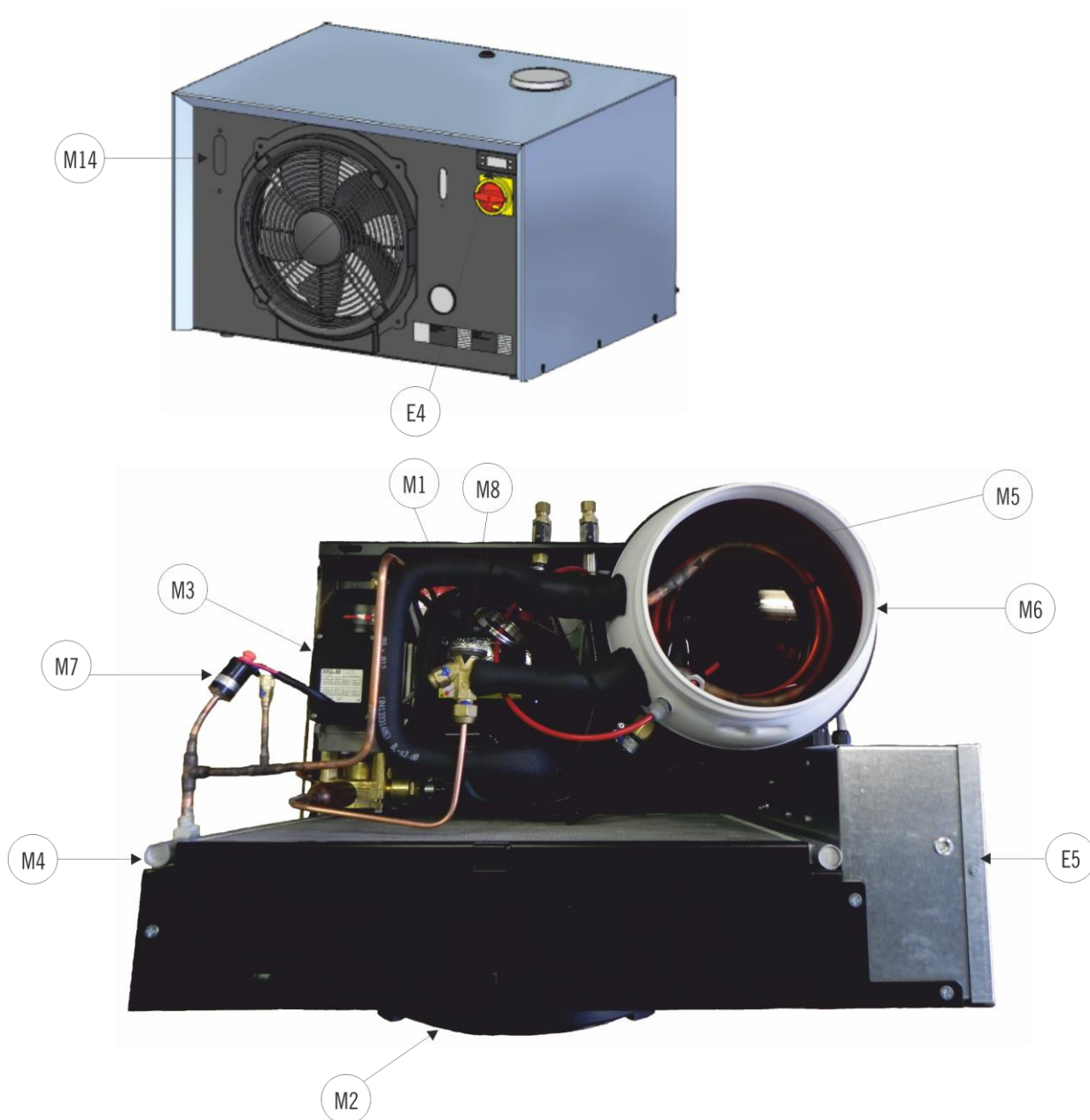
Once the torch is connected, switch on to allow the circulation of the coolant in the pipes.

Note: the temperature display is not adjustable

Let it operate for a few moments, then top up the coolant level if necessary.

Note: if the pump does not fetch, drain the coolant output circuit at the outlet of the **FRIJET 300i**.

E - OPERATOR MANUAL



- The water/Freon exchanger (plate evaporator) **M5** is the source of cooling of the refrigerant circuit. Calories are transferred from the water circulating in the plate evaporator to the refrigerant fluid (R407C), thus lowering the water temperature.
- The forced-air condenser (radiator **M4**) is the hot source of the refrigerating circuit – it transfers the calories from the water to the ambient air. The fan **M2** operates at the same time as the compressor.
- The motor-driven pump **M3** for water circulation makes it possible to carry, in closed circuit, the cooled water from the tank **M6** to the torch. This pump works permanently as soon as the apparatus is switched on.
- The regulating electronic thermostat **E4** (factory set) automatically regulates the water supply temperature.
- The hermetic piston compressor **M1** makes it possible to increase the pressure of the refrigerating fluid and to make it circulate (admission in the evaporator and expulsion in the condenser).
- The pressure reducing valve **M8** is the part which lowers the pressure of refrigerating fluid between the condenser and the evaporator. Its mechanism is set in the factory.
- The continuous hydraulic bypass is a hydraulic safety device. It limits the pressure if the circuit is destroyed.
- The flow rate indicator-controller with a float **M14** installed on the water return circuit makes it possible to :
 - the flow rate measurement with FREEZCOOL liquid (from 1 to 6 l/mn) :
 - with **OCF150** torch = 2,7 l/mn
 - with **CPM 250** torch = 3 l/mn
 - with **CPM 300** torch = 3 l/mn
 - with **CPM 400-450** torch = 4 to 5 l/mn
 - with **T5** torch = 4 to 5 l/mn
 - control visually the flow rate (float)
 - to monitor the water flow rate (the setpoint is factory adjusted to 2,5 l/mn).
- The time relay **E5** delivers a water safety contact if the lack of water circulation is greater than 5 seconds (prevents the faults due to air bubbles).
- The high-pressure pressure switch **M7** switches off the compressor and fan unit if the pressure in the refrigerating circuit is exceeded (if the condenser is fouled)

F - MAINTENANCE

1 - SERVICING

No special servicing is needed except for the air condenser and the hydraulic circuit that must be kept clean.

A) AIR CONDENSER (RADIATOR)

The slats of the radiator must be cleaned at intervals that you will fix according to ambient conditions.

Once the installation stopped, clean the condenser with compressed air (max. 5 bars) by blowing from the inside of the ventilation compartment to the exterior. Remove the cover to carry out this operation.

B) HYDRAULIC CIRCUIT (FREEZCOOL)

Check the cleanliness of the coolant. If it becomes turbid or opaque, drain, rinse and fill up the circuit with **FREEZCOOL**. The liquid should be changed at least once a year.

PROLONGED STOP

When the installation is going to be stopped for a long time, it is advised to drain completely the water circuit.
When starting the installation up again, carry out the same controls as for a first start-up.

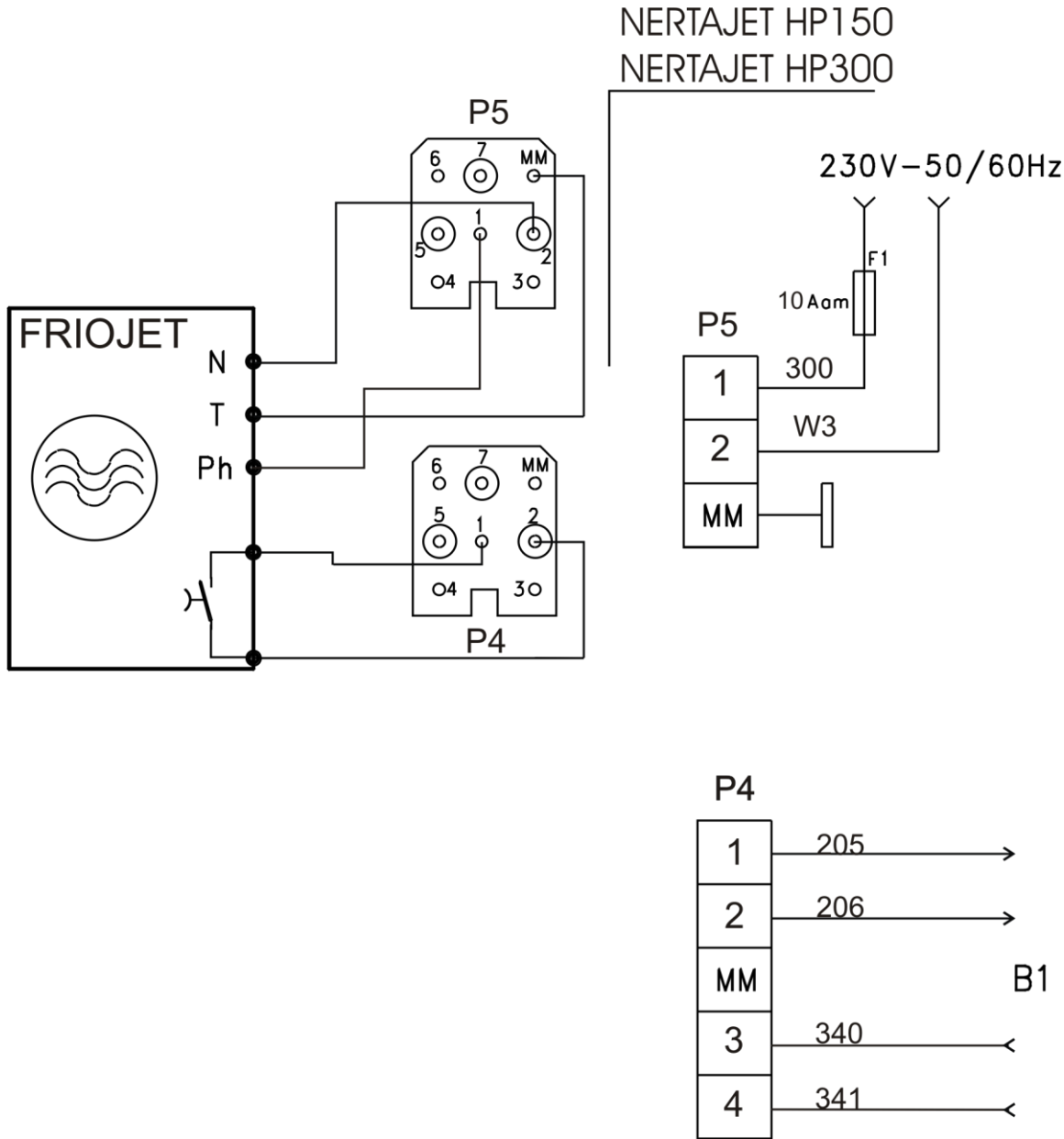
2 - TROUBLESHOOTING

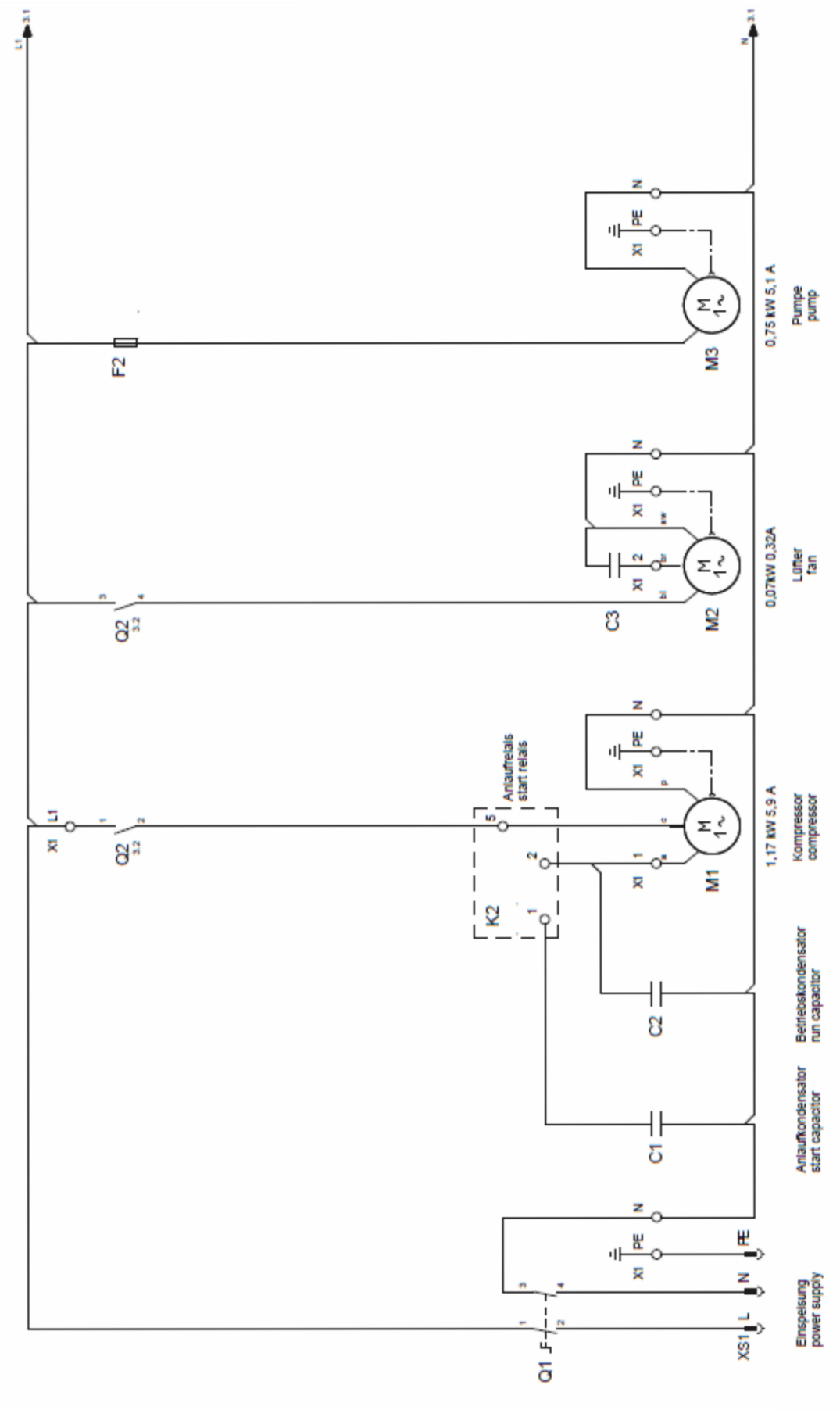
DISPLAY

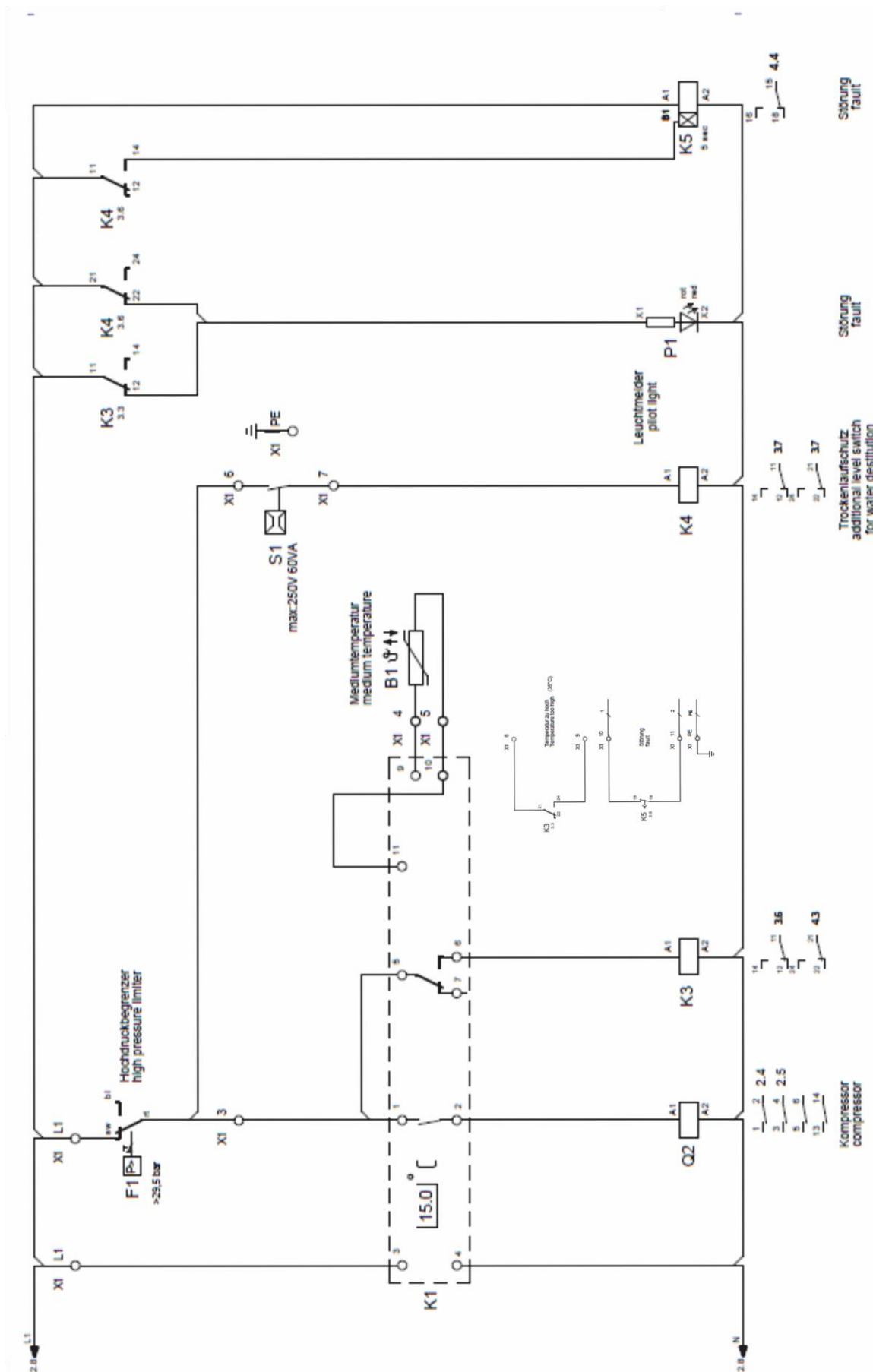
During normal operation, the probe value is displayed. In the event of an alarm, the temperature flashes alternately with the alarm code

Alarm code	Description
AL1	Low temperature alarm
AH1	High temperature alarm

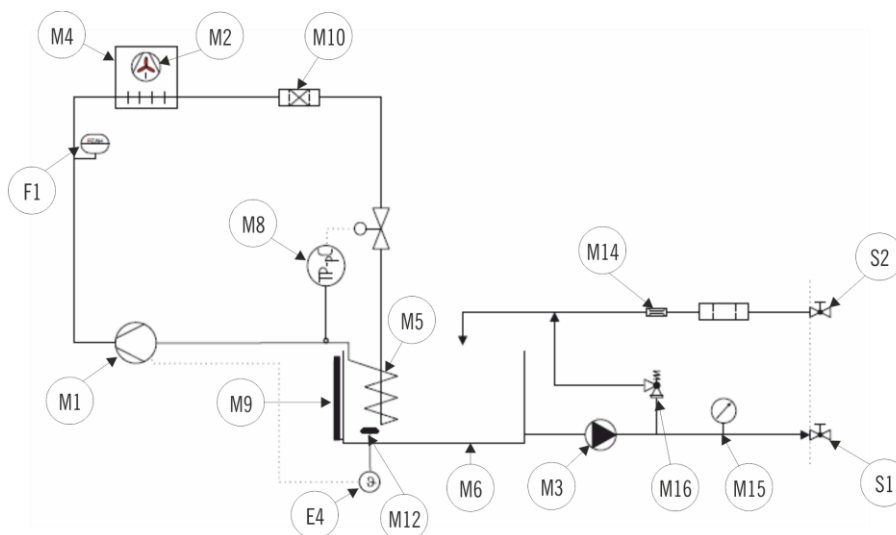
ELECTRICAL CONNECTION DIAGRAM





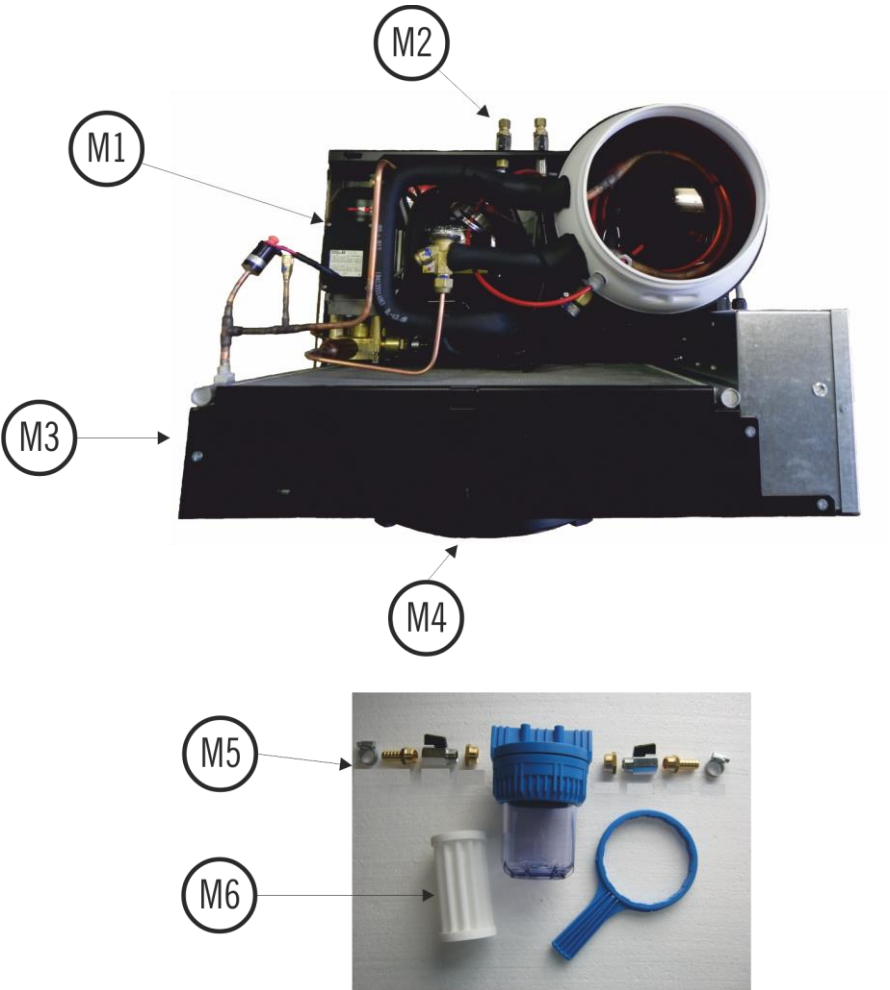


FLUIDS DIAGRAM



- M1** Compressor
- M2** Fan
- M3** Pump
- M4** Condenser
- M5** Heat exchanger
- M6** Tank
- F1** High pressure switch
- M8** Pressure reducer valve
- M9** Water level indicator; change; topping up
- M10** Drier
- E4** Thermostat
- M12** Probe
- M14** Output controller
- M15** Pressure gauge
- M16** Solenoid valve
- S1** Water outlet
- S2** Water return

3 - SPARE PARTS



		<div><div>✓</div>normally in stock</div> <div><div>x</div>not in stock</div> <div>on request</div>		
Item	Ref.	Stock	Order	Designation
M1	W000381026			Pump Y4081 033M3H 8B 50 Hz
M2	W000381422			Water outlet / Water return
M3	W000382837			MG output controller
M4	W000382838			Metallic air filter
M5	W000381421	✓		Filter kit 100 µm
M6	W000381027	✓		Filter cartridge 100 µm

➤ For parts order, give the quantity required and put the number of your machine in the box below.

CE Type

Matricule

TYPE:

Number:

[illegible]