

# INSTRUCTIONS FOR THE INSTALLATION, USE AND MAINTENANCE



Ed 2013  
GB



## FREEZER 200/1



technogel  
spa

MACCHINE E IMPIANTI  
PER GELATO

ICE CREAM EQUIPMENTS  
AND MACHINES

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## Introduction

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Thank you for choosing a Technogel machine. To ensure trouble-free operation of your machine, please read the **Instructions for the Installation, Use and Maintenance** very carefully.

The descriptions and illustrations contained in this manual are not binding. **Technogel Spa** reserves the right to make any changes to the machine for constructional and/or commercial reasons that the company feels necessary at any time and without prior warning.

CAUTION



**In compliance with current Standards regulating personnel safety in the workplace, the instructions given in the next two sections must be followed very closely.**

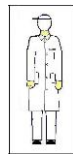
### ⇒ Authorized personnel

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Please note the symbols which appear at the side of each description of work to be carried out in installation, use and maintenance of the machine:



= Technician



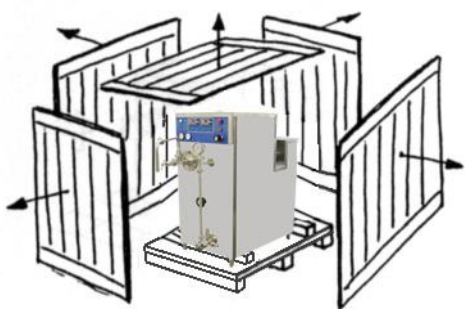
= User

Where the Technician symbol is given (either an electrician, a plumber, a refrigeration expert or a mechanic) this means that the work must only be carried out by these people. If the work is attempted by the user **it could prove dangerous and is to be avoided at all costs.**



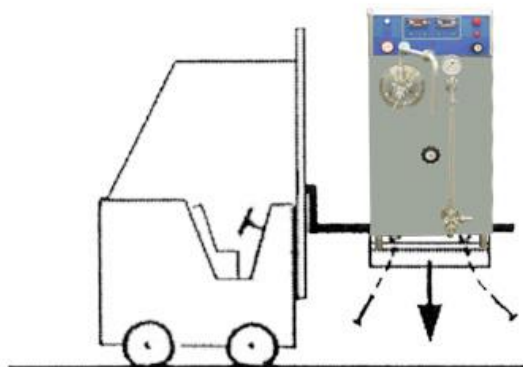
## Instructions for unpacking the machine

**FREEZER 200/1 - GROSS WEIGHT 585 KG. NET WEIGHT 460 KG.**



Remove all wood packing panels from the sides and top

Lift the machine using a fork lift truck, inserting the forks between the base of the machine and the bottom of the crate



Unscrew the four bolts on the base of the crate which hold the machine locked in position

### **CAUTION !**

Once the bolts have been removed, the bottom of the crate will detach from the machine base.

After removing the bottom of the crate, lower the fork lift carriage and rest the machine on the ground.

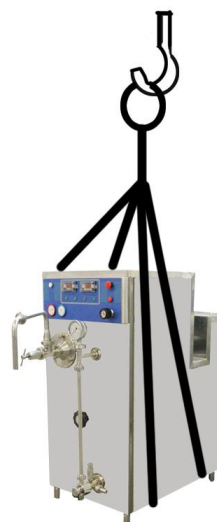
**THE TYPE OF WOOD USED FOR THE CRATE IS NATURAL PINE AND DOES NOT CONTAIN ANY CHEMICALS WHATSOEVER. IT CAN THEREFORE BE RECYCLED**



## ⇒ Instructions for lifting the machine

**FREEZER 200/1 -**

**NET WEIGHT = 460 kg.**



Raise the machine using a fork lift truck, inserting the forks under the sides of the machine between the front and rear wheels.

Lift the machine using belts as shown in the figure positioned close to the front and rear wheels. The cable used to raise the machine must be positioned exactly in the center of the machine.

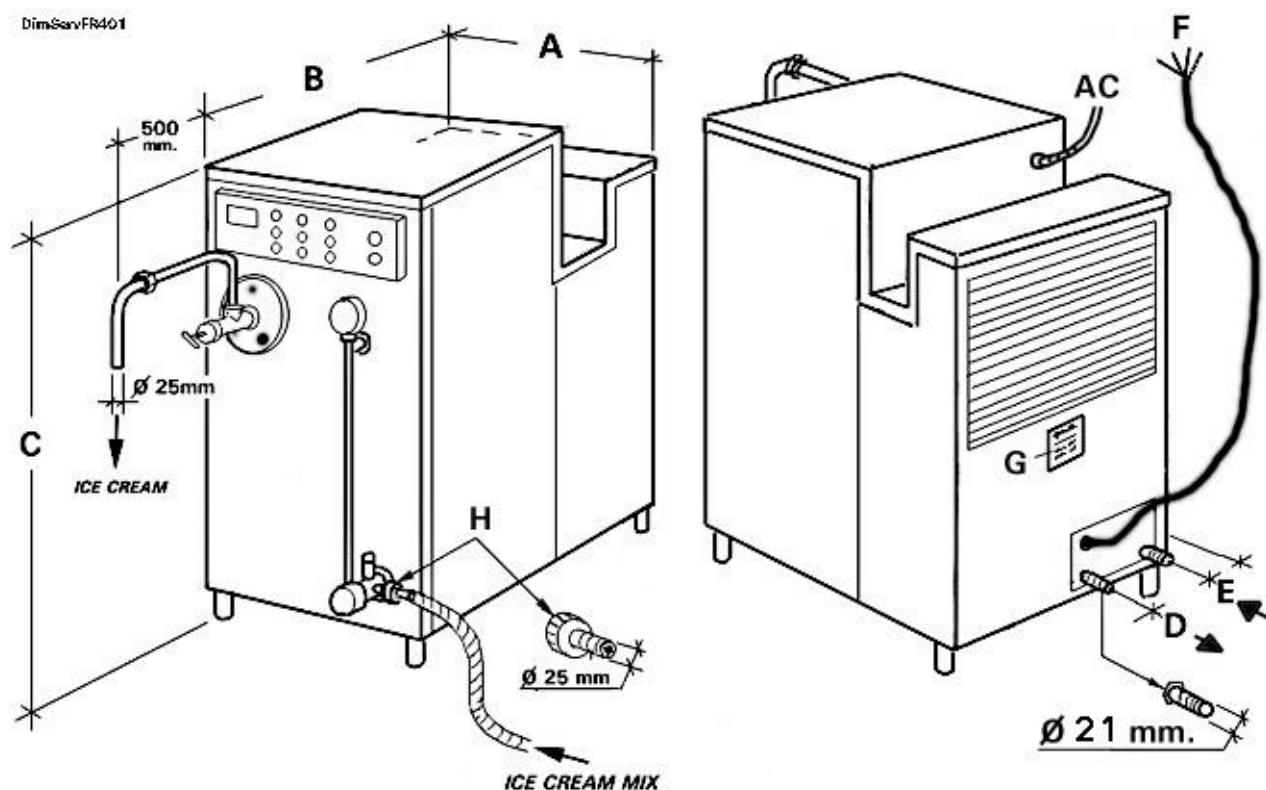
## HOW TO MOVE THE MACHINE



Move the machine using a manual pallet trolley. Insert the trolley forks either under the side or the front of the machine.

After positioning the machine, make sure all four legs rest on the ground. Regulate the feet so that the machine tilts forward slightly.

## ⇒ Positioning of different facilities



### CAUTION:

For trouble-free operation of the machine it is not necessary for the machine to be anchored to the floor, nor are any special measures necessary to limit vibration.

A number of important points should, however, be borne in mind:

- Leave a space of at least 50 cm around the machine. This is indispensable to ensure maintenance work can easily be carried out on the machine.
- Connect the machine to the electricity supply at point **F** with a cable coming from above to avoid any danger of crushing underfoot. For power data, please see page 7.
- Make sure the floor is strong enough to take the weight of the machine.
- Check the machine is stable by making sure that the four legs are firmly resting on the floor.
- Connect the machine to the water supply at points **D** and **E** with firmly fitted piping which will withstand a minimum pressure of **10 Bar**. For data regarding consumption please see page 8.
- Connect the machine to the compressed air at point **AC**. For data regarding consumption please see page 9.

Dimensions of the machine:



<b>A</b> Width in mm	<b>B</b> Depth in mm	<b>C</b> Height in mm	<b>Weight</b> Kg.
<b>700</b>	<b>1050</b>	<b>1480</b>	<b>460</b>

## Machine identification

Each machine is fitted with a plate giving the following information:

- type of machine
- serial number
- year of manufacture
- voltage, and absorption
- electrical power
- type and quantity of refrigerating gas

The plate is applied to the rear of the machine. The plate for this machine is as indicated below:

 <b>technogel</b>	
MACCHINA TIPO MACHINE TYPE	
MATRICOLA N. SERIAL NUMBER	N. <input type="text"/>
ANNO YEAR	<input type="text"/>
VOLTAGGIO VOLTAGE	V <input type="text"/> A <input type="text"/>
POTENZA POWER	KW <input type="text"/>
GAS FREON	R <input type="text"/> Kg <input type="text"/>
Via Boschetti 51, GRASSOBBIO (BG) ITALIA Tel. 035-4522062 Fax 035-4522682	
	

When ordering spare parts and applying for technical assistance, please give the data indicated on the serial plate to ensure precise identification of the machine:

⇒ MACHINE TYPE	<b>FREEZER 200/1</b>
⇒ SERIAL N°	
⇒ VOLTAGE	V. _____ HZ _____



## ⇒ Electrical installation

The electrical installation to which the machine is connected must be in compliance with standards and the electrical work required must be carried out by a qualified electrician. An efficient electrical installation with adequate earth is of primary importance to ensure trouble-free operation of your machine.

We recommend installation of a suitable wall mounted differential circuit-breaker. See table (A) for power supply and absorption data

Check that the power supply is correct for the machine details as indicated on the plate (see page 6).

The machine's power cable has **4** wires: the **yellow/green** wire is the earth – the other three are the **three phases**.

**Table (A)**

<b>FREEZER 200/1</b>	<b>220 V 50 Hz</b>	<b>220 V 60 Hz</b>	<b>200 V 50/60Hz</b>	<b>400 V 60 Hz</b>	<b>380 V 50 Hz</b>	<b>415 V 50Hz</b>
Total power <b>kW.</b>		<b>8,9</b>		<b>8,9</b>	<b>8,9</b>	
Max absorption <b>A.</b>		<b>34</b>		<b>22</b>	<b>22</b>	
Power cable N° of wires and cross section	<b>4 x 6 mm<sup>2</sup></b>	<b>4 x 6 mm<sup>2</sup></b>		<b>4 x 2,5 mm<sup>2</sup></b>	<b>4 x 2,5 mm<sup>2</sup></b>	<b>4 x 2,5 mm<sup>2</sup></b>

**TECHNOGEL DISCLAIMS ALL RESPONSIBILITY FOR DAMAGE ARISING FROM INCORRECT ELECTRICAL INSTALLATION OR FAULTS IN THE POWER SUPPLY**



## Connection of water supply

The refrigerating system has a water-cooled condenser and it is therefore necessary to connect the pipe coming from the mains water supply or from the tower water system at the point where the **WATER INLET** connection is located on the back of the machine at the bottom and to connect the drainage pipe or pipe recycling to the water tower system where the **WATER OUTLET** connection is located.

Please note that it is important to use rubber piping for the water supply connection which is designed to withstand a pressure of at least **10 bar**, with an internal diameter of approx. 21 mm (suitable for the connectors supplied with the machine).

If there are no labels indicating the water supply INLET and OUTLET, please note that the INLET pipe is the one that connects to the pressure valve.

### - WATER PRESSURE AND CONSUMPTION

If the machine operates on mains water, make sure that the water going into the machine is at least **1 Bar** in pressure.

If the machine operates on tower water, make sure that the water going into the machine is at least **2 Bar** in pressure with a maximum temperature of **29°C**.

In both cases maximum pressure for water entering the machine must not exceed **4 Bar**.

**WATER TOWER** - The average consumption with the refrigerating system in operation is as follows:

**FREEZER 200/1 = 1800 litres/hour\***

\*depending on the temperature of the water on entry

The quantity of water (max. temperature **+29°C** and minimum pressure **2 Bar**) which must circulate in one hour of the machine.

**WATER CITY** - The average consumption with the refrigerating system in operation is as follows

**FREEZER 200/1 = 350 litres/hour\***

***In the case of water containing impurities, it is necessary to position a purifying filter to avoid clogging and/or damage to the pressure valve. If the water is very hard it should be softened with a special water softening system.***





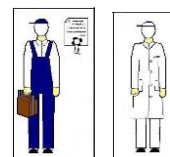
## Pneumatic connection

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Connect filtered and de-humidified compressed air to the special rapid connector **AC** (see please page 9) located on the rear of the machine at the top.

The compressed air must be at least **7 Bar** in pressure.

The quantity of air required: suction of **11** liters per minute



## ⇒ “Ice-cream mixture” connection

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As indicated on page 5, connect a rubber pipe with internal diameter 25 mm and max. 4 metres in length to point **H** (rubber holder supplied with machine).

### **NB Do not use a rigid steel tube**

If the maturation tank from which the mixture is taken is over 4 metres away, it is possible to deliver the mixture using a pump providing the pressure of the mixture on arrival does not exceed 0.5 Bar.

If the pipe leading to the machine is made of steel, the last half metre of pipe must be rubber.



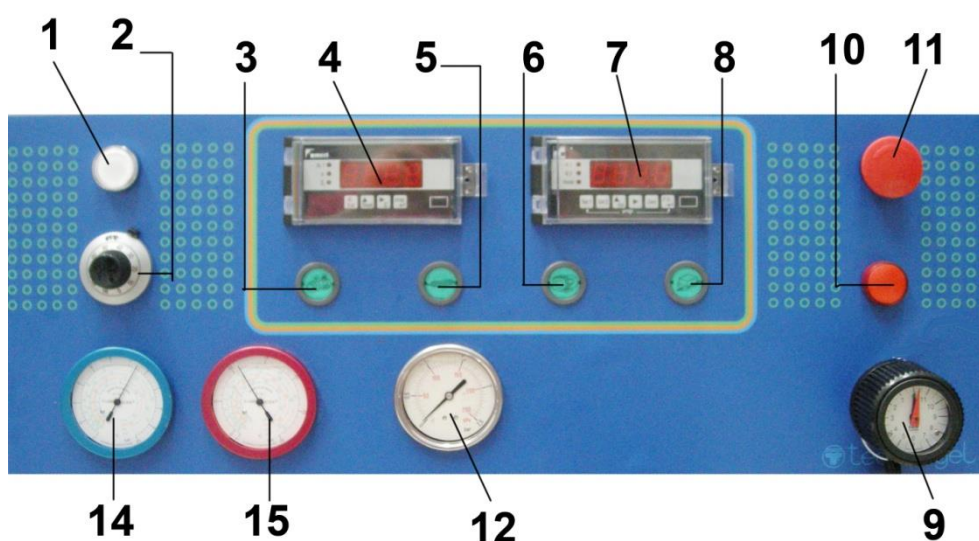
# CAUTION IMPORTANT

**TO CARRY OUT INITIAL START-UP, PRESS THE “START” BUTTON AND THEN WAIT FOR AT LEAST 60 MINUTES BEFORE ACTIVATING THE REFRIGERATOR COMPRESSOR.**

**IF THE MACHINE IS DISCONNECTED FROM THE POWER SUPPLY FOR ONE DAY OR MORE, AFTER PRESSING THE “START” BUTTON, IT IS NECESSARY TO WAIT FOR AT LEAST 60 MINUTES BEFORE ACTIVATING THE REFRIGERATOR COMPRESSOR.**

**IF THE MACHINE IS NEVER DISCONNECTED FROM THE POWER SUPPLY NO WAITING PERIOD IS NECESSARY.  
COMPRESS**

## Description of machine control panel



Pos.	Components	Function
1	white button "RESET" machine power	illuminated button = applied voltage Off = Power off button
2	Potentiometer overrun	Nel l'air regulator iced
3	Push button start / stop "group bombs"	Starts and for pumps
4	Ice cream production Viewer	Displays the time-liter ice cream produced
5	Push button start / stop "agitator"	Starts and for the agitator (turbine)
6	Push button start / stop "refrigerator compressor"	Starts and stops the compressor fridge
7	Switchboard Meter	Controls and displays ice hardness
8	Push ON / OFF "hot gas"	Hot Gas ON = consent for the injection of hot gas from the remote 9 OFF = Hot gas injection to stop
9	Manual valve regulating "hot gas" with gravitational gauge connected	Turning it counterclockwise, hot gas is introduced. Indicative quantity is detected on the pressure gauge on the wheel.
10	Alarm lamp	Notice engine failure or shutdown the machine
11	Pushbutton "emergency"	Pressing it will be for the entire machine.
12	Indicator compressed air flow	Nel air Indicator% cream in the regulation is check with the potentiometer (2)
14	Pressure gauge indicating the pressure / temperature condensation of the refrigeration	Indica, with the machine running. pressure / condensing temperature
15	Pressure gauge indicating the pressure / temperature Evaporation of the refrigeration	Indica, with the machine running, the pressure / temperature evaporation

## ⇒ Instructions for dismantling mixer turbine: first time then

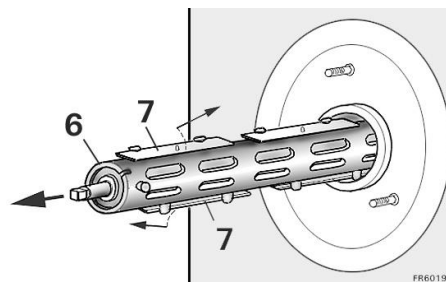
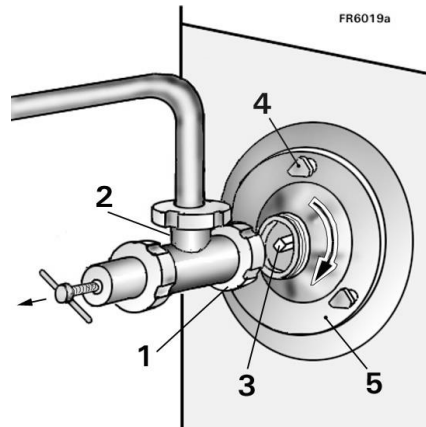
Check that the “EMERGENCY” button 11 (page 10) is off and that the power supply to the control panel is therefore disconnected.

Using the appropriate spanner, dismantle faucet 2 by unscrewing ringnut 1. Unscrew handwheels 4 using the appropriate spanner and dismantle flange 5 by pulling towards you.

Remove turbine 6 from the freezer tube and, as it is being extracted, dismantle scraper knives 7.

While dismantling the knives protective gloves must be worn as the knives are very sharp indeed and you could cut yourself very easily.

When dismantling, do not drop them as they could dent.



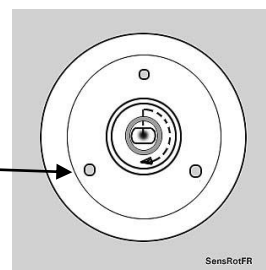
### CHECKING THE DIRECTION OF ROTATION

Check that the “EMERGENCY” button 11 (page 10) is ON and connect the power supply by pressing the “RESET” button 1 (page 10).

Press the stirrer button 5 and watch the hub to check which way it rotates by looking through into the inside of the freezer tube.

It must rotate in a clockwise direction

If it does not do so, disconnect the power supply and invert any two of the three phases of the machine power supply cable. Test again to check the direction of rotation.

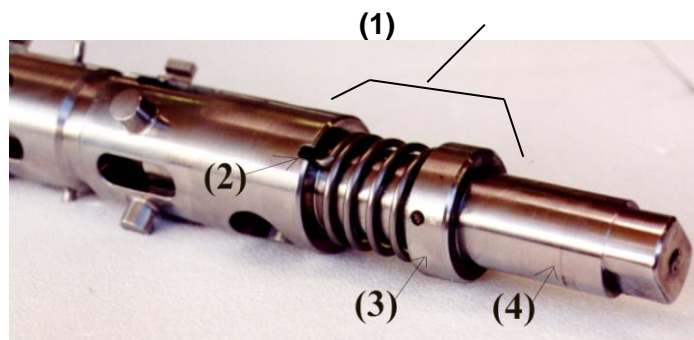


**TAKE CARE WHEN HANDLING THE KNIVES AS THEY ARE VERY SHARP  
AND YOU COULD CUT YOURSELF**

## Correct assembly of the turbine and knives

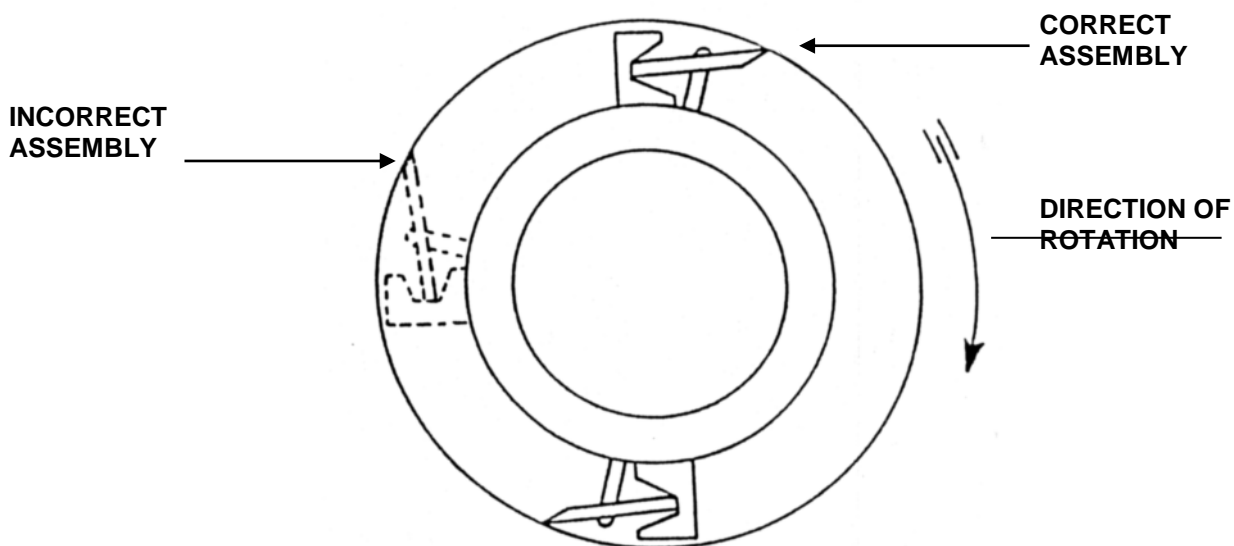
Before reassembling the turbine, check that the packing gland (1) is correctly mounted:

- the locking foot (2) on the spring must fit in its seat.
- The rotating part (3) of the packing gland must be free to move along the axle of the turbine (4) with the force of the spring. If the rotating part (3) of the packing gland is blocked with the spring crushed, it is necessary to dismantle it by removing it from the axle (4) and to grease the washer inside using vaseline.



When re-assembling the turbine in the freezer tube, make sure the scraper knives are mounted correctly.

**Correct assembly is as shown below:**



**WHEN ASSEMBLING THE TURBINE IN THE MACHINE, BE CAREFUL NOT TO SCRAPE THE CHROME ON THE OUTSIDE OF THE FREEZER TUBE. ASSEMBLE SLOWLY AND CAREFULLY.**

## AUTHORIZED AND UNAUTHORIZED USAGE

**TECHNOGEL FREEZERS** are specially designed for the manufacture of ice-cream.

If the machines are used for any other purpose than the production of ice-cream the Customer does so at his own risk.

### ⇒ **Conditions of usage**

Quantities the machine can produce: minimum quantity is half its production rate (i.e. 100 litres of ice-cream with 100% increase in volume; maximum quantity (200 liters of ice-cream with 100% increase in volume).

The temperature of the ice-cream produced will depend on the type of mixture used and the quantity of ice-cream produced.

The minimum increase in volume recommended to obtain good quality ice-cream is 30%.

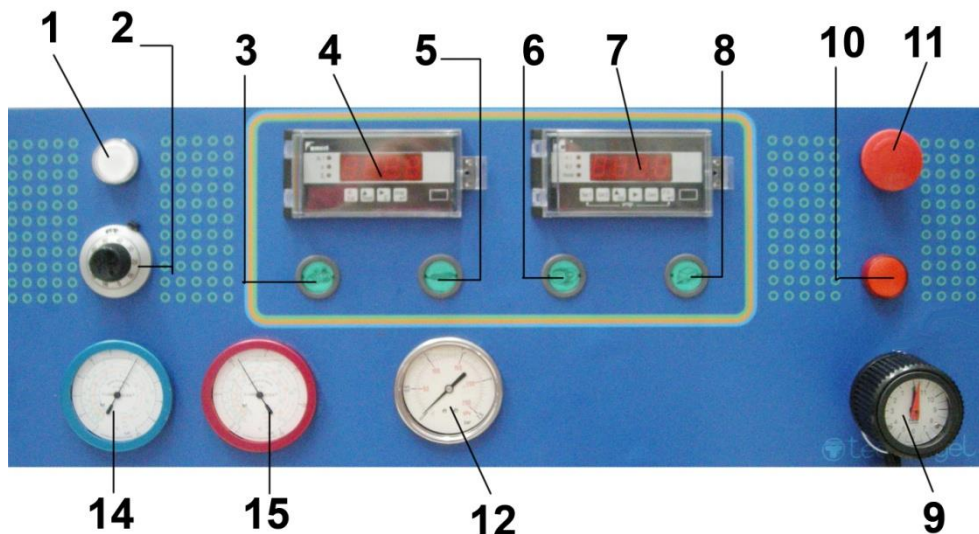


**THE PRODUCTION QUANTITIES INDICATED CAN BE OBTAINED WHEN THE CONDENSATION TEMPERATURE OF THE REFRIGERATING PLANT IS BETWEEN 35°C AND 40°C (OPTIMUM CONDENSATION)**

**WITH CONDENSATION OF OVER 45°C, THE MACHINE'S PRODUCTION IS GREATLY REDUCED. OPERATING UNDER THESE CONDITIONS OVER A LONG PERIOD OF TIME COULD DAMAGE THE REFRIGERATING PLANT.**



## Operation of the machine



Press the “**RESET**” pushbutton **1** to operate the machine and ensure that all the motors can be started up.

Press pushbuttons **3** (pump), **5** (stirrer) and **6** (fridge compressor) to start the relative motors. When the pushbuttons light up, this means the relative motor has started; when the lights are off, this means the relative motors are stopped.

**Caution:** pushbutton **3** (pump) can be on or off as required irrespective of the others. However, if pushbutton **5** is not pressed (stirrer), the fridge compressor (pushbutton **6**) will not operate.

Adjusting the pump flow rate and therefore the production of ice cream

To regulate the production of the machine, increases or decreases the speed of the pumps (and hence, the production of ice cream now) with the handwheel black (pos. T p. 15) placed on the front of the machine. The pump is displayed by the display of the flow rate 4 L / h and the production of ice cream with 100% overrun.

(See

Page

16)

The pump flow must be associated with the injection of air into the ice cream to be made manually with the regulator. See the following pages how.

### - Display of “**viscosity**”

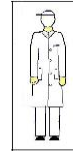
During operation of the machine, display **7** gives the “**viscosity**” value for the ice-cream at that particular moment in time. This numerical value (Ampere), which is low at the start and higher as the ice-cream comes ready, is only indicative and enables the operator to check that the flow of ice-cream is constant during production.

The maximum viscosity data is set when the machine is commissioned and if this figure is exceeded (maximum ice-cream hardness) the ampere system inside display **7** will automatically stop the fridge compressor for a few seconds and it will then start again once the value returns within normal parameters.

### - Connection of “**hot gas**”

Press pushbutton **8** to give the go-ahead for injection of hot gas. The quantity of gas injected is adjusted using the appropriate regulator **9** and display of the viscosity value appears on display **7**. Instructions are given on the following pages.





## Start-up of the machine

Connect the Freezer pump unit to a storage mixing tank with a pipe **A** made of rubber or flexible plastic. The pipe must not be more than **4 meters** in length.

**A rigid stainless steel tube should not be used.**

Before starting the machine, open faucet **B** so that the thread of the handwheel protrudes by approx. 4.5 cm.

Connect the panel to the power supply by pressing button **C** “RESET” (light on).



Start the pump unit on pushbutton

Turn handwheel (**T**) (pump speed adjustment) clockwise to position **1.5** (black hand)

Set the air regulation valve (**S**) at the minimum value: Screw the handle (**4**) clockwise till it gets fixed.

**The first load of mixture must be without air.**

When the liquid mixture begins to emerge from the outlet pipe, tighten handwheel **B** so that the thread is approximately 1 cm from the faucet.

Wait for the pressure inside the machine to reach **5 Bar** (this can be read on pressure gauge **G**) and then stop the pump unit using



pushbutton



Start the mixing turbine



and the fridge compressor in that order.



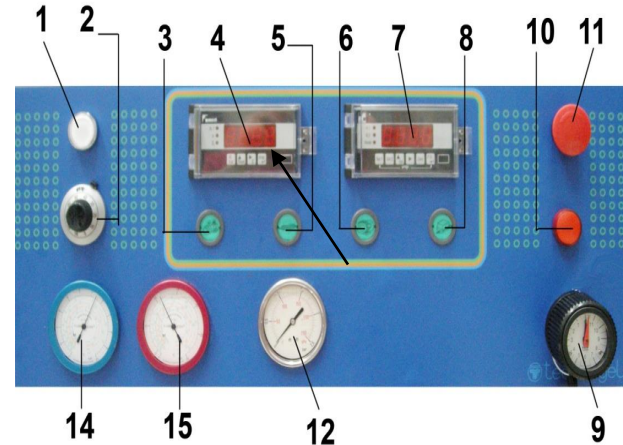
Wait a few minutes and then start the pump again by pressing and inject air in the ice-cream by unscrewing the handle (**4**) and manage to drag the ball (**5**) at the middle of the scale (**6**).

While the machine is in operation, make sure that the pressure of the ice-cream inside the freezer, as indicated on gauge **G**, remains between **10** and **13 Bar** by tightening or loosening handwheel **B** of the outlet faucet.

If production is low, the ice-cream will be too hard and the viscosity therefore increases until it stops the fridge compressor for a few seconds. To solve the problem, increase the pump speed using handwheel **T** taking the value which appears on display **E** to a higher value (e.g. **200 Lt/h**).

If on the other hand production is too high and the ice-cream is soft, therefore viscosità is too low, reduce the speed of the pump taking the value to **100 Lt/h**.

In the next few pages instructions are given to calculate the increase in volume and know what increase in volume the ice-cream should have.





## ⇒ Instructions for calculating ice-cream overrun

To know the exact increase in volume of the ice-cream currently in production, follow the instructions below:

- Take a 1 litre container, fill with the liquid mixture and weigh it. When the tare (weight of empty container) is subtracted, the net weight of a litre of mixture is obtained.
- Fill the same container with ice-cream, weigh it, subtract the tare and you will have the weight of 1 liter of ice-cream made from the mixture.

Apply the same formula and you will get the increase in volume in terms of percentage:

$$\frac{\text{WEIGHT OF MIXTURE} - \text{WEIGHT OF ICE-CREAM}}{\text{WEIGHT OF ICE-CREAM}} \times 100 = \%$$

**Example:** 1 litre of mixture weighs 1kg 50 g and 1 litre of ice-cream made from the same mixture weighs 0.580 kg =

$$\frac{1.050 - 0.580}{0.580} \times 100 = \frac{0.470}{0.580} \times 100 = 0.81 \times 100 = \underline{81\%}$$

**The litre of ice-cream weighing 0.580 kg has an increase in volume of 81%.**

To increase or decrease the volume, increase or decrease the pressure of the air injected by the pump by turning knob **E** (see page 15).

We recommend increasing or decreasing by **0.2 Bar** at a time; wait for the ice-cream inside the machine to be replaced and after check the new increase in volume. If necessary, change again.

It is possible that the increase or decrease in air pressure will increase or decrease ice-cream production. Check therefore and if necessary change it by increasing or decreasing the speed of the pump using the "increase" or "decrease" buttons **D** (see page 14).

Once the right balance has been found between pump speed, air pressure injected and the correct viscosity of the ice-cream, the operator will know how to set the Freezer for future start-ups with that type of product.

## Regulation of ice-cream viscosity with the hot gas valve

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When the Freezer is connected to a packing machine, the quantity and viscosity of the ice-cream produced must be regulated to suit requirements.

If the requirement is less than the quantity your Freezer produces, the ice-cream emerging from the machine will be too hard and it will be difficult to fill in to the cones, cups, etc.

To solve this problem, the machine is equipped with a hot gas injector which serves to regulate the viscosity of the ice-cream.

Instructions for regulating ice-cream viscosity with the hot gas:

While the Freezer is in operation, press the **"HOT GAS"** button **N**.

Inject hot gas by turning knob **H** in an anti-clockwise direction.

To establish the right quantity, check the viscosity value on the display **7** and stabilize it at the value which, in your opinion, is right for the product currently in production.

Example:

If prior to regulation the value of viscosity appearing on the display was **"8"** and the ice-cream is too hard and after injecting hot gas you see that the ice-cream is okay when the value displayed is **"7.2"**, keep this value of viscosity by leaving the hot gas connected until production is terminated.

Regulation is very sensitive. Just a slight turn of the knob is sufficient to achieve results.

On termination of production, disconnect the hot gas on the keyboard and turn knob **H** off completely.

## ⇒ Use of pump safety valves

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If the pressure inside the freezer pipe exceeds **15 Bar** (pressure indicated on pressure gauge **G**, the safety valves **VS** will off-load the excess mixture onto the ground.

To stop discharge of the mixture, use faucet **B** and open as much as necessary to take the pressure back to the current values (from **10** to **13 Bar**).

## ⇒ Checking operation of the refrigerating system

The machine is fitted with gauges indicating the pressures and operating temperatures of the refrigerating plant.

During operation it is possible to check whether the refrigerating system is operating correctly:

### - High pressure gauge (condensation) R

This gauge measures the condensation; observe the scale corresponding to the Freon inside the machine, the temperature, when the machine is in operation. It should be **minimum + 35°C, maximum + 40°C**.

**If the temperature displayed is over +40°C (check after 5 minutes because at the start it is normal for the temperature to rise and then fall), this means that the cooling water reaching the machine is insufficient. Call the technical service for them to check it.**

### - Low pressure gauge (evaporation) P

This gauge measures evaporation, i.e. the cold produced by the machine. Observe the Freon scale inside the machine; the temperature should vary between **-26°C and -29°C**.



### CAUTION - VERY IMPORTANT NOTE

**IT IS EXTREMELY IMPORTANT TO SUPPLY THE PRESSURE AND TEMPERATURE FIGURES ON GAUGES P AND R TO THE TECHNICAL SERVICE IF THEIR ASSISTANCE IS REQUIRED.**

**THE DATA MUST ALWAYS BE READ WITH THE MACHINE IN OPERATION**


**TECHNICAL WORK ON THE MACHINE MUST NOT BE CARRIED OUT BY UNAUTHORIZED PERSONNEL AS THIS COULD PROVE DANGEROUS FOR THEIR SAFETY**

## ⇒ Washing the machine

Once production of ice-cream has been terminated, connect the same mixture pipe to a tank containing water (**maximum temperature 70°C**) mixed with detergent and disinfectant.

For the type of detergent and disinfectant Technogel advises the customer to request information from a specialized company such as DIVERSEY/LEVER or HENKEL etc. who will supply a specific product for this purpose.

**NEVER USE CHLORINE TO DISINFECT AS THIS WOULD DAMAGE THE INTERNAL SURFACES OF THE MACHINE**

Pump the water out of the machine by pressing the pump button , turn on the ice-cream outlet faucet

and start the stirrer .

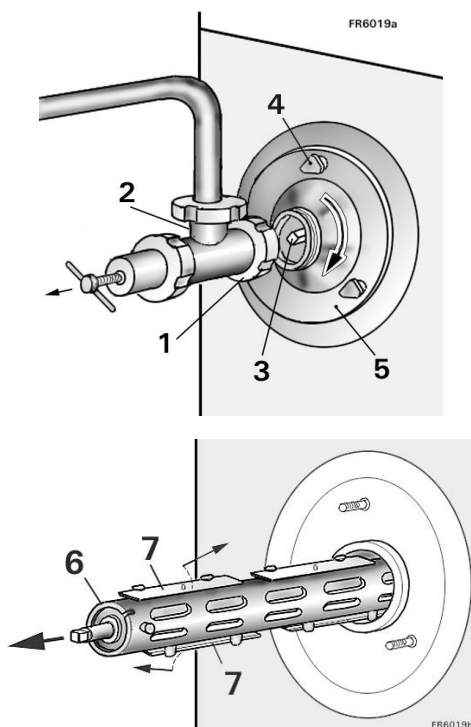
Repeat the operation until the water coming out is clean.

**DURING WASHING OPERATIONS, THE REFRIGERATION COMPRESSOR MUST**

**DO NOT LEAVE THE TURBINE IN OPERATION IF THERE IS NO WATER IN THE MACHINE. EVEN IF THERE IS WATER IN THE MACHINE THE MACHINE SHOULD NOT BE LEFT IN OPERATION AS IT WILL GIVE EXCESSIVE WEAR AND TEAR ON THE BUSHINGS AND BLADES. OPERATE FOR 10 SECONDS AND THEN STOP FOR 30 SECONDS AND CONTINUE WITH INTERMITTENT USAGE UNTIL WASHING IS COMPLETE.**

When washing is finished, it is essential to empty the refrigeration pipe completely of any residual washing water. Follow the instructions below:

- A) Disconnect power to the control panel by pressing the **"START"** button (light off).
- B) Unscrew the three handwheels (4) and dismantle the flange (5) complete with faucet (2).
- C) Remove the turbine (6) from the freezer pipe taking care to dismantle, as they are extracted, the scraper knives (7). Do not drop them.
- D) Dry all the dismantled pieces and the inside of the freezer pipe.
- E) Before re-assembling the various pieces, grease all the washers on the faucet, packer gland of the turbine (see page 12) and flange with vaseline.



**MAKE SURE THE SCRAPER KNIVES ARE ASSEMBLED CORRECTLY (see page 12).**

## ⇒ Noise level

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The noise level measured 1 metre from the machine is less than 70 dB (A).

## ⇒ Ecological warning

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### **CAUTION !!!**

**“This machine contains substances which may damage the ozone layer. When the machine is no longer in use it must be consigned to a specialized waste disposal center. Ask the rubbish disposal services of your town or city for information.”**

## ⇒ Warning of possible breakdown of the machine

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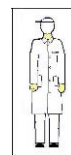
During the cold winter weather if the machine is not in operation make sure that the temperature of the room where the machine is installed does not fall below 0°C. As the machine is water-cooled, if the temperature drops below freezing point the refrigerating system could break and this would prove costly to repair.

If it is not possible to ensure the temperature remains above freezing point, empty the condensation circuit of residual water. This operation must be carried out by a Refrigeration Technician.

# Maintenance

After each washing operation, all accessible washers should be greased with vaseline to ensure ease of assembly and operation.

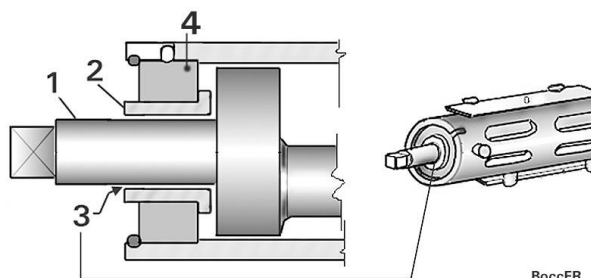
Check the washers and springs on the pump unit each week and if necessary replace them. This is extremely important for trouble-free operation of the machine.



Check periodically that there is not too much play (3) between the eccentric shaft (1) and bushing (2).

The play (3) must be maximum **1 mm**. If it is more, replace piece (4) complete with bushing.

If there is excessive play, scraping of the ice-cream will not be carried out correctly and the knives will wear out rapidly.



BoccFR

⇒ **After the first month of operation:**

- Check the tension of the turbine stirrer motor belts. Even if just one is worn, change them all.



⇒ **After each season of operation check the following:**

- The worm screw reduction unit (3) is oil lubricated. Check the level and top up as necessary.

After **4000 hours'** operation change the oil.

The types of oil are as follows:

**IP TELESIA OIL 15° OR**

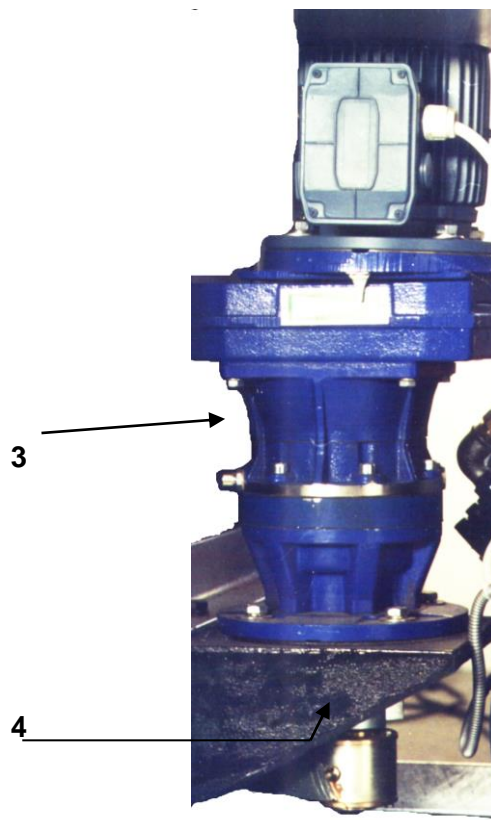
**BP ENERGOL SGXP 150**

Quantity = **1 kg**.

- Check lubrication of the connecting rod (4). Lubricate with grease and if necessary add **SKF LGMT 2/1**.
- Check the lubrication of the support which pulls the turbine. The same grease should be used for this purpose as mentioned above.

⇒ **At the start of each season, check the condition of the refrigeration plant:**

- Check the refrigerating gas
- Clean the condenser



## Technical assistance

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### **WARNING DANGER !!!**

**Work carried out on the machine by unauthorized personnel can prove dangerous.**

We therefore advise you to call THE AUTHORIZED TECHNICAL SERVICE in case of any fault in the machine.

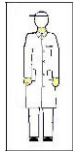




**TECHNOGEL DISCLAIMS ALL RESPONSIBILITY FOR ANY DAMAGE ARISING FROM TECHNICAL INTERVENTION CARRIED OUT BY UNAUTHORIZED PEOPLE**

**TECHNOGEL ALSO DISCLAIMS ALL RESPONSIBILITY FOR DAMAGE CAUSED BY THE USE OF NON-ORIGINAL SPARE PARTS WHICH HAVE NOT BEEN APPROVED FOR USE ON MACHINES MANUFACTURED BY THE COMPANY.**

The next few pages give **INSTRUCTIONS RESERVED FOR THE TECHNICAL SERVICE** with the technical information for each type of machine.

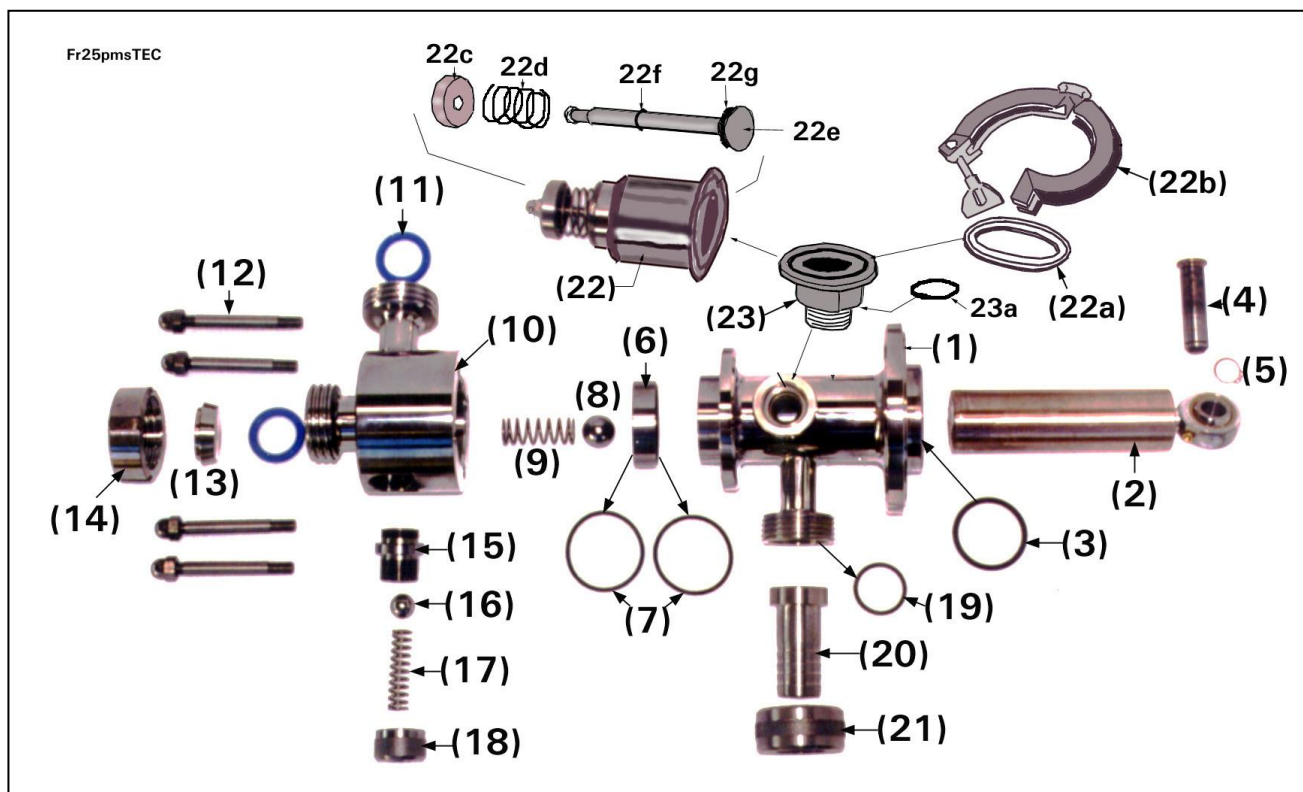
## ⇒ Trouble-shooting

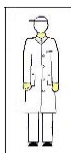

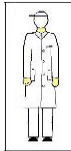
The user can work on the machine without any risk or danger only when the symbol indicates he may do so.

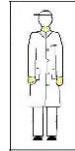
FAULT IN OPERATION	CAUSES	REMEDIES	
During operation the refrigeration compressor stops and starts again.	<p><i>No cooling water in the compressor.</i></p> <p><i>The ice-cream is too hard and reaches "viscosity limit" causing the compressor to stop and start.</i></p>	<p>Check the water supply.</p> <p>Increase the pump speed or insert the hot gas.</p>	
<p>During operation:</p> <ul style="list-style-type: none"> <li>- PUMP stops or</li> <li>- TURBINE stops or</li> <li>- COMPRESSOR stops</li> </ul>	<p><i>The corresponding magneto heat relay has been activated inside the switchboard owing to overloading or for some other reasons.</i></p>	<p>Reset the corresponding magneto heat relay by pressing the pushbuttons on the right hand side of the machine</p> <p>If the problem recurs, have the Technician check absorption of the motor involved.</p>	
<p>On start-up the fridge compressor doesn't start</p> <p>During operation the refrigeration compressor stops.</p>	<p><i>Gauges P and R (page 18) are on zero.</i></p> <p><i>Ampere switchboard F (page 18) doesn't give the go-ahead for start-up</i></p> <p><i>The pressure switch indicating low pressure has been activated</i></p> <p><i>The pressure switch indicating high pressure has been activated</i></p>	<p>No Freon Gas. Check and top up if necessary.</p> <p>Check and replace if broken</p> <p>Freon gas level low. Top up.</p> <p>The water condensation tap is closed and insufficient water is reaching the machine or it may be reaching the machine but is warm. Check the water and check whether the condenser is dirty.</p>	
The pressure of condensation indicated by the gauge on the control panel is very high and remains high, the refrigeration compressor works but the ice-cream produced by the machine is soft.	<i>Either there is not sufficient water being supplied to the refrigeration system's condenser or the water is too hot or the condenser is dirty and there is no heat exchange.</i>	<p>Check the water and/or clean the condenser.</p> <p>Do not operate the machine in this condition.</p>	
The pressure of evaporation indicated by the gauge on the front of the machine is too low and ice-cream comes out too soft.	<i>Probably there is not enough gas in the refrigerating system.</i>	<p>Check and top up the gas. For the type and quantity of gas please see the plate on the machine.</p>	



## Trouble-shooting faults in the pump unit



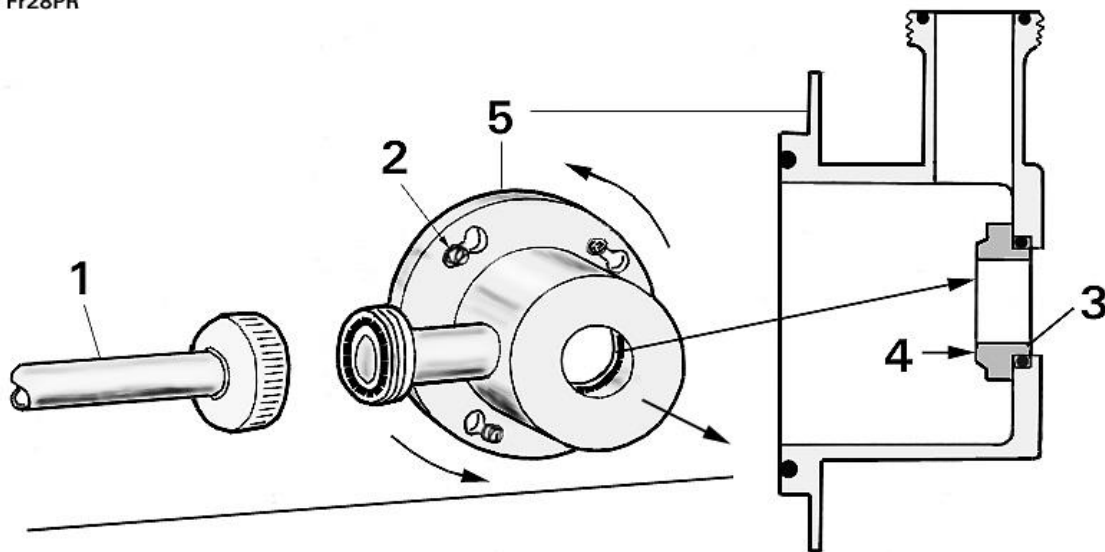
FAULTS IN OPERATION	CAUSES	REMEDIES	
Leakage of mixture under the machine where the pump unit is located	<i>O-ring (3) are worn or broken</i>	Check and replace if necessary	
Ice-cream does not contain air (does not increase in volume)	<i>Compressed air is not reaching the machine. Compressed air is not reaching the pumps. It is possible that the check valve of compressed air (22a) is blocked or glued to its washer (22g)</i>	Check the compressed air unit inside the machine. Check the pressure regulator S, see page 15. Check and replace O-ring (22g).	
Ice-cream has too much air in it although the same pressure of compressed air was used.	<i>Mixture reaching the machine is too cold and therefore stickier so that the pump in the first stage has difficulty in sucking it up. The mixture storage tank is too far away (more than 4 m.) and the pump in the first stage has difficulty in sucking it up.</i>	Check the temperature of the mixture.  Check the distance of the tank and if it is not possible to bring it closer, use a servo-freezer positioned close to the machine.	



## ⇒ Leakage from the packing gland

FAULTS IN OPERATION	CAUSES	REMEDIES
The mixture runs out of piece (5) when loading is being carried out at the start.	<i>The O-ring has not been lubricated on the packing gland as described on page 12.</i>	Follow instructions given on page 12.
Ice-cream runs out of the piece (5) while the machine is in operation.	<p><i>The packing gland spring has lost its flexibility.</i></p> <p><i>The fixed part (3) of the packing gland mounted on piece (5) is not in good condition.</i></p> <p><b>CAUTION:</b> <i>Fixed part (3) can break in three different ways:</i></p> <ul style="list-style-type: none"> <li>- owing to wear and tear</li> <li>- because the machine was left running during washing without any water in the freezer pipes</li> <li>- because the machine was left running too long even though there was water inside.</li> </ul>	<p>Replace the spring of the packing gland.</p> <p>To dismantle piece (5): remove connecting pipe (1) – loosen screws (2) without removing them – turn piece (5) in an anti-clockwise direction and pull it outwards – (dismantle packing gland part (3) and insert the new one.</p> <p><b>CAUTION:</b> Always change the complete part of the washer. When assembling the new part, do not use tools but only your hands. The plastic material the piece is made of is very soft and if surface (4) dents it will not seal properly.</p>

Fr28PR



## Technical specifications: FREEZER 200/1

Refrigerator compressor	Copeland SKROLL- kW 5 Copeland semi-airtight HP 4 – kW 3 Dorin semi-airtight HP 4 – kW 3
Refrigerating gas	Freon R404 (quantity 4 kg.)
Dasher stirrer motor	900 r.p.m. – 3 Hp – 2,2 kW
Condensation	Water
Pump motor	1400 r.p.m. – 1 Hp – 0,75 kW

Magnetothermals calibration		200 V 50/60HZ	220 V 50HZ	220 V 60HZ	380 V 50HZ	440 V 60HZ	415 V 50HZ
Refrigerating compressor	A		20	20	12	12	12
Dasher stirrer motor	A		9,5	9,5	6	6	6
Pump motor	A		3,5	3,5	2,2	2,2	2,2

Electric system fuses	200V and 220V	380V and 415V
Primary transformer F2	n°2 d. 5 x 20 2A quick type	n°2 d. 5X20 2A quick type
Secondary transformer	n°1 d. 5 x 20 8A delayed type	n°1 d. 5 x 20 8A delayed type
Fan and resistance compressor protection	n°2 d. 5 x 20 2A quick type	n°2 d. 5 x 20 2A quick type

Pressure switches calibration-low/high pressure	Set in values
Low pressure threshold value	0,2 Bar
High pressure threshold value	20 Bar
Differential	0,7 Bar

Oil pressure switch (where equipped)	Calibration values: 0,7 – Differential 0,2 Bar
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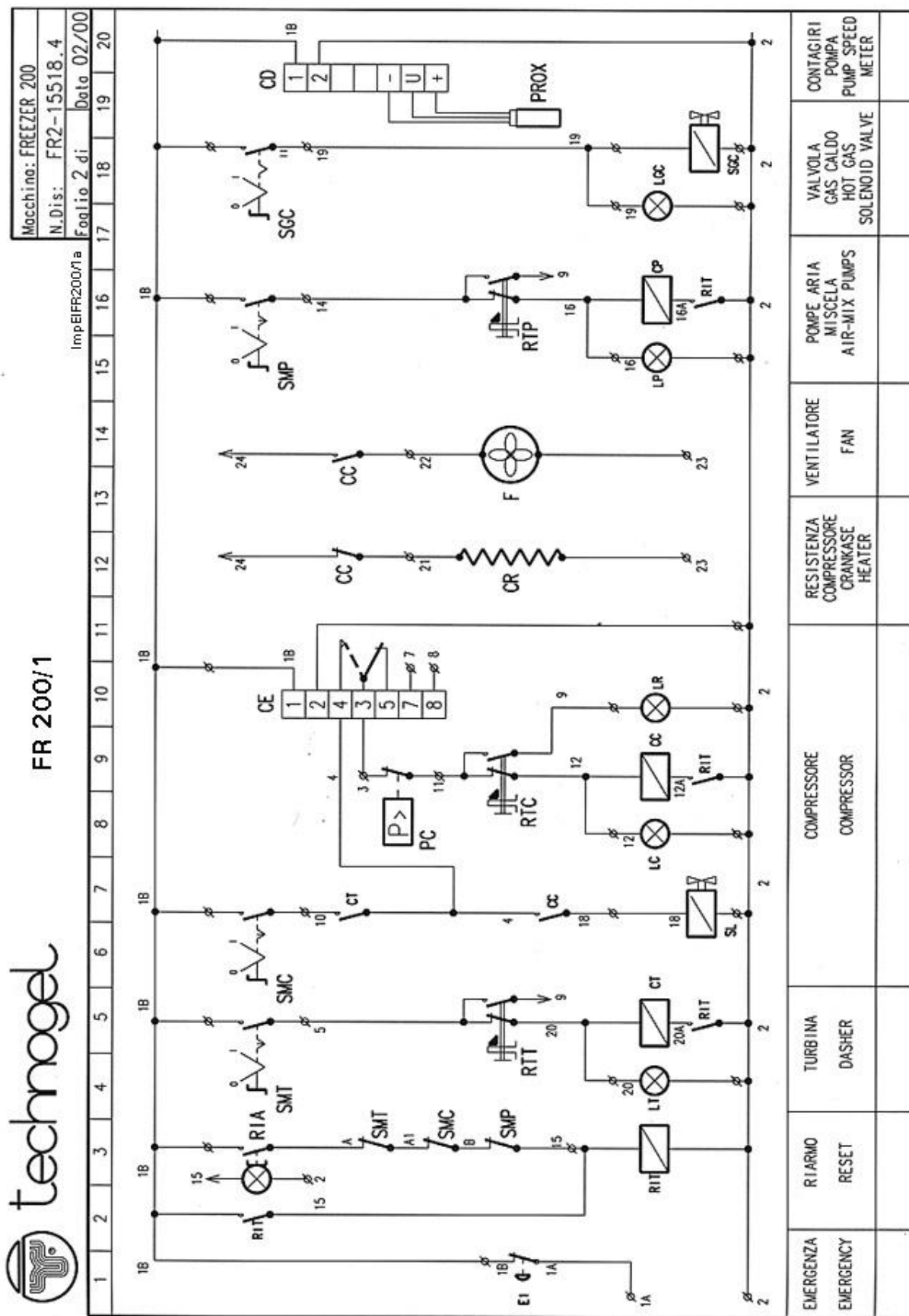
### REFRIGERATOR SYSTEM WORKING TEMPERATURES

Condensation (high pressure)	Evaporation (low pressure)
+35°	-28/-32°C

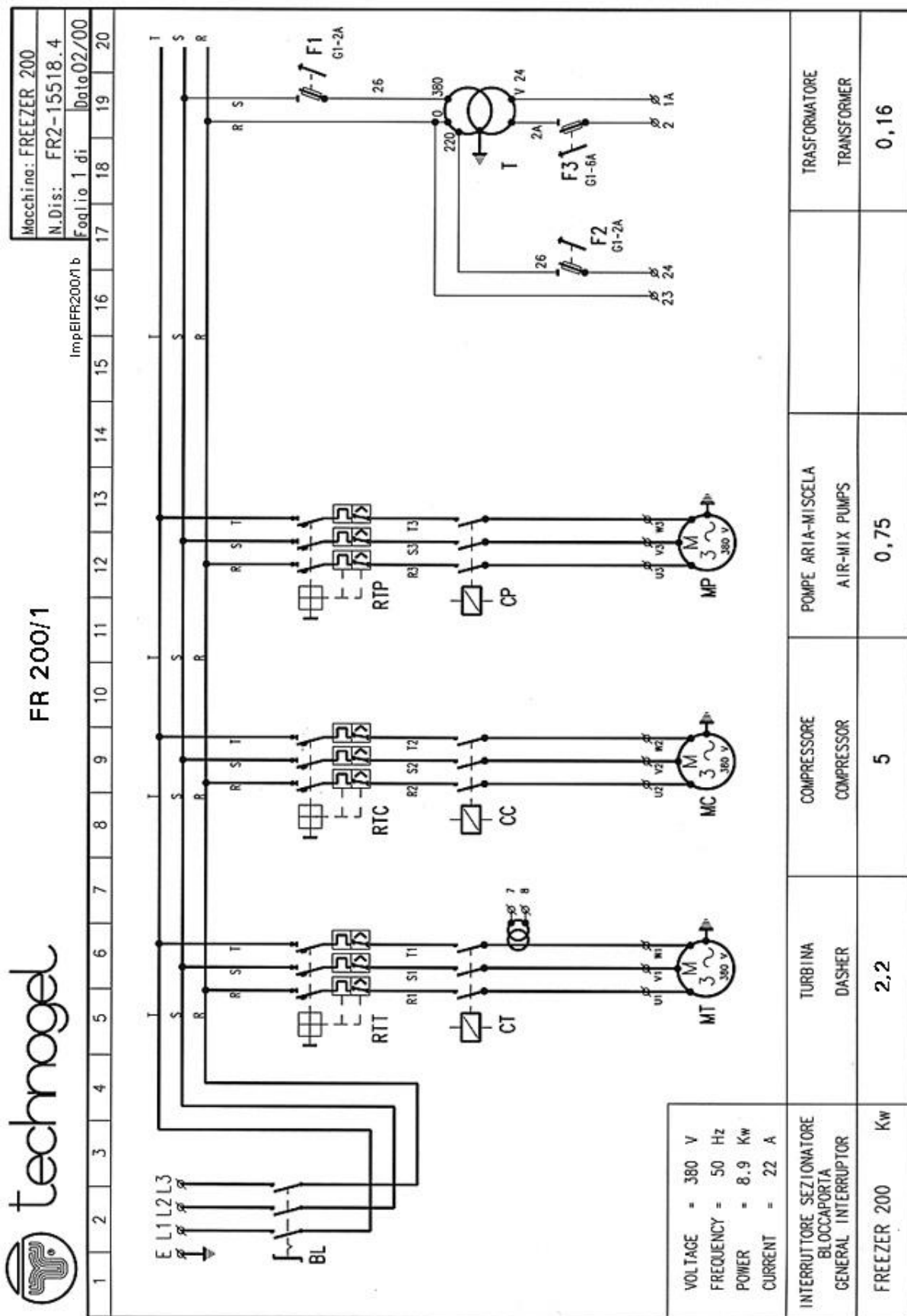
Value viscosity	220V	380/415V
	9 A.	6 A.

The machine is delivered with the above-mentioned values and calibrations performed in factory.

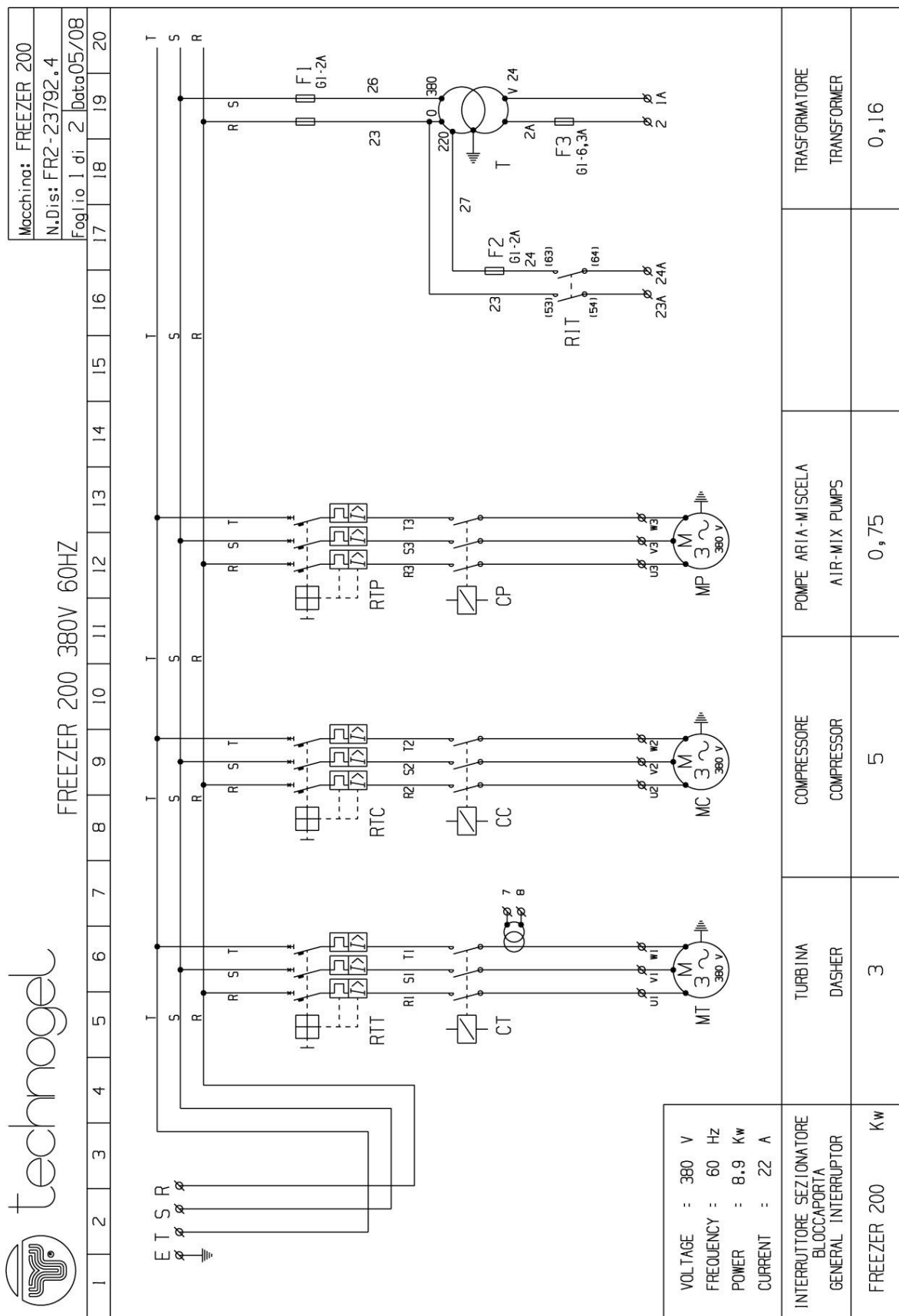
**TECHNOGEL S.p.A. IS NOT RESPONSIBLE FOR DAMAGES TO OBJECTS AND/OR PERSONNEL CAUSED BY MODIFICATIONS TO THE PRE-SET VALUES, OR FROM USING FUSES THAT HAVE INCORRECT CHARACTERISTICS AND SIZE, OR IN ANY CASE DIFFERENT FROM THOSE PRESCRIBED.**



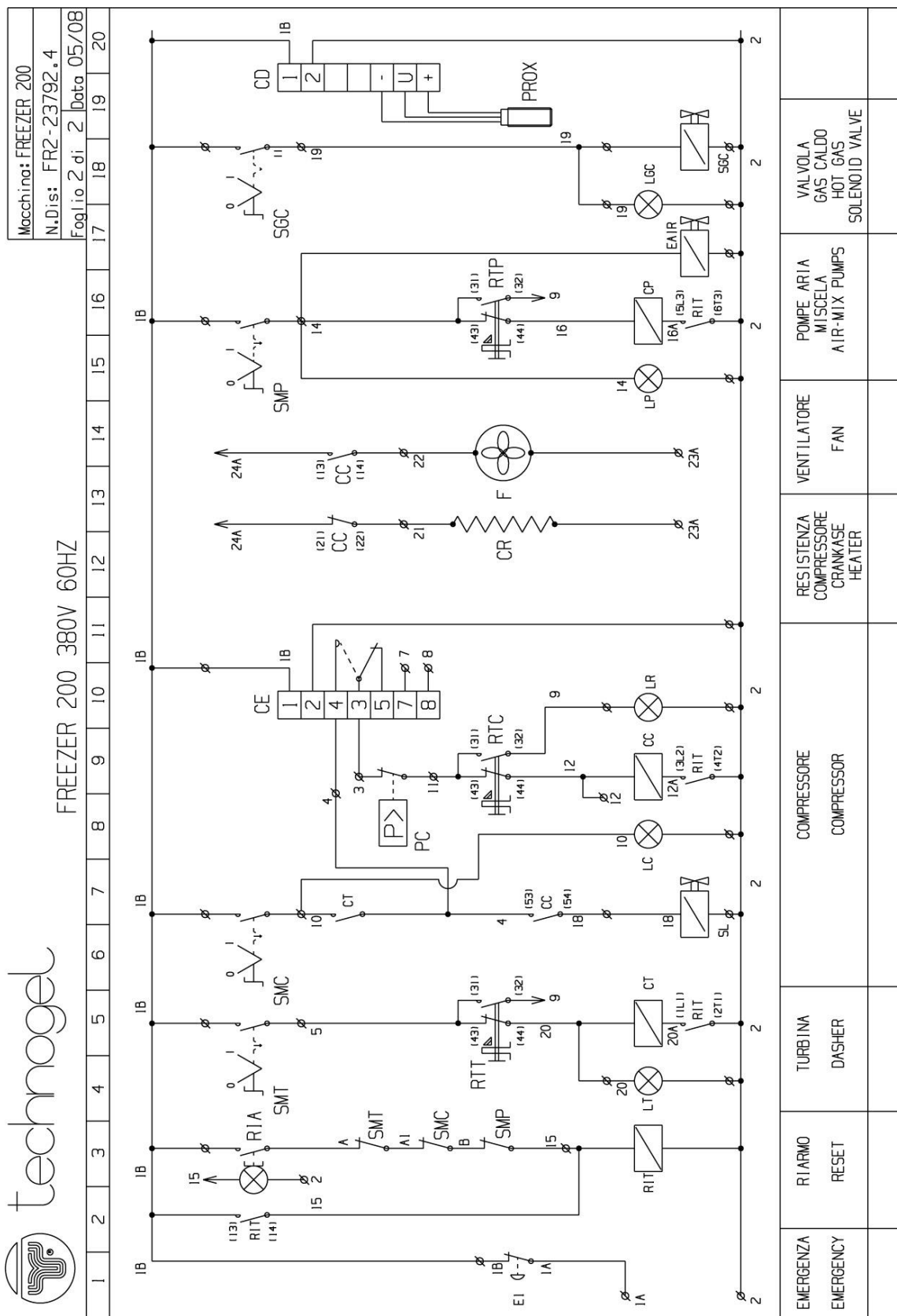
⇒ **Electric system**



⇒ **Electric system**



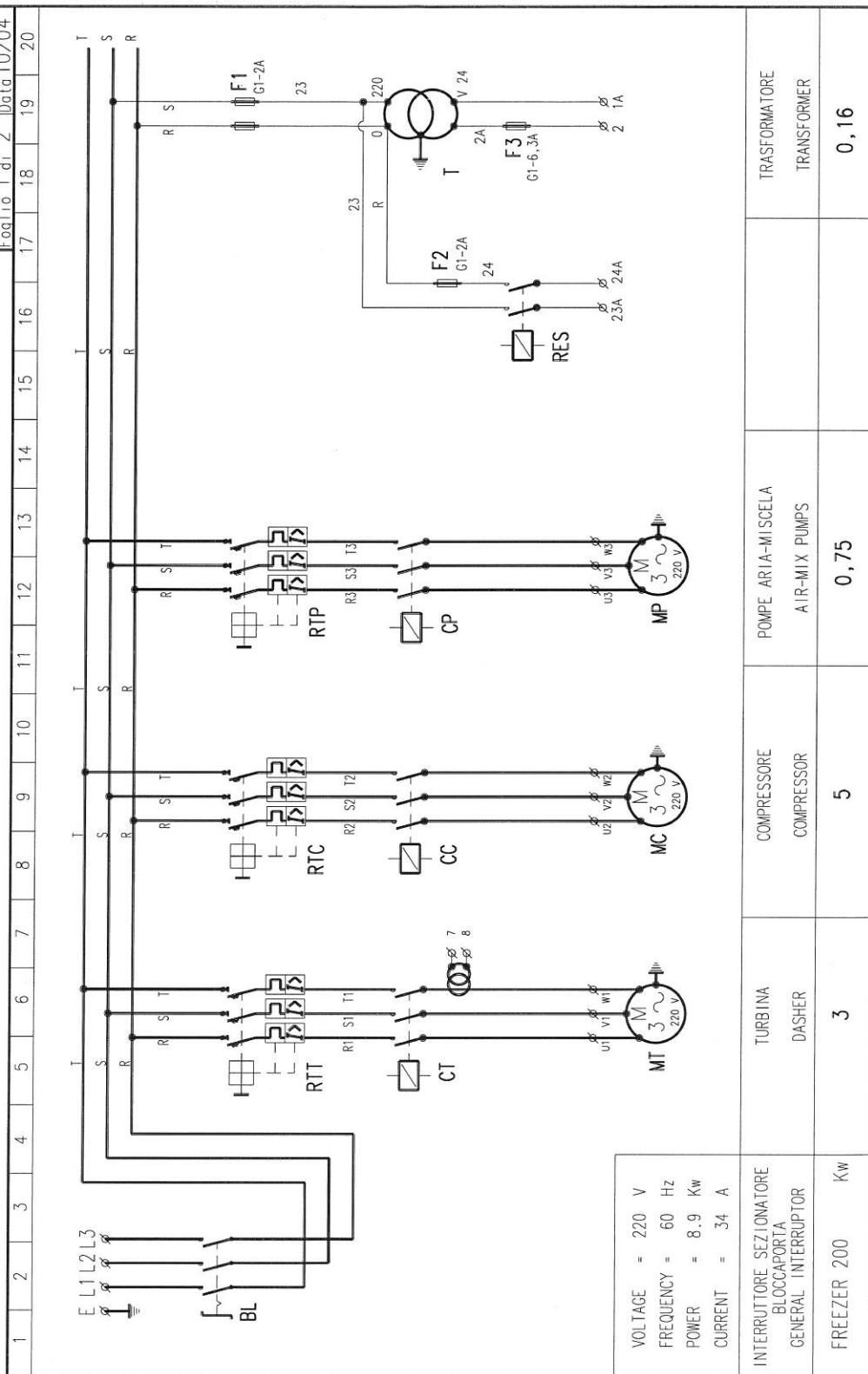
⇒ **Electric system**



⇒ Electric system

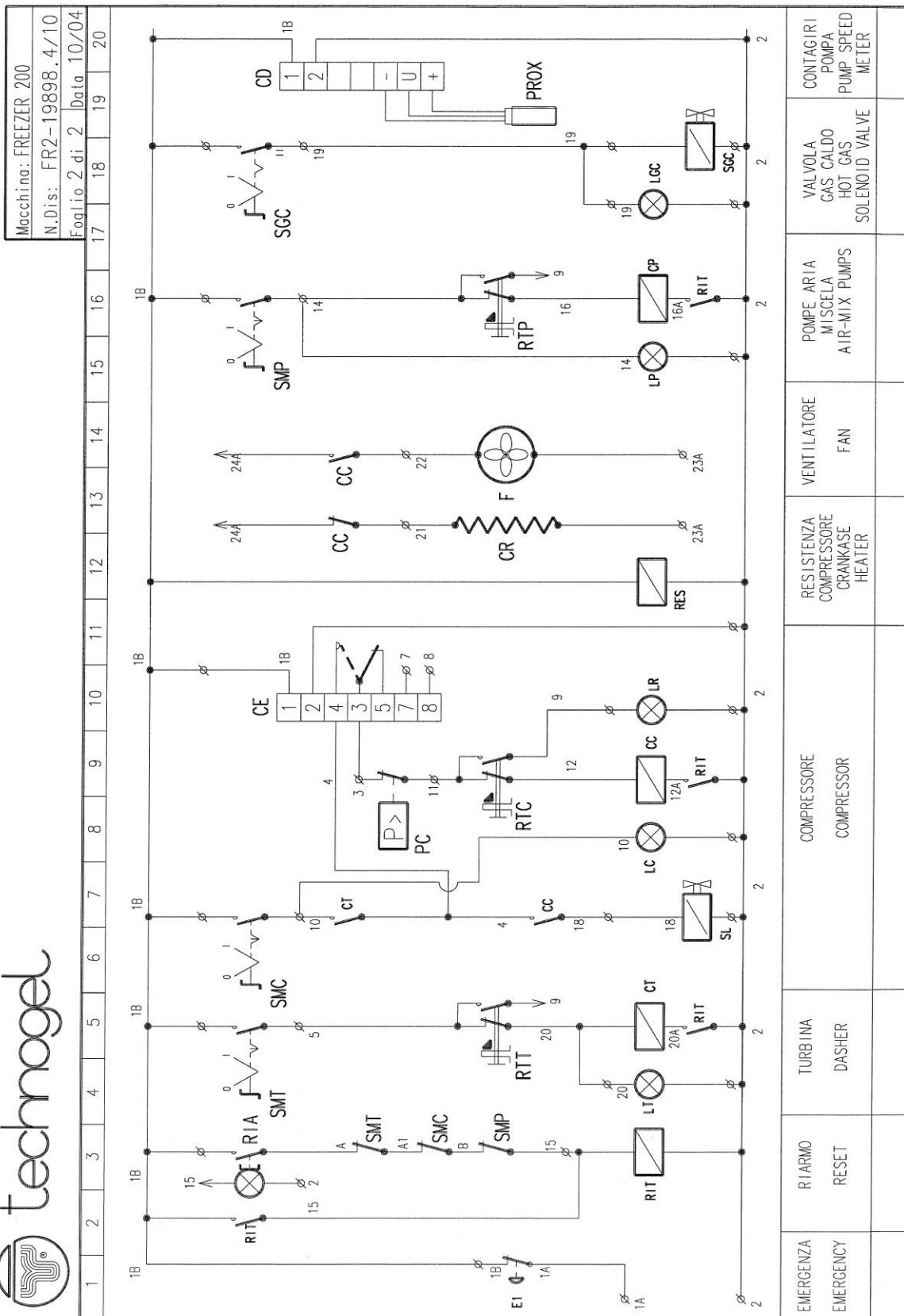


Macchina: FREEZER 200  
N.Dis: FR2-19898.4/10  
Foglio 1 di 2 Data 10/04





## ⇒ Electric system



## ⇒ Spare parts

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The next few pages describe the various units comprising the machine.

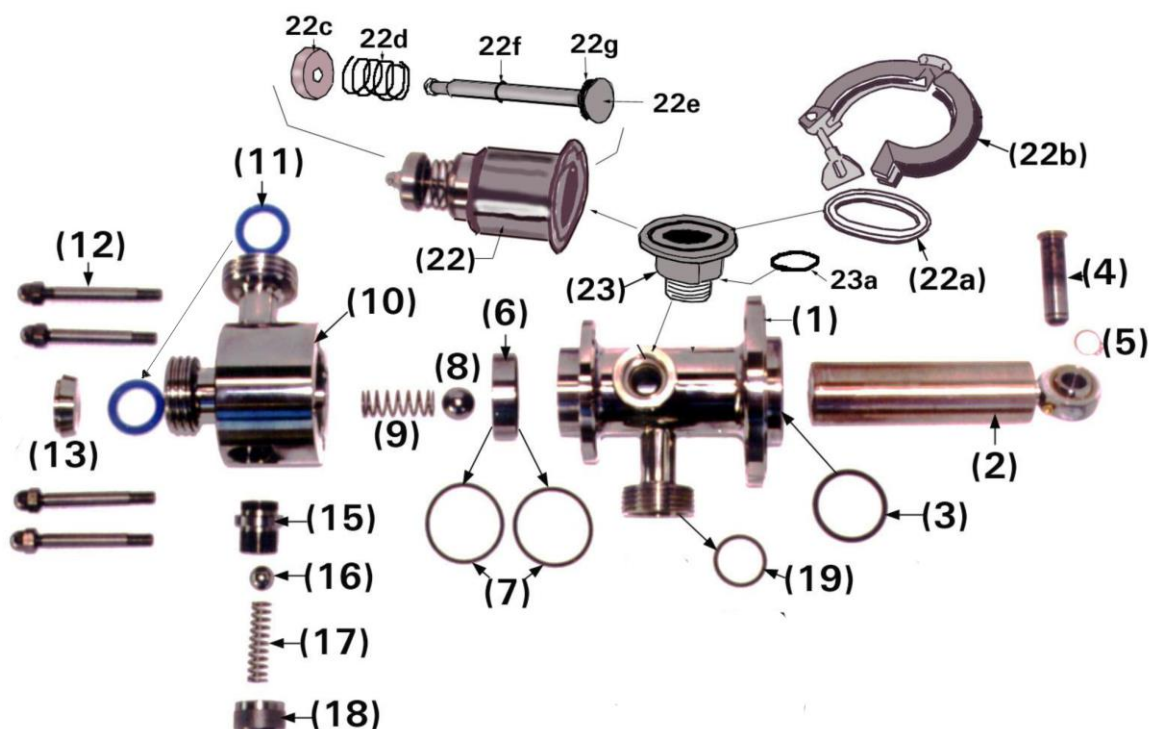
When requesting spare parts, please quote the following:

- **Type of machine**
- **Serial number of the machine**
- **Machine voltage (if the spare part required is electrical)**
- **Code number of the piece indicated or the number corresponding to the piece and the page number where it appears.**

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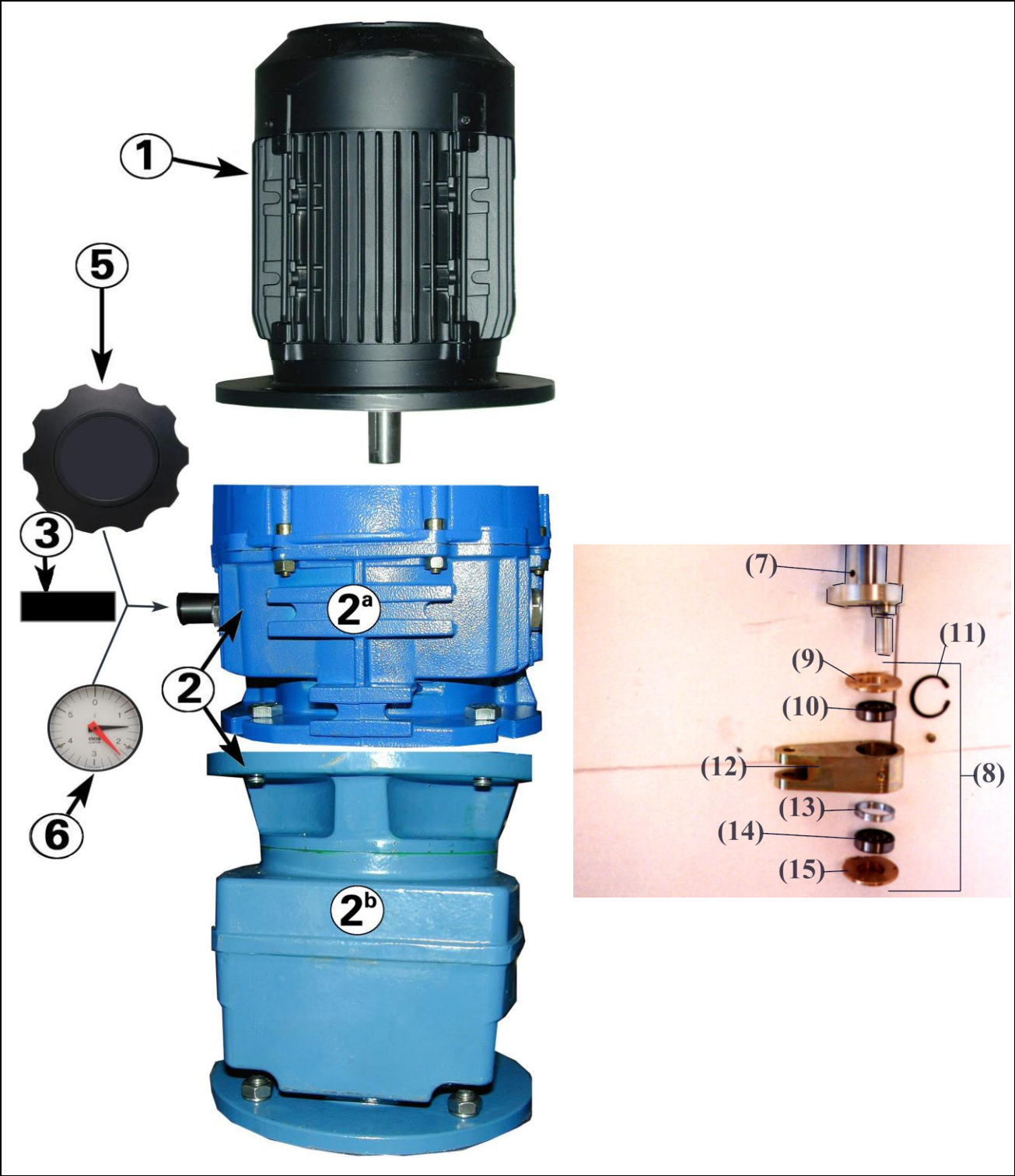
⇒

## ⇒ Pump unit FREEZER 200/1 CLAMP



Pos. #	# of Pieces	Part name	FREEZER 200/1 Part number
1	1	Pump casing	FR1-29480.3
2	1	Pump piston	FR1-2221-3/20
3	1	Pump "OR" gasket	MX-0054
4	1	Hardened piston pin	FR1-2220.0/11
5	1	Piston pin snap ring	SEEL-14E
6	1	Check valve seat	FR1-5670.0
7	2	"OR" gasket for valve seat	VR-029
8	1	Check valve ball	FR3-0068
9	1	Valve ball spring	FR1-5672.0
10	1	Pump head	FR1-3738.0
11	2	"DN20" type gasket	US-0099
12	4	Head blocking screws	FR1-2226.0
13	1	Head plug	LN-0084
15	1	Safety valve nipple	FR-2061.0
16	1	Safety valve ball	FR3-0074
17	1	Safety valve spring	FR1-2062.0
18	1	Safety valve blocking ring nut	FR1-3099.3
19	1	Rubber holder "OR" gasket	US-0099
22	1	Complete air register valve	FR1-12597.4
22a	1		US-0099
22b	1		US-0098
22c	1		FR1-4501.0
22d	1		ML-6004.6
22e	1		FR1-4500.0
22f	1	OR	MB-0012
22g	1	OR	AV-00028
23	1	junction	FR1-12882.0
23a	1	OR	AV-00066

# Pump variator assembly with connecting rod



## ⇒ Speed variator with connecting rod components list

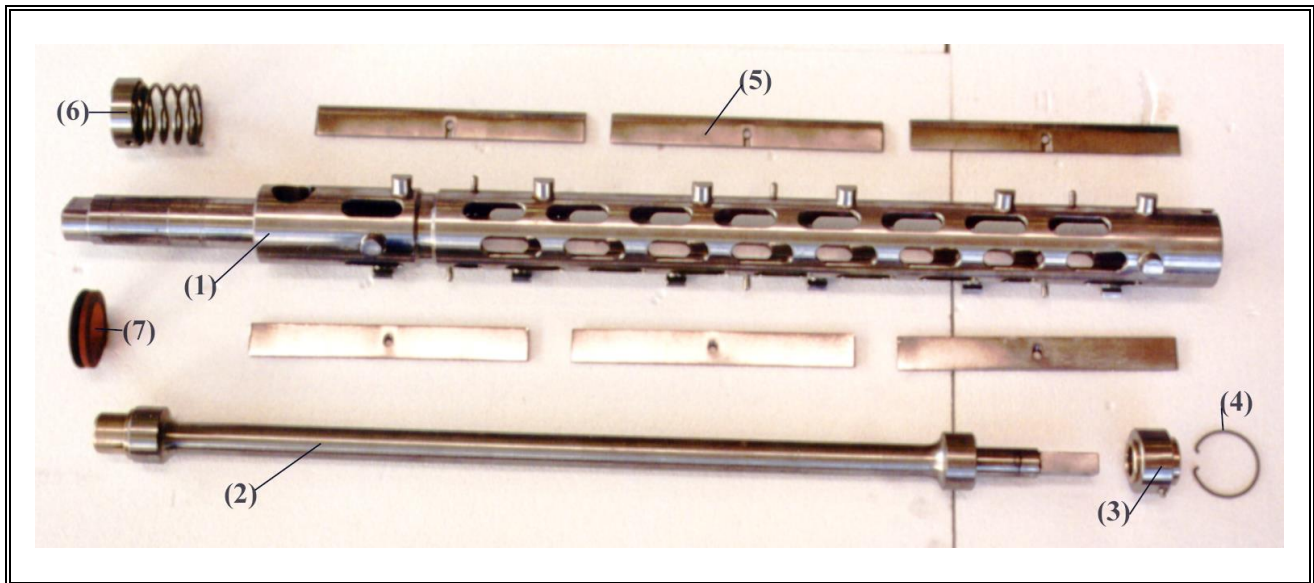
Pos.	Part name	Part number
1	Speed variator motor: <ul style="list-style-type: none"> <li>• 220/240 V 380/415 V - 50 Hz</li> <li>• 220/380 V - 60 Hz</li> <li>• 200 V - 50/60 Hz</li> </ul>	MO-0001 FR3-0101/6 FR3-0101/2B
2	Speed Variator	RV-14556.6/10
2a	Variator	RV-20376.6
2b	Gear reduction Unit	RV-20380.6
3	Speed variator slide with rack	FR1-2466.0/20
5	Speed variator control handwheel with extension	FR1-13577.3
6	Gravitational r.p.m. indicator	FR3-0239
7	Eccentric connecting rod drag	FR1-19666.3
8	Complete connecting rod	FR1-1793.4/20
9	Upper connecting rod cover	FR1-7116.0
10	Bearing	CS-7732.6
11	Snap ring	SEEA-52I
12	Connecting rod casing	FR1-1793.0/20
13	Spacer	FR1-4462.0
14	Bearing	CS-7732.6
15	Lower connecting rod cover	FR1-7115.0

### WARNING

To replace clutch (4), disassemble first motor (1) and then the variator slide (3); be careful when assembling the clutch as the carbon ring is extremely fragile.

The surface of the carbon disc and of the smooth disc must be completely clean and dry. Do not lubricate with grease or oil.

## ⇒ Dasher unit with packing gland and knives FR 200/1

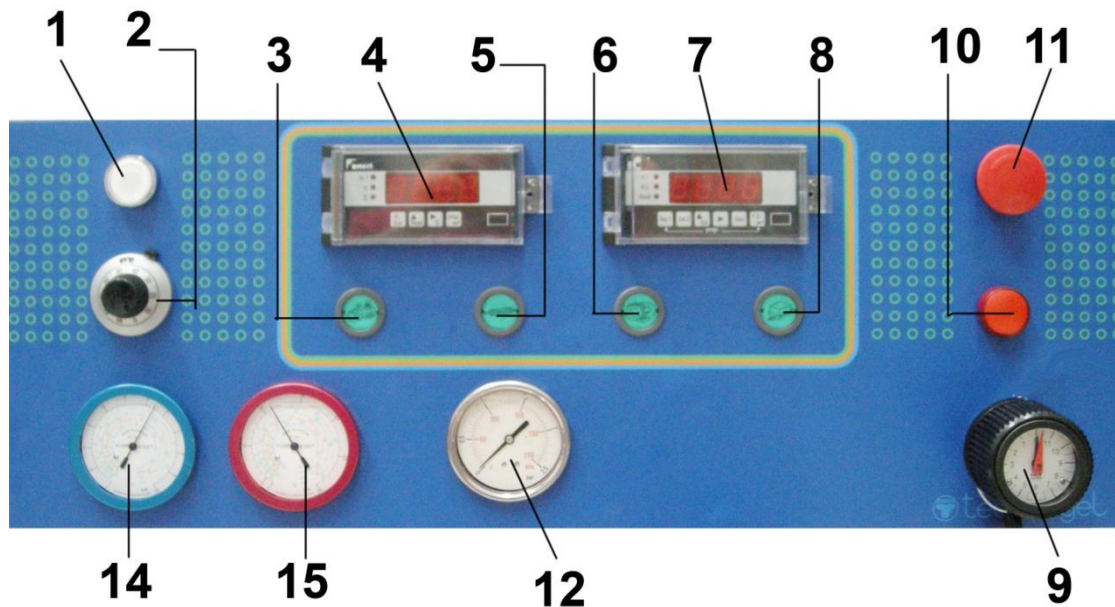


Pos.	Part name	Part number
1	Turbine casing	FR1-3798.3/30
2	Cam shaft	FR1-4518.3/10
3	Cam shaft coupling with guide bushing	FR1-4471.3
4	Bushing lock snap ring	FR1-3698.0/20
5	Ice cream scraping blade (6 pieces)	FR1-10765.0
6	Movable stuffing box (spring + metallic part + rubber seal)	FR3-0027
	- spring only	FR3-0104
	- hard metallic part with "OR" only	FR3-0110
	- "OR" gasket only	AV-00133
7	Red Rulon stuffing box (fixed part - "OR" gasket)	FR3-0103
	- "OR" gasket only	AV-00134

N.B. The two pieces pos. (2) and pos. (3), are provided with special bronze bushings.

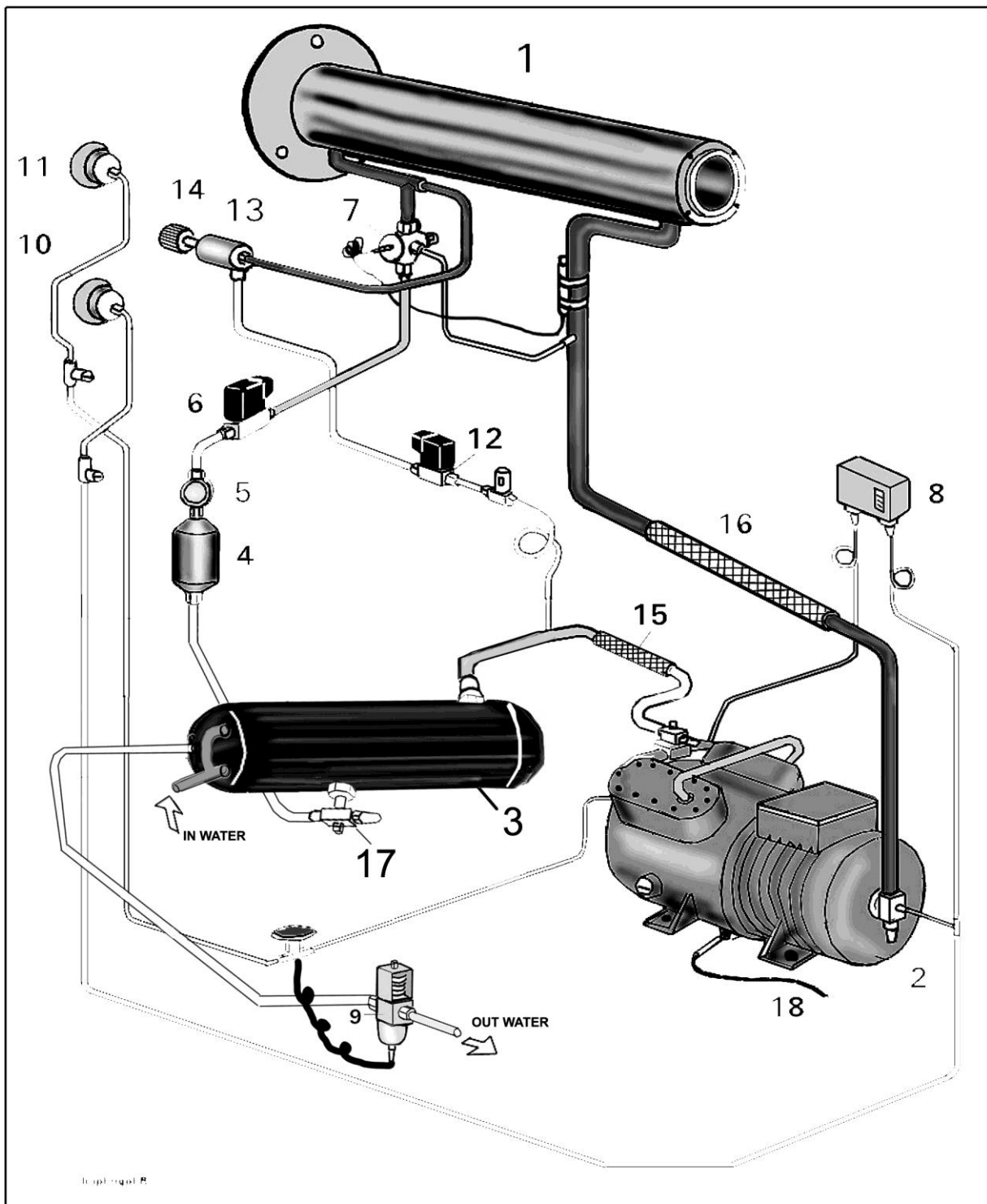


## ⇒ Control panel unit - FREEZER 200/1



Pos.	Name of component	Code
1	Complete RESET button	CC-14382.6
2	Light for pushbutton 30 V 50/60 Hz	CC-8574.6
3-5	Potentiometer OVERRUN	CC-5719.6
6-8	Pushbutton: pump – dasher – compressor and hot gas	MXT-0017
4	Light for pushbutton 30 V 50/60 Hz	CC-19709.6
7	Flowmeter	CC-15128.6
9	Amperometric viscosity control	
10	HOT GAS regulator - see details on page 40	
11	Red ALARM warning light	FR3-0164 – FR3-0166
	Bulb only	CC-8574.6
12	EMERGENCY pushbutton	CC-14776.6 + CC-14777.6
14	Manometer OVERRUN	
15	Refrigeration plant condensation gauge	FR6-0318
	Refrigeration plant evaporation gauge	FR6-0317

## Refrigeration plant – FREEZER 200/1

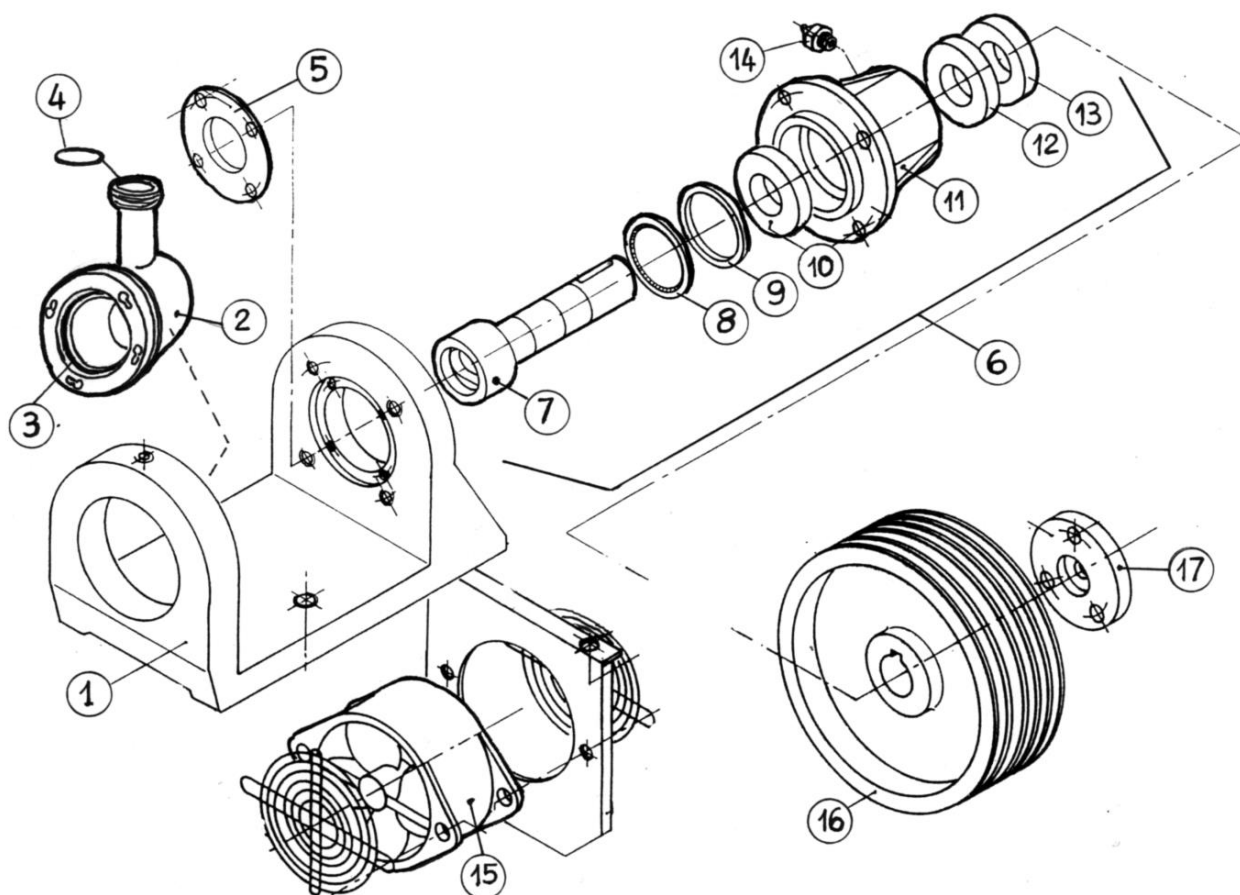




## ⇒ COMPONENTS LIST FOR REFRIGERATING SYSTEM FREEZER 200/1

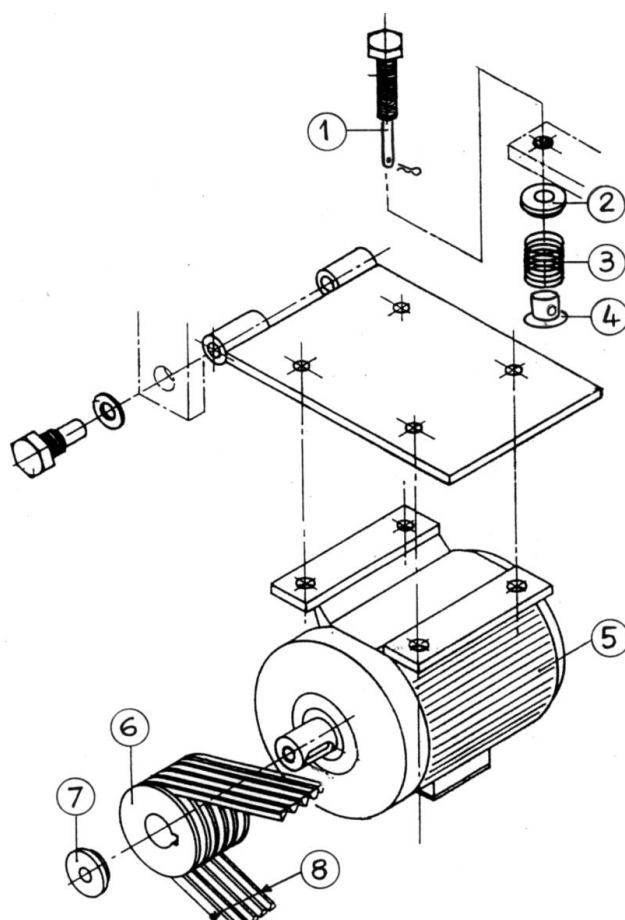
Pos.	Part name	FREEZER 200/1  Part Number
1	Freezer tube	FR1-5075.3
2	Refrigerating compressor:  - DORIN V 220/380 50 Hz V 220/380 60 Hz V 200 50-60 Hz  - COPELAND V 220/240 -380/415 50 Hz	- CP-25034.6 CP-25035.6
3	Cylinder condenser: Copper concentric tubes condenser Liquid receiver	FR1-023
4	Gas filter	CD-5623.6/M
5	Gas pilot light	M2-0049
6	Solenoid valve without electric coil - electric coil only V 24-50/60 Hz	VV-5614.6 VV-5616.6
7	Thermal expansion valve	VT-9020.6
8	High/low pressure switch	TR-5714.6
9	Water pressure switch valve	FR3-0095
10	Low pressure gauge (evaporation)	FR6-0064
11	High pressure gauge (condensation)	FR6-0065
12	Hot gas solenoid valve without electric coil - electric coil only V 24-50/60 Hz	VV-5614.6 VV-5616.6
13	Hot gas injection valve (for details see page )	FR1-5158.3
14	Knob with gravitational indicator - gravitational indicator only	FR1-3820.0 FR3-0199
15	Force piping vibration-damping flexible tube	ME-0101
16	Return piping vibration-damping flexible tube	FR3-0008
17	Condenser tap	FR6-0244
18	Compressor timing case resistor - for FRASCOLD compressor - for DORIN compressor - for BITZER compressor - for COPELAND compressor	FR3-0004  CP-012
19	Oil pressure switch (only where equipped)	

## ⇒ Support unit with flange and ventilator



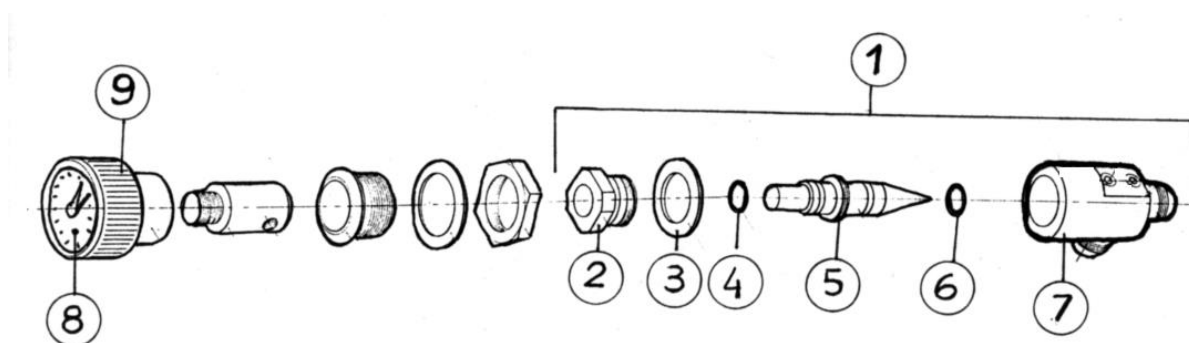
Pos.	Name of component	Code
1	Aluminium freezer holder support and support	FR1-3719.0/10
2	Freezer pipe flange	FR1-4480.3/10
3	O-ring for flange	FR3-0037
4	Mixture inlet mouth seal	R.013.32
5	Stainless steel protection flange	FR1-3713.0
6	Complete support	FR1-7257.4
7	Turbine drawing shaft	FR1-1741.0/20
8	Oil protection rotating seal	GU-7256.6
9	Spacer	FR1-1820.0/01
10	Bearing	CS-7255.6
11	Aluminium support body	FR1-3717.0/20
12	Bearing	CS-7254.6
13	Bearing	CS-7255.6
14	Greaser attachment	GU-7331.6
15	Ventilator	DFA-5048.6
16	Support pulley 1 <sup>st</sup> stage with 5 grooves	FR1-1740.0/10
	Support pulley 2 <sup>nd</sup> stage with 6 grooves	FR6-0105
17	Pulley locking flange	FR1-4522.0/10

## Dasher drawing motor unit



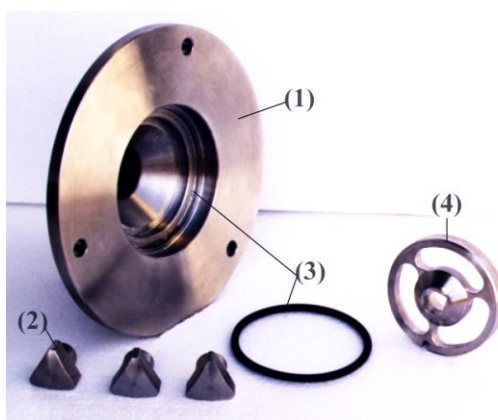
Pos.	Name of component	Code
1	Belt tensioner screw	-
2	Top belt tensioner disk	-
3	Belt tensioner spring	-
4	Bottom belt tensioner bush	-
5	Stirrer motor 220/240-380/415 V 50 Hz 220/380 60 Hz 440 60 Hz	MO-8301.6 MO-8301.6
6	Pulley motor – 5 groove	FR3-6253.0
7	Pulley locking disk	FR3-6254.0
8	Transmission belts	M2-0039

## “Hot gas” valve unit



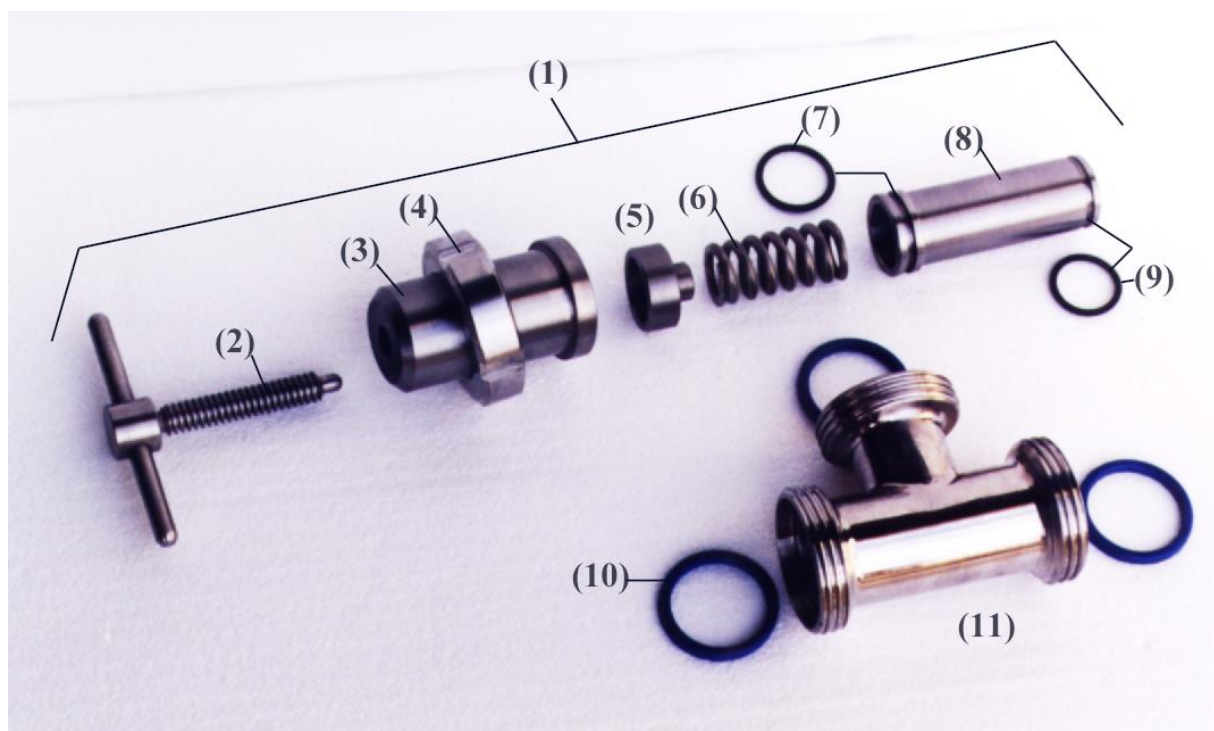
Pos.	Name of component	Code
1	Complete hot gas valve	FR1-5158.3
2	Valve closing nipple	FR1-5154.0/10
3	Washer	RCU-0016
4	Front O-ring	FR6-0062
5	Adjuster shaft	FR1-5155.0
6	Rear O-ring	FR6-0062
7	Hot gas valve body	FR1-5158.3
8	Gravitational indicator	FR3-0199
9	Adjustment knob with gravitational indicator	FR1-3820.0

## ⇒ Flange unit with turbine centering device



Pos.	Name of component	Code
1	Front flange of freezer pipe	FR1-3715.3/10
2	Flange locking wheel (no.3)	FR1-1808.0
3	O-ring	FR3-0037
4	Turbine centering device	FR1-1742.0/10

## Ice-cream outlet faucet unit

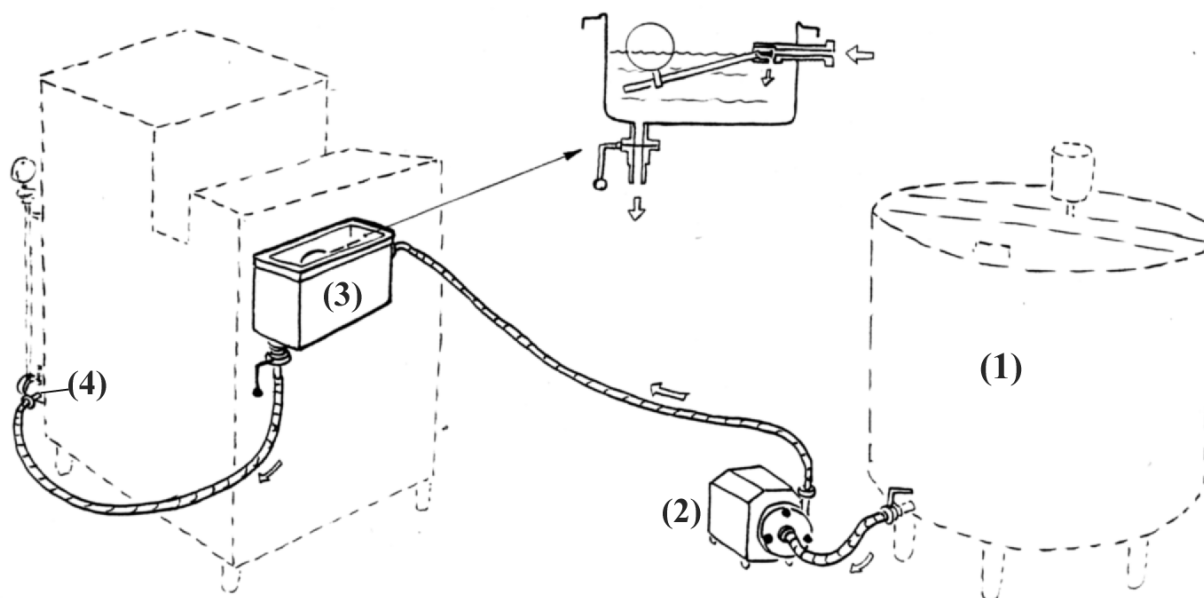


Pos.	Name of component	Code
1	Complete ice-cream outlet faucet	FR1-8134.4
2	Faucet closure threaded pin	FR1-6219.3
3	Faucet body	FR1-6218.3
4	DN40 Faucet locking device	R-012.40
5	Spring pusher platelet	FR1-3707.0/10
6	Spring	FR1-3701.0/10
7	O-ring	AV-00020
8	Faucet piston	FR1-3708.0/21
9	O-ring	AV-00060
10	DN40 washer	R-013.40
11	Faucet seat T-connector	FR1-3711.2/12

## Machine operation with servofreezer

As illustrated in the drawing below, the **servofreezer (3)** is generally located behind the machine, raised from the ground. The pump **(2)** which supplies the servofreezer must be placed near the mixture storage tank, which in turn may be as far as 15 metres away from the freezer.

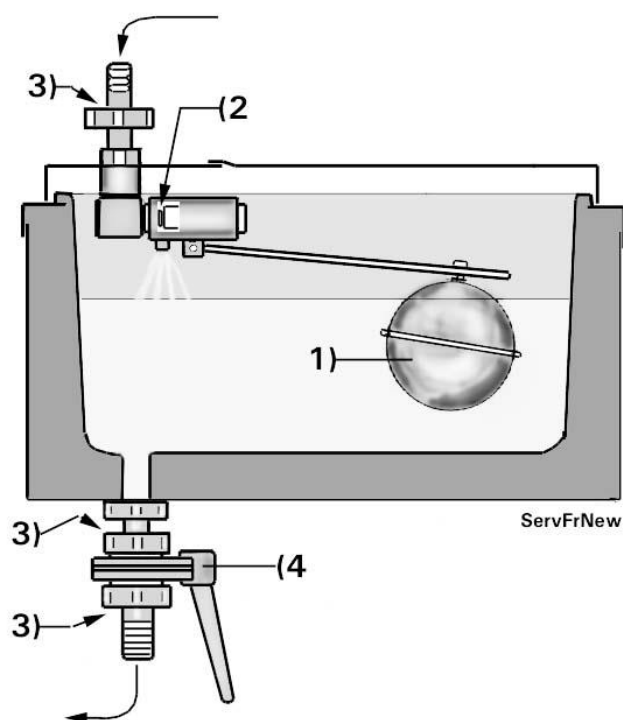
The piping that connects the servofreezer **(3)** to pump **(2)** must be made of rubber or plastic. We strongly advise not to use metallic piping.



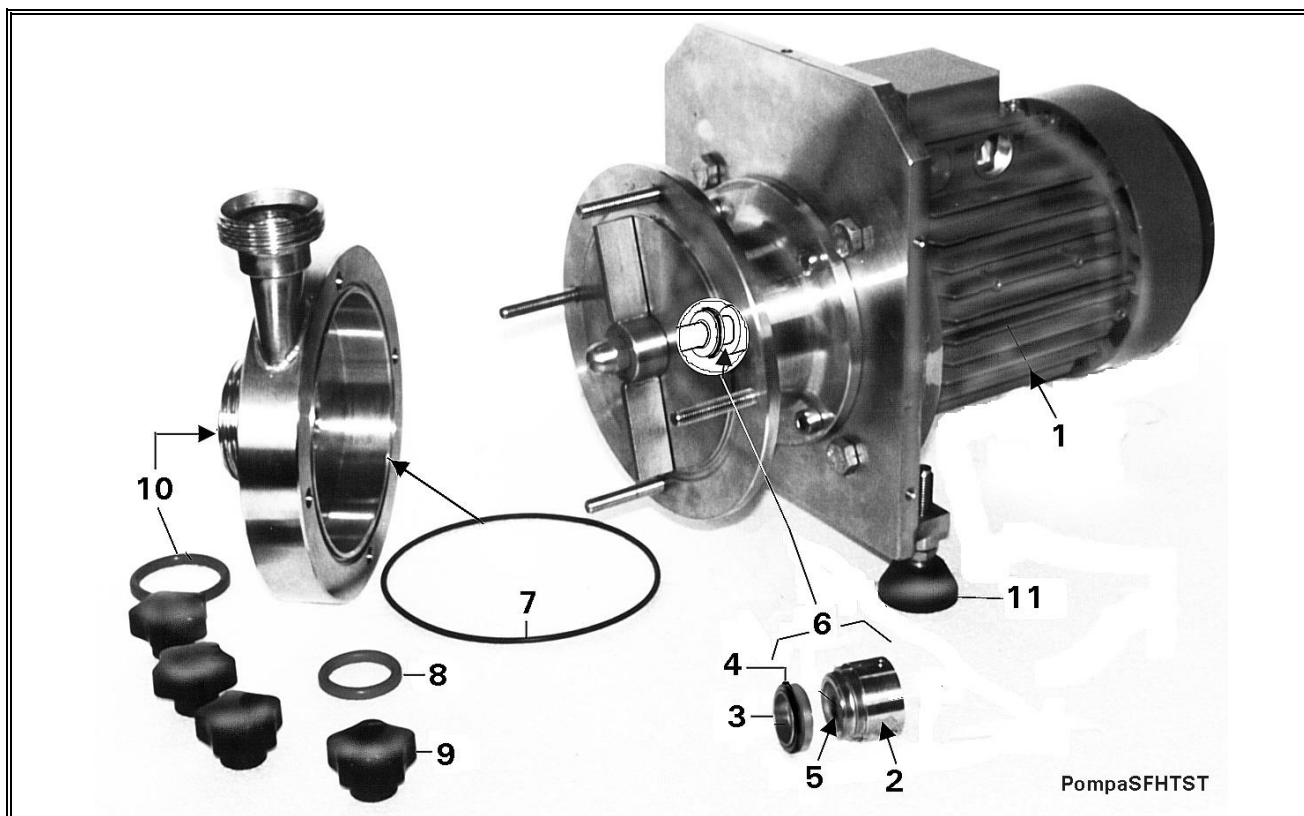
In case **Technogel S.p.a.** has supplied only the servofreezer and that the Client must install the pump, we recommend installing a **centrifugal** pump with a maximum head of **10 metres (thrust pressure)**.

In case the storage tank is positioned above the freezer (for example, on the floor above), just connect the tank outlet directly to the servofreezer, without the aid of a pump.

## Spare parts for servofreezer



Pos.	Part name	Part Number
1	Stainless floating ball	SF-012
2	Mixture inlet small piston seal gasket	MP-0008
3	DN20 connection gasket	TM-0006
4	DN25 MF throttle tap	MW-00227/2



Pos.	Part name	Part Number
1	Motor 0.75 hp 1400 r.p.m.220/240-380/415 V50 Hz 220/380 V60 Hz	MO-0008 DFA-0029/6
2	Pump stuffing box rotating part	MW-0172
3	Stuffing box fixed part	MW-0080
4	Fixed part "OR" gasket	AV-00125
5	Rotating part "OR" gasket	AV-00124
6	Complete stuffing box	MW-00166
7	Pump cover "OR" gasket	T1-0081
8	Force main DN25 gasket	TM-0006
9	Pump cover closing handwheel	DE-0020
10	Inlet union DN40 gasket	R-013.40
11	Pump support foot	BA-0002



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