

OPERATION MANUAL

LAUDA
ultracool



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Ultracool mini

0240 Indigo 2010 50/60Hz

Article number 50Hz: E6813018-A3, HP P/N 0960-2796

Article number 60Hz: E6813218-A3, HP P/N 0960-2795

Warnings

This Operation Manual is to be followed by all persons working with the unit. It is imperative that this Manual is made freely available at all times to service personnel and is kept at the point where the unit is installed.

To download this Operation Manual in your local language, go to the HP Indigo portal:
<https://h21021.www2.hp.com/C1/Technical%20Marketing/default.aspx>
Click on your press category, then choose your press and look in the “Latest Resources” column.

The basic maintenance, as indicated in point 5.1, should be carried out by properly trained personnel and, if necessary, under the supervision of a person qualified for this job.

Lauda Ultracool S.L. personnel, or personnel authorised by Lauda Ultracool S.L., should carry out any work in the refrigerating or electric circuit during the warranty period. After the warranty period, the work must be carried out by qualified personnel.

Disposal of Waste Equipment by Users in Private Household in the European Union.



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

Product disassembly Instructions to address product reuse and treatment are available under request.

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Attention. Points of special interest to keep in mind.

1 Introduction

1.1 General notes

- This water chiller complies fully with CE.
- The Company does not accept responsibility if safety regulations are not met during handling, operation, maintenance and repair, even though these may not be strictly stated in this operation manual.
- We recommend the translation of this operation manual into the native language of foreign workers.
- The usability and life cycle of the water chiller as well as avoiding premature repairs depends on proper operation, maintenance, care and competent repair under consideration of this operation manual.
- We are constantly updating our products and are confident that they respond to the latest scientific and technological demands. However, as manufacturers, we do not always know the end use or the total range of our products' applications. Therefore we cannot accept liability for our products in applications where additional safety measures may be necessary. We highly recommend that users inform us of the intended application in order to undertake additional safety measures, if necessary.

1.2 Safety regulations



The operator has to observe the national working, operating and safety regulations. Also, existing internal factory regulations must be met. Maintenance and repair work must only be carried out by specially trained personnel and, if necessary, under supervision of a person qualified for this work.

- Protective or safety devices must not be removed, modified or readjusted.
- During operation of the water chiller none of the protective or safety devices must be removed, modified or readjusted, temporarily or permanently.
- Only use correct tools for maintenance and repair work.
- Use original spare parts only.
- All maintenance and repair work must only be carried out to the machine once it has been stopped and disconnected from the power supply. Ensure that the water chiller cannot be switched on by mistake by unplugging it.
- Do not use flammable solvents for cleaning.
- Keep the surrounding area absolutely clean during maintenance and repair work. Keep free of dirt by covering the parts and free openings with clean cloth, paper or adhesive tape.
- Ensure that no tools, loose parts or similar are left inside the system.

2 Installation

2.1 Reception and Inspection



On receipt of the ultracool unit, it must be inspected for damage during transport. In the case of any damage, external or internal, this cannot be referred to the manufacturer because all units are checked before dispatch. **If any damage is observed, this should be documented and reported to the forwarding company. The Lauda Ultracool S.L. warranty does not include any damages incurred during transportation.**

The refrigerant circuit controls are set before shipment of the unit. They should not be re-adjusted under any circumstances (except by an authorized service agent). This would void the warranty of the unit.

2.2 Transportation



Keep the unit upright at all times. Do not tilt when shipping or moving. **The tilting of the ultracool unit may affect the internal suspension of the refrigerant compressor.**

The ultracool unit must be transported by pallet jack or forklift truck.

2.3 Site

The ultracool unit must be installed in an atmosphere where the range of temperatures is within the indicated margins mentioned in point 3.1. It is necessary to add ethylene or propylene glycol to the water of the circuit, as indicated in point 2.4.

The chiller must be installed on a solid level surface that is capable of supporting a minimum of 400kg (880 lb).

We recommend the installation of the ultracool unit in a well-ventilated site and in a corrosive-free, dust-free atmosphere.

In the case of out-door installation the chiller must be protected from rain with a roof and it must be installed in such way that the control panel receives as few direct sunlight as possible.

In average the unit will be exhausting 27000 Watts (92178 Btu/h) into the surrounding air. Most of this heat comes from the cooling of the application and a small part is produced by the chiller itself. It is important that this heat can be removed in order to maintain an ambient temperature as low as possible (the higher the ambient temperature is, the lower the chiller performance). The air flow rate is approximately 150 m³/min (5297cfm). The fan draws air through the condensers grid at the front and back side of the chiller and exhausts it through the top. The condensers grid size is 549 mm (21,6") x 645 mm (26,6") each one.

2

Installation

Leave a space of 1m (40") around the UC unit (see **figure 1**). It is important to facilitate maintenance work and cleaning, especially in front of the condenser grid and in the left panel.

If necessary the unit can be installed without any free space on the left and right panels. In this case foresee that the unit can be moved forwards to free the lateral panels when there are maintenance works to be carried out.

The inlet of fresh air onto the condenser should be in the most direct way possible, avoiding any chance of air recycling (the ceiling above should not be at less than 1 m (40")).

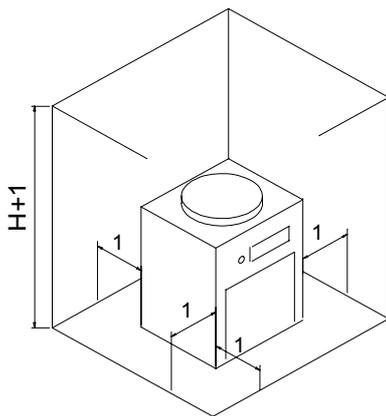


Fig.1

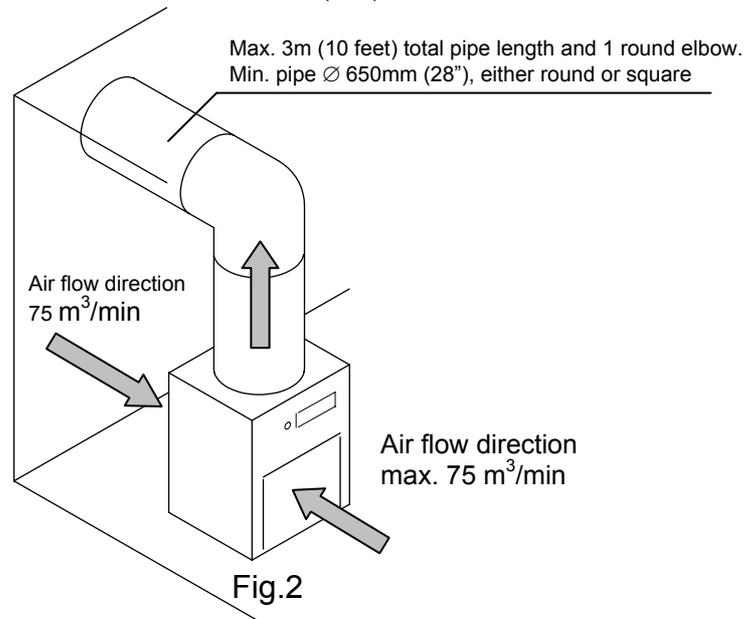


Fig.2

Figure 1: In case of installation in a small room it is imperative that the room has an appropriate ventilation system to evacuate all the heat generated by the chiller as explained before on this same point. If the heat is not removed the temperature in the room will quickly increase beyond the operating limits of the unit and it will stop by high pressure alarm (see point 3.1).

Figure 2 shows the maximum length that the air from the chiller can be conducted if the room has not an appropriate ventilation system. In this case it is still necessary to install a ventilation grid facing each condenser with a minimum surface of 0.75 m² (8 square feet).

Make sure that if the chiller is vented to the outside there is a way (a louver door or shutoff door on the outside wall) to keep the cold outside air from entering the chiller when it is not operating. Take into account the pressure drop created by these elements when sizing the air duct.

In this type of installation consider that the chiller will be drawing into the room the same amount of air that it is exhausting to the outside.

2.4 Installation



The ultracool units must always operate with the panels closed to enable the inlet of fresh air only through the condenser.



50 Hz and 60 Hz version except for USA

This unit is adjusted to a cold water setpoint of 6°C (43°F) and an antifreeze setpoint of -1°C (30°F). A minimum ethylene or propylene glycol concentration of 15% must be added to the water circuit to avoid freezing and the antifreeze setpoint must be adjusted in accordance to the table below. For instance, if the minimum ambient temperature is -10°C, then 30% of ethylene or propylene glycol is required and the antifreeze setpoint must be adjusted at -14°C (7°F).

60 Hz version for USA

This unit is adjusted to a cold water setpoint of 43°F (6°C), and an antifreeze setpoint of 21°F (-6°C). A minimum ethylene or propylene glycol concentration of 20% must be added to the water circuit to avoid freezing. If the ambient temperature is lower than 21°F (-6°C), the Ethylene or propylene glycol concentration must be adjusted at 30% and the antifreeze setpoint at 7°F (-14°C).

The following table indicates the glycol concentration and antifreeze set point required depending on the minimum ambient and cold water temperatures. **Always use the most restrictive of these two parameters to select the amount of glycol and antifreeze set point.**

Cold water set point		$T^{\circ} \geq 6^{\circ}\text{C}$	$6^{\circ}\text{C} > T^{\circ} \geq 0^{\circ}\text{C}$	$0^{\circ}\text{C} > T^{\circ} \geq -3^{\circ}\text{C}$
Minimum ambient temperature	50Hz version °C	$T^{\circ} \geq -3^{\circ}\text{C}$	$-3^{\circ}\text{C} > T^{\circ} \geq -6^{\circ}\text{C}$	$-6^{\circ}\text{C} > T^{\circ} \geq -15^{\circ}\text{C}$
	60Hz version °F	$T^{\circ} \geq 27^{\circ}\text{F}$	$27^{\circ}\text{F} > T^{\circ} \geq 21^{\circ}\text{F}$	$21^{\circ}\text{F} > T^{\circ} \geq 5^{\circ}\text{F}$
Antifreeze set point	50Hz version °C	-3°C	-6°C	-14°C
	60Hz version °F	27°F	21°F	7°F
Ethylene or propylene glycol concentration (1)		15%	20%	30%
Water circuit mixture (2):	Refrifluid B + Ethylene or propylene glycol + Water	2 litres (0.5 gal)+ 15 litres (3.9 gal) + 85 litres (22.5 gal)	2 litres (0.5 gal) + 20 litres (5.3 gal) + 80 litres (21.1 gal)	2 litres (0.5 gal) + 30 litres (8 gal) + 70 litres (18.4 gal)

- (1) The ethylene or propylene glycol percentage is given as % measured as weight of the total mixture. In case of any modification in the quantity of water in the installation, the concentration of ethylene or propylene glycol should be checked.
- (2) If more volume is required it is necessary to keep the ethylene or propylene glycol concentration.



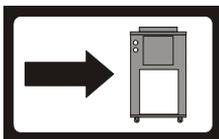
Only an authorized technical service can adjust the antifreeze thermostat set point.

Do not use automotive antifreeze. Use lab grade ethylene or propylene glycol only! Do not use an ethylene or propylene glycol concentration above 30%; this would damage the water pump.

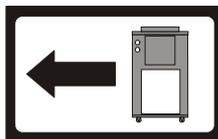
The product "Refrifluid B" is supplied with the chiller.

2.5 Identification labels on the ultracool unit

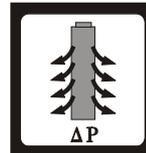
You can find the following labels stuck on the ultracool unit.



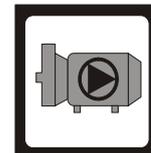
Water inlet from the installation to the ultracool unit (**inside the housing**).



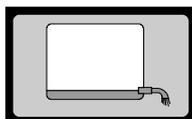
Water outlet from the ultracool unit to the installation (**inside the housing**).



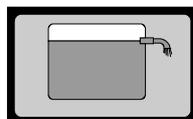
Water filter pressure drop.



Water pump pressure.



Drain (**inside the housing**).



Connection for the tank overflow (**inside the housing**).



Danger of cuts!
Completely disconnect the chiller power supply before opening this cover.



Power supply depending on version.

2.6 Water Connection

Leave at least **1.5 meters (5 feet) of flexible pipe** right after the chiller's inlet and outlet connection. It will allow to move the chiller for a better maintenance access without dismantling the water pipes.

The chiller should be located as close as possible to the Indigo machine. **The water lines must be in pipes of at least 1". Maximum equivalent total pipe length depends on the pipe size:**

	Maximum total pipe length
pipe diameter 1"	60 m (195 feet)
pipe diameter 1 ¼"	110 m (396 feet)

Table 1.2 Equivalent Length for Common Fittings and Valves:

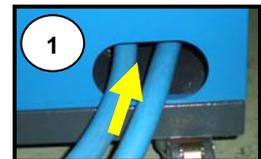
Equivalent pipe length m (feet)	Type of Fitting or Valve	
	90° Bend	Ball Valve
1.5 (5)	0.3 (1)	0.3 (1)

Minimize the number of bends in the water lines. The length of hose, number of fittings, valves, etc. will also cause an increase of the pressure drop.



To perform the water connections **make sure the chiller is turned Off and disconnected from any power supply** and open de left panel of the chiller.

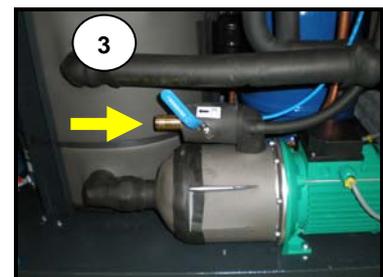
1.- Introduce the inlet and outlet water pipes inside the chiller housing through the connections port.



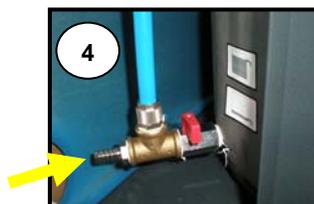
2.- Connect the inlet water pipe to the hose carrier located at the inlet of the water filter



3.- Connect the outlet water pipe to the hose carrier located at the pump outlet. See the identification labels.



4.- Connect a pipe at the drain and overflow connection located at the bottom of the water tank. Use a flexible pipe with 10mm internal diameter.





Always install thermal insulation for all pipes or, at least, make sure that the pipes are opaque to the light.

When possible install the water lines at the same level as the chiller until reaching the Indigo printing press. The height difference between the chiller and the application should never exceed 10m (33 feet). **In the installations in**

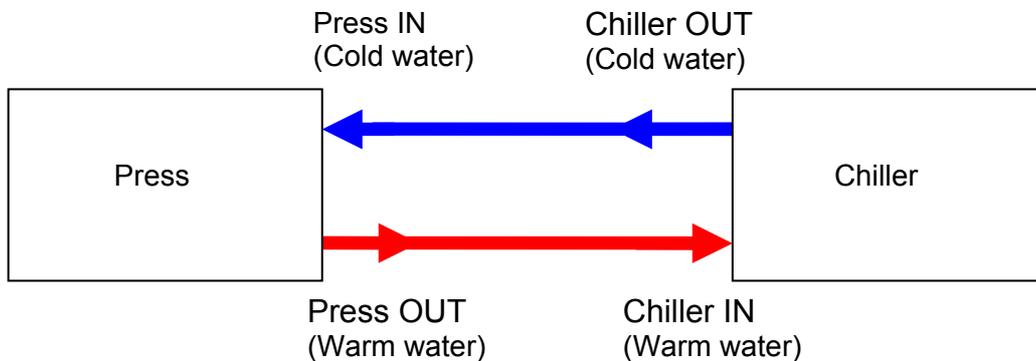


which the water level of the circuit exceeds the maximum level of the tank inside the ultracool unit, it will be necessary to install a check valve in the water outlet of the ultracool unit and a solenoid valve in the water inlet. The power supply of this solenoid valve will be carried out by terminals designed for that purpose (see electrical diagrams).

To prevent rusting of the water pipes, we recommend plastic pipes and fittings.

Where flexible tubing is used, it should be of reinforced construction and rating for a minimum working pressure of 6 bar g (90 psig) within -15°C and 30°C (5°F and 86°F).

Use the following diagram as a reference to connect the water pipes between the chiller and the press:



2.7 Electrical Connection

Operating voltage 400VAC +/-10%, 50Hz, 3 Ph or 460VAC +/-10%, 60Hz, 3 Ph depending on the version.

The chiller is designed to run on 460V, the swings in voltage is not a range the chiller should be operated within for long periods. Lower voltage swings are permitted for brief periods only. If the chiller is left to run at low voltage continuously it can cause pump and motor burn out. It must be checked that the supply voltage does not exceed a maximum variation of 10% referring to nominal.

2

Installation

Introduce the main power supply cable through the cable gland located at the bottom of the right panel (see fig.7). Avoid as much as possible that the cable gets in contact with the air/refrigerant heat exchanger (which looks like a radiator) as its surface gets hot during operation (fig.8). Connect the cable with the incoming power terminal block which is located on the left side of the X1 terminal block inside the electrical box of the chiller. (see fig.9).



Fig.7



Fig.8

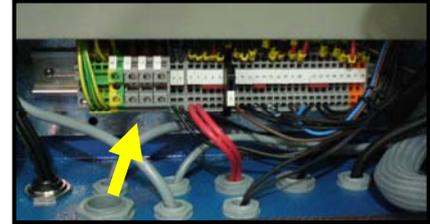


Fig.9

Number of wires: 4 wires (3phases+ earth). The wire size should meet local electrical codes.

Maximum fuse size: 32 Amps (50 /60 Hz)

Minimum circuit ampacity: 32 Amps (50 /60 Hz)

The chiller has some special terminals prepared for the following functions:

- **Terminals 23 and 24, remote On/Off operation:** This chiller is meant to be turned On and Off automatically by the HP Indigo press. This remote On/Off signal is transmitted to these terminals by a dry contact in the press (open contact = chiller Off, closed contact = chiller On).

Note: During the initial commissioning, the chiller must stay turned Off but connected to the power supply (Main power switch On) for at least 6 hours (see point 3.2). During this time the chiller must not receive any On signal.

- **Terminals 25 and 26, external solenoid valve connection:** They can be used to supply a solenoid valve with 24VAC. If the pipes or the Indigo machine are installed above the level of the chiller's outlet this valve prevents backflow when the chiller is stopped (see point 2.6). These terminals are at 24V only when the water pump is working.
- **Terminals 27 and 28, external alarm report signal:** These terminals provide a dry contact for a general alarm of the chiller. This contact is open as long as there is no active alarm.
- **Terminals 29 (GND), 30 (TxRx+) and 31 (TxRx-), Modbus network RS485.** The unit can be connected to a supervisory Modbus network via a standard RS485 serial line. For the RS-485 connection use twisted pair shielded cable AWG20 (0,5 mm²) or AWG22 (0,3 mm²). The maximum length is for this cable 100m, keep it away from power cables. Speed 19200 Baud.



A system of fuses or circuit breakers must be installed before the power inlet connection to the ultracool unit. The maximum size of these protections is defined in the ultracool characteristics plate.

3 Start-up

3.1 Operating Conditions

The control thermostat in the chiller will control it in order to maintain the preset cold water temperature.

Water temperature at the inlet:

Nominal:	11°C (53°F)
Maximum:	30°C (86°F)

Cold water temperature at the outlet (1):

Nominal:	6°C (43°F)
Minimum:	-3°C (26.6°F)
Maximum:	15°C (60°F)

(1) Make sure the ethylene/propylene proportion is appropriate for the cold water temperature selected (see the table on point 2.4 of this manual). The antifreeze protection must also be adjusted according to the proportion of glycol used.

Temperature of the ambient air:

Nominal:	25°C (77°F)
Minimum:	-15°C (5°F)
Maximum:	50°C (122°F)

3.2 Chiller start-up



Clean the application water circuit with tap water in order to be sure that there are no free particles. Otherwise the filter element can block up during the start up process.

Turn Off the Main power switch (to avoid any possibility of unexpected start up of the equipment during this operation). Open a lateral panel, open the tank cover and fill the tank **with water of the required quality (see annex 9), the suitable glycol concentration and the Refrfluid B additive** according to **point 2.4** of this manual. Fill it directly to the tank until the maximum level of the tank is reached. Lift the level switch manually to make sure it resets itself: when it resets you will hear its contact “click”.

Open the water inlet and outlet valves completely as shown on the following pictures:



3

Start-Up

Make sure that the external fuses are installed. See electrical diagram.

Make sure that the Remote On/Off control is not connected between terminals 23 and 24 and a wire-bridge is not installed between them either.

Turn on the Main power switch (element 1 in the control panel, see point 4) and check if the phase sequence order is correct: The chiller is equipped with a phase sequence detector relay (KA1) that will not let the motors start if the sequence of phases at the main power supply is wrong.

The phase sequence detector relay (KA1) works as long as the general switch is On and the Q2 circuit breaker is On. You can see when the relay is operating because the “PWR” led will be lit. If the phase sequence is right the LED “RY” will be lit. If the phase sequence is wrong, the LED “RY” will **not** be lit. If this happens **switch OFF the main power switch, disconnect the chiller from the power supply** and exchange two phases in the main power supply.



If the phase sequence is not correct, the thermostat display will show the alarm “FL” when the chiller receives an On signal and it will not start up.



Phase Sequence Detector Relay inside the electrical box with the Power (PWR) and phase sequence (RY) indicator LEDs.



After turning On the Main power switch it's necessary to wait six hours before continuing with the start-up sequence. This time is necessary for the crankcase of the compressor to heat up. **The compressor can be damaged if this procedure is not followed.**

Close both lateral panels and **switch OFF the main power switch during any electrical intervention.**

Connect the Remote ON/OFF control in terminals 23 and 24. If you do not use a remote control, connect the wire-bridge supplied inside the electrical box to link terminals 23 and 24.

Switch ON the general switch and, if necessary, give an ON signal through the remote ON/OFF, then **the unit will start up.**

After 5 minutes stop the unit, open the left panel and check the level in the tank. If the level is below the maximum then refill the water tank again. Repeat this operation until water level in the tank remains constant.

When refilling the tank respect the ethylene or propylene glycol concentration as per point 2.4.

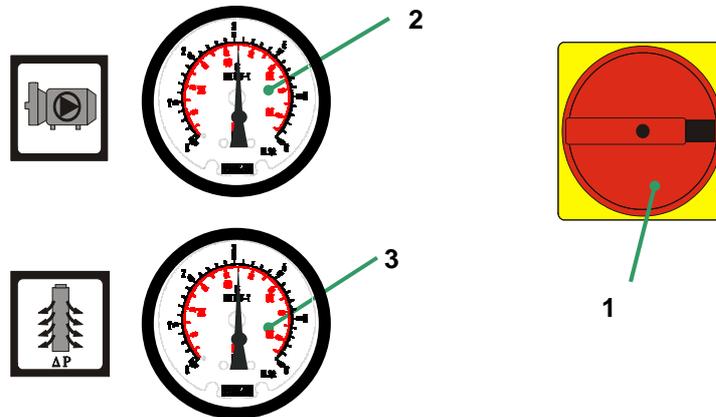
On the control thermostat select the desired temperature of the cold water outlet (see point 4.2.1). The ultracool units are delivered with a pre-set temperature of 6°C (43°F).



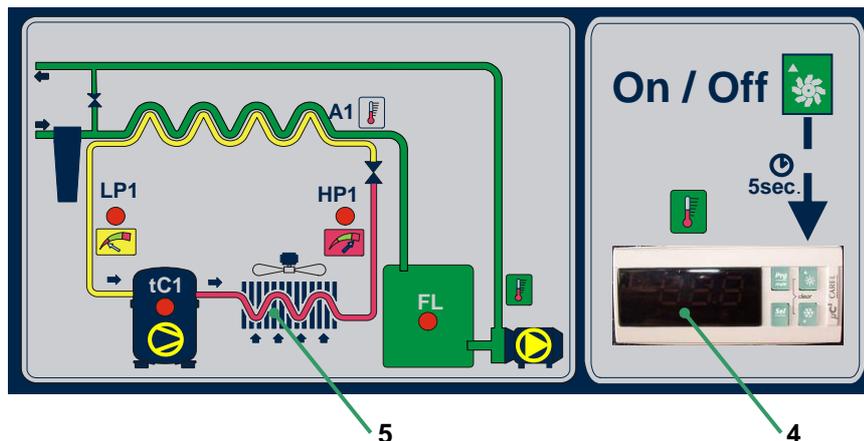
Check the working pressure of the water pump, if it is higher than 5,1 bar (74 psi) and all manual valves in the circuit are fully open, then check that the water pipes meet the requirements on point 2.6.

4 Control Panel

Refrigerant pressure gauges



Control Panel of UC-140

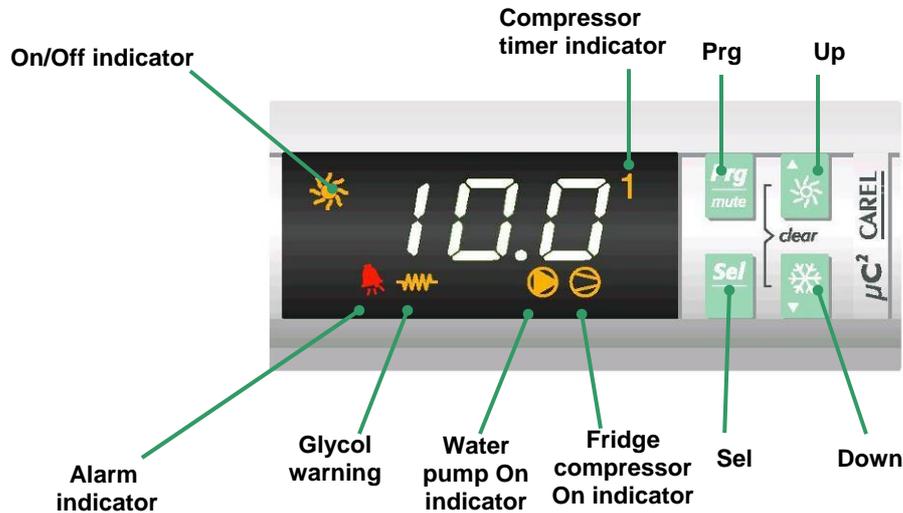


4.1 Components of the Control Panel

The control panel consists of the following elements:

1. **Main power switch:** connects and disconnects the ultracool unit from the power supply.
2. **Water pressure gauge:** indicates the pressure supplied by the pump
3. **Water filter pressure gauge:** indicates the pressure drop of the water filter and the evaporator.
4. **Control thermostat:** indicates the cold water temperature at the outlet of the ultracool unit and enables it to be regulated.
5. **Flow diagram.** It helps to identify the alarms and signals that appear in the thermostat display see section 4.2.)

4.2 Control Thermostat



4.2.1 Operation

As long as the main power switch is on, the display of the control thermostat shows the water temperature measured in the water tank.

Remote On/Off: The chiller cannot be started without an On signal through Remote On/Off control from the press (circuit closed between terminals 23 and 24). See point 2.7.

Local On/Off: As long as the remote On/Off is connected, the chiller can be also turned On and Off locally through the control thermostat keypad. In order to start/stop the chiller press the UP button during a few seconds. When the chiller turns On the On/Off indicator signal is lit in the thermostat display as depicted above.

Setting the temperature: to introduce the required working temperature (between 5°C (40°F) and 15°C (60°F) use the following procedure:

- Press **Sel** button for about 5 seconds, the display will show "- / -".
- Press **Down** button several times until the display shows "- r -".
- Press **Sel** button and the display will show "- r01 -". This parameter is the setpoint.
- Press **Sel** button to display the current setpoint value.
- To increase or to decrease the value of the setpoint, use the **Up** and **Down** buttons.
- Press **Sel** button to confirm the new value. The display will show "- r01 -".
- Press **Prg** button three times to exit the setpoint modification procedure. The display will show again the water tank temperature.

1. **On/Off indicator:** it indicates when the chiller is turned On.
2. **Alarm indicator:** this is lit when there is an alarm. Depending on the alarm it can cause fridge circuit or all the ultracool unit to stop. The display will show the alarm code:
 - Alarm code FL: Wrong power supply phase sequence, low water level alarm or pump overload.
 - Alarm code A1: Antifreeze alarm.
 - Alarm code tC1: compressor overload alarm
 - Alarm code LP1: Low refrigerant pressure.
 - Alarm code HP1: High refrigerant pressure.
 - Alarm code Ht: High water temperature.
 - Alarm code E1, E2, E4: Sensor disconnected, short-circuited or faulty.
 - Alarm code EPr : EEPROM error during operation.
 - Alarm code EPb: EEPROM error at start-up.
 - Alarm code ELS: Low supply voltage.
 - Alarm code EHS: High supply voltage.
3. **Glycol warning:** this indicator is lit when the working conditions of the chiller require ethylene or propylene glycol as antifreeze agent in the water circuit to avoid freezing. Be sure that the water mixture has the suitable ethylene or propylene glycol concentration when this is lit. Please check **point 2.4** from this manual to adjust the ethylene or propylene glycol concentration of the water mixture according to the ambient temperature and antifreeze set point.
4. **Pump On indicator:** this remains lit when the pump is working.
5. **Compressor On indicator:** this remains lit when the compressor is working.
6. **Compressor timer indicator:** when “1” blinks it means that the thermostat is delaying the compressor’s start. Once the compressor starts “1” is fixed.

Modbus network: This thermostat has a RS485 serial connection for Modbus network able to transmit the cold water temperature, cold water pressure and ambient temperature to the press. The water flow is also determined by the working pressure of the pump: As long as the working pressure of the pump is at 5,1 bar (74 psi) or less, the press will receive enough water flow (4200 l/h (18,5 US gal/min) or more).

5 Maintenance

5.1 Basic Maintenance

Weekly:

Verify that the water temperature indicated on the control thermostat is approximately at the set point.

Verify the water level in the tank.

Verify the state of the water filter, if the pressure drop exceeds 1 bar (10 psi) (see element 3 on point 4) change the filter element.

Monthly:

With the Unit disconnected (Main power switch Off), clean the condenser with a blast of compressed air, from the inside towards the outside.

Clean the housing, internally and externally, eliminating the dust present especially on the water pump rack.

Yearly:

Change the filter element and refill the circuit with water of the required quality (see annex 9), the suitable glycol concentration according to point 3.1 of this manual and all the Refrfluid B additive supplied with the chiller (2 litres (0.5 US gal) per each 100 litres (26.4 US gal) of water tank volume).

6 Troubleshooting

In the following chart the possible causes for an alarm are given together with their solution:

DEFAULT	CAUSE	SOLUTION	RESTART PROCEDURE
HP1. Alarm due to high pressure of the refrigerant: The pressure of the fridge circuit is higher than the maximum allowed (20 bar/290 psig). It stops the compressor.	Lateral panels of the housing open	Close the panels	Disconnect the chiller and connect it again by turning Off/On the main power switch (element one on point 4.1).
	Low airflow into the condensor	Check that there is enough free space in front of the condenser and clean the condenser if necessary	
	The ambient temperature is too high	Wait until the ambient temperature is lower. Check that the indications on point 2.3 are respected.	
	Water temperature too high	Try to cool down the water in the circuit running the chiller with the application stopped. If the unit still stops, try doing this with the outlet valve completely closed (see point 3.2).	
	Motor fan not working	The motor fan is not working if it is not turning when the chiller is running and tripping by HP1, then contact authorised technical service.	
High pressure switch failure	Contact authorised technical service.		
LP1. Alarm due to low pressure of the refrigerant: The pressure of the fridge circuit is below the minimum allowed (0.5 bar / 7 psig)	Ambient temperature too low	The minimum ambient temperature is -15°C.	The Low-pressure safety switch (SLP) automatically resets itself when the pressure is back to normal
	Water freezing	Verify the ethylene or propylene glycol content. See point 2.4. If the problem persists contact an authorized technical service.	
	Gas leakage	Contact authorised technical service.	
Low pressure switch failure	Contact an authorised technical service.		

DEFAULT	CAUSE	SOLUTION	RESTART PROCEDURE
tC1 Compressor overload alarm	Excess current Compressor running in the wrong direction	Check if the electrical connections are correct. Check supply voltage and power surges. All the motors in the chiller are delivered turning in the same direction. Verify that the pump is turning in the right direction. See point 3.2.	Disconnect the chiller (turn Off the main power switch, see element 1 on point 4). Open the electrical box and reset the circuit breaker . Turn the Main power switch On and start the unit through the remote On/Off control.
FL. Wrong power supply phase sequence or Water level alarm	Wrong phase sequence at the main power supply Level switch did not switch to the "full" position Water leak in the internal circuit of the UC. Water leak in the external water circuit. Water leak in the water pump	Switch OFF the main power switch, disconnect the chiller from the power supply and exchange two phases in the main power supply. Check that the level switch works properly and that the tank is full enough. After disconnecting the Main Power switch open the back panel, open the water tank, lift the level switch manually. If it works correctly you should hear its contact "click". Close the tank and the panel and try to start the unit again Contact authorised technical service. Find the leak and get it repaired. If there is a leak in the water pump seal contact authorised technical service to replace the whole water pump. Check that the water quality is inside the limits (see point 9).	Once the phase sequence is correct the chiller will work normally automatically. The level switch automatically resets itself when there is enough water in the tank
or Water pump overload	Circuit breaker Q2 is Off	Check if the electrical connections are correct. Check voltages, intensities and variations. Check water pressure. Check water quality. Check if the pump is blocked	Disconnect the chiller (turn off the main power switch, see element 1 on point 4). Open the electrical box of the chiller and reset the circuit breaker. Turn the Main power switch On and start the unit through the remote On/Off control.

DEFAULT	CAUSE	SOLUTION	RESTART PROCEDURE
<p>A1.</p> <p>Antifreeze control operates continuously (see point 4)</p>	<p>Water circuit blocked</p> <p>Possible freezing due to low ambient temperature</p> <p>Water tank temperature sensor fault</p>	<p>Clean the water circuit, if necessary replace the water filter element. Check for closed valves in the circuit.</p> <p>The ethylene or propylene glycol concentration must be according to point 2.4 and the antifreeze setpoint also has to be adjusted according to it. Contact authorised technical service.</p> <p>Measure the water temperature inside the tank and check that it is approximately the same as shown on the control thermostat's display. If it isn't contact authorised technical service.</p>	<p>The control will go back to normal operation when the problem is solved</p>
<p>Ht</p> <p>High water temperature</p>	<p>The water tank temperature is above 35°C for some minutes</p>	<p>Check the cold water set point is within the limits indicated on point 3.1. Disconnect the application from the chiller for a while and run the chiller without load. If the problem persists contact authorised technical service.</p>	<p>The chiller is still working normally.</p>
<p>The control thermostat displays the following codes:</p> <p>E1, E2, E4.</p> <p>EPr, EPb.</p> <p>ELS, EHS.</p>	<p>A temperature sensor (NTC sensor) or pressure transducer is faulty, disconnected or short-circuited.</p> <p>There is an internal memory error.</p> <p>The power supply voltage is out of limits.</p>	<p>Contact authorised technical service.</p> <p>Contact authorised technical service.</p> <p>Check that the power supply is within the specifications on point 2.7</p>	<p>The chiller can be restarted when the faulty part is replaced</p> <p>The chiller will go back to normal operation when the problem is solved</p>

7 Technical Features

UC			240 Indigo 50Hz	240 Indigo 60Hz
Cooling capacity		kW (ton)	26,3 (7.5)	25,2 (7)
Water flow		l/h (gpm)	4200 (18.5)	4200 (18.5)
Water pressure		bar (psi)	5,1 (74)	4,8 (70)
Compressor		kW	5,9	5,7
Condenser		kW (ton)	32,2 (9)	30,6(8.7)
Evaporator		kW (ton)	26,3(7.5)	25,2(7)
Motor fan		N°	1	1
		KW	0,8	0,8
		m3/h (scfm)	9000 (5300)	9000 (5300)
Water pump		kW	1,85	1,91
	max flow	l/h (gpm)	12000 (52.8)	7900 (35)
	min flow		1200 (5.3)	790 (3.5)
	max pres.	bar (psi)	5,6 (81)	6,5 (94)
	min pres.		3 (43)	3,1 (45)
Water tank volume		litre (US gal)	100 (26.4)	100 (26.4)
Water connections			1" hose carriers	
Dimensions	Front	mm (in)	715 (28)	715 (28)
	Depth	mm (in)	945 (37)	945 (37)
	Height	mm (in)	1490 (59)	1490 (59)
Weight		kg (lb)	260 (573)	260 (573)
Sound Pressure Level (1)		dB(A)	57,5	59,1
Power		kW	8,6	8,4
Max. fuse size		A	32	32
Voltage		V/P/Hz	400/3/50	460/3/60
Nominal COP			3,9	3,9

All data related to nominal conditions: Water outlet temperature 6°C and ambient temperature 25°C.

(1) Sound Pressure Level at 5 metres from the chiller in free-field conditions.

9 Annexes

9.1 Water quality

In order to protect the water circuit of the ultracool units, the water to be cooled must have specific physical/chemical properties so that it is not aggressive. If this water is outside any of the limits listed in the table below, it can seriously damage some of the materials of the ultracool unit.

Parameter	Limit values
pH	7 – 8
Total Hardness (TH)	< 150 ppm
Conductivity	50 – 500 $\mu\text{S}/\text{cm}$
NH_3	< 2 ppm
Total iron ions (Fe^{2+} and Fe^{3+})	< 0.2 ppm
Chloride (Cl^-)	< 300 ppm
H_2S	< 0.05 ppm
Solid particles	< 150 μm
Ethylene or propylene glycol	Min 15% - Max 30%

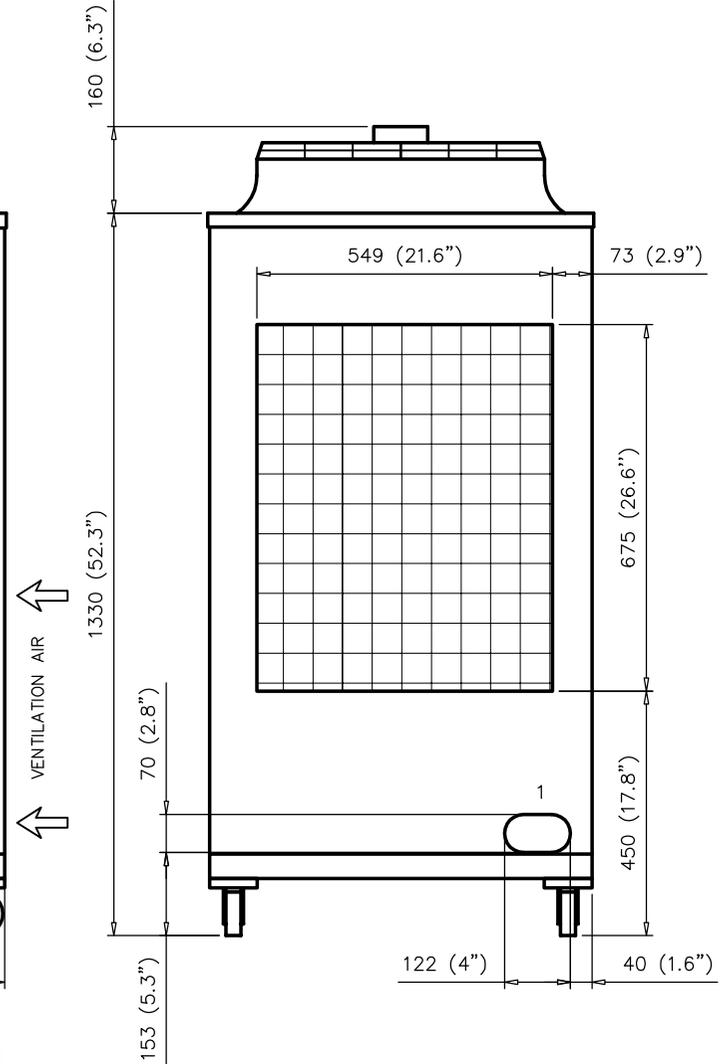
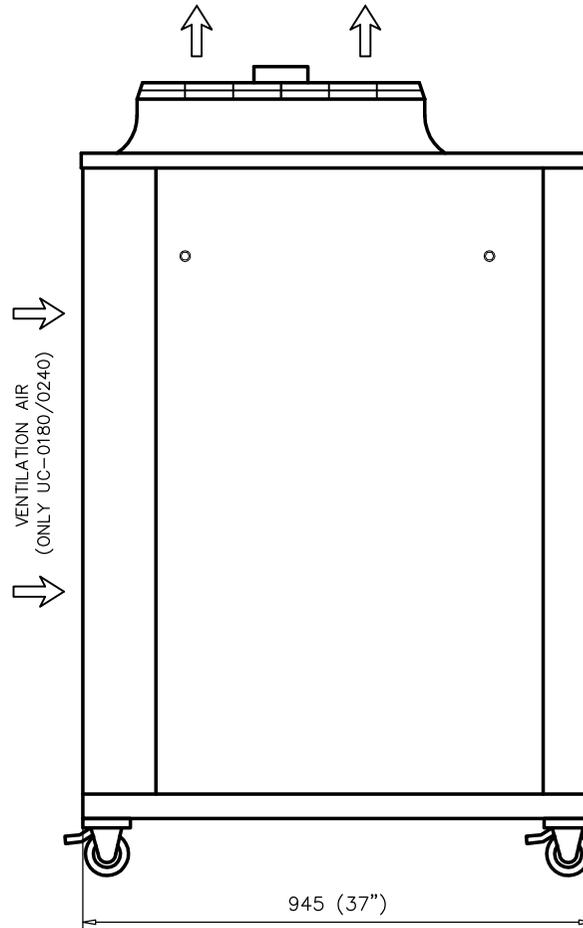
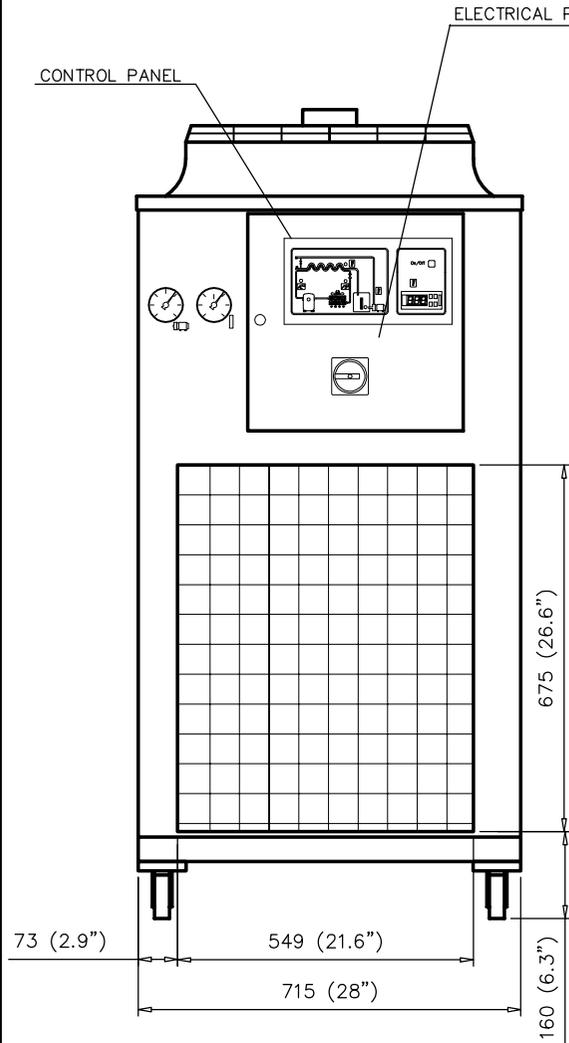
The Total Hardness is specified in ppm (mg/L) of Ca_2CO_3 .

Please note that ultra pure waters like deionised water can also be harmful for some of the materials of the ultracool units as they have a conductivity below 50 $\mu\text{S}/\text{cm}$.

A concentration of ethylene or propylene glycol higher than the 30% can seriously damage the pump of the ultracool units.



Lauda Ultracool S.L. will not accept any warranty for any damage caused by water that is out of one or more of the above limits.

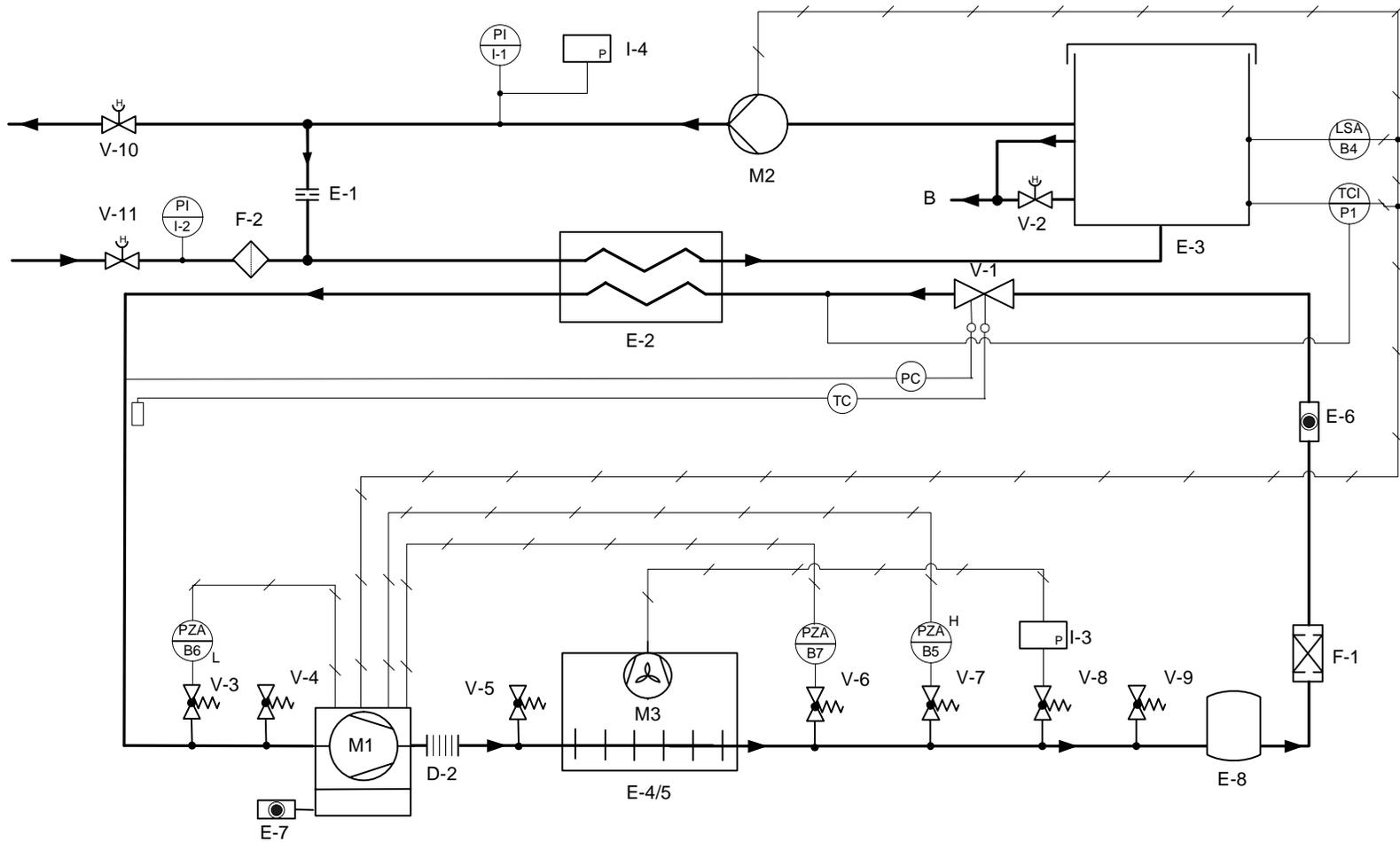


DIMENSIONS IN mm (INCHES)

ULTRACOOOL	WEIGHT	
	ST	SP
0060	145 kg (320 lb)	165 kg (364 lb)
0080	155 kg (342 lb)	175 kg (386 lb)
0100	155 kg (342 lb)	175 kg (386 lb)
0140	155 kg (342 lb)	180 kg (397 lb)
0180	180 kg (397 lb)	210 kg (463 lb)
0240	195 kg (430 lb)	230 kg (507 lb)

- 1.- CONNECTIONS PORT:
- 25 mm (1") WATER INLET HOSE
 - 25 mm (1") WATER OUTLET HOSE
 - 10-12 mm (1/2") DRAIN AND OVERFLOW HOSE

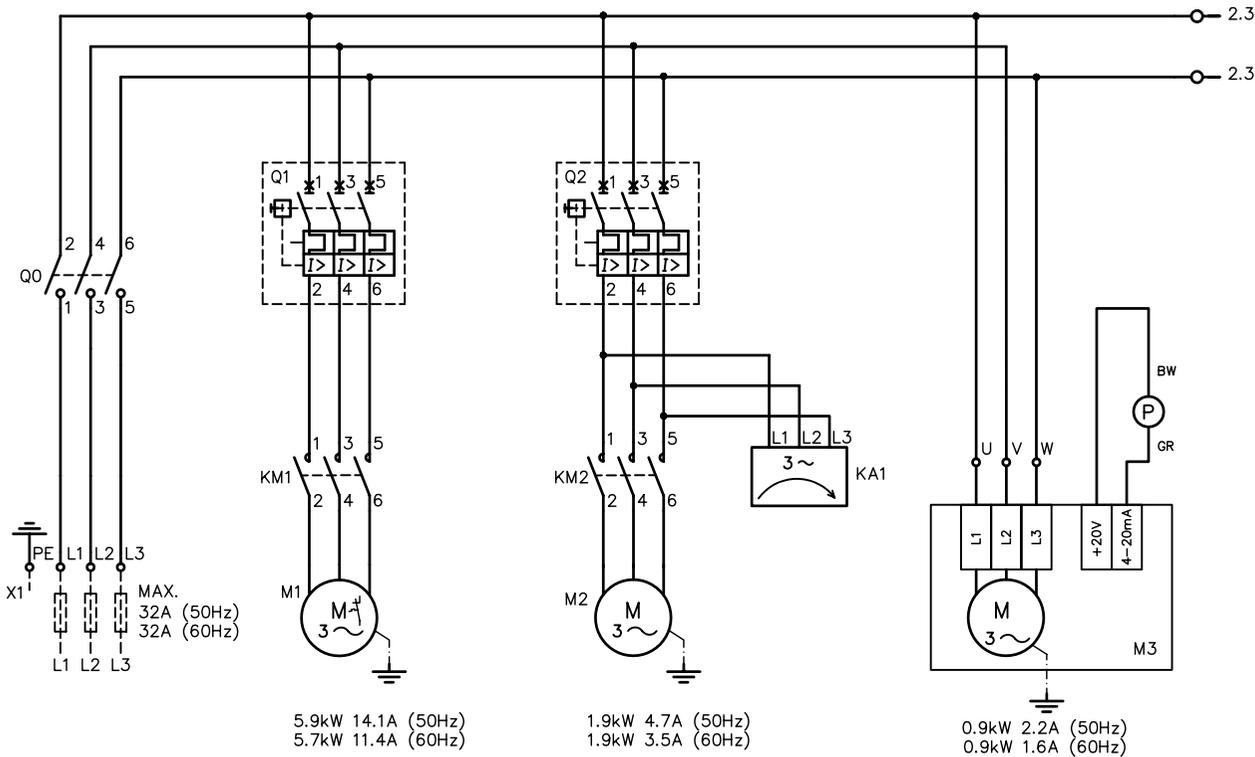
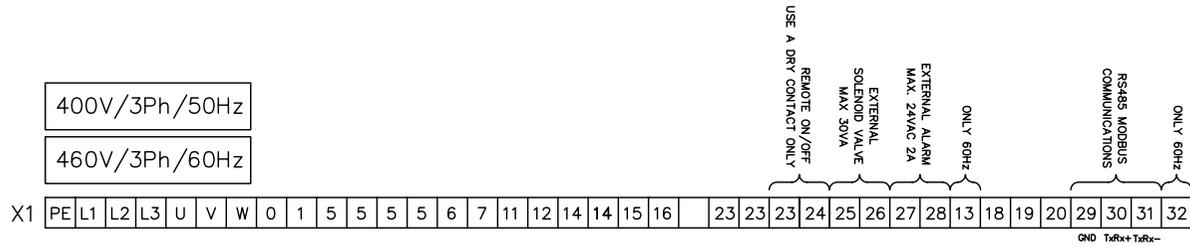
N°	ED-7007	REV.:	6
DATE:	24.09.07	DATE:	31.05.11
DIB.:	QUIM G.	APP.:	NABIL K.

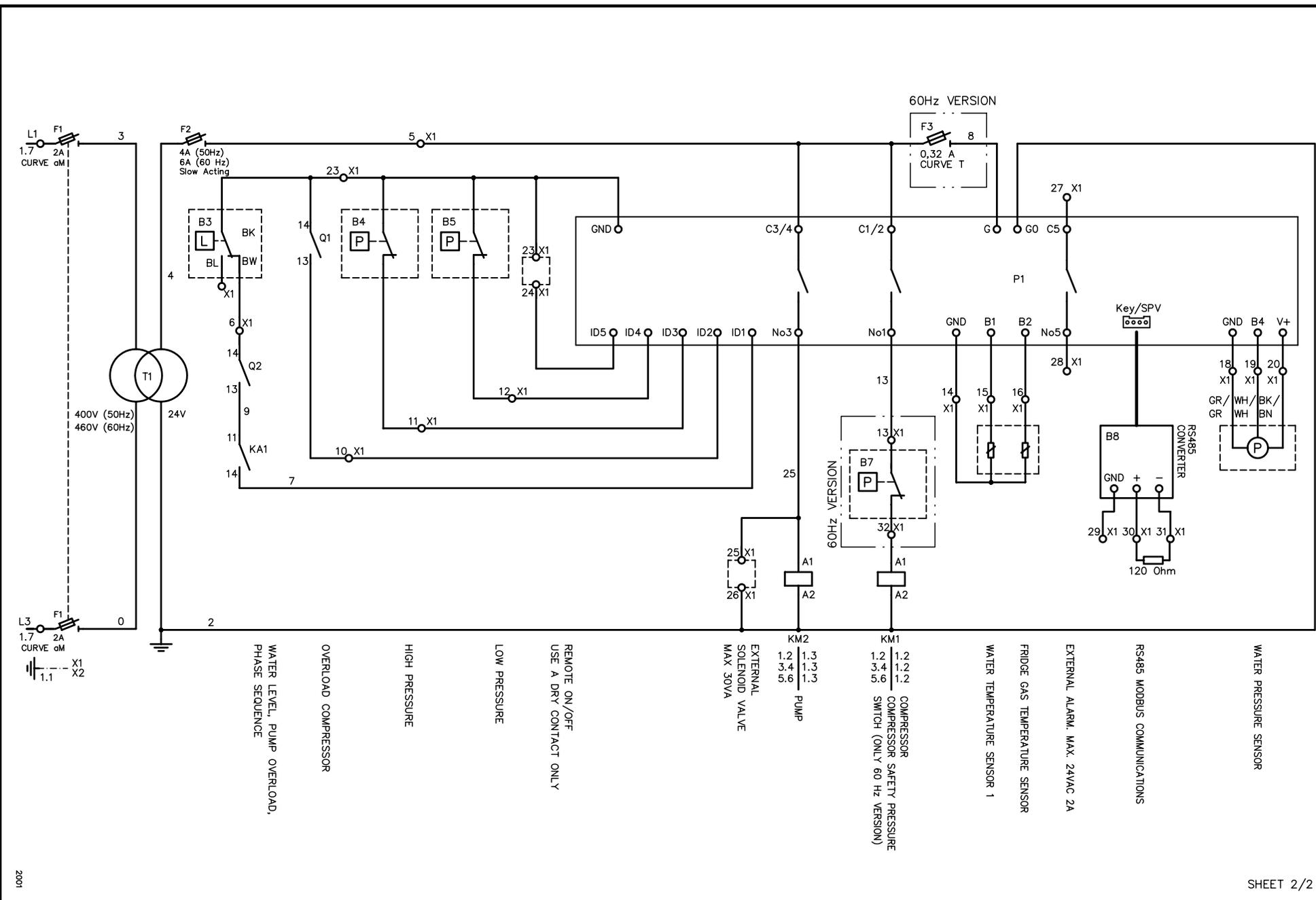


TAG	DESCRIPTION	TAG	DESCRIPTION	TAG	DESCRIPTION	TAG	DESCRIPTION
E-1	Water by-pass with calibrated capillary pipe	F-1	Filter dryer	B5	High pressure safety switch	V-1	Expansion valve
E-2	Water - freon evaporator	F-2	Water filter	B6	Low pressure safety switch	V-2	Drain manual valve
E-3	Water tank	I-1	Water outlet pressure gauge	B7	Compressor safety pressure switch (only 60Hz version)	V-3/9	Schrader valve
E-4/5	Freon condenser	I-2	Water inlet pressure gauge	P1	Control thermostat	V-10/11	Manual valve
E-6	Sight glass (optional)	I-3/4	Pressure transducers	M1	Freon compressor	B	Emptying + Overflow tap
E-7	Sight glass - oil level	D-2	Vibration adjuster	M2	Pump		
E-8	Liquid vessel	B4	Level switch	M3	Motor fan		

Nº:	EF-7056	REV.:	1
DAT.:	30.06.09	DAT.:	13.11.09
DIB.:	X. Prats	APR.:	Quim G.

- M1 - FREON COMPRESSOR
- M2 - PUMP
- M3 - MOTOR FAN
- KM1 - COMPRESSOR CONTACTOR
- KM2 - PUMP CONTACTOR
- Q0 - GENERAL SWITCH
- Q1 - COMPRESSOR CIRCUIT BREAKER
- Q2 - PUMP CIRCUIT BREAKER
- F1/2 - TRANSFORMER FUSES
- F3 - CONTROL THERMOSTAT FUSE (ONLY 60Hz VERSION)
- T1 - TRANSFORMER
- B4 - LEVEL SWITCH
- B5 - HIGH PRESSURE SAFETY SWITCH
- B6 - LOW PRESSURE SAFETY SWITCH
- B7 - COMPRESSOR SAFETY PRESSURE SWITCH (ONLY 60 Hz VERSION)
- B8 - RS485 CONVERTER
- P1 - CONTROL THERMOSTAT
- KA1 - PHASE SEQUENCE DETECTOR RELAY





N°: EE-7049/2	REV.: 3
DATE: 03.04.09	DATE: 12.11.09
DIB.: A.MARAÑÓN	APR.: QUIM G.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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Refrifluid B

CHARACTERISTICS

Refrifluid B is a fluid specially designed for the treatment, cleaning and conservation of the inside of tanks and piping in water coolers, especially when it is necessary to avoid bacteria, algae and fungi growing.

Its composition has been specially designed to accomplish three different objectives:

- It includes a widely effective bactericide, algacide and fungicide based on non-corrosive quaternary ammonium components.
- It can be used adding a little quantity of the product directly into the water tank.
- It contains an anticorrosive, which covers all metallic surfaces with a thin film, protecting them from corrosion.

USE AND CARE

It must be used in small quantities. The maintenance concentration has to be in the proportion 1:50 (1 litre of refrifluid B for each 50 litres of water) and it has to be added at least once per year (refilling the tank with new water).

When the system requires to be cleaned, due to the bacteria, algae and fungi growth, the proportions should be higher (1:15 – 1:25). In such case, besides, it would be recommended to use before the product DA8, for carry over the incrusted organic material. Afterwards it is possible to fill in again the tank and set up the unit.

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND MANUFACTURER IDENTIFICATION

Commercial name of the product: REFRI-FLUID B

Description: Bactericide and anticorrosive fluid

Manufacturer: SENIGRUP, S.L.

C-55 Km.25 Poligono Industrial Raval dels Torrents Nave-A

Tel. 0034 93 833 28 88 – Fax.0034 93 833 28 89

08297 Castellgalí (Barcelona). SPAIN

2. COMPOSITION / INFORMATION ON THE COMPONENTS:

Active ingredients: Water base antifouling and anticorrosion solution

Neutral water base solution, which contains, among others

Quaternarium ammonium <5%

Anticorrosives (Azol) >30%

Other ingredients: Water.

3. IDENTIFICATION OF DANGERS:

This product is harmful if ingested.

4. FIRST AID MEASURES:

In case of contact with eyes: Rinse constantly and abundantly with water for 15 minutes. If irritation persists, contact a doctor.

In case of contact with skin: Wash with soap and water.

In case of ingestion: Wash out mouth and drink water. Do not induce vomiting. Take the person to a medical centre.

In case of inhalation: There is no danger.

5. PROTECTION MEASURES AGAINST FIRE:

Appropriate extinction methods: foam, sprayed water, carbonic gas

Non- Appropriate extinction methods: ---

Special protection equipments: Not required

Additional information: ---

6. SPECIAL MEASURES IN CASE OF ACCIDENTAL SPILLAGE:

Protection for persons: In case of contact, remove all clothing and wash with abundant water. Cordon off the area.

Protection for the environment: Act responsibly. Do not channel the spillage to sewers, public gutters, trenches or water pipes, in the open or underground.

Cleaning up and disposal: Wipe up the spillage using absorbent material. Rinse any possible remains with plenty of water.

7. HANDLING AND STORAGE:

Handling: Handle with care and use adequate clothing for the handling of chemical products.

Storage: Store in a cool, dry place in closed containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protection equipment: Adequate clothing for the handling of chemical products

Respiratory System protection: Not required

Protection for hands: Rubber gloves

Protection for eyes: Safety glasses

Protection for the skin: General protections and safety shoes

General safety and hygiene measures: No eating, drinking or smoking during handling

9. PHYSICAL AND CHEMICAL PROPERTIES:

Physical state: Liquid.

Colour: Pink.

Odour: Characteristic.

Fusion point: below 0°C.

Boiling point: higher than 100°C.

Inflammation point: not applicable.

Explosion limits: not applicable.

Ignition temperature: not applicable.

Vapour pressure: ---

Density (at 20°C): 1,01-1,02 g/cm³.

Solubility in water (at 20°C): Miscible in water.

Solubility in other solvents: Alcohols and organic solvents.

Ph at 20°C: 9.5-10.0

Viscosity: 5-20 centipoises in Brookfield

10. STABILITY AND REACTIVITY:

Conditions to avoid: Avoid contact with oxidising products.

Dangerous reactions: None in particular.

Materials to prevent: Oxidising agents.

Harmful by-products from decomposition: Negligible

11. TOXICOLOGICAL INFORMATION:

Toxicity: Not found.

Sensitization: Not reported.

12. ECOLOGICAL INFORMATION:

Environmental behaviour: Biodegradable.

Ecotoxic effects: Low danger.

13. DISPOSAL CONSIDERATIONS:

Product: The product must be disposed, taking into account the national, autonomous region and local regulations.

Packaging: The product must be disposed, taking into account the national, autonomous region and local regulations.

14. TRANSPORTATION:

Not classified. Not dangerous or flammable.

15. REGULATION INFORMATION:

Signalling in accordance with the EU directives

Signals: Xn

Sentences R/S:

R 25 Toxic if ingested

R 36/38 Irritates eyes and skin

S 20/21 Do not eat, drink or smoke during the product usage

S 24/25 Avoid contact with eyes and skin.

S 36/37/39 Use adequate clothing gloves and face and eyes protections.

16. OTHER INFORMATION:

The information contained in the safety sheet is, up to date, considered correct and reliable. However, the given data and recommendations do not imply a warranty. As the working conditions are out of our company control, it is the end user's responsibility to ensure the conditions for a safe usage of the product. **REVISION DATE:03-01-05 ED:1**



EC Declaration of conformity

GB

97/23/EC (Defined by pressure equipment directive)

2006/42/EC (Known as the 'Machinery Directive')

Lauda Ultracool S.L.

Based in Terrassa-Barcelona-Spain, Colom II Street, nº 606, Postal Code 08228

Declares that under our sole responsibility for supply/manufacture of the product:

Model

UC-0060/0080/0100/0140/0180/0240

To which this declaration relates, is in conformity with the Directive 97/23/EC issued by the EUROPEAN COMMUNITY



EC Konformitäts Erklärung

D

97/23/EC (Defeniert in der Druckgeräteverordnung)

2006/42/EC (Bekannt als 'Maschinen Weisung')

Lauda Ultracool S.L.

Mit Sitz in Terrassa-Barcelona-Spain, Colom II Strasse, nr. 606, Postfach 08228

Erklärt, daß unserer alleinigen Verantwortung unterliegt, das Lieferung/Herstellung des Produktes:

Modell

UC-0060/0080/0100/0140/0180/0240

Auf welches diese Erklärung Bezug nimmt, den erlassenen Weisungen 97/23/EC der EUROPÄISCHEN GEMEINSCHAFT



Declaration de conformité CE

F

97/23/EC (Défini par la directive des équipements sous pression)

2006/42/EC (connue comme 'Directive Machine')

Lauda Ultracool S.L.

Domicilié à Terrassa-Barcelona-Espagne, rue Colom II, no. 606

Déclare sous sa seule responsabilité de fournisseur/fabriqueur du produit:

Modell

UC-0060/0080/0100/0140/0180/0240

Objet de cette déclaration, est en conformité avec la Directive 97/23/EC issue de la COMMUNAUTE EUROPEENNE



Declaración de conformidad CE

E

97/23/EC (Definida por la directiva de equipos a presión)

2006/42/EC (Conocida como 'Directiva de maquinaria')

Lauda Ultracool S.L.

Con sede en Terrassa-Barcelona-España, calle Colom II nº 606, C.P. 08228

Declara que, bajo nuestra responsabilidad como proveedores/fabricantes, el producto:

Model

UC-0060/0080/0100/0140/0180/0240

Es conforme a la Directiva 97/23/EC establecida por la COMUNIDAD EUROPEA.



EC Konformitäts Erklärung

NL

97/23/EC (Ontworpen volgens de Pressure Equipment Directive - richtlijnen)

2006/42/EC (Bekend als 'machine richtlijn')

Lauda Ultracool S.L.

Gezeteld in Terrassa-Barcelona-Spanje, Colom II Straat, nr. 606, Postcode 08228

Verklaart dat onder volledig eigen verantwoordelijkheid voor de levering/fabricage van onderstaand product

Modell

UC-0060/0080/0100/0140/0180/0240

Waartoe deze verklaring behoort, conform is aan de richtlijn 97/23/EC, uitgegeven door de EUROPESE GEMEENSCHAP



Declaration de conformité CE

I

97/23/EC (Definita dalla direttiva dei recipienti a pressione)

2006/42/EC (conforme alla 'Direttiva Macchine')

Lauda Ultracool S.L.

Colom II Street, nº 606, Terrassa-Barcelona Codice Postale 08228

Dichiara la responsabilità per la produzione prodotto:

Modell

UC-0060/0080/0100/0140/0180/0240

Il contenuto della presente relazione è in conformità con la Direttiva 97/23/EC della COMUNITÀ EUROPEA



Declaración de conformidad CE

CZ

97/23/EC (Definováno směrnicí pro tlaková zařízení)

2006/42/EC (Machinery Directives)

Lauda Ultracool S.L.

Se sídlem Terrassa-Barcelona-Spain, Colom II Street, nº 606, Postal Code 08228

Z titulu své odpovědnosti výrobce a dodavatele prohlašuje ze toto prohlášení o shode se vztahuje k zařízení:

Model

UC-0060/0080/0100/0140/0180/0240

A je plně v souladu se směrnicí Evropského společenství c. 97/23/EC



EC Konformitäts Erklärung

DK

97/23/EC (Defineret af direktivet for trykluftdstyr)

2006/42/EC (Kendt som 'Maskindirektivet')

Lauda Ultracool S.L.

Bosiddende i Terrassa-Barcelona-Spain, Colom II Street, nº 606, Postal code 08228

Erklærer under eneansvar for levering/fremstilling af produktet:

Modell

UC-0060/0080/0100/0140/0180/0240

Hvortil denne erklæring relaterer, at produktet er i overensstemmelse med Direktivet 97/23/EC udstedt af det EUROPÆISKE FÆLLESSKAB



Declaration de conformité CE

RO

97/23/EC (Conform reglementarilor de utilizare a echipamentelor sub presiune)

2006/42/EC (Cunoscuta ca 'Directiva Constructiilor de Masini')

Lauda Ultracool S.L.

Domicilié à Terrassa-Barcelona-Espagne, rue Colom II, no. 606

Declara pe proprie raspundere ca furnizarea/fabricarea produsului:

Modell

UC-0060/0080/0100/0140/0180/0240

La care se refera aceasta declaratie este in conformitate cu Directiva 97/23/EC emisa de COMUNITATEA EUROPEANA

LAUDA
ultracoolXavi Prats
Technical DirectorMarta Pino
Plant manager