T E C H N I C A L
D O C U M E N T A T I O N

USER'S MANUAL

FQ12Z007C

FILLER

BLO 2 FILL

SACMI

ENGLISH

Translation of original instructions

MANUFACTURER

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SERIAL NUMBER

PUBLISHED ON

30/09/2022

VERSIONS

ESFXXXA

INDEX

1 GENERAL INFORMATION

1.1 INTRODUCTION

SAFETY INSTRUCTIONS

The “partly complete machinery” described in this instruction manual will hereinafter be referred to simply as “machine”. This document, which is an integral part of the machine, has been produced by the manufacturer in its original language (Italian). The manual may be translated for legislative and/or commercial purposes into other languages and, if necessary, the following text will be added: translation of the original instructions.
The products and all information in this manual are subject to change without notice. Based on the information provided, it is assumed that the persons working on this machine are fully trained and qualified in all aspects of their operation. In addition, it is assumed that they will use the appropriate safety equipment and take the necessary precautions to prevent misuse of the units.

NOTICE

The Instructions Manual contains important information for safeguarding all personnel who work on the machine as well as the machine itself. It is the responsibility of the company using the machine to always ensure that all personnel in charge have fully understood the operating instructions. If in doubt, contact the manufacturer for more information.
Notwithstanding the machine is equipped with active and passive safety devices, all risks resulting from incorrect use cannot be avoided. The manufacturer shall not be held responsible for failure to heed safety precautions and accident prevention rules and standards specified throughout this manual and property damage and personal injury caused by unintended, inappropriate and erroneous use of the machine.
Any changes to the machine must be duly authorised by the manufacturer in advance. All operations on the machine (maintenance, adjustments, repairs, cleaning) must be performed by suitably trained personnel and according to the instructions of this manual.
The Manufacturer reserves the right to make any technical changes to this manual and the machine without prior notice and undertakes to send the update of this publication, only in the event of changes deemed significant to the machine and its operation.
Additional copies of this manual can be obtained by contacting the Manufacturer’s customer service department.
All machine technical documentation can be consulted and downloaded in electronic format on the Manufacturer portal.
The illustrations in this manual are approximate and are for reference only; some parts of the machine may differ slightly from those shown.

The information contained herein is guaranteed as being correct only if the user carefully follows all the guidelines and instructions provided in this manual.
Suitable complementary training sessions are available upon request for better understanding the machine.

1.2 STORAGE OF THE MANUAL

SAFETY INSTRUCTIONS

The manual and its annexes are integral part of the machine documentation and they must:
- follow the machine even in case of sale;
- be kept close to the machine, in an easy and accessible place and protected by environmental agents which may undermine their integrity and duration;
- be available and accessible for a rapid consultation at any time by workers.

1.3 HOW TO USE THE MANUAL

The information and instructions are grouped together organized in chapters and paragraphs. The subject of interest can be easily located by consulting the table of contents.
Read the information preceded by the symbols below with care as they are essential for the health and safety of the operators.

DANGER	**DANGER**	Risk of death or serious injuries.
WARNING	**CAUTION**	Probable risk of death or serious injuries.
CAUTION	**ATTENTION**	Risk of minor injuries.
NOTICE	**WARNING**	Warnings not related to physical injuries.
SAFETY INSTRUCTIONS	**SAFETY INSTRUCTIONS**	Safety instructions or procedures.
SAFETY INSTRUCTIONS		

Chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS must be carefully read in its entirety as it contains important information and warnings regarding safety.

1.4 USERS OF THE MANUAL

Machine operators are defined as follows in this manual:
- operator: person responsible for supervising and operating the machine
- maintenance worker: person responsible for performing routine maintenance.

For the exact definition of the personnel qualifications, refer to paragraph OPERATOR TRAINING in chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS.

NOTICE

The term “operator” is a generic term used to identify a person who has to work on the machine: operator, maintenance worker, etc.

1.5 WARRANTY

The Manufacturer, within the limits of the contractual warranty, will be liable for the machine only for its original configuration and in relation to the subject who has concluded the sale or lease contract, in relation to the user named by the buyer leasing company.
Any intervention changing the machine configuration or the machine working cycle must be performed or authorised by the Manufacturer.
The Manufacturer is not liable for consequences resulting from the use of non-original spare parts and interventions performed by non-authorised technicians.
The warranty does not cover parts subject to wear and tear.
The warranty is void in the following cases:
- improper use of the machine;
- required maintenance jobs not performed;
- altering, tampering or misuse of the machine;
- if spare parts different from the ones originally installed in the machine are used;
- if changes are made.

The Manufacturer is not liable for damages to the machine caused by misuse or malfunctioning of other equipment connected to the machine itself.
The warranty covers only machine damage and/or malfunctions with explicit exclusion of compensation for any additional damage. In any case, the seller shall not be held responsible for loss due to lack of or reduced production, as well as any special, indirect or consequential loss of any nature whatsoever. As regards any annexes or modifications to the above, in any case the general terms and conditions set forth in the contract shall be abided.
In any case, it is omitted any warranty different from the one assumed by the Manufacturer in relation to the machine buyer or, in case of a lease, the user named by the buyer leasing company.

NOTICE

All operations of warranty service and extraordinary maintenance are not either operators’ responsibility or maintenance technicians’ responsibility, but only experts and technicians recommended by the Manufacturer can perform those actions.
Such operations are not described and included within this manual, so the machine buyer or, in case of a lease, the user named by the buyer leasing company must directly contact the Manufacturer to plan interventions or require need instructions.

1.6 ANNEXES

The following documents complement the present instruction manual.

- MACHINE LIFTING AND POSITIONING DIAGRAM.
- TYPE B INSTRUCTIONS (this document may be divided into several files and contains the information concerning the use of the control system and the machine's electrical and electronic components).
- TYPE C INSTRUCTIONS (description of circuit boards).
- WIRING DIAGRAMS.
- PNEUMATIC DIAGRAM.
- HYDRAULIC DIAGRAM.
- LUBRICATION SYSTEM DIAGRAM.
- LAYOUT.
- LUBRICANTS AND ADHESIVES DOCUMENTATION.
- AIR CONDITIONER DOCUMENTATION (if supplied).
- VISION SYSTEM INSTRUCTIONS MANUALS (if present).
- DATA SHEET (this document contains information regarding machine settings/adjustments in relation to the material to be processed/product to be produced).
- CAPPER INSTRUCTION MANUAL.
- CAP FEEDER INSTRUCTION MANUAL (if provided).
- SANITIZING SYSTEM INSTRUCTION MANUAL (if provided).
- FILTERING SYSTEM INSTRUCTION MANUAL (if provided).

1.7 KEY TO THE SAFETY SYMBOLS

1.7.1 WARNING SIGNS

General hazard.

Danger of scalding on hot surfaces.

Pinch point – keep hands and fingers clear.

Risk of electrocution.

Slipping hazard.

Danger of falling.

1.7.2 DANGER SIGNS

Do not perform any lubrication or maintenance operations on moving parts.

Do not remove the safety devices and guards.

General touch prohibition.

Do not put your hands into the opening.

1.7.3 ALERT SIGNS

You are required to wear protective gloves.

You are required to connect the marked point to a ground connection.

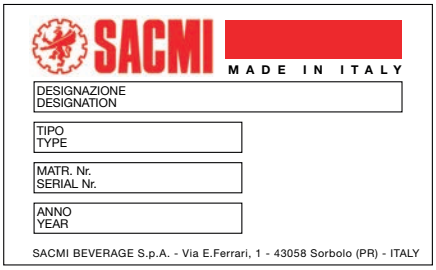
Lifting point.

1.7.4 OTHER SIGNS

Dispose in accordance with current laws and regulations.

1.8 NAMEPLATE

The machine is identified by a plate applied to the frame of the machine.



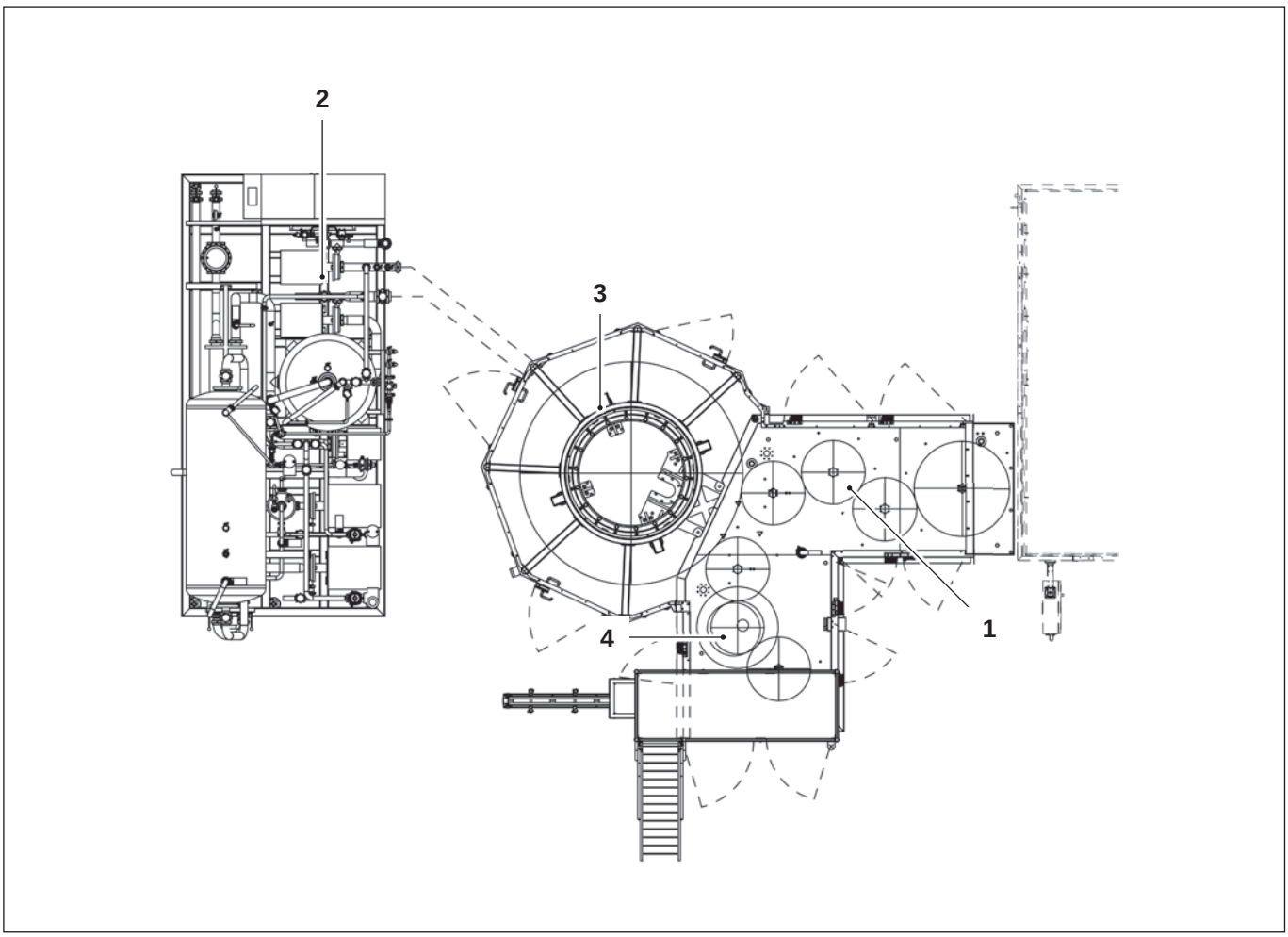
2 MAIN FEATURES

2.1 DESCRIPTION OF THE MACHINE

The ESF series filling machines are dedicated to filling and capping pet containers.
The containers, coming from blow molding machine, are filled by means of an electronic-volumetric system and then capped.

2.1.1 MAIN EQUIPMENT

1 Container conveyor belt
2 Mixer
3 Filling carousel
4 Capper



2.1.1.1 Container transport unit

This unit controls the containers coming from blow molding machine or conveyor line and manages them during the entire filling process.
This unit may consist of:
- conveyor belt;
- a container stopping device;
- auger;
- container starwheels and guides;

The type and number of the parts of the container conveyor changes in relation to the configuration of the machine.

2.1.1.2 Mixer

This unit is indented for performing liquid food products mixing and carbonation.
Mixer configuration varies according to the product, below is a description of the sections of which it can be composed.

Deaeration section
Water is nebulized into the horizontal tank through a nozzles system. Water deaeration is performed through the vacuum, which is generated in the tank with a liquid ring pump, and through the injection of a small amount of carbon dioxide directly in the water before the entry in the deaerator (Strip).

Mixing section
The mixing section allows water and syrup to be mixed according to the predetermined dilution ratio.
According to set recipe, water and syrup are sucked from relevant tanks and mixed; mixing is regulated by means of mass meters, which regulate modulating valve opening depending on the value currently detected and the set recipe.

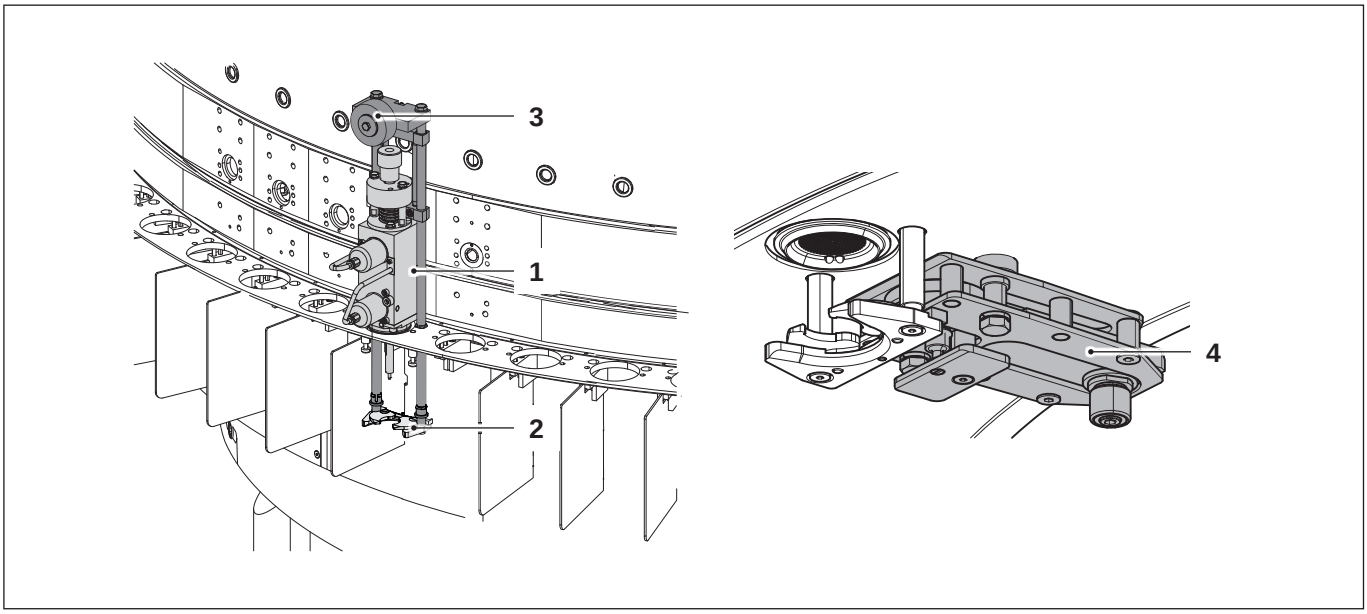
Carbonation section
The carbon dioxide (CO2) is managed automatically through a proportional modulating valve and it is measured with a mass flow measurer (Coriolis principle), while the flow of the finished product is measured with a magnetic flow measurer. The injection of carbon dioxide (CO2) is performed in line and at high pressure (10 bar usually), so that it is always above the saturation pressure (Henry law) at the working temperature (up to 18°C) and favours gas dissolution in the product in order to obtain a stable product, ready for filling.
The carbon dioxide injector (CO2) is connected to a recirculation system, keeping the working cycle constant (independently of the flow rate required by the filler) and thus achieving high precision dosing according to the set recipe.
The perfect dissolution of gas in the product is eventually achieved with a corrugated pipe static mixer and, if present, with the heat exchanger plates.

Break section
Break section allows the product to be stabilized.
It consists of a pressure tank, a centrifugal pump and a tank pressure control system.

Flavoring metering section
The aroma, taken from a tank, is metered by means of a volumetric pump whose operating speed varies according to the dilution ratio provided in the recipe.

2.1.1.3 Filling carousel

This unit is indented for managing containers filling.
The product reaches the filling valve, passing through lower rotary joint, annular manifold (if provided) and connecting pipes.
The filling is volume type and is controlled by flow meter on installed on feed pipe.
Filling valve **1**, by means of grippers **2**, supports bottle during all filling steps.
Bell **3** accompanies the bottle as it approaches and moves away from the valve at the beginning and end of the filling step.
Dummy bottle **4**, for which automatic insertion/removal is provided, allows valve sanitation.



2.1.1.4 Cap feeder

This unit is indented for caps orienting and capper supply.
All information about cap feeding device is given in the instruction manual.

2.1.1.5 Capper

This unit is indented for apply cap on the container.
All information about capper is given in the instruction manual.

2.1.1.6 Electrical system

The electrical cabinet includes the electrical and mechanical parts required for the electric operation of the points of use (contactors, relays, etc.), the electronic parts for motor handling and control and the devices that process the signals coming from the control sensors of the machine (PLC, inverters, axis control, etc.).

2.1.1.7 Pneumatic system

The pneumatic system consists of the devices for air preparation (filters, pressure regulators, pressure switches, safety valves) and of the control parts of the pneumatic actuators (solenoid valves).

2.1.1.8 Lubrication system

The machine is supplied with centralized lubrication terminals to make fixed points or hard to reach point lubrication fast and easy.
The machine can be provided with an electric pump (optional) for automatic lubrication.

2.1.1.9 Operator interface

The operators provide the commands to the machine or control operation with the operator interface.
The operations indicated below can be performed with the operator interface:
- set the operating cycle;
- set or change the operating parameters even during the operating cycle;
- display messages and the specific values;
- save and retrieve the parameters of the selected operating cycle;
- self-testing;
- maintenance control.

NOTICE

The information regarding the operator interface is given in chapter 6 - OPERATING INSTRUCTIONS and in the documents INSTRUCTIONS B.

2.1.1.10 Air filtration system

The machine can be equipped with a fan unit (optional) that filters the air inside the machine.
All information about filtration system is given in the instruction manual.

2.1.2 INTENDED, PROHIBITED USE AND MISUSE OF THE MACHINE

INTENDED USE

The machine is specially designed and constructed for filling and capping bottles that have been agreed upon with the Manufacturer Technical Office.
The machine works in safety if:

- it is used under the conditions and within the limits prescribed and indicated in this manual;
- it is serviced properly and regularly as indicated in chapter 8 - MAINTENANCE;
- it is always used correctly by strictly following the directions given in chapter 6 - MACHINE OPERATING INSTRUCTIONS.

UNINTENDED AND PROHIBITED USE

No other use is intended unless expressly authorized by the Manufacturer.
The Manufacturer shall not be held responsible for any malfunction or damages to persons or objects due to use other than that indicated in this manual.

MISUSE OR ERRONEOUS USE

The Manufacturer shall not be held responsible for any malfunction or damages to persons or objects due to misuse/ erroneous use of the machine.
The most frequent cases of this use are usually due to:

- failure to comply with the safety and prevention rules indicated in this manual;
- improper use of the machine or of the relevant parts;
- operators improperly trained;
- fatigue (above all during the night shift) or distraction;
- negligence caused by superficiality or wrong habits.

Only expert, trained personnel that is familiar with the use and the operating modes can use the machine. The personnel should also be able to:

- properly use the machine in regular operating conditions;
- face any emergencies.

Do not perform the operations listed below in the machine.

- Do not remove or deactivate the safety guards and the safety devices.
- Do not lubricate or perform maintenance operations with the machine running.
- Do not get on and/or climb the machine or parts related to it.

2.2 OVERALL DIMENSIONS

See the attached LAYOUT document for overall dimensions.

2.3 SPECIFICATIONS

2.3.1 TECHNICAL DATA

See the attached LAYOUT document for machine technical data.

ELECTRIC SYSTEM
The information that deals with the electric system is given in the WIRING DIAGRAM.

COMPRESSED AIR SPECIFICATIONS ACCORDING TO DIN ISO 8573-1

Class	Particles quantity max/m³ Particle diameter d (µm)			Dew point under pressure (°C)	Remaining oil content (mg/m³)
	0,1 < d <=0.5	0.5 < d <=1	1 < d <=5		
0	Specified according to application and better than the value indicated for Class 1				
1	100	1	0	<= -70	0.01
2	100,000	1,000	10	<= -40	0.1
3	---	10,000	500	<= -20	1
4	---	---	1,000	<= +3	5
5	---	---	20,000	<= +7	---

Max. particle quantity: Class 2
Dew point under pressure: Class 4
Remaining oil: Class 1

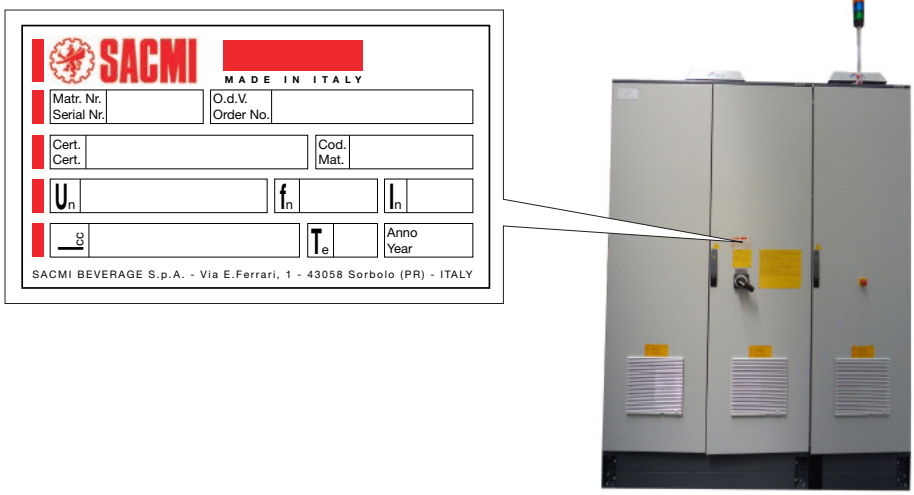
WATER SPECIFICATIONS

Use drinking water, without sediment, with the following features:

Filtration rating	0.02 ÷ 0.05 mm
Langelier Saturation Index	0 ÷ 1
Hardness	8 ÷ 15 °fH

2.3.2 TECHNICAL DATA PLATE

The electrical specifications of the machine are given on a plate applied to the electrical cabinet.



2.3.3 ACCEPTABLE FLUCTUATIONS IN THE INDICATED VARIABLES

ELECTRICAL SYSTEM

Voltage = 400 V	± 10 %
Voltage ≠ 400 V	± 5 %
Frequency	± 2 %

All the information concerning the electrical system are indicated into the ELETRICAL SCHEME.

PNEUMATIC SYSTEM

Flow rate	± 15 %

2.3.4 OPERATIONAL CHARACTERISTICS

The machine may process containers and filling products that have been agreed upon with the Manufacturer Technical Office.

⚠ CAUTION

Never use any material that may be hazardous in the event of skin or eye contact, swallowing, inhalation or that may produce fumes and/or toxic or dangerous phenomena during processing.

2.3.5 AIRBORNE NOISE EMISSION LEVELS

SOUND PRESSURE LEVEL (EN ISO 11202)

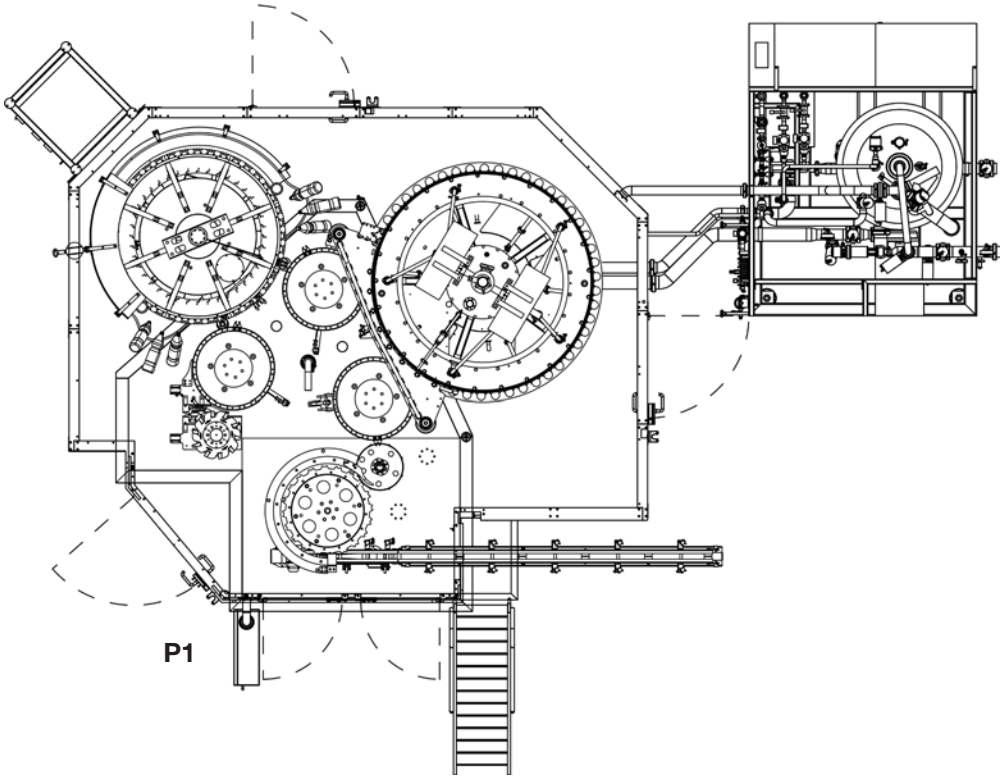
Test conditions
- Operating conditions: trial run with product.
- Type of processing: filling PET bottles
- Operating cycle: filling
- Test environment: industrial building with reflective floor.

Instruments used
Class 1 instruments (IEC 804).

Measured values

Measuring point	L_{pA} dB(A)
P1	77.9

L_{pA} dB(A) Emitted sound pressure level, corrected, A-weighted, time-averaged.



3 SAFETY EQUIPMENT AND PRECAUTIONS

3.1 SAFETY DEVICES

3.1.1 GENERAL GUIDELINES

SAFETY INSTRUCTIONS

The machine is provided with a number of electrical and/or mechanical safety devices in order to safeguard the operators and the machine itself. It is severely forbidden to alter, tamper with or lock out in any way the safety system provided in the machine.
Some illustrations within the manual, for further detailed descriptions, represent the machine or, its components, without protections or removed protections; it is strictly forbidden to use the machine without protections or disabled protections.
Warning signs are provided on the machine to indicate any hazards in the zone where the sign is attached, as well as plates with information and/or pictograms indicating correct and safe machine use. Always take all necessary safety precautions before working on the machine.
The presence of safety devices does not exempt the operators from exercising extreme caution during work, avoiding actions that may endanger him/herself or damage the machine at all times. In particular, the workers must never come into contact with moving machine parts.
The Manufacturer is not responsible for any alteration or non-use of the safety devices.

3.1.1.1 Required environmental conditions for correct machine operation

The conditions required are those commonly found in an industrial environment.
The foundations must be constructed on solid ground, with no water seepage and suitable to withstand the indicated loads.
The environment must be adequately ventilated with openings that admit fresh air to replace stale air.
Some environmental conditions such as sea level, high relative humidity and high temperatures may affect operation. Therefore these particular conditions should be specified at the time of order.
The user must assure that the lighting in the work areas allows the operations and all parts to be clearly seen. The lighting must meet the laws in force. In particular, it must be free of shadows, bothersome glaring and stroboscopic effects; we recommend a minimum lighting level of 500 lux.
The machine:
- it is designed to work only indoors;
- it is designed to work at a temperature ranging from +5°C to +40°C;
- it is designed to work at a maximum temperature of 40°C with relative humidity less than 50%; higher relative humidity may be permitted at lower temperatures (for example 90% at 20°C);
- it is designed to work at altitudes less than 1000m above sea level;
- can be stored indoors in dry areas where the temperature ranges from +10°C to +35°C (the maximum temperature may reach 70 °C only for periods < 24 hours);
- it is not designed to work in a potentially explosive atmosphere;
- it is not designed to work in areas where fires may break out;
- it is not designed to work in dusty environments;
- it is not designed to work in the presence of acids, corrosive agents and salt;
- it is not designed to work in the presence of ionizing and non-ionizing radiation (X-rays, lasers, microwaves, ultraviolet rays).

3.1.2 SAFETY DEVICES INSTALLED

The machine is provided with active and passive safety devices used to protect the operators and the machine as well.

Shutdown devices
The shutdown devices detect and indicate operating faults and block start-up or stop operation.

Shutdown indication
Every time a shutdown condition occurs, it is indicated by the indicator tower installed in the machine or in the electrical cabinet.
The cause of the fault that shut down the machine is indicated on the control panel.
The meaning of the fault messages is given in the document INSTRUCTIONS B.

Safety devices for the operators
The machine is provided with accident prevention mechanical safety devices that are removable and connected to shutdown electric devices.
In addition, fixed mechanical guards are provided. They prevent the accidental access to the moving parts and to the dangerous parts because they are live or very hot.

Emergency stops
Emergency stops are provided by means of emergency stop buttons with mechanical self-lock. They are red on a yellow background. They immediately stop the machine and this operation prevails over the other operations.

NOTICE

These buttons must only be used when an emergency or dangerous situation occurs because it interrupts the power supply. This means that the operator must wait the time necessary for restoring the operating conditions when restarting the machine.

SAFETY INSTRUCTIONS

If the Manufacturer does not supply the entire assembly to which the machine will be incorporated, the final user must connect the emergency stop circuit of the machine dealt with in this manual to the emergency stop circuit of the line to which the machine will be added.

Indicator tower
This is an audible/visual device that is positioned on the top of the machine.
It can be seen from any angle and makes visualization of machine status easier according to the activated color, the way it was activated and the audible signal emitted.

TYPE	COLOUR	MEANING
	White	Powered machine
	Green	Machine operating in automatic mode
	Blue	Operator intervention request (pre-alarm condition)
	Yellow	Machine in shutdown condition

The audible indicator remains active for 5 seconds from when the first fault occurs.

#	Description	Type of drive	Position
1	Electrical disconnector	Electrical disconnection	On electrical cabinet
2	Air supply disconnector	Air supply	
3	Hydraulic disconnector	Water supply	
4	Emergency button	Emergency electrical and pneumatic disconnection	On front and back and on mobile control device
5	Signalling column	Indication	On top

See the attached LAYOUT document for safety devices arrangement.

3.1.3 LOCK OUT / TAG OUT (LOTO)

Before carrying LOTO procedure, stop the machine as indicated in chapter 6 - MACHINE OPERATING INSTRUCTIONS.

Energy	Action	Check
Electric	- Set switch **1** to **OFF** (or **O**). - Lock the switch **1** in the **OFF** (or **O**) position with a multiple device for LockOut. - Remove and personally store the keys of the locking devices.	- Try to start the machine; the machine must NOT start. - See notes below.
Pneumatic	- Close valve **2**. - Lock the valve **2** in the closed position using a multiple LockOut device. - Remove and personally store the keys of the locking devices.	- Check that the valve is closed and locked.
Hydraulic sys.	- Close valve **3**. - Lock the valve **3** in the closed position using a multiple LockOut device. - Remove and personally store the keys of the locking devices.	- Check that the valve is closed and locked.

Due to the presence of electronic drives and/or converters, some parts of the electrical cabinet may have a dangerous voltage for a few minutes, even after the power system has been disconnected.

The part of the electrical system before the switch may be live even with the main switch in the OFF position.

3.2 HANDLING PROCEDURES

SAFETY INSTRUCTIONS

Only specially trained authorized personnel may lift and handle the machine.
No one should ever be near the hanging load and/or in any case within the range of action of the lift equipment while the load is being hoisted and transported.
The loads may only be handled manually, where possible, by personnel properly trained on how to lift and handle, observing all current safety standards and laws.
The manufacturer shall not be held responsible for any personal injury or property damage resulting from failure to observe current safety standards and handling materials in the user's facility.

Use the lift equipment only in the manner specified in this manual. Hooking up the equipment or lifting in other ways may compromise the hook up points and the lift equipment creating extremely dangerous situations for the operators.

⚠ CAUTION

Risk of being crushed at the points in which the equipment is attached when hoisting the load.

After being used to install the machine, the lift equipment and slings should be stored in a dry area protected against atmospheric agents taking all the measures necessary to conserve the materials the equipment is constructed in.
Steel ropes are to be covered with protective oil or grease and must be hung up vertically with their eyebolts to prevent them from bending or curling up.
Synthetic slings are to be stored away from heat sources, acids and preferably in a dry area.
The equipment and lugs are to be stored in a dry area protected against humidity and corrosion with specifically formulated products or oil or grease.

⚠ WARNING

If the lift equipment is to be used another time after being put away and stored in a store room, its surface is to be thoroughly checked to identify any corrosion points, damage or torn strands, for example on the ropes.
Never use damaged equipment or ropes.

3.2.1 LIFTING PROCEDURES

To safely and correctly lift and handle the machine always:
- use the most suitable lifting equipment with an adequate lift capacity;
- check the safety device of the hook;
- cover all sharp edges with rags and/or cardboard;
- make sure the lift devices do not damage machine components not provided for this purpose.

Before lifting:
- make sure all personnel is safely away and that no one can enter the area where the machine is being moved;
- make sure the load is stable;
- gradually lift in a vertical manner in order to avoid swaying and irregular movements.

3.2.2 HANDLING

While being moved, the load must always remain perfectly horizontal regardless of the type of lift equipment used.
To facilitate the lifting and handling operations use bars, levers and ramps at a safe distance away. Never use only hands.
The person in charge must:
- have a clear view of where the machine is to be moved;
- give instructions to the crane operator from a position where he/she can be clearly seen;
- stop immediately if dangerous conditions arise.

3.2.3 PLACING THE LOAD

Before placing the load make sure the floor is perfectly level and its load bearing capacity is suitable for the weight of the machine.
Do not place the loads in areas where they may create potential dangers or prevent access to equipment and/or emergency exits.
The machine must be placed on the cross-bars provided so that it is stable and the slings can be easily removed.
Do not place worn containers or those with protruding material on top of it.
Do not stack material at dangerous heights where they risk falling down.

3.3 INSTALLATION REGULATIONS

SAFETY INSTRUCTIONS

Install the machine by following the instructions provided by the Manufacturer and observing safety standards and regulations.
Make sure there is enough space around the machine so that it can be operated and serviced easily. It is important to take into consideration the dimensions of the machine in all the positions moving parts may reach, in particular:
- the space for whole body access to operate and perform maintenance must be ≥ 500 mm;
- the distance between moving parts and fixed obstacles to prevent total body crushing must be ≥ 500 mm.

The area surrounding the machine must always be kept free of obstacles, clean, dry and well-lit.
The customer must make sure that fire suppressors are provided in the area where the machine is installed and that there is a system for protection against voltage fluctuation in the electricity supply line. These must conform to laws currently in force in the country where the machine is installed.

DANGER

Connect the machine to a suitable and efficient grounding system.

CAUTION

The electric system is not provided with the differential safety device, unless this device was expressly requested.

NOTICE

If electronic converters are provided in the electrical cabinet, the differential safety devices, installed on the power supply line of the electrical cabinet, must protect against ground fault current with direct component.

SAFETY INSTRUCTIONS

The Manufacturer shall not be held responsible for any property damage or personal injury resulting from improper installation.

The machine must be installed on foundations whose features are as specified by the Manufacturer in the FOUNDATION DIAGRAMS. These foundations must withstand both static load and dynamic load caused by the machine during operation.
In cases where the geometry of the machine requires the realizations of foundations below the pavement level, will be payable by the Customer to prepare all necessary safety devices to allow access in safety to the machine and its foundations.
In particular, the customer must provide the entire pavement on the machine to close each access to the foundations; such pavement must be dimensioned in such a way as to withstand all the loads to which it may be subjected.

3.4 REGULATIONS FOR USE, ADJUSTMENTS, MAINTENANCE

WARNING

Before any operation in the machine, the operators that must work on it must:
- make sure the machine is not accidentally started by stopping the power supplies (electrical, pneumatic, etc.) and applying personal locking devices to them (for example padlocks) with the name of the operator who put them on;
- remove and keep the keys of the locking devices.

WARNING

Do not use the machine if a safety device is malfunctioning; put the machine out of service by setting the disconnectors of power supplies to the "isolated circuit" position.
Operate the machine only when the safety devices are perfectly efficient.

WARNING

Do not perform control, repair or maintenance operations on moving parts.
Clearly visible warning signs must be shown to inform the operators regarding this prohibition.

WARNING

Do not get or rest on machine parts other than service floors, ladders or parts expressly indicated in this manual when working in the machine: parts like guards or perimeter parts are not designed to sustain the weight of a person and might collapse causing personal damages and damages to the machine.
For operations on the machine to be performed at ground level or in the relevant service floor, use appropriate working platforms or other personal lift devices that comply with current regulations.

CAUTION

During operation, electric motors may reach temperatures that can cause light burns. Work on the motors using the suitable precautions.

CAUTION

If inhalable dust is generated when cleaning the machine, wear a suitable protective mask and properly ventilate the room.

⚠ CAUTION

When using and/or handling chemical substances, lubricants and coolants follow the indications given in the relevant safety data sheets.

SAFETY INSTRUCTIONS

To ensure top machine performance and trouble-free operation, it is essential that the directions supplied by the Manufacturer are followed and that the required maintenance is carried out as indicated.
In particular, check all of the safety devices on a regular basis to verify they work properly and check the insulation of the electrical cables as well as the efficiency of the ground connection. Replace the cables, if damaged.

SAFETY INSTRUCTIONS

The safety devices may have to be temporarily removed or deactivated for some adjustment and/or maintenance operations. Always restore them after adjustment and/or maintenance operations have been completed and before the machine is operated.

SAFETY INSTRUCTIONS

The electrical cabinets and the junction boxes installed in the machine include parts that may be live.
Access with a specific tool is only allowed. Only qualified personnel trained to reach live parts can have this tool.
When the electrical cabinet is live, the qualified personnel can only reinstall the safety devices of the electric circuit.

SAFETY INSTRUCTIONS

When “outlet-plug” connections are provided in the electrical cabinets and in the junction boxes installed in the machine, disconnect only when the machine is stopped and after the electrical system has been disconnected from mains power supply.

SAFETY INSTRUCTIONS

Use specific tools to connect and disconnect the conductors in the “spring” terminals.

SAFETY INSTRUCTIONS

It is forbidden to remove nameplates and labels from the machine.
The user must restore markings (on conductors, terminals, devices, etc.), plates and labels that have become illegible, and keep them clean.

NOTICE

The manufacturer disclaims any liability for damage to persons or property and any form of warranty shall be forfeited in the event of:
- spare parts different from those initially installed in the machine are used;
- spare parts are incorrectly installed;
- jobs or modifications not authorized by the Manufacturer are carried out;
- tampering.

NOTICE

Dispose of any chemicals, lubricants and refrigerants used in compliance with the regulations in force in the country of installation of the machine.

SAFETY INSTRUCTIONS

The jog device must only be used by one person that has complete visual control over the machine and rotating mechanical parts.
The operator that intervenes on the rotating mechanical parts must be absolutely sure that no other operator can inadvertently activate machine operation. The operator may be exposed to serious risks if this procedure is not followed precisely.
Precise procedures regarding machine safety device enabling and trigger pulses must be followed to use the jog device.
The device controls machine functions in order to obtain slight movements of the moving parts.
A voluntary action must be performed on the maintained action controls (person present when controls used) in order for the device to operate. These controls shut down the machine immediately when the device is released.

3.4.1 NOTES FOR USE, ADJUSTMENT AND MAINTENANCE

3.4.1.1 Residual risks

RISKS DUE TO PNEUMATIC OVERPRESSURE

Do not change the adjustment of the pressure relief devices that protect the pneumatic system of the machine. The improper adjustment of these devices may cause malfunctions or breakages of parts of the pneumatic system and cause dangers to the operators' safety.

RISKS OF CRUSHING/SHEARING

Danger of entangling and shearing by the starwheels and the filling carousel with machine running in manual mode or through the use of hand-motion device with the machine off.

ELECTRICAL HAZARDS

The part of the electrical system before the switch may be live even with the main switch in the OFF position.
Cut off power from the machine power line with the power disconnector of the plant.

Due to the presence of electronic drives and/or converters, some parts of the electrical cabinet may have a dangerous voltage for a few minutes, even after the power system has been disconnected.

3.4.1.2 Access to the machine

Do not put your hands into the openings of the guards when the machine is running.

SAFETY GUARDS WITH INTERLOCKING DEVICES
The machine is equipped with perimeter guards with electrical interlock.
The safety guards are unlocked only when no parts are rotating and no pneumatic pressure is exerted.

Do not force the opening of the guards. Use the release keys on each interlock to access the machine whenever power is missing.
Only the personnel authorized to access and service the machine must have the keys for guard release.
Open and close the guard with cause to avoid damaging the interlocks.

SAFETY GUARDS WITH MECHANICAL LOCK
A number of safety guards with mechanical locks may stay in place even without the fixing screws.

Always secure all the safety guards in place before attempting to start up the machine.

3.5 REGULATIONS FOR CEASE USE AND DISMANTLING

3.5.1 CEASE USE

SAFETY INSTRUCTIONS

Follow the instructions given in chapter 9–DISMANTLING, paragraph DECOMMISSIONING, in compliance with current regulations.

SAFETY INSTRUCTIONS

Only skilled personnel properly trained on how to work on and handle the machine are authorized to work on it.
Use only adequate lift means and equipment that comply with current regulations and standards.

NOTICE

If the machine needs to be moved from an industrial plant to another, please contact the Manufacturer's customer service centre for assistance in packaging and transport specifications.

3.5.2 DISMANTLING

SAFETY INSTRUCTIONS

Follow the procedures indicated in chapter 9-DISMANTLING, paragraph DISMANTLING, in compliance with the rules in force.

SAFETY INSTRUCTIONS

Only expert personnel trained on appropriate operating and handling methods can perform dismantling operations.
Use only adequate lift means and equipment that comply with current regulations and standards.

NOTICE

Dispose of used chemical substances, lubricants and coolants in compliance with the rules in force in the country where the machine is installed.
Dispose of the machine so as to recycle the various materials in compliance with the rules in force in the country where the machine is installed.

3.6 OPERATOR TRAINING

COMPANY USING

SAFETY INSTRUCTIONS

The machine is designed for professional use.
The company using the machine must prevent access by unauthorized personnel.
The company using this equipment must see that their personnel:

- read and understand the manual in its entirety.
- are adequately instructed and trained on how to safely carry out their tasks.
- receive specific training on how to operate this machine correctly.
- wear work gloves, safety shoes and all the personal protective equipment set forth by work place safety and health laws taking into consideration the type of chemical substances used.
- do not wear any loose or hanging clothes, rings, necklaces, bracelets, watches, ties or other items that may be caught in moving machine parts.
- receive specific training on how to face emergency situations resulting from operator injuries.

Additional training courses are available on request to become more familiar with the machine.

OPERATOR

SAFETY INSTRUCTIONS

The operator must at least:
- understand the technology employed and have specific experience in operating this type of machine;
- be well educated and able to read and fully understand the contents of this manual as well as properly interpret the drawings provided;
- know all the safety rules and standards in force in the country in which the machine is installed:
  - general (hygiene and on-the-job safety, accident prevention);
  - specific (for the type of product handled by the machine).

Operator tasks
The action of the operator on the machine during production consists of:
- visual check and supervision of production with operator interface;
- load consumable material used during production.

MAINTENANCE WORKER

SAFETY INSTRUCTIONS

Choose maintenance workers with the same criteria used for operators.
They must have the specific technical knowledge (mechanical, electrical, pneumatic, etcetera) required for safely performing the operations they are responsible for indicated in the manual, using appropriate tools or devices.

Maintenance worker's tasks
A maintenance worker is allowed to perform the routine maintenance operations indicated in the instructions manual limited to his mechanical, electrical, pneumatic, etc. expertise.

4 INSTALLATION

4.1 SHIPPING, LIFTING AND POSITIONING THE MACHINE

The machine is divided into various blocks to meet shipping and installation requirements.
Upon arrival at the user's premises, the crates must be handled with the utmost care and moved, both inside and outside, by equipment of adequate capacity, in accordance with the instructions on the packaging and the accompanying documents of the goods.
The attached diagram illustrates the most suitable procedures and systems for lifting heavy and big parts or parts that require special care and equipment provided by the Manufacturer.
When lifting the smaller parts and packages, be careful and use the most suitable equipment observing the safety precautions.

SAFETY INSTRUCTIONS

Only specially trained authorized personnel may lift and handle the line.
No one should ever be near the hanging load and/or in any case within the range of action of the lift equipment while the load is being hoisted and transported.
The loads may be handled manual, where possible, only by personnel properly trained on how to lift and handle, observing all current safety standards and laws.
Observe all the safety regulations indicated in paragraph SAFETY RULES FOR HANDLING of chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS.

NOTICE

The Manufacturer shall not be held responsible for any personal injury or property damage resulting from failure to observe current safety standards regarding lifting and handling materials in the user’s facility.

4.2 INSTALLATION

SAFETY INSTRUCTIONS

Assembly operations must be performed only by specialised personnel and authorised to that kind of operation. Observe all the safety regulations indicated in paragraph SAFETY RULES FOR HANDLING of chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS.

- Position filling machine turret.
- If provided, position the rinsing turret.
- If provided, position the mixer.
- Assemble the turrets and the various devices.
- Install the additional conveyor belts (if provided).
- Install side panels on conveyor belt (if provided).
- Install photocells on conveyor belts (if provided).
- Level machine using the adjustable height threaded legs.
- Connect machine conveyor belt to the one of conveyor line.

4.3 CONNECTIONS

NOTICE

Only properly trained personnel are authorized to hook the machine up to the various systems.

4.3.1 WASHING SYSTEM

Connect machine to washing liquid supply system, as directed in the LAYOUT document.

NOTICE

The machine must be connected by observing all regulations currently in force in the country where the machine is installed.

4.3.2 PNEUMATIC SYSTEM

Connect the machine to the compressed air distribution system.

NOTICE

Connection of the machine's control unit to the compressed air mains must be performed in compliance with the regulations of the country of installation of the machine.

4.3.3 ELECTRICAL SYSTEM

The customer must assure the machine is connected to a power supply system equipped with a device that protects against surges. The cut off current must be suitable to protect the supply wires.

SAFETY INSTRUCTIONS

As there are a number of electronic converters inside the electrical cabinet, make sure the ground fault circuit interrupters on the power supply line of the electrical cabinet are of the B type (as recommended by CEI 64-8 specifications, art. 532.2.1.4) thereby ensuring adequate protection against leakage currents.

4.3.3.1 Electrical cables

Connect as shown in the electrical diagram.

SAFETY INSTRUCTIONS

The power and ground cables should have an adequate cross-section and be constructed so that they are suitable for the specific wiring system.

NOTICE

Seal the conduit for the electric cables with polyurethane foam or similar products to assure they remain clean and in good condition.

4.3.3.2 Grounding system

Within the switchboard, make the connection of the points marked with the symbol  (417-IEC-5019) to a suitable earthing system.
Any paint present in the areas where the ground conductors come into contact with the machine should be removed before the relative screws are tightened in order to ensure perfect electrical continuity.

SAFETY INSTRUCTIONS

The power and ground cables should have an adequate cross-section and be constructed so that they are suitable for the specific wiring system.

DANGER 

Failure to earth the indicated parts may cause serious machine damage and personal injury.

4.3.4 PRODUCT FEEDING SYSTEM

Connect machine to product supply system, as directed in the LAYOUT document.

NOTICE

The machine must be connected by observing all regulations currently in force in the country where the machine is installed.

4.3.5 CO2 AND STEAM SUPPLY SYSTEMS (IF PROVIDED)

Connect machine to CO2 supply system and steam supply system, as directed in the LAYOUT document.

NOTICE

The machine must be connected by observing all regulations currently in force in the country where the machine is installed.

5 START-UP

NOTICE

For machines equipped with components that fall within the scope of application of directive 97/23/EC, the Client must perform commissioning testing before use, in compliance with the legislation in force in the country of use.

5.1 FIRST START-UP

The machine is to be started up the first time by personnel specially trained in the mechanical and electric fields.

NOTICE

Only the technicians of the machine Manufacturer can perform these operations. If they are performed by other persons, they may create dangerous situations and cause serious damages to persons and/or the machine.

The customer's machine operator and maintenance staff must simply look on when the machine is started up (to better understand the operating principle of the machine, how to adjust the auxiliary equipment, accessories and safety devices and guards employed) and test runs are carried out to check the adjustments made.
Before commissioning the machine, make sure:
- the machine and/or equipment show no signs of damage incurred during shipment, handling and installation;
- all the fasteners used for shipment have been removed;
- all the materials and tools employed for installation have been removed;
- the power supply is as indicated on the machine nameplate;
- the pneumatic supply is as required;
- the cooling system supply is as required;
- the cables and/or tubes are properly connected and not damaged or twisted;
- whether all the shut off valves are open;
- the safety guards are completely and correctly installed;
- the sequence of the phase wires is correct by checking the direction in which all the motors run;
- the operation of all the safety devices;
- the operation of the audible/visual indicator devices.

NOTICE

The Manufacturer declines all responsibility for damages to people or things and any sort of warranty expires in case of:
- spare parts different from those initially installed in the machine are used.
- spare parts are incorrectly installed.
- interventions or modifications not been authorised by the Manufacturer;
- the machine is tampered or altered in any way.

NOTICE

The information regarding the operator interface is given in chapter 6 - OPERATING INSTRUCTIONS and in the documents INSTRUCTIONS B.

Conditions
- Electrical and pneumatic power supply corresponding to that required by the machine.

Procedure
- Turn keyboard mode selector switch to **AUT** position.
- Press reset button **R** to reset the machine.
- Use the controls to manually operate valves, pumps and motors; check that they work properly.
- If necessary, perform the passivation procedure as directed below.

Step	Solution	Flow rate	Temperature	Length
RINSING	demineralized water	higher than system working flow rate	ambient	20 minutes
DEGREASING	soda 2%	-	80 °C	1 hour
RINSING	demineralized water	higher than system working flow rate	ambient	until reaching the original pH
PASSIVATION	nitric acid 6%	-	ambient	4 hours
RINSING	demineralized water	higher than system working flow rate	ambient	until reaching the original pH
DRYING			ambient	4/24 hours
RINSING	demineralized water	higher than system working flow rate	ambient	10 minutes

5.2 SUBSEQUENT START-UP PROCEDURES

NOTICE

The information regarding the operator interface is given in chapter 6 - OPERATING INSTRUCTIONS and in the documents INSTRUCTIONS B.

Conditions
- Electrical and pneumatic power supply corresponding to that required by the machine.
- Make sure all the equipment is installed correctly and corresponds to that indicated on the DATA SHEET.
- Make sure all the parameters given on the data sheet have been properly set for the machine. Some of the parameters can be set with the operator interface while others need to be set directly on the machine.
- Closed guards.

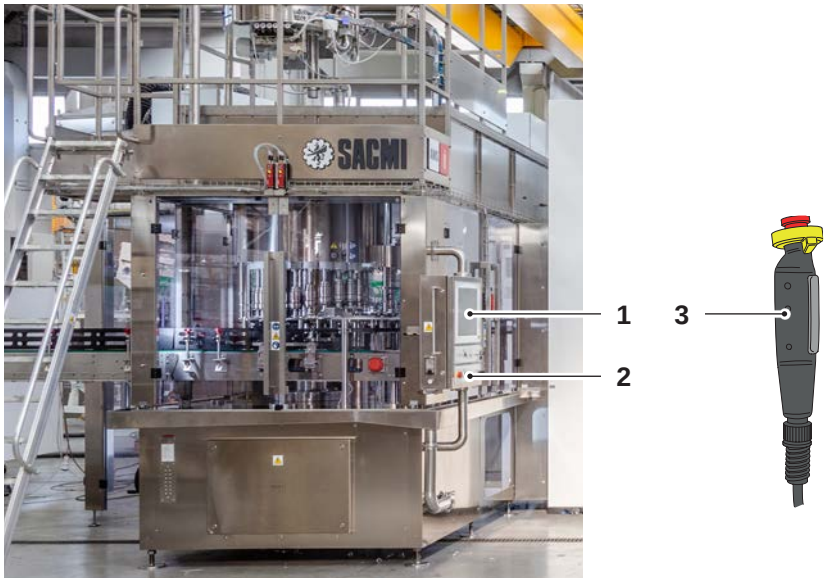
Procedure
- Perform CIP washing procedure, as directed in chapter 6 - OPERATING INSTRUCTIONS.
- Set operating mode to **AUTOMATIC**.
- Press reset button **R** to reset the machine.
- Activate the desired production cycle.

6 OPERATING INSTRUCTIONS

6.1 USER INTERFACE

Operator interface includes:
1 Control panel;
2 Push-button panel;
3 Mobile control device.

Parts type and number changes in relation to machine configuration.



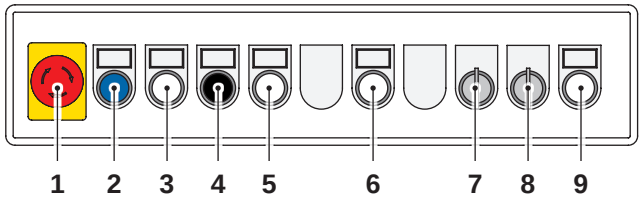
Control panel

NOTICE

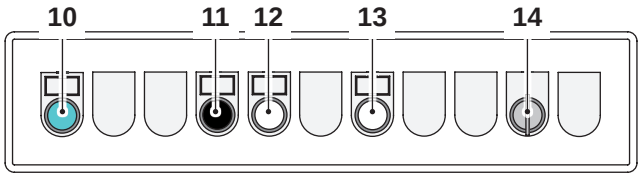
The information regarding the programming and use of the control panel is given in the document INSTRUCTIONS B.

Pushbutton panel

ID	DESCRIPTION	MORPHOLOGY	FUNCTION
1	**EMERGENCY**	Mushroom head push button (red)	Pressed: it immediately STOPS the machine
2	**RESET**	Backlighted push button (blue)	The flashing illumination of the indicator indicates the detection of one or more faults. • When it is pressed for a few seconds it executes machine reset and alarms restoration (the machine is powered and the power units are restored). Blinking button goes off.
3	**START CYCLE MANUAL**	Lit push button (white)	Flashing light signals that button is active. • Pressed simultaneously with “AB-Key” button starts the selected manual cycle. The button stays lit.
4	**CYCLE STOPS**	Black push button	Pressed: it allows machine timed STOPPAGE at the end of the movements in progress.
5	**START CYCLE**	Lit push button (white)	Pressed: it starts automatic cycle.
6	**RELEASE GUARDS BLOWER**	Lit push button (white)	When this key is pressed, it causes sending machine safety guard locks unlocking request. • When light is STEADY, it indicates that safety guard is closed, but not locked (lockable). • When light is OFF, it indicates that safety guard is closed and locked (unlockable). • FAST flashing light indicates that the safety guard is being locked/unlocked. • SLOW flashing light indicates that the button is active.
7	**MACHINE MANAGEMENT**	Key selector (2 positions)	It allows to select blow molding machine operation independently (STAND ALONE) or in combination with filling machine (COMBO). In COMBO mode, blow molding machine and filling machine automatic cycle start-up and stoppage are controlled respectively by buttons **12**-**13**
8	**OPERATION**	Key selector (2 positions)	Used to define whether the machine is in "maintenance" mode (ON) or in "automatic" or "manual" mode (OFF).
9	**AB-KEY**	Lit push button (white)	Pressing this key enables different types of operations, activated only by pressing a second button, either this physical or represented on the operator interface. • Selector switch **8** set to “ON”: pressed at the same time with button **3**, it starts the selected manual cycle. • Selector switch **8** set to “OFF”: pressed at the same time with button **3**, it controls timed start-up of all blow molding machine axes. • Selector switch **8** set to “OFF”: pressed together with start-up button displayed in the pop-up window that appears on the screen, it commands the previously selected area to be started manually.



ID	DESCRIPTION	MORPHOLOGY	FUNCTION
10	**TRANSPONDER KEY**		By approaching this receiver, a “transponder” key allows you to automatically log in
11	**FILLING MACHINE/ COMBO CYCLE STOPPAGE**	Black push button	Pressed: It allows filling machine timed STOPPAGE at the end of the movements in progress. If selector switch **7** is turned to “COMBO” mode, it stops automatic cycle of both the filling machine and the blow molding machine at the end of the movements in progress.
12	**FILLING MACHINE/ COMBO CYCLE START-UP**	Lit push button (white)	Pressed: It STARTS machine functioning. If selector switch **7** is turned to “COMBO” mode, it starts automatic cycle of both the filling machine and the blow molding machine.
13	**UNLOCKING FILLING MACHINE SAFETY GUARDS**	Lit push button (white)	When this key is pressed, it causes sending machine safety guard locks unlocking request. • When light is STEADY, it indicates that safety guard is closed, but not locked (lockable). • When light is OFF, it indicates that safety guard is closed and locked (unlockable). • FAST flashing light indicates that the safety guard is being locked/unlocked. • SLOW flashing light indicates that the button is active.
14	**FILLING MACHINE MAINTENANCE**	Key selector (2 positions)	Used to define whether the machine is in "maintenance" mode (ON) or in "automatic" or "manual" mode (OFF).



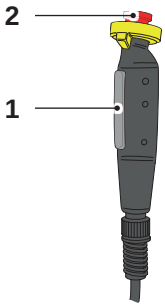
Mobile control device
The mobile control device (jog) is used for maintenance and/or size change-over operations at controlled and safe speed with safety guards open.

NOTICE

Adjustments are not allowed on moving parts, not even with the use of the mobile control device.

To activate the device, turn OPERATION selector switch on push-button panel to **SET-UP**.
Button **1** has three positions:
- fully released: operations are NOT allowed;
- intermediate position: running condition;
- fully pressed: panic emergency; reaching the panic position is seen as an anomaly and requires a reset.

Button **2** allows emergency stop.



NOTICE

The mobile control device operates, only if the dedicated safety guard is open.
Speed in jog mode cannot exceed 3% of maximum speed.

Devices location is indicated in the attached LAYOUT document.

6.2 RUN/STOP

See paragraph OPERATOR INTERFACE and the documents INSTRUCTIONS B for references to controls.

Run
If the safety and operating conditions are met:
- Press **RESET** key on push-button panel to enable safety guards locking and allow start-up.
- Press **CYCLE START** key on push-button panel to turn machine on.

Jog mode
If the safety and operating conditions are met:
- Select jog mode operation.
- Press **RESET** key on push-button panel to enable safety guards locking.
- Press **START** key on the mobile push-button panel to turn machine on.

Stop
- Wait until all the containers are out of the machine, then pres **CYCLE STOP** key on push-button panel to stop the machine.

Emergency stop
The emergency stop that can be activated with the special buttons or by the display of fault messages that cause the machine to shut down. Deactivate the emergency stop button or identify and remove the cause of the activation of the safety device; clear the faults.
See the documents INSTRUCTIONS B for the description of the faults.

6.3 CLEANING

6.3.1 CLEANING WITH BROKEN BOTTLE/CONTAINER

Use adequate protective equipment (safety gloves, pliers, etc.), when filling glass bottles/containers.

- Stop the machine.
- Remove any residues of broken bottles/containers.
- Clean the machine base with a damp cloth and dry it with compressed air.
- Clean the sensors, photocells and reflectors delicately, making sure not to move or damage them.

6.3.2 CIP WASHING

The machine is provided with a CIP washing device that is intended for washing and sanitizing the parts in contact with the filling liquid.
Types of washing:

- **RINSE ONLY**: consists of a simple washing with water;
- **SANITATION**: consists of a complete washing of the plant with the use of a washing product;
- **FLOODING**: consists of filling all machines with an appropriate cleaning solution to keep them clean during periods of inactivity (i.e. at night or on weekends). The filling can only be carried out after sanitizing the system.

SANITATION
The machine sanitation cycle is defined as the succession of stages of washing, rinsing and drainage in the manner and time required to ensure complete cleaning of the filler and the dramatic reduction of microbial load and varies depending on many parameters, such as the type of filled product, the type of plant, environmental conditions (higher temperatures require more frequent sanitations) modes of use of the filling line.
The sanitization cycles can be 3 steps (ref.1-3, usually used for frequent washing and sanitization cycles, occasionally alternated with 5 steps), 5 steps (ref.1-5, for more complete sanitization cycle services) or 7 steps (ref.1-7, for sanitization cycle services after bottling of more problematic products (i.e. milk-based).

1. In the case of hot filling, it is necessary to perform initial rinsing at the temperature used for filling the product and then gradually decrease it until the mains temperature is reached.If the filling is cold, simply rinse at the mains temperature. This first rinse allows the elimination of most of the product residues from the piping and its duration will vary depending on the product that has been bottled previously (of course, if the product is water, rinsing will be very brief).
2. Carry out a cycle with soda (1.5%-2% at 80°-85°C) to permanently eliminate product residues left after rinsing.
3. Perform a rinse cycle with water at mains temperature until the soda (or acid) is completely eliminated.
4. Carry out a cycle with acid (usually nitric 1% at 30°C or phosphoric max 1% at 30°C) or with sanitizer (PAA-based chemical such as P3 -Oxonia or Divosan Mezzo).
5. Carry out a new cycle with soda (1.5%-2% at 80°-85°C).
6. Perform a cycle with sanitizer (PAA-based chemical such as P3 -Oxonia or Divosan Mezzo).
7. Once the cycle with acid or sanitizer has been completed, perform a final rinse with water at mains temperature. This rinse, usually the last to be carried out before the new production, will continue until acid or sanitizer value corresponds to that decided by the customer.

The following chart summarizes concentrations, temperatures and cycle duration of some products to be used for washing that can be used during sanitization. This chart is to be considered as a purely indicative and non-binding trace.

PRODUCTS for WASHING	CONCENTRATION	TEMPERATURE	DURATION expressed in minutes
Caustic Soda (NaOH)	2%	80 °C	30
Nitric Acid (HNO3)	1%	30 °C	20
phosphoric acid (H3PO4)	1%	30 °C	20
PAA Solution	250 - 300 ppm	20 °C	20
Hot water		95°c	45

SAFETY INSTRUCTIONS

Dangerous substances (acids, soda, etc.) are used during sanitation cycles and dangerous temperatures are reached. Always take all appropriate precautions.
In the event of accidental contact with the sanitising products, rinse thoroughly with water or, if available, with detergent substances provided. In any case, immediately consult a doctor.

6.3.3 COP WASHING

The machine can be equipped with the COP washing system, which allows the machine to be washed externally automatically.
See OPERATOR INTERFACE paragraph and INSTRUCTIONS B documents for references to controls.

7 ADJUSTMENTS

WARNING

Only skilled personnel familiar with the machine and the plant can perform adjustment operations as indicated in chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS. Perform adjustment operations with the machine stopped, unless otherwise specified. Take all the measures required to avoid machine accidental start-up. Take into account the main possible risks and the safety instructions given in chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS.

NOTICE

The Manufacturer declines all responsibility for damages to people or things and any sort of warranty expires in case of:
- spare parts different from those initially installed in the machine are used.
- spare parts are incorrectly installed.
- interventions or modifications not been authorised by the Manufacturer;
- the machine is tampered or altered in any way.

NOTICE

The information regarding the operator interface is given in chapter 6 - OPERATING INSTRUCTIONS and in the documents INSTRUCTIONS B.

7.1 PNEUMATIC SYSTEM ADJUSTMENT

Conditions
- Machine on and air supplied.

Pressure adjustment 1
- Lift the adjustment handle.
- Turn the adjustment handle clockwise and set a pressure lower than the desired one.
- Turn the adjustment handle counterclockwise to se the desired pressure.
- Press the adjustment handle.

Flow adjustment 2
- Loosen the locking ring.
- Turn the adjustment handle clockwise to increase the flow or counterclockwise to decrease it.
- Tighten the locking ring.

8 MAINTENANCE

WARNING

Only skilled personnel familiar with the machine and the plant can perform maintenance operations as indicated in chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS.
Perform operations with the machine stopped, unless otherwise specified. Take all the measures required to avoid machine accidental start-up.
- Perform the Lock Out / Tag Out procedure (LOTO), as indicated in chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS.
- Place a “maintenance in progress” sign.

The maintenance operations are subdivided as follows:
- routine maintenance jobs (to be carried out by the customer’s maintenance staff);
- special maintenance (to be performed by the manufacturer’s specialized staff or by personnel authorized by him).

The following are some examples of routine maintenance:
- mechanical operations: lubricating and cleaning the mechanical parts, replacing and tensioning the belts, replacing or cleaning hydraulic valves;
- electric operations: replacing the fuses in the cabinet;
- operations on pneumatic system: pneumatic system lubrication, condensate training, pressure check.

NOTICE

The Manufacturer declines all responsibility for damages to people or things and any sort of warranty expires in case of:
- spare parts different from those initially installed in the machine are used.
- spare parts are incorrectly installed.
- interventions or modifications not been authorised by the Manufacturer;
- the machine is tampered or altered in any way.

NOTICE

The information regarding the operator interface is given in chapter 6 - OPERATING INSTRUCTIONS and in the documents INSTRUCTIONS B.

NOTICE

As regards machinery equipped with components that fall within the field of application of Directive 97/23/EC, the client must conduct tests after putting it into service in compliance with the established methods and times.

8.1 ROUTINE MAINTENANCE

8.1.1 SCHEDULED MAINTENANCE

Follow the indications given in the maintenance schedule with care for a high level of efficiency and safety of the device.
Regular maintenance prevents malfunctions and repair operations, thereby reducing downtimes and maintenance costs.
Maintenance schedule has been divided as indicated below:

- every 200 hours of operation;
- Every month or every 500 hours of operation;
- every 1000 hours of operation;
- Every six months or every 3000 hours of operation;
- Every year or every 6000 hours of operation;
- Every two years or every 12000 hours of operation.

	ID (3)	Point of operation	Action taken	Product (1)	Time (2)
200 h	2	Air filtration system (if provided)	Cleaning/replacement		10/30
		Sensors/photocells	Checking/cleaning		10
		Electrical cabinet fan filters (if provided)	Cleaning		10
	1	Centralized lubrication terminals (if provided)	Lubrication	**G.17**	10
500 h		Emergency push buttons	Check operation		10
		Safety microswitches	Check operation		10
		Audible/visual indicators	Check operation		2
		Electrical boxes and cabinets	Check seals		5
		Electrical cables	Check connections and conditions		10
		Ground system cables	Check connections and conditions		5
1000 h		Electrical cabinet fan filters (if provided)	Cleaning		20
		Lubrication pump tank (if provided)	Lubricant top-up	**G.17**	10
3000 h		Electrical boxes and cabinets	Check seals		5
		Electrical cables and grounding system	Check connections and conditions		15
		Residual current devices of the switches	Verify they work efficiently		10
6000 h	5	Water filter (if provided)	Replacement		5
		Air/CO_2 filter (if provided)	Replacement		5
	6-7	Pre-filter and air filtration system filter (if provided)	Replacement		10
	15	Reduction gears	Replace lubricant	**O.25**	60

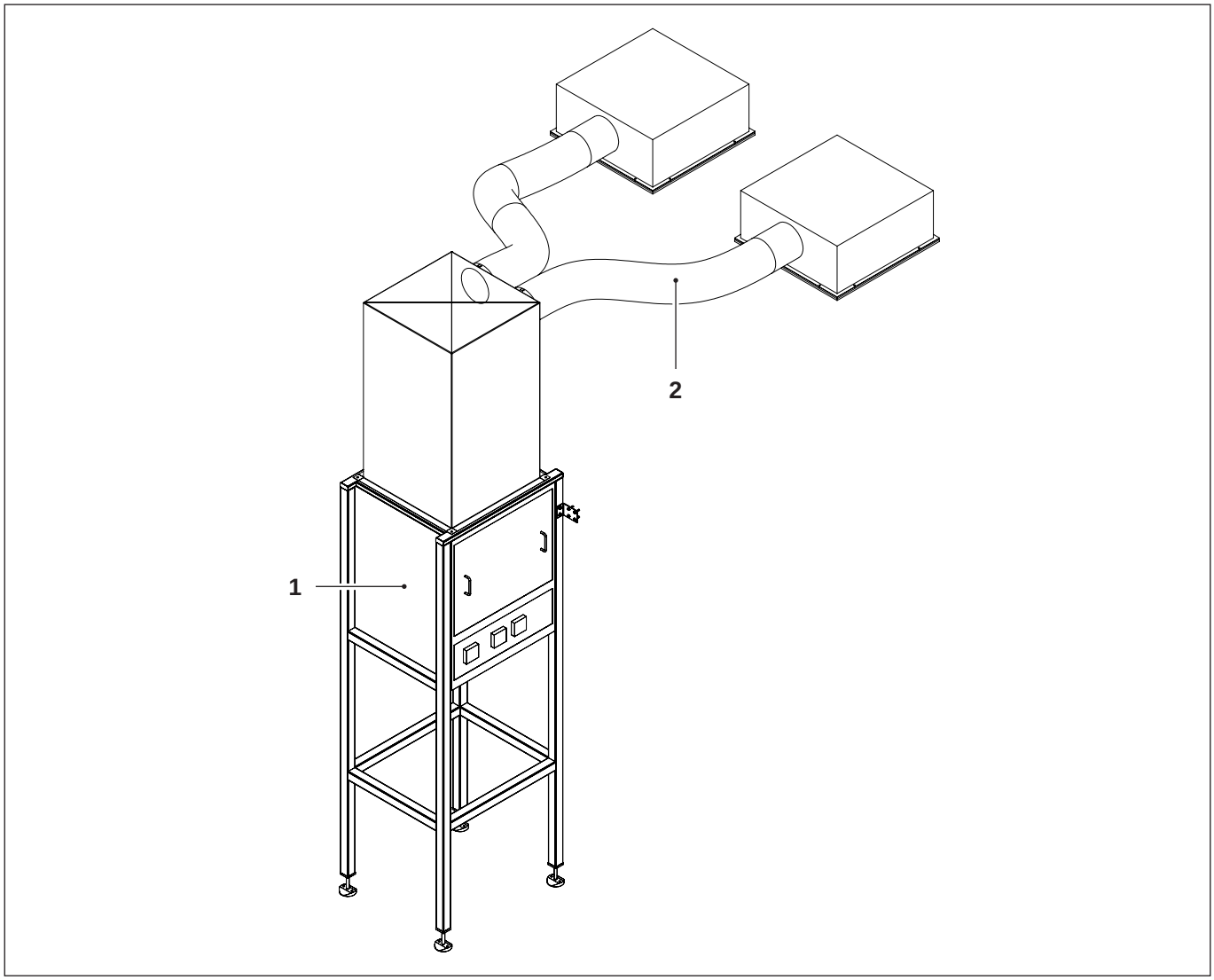
(1) Product to be used, see LUBRICANTS AND ADHESIVES DOCUMENTATION.
(2) Estimated time required for maintenance worker to perform operation, expressed in minutes.
(3) Maintenance operation identification code on operator interface.

8.1.1.1 Every 200 hours of operation

ID 2 **Cleaning air filtration system** 200 ore

- Clean pre-filter **1** with compressed air blowing in the opposite direction to operating flow, if necessary replace it.
- Check pipes **2** for wear and tear/cleanliness, if necessary replace them.

For more information, refer to filtration system instruction manual.



PHOTOCELL / SENSOR CLEANING 200 hours

Clean the sensors, photocells and reflectors delicately, making sure not to move or damage them.

ID 1 **Centralized lubrication** 200 hours

Lubricate all the lubrication points with a gun until the lubricant **G.17** (see LUBRICANTS and ADHESIVES DOCUMENTATION) begins to come out of the drain hole or the sealing ring on the respective part (see LUBRICATION SYSTEM DIAGRAM).

8.1.1.2 Every month or every 500 hours of operation

CHECK OPERATION OF THE EMERGENCY STOP BUTTONS

500 hours

- Turn on the machine with the main switch.
- Clear the faults.
- With the machine stopped, press one of the emergency stop buttons. Make certain the relative fault message is shown on the control panel.
- Release the pressed emergency stop button.
- Clear the faults (the fault message must disappear).
- Proceed in the same manner for the other emergency stop buttons.
- Replace the faulty devices.

CHECKING SAFETY LIMIT SWITCHES OPERATION

500 hours

Operations to perform when the machine is energized.

- Close all machine accident prevention safety guards.
- Clear the faults.
- Perform the following procedure for each safety guard:
  - With the machine stopped, open the safety device and make sure the relative fault message appears on the control panel.
  - Close the guard.
  - Clear the faults (the fault message must disappear).
  - Operate the machine.
  - Try to open the guard without forcing it to avoid damage to make sure it is locked.
  - Stop the machine.
- Replace the faulty devices.

CHECK OPERATION OF THE AUDIBLE/VISUAL INDICATORS

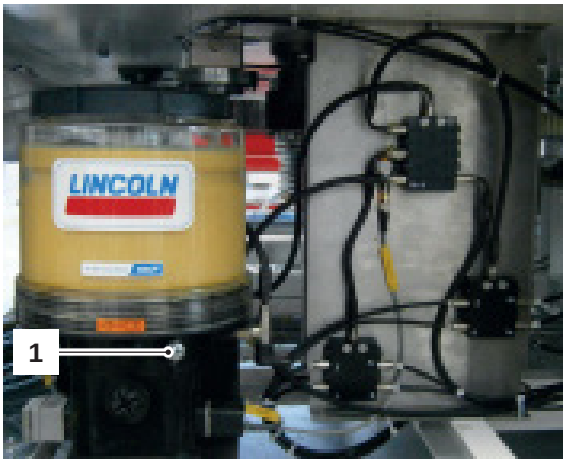
500 hours

- Turn on the machine with the main switch.
- When the cabinet comes on, the light tower and led indicators on the control panel light up and the audible alert signal on the indicator tower sounds during the first 3 seconds.

8.1.1.3 Every 1000 hours of operation

REFILLING ELECTRIC PUMP WITH LUBRICANT 1000 hours

Top up the tank with the lubricant **G.17** (see LUBRICANTS AND ADHESIVES DOCUMENTATION) via the grease nipple **1**.



8.1.1.4 Every six months or every 3000 hours of operation

CHECK SEALS OF SWITCHBOARDS AND ELECTRICAL BOXES 3000 hours

Make sure the cabinet doors and covers of the electrical boxes close correctly and that the seals are in place and not worn to avoid compromising the correct degree of protection.

8.1.1.5 Operations to be carried out every year or every 6000 hours of operation

ID 15 Change the oil in the gearboxes 6000 hours

Check the type of lubricant indicated on the plate installed in the gearbox (see LUBRICANTS AND ADHESIVES DOCUMENTATION). The plate also indicates whether the gearbox is “life-lubricated” (lubricant does not need to be changed).

- Place exhausted oil collection container under drain plug.
- Loosen the filling plug.
- Loosen drain plug and let oil completely flow out.
- Tighten the drain plug.
- Add the **O.25** oil (see LUBRICANTS AND ADHESIVES DOCUMENTATION), using the level gauge to check the level (if provided).
- Tighten the filling plug.

8.1.2 UNSCHEDULED MAINTENANCE

8.1.2.1 Size change procedures

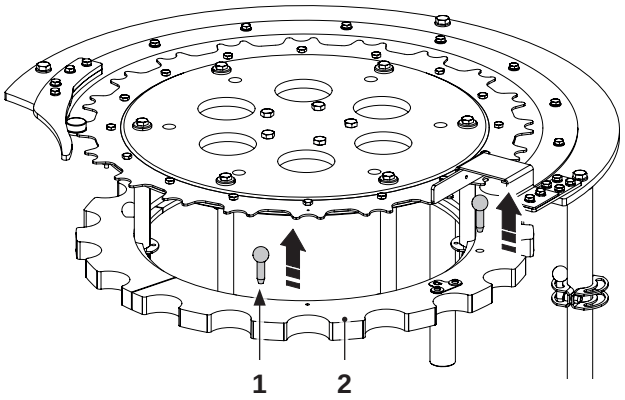
The machine was designed to make format changes faster and easier. Most of the time part adjustment and replacement are performed without the use of tools.
All the parts are marked to make their identification easier. The parts are also shown on the relative DATA SHEET.
The mark consists of a numeric code and a colored sticker (if present) to make a visual search of the parts easier. The colored sticker is a unique code that only identifies the type of format. Therefore, two different types of formats will have different color codes. If some equipment has several different colored stickers, this means that the equipment can handle several containers/labels.
Follow the indications given on the DATA SHEET to install the correct equipment.

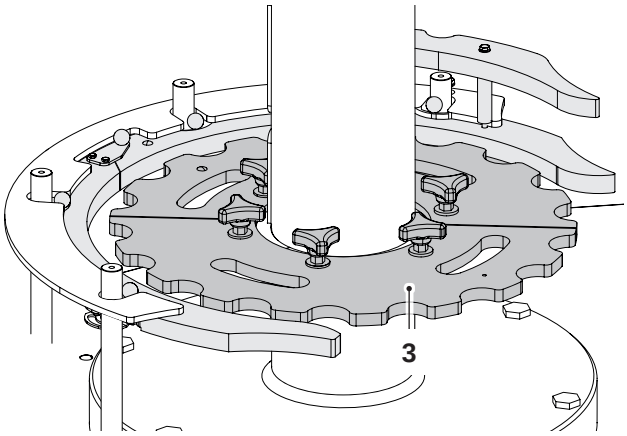
Procedure
- Wash the system.
- Replace the equipment with those appropriate for the size to be processed.
- Adjust equipment position with respect to those appropriate for the size to be processed.
- If provided, change capper size, as directed in the relative instruction manual.
- If provided, change cap feeder size, as directed in the relative instruction manual.
- Adjust sensors/photocells position in relation to the size to be processed.
- Adjust pneumatic and hydraulic system for the size to be processed.
- If provided, adjust orientation/quality control systems position for the size to be processed (as directed in the corresponding documentation).
- Upload operating parameters (recipe) by means of the control panels.

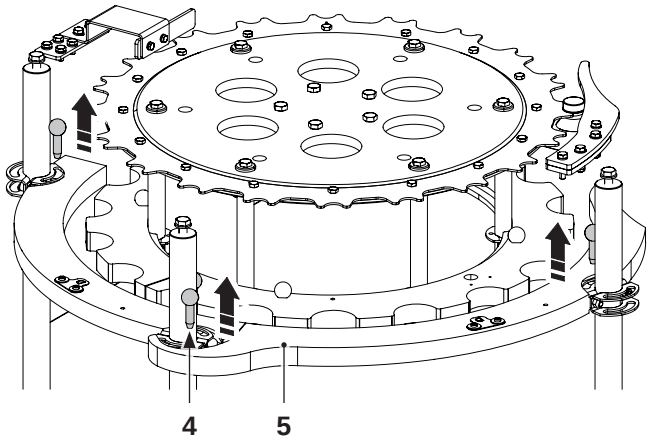
REPLACING PET CONTAINER STARWHEELS AND GUIDES

- For each transfer starwheel:
  - Remove knobs **1**.
  - Remove the turn-plate **2**.
- For each capper starwheel:
  - Loosen handwheels and remove starwheel **3**.
- For every container guide:
  - Remove knobs **4**.
  - Remove the guide **5**.

Install container starwheels and guides by matching the markings, proceeding in the opposite way as described for the removal step.



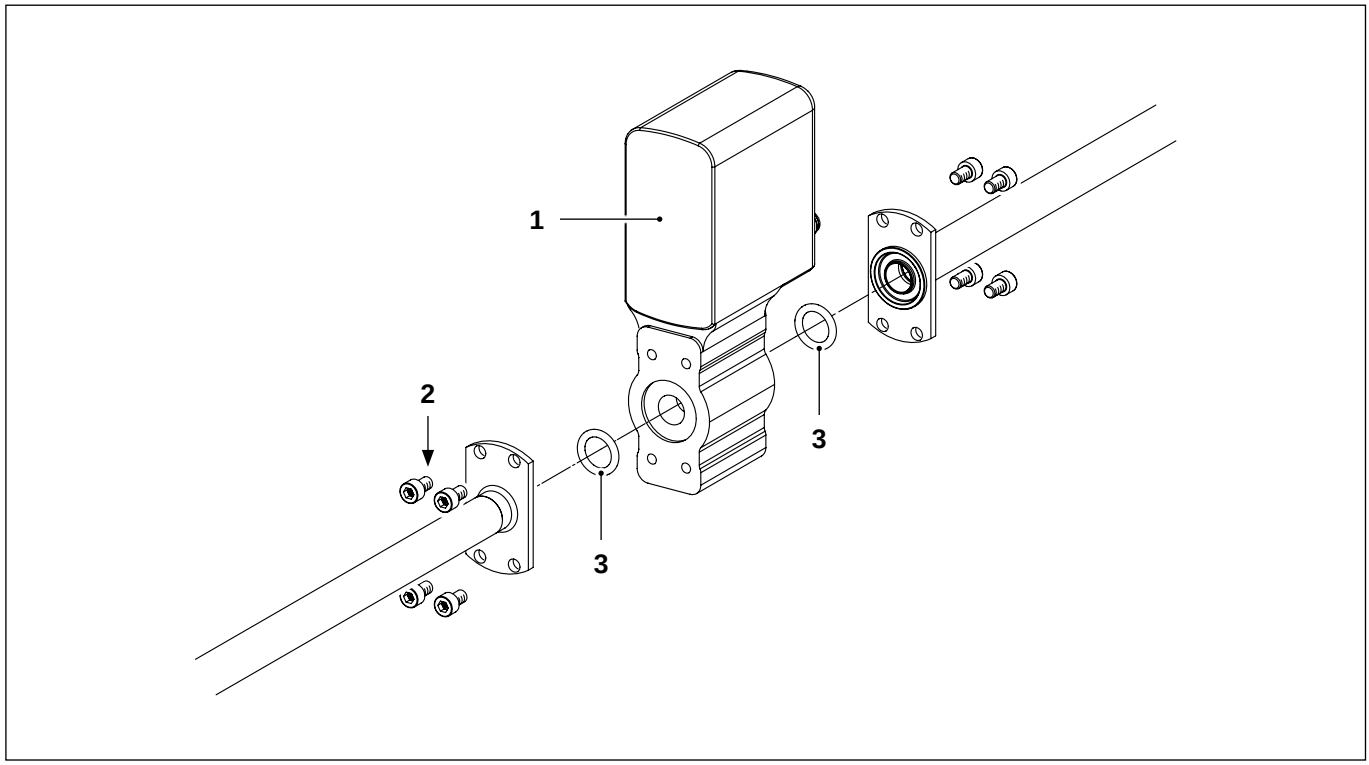




8.1.2.2 Flow meter replacement

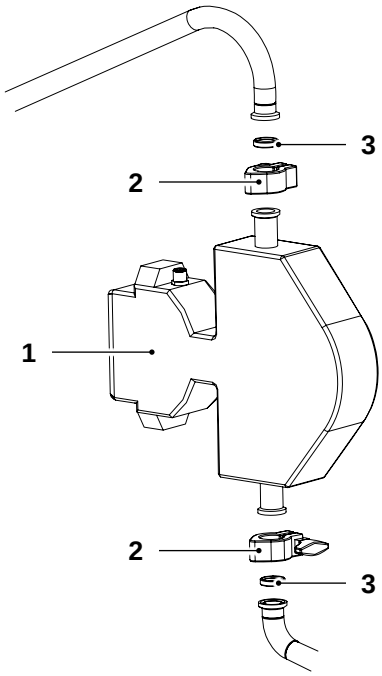
MAGNETIC FLOW METER
Conditions
- Machine in maintenance mode.

Procedure
- Electrically disconnect the flow meter **1**.
- Unscrew screws **2** to disconnect the product supply pipes from the flow meter.
- Remove gaskets **3** and from their seats, check for wear and replace with new ones if necessary.
- Replace the flow meter.
- Install the gaskets **3**.
- Tighten the screws **2**.
- Electrically connect the flow meter.
- Calibrate the flow meter.



MASS FLOW METER
Conditions
- Machine in maintenance mode.

Procedure
- Electrically disconnect the flow meter **1**.
- Open the terminals **2** to disconnect the product supply pipes from the flow meter.
- Remove gaskets **3** and from their seats, check for wear and replace with new ones if necessary.
- Replace the flow meter.
- Install the gaskets **3**.
- Close the terminals **2**.
- Electrically connect the flow meter.
- Calibrate the flow meter.



8.1.2.3 Flow meter calibration

After replacing the flow meter, the set-point volume must be checked and corrected if necessary.
Carry out 3 dosages with the same valve and carry out the 3 weighings using a scale.
Average the weighings and change the set-point value per recipe according to the deviation determined.

• Example no. 1:
500 ml set-point and 495 ml weighted average ---> correct the setpoint for the specific valve to 505
[=expected volume + expected volume-weighted average = 500 + (500 - 495) = 500 + 5]

• Example no. 2:
500 ml set-point and 505 ml weighted average ---> correct the setpoint for the specific valve to 495
[=expected volume + expected volume-weighted average = 500 + (500 - 505) = 500 - 5]

Carry out the procedure described above for each valve until all the valves on the turret have been fully calibrated.

8.2 SPECIAL MAINTENANCE

The operations for special maintenance must not be performed by the operator or by the maintenance staff. They are reserved to the technicians of the machine Manufacturer.
Therefore these operations are not dealt with in this manual.

	ID (3)	Point of operation	Action taken	Product (1)	Time (2)
3000 h	3	Upper rotating manifold	Revision		
		Lower rotating manifold			
6000 h	8	Bottle handling grippers			
	9	Filling valves			
	10	Tap grippers			
	11	Dummy bottle device			
	12	Bottle lifting device			
12000 h	17	Auger control			
	19	Filling system gaskets	Replacement		
	18	Bottle sliding surfaces (if provided)			
24000 h	21	Drive system	Revision		
	22	Conveyor belt			
	23	Transfer starwheels			
	24	Covers	Checking seal/replacement		
	25	Control ring units	Revision		
	26	Vacuum pump			
36000 h	28	Gears	Check for wear and replace		
	29	Tank lifting unit	Revision		
48000 h	31	Slewing bearing	Check for wear and replace		

9 DISMANTLING THE MACHINE

SAFETY INSTRUCTIONS

Dismantle the machine following the safety warnings indicated in chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS.

9.1 MACHINE DECOMMISSIONING

SAFETY INSTRUCTIONS

Only skilled personnel properly trained on how to work on and handle the machine are authorized to work on it.
Use only adequate lift means and equipment that comply with current regulations and standards.

When the machine is not going to be operated for an extended period or is no longer going to be used, follow the directions given below to make it inoperative.

- Use the factory main switch to cut off electrical power to the supply line.
- Remove the power cable fixed to the terminal board of the switchboard.
- Disconnect the compressed air connection (if provided) between the pneumatic unit and factory's air mains.
- Disconnect the suction hood from the smoke suction system (if connection present).
- Activate the safety devices, if necessary.
- Thoroughly clean the entire machine paying special attention to the working parts, applying protective lubricant.
- Close the doors to prevent damage from tampering or dust from getting in.

NOTICE

If the machine needs to be moved from an industrial plant to another, please contact the Manufacturer's customer service centre for assistance in packaging and transport specifications.

9.2 DISMANTLING THE MACHINE

SAFETY INSTRUCTIONS

Only skilled personnel properly trained on how to work on and handle the machine are authorized to work on it.
Use only adequate lift means and equipment that comply with current regulations and standards.

If the machine is to be dismantled, first of all, make it inoperative as instructed below.
- Use the factory main switch to cut off electrical power to the supply line.
- Remove the power cable fixed to the terminal board of the switchboard.
- Detach the connecting cables between the electrical cabinet and machine by unplugging the connectors.
- Disconnect the compressed air connection (if provided) between the pneumatic unit and factory's air mains.
- Disconnect the suction hood from the smoke suction system (if connection present).
- Activate the safety devices, if necessary.
- Empty the lubrification plant (if any) from oil.

WARNING

Remove the line parts observing current safety standards and following the instructions given in chapter 4 – INSTALLATION and safety guidelines given in chapter 3 - SAFETY EQUIPMENT AND PRECAUTIONS.

NOTICE

Dispose of chemical substances, lubricants and coolants according to local laws in force in the country the machine is installed in.
Always dismantle the machine so that the materials can be recycled as set forth in laws in force in the country in which the machine is installed.