

**INSTRUCTION
AND
SERVICE PART MANUAL
FOR**

FREEZER CS 1100-2P, R404a

Serial Number : F-0144

**. CUSTOMER : Alfred & Co Ltd
. FACTORY : Wembley - GB**

. DELIVERY : March 1998

MACHINERY WORLD

. VERSION : 1 of March 1998

- . When requesting information about your machine always state: model of the machine, serial n°, order n°.**
- . Keep this manual in a safe place for future reference.**

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Operating instructions
Instruction manual
Process controller programming

**PRESSURE AND TEMPERATURE JM SERIES
INDICATOR**

Programming instructions
Operating instructions
Instruction manual
Indicator programming

CS FREEZER RUNNING TEST REPORT**REFRIGERATION SYSTEM**

Refrigeration plant
Compressor refrigerant and oil charge
Technical Danfoss documentation
Operating instruction Compressor

CYLINDER PRESSURE CONTROLLER

Frequency/rate transmit.: Instruction manual
Pressure transmitter: operation manual

SPARE PARTS**STANDARD SPARE PART KIT DELIVERED WITH THE MACHINE****RECOMENDED SPARE PARTS LIST****WIRING DIAGRAM**

INTRODUCTION

The purpose of this manual is to provide instructions for the safe installation, operation and maintenance of your SOREN equipment.

SOREN is committed to provide quality equipment and customer satisfaction.

Specialized personnel has to read and understand the entire manual before removing from the crate and installing the equipment.

Should you have any questions concerning any information contained in this manual, contact SOREN s.n.c.

SOREN reserves the right to improve, change or modify the construction of its equipment or any parts thereof without incurring any obligation to provide like changes to equipment previously sold.

Keep this manual in a safe place for future reference.

The note **“not applicable”** written on same paragraph of this manual means that the features described on same are not present on this machine/plant

1. STANDARD WARRANTY

Obligation of Seller (SOREN): during the warranty period, Seller shall repair or, at Seller's option, replace parts determined by Seller to be defective in material or workmanship. The warranty period is one (1) year from the date of delivery to Buyer F.O.B. point of manufacture. The foregoing shall be the sole obligation of Seller under this warranty with respect to the supply of this machine and/or other equipment.

- ◆ **Warranty Exclusion:** Repair or replacement of parts required because of misuse, improper care of storage, negligence, alteration, accident, or lack of specified maintenance are excluded from Seller's warranty obligations.
 - Normal wear parts are also excluded from this warranty.

- ◆ **Limitation of liability and remedies:** The liability of Seller for breach of any warranty obligation is limited to:
 - the repair or replacement of the equipment on which the liability is based; or at Seller's option
 - the refund to Buyer of the amount paid by Buyer to Seller for said equipment.
- ◆ **Seller shall not be liable for incidental or consequential damages of any kind whatsoever. The remedies set forth herein are exclusive.**
- ◆ **Infringement:** Seller will not be liable for the infringement of any patent by the Buyer's use of any equipment or materials delivered.

2. IDENTIFICATION OF THE MACHINE

SOREN CS "freezers" are machines for continuous ice cream production starting from ice cream mix at 4°C by refrigeration and adjustable air injection. They are designed and manufactured according to the up-dated technological knowledges and are classified as follows:

- ◆ **Model, meaning:**
 - freezer type (e.g. CS)
 - hourly maximum ice cream production (100% overrun) in liters (e.g. 100; 200, 400, 800, 1100)
 - pump n. (e.g. 1P; 2P)
- ◆ **Year**
- ◆ **Serial n**
- ◆ **Refrigerant type**

On the name plate (see illustration below) the following particulars are marked:

- ◆ Name and address of the manufacturer
- ◆ CE mark
- ◆ Model
- ◆ Serial number
- ◆ Year of construction

 SOREN	
SOREN s.n.c. Via Pacinotti, 29 20094 CORSICO (MI) Italy Tel. (02) 45177.1 - Fax 02 45177.340	
Macchina	<input type="text"/>
Serie n°	<input type="text"/>
Anno	<input type="text"/>

3. SAFETY

3.1. GENERAL SAFETY INFORMATION

The following information provides specific information on hazardous conditions which are inherent in the Continuous Ice Cream Freezer.

The SOREN Continuous Ice Cream Freezer is a mechanical freezing machine which by the very nature of its design creates certain unavoidable hazards. Safe operation requires the application of sound and prudent operating, maintenance and servicing procedures under the direction of properly trained supervisors.

Our objective in providing instructions and warnings is to identify each area of potential hazards and its level of severity and to guide each worker for safe operation, service and maintenance procedures.

SOREN equipment is designed to provide minimum operator access to hazardous areas while providing adequate access for service by trained personnel. Hazardous areas are provided with guards. Various types of fasteners may be used for the guards depending on how frequently routine access is required. Regardless of the type of fastener used, the mere existence of a guard should alert the worker to the presence of a hazard. Never operate or test run the equipment with a guard removed, unless under the supervision of properly trained and authorized personnel. Then use extreme caution to avoid the hazard.

DEFINITIONS:

DANGER !

An immediate hazard with a possibility of severe personal injury or death if instructions, including recommended precautions, are not followed

WARNING !

Hazard or unsafe practices which could result in severe personal injury or death if instructions, including recommended precautions, are not followed.

CAUTION !

Possible hazard or unsafe practices with could result in minor injury or damage to product or property if instructions including recommended precautions, are not followed.

3.2. SAFETY FIRST

SOREN equipment is designed and manufactured with due consideration and care for generally accepted safety standards. However, like any mechanical device, the proper and safe performance of this equipment depends upon using sound and prudent operating, maintenance and servicing procedures under properly trained supervision.

SAFETY

For your protection, and the protection of others, learn and always follow the safety rules outlined in this booklet.

3.3. OPERATING ZONE

An operating zone should be established around all machines. A brightly painted guard rail or warning stripe should define the zone. Only the operator or other authorized personnel should be within the operating zone when machine control circuits are energized or the machine is running. No tools or other equipment should be kept within the operating zone.

3.4. INSTALLATION

WARNING !

Power sources, such as electric and air, should be installed by trained and authorized personnel only.

3.5. SAFETY INSPECTION

Before starting a machine:

- Be absolutely positive all guards and safety devices are installed and operative.
- Be sure all personnel are clear of the machine.
- Remove (from the operating zone) any materials, tools or other foreign objects that could cause injury to personnel or damage the machine.

- Make certain the machine is in operating condition.
- Make certain all indicating lights, horns, pressure gauges or other safety devices or indicators are in working order.

After shutdown:

- Make certain all air and electrical power is turned off.

3.6. GENERAL OPERATING SAFETY

- Do not operate this machine until you read and understand the operating instructions and become thoroughly familiar with the machine and its controls.
- Never operate a machine while a safety device or guard is removed or disconnected.
- Do not start the machine until all other personnel in the area have been warned and have moved outside the operating zone.
- Remove any tools or other foreign objects from the operating zone before starting.
- Absolutely do not have loose clothing, neckties, necklaces or unrestrained long hair near an operating machine.
- Do not wear gloves, rings, watches, bracelets or other jewelry near an operating machine.
- Keep the operating zone free of obstacles that could cause a person to trip or fall towards an operating machine.
- Never sit or stand on anything that might cause you to fall against the machine.

SAFETY

- Know the **EMERGENCY STOP** procedure for the machine.
- Air and electrical power must be off when the machine is not in use.
- Never manually operate limit switches with power on.
- Keep alert and observe indicator lights and warnings that are displayed on the machine.
- Never leave the machine unattended while in operation.
- Do not operate faulty or damaged equipment. Make certain proper service and maintenance procedures have been performed.
- Avoid placing fingers, hands, or any part of your body into the machine or near moving parts when control circuits are energized.

3.7. SERVICE AND MAINTENANCE

SAFETY

- Do not service a machine until you are thoroughly qualified and familiar with the tasks to be performed.
- Never operate any controls while other persons are performing maintenance on the machine.
- Do not bypass a safety device.
- Always use the proper tool for the job.
- Never open covers that house electrical components when power is on.
- Only perform maintenance on a machine in motion when properly trained and required to do so. When directed to make

adjustments on machines in motion, extreme care must be taken.

- All air pressure must be relieved before performing maintenance or loosening connection on any pressurized system.
- Air and electrical power are to be turned off unless they are absolutely required for the specific servicing being performed.

Do not enter a confined space without first checking for toxic fumes and providing standby personnel on the site.

3.8. ELECTRICAL HAZARD

DANGER!

The Continuous Ice Cream Freezer is normally powered by electric motor(s) and have many other electronic controls and devices. This creates a hazard of electrical shock which could cause severe injury or even loss of life.

To minimize the risk from this inherent hazard:

- All electrical/electronic maintenance should be performed by trained and authorized electricians only.
- Always assume that power is on and treat all conditions as live. This practice assures a cautious approach which may prevent an accident or injury.
- To remove the load from circuit or equipment, open disconnect or breaker and lock in open position.

SAFETY

- Make certain that the circuit is open by using the proper test equipment.
- Capacitors must be given time to discharge, otherwise it should be done manually with care.
- There may be circumstances where "trouble-shooting" on live equipment may be required. Under such conditions, special precaution must be taken as follows:
 - Make certain your tools and body are clear of the ground
 - Extra safety measures should be taken in damp areas
 - Be alert and avoid any outside distractions.
 - Before applying power to any equipment, make certain that all personnel are clear of the machine.
 - Control panel doors should be open only when checking out the electrical equipment or wiring. After closing the panel door, make certain that (on those panels where applicable) the disconnect handle mechanism is operating properly.
- All covers on junction panels should be closed before leaving any job.
- All electrical apparatus must be properly grounded and overload protected.
- All electrical connections should be protected by confining them within a sealed junction box.

3.9. MECHANICAL HAZARD

DANGER !

The Continuous Ice Cream Freezer has mechanical components which operate the dasher(s) and pumps (belts, pulleys, couplings). These components are guarded and/or enclosed.

However, it is necessary to remove the guards/enclosures to perform routine maintenance cleaning or services procedures. These components may be powered by electric motors which may start unexpectedly during these procedures severe injury or even loss of life could result.

Dasher and Coupling

- In order to assure maximum sanitary operating conditions or for certain maintenance and servicing procedures it is necessary to disassemble and assemble the dasher.

DANGER !

Should the dasher start rotating unexpectedly during servicing and maintenance procedures severe injury or loss of life could result. ALWAYS turn off the electrical power supply and LOCK OUT using a locking device for which only the person doing the work has the key before performing service or maintenance.

SAFETY

Rotating Coupling: NEVER remove the couplin guard(s) or service the coupling assembly without locking out the drive power source such that only the person involved has the key.

Reaching in or around the coupling while the freezer is running could cause severe injury or loss of life.

Dasher: The dasher assembly is heavy. This creates a hazard of severe injury for anyone handling it incorrectly. Provide enough workers or mechanical lifting assistance to enable removing, installing and servicing the dasher safely.

To minimize the risk from these inherent hazards:

- Only trained and authorized mechanics should perform maintenance or service work on the freezer
- INSTALL an emergency shut-off switch within easy reach of the operator.
- ALWAYS turn off the electrical power supply and LOCK OUT using a locking device for which only the person doing the work has the key, BEFORE performing any of the following:
 - Removing the guards from the motor coupling or from the front bearing.
 - Performing any maintenance or service on the motor(s).
 - Removing the front door.
 - Disassembling the pump cover or rotors
 - Assembling or disassembling the dasher

SCRAPER BLADES

The scraper blades assembled on the dasher must be sharp to work correctly. This creates

a hazard of severe cuts for anyone handling the dasher assembly or scraper blades incorrectly. Wear protective clothing for the hands and arms when handling the dasher assembly or the scraper blades. Avoid contacting the cutting edge of the scraper blades.

DANGER !

All dasher have removable scraper blades. These blades can be very sharp and cause severe injury if not handled properly.

To minimize the risk of cuts from these blades when removing and installing the dasher:

- When removing the dasher by hand, always use heavy protective gloves (such as welders gloves) that reach to the elbows.
- Always work with at least one other trained person when removing or installing the dasher.
- Remove each blade from the dasher as soon as possible to remove the danger from others in the immediate area.
- Always store the blades together in a labeled container when not in use.

SAFETY

3.10. THERMIC HAZARDS

DANGER !

During cleaning and sanitizing front door and pumps surfaces can reach high temperatures (above 65°C) and cause severe burns if touched. To avoid the risk, during these operations, personnel must keep away from these parts of the machine (no manual intervention is necessary during cleaning and sanitizing).

3.11. COMPRESSED AIR HAZARD

The CS Freezer uses compressed air for the following functions:

- Added to the product to produce "overrun"
- Operate the bypass covers on the product pump

Compressed air creates certain unavoidable hazards. Compressed air may retain the power to move objects even after the supply is turned off. Air operated mechanical devices may operate unexpectedly from a remote control signal. If the air supply pressure exceeds design limits, plastic line connections could come apart and move around uncontrolled. These create a hazard of severe injury to personnel working in the area.

To minimize the risk from these inherent hazards:

- All installation of compressed air must be performed by trained and authorized pipefitters only.

- All compressed air installation must comply with all applicable codes and standards.
- Install a hand operated shut-off valve in the supply line to allow isolation of components before service or maintenance
- DO NOT perform any maintenance or service on the compressed air system components unless the supply valve to the system has been closed and locked or tagged.
- Train operating and maintenance personnel to always fully reconnect the removable air lines used to operate the pump bypass feature.

SAFETY

3.12. CLEANING HAZARD

DANGER!

The use of water around electronic equipment enclosures creates a hazard of electric shock which could cause severe injury or loss of life. Turn off the electric power supply and lock out before using any water for cleaning or rinsing around the electrical enclosures. Be certain the doors on all electric enclosures are closed and fasteners tightened. Never spray water directly into any electric controls or enclosures.

DANGER!

To properly clean and sanitize the Continuous Ice Cream Freezer for use with food products it may be necessary to use chemical solutions. Many of the commonly used chemical used chemical solutions could cause severe injury to personnel if contacted. The hazard is especially severe for eyes, skin or inhalation.

To minimize the risk from these inherent hazard:

- Thoroughly train all personnel working with cleaning or sanitizing chemicals in their safe handling and disposal following use.

Manual Cleaning Procedure:

- Do not use toxic and/or flammable solvents to clean a machine.
- Turn off air and electrical power prior to cleaning a machine.
- Equip all personnel using cleaning/sanitizing solutions with protective clothing, including eye protection.
 - Keep electrical panel covers closed and power off when washing a machine.
 - Always clean up spills around machine as soon as possible.
 - Never attempt to clean a machine while it is operating.

Cleaning In place procedure:

- Make certain that all connections in the cleaning circuit are tight to avoid contact with hot water or cleaning solutions.
- When the cleaning cycle is controlled from a remote or automated control center, establish fail-safe procedures to avoid automatic start-up while servicing equipment in the circuit.
- On equipment which includes manways, make certain covers are closed and latched prior to starting the cleaning cycle.

SAFETY

3.13. HALOCARBON HAZARD

If the Continuous Ice Cream Freezer uses halocarbon as a refrigerant for freezing the product, the following precautions are important. Halocarbon (R-22 or R-404A) is colorless and clear in appearance with only a slight ethereal odor. It is heavier than air and thus displaces much needed oxygen for breathing. Thus it has the potential hazard of producing unconsciousness and even loss of life.

Do not open any connection into the refrigeration system until all refrigerant is evacuated and the freezer is isolated by closing the hand valves in the liquid and suction lines.

DANGER !

A sudden release of refrigerant liquid sprayed on the skin can cause serious damage to skin tissue. Keep eyes and exposed skin areas away from any potential refrigerant discharge. If such a refrigerant burn occurs, flush immediately with cold water, apply ice packs if severe and see a physician at once.

Refrigerant R-22 and R-404A are generally considered to be chemically nontoxic and nonflammable; however, any gas under pressure can be hazardous because of the energy latent in the pressure alone. Never fill any refrigerant gas cylinder completely with liquid. Always limit to approximately 80% liquid full. This will allow for normal expansion.

To minimize the risk from this inherent hazard:

- The refrigeration installation must comply with all applicable codes and standards
- The refrigeration installation must be performed only by pipefitters trained and authorized for halocarbon refrigeration systems.
- Maintenance and service of the refrigeration system must be performed only by trained and authorized service personnel.
- Install a hand operated shut-off valve in the line to each service connection to allow isolation of components during service or maintenance.
- Thoroughly train all operating and maintenance personnel in the areas of:
 - use and care of personal protective equipment;
 - the hazardous effects of halocarbons;
 - first aid procedures.

WARNING !

When evacuating or purging any sistem containing R22 or R404A, always ventilate the area immediately. Concentrations in the presence of open flames such as gas range or gas water heater pilot lights may break down and form small amount of harmful phosgene gas.

SAFETY

- Develop and use a plant-wide program for the safe operation and maintenance of the halocarbon refrigeration system and all associated equipment.
- Provide personal protective equipment including protective clothing and respiratory protection.
- Provide adequate ventilation for the processing area.
- Provide first aid supplies.

3.14. AMMONIA HAZARD

If the Continuous Ice Cream Freezer uses ammonia as the refrigerant for freezing the product, the following precautions are important. Ammonia NH₃ (R717), is a hazardous chemical, which, when used incorrectly can cause severe injury or even loss of life.

Some specific hazards are:

- Breathing of ammonia gas (concentration over 400 ppm, exposure time over 1 hour) can injure the respiratory system, or in severe cases, cause suffocation.
- Extremely high concentrations of ammonia gas (over 4% by volume) are flammable by spark ignition and may explode.
- Direct contact to eyes with ammonia liquid can cause blindness.
- Direct contact to skin with ammonia liquid can cause severe burns.

Do not open any connection into the refrigeration system until all refrigerant is evacuated and the freezer is isolated by closing the hand valves in the liquid and suction lines.

WARNING !

A sudden release of refrigerant liquid sprayed on the skin can cause serious damage to skin tissue. Keep eyes and exposed skin areas away from any potential refrigerant discharge. If such a refrigerant burn occurs, flush immediately with cold water, apply ice packs if severe and see a physician at once.

Pressured gas can be hazardous because of the energy latent in the pressure alone.

Never fill any refrigerant gas cylinder completely with liquid. Always limit to approximately 80% liquid full.

This will allow for normal expansion .

To minimize the risk from this inherent hazards:

- The refrigeration installation should comply with all applicable codes and standards.
- The refrigeration installation must be performed only by pipefitters trained and authorized service personnel.
- Maintenance and service of the refrigeration system must be performed only by trained and authorized service personnel.
- Install a hand operated shut-off valve in the line to each service connection to allow isolation of components during service or maintenance
- Thoroughly train all operating and maintenance personnel in the areas of:
 - use and care of personal protective equipment ;
 - the hazardous effects of ammonia ;

SAFETY

- first aid procedures.

WARNING !

When evacuating or purging any ammonia system always ventilate the area immediately. Concentrations of ammonia can cause severe injury or even loss of life. Extremely high concentrations of ammonia gas are flammable by spark ignition and may explode.

- Develop and use a plant wide program for the safe operation and maintenance of the ammonia refrigeration system and all associated equipment.
- Provide personal protective equipment including protective clothing and respiratory protection.
- Provide adequate ventilation for the processing area.
- Provide first aid supplies.



SAFETY

3.15. SAFETY LABELS

SAFETY INSTRUCTIONS

Read instruction manual and understand operation of this machine before starting.

Service and maintenance by trained authorized personnel only.

Power sources must be locked out before servicing by trained personnel only.

WARNING

Do not remove any panels while machine is operating.

Motors, gears or other operating mechanisms inside may cause serious injury to hands or limbs.

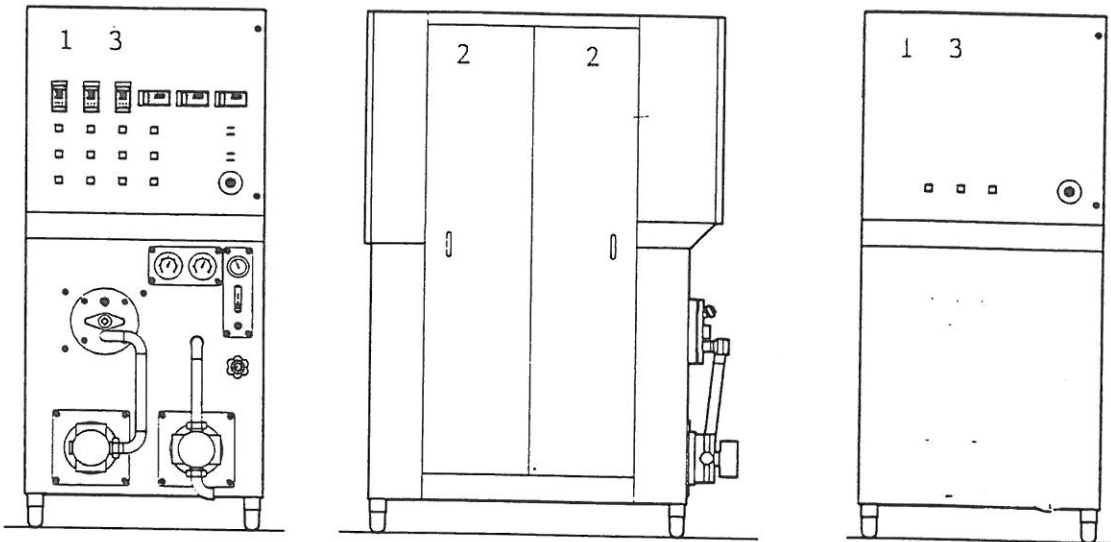
Power sources must be locked out before servicing by trained personnel only.

WARNING

Do not operate machine with guard removed.



3.15. SAFETY LABELS



1

SAFETY INSTRUCTIONS

Read instruction manual and understand operation of this machine before starting.

Service and maintenance by trained authorized personnel only.

Power sources must be locked out before servicing by trained personnel only.

2

! WARNING

Do not remove any panels while machine is operating.

Motors, gears or other operating mechanisms inside may cause serious injury to hands or limbs.

Power sources must be locked out before servicing by trained personnel only.

3

! DANGER

This enclosure contains electrical equipment

Hazardous electrical voltage present may cause shock, burns or loss of life.

Use extra precautions in damp areas

Power sources must be locked out before servicing by trained electricians only

4. FORESEEN AND NOT FORESEEN USES OF MACHINE

WARNING !

This machine is designed to produce ice cream to be packed in different ways (cups, cones, bulk, etc.). The SOREN freezer can also be used to cool liquid food products containing at least 1-2% of fat.

Any other use is improper and so is prohibited by SOREN. In particular the machine must not be used for production and processing of:

- grated-ice drink*
- toxic and not toxic chemical products and chemical products mixes*
- alcohol based products explosive products*

5. DESCRIPTION OF THE MACHINE AND SPECIFICATIONS

5.1. PURPOSE OF THE MACHINE

APV CS "freezers" are machines for continuous ice cream production by dosing, mixing and refrigerating ice cream mix and air.

5.2. PRINCIPLE OF OPERATION

The unit is a combination of various systems working together to:

- Pump the product through the freezing cylinder
- Freeze the product to the correct stiffness.
- Add air at a controlled rate.
- Incorporate air uniformly into the product.
- Pump the frozen product to the next process step.

The principle of operation is best understood if each system is considered separately.

5.3 MACHINE ANALYSIS BY HACCP

43/93/CEE METHOD

5.3.1 Analysis of alimentary Hazards

Freezers are machines that permit the continual production of ice-cream by means of a previously pasteurised mix; as it freezes, the mass absorbs air, injected into the mix on entry into the freezer cylinder.

In a machine processing a previously pasteurised, refrigerated mix that is cooled to safe temperatures from a microbial point of view, the alimentary hazards are mainly associated with:

- the possibility of external contamination

- problems associated with the cleanliness of machine parts in contact with the product

5.3.2. Identification of points at which alimentary hazards may develop

Problems related to external contamination are exclusively associated with the injection of air or nitrogen into the mix. Cleanliness related problems are on the other hand linked with the efficiency of washing and sanitisation; the areas most under risk are the dasher (agitator shaft), the pumps, the air injection valve and the front inspection port.

5.3.3. Provisions taken with regard to the identified points

- Injection air
- The compressed air used by the client to feed the injection valve mounted on the freezer must be filtered to ensure an adequate level of hygiene and must be free of oil.
- Washing and sanitisation
- The machine is designed and constructed to be closed circuit washed (CIP wash)
- To ensure a sufficient flow of detergent liquid during the CIP cycle, it is necessary to by-pass the feeder plunger pump or blades of the rotary pump/s either manually or using the pneumatic device on the pump front cover (vented cover). During the CIP washing cycle, the pumps and the dasher must be periodically activated to ensure complete cleaning of the same. The CIP washing cycle (sequence and length of the

washing cycle (sequence and length of the various washing phases, type of detergents, concentrations and temperatures) is described in detail in the machine instruction manual, in the chapter “*Washing and sanitisation*” and must be scrupulously followed.

- The effectiveness of the cycle must always be checked and, if necessary, suitably corrected.
- It is recommended to scrupulously clean the machine manually before first time operation (see para. 11.1), and periodically during service (see para. 11.2)
- Before starting production of each batch, always sanitise the machine (see para. 11,3,5).

5.3.4. Control operations with regard to the identified points

Air injection

- The quality of the injected air must be periodically checked by microbiological and physical analysis.

Washing and sanitisation

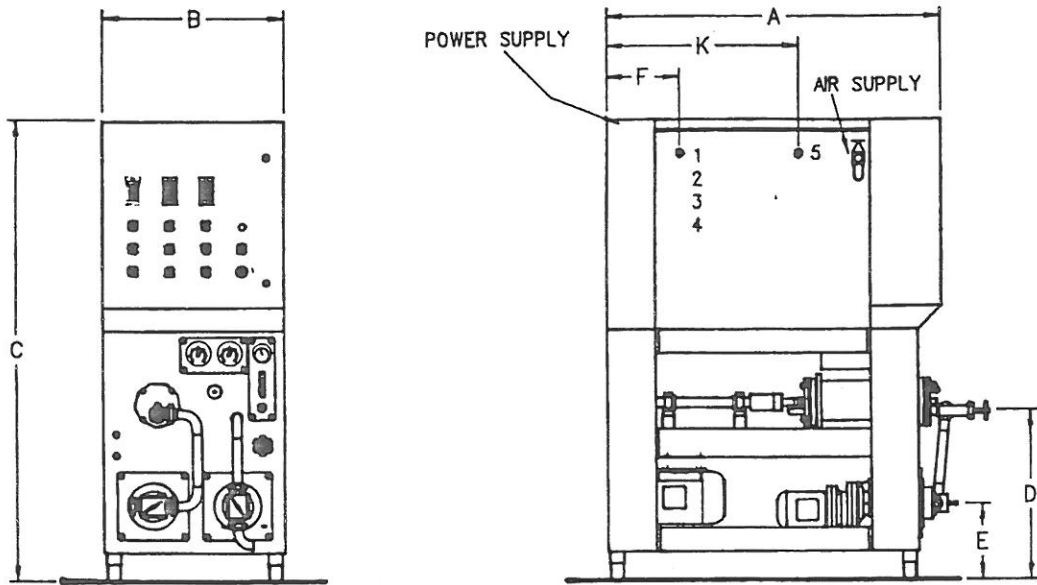
- At the end of a washing cycle it is necessary to periodically (at least once a week), check the state of cleanliness of the machine surfaces in contact with the product, by visual, olfactory and microbial inspection.
- The air injection valve and front inspection port must be removed and washed by hand after every washing cycle.

5.4. SPECIFICATIONS

TYPE	CS 1100-2P
SERIAL NUMBER	F-0144
YEAR	1998
I.S.P.E.S.L. (*) DATA N°	
PRESSURE VESSEL	E-0038
SERIAL NUMBER	CN 97300038
SAFETY RELIEF VALVE	CASTEL – 23 bar
SERIAL NUMBER	018778 011315

() (Italian code for pressure vessels manufacturing control and testing)*

DESCRIPTION OF THE MACHINE AND SPECIFICATIONS DIMENSION AND WEIGHT



DIMENSIONS		
TYPE	CS 100	CS 200
	R404 A	R404 A
A	1200	1400
B	750	
C	1970	
D	720	
E	320	
F	NA	NA
K (water)	500	500

SHIPPING DATA			
NET WGT	KG	685	790
GROSS WGT	KG	855	970
VOLUME	m ³	4,20	4,70

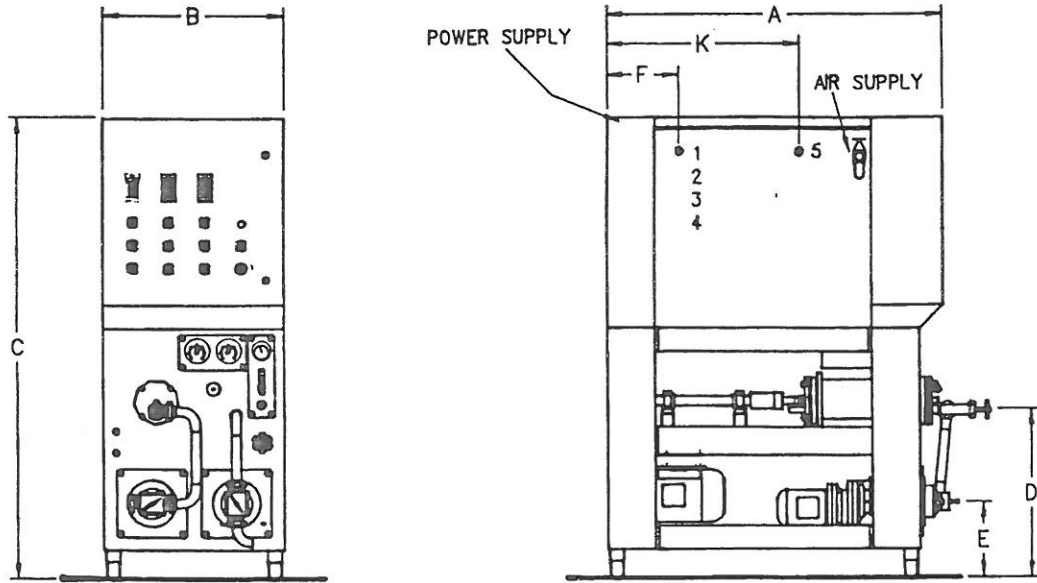
- | | |
|---|--|
| <ul style="list-style-type: none"> 1 - SAFETY RELIEF VALVE - 150 LB. : 2 - BACK PRESSURE REGULATOR : 3 - HOT GAS INLET SOLENOID : 4 - LIQUID REFRIGERANT INLET SOLENOID : 5 - COOLING WATER INLET - OUTLET : | <ul style="list-style-type: none"> 1 " . NPT OR WELD CONNECTION 2.0 " . WELD CONNECTION 1/2 " . NPT OR WELD CONNECTION 1/2 " . NPT OR WELD CONNECTION CS 100, 200 : 1" ^{3/4} |
|---|--|

NOTE :

- . R404 A Freezers have a built-in refrigeration plant.
- . AMMONIA Freezers must be connected to an external refrigeration plant
- . NA : not applicable

SP000011- 05/11/96

DESCRIPTION OF THE MACHINE AND SPECIFICATIONS DIMENSION AND WEIGHT



DIMENSIONS						
TYPE	CS 400		CS 800		CS 1100	
	R404 A	AMMONIA	R404 A	AMMONIA	R404 A	AMMONIA
A	1300		1700		1950	
B	900					
C	2000					
D	800					
E	310					
F	NA	300	NA	300	NA	300
K (water)	500	NA	600	NA	600	NA

SHIPPING DATA							
NET WGT	KG	1150	900	1330	1050	1480	1180
GROSS WGT	KG	1370	1120	1570	1281	1750	1450
VOLUME	m ³	5,00		6,30		7,00	

- 1 - SAFETY RELIEF VALVE - 150 LB. :
- 2 - BACK PRESSURE REGULATOR :
- 3 - HOT GAS INLET SOLENOID :
- 4 - LIQUID REFRIGERANT INLET SOLENOID :
- 5 - COOLING WATER INLET - OUTLET :

- 1" . NPT OR WELD CONNECTION
- 2.0" . WELD CONNECTION
- 1/2" . NPT OR WELD CONNECTION
- 1/2" . NPT OR WELD CONNECTION
- CS 400: 1" , CS 800 : 1" ^{1/4} - 1" ^{1/2} , CS 1100 : 1"

NOTE :

- . R404 A Freezers have a built-in refrigeration plant.
- . AMMONIA Freezers must be connected to an external refrigeration plant
- . NA : not applicable

SP000012- 05/11/96

DESCRIPTION OF THE MACHINE AND SPECIFICATIONS

POWER SOURCES AND UTILITIES REQUIRED

- Electrical power: 415/3/50
- Sanitary compressed air: 7 bar
- Cooling water: 20°C (max), 4 bar
- Refrigerant type: R404A

- self containing freon refrigeration unit, including semi-hermetic compressor and condenser with pressure controlled water valve.

FREEZER FEATURES

The technical and functional features of the machine are shown in the table.1

The maximum capacities listed are based on the following conditions:

- ice cream mix with 10% fat
- 15% sugar (of which 85% is sucrose)
- 0,3 % stabilizer
- 38% total solids
- temperature mix entering: 4° C
- ice cream drawn at -5° C.
- refrigerant evaporating temperature in the jacket: -33°C

MAIN FREEZER COMPONENTS

- stainless steel 304 frame
- freezing cylinder made of plated chrome--nickel
- freezing vessel-evaporator made of 304 stainless steel
- dasher and machine parts in contact with product made of 316 st. steel with scraper blades of special sanitary alloy
- rotary pumps, made of 316 st. steel, with rotors of resilient sanitary material
- dasher drive and pump drive, powered by electrical motors
- control and power panel and electrical system according to the directive 72/23/CEE

TABLE 1 - CS ICE CREAM FREEZER

13-nov-97

FEATURES	CS100	CS200	CS400	CS800	CS1100	CS1500
OUTPUT ICE CREAM (min-max)	20-100	40-200	80-400	140-780	200-1060	300-1500
REFRIGERATING POWER	4.400	9.810	17.200	27.270	38.350	55.600
CONDENSING/EVAP. TEMPERATURE	+30/-32.5					
REFRIGERANT TYPE	R22 / R404A / NH3					
CYLINDER SURFACE	0,08	0,16	0,29	0,48	0,59	0,80
CYLINDER INNER DIAM.	105	105	155	155	155	155
BLADES	3x1	3x2		3x4	3x5	3x7
COMPRESSOR MOTOR	2,2	5,5	11	18,5	22	37
DASHER MOTOR	3	4	7,5	11	15	22
DASHER SPEED	340	340	300	300	300	300
PUMP MOTOR	0,55	0,55	0,75	0,75	0,75	0,75
MIX PUMP (Std model)	Piston					
MIX PUMP (Optional)	#0 ROTARY					
ICE CREAM PUMP (If included)	#0 ROTARY					
MAX AIR CONSUMPTION	100	200	400	800	1.100	1.500
REQUIRED AIR PRESSURE	7					
CONDENSER INLET / OUTLET	1" / 1"					
CONDENSER WATER REQ. APP.	1.600	3.300	7.600	9.500	13.000	30.000
REQUIRED WATER PRESSURE	4					
	1 1/4" / 1 1/2"					
	2" / 2"					

6. MACHINE NOISE EMISSION

Noise sources of the machine are:

- dasher motor
- pump motor

Measurements made on freezer CS have given the following results:

Machine including refrigerant compressor:

- equivalent continuous A-weighted sound pressure level at workstations is from 76 to 78 dB (A)
- peak C-weighted instantaneous sound pressure value at workstations is lower than 130 dB.

Machine connects to refrigeration unit centralized:

- Continuous sound pressure level equivalent "A", at workstation, is from 74 to 76 dB (A).

7. IMPORTANT CAUTIONS

The following important cautions describe ways to avoid incorrect operating procedures which will cause serious damage to the SOREN FREEZER.

7.1 PROTECT CHROME CYLINDER

The inside surface of the freezing cylinder is chrome plated. Incorrect operating procedures may cause severe damage or rapid wear of the chrome surface and require an expensive cylinder replacement.

- **Do not** operate dasher without product or water in the cylinder.
- **Do not** operate dasher with worn scraper blades at less than the recommended width dimension.
- **Do not** use any type of acid cleaner or acid rinse. Acid attacks chrome.

7.2. AVOID FREEZE-UP

Incorrect operating procedures may cause a "freeze-up". A freeze-up occurs when the product becomes too cold and too stiff. The resulting load on the dasher motor and drive components may cause severe damage to the dasher, belts, motor, and other drive components. If the dasher stops, the product inside the cylinder will freeze further, requiring a time consuming defrosting procedure before production can resume.

In addition to the operation instructions to prevent freeze up;

- **Do not** turn on the refrigeration without the dasher running.

- **Do not** allow the supply of mix to the freezer to stop during freezing operations.
- **Do not** operate with product stiffness at greater than 100% motor load.
- **Do not** turn on the refrigeration when flushing out with water.
- **Do not** leave the refrigeration on when flushing out with water.
- **Do not** obstruct the freezer outlet.

7.3. BEWARE OF SANITIZING SOLUTIONS

WARNING !

Sanitizing solutions are extremely corrosive, especially those which contain halogen compounds (chlorine, bromine, iodine). Solutions of these chemicals, will attack the chrome surface of the freezing cylinder and the the special hard alloy stainless steel scraper blades. To prevent serious damage.

- **Do not** sanitize the freezer sooner than 15 minutes immediately prior to starting production.
- **Do not** leave sanitizing solutions in prolonged contact with any surface - product contact or exterior. As droplets dry out they become more concentrated and will cause corrosion pitting.
- **Do not** use any type of acid sanitizer. Acid attacks chrome.

IMPORTANT CAUTIONS

7.4. PREVENT PUMP DAMAGE

WARNING !

Incorrect operating procedures may cause damage or rapid wear to pump parts, especially the rotors and shafts. To obtain maximum service life of pump parts;

- **Do not** operate the pumps "dry" (without water or product present).
- **Do not** use screwdriver or other prying type tools when removing rotors. Use the rotor removal tool provided.
- **Do not** operate product pump against excessive discharge pressure.
 - Keep discharge lines short as possible.
 - Use large as possible discharge lines.
 - Use few as possible elbows, tees, and/or valves in discharge line
 - Use wide sweep elbows wherever possible in discharge line.

7.5. PREVENT DASHER DAMAGE

Incorrect operating and/or maintenance procedures may cause severe damage to the dasher and expensive replacement. To obtain maximum service life of the dasher;

- **Do not** allow the freezer to "freeze-up".
When using the "series 15" or "series 30" dasher designs;
- **Do not** continue to operate the freezer when the bearings in the front dasher head or the beater support are worn beyond recommended tolerances.

INSTALLATION AND ASSEMBLY

WARNING !

If the lifting equipment slips or breaks, severe injury may result. Make sure lifting equipment is rated for the weight of the unit. Only trained personnel should operate the lifting equipment.

- Remove skid from under the freezer.
- Gently lower the freezer until the adjustable legs support the weight
- Remove the top panels (not fastened down).
- Remove both right and left side panels in preparation for leveling as well as for the cooling water and electrical connections.
- Level the freezer by turning the adjustable feet in or out. When correctly positioned, the freezer should be level from side and have a slight pitch end to end so that water drains out the front of each freezer cylinder. this is an approximate 5 mm per meter slope.
- Check each adjustable leg. Be certain they are all firmly against the floor when leveling is finished.

8.4. ASSEMBLY / DIS-ASSEMBLY

SCRAPER BLADES

To assemble

DANGER !

Scraper blades can be very sharp and cause severe injury if not properly handled: when installing scraper blades use protective gloves.

- Position the blade so that the beveled edge is facing away from you, and the letter "T" on both the blades and dasher coincide. Referring to step 1, vertically position the blade between pins A and B, making sure that the square hole in the blade is directly in the center of pin B. Push the rightside of the blade forward with the thumb of your right hand, bending the blade enough so that you are able to push the blade down behind pin C.
- Push the blade forward again (and if it has been correctly positioned in pin B) it will snap into the correct articulate position in step 2.

To dis-assemble

DANGER !

Scraper blades can be very sharp and cause severe injury if not properly handled: when removing scraper blades, use protective gloves.

- Tip the blade up so that it is positioned as illustrated in step1.

8. INSTALLATION AND ASSEMBLY

8.1. RECEIVING AND INSPECTION

SOREN equipment is run tested or inspected prior to shipment. When leaving the factory, it is well created for normal transportation procedures. SOREN cannot, however, guarantee safe arrival. Therefore, upon receipt of this equipment, check the received items against the packing list for damage or missing parts. Check the packing material thought for small parts.

8.2. INSTALLATION PLACE

WARNING !

Install the freezer in an area with good ventilation. The possibility of leaking refrigerant liquid or gas creates a hazard of severe injury or loss of life when installed in areas with poor ventilation.

Install the freezer in a location with good lighting and allow around it for maintenance and operation the following space:

- front (for dasher removal): 1300 mm (CS1100); 800 mm (CS400, CS200, CS100)
- rear (for maintenance): 800 mm
- both side (for maintenance) : 800 mm

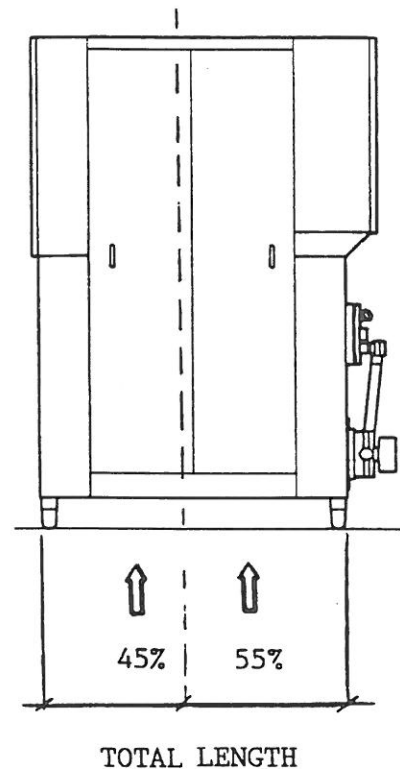
Locate with consideration for required service connections. keep service supply lines as short and direct as possible for optimum operating efficiency.

Locate close to associated process equipment to minimize piping between equipment and minimize pressure build up through lines.

Locate near floor drains with a hose station nearby.

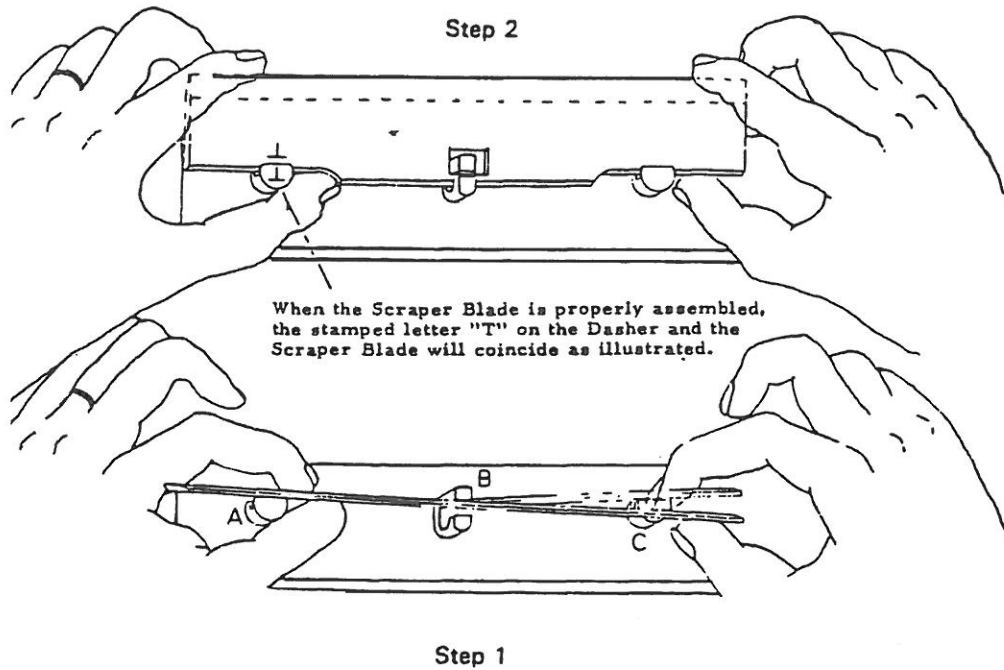
8.3. UNCRATING, INSTALLATION AND LEVELING

- Remove the crating, but leave freezer on skid.
- Move to plant installation site and place in position.
- Raise the freezer with a lift truck, positioning the forks as illustrated in the figure below.
- Be certain that the lift truck capacity is higher than the freezer weight.



INSTALLATION AND ASSEMBLY

- Press forward with the right thumb while lifting the right end of the blade up and away from the dasher.



9. OPERATION

9.1. UNIT PREPARATION

Before pre-start-up-procedures disassembly freezer and clean carefully all product contact surfaces (see 10.1 "FIRST CLEANING OF THE MACHINE")

9.2. PRE-START-UP PROCEDURES

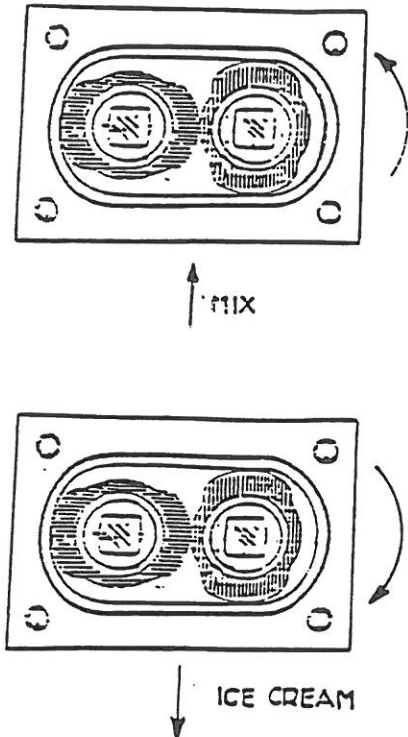
9.2.1. DASHER AND DASHER DRIVE

- Remove the freezing cylinder front door and dasher.
- Remove stainless steel panels to access the dasher drive area.
- Check V-belt tension.
- Check dasher rotation by jogging the starter. Correct rotation is counter clockwise facing the front of the freezer.
- Assemble scraper blades onto dasher.
- Assemble dasher assembly into freezer using the cylinder protector and reassemble the front door.

9.2.2. PUMP(S) AND PUMP(S) DRIVE

- Disassemble the rotary pump(s) on the front door and rear of the unit (see 11.1 "PUMP MAINTENANCE") Disconnect piping and remove the cover, rotor and body.
- Check oil level in the pump gear-case(s). If necessary, add oil (see 11.1 "PUMP MAINTENANCE")
- Check pump(s) rotation by jogging the starter.
- Reassemble pumps and piping

The correct rotation of the mix rotary pump is:



9.2.3. PISTON PUMP AND PUMP DRIVE

- Disassemble the piston pump on the front of machine, clean parts manually and reassemble the pump.
- Check oil level in of gear-case If necessary, add oil.

OPERATION

9.3. PRODUCTION

9.3.1. START-UP PROCEDURE

(see "FRONT PANEL")

- Turn on the main power switch (pos. 33) push the reset button (pos. 32) and wait at least four hours before starting to permit the resistance inside the compressor worm the oil.
- If not, there will be oil entrainment problems into the evaporating chamber from the freon compressor at start up.
- Make sure that the condenser cooling water is open.
- Remove the observation plug (pos.31) from the observation port on the front door.
- Push the mix pump (pos. 6) button which will also start the booster pump (centrifugal pump). If the booster pump had been wired separately, start the buster pump first.
- Place the Production - C.I.P. swith in the "production" position (pos. 16) and Pump P1 button .
- Continue to run the pumps until the product level in the inner cylinder has reached the observation port.
- Stop the pumps (pos. 3)
- Replace the observation plug (pos. 28).
- Set the desired viscosity (in % - max 100%) on the viscosity regulator (pos. 12).
See Paragraph 9.3.4. " Viscosity setting & adjustment ". The set point entered by the operator appears in the display marked "w".
- Set the ovverrun you desire in the ice cream (in %) on the overrun regulator (pos. 10). See Paragraph 9.3.2. " Overrun setting & adjustment". The set point entered by operator appears in the display marked "w". The overrun automatically turned on or off when the pumps are turned on or off.
- Set the desired cylinder pressure (in bar) on the cylinder pressure regulator (pos. 11). See Paragraph 9.3.3. "Cylinder pressure setting & adjustment" . The set point entered by the operator appears on the display marked "w".
- Start the dasher by pushing the start dasher button (pos. 5).
- Start the refrigeration by pushing the start refrigeration button (pos. 4).
- Start the pumps by pushing the start pumps button, when the dasher motor load indicator (Display XS) will reach

60-70 % of the dasher motor load (machines with series 80 (solid) dasher must have product flow through the inner cylinder before refrigeration commences). At the same time start the booster pump.

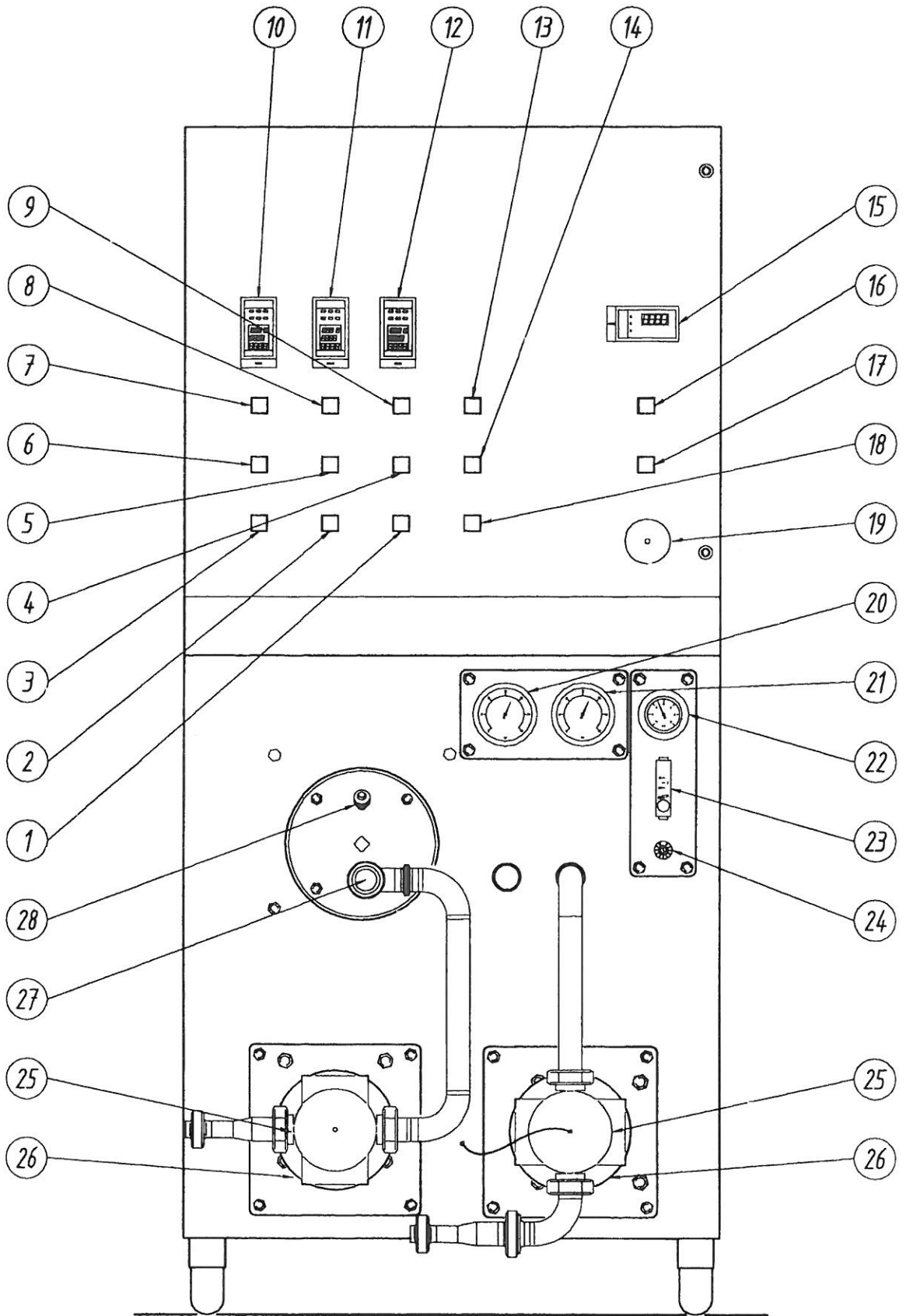
- The dasher motor load indicator (stall monitor) is pre-set at the factory.
- When the dasher motor load indicator reaches the first pre-set level (set a 100% of the motor load) an alarm bell is sounded (this set point can be cheanged).
- When the dasher motor load indicator reaches the second pre-set sensing level (set at 105% of the motor load) the compressor and the dasher will stop. (this set point cannot be changed)
- The operator is therefore alerted and should take corrective action immediately to prevent this stop.
- As the dasher motor load indicator retreats, the alarm bell will stop.
- To obtain the desired output, adjust the speed of the pumps by turning the pump crank (pump speed controll label) counter-clock-wise to increase the output and clockwise to decrease the output.

- When the lines and other product-contact surfaces have cooled to product temperature, check for overrun and stiffness; make the necessary adjustments to achive the desired product.
- Adjust the overrun with the overrun regulator (pos. 10).
- Adjust the viscosity with the viscosity regulator (pos. 12).
- The mix flow meter gives the mix flow rate expressed in liters per hour.

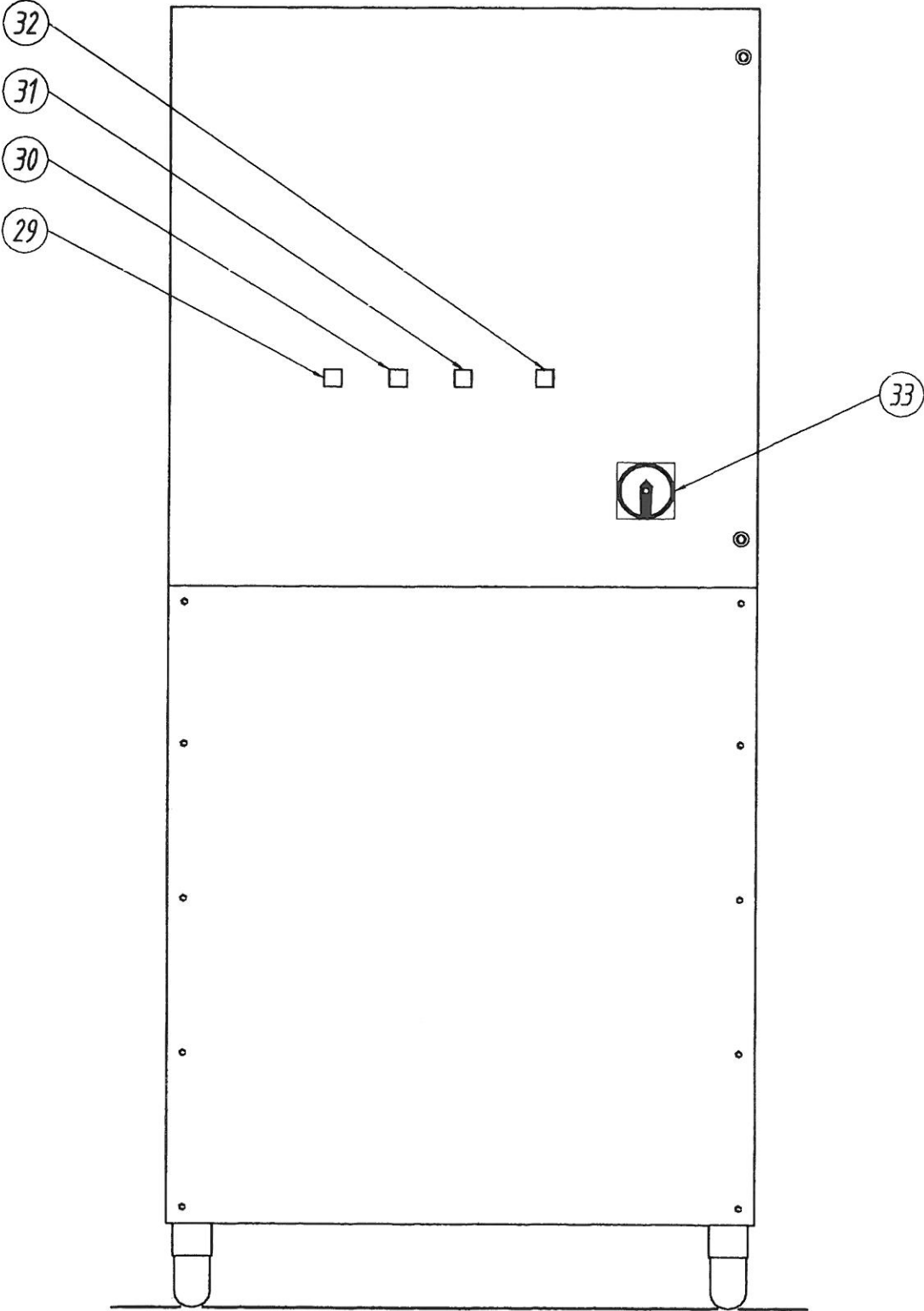
CAUTION !

Change the speed of the pumps only while the pumps are in operation.

OPERATION : FRONT PANEL



OPERATION : BACK PANEL



OPERATION

FRONT PANEL

<i>pos.</i>	<i>description</i>
1	Compressor C3 / stop
2	Dasher D2 / stop
3	Pumps P0-P1 / stop
4	Compressor C3 / start
5	Dasher 2 / start
6	Pumps P0-P1 / start
7	Pump P1 inverter / alarm
8	Hot gas / valve EV2
9	Oil compressor C3 / low level
10	Overrun / control
11	Cylinder pressure / control
12	Viscosity / control
13	Min.e max./pressure switch PS1
14	Reset compressor C3/ overload
15	Mix flow rate / indicator
16	Production CIP
17	Auxiliary on
18	Compressor C3 / overload
19	Emergecy / stop
20	Suction pressure
21	Condensing pressure
22	Cylinder pressure
23	Air flow meter
24	Overrun man. / control
25	Mix -Ice cream / pump
26	Kwick - clean Vented cover
27	Discharge valve
28	Obssevation port

BACK PANEL

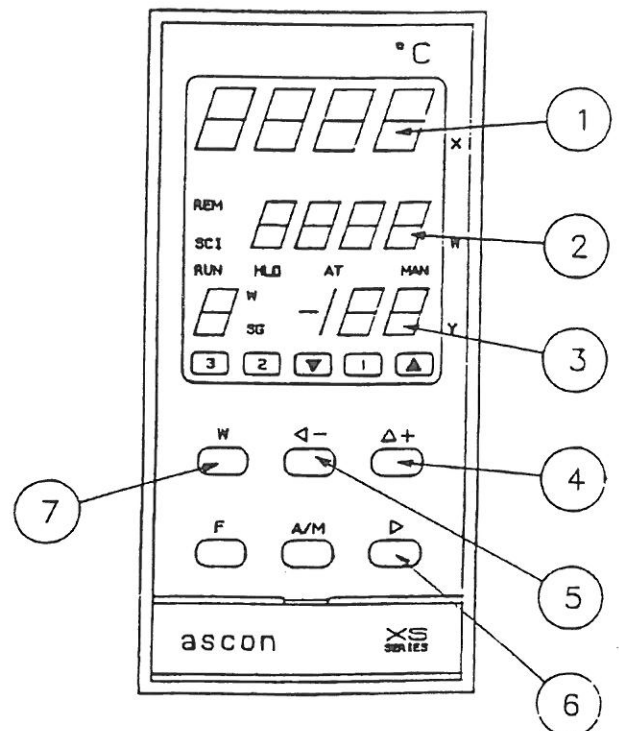
<i>pos.</i>	<i>description</i>
29	Safety doors device /on- off
30	Safety doors device / exclusion
31	Auxiliary on
32	Reset inverter / pump P1
33	Main / switch

OPERATION

9.3.2. OVERRUN SETTING & ADJUSTEMENTS

For setting up or adjusting the desired overrun to be dosed into the ice cream mix please follow the below instruction.

- Press the key "w" (pos.7) one time. If you have inadvertently pressed the key more than once, wait some seconds without press any key and the tool will return to the starting point
- The display "w" (pos.2) will start lighten.
- Press the key "< -" (pos.5) to select the digit to be change which will still lighten when selected. Keep pressing key "< -" until you reach the desired digit.
- Press the key "Δ+" (pos.4) until reached the digit value desired. If you have gone beyond the desired value, you have to keep pressed the key "Δ+" until you reach once again the desired value.
- To select another digit press key "< -" until you reach the desired digit.
- To change value press key "Δ+".
- When the desired overrun is all selected on the display "w" press key ">" (pos.6).
- Display "x" (pos.1) indicates instantaneously the quantity of air dosing (litres/min).
- Display "w" indicates the set point.
- Display "y" indicates the % of opening of the air mass flow meter.

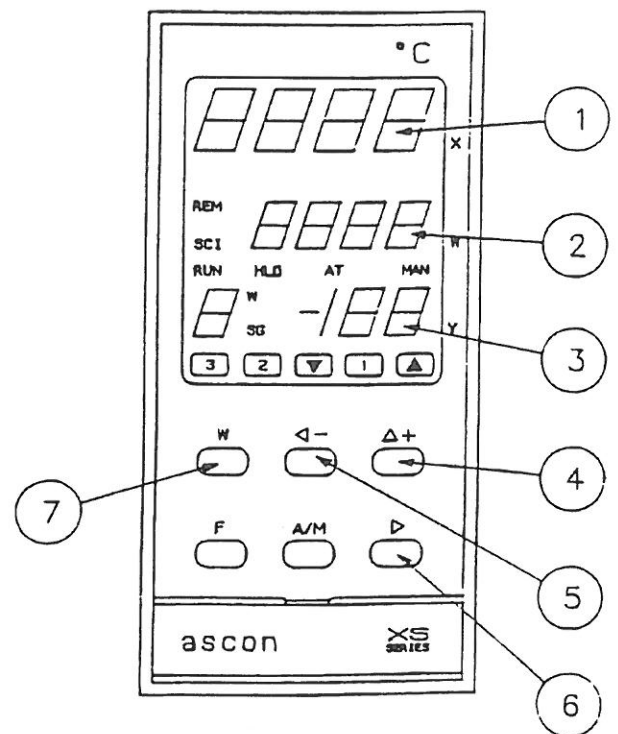


OPERATION

9.3.3. CYLINDER PRESSURE SETTING & ADJUSTMENT

For setting up or adjusting the desired inner cylinder pressure (in bar) please follow the below instruction.

- Press the key "w" (pos.7) one time. If you have inadvertently pressed the key more than once, wait some seconds without press any key and the tool will return to the starting point.
- The display "w" (pos.2) will start lighten.
- Press the key "< -" (pos.5) to select the digit to be change which will still lighten when selected. Keep pressing key "< -" until you reach the desired digit.
- Press the key "Δ+" (pos.4) until reached the digit value desired. If you have gone beyond the desired value, you have to keep pressed the key "Δ+" until you reach once again the desired value.
- To select another digit press key "< -" until you reach the desired digit.
- To change value press key "Δ+".
- When the desired cylinder pressure is all selected on the display "w" press key ">" (pos.6).
- Display "x" (pos.1) indicates instantly the cylinder pressure, misured by the pressure probe.
- Display "w" indicates the set point.
- Display "y" indicates the % of the ice cream pump speed.



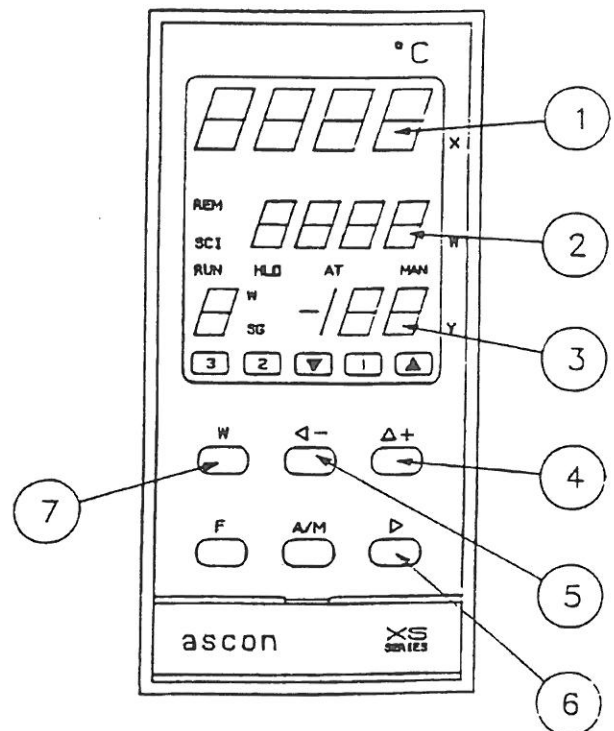
OPERATION

9.3.4. VISCOSITY SETTING & ADJUSTMENT

For setting up or adjusting the desired viscosity of the ice cream (represented by the % of dasher motor load) please follow the below instruction.

- Press the key "w" (pos.7) one time. If you have inadvertently pressed the key more than once, wait some seconds without press any key and the tool will return to the starting point
- The display "w" (pos.2) will start lighten.
- Press the key "< -" (pos.5) to select the digit to be change which will still lighten when selected. Keep pressing key "< -" untill you reach the desired digit.
- Press the key "Δ+" (pos.4) untill reached the digit value desired. If you have gone beyond the desired value, you have to keep pressed the key "Δ+" untill you reach once again the desired value.
- To select another digit press key "< -" untill you reach the desired digit.
- To change value press key "Δ+".
- When the desired viscosity is all selected on the display "w" press key ">" (pos.6).
- Display "x" (pos.1) indicates instantaneously the % of the dasher motor load (which represents the viscosity of ice cream).
- Display "w" indicates the set point.

- Display "y" indicates the % of opening of the Danfoss back pressure regulator.



OPERATION

9.3.5. STOPPING AND RESTARTING MACHINE DURING PRODUCTION

Stopping

- Stop refrigeration (pos.1).
- Stop pump (pos.3) and booster pump if used.
- Stop dasher if shut-down is to be longer than 10 minutes (pos. 2).

Restarting

- Start dasher (pos. 5).
- Start refrigeration (pos.4).
- Start pumps (pos.6).
- Also start booster pump at the same time.

9.3.6. STOPPING MACHINE AT THE END OF RUN

When mix tank is nearly empty, add water and follow procedure below:

- Stop refrigeration (pos. 1).
- After a short period of time finished product will soften and become less viscous.
- Open hand-operated full-flow mix and ice cream pumps.
- Turn the pneumatic air-operated full-flow mix and ice cream pumps switch into "C.I.P" position (pos. 16)
- Stop booster pump when mix tank is empty or when water becomes clear.
- Stop dasher (pos.2).
- Turn off condenser cooling water.
- Machine is now ready for in-place-cleaning.

OPERATION

9.3.7. DETERMING THE OVERRUN FACTOR

To determine the overrun factor in a product, use the following formula: weight of a given volume of starting product ice cream mix minus the weight of the same volume of a finished product divided by the weight of this same volume of the finished product. The quotient of this division times 100, thus :

$$\frac{(\text{wt. starting product}) - (\text{wt.same vol. finished product})}{(\text{wt.same vol. finished product})} \times 100 = \% \text{ overrun}$$

For example: weight per liter of starting product is 1.08 Kg. and the yield weight in the finished product is 0.6 Kg. per liter :

$$\frac{(1.08 \text{ Kg. starting product}) - (0.6 \text{ Kg. per liter finished product})}{(0.6 \text{ Kg. per liter finished product})} \times 100 = 80\% \text{ overrun}$$

9.4 OVERRUN TABLE - Metric

Weight in grams of finished product in various sized container			Overrun percent for various densities (grams/litres) of mix (product) input			
overrun at			% overrun at	% overrun at	% overrun at	%
1/4 litre	1/2 litre	1 litre	1080 g/l	1092 g/l	1104 g/l	116g/l
108	216	432	150	153	156	158
110	219	438	147	149	152	155
111	222	444	143	146	149	151
113	225	450	140	143	145	148
114	228	456	137	139	142	145
116	231	462	134	136	139	142
117	234	468	131	133	136	138
119	237	474	128	130	133	135
120	240	480	125	127	130	133
122	243	486	122	125	127	130
123	246	492	120	122	124	127
124	249	498	117	119	121	124
126	252	504	114	117	119	121
128	255	510	112	114	116	119
129	258	516	110	112	114	116
130	261	522	107	109	111	114
132	264	528	105	106	109	111
134	267	534	102	104	106	109
135	270	540	100	102	104	107
136	273	546	97	100	102	104
138	276	552	96	98	100	102
139	279	558	94	96	97	100
141	282	564	91	94	95	98
143	285	570	89	92	93	96
144	288	576	88	90	91	94
146	291	582	86	88	89	92
147	294	588	84	86	87	90
148	297	594	82	84	85	88
150	300	600	80	82	84	86
151	303	606	78	80	82	84
153	306	612	76	78	80	82
154	309	618	75	77	78	80
156	312	624	73	75	76	79
157	315	630	71	73	75	77
159	318	636	70	72	73	75
160	321	642	68	70	71	74
162	324	648	67	68	70	72
164	327	654	65	67	68	70
165	330	660	64	65	67	69
166	333	666	63	64	66	67
168	336	672	61	63	64	66
170	339	678	59	61	63	65
171	342	684	58	60	61	63
173	345	690	57	58	60	62
174	348	696	55	57	59	60
176	351	702	54	56	57	59
177	354	708	53	54	56	58
179	357	714	51	53	55	56
180	360	720	50	52	53	55

OPERATION

9.5. OPERATION PROBLEM SOLVING

Product too soft

- Liquid refrigerant filter clogged.
- Liquid refrigerant pressure too low.
- No liquid refrigerant available.
- Scraper blades need reconditioning.
- Mix flow rate too high.
- Mix supply too warm.
- Mix formulation incorrect.

Overrun too low

- Leaking air connections.
- Air supply pressure too low.
- Freezing cylinder pressure too high.
- Mass flow meter or controller not working correctly.
- Mix formulation incorrect.
- Product too soft or too stiff.

Overrun too high

- Air supply pressure too high.
- Rerun added to mix supply.
- Mix pump worn.
- Air in mix supply.

Air pockets in product

- Rerun added to mix supply.
- Freezing cylinder not full.
- Mix formulation incorrect.
- Product too cold or too warm.

10. CLEANING AND SANITIZING

DANGER !

The use of water around electronic equipment enclosures creates a hazard of electric shock which could cause severe injury or loss of life. Turn off the electric power supply and lock out before using any water for cleaning or rinsing around the electrical enclosures. Be certain the doors on all electric enclosures are closed and fasteners tightened. Never spray water directly into any electric controls or enclosures.

CAUTION !

The presence of any water inside electrical control enclosures, may ruin the controls. Be certain the doors on all electric enclosures are closed and fasteners tightened. Never spray water directly onto any electric controls or enclosures.

DANGER !

Direct contact with cleaning/sanitizing solutions may cause chemical burns. Equip all personnel performing cleaning/sanitizing operation with protective clothing (including eye protection).

CAUTION !

Do not use any acid type cleaner to clean the inner cylinder: acid attacks the chrome inner cylinder lining.

Buyer is liable for the chemical solutions used for cleaning/sanitizing. In particular these chemical products must be compatible with the inner cylinder lining. Chemical cleaning supplier should give directions about the right products, their recommended concentrations, temperature and exposure times.

10.1. FIRST CLEANING

Carefully clean all product contact surfaces prior to use to eliminate all possible foreign material which may have accumulated during manufacture, shipment and installation. In addition this gives plant personnel an opportunity to become familiar with the freezer.

- Use a detergent solution.
- Disassemble all of the product contact areas of the freezer, including:
 - ✦ freezer cylinder front door;
 - ✦ dasher assembly;
 - ✦ freezing cylinder rear door;
 - ✦ rotary pumps, covers, rotors, bodies.
- Scrub the interior surfaces of the cylinder and all the removed product contact parts, using a brush and detergent until completely clean.
- Thoroughly rinse away all traces of detergent solution with clean water and allow cylinder to drain.
- Reassemble all of the product contact parts.
- Clean the exterior surfaces of the freezer by wiping methods only.

CLEANING AND SANITIZING

10.2. RECOMANDATIONS ABOUT CLEANING

The freezer is designed to be cleaned using C.I.P. method and circulation cleaning methods may be used for daily cleaning. See specific recommendations following:

- Periodically, the unit should be disassembled. All product contact surfaces, except the cylinder, should be hand washed to remove product deposits. Check for any worn or deteriorating parts at this time.
- Once a week inspection is recommended
- If the machine will not be used for a month or more, the following procedure is recommended:
 - Remove all blades and seals from dashers and store
 - If the freezer cylinder is chrome nickel or Crepackimet, coat the surface with vegetable or other food grade oil

10.3. CIRCULATION CLEANING - C.I.P.

Circulation cleaning methods provide a convenient way to clean the product contact area of the equipment without disassembly. These methods require a separate system of tanks, pump, valves, and controls specifically designed for that purpose. A sequence of cleaning steps including rinses, chemical cleaning, and chemical sanitizing, known as a CIP program, may be used to effectively clean and sanitize the equipment. Recommended flow rate for effective C.I.P. cleaning is 5.000 l/h per cylinder.

10.3.1. SEQUENCE OF CLEANING STEPS - C:I:P

C.I.P is a combination of following steps:

- Preliminary rise with water
- Cleaning with chemical solutions (solutions wash)
- Rinse :remove of residual detergent solution
- Sanitize: treatment with heat or chemical solution prior to product process to kill bacteria.

WARNING !

In case the machine or part of product circuit, have been disassembled, before starting CIP operations, make sure that all parts have been correctly tightened.

DANGER !

During cleaning and sanitizing front door and pumps surfaces can reach high temperatures (80°C) and cause severe burns if contacted.

To avoid the risk, during these operations, personnel must keep away from these parts of the machine (no manual intervention is necessary during cleaning and sanitizing).

WARNING !

Rotary pump type FAR : If the rotary pump is not equipped with the by-pass on the cover plate (vented cover), it is necessary to remove rotors before starting the C.I.P. operations.

Piston pump:

When the machine is equipped with a piston mix pump, both during C.I.P. and sanitizing operations, this must not be running.

CLEANING AND SANITIZING

WARNING !

In both cases (rotary FAR pump or piston pump) the cleaning and sanitizing solution must never exceed 82°C.

10.3.2. PRE-RINSE

The purpose of this step is to flush out as much of the soil (residual product) as possible and minimize the soil which must be chemically removed in the following steps.

If the product contains fat(s), the temperature should be above the fat melting point. If the product contains protein, too high temperature can "set" the protein making them more difficult to remove.

Generally, temperatures between 50-60°C are best.

Continue to rinse, discharging to drain, until the rinse water becomes clear.

10.3.3. SOLUTION WASH

The purpose of this step is to chemically and mechanically remove the soil in the system. Typically, caustic cleaning chemicals are best for most types of soil (residual product).

Concentration of caustic cleaning solutions is typically 1% causticity.

Circulate the cleaning chemical solution for 30 minutes. temperature ~ 75°C.

10.3.4. RINSE

The purpose of this step is to rinse the system clear of the chemical solution and removed soil.

Use the water at 50 -60°C:

At the start of this step, route the return into the cleaning solution tank to recover the solution remaining in the system. After an appropriate time, divert to drain.

Continue rinse until returning water is clear of chemical and removed soil.

10.3.5. ACID WASH

WARNING !

The inner cylinder of freezer is chrome plated: Do not use acid wash step as, chrome Has no resistance to acid attack!

10.3.6 SANITIZING

The purpose of the sanitizing step is to apply a bactericidal treatment prior to processing of food products. Chemicals typically used are extremely corrosive and must not be left in prolonged contact with any part of the machine.

Therefore, this treatment should only be applied when processing is to start immediately following sanitizing.

- Recirculate for 5 minutes.
- Flush chemical sanitizers from system or start up with potable water before introducing food product.
- Do not allow chlorine solution to sit in freezer. If chlorine type chemical sanitizer is used, recommended strength is 100 ppm available chlorine in unheated water.

Note: An alternative sanitizing method is to recirculate potable water (82°C) for 30 minutes.

11. MAINTENANCE

11.1. PUMP MAINTENANCE

BEARING ADJUSTMENT

To test for loose shaft bearing, grasp the rotor shaft firmly and move in and out while the pump is disassembled. If the bearing show looseness by a "chucking" sound or there is a feel of movement, tighten by the following procedure:

- Remove the lock screw in each of the bearing adjustment nuts (fig.1).
- Using a spanner wrench, tighten one bearing adjustment nut at a time (fig.2).
- Rotate the rotor shafts back and forth 180° during adjustment.

- Tighten one adjustment nut until a slight resistance to shaft rotation is felt no more. Mark its position and back the adjustment nut off one-half turn.
- Tighten the other adjustment nut the same way, but leave it in its tightened position (do not back off).
- Replace lock screw and secure.
- Move the first adjustment nut back to its mark. Replace lock screw and secure.

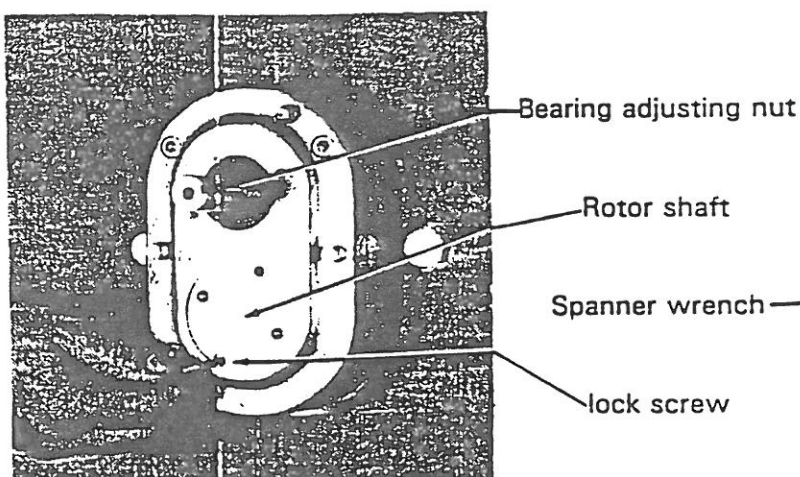


Fig.1

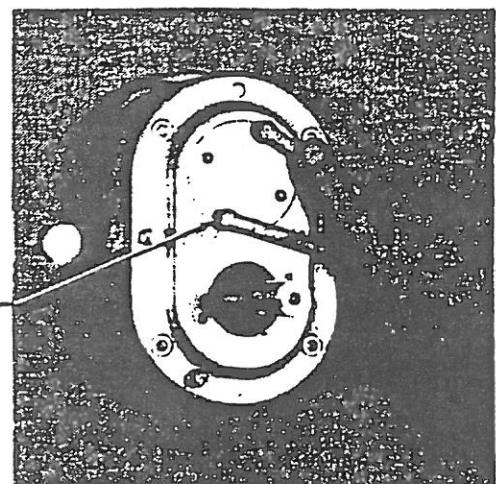


Fig.2

MAINTENANCE

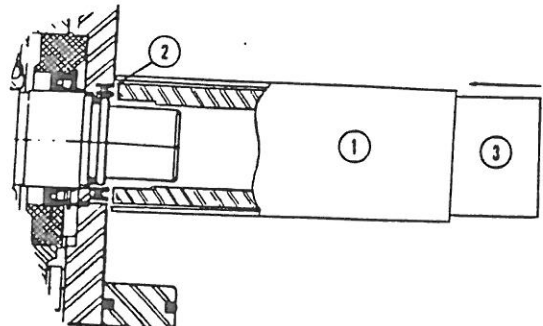
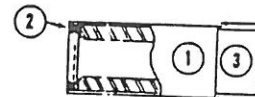
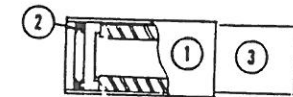
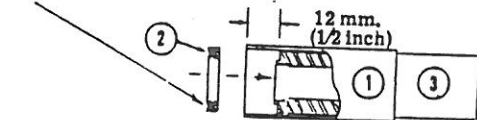
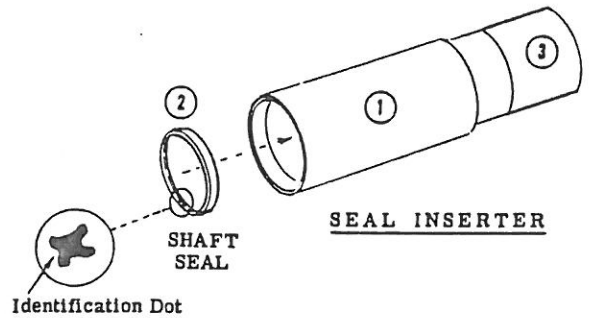
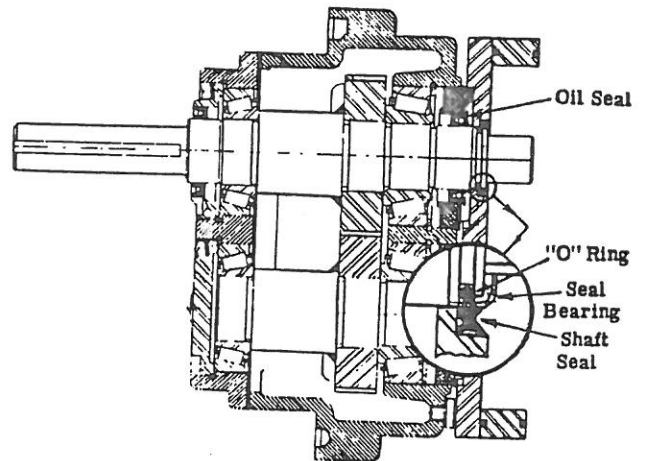
ROTOR IN PUMPS

Dis-assembly of pump/s for installation of pump rotor:

- Remove four retaining hex nuts from gear case studs.
- Remove operating bar and handle assembly.
- Remove face plate and full flow cover assembly.

Note: take care when withdrawing these assemblies to prevent scoring of gear case studs.

- Whenever re-assembling pumps, make sure that chamber seal (and shaft seal) are well seated in their grooves.
- Remove the pump rotor from extra parts box shipped with freezer.
- Lubricate these rotor and the exposed rotor shafts with sanitary lubricant.



CAUTION !

Install or assemble rotor onto shaft by hand, using caution to assemble so that dimple (match mark) on rotor corresponds with dimple (match mark) on shaft. See illustration.

WARNING !

If these instructions are not strictly followed, severe or complete damage to the pumps could result.

- For re-assembly of pump, reverse the above steps.

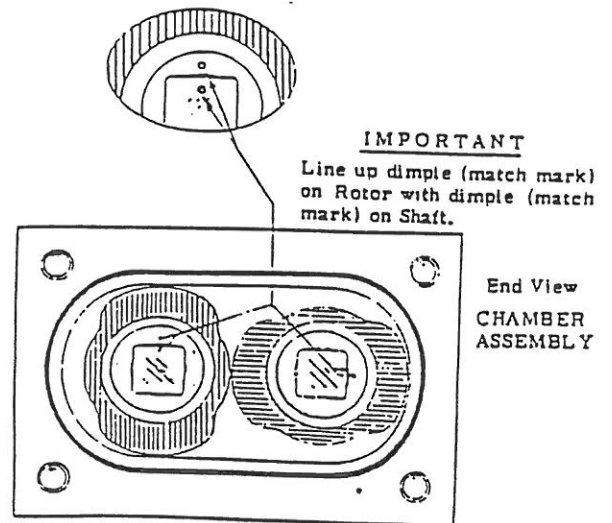
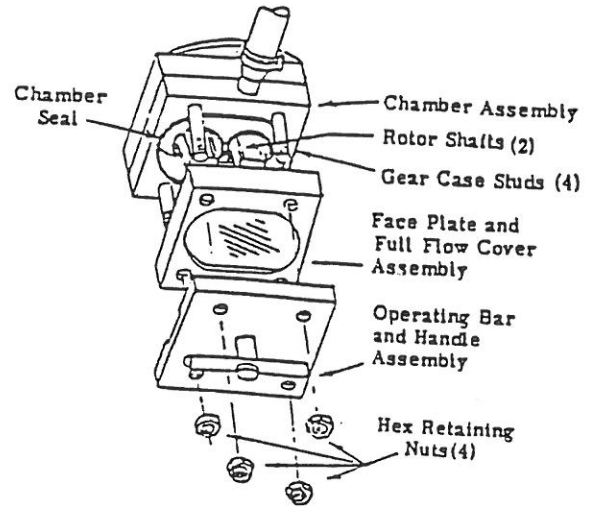
MAINTENANCE

ROTARY PUMP SHAFT SEALS

Shaft seal should be replaced monthly or when leaking occurs.

- Remove worn shaft seal.
- Check seal bearing and "O" rings for wear; replace if necessary (see circle insert on pump illustration).

- Use seal inserter to replace shaft seals.
- Lubricate new shaft seal (2) with sanitary lubricant.
- Slide back inside cylinder (3) until recessed 12 mm. (1/2 inch).
- Insert new shaft seal into recessed area of inserter (1), making sure identification dot of seal (2) is visible or facing to the outside of inserter.
- Slide forward inside cylinder (3), bringing seal even with the front rim of the inserter
- Slide inserter (1) over pump rotor shaft and pump body.
- Push inside cylinder (3) slowly forward against pump body, inserting seal (2) into its cavity.
- Remove seal inserter (1).
- Check the newly assembled seal (2) making sure the lips of seal are not twisted and the lip of seal is even with periphery of the cavity.



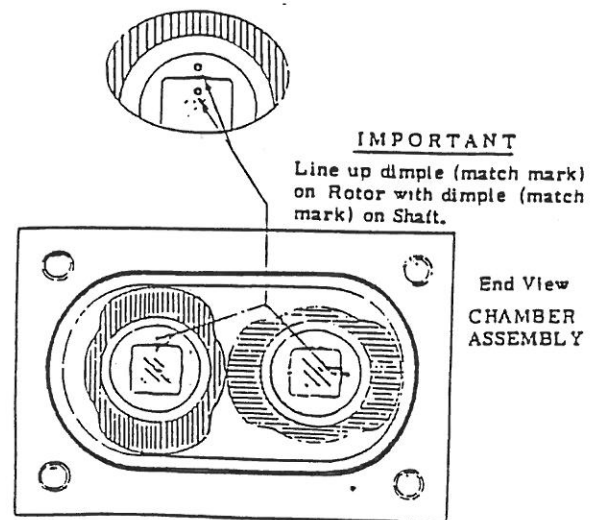
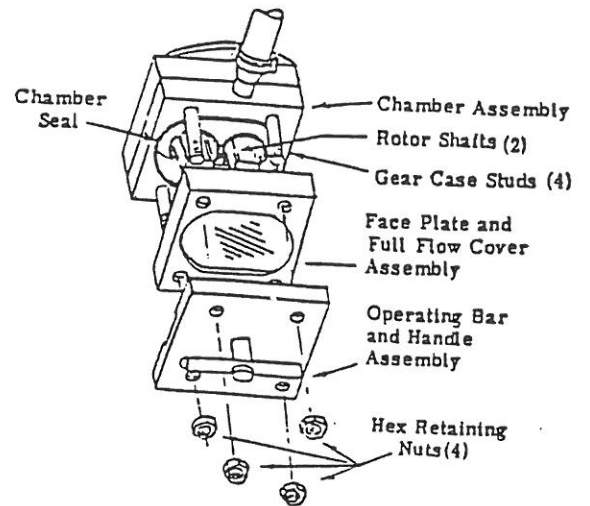
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MAINTENANCE

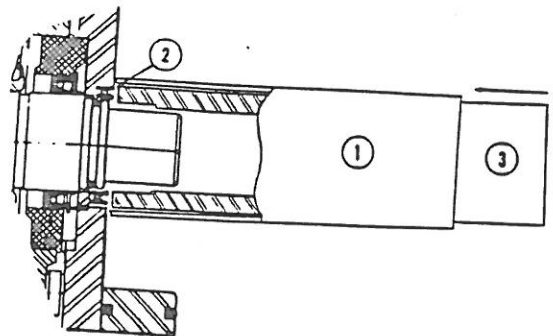
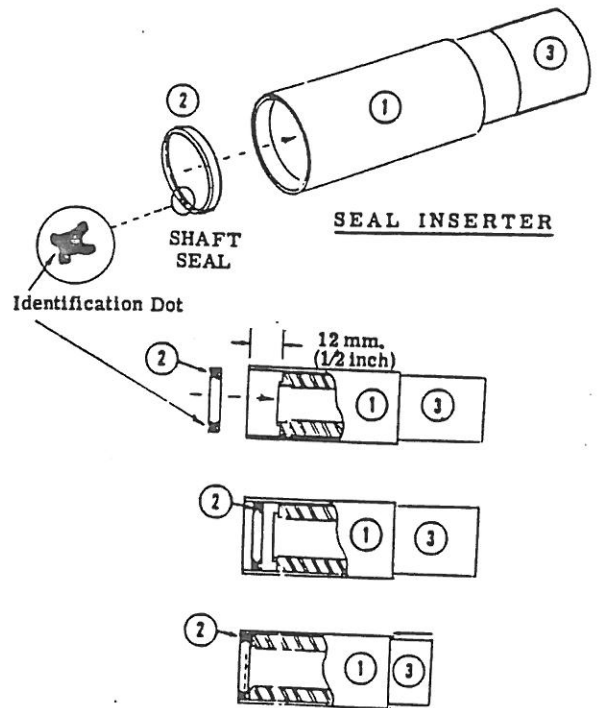
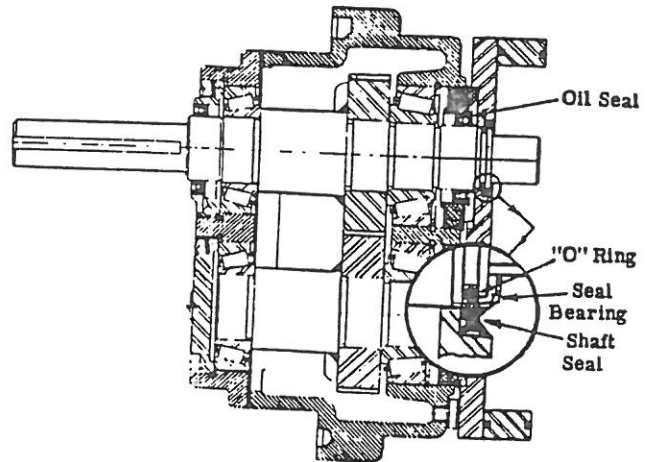
ROTOR IN PUMPS

Dis-assembly of pump/s for installation of pump rotor:

- Remove four retaining hex nuts from gear case studs.
- Remove operating bar and handle assembly.
- Remove face plate and full flow cover assembly.

Note: take care when withdrawing these assemblies to prevent scoring of gear case studs.

- Whenever re-assembling pumps, make sure that chamber seal (and shaft seal) are well seated in their grooves.
- Remove the pump rotor from extra parts box shipped with freezer.
- Lubricate these rotor and the exposed rotor shafts with sanitary lubricant.



CAUTION !

Install or assemble rotor onto shaft by hand, using caution to assemble so that dimple (match mark) on rotor corresponds with dimple (match mark) on shaft. See illustration.

WARNING !

If these instructions are not strictly followed, severe or complete damage to the pumps could result.

- For re-assembly of pump, reverse the above steps.

MAINTENANCE

ROTOR CARE

- Before starting the freezer, and after cleaning, lubricate pump body Interior with sanitary, food grade lubricant. **Do not use silicon compounds.**
- Since the amount and location of wear will differ with each pump, do not interchange rotors and other pump parts (interchanging parts may result in erratic operations).
- **Never permit pumps to run dry.** The most common cause of Rotor damage and wear is lack of lubrication or lack of fluids being pumped. Running pumps dry or without lubrication may cause rotor surface temperatures to rise to a damaging point within a few minutes after starting.

11.2. ROTARY PUMP PROBLEMS

PRODUCT LEAK

- Shaft seal excessively worn.
- Seal bearing excessively worn.
- Seal parts improperly cleaned and lubricated.
- Nicks and burrs in seal cavity and/or seal bearing.
- Loose bearings.
- Abrasive product.
- Seals improperly installed.

EXCESSIVE BEARING WEAR

- Oil contamination.
- Operating at excessive pressure and at excessive speeds.
- Improper bearing adjustment

OIL CONTAMINATION

- Prolonged product leakage.
- Failure to change oil.
- Breather positioned wrong.
- Oil seals improperly installed.
- Failure to clean gear case front regularly.

SHORT LIFE FOR SHAFT SEAL

- Running pump dry.
- Nicks or burrs in seal bearings or in seal cavity.
- Improper seal installation.
- Loose bearings.

EXCESSIVE ROTOR WEAR

- Running pump dry.
- Pumping abrasive product.
- Circulating cleaning solution with rotors in.
- Nicks in body and cover.
- Excessive speeds and pressures.
- Extreme and sudden product temperature changes.

ROTOR DAMAGE

- Running pump dry.
- Hard substances passing through pump.
- Loose bearings.
- Nicks and burrs in cover and body.

OIL LEAK

- Breather plugged.
- Oil seal excessively worn.
- Loose bearings.
- Excessive wear on shaft at contact with oil seal.
- Improper oil seal installation.

MAINTENANCE

EXCESSIVE SHAFT WEAR AT CONTACT WITH OIL SEAL

- Excessive exposure of oil seal to external abrasive.
- Oil contamination.
- Failure to clean gear case front regularly.

EXCESSIVE COVER WEAR

- Running pump dry.
- Excessively pressure and speeds.
- Abrasive product run through the pump.

MAINTENANCE

11.3. SCRAPER BLADE MAINTENANCE

Assembly of scraper blades onto dasher

Dasher must be removed from freezer to assemble scraper blades.

Remove front door assembly with care to support during removal.

Removing the retaining ring to one side over dasher drive coupling, the drive pin will be exposed.

Using a small wood dowel, gently tap exposed the drive pin out from keyed hole in dasher drive coupling and rear dasher shaft.

To prevent possible damage to the pin, take great care not to allow pin to drop. Dasher is now ready to be removed from the front of freezer.

Rotating coupling: NEVER remove the couplin guard(s) or service the coupling assembly without locking out the drive power source such that only the person involved has the key.

Reaching in or around the coupling while the freezer is running could cause severe injury or loss of life.

Dasher: the dasher assembly is heavy. This creates a hazard of severe injury for anyone handling it incorrectly. Provide enough workers or mechanical lifting assistance to enable removing, installing and servicin the dasher safely.

DANGER !!

All dashers have removable scraper blades. These blades can be very sharp and cause severe injury if not properly handled. When installing or removing dasher always use heavy protective gloves that reach to the elbows.

DANGER !!

Should the dasher start rotating unexpectedly during servicing and maintenance procedures severe injury or loss of life could result. ALWAYS turn off the electrical power supply and LOCK OUT using a locking device for which only the person doing the work has the key before performing service or maintenance.

MAINTENANCE

TO ASSEMBLE

DANGER !!

Scraper blades can be very sharp and cause severe injury if not properly handled: when installing scraper blades use protective gloves

- Position the blade so that the beveled edge is facing away from you, and the letter "T" on both the blades and dasher coincide. Referring to step 1, vertically position the blade between pins A and B, making sure that the square hole in the blade is directly in the center of pin B. Push the rightside of the blade forward with the thumb of your right hand, bending the blade enough so
- that you are able to push the blade down behind pin C.

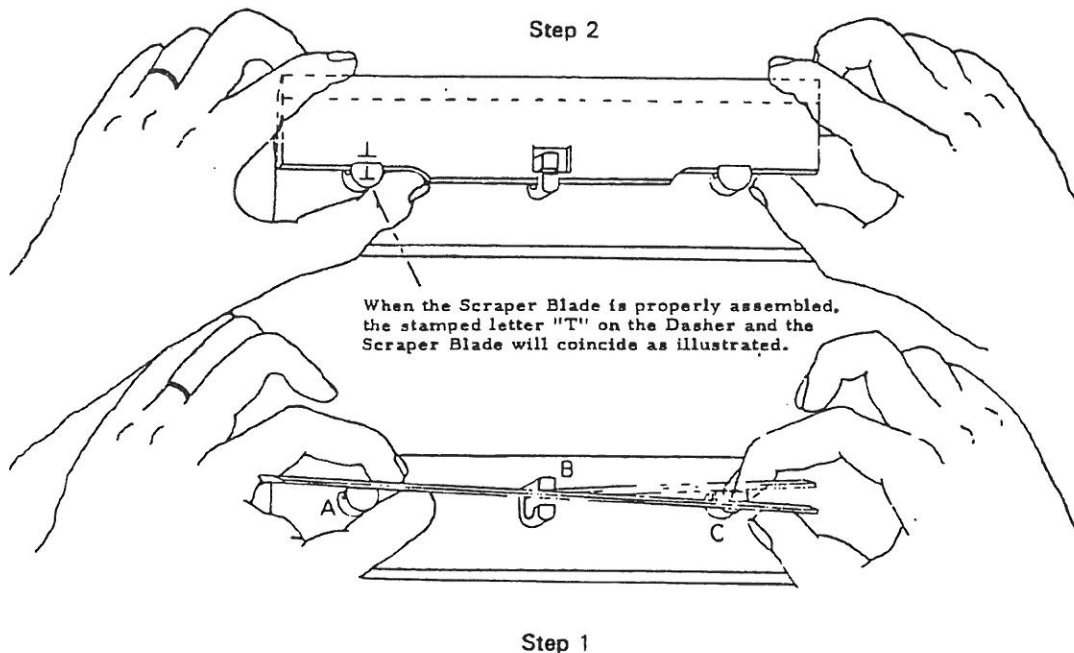
- Push the blade forward again (and if it has been correctly positioned in pin B) it will snap into the correct articulate position in step 2.

TO DIS-ASSEMBLE

DANGER !!

Scraper blades can be very sharp and cause severe injury if not properly handled: when removing scraper blades, use protective gloves.

- Tip the blade up so that it is positioned as illustrated in step 1.
- Press forward with the right thumb while lifting the right end of the blade up and away from the dasher.



MAINTENANCE

GENERAL INFORMATION

- Scraper blade are extremely hard and therefore subject to nicks when mishandled.
- Blades are designed to give maximum service. Wear depends on operating conditions (fig 1).
- Products with a high percentage of water and products that contain certain fruits or grit accelerate wear.
- Running dasher too long during the cleaning operation or running dasher dry is not raccumended.
- Avoid bending blades when removing the dasher from the inner cylinder. Follow the instruction for dasher removal. Bent blades should not be used. They will not scrape the cylinder wall properly, greatly lowering the efficiency of heat exchange.
- Scraper blades need reconditioning when the scraping edge becomes "knife-sharp",

rounded, or nicked (see fig. 2). Remove the blades for reconditioning monthly, and replace with a reconditioned set of blades. the length of time which blades remain in good condition will dependlargely on the type of product being processed. Experience will determine frequency of reconditioning.

BLADE RECONDITIONING

- Blades that have a heel over 0.75 mm (1/32 inch) should be reconditioned (see fig. 2). After the blade has been repeatedly filed or reconditioned down to 31.7 mm (1-1/4") width (see fig. 3), it should be replaced with a new blade. To permit sufficient time for good reconditioning, a spare set of blades should always be kept available.

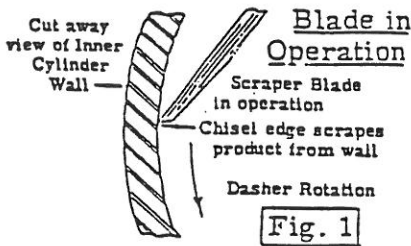


Fig. 1

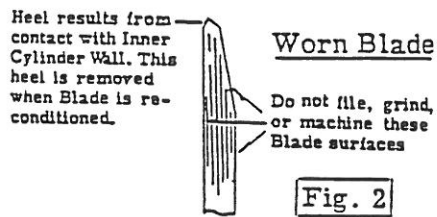


Fig. 2

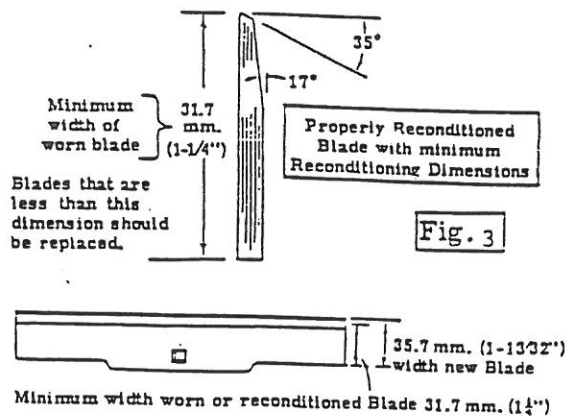


Fig. 3

MAINTENANCE

SPECIAL CLEANING INSTRUCTION

DANGER !!

Scraper blades can be very sharp and cause severe injury if not handled properly: use protective gloves.

- The scraper blades are made from high quality hardened stainless steel. Certain condition may cause small spots to develop. If unchecked, these spots enlarge, resulting in serious corrosion and pitting.
- At the first indication of these spots, treat the blades as follows:
- Remove blades from the dasher and immerse them in a solution of 20% nitric acid, 2% potassium or sodium dichromate, and 78% water.

CAUTION !!

Never allow the cleaning solution to come in contact with the nickele inner cylinder.

DANGER !!

Special cleaning solution could cause severe injury to personnel if contacted. The hazard is especially severe could cause severe injury to personnel if contacted. The hazard is especially severe for eyes and skin: use protective clothing including eye protection.

- An immersion time of 30 minutes at 43°C is recommended.
- Rinse blades thoroughly in clear water. Dry.
- If necessary, clean daily after a day's run until all colored spots have disappeared (it is important to remove all colored spots).

SENSORE DI PROSSIMITA' PROXIMITY SENSOR

Per avere l'indicazione esatta del numero dei giri in uscita del motor-variatore è possibile applicare direttamente sulla carcassa variatore, o sulla carcassa differenziale, un sensore induttivo posto ad una distanza di 0,5 - 1,5 mm da una ruota dentata con 18 denti, come nelle figure sotto riportate, che trasmette gli impulsi al contagiri analogico o al contagiri digitale.

Il sensore induttivo è a norme NAMUR non amplificato con tensione nominale di 9 Volt, con limite di temperatura da -20°C a +100°C.

Nelle grandezze variatore 05 - 10 il sensore è di M8x1, mentre nelle grandezze 20 - 30/50 - 100 il sensore è M12x1.

Nei gruppi con differenziale nelle grandezze 05 - 10 il sensore è M8x1, mentre nelle grandezze 20 - 30/50 - 100 il sensore è M12x1.

Quando il sensore è influenzato dal metallo, la sua resistenza interna è 7 k OHMS e il suo consumo in corrente è 1 mA; questo corrisponde a un contatto aperto.

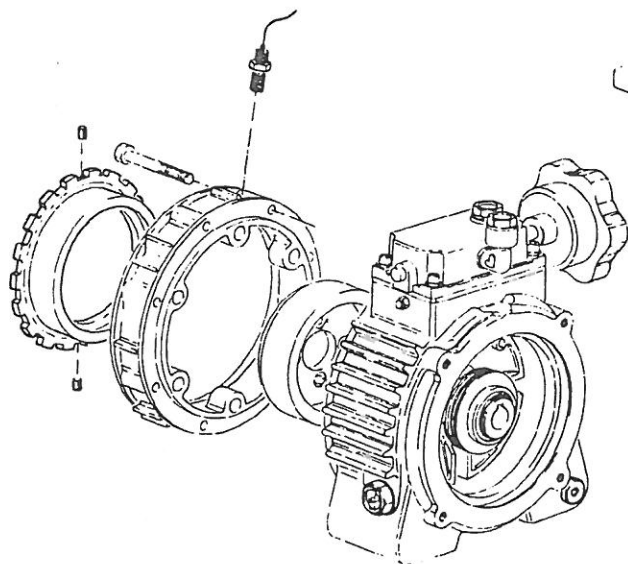
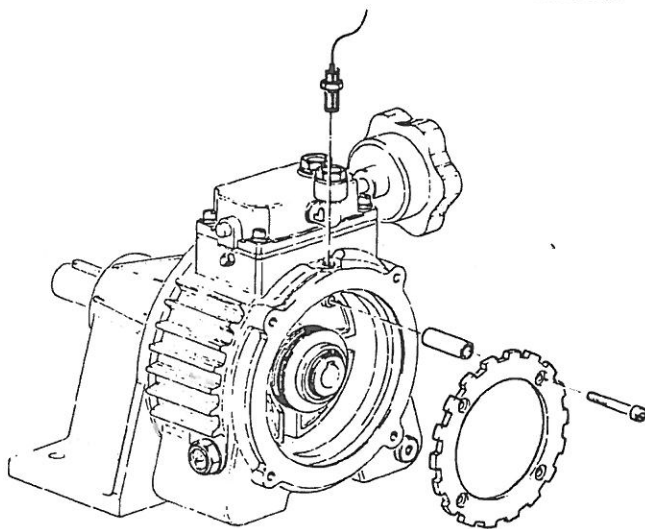
A reading of the precise output rpm of the motor-variator can be obtained by installing a proximity sensor, either on the variator casing or on the casing of the epicyclic differential; the sensor is located at a distance of 0.5 - 1.5mm from a disk having 18 notches around its circumference as shown below. The transducer serves to relay impulses to an analog or digital rev counter.

The proximity sensor is to NAMUR regulations. It is unamplified and operates at a nominal tension of 9 volts. When the sensor detects the proximity of a metal object its internal resistance is ≥ 7 Kohms and current consumption is ≤ 1 mA; this state is equivalent to a contact break. When distanced from metal, resistance falls to ≈ 1 Kohm and current consumption is ≥ 3 mA; this is equivalent to a contact make. The temperature range within which specified data are valid is -20°C to +100°C. Response time is 5". An M8x1 sensor is fitted to variator sizes 05 - 10; M12x1 for sizes 30/50 - 100.

On units with epicyclic differential, sizes 05 - 10, the sensor is M8x1; M12x1 for sizes 20 - 30/50 - 100.

When in close proximity to metal, internal resistance is 7 k OHMS and current consumption 1 mA; this signifies a contact break.

**VERSIONE MOTOVARIATORE NORMALE
VERSION FOR STANDARD MOTOR-VARIATOR**



**VERSIONE MOTOVARIATORE CON DIFFERENZIALE
VERSION FOR MOTOR-VARIATOR WITH EPICYCLIC DIFFERENTIAL**

NORME GENERALI GENERAL RULES

INSTALLAZIONE

- Per l'installazione occorre rispettare le seguenti condizioni:
- assicurare l'allineamento tra motore e riduttore e tra riduttore e macchina operatrice
 - montare il riduttore in modo che non subisca vibrazioni in fase di lavoro
 - lavorare le parti che vanno calettate sugli alberi con tolleranza ISO H7, per evitare di forzare e quindi danneggiare irrimediabilmente il riduttore in fase di montaggio
 - il riduttore viene verniciato con vernice protettiva resistente agli agenti atmosferici. Nel caso di ambienti particolarmente aggressivi, provvedere ad ulteriori verniciature speciali, proteggendo il bordo esterno degli anelli paraolio per evitare che si essichi la gomma causando perdite d'olio
 - assicurarsi che la posizione del livello dell'olio sia adatta alla posizione di montaggio del riduttore e che l'olio lubrificante abbia la viscosità prevista a catalogo
 - eseguire un'accurata pulitura e trattare con adeguati protettivi, le parti metalliche di contatto, prima del montaggio, onde evitare ossidazioni e il conseguente bloccaggio delle parti stesse
 - verificare al momento della messa in funzione che l'impianto elettrico sia munito di protezione termica onde evitare danni al motore
 - verificare che la tensione di alimentazione stampigliata sulla targhetta del motore elettrico coincida con la tensione di rete.

USO E MANUTENZIONE

Nel caso si prevedano sovraccarichi, urti o bloccaggi in fase di funzionamento occorre prevedere nell'installazione anche giunti di sicurezza. I riduttori della serie R1, in tutte le sue grandezze e i riduttori della serie R2-R3 per le grandezze 40-50-63, vengono forniti completi di lubrificante a vita, pertanto sono provvisti solo di un tappo di carico e un tappo di scarico e mancano dei tappi di livello. I riduttori della serie R2-R3 per le grandezze 80-100-125 vengono forniti completi di olio e richiedono una manutenzione di cambio olio da effettuarsi dopo le prime 500±1000 ore (periodo di rodaggio) di funzionamento, provvedendo ad un lavaggio interno prima del ripristino. Successivamente sostituire il lubrificante ogni 4000 ore lavorative. Se il riduttore resta inattivo per lungo tempo, in ambienti umidi, riempirlo totalmente d'olio per proteggere le parti interne e ripristinare il livello alla successiva messa in funzione. Se possibile non racchiudere il riduttore in protezioni scatolate e garantire il libero afflusso all'aria per il naturale scambio termico.

LUBRIFICAZIONE

I riduttori della serie R1 e della serie R2-R3 (nelle prime tre grandezze) sono forniti con lubrificazione permanente a grasso:

- "IP ATINA GREASE 0" per R1/40 - R1/50 - R1/63 - R1/80 - R1/100 - R1/125
- "IP TELESIA COMPOUND A" per R2-R3/40 - R2-R3/50 - R2-R3/63

I riduttori della serie R2-R3 (nelle tre grandezze superiori) sono forniti in bagno d'olio e la lubrificazione avviene per sbattimento d'olio:

- "IP MELLANA OILS" per R2-R3/80 - R2-R3/100 - R2-R3/125

I riduttori vengono forniti di lubrificante adatto per carico medio (220 cst a 40 °C), se non specificato diversamente all'ordinazione.

La viscosità consigliata dell'olio minerale, a seconda del tipo di carico, vale per temperature ambiente comprese fra 0°C e 30°C. Per temperature inferiori scegliere una gradazione di viscosità immediatamente inferiore e per temperature superiori scegliere una gradazione di viscosità immediatamente superiore. È molto importante fornire la posizione di montaggio per il giusto riempimento d'olio del riduttore al livello specifico. Per le sostituzioni attenersi all'indicatore di livello controllabile a vista.

INSTALLATION

The following instructions must be complied with during installation:

- ensure correct alignment between the motor and gear unit and between the gear unit and the driven machine
- mount the gear unit so that it is not subject to vibrations while operating
- machine the parts which are keyed onto the shafts with tolerance ISO H7, to avoid forcing the gear unit during mounting (this might damage it beyond repair)
- the gear unit is supplied painted for protection against atmospheric agents. In especially aggressive environments, apply additional special paint, protecting the outer edges of the oil seals to prevent the rubber from drying and causing oil leaks
- ensure that the oil level position is suitable for the gear unit mounting position and that the lubricating oil has the viscosity specified in the catalogue
- clean the mating surfaces thoroughly and coat with suitable protective substances before assembly to prevent oxidation leading to seizing.
- when starting up, check that the electric is equipped with overload cut-out to prevent damage to the motor.
- check that the supply voltage punched on the electric motor nameplate is the same as the mains voltage.

USE AND MAINTENANCE

If shocks, impacts or seizure are expected during operation, safety couplings must be fitted. R1 series gear units, in all sizes, and R2-R3 series gear units in sizes 40-50-63, are lubricated for life; they therefore have filler cap and drain plug only, without the level cap. R2-R3 series gear units in sizes 80-100-125 are supplied complete with oil and require an oil change after the first 500-1000 operating hours (running-in period); wash out before refilling. Subsequent oil changes should be made every 4000 operating hours. If the gear unit is to be laid up for a long period in a damp environment, fill it full of oil to protect the internal components, returning the oil to the normal level before using. If possible, do not enclose the gear unit in a boxed casing and ensure a free air flow for natural cooling.

LUBRICATION

R1 series gear units and the first three sizes of series R2-R3 are supplied greased for life:

- "IP ATINA GREASE 0" for R1/40 - R1/50 - R1/63 - R1/80 - R1/100 - R1/125
- "IP TELESIA COMPOUND A" for R2-R3/30 - R2-R3/50 - R2-R3/63

R2-R3 series gear units (in the three larger sizes) are supplied oil-immersed with oil splash lubrication:

- "IP MELLANA OILS" for R2-R3/80 - R2-R3/100 - R2-R3/125

Gear units are supplied with lubricants suitable for average loads (220 cst at 40°C), unless otherwise specified with order.

The recommended viscosity for mineral oil, in relation to the load type, applies for ambient temperatures between 0°C and 30°C. For lower temperatures select the viscosity level immediately below and for higher temperatures select the viscosity level immediately above.

It is very important to specify the mounting position so that the gear unit can be filled with oil properly to the specific level. For oil changes, refer to the visible level indicator.

LUBRIFICAZIONE RIDUTTORE COASSIALE LUBRIFICATION - COAXIAL GEAR UNIT

I riduttori della serie R1 e della serie R2-R3 (nelle prime tre grandezze) sono forniti con lubrificazione permanente a grasso:

IP ATINA GREASE O:

SRT-SRF-SRM-03-1 / SRT-SRF-SRM-05-1
SRT-SRF-SRM-10-1 / SRT-SRF-SRM-20-1
SRT-SRF-SRM-30-1 / SRT-SRF-SRM-50-1
SRT-SRF-SRM-100-1

IP TELESIA COMPOUND A:

SRT-SRF-2-40 / SRT-SRF-3-40
SRT-SRF-2-50 / SRT-SRF-3-50
SRT-SRF-2-63 / SRT-SRF-3-63

I riduttori della serie R2-R3 (nelle tre grandezze superiori) sono forniti in bagno d'olio e la lubrificazione avviene per sbattimento dello stesso:

IP MELLANA OILS:

SRT-SRF-2-80 / SRT-SRF-3-80
SRT-SRF-2-100 / SRT-SRF-3-100
SRT-SRF-2-125 / SRT-SRF-3-125

I riduttori vengono forniti di lubrificante adatto per carico medio (220 cst a 40 °C), se non specificato diversamente all'ordinazione. La viscosità consigliata dell'olio minerale, a seconda del tipo di carico, vale per temperature ambiente comprese fra 0°C e 30°C. Per temperature inferiori scegliere una gradazione di viscosità immediatamente inferiore e per temperature superiori scegliere una gradazione di viscosità immediatamente superiore. E' molto importante fornire la posizione di montaggio per il giusto riempimento di lubrificante del riduttore al livello specifico, (vedi pag. 77-78-79).

Per i riduttori lubrificati ad olio, sostituirlo circa ogni 4000 ore di lavoro attenendosi all'indicatore di livello controllabile a vista.

R1 series gear units and the first three sizes of series R2-R3 are supplied greased for life:

IP ATINA GREASE O:

SRT-SRF-SRM-03-1 / SRT-SRF-SRM-05-1
SRT-SRF-SRM-10-1 / SRT-SRF-SRM-20-1
SRT-SRF-SRM-30-1 / SRT-SRF-SRM-50-1
SRT-SRF-SRM-100-1

IP TELESIA COMPOUND A:

SRT-SRF-2-40 / SRT-SRF-3-40
SRT-SRF-2-50 / SRT-SRF-3-50
SRT-SRF-2-63 / SRT-SRF-3-63

R2-R3 series gear units (in the three larger sizes) are supplied oil-immersed with oil splash lubrication:

IP MELLANA OILS:

SRT-SRF-2-80 / SRT-SRF-3-80
SRT-SRF-2-100 / SRT-SRF-3-100
SRT-SRF-2-125 / SRT-SRF-3-125

Gear units are supplied with lubricants suitable for average loads (220 cst at 40°C), unless otherwise specified with order.

The recommended viscosity, for mineral oil, in relation to the load type, applies for ambient temperatures between 0°C and 30°C. For lower temperatures select the viscosity level immediately below and for higher temperatures select the viscosity level immediately above.

The mounting position must be taken into consideration in order to ensure that the unit is filled to the correct level (see pages 77-78-79).

In the case of oil lubricated gear units, change the oil at 4000 hours referring to the level shown at the level indicator plug.

QUANTITÀ DI LUBRIFICANTE CONTENUTO NEI RIDUTTORI (Kg) QUANTITY OF LUBRICANT CONTAINED IN GEAR UNITS (Kg)

RIDUTTORI R1 / GEAR UNITS R1			
GRANDEZZA RIDUTTORE GEAR UNIT SIZE	Q.TÀ LUBRIFICANTE LUBRICANT Q.TY	TIPO LUBRIFICANTE LUBRICANT TYPE	MARCA MAKE
SRT-SRF-SRM-03-1	0,100	ATINA GREASE O	IP
SRT-SRF-SRM-05-1	0,380		
SRT-SRF-SRM-10-1	0,650		
SRT-SRF-SRM-20-1	1,000		
SRT-SRF-SRM-30-1 SRT-SRF-SRM-50-1	1,400		
SRT-SRF-SRM-100-1	1,800		

RIDUTTORI R2 - R3 / GEAR UNITS R2 - R3			
GRANDEZZA RIDUTTORE GEAR UNIT SIZE	Q.TÀ LUBRIFICANTE LUBRICANT Q.TY	TIPO LUBRIFICANTE LUBRICANT TYPE	MARCA MAKE
SRT-SRF-2-40 SRT-SRF-3-40	0,300	TELESIA COMPOUND A	IP
SRT-SRF-2-50 SRT-SRF-3-50	0,800		
SRT-SRF-2-63 SRT-SRF-3-63	1,300		
SRT-SRF-2-80 SRT-SRF-3-80	2,100	MELLANA OILS	IP
SRT-SRF-2-100 SRT-SRF-3-100	4,200		
SRT-SRF-2-125 SRT-SRF-3-125	6,300		

QUANTITÀ DI LUBRIFICANTE CONTENUTO NEI RIDUTTORI
AMOUNTS OF LUBRICANT IN GEAR UNITS

R1			
GRANDEZZA RIDUTTORE GEAR UNIT SIZE	Q.TÀ LUBRIFICANTE LUBRICANT Q.TY	TIPO LUBRIFICANTE LUBRICANT TYPE	MARCA MAKE
RM1/40 RT1/40 RF1/40	0.100 kg	ATINA GREASE 0 SIMMIA GREASE 0	IP SHELL
RM1/50 RT1/50 RF1/50	0.380 kg		
RM1/63 RT1/63 RF1/63	0.650 kg		
RM1/80 RT1/80 RF1/80	1.000 kg		
RM1/100 RT1/100 RF1/100	1.400 kg		
RM1/125 RT1/125 RF1/125	1.800 kg		
R2 - R3			
GRANDEZZA RIDUTTORE GEAR UNIT SIZE	Q.TÀ LUBRIFICANTE LUBRICANT Q.TY	TIPO LUBRIFICANTE LUBRICANT TYPE	MARCA MAKE
RT2/40 RT3/40 RF2/40 RF3/40	0.300 kg	TELESIA COMPOUND A TIVELA COMPOUND A	IP SHELL
RT2/50 RT3/50 RF2/50 RF3/50	0.800 kg		
RT2/63 RT3/63 RF2/63 RF3/63	1.300 kg		
RT2/80 RT3/80 RF2/80 RF3/80	2.100 kg	MELLANA OIL OMALA OIL	IP SHELL
RT2/100 RT3/100 RF2/100 RF3/100	3.000 kg		
RT2/125 RT3/125 RF2/125 RF3/125	4.000 kg		

Le quantità di lubrificante indicate si riferiscono alla posizione di montaggio B3-B5.

The quantities of lubricant indicated, refer to the mounting position B3-B5.