

# Larta1

## OPEN TYPE MILK COOLING TANK

LRT 50 – LRT 2500

## INSTRUCTION MANUAL FOR SAFE AND EFFICIENT USE

IMPORTANT NOTE!!



IF THE TANK CONTAINS R290 OR R454C REFRIGERANT, SEE THE INSERT!



|                                                                                           |           |
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# 1. INTRODUCTION

Having chosen the milk cooling tank of LRT , you have chosen a perfect product, made by those who perfectly know the secrets of cooling and conserving milk. The milk cooling tank is constructed by using the most modern equipment and technology.

The milk refrigeration is performed by a stainless steel straight direct expansion evaporator plate, which is operated in an economical way with the maximum performance.

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

The cooling controller is made by Dixell with a malfunction rate of less than 1%.

The agitation motor is made in France by Sirem and its power is 90W/230V/30 rpm (models LRT 50 - LRT 1250) and 120W/230V/30 rpm (models LRT 1500 - LRT 2500).

The close type compressors are manufactured by the most trusted manufacturers in the European market.

The base of the milk cooling tank has been designed for safe operation, easy maintenance and high aesthetics. The refrigerating unit and the control panel are well protected from the external environmental conditions and from small animals and rodents entering the refrigerating unit.

It has to be mentioned that the entrance of small animals where the mechanisms are placed is a very serious problem and affects the milk tank's life duration. The rodents eat the cables and the insulation material of the piping as well as even totally destroy the refrigerating unit.

# 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. PRODUCT INTRODUCTION



**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

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.

|                                                                                                                       |              |                 |         |
|-----------------------------------------------------------------------------------------------------------------------|--------------|-----------------|---------|
| Model                                                                                                                 | LRT1000      | Serial No       |         |
| Rated Volume                                                                                                          | 1000 lt      | Date            | /25     |
| Class                                                                                                                 | 2BII         | Weight          | 285 kg  |
| Refrigerant                                                                                                           | R454C        | Refrig. Power   | 7822 W  |
| Leq CO <sub>2</sub>                                                                                                   | 0.415 tonnes | Refrig. Charge  | 2850 gr |
| High Pressure                                                                                                         | 28 bar       | low Pressure    | 18 bar  |
| Rated Voltage                                                                                                         | 230V - 1N    | Rated Frequency | 50 Hz   |
| Power Rate                                                                                                            | 3978 W       | Max Current     | 28.75 A |
| IP                                                                                                                    | X4           |                 |         |
|  ISO 5708<br>EN13732<br>Made in EU |              |                 |         |
| 100010006120110                                                                                                       |              |                 |         |

### WARNING LABELS

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



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.



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

### 5.1. INSTALLATION SITE

The milk cooling tank can be installed indoors or outdoors. It is very important, to install the cooling tank at **a well-ventilated place, with hot and cold water supply.**

If the milk cooling tank is installed indoors, make sure the place of installation has sufficient ventilation openings. It is recommended that the milk cooling tank were placed in such a way that the condenser lies near an opening for the produced heat to be discarded.

If the milk cooling tank is to be installed outdoors, despite it is made of waterproof products, it must be placed under a roof to avoid the impact of the weather conditions (rain, snow, etc.). In this manner, you extend its life-time.

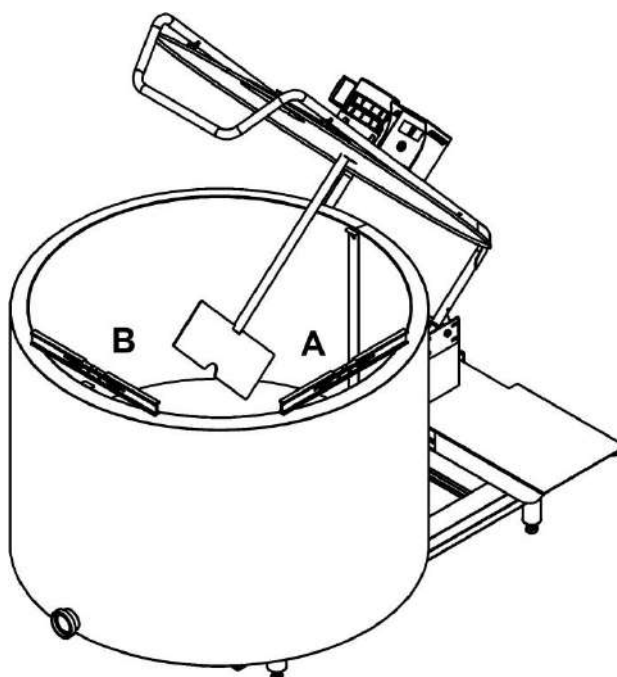
It is also crucial to place both the milk cooling tank and the condensing units, on a flat surface made of concrete. The installation of the milk cooling tank on a surface that may be deformed can result in inaccurate measurements and cause important damages to the equipment of the tank.

### 5.2. MILK COOLING TANK LEVELING

It is very important to level the tank properly in order to obtain accurate measurement.

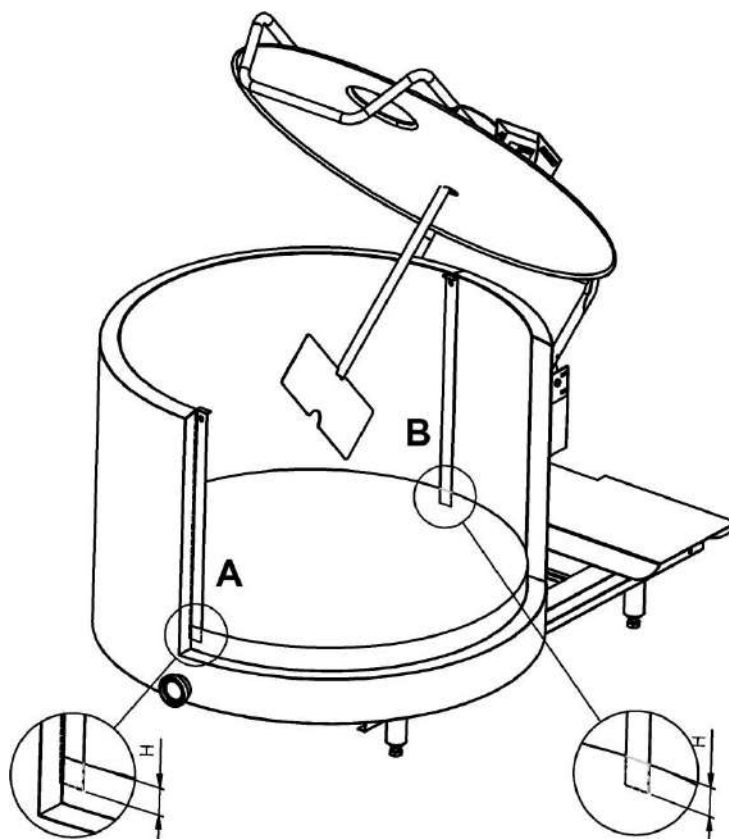
Place the tank on a stable and leveled surface and follow the procedure as described below:

1. Open the lid and place the spirit level on the edge of the tank as shown in position A and adjust the legs of the tank until absolute leveling is achieved.
2. Place a spirit level on the edge of the tank as shown in position B and adjust the legs of the tank until absolute leveling is achieved.
3. Ensure that the horizontal leveling hasn't changed.



PICTURE 1

4. Fill the tank with water to 15-20% of its total volume.
5. Place the dipstick at position A (front) as shown in the picture below and measure the level of water in the tank.
6. Place the dipstick at position B (back) as shown in the picture below and measure the level of water in the tank.
7. If there is a difference in measurement between the aforementioned positions adjust the legs of the tank until both measurements are equal.



PICTURE 2

### 5.3. ELECTRICAL CONNECTIONS

An authorized electrician should perform the electrical installation that will power the milk cooling tank.

A single-phase tank must be connected to an electrical installation of 220V, 50Hz/60Hz with a separate ground conductor, whereas a three-phase tank must be connected to an electrical installation of 400V, 50Hz with a five polar cable (3 phases + neutral + ground conductor).

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, etc.).

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 400 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!** 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.



**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 staff 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. OPERATION PRINCIPLE

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 milk vessel tank is made of stainless steel 18/10 AISI 304. The tank vessel consists of two walls. Between them there is insulation material of environmental friendly polyurethane foam, which is inserted under controlled infusion. On lid of the tank and directly connected with the stirring motor, the agitation is adjusted. This agitation paddle is constructed of stainless steel and has two shaped ribs at both its diametrical sides. This shape has been chosen for the better and more equalized stirring of the product. Inside the tank are located a dipstick and a calibration chart.

The stirring motor and the control panel with the milk temperature controller are placed on the milk cooling tank lid. This controller is used as a thermostat, thermometer and a stirring state controller. The milk inlet of a Ø200 diameter is placed on the lid, too. A handle is placed on the front of the cover, which is used for opening the lid.

The valve of the milk inlet (DN50, SMS51) is located at the bottom of the tank (models LRT 100-LRT 300). The base is made of stainless steel and can be completely dismantled. It consists of the upper and the bottom cover, four adjustable legs, four footing-bases and lateral covers. The base has been so designed that the tank can safely operate, be easy to maintain, be fully protected from various weather conditions and the entrance of small animals and rodents in the refrigerating unit. This protection is succeeded by four stainless steel covers placed at the four sides of the base. These covers are perforated so that the heating produced by the condenser and the compressor can be easily emitted. Simultaneously, the holes have such small dimensions that actually prevent the entrance of small animals and rodents into the refrigerating unit. In models LRT 400 - LRT 2500 the refrigerating unit is placed adjacent to the tank, also protected by perforated stainless steel covers.

The cover of the tank is also made of stainless steel. On the cover, a safety system can be adjusted so that it interrupts the operation of the stirring system motor in case the cover is opened. This system is called gravity switch. The gravity security system can be adjusted on the stirring electro-motor. When the cover of the tank opens, it is activated and interrupts the operation of the stirring electric motor. As soon as the cover is closed again, the stirring operation restarts.

## 8. TECHNICAL SPECIFICATIONS

### 8.1. GENERAL

**CONSTRUCTION:** Stainless steel 18/10, DIN 1.4301 (AISI 304) for inner and outer tank vessel.

**TANK TYPE:** Vertical type cylindrical tank, free standing, smooth inner sides, rounded angles, perfectly polished welding, adjustable legs for uneven floors. Direct expansion bottom designed to ensure total drain of tank. The design of evaporator plates prevents milk freezing even at low milk volumes. Crash test 60BAR. Function pressure: 30BAR. Fine insulation with precisely controlled infusion of high – density environment friendly polyurethane foam. 30rpm (90W) single-phase agitator motor for LRT 50 – LRT 1250, 30rpm (120W) single-phase agitator motor for LRT 1500 – LRT 2500, stainless steel lid without any screws inside and one-piece agitator (without joints). Automatic stop of the agitation motor when lid is open. Milk inlet Ø200mm and stainless steel cover. Elevated parts (opening handle, stirring motor and electrical control panel) for easy cleaning. Milk outlet and milk cooling tank evaporator plate inclination according to the international standards (ISO 5708). Stainless steel springs for easy opening and closing of the milk cooling tank lid (for LRT 200 – LRT 2500). Stainless steel dipstick and standard calibration chart. IP55 panel for electric instrument (Applicable Standard: EN 60529/91, Applicable directives: LVT 73/23/EEC). Stainless Steel Butterfly valve DN50, SMS51, Tri-clamp with one end nut, other threaded (male part), PVC cap and stainless steel chain for DN50 valves. Perforated stainless steel condensing unit cover with removable sides for easy maintenance and for the condensing unit ventilation – protection (Patent No.: 1004080) for LRT 50lt - LRT 1250lt.

**CONDENSING UNIT:** Hermetically sealed condensing unit compressor made by Embraco. L'Unite Hermetique, Maneurop and Copeland, coolant type R404A (full ecological). For the protection and the condensing unit's better performance have been mounted solenoid valve, high pressure switch, low pressure switch, high pressure switch for the second fun regulation (models LRT 1000-LRT 2500) on the refrigeration circuit. Thermo-expansion valve and refrigerant receiver on LRT 2000/LRT 2500.

**INSULATION TYPE:** INTERVOL RFN-24.Two components polyurethane rigid foam system. Blowing agent used is HCFC-141b (CFC – free system).Thickness: 45mm.Density: 40kg/m3 (DIN53420).Compressive strength: 20kPa (DIN53421).Thermal conductivity, 24C:0. 023 W/m. K (DIN18164).

**PANEL FOR ELECTRONIC CONTROLLER:** PROTECTION CLASS: IP55 class-standard (Applicable Standard: EN 60529/91, Applicable directives: LVT 73/23/EEC). TYPE: Tank mounted.

**MILK CONTROLLER - THERMOSTAT:** OPERATING TEMPERATURE: 0 – 60 °C. STORAGE TEMPERATURE: -30 - +85 °C. POWER SUPPLY: 110V, 230V – 50/60Hz ± 10%. POWER ABSORPTION: 3VA max. Manufacturer: DIXELL SRL, ITALY. FUNCTION: When the compressor reaches the set point, it stops its function and the auto agitation of milk begins for 15 minutes pause, 3 minutes agitation and so on until the milk temperature is SET+ Hy when the compressor starts again. In case of probe failure, the output is according to parameter “CO<sub>N</sub>” - Compressor ON time with faulty probe (range: 0 - 255min , val. 15min) and “CO<sub>F</sub>” - Compressor OFF time with faulty probe (range: 0 - 255min , val. 30min). Note: All of the milk controller parameters are adjustable.

**DIPSTICK:** High precision stainless steel dipstick (AISI 304) for easy and direct volume reading in mm.

## 8.2. POWER AND COOLING SPECIFICATION

### For R 404A Refrigerant type

| Milk Cooling tank type | Maximum capacity (Liters) | Weight (Kg) | Fan cooled condensing unit type | Voltage (V) Frequency (Hz) | Refrigerant type | Refrigeration capacity | Maximum Power Rate(W) | Run current(A) | Maximum current (A) | Number of milkings |
|------------------------|---------------------------|-------------|---------------------------------|----------------------------|------------------|------------------------|-----------------------|----------------|---------------------|--------------------|
| LRT 50                 | 52                        | 52          | NEK6181GK ASPERA                | 220V–240V 50Hz, 1~         | R 404A           | 835W 1/3HP             | 580                   | 3.52           | 4.65                | 2                  |
| LRT 100                | 125                       | 72          | NEK6210GK ASPERA                | 220V–240V 50Hz, 1~         | R 404A           | 1023W 1/2HP            | 703                   | 4.03           | 4.54                | 2                  |
| LRT 200                | 230                       | 110         | NT6224GK ASPERA                 | 220V–240V 50Hz, 1~         | R 404A           | 2190W 1HP              | 1303                  | 6.27           | 7.30                | 2                  |
| LRT 200                | 230                       | 110         | NEK6210GK ASPERA                | 220V–240V 50Hz, 1~         | R 404A           | 1023W 1/2HP            | 703                   | 4.03           | 4.54                | 4                  |
| LRT 300                | 332                       | 128         | NJ9232GK ASPERA                 | 220V–240V 50Hz, 1~         | R 404A           | 2578W 1_1/4HP          | 1612                  | 7.67           | 9.16                | 2                  |
| LRT 300                | 332                       | 128         | NT6224GK ASPERA                 | 220V–240V 50Hz, 1~         | R 404A           | 2190W 1HP              | 1303                  | 6.27           | 7.30                | 4                  |
| LRT 300                | 332                       | 128         | TAJ9513 L'Unite                 | 380V–400V 50Hz, 3~         | R 404A           | 1437W 1,2HP            | 1450                  | 3.10           | 4.47                | 2                  |
| LRT 400                | 434                       | 170         | NJ9232GK Aspera                 | 220V–240V 50Hz, 1~         | R 404A           | 2578W 1_1/4HP          | 1612                  | 7.67           | 9.16                | 4                  |
| LRT 400                | 434                       | 170         | TAJ4519Z L'Unite                | 380V–400V 50Hz, 3~         | R 404A           | 3998W 1,5HP            | 2124                  | 4.92           | 5.90                | 2                  |
| LRT 400                | 434                       | 170         | NJ9238 ASPERA                   | 220V–240V 50Hz, 1~         | R 404A           | 3811W 1,5HP            | 2149                  | 10.14          | 16.00               | 2                  |
| LRT 500                | 523                       | 176         | NJ9238 ASPERA                   | 220V–240V 50Hz, 1~         | R 404A           | 3811W 1,5HP            | 2149                  | 10.14          | 16.00               | 2                  |
| LRT 500                | 523                       | 176         | TAJ4519Z L'Unite                | 380V–400V 50Hz, 3~         | R 404A           | 3998W 1,5HP            | 2124                  | 4.92           | 5.90                | 2                  |
| LRT 500                | 523                       | 176         | NJ9232GK Aspera                 | 220V–240V 50Hz, 1~         | R 404A           | 2578W 1_1/4HP          | 1612                  | 7.67           | 9.16                | 4                  |
| LRT 500                | 523                       | 176         | TAJ9513 L'Unite                 | 380V–400V 50Hz, 3~         | R 404A           | 2578W 1,2HP            | 1437                  | 3.10           | 4.47                | 4                  |
| LRT 650                | 657                       | 202         | FH 4524Z L'Unite                | 220V–240V 50Hz, 1~         | R 404A           | 4267W 2HP              | 2396                  | 10.74          | 19.20               | 2                  |
| LRT 650                | 657                       | 202         | TFH 4524Z L'Unite               | 380V–400V 50Hz, 3~         | R 404A           | 4288W 2HP              | 2399                  | 5.16           | 8.80                | 2                  |
| LRT 650                | 657                       | 202         | NJ9238 ASPERA                   | 220V–240V 50Hz, 1~         | R 404A           | 3811W 1,5HP            | 2149                  | 10.14          | 16.00               | 4                  |
| LRT 650                | 657                       | 202         | TAJ4519Z L'Unite                | 380V–400V 50Hz, 3~         | R 404A           | 3998W 1,5HP            | 2124                  | 4.92           | 5.90                | 4                  |
| LRT 800                | 850                       | 254         | FH4531Z L'Unite                 | 220V–240V 50Hz, 1~         | R 404A           | 6219W 2,5HP            | 3186                  | 14.05          | 24.15               | 2                  |
| LRT 800                | 850                       | 254         | TFH4531Z L'Unite                | 380V–400V 50Hz, 3~         | R 404A           | 6139W 2,5HP            | 3066                  | 6.48           | 10.75               | 2                  |
| LRT 800                | 850                       | 254         | FH4524Z L'Unite                 | 220V–240V 50Hz, 1~         | R 404A           | 4267W 2HP              | 2396                  | 10.74          | 19.2                | 4                  |
| LRT 800                | 850                       | 254         | TFH4524Z L'Unite                | 380V–400V 50Hz, 3~         | R 404A           | 4288W 2HP              | 2399                  | 5.16           | 8.80                | 4                  |
| LRT 1000               | 1070                      | 285         | FH4540Z L'Unite                 | 220V–240V 50Hz, 1~         | R 404A           | 7822W 3HP              | 3978                  | 18.59          | 28.75               | 2                  |
| LRT 1000               | 1070                      | 285         | MTZ36 Maneurop                  | 380V–400V 50Hz, 3~         | R 404A           | 7497W 3HP              | 3567                  | 7.59           | 10.75               | 2                  |
| LRT 1000               | 1070                      | 285         | FH4531Z L'Unite                 | 220V–240V 50Hz, 1~         | R 404A           | 6219W 2,5HP            | 3186                  | 14.05          | 24.15               | 4                  |

| Milk Cooling tank type | Maximum capacity (Liters) | Weight (Kg) | Fan cooled condensing unit type | Voltage (V)<br>Frequency (Hz) | Refrigerant type | Refrigeration capacity | Maximum Power Rate(W) | Run current(A) | Maximum current (A) | Number of milkings |
|------------------------|---------------------------|-------------|---------------------------------|-------------------------------|------------------|------------------------|-----------------------|----------------|---------------------|--------------------|
| LRT 1000               | 1070                      | 285         | TFH4531Z L'Unite                | 380V-400V<br>50Hz, 3~         | R 404A           | 6139W<br>2,5HP         | 3066                  | 6.48           | 10.75               | 4                  |
| LRT 1250               | 1275                      | 300         | MTZ40 Maneurop                  | 380V-400V<br>50Hz, 3~         | R 404A           | 8246W<br>3,3HP         | 4024                  | 8.64           | 11.75               | 2                  |
| LRT 1250               | 1275                      | 300         | FH4540Z L'Unite                 | 220V-240V<br>50Hz, 1~         | R 404A           | 7822W<br>3HP           | 3978                  | 18.59          | 28.75               | 4                  |
| LRT 1250               | 1275                      | 300         | MTZ36 Maneurop                  | 380V-400V<br>50Hz, 3~         | R 404A           | 7497W<br>3HP           | 3567                  | 7.59           | 10.75               | 4                  |
| LRT 1500               | 1518                      | 320         | MTZ50 Maneurop                  | 380V-400V<br>50Hz, 3~         | R 404A           | 10652W<br>4,2HP        | 4349                  | 8.91           | 13.54               | 2                  |
| LRT 1500               | 1518                      | 320         | FH4540Z L'Unite                 | 220V-240V<br>50Hz, 1~         | R 404A           | 7822W<br>3HP           | 4008                  | 18.72          | 28.88               | 4                  |
| LRT 1500               | 1518                      | 320         | MTZ36 Maneurop                  | 380V-400V<br>50Hz, 3~         | R 404A           | 7497W<br>3HP           | 3597                  | 7.72           | 10.88               | 4                  |
| LRT 2000               | 2030                      | 450         | ZB45 Copeland                   | 380V-400V<br>50Hz, 3~         | R 404A           | 13526W<br>6HP          | 5210                  | 11.51          | 15.14               | 2                  |
| LRT 2000               | 2030                      | 450         | MTZ40 Maneurop                  | 380V-400V<br>50Hz, 3~         | R 404A           | 8246W<br>3,3HP         | 4054                  | 8.77           | 11.88               | 4                  |
| LRT 2500               | 2555                      | 480         | ZB45 Copeland                   | 380V-400V<br>50Hz, 3~         | R 404A           | 13526W<br>6HP          | 5210                  | 11.51          | 15.14               | 4                  |

**For R 290 / R 454C Refrigerant type**

| Milk Cooling tank type | Maximum capacity (Liters) | Weight (kg) | Fan cooled condensing unit type       | Voltage (V)<br>Frequency (Hz) | Refrigerant type | Refrigeration capacity | Maximum Power Rate(W) | Run current(A) | Maximum current(A) | Number of milkings |
|------------------------|---------------------------|-------------|---------------------------------------|-------------------------------|------------------|------------------------|-----------------------|----------------|--------------------|--------------------|
| LRT 50                 | 52                        | 52          | EMX6210U<br>EMBRACO                   | 220V-240V<br>50Hz, 1~         | R 290            | 1000 W<br>1/3 HP       | 500                   | 2.72           | 3                  | 2                  |
| LRT 100                | 125                       | 72          | EMX6210U<br>EMBRACO                   | 220V-240V<br>50Hz, 1~         | R 290            | 1000 W<br>1/3 HP       | 500                   | 2.72           | 3                  | 2                  |
| LRT 200                | 230                       | 110         | NEX6225UA<br>EMBRACO                  | 220V-240V<br>50Hz, 1~         | R 290            | 2321 W<br>1 HP         | 1100                  | 5.98           | 5                  | 2                  |
| LRT 300                | 332                       | 128         | NEX6225UA<br>EMBRACO                  | 220V-240V<br>50Hz, 1~         | R 290            | 2321 W<br>1 HP         | 1100                  | 5.98           | 5                  | 2                  |
| LRT 400                | 434                       | 170         | AJ4519P-FZ3A<br>(AJ4519P)<br>TECUMSEH | 220V-240V<br>50Hz, 1~         | R 454C           | 3477 W<br>11/2 HP      | 1500                  | 8.15           | 9                  | 2                  |
| LRT 500                | 523                       | 176         | AJ4519P-FZ3A<br>(AJ4519P)<br>TECUMSEH | 220V-240V<br>50Hz, 1~         | R 454C           | 3477 W<br>11/2 HP      | 1500                  | 8.15           | 9                  | 2                  |
| LRT 650                | 723                       | 202         | FH4522P-<br>XC3A<br>TECUMSEH          | 220V-240V<br>50Hz, 1~         | R 454C           | 4389 W<br>2 HP         | 1500                  | 8.15           | 9                  | 2                  |
| LRT 800                | 850                       | 254         | FH4532P-<br>XC3A<br>TECUMSEH          | 220V-240V<br>50Hz, 1~         | R 454C           | 5650 W<br>2 1/2 HP     | 2000                  | 10.87          | 10                 | 2                  |
| LRT 1000               | 1070                      | 285         | FH4538P-<br>XC3A<br>TECUMSEH          | 220V-240V<br>50Hz, 1~         | R 454C           | 6962 W<br>3 HP         | 2500                  | 13.59          | 12                 | 2                  |

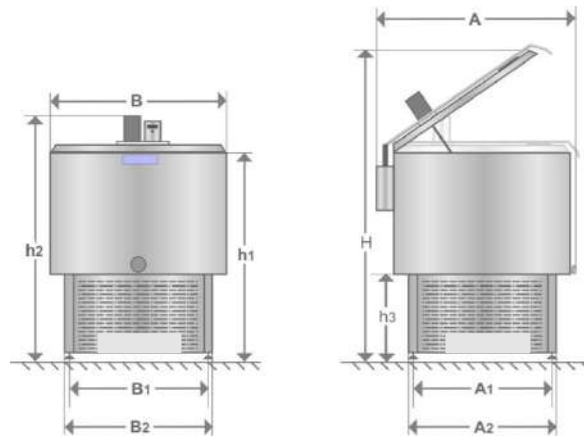
|          |      |     |                         |                        |        |                    |      |      |     |   |
|----------|------|-----|-------------------------|------------------------|--------|--------------------|------|------|-----|---|
| LRT 1000 | 1070 | 285 | MTZ36JG4BVE<br>MANEUROP | 380V–400V<br>50Hz, 3~  | R 454C | 6694 W<br>2 2/3 HP | 2600 | 4.94 | 6.5 | 2 |
| LRT 1250 | 1275 | 300 | MTZ40JH4AVE<br>MANEUROP | 380V–400V<br>50Hz, 3~  | R 454C | 7883 W<br>3 1/3 HP | 3200 | 6.08 | 7.5 | 2 |
| LRT 1500 | 1518 | 320 | MTZ50HK4EVE<br>MANEUROP | 380V–400V<br>50Hz, 3~  | R 454C | 9200 W<br>4 1/8 HP | 3200 | 6.08 | 7.5 | 2 |
| LRT 2000 | 2030 | 450 | MTZ72<br>MANEUROP       | 380 –400V<br>50 Hz, 3~ | R 454C | 13350 W<br>6.1 HP  | 5000 | 9.50 | 12  | 2 |

### 8.3. CONDITIONS OF MEASUREMENT FOR THE PERFORMANCE OF THE REFRIGERATING UNIT

- Ambient temperature: +32 °C
- The superheat value is set at 9-11 K
- Condensing temperature is +45 °C
- Evaporating temperature: 0 °C
- Temperature of refrigerant at condenser outlet is sub cooled within the condensing limits of the unit 0-2 K
- The technical characteristics of the refrigerating units are mentioned in the manufacturers' catalogues

## 8.4. MAIN DIMENSIONS

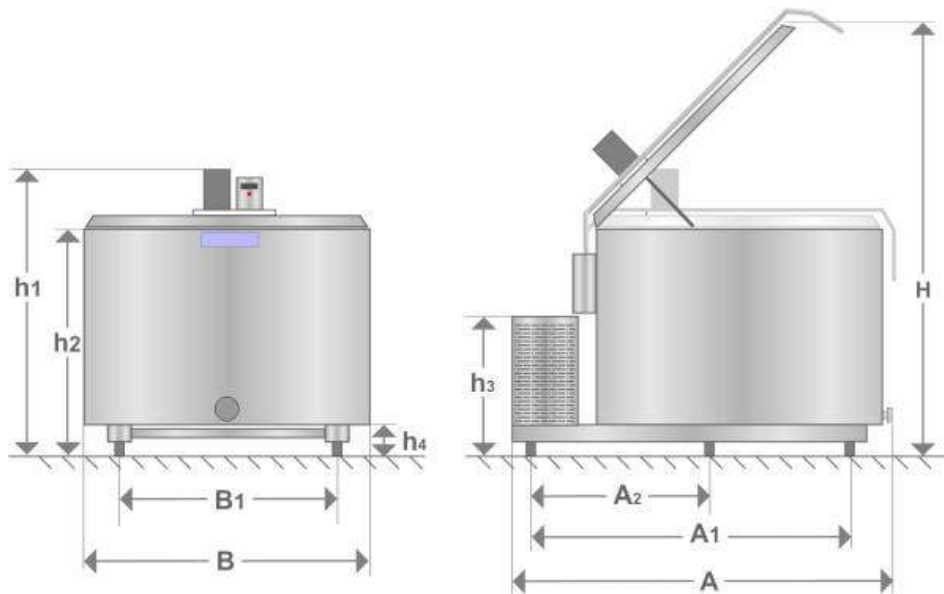
### TYPE LRT 50 - LRT 300



### DIMENSIONS/mm

| Milk Cooling tank type | A    | A1  | A2  | B   | B1  | B2  | H    | h1   | h2   | h3  |
|------------------------|------|-----|-----|-----|-----|-----|------|------|------|-----|
| LRT 50                 | 560  | 280 | 365 | 520 | 280 | 365 | 1350 | 820  | 1050 | 440 |
| LRT 100                | 780  | 330 | 400 | 680 | 410 | 500 | 1660 | 980  | 1190 | 420 |
| LRT 200                | 1030 | 530 | 610 | 890 | 530 | 610 | 1520 | 990  | 1220 | 420 |
| LRT 300                | 1130 | 530 | 620 | 990 | 530 | 610 | 1700 | 1030 | 1250 | 420 |

### TYPE LRT 400 - LRT 2500



## DIMENSIONS/mm

| Model            | A    | A1   | A2  | B    | B1   | H    | h1   | h2   | h3   | h4  | H with handle |
|------------------|------|------|-----|------|------|------|------|------|------|-----|---------------|
| LRT 400 compact  | 1670 | 950  | -   | 1090 | 670  | 1445 | 1050 | 830  | 685  | 180 | 1555          |
| LRT 400          | 1830 | 1250 | -   | 1090 | 670  | 1555 | 1050 | 830  | 685  | 180 | 1555          |
| LRT 500 compact  | 1620 | 950  | -   | 1090 | 670  | 1620 | 1190 | 965  | 685  | 180 | 1705          |
| LRT 500          | 1830 | 1380 | -   | 1090 | 670  | 1705 | 1190 | 965  | 685  | 180 | 1705          |
| LRT 650 compact  | 1600 | 950  | -   | 1090 | 670  | 1765 | 1345 | 1120 | 685  | 180 | 1830          |
| LRT 650          | 1830 | 1380 | -   | 1090 | 670  | 1840 | 1345 | 1120 | 685  | 180 | 1830          |
| LRT 800 compact  | 1770 | 1310 | -   | 1290 | 925  | 1910 | 1265 | 1040 | 685  | 192 | 1985          |
| LRT 800          | 2140 | 1630 | -   | 1290 | 925  | 1740 | 1265 | 1040 | 685  | 192 | 1985          |
| LRT 1000 compact | 2050 | 1320 | 450 | 1495 | 910  | 1925 | 1250 | 1010 | 840  | 192 | 1975          |
| LRT 1000         | 2350 | 1320 | 450 | 1495 | 910  | 1975 | 1250 | 1010 | 840  | 192 | 1975          |
| LRT 1250         | 2320 | 1320 | 450 | 1495 | 940  | 2090 | 1495 | 1150 | 840  | 192 | 2050          |
| LRT 1500         | 2320 | 1560 | 590 | 1495 | 1140 | 2200 | 1645 | 1300 | 818  | 192 | 2250          |
| LRT 2000 compact | 2320 | 1490 | 680 | 1840 | 1130 | 2200 | 1510 | 1200 | 880  | 192 | 2260          |
| LRT 2000         | 2700 | 2290 | 450 | 1840 | 1130 | 2200 | 1510 | 1200 | 880  | 192 | 2260          |
| LRT 2500 compact | 2320 | 1490 | 680 | 1840 | 1130 | 2390 | 1700 | 1390 | 1070 | 192 | 2450          |

## 9. USING THE TANK

### 9.1. COOLING CONTROLLER

LRT open type tanks are equipped with Dixell XR80CX controller specialized in controlling milk cooling and preservation processes.



Main characteristics:

- User friendly interface
- Accurate control
- Manual start of agitation
- All the parameters are fully configurable
- Current temperature always displayed on the screen
- Indication led for cooling and agitation operation

#### DIXELL XR80CX 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.

## 9.2. ADJUSTING THE BASIC PARAMETER VALUES OF THE XR80CX

1. 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.
2. First press and hold the SET key-button together with the (▼) key for at least 7 seconds
3. Led **Hy** is displayed.
4. Repeat step 2 pressing both keys for 7 sec. Led **Pr2** will be displayed. Release the keys and **Hy** is displayed.
5. Press the SET key until the **Hy** temperature (2.0°C) is displayed.
6. By pressing the **SET** key again the **LS** is displayed.
7. Press the **SET** key, and then by pressing the (▲▼) keys you can set the minimum temperature. **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 5.0oC.**
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 the 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 15seconds.

### How to start a manual agitation cycle

Push the  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 5seconds 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 5seconds the normal display will be restored.

#### How to change a parameter value

1. Enter the programming mode by pressing the SET and ▼ key for 7s ( 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.
6. To exit press the SET + ▲ or wait 15s without pressing a key.

#### How to enter the hidden menu

1. Enter the Programming mode by pressing the SET+DOWN buttons for 3 sec (the °C or °F LED will start blinking).
2. Released the buttons and then push again the SET+DOWN buttons for more than 7 sec. The Pr2 label will be displayed immediately followed from the HY parameter.
3. Now it is possible to browse the hidden menu.
4. Select the required parameter.
5. Press the SET button to display its value.
6. Use UP or DOWN to change its value.
7. Press SET to store the new value and move to the following parameter.
8. To exit: Press SET+DOWN or wait 15 sec without pressing a key.

**NOTE1:** if no parameter is present in Pr1 menu, after 3 sec the “noP” message will be displayed. Keep the buttons pushed till the Pr2 message will be displayed.

**NOTE2:** the set value is stored even when the procedure is exited by waiting for the time-out to expire

#### How to lock the keyboard

1. Press and hold for more than 3seconds 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.
3. If a key is pressed more than 3seconds the POF message will be displayed.

#### To unlock the keyboard

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

#### Meaning of Led

| LED                                                                                 | MODE     | FUNCTION                                           |
|-------------------------------------------------------------------------------------|----------|----------------------------------------------------|
|  | ON       | Compressor enabled                                 |
|                                                                                     | Flashing | Anti-short cycle delay enabled                     |
|  | ON       | Fans enabled                                       |
|                                                                                     | Flashing | Fans delay after defrost in progress               |
|  | ON       | An alarm is occurring                              |
|  | ON       | Continuous cycle is running                        |
|  | ON       | Energy saving enabled                              |
|  | ON       | Light on                                           |
|  | ON       | Agitator enabled                                   |
|                                                                                     | Flashing | Delay at power-on active (odS different from zero) |
| °C/°F                                                                               | ON       | Measurement unit                                   |
|                                                                                     | Flashing | Programming phase                                  |

#### 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. In such case 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 thought 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 SETTING VALUES

| Ένδειξη<br>Label | Περιγραφή (λειτουργίας)<br>Description | Όρια Διακύμανσης<br>Range                                  | Τιμή<br>Value | Μενού<br>Menu |
|------------------|----------------------------------------|------------------------------------------------------------|---------------|---------------|
| Set              | Temperature Set Point                  | LS to US                                                   | 4.0           | -             |
| Hy               | Differential                           | [0.1 °C to 25.5 °C] [1 °F to 45 °F]                        | 2.0           | Pr1           |
| LS               | Minimum set point                      | [-55.0°C to SET]<br>[-67°F to SET]                         | 1.0           | Pr2           |
| US               | Maximum set point                      | [SET to 150.0°C]<br>[SET to 302°F]                         | 15.0          | Pr2           |
| SrS              | Second set point                       | [SET to US]<br>[SET to US]                                 | 15.0          | N.V.          |
| Srt              | Compressor off time with SrS set point | 0 to 255 min                                               | 0             | N.V.          |
| ot               | Thermostat probe calibration           | [-12.0°C to 12.0°C]<br>[-21°F to 21°F]                     | -0.5          | Pr1           |
| odS              | Outputs delay at start up              | 0 to 255 min                                               | 0             | Pr2           |
| AC               | Anti-short cycle delay                 | 0 to 50 min                                                | 1             | Pr1           |
| Con              | Compressor ON time with faulty probe   | 0 to 255 min                                               | 15            | Pr2           |
| CoF              | Compressor OFF time with faulty probe  | 0 to 255 min                                               | 30            | Pr2           |
| CF               | Temperature measurement unit           | °C(0); °F(1)                                               | °C            | Pr2           |
| rES              | Resolution                             | dE(0); in(1)                                               | dE            | Pr1           |
| AGC              | Agitator configuration                 | EL(0); in(1)                                               | EL            | Pr2           |
| tiC              | Agt parameter resolution (min/ sec)    | Min(0); SEC(1)                                             | Min           | Pr2           |
| iAG              | Interval between 2 agitator cycles     | 0 to 120 min                                               | 15            | Pr1           |
| Agt              | Agitator cycle duration                | 0 to 255 min/sec                                           | 3             | Pr1           |
| Apo              | Agitator cycle enabled at power on     | n(0); Y(1)                                                 | n             | Pr2           |
| ALC              | Temperature alarms configuration       | rE(0); Ab(1)                                               | Ab            | Pr2           |
| ALU              | Maximum temperature alarm              | °C[0.0 to 50.0 o ALL to 150.0]<br>°F[0 to 90 o ALL to 302] | 100           | Pr1           |
| ALL              | Minimum temperature alarm              | °C[0.0 to 50.0 o -55.0 to ALU] °F[0 to 90 o -67.0 to ALU]  | -50.0         | Pr1           |
| Ald              | Temperature alarm delay                | 0 to 255 min                                               | 15            | Pr1           |
| dAo              | Delay of temperature alarm at start up | 0.0 to 24h00min (144)                                      | 1.3           | Pr2           |
| Adr              | Serial address                         | 1 to 247                                                   | 1             | Pr2           |
| PbC              | Kind of probe                          | PtC(0); ntC(1)                                             | ntC           | Pr2           |
| onF              | On/off key configuration               | nu(0); OFF(1); ES(2)                                       | nu            | Pr2           |
| rEL              | Firmware Release                       | sola lettura                                               | 6.5           | Pr2           |
| Ptb              | Map code                               | sola lettura                                               | 1             | Pr2           |

## 10. MILK COOLING TANK MAINTENANCE - CLEANING

**The milk cooling tank has special maintenance and cleaning requirements.** The machine is used for the refrigerating and the conservation of the milk, so it requires **daily** and efficient cleaning. The cleaning of the inside of the tank, which is in contact with the milk, as well as the external surface of the milk cooling tank, should be performed with hot water and a suitable brush.



Before every cleaning or maintenance job, ensure that the milk cooling tank has been properly disconnected from electricity.

Cleaning and the maintenance are performed after the machine has been unplugged from electricity.

Clean daily the external and internal surfaces of the tank.

### 10.1. CLEANING THE TANK

After you have emptied the tank of milk, rinse it with cold water in order to clean the remains of milk. Then, clean the tank carefully with hot water at about 45 °C and only use detergents used for foods.

Rinse the interior of the tank out with plenty of cold water and scrub it with a brush suitable for commissary until it is thoroughly cleaned.



After cleaning the tank, you have to dry it thoroughly by using an absorbent paper towel or special cloth that does not leave thrum, which can cause infection or electric shock.

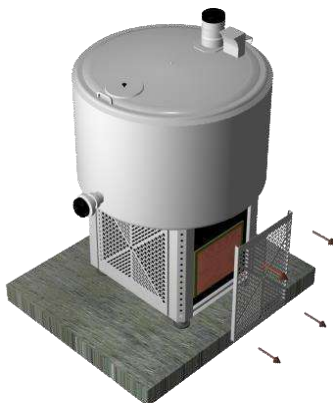
Cleaning the control panel has been performed by using a **lightly** wet piece of cloth and **after you have disconnected the machine from electricity.**

### 10.2. CLEANING THE CONDENSER OF REFRIGERATING UNIT

It is an absolute necessity to clean the condenser of the refrigerating unit after scheduled periods of time, in order to have long-lasting and faultless operation of the milk cooling tank. The cleaning of the condenser can be performed after you remove the lateral cover at the side of the condenser, by unscrewing the screws that keep the cover in place. If the above procedure is possible, you can clean the condenser by using air under pressure. You can also clean the condenser by carefully using a brush in order to remove all the dust and the other garbage from its surface.



**DO NOT USE WATER TO CLEAN THE CONDENSER.**



## 11. SAFETY MEASURES

The milk cooling tank is fitted with safeguards at all its moving parts. The access to the interior of the electric panel requires the use of a screwdriver and is in accordance with the requirements for the safeguards of the directive 98/37/EK

The electric parts of the installation are adequately covered in order to be safe in use (ex: wires).

The surface of the milk cooling tank is smooth, continuous and such formed as to disable the milk access in small cracks, bacteria which can cause infection in the milk. Furthermore, the surfaces are cleanable and where needed easy to disinfect.

The inaccessible places are constructed in such a way so as to be easily cleanable.

The bearings are fitted at the out-of-food area. Their lubrication is performed by the use of special lubricant suitable for food.



Before maintenance or cleaning, make sure that the milk cooling tank has been disconnected from electricity.

**Always remember:** The right cleaning and maintenance of the machine makes your job more productive and safe.



Do not remove the signs from the machine.



After your work is finished, cover the machine with a dustsheet in order to prevent the dust to collect on the tank or fall into the tank when opened. Place all the protective covers in place.

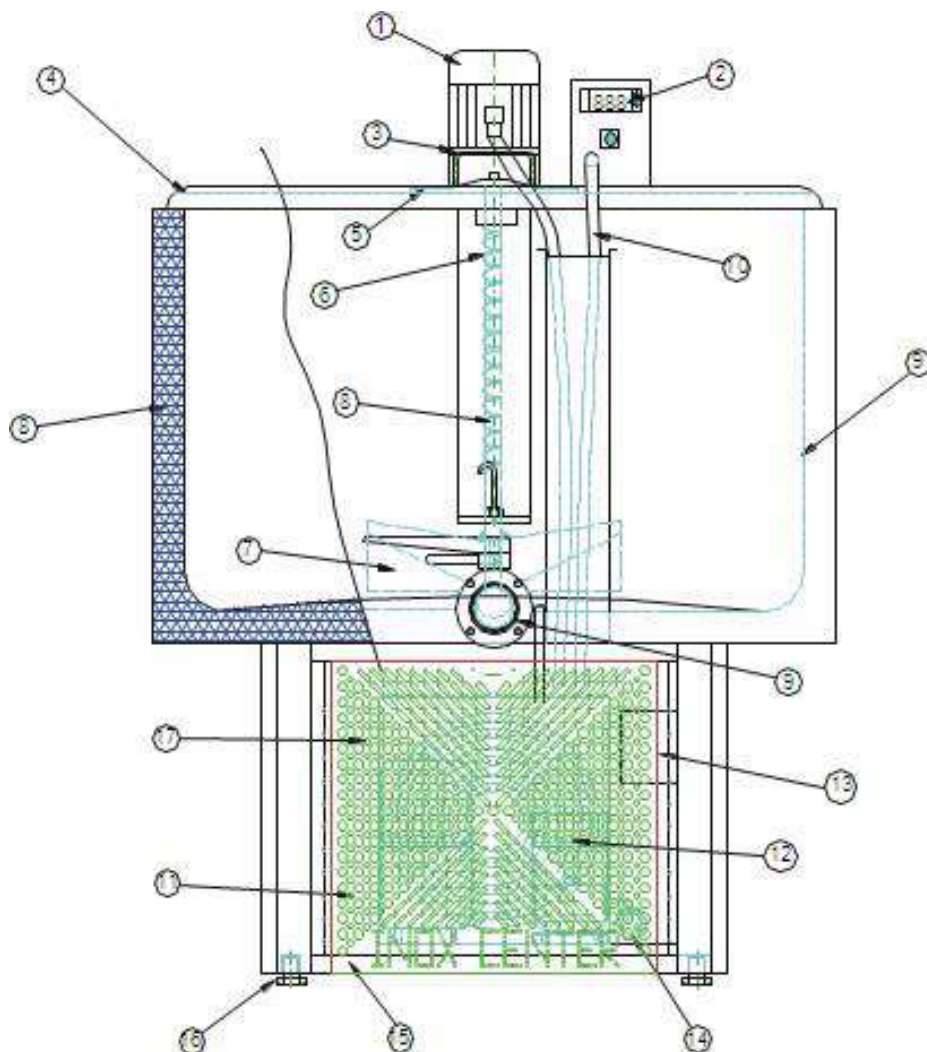
## 12. MALFUNCTION AND TROUBLESHOOTING

| MALFUNCTION                                                                                        | POSSIBLE CAUSE                                                                            | TROUBLESHOOTING                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The device does not operate at all.<br>There is no voltage at the control panel.                   | No voltage.                                                                               | Check if the operation button is at ON position (lit lead).<br>Check if there is voltage at the electric line that feeds the milk cooling tank.<br>Check the fuse of the electric line that feeds the milk cooling tank.<br>Check the electric connections at the electric panel and the socket of the tank.<br>Check the connection terminal blocks.<br>If the problem is not solved, contact authorized services. |
| The stirrer and the condenser ventilator work but the refrigerating compressor does not work.      | The thermal fuse stopped operation probably due to loss of voltage or compressor failure. | Wait for 2 minutes until the thermal fuse permits operation again.<br>If the problem occurs again, check the circuit voltage and the voltage loss at the unit.<br>If there is sufficient voltage and the problem is not solved, contact authorized services.                                                                                                                                                        |
| In case any thermal protection fails, you should open the control panel and fix it (MV400 – 2500). |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                     |

**For any other problem, contact the service department of the company.**

## 13. MECHANICAL DRAWINGS (MACHINE PARTS)

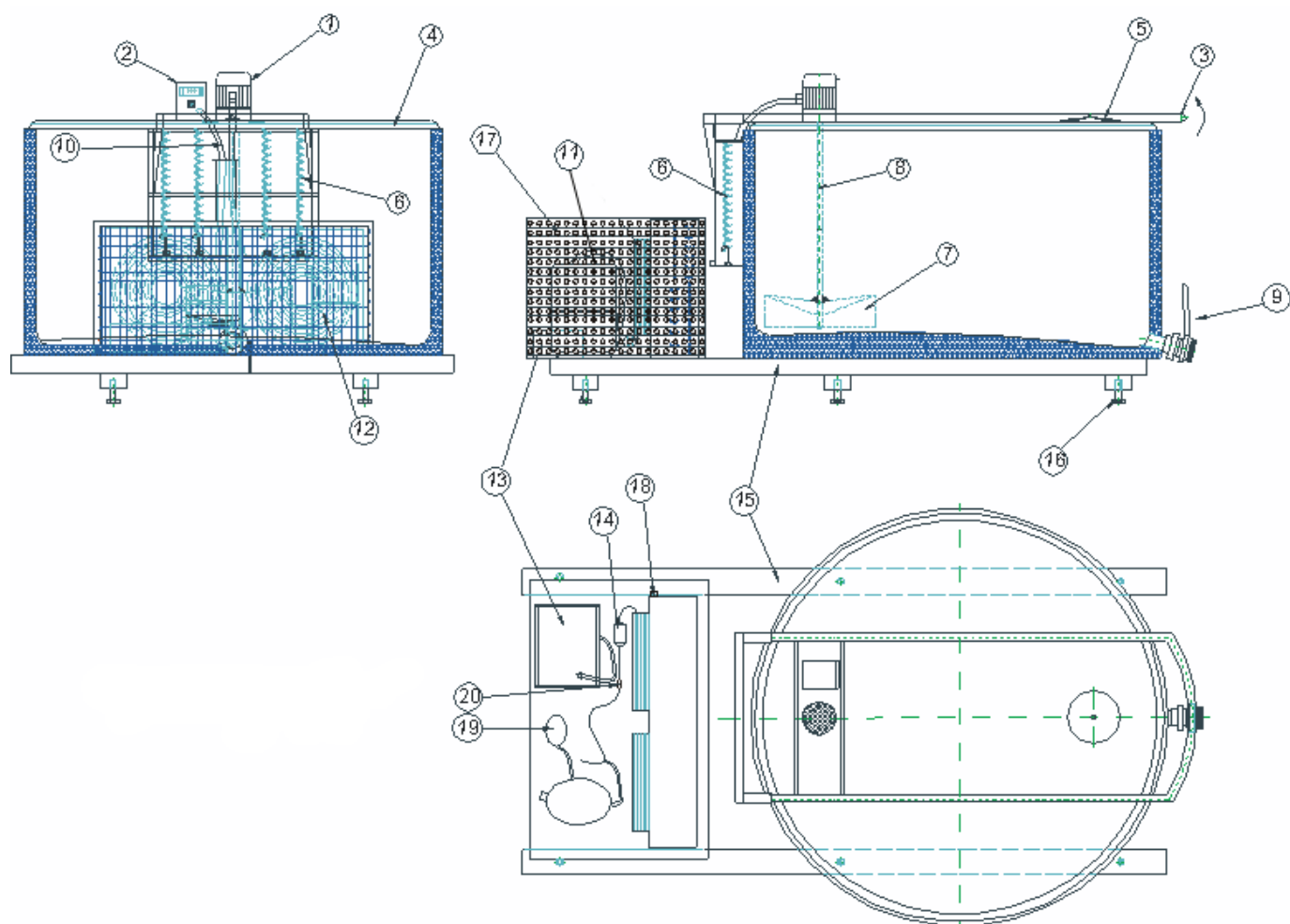
TYPE LRT 50 - LRT 300



| A/A | MACHINE PARTS                                                 | PCS  | A/A | MACHINE PARTS                                       | PCS |
|-----|---------------------------------------------------------------|------|-----|-----------------------------------------------------|-----|
| 1.  | Agitation motor                                               | 1    | 10. | Insulated electricity cable                         | 2   |
| 2.  | Control panel – Electronic thermometer                        | 1    | 11. | Compressor                                          | 1   |
| 3.  | Tank handle                                                   | 1    | 12. | Ventilator                                          | 1   |
| 4.  | Tank lid                                                      | 1    | 13. | Electrical box IP 55                                | 1   |
| 5.  | Milk inlet                                                    | 1    | 14. | Refrigerant filter                                  | 1   |
| 6.  | Supporting system mechanism of milk cooling tank lid (spring) | 0-1* | 15. | Milk cooling tank base                              | 1   |
| 7.  | Agitation paddle                                              | 1    | 16. | Adjustable legs                                     | 4   |
| 8.  | Agitation shaft                                               | 1    | 17. | Perforated stainless steel refrigerating unit cover | 4   |
| 9.  | Outlet valve                                                  | 1    |     |                                                     |     |

\*Depending on the model

# TYPE LRT 400 – LRT 2500



| A/A | MACHINE PARTS                                                 | PCS  | A/A | MACHINE PARTS                                                 | PCS  |
|-----|---------------------------------------------------------------|------|-----|---------------------------------------------------------------|------|
| 1.  | Agitation motor                                               | 1    | 11. | Compressor                                                    | 1    |
| 2.  | Control panel – Electronic thermometer                        | 1    | 12. | Ventilator                                                    | 1-2* |
| 3.  | Tank handle                                                   | 1    | 13. | Electrical box IP 55                                          | 1    |
| 4.  | Tank lid                                                      | 1    | 14. | Refrigerant filter                                            | 1    |
| 5.  | Milk inlet lid                                                | 1    | 15. | Milk cooling tank base                                        | 1    |
| 6.  | Supporting system mechanism of milk cooling tank lid (spring) | 1-4* | 16. | Adjustable legs                                               | 4-6* |
| 7.  | Agitation paddle                                              | 1    | 17. | Perforated stainless steel refrigerating unit cover           | 1    |
| 8.  | Agitation shaft                                               | 1    | 18. | High pressure protection switch and 2nd fan regulation switch | 2    |
| 9.  | Outlet valve                                                  | 1    | 19. | Low pressure switch                                           | 1    |
| 10. | Insulated electricity cable                                   | 1    | 20. | Solenoid valve                                                | 1    |

\*Depending on the model

## 14. ELECTRICAL DATA AND DRAWINGS

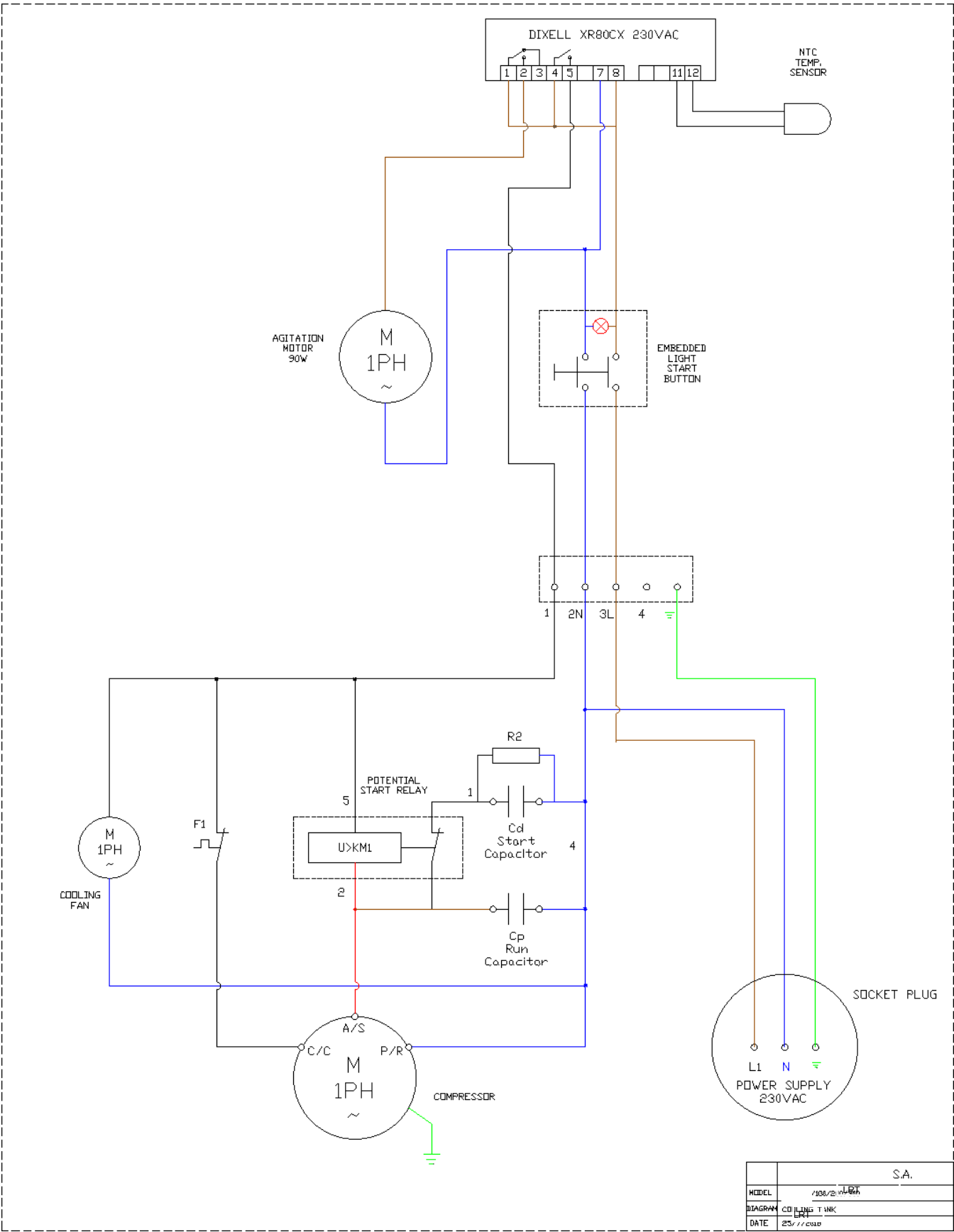
### 14.1. ELECTRIC CABLE SELECTION TABLE

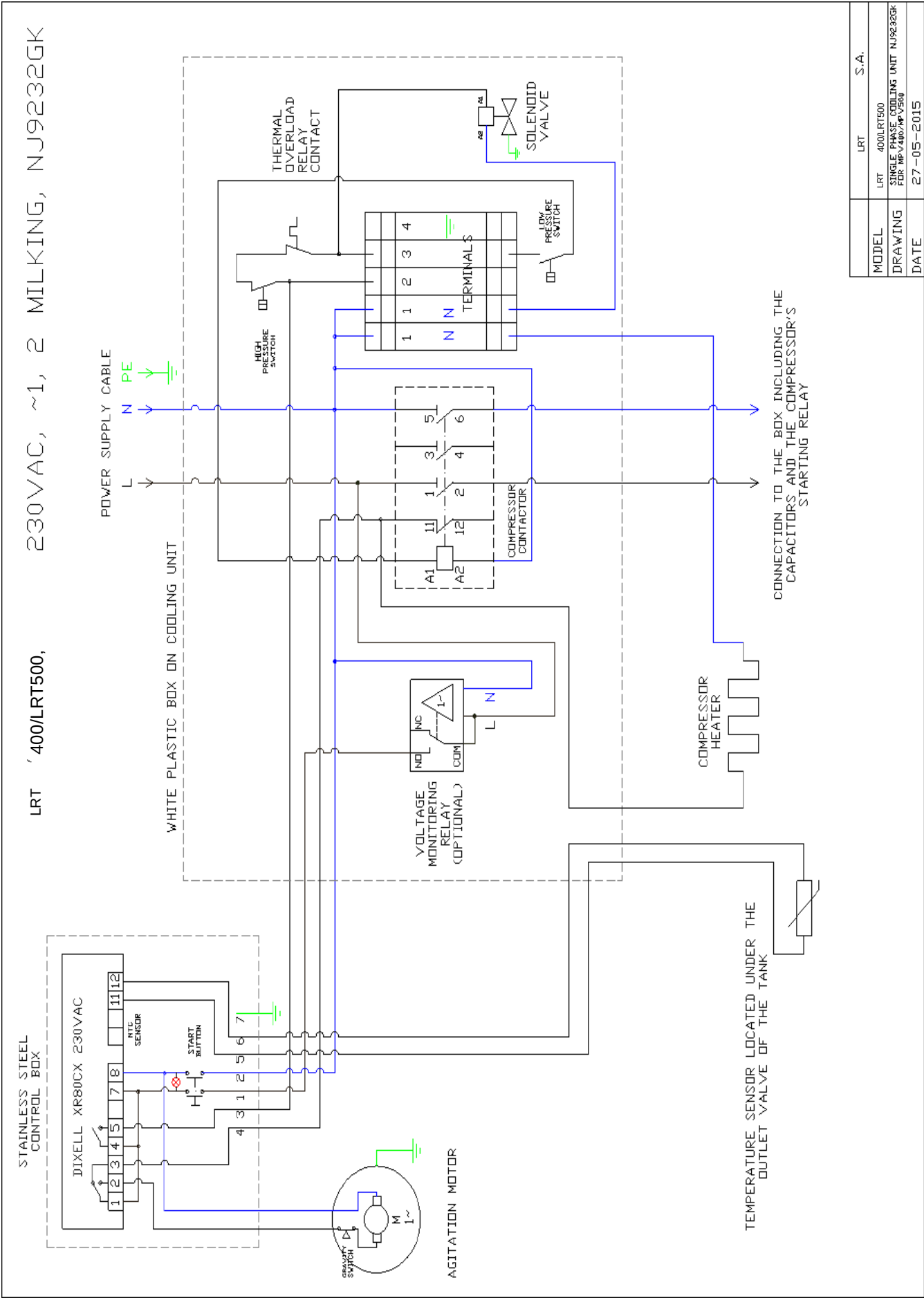
| Type    | Power | Fuse<br>K type | Electri-<br>cal line<br>length | Cross sec-<br>tional area |
|---------|-------|----------------|--------------------------------|---------------------------|
|         | W     | A              | m                              | mm <sup>2</sup>           |
| LRT 50  | 650   | 10             | 25                             | 1,5                       |
|         |       |                | 50                             | 1,5                       |
|         |       |                | 75                             | 1,5                       |
|         |       |                | 100                            | 1,5                       |
|         |       |                | 125                            | 2,5                       |
|         |       |                | 150                            | 2,5                       |
| LRT 100 | 800W  | 10             | 25                             | 1,5                       |
|         |       |                | 50                             | 1,5                       |
|         |       |                | 75                             | 1,5                       |
|         |       |                | 100                            | 1,5                       |
|         |       |                | 125                            | 2,5                       |
|         |       |                | 150                            | 2,5                       |
| LRT 200 | 1300W | 10             | 25                             | 1,5                       |
|         |       |                | 50                             | 1,5                       |
|         |       |                | 75                             | 1,5                       |
|         |       |                | 100                            | 2,5                       |
|         |       |                | 125                            | 2,5                       |
|         |       |                | 150                            | 4                         |
| LRT 300 | 1700W | 10             | 25                             | 1,5                       |
|         |       |                | 50                             | 1,5                       |
|         |       |                | 75                             | 2,5                       |
|         |       |                | 100                            | 4                         |
|         |       |                | 125                            | 4                         |
|         |       |                | 150                            | 6                         |
| LRT 400 | 2500W | 16             | 25                             | 2,5                       |
|         |       |                | 50                             | 2,5                       |
|         |       |                | 75                             | 2,5                       |
|         |       |                | 100                            | 4                         |
|         |       |                | 125                            | 4                         |
|         |       |                | 150                            | 4                         |
| LRT 500 | 2500W | 16             | 25                             | 2,5                       |
|         |       |                | 50                             | 2,5                       |
|         |       |                | 75                             | 2,5                       |
|         |       |                | 100                            | 4                         |
|         |       |                | 125                            | 4                         |
|         |       |                | 150                            | 4                         |

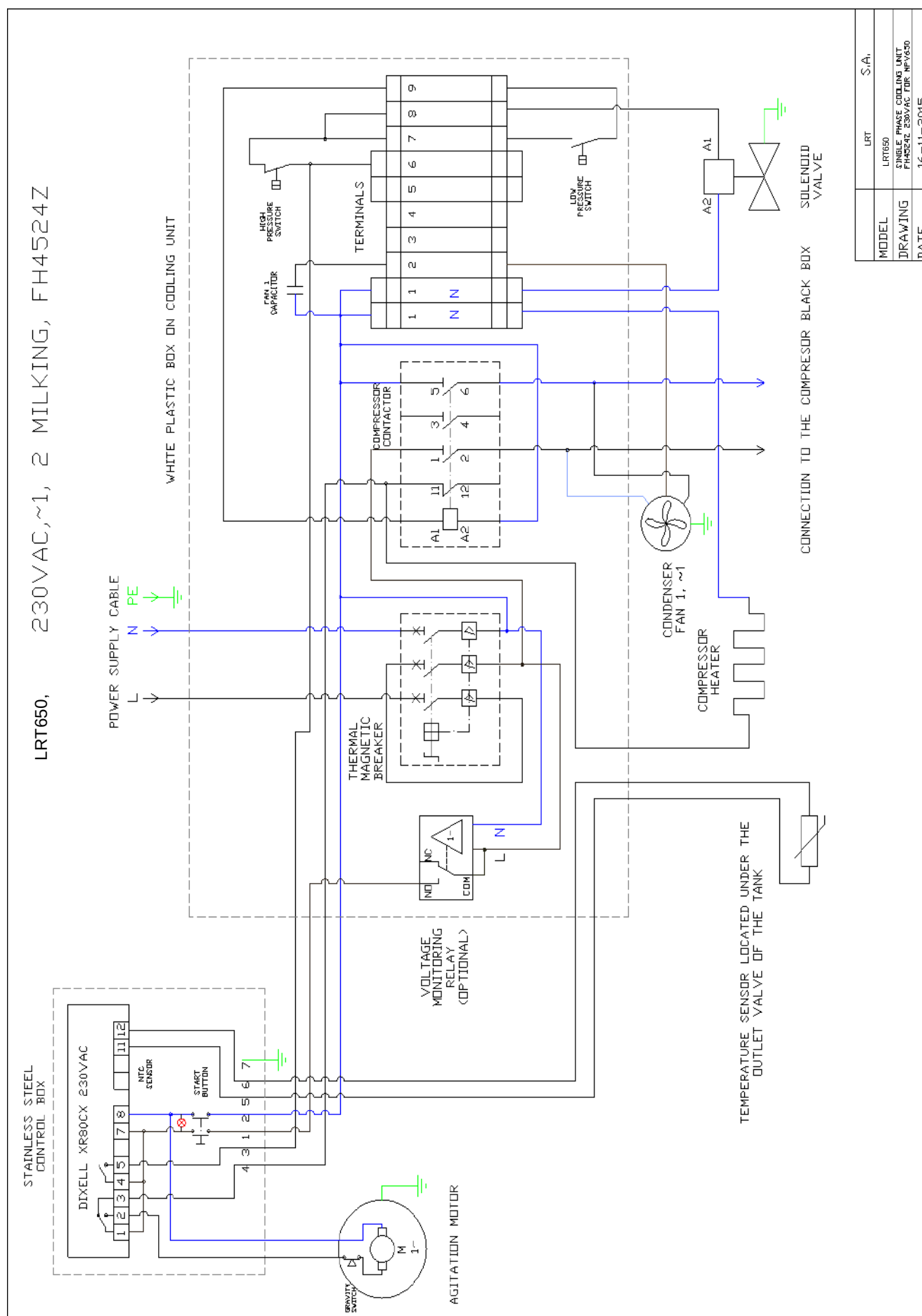
| Type              | Power | Fuse | Electri-<br>cal line<br>length | Cross<br>sectional<br>area |
|-------------------|-------|------|--------------------------------|----------------------------|
|                   | W     | A    | m                              | mm <sup>2</sup>            |
| LRT 650           | 2800W | 16   | 25                             | 2,5                        |
|                   |       |      | 50                             | 2,5                        |
|                   |       |      | 75                             | 2,5                        |
|                   |       |      | 100                            | 4                          |
|                   |       |      | 125                            | 4                          |
|                   |       |      | 150                            | 6                          |
| LRT 800           | 3600W | 20   | 25                             | 2,5                        |
|                   |       |      | 50                             | 2,5                        |
|                   |       | 25   | 75                             | 4                          |
|                   |       |      | 100                            | 4                          |
|                   |       |      | 125                            | 6                          |
|                   |       |      | 150                            | 6                          |
| LRT 1000          | 4700W | 25   | 25                             | 2,5                        |
|                   |       |      | 50                             | 4                          |
|                   |       | 30   | 75                             | 4                          |
|                   |       |      | 100                            | 6                          |
|                   |       |      | 125                            | 6                          |
|                   |       |      | 150                            | 10                         |
| LRT 1250          | 4850W | 3x16 | 25                             | 5x2,5                      |
|                   |       |      | 50                             | 5x4                        |
|                   |       | 3x20 | 75                             | 5x4                        |
|                   |       |      | 100                            | 5x4                        |
|                   |       |      | 125                            | 5x6                        |
|                   |       |      | 150                            | 5x6                        |
| LRT 1500          | 5500W | 3x16 | 25                             | 5x2,5                      |
|                   |       |      | 50                             | 5x4                        |
|                   |       | 3x20 | 75                             | 5x4                        |
|                   |       |      | 100                            | 5x4                        |
|                   |       |      | 125                            | 5x6                        |
|                   |       |      | 150                            | 5x6                        |
| LRT 2000-<br>2500 | 7900W | 3x20 | 25                             | 5x2,5                      |
|                   |       |      | 50                             | 5x4                        |
|                   |       | 3x25 | 75                             | 5x4                        |
|                   |       |      | 100                            | 5x4                        |
|                   |       |      | 125                            | 5x6                        |
|                   |       |      | 150                            | 5x6                        |

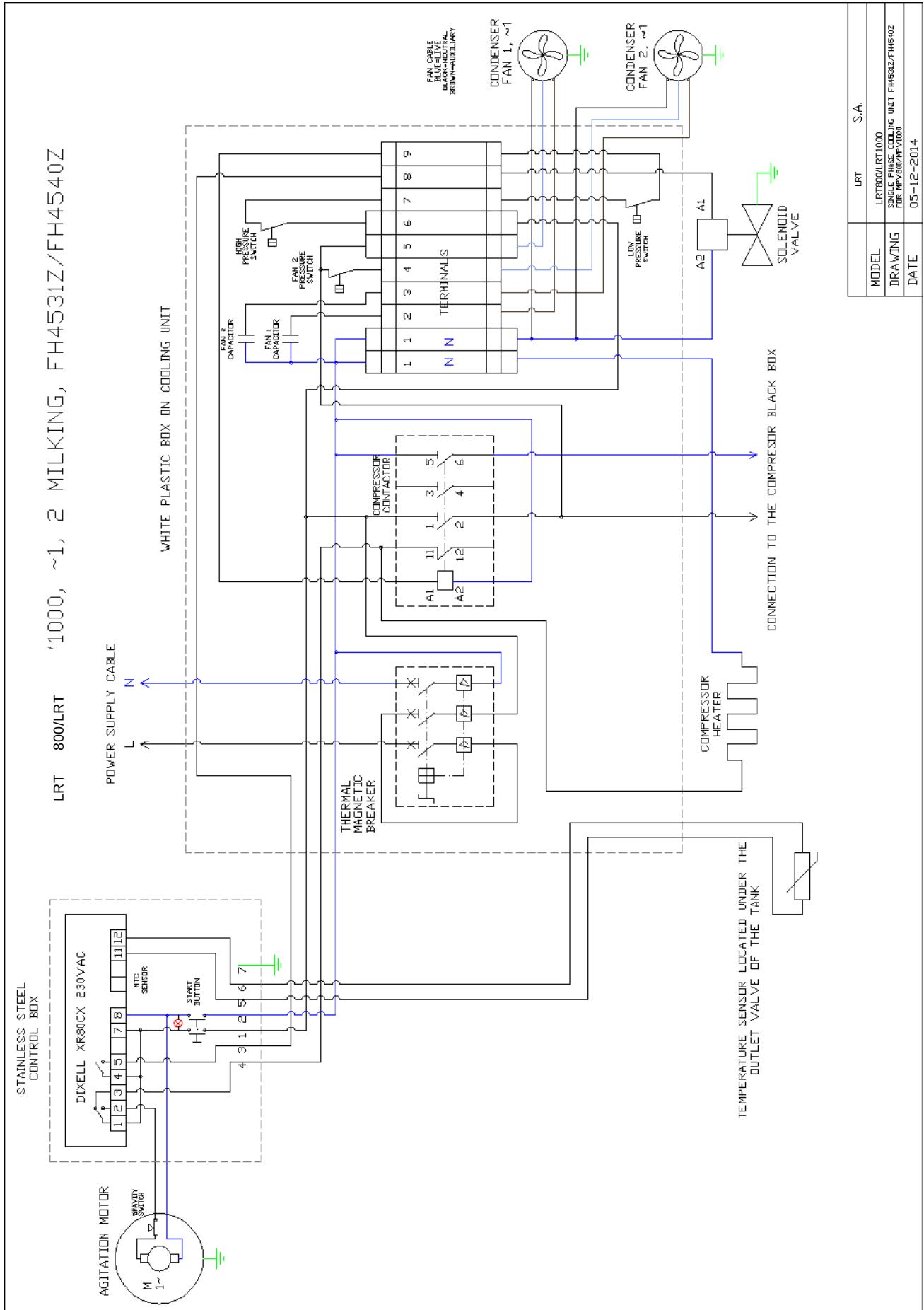
14.2. ELECTRICAL DRAWINGS

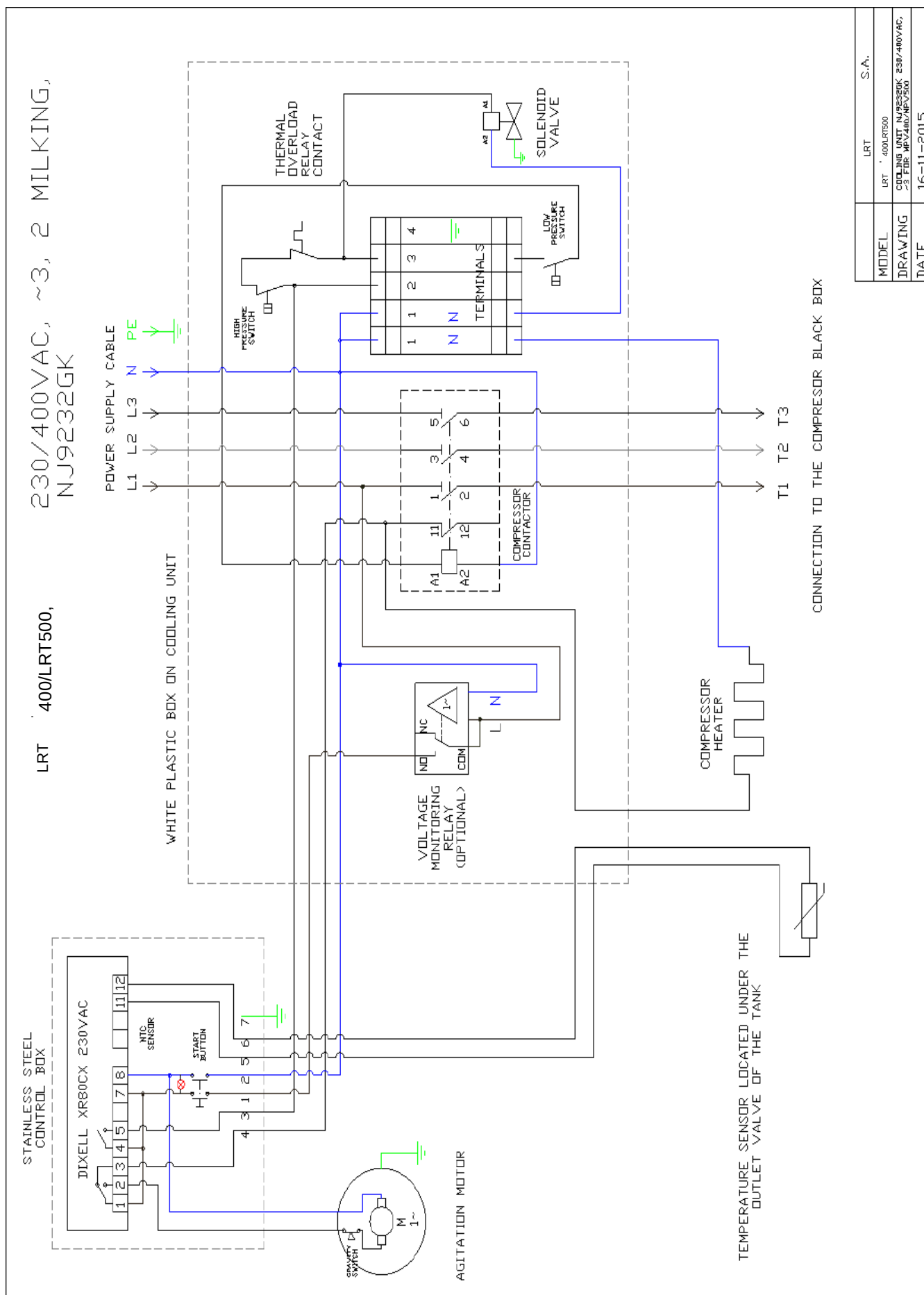
LRT 50/LRT 100/LRT 200/LRT 300 230VAC, ~1

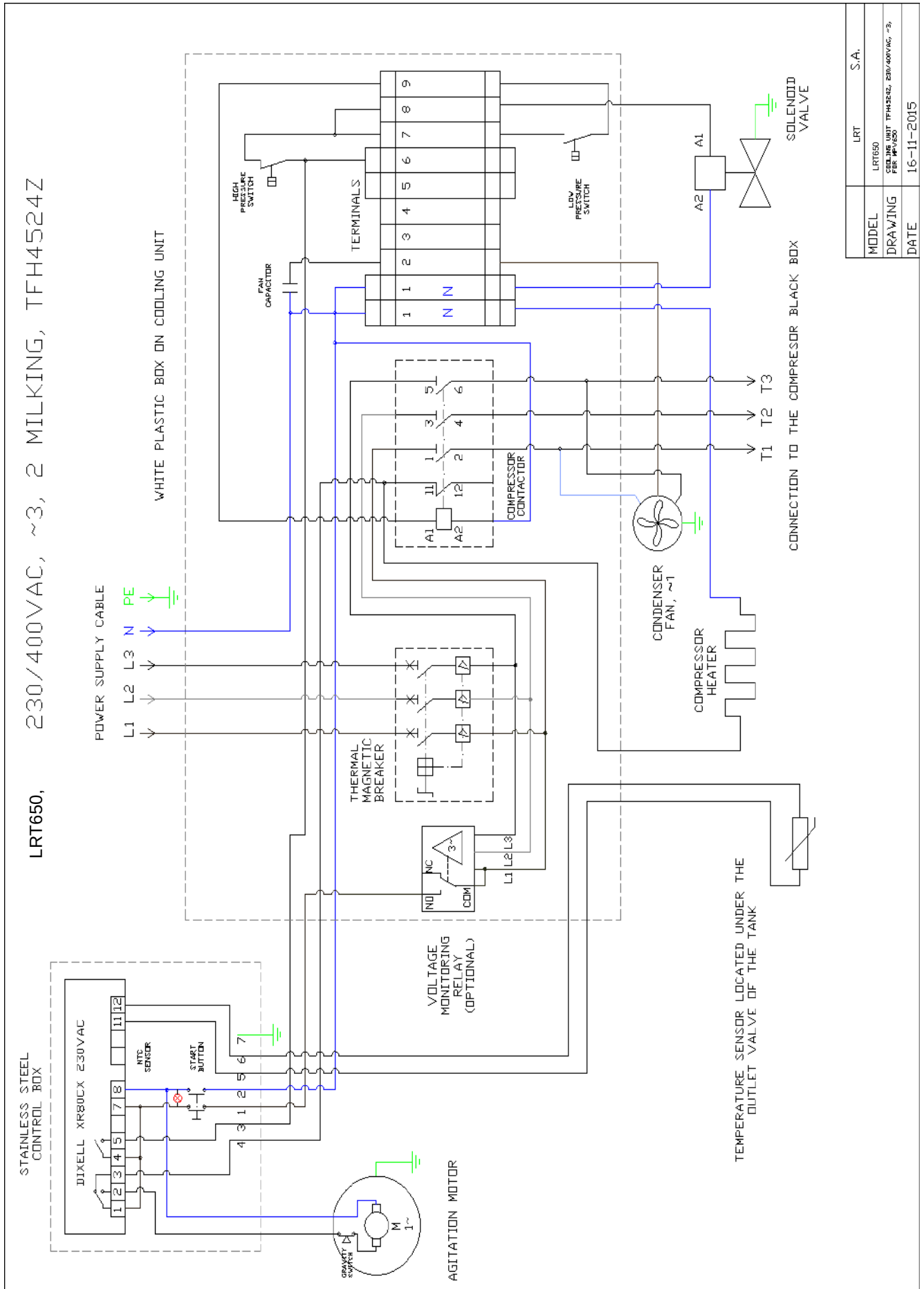


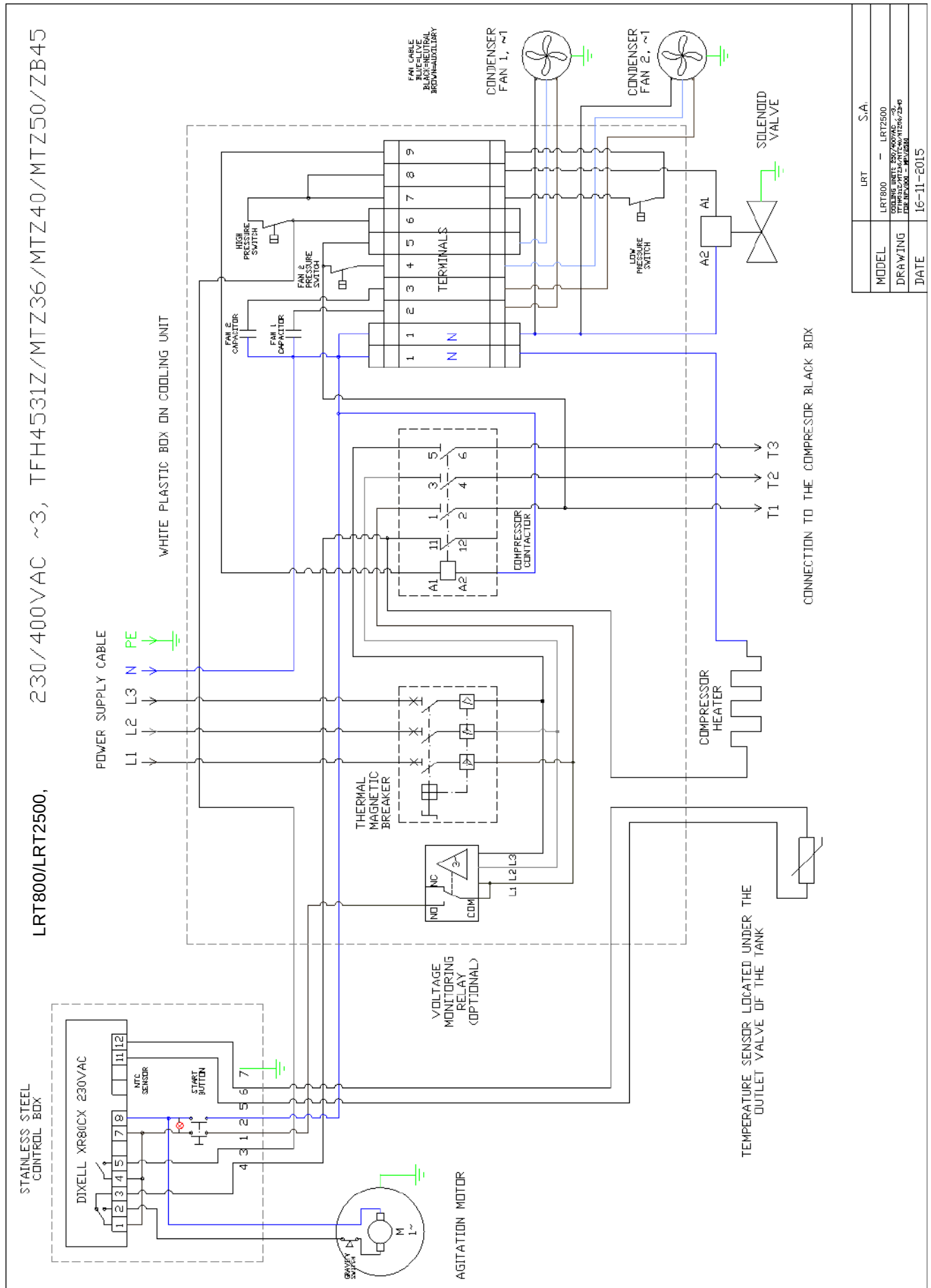












## 15. SAFETY MANUAL INSERT

### IMPORTANT NOTE:



Please read this manual carefully before installing or operating the new cooling tank. Be sure to save this manual for future reference.



**CAUTION: Fire hazard**

## SAFETY PRECAUTIONS

Read the safety precautions before operation and installation. It is mandatory to make a risk assessment prior to installation. Incorrect installation due to ignorance of the instructions can cause serious damage or injury.



**WARNING! DO THE NECESSARY RISK ASSESSMENT OF THE INSTALLATION AREA (EN378)**

### 1. Installation (space).

- Piping installation should be kept to a minimum.
- Piping must be protected from physical damage.
- Spaces where refrigerant pipes are located must comply with national gas regulations.
- Mechanical connections must be accessible for maintenance purposes.
- In cases requiring mechanical ventilation, ventilation openings must be kept free of obstructions.
- When disposing of the product, national regulations must be observed and it must be treated properly.

### 2. Maintenance.

- All persons involved in work or interventions on the refrigerant circuit must hold a valid certificate from an accredited industry authority, which certifies their abilities to handle refrigerants in a safe manner, in accordance with recognized industry assessment standards.

3. Maintenance and repair requiring the assistance of qualified personnel should be carried out under the supervision of a person competent in the use of flammable refrigerants.

Do not use any means to accelerate the defrosting process, other than those recommended by the manufacturer.

5. The appliance should be stored in a room without any continuous sources of ignition (for example: open flame, operating gas appliance or operating electric heater).

6. Take great care to prevent foreign matter (oil, water, etc.) from entering the pipes. Also, when storing the pipes, securely seal the opening with a clamp, adhesive tape, etc.

7. Do not drill or burn.
8. Make sure that the refrigerants do not contain any odor.
9. The refrigeration unit should be stored in a well-ventilated place where the room size corresponds to the room space according to the operating specifications.
10. The refrigeration unit should be stored to avoid mechanical damage.

## MAINTENANCE INFORMATION

### 1. Site checks

Before starting work on systems containing flammable refrigerants, safety checks are necessary to ensure that ignition risks are minimized. For repairs to the refrigerant system, the following precautions should be taken before carrying out work on the system.

### 2. Work procedures

Work should be undertaken under controlled procedures to minimize the risk of a flammable gas or vapor being present during the work.

Technical personnel responsible for the operation, supervision and maintenance of refrigeration systems must have received adequate instructions and be competent in respect to their duties.

Work should only be undertaken with suitable tools (in case of uncertainty, contact the tool manufacturer to find out whether they are suitable for use with flammable refrigerants)

### 3. General work area

All maintenance personnel and other persons working in the area should be instructed on the nature of the work being carried out. Confined spaces should be avoided. The area around the work area should be isolated. Ensure that the conditions within the area are safe by checking for flammable materials.

### 4. Check for the presence of refrigerant

The area should be checked with a suitable refrigerant detector before and during work to ensure that the technician is aware of the presence of potentially flammable materials in the atmosphere. Ensure that the leak detection equipment used is suitable for use with flammable refrigerants, e.g. non-sparking, properly sealed or intrinsically safe.

### 5. Presence of fire extinguisher

If any work involving high temperature is to be carried out on the refrigerant equipment or other involved parts, appropriate fire extinguishing equipment should be available. You should have a dry powder or CO<sub>2</sub> (carbon dioxide) fire extinguisher near the charging area.

### 6. No source of ignition

No person carrying out work on a refrigerant system which involves the exposure of any pipe containing or having contained flammable refrigerant shall use any source of ignition in such a manner as to create a fire or explosion hazard. All possible sources of ignition, including smoking, shall be kept well away from the point of installation, repair, removal or disposal, during which flammable material may be released into the surrounding area. Before carrying out work, the area around the equipment shall be surveyed to ensure that there are no ignition or fire hazards. "NO SMOKING" warning signs shall also be posted.

### 7. Ventilation area

Ensure that the area is open and properly ventilated before working on the system or carrying out any work involving high temperatures. A degree of ventilation should continue to be available during the work. The ventilation should safely distribute any escaping refrigerant and preferably discharge it to the outside, into the atmosphere.

### 8. Checks on refrigeration equipment

When electrical parts are replaced, they should be suitable for the purpose and in accordance with the specifications. The manufacturer's maintenance and service instructions should always be followed.

If you have any questions, consult the manufacturer's technical support for assistance. The following checks should be applied to installations using flammable refrigerants:

- The charge quantity is according to the size of the room in which the refrigeration parts are installed.
- The ventilation mechanism and outlets are functioning properly and are not obstructed.
- If an indirect refrigerant circuit is used, the secondary circuits should be checked for the presence of refrigerant. The marking on the equipment is still visible and legible.
- Marking that is not legible should be changed.
- The refrigerant pipe or components are located in a position where they will not be exposed to any substance that may corrode the components of the circuit, unless the components are made of materials that are inherently resistant to corrosion or are suitably protected against corrosion.

## **9. Electrical System Checks**

The repair and maintenance of electrical systems includes initial safety checks and component testing procedures. If there is a fault that could compromise safety, then no electrical supply should be connected to the circuit until the fault has been rectified. If the fault cannot be rectified immediately but it is necessary to continue operation of the unit, an alternative temporary solution should be implemented. This should be reported to the equipment owner so that all parties are informed.

Initial safety checks should include:

- capacitors should be de-energized: this should be done in a safe manner to avoid the possibility of sparking
- no live electrical parts or wiring are exposed when charging, recovering or cleaning the system
- earthing is always present.

## **10. Repairs to sealed components**

10.1 During repairs to sealed components, all electrical devices should be disconnected from the equipment before any removal of sealed covers, etc. If it is absolutely necessary to have electrical power to the equipment during servicing, a leak detection device in continuous operation should be installed at the most critical point to warn of a potential critical condition.

10.2 Special attention should be paid to the following to ensure that work on electrical parts does not alter the enclosure in such a way as to affect the level of protection. This includes damage to cables, a large number of connections, terminals not made in accordance with existing specifications, damage to sealants, incorrect application of glands, etc.

- Ensure that the device is securely mounted.
- Ensure that sealants or sealing materials have not deteriorated to the point where they no longer serve the purpose of preventing the entry of flammable gases into the space. Replacement parts should meet the manufacturer's specifications.

**NOTE:** The use of silicone sealant may impair the effectiveness of certain types of leak detection equipment. Intrinsically safe components do not need to be isolated before working on them.

## **11. Repair on Intrinsically Safe Components**

Do not apply any permanent inductive or capacitive loads to the circuit without ensuring that the permissible voltage and current limits for the equipment being used are not exceeded. Intrinsically safe components are only those on which one can work at any given time in the presence of flammable gases. Test equipment should be of the correct rating.

Replace components only with replacement parts specified by the manufacturer. Other parts may cause the refrigerant to ignite in the atmosphere from a leak.

## **12. Wiring**

Check that wiring is not exposed to wear, corrosion, excessive pressure, vibration, sharp surfaces or other adverse environmental conditions. The inspection should also consider the effect of aging or continuous vibration from sources such as compressors or fans.

## **13. Detection of flammable refrigerants**

Under no circumstances should potential sources of ignition be used when searching for or locating refrigerant leaks. A halogen torch (or any other detector using a naked flame) should not be used.

## **14. Leak detection methods**

The following leak detection methods are considered acceptable for systems containing flammable refrigerants. Electronic leak detectors should be used to detect flammable refrigerants, but the sensitivity may not be adequate, or calibration may be required. (Calibration of the equipment should be carried out in a room without refrigerant present). Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant. Leak detection equipment should be set to the LFL of the refrigerant and should be calibrated to the refrigerant being used and the appropriate gas percentage confirmed (25% maximum percentage). Leak detection fluids are suitable for use on most refrigerants, but the use of cleaners containing chlorine should be avoided as chlorine can react with the refrigerant and corrode copper pipes.

If a leak is suspected, all naked flames should be extinguished or removed. If a refrigerant leak requiring welding is found, all refrigerant should be recovered from the system, or isolated (by closing valves) to a part of the system away from the leak. For devices containing FLAMMABLE REFRIGERANTS, pure oxygen free nitrogen (OFN) should be introduced into the system both before and during the brazing process.

## **15. Removal and evacuation**

When accessing the refrigerant circuit to make repairs for any other purpose, conventional procedures should be followed, however, for FLAMMABLE REFRIGERANTS it is important to follow best practice as flammability should be considered. Refrigerant systems should not be opened by welding. The following procedure should be followed:

- removal of refrigerant,
- purging of the circuit with inert gas,
- evacuation,
- purging again with inert gas,
- opening the circuit by tapping or welding.

The refrigerant charge should be recovered in the appropriate cylinders. For devices containing FLAMMABLE REFRIGERANTS, the system should be purged with pure oxygen free nitrogen (OFN) to maintain the safety of the unit. This process may need to be repeated several times. Compressed air or oxygen should not be used to purge refrigerant systems.

For devices containing FLAMMABLE REFRIGERANTS, purging can be accomplished by removing the vacuum from the system via OFN and continuing to fill until operating pressure is reached, then venting the OFN to atmosphere and finally re-evacuating the circuit. The above process can be repeated until there is no refrigerant remaining in the system. When using the final OFN charge, the system should be brought to atmospheric pressure before work can be done on it. This process is critical if welding operations are to be performed on the pipes.

Ensure that the vacuum pump outlet is not blocked by any sources of ignition and is vented.

## **16. Charging Procedures**

In addition to the conventional charging procedure, the following requirements should be followed:

- Work should only be undertaken with suitable tools (if in doubt, consult the tool manufacturer to determine if they are suitable for use with flammable refrigerants)
- Ensure that cross-contamination of refrigerants does not occur when using charging equipment. Pipes or lines should be kept as small as possible to minimize the amount of refrigerant contained in them.
- Cylinders should be placed upright.
- Ensure that the refrigerant system is grounded before charging with refrigerant.

## **17. Decommissioning**

Before carrying out this procedure, it is essential that the technician is familiar with the equipment and all components. It is recommended to use good practices to ensure that the refrigerant is fully recovered or vented in a safe manner (for models with R290 refrigerant). Before carrying out the procedure, a sample of refrigerant and oil should be taken.

In case analysis is required before using the recovered refrigerant. It is essential that the electrical supply is available before starting the procedure.

a) Familiarize yourself with the equipment and its operation. b) Electrically isolate the system

c) Before attempting the procedure, ensure that:

- mechanical handling equipment is available, if required, for handling the refrigerant cylinders,
- all personal protective equipment is available and used correctly,
- the recovery procedure is always supervised by a competent person,
- the recovery equipment and cylinders comply with the appropriate standards.

d) If possible, evacuate the refrigerant system.

e) If evacuation is not possible, use a collector so that the refrigerant is removed from various points in the system.

f) Ensure that the cylinder is on the scales before evacuation is carried out.

g) Start the recovery machine and operate according to the manufacturer's instructions. h) Do not overfill the cylinders. (Not more than 70% of the liquid volume. The density of the refrigerant liquid at a reference temperature of 50°C).

i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

j) When the cylinders have been properly filled and the process is completed, ensure that the cylinders and equipment have been removed from the site in a timely manner and all isolation valves on the equipment are closed.

k) The recovered refrigerant should not be used in another refrigerant system unless it has been cleaned and tested.

## 18. Labeling

Equipment should be labeled stating that it is out of service and does not contain refrigerant. The label should include a date and signature. Ensure that there are labels on the equipment stating that it contains flammable refrigerant.

## 19. Recovery

When removing refrigerant from the system, either for service or for decommissioning, it is good practice to ensure that all refrigerant is removed in a safe manner. When transferring refrigerant in cylinders, ensure that only the appropriate refrigerant recovery cylinders are used. Ensure that the correct number of cylinders are available to hold the total volume of refrigerant in the system. All cylinders used are designed for the refrigerant being recovered and are labelled for that refrigerant (e.g. special cylinders for refrigerant recovery). The cylinders should be complete with the pressure relief valve and associated shut-off valves in good condition.

Empty recovery cylinders are evacuated and, if possible, cooled before recovery is carried out.

The recovery equipment should be in good condition with a set of instructions relating to the existing equipment and which should be suitable for the recovery of flammable refrigerants. In addition, a set of scales should be available and in good condition.

The pipes should be complete with sealed joints and in good condition. Before using the recovery machine, check that it is in a satisfactory condition, has been properly maintained and any electrical components associated with it are sealed to prevent ignition in the event of a refrigerant release. If in any doubt, consult the manufacturer.

The recovered refrigerant should be returned to the supplier in the correct cylinder and with the relevant Waste Transfer Note. Do not mix refrigerants in recovery units and especially inside cylinders.

If it is necessary to remove compressors or compressor oils, ensure that they have been evacuated to an acceptable level to ensure that no flammable refrigerant remains in the lubricant. The evacuation process should be carried out before the compressor is returned to the suppliers. Only electrical heat should be applied to the compressor to accelerate this process. When draining oil from a system, it should be done in a safe manner.

## 20. Venting of HC refrigerant (R290)

Ventilation can be carried out as an alternative to refrigerant recovery. Since HC refrigerants have no ODP and negligible GWP, venting them may be considered acceptable under certain conditions. However, if venting is considered, it should be carried out in accordance with the relevant national rules or regulations, if they allow it.

In particular, before venting a system, it will be necessary to:

- Ensure that waste legislation has been considered
- Ensure that environmental legislation has been considered
- Ensure that legislation on the safety of hazardous substances is complied with
- Venting is only carried out with systems containing a small amount of refrigerant, usually less than 500 g.
- Venting into a building is not permitted under any circumstances
- Venting should not be to a public area or to a place where people are not aware that the process is being carried out
- The hose must be of sufficient length and diameter to extend at least 3

m beyond the outside of the building

- Venting should only be carried out if it is certain that the refrigerant will not be discharged into adjacent buildings and will not migrate to a location below ground level. The hose is made of a material compatible for use with HC refrigerants and oils. A device is used to raise the discharge hole of the hose at least 1 m above ground level and in such a way that the discharge hole is facing upwards (to aid dilution). The end of the hose can now discharge and disperse the flammable fumes into the ambient air. There should be no restrictions or sharp bends in the vent line that would impede ease of flow.

- There should be no ignition sources near the hose discharge hole
- The hose should be checked regularly to ensure that there are no holes or kinks in it that could lead to leakage or blockage of the flow path

When venting is carried out, the refrigerant flow should be measured using a multimeter at low flow rates to ensure that the refrigerant is diluted well. Once the refrigerant has stopped flowing, if possible, the system should be purged with OFN. Otherwise, the system should be pressurized with OFN and the venting process carried out two or more times to ensure that there is minimal HC refrigerant in the system.

## ANNEX

The maximum filling in a room must comply with the following:

$$m_{\max} = 1.5 \times m_1 \text{ (where } m_1 = 4m_3 \times \text{LFL kg/m}^3\text{)}$$

Where:

- $m_{\max}$  is the maximum permissible filling in a room in kg.
- LFL is the lower flammability limit, in kg/m<sup>3</sup>.
- $m_3 = 1.7\text{kg}$  - the maximum permissible quantity (EN 378).

For example, in a room with dimensions 5x5x2 (LxWxH), the maximum filling quantity will be:

$$m_{\max} = 1.5 \times 4 \times 1.7 \times \underline{0.293} = 2.98 \text{ kg}$$

Where LFL for use of R-454C equals to 0.293

If the filling quantity is more than 6 times the maximum permissible by law ( $6m_3$ ), then the zone is **ATEX**.



**WARNING** This symbol indicates that this appliance uses flammable refrigerant. If the refrigerant leaks and is exposed to an external ignition source, there is a risk of fire.



**CAUTION** This symbol indicates that the operating manual should be read carefully.



**CAUTION** This symbol indicates that the equipment should be operated by qualified personnel and based on the installation manual.

With the purchase of the goods referred to in the aforementioned invoice, the company provides one (1) year warranty for all electromechanical parts and five (5) years for the stainless steel parts against corrosion and against leakage for the evaporator.

The machine has passed quality control test at the manufacturing plant and is confirmed that it operates normally and does not have any problems. The warranty covers all the parts of the milk cooling tank apart from the compressor.

Upon delivery, the BUYER is responsible for checking the goods immediately for defects that may occur during transport and bring them to the attention of LRT without delay, in writing.

**CONDITIONS OF WARRANTY**

The warranty period begins from the date of shipment of the machine which is stated on the included invoice.

The warranty is valid only when the damaged part has returned to LRT

LRT is obliged to replace the damaged part but doesn't cover its value and replacement expenses.

The transportation cost of the replacement part to Buyer site is covered by LRT .

The transportation cost of the damaged part to LRT is covered by the Buyer.

The device is sent for service to LRT with the buyer's responsibility, regardless of whether the service is covered under warranty or not.

**THE WARRANTY IS NOT VALID IF**

A non-authorized technician has opened or serviced the machine.

The machine appears to be damaged from falls or by other objects crashing into it.

The damage was caused by flood, excessive moisture or fire.

The machine malfunctions were caused by voltage fluctuation, improper mechanical and electrical installation and by lightning or voltage spikes.

**Operating voltage:**

**230V ± 5%, 50/60Hz**

**230/400V ± 5%, 50Hz**

**120V ± 5%, 50/60Hz**

**16. NOTES**

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