INSTALLATION AND MAINTENANCE MANUAL
FOR TRANSPORTATION MILK COOLING TANKS
WITH
COOLING CONTROLLER

WARNING! READ THE INSTRUCTIONS MANUAL BEFORE OPERATE

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<table>
<thead>
<tr>
<th>CONTENT</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INTRODUCTION</td>
<td>3</td>
</tr>
<tr>
<td>2. SAFETY RULES AND GENERAL INSTRUCTIONS</td>
<td>3</td>
</tr>
<tr>
<td>3. PRESENTATION OF PRODUCT</td>
<td>3</td>
</tr>
<tr>
<td>4. LABELING</td>
<td>3</td>
</tr>
<tr>
<td>4.1 MANUFACTURER &amp; TECHNICAL SPECIFICATION LABEL</td>
<td>3</td>
</tr>
<tr>
<td>4.2 WARNING LABELS</td>
<td>4</td>
</tr>
<tr>
<td>5. INSTALLATION INSTRUCTIONS</td>
<td>4</td>
</tr>
<tr>
<td>5.3 ELECTRICAL CONNECTIONS</td>
<td>4</td>
</tr>
<tr>
<td>6. PRINCIPLES OF OPERATION-DESCRIPTION OF THE MACHINE</td>
<td>5</td>
</tr>
<tr>
<td>7. DESCRIPTION</td>
<td>5</td>
</tr>
<tr>
<td>8. USING THE MILK COOLING TANK</td>
<td>6</td>
</tr>
<tr>
<td>8.1 COOLING CONTROLLER</td>
<td>6</td>
</tr>
<tr>
<td>8.2 ADJUSTING THE BASIC PARAMETER VALUES OF THE XR80CX</td>
<td>7</td>
</tr>
<tr>
<td>9. MALFUNCTION AND TROUBLESHOOTING</td>
<td>10</td>
</tr>
<tr>
<td>10. ELECTRICAL DRAWINGS</td>
<td>11</td>
</tr>
<tr>
<td>11. WARRANTY CERTIFICATE</td>
<td>13</td>
</tr>
<tr>
<td>12. NOTES</td>
<td>14</td>
</tr>
<tr>
<td>13. TECHNICAL SUPPORT</td>
<td>15</td>
</tr>
</tbody>
</table>

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1. INTRODUCTION

Choosing the milk cooling tank of Milkplan, you chose a perfect product, made by people who perfectly know the secrets of milk conservation. The milk cooling tank is constructed using the most modern equipment and technology, all in accordance to the European accepted standards.

Milk refrigeration is performed by a stainless steel, straight direct expansion evaporator plate, developed by Milkplan's R&D department. The appropriate design, and the efficient mounting of the evaporator on the milk cooling tank's body, create the best conditions for a rapid cooling of the contained milk, providing, combined with agitation, the proper cooling and conservation of the product.

The materials used for the construction of the milk cooling tank are the most trustworthy in the European Trade Market and guarantee the long life and the faultless operation of your milk cooling tank.

The electronic milk controller is manufactured by the Italian firm Dixell and has a malfunction factor of less than 1%.

The agitation motor is made in France by Sirem, in different models whose characteristics depend on the tank they serve.

The final user of the tank may choose the condensing unit that is suitable to his/her needs, among various alternative models offered by Milkplan. Therefore, there is an option for a reciprocating hermetic compressor Maneurop, or a reciprocating hermetic compressor L'Unite Hermetique (Tecumseh) or even a Copeland scroll compressor. All types of compressors used are hermetic and their horsepower is always chosen according to the needs of each customer.

All Milkplan closed, horizontal-type milk-cooling tanks, are manufactured with two independent refrigeration circuits, allowing, thus, the user to install two independent cooling units, even after the final installation.

The proper installation of the tank is achieved by stainless steel (AISI 304), special manufactured form legs, fully adjustable, for an effective leveling.

2. SAFETY RULES AND GENERAL INSTRUCTIONS

During the designing and the construction of this machine, we have spared no effort to make your job more efficient and secure. However, caution is always important. Prevention is better than cure.

This machine is designed and constructed according to the Annex V directive 98/37 EU and the EN 292-1, EN 292-2, EN 294, EN 349, EN 418, EN 1672-1, EN 1672-2, EN 60204-1 standards.

This exclamation point in the yellow, equilateral triangle alerts the user about danger and measures to be taken to avoid risks, injuries and damages. Upon seeing it, you are highly advised to pay attention to the warning and be careful about risks.

An instruction follows this symbol.

3. PRESENTATION OF PRODUCT

ATTENTION! This manual is an integral part of the milk cooling tank and must be kept at a safe place, close to the milk cooling tank; all users must know its presence and content. Do not expose this manual to rain or moisture.

Do not neglect to read this manual, despite your previous experience. A few moments of careful reading will save you time and prevent many problems. Read carefully the instructions, before the start-up of the machine, its normal use, maintenance or other functions and follow exactly the instructions and warnings as mentioned below.

Place the stickers on the machine and replace any lost or damaged sticker or label immediately!

Only adequately trained staff, responsible for the use of the machine should handle it. A trained person is adequately informed or can supervise by another trained person in order to prevent or eliminate any risk of accident.

4. LABELING

4.1 MANUFACTURER & TECHNICAL SPECIFICATION LABEL

The manufacturer's label of technical specifications must be visible at all times, for it contains essential information about the manufacturer (address, phone number, fax) and the proper installation of the machine (the model, serial number, year of manufacture, the technical characteristics of the condensing unit, power and voltage, electrical current and weight) and the CE mark.
4.2 WARNING LABELS

The warning labels inform the operator about the machine or the equipment or about persisting risks, despite all measures adopted.

![WARNING! READ THE INSTRUCTIONS MANUAL BEFORE OPERATE](image)

![ATTENTION ELECTRIC SHOCK](image)

Due to the nature of the product the tank contains, hygiene rules should be applied. The following labels must be installed at a place seen by all employees.

![WASH YOUR HANDS](image)

![WORK WITH APPROPRIATE CLOTHES](image)

![WORK WITH HAT APPROPRIATE](image)

The signs (warning labels) should be fixed at a visible and not removable part of the machine or on a data plate attached to the machine in such a way that it cannot be removed or become illegible during the function of the machine in the working environment.

Keep them clean and replace them immediately detached or damaged.

5. INSTALLATION INSTRUCTIONS

5.3 ELECTRICAL CONNECTIONS

An authorized electrician must work on the electrical installation that will power the milk cooling tank. A single-phase tank must be connected to an electrical installation of 220V, 50Hz with a separate ground conductor, whereas a three-phase tank must be connected to an electrical installation of 380V, 50Hz with a five polar cable (3 phases + neutral + ground conductor).

![ATTENTION!](image)

For your protection, the milk cooling tank must be provided with a grounded protective conductor, of suitable capacity, to ensure the proper grounding of the machine.

The diameter of the cables must be chosen according to the electrical power of the milk cooling tank. Consult table 1 of the appendix to choose the type of the cable. The cable must be straight, without coils (twisted extensions of electrical cable, e.t.c).
The milk cooling tank must be connected to a separate, fused electrical line, with a K type fuse or a micro-automatic for electric motors in the electrical panel.

Supplying two milk cooling tanks through the same fuse is absolutely forbidden.

The electrical connections of the milk cooling tanks, from 500 liters of capacity and beyond, must be inside the electrical panel, and the electrical line must be connected to an industrial type socket or to the power board of the building.

ATTENTION! The power line of the tank should be made of a unique cable of sufficient dimensions, without any connections or terminal connectors. The manner of wiring the tank must ensure that only authorized stuff or trained persons can approach the power lines and the electrical cables. DANGER OF ELECTRIC SHOCK!

Once performed the electrical connection, measure the voltage fluctuation by using a voltmeter. While the milk cooling tank is operating, the voltage drop must not be greater than 3% of the nominal one. (At a circuit of 220V, the voltmeter should measure at least 214V).

High voltage drop at the power supply line may cause serious damage to the refrigerating mechanism, which is not covered by the guarantee.

NOTE: Wrong connections at the terminal blocks or the socket plugging can also cause voltage loss.

6. PRINCIPLES OF OPERATION-DESCRIPTION OF THE MACHINE

The milk cooling tank is especially designed and constructed for the refrigeration and the conservation of milk and ensures the perfect quality of the product. The refrigeration of the milk must be done immediately after its collection in order to minimize its possible vitiation during its transportation.

The milk cooling tank cools the milk by using one or two condensing units. The proper refrigeration is achieved by one or two agitation paddles, rotated by an electro reducer. The insulated walls of the milk cooling tank keep temperature stable for a sufficient period of time by reducing thermal loss. The entire construction and performance of the milk cooling tank are in accordance to the International Standards ISO 5708 and EN 13732.

7. DESCRIPTION

The cylindrical/elliptical milk vessel of the tank is made of 18/10 AISI 304 stainless steel. The tank vessel consists of two walls. A fine insulation, of a precisely controlled infusion, made of high density, environment friendly polyurethane foam exists between them. A complete agitation system, on the upper side of the tank, is directly connected to the stirring motor. Both the agitation paddle and the shaft are made of stainless steel and their special shape achieves agitation even with small quantities of product. A dipstick and a calibration chart of 1mm accuracy are installed inside the tank.

A user-friendly control panel is located on the front side of each tank, in a stainless steel (AISI 304) frame, secured from humidity, dirt and dust. Milk controller (IP 65) allows complete parameterization to the user, offering, simultaneously full functionality of the equipment, in accordance to the real needs at workplace.

On the lower part of the tank, one can see the milk outlet and the butterfly valve (dimensions DN50). A connection tool of the washing system of the tank is also located in the front side, ready to be connected to the butterfly valve.

The watertight manhole is made of stainless steel (AISI 304) and must remain closed during the collection and the cooling of the milk and during washing.

After an operation of the tank is completed (refrigeration/drainage/washing), you should make a visual inspection of the tank to verify the results of the operation.

Do not forget to verify that rinsing water, from the washing process, has been completely emptied before the first pouring of the milked milk.
8. USING THE MILK COOLING TANK

Milkplan cooling control panel is equipped with all the necessary elements for effective cooling operation of milk cooling tank.
- User friendly
- Electronic thermometer – thermostat (agitation program is included)
- Sound alarm in case of compressor, agitation motor malfunction

The panel of stainless steel control box contains the cooling controller XR80CX and two buttons.
The first button “COOLING” should be pressed when the user want to start cooling process and the controller will automatically control the operation of the compressor and the agitation motor.
The second button “MANUAL AGITATION” can be used to start agitation while the cooling controller is deactivated. For example when the tank is connected to the external CIP and is ready to be cleaned.

8.1 COOLING CONTROLLER

Milkplan simple automatic control panel is equipped with Dixell XR80CX controller specialized for controlling milk cooling and preservation processes.

Main characteristics:
- User friendly
- Accurate control
- Manual start of agitation
- Each instrument is fully configurable
- Current temperature always displayed on the screen
- Electronic thermometer – thermostat (agitation program is included)
CONTROLLER

Exclusively the DIXELL controller XR80CX with which your milk tank is equipped performs the control of the refrigerating milk tank.

This controller is very flexible, and allows for the automatic operation of the tank with an ON/OFF switch.

The stirring operation is industrially regulated and the user should take no steps in order to operate it. The stirrer operates throughout the operation of the refrigerating process. When the refrigeration is completed, the refrigerating unit stops and the stirrer operates at mode of 3 minutes rotation and 15 minutes pause (the time periods are adjustable).

Always remember that you should:

Set the refrigerating milk tank in operation mode as soon as the agitation paddle is covered with milk. Do not turn the tank off as long as it contains milk.

Turn the milk cooling tank off when it does not contain milk.

Avoid opening the lid of the tank, as long as it is in operation because the stirrer stops and there is a risk of ice formation.

If you want to take a sample of the milk while the stirring system is in the 15 minutes non-operating stage, push and hold the button-key to make it operate. With this procedure you can take a homogeneous sample.

During winter and if the temperature falls under 4°C, the milk cooling tank won’t start. It is necessary to put hot milk in the tank and wait a few minutes until the refrigerating unit starts to operate.

8.2 ADJUSTING THE BASIC PARAMETER VALUES OF THE XR80CX

After the milk cooling tank is switched on, a dashed line is displayed on the controller’s screen. Next, the temperature of the room where the milk cooling tank is installed is displayed.

1. First press the SET key-button together with the (▼) key for at least 7 seconds
2. Led Hy is displayed.
3. Repeat step 2 pressing both keys for 7 sec. Led Pr 2 will be displayed. Release the keys and Hy is displayed.
4. Press the SET key until the Hy temperature (2.0°C) is displayed.
5. By pressing the SET key again the LS is displayed.
6. Press the SET key, and then by pressing the (▲ ▼) keys you can set the minimum temperature.
7. The temperature is already set to 1.0°C
8. By pressing the SET key, the display blinks three times meaning that the temperature you set has been stored.
9. After this, the led US is displayed. Press the SET key, and then by pressing the (▲ ▼) keys you can set the maximum temperature. The maximum temperature is already set to 5.0°C.
10. By pressing the SET key, the display blinks three times meaning that the temperature you set has been stored.
11. Immediately after, the led Ot is displayed which calibrate the thermostat probe. Push the SET key once, and by pressing (▲ ▼) set the desirable temperature. Press the SET key again and the display blinks three times meaning that the temperature set has been stored. The value of parameter is set to –0.5°C

Soft start function

If at start up, or during the regulation process, the input signal value is higher than the “SrS+Hy”, the controller starts the regulation considering as target temperature the parameter SrS. When the temperature reaches the SrS value the compressor stops. Then after the time set in parameter Srt, the controller starts the regulation based on the standard SET POINT.

How to reset the soft start parameters

In order to reset the values of the soft start parameters you have to follow the 5 first steps of the chapter “checking the basic parameters values”. Afterwards you have to press and release the SET key until you reach the parameter Srt. The value of this parameter is 0min. and if you wish to change it you have to press the arrows. After the calibrating of the parameter press the SET key, the display blinks 3 times which means that the value has been stored. After this the controller pass automatically to the parameter SrS which adjusts the temporary stop of the compressor, the value of this parameter is 15°C and if wish to change it you have to press the arrows, after the calibrating you should press the SET key so as to store the new value.

To exit press the SET + ▲ or wait 15s without pressing a key.

How to see the Set Point

1. Push and immediately release the SET key: The display will show the Set point value.
2. Push and immediately release the SET key or wait for 3 seconds to display the probe value again.

How to change the Set Point

1. Push the SET key for more than 3 seconds to change the point Set value;
2. The value of the set point will be displayed and the LED starts blinking.
3. To change the set value push ▲ or ▼ arrows.
4. To memorise the new set point value push the SET key again or wait for 15 seconds.

How to start a manual agitation cycle

Push the Up (▲) key for more than 3 seconds and the manual agitation cycle will start.

How to see the min temperature

1. Press and release the ▼ key.
2. The Lo message will be displayed followed by the minimum temperature recorded.
3. By pressing the ▼ key again or by waiting for 5 seconds the normal display will be restored.

How to see the max temperature

1. Press and release the ▲ key.
2. The Hi message will be displayed followed by the maximum temperature recorded.
3. By pressing the ▲ key again or by waiting 5 seconds the normal display will be restored.

How to change a parameter value

1. Enter the programming mode by pressing the SET and ▼ key for 7 s (and start blinking)
2. Select the required parameter.
3. Press the SET key to display its value (LED starts blinking)
4. Use (▲ ▼) to change its value
5. Press SET to store the new value and move to the following parameter.

To exit press the SET + ▲ or wait 15 s without pressing a key.

How to lock the keyboard

1. Press and hold for more than 3 seconds the (▲ ▼) keys
2. The POF message will be displayed and the keyboard will be locked. At this point it will be possible to see only the set point or the MAX or MIN temperature stored.

If a key is pressed more than 3 seconds the POF message will be displayed.

To unlock the keyboard

Keep pressed together for more than 3 s the ▲ ▼ keys.

Meaning of Leds

*ON: Compressor enabled.
*Flashing: Programming phase (flashing with * Anti-short cycle delay enabled
ON: Agitator enabled
Flashing: Programming phase (flashing with *)

ALARM SIGNALS

EE: The instrument is provided with an internal check verifying memory integrity. The ALARM "EE" flashes when a failure in the internal memory is detected. Please call the service.
P1: Probe alarm -P1- starts several seconds after the fault in the related probe. It automatically stops several seconds after the probe restarts normal operation. Check connections before replacing the probe. In case of fault in the thermostat probe, the starting and the stopping of the compressor are regulated through the parameters Con & COF.
HA: Maximum temperature alarm automatically stops as soon as the thermostat temperatures returns to normal and when defrosting stops.
LA: Minimum temperature alarm automatically stops as soon as the thermostat temperature returns to normal and when defrosting stops.

DEFAULT SETTINGS

<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
<th>Range</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set</td>
<td>set point</td>
<td>LS-US</td>
<td>4,0</td>
</tr>
<tr>
<td>Hy</td>
<td>Differential</td>
<td>0,1-25,5°C / 1-255°F</td>
<td>2,0</td>
</tr>
<tr>
<td>LS</td>
<td>Minimum set point</td>
<td>-50°C - SET</td>
<td>1,0°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-58°F - SET</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>Maximum set point</td>
<td>SET - 150°C</td>
<td>5,0°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SET - 302°C</td>
<td></td>
</tr>
<tr>
<td>Label</td>
<td>Name</td>
<td>Range</td>
<td>Value</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Ot</td>
<td>Thermostat probe calibration</td>
<td>-12°C - +12°C</td>
<td>- 0,5°C</td>
</tr>
<tr>
<td>OdS</td>
<td>Outputs delay at start up</td>
<td>0 - 255 min</td>
<td>0</td>
</tr>
<tr>
<td>AC</td>
<td>Anti-short cycle delay</td>
<td>0 - 50 min</td>
<td>1</td>
</tr>
<tr>
<td>Con</td>
<td>Compressor On time with faulty probe</td>
<td>0 - 255 min</td>
<td>15</td>
</tr>
<tr>
<td>COF</td>
<td>Compressor OFF time with faulty probe</td>
<td>0 - 255 min</td>
<td>30</td>
</tr>
<tr>
<td>CF</td>
<td>Temperature measurement units</td>
<td>°C - °F</td>
<td></td>
</tr>
<tr>
<td>rES</td>
<td>Διαχωρισμός / Resolution</td>
<td>In : dE</td>
<td>dE</td>
</tr>
<tr>
<td>AgC</td>
<td>Agitator configuration</td>
<td>EL = with compressor</td>
<td>EL</td>
</tr>
<tr>
<td>tIC</td>
<td>Resolution for the Agt parameter</td>
<td>nP = minutes</td>
<td>nP</td>
</tr>
<tr>
<td>IAg</td>
<td>Interval between agitation cycle</td>
<td>1 - 120 min</td>
<td>15</td>
</tr>
<tr>
<td>Agt</td>
<td>Length for agitation cycle</td>
<td>0 - 255 min</td>
<td>3</td>
</tr>
<tr>
<td>APO</td>
<td>First agitation cycle after start up</td>
<td>n = immediately</td>
<td>Y</td>
</tr>
<tr>
<td>ALc</td>
<td>Temperature alarms configuration</td>
<td>rE - Ab</td>
<td>Ab</td>
</tr>
<tr>
<td>ALU</td>
<td>Maximum temperature alarm</td>
<td>ALL-150°C</td>
<td>100</td>
</tr>
<tr>
<td>ALL</td>
<td>Minimum temperature alarm</td>
<td>-50.0°C - ALU</td>
<td>-50</td>
</tr>
<tr>
<td>ALd</td>
<td>Temperature alarm delay</td>
<td>0 - 255 min</td>
<td>15</td>
</tr>
<tr>
<td>dAo</td>
<td>Delay of temperature alarm at start up</td>
<td>0 - 23 h &amp; 50 min</td>
<td>1,3</td>
</tr>
<tr>
<td>PbC</td>
<td>Probe selection</td>
<td>Ptc-ntc</td>
<td>ntc</td>
</tr>
<tr>
<td>Srt</td>
<td>Initial regulation time</td>
<td>0 - 59 min</td>
<td>0</td>
</tr>
<tr>
<td>SrS</td>
<td>Initial regulation Set point</td>
<td>-55,0°C - 150,0°C</td>
<td>15</td>
</tr>
<tr>
<td>rEL</td>
<td>Software release</td>
<td></td>
<td>3,0</td>
</tr>
<tr>
<td>Ptb</td>
<td>Map code</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

*Hidden parameters*
<table>
<thead>
<tr>
<th>MALFUNCTION</th>
<th>POSSIBLE CAUSE</th>
<th>TROUBLESHOOTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>The device does not operate at all.</td>
<td>No voltage.</td>
<td>Check if the operation button is at ON position (light indication).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check if there is voltage at the electric line that feeds the milk cooling tank.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the fuse of the electric line that feeds the milk cooling tank.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the electric connections at the electric panel and the socket of the tank.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the connection terminal blocks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the voltage controller that is located in the electrical panel of cooling unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the voltage for hypertension or hypotension.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the phase sequence on three-phase machines and if necessary change between the two phases of the socket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the problem is not solved, contact our company’s technical department.</td>
</tr>
<tr>
<td>The electronic thermostat is on but the cooling units do not start.</td>
<td>Absence of voltage in the coil of power relay of the compressor.</td>
<td>Check the thermo magnetic switch in the electrical panel and the transformer of the electrical panel of the cooling unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the problem is not solved, contact our company’s technical department.</td>
</tr>
<tr>
<td>The electronic thermostat is on, cooling units do not start.</td>
<td>The agitation has not started.</td>
<td>Check if the agitator rotates.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the agitator rotates, it is a false alarm, you must contact the company.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If it does not rotate check the agitator relay and the agitation motor for possible damage.</td>
</tr>
<tr>
<td>Washing process does not start.</td>
<td>Lack of tension in the washing panel.</td>
<td>Open the front part of the control panel and check the thermo magnetic switch for possible damage.</td>
</tr>
</tbody>
</table>
## 10. ELECTRICAL DRAWINGS

**JUNCTION BOX CONNECTION**

<table>
<thead>
<tr>
<th>MAIN POWER SUPPLY</th>
<th>AGITATION MOTOR 1</th>
<th>AGITATION MOTOR 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 N E1 E2</td>
<td>L1 L2 L3</td>
<td>L1 L2 L3</td>
</tr>
</tbody>
</table>

E1. Command for the solenoid valve of the cooling unit 230VAC  
E2. Command for the agitation motor contactor 230VAC
11. WARRANTY CERTIFICATE

The manufacturer warrants this product as being free of defects in material, design and workmanship:

IMERIDIS MAKROPOULOS MILKPLAN S.A.
DAIRY AND FARMING EQUIPMENT
3RD KM LAGADAS - KOLIKO NAT. ROAD
GR 572 00, P.O. BOX 212
Tel & Fax: +30 23940 20400

ΕΓΓΥΗΣΗ ΝΟ / WARRANTY NO:
ΣΤΟΧΕΙΑ ΠΕΛΑΤΗ / Client data

<table>
<thead>
<tr>
<th>Name:</th>
<th>City:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>Internal revenue service:</td>
</tr>
<tr>
<td>Telephone:</td>
<td>Date of trade:</td>
</tr>
<tr>
<td>VAT No:</td>
<td></td>
</tr>
<tr>
<td>Receipt of trade:</td>
<td>Serial number:</td>
</tr>
</tbody>
</table>

End of warranty:

The company provides the machine with one-year (1) warranty of good operation.
The machine has been examined at the manufacturing plant and confirms that it operates normally and does not have any problems.

FOR MILKPLAN S.A.  
(The authorized dealer-stamp and signature)  
THE PURCHASER

THE WARRANTY IS NOT VALID IF:

- A non-authorized technician has serviced the machine.
- The machine appears damaged from a fall or strikes etc.
- Flood, excessive moistness or fire has caused the damage.
- The machine malfunctions caused by low voltage, wrong electrical installation (Voltage 220V± 3%, 50Hz).
13. TECHNICAL SUPPORT

For further information for the technical support, contact the MILKPLAN service:

MILKPLAN S.A. IMERIDIS – MAKROPoulos
DAIRY AND FARMING EQUIPMENT S.A
3RD KM LAGADAS - KOLHiko NAT. ROAD
GR 572 00, P.O.BOX 212
sales@milkplan.com
www.milkplan.com

Before you contact our company, find the metal plate that has the serial number of the milk cooling tank and write it down so as to have it when you are asked for it.

Manual editing – Copyright
This manual is part of the research into the requirements that should be fulfilled according to the following standard: European Safety Regulations For European machines, 98/37/EEC. According to this research, the machine could have the CE mark.

This manual is a part of the MILK COOLING TANK and it must be available to anyone who wishes to operate, maintain, repair or control the milk cooling tank function.

Do not expose this manual to water, moisture and dust or to extreme temperatures. Keep it near the machine.

In case of damage or loss, ask for a copy from the manufacturer or the Authorized Service Center.

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