use and maintenance

AROL NORTH AMERICA

Model

M - CLOSYS EAGLE VP

Serial number

A3279

Pitch diameter

550 mm

Nr of heads

1

Manufacturing year

2014

TRANSLATION OF THE ORIGINAL INSTRUCTIONS

AROL closure systems

CE

Revision

01 06/2014

WARNING

BEFORE START UP THE MACHINE, READ CAREFULLY THE TECHNICAL INSTRUCTIONS IN THIS PUBLICATION AND SCRUPULOUSLY FOLLOW THE INDICATIONS IN THIS MANUAL.

KEEP THE MANUAL IN A PLACE EASY TO GET AND WEEL KNOWN BY THE USER (Operators and personnel charged with the maintenance).

AROL closure systems

http://www.arol.com

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CEP 04534-013 São Paulo / SP - BRAZIL

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A GENERAL INFORMATION

1. CERTIFICATIONS

The machine is realized in compliance with the relevant EC Directives applicable at the time of release on the market. Being the machine within the scope of *ANNEX II A* of the European Directive 2006/42/EC, *AROL S.p.A.* affixes the CE marking by Self-certification.

The original copy of the *DECLARATION OF CONFORMITY* is supplied as annex to the machine documentation and must be filed until machine disposal.

Here is a fac-simile copy of the *DECLARATION OF CONFORMITY.*

AROL closure systems

EC DECLARATION OF CONFORMITY

(Attachment II A of Directive 2006/42/EC)

The manufacturer

AROL S.P.A.
VIALE ITALIA, 193
14053 CANELLI (AT) – ITALY

DECLARES

under his responsibility that the new machine described below:

Type:
Serial no.:
Construction year:

suitable to apply caps to rigid preformed containers is compliant with the following directives:

- **2006/42/CE**
- **2004/108/CE**

The person authorized to prepare the relevant technical construction file is:
AROL S.p.A. – Viale Italia 193, 14053 CANELLI (AT) - ITALIA

CE

CIRIO Sergio
Managing Director

Canelli, ...

TRANSLATION OF THE ORIGINAL STATEMENT

AROL S.p.A. – Viale Italia, 193 – 14053 CANELLI (AT) – ITALY
Tel. +39 0141 820.500 Fax +39 0141 820.555 – www.arol.it

2. MACHINE IDENTIFICATION

The machine has an identification plate, placed in the rear part of the base (see Fig.1 and Fig.2).

On the plate are reported:

- Machine model (MODEL)
- Type of machine (TYPE)
- Pitch diameter (P.D. in mm)
- Number of heads (HEADS)
- Machine serial number (SERIAL N.)
- Manufacturing year (YEAR)
- Marking (CE)

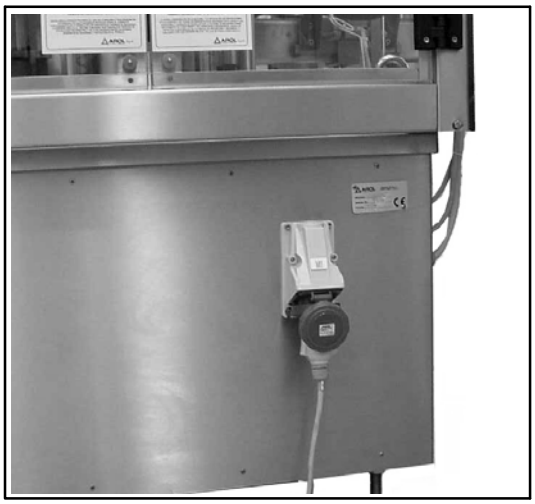


Fig.1

Fig.2

3. INTRODUCTION

This manual is addressed to the operators and specialized staff to enable a correct machine use.

The operator finds here instructions and indications for:

- a correct machine installation.
- A functional description of the machine and of each component, including also the accident-preventing safety norms.
- Adjustments on the machine while setting and starting it up.
- A correct scheduled and routine maintenance.
- Pay attention to the most elementary safety and accident-preventing norms.

The operator can thus know the machine features and operation.

The used terms and symbols are specified here below to understand the manual fully:

TERM	*DESCRIPTION*
OPERATOR	Person charged with the machine operation, adjustment, routine maintenance and cleaning.
QUALIFIED TECHNICIAN	Specialized person, suitably trained and authorized for installation, extraordinary maintenance or repair interventions requiring a special machine knowledge.
EMPLOYER (OR CUSTOMER)	Person legally responsible for the machine use.

GRAPHIC SYMBOL	*DESCRIPTION*
	Manual section reserved to the *qualified technician*
	Pay attention to the accident-preventing norms
	Possibility of damaging the machine and/or its components
	Special note

4. WARRANTY AND FINAL TEST

The machine is delivered to the customer ready to be installed, after having passed all tests arranged by the manufacturer at the factory, according to the laws in force. During the warranty, the manufacturer engages to eliminate possible faults or defects provided that the machine has been used correctly, in compliance with the instructions of the use and maintenance manuals.

For everything not specifically indicated in this manual, refer to the "*GENERAL SALES CONDITIONS point 8 WARRANTY - LIABILITY RESTRICTIONS.*"

***AROL* shall not be liable for inconveniences, breakage, accidents, etc., due to the non-knowledge (or anyway to the failed application) of the specifications herein. The same applies to changes, modifications and/or installation of non-genuine accessories or spare parts without previous authorization.**

In particular, *AROL* declines all liabilities for damage due to:

- Acts of God.
- Wrong maneuvers.
- Failed maintenance.
- Damage of the electric or electronic components due to condensate or contact with outer conductors.

***AROL* further declines all liabilities resulting from an incorrect or improper machine use.**

The warranty shall be cancelled if machine components are modified or replaced, or if the software of programmable components is varied, without previous authorization by the manufacturer.

5. CUSTOMER'S OBLIGATIONS

The customer shall suitably train and inform the operators on the following topics concerning safety while using the machine:

- specific instructions for the machine use and maintenance.
- General accident-preventing norms, or norms specified by international directives and by laws of the machine destination country.

After the training, the customer must ensure the qualified technicians and operators have understood the above points, and must make them sign the "Performed training sheet" enclosed herewith.

These qualified technicians and operators only can work on the machine.

The customer, or a persons charged by him, shall deliver the P.P.M. (Personal Protection Means) required for all operations on the machine needing them (maintenance, cleaning, etc.).

6. CONSULTATION MODE OF THE MANUAL

The consultation of the manual is made easy by the insertion in the front page of a general index that allows to find in an immediate way the subject of interest. Chapters are organized in a hierarchy structure that makes easy the finding of the desired information.

Before any operation with or on the machine read the procedures and warnings herein carefully.

SOME FIGURES IN THIS MANUAL ARE APPROXIMATE AND MAY DIFFER AS FOR THEIR ASPECT FROM THE MACHINE DESCRIBED IN THIS MANUAL. Such differences represent machine components that can be positioned differently depending on the version, but that can be easily recognized. The reported instructions and use modes for all described components anyway remain valid.

7. KEEPING THIS USE INSTRUCTION MANUAL

To keep the "Manual" correctly, it is recommended to:

- keep the manual in the room where the machine operates and in areas protected against humidity, so as not to jeopardize its life in time.
- Use the manual not damaging it.
- Not to remove, add, modify or edit any part of the document; possible updates shall be made exclusively by *AROL.*
- Give the manual to the other owner of the machine.

8. REPRODUCTION RESTRICTION, RESPONSIBILITY AND COPYRIGHT

The reproduction of this manual is allowed only for training and information purposes of the staff charged with the machine use.

No reproduction allowed for other purposes, without explicit authorization by *AROL.*

As *AROL* is steadily involved in the improvement of its products, the information in this manual may be changed without notice. Utmost care was used while preparing this manual. Anyway, *AROL* does not undertake any responsibility for errors or omissions. No responsibility is taken for damages resulting from the use of the information herein.

9. REVISIONS

The manufacturer engages to issue future revisions of the manual following to modifications on the machine.

10. MEASURES BY THE CUSTOMER

Excluding special contract conditions, the customer must arrange the following:

- power supply, including the protection lead commonly called “GROUND WIRE”.
- Pneumatic supply.
- The protection of the power line from overcurrents and indirect contacts (it is recommended to install a differential switch).
- Generic tools for the machine maintenance and consumables.
- Lifting means suitable for the machine handling.

11. HOW TO ASK FOR INTERVENTIONS

AROL puts its own Technical Service at the disposal of its customers to solve any problem regarding the machine use and maintenance.

The interventions must be required after carefully evaluating the faults and their reasons, and stating:

- The details on the occurred faults.
- The performed checks.
- The performed adjustments and resulting effects.
- Any further information deemed useful.

The requests for interventions by the Customer Technical Service must be forwarded one to the following addresses:

AROL closure systems http://www.arol.com	*AROL S.p.A.* Viale Italia, n° 193 14053 CANELLI (Asti) ITALY Tel.: +39 0141 820500 - Fax: +39 0141 820555
AROL Hexagone closure systems http://www.arol.com	*AROL HEXAGONE* Z.a. Saint Vincent Rue de l'Artisanat F - 73190 CHALLES LES EAUX Tél.: +33 04 79 72 85 95 - Fax: +33 04 79 72 71 76
AROL North America closure systems http://www.arol.com	*AROL NORTH AMERICA* 450 satellite Blvd. NE Suite A U.S.A. - Suwanee Georgia 30024 Phone: +1 678 318 1290 - Fax: +1 678 318 1296
AROL China closure systems http://www.arol.com	*AROL CHINA* Room 128, No. 69 Tongzhou Rd - Hongkou district 200080 Shanghai PR of CHINA Phone: +86 13552882352
AROL Brasil closure systems http://www.arol.com	*AROL BRASIL* Rua Joaquim Floriano, n° 871, conjunto 111, sala A, Itaim Bibi CEP 04534-013 São Paulo / SP - BRAZIL

12. HOW TO ORDER SPARE PARTS

All orders for spare parts must be sent to *AROL.*

The warranty is cancelled if non-genuine spare parts are installed.

To order spare parts, fill in the suitable form in the "*SPARE PART CATALOGUE*" for the machine.

Spare part replacement must be carried out by specialized technicians following the procedures and using ALL SAFETY PRECAUTIONS described in the chapters "Maintenance" and "Safety".

13. CHARACTERISTICS OF THE OPERATORS

To understand the instructions (text and figures) the machine operators must have (or get, though a suitable training and education) at least the following characteristics:

- sufficient general and technical knowledge to read and understand the manual content in the sections concerning them and to interpret drawings and schemes correctly.
- Capacity of understanding and interpreting symbols and pictograms.
- Knowledge of the main accident-preventing and hygienic norms.
- Global knowledge of the machine and of the environment where the machine is installed.
- Capacity of behaving correctly in case of machine emergency situations.

The qualified technicians, besides the above characteristics, must also have a good technical preparation and/or a suitable working experience in the relevant field. Further, they must have specific and special (mechanical and electrical) technical knowledge needed for the operations described in this manual.

13.1. INFORMATION - JOB INSTRUCTIONS - TRAINING

13.1.1. INFORMATION - JOB INSTRUCTIONS

The customer shall inform and train the personnel charged to use the machine and make sure that:

- On the work place there are suitable information concerning dangers, risks and prevention and protection solutions including the use of P.P.M., if provided.
- the workers the task of using of work equipment receive a suitable training accordingly.
- The workers the task of using of equipment requiring special knowledge and responsibility receive a suitable and specific training, so that they can use such equipment safely and suitably, also as far as risks caused to other people are concerned.

13.1.2. TRAINING

Training is the activity aimed at understanding the correct machine use, thus complying with the obligations described in the European Directive in force.

13.2. PRECAUTIONS FOR THE OPERATORS' SAFETY

When container parts must be removed from the machine it is necessary: to switch off all the energy sources, to wear protective gloves with cutting protection and to remove each foreign matter using a small broom and a dustpan.

To install, maintain or change size, sometimes it is necessary to change some parts of the sorter or the delivery chute. Due to the weight of these components and to their positioning in the machine upper part, this operation must be carried out with the machine off, using suitable lifting systems.

14. MACHINE DESCRIPTION - DATA AND TECHNICAL SPECIFICATIONS

14.1. GENERAL DESCRIPTION

The CLOSYS EAGLE VP is able to apply pre-threaded caps (screw caps).

This model applies caps on containers as described in table "*Closure type*" in the chapter "*TECHNICAL DATA*".

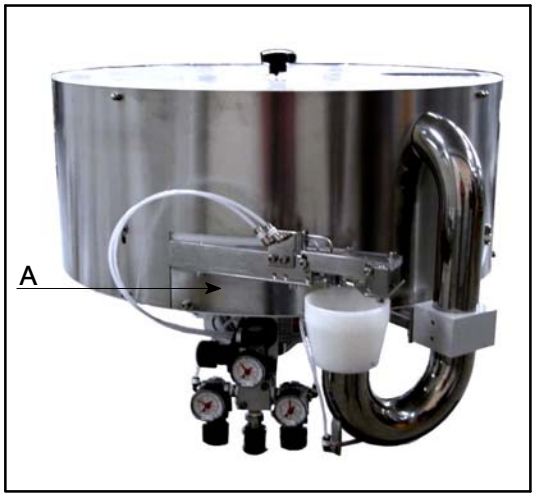


Fig.3

14.1.1. MAIN UNITS OF THE MACHINE

Caps arriving from the caps sorter (A), are driven by a caps chute (B) until the distribution head (C).

Cap placed about 45°, is taken with a system called "pick and place", that supports a transfer device (F) that transfers the cap under the capping head where it is taken by the closure gripper (G).

Containers are moved inside the machine by a transfer belt.

The rotation of the star-wheel (D) transfers containers under the capping head (E) where the closure takes place.

The capping head following the profile of a cam will take the cap from the transfer device by the closure of the mechanical gripper.

Then there is the application on containers by screwing of the cap.

After the closure, there is the detachement from the bottle in ext and the rearmement for the following closure.

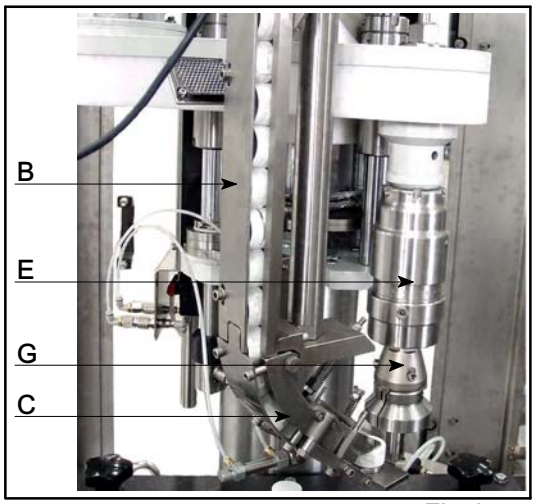


Fig.4

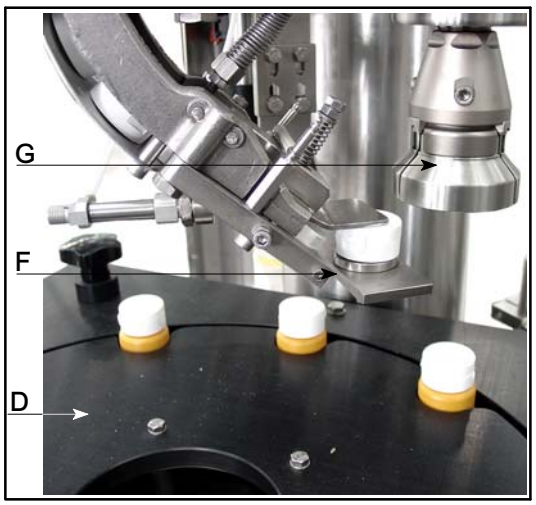


Fig.5

14.2. MACHINE TECHNICAL DATA

Model:	CLOSYS EAGLE VP
Serial no.:	A3279
Rotation:	clockwise
Manufacturing year:	2014

a. Weight

Machine weight	350	kg

b. Productive capacity

Pcs/h	1.800

c. Electrical data

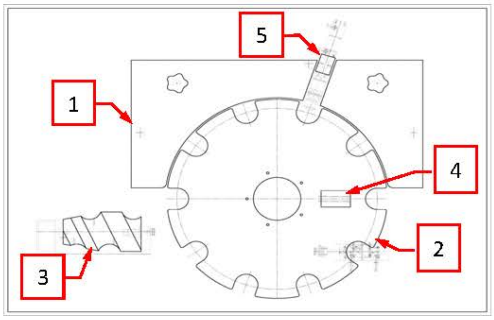
Supply voltages:		
main	575	V ~
	60	Hz
auxiliary	24	V =
Installed power:		
electric board	0.40	kW
machine rotation main motor	1.10	kW
caps sorter motor	0.37	kW
head rotation motor	0.37	kW
Total installed power:	**2.24**	kW

d. Pneumatic data

Sterile air capacity	400 ≈	Nl/min
Sterile air min. pressure	6	bar
Sterile air max. pressure	8	bar

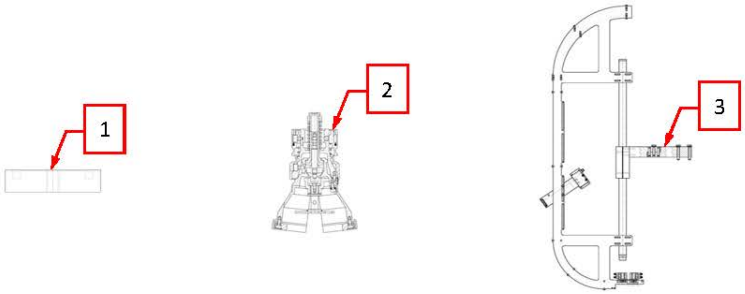
e. Closure type

EQUIPMENT COLOURS TABLE



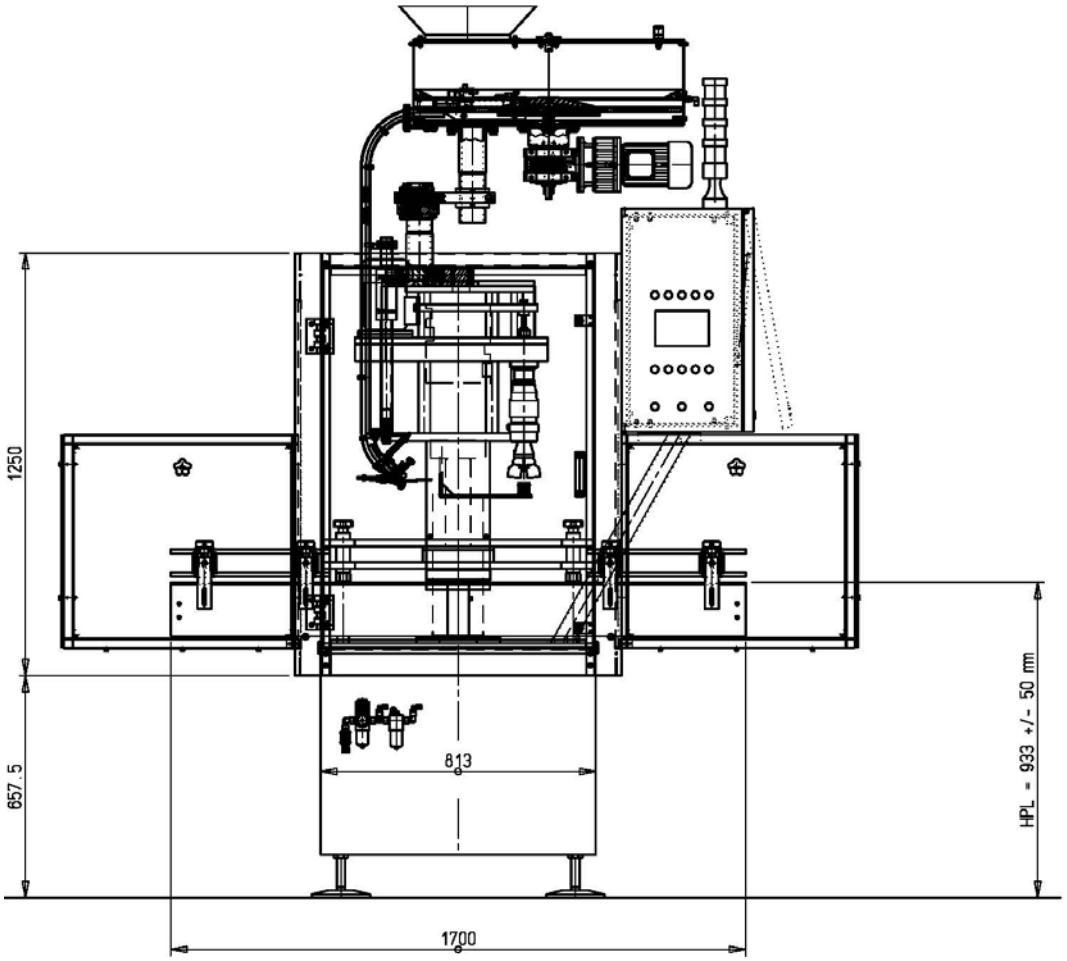
AROL closure systems		Order confirmation \ OCR	Conveyor	Body guide central star-wheel	Worm	Container ejector	Spindle stopping spacer							
Serial number:	A3279													
Model name:	EAGLE VP													
Bottle														
Code\Description	Maker\Notes		1	2	3	4	5							
Z00A3279B001		14002801	AB01	AB01										
BOTTIGLIA SAGOM. HDPE 152X153 H.294 4L														
Z00A3279B002		14002801	AB02	AB02										
BOTTIGLIA CILIND. HDPE D.158 H.290 4L														

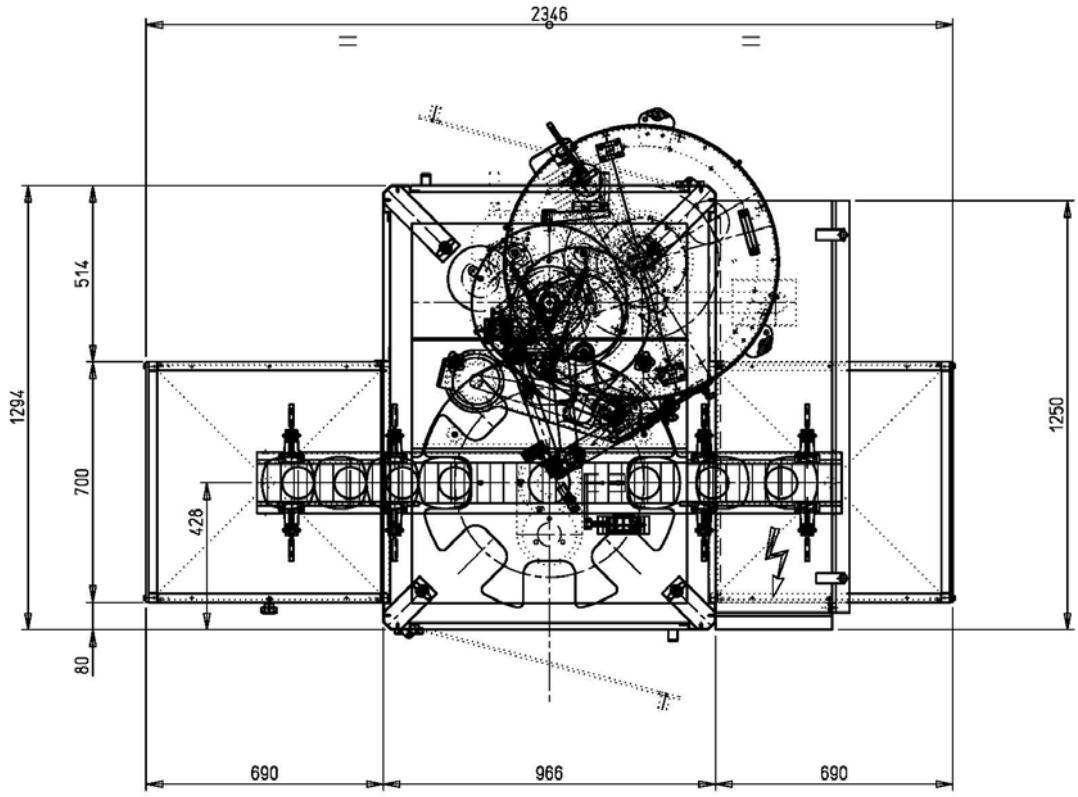
FORMAT CHANGE MARKS TABLE



AROL closure systems		Order confirmation \ OCR	Cap gripper pin	Chuck / Gripper / Terminal	Feeding chute								
Serial number:	A3279												
Model name:	EAGLE VP												
Cap													
Code\Description	Maker\Notes		1	2	3								
Z00A3279C001		14002801	AC01	AC01	AC01								
CAPS. PREF. FLAT D.88 H.22,5 1PR 216 VERDE													
Z00A3279C002		14002801	AC02	AC02	AC02								
CAPS. PREF. FLAT D.94,5 H.23,1 1PR 228 BIANCA													

f. Overall dimension scheme





15. DIRECTIVES - CERTIFICATIONS - USE RESTRICTIONS

15.1. EC DIRECTIVE

The following EC directives have been referred to while designing and manufacturing the machine:

2006/42/CE	DIRECTIVE OF THE EUROPEAN PARLIAMENT on the approximation of the laws of the Member States relating to machinery.
2004/108/CE	DIRECTIVE OF THE EUROPEAN PARLIAMENT on the approximation of the laws of the Member States relating to electromagnetic compatibility.

15.2. EXPLOSIVE ATMOSPHERE

The machine is not suitable for being used in premises where atmospheres with explosion risk are expected or expectable. The customer must not use the machine in explosive or partially explosive atmosphere.

15.3. USE ENVIRONMENTAL CONDITIONS

The machine is built for working in ventilated and well lit closed environments.

The temperature of work environment must be included between 5 °C and 40 °C.

15.4. LIGHTING

The machine uses the lighting according to the place of setting up. Anyway, the machine must not work in dark areas.

Concerning how to provide suitable lighting, the user is responsible for the respect of the applicable standards.

15.5. NORMS COVERING THE RISK OF EXPOSURE TO NOISE

Work in bottling environments, where the noise level in very high, must be managed, bearing in mind the significant risks to hearing and other parts of the body, in compilance with all of the norms issued by the various national and local bodies.

15.5.1. INFORMATION ON NOISE EFFECTS

Exposure to noise can provoke:

- Hearing problems (if temporary) or damage (if permanent).
- Physiological problems or damage (to the cardiovascular system and breathing apparatus, to the gastroenteric apparatus and to the nervous system).
- Psychological problems or damage (difficult to evaluate because it is linked to the personal experience of the subject).
- Poor attention and effort at work, difficulty in receiving communications via sound.

15.5.2. THE EFFECTS ON HEARING

More is known about the effects on hearing, and it is the problem seen most often in the work environment.

Damage from noise pollution has the following characteristics:

- It increases with exposure time, but not proportionally.
- It has a greater effect on subjects with reduced resistance and those who are not of working age, but these relationships are neither constant nor linear.
- It has a greater effect if it disturbs sleep and rest.

In order to determine damage of hearing, it is important to establish the total quantity of energy absorbed by the subject overtime, this is expressed in terms of “continuous noise level equivalent”.

When determining this, one must bear in mind other factors such as pulsing, the tone components, etc.

In short, the main factors that determine the presence of damage are:

- the level of sound pressure.
- The exposure time.
- The spectral composition of the noise.

15.5.3. MACHINE SOUND EMIISSION

The measure of the intrinsic noise of the machine has been made at the *AROL*, according to the following criteria:

- Nominal production speed indicated in table at page 10 point "**b.**".
- Containers often used.
- Complete of conveyor belts.
- Automatic operation.

As there are no specific indications of the work area of the machine or operator working position, we located 6 measurement points (three in the fron part of the machine and three in the rear part of the machine, far away about 1 meter to each other and the external surface of the machine protections, at a height of about 1,6 m from the floor).

The registered values, taken on machines technically comparable with those in exam, showed a noisiness value lower than 80 dB(A) L_{eq}.

When the machine is inserted in the bottling line, the *Employer* must comply with the laws in force concerning the noise level.

Machine: model		Operating conditions	
EAGLE		Production: nominal	
DECLARED NOISE EMISSION in accordance with ISO 4871			
Measured A-weighted emission sound pressure level, $L_{pAd\ (rif.\ \mu Pa)}$:			
Point 1	*Point 2*	*Point 3*	*Point 4*
75	74	78	79

Values determined in according ISO 415-2 Appendix A, ISO 11204.

NOTE: The sum of measured noise emission value and its associated uncertainty represents an upper boundary of the range of values which is likely to occur in measurements.

15.6. RESIDUES AND ENVIRONMENTAL CONTAMINATION

If the processed material is that the contract provides, there aren't noxius substances.

15.7. SCRAPPING AND DISPOSING

As there are in force different norms of observation, it is necessary to follow the prescriptions fixed by laws and authorities of the states where the machine will be installed.

Proper precautions must be taken for out-of-order and scrapping of the machine in order to avoid possible dangerous situations.

In particular, follow these general instructions:

1) disconnect the machine from the electric network and check that no residual voltage exists.
2) Empty all the lubrication points of oil paying attention in not dispersing and dispose it according the laws in forces in the country where the machine has been used.
3) Lock all the moving parts of the machine, making sure that there are no possibilities of movement, also due to accidental collision during the transfer operation.
4) With the help of qualified and authorized personnel proceed to the dismounting of components and the differentiated collection of materials (steel, plastic, electrical components, wires, etc.) in order to dispose everything according to the indications forseen by the laws in force.

Always use security clothes during the operations that require direct intervention on the machine.

16. SAFETY AND PREVENTION MEASURE

16.1. GENERAL INFORMATION

The employer will must provide for the training of the staff about dangers caused by accidents, about equipments arranged for the operator safety, about dangers of noise emission and about the general accident rules provided by international directives and by legislation of the country of designation of the machine.

Anyway the behaviour of staff, maintenance operator, cleaning, control, etc. will must scrupulously respect the accident norms of the country of designation of the machine.

Before starting work, the operator will must know perfectly position and operation of all controls and machine features; in addition he must have read this manual.

The machine must be used only from operators that were engaged in training carried out on the premises by AROL S.p.A. technicians and that understood totally the instructions of this manual.

It is necessary to respect totally instructions, cautions, general accident rules that are in this manual.

It is basic that the maintenance operator works around and inside the machine only after the activation of all safety equipments intended by the constructor that put the machine in safety conditions.
In addition, when the machine is put in maintenance, all the surrounding areas must be prohibited.

16.2. INTENDED, NOT INTENDED AND MISTAKEN USES

The machine has been made to proceed caps on preformed rigid containers with production limits reported in chapter "*TECHNICAL DATA*" of this manual; having characteristics (material, dimensions, weight, ecc) agreed with the customer and declared in the contract and work in a closed industrial environment, protected from atmospherics agents, and with a correct lightning (see par. 15.4. page 14).

The machine receives caps correctly orientated by the its orientation system. Containers are moved into the machine by a transfer belt integrated in the machine.

Besides the conduction of the machine out of what underlined in the chapter "*TECHNICAL DATA*", just as an example and not exhaustive purpose, is considered as incorrect or not provided use of the machine, if the machine is used to:

- proceed caps or containers not sampled during the order, designing and manufacturing phases.
- Load the machine (caps and containers) in different ways from the provided ones by *AROL S.p.A.* (the machine is loaded automatically).
- Invert the rotation direction of one or more motors on the machine.
- Avoid or defeat in everyway active or passive safety devices (see par. 16.4. page 20).
- Carry out maintenance operation and/or size change without putting the machine in safety conditions.
- Feed with tensions or pressures different from the ones reported on the plate data on the machine.

16.3. WORKING AND CONTROL AREA

The terms "*Working area*" "*Control area*" mean the areas in which the operator can stop making his tasks.

The work area shall NEVER be occupied by tools or other objects which may create obstructions. Nothing shall interfere with the freedom of movement of the operators.
Moreover, in case of emergency, the personnel in charge must be able to freely and quickly access the line.
The operators shall enforce the prescriptions and notice the persons in charge about any non compliance.

Machine control and operation in standard working conditions (automatic mode) must occur in the specific operating area only.

The figure below indicates the work and control areas on the machine.

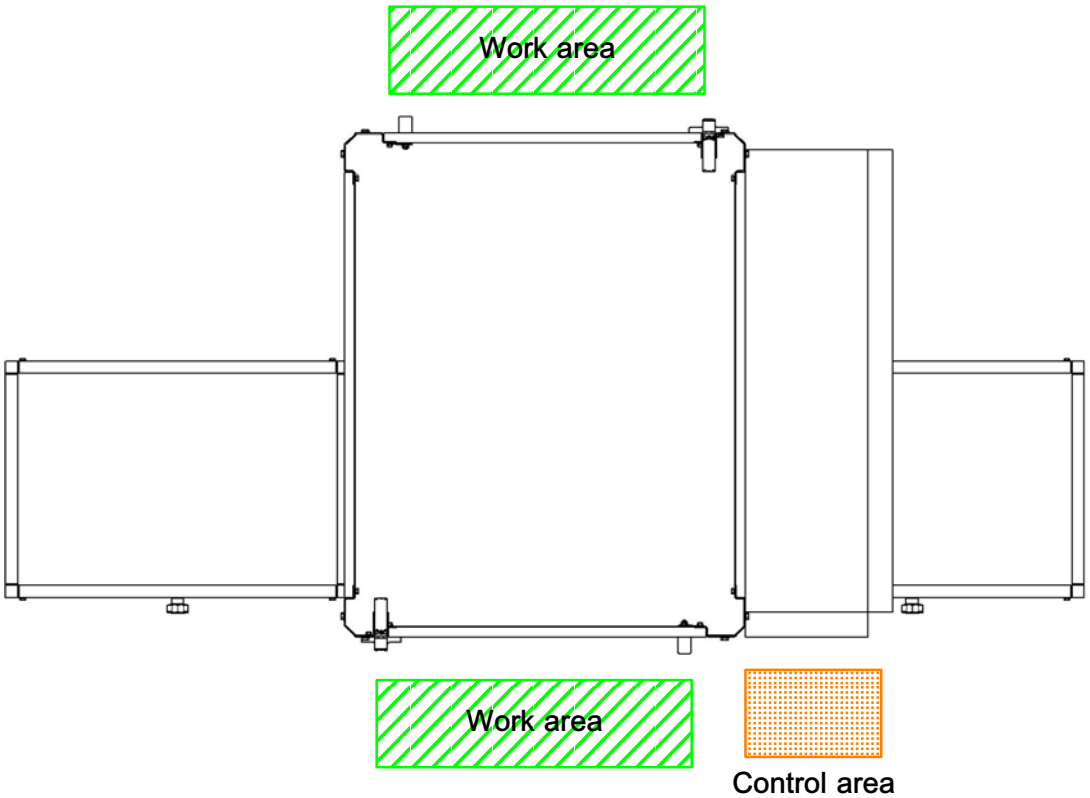


Fig.6

The control panel, in design stage, can be positioned either at the entry or at the exit of the machine.

The maintenance operator shall operate around and inside the machine only after the activation of all the safety devices foreseen by the Manufacturer to put the machine in safe conditions.
Moreover, when the machine undergoes maintenance, all the surrounding areas must be forbidden.

16.4. RISKS - PROTECTIONS - CAUTIONS AND PRECAUTIONS

16.4.1. GENERAL SAFETY

To guarantee health and safety of the people exposed, the machine is provided with this safeties:

16.4.1.1.PASSIVE SAFETIES

Fixed guards

All the fixed guards installed on the machine are connected to the structure by means of fastening devices which do not allow manual removal, since they necessarily require the use of specific tools.

This condition to assign an objective tampering responsibility to the operator who uses the machine after removing the fixed guards.

The housing of the fixed guards in vertical position in the structure of the machine has been designed so that the guards, once the fastening devices have been removed, do not remain in closed position, falling by gravity.

It is not possible to operate the machine with the guards simply resting on the structure, in closed position.

In case of accident, the operator in charge of the machine will not be able to provide as justification the fact that he didn't know about the lack of the fastening devices or of the guards, since it is evident that they are missing.

To access the area protected by the guard, it is necessary to put the machine in maintenance mode.

16.4.1.2.ACTIVE SAFETIES

Interlocked mobile guards

The machine is provided with mobile guards to protect the inner elements of the machine, connected to the structure by means of fastening systems which enable its opening, but not its detachment.

Each mobile guard is provided with interlock device to perform the check of the opening, stopping all dangerous organs.

Emergency buttons

Pressing one of the red mushroom emergency buttons causes:

- Immediate disengagement of the automatic cycle (machine stop).
- Consent inhibition of the auxiliary organs.
- Switch off of the on board electric power.

16.4.1.3.POSITION OF THE SAFETIES

PASSIVE SAFETIES

- Fixed guards.
  - a. Basement guard.

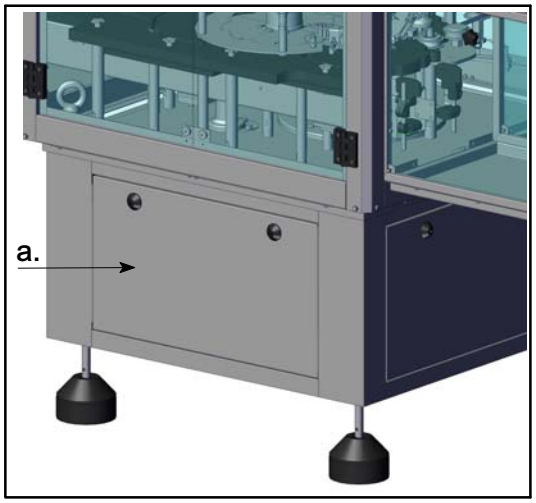


Fig.7

b. Entry tunnel.

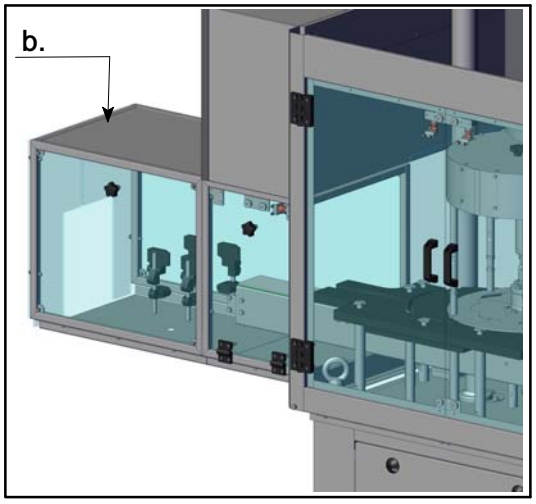


Fig.8

c. Exit tunnel.

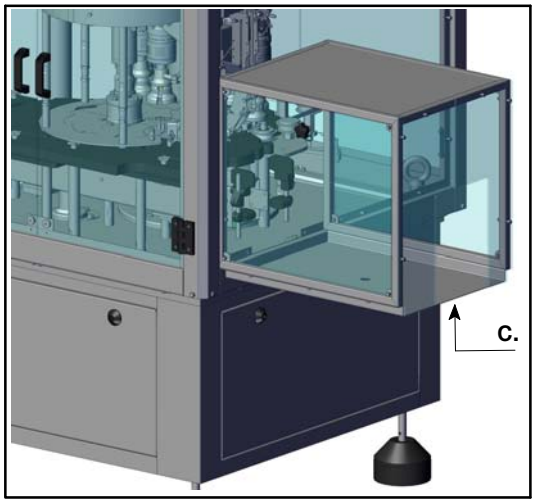


Fig.9

d. Head protection guard.

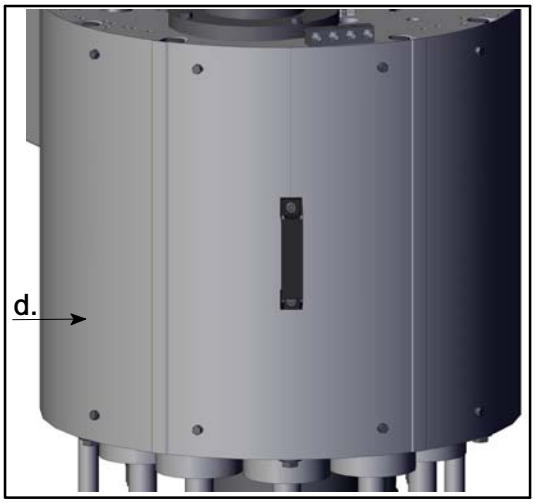


Fig.10

ACTIVE SAFETIES

- Interlocked mobile guards.

  e. Front and rear safety doors.

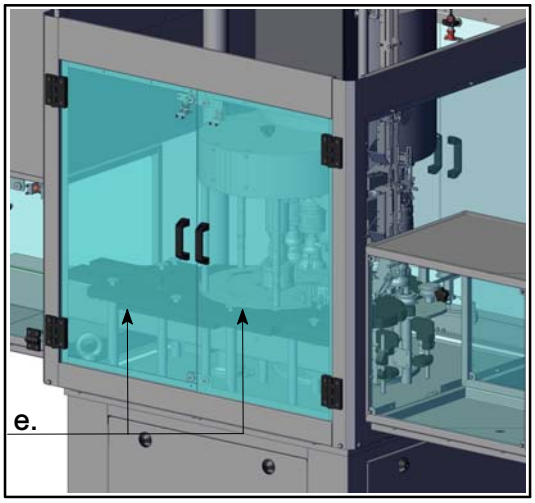


Fig.11

- Emergency button.

  f. Mushroom button on the control panel.

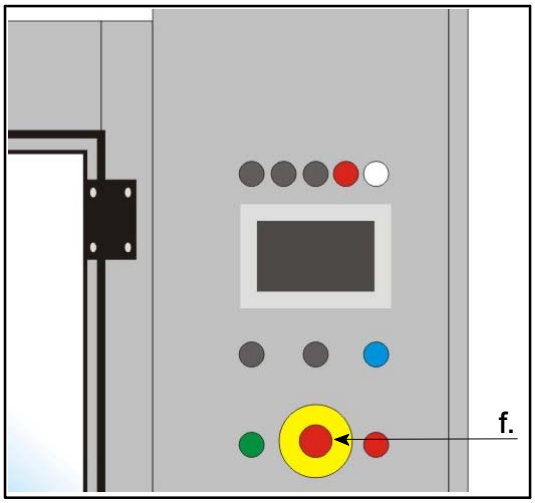


Fig.12

16.5. PLATES

Several obligation and/or warning plates to attract the operator's attention are arranged on the machine.

The warning plates on the machine have an extremely important safety function; the operators must follow the indications in these plates.

It is forbidden to remove the warning and obligation plates having a safety function.

Should these plates accidentally wear and not be legible anymore, or should they be removed or detach from their position, they must be replaced by new ones to be ordered at *AROL.*

The following table and figures indicate the pictogram on the machine and their position.

PICTOGRAM	MARK	DESCRIPTION
	A	Indicates the presence of voltage with dangerous values.
	B	Indicates the danger of squashing with moving mechanical organs.
	C	Indicates the danger to knock against the door of the electrical board during the opening.
	D	Indicates the prohibition to extinguish fires with water.
	E	Indicates the prohibition to touch as there are equipment under voltage.

PICTOGRAM	MARK	DESCRIPTION
	F	Indicates the prohibition to remove protections of the danger organs of the machine.
	G	Indicates the prohibition to adjust, clean or lubricate moving parts.
	H	Indicates the prohibition to put arms inside the bottles entrance/exit tunnel.
	I	Indicates the duty to see instruction manual before to operate on the machine.
	J	Indicates the lifting points of the machine or component, indicating the necessity to use suitable means.

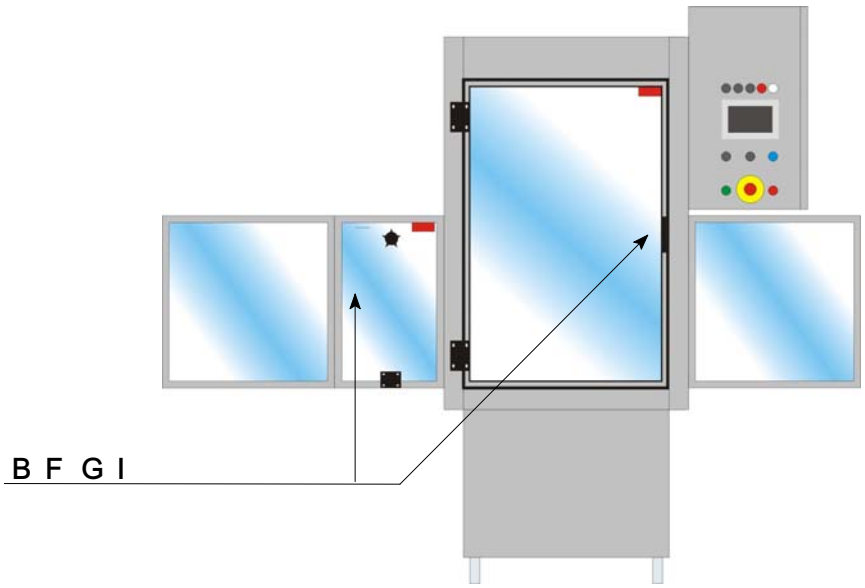


Fig.13

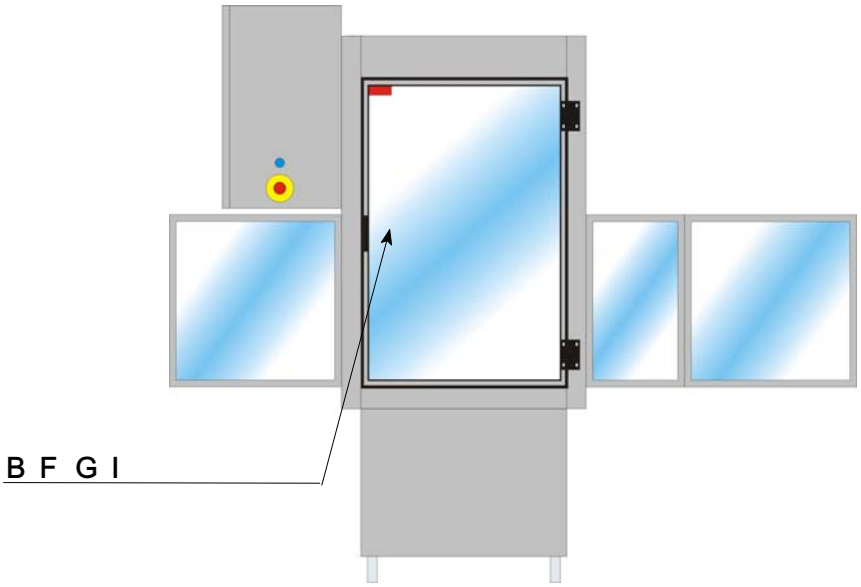


Fig.14

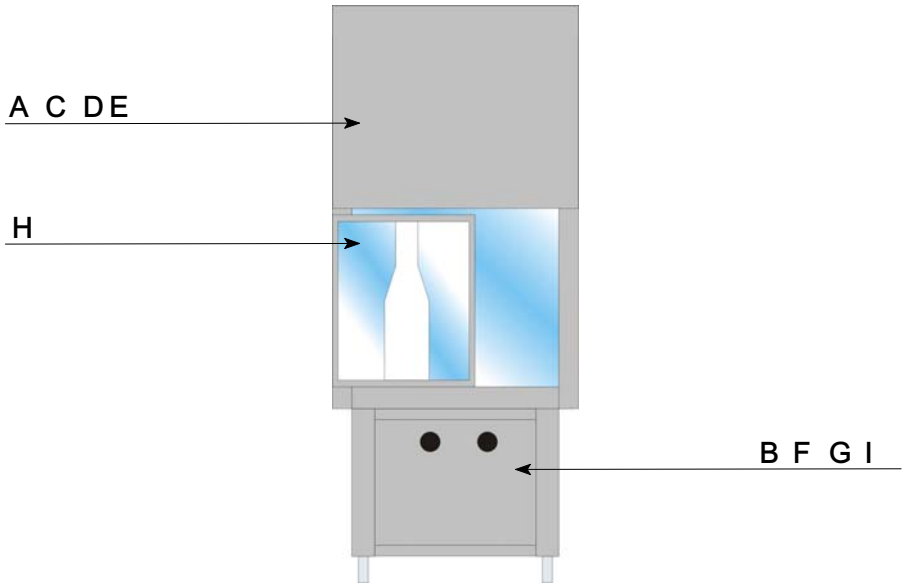


Fig.15

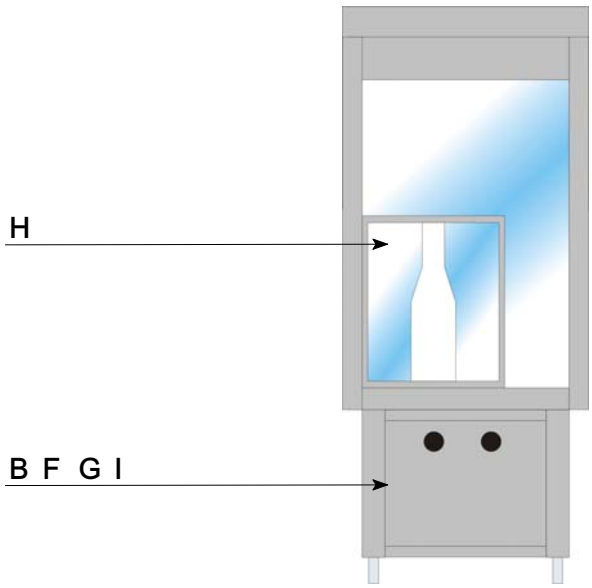


Fig.16

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B PACKAGING, TRANSPORT AND POSITIONING

1. PACKAGING - MOVING - SHIPPING AND TRANSPORT

1.1. PACKAGING

AROL S.p.A. according to the transport means, guarantees suitable packaging for a good preservation of components during the transport.

Packaging, transport and storage.
The packaging operations, lifting, moving, transport and unpacking of the machine and components, must be carried out only by personnel that know this kind of operations and helped by personnel that know the machine.

During the operations the personnel must wear the individual protection devices.

The personnel must follow the following general rules:

- stay away from loads before the lifting and lowering.
- Do not stay under hanging loads.
- Keep unhautorised persons away.

If it is necessary, guide the load during the lifting, always use suitable means to keep safety distances from the hanging machine.

To ignore these precautions may cause heavy damages or phisycal damages.

Also the transport must be carry out by qualified personnel, they will receive instructions about the storage of components on the transport mean.

On the transport mean, the components must be fastened by stripes or other means suitable to avoid the overturning.

1.1.1. CASE SHIPPING

This type of shipping, provides a packaging in a wooden case suitable for the transport according to the new directives.

AROL S.p.A. usually gives besides interblocks or shock resistant materials for the inner part of the case, report on the outer side of the case:

- Weights (gross - net).
- The center of gravity.
- Receiver.
- The packing list.
- Indications for a correct movimentation.

1.2. MACHINE LIFTING

For the movimentation of the machine and its components, it is necessary to use suitable lifting means.

The capacity of these means must be suitable to the weight to move.

The movimentation must be slowly and with a good light and the installation area must be free.

The moving and lifting procedures must be carried out only by skilled staff only having accident prevention protections.

Do not stay or pass under the loading and movimentation areas.

Lift the case as follows:

- sling in the points marked on the case using chains/belts with a capacity grater than the weight indicated in the packaging list.
- Lift the case using suitable lifting means.

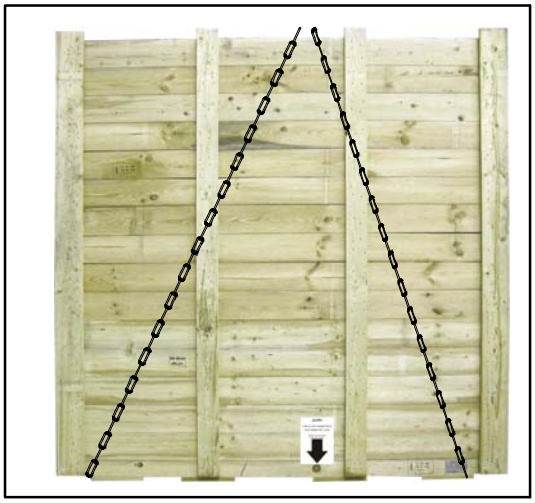


Fig.17

Consider the position of the center of gravity to handle the case correctly.

1.3. UNLOAD AND MOVING OF THE MACHINE

When the machine arrives, it is necessary to check that each single component did not get damaged during the transport and that all the parts indicated in the shipping list are present. Eventual damages due to the transport must be immediately reported to the manufacturer.

To unload the machine, proceed as follows:

- remove the anchorage devices to the mean of transport (if provided).
- Remove the wooden block (if provided).
- Lift the machine as described in paragraph 1.2. and move it close to the installation area.

The movimentation of the components must be carried out by suitable lifting means.

The disposal of materials must be carried out according to the norms in force of the country where the machine is installed, taking note of the nature of the materials:

- Straps, nails and metal parts.
- Wood and plywood.
- Plastic materials (protection sheet, barrier bag).

The personnel charged of the movimentation must follow the listed below instructions:

- Make sure that the passing areas are clear. The floor must be completely dry and free of oil, so as to avoid slipping or falling during the transport, installation, connection, adjustment, ecc.
- Always wear suitable work clothes.
- Never climb on the load to balance it. This is a real danger.

1.4. PREDISPOSITION FOR THE INSTALLATION

Before the arrival of the machine, the user must create an adequate environment having the following characteristics:

- levelled and anti-slip floor.
- Good lighting in accordance with the laws in force.
- Grounding installation in accordance with the laws in force.

1.4.1. FLOOR

The floor must be suitable to support the weight of the machine (the weight is indicated in the table "*Weight*" in chapter "*MACHINE TECHNICAL DATA*") and support without vibrations the dynamic stress.

1.5. INSTALLATION

- Open the case.
- Remove the packing elements.

Packing materials must be disposed according to the laws in force

- Open the side guards (C) of the basement.

t

Fig.18

- Loosen the fastening nuts (D) in the opposite corners of the basement.

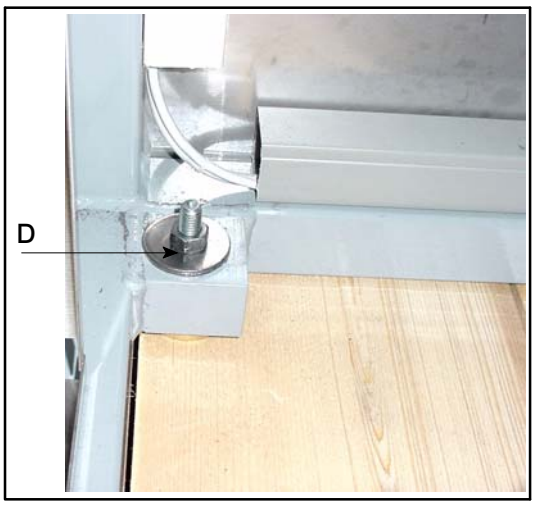


Fig.19

- Hook 4 lifting belts/chains (A) to the fitting eyebolts (B) placed in the corners of the baseframe.

Use belts/chains adeguate to the lifting of the machine and in compliance to the safety rules in force, checking them before using them to see if there are some defects.

Lifting the machine, be sure that the belts/chains do not excessively press parts of the machine..

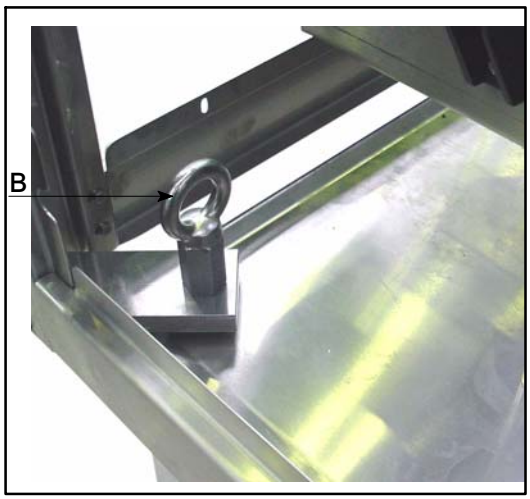


Fig.20

- Screw the threaded supporting feet (E) on the suitable threaded bushes.
- Lay the machine on the floor on the supporting plates (F), previously positioned.
- Level the machine: place the the level on the baseframe and adjust (by screwing or unscrewing) the threaded supporting feet (E).

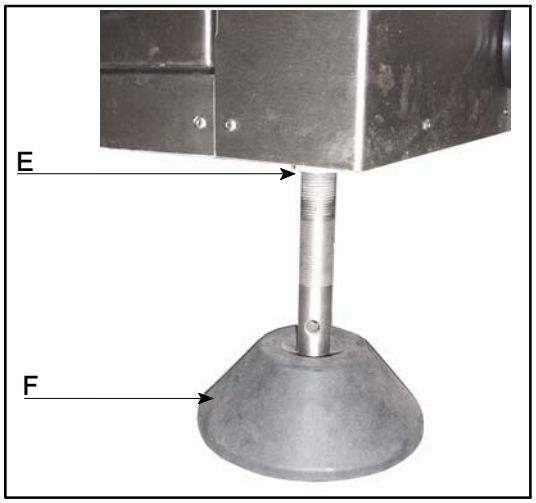


Fig.21

1.5.1. CONNECTION OF THE PROTECTIONS AT THE MACHINE ENTRY AND EXIT

The conveyor belt protections supplied with the machine must be compulsorily installed.

For the installation, operate as follows:

- position the protections (G) on the entry belt and fasten it with the bolts (H) supplied with the machine.
- Repeat the operation with the protection for the exit belt.

<u>The fixed protections and the "tunnels" for the conveyor belt are marked with a number. Install the "tunnels" on the fixed protections indicating the same number.</u>

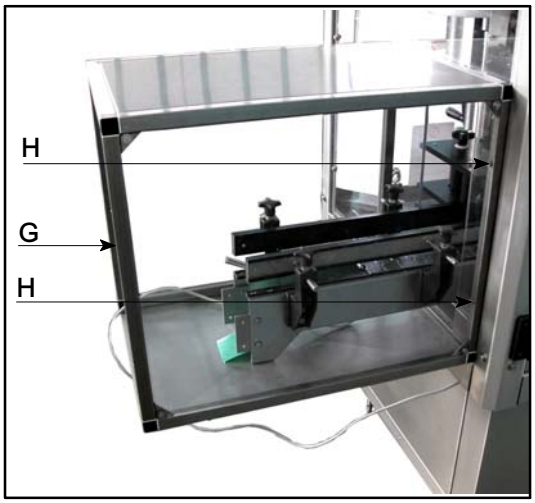


Fig.22

1.5.2. CONNECTION OF THE MACHINE WITH THE LINE CONVEYORS

Connect the conveyor belt with the machine as follows:

- fit the line conveyor belts on the plates (I) on the body of the machine belt.
- Drill two holes on each side of the components to be connected.
- Fasten the various elements by bolts.

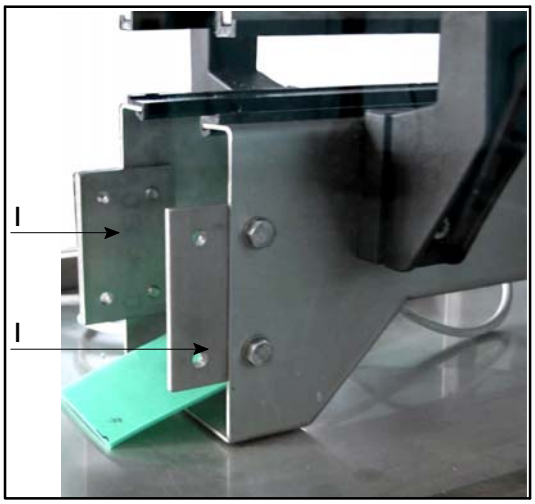


Fig.23

1.5.3. PHOTOCELL POSITIONING ON THE CONVEYOR BELT

- Place the photocell for the automatic entrance start up and the one for the stop in case of bottles accumulation in exit as described in Fig.24 and Fig.25.
- The entrance automatic start up photocell must be placed in such way that the machine stops when about 5 bottles remain in entrance so to guarantee the sufficient bottle push.

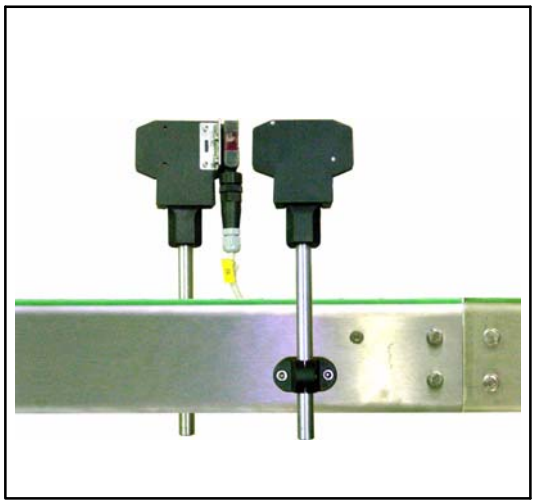


Fig.24

- The machine stop photocell for exit accumulation must be placed in such way that from the center of the star-wheel and the photocell there is a space of about 800 mm.

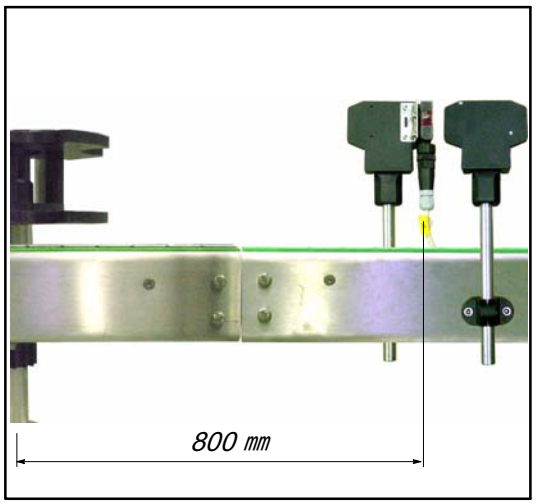


Fig.25

1.5.4. COMPONENT INSTALLATION

For installing the machine components, refer to the chapters on the same components. See the section "*COMPONENTS INSTALLED ON THE MACHINE*".

1.5.5. ELECTRICAL CONNECTION

Before carrying out the electrical connection, check that the characteristics of the electrical line correspond to the plate data of the machine (available tension, frequency, etc.).

Before the connection, disconnect the electrical feeding in the installation at the bottom of the general switch.

The electrical connection of the machine is carried out by the customer and must take in consideration:

- laws and technical norms of the country where the machine is installed.
- Data reported on the plate on the door of the main electrical board (see example facsimile Fig.26).
- Data reported on the electric diagram that is enclosed to this manual.

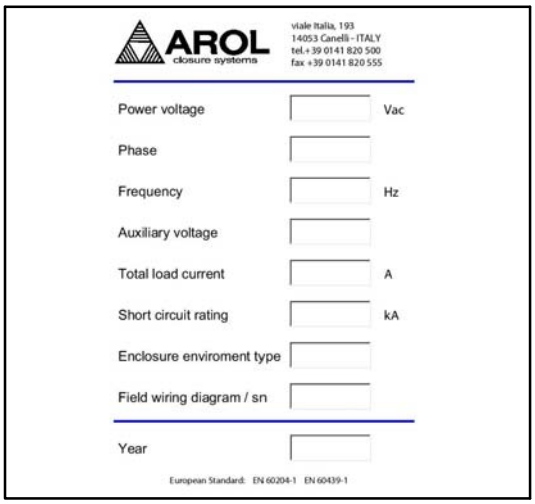


Fig.26

If the machine has not a plug connection, the entrance of the cable in the electrical board is provided from the top by a suitable cable gland and the connection by clamps marked on the general switch. Connect the three phases (L1, L2,L3), of the ground cable (PE) and when provided the relevant clamp, also the neutral wire (N).

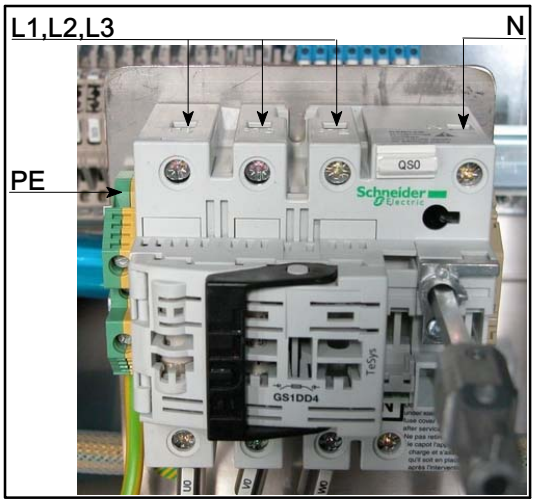


Fig.27

The Fig.27 is just an example and can be lightly different, according to the used components.

The customer must guarantee the absence of micro-interruption on the feeding tension of the machine.

To avoid damages and let the machine operate in a correct way, it is necessary to connect the machine to an efficient grounding.

A good grounding of the machine it is necessary for the protection against indirect contacts. Moreover it decreases the possibility of inconveniences that may affect on the control circuit.

Inside the main electrical panel there is an equipotential bonding (ground bar) to which all the grounds on the machine and all the grounding points of the equipment located within the same panel are connected. To ease the connection of the ground wire to the line, this circuit was derived from a yellow/green terminal next to the main switch, which acts as "grounding point"; the ground wire shall be connected to this terminal.

*When connected to a system of **type TN**, in order to guarantee effective protection of persons against indirect contact, you should always make sure that the impedance of the fault loop in the supply point is such as to ensure proper coordination with the protective device installed on the machine. This is essential to prevent, in case of fault, contact voltages persistence for dangerous times.*

When connected to a system of distribution of **type TT**, please note that a differential current switch (appropriately coordinated with the ground system) MUST be installed upstream of the machine.

1.5.6. PNEUMATIC CONNECTION

Before carry out any operation make sure that the installation is not under pressure, and disconnect the feeding if necessary.

The air used in the pneumatic installation must be filtered, so without impurities, and dried.

Carry out the connection to the network as follows:

- connect the main pneumatic unit coupling (A) to the distribution net.
- If necessary, open the sliding valve (B).

For the pneumatic data refer to the table "*Pneumatic data*" in the section "*MACHINE TECHNICAL DATA".*

The complete pneumatic system is supplied with the spare part catalog.

Fig.28

C

FIRST START UP, OPERATING AND USE

1. SETTING UP, CHECKS AND TEST FOR THE FIRST START UP

The stting up operations of the machine for the first start up must be carried out by qualified technicians.

The machine has been tested by the Manufacturer premises before the shipping; all the calibration and eventual adjustments have been carried out during the test.

1.1. CHECKS BEFORE THE START UP

In order to prevent errors and/or accidents, before the start up of the machine it is necessary to carry out some checks:

- check that all the electric feeding phases are correctly connected.
- Check that the machine is correctly feeded, checking the tension.
- Check that there are no leaks in the pneumatic unit.
- Check that when the protection hatches are open by a microswitch, the machine stops.
- Check that all the controlling are operating.
- Check the correct motor absorption.
- Check the correct rotation direction of motors.
- Check the grounding of the machine by equipotential measures.

1.1.1. CHECK OF THE MACHINE ROTATING DIRECTION

After carrying out the electric connections, turn the main switch on and, before starting the machine, operate as follows:

- rotate the main switch to the position *MAN.*
- Press the button *SAFETY RESET*.
- Press the control 

to enter manually the operation of the cap sorter.
- Check that the caps sorter correctly supplies the cap delivery chute.
- If the caps do not come out from the outlet it is necessary:
  - open the door disconnecting knife switch.
  - Turn the switch off from the main board of the supply line.
  - Check there is no voltage by a voltmeter.
  - Reverse two phase cables.

2. ZONES-OPERATORS AND USE RULES

Are briefly reported definitions already listed in chapter “Security and accident prevention”.

2.1. WORK ZONE-CONTROL ZONE

WORK ZONE: is the place where the operator can stay to check the production and has the possibility to intervene in case of necessity according to his duty.

CONTROL ZONE: are places where the operator can carry out the controlling and check operations on the machine, carrying out on the suitable controlling panels.

The specialised staff able to work on this machine must have requirements indicated into the introduction of this manual and moreover must have a good knowledge of this manual and all information about security.
on the contrary the Manufacturer declines all responsibility derivating caused by the non respect of these conditions.
Any other different use from the one indicated by the Manufacturer and according the values greater than characteristics of the machine, is considered “improper use”, causing the loss of warranties and the full responsibility by the user.

2.2. RESIDUAL RISKS

The eventual residual risks present on the machine are highlighted on the machine by suitable signals and reported in the relevant sections of this manual.

2.3. NUMBER OF OPERATORS

The operations described in this manual, referring the cycle of life of the machine, have been analyzed by AROL S.p.A.. So the number of phases and operations indicated is the one most suitable to carry out the functions in a optimal way.

The machine has been designed and built for being conducted by an operator charged to refill of raw materials and check the good flowing of the production.

A number lower or greater of operators, can modify the expected result or create a danger for the security of personnel involved.

2.4. SAFETY NORMS FOR THE OPERATION

Wrenches and tools used for the maintenance or the access to machine hazardous sections, as well as the key of the mode switch *AUT/MAN* on the electric panel, must not be left at the disposal of operators not suitably trained for the size change or the maintenance.

All check, adjustment, maintenance and lubrication steps must be carried out by staff previously trained and instructed.

All check, adjustment and maintenance steps of the electric system must be carried out by staff previously trained and instructed.

People on drugs, alcohol or drowsiness-causing medicines are not allowed to use or maintain the machine.

All check, adjustment, maintenance and lubrication steps must be carried out with the MACHINE STOPPED and DISCONNECTED POWER.

The cap/cork feeding system has been designed and manufactured to be loaded by an automatic elevator with ground loading.

If caps/corks are loaded manually, this operation must be performed with the machine off.

For interventions in the machine upper part, with MACHINE STOPPED and DISCONNECTED POWER, exclusively use climbing means (ladders, scaffolds) equipped with guards and according to the laws in force. Do not carry out any intervention climbing on the machine structure or parts.

2.5. CONTROLS AND OPERATING INDICATORS

Controls and operating indicators can may be placed:

- On the keyboard and operator interface panel.

Fig.29

3. MACHINE CONTROLS

The nomenclature and position of devices placed on the panel can be different from the one described in the following paragraphs.

It is recommended to pay more attention to the functions of each device than to their nomenclature or position on control panel.

The complete and correct position is, anyway visible in the electric diagram enclosed with this manual.

3.1. LAY-OUT OF THE CONTROLLING PANEL

FRONT VIEW

Fig.30

REAR VIEW

Fig.31

LATERAL VIEW

Fig.32

3.2. DEVICES ON THE PANEL

Hereinafter the machine main controls functions are described.

	DOOR LOCK SWITCH	
	EMERGENCY Red button on yellow field.	It stops the machine immediately.
	JOG Black button with return when released.	Controls the rotation by pulses of the machine.
	*AUT/MAN* MANUAL CONTROL KEY Two stable positions selector, with removable key.	*AUT* - engages the automatic rotation of the machine. *MAN* - engages the rotation by pulses of the machine.
	SPACE (For eventual other functions).	

	START Green button with return when released.	Pressing this button, the machine starts up.
	STOP Red button with return when released.	Pressing this button the machine stops.
	SAFETY RESET Blue luminous button with return when released.	Pressing this button one can obtain the safeties reset. The button is on only when the lamp is on.
	SAFETY DEVICE TRIPPED Red luminous button.	When lit, indicates that one or more safety protections intervened, locking the machine.
	POWER ON White luminous button.	When lit, indicates that the machine is electrically powered.

	FLASHING LIGHT + SIREN COLUMN	The red flashing light indicates an alarm has occurred or a safety device has activated. The yellow flashing light indicates the machine is in stand-by waiting for product. The green flashing light indicates the machine is rotating. The siren sends a sound signal every time an alarm or a safety device is activated, when the machine re-starts in automatic mode or when the machine operates in manual mode (*Jog, Lifting/Lowering*)
	CONTROL DISPLAY	

4. OPERATOR PANEL

Each displayed message is associated with a short description of its function and of the operation needed to restore the machine standard operating conditions.

4.1. OPENING PAGE

The operator panel initialize at the machine switching-on.

At the switching-on, no key shall be pressed until the opening page is displayed on the panel.

The page shows info on the manufacturer and on the installed software release (at the right bottom).

Touch anywhere on the screen to access the *"machine status"* page.

Fig.33

4.1.1. TIME AND DATE ADJUSTMENT

In the opening page shows the date and time (at the left bottom).

It is possible to adjust date and time, proceeding as described below:

- Push on date and time (A), displayed at the left bottom in the opening page.

Fig.34

- On the screen appears the adjustment page.
- Press the key (C), to enter the date adjustment page.

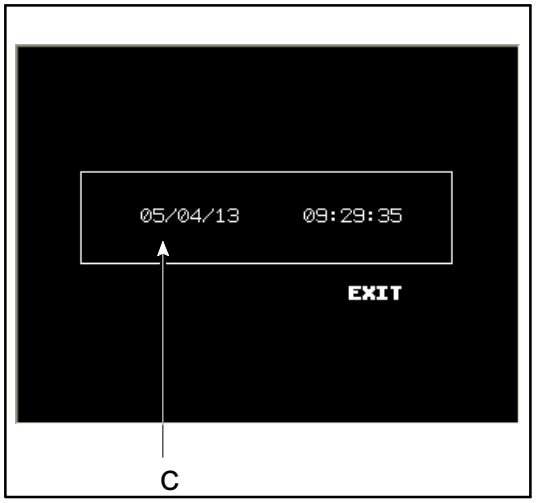


Fig.35

- Digit the new value to set on the appeared keyboard.
- Confirm by pressing the key (D), of the keyboard.

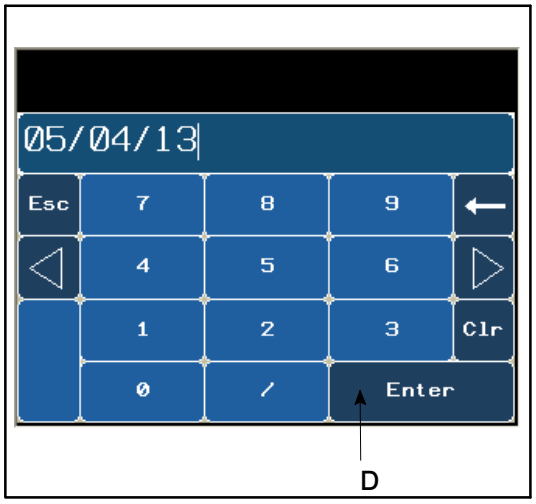


Fig.36

- Press the key (**B**), to enter the time adjustment page.

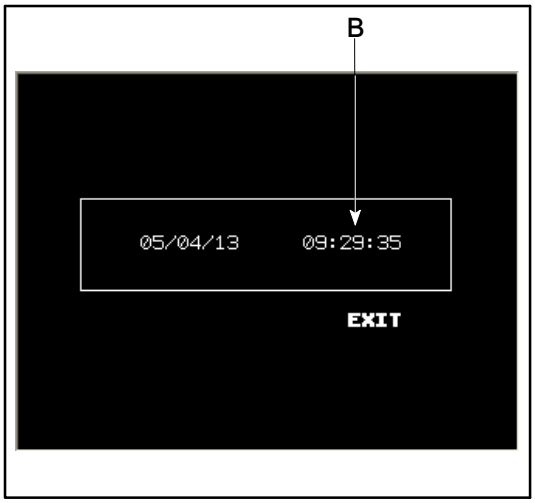


Fig.37

- Digit the new value to set on the appeared keyboard.
- Confirm by pressing the key (**F**), of the keyboard.

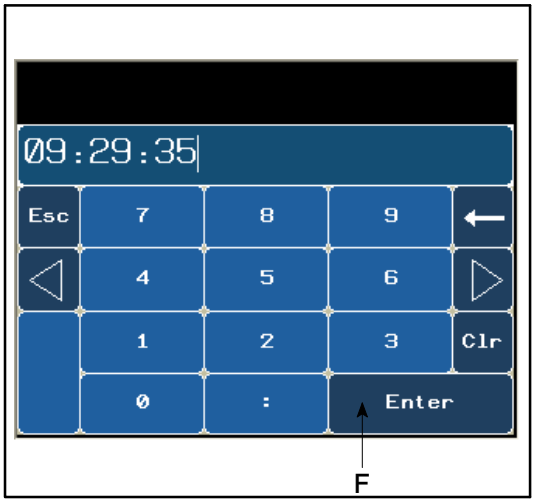


Fig.38

- After the modification operations, press the key (**G**).

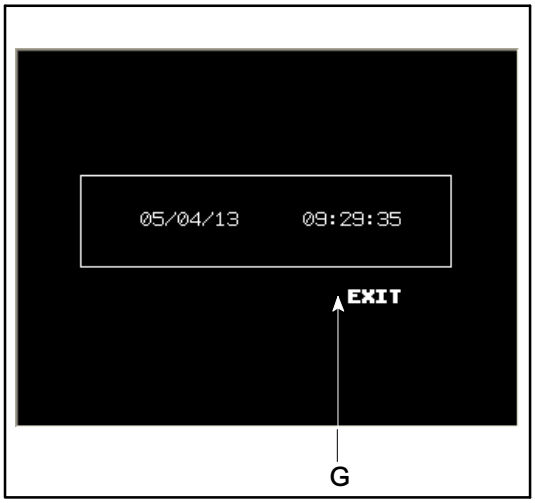


Fig.39

4.2. MACHINE STATUS PAGE

During the machine standard operation, the operator panel displays a status page that shows:

1) operating mode.
2) recipe number.
3) production speed.
4) machine status.
5) error messages (active alarms).
6) closure head rotation speed.

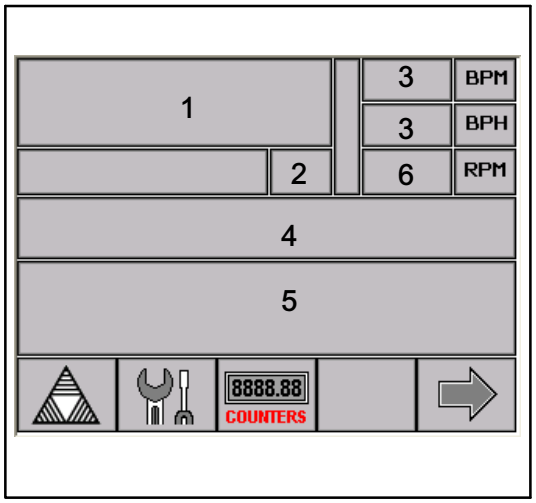
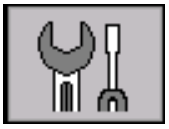
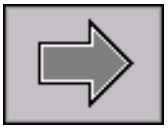


Fig.40

4.2.1. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	INFO - A page with information on *AROL* is displayed by pressing this key. The *"machine status"* page is displayed again by touching the screen.
	LANGUAGE SELECTION - The selected language is set on the display pressing the key for the wished language.
	COUNTERS - Pressing this key it is possible to enter the page where are displayed the counters on the machine.
	KEY FUNCTIONS PAGE ACCESS - Pressing the key the key functions page is accessed.

4.2.2. OPERATING MODE

This field indicates the machine operating mode.

MANUAL

The machine is ready to operate through the manual jog control (JOG).

AUTOMATIC

The machine is ready for the automatic operation, but not running yet.

RUNNING

The machine works automatically. If it is stopped, a message explaining the reason is displayed in the ”machine status” field.

The displayed value is an average of the instantaneous speed in BPM, thus the displaying can be lightly slowed down. A variation by ±2 bpm and by ±120 bph in the displayed value is normal.
The production is counted by a sensor placed in the machine lower part. At each turn of the starwheel (A), 6 impulses, the sensor counts a bottle (Fig.41).

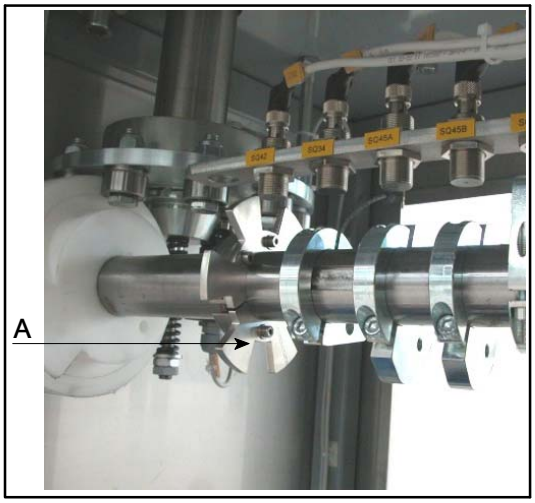


Fig.41

4.2.3. MACHINE STATUS

This field displays warning messages on the machine operating status.

MAXIMUM SPEED

The entrance sensor (B2) is engaged and so the panel operates at the speed set on the operator panel.

WAITING FOR BOTTLES

The machine is stopped as there is no bottle on the entrance belt. The entrance sensor (B2) must be dimmed before the machine is re-started.

EXIT BELT TOO FULL

The exit accumulation sensor (B6) is dimmed, thus the machine is stopped waiting for the exit to be cleared.

SLOWDOWN

The exit slowing-down sensor, if installed, is dimmed, thus slowing down the machine rotation speed.

VACUUM WAIT

When the vacuum creation pump is installed, it indicates that the machine is stopped and waiting for the vacuum value necessary for the correct operation to be reached.

WAITING ENABLE

The machine is stopped waiting for the rotation consent from an outer source (to be arranged by the customer).

EMPTYING

From a bottle lack, it indicates the machine is still rotating for a set number of steps necessary to close the containers still under the heads.

WAITING FOR CAPS

The machine is stopped as there is no cap in the delivery chute. The cap lack sensor (B1) must be dimmed before the machine is re-started.

SYNCHRONIZED SPEED

The machine operates in synchronous mode with the set outer reference.

MACHINE IN BY-PASS

The by-pass mode has been selected to exclude the machine by the work cycle.

CAPS STORAGE BIN FULL

It indicates that the caps maximum level in the stock tank has been reached.

4.2.4. ERROR MESSAGES (ACTIVE ALARMS)

The active alarm field displays warning messages on possible problems during the machine operation. If there are several alarms, the most important one is displayed first, and once the problem explained in the displayed message has been solved, the other present alarms are displayed, till all found problems are solved.

The “Message table” lists all possible alarms and their solutions.

The panel displays only the messages of the machine described hereby.

	MESSAGE	DESCRIPTION	SOLUTION
3	ERROR 10 SAFETY CIRCUIT (KM0)	Probable remote control switch failure (KM0).	Switch the machine off and check the re. component. If restored starting up the machine, the message fades away.
4	ERROR 11 SAFETY CIRCUIT (KM1)	Probable failure of the machine safety remote control switch (KM1).	
6	CHANNEL 1 SAFETY CIRCUIT ALARM	Probable failure of one of the two safety circuit canals.	It is necessary to check the correct operating of the safety sensors and all the others components of the safety chain.
7	CHANNEL 2 SAFETY CIRCUIT ALARM		
8	ERROR 15 SAFETY CIRCUIT	Interruption of the safety device sequence. Sometimes it can be displayed because the doors are not correctly closed.	Otherwise, check the electrical continuity of the safety device sequence.
9	ERROR 20 SAFETY CIRCUIT		
10	WAITING FOR PROFIBUS ACTIVATION	Wait for the complete inizialization of the profibus circuit.	
15	PUSH THE RESET BUTTON (SB6/SB6A)	All safety devices have been reset.	Press the reset button to continue with the machine operation.
16	CAPS CHUTE FULL (B12)	The sensor (B12) noticed a caps accumulation in the caps chute.	

	MESSAGE	DESCRIPTION	SOLUTION
17	LOW AIR PRESSURE (SP1)	A pressure lack in the compressed air circuit does not enable the machine correct operation.	Check the presence of air in the pneumatic circuit and possibly the correct operation of the solenoid valve (YV1) or of the pressure switch (SP1). Remove the message pressing the button RESET or START.
18	CAPS SORTER LATERAL DOOR OPEN (SQ41A)	The sorter side door is open. This can be due to an excessive pressure by the caps for a probable delivery chute clogging.	Clear the delivery chute and the sorter outlet, close the door. Press the RESET button and the START button to re-start the machine.
19	CAPS SORTER UPPER DOOR OPEN (SQ41B)	The sorter closing door is open.	Close the door and re-start the machine.
20	HEIGHT MAXIMUM LIMIT REACHED (SQ5)	The messages are displayed while adjusting the height and indicate that the limit has been reached and thus it is impossible to continue.	
21	HEIGHT MINIMUM LIMIT REACHED (SQ6)		
22	ADJUSTMENT HEIGHT REACHED	The stop placed on the sample bottle (if installed) has been reached while adjusting the machine.	
23	CAPS CHECK INTERVENTION (B10)	It signals cap lacking. If the condition does not stop the machine (see parameter 300) the displayed message flashes, while if the alarm stops the machine it is fixed.	Remove the message pressing the button RESET or START.

	MESSAGE	DESCRIPTION	SOLUTION
24	FRONT PANEL EMERGENCY PRESSED (SB10)	The emergency push button on the indicated panel is pressed.	Release the button and re-start the machine. Press the RESET button and the START button to re-start the machine.
25	REAR PANEL EMERGENCY PRESSED (SB10B)		
26	FOIL CHECK INTERVENTION	It indicates the intervention of the *FOIL* presence check device.	
27	HEIGHT MAXIMUM REGULATION LIMIT REACHED	The stroke end value has been reached during the height automatic adjustment.	
28	HEIGHT MINIMUM REGULATION LIMIT REACHED		
29	RELEASE THE HANDLES FASTENING ANTI-TWIST COLUMNS (SQ64A/SQ64B)	The handles fastening the anti torsion columns are locked.	Unlock the handles.

	MESSAGE	DESCRIPTION	SOLUTION
30	MACHINE MOTOR OVERLOAD (QM1)	The magneto-thermal switch protecting the specified motor has activated.	Check the reason of the excessive stress on the re. motor, reset the switch inside the electric board and re-start the machine.
31	HEADS MOTOR OVERLOAD (QM2)		
32	CAPS SORTER MOTOR OVERLOAD (QM4)		
33	HEIGHT REGULATION MOTOR OVERLOAD (QM6)		
34	CAPS STORAGE TANK OVERLOAD		
35	BELT MOTOR OVERLOAD (QM13)		
36	VACUUM PUMP MOTOR OVERLOAD (QM8)		
37	PUNCHES MOTOR OVERLOAD (QM21)		
38	AIR PUMP MOTOR OVERLOAD (QM9)		
39	HEADS MOTOR FAN OVERLOAD (QM2F)		
40	PANEL ACCESSORIES OVERLOAD (QF17)		
41	SUCTION MOTOR OVERLOAD (QM15)		

	MESSAGE	DESCRIPTION	SOLUTION
42	MACHINE MOTOR DRIVE ALARM (U1)	The frequency converter controlling the specified motor has generated an error message.	Refer to the frequency converter instruction manual to check the cause.
43	HEADS MOTOR DRIVE ALARM (U2)		
44	CAPS SORTER MOTOR DRIVE ALARM (U4)		
45	BELT MOTOR DRIVE ALARM (U13)		
46	HEIGHT REGULATION MOTOR DRIVE ALARM (U6)		
47	CAPS ELEVATOR MOTOR OVERLOAD	The magneto-thermal switch protecting the specified motor has activated.	Check the reason of the excessive stress on the re. motor, reset the switch inside the electric board and re-start the machine.
48	CAPS BELT MOTOR OVERLOAD		
49	CAPS BELT MOTOR INVERTER ALARM	The frequency converter controlling the specified motor has generated an error message.	Refer to the frequency converter instruction manual to check the cause.
51	ENTRANCE FEED SCREW SAFETY SENSOR (SQ1)	A sensor on the specified driving component for the bottles has activated. This is due to a clogging. If the indication flashes, the component has restored its operating condition. If the indication does not flash, remove the clogging manually.	Check no container hinders the passage of other containers. Remove the clogging, press the RESET push button and START the machine again.
52	INFEED STAR-WHEEL SAFETY SENSOR (SQ2)		
53	OUTFEED STAR-WHEEL SAFETY SENSORS (SQ3)		
54	TRANSFER STAR-WHEEL SAFETY SENSOR (SQ4)		

	MESSAGE	DESCRIPTION	SOLUTION
55	CAPS DISTRIBUTOR SAFETY SENSOR (SQ27)	A cap is clogged at the beginning of the delivery pipe, thus preventing the delivery of the caps in the machine chute (SQ27).	Check the cap has entered the pipe and solve the possible clogging. Press the RESET button and the START button to re-start the machine.
56	BELT SAFETY SENSOR (SQ70)	The sensor signalling a faulty operation of the belt tensioning device (SQ70) has activated.	Replace the belt, press the RESET button and re-start the machine.
57	BOTTLE TOO HIGH (B16)	The sensor (B16) indicates there is a bottle exceeding the height limit because the cap is wrongly positioned.	Press the RESET button and the START button to re-start the machine.
58	SORTER SAFETY SENSOR (SQ91)	One of the safety devices on the caps sorter has activated (SQ91, motor state, etc.).	Restore the safety conditions. Press the RESET button and the START button to re-start the machine.

	MESSAGE	DESCRIPTION	SOLUTION
60	RIGHT-FRONT DOOR OPEN (SQ12)	There door or lid has been opened, so that the machine cannot operate standard.	Close it, press the RESET button and the START button to re-start la machine.
61	LEFT-FRONT DOOR OPEN (SQ13)		
62	RIGHT-REAR DOOR OPEN (SQ14)		
63	LEFT-REAR DOOR OPEN (SQ15)		
64	FRONT DOOR OPEN (SQ12/SQ13)		
65	REAR DOOR OPEN (SQ14/SQ15)		
66	ENTRANCE TUNNEL OPEN (SQ16A/SQ16B)		
67	EXIT TUNNEL OPEN (SQ17A/SQ17B)		
68	RIGHT SIDE DOOR OPEN (SQ22)		
69	LEFT SIDE DOOR OPEN (SQ23)		
73	DUST EXTRACTOR FULL	It indicates that the dust recovery tank is full.	Empty the tank. Press the RESET button and the START button to re-start the machine.
75	CAPS CHUTE A DISTRIBUTOR SAFETY	A cap clogged at the inlet of the delivery pipes has caused the activation of the safety device of the indicated distribution chute.	Check the cap has entered the relevant pipe and possibly solve the possible clogging; then, restart the machine.
76	CAPS CHUTE B DISTRIBUTOR SAFETY		
77	HEAD SAFETY SWITCH INTERVENTION (SQ90)	The sensor (SQ90) indicates that a bottle has remained locked under the head due to the created vacuum. The machine is immediately stopped.	Remove the bottle left locked. Press the RESET button and the START button to re-start the machine.

	MESSAGE	DESCRIPTION	SOLUTION
78	VACUUM CIRCUIT ALARM	The vacuostat (VP1) detects the presence of capped bottles without the wished vacuum value has been reached inside them. This alarm does not stop the machine.	
79	COMPRESSOR UNIT SAFETY INTERVENTION	It indicates that one or more compressing units are not correctly inserted in their seats.	Insert correctly the compressing unit. Press the RESET button and the START button to re-start the machine.
80	PUNCHES MAXIMUM LIMIT REACHED (SQ38)	The messages are displayed while adjusting the height of the punches. They indicate that the min. or max. adjustment limit has been reached and thus it is impossible to continue.	
81	PUNCHES MINIMUM-LIMIT REACHED (SQ39)		
82	MINIMUM CAPS LEVEL IN CAPS STORAGE TANK (B14)	The sensor in the elevator tank detects cap lacking. The machine operation is not stopped.	Fill the tank till dimming the sensor.
83	FALLEN BOTTLE ALARM (B23)	It indicates that at the machine entry there is a bottle in incorrect position.	Adjust the bottle position. Press the RESET button and the START button to re-start the machine.
84	CAPS STORAGE BIN DOOR OPEN	It indicates the the caps collecting tank door is open. The machine is stopped.	Close the lid, press the RESET button and the START button to re-start the machine.
85	MACHINE DISABLED	It indicates that the machine is not operating, all the functions are disabled.	
86	LINE EMERGENCY PRESSED	The remote emergency button on the line has been pressed.	Release the button, press the RESET button and the START button to re-start the machine.

	MESSAGE	DESCRIPTION	SOLUTION
87	BOTTLE PRESENCE SENSOR CHECK INTERVENTION	It indicates the intervention of the check system of the correct operating of the bottles presence sensor.	Check the correct operating of the sensor.
88	CAP CHECK DEVICE ALARM	It indicates that the correct capping device is in alarm mode.	Check the alarm condition on the panel of the device.
90	MACHINE MOTOR DISCONNECT OFF (QS1)	The disconnect off of the motor has been opened.	Close the disconnect off contact and press the START button to re-start the machine.
91	MACHINE MOTOR FAN DISCONNECT OFF		
92	HEADS MOTOR DISCONNECT OFF (QS2)		
93	HEADS MOTOR FAN DISCONNECT OFF		
94	HEADS MOTOR BRAKE DISCONNECT OFF		
95	CAPS SORTER MOTOR DISCONNECT OFF (QS4)		
96	CAPS SORTER MOTOR FAN DISCONNECT OFF		
97	BOTTLES CONVEYOR BELT DISCONNECT OFF (QS13)		
98	HEIGHT REGULATION MOTOR DISCONNECT OFF (QS6)		
99	CAPS STORAGE TANK MOTOR DISCONNECT OFF		
100	AIR PUMP MOTOR DISCONNECT OFF		

	MESSAGE	DESCRIPTION	SOLUTION
130	MACHINE MOTOR FAN OVERLOAD (QM1F)	The magneto-thermal switch protecting the specified motor has activated.	Check the reason of the excessive stress on the re. motor, reset the switch inside the electric board and re-start the machine.
131	COOLING UNIT OVERLOAD		
132	STERILIZATION OVERLOAD		
140	PLC BATTERY FAULT	It indicates that the PLC battery is in abnormal condition.	It is necessary to check the battery connection and eventually, replace it.
141	I/O MODULE FAULT	It indicates that one of the entrance/exit modules of the PLC is in alarm.	Check the correct operating of the module.

4.2.5. ALARM MESSAGES HISTORIAN

4.2.5.1. VISUALIZATION

It is possible to visualize on a outer support, the historian of the interventions and re settings of the alarm messages.

To see the list, proceed as follows:

- Press on alarms visualization field (A).
- The page *"alarms message historian"* appears, where it is possible to see when alarms intervened and when they has been reset.
- Press the key (E) to exit *"alarms message historian"* page.

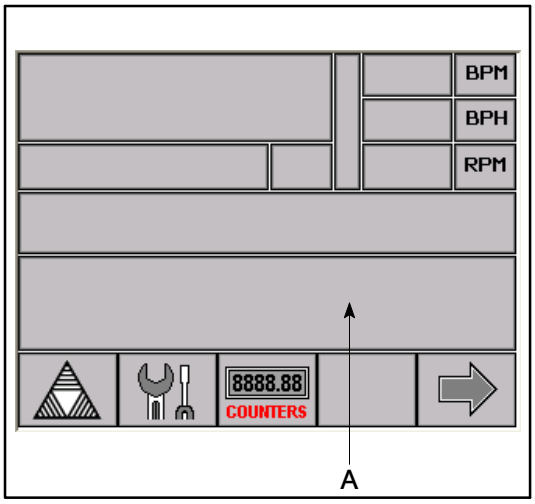


Fig.42

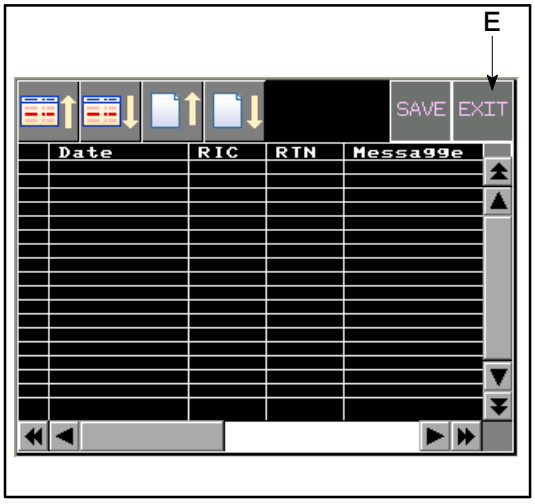


Fig.43

4.2.5.2. DATA STORAGE ON OUTER SUPPORT

It is possible to visualize and store the intervention and resets of the alarm messages historian on an external support.

To see the list, proceed as follows:

- Turn the door lock switch on *OFF* position.
- Open the electric board.
- Insert the memory card into the USB port (A), placed in the rear part of the panel.
- Close the electric board.
- Turn the door lock switch on *ON* position.
- Wait for the panel to complete the start up operation.
- Press on any part of the screen and enter the *"machine status"* page.
- Press on the field (C) to visualize alarms.
- The page *"alarms message historian"* appears, where it is possible to see when alarms intervened and when they has been reset.

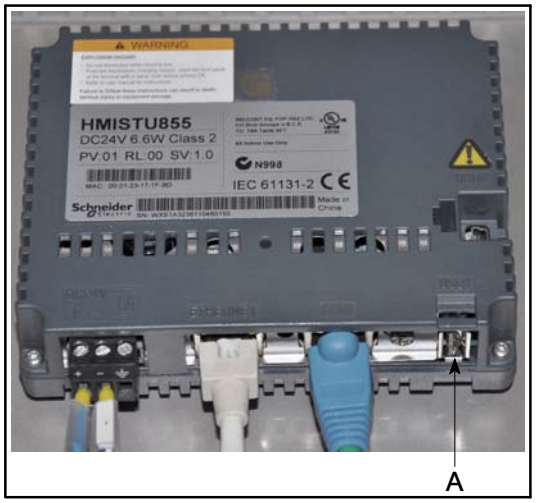


Fig.44

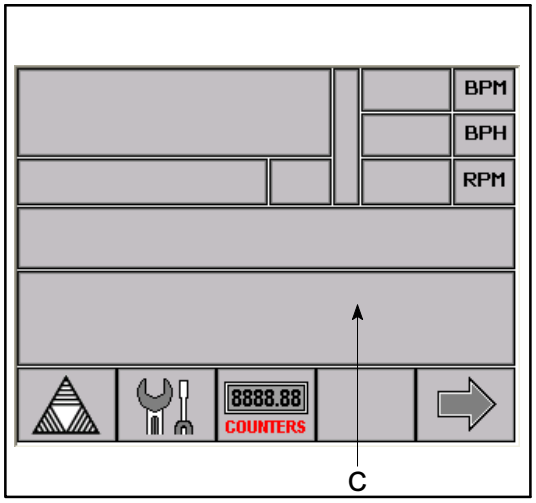


Fig.45

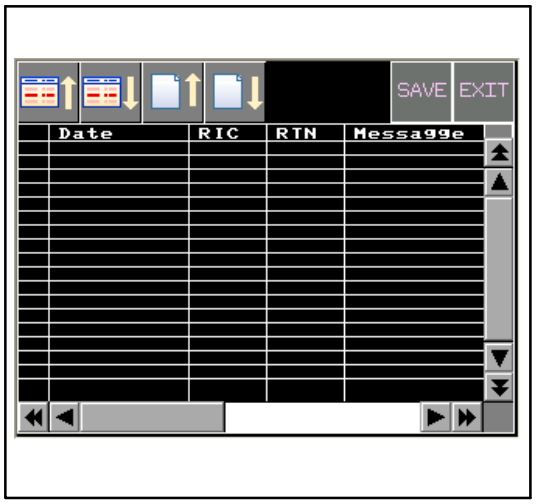


Fig.46

- Press the key (**D**) to transfer data referring to the alarm messages on the memory card.
- Press the key (**E**) to exit the *"alarms message historian"* page.
- Turn the door lock switch on *OFF* position.
- Open the electric board.
- Remove the memory card from the USB port, placed in the rear part of the panel.
- Close the electric board.
- Turn the door lock switch on *ON* position.

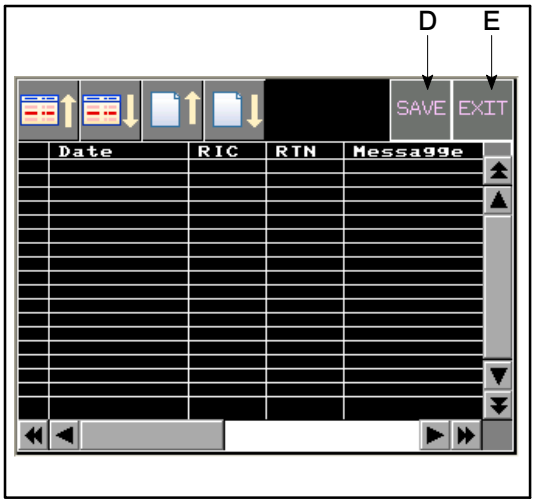


Fig.47

4.2.5.3. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	**PREVIOUS LINE** - Pressing the key, you can scroll to the previous line.
	**NEXT LINE** - Pressing the key, you can scroll to the next line.
	**PREVIOUS PAGE** - Pressing the key, you can enter the previous page.
	**NEXT PAGE** - Pressing the key, you can enter the next page.
	**SAVE** - Pressing the key, you can transfer data on the USB memory card.
	**EXIT** - Pressing the key, you can exit from the visualization page of the *“alarms message historian”.*

4.3. COUNTERS

It is possible to select any time in the page display counters.

To access the display counters, you must:

- in the *"machine status"* page page, press the key (A).

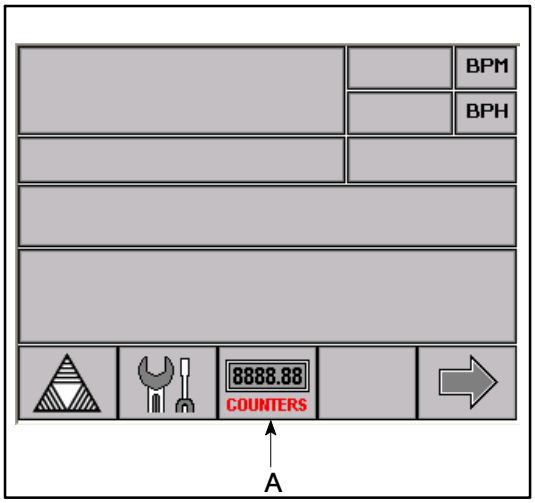


Fig.48

- In the *"machine rotation"* page are displayed in the following fields:
  - TOTAL: is the total number of hours of work the machine. The field is not reset.
  - BATCH: part is the number of hours of work the machine. You can reset the count, holding at least 3 seconds for the key (R).

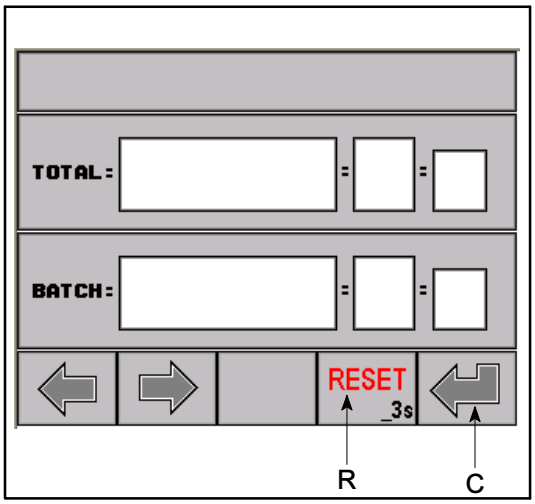


Fig.49

- In the *"bottle"* page are displayed in the following fields:
  - TOTAL: indicates the total number of capped bottles during the automatic gearwork cycles of the machine. The field is not reset.
  - BATCH: indicates the capped bottles partial number. You can reset the count, holding at least 3 seconds for the key (R).

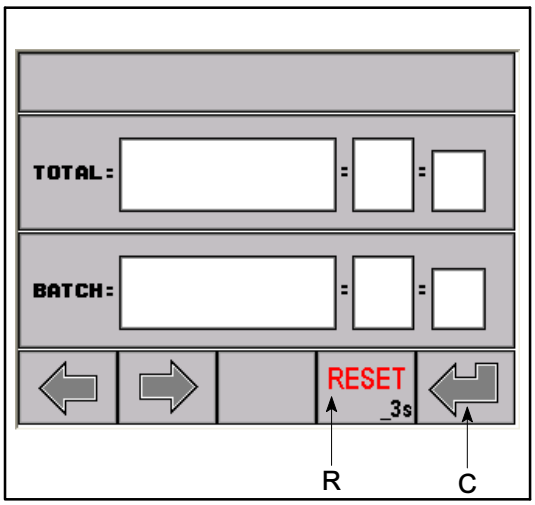
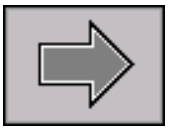
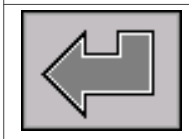


Fig.50

- To return to the *"machine status"* page, press the key (C).

4.3.1. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	COUNTERS - Pressing this key it is possible to enter the page where are displayed the counters on the machine.
	RESET - press the button for at least 3 seconds, you can reset the counter BATCH.
	NEXT PAGE - Pressing the key the next page is accessed.
	PREVIOUS PAGE - Pressing the key the previous page is accessed.
	PREVIOUS LEVEL PAGE RETURN - Pressing the key, you can return to the previous level page.

4.4. LANGUAGE SELECTION

The displaying language for all writings in the operator panel can be selected at any time.

To access the language configuration page, is necessary:

- in the *"machine status"* page page, press the key (A).

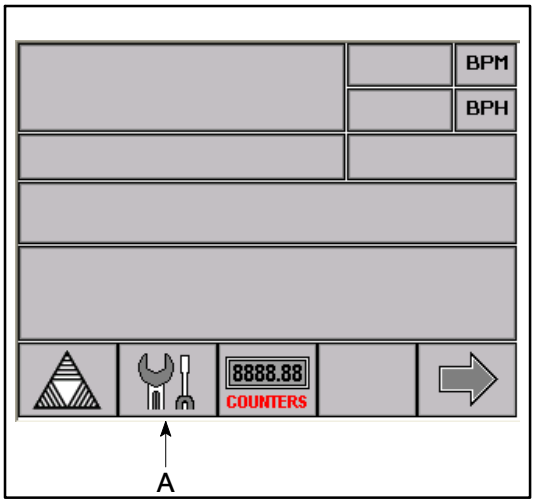


Fig.51

- Press the key (B) for the wished language.
- To return to the *"machine status"* page, press the key (C).

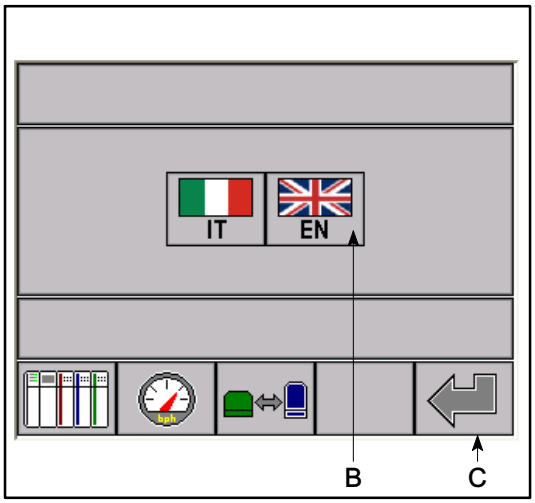
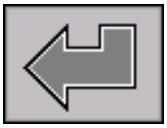


Fig.52

4.4.1. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	**LANGUAGE SETTING** - The language setting page is accessed by pressing this key.
	**LANGUAGE SELECTION** - The selected language is set on the display pressing the key for the wished language.
	**PREVIOUS LEVEL PAGE RETURN** - Pressing the key, you can return to the previous level page.

4.5. PLC STATUS VISUALISATION

It is possible to see the state of entrances and exit of the PLC, proceeding as described below:

- from the "*language selection*" page pressing the key (**D**) it is possible to enter to the *"input/ output status"* page.

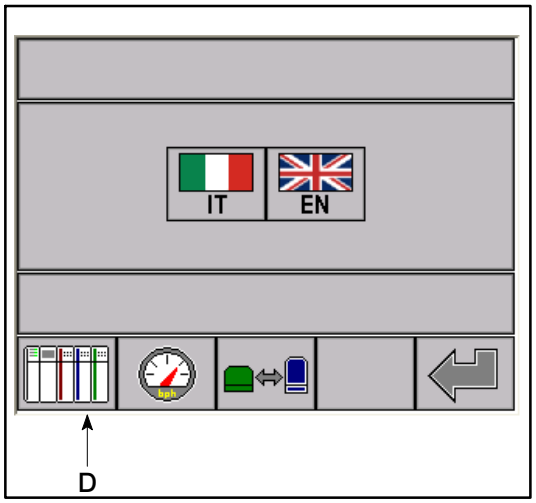


Fig.53

- In this page are displayed the the status of the entrances and exit of the PLC.

This is a displaying page only. It is NOT possible to modify any status.

- Each square indicates the state of the entrances and exit of the PLC.
- For each square there is the relevant PLC address of the represented entrance and exit.
- Each cell represents the address of the relevant bit, **as described in the electric diagram.**
- Press the key (**E**) to enter the other pages of state visualisation.
- To return to the "*language selection*" page, press the key (**F**).

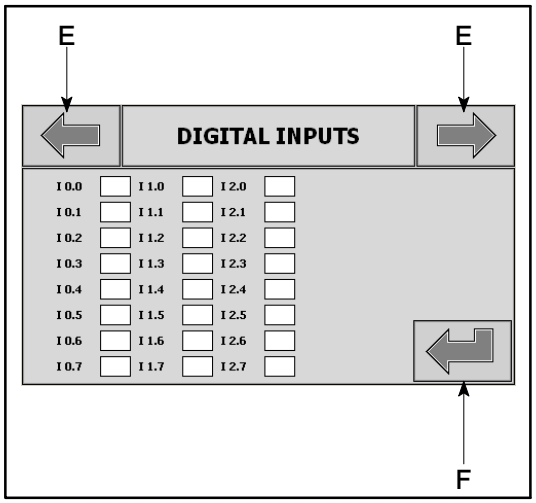
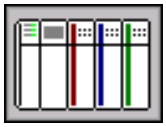
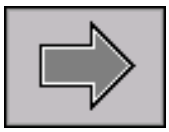
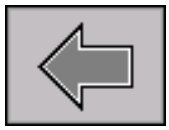


Fig.54

4.5.1. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	**PLC STATUS -** Pressing the key the status PLC page is accessed.
	**NEXT PAGE -** Pressing the key the next page is accessed.
	**PREVIOUS PAGE -** Pressing the key the previous page is accessed.
	**PREVIOUS LEVEL PAGE RETURN** - Pressing the key, you can return to the previous level page.

4.6. SPEED REFERENCE

It is possible to set the speed references of the machine, proceeding as follows:

- From the page *"language selection"* pressing the key (**D**) it is possible to enter to the machine speed adjustment page and speed references.

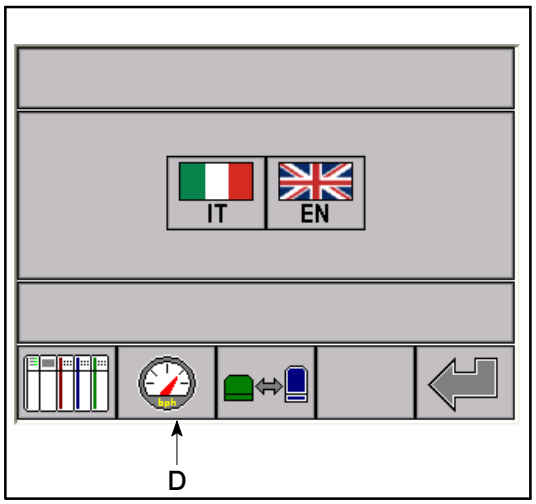


Fig.55

- Press on the field (**E**) and digit the desired value.

It is possible to set a value between the *minimum speed* and the *maximum production speed*.

- To return to the "*language selection*" page, press the key (**C**).

Once the button (**C**) is pressed, on the display will appear the message *"Save the changes?"*. Select the desired option, to return to the *"language selection"* page.

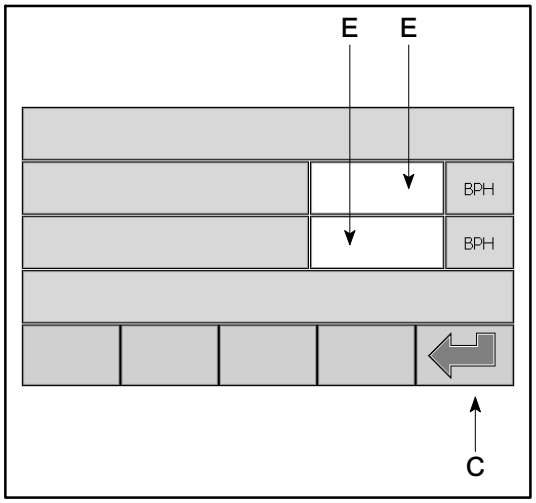
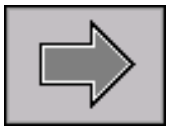
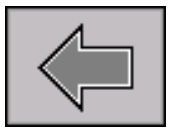
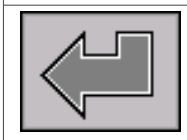


Fig.56

4.6.1. DESCRIPTION OF THE SPEED REFERENCE

PARAMETER	DESCRIPTION
PRODUCTION SPEED	The parameter is referring to the machine rotation speed, when the entrance sensors B2 and B5 are both engaged.
MINIMUM SPEED	The parameter is referring to the machine rotation speed, when the automatic start up sensor B2 only is engaged. The minimum value that could be set is equal to ⅓ of the maximum speed, defined in order acknowledgement.

4.6.2. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	NEXT PAGE - Pressing the key the next page is accessed.
	PREVIOUS PAGE - Pressing the key the previous page is accessed.
	PREVIOUS LEVEL PAGE RETURN - Pressing the key, you can return to the previous level page.

4.7. USERS ACCESS

4.7.1. TYPE OF USER

According to the registered user it is possible to carry out certain operations.

USER	ACCESS
OPERATOR	Accessing as “operator” user it is possible to recall recipes previously stored.
MAINTENANCE MAN	Accessing as “maintenance man” user it is possible to modify parameters of the recipes and create new ones.

4.7.2. USER REGISTRATION

To register a user, it is necessary to:

- in the *“machine status”* page page, press the key (A).

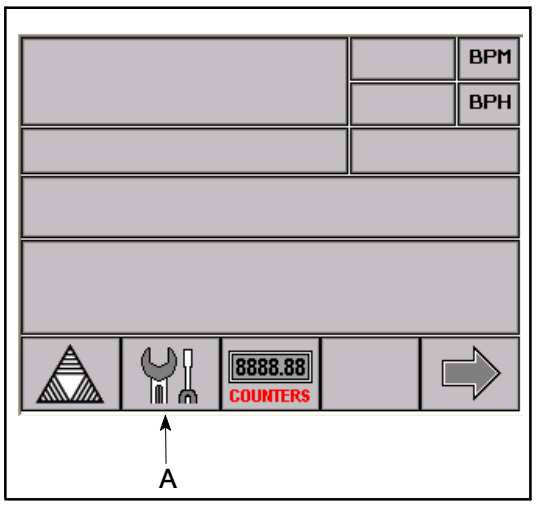


Fig.57

- press, from the page *“language selection”* on the field (D) to carry out the login.

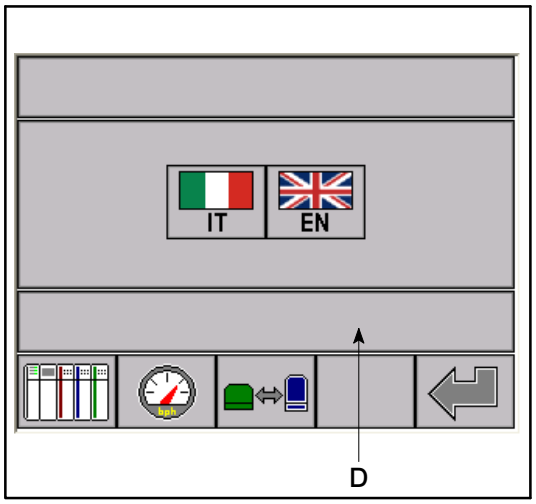


Fig.58

- On the display will appear a window to type the user name and password.
- Press on the field (E) on the display and type, on the keyboard that will appear, the user name.
- Press on the field (F) on the display and type, on the keyboard that will appear, the password.

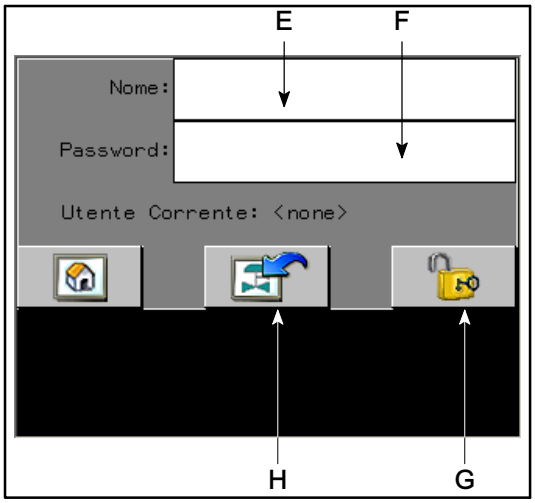


Fig.59

Once the field (E) is pressed, it is necessary to check that the CAPS button is not selected (if selected the green led is on).

To access the numerical keyboard, besides the field (F) it is necessary to press the button (V) too.

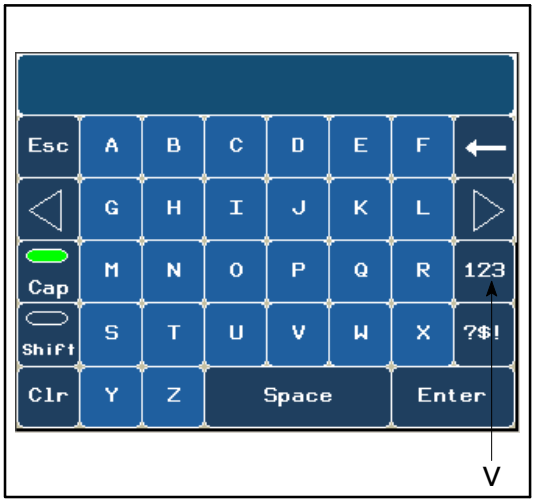


Fig.60

- Once the user name and password are typed, press the keys (G) and (H) to carry out the login.
- On the display appears the user name that carried out the login.

If the registration is not carried out, in the page *"language selection"* in field (Z) will appear the message NO USER LOGGED.

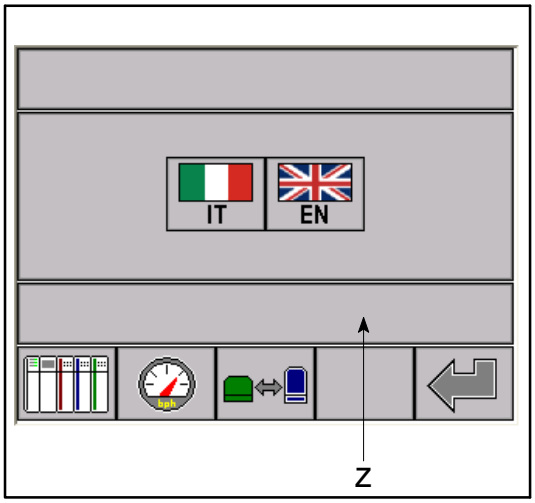


Fig.61

If case of access to the page *"product recipe selection"* without registration, appears an error message, as indicated in Fig.62.

- Press the key (V) and carry out the log-in.

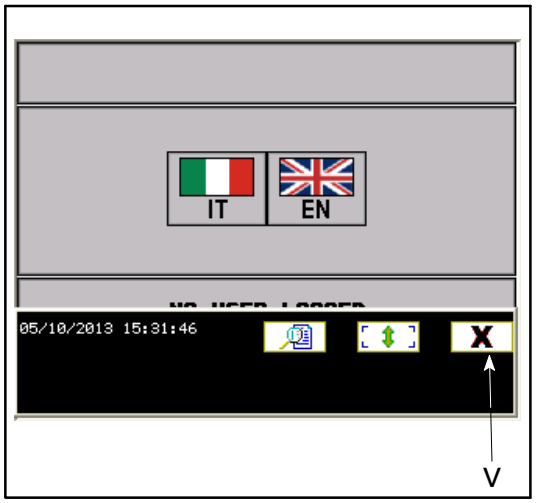


Fig.62

4.7.2.1. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	LANGUAGE SELECTION - The selected language is set on the display pressing the key for the wished language.
	PREVIOUS LEVEL PAGE RETURN - Pressing the key, you can return to the previous level page.
	INFO - A page with information on *AROL* is displayed by pressing this key. The *"machine status"* page is displayed again by touching the screen.
	LANGUAGE SELECTION - Pressing the key, you can return to the language selection page.
	USER CONFIRMATION - Pressing the key, you can confirm the insertion of data of the selected user.

4.8. PRODUCT RECIPE

4.8.1. ENTER THE PRODUCT RECIPE SELECTION PAGE

It is possible to select a recipe previously stored, proceeding as follows:

- Register user and password as indicated in par. 4.7. page 71
- Press the key (R) to enter to the *"product recipe selection"* page.
- To return to the *"language selection"* page, press the key (P).

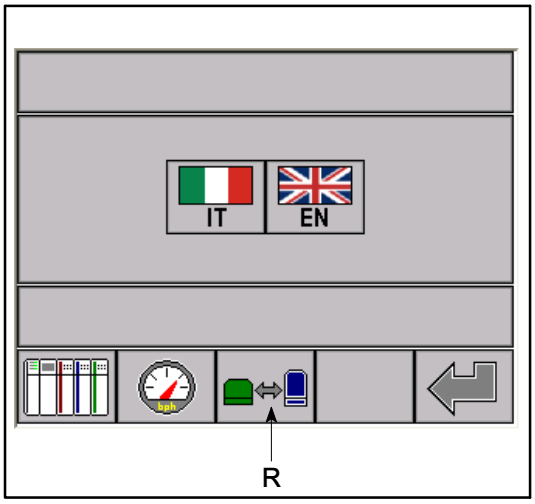


Fig.63

The key (R) appears only when the mode switch is on MANUAL mode.

- To return to the *"machine status"* page, press the key (C).

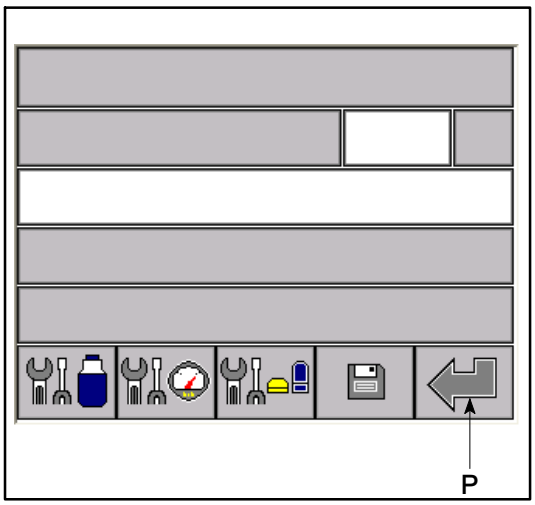
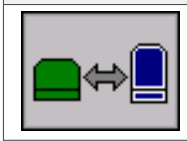


Fig.64

4.8.1.1. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	PRODUCT RECIPE SELECTION - Pressing the key, the *"product recipe selection"* page is accessed.
	PREVIOUS LEVEL PAGE RETURN - Pressing the key, you can return to the previous level page.

4.8.2. SET RECIPE RECALL

It is possible to select a recipe previously stored, proceeding as follows:

- Enter the *"product recipe selection"* page, proceeding as described in par.4.8.1. Page 74.

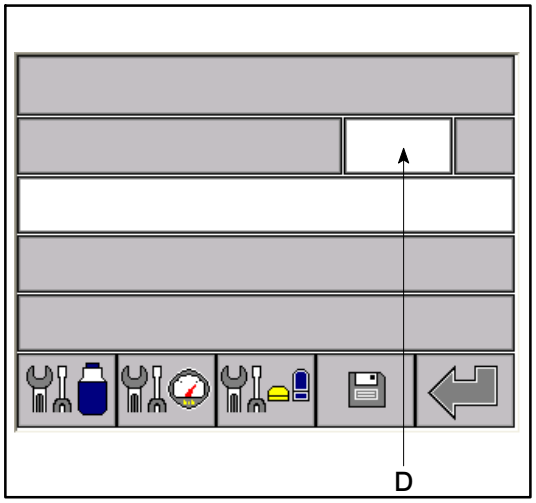


Fig.65

- Press on the field (D) and type the number relevant to the recipe to recall.
- Type on the keyboard appeared, the value relevant to the recipe to recall and confirm the typing pressing the key (G).
- Once the key (G) is pressed, the machine will automatically set on the values previously stored.

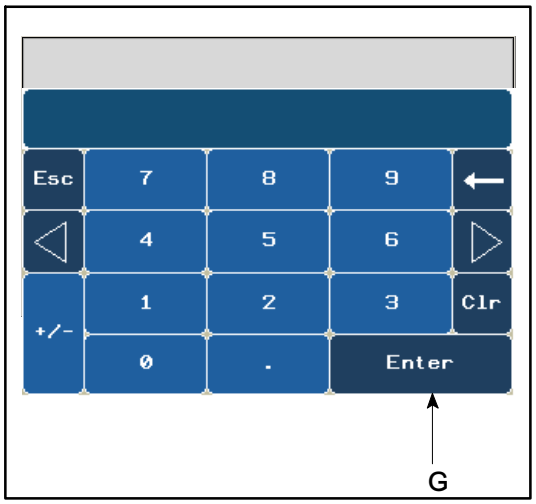


Fig.66

- To name the recipe, it is necessary to press on field (E), and set the recipe name.
- Press on field (F) to save the modifications carried out to the recipe name.

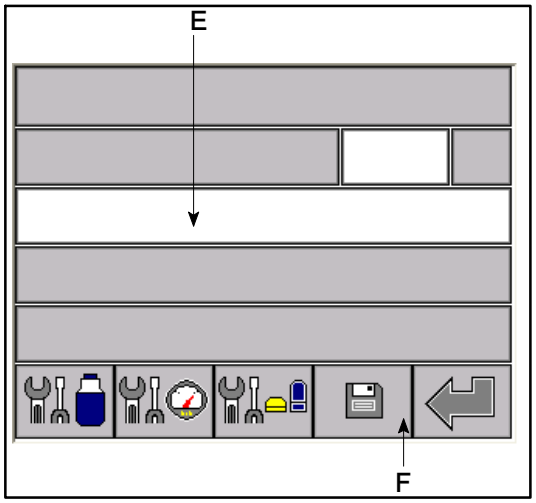


Fig.67

- To return to the *"language selection"* page, press the key (P).

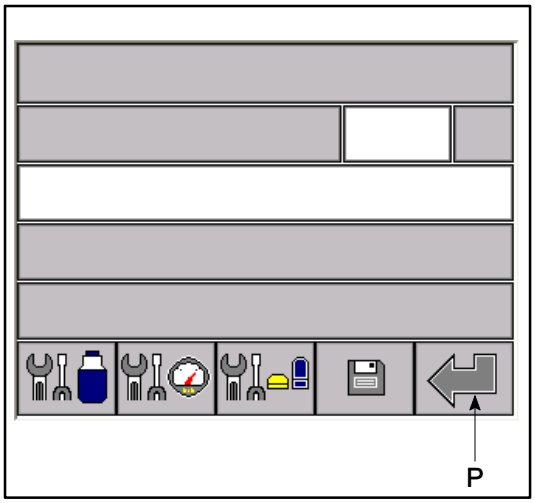


Fig.68

4.8.3. MODIFICATION OF THE MACHINE CONFIGURATION PARAMETERS

It is possible to modify the machine configuration parameters of one recipe, proceeding as follows:

- Recall the recipe to modify, following the instructions reported in par.4.8.2. page.75.

To modify a recipe it is necessary to access as “maintenance man”.

- Press the key (L) to access pages referring to the parameters of the machine.
- Following the instructions listed below, access parameters set up pages and carry out the necessary modifications.

Once the button (P) is pressed, on the display will appear the message *“Save the changes?”.* Select the desired option, to return to the *“product recipe selection”* page.

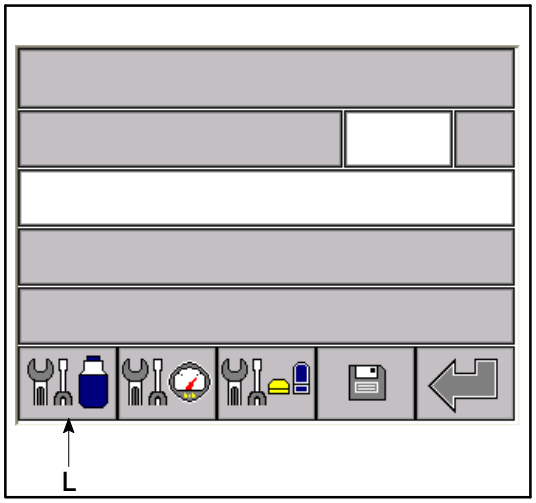


Fig.69

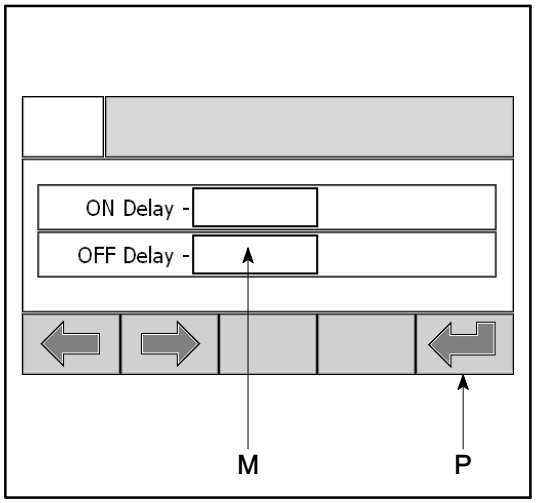


Fig.70

4.8.3.1. NUMERICAL PARAMETERS

To change the set up numerical parameters of the machine, it is necessary to:

- press on the value to change (M).
- Type on the keyboard, the new value to set up.
- Confirm by pressing the key (I), on the keyboard.

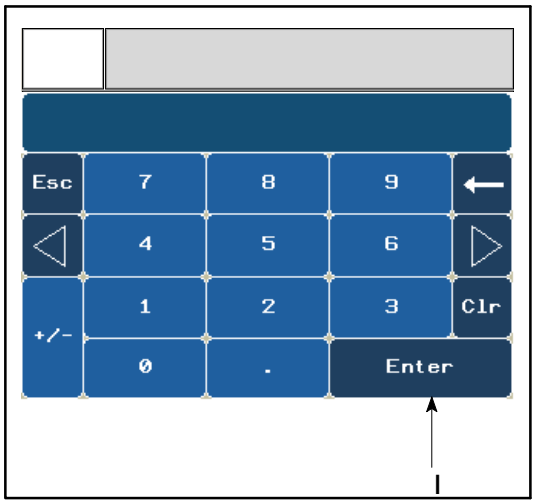


Fig.71

4.8.3.2. ENGAGEMENT PARAMETERS

Pressing on the value (C) it is possible to engage (ON) or disengage (OFF) the function referring to the parameter.

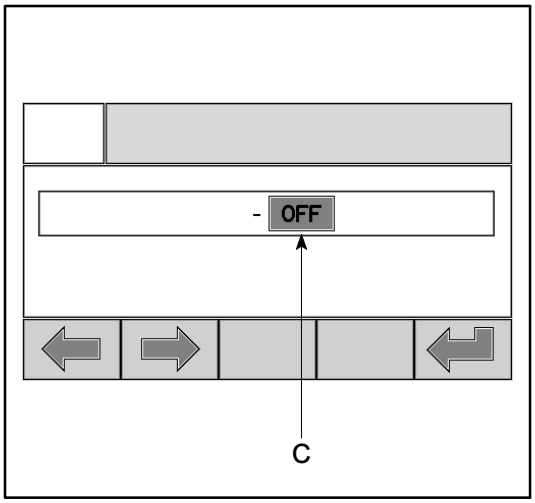


Fig.72

4.8.3.3. PARAMETERS WITH PRE SET CHOICE

To set the operating mode, press one time on the desired key (D).

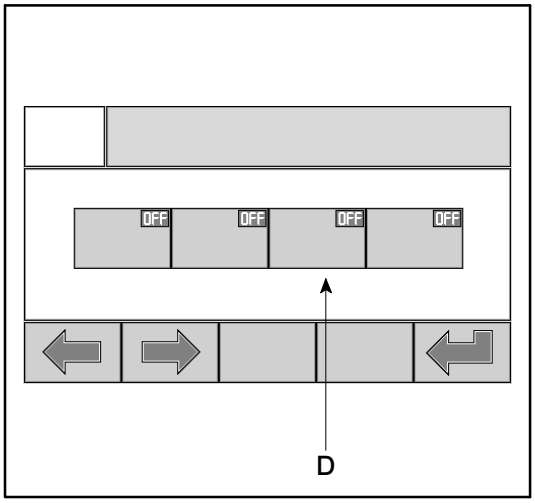
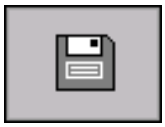
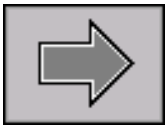
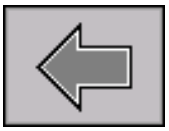


Fig.73

4.8.3.4. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	**PARAMETERS SETTING -** The parameter setting and displaying page is accessed by pressing this key.
	**RECIPE NAME SAVING** - Pressing the key it is possible to save the set name of the recipe.
	**NEXT PAGE -** Pressing the key the next page is accessed.
	**PREVIOUS PAGE -** Pressing the key the previous page is accessed.
	**PREVIOUS LEVEL PAGE RETURN** - Pressing the key, you can return to the previous level page.

4.8.3.5. SETUP PARAMETERS

The panel displays only the parameters of the machine described hereby.

N°.	PARAMETER	DESCRIPTION		
100	MISSING CAPS SENSOR (B1)	The cap lack sensor (B1) keep its signal active as long as there are caps in the delivery chute. The signal lack forces the machine to stop. The message is displayed: *waiting for caps*	ON delay	It delays the machine restart so that the chute can be loaded largely. Typical time 3.0 s.
			OFF delay	It enables to ignore the gap between caps during the machine operation. Typical value 1.0 s. Entering a too high value may result in non-capped bottles.
101	AUTOMATIC START SENSOR (B2)	The automatic start sensor (B2) keep its signal active as long as there are containers at the machine entrance. The signal lack stops the machine. The message is displayed: *waiting for bottles*	ON delay	It delays the machine start so as to restart with a wider container storage. Typical time 3.0 s.
			OFF delay	It must be set at a value higher than the time between containers passing in the production line. Typical time 1.0 s.

N°.	PARAMETER	DESCRIPTION		
102	MAXIMUM SPEED SENSOR (B5)	The max. speed sensor (B5) reads the presence of containers accumulating at the machine entrance to give the consent to the machine max. speed rotation. The message is displayed: *maximum speed*	ON delay	It must be set at a value enabling to ignore the simple passage of containers. Typical time 1.0 s.
			OFF delay	It must be set at a low value, so that the machine rotation slows down as soon as there is no container accumulation. Typical time 1.0 s.
103	EXIT SENSOR (B6)	The exit sensor (B6) reads containers accumulating at the exit of the machine, stopping it when the exit belt is full. The message is displayed: *exit belt too full*	ON delay	Set the min. value enabling to ignore the passage of containers. Entering a too high value may result in broken containers at the exit. Typical time 1.0 s.
			OFF delay	It sets the delay time for the restart after there is no accumulation at the exit. Typical time 3.0 s.

N°.	PARAMETER	DESCRIPTION		
104	CAPS SORTER CHECK SENSOR (B12)	The sorter control sensor (B12) reads caps in the delivery chute; if there is no cap, it controls the sorter.	ON delay	It delays the reading of caps so that the delivery chute can be filled. The value depends on the chute loading speed. A too low value causes an intermittent operation of the sorter, while a too high value causes a safety activation. Typical value 0.4 s.
			OFF delay	Enter a low value to activate the cap feeding more quickly. Typical value 0.2 s.
105	ELEVATOR CHECK SENSOR (B13/SQ30)	The elevator control sensor (B13/SQ30) reads when there is no cap inside the sorter, thus forcing its control signal for loading.		The values of this parameter closely depend on the sorter technology.
			ON delay	Typical value 1.0 s.
			OFF delay	Typical value 1.0 s.
107	CAPS SORTER MAXIMUM SPEED SENSOR (B29)	The sorter max. speed sensor (B29) reads an excessive emptying of the delivery chute controlling an increase in the sorter speed.	ON delay	It delays the reading of caps so that the delivery chute can be filled in the space between this sensor and the sorter min. speed sensor. Typical value 0.5 s.
			OFF delay	Set a low value to activate the caps sorter speeding-up more quickly. Typical value 0.5 s.

N°.	PARAMETER	DESCRIPTION		
108	CAPS STORAGE BIN SENSOR (B15)	The cap level sensor in the storage tank (B15) reads the reaching of the cap max. level inside the tank. The machine is stopped. The message is displayed: *caps storage bin full*	ON delay	Set a value to enable a fast intervention in case of accumulation. Typical value 1.0 s.
			OFF delay	Set a sufficiently long time to enable the correct movement of the cover on the next tank.
109	CAPS STORAGE TANK LEVEL SENSOR (B14)	The elevator cap level sensor (B14) reads the reaching of the cap min. level inside the elevator drum. The message is displayed: *minimum caps level in caps storage tank*	ON delay	Set a value to enable a fast intervention in case of emptying. Typical value 1.0 s.
			OFF delay	Set a value to enable a fast intervention in case of emptying.
200	MACHINE START	Delay time in the machine start between pressing the start push button and the carousel starting its rotation. During this time the machine gives a sound signal.	ON delay	Typical value 1.0 s.
201	HEADS STOP	The parameter enables to keep the heads rotating for a certain time after the machine has stopped.	OFF delay	The heads usually stops simultaneously with the machine. Typical value 0.0 s.
203	BUZZER ALARM DURATION (HA1)	The value of this parameter indicates the duration time of the sound alarm given by the machine in failure conditions and at the start.	ON delay	Typical value 3.0 s.

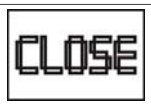
N°.	PARAMETER	DESCRIPTION		
204	MAIN SOLENOID (YV1)	This parameter enables to intervene on the switching-off delay of the solenoid valve controlling air blowing vs. the machine stop. Two different values can be set for the switching-off depending on the machine operating mode.	manual	It is the value applied with the machine operating automatically. Typical value 1.0 s.
			automatic	It is the value applied with the machine operating automatically. Typical value 5.0 s.
205	CAPS SORTER	This parameter enables to indicate the delay time of the cap sorter start vs. the machine start.	ON delay	Typical time 1.0 s.
			OFF delay	This parameter enables to indicate the delay time of the cap sorter switching-off vs. a stop of the machine waiting. Typical value 30 s.
206	CAPS ELEVATOR	This parameter enables to adjust the delay times at the start and stop of the cap elevator control signal vs. the cap absence read in the sorter.	ON delay	The delay at the elevator start can be useful for some types of feeders needing to work with few caps. Typical value 0.5 s.
			OFF delay	The delay in the elevator switching-off enables to load more caps in the sorter. Typical value 0.5 s.
208	DELAYED START UP AFTER VACUUM	This parameter enables to set a delay in the machine start after the necessary vacuum value has been reached.	ON delay	Typical value 2.0 s.

N°.	PARAMETER	DESCRIPTION		
209	VACUUM VALVE OPENING DELAY	This parameter defines the opening time of the vacuum valve after a machine stop or pause.	ON delay	Typical time 0.0 s.
210	PUMP STOP AFTER MACHINE STOP	This parameter defines the time of the vacuum creation pump still operating after the machine has been stopped by the operator. Before stopping the pump, the vacuum valve closing is waited. The delay time is the sum of the parameter 209 with the current one for all effects.	OFF delay	Typical value 3.0 s.
211	PUMP STOP AFTER MACHINE IN STAND-BY	This parameter defines the time of the vacuum creation pump still operating whenever the machine is stopped in waiting conditions. Before stopping the pump, the vacuum valve closing is waited. The delay time is the sum of the parameter 209 with the current one for all effects.	OFF delay	Typical value 10.0 s.
212	CAPS VIBRATOR STOP DELAY	The parameter defines the time of delay of vibrator turn off in the tank of the elevator, in comparison to the caps elevation device.	OFF delay	Typical value 5.0 s.

N°.	PARAMETER	DESCRIPTION		
213	CAPS CONVEYOR BELT STOP DELAY	The parameter defines the time of delay of belt turn off, in the elevator tank in comparison to the caps elevation belt stop.	OFF delay	Typical value 5.0 s.
214	OVERTURNED CAPS DISCARDER	The parameter allows to define the times that adjust the overturned caps ejection system operating.	ON delay	It indicates the minimum time necessary to define the device intervention.
			OFF delay	It indicates the duration of the intervention of the overturned caps discarder device.
215	DOORS OPENING ENABLE	The parameter referes to the doors opening and closing operations.	N.	
300	ERRORS CHECK FOR MACHINE STOP	The parameter defines the number of consecutive errors in the cap control to stop the machine automatically. If the value 0 is set, the machine does not stop automatically still displaying the cap control. The message is displayed: *caps check intervention*	N.	Typical set value 0.
301	STEPS FOR CAP RELEASE	This parameter defines the distance in steps of the machine between the bottle presence sensor and the cap release activation. When the value is 0, the cap is released simultaneously with the bottle presence.	N.	The set value must be adjusted at the machine installation.

N°.	PARAMETER	DESCRIPTION		
302	STEPS FOR 2ND CAP RELEASE	This parameter defines the distance in steps of the machine between the bottle presence sensor and the release activation for the second cap supply chute. When the value is 0, the cap is released simultaneously with the bottle presence.	N.	The set value must be adjusted at the machine installation.
303	STEPS FOR 3RD CAP RELEASE	This parameter defines the distance in steps of the machine between the bottle presence sensor and the release activation for the third cap supply chute. When the value is 0, the cap is released simultaneously with the bottle presence.	N.	The set value must be adjusted at the machine installation.
304	STEPS FOR CAP CHECK	This parameter defines the distance in steps of the machine between the bottle presence sensor and the release activation for the cap supply chute.	N.	The set value must be adjusted at the machine installation.
305	STEPS FOR EMPTYING CYCLE	This parameter defines the emptying, namely the number of machine steps necessary to keep the turret rotating from the lack of bottles on the conveyor belt, so as to close the containers still under the heads. The message is displayed: *emptying*	N.	The set value must be adjusted at the machine installation.

N°.	PARAMETER	DESCRIPTION		
306	STEPS FOR GAS INJECTION	The parameter defines the distance in machine steps between the bottle presence sensor and the activation of the electrovalve for the gas injection into the bottle neck.	N.	The set value must be adjusted at the machine installation.
307	STEPS FOR BLOCK BOTTLE	This parameter defines the distance in steps of the machine between the bottle presence sensor and the release activation for the bottle blocking cylinder.	N.	The set value must be adjusted at the machine installation.
308	STEPS FOR OPEN GRIPPER	This parameter defines the distance in steps of the machine between the bottle presence sensor and the release activation for the gripper opening valve.	N.	The set value must be adjusted at the machine installation.
309	STEPS FOR BOTTLE EXTRACTOR	This parameter defines the distance in steps of the machine between the bottle presence sensor and the release activation for the bottle extraction cylinder.	N.	The set value must be adjusted at the machine installation.
405	SYNCHRONIZED SPEED	The parameter enables the turret to rotate in synchronism with the reference supplied by an analog signal from the outer line.	enabled	If such parameter is enabled, the turret rotates synchronized. Otherwise, its speed depends on the setup on the operator panel.
410	CAP PRESSING DEVICE	This parameter enables the operation of the device pressing the caps so that they perfectly adhere on the bottle neck.	enabled	

N°.	PARAMETER	DESCRIPTION		
411	BOTTLE-STOP	This parameter activates the operation of the device to lock the containers at the machine entry.		
		**OPEN** - Pressing the relevant button, the device allows the passage of containers.		
		**AUTO** - Pressing the relevant button, the device allows the passage of containers according to their flow.		
		**CLOSE** - Pressing the relevant button, the device does not allow the passage of containers.		
412	BOTTLES DISCARDER UNIT	The parameter activates the operation of the device to reject incorrectly capped containers.	enab led	If enabled, its operation depends on the capping control devices installed on the machine.
413	CLEANING CYCLE DURATION	The parameter indicates the effective duration of the washing cycle.	ON delay	
414	VACUUM REGULATION ENABLE SPEED	The parameter indicates the minimum limit when the choking vacuum valve intervenes, in such way to adjust the vacuum quantity at low speeds.	BPM	
415	HEADS ROTATION	The parameter engages the heads rotation motor.	enab led	
416	CAPS SORTER	The parameter engages the caps sorter rotation in automatic mode.	enab led	If this parameter is enabled, when the machine starts up, automatically will start up also the caps sorter.

N°.	PARAMETER	DESCRIPTION		
417	BOTTLES CONVEYOR BELT	The parameter engages the bottles transfer belt motor.	enab led	
418	BOTTLES CONVEYOR BELT BY-PASS	The parameter engages the BY-PASS mode operating of the bottles transfer belt.	enab led	
419	VACCUM PUMP	It engages or disen-gages the operating of the vacuum pump.	enab led	
420	MACHINE BY-PASS	It engages or disen-gages the by-pass mode to exclude the machine from the work cycle. The message is dis-played: *Machine by-pass*	enab led	If this parameter is enabled, the JOG operating of the machine is disabled.
500	SIZE SELECTION	It allows to select the format to proceed.		
900	SAVE THE CHANGES? YES/NO	It allows to store the modification carried out to the recipe set into the recipes archive.	YES	The modification will be stored into the recipes archive and used again to the next recall of the pro-ceeded recipe.
			NO	The modification will not be stored into the recipes archive: to the next recall, the recipe proceeded at the moment, the modified parameters will be replaced by the values previously stored.

4.8.4. COMPONENTS SPEED REFERENCES SET UP

It is possible to modify the machine configuration parameters of one recipe, proceeding as follows:

- recall the recipe to modify, following the instructions in par.4.8.2. page 75.

To modify the set up of a recipe it is necessary to access as “maintenance man”.

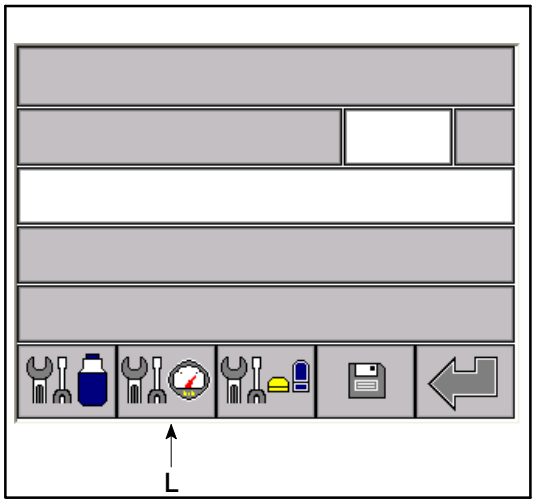


Fig.74

- Press the key (L) to access pages referring to the components speed references.

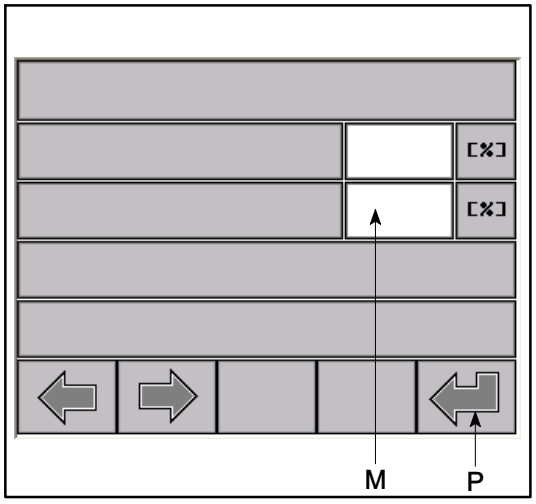


Fig.75

- Press on the value to modify (M).
- Type on the keyboard, the new value to set up.
- Confirm by pressing the key (I), on the keyboard.
- Press the key (P) to return to the *“product recipe selection”* page.

Once the key (P) is pressed, on the display will appear the message *“Save the changes?”*. Select the desired option, to return to the *“product recipe selection”* page.

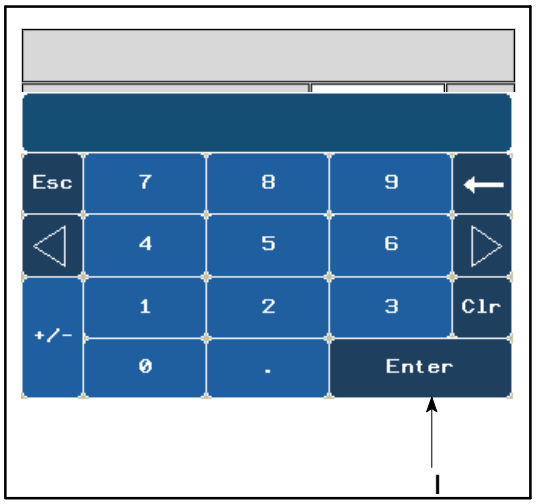


Fig.76

4.8.4.1. LIST OF COMPONENTS SPEED REFERENCES

RIFERIMENTO	DESCRIPTION
HEAD MOTOR REFERENCE	The parameter allows to adjust the rotation speed of the heads rotation motor, according to the machine main motor rotation speed. Inserting a negative value in the head rotation speed reference field, it is possible to get a reverse head rotation.
CAPS SORTER MOTOR REFERENCE	The parameter allows to adjust the rotation speed of the caps sorter motor rotation. In case of vibrating caps sorter, this parameter allows to increase or decrease the vibrations frequency.
CAPS SORTER MOTOR REFERENCE REDUCTION	The parameter identifies the percentage of the rotation speed reduction in comparison to the set value in *"caps sorter motor reference"*, of the caps sorter. This condition is verified when the caps sorter maximum speed sensor B29 (when provided) is engaged.
CAPS STORAGE TANK REFERENCE	The parameter allows to increase or decrease the vibration frequency of the supplementary tank.
EXTERNAL REFERENCE	The parameter allows to adjust the analogical exit value (used for the outer synchronism) according to the machine main motor rotation speed.

Increasing or decreasing the reference percentage (%), it is possible to adjust the motor speed relevant to the changed value, according to the machine main motor speed.

4.8.4.2. ENTRANCE SYNCHRONISM SPEED REFERENCE

It is possible to set speed references of the machine synchronism, proceeding as follows:

- recall the recipe to modify, following the instructions in par.4.8.2. page 75.

<u>To modify the set up of a recipe it is necessary to access as “maintenance man”.</u>

- Press the key (L) to access pages referring to the components speed references.
- Pressing on keys (E), scroll pages up to *“Entrance synchronism speed reference”.*
- Press on the field (F) to modify.
  - ANALOG REFERENCE. Insert in fields (O) minimum and maximum analog values of the analog value of the machine entrance reference.
  - PRODUCTION SPEED. Insert in fields (M) the production speed minimum and maximum value, which the machine will turn, according to the analog reference received at the entrance.
- Enter on the appeared keyboard, the new value to set.

<u>Pressing on the units (H), it is possible to change the value from V to mA.</u>

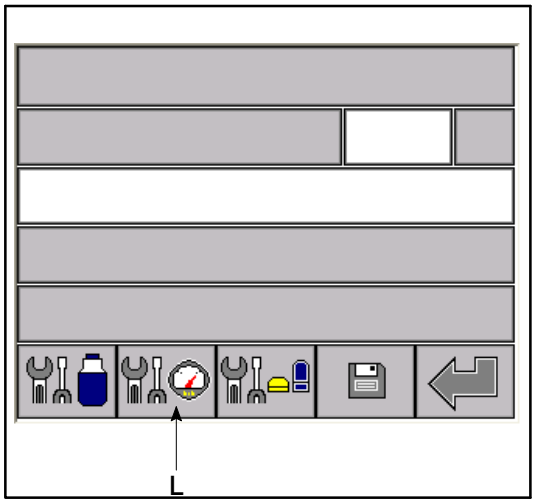


Fig.77

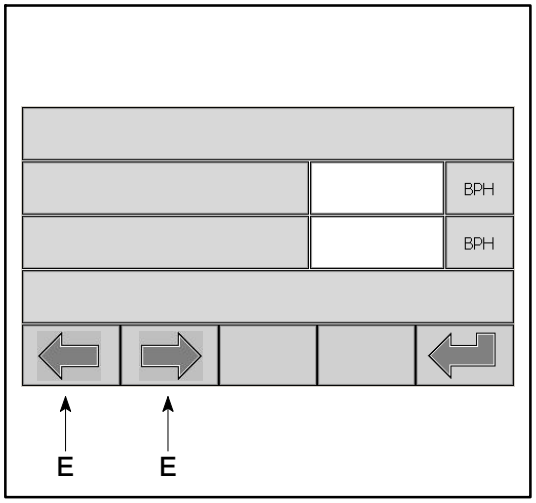


Fig.78

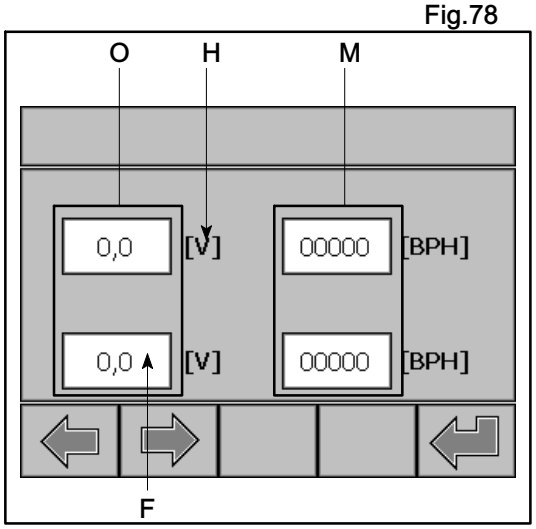
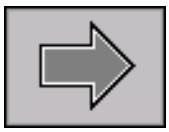
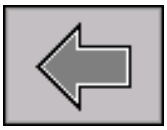


Fig.79

4.8.4.3. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	COMPONENTS SPEED REFERENCES SET UP Pressing this button it is possible to enter the machine components speed references set up page.
	NEXT PAGE - Pressing the key the next page is accessed.
	PREVIOUS PAGE - Pressing the key the previous page is accessed.
	PREVIOUS LEVEL PAGE RETURN - Pressing the key, you can return to the previous level page.

4.8.5. RECIPE SETTING

4.8.5.1. COPY OF A SINGLE PRODUCT RECIPE

It is possible to copy parameters of a recipe as described below:

- Press the key (L) to access *"copy of a single product recipe"* pages.

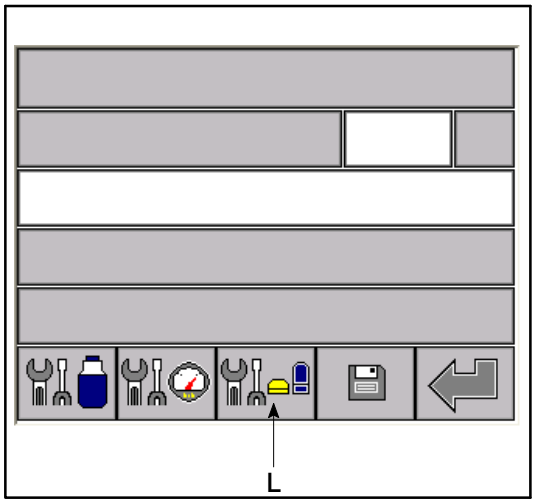


Fig.80

To modify the set up of a recipe it is necessary to access as "maintenance man".

- Press on the value (B) of the field SOURCE RECIPE.
- Type on the appeared keyboard, the value referring to the recipe from which copy the parameters.
- Confirm by pressing the key (I), on the keyboard.
- Press on the value (C) of the filed DESTINATION RECIPE.
- Type on the appeared keyboard, the value referring to the recipe in which copy the parameters.
- Confirm by pressing the key (I), on the keyboard.
- Press the key (M) to store data in the destination recipe.
- Press the key (P) to return to the *"product recipe selection"* page.

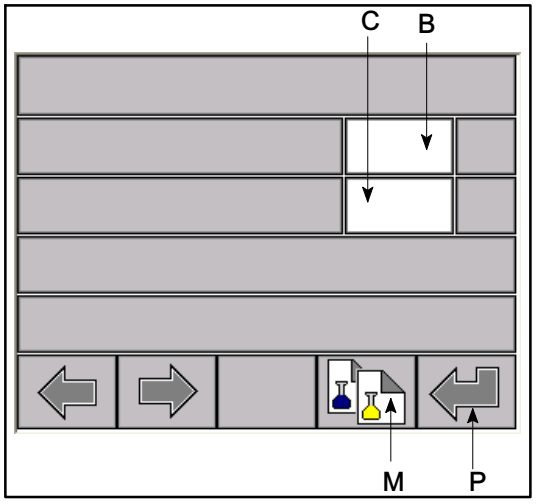


Fig.81

It is possible to set up to 20 recipes. If it is necessary to set a greater number, contact the *Arol Assistance Service.*

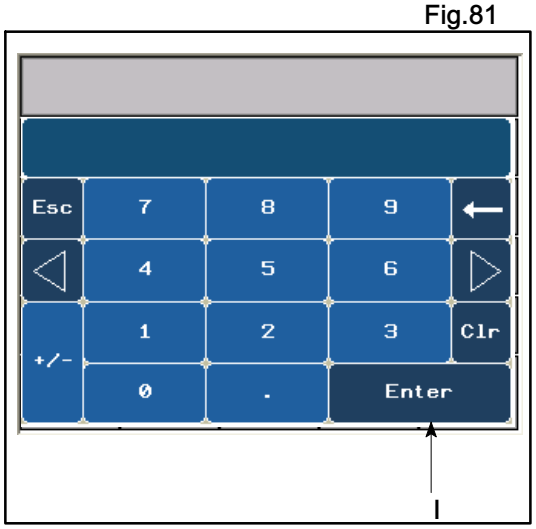


Fig.82

4.8.5.2. PRODUCT RECIPE REPLACEMENT

It is possible to replace parameters of all recipes as described below:

- Press the key (L) to access *"copy of a single product recipe"* pages.

<u>To modify the set up of a recipe it is necessary to access as "maintenance man".</u>

- Press the key (M) to enter *"product recipe replacement"* page.
- Press on the value (B) of the field SOURCE RECIPE.
- Type on the appeared keyboard, the value referring to the recipe from which copy the parameters.
- Confirm by pressing the key (I), on the keyboard.
- Press the key (M) to replace the data of the source recipe on all the recipes.
- Press the key (P) to return to the *"product recipe selection"* page.

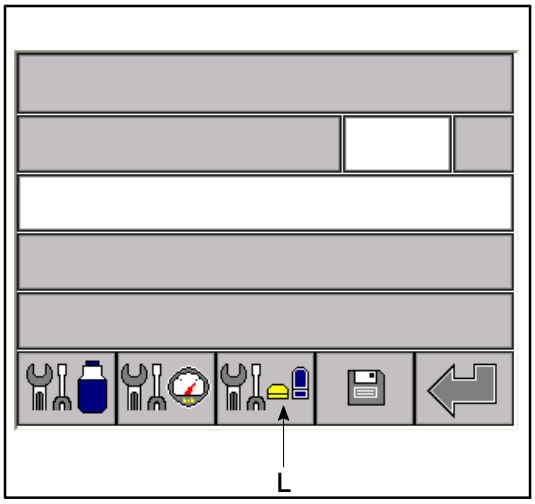


Fig.83

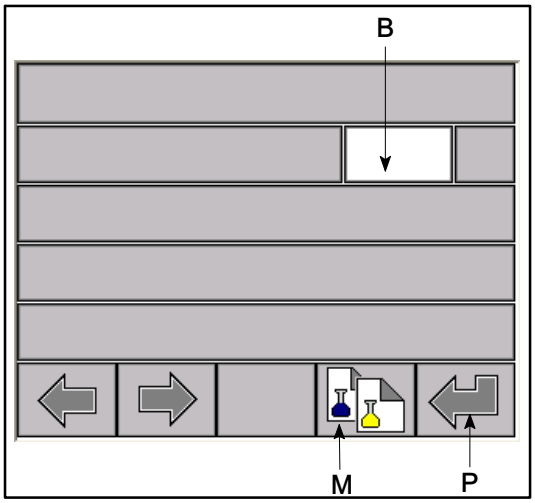


Fig.84

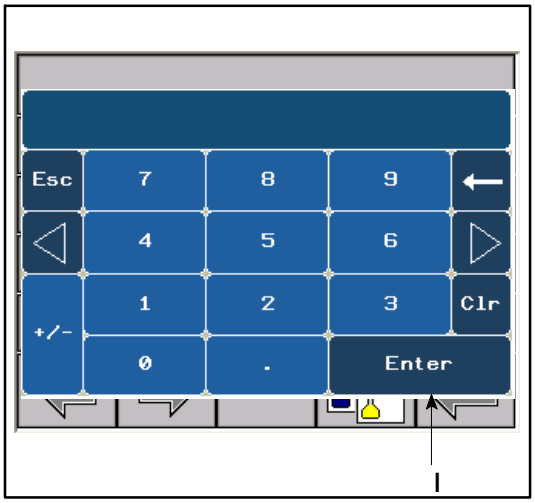
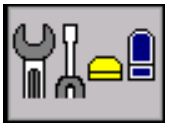
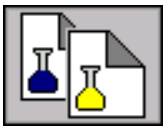
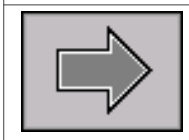
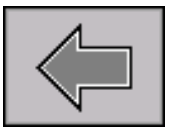
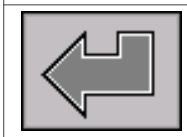


Fig.85

4.8.5.3. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	**RECIPE SET UP** - Pressing the button it is possible to enter the product recipe set up page.
	**PRODUCT RECIPE MODIFICATION** - Pressing the button, the modification about the product recipe are applied.
	**NEXT PAGE -** Pressing the key the next page is accessed.
	**PREVIOUS PAGE -** Pressing the key the previous page is accessed.
	**PREVIOUS LEVEL PAGE RETURN** - Pressing the key, you can return to the previous level page.

4.9. MACHINE CONTROLS

On the operating panel there are the buttons to control some machine functions.

To enter the *"controls pages"* it is necessary to:

- in the *"machine status page"* page, press the key (A).

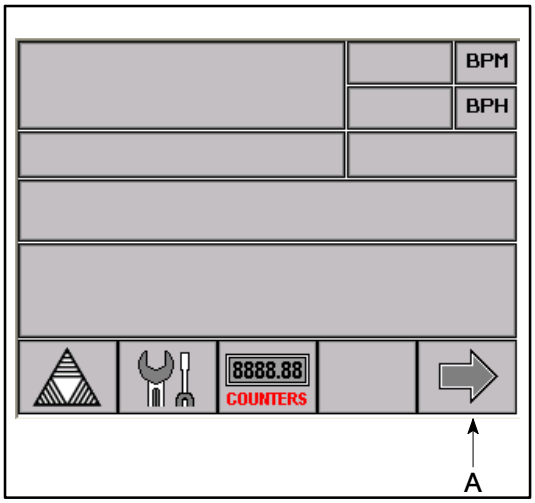


Fig.86

- According to the operation to do, press on the relevant button.
- Press the key (P) to return to the *"machine status"* page.

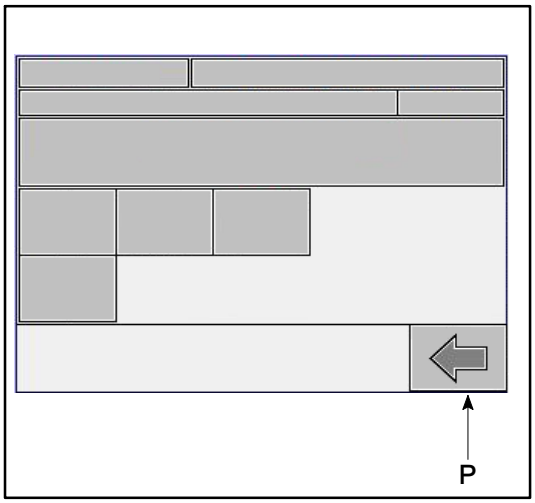
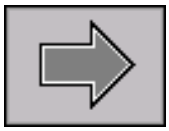
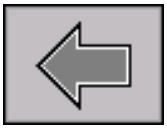


Fig.87

<u>On the panel are displayed only the functions relevant to the machine object of this manual.</u>

To the par.4.9.2. page 99 it is possible to find a short description of the function of the buttons.

4.9.1. DESCRIPTION OF THE KEYS FUNCTIONS

ICON	DESCRIPTION
	NEXT PAGE - Pressing the key the next page is accessed.
	PREVIOUS PAGE - Pressing the key the previous page is accessed.

4.9.2. DESCRIPTION OF MACHINES CONTROLS

KEY	DESCRIPTION
	CAPS ORIENTATOR in MANUAL position The cap delivery chute loading is activated in manual mode by pressing this key. The motor switches off releasing the key. The key enables the switching - on/off function only with the machine stopped.

5. OPERATING MODES

The machine can operate, according to the situations, in automatic or manual mode.

Switching between the two operating modes is operated by the key mode switch with two positions *AUT/MAN*:

- *MAN* mode: to be used during size changes or maintenance interventions, it enables the machine jog operation with closed protection doors.

  Pressing the outer *JOG* push button it is possible to carry out jog closure cycles.

- *AUT* mode: to be used during the standard machine productive activity, it enables the automatic cycle operation of the machine.

  Pressing the *START* push button the machine is automatically started.

During the operation in *AUT* mode, the key mode must be removed from the control panel and kept far from the working place.

6. PRELIMINARY CHECKS

Before starting the machine up, check the following:

- Check all safety devices are operating.
- Check the protection doors are closed.
- Check all machine components are lubricated (see chapter *LUBRICATION*).
- Make sure the specific installed equipment are suitable for the size to be processed.
- Check the correspondence between container and cork to be treated.

Every set of equipment is marked as shown in the table "**e.**" on page 11. Each mark corresponds to a size to be processed.

- Check the height of the closure unit according to the container height.
- After checking and possibly adjusting the turret height, make sure the equipment is aligned.

To check the alignment, carry out a test making the machine perform a whole cycle at slow speed and in jog mode after having fed a few containers. After having set the mode switch on *MAN*, press the *START* push button.

- Check the cork orientator is sufficiently full.
- Check that the working pressure is correct (the pressure is indicated on the pressure gauges).

7. HEIGHT ADJUSTMENT OF THE TURRET

To carry out the adjustment and check, proceed as described below:

- open the protection doors.
- Unlock the screw (A) locking the column.
- Turn the handwheel (B) in clockwise direction to lift the turret until to exceed the height of the bottle.
- Lean a bottle of the format to handle on the plate (C).
- Turn the handwheel (B) in counter clockwise direction to lower the turret until the spacer (D) is on the bottle.
- Remove the bottle used for the adjustment.
- Lock the screw (A).
- Close the protection doors and make sure all safety devices are restored.
- Press the button *SAFETY DEVICE RESET*.
- At the adjustment end, turn the mode switch *AUT/MAN* to *AUT* and remove the key.

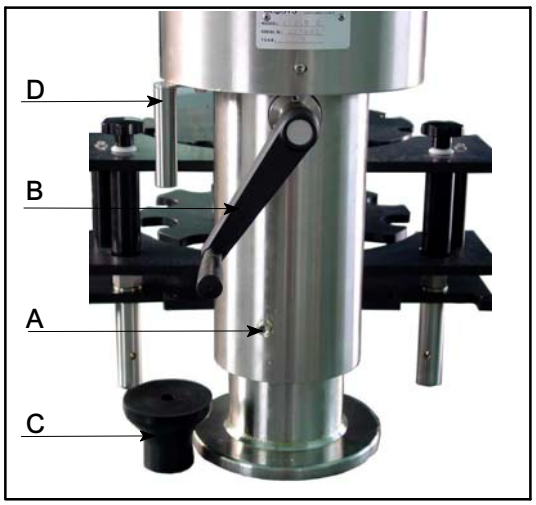


Fig.88

8. USE OF THE MACHINE

The descriptions of the light indicators are displayed in par. "*MACHINE CONTROLS*" while the key functions are displayed in paragraph "*OPERATOR PANEL*".

8.1. START UP

To carry out the start up of the machine, carry out the following operations:

1) turn the cut-off switch to *ON* position, the *POWER ON* lamp will light up.
2) Check that the other lamps on the panel are switched off.
3) If necessary, restore all safety devices as indicated in paragraph on page 103.
4) Make sure the mode switch *AUT/MAN* is on *MAN*.
5) Select on the operator panel the recipe referring to the format to proceed (see *"product recipes selection"* in chapter *"OPERATOR PANEL"*).
6) From the main page of the operator panel press  to access to machine operating controls pages. Press 

to set the operation of the cap sorter in manual mode and to hold it till the delivery chute is totally filled.
7) Turn the *AUT/MAN* selector to *AUT* position.
8) Press *SAFETY RESET* button.
9) Set the machine to the start up pressing the *START* button.
10) When a certain number of containers are at the machine entrance, a photocell allows the start up of the machine at a fixed speed.

On the exit belt there is a photocell that in case of containers accumulation stops the rotation of the machine.

This type of stop, is marked by a device with flashing light, it must be considered temporary with automatic start up.

As soon as the accumulation is over the machine utters a sound signalation and the automatically start up.

8.2. WORK CYCLE STOP

With the *STOP* button it is possible, if necessary, to stop the machine for temporary stops, the *POWER ON* lamp remain on , the other lamps go off.

8.3. GUARDS/SAFETY PROTECTIONS

8.3.1. EMERGENCY STOP

The emergency stop is carried out as follows:

1) press the *EMERGENCY STOP* button.
   - All functions of the machine stop.
   - The *SAFETY DEVICE* lamp will light up.
   - The *POWER ON* lamp remains on.
   - The other lamps go off.
   - On the display there is the relevant message.
   - To re-engage the button, turn it in direction of the arrow.

   Before re-starting the machine, press the safety reset push button *SAFETY DEVICE RESET*.

8.3.2. STOP DUE TO TRIPPING OF THE MACHINE SAFETIES

The machine stops when:

1) Protection doors are open during the operating.
   - The *POWER ON* lamp remains on.
   - The *SAFETY DEVICE* lamp will light up.
   - On the display there is the relevant message.

Close the doors and press the safety reset push button *SAFETY DEVICE RESET*.

2) Microswitch controlling the starwheel intervenes, probably passage of containers with greater dimensions.
   - The *POWER ON* lamp remains on.
   - The *SAFETY DEVICE* lamp will light up.
   - On the display there is the relevant message.

Re-set the security as described in paragraph at page 130. Before re-starting the machine, press the safety reset push button *SAFETY DEVICE RESET*.

8.3.3. STOP DUE TO TRIPPING OF PROTECTIONS

The machine stops when:

1) the motors thermal protection operates.
   - The *POWER ON* lamp remains on.
   - On the display there is the relevant message.

Re-set the motor protections. Before re-starting the machine, press the safety reset push button *SAFETY DEVICE RESET*.

2) Frequency converter protection intervenes.
   - The *POWER ON* lamp remains on.
   - On the display there is the relevant message.

Re-set the frequency converter protection. Before re-starting the machine, press the safety reset push button *SAFETY DEVICE RESET*.

8.3.4. STOP WITH AUTOMATIC START UP

The machine stops when:

1) lack of caps in the caps chute check intervenes.
   - The *POWER ON* lamp remains on.
   - The yellow flashing light on the control panel upper part switches on.
   - When the caps level in the caps chute is regenerated, the machine utters a sound signal and then automatically re-stars.
2) The entrance transfer belt check intervenes, there is a lack of containers.
   - The *POWER ON* lamp remains on.
   - The yellow flashing light on the control panel upper part switches on.
   - When the flow of containers on conveyor belt is regenerated, the machine utters a sound signal and then automatically re-starts.
3) The exit transfer belt check intervenes, there is an accumulation in exit.
   - The *POWER ON* lamp remains on.
   - The yellow flashing light on the control panel upper part switches on.
   - When the container overfilling on the conveyor belt is over, the capper utters a sound signal and then automatically re-starts.

8.4. MACHINE SPEED ADJUSTMENT

Adjust the production speed by the operator panel (see *"speed reference"* at the paragraph *OPERATOR PANEL*).

Adjust the speed only a machine in motion.

The set value is applied when the photocells are committed to minimum and maximum speed. If this does not happen, the machine speed is equal to the minimum speed previously set.

8.5. ADJUSTMENT OF THE TRANSFER BELT SPEED

If it is necessary to change the rotation speed of the transfer belt, it is necessary to carry out as described in paragraph *"speed reference"* in chapter *"OPERATING PANEL"*.

8.6. HEAD ROTATION SPEED ADJUSTMENT

If it is necessary to adjust the rotation speed of the head it is necessary to carry out by the operator panel (see *"speed reference"* at the paragraph *OPERATOR PANEL*).

The adjustment of the head roptation speed must be carried out when the motor is in rotation.
The speed must be adjusted according to the production speed and the nuber of necessary rotations for the closure of the cap.

The screwing head rotation speed is correctly adjusted when, once the screwing of the cap is completed, the closure terminal stops on the cap a few tenths of second before the exit of the bottle from the screwing position.

A stop of the rotation of the terminal longer than some tenths of second notice a head rotation speed too high, in this case it is necessary to decrease it.

If the screwing terminal rotation does not stop at all, tha cap could be not sufficiently screwed, so the head rotation speed must be increased.

Carry out some closure tests before starting up the production.

8.7. DISCONNECTION FROM THE WORK CYCLE

If it is necessary to exclude the machine from the work cycle, using the transfer belt for the container passage, it is necessary to:

- Open the protection doors.
- Remove the star-wheel.
- Remove the conveyor.
- Loosen bolts (C).
- Turn the support of 90°.
- Fix one of the bolts to lock the unit.
- Put the fitting rebord for the direct passage, supplied by request.
- Close the protection doors and make sure all safety devices are restored.
- Press the button *SAFETY DEVICE RESET*.

For the container passage it is not necessary to keep the machine operating.

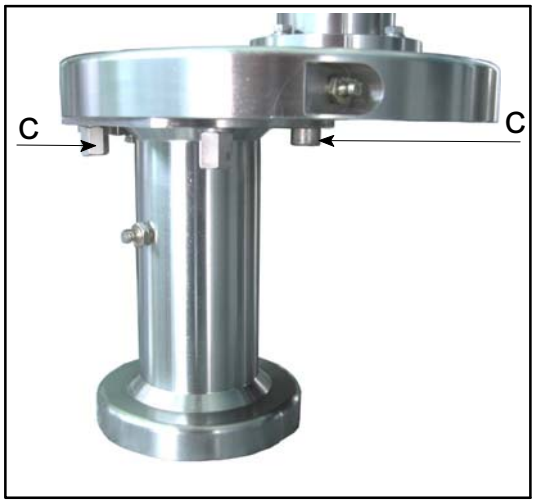


Fig.89

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D CLEANING AND MAINTENANCE OF THE MACHINE

1. MACHINE CLEANING

Hereinafter are described the indications for the cleaning of the machine and its components.

Specifying that it is necessary to clean the machine under the capping zone, it is possible to carry out a cleaning to remove from the transfer units, transmission base and all the outer components eventual dusts and product residuals.

It is absolutely forbidden to clean the machine with water jets under pressure or aggressive detergents and above all the water jets must not be addressed over the capping zone.

Over the capping zone it is allowed to carry out a cleaning using a cloth dampened with the following products:

PRODUCT	MAXIMUM TEMPERATURE [°C]	pH
Water	35	
Neutral detergents	35	5 ÷ 9

Before carrying out the cleaning, it is recommended to make reference to the product cards relevant to the detergents.

For the cleaning of the components of the machine see the paragraphs referring to each components. See section "*COMPONENTS ON THE MACHINE*".

Detergents residuals or residuals of liquids used for the cleaning of the machine must be disposed according the laws in force of the country in which the machine is used.

2. SAFETY NORMS FOR THE MAINTENANCE

2.1. MAINTENANCE PREPARATION

BEFORE ALL MAINTENANCE OPERATIONS, the machine must be set in safety conditions to prevent danger of unexpected starts and/or electrocution.

The maintenance preparation must be charged to qualified technicians and be performed as follows: the door disconnecting knife switch must be set “O” (OPEN), then locked in this position by a lock - not supplied - to be fit in the suitable slots of the disconnecting switch.

The lock key is removed and kept by the responsible maintenance technician for the whole intervention.

- A sign “Maintenance in progress” must be placed on the control board.
- The section under maintenance must be fenced off to prevent unauthorized persons from accessing and must be signalled by plates: “Danger! Maintenance in progress”.
- After the maintenance works and before starting the machine again it is always necessary:
  - to check that the possibly replaced parts and/or used tools have been removed from the machine.
  - To check that all guards, protections and safety devices possibly removed during the intervention have been re-installed correctly and are operating.

The standard operating conditions will be restored only after the intervention and the checks.

2.2. GENERAL SAFETY WARNINGS

The safety for the machine and the operators also depends on a regular maintenance according to the manufacturer's indications.

The routine and extraordinary maintenance interventions must be exclusively charged to skilled staff, that is to technicians qualified according to the specifications in the manual introduction.

If outsourced operators intervene, they must ensure the same performance of the inhouse qualified technicians and must work in safe operating conditions.

The qualified technicians must:

- respects the limits of their tasks (mechanical, electrical, etc.).
- Follow the procedures and warnings in the manual, within their tasks.
- Follow the times and intervals indicated in the manual for scheduled maintenance interventions.

The following general warnings must be noted:

- Electrocution hazard due to direct contact with the machine power supply terminal boards and in the electrical system connector blocks (the hazard is signalled by plates with the suitable triangle with yellow bottom).
- Be extremely careful during the interventions on the electrical system, if the system must be left live. Such interventions must be carried out by staff skilled in this type of maintenance only, trained and correctly equipped for the steps to be made. Interventions with the system live must always be previously authorized by the employer, who shall supervision them evaluating the specific risk conditions.
- Repair pneumatic systems and components only after having cut them off and having checked there is no residual pressure inside the components.
- It is forbidden to carry out maintenance and lubrication interventions on moving components.
- When working on heated parts, always wait for them to cool down to avoid burns or scalds.

2.3. WARNINGS FOR A CORRECT MAINTENANCE

For a good maintenance:

- follow the maintenance intervention intervals indicated in the manual; the interval (indicated in time or in working cycles) between interventions must be meant as max. limit not to be exceeded. If necessary, it can be shorter.
- A correct preventive maintenance requires a constant care and continuous monitoring of the system and of the machines. Promptly check the cause for possible faults such as excessive noise, overheating, etc. and solve it.
- In case of doubts, contact the manufacturer.

3. GENERAL INFORMATION

3.1. MAINTENANCE SCHEDULE

From the constructive point of view, interventions concern mechanical, electrical and pneumatic parts.

For practical reasons the provided interventions are grouped according to time and complexity criteria. Each intervention or group of interventions can concern about mechanical, electrical and pneumatic aspects. For practical reasons again, there is a distinction between **ordinary** and **extraordinary** maintenance.

The ordinary maintenance is divided in two categories:

- scheduled ordinary maintenance (or preventive).
- Ordinary maintenance according to the conditions (caused by wear and tear).

The scheduled ordinary maintenance (so called periodical or preventive) includes inspections, checks and interventions that, to prevent stops and faults, keep under control:

- the lubrication state of the machine.
- The state of parts that can be affected by wear and tear.

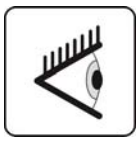
The ordinary maintenance according to the conditions on the contrary, concerns components of the machine that are not subject to periodical checks and wear and tear previously qualifiable.

Must be checked or replaced according to their state of wear.

3.2. WARNING SYMBOLOGY

The following symbols indicate the warnings that MUST be followed by the person charged with the maintenance during the maintenance operations.

Forbiddances			
	It is forbidden to lubricate, repair or adjust during the movement		It is forbidden to remove the security devices
	Forbidden admission to not authorized persons.		It is forbidden to extinguish with water.

Type of inspection and intervention			
	Visual inspection.		Lubrication intervention with oil.
	Auditive inspection.		Lubrication intervention with grease.
	Intervention with tools.		Manual intervention

Individual protection devices			
	It is compulsory to use protection gloves.		It is compulsory to use protection glasses.

4. MAINTENANCE INTERVENTION

The following table has the maintenance time limit and the necessary operations for a correct operating and a long lasting during of the machine.

The described interventions are settled in intervals quantified in hours.

Interval (h)	*Working in 1 shift*	*Working in 2 shifts*	*Working in 3 shifts*
8	-	-	-
40	1 week	-	-
120	3 weeks	-	1 week
250	6 weeks	3 weeks	2 weeks
500	3 months	6 weeks	1 month
1000	6 months	3 months	2 months
3000	12 months	9 months	6 months
6000*	*	*	12 months
* every 6000 hours or anyway once a year.			

As an exemple in the table above there are correspondance calculated in weeks, months and years, considering daily workshifts of 8 hours each.

5. MAINTENANCE AND LUBRICATION PLANNING

operation	*intervention type*	*reference*
40 hours	routine maintenance	See chapter 8. on page 114
120 hours	lubrication	See chapter 9.5. on page 123
120 hours	routine maintenance	See chapter 8. on page 114
250 hours	lubrication	See chapter 9.5. on page 123
500 hours	lubrication	See chapter 9.5. on page 123
500 hours	routine maintenance	See chapter 8. on page 114
1000 hours	lubrication	See chapter 9.5. on page 123
1000 hours	routine maintenance	See chapter 8. on page 114
3000 hours	routine maintenance	See chapter 8. on page 114
6000 hours	routine maintenance	See chapter 8. on page 114
12000 hours	routine maintenance	See chapter 8. on page 114
	extraordinary maintenance	See chapter 10. on page 130

6. WORN PARTS OF THE HEAD

It is recommended to have in stock a spare parts kit.

SPARE PART KIT	Working hours		
	3000	6000	18000
Springs: ■ Compensating spring ■ Ejector rod supporting spring	x		
Bearings: ■ Central radial bearing ■ Axial bearing on the ejector rod	x		
Bush for plug		x	
Magnetic rings			x
Seal ring O-rings	x		
Seal ring V-ring	x		

Carry out the head overhaul, following the instructions in the chapter referring to the capping head.

7. WORN PARTS OF THE CLOSURE GRIPPER

It is recommended to have in stock a spare parts kit.

SPARE PART KIT	Working hours	
	1000	3000
Springs: ■ Gripper release spring ■ Gripper adjustment spring	x	
Balls of the fast release device	x	
Cap gripper ring *(only if in plastic material)*		x

Carry out the gripper overhaul, following the instructions in the chapter referring to the closure gripper.

8. PLANNED MAINTENANCE

8.1. EVERY 40 WORKING HOURS

OPERATION	*PURPOSE*	*NOTES*
Emergency operating check.	When the machine is stopped let manually intervene the emergencies (star-wheel, worm, doors and emergency button) and check that on the panel the lamp *SAFETY DEVICE* is lit and the relevant message is displayed. After the safety devices have activated and with the machine in automatic operation mode, check that, pressing the push button *START*, the machine does not start and the red flashing light flashes.	
Cleaning of the transfer unit.	Remove, from the whole lenght of the line, any obstacle to the free moving of bottles.	Clean carefully the traces of product.
Air pressure check.	Check the air feeding pressure devices. Check that manometers of the machine mark the pressure indicated on the fitted plate, out on them.	

<u>If compressed air is used (not recommended) it is necessary to wear protection gloves, earplugs and glasses, be careful to people close to the machine</u>

8.2. EVERY 120 WORKING HOURS

OPERATION	*PURPOSE*	*NOTES*
Capping head cleaning.	Clean the head so that the bottled substances do not alter its performance and do not spoil its components.	See "*CAPPING HEAD CLEANING*.
Closure gripper cleaning.	Clean the gripper so that the bottled substances do not alter its performance and do not spoil its components.	See "*CLOSURE GRIPPER CLEANING AND CHECK*" in the closure gripper chapter.
Cleaning of the caps sorter.	Clean the caps sorter and check the correct feeding.	See the relevant chapter

<u>If compressed air is used (not recommended) it is necessary to wear protection gloves, earplugs and glasses, be careful to people close to the machine</u>

8.3. EVERY 500 WORKING HOURS

OPERATION	*PURPOSE*	*NOTES*
Lubrication of the capping head movable parts.	Lubricate the springs. Lubricate the upper bush and the seat of the head central body. Lubricate the plug bush.	See "*PART LUBRICATION*".
Check the conditions of the upper ejection device of the closure head.	Check the conditions of the bearings, if necessary replace it.	See *"BEARINGS OVERHAUL"*.

8.4. EVERY 1000 WORKING HOURS

OPERATION	*PURPOSE*	*NOTES*
Check of the closure gripper springs.	Check the state of springs	If necessary, replace springs
Check the cap gripper ring of the closure gripper cap.	Check the state of wear of the gripper cap ring.	If necessary, replace the cap gripper ring.
Closure gripper cleaning.	Clean the gripper so that the bottled substances do not alter its performance and do not spoil its components.	See "*CLOSURE GRIPPER CLEANING AND CHECK*" in the closure gripper chapter.
Check of the springs of the cap "pick off" device.	Check the state of wear of springs of "pick off" device. If worn or damaged, replace them.	
Check of height sliding of the turret.	Check the correct sliding in height, letting the turret make an excursion from the minimum value to the maximum value, in such way to guarantee a good sliding of parts during the time.	
Equipment timing check.	Check the timing of the whole equipment and if it is necessary time it again.	See "*TRANSFER EQUIPMENT TIMING*" page 130.
Electric connections check.	Check and clean carefully all of the connections and, if necessary, replace worn parts. If any water infiltrations are found, even small ones, find immediately the source of the problem and eliminate it.	

OPERATION	*PURPOSE*	*NOTES*
Noises check (visual and auditory) clearances and cuts.	Check starting and stopping several times the capping turret without bottles,in order to check any abnormal noise,vibration in motorization components (motors reducers,gears and bearings). Replace all worn components. Lubricate the new installed components Clean and lubricate the dismounted components If there are any anomalies it is necessary to contact the *TECHNICIAN SERVICE.*	
Pneumatic system check.	Check proper operations and any leaks (fittings, pipes,etc.). • check the air pressure at machine entrance. • Feeding the pneumatic installation with compressed air, check that there are no leaks, broken or not connected pipes. • Check that manometers of the machine mark the pressure indicated on the fitted plate, put on them.	

8.5. EVERY 3000 WORKING HOURS

OPERATION	*AIM*	*NOTE*
Head overhaul.	Completely overhaul the capping head, replacing the wear components.	See "*CAPPING HEAD MAINTENANCE AND OVERHAUL*". Remove the head completely and replace: • the springs. • the bearings. • the seal ring.

8.6. EVERY 6000 WORKING HOURS

OPERATION	*PURPOSE*	*NOTES*
Replacement of the plug bush.	Dismount the head and replace the plug bushes.	See *"OVERHAUL OF THE PLUG BUSHES"*.
Overhaul of the closure grippers.	Overhaul the gripper completely.	See "*CLOSURE GRIPPER OVERHAUL*" in the closure gripper chapter. Dismount gripper completely and replace the worn components.

8.7. EVERY 12000 WORKING HOURS

OPERATION	*PURPOSE*	*NOTES*
Machine general check.	Check the regular operating of the machine, if there are any anomalies it is necessary to contact the *TECHNICIAN SERVICE.*	

8.8. EVERY 18000 WORKING HOURS

OPERATION	*AIM*	*NOTE*
Head overhaul.	Completely overhaul the capping head, replacing the wear components.	See "*CAPPING HEAD MAINTENANCE AND OVERHAUL*". Remove the head completely and replace: • the springs. • the bearings. • the seal ring. • The magnetic rings. • The plug bushes. Check the head correct tightening torque.

9. LUBRICATION

9.1. GENERAL INFORMATION

All the lubrication steps must be carried out with the machine stopped.

Before any lubrication step set the machine in "*Maintenance status*".

Before starting the machine, check the lubrication of all components described in this section.

If the machine is not used for a long time, lubricate it again.

Mineral oils, when not used for over six months, loose their properties and must be changed.

9.2. LUBRICANT TYPE-APPROVAL ACCORDING TO NSF

The type-approval according to NSF includes two categories: NSF - H1 and NSF - H2.

- H1 indicates *Food grade lubricants*, that can thus be used in all friction points of machines and systems for the food and pharmaceutical industries, where occasional, and technically unavoidable, contacts can occur between lubricant and food.
- H2 indicates lubricants that are recommended for the general use in the food and pharmaceutical industries, supposing that a contact with the fool is totally to be excluded.

9.3. LUBRICANT TYPES

The *R&D* department of *AROL,* after careful studies and functional tests, has decided to use the lubricants indicated in the table below to lubricate its machines:

		KLÜBER LUBRICATION	MOLYKOTE FROM DOW CORNING	PETRO-CANADA	DUPONT
A	grease	Klübersynth UH1 64-62	G4501	-	-
B	grease	Klüberlub NH1-11-222	-	-	-
C	oil	Paraliq P 150	L0115FG	-	-
D	oil	Klübersummit FG46	L0346FG	Purity FG EP150	-
E	grease	-	-	Purity FG Synth	-
F	grease	Klüberpaste UH1 84-201	P1900	-	-
G	grease	Barrierta L55/1	-	-	Krytox GPL 226
H	grease	Klübersynth UH1 64-62	G4501	-	-
I	oil	-	-	Purity MF spray	-
J	grease	Klübersynth UH1 64-62	G4501	-	-
K	grease	Paraliq GB363	-	-	-
L	grease	Paraliq GB363	-	-	-
M	grease	Klüberlub NH1-11-222	-	-	-
N	oil	Klüberoil 4 UH1 220 N	L1122FG	Purity FG gear oil 220	-
O	grease	Klübersynth UH1 64-62	G4501	-	-
P	grease	Klübersynth UH1 64-1302	-	-	-

9.3.1. FEATURES OF THE USED LUBRICANTS

Product name	NSF	NLGI	Basic oil	Thickener	Viscosity index	Basic oil viscosity (cSt)	Processed penetration (0.1 mm)	Min. temp. (°C)	Max. temp. (°C)
KLUBER									
Klübersynth UH1 64-62	H1	2	PAO	gel-silica		60	265-295	-40	150
Paraliq P 150	H1		WO			150		-15	100
Klübersummit FG46	H1		PAO		130	46		-45	135
Klüberpaste UH1 84-201	H1	1	PAO	PTFE		200			
Barrierta L55/1	H1	1	PFPE	PTFE		400		-40	260
Paraliq GB363	H1	2	MO	silicate			215-245	-30	140
Klüberlub NH1-11-222	H1	2	WO	complex aluminum		220	265-295	-15	110
Klübersynth UH1 64-1302	H1	2	Synth	silicate		1300	265-295	-10	150
Klüberoil 4 UH1 220 N	H1		PAO		150	220		-25	120
MOLYKOTE									
G4501	H1	1	PAO	complex aluminum		100	310-340	-40	150
L0115FG	H1		MO		100	140		-18	
L0346FG	H1		MO		100	46		-21	
P1900	H1	1	MO	complex aluminum		85	290-340	-30	300
L1122FG	H1		PAO/MO		142	197		-33	
PETRO-CANADA									
Purity FG EP150	H1		HT/MO		95	144		-18	
Purity FG Synth	H1	2	PAO	complex sulfonate calcium		46	294	-45	200
Purity MF spray	H1		HT/MO		150	151		-9	150
Purity FG Gear Oil 220	H1		HT/MO		92	206		-18	
DUPONT									
Krytox GPL 226	H1	2	PFPE	PTFE	155	240		-30	288

9.3.2. LUBRICANT RE-ORDERING

The lubricants used for the machine can be directly ordered to *AROL* or to the local distributors.

See the table here below for the international addresses.

KLÜBER LUBRICATION	http://www.klueber.com
MOLYKOTE FROM DOW CORNING	http://www.molykote.com
PETRO-CANADA	http://www.petro-canada.ca
DUPONT	http://www.krytox.com

9.4. KEY TO THE LUBRICATION SCHEMES

SYMBOL	*DESCRIPTION*
	Lubricate with manual pump for grease
	Lubricate with brush for grease
	Lubricate with spray bottle
	Lubricate with manual pump for oil

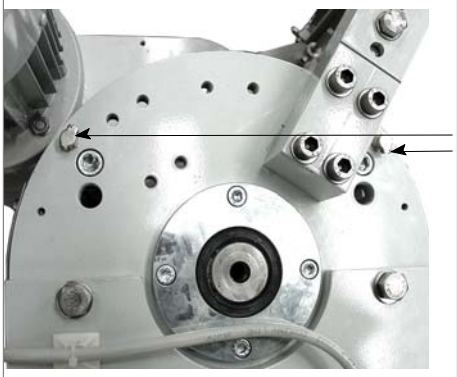
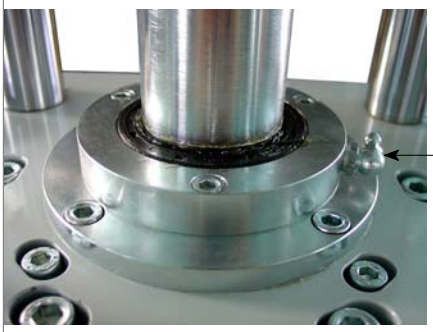
Grams are referred to each lubrication point.

9.5. POINTS TO BE LUBRICATED

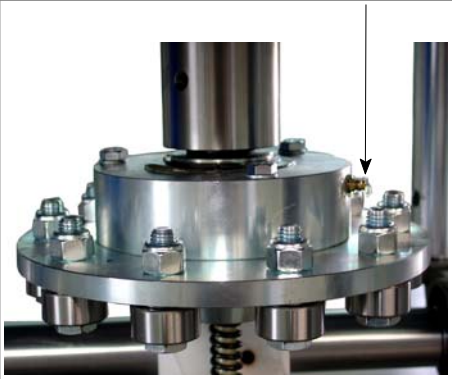
To protect the machine from wear, seizure or other severe damage to the mechanisms, it is necessary to lubricate and grease periodically all indicated points.

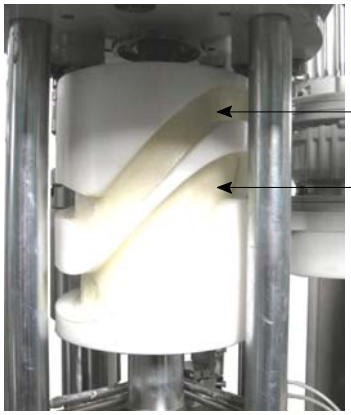
AROL guarantees the maintenance intervals indicated hereby and the correct operation of the mechanisms exclusively with these lubricants.

9.5.1. EVERY 250 HOURS LUBRICATION

LUBRICATION POINTS		*DESCRIPTION*
	 **0,15 gr.** **N**	Lubricate the sliding columns
	 **5 gr** **A**	Lubricate the central bearings.

9.5.2. EVERY 250 HOURS LUBRICATION

LUBRICATION POINTS		*DESCRIPTION*
	 5 gr M	Lubricate the star-wheel shaft
	 10 gr M	Lubricate the star-wheel shaft bearings.
	 10 gr M	Lubricate the star-wheel shaft gearings.
	 M	Lubricate the motion trasmission gearing

	 M	Lubricate the star-wheel rotation cam
	 3 gr M	Lubricate the front orientable support
	 3 gr M	Lubricate the rear orientable support
	 A	Remove the cover to lubricate. Lubricate the spindle controlling cam

	 3 gr A	Lubricate the sliding upper roller.
	 5 gr A	Lubricate the sliding lower roller.
	 A	Lubricate the caps transfer device controlling cam

9.6. BONFIGLIOLI REDUCER LUBRICATION

9.6.1. INTRODUCTION

On the reducer there is an identification plate as the one that follows. On this plate there are all the references and all the indispensable indications for its correct identification.

Fig.90

9.6.2. OIL REPLACEMENT FOR VF130....VF150 AND W110

Do not mix oil with different trade marks and characteristics and check that the oil in use has high anti-foam characteristics and EP.

If an identic lubricat is not available completely empty the reducer and clean it inside with a light solvent, before the next filling.

1) Place a container of adecuate capacity under the discharge plug.
2) Remove the charge, discharge and level plug and let the oil freely flow.

To make easier the discharge operation, it is recommended to operate with hot oil.

3) Wait some minutes so that all the oil is went out, then screw again the discharge plug, after the gasket has been replaced.
4) Pour new oil only afterr the reducer is its definitive position, until the half of the level plug is reached.
5) Screew the charge plug, after the gasket has been replaced.

The exhausted oil must be disposed according to the environment protection norms.

If there are leaks, before to reset the lubricant quantity, it is necessary to find the cause of the problem before startin up again the reducer.

9.6.3. LUBRICATION

Reducers VF30....VF49 and W63....W86

For reducers of this group, that are on a average at low power, the permanent lubrication with synthetic oil is adopted. These reducers have not charge, discharge and level oil plugs and so do not need any maintenance having already the right oil quantity.

Reducers VF130....VF150 and W110

For reducers of this group, that are on a average at high power, the oil lubrication is adopted. Reducers have charge, discharge and level oil plugs

Reducers are supplied with a lubrication oil load **Shell Tivela oil S320** type.

It is recommended, if the lubricants is not of the recommended ones, that it has an equivalent composition on synthetic nature and viscosity. Moreover it must have the suitable antifoam additives.

Oil quantity table (litres).

		B3	B6	B7	B8	V5
VF30		0.045	0.045	0.045	0.045	0.045
VF44		0.075	0.075	0.075	0.075	0.075
VFR44		0.050	0.050	0.050	0.050	0.050
VF49		0.12	0.12	0.12	0.12	0.12
VFR49		0.065	0.065	0.065	0.065	0.065
VF130	HS	3.9	2.5	2.5	2.3	3.3
	P(IEC)	3.0	2.5	2.5	2.3	3.3
VFR130		0.40	0.50	0.50	0.70	0.40
W63	i=7...15	0.31	0.31	0.31	0.31	0.31
	i=19...100	0.38	0.38	0.38	0.38	0.38
W75	i=7...15	0.48	0.48	0.48	0.48	0.48
	i=30,40	0.52	0.52	0.52	0.52	0.52
	i=20...100	0.56	0.56	0.56	0.56	0.56
W86	i=7...15	0.64	0.64	0.64	0.64	0.64
	i=30	0.73	0.73	0.73	0.73	0.73
	i=20...100	0.90	0.90	0.90	0.90	0.90
W110	P80...P132	1.5	1.7	1.7	1.9	1.7
	M2-M3	1.5	1.7	1.7	1.9	1.7
	7□ i □ 15	1.5	1.7	1.7	1.9	1.7
	20□ i □ 100	2.7	1.7	1.7	1.9	1.7

10. MAINTENANCE-TIMING

10.1. TRANSFER EQUIPMENT TIMING

10.1.1. STAR-WHEEL TIMING

In case the star-wheel is not timed, it is necesary to:

- open protection doors.
- Place the star-wheel, turning it manually on itself until the clutch device come back to its original seat (there is a click).
- Close the protection doors and make sure all safety devices are restored.
- Press the button *SAFETY RESET*.
- At the adjustment end, turn the mode switch *AUT/MAN* to *AUT* and remove the key.
- Restart the machine pressing the *START* button.

If, after these operations, the star-wheel is not in the correct position, it is necessary to:

- turn the selector on *MAN* position.
- Turn the machine by pulses until the bottle is in the closure point and the head descends until to touch the cap.
- Open protection doors.
- Loosen the locking screw (C).

  In this way the star-wheel is free to turn and so is possible to time it in such way that the pocket is coaxial to the head.
- Firmly lock the screw (C).
- Close the protection doors and make sure all safety devices are restored.
- Press the button *SAFETY DEVICE RESET*.
- At the adjustment end, turn the mode switch *AUT/MAN* to *AUT* and remove the key.

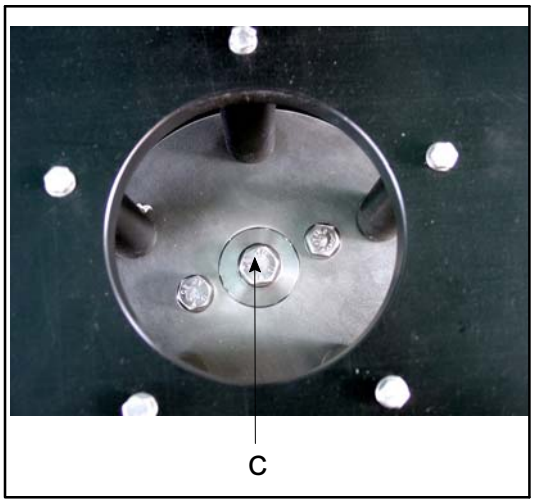


Fig.91

E

FORMAT CHANGE

1. PREMISE

All the equipment change operations must be carried out when the machine is not operating.

Close pneumatic feeding.

The machine has been designed to handle containers and caps described in table "**e.**" page 11. It is necessary that each container and /or cap is handled exclusively with the equipment indicated in the table.

Each series of equipment is marked according to the format to handle:

- container body guide equipments are marked by coloured wedges.
- Caps guide equipments, in case of several formats, are marked by an identification letter.

See table "**e.**" page 11 for the formats identification.

When delivered the machine is ready to apply one of the types of containers and/or caps for which has been manufactured.

To carry out correctly and without obstruction the format change operations it is necessary to lift the turret to its maximum height as described in paragraph 7. page 101.

2. CONTAINERS FORMAT CHANGE

If it is necessary to change the format of the container to handle it could be necessary to proceed as described in section "*INSTALLATION AND REMOVAL OF THE BOTTLES TRANSFER EQUIPMENT*":

- Replace the conveyor.
- Replace the star-wheel.
- Replace the container-neck guide.
- Connect or disconnect the container antirotation device.

Moreover it is necessary to adjust in height the turret (see par. 7. page 101).

3. CAP FORMAT CHANGE

When it is necessary to change the type of cap to apply, it could be necessary to proceed as described in section "*COMPONENTS ON THE MACHINE*", replace the:

- caps distribution unit.
- Orientating unit.
- Closure gripper.

Moreover it is necessary to replace the caps transfer device, proceeding as described in section "*INSTALLATION AND REMOVAL OF CAPS TRANSFER EQUIPMENT*".

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F INSTALLATION AND REMOVAL OF THE BOTTLES EQUIPMENT

1. CONVEYOR

1.1. REMOVAL

- Unscrew fixing knobs (G) of the conveyor.
- Remove the conveyor (F).

1.2. INSTALLATION

- Place the conveyor (F) into fitting seats.
- Fix by knobs (G).
- Adjust the position of the conveyor in the following way:
  - insert two bottles into the pockets of the star-wheel
  - near the conveyor to the bottles.

<u>check that bottles have a minumum clearance in such way to allow a regular flow</u>

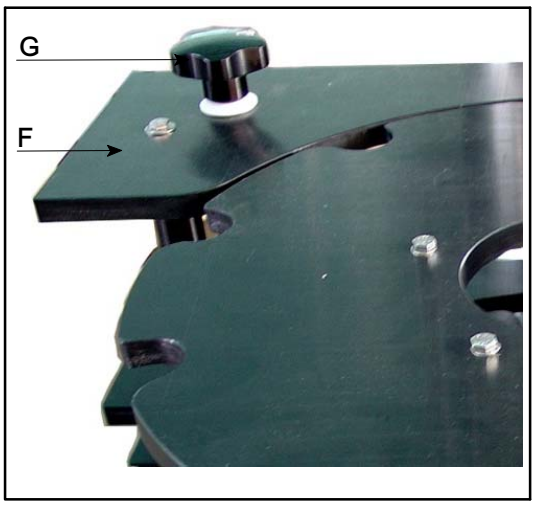


Fig.92

2. STAR-WHEEL

2.1. REMOVAL

- Unscrew bolts (H).
- Remove the star-wheel (I).

2.2. INSTALLATION

- Place the star-wheel into the fitting seats.
- Lock by bolts (H).

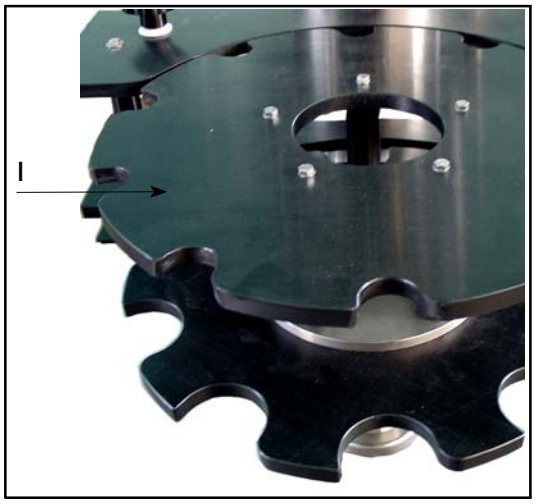


Fig.93

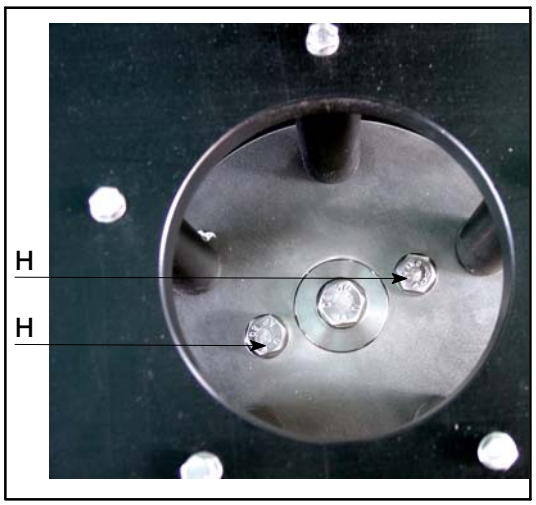


Fig.94

3. CONTAINERS ANTIROTATION DEVICE

According to the type of container in use, it could be necessary to use the antirotation device.

If the device is present on the machine but its use is not nedded, it is necessary to

- close the sliding valve (N).

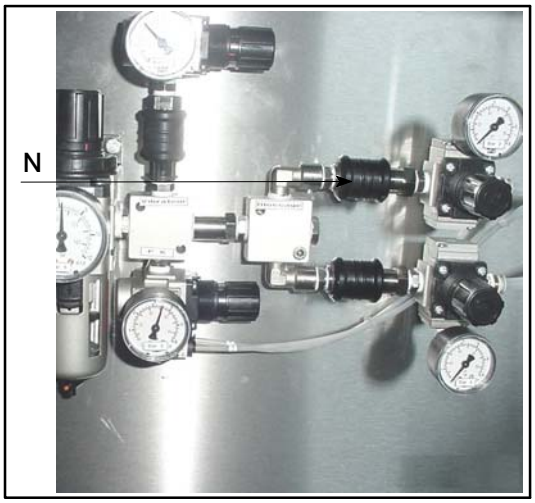


Fig.95

- Close manually the rod of the bottles antirotation cylinder (O).

Fig.96

If it is necessary to put in action again the device, it is necessary to:

- open the sliding valve (N).

To know the format of containers that need the containers antirotation device, see the table "*Closure type*" in "*MACHINE TECHNICAL DATA*" section.

G INSTALLATION AND REMOVAL OF THE CAPS TRANSFER EQUIPMENT

1. CAPS DISTRIBUTION UNIT

For the installation and the removal of the caps transport unit it is necessary to see the chapter in section "*COMPONENTS PRESENT ON THE MACHINE*".

2. CAPS TRANSFER DEVICE

2.1. REMOVAL

- Unscrew the fixing screw (A).
- Remove the caps transfer pin (B).

Fig.97

<u>If it is necessary to remove completely the transfer device, it is necessary to:</u>

- Unscrew the bolts (D).
- Unscrew the nut (E).
- Remove the complete corks transfer device.

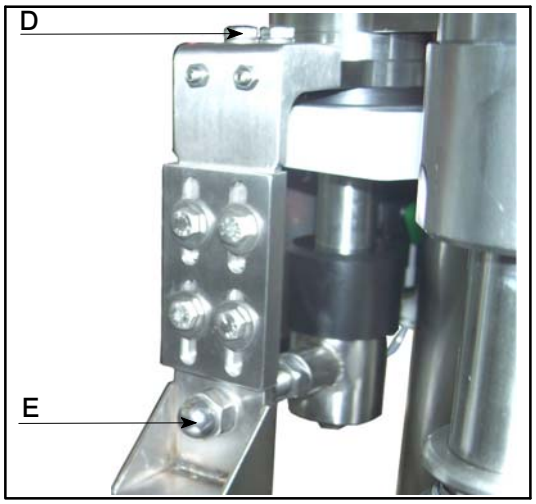


Fig.98

2.2. INSTALLATION

- Place the caps transfer pin (B) on the reference bracket.
- Lock the pin by the fixing screw (A).
- Place the cork transfer bush (C) on the reference bracket.
- Lock the transfer bush by the fixing screw (A) and the the bush fixing Allen screws (B).

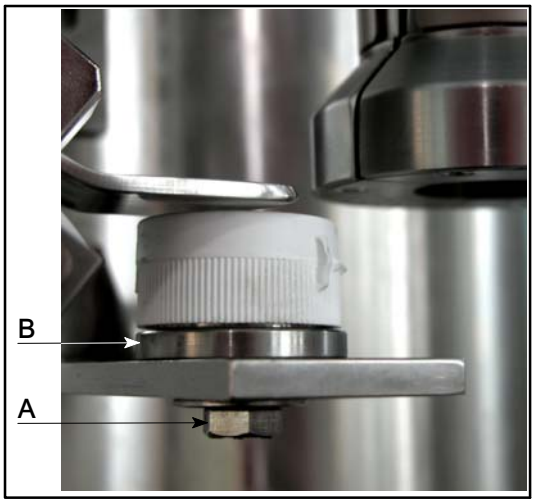


Fig.99

<u>To install the complete caps transfer device, it is necessary to:</u>

- Remove the complete corks transfer device.
- Fix the transfer device to the support by bolts (D).
- Fix the transfer device to the support by nut (E).

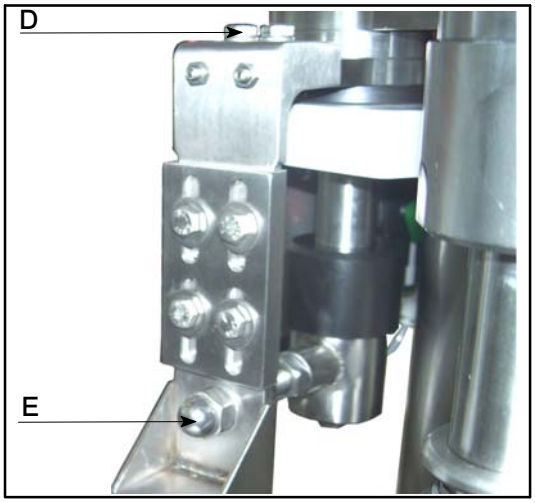


Fig.100

H COMPONENTS ON THE MACHINE

In the following chapters, there are, in a complete way, the instructions about the components that are supplied with the machine.

The instructions about the components are grouped in only one chapter for each component, in such way the customer can easly refere the information about thair use.

The operations indicated in this section are for the *qualified technician.*

1. CENTRIFUGAL CAPS SORTER

1.1. INSTALLATION OF THE CAPS SORTER

For the installation of the centrifugal caps sorter see the listed below operations:

- Unscrew the screws (A) that fixing the cover (B) to the hopper (C).

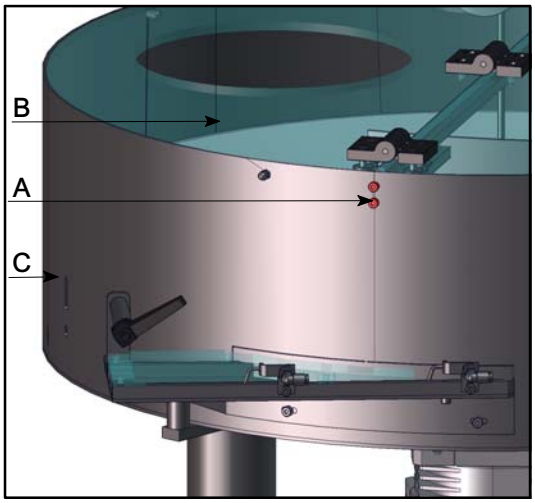


Fig.101

- Remove the cover (B).

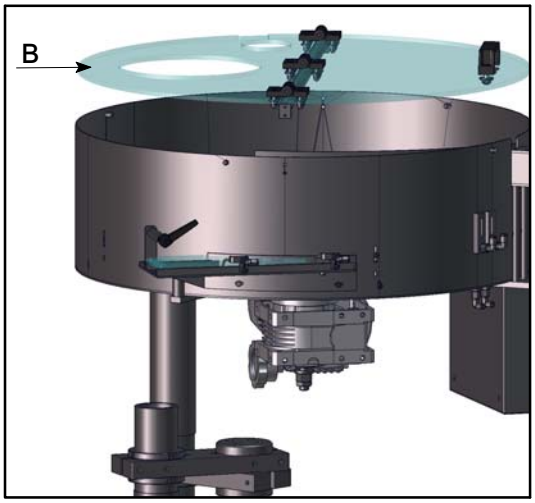


Fig.102

- Remove the screw (D)

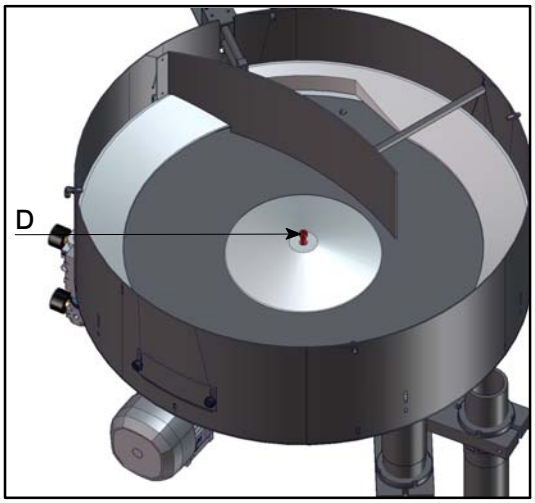


Fig.103

- Slide out the central cone (**E**).

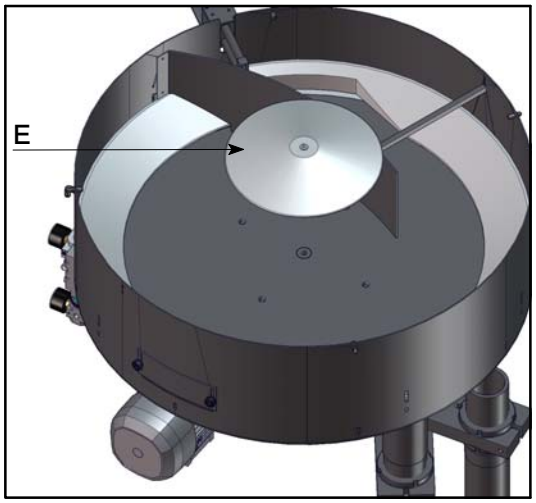


Fig.104

- Screw at the center of the rotating disc an eyebolt (**F**).

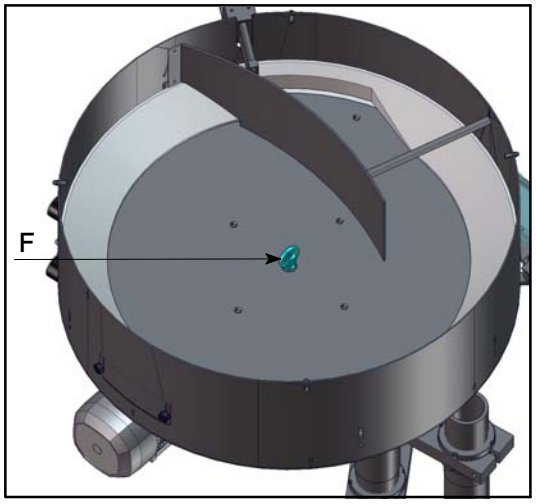


Fig.105

- Hook with a belt or a chain with hooks (**G**) to the eyebolt (**F**).

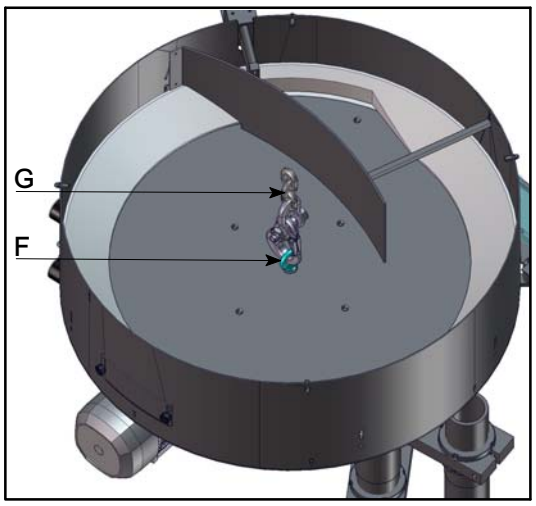


Fig.106

- Unscrew the bolts (H) that fasten the caps sorter to the transport platform.
- Lift the caps sorter with adequate lifting means.

The caps sorter mass is not symmetrically distributed so it overturns when lifted up.
Do not stand or walk under the caps sorter when it is hoisted!

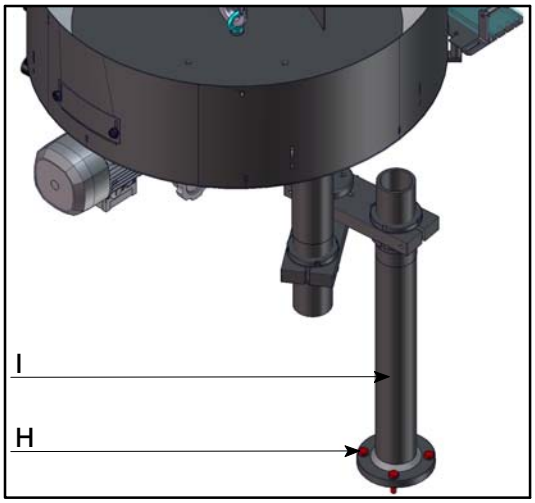


Fig.107

- Position the caps sorter complete with the support (I) in such way that the references on the support and the references of the flange are aligned and that the exit mouth is aligned with the caps chute.
- Fix the caps sorter by bolts (H).
- Unhook the belt or the chain with hooks (G) from the eyebolt (F).
- Remove the eyebolt (F)

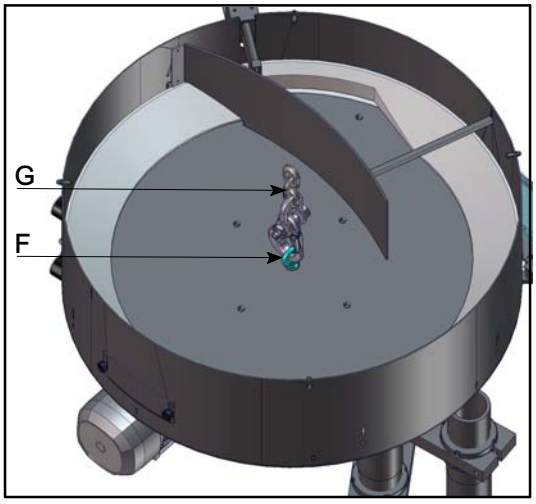


Fig.108

- Remount the cone (E) and fix it with the screw (D).

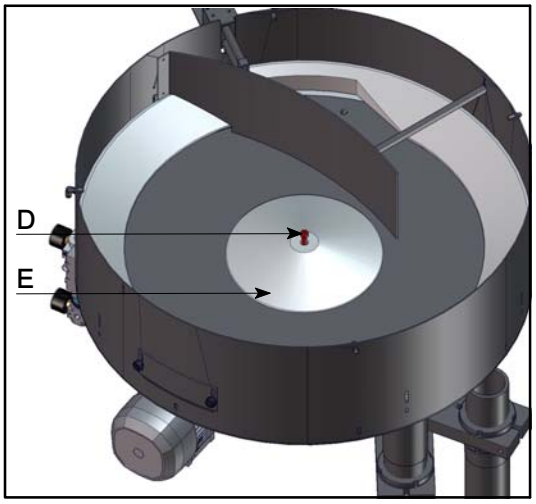


Fig.109

- Place and fasten the cover (B) on the caps sorter proceeding as described below:
  - Lean the complete cover on the support pins set on the hopper in such way the hole (J) for the caps level device is in the opposite of the caps exit mouth (K).

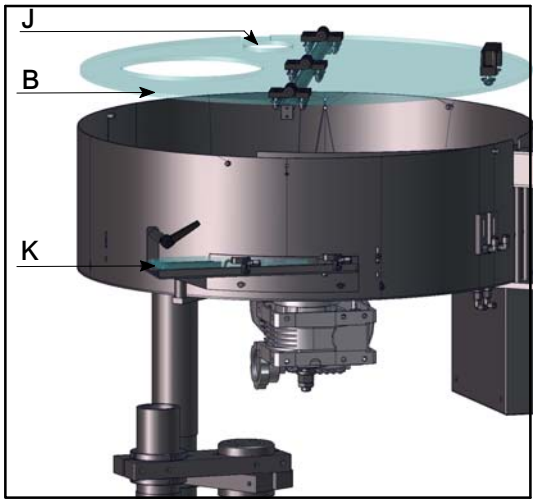


Fig.110

  - Fix the cover to the caps sorter hopper screwing the screws (A) to the cover holder rod (L).

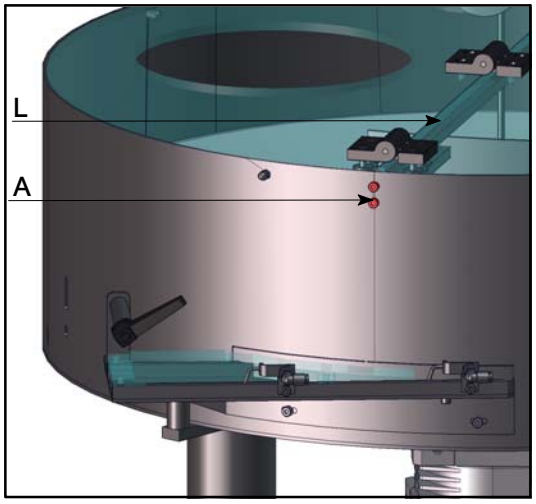


Fig.111

- Place the caps level device (M) on the caps sorter proceeding as described below:
  - Place the level blade (m1) in the hole (J) of the cover and the rod fixing bush (m2) on the hopper (C).
  - Fasten all things locking the screw (m3) against the hopper.

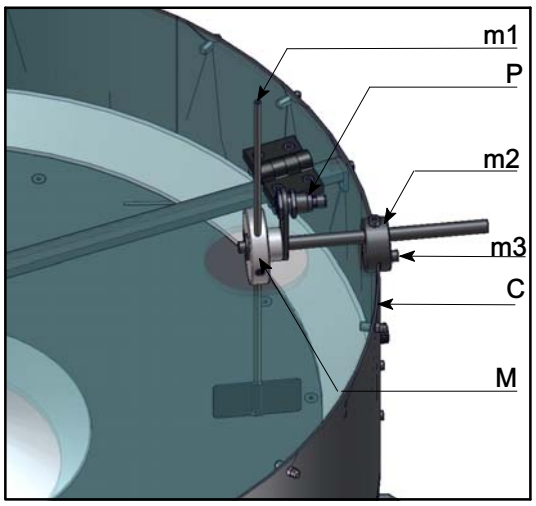


Fig.112

- Connect the air main tube of the main pneumatic unit to the coupling (**N**) of the pneumatic unit.

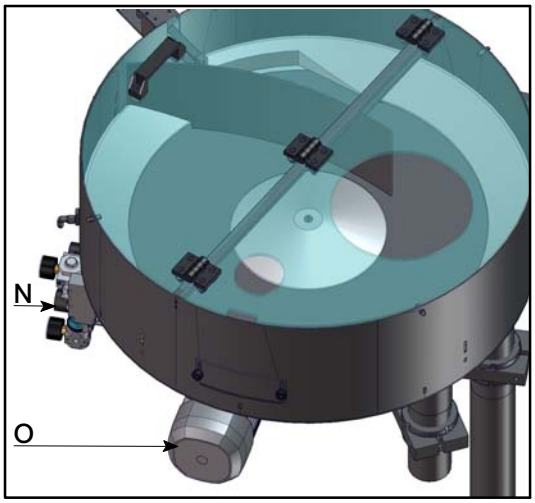


Fig.113

- Fix the caps chute to the caps exit mouth by fixing handle (**Q**).

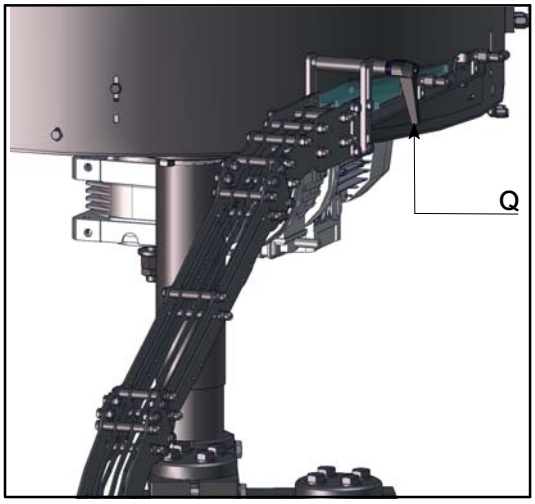


Fig.114

- Check that the rotation direction of the inner disc (**R**) is correct; (the rotation must be sufficient in order to insert caps into the exit mouth), on the contrary:
  - invert 2 of the phases of motor feeding.
  - Repeat the listed above operations to check if the rotation is regular.

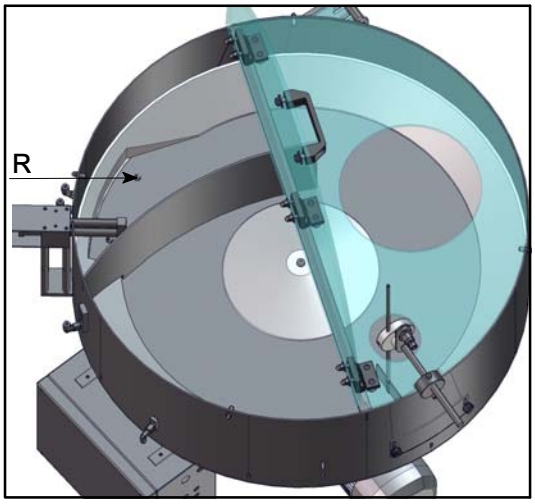


Fig.115

1.2. CAPS SORTER LOADING

For the loading of the caps sorter it is necessary to follow the precautions indicated in paragraph "*SAFETY NORMS FOR THE OPERATION"* in section *"FIRST START UP, OPERATING AND USE"*

On the caps sorter is installed a caps level sensor (P) having the task to signal to the automatic elevator when it is necessary to put a new quantity of caps.

For a correct operating, if the caps sorter is loaded with different system from the automatic elevator, it is necessary to supply a quantity of caps that arrives at least 5 mm under the lower plate of the device.

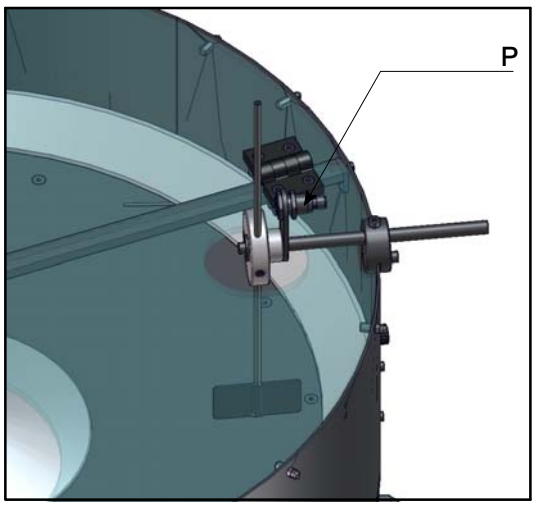


Fig.116

1.3. CAPS SORTER EMPTYING

To discharge the caps sorter it is necessary to carry out the following operations:

- Press 

to set the operation of the cap caps sorter in manual mode and to hold it till totally empty.

1.4. CAPS FORMAT CHANGE

For the caps format change, it could be necessary to proceed as described below:

- Lift the knob (S), turn it of 90° in such way to avoid the return in its seat.
- According to the diameter of the cap to proceed, carry out on the knob (U) in such way to move the adjustable bulkhead (T).
- The adjustable bulkhead (T) must be correctly lead the cap into the exit mouth according to the diameter of the cap itself.
- Turn the knob (S) of 90° in locking position and lower it in such way to fasten the adjustable bulkhead.

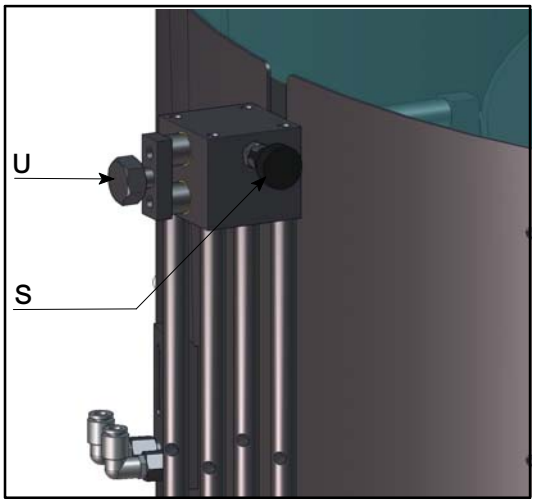


Fig.117

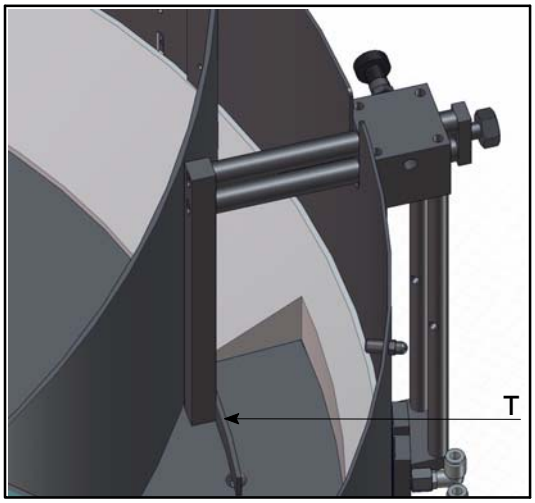


Fig.118

1.5. ADJUSTMENT OF THE CAPS SORTER

If the cap is not correctly shifted by the nozzles it is sufficient to increase or decrease the air pressure by the fitting pressure reducers.

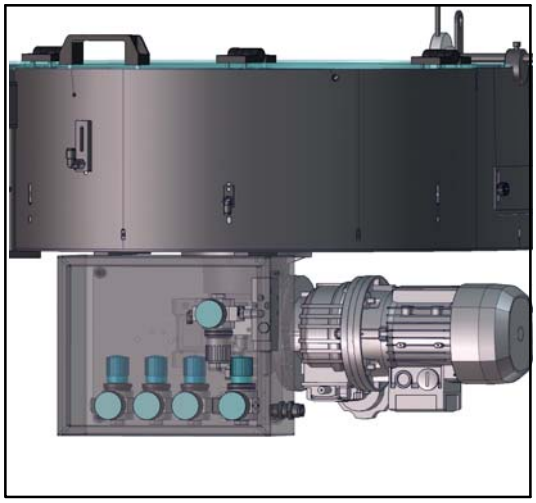


Fig.119

Use compressed air without impurities.

1.6. MAINTENANCE OF THE CAPS SORTER

The caps sorter does not need a particularly maintenance, it is sufficient a daily cleaning and the removal of deformed caps that may cause a caps chute obstruction.

If there is an anomalous distribution, it is necessary to carry out the following operations:

- check that the nozzles (U1) are not obstructed and are in the correct position to push caps into the caps chute.

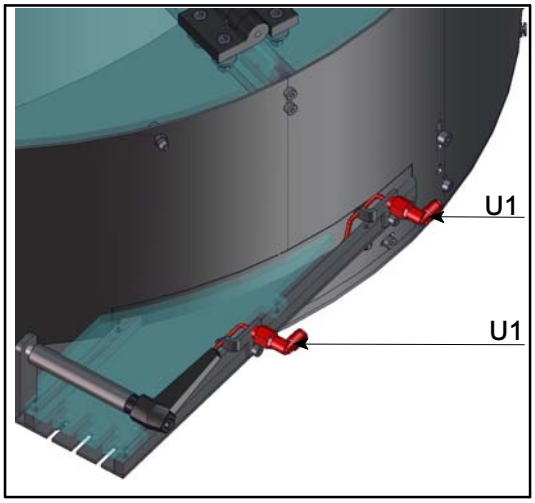


Fig.120

- Check that the nozzles (U2) are not obstructed.

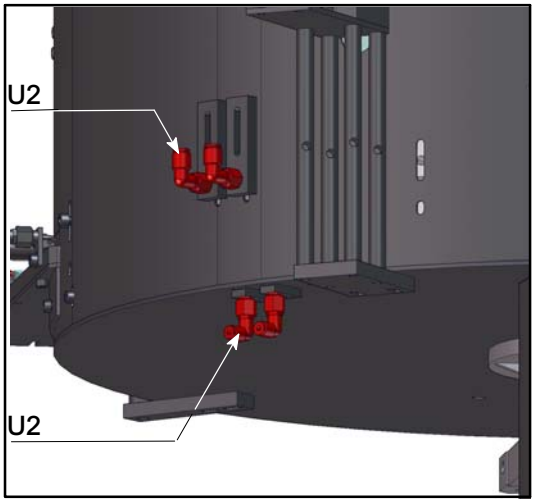


Fig.121

- Check that the nozzles (U3) and (U4) are not obstructed.

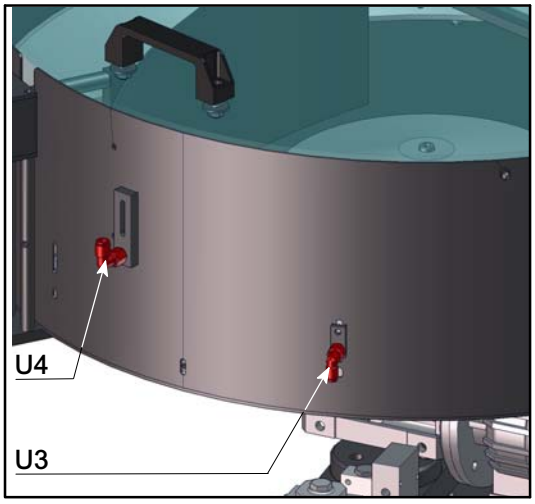


Fig.122

Use compressed air without impurities.

2. CAPS CHUTE

2.1. CAPS CHUTE INSTALLATION

To install the caps chute on the machine, it is necessary to:

- place the bracket (A) complete with the caps chute and caps distribution head on the bracket (B) of the upper plate.

<u>On the bracket (B) there are two centering dowels.</u>

- Fix by bolt (C).

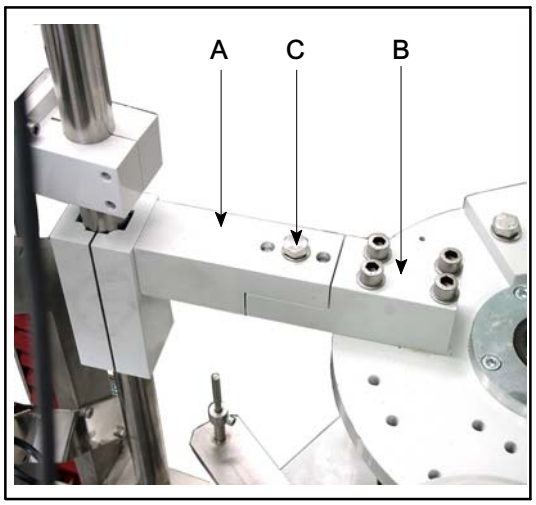


Fig.123

- Check that the cap transfer pin (F) of the pick and place device is at the center of the distribution head (D).

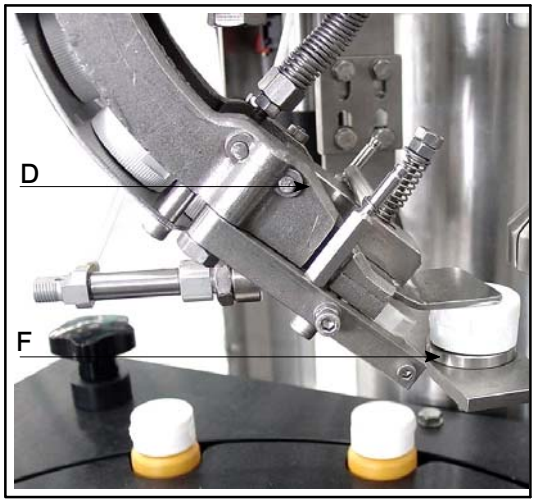


Fig.124

- Connect the electric connections of the photocell (E).

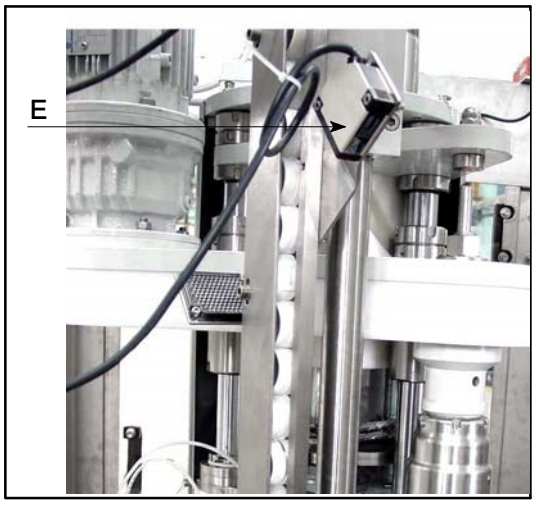


Fig.125

- Connect the pneumatic connections (G) of the caps stopping cylinder (H).

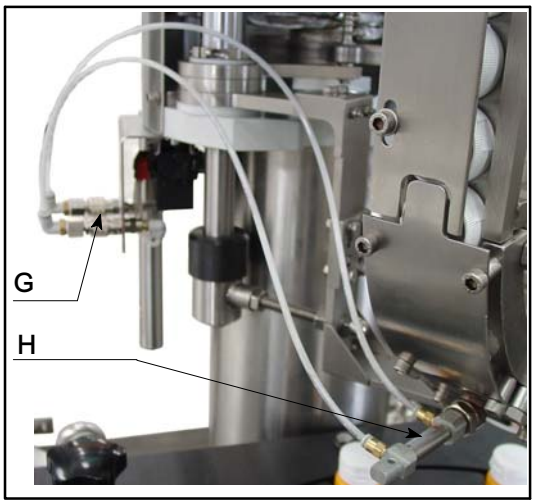


Fig.126

2.2. DISCHARGE OF THE CAPS CHUTE

To discharge the caps chute it is necessary to operate as follows:

- put a collect container under the the caps distribution head (D).
- Close the pressure and close the caps stopping cylinder rod (H).
- Remove the arms spring (M).
- Open arms (N).
- Empty the caps chute.
- Close the arms (N).
- Reposition the arms spring (M).
- Give pressure to the caps stopping cylinder (H).

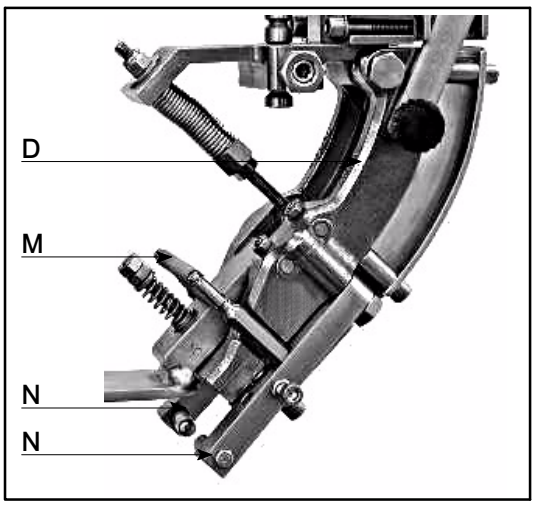


Fig.127

2.3. CAPS FORMAT CHANGE

When the cap to handle changes, it could be necessary to replace the caps chute and the distribution head proceeding as follows:

- disconnect the electric connections from the photocell (E) (one or more).

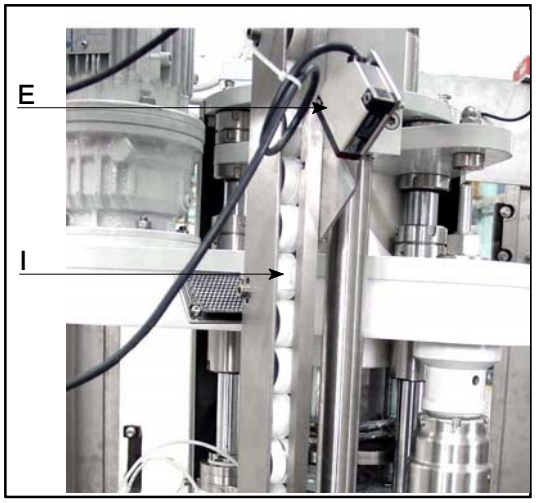


Fig.128

- Disconnect the pneumatic connections (G) of the caps stopping cylinder (H).

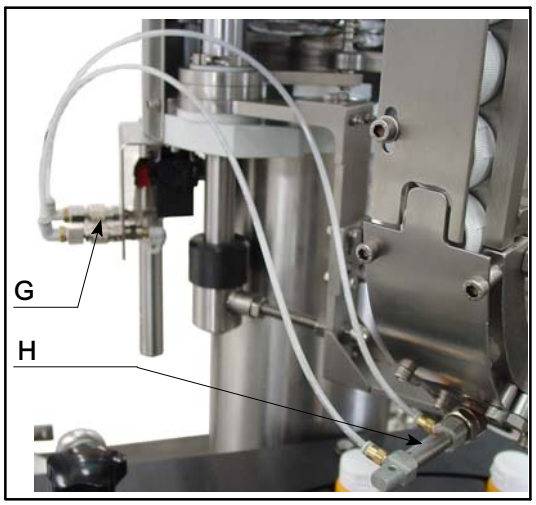


Fig.129

- Unscrew and remove the bolt (C)
- Remove the whole caps chute (I)

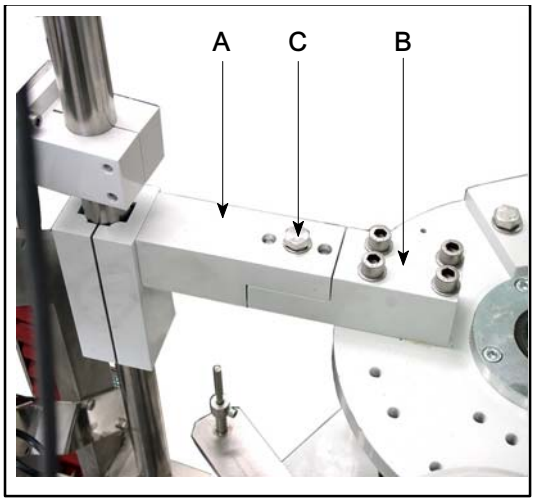


Fig.130

- Mount, proceeding in the reverse way, the caps distribution unit suitable to the new type of cap to handle.

<u>On the bracket (B) there are two centering dowels</u>

- Check that the caps chute is aligned to the caps exit mouth of the caps sorter
- Reconnect the electric connections of the photocell.
- Reconnect the pneumatic connections of the caps stopping cylinder.

3. “VP71O” HYSTERESIS CAPPING HEAD

BEFORE CARRYING OUT ANY MAINTENANCE OPERATIONS, the machine must be in safety conditions to avoid untimely screwing and/or electrocution.

3.1. HEAD MAIN PARTS

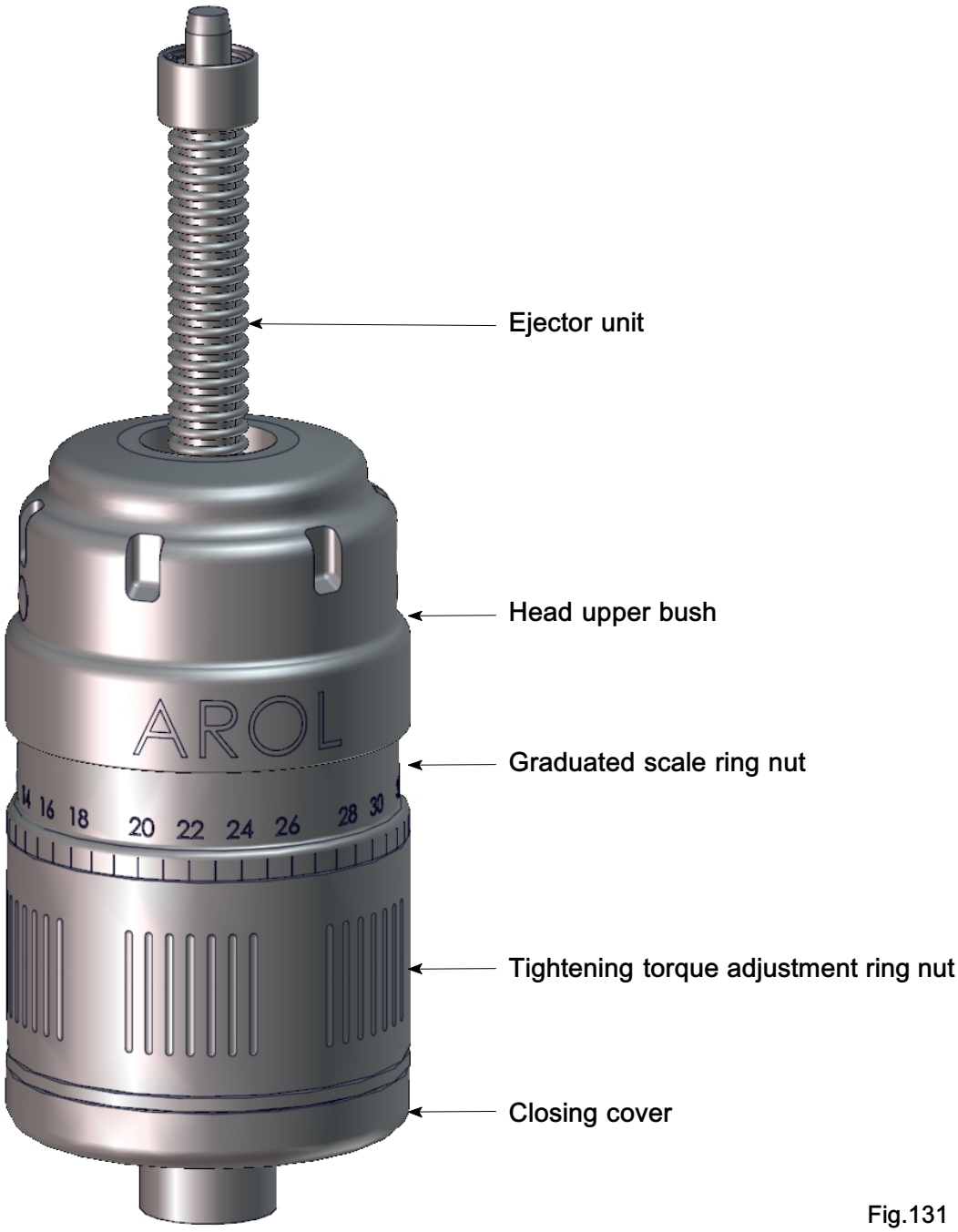


Fig.131

3.2. TOOLS NEEDED FOR THE REMOVAL AND MAINTENANCE

N°		Wrench	Supplied
1		Ring nut wrench 80-90	YES
2		Ring nut wrench 45-50	YES
3		Compass wrench	YES
4		Couple adjustment gripper	YES
5		Magnet and bearing extraction wrench	YES
6		Bearing extraction supplementary plate	YES
7		Ring removal tube	YES
8		Hexagonal wrench 17 mm	NO
9		Wrench for socket head screws 3 mm	NO
10		Bit wrench	NO

3.3. CAPPING HEAD REMOVAL AND INSTALLATION

Protect the centerer upper surface with rubber or similar material.

For the needed wrenches needed see the par.3.2. on page152.

3.3.1. REMOVAL

- Remove the closure gripper from the capping head.
- Release the head fastening ring nut (A) with the suitable wrench (2).

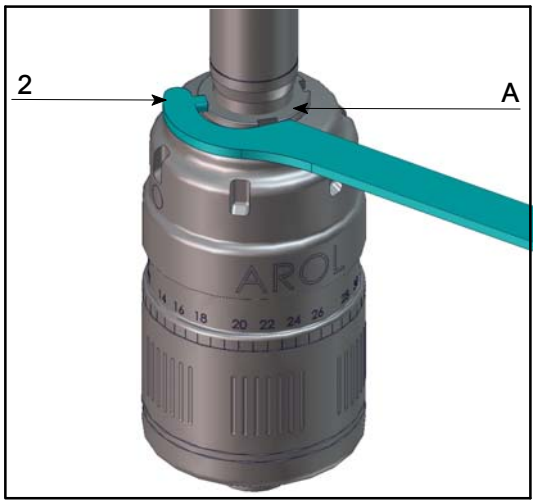


Fig.132

- Loosen the ring nut (A) till releasing the head.
- Release the head of the turret using the wrench (1).

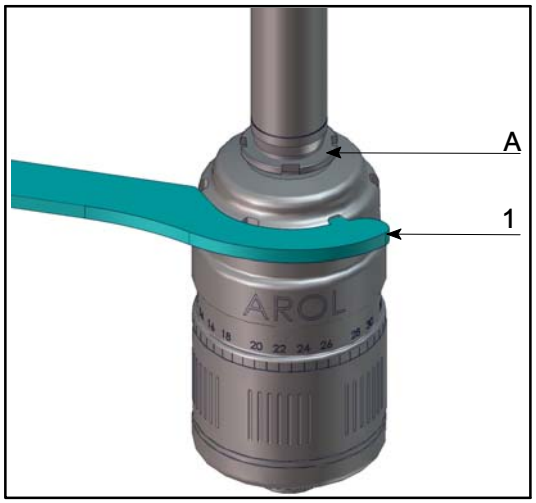


Fig.133

- Remove the head loosening manually.

Fig.134

3.3.2. INSTALLATION

- Screw the head manually as far as possible.

Fig.135

- Screw till the end of the head thread using the wrench (1).

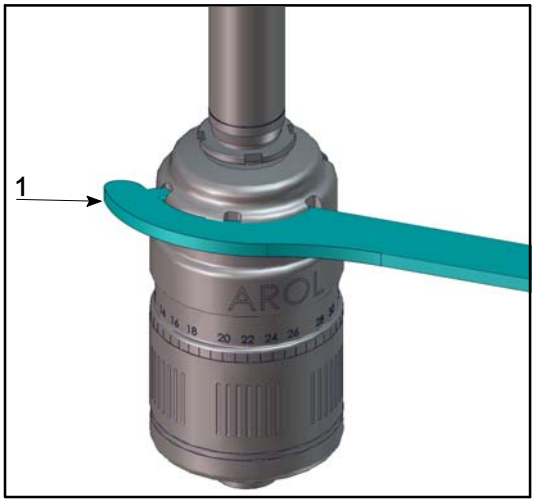


Fig.136

- Screw the head fastening ring nut (A) till it touches the head.
- Lock the head fastening ring nut (A) with the suitable wrench (2).

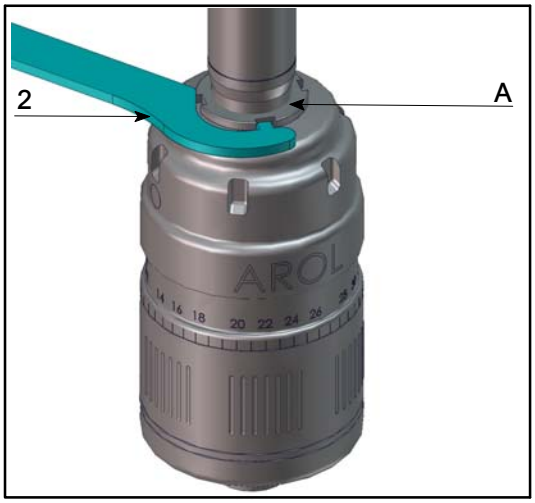


Fig.137

3.4. HEAD ADJUSTMENT

For the needed wrenches needed see the par.3.2. on page152.

3.4.1. TIGHTENING TORQUE ADJUSTMENT

This step can be carried out with the head installed on the machine.

The adjustment is made by a graduated scale etched on the ring (F) (in *Pound x Inch*) and a reference (G) etched on the magnets adjustment ring nut (H).

To carry out the adjustment, proceed as follows:

- Insert the couple adjustment gripper (4) on the magnets adjustment ring nut (H).

Fig.138

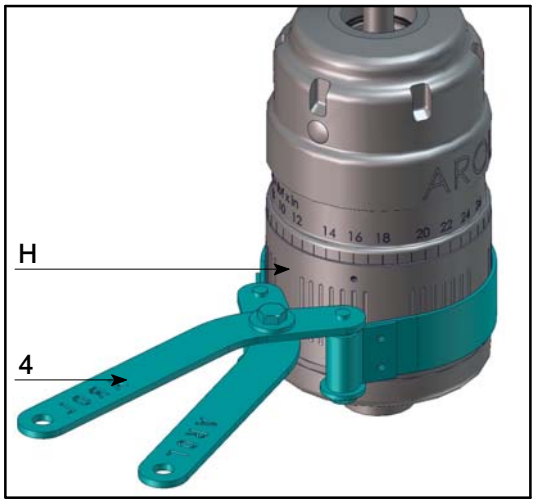


Fig.139

- Tighten the gripper (4) in such way that the belt sticks to the ring nut and turn the magnets adjustment ring nut (H) until to get a lining up between the value of the desired tightening torque and the reference (G).

It is also possible to carry out the tightening torque adjustment manually without the using of the gripper.

- **The adjustment must be made on all capping heads with the same tightening torque.**

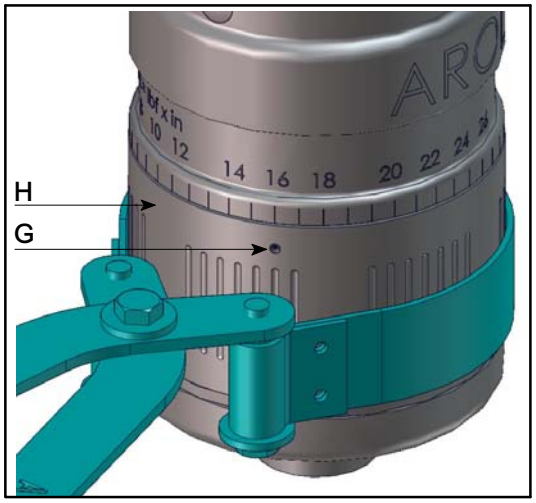


Fig.140

3.4.2. VERTICAL LOAD CHANGE

To change the vertical load it is necessary:

- Push the head upper bush (J) downwards and then rotate it counter-clockwise, holding the head lower part still.

Fig.141

Fig.142

- The upper bush (K) comes out upwards.

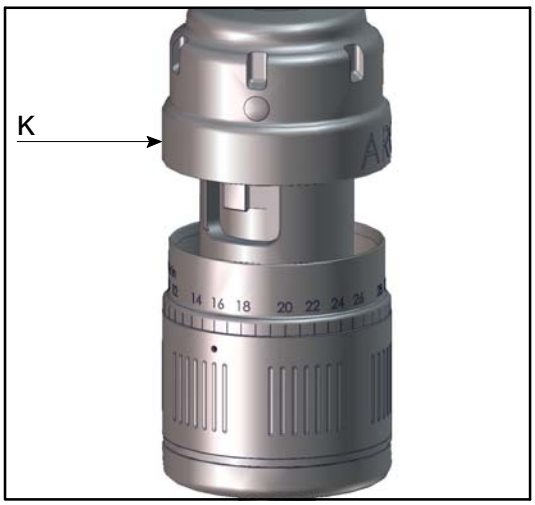


Fig.143

- Pull the compensating spring (MC) out.
- Replace it with a spring suitable for the vertical load to be achieved.

The springs indicated in the table here below are available as standard (1 kg_f = 9.81 N).

Load Kg_f	Color	Code
4	None	P07D00621300
8	YELLOW	P07D00621700
12	BROWN	P56D02555900
16	WHITE	P07D00621900
20	RED	P03D00363500
25	BLUE	P52D02240100
32	GREEN	P52D02240300
61	VIOLET	P52D02240400
100	BLACK	P52D02240700

- Re-install proceeding reversely than the removal, taking care to grease the spring.

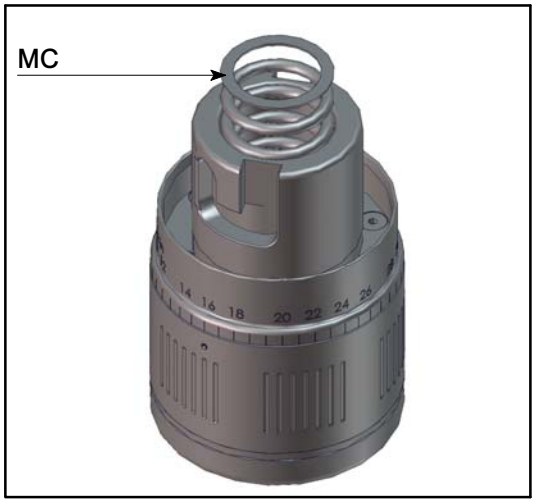


Fig.144

3.5. CLEANING OF THE HEAD

Hereinafter are described the indications for the cleaning of the heads.

To keep a correct cleaning of the head it is allowed to carry out cleaning to remove from the components eventual dusts and product residuals.

It is absolutely forbidden to clean the head with water jets under pressure or aggressive detergents.

It is recommended to use rags wetted with preferably warm water and non-aggressive detergents.

PRODUCT	MAXIMUM TEMPERATURE [°C	pH
Water	35	
Neutral detergents	35	5 ÷ 9

Before carrying out the cleaning, it is recommended to make reference to the product cards relevant to the detergents.

Detergents residuals or residuals of liquids used for the cleaning of the heads must be disposed according the laws in force of the country in which the machine is used.

Do not use cotton wool or other flimsy materials.

t is hazardous to use compressed air.

3.6. CAPPING HEAD MAINTENANCE AND OVERHAUL

3.6.1. HEAD OPENING

For the needed wrenches needed see the par.3.2. on page152.

To open the capping head , proceed as follows:

- Push the head upper bush (J) downwards and then rotate it counter-clockwise, holding the head lower part still.

Fig.145

Fig.146

- The upper bush (K) comes out upwards.

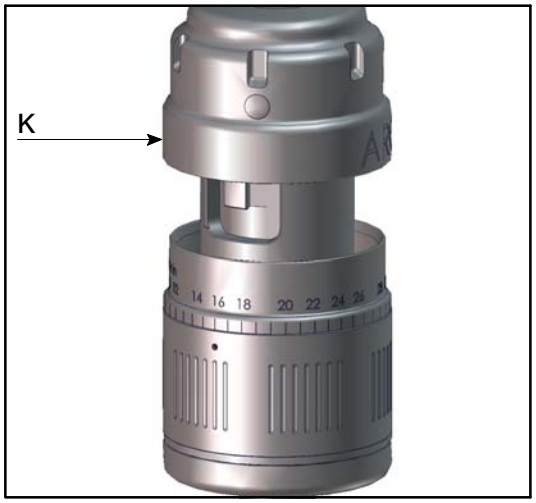


Fig.147

3.6.2. MAGNETIC RING OVERHAUL

For the needed wrenches needed see the par.3.2. on page152.

3.6.2.1. MAGNETIC TORQUE CHECKING

Magnetic rings are components that tend to lose their original features in time; thus, they must be replaced one or more times during the head life.

Check using a torquemeter that the torque corresponds (with a tolerance ±10%) to the static torque value set on the slotted ring nut.

If the tolerance is higher than the one indicated above, replace the magnetic rings.

3.6.2.2. INNER MAGNETIC ROTOR OVERHAUL

When it is necessary to replace the inner magnetic ring, proceed as described below:

- Open the head (see par. 3.6.1. on page 159).
- Pull the compensating spring out.
- Position the head in a jaw.
- Using the wrench (3), unscrew and remove the closure protection (L) with the gasket.

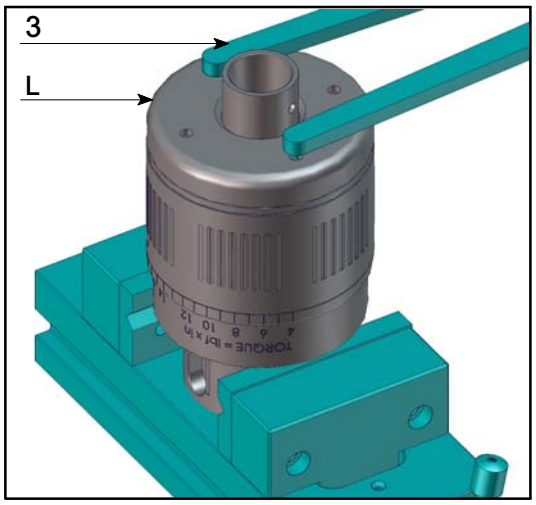


Fig.148

- Screw the ring removal tube (7) to the gasket holder ring (M).

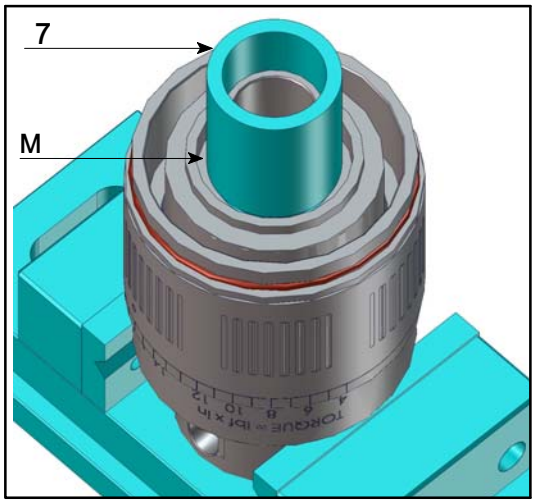


Fig.149

- Using the ring removal tube (7), slide the gasket holder ring (M) out.

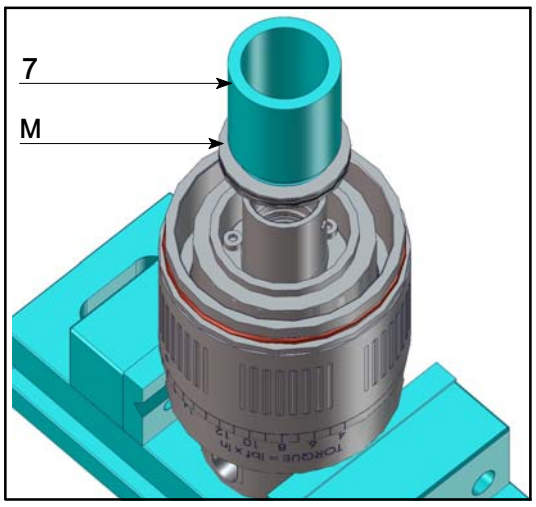


Fig.150

- Manually increase the torque by screwing the magnets adjustment ring nut (H) until the stroke end.

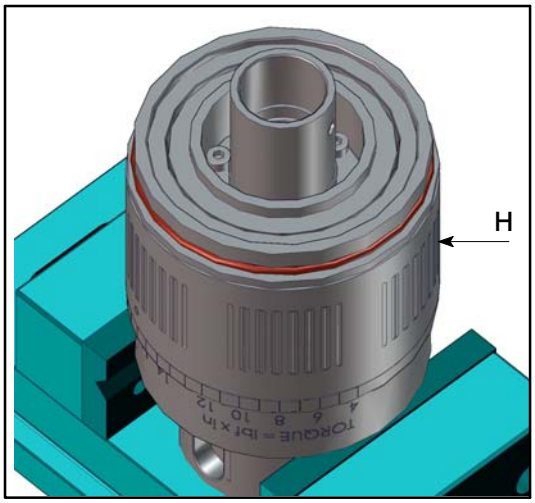


Fig.151

- Using the wrench (9), unscrew the fastening screws and remove the ejector guide bush (O).

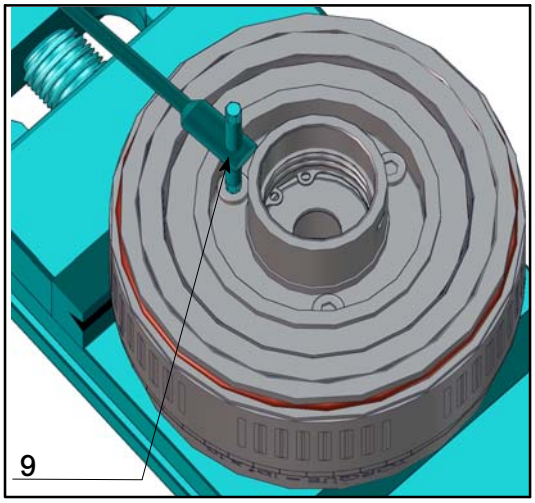


Fig.152

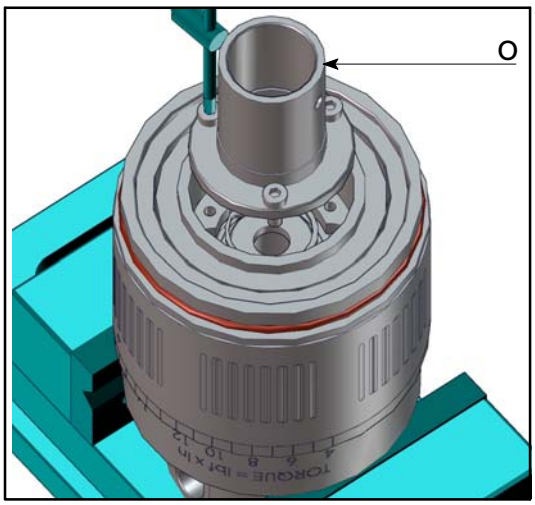


Fig.153

- Remove the snap ring (P) by a bit gripper (10).

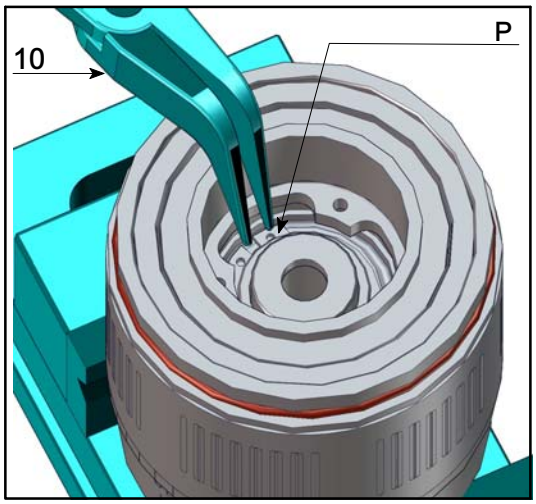


Fig.154

- Insert the magnets and bearings extraction wrench (5) instead of the ejector guide bush (O), and fasten it by the screws previously removed.

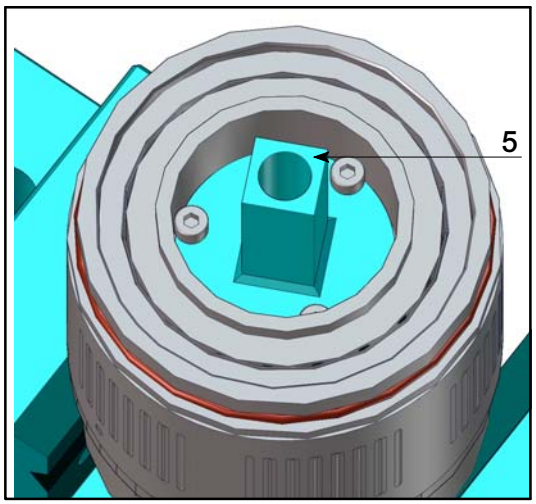


Fig.155

- For an easy removal of the inner magnet, manually decrease the torque by screwing the magnets adjustment ring nut (H) until the stroke end.
- Insert the head by the side of the magnets and bearings extraction wrench (5) in a jaw.

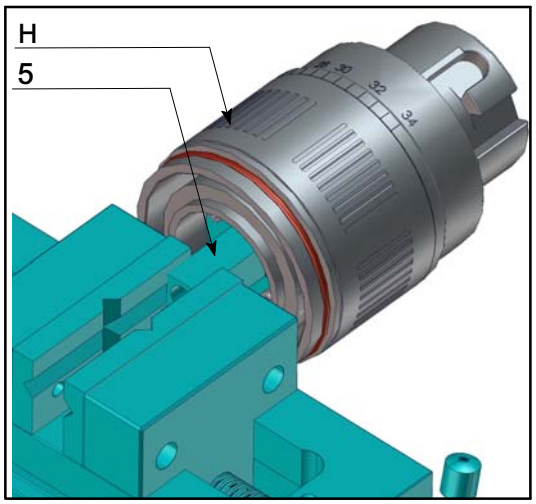


Fig.156

- Pull the outer part of the head out from the magnets holder shaft.

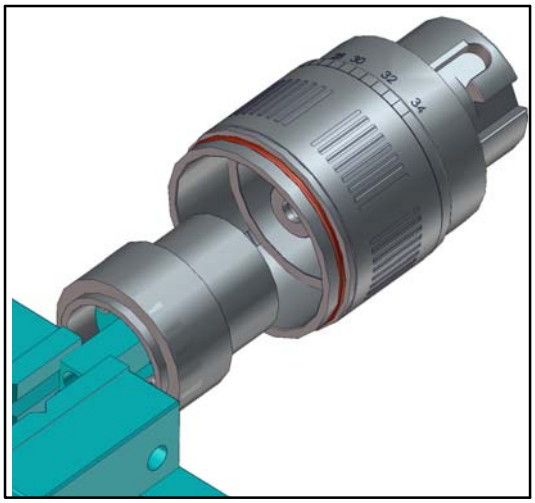


Fig.157

- Using the allen screw wrench (9), unscrew the screws to remove the magnets and bearings extraction wrench (5).

Keep the magnet away from other metallic parts.

- Re-install proceeding inversely than the removal.

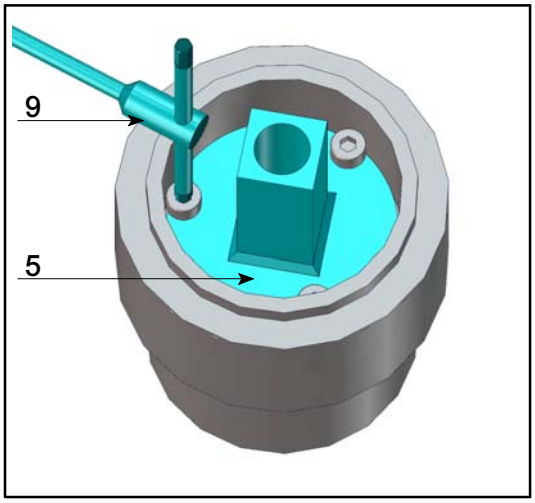


Fig.158

- Before re-installing the head, clean and grease all components as described in the par.3.7. on page 179.

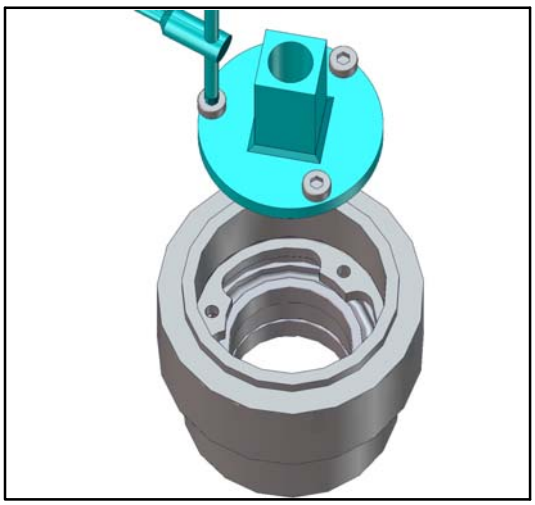


Fig.159

3.6.2.3. OUTER MAGNETIC RING OVERHAUL

When it is necessary to remove or replace the outer magnetic ring, proceed as described below:

<u>Write down the value of the screwing torque set on the graduated scale engraved on the ring (F).</u>

- Slide the outer part of the head out from the inner magnet, proceeding as described in par.3.6.2.2. Page 161.

Fig.160

- Using the allen screw wrench (9), unscrew and remove the fastening screws.

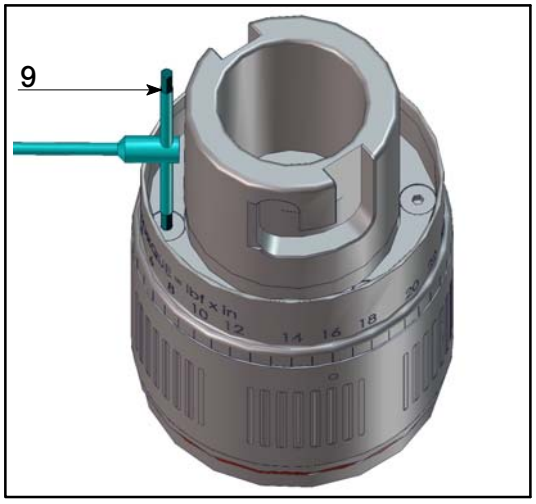


Fig.161

- Slide the graduated ring (F) out, complete with the central body (Q).

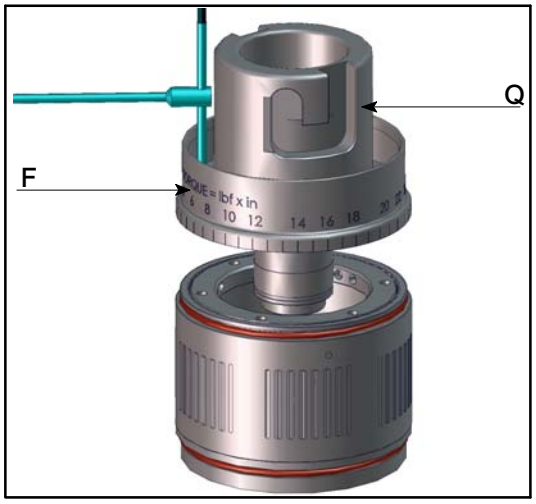


Fig.162

- Unscrew the torque adjustment ring nut (H) from the magnet holder bush (R).

Fig.163

- Remove balls (S).

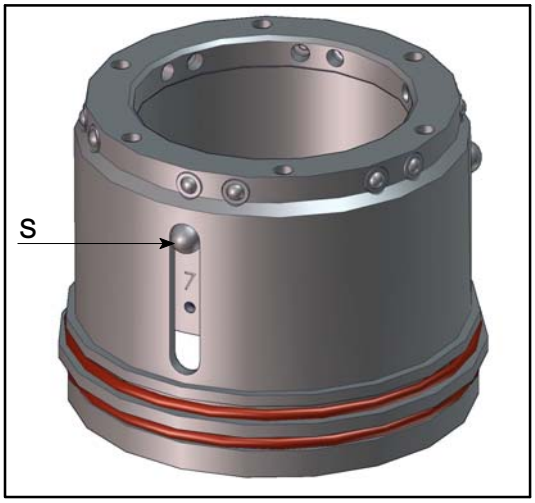


Fig.164

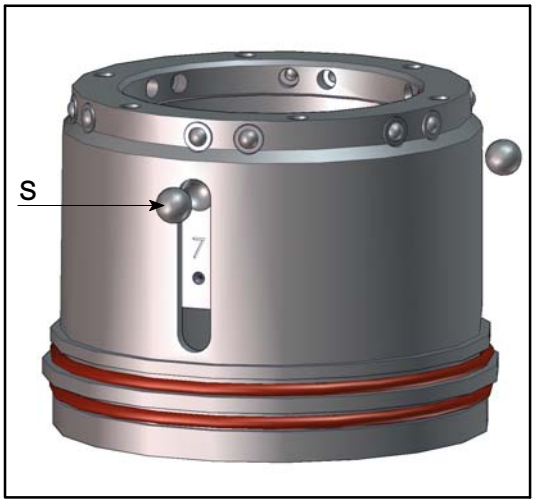


Fig.165

- Slide the magnetic ring (T) out from the magnets holder bush (R).

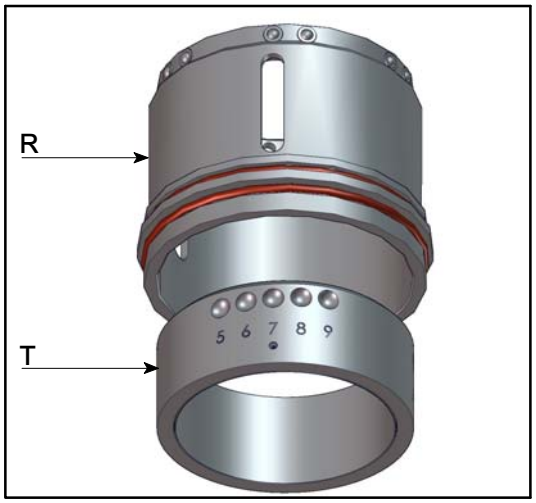


Fig.166

Re-install proceeding inversely than the removal.

- Before re-installing the head, clean and grease all components as described in the par.3.7. on page 179.
- Insert the magnetic ring (T) inside the magnet holder bush (R).
- Line up the center placed in correspondance of a blind fent with the fents of the magnets holder bush.
- Position the balls (S).

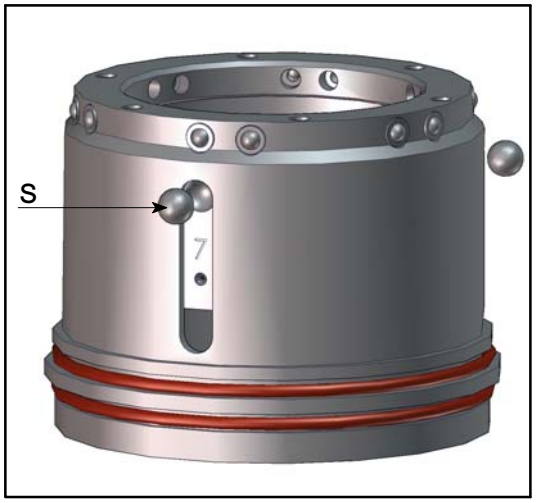


Fig.167

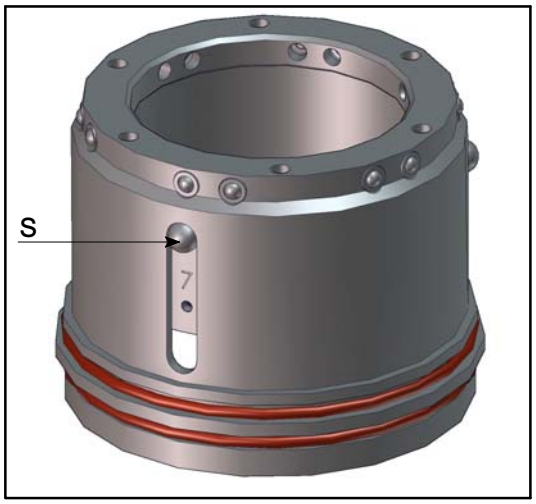


Fig.168

- Screw the torque adjustment ring nut (H) until stroke end; the center positioned on the outer part of the ring nut must be lined up to the center placed on the upper surface of the magnets holder bush (R).

After the screwing, if the two centers are not lined up, it is necessary to unscrew the magnets adjustment ring nut and screwit again starting from a different thread principle.

Screwing the torque adjustment ring nut, make sure that the balls are positioned into the inner trak of the ring nut. If it is necessary, lightly unscrew the ring nut and correctly position the balls.

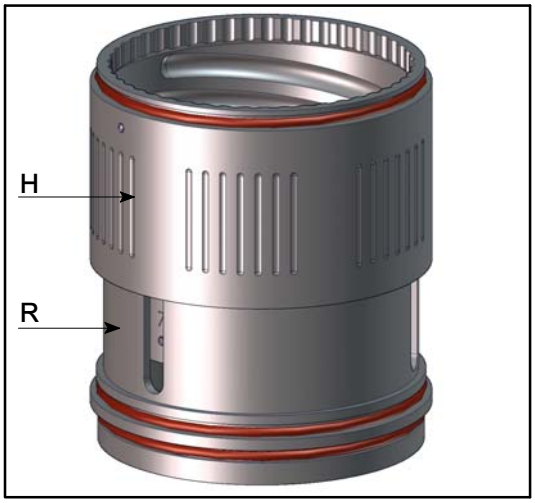


Fig.169

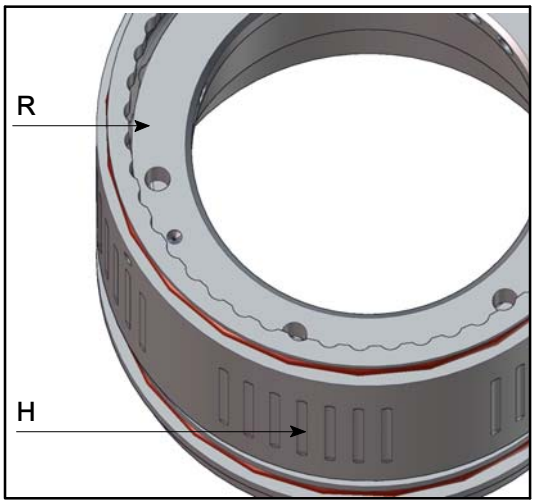


Fig.170

- Position the graduated ring (F) complete with central body (Q) on the magnets holder bush (R).

For a correct mounting , it is necessary that the center positioned on the outer surface of the graduated ring is lined up with the center positioned on the outer surface of the torque adjustment ring nut.

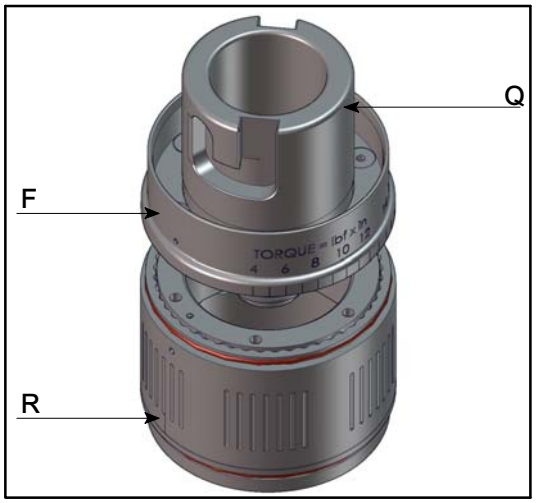


Fig.171

- Using an allen screw wrench (9), screw the screws in such way to fasten the central body (Q) to the magnets holder bush (R).

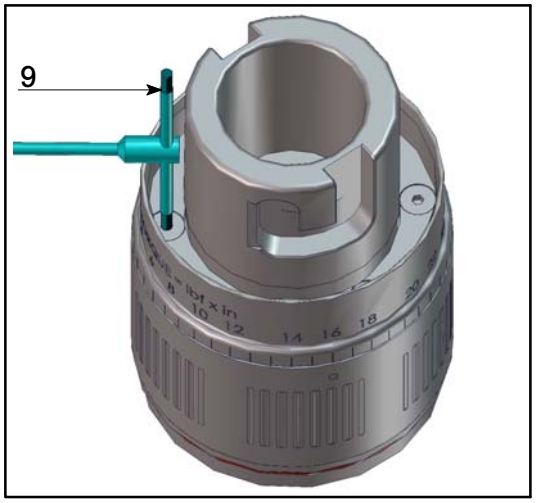


Fig.172

3.6.3. SEAL RING OVERHAUL

3.6.3.1. O-RING

When it is necessary to replace the O-rings, proceed as described:

- Slide the gasket holder ring (M) out as described in par.3.6.2.2. page 161.

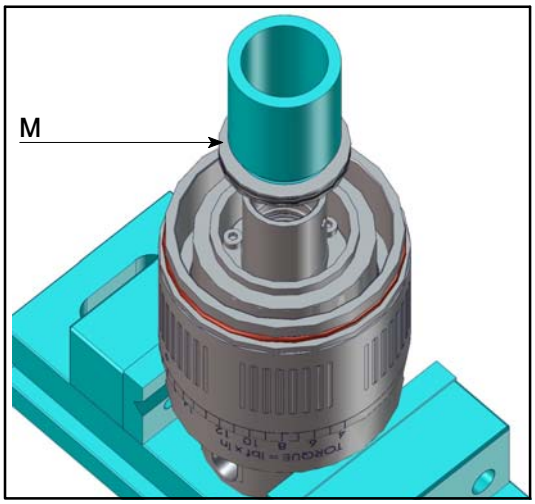


Fig.173

- Use a suitable tool to remove the O-ring (OR1).

Fig.174

- Unscrew the torque adjustment ring nut (H) from the magnets holder bush (R) as described in par.3.6.2.3. a page 165.
- Use a suitable tool to remove the O-ring (OR2).

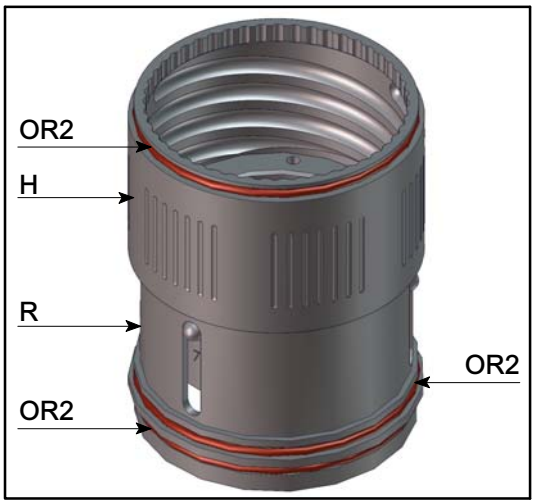


Fig.175

3.6.3.2. V-RING

When it is necessary to replace the V-rings, proceed as described:

- Unscrew and remove the closure cover (L) as described in par.3.6.2.2. page 161.

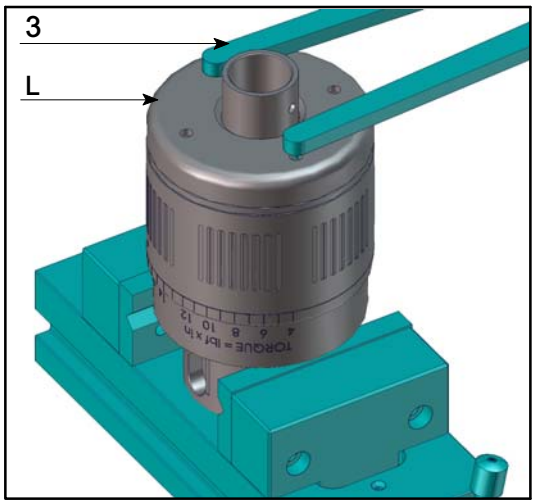


Fig.176

- Use a suitable tool to remove the V-ring (VR).

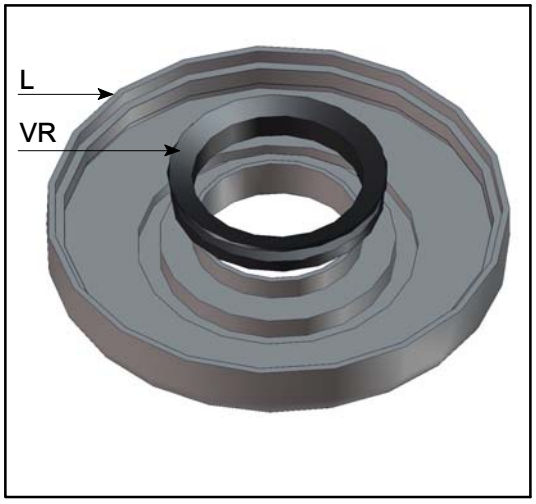


Fig.177

3.6.4. BEARINGS OVERHAUL

When it is necessary to remove or replace the bearings, proceed as described below.

3.6.4.1. CENTRAL BODY BEARING

- Slide the outer part of the head out from the inner magnet side, proceeding as described in par.3.6.2.2. page 161.
- Using a bit wrench (10) remove the snap ring (U), fastening the bearing.

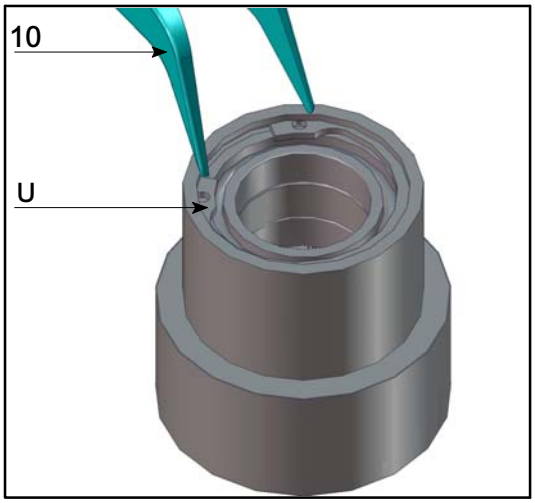


Fig.178

- Insert the bearings dismounting plate (6) inside the bearings holder bush (V).

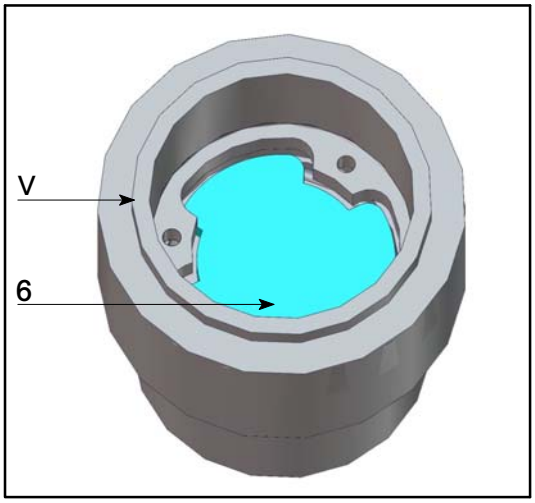


Fig.179

- Insert the bearings and magnets extraction wrench (5) inside the bearings holder bush (V).

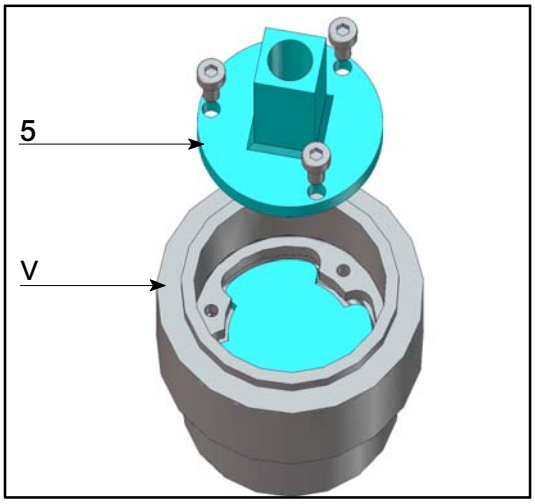


Fig.180

- Using the allen screw wrench (9) screw the screws fastening the wrench (5) to the bearings holder bush (V).

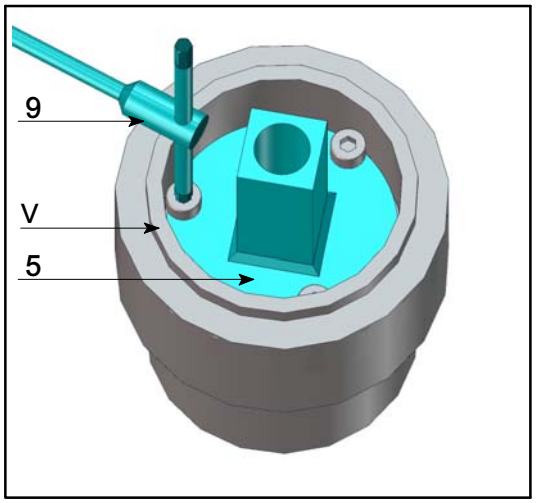


Fig.181

- Using the hexagonal screw (8), screw the bolt of the magnets and bearings extraction wrench (5).

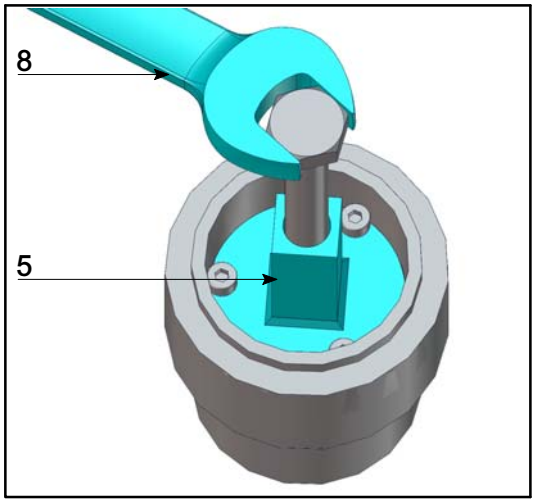


Fig.182

- Screw until to extract the first central bearing (W1) from the bearings holder bush (V).

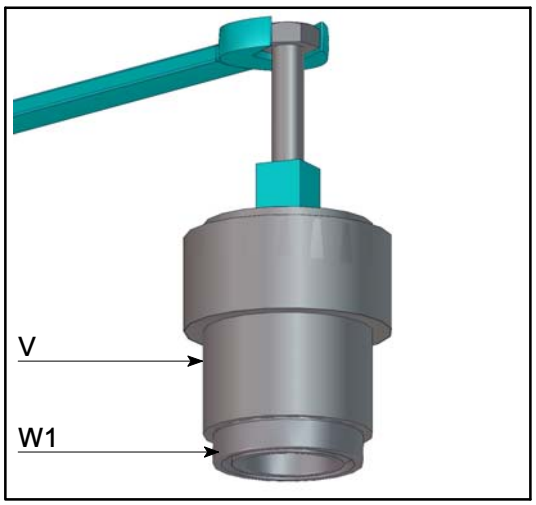


Fig.183

- Go on screwing to remove the inner spacer (X), the outer spacer (Y) and the central bearing (W2).

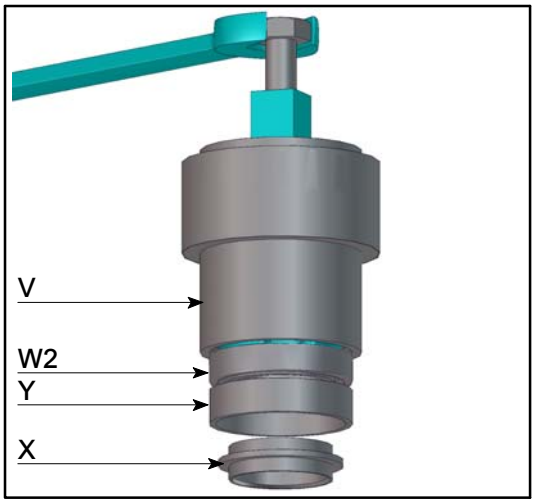


Fig.184

- Before remounting the head, proceeding in the reverse way to what described above, clean and lubricate the components described in par.3.7. page 179.

3.6.4.2. AXIAL BEARING ON THE EJECTOR ROD

- Remove the snap ring (D) by a bit gripper (10).

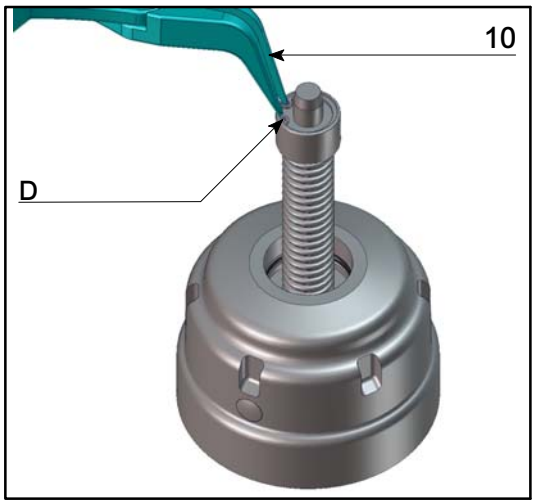


Fig.185

- Remove the bearing fastening ring nut (E) from the ejector rod (F).

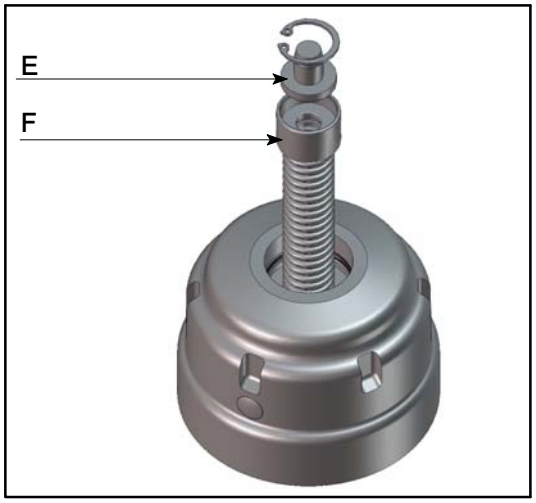


Fig.186

- Remove the axial bearing (G) from the ejector rod (F).

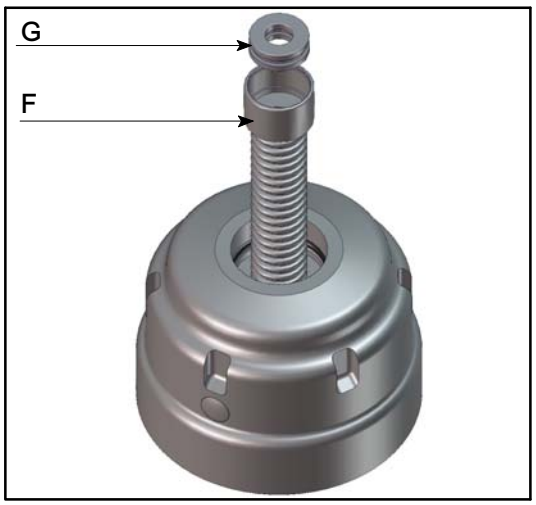


Fig.187

3.6.5. SPRINGS OVERHAUL

3.6.5.1. COMPENSATING SPRING

To carry out the compensating spring overhaul, proceed as follows:

- Open the head (see par. 3.6.1. on page 159).
- Pull the compensating spring (MC) out.
- Re-install proceeding reversely than the removal, taking care to grease the spring.

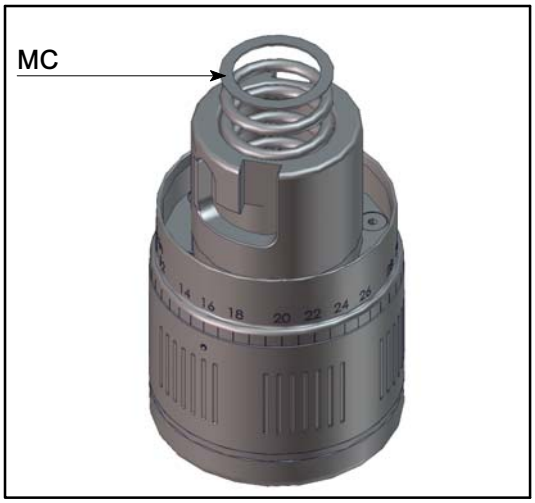


Fig.188

3.6.5.2. EJECTOR ROD SUPPORTING SPRING

To carry out the ejector rod supporting spring, proceed as follows:

- Open the head (see par. 3.6.1. on page 159).
- Remove the snap ring (M) by a bit gripper (10).

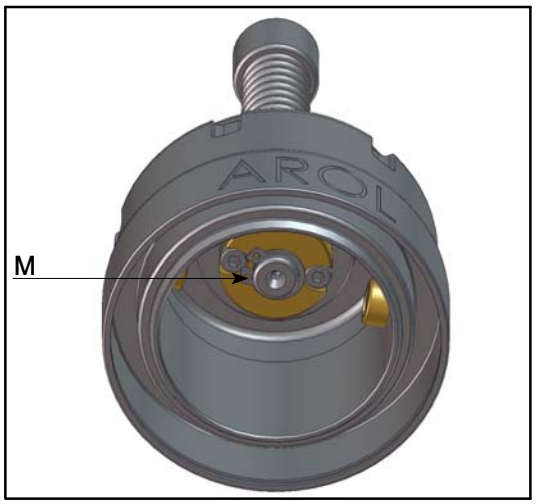


Fig.189

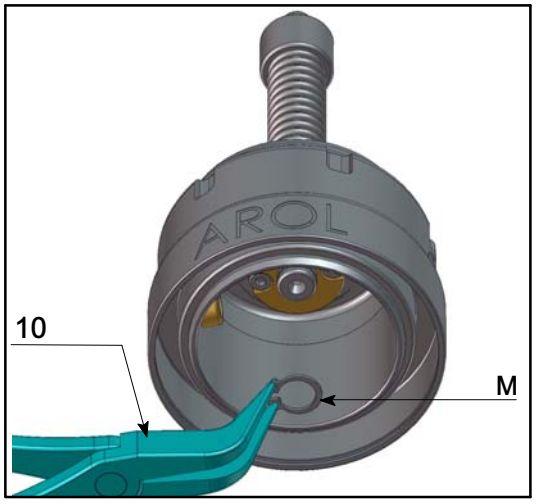


Fig.190

- Pull the ejector control rod (I) complete with spring (N) out.
- Re-install proceeding reversely than the removal, taking care to grease the spring.

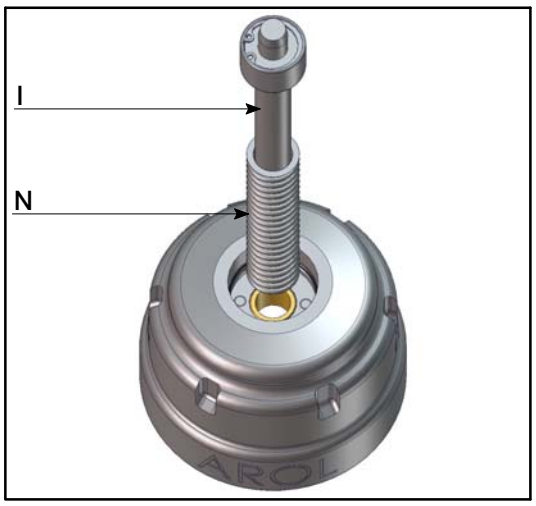


Fig.191

3.6.6. PLUG BUSH OVERHAUL

Remove the bush for dowel (M) pulling it out from the pin (N).

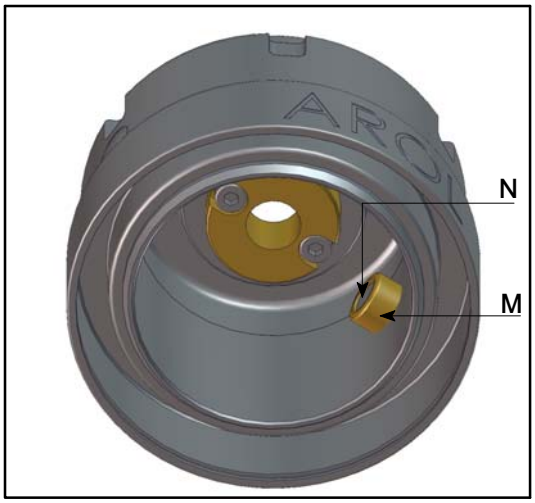


Fig.192

Re-install the bush caring to position it correctly, with the most curved side facing the head inner side.

The plug bushes (M) must be both replaced in the same intervention period.

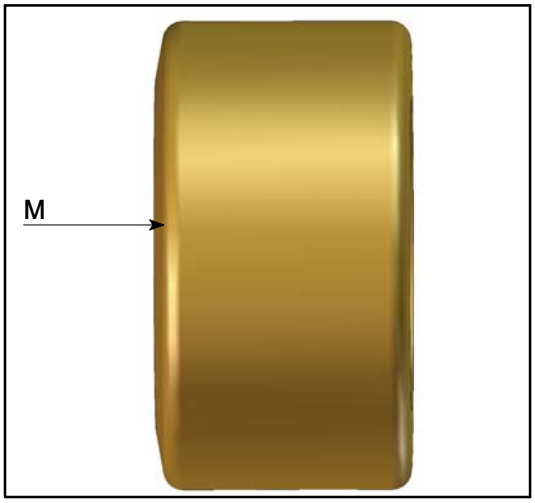


Fig.193

3.6.7. HEAD INSTALLATION

Re-install proceeding reversely than the removal.

Before re-installing the head, clean and grease all components as described in the paragraph 3.7. on page 179.

3.7. PARTS LUBRICATION

As it is difficult to define the exact quantity of grease to apply with the paintbrush, saying "brush-stroke" we mean grease's quantity on the paint-brush if we bathe half of a nr. 8 paintbrush bristles (large 10 mm with bristles 18 mm height) and removing leaks by passing paint-brush's long sides on the container edge.

Use lubricant type “**G**”.

For the lubricant reference, see paragraph 9.3. on page 121.

- Using a brush spread a film of lubricant on the springs.
- Using a brush spread a film of lubricant on the seat of the ejector controlling rod and on the thread of the head upper bush.

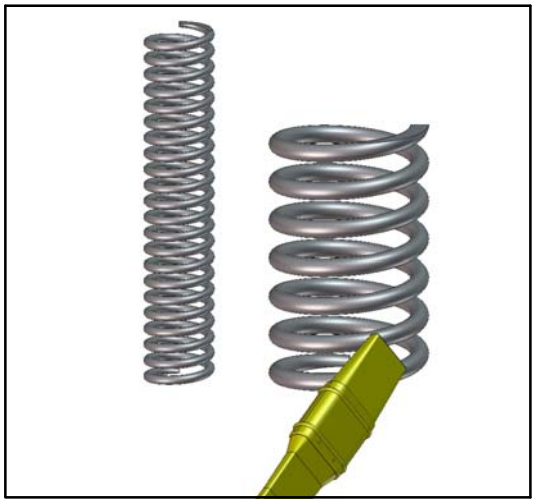


Fig.194

Fig.195

- Clean the inner part of the head upper bush and then using a brush spread a film of lubricant.

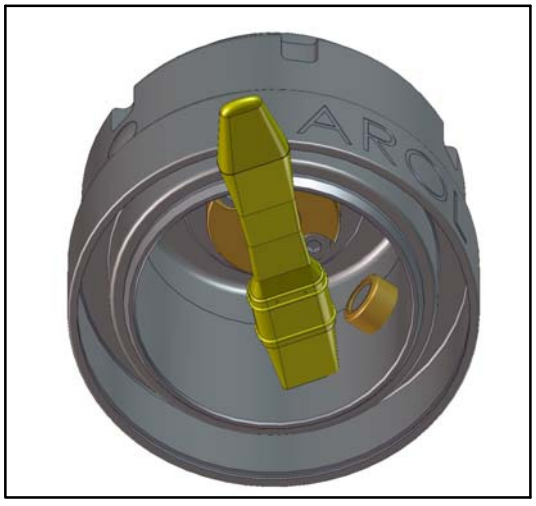


Fig.196

- Using a brush spread a film of lubricant on the bushes for plugs.

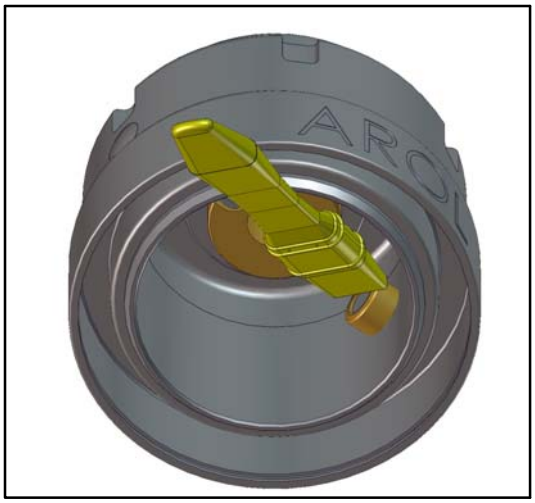


Fig.197

- Clean the inner and outer part of the central body and then using a brush spread a film of lubricant.

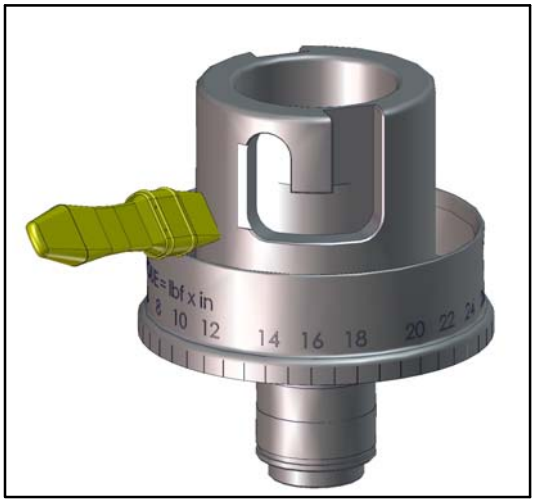


Fig.198

- Using a brush spread a film of lubricant on the seat of the head central body release.

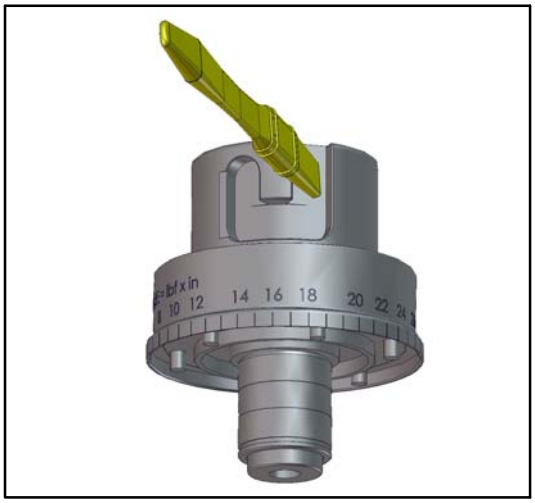


Fig.199

- Clean the magnets adjustment ring nut and then using a brush spread a film of lubricant.

Fig.200

- Clean the magnetic rings and then using a brush spread a film of lubricant.

Check that on the outer surface of the inner magnetic ring there are no traces of lubricant, on the contrary remove them.

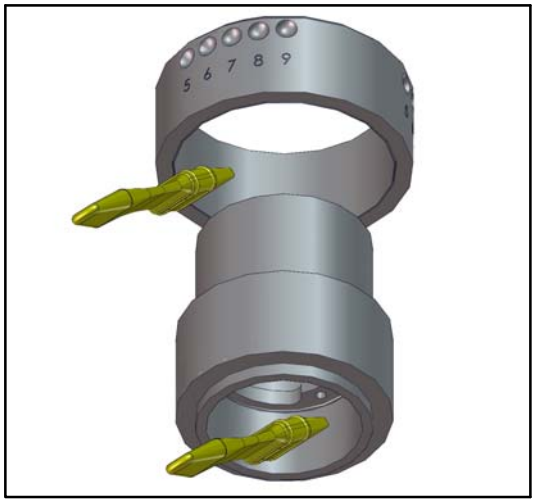


Fig.201

- Clean the central bearings and then using a brush spread a film of lubricant on all the surfaces.

Check that on the outer surface of the inner magnetic ring there are no traces of lubricant, on the contrary remove them.

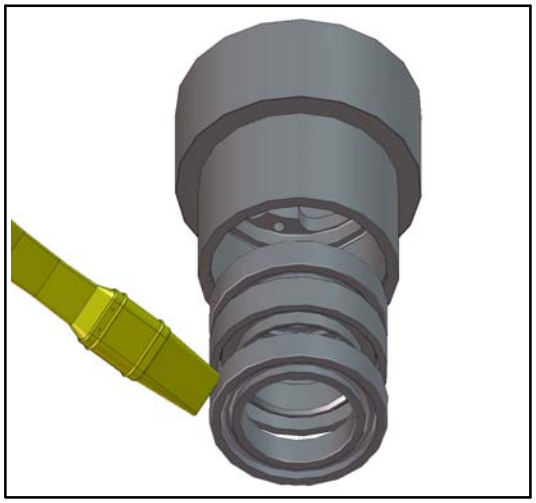


Fig.202

4. VP335 CLOSURE GRIPPER

BEFORE CARRYING OUT ANY MAINTENANCE OPERATIONS, the machine must be in safety conditions to avoid untimely screwing and/or electrocution.

4.1. CLOSURE GRIPPER MAIN PARTS

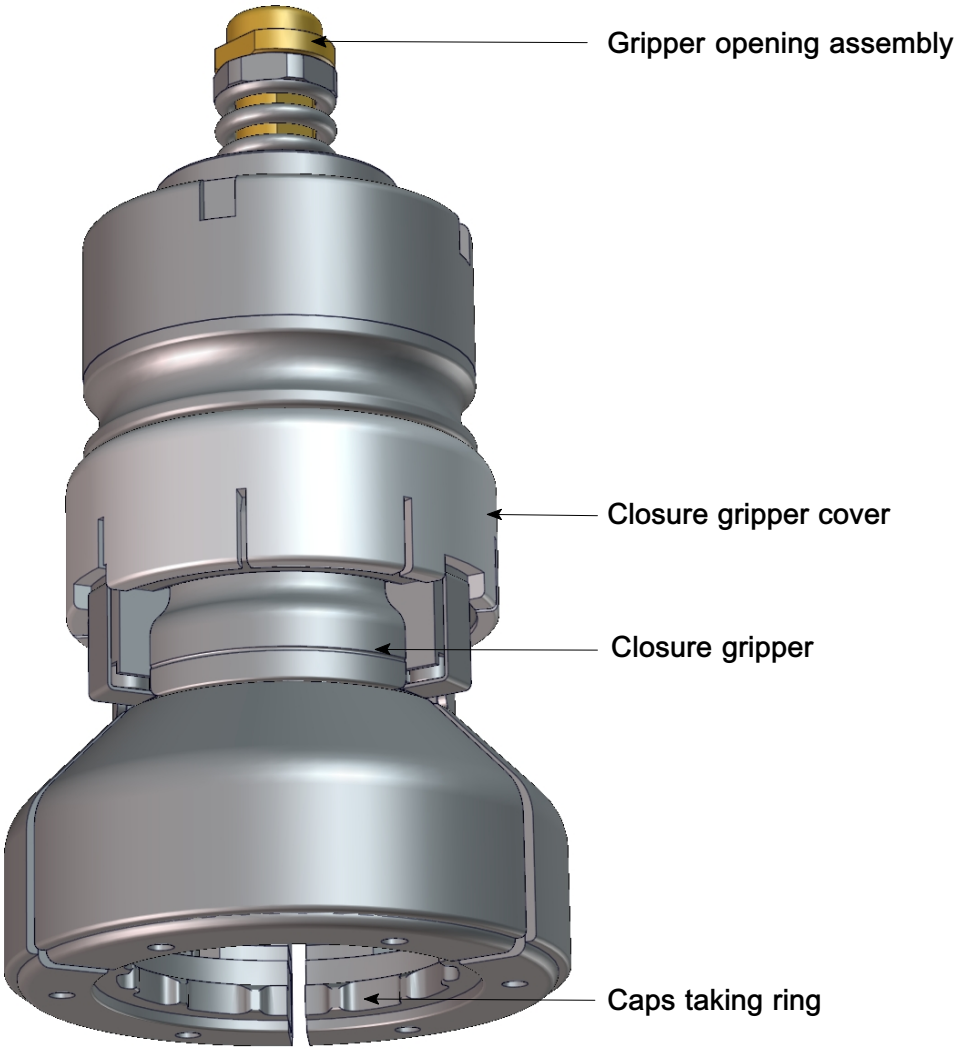


Fig.203

4.2. TOOLS NEEDED FOR THE DISMOUNTING AND MAINTENANCE

N°		Tool	Supplied
1		Hexagonal wrench 7 mm	NO
2		Hexagonal wrench 17 mm	NO
3		Hexagonal wrench 19 mm	NO
4		Allen screw wrench 2,5 mm	NO
5		Allen screw wrench 3 mm	NO
6		Allen screw wrench 5 mm	NO
7		Gripper mounting tool	YES
8		Wrench for ring nut 60-70	YES
9		Gripper cover inserting tube	YES
10		Gripper cover removing tube	YES

4.3. CLOSURE GRIPPER REMOVAL / INSTALLATION

To replace the closure gripper, proceed as follows:

4.3.1. REMOVAL

To remove the closure gripper, proceed as follows:

- Hold with a hand the closure gripper.
- Lower and lightly turn in counter clockwise direction the ring nut (A).
- Holding down the ring nut (A), slide the gripper (B) out pulling it downwards.

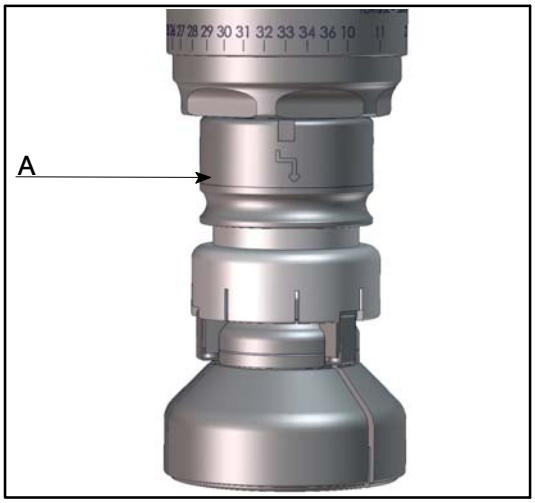


Fig.204

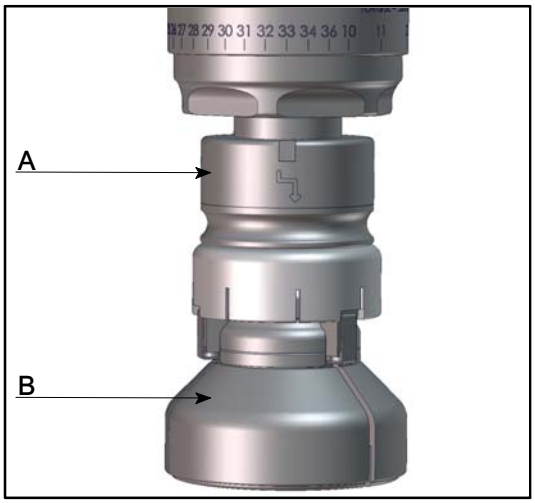


Fig.205

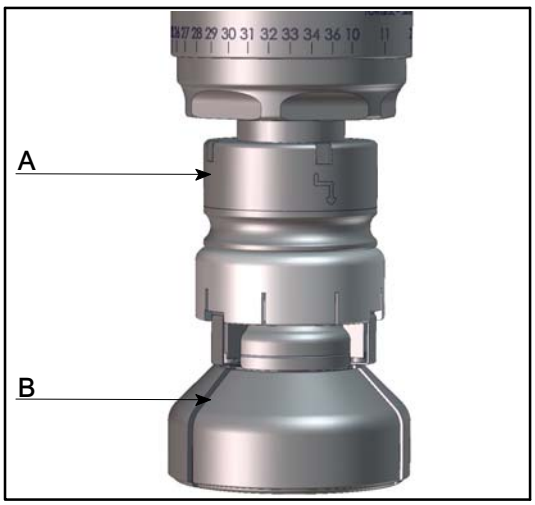


Fig.206

- Remove the closure gripper.

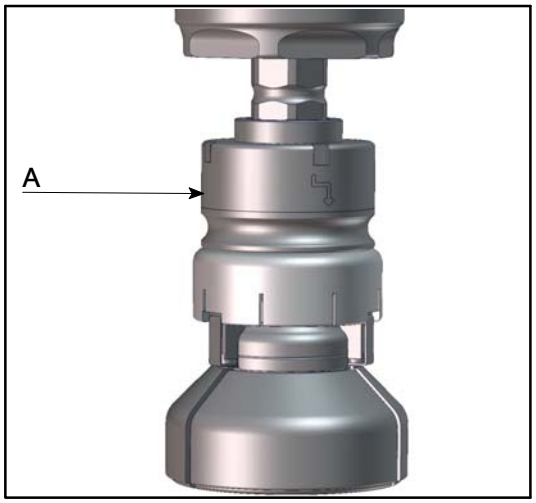


Fig.207

4.3.2. INSTALLATION

To install the closure gripper, proceed as follows:

- Lower and keep down the ring nut (A).
- Insert the gripper unit finding the right coupling by turning and pushing the gripper upwards until it is completely inserted.
- Fasten the gripper to the head, turn in clockwise direction the ring nut (A).

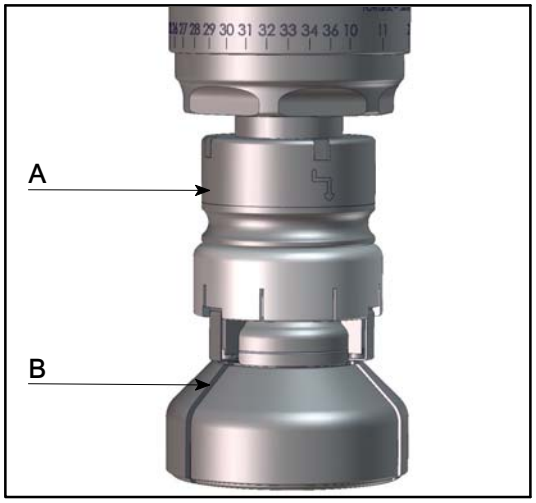
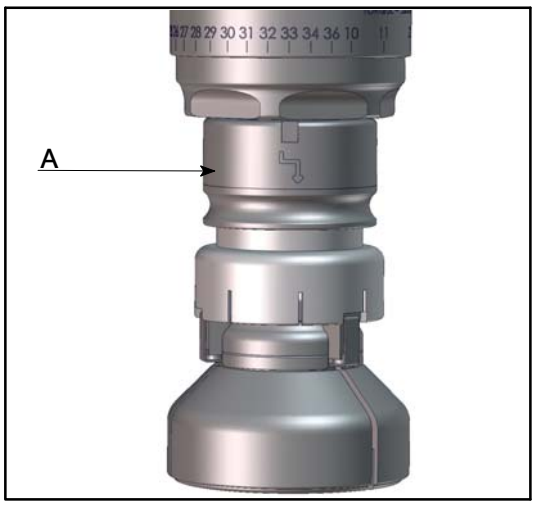


Fig.208



4.4. CLEANING OF THE CLOSURE GRIPPER

Hereinafter are described the indications for the cleaning of the closure gripper.

To keep a correct cleaning of the closure gripper it is allowed to carry out cleaning to remove from gripper's units, eventual dusts and product residuals.

It is absolutely forbidden to clean the closure gripper with water jets under pressure or aggressive detergents.

For the general cleaning is recommended to use clothes wet in lukewarm water and not aggressive detergents.

PRODUCT	MAXIMUM TEMPERATURE [°C]	pH
Water	35	
Neutral detergents	35	5 ÷ 9

The customer must make reference to the instruction given by the supplier of detergents used for the cleaning.

Detergents residuals or residuals of liquids used for the cleaning of the gripper must be disposed according the laws in force of the country in which the gripper is used.

Do not use wadding or others inconsistent materials.

It is dangerous to use compressed air.

4.5. CLOSURE GRIPPER ADJUSTMENT

For the tools necessary for the dismounting of the closure gripper see par. 4.2. page 183.

When it is necessary to adjust the gripper pressure on the cap, proceed as described below:

- Remove the closure gripper from the capping head as described in par. 4.3. page 184.
- Insert the hexagonal wrench (2) into the seat of the closure nut of the rod guide bush (C) and the hexagonal wrench (3) on the nut (D).

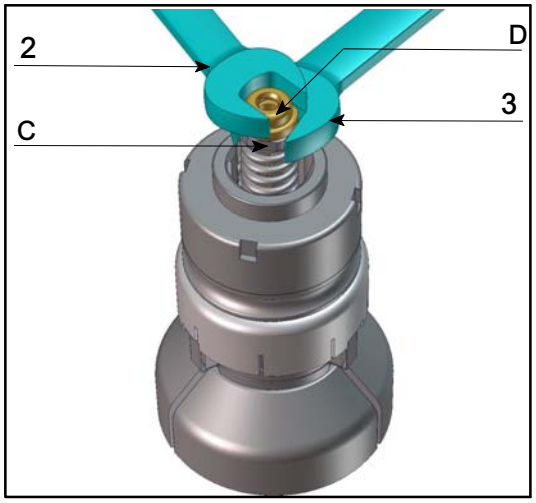


Fig.209

- Unscrew and remove the closure nut of the rod guide bush (C)

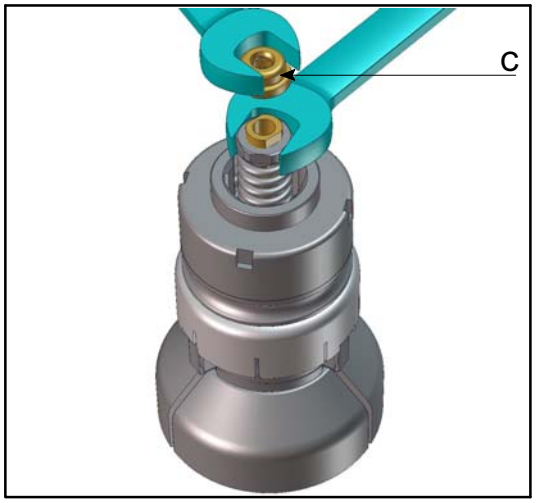


Fig.210

- Slide the adjustment pin (E) out.

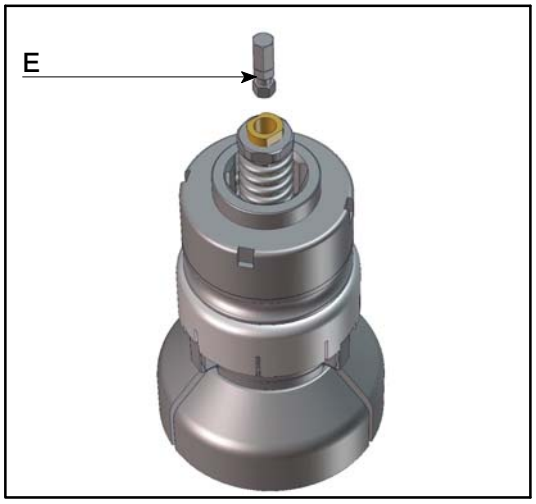


Fig.211

- Increase the distance (**e1**) to increase the gripper pressure.
- Decrease the distance (**e1**) to decrease the gripper pressure.

After the adjustment, remount proceeding in the reverse way to what described above.

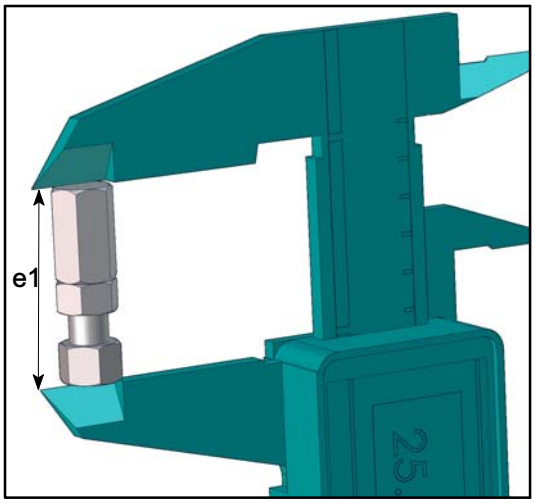


Fig.212

4.6. OVERHAUL OF THE CLOSURE GRIPPER

For the tools necessary for the dismounting of the closure gripper see par. 4.2. page 183.

4.6.1. GRIPPER CHECK

- Remove the closure gripper from the capping head as described in par. 4.3. page 184.
- Check that the closure nut of the rod guide bush (C) is locked.
- Check the efficiency of the spring (F) ands, if it is necessary, replace it.
- Mount the gripper on the closure head.

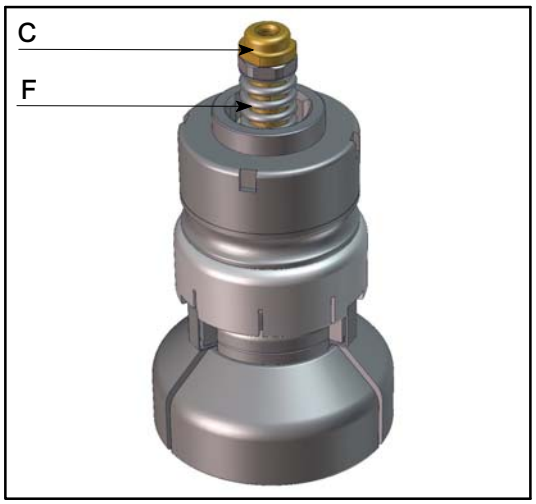


Fig.213

4.6.2. CAP GRIPPER EXTENSION OVERHAUL

- Using the Allen screw wrench (5),unscrew and remove the fastening screws (G).

<u>If it is necessary turn the caps stopping pad (H) in such way to line up the holes with the fastening screws of the extension (G)</u>

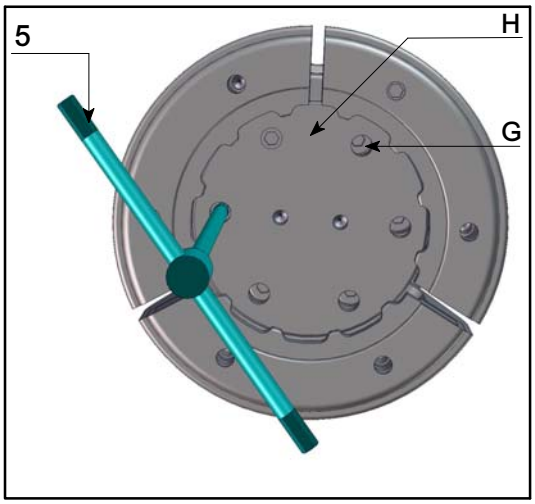


Fig.214

- Remove the gripper extension (I).

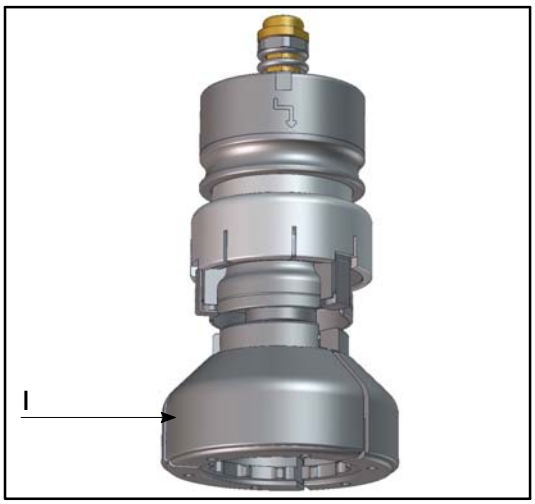


Fig.215

4.6.3. OVERHAUL OF THE GRIPPER PRESSURE ADJUSTMENT SPRING

If it is necessary to remove the gripper controlling spring, proceed as described below:

- Remove the closure gripper from the capping head as described in par. 4.3. page 184.
- Insert the hexagonal wrench (2) into the seat of the closure nut of the rod guide bush (C) and the hexagonal wrench (3) on the nut (D).

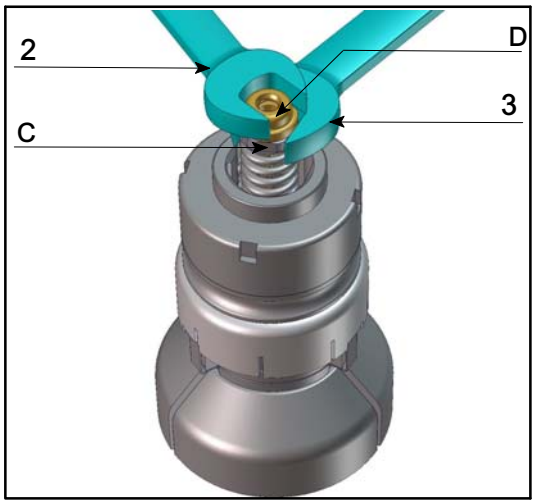


Fig.216

- Unscrew and remove the closure nut of the rod guide bush (C)

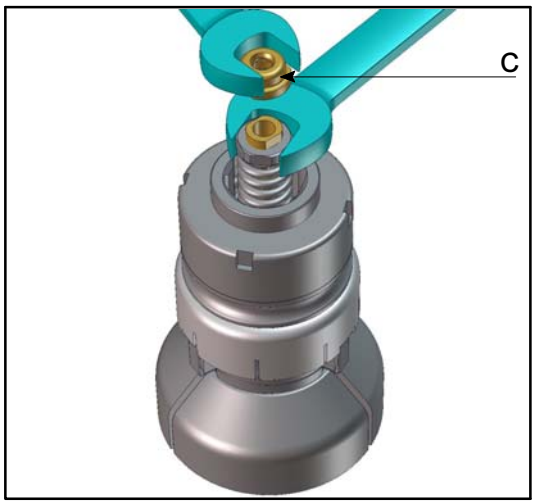


Fig.217

- Unscrew and remove the nut (D)

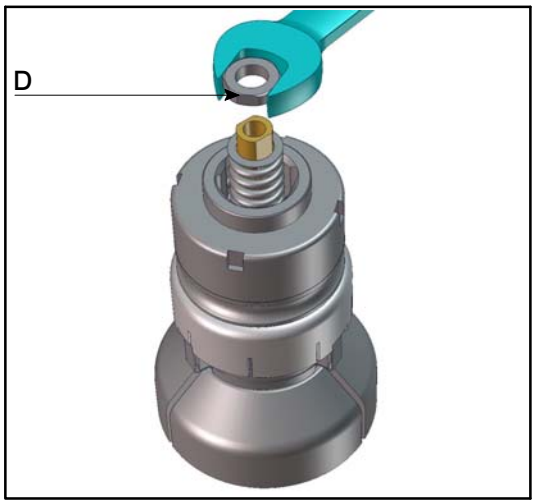


Fig.218

- Slide the spring (F) out and, if it is necessary, replace it.

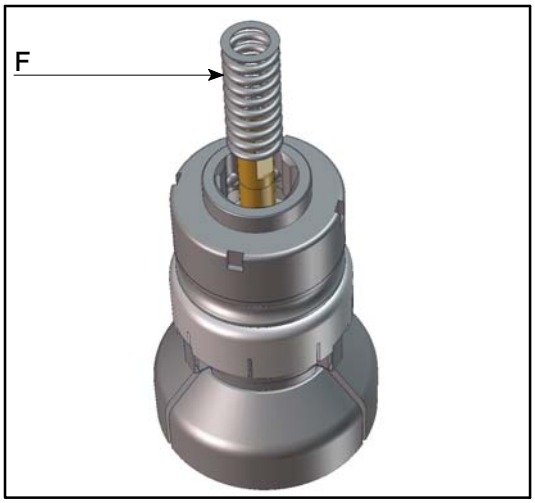


Fig.219

4.6.4. OVERHAUL OF THE FAST RELEASE DEVICE SPRING

If it is necessary to replace, the fast release device spring, proceed as follows:

- Remove the closure gripper from the capping head as described in par. 4.3. page 184.
- Remove the gripper opening unit and the gripper pressure adjustment spring as described in par. 4.6.3. page 191.
- Insert the tool (7) into a jaw.

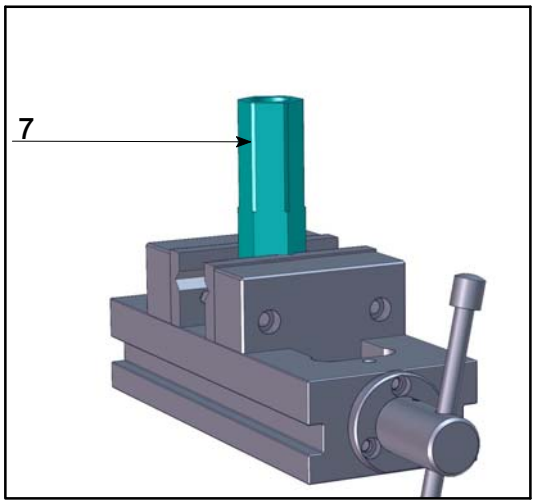


Fig.220

- Position the gripper on the tool (7).

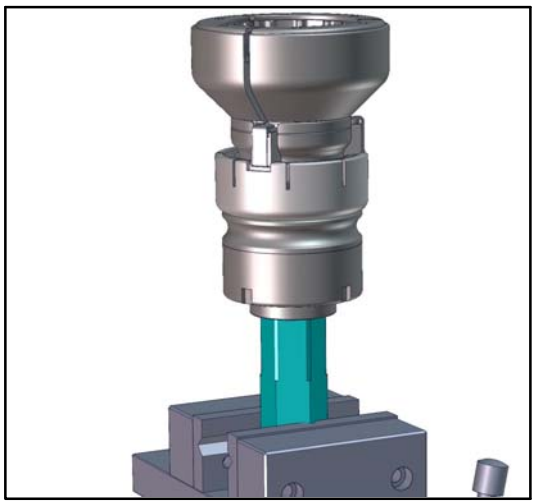


Fig.221

- Using the wrench for ring nut (8) unscrew and remove the cover (J).

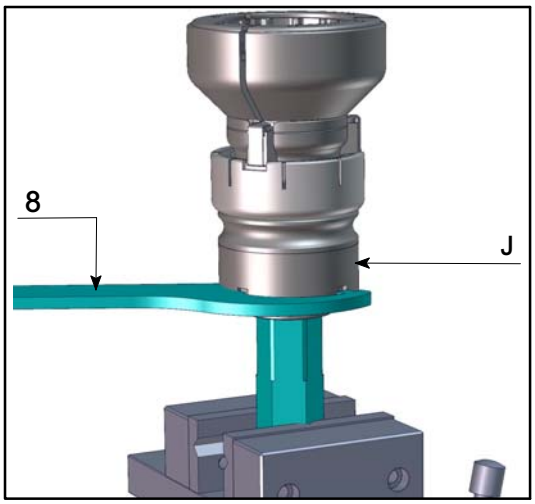


Fig.222

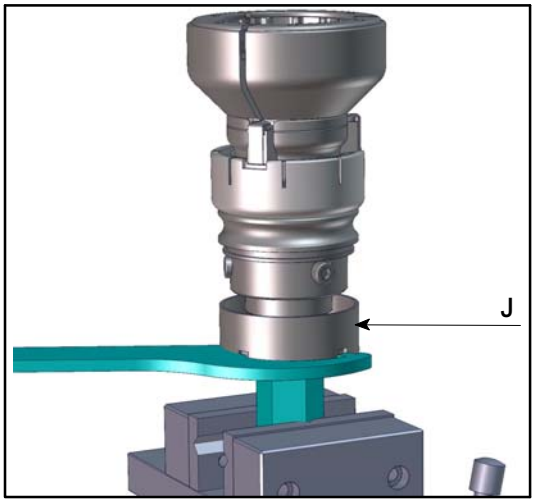


Fig.223

- Remove the closure gripper from the tool (7).

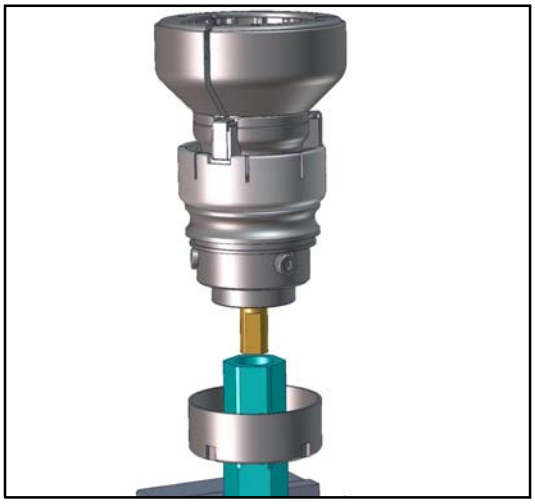


Fig.224

- Using the Allen screws wrench (6), unscrew and remove the fastening screws (K).

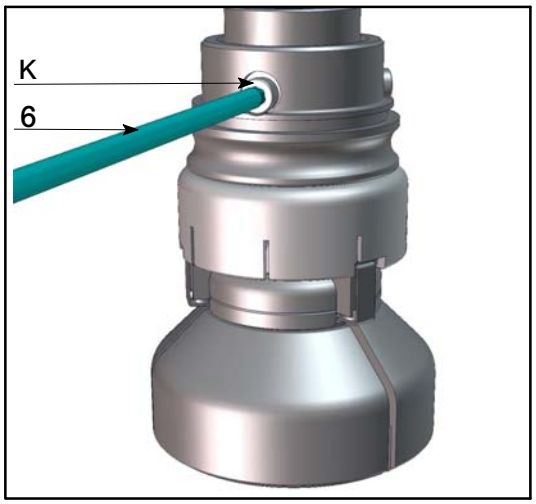


Fig.225

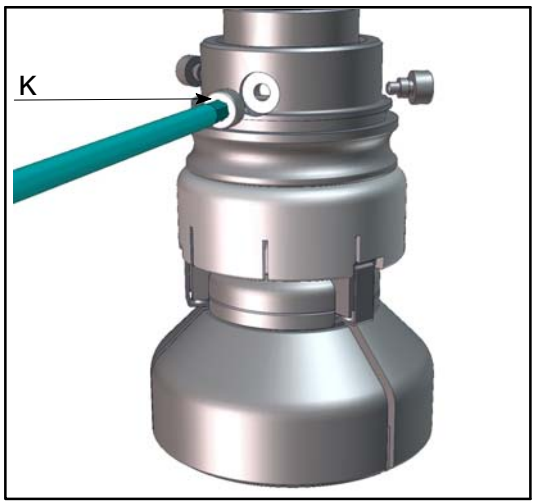


Fig.226

- Slide the sliding ring nut (L) out.

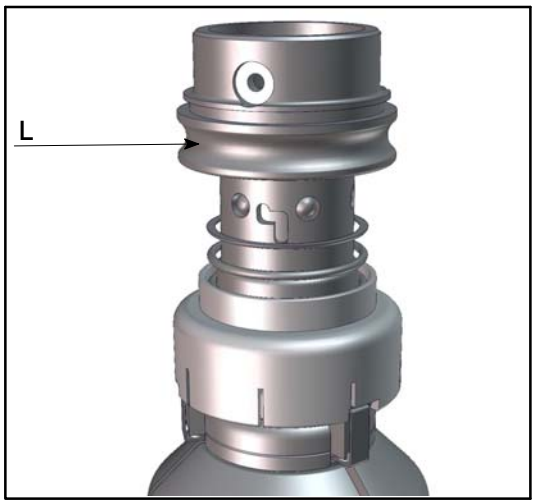


Fig.227

- Slide the fast release device spring (M) out and, if it is necessary replace it.

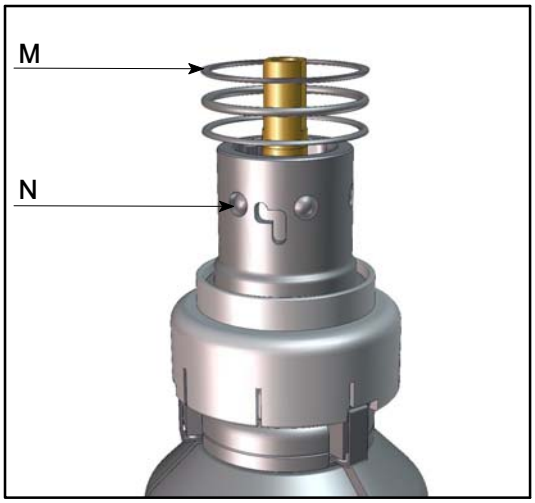


Fig.228

When removing the sliding ring nut and the fast release device spring, balls (N) are free and can lose themselves.

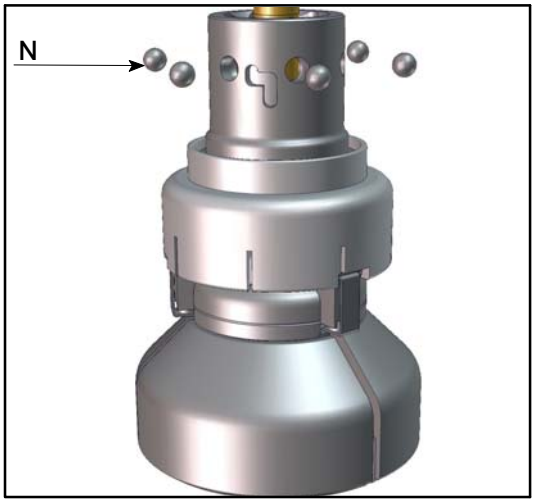


Fig.229

4.6.5. OVERHAUL OF THE GRIPPER RETURNING SPRING

If it is necessary to remove the gripper returning spring, proceed as follows:

- Remove the closure gripper from the capping head as described in par. 4.3. page 184.
- Remove the gripper extension as described in par 4.6.2. page 190.
- Straighten the screws locking plates (O) in such way to free the screws (P).

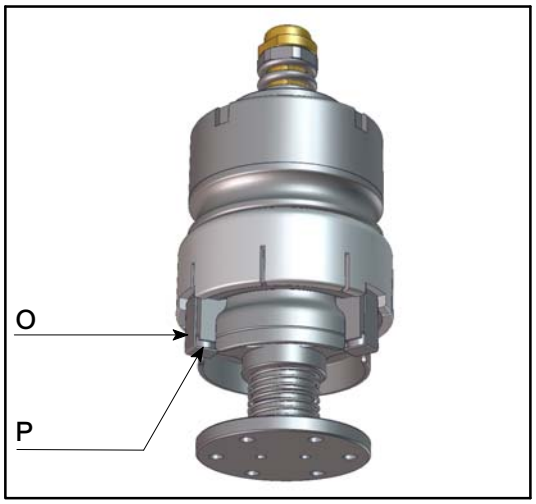


Fig.230

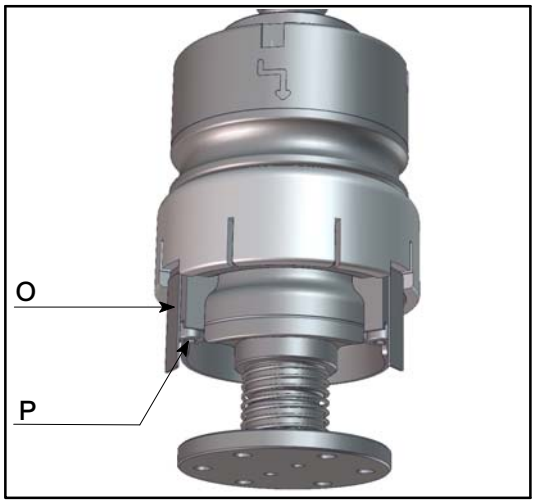


Fig.231

- Using the allen screws wrench (5), unscrew and remove the allen screws (P).

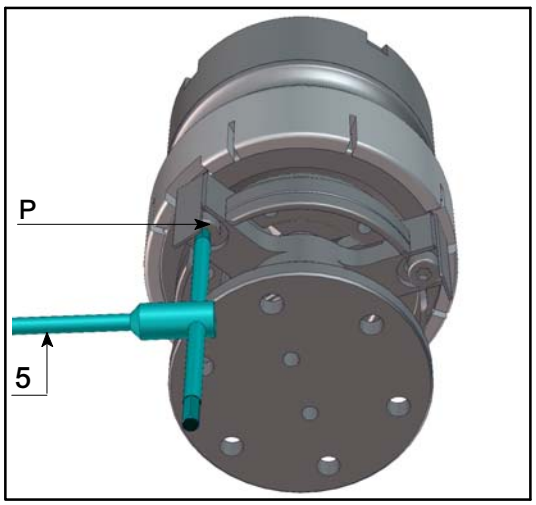


Fig.232

- Remove the stopping ring (Q).

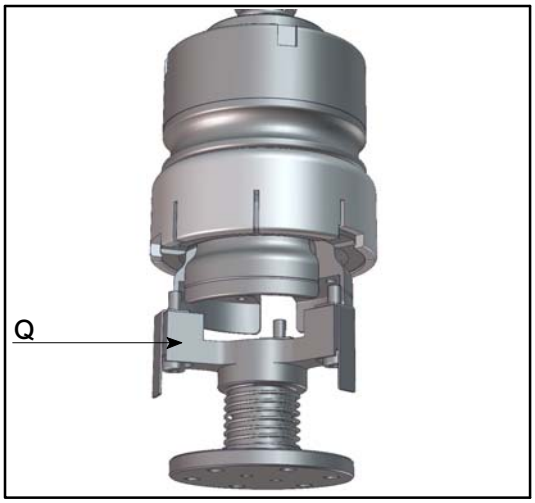


Fig.233

- Using the allen screws wrench (4), unscrew and remove the screws (Z).

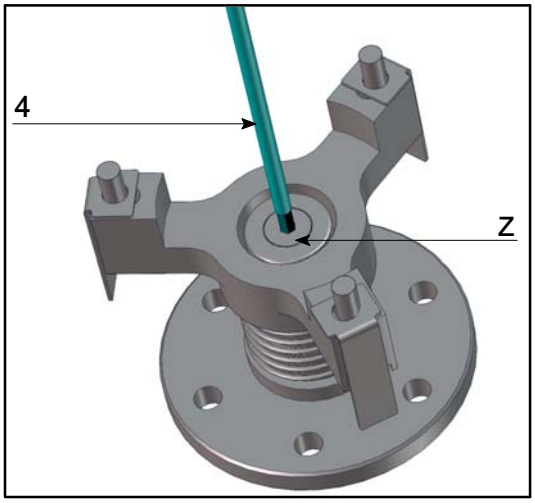


Fig.234

- Remove the washer (A).

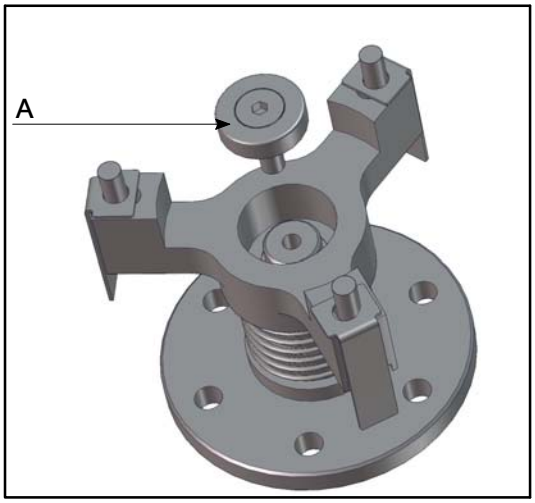


Fig.235

- Slide the cap stopping pad (**H**) out complete with the gripper return spring (**B**) from the stopping ring (**Q**).

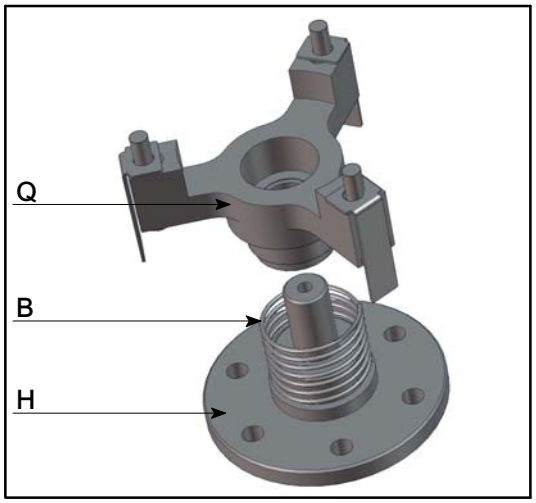


Fig.236

4.6.6. CAP GRIPPER OVERHAUL

- Remove the closure gripper from the capping head as described in par. 4.3. page 184.
- Remove the gripper opening unit and the pressure adjustment spring as described in par 4.6.3. page 191.
- Straighten the screws locking plates (O) in such way to free the screws (P).

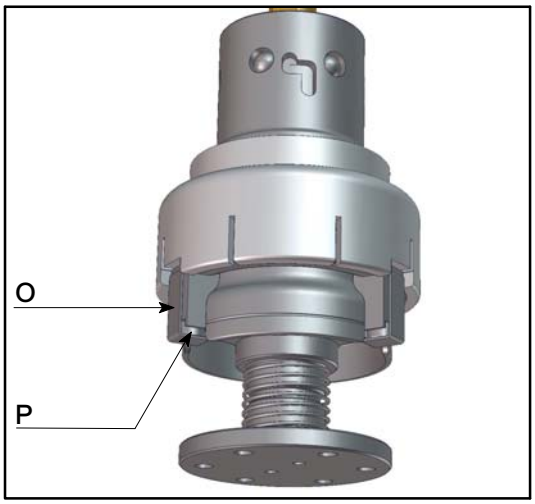


Fig.237

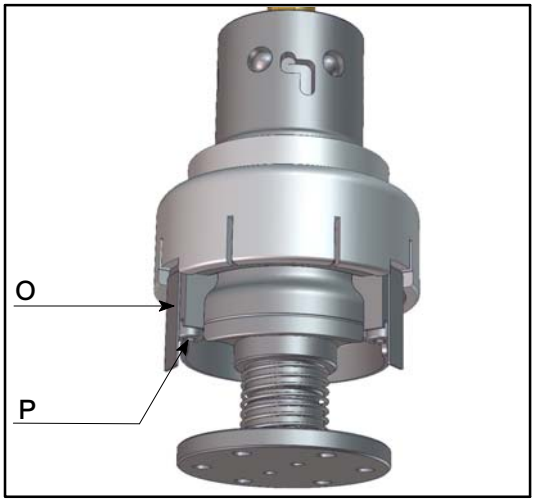


Fig.238

- Using the allen screws wrench (5), unscrew and remove the allen screws (P).

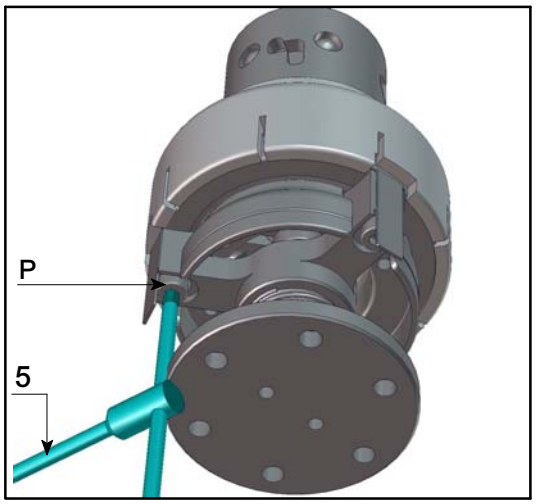


Fig.239

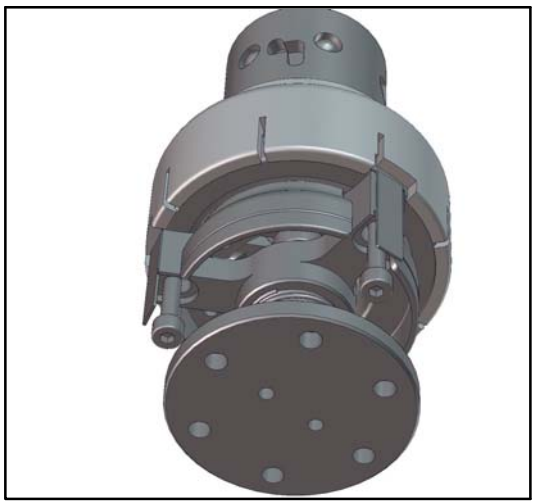


Fig.240

- Remove the stopping ring (Q).

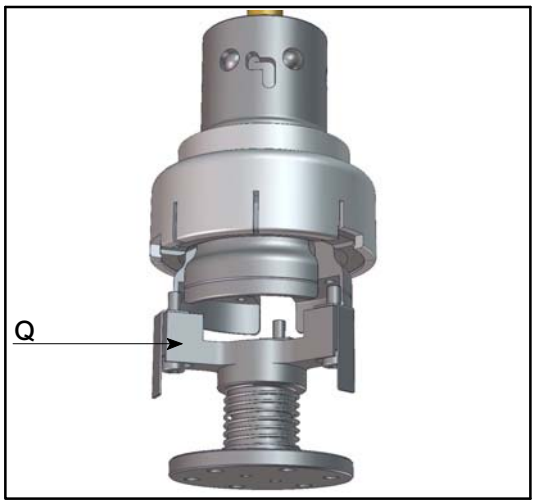


Fig.241

- Using the suitable gripper cover removing tube (10), push the gripper cover (R) upwards in such way to extract it from its position.

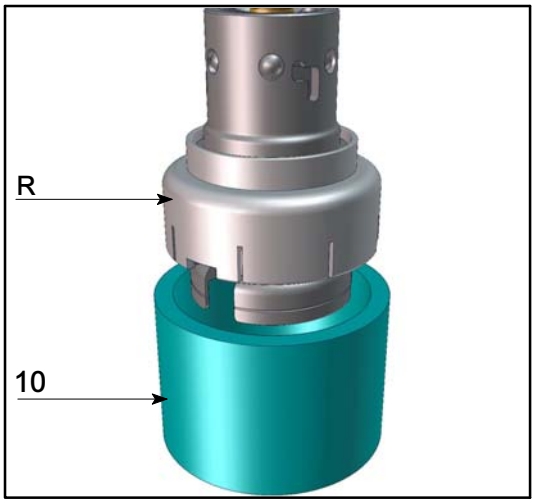


Fig.242

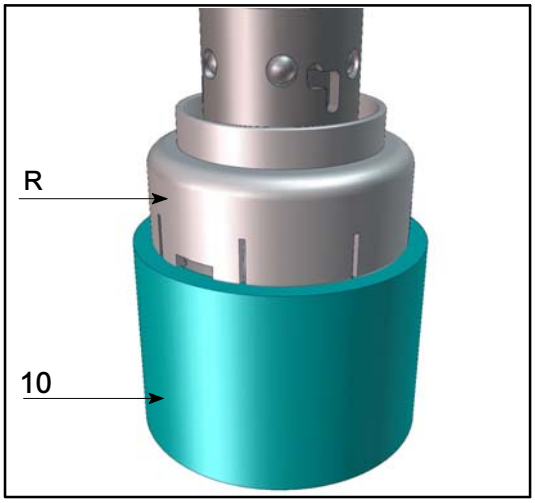


Fig.243

- Using the allen screws wrench (6), unscrew and remove the fastening screws (S).

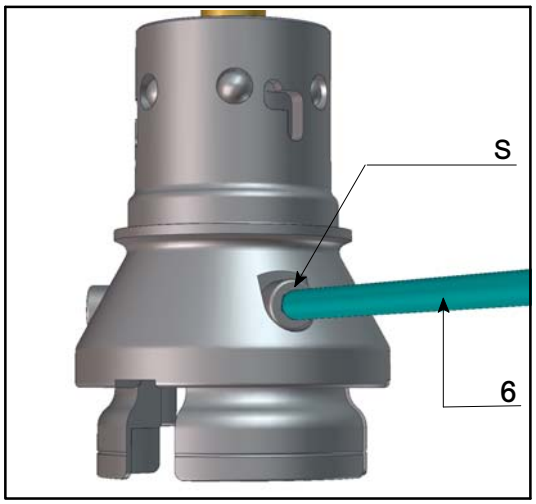


Fig.244

Fig.245

- Slide the gripper out (3 parts) (T) complete with the guide bush (U) and gripper opening pin (V).

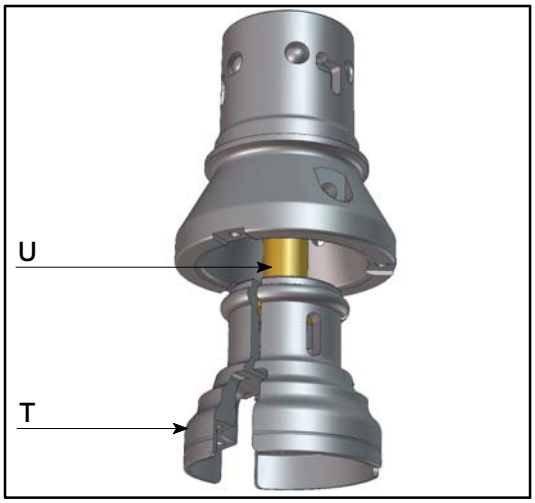


Fig.246

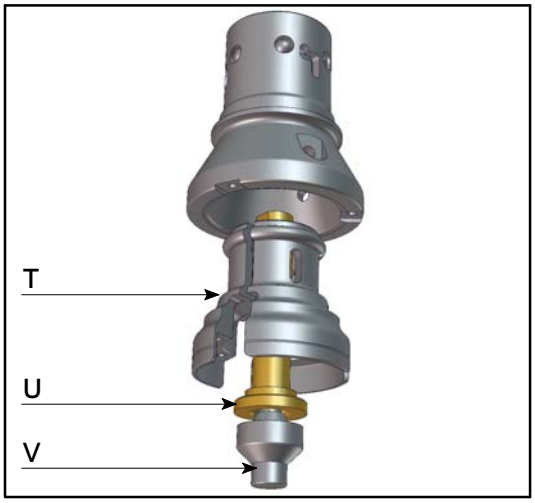


Fig.247

4.6.7. CAP GRIPPER RING OVERHAUL

If it is necessary to remove only the cap gripper ring (W) (made of 3 parts) it is necessary to:

- Unscrew the allen screws (X) using an Allen screw wrench (5).

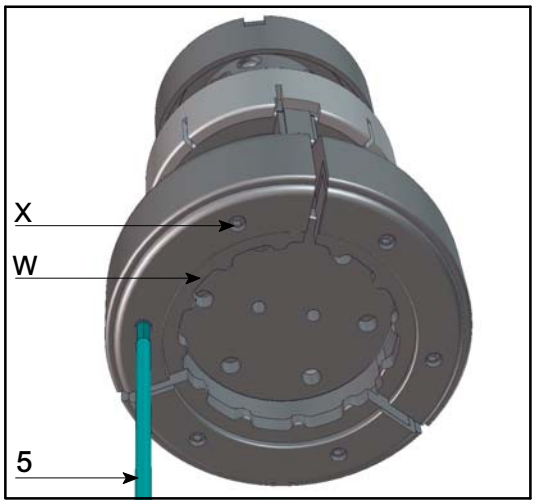


Fig.248

- Remove the 3 sectors of the screws containing cover (Y) complete with the cap gripping ring sector (W).

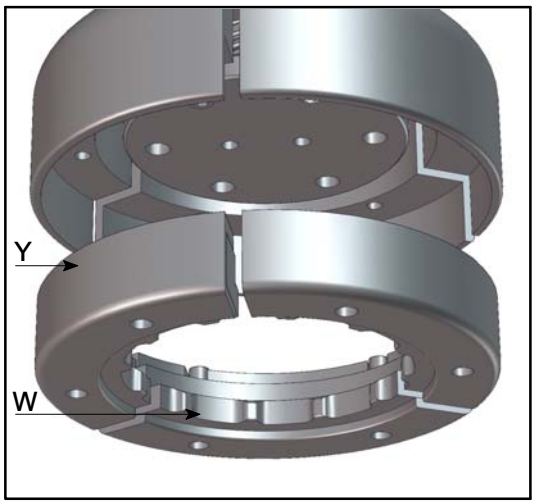


Fig.249

- Slide the sectors of the screws containing cover (Y) out from the sectors of the cap gripping ring (W).

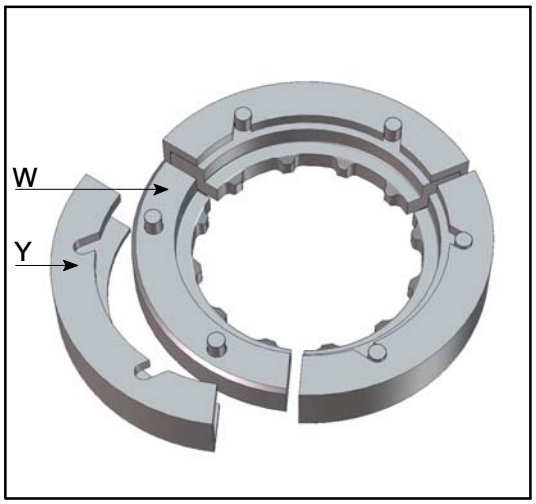


Fig.250

4.6.8. REMOVAL OF THE BALLS OF THE FAST RELEASE DEVICE

- Remove the sliding ring nut (**L**) and the fast release device spring (**M**), as described in par. 4.6.4. page 193.

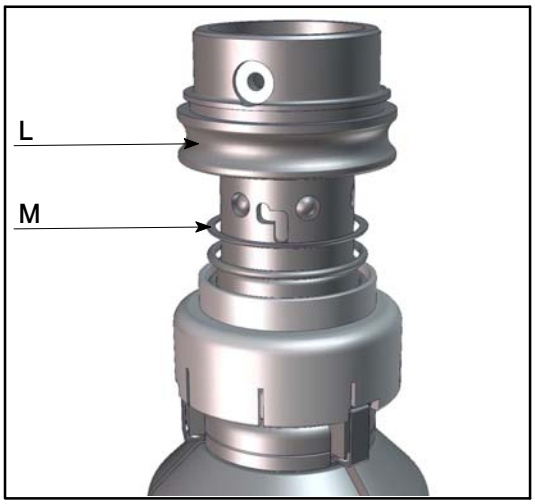


Fig.251

- Remove the balls (**N**) and, if it is necessary replace them.

<u>When removing the sliding ring nut and the fast release device spring, balls are free and can lose themselves.</u>

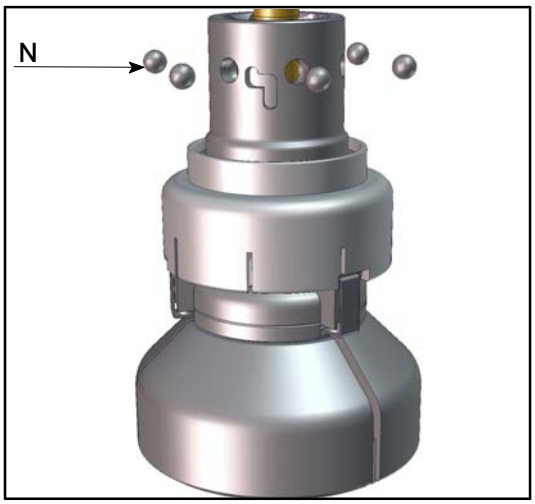


Fig.252

4.6.9. GRIPPER MOUNTING

Before mounting the closure gripper, clean and lubricate all the components.

Use lubricant type “K".

For the lubricant reference, see paragraph 9.3. on page 121.

Remount proceeding in the reverse way to what described for the dismounting.

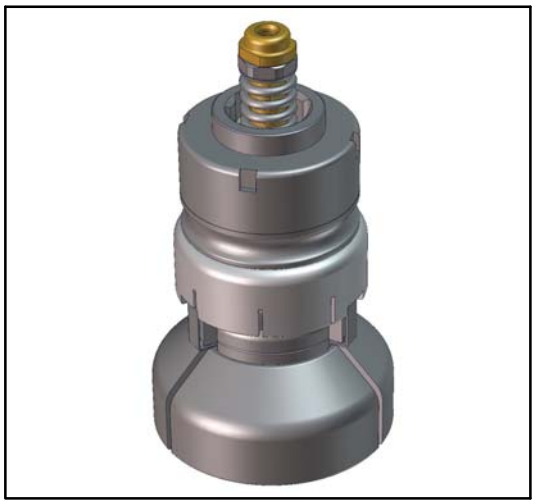


Fig.253

Remount the gripper cover (R) proceeding as follows:

- Position the gripper cover in such way that the seats (r1) are timed with the stopping ring (Q).

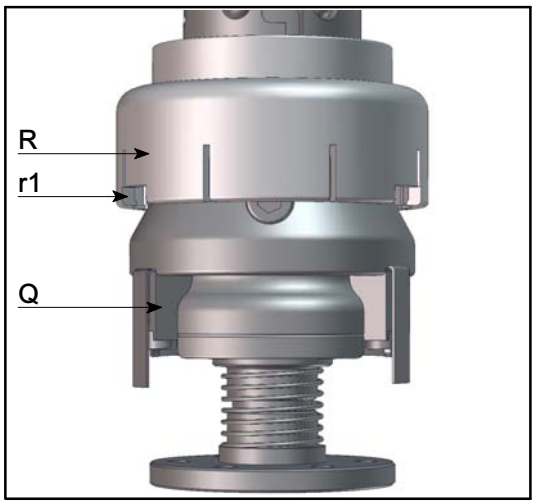


Fig.254

- Using the suitable gripper cover inserting tube (9), push downwards the gripper cover (R) in such way to position it on the gripper holder bush

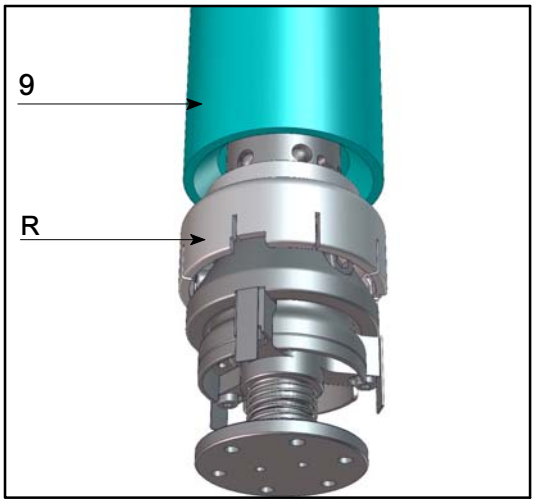


Fig.255

- The cover (R) is correctly positioned when the tooth (r2) of the cover itself is seamed under the gripper holder bush; you can hear a click when the coupling is completed. (see also detail in Fig.257)

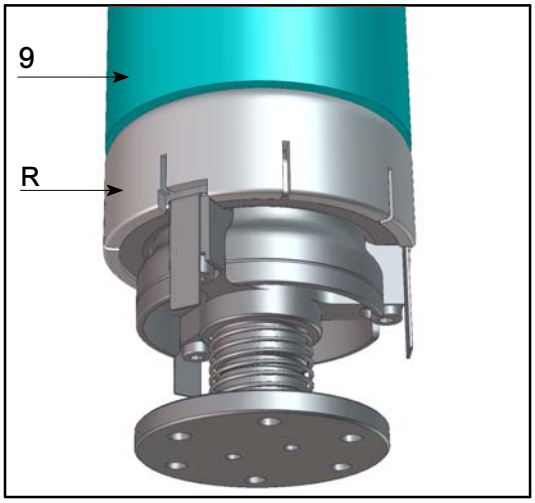


Fig.256

At the moment of gripper mounting, use, for the tightening of Allen screws, a medium resistance thread-locker substance.

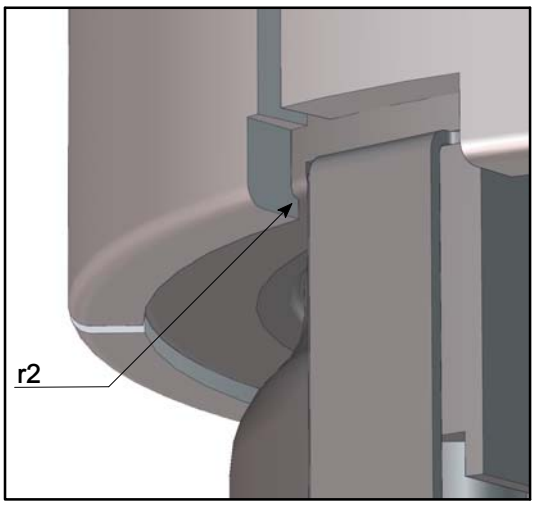


Fig.257

4.6.10. LUBRICATION OF PARTS

Use lubricant type “K".

For the lubricant reference, see paragraph 9.3. on page 121.

- Lubricate the springs.

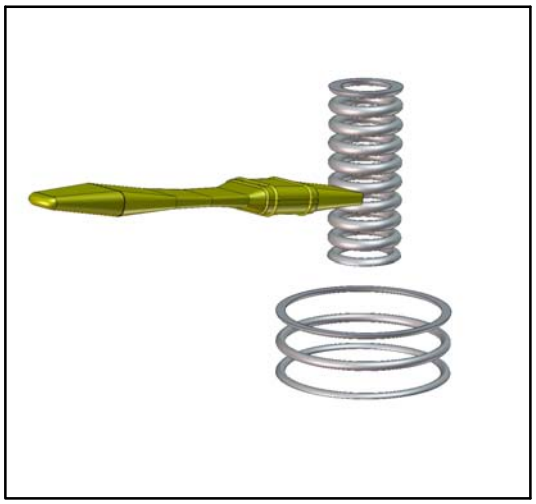


Fig.258

- Lubricate the gripper holder bush.

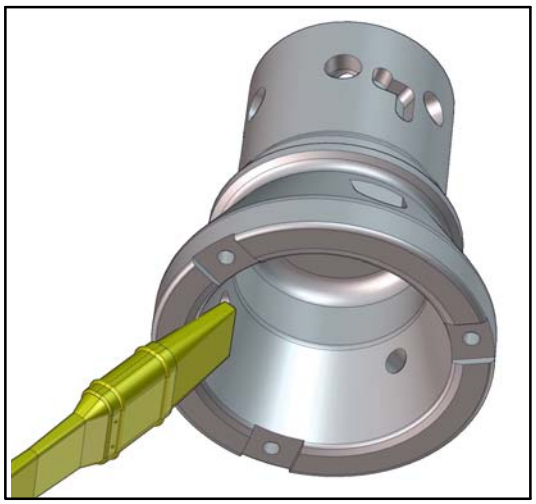


Fig.259

- Lubricate the cap gripper sectors.

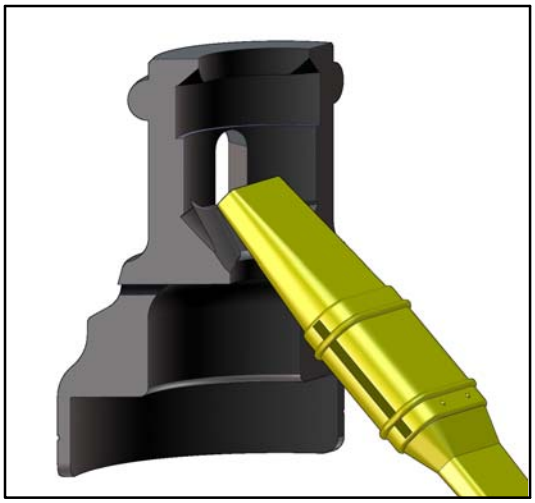


Fig.260

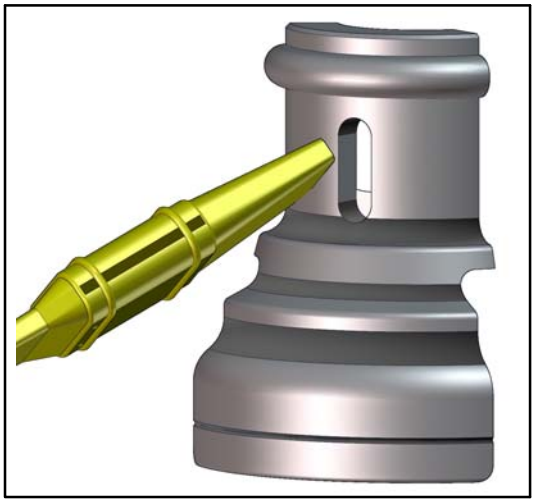


Fig.261

- Lubricate the gripper opening pin.

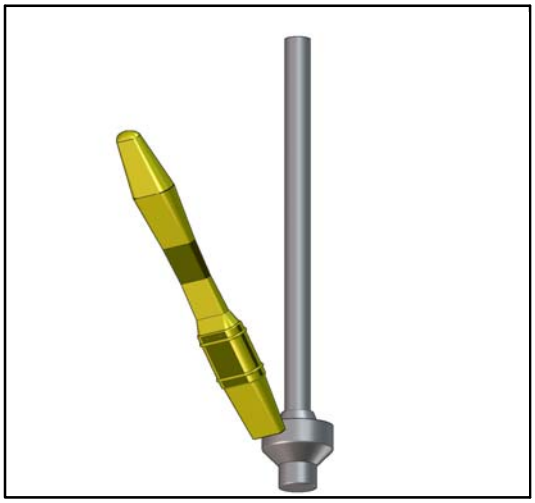


Fig.262

- Lubricate the gripper opening pin guiding bush.

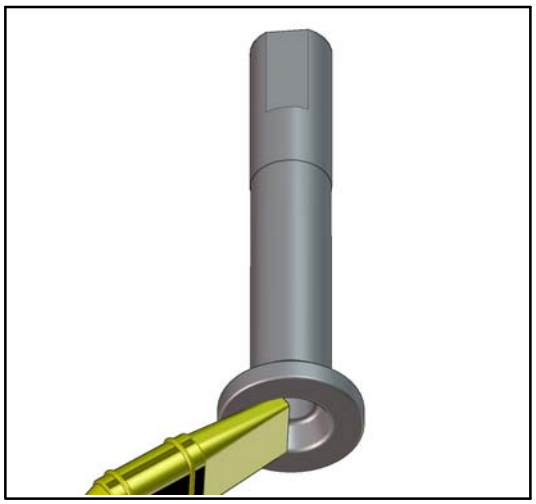


Fig.263

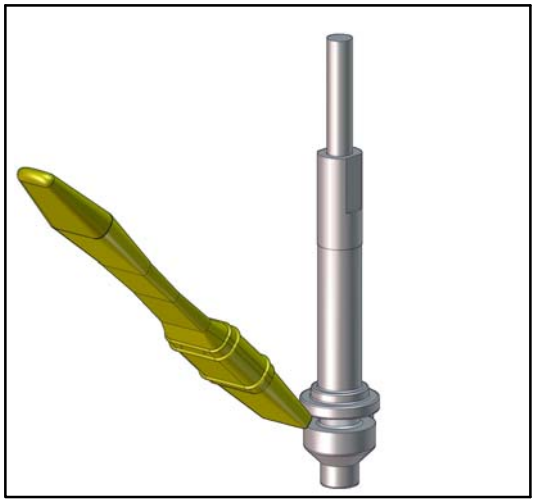


Fig.264

- Lubrication of the pin guiding bush when the gripper is remounted.

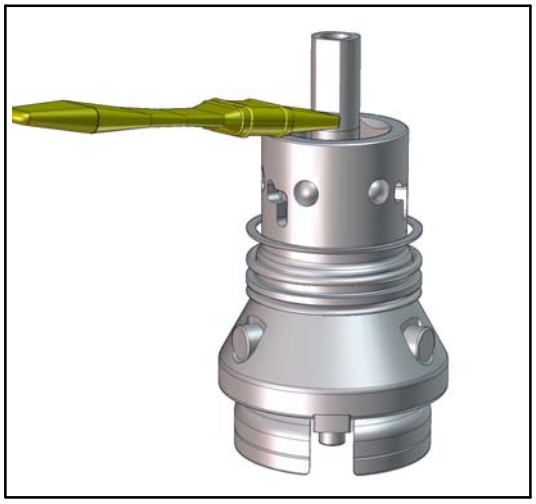


Fig.265

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1. INTRODUCTION

The machine has a *SAFETY RESET* lamp and a display for messages that highlights the safeties interventions.

For any anomaly or malfunctioning indicated by the indicator lamp or display it is necessary to find the cause and intervene immediately to provide the necessary remedes.

For all the problems that are not indicated by the lamp or display it is necessary first to find the unit where there is the problem.

The problem list, in the following pages, can be helpful to find as soon as possible the causes of problems and how to eliminate them.

It is necessary that the finding and interventions on problems are carry out with method (from the most probable cause to the least probable cause) and following a logic sequence.

Follow the scale method: a first intervention, test of the obtained result and then passage to the following problem.

The list is referees to the machine. If the machine is working in synchronism with a production line, it is necessary to read the Manuals of the other machines of the line.

The main units of the machine are the following:

- Motorization.
- Containers transfer.
- Closure unit.
- Caps/corks distribution.
- Caps/corks feeding.

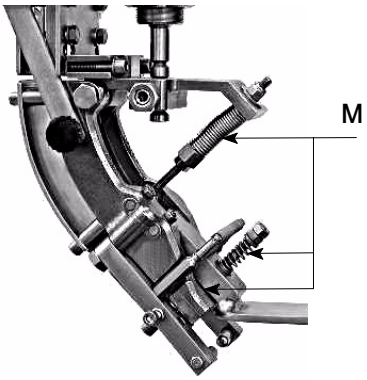
Before carrying out any maintenance or overhaul operations turn the machine on "*Maintenance State*".

PROBLEM	CAUSE	SOLUTION
The machine does not start or stops while running	Emergency stop device has been triggered. On the electric panel the lamp *SAFETY DEVICES TRIPPED* is on moreover, on the display appears the relevant message to the intervened security.	Check that the *EMERGENCY* button has been pressed. If yes, release it. Restart the machine pressing the *SAFETY RESET* button and then the *START* button.
		Check that the hatches of the machine are closed. Restart the machine pressing the *SAFETY RESET* button and then the *START* button.
		A security device of the container movimentation has been triggered. Remove deformed or broken containers or parts of containers and reset the equipment timing. Close protection hatches and restart the machine pressing the *SAFETY RESET* button and then the *START* button.
	Intervention of magneto-thermic protection of one or more motors. On the display appears the relevant message to the intervened security.	Find the cause of the overloading (bearings, reducer seizure, foreign bodies into the toothing of gearings and movement trasmission). Disconnect the general switch, open the control panel and eventually press the magneto-thermic button that has been triggered. Close the panel and press again the general switch, the *THERMAL CUT-OUT RESET* lamp is off. Restart the machine pressing the *SAFETY RESET* button and then the *START* button.
	The *START* button has not been pressed.	Press the *START* button.

PROBLEM	CAUSE	SOLUTION
The machine does not start or stops while running	Lack of containers in entrance.	Check the causes that prevent the containers flow.
		NOTE: **As soon as the containers arrive near the entrance, the machine stars.**
		If in entrance containers regularity arrive, check the correct efficiency of machine start photocells.
	Containers accumulation in exit.	Check the causes that prevent the containers downflow.
		NOTE: **As soon as the overload is over, the machine starts.**
		If there is no overload in ext, check the efficiency of machine stop.
	Lack of caps into the caps chute.	Refill the caps sorter and check eventual obstructions.
		NOTE: **As soon as the caps cover the caps chute photocells, the machine starts.**
		If there is no lack of caps or obstruction, check the efficiency of the photocells.

PROBLEM	CAUSE	SOLUTION
Lifting or lowering the head, it does not move in height.	Interferences with the containers conveying equipment, foreign bodies into the lifting mechanism, other things	Find the cause that prevents the lifting and eliminate it.
	The fixing screw of the sliding bush has not been loosened.	Loosen the screw.
	Maximum or minimum height range limits of the head have been reached.	Check that the machine is prepared for the format of container to handle. If yes, contact the *Technical Assistance Service.*
Containers are deformed or broken or are badly driven during the load phase	The star-wheel is not timed with the turret.	Time the star-wheel with the turret. Time the star-wheel with the turret and the worm with the star-wheel.
	Equipments for the containers transfer are not suitable.	Replace the equipment with the suitable one for the format to handle.
Containers are deformed or break during the closure phase	The head is too low.	Place the head at the correct height for the container to handle.
	Equipments for the containers transfer are not suitable.	Replace the equipment with the suitable one to the format to handle.
Caps do not descent from the caps sorter	The exit mouth of the caps sorter is obstructed.	Remove any caps or part of caps or foreign bodies.
		Check on manometers that the pressure of air jets is correct.
	Off size or deformed caps.	Use caps of the suitable format and with uniform characteristics.

PROBLEM	CAUSE	SOLUTION
The cap is badly screwed on the bottle .	Incorrect closure gripper.	Use the suitable gripper for the cap to handle.
	Caps fragments into the closure gripper.	Eliminate the fragments into the gripper.
	Insufficient gripper pressure.	Adjust the gripper pressure (see the relevant chapter).
	Central star-wheel or neck guide not suitable to the format of bottle to handle.	Replace the central star-wheel and neck guide with suitable ones to the format to handle.
	Compensation spring is broken.	Replace the spring with a new one. For the replacement see the relevant paragraph about the capping head.
	Containers/caps threads do not conform.	Check the correct correspondence between the bottle to handle and the used cap.
The cap is not completely screwed on.	Insufficient magnetic clutch.	Increase the closure torque of the head. For the adjustment see the paragraph about the capping head.
	The cap slides into closure gripper.	Check the state of wear of grippers and eventually replace it with a new one.
		Check that the gripper is suitable to the cap to handle, eventually replace it with a suitable one.
	Bottles turn on themselves.	Check the state of wear of centering device teeth.
	Springs of the head do not work.	Push upwards the head body. There must be the the elastic reaction of the compensation spring. For the replacement see the paragraph about the capping head.
The cap is screwed too much.	Excessive magnetic clutch.	Decrease the closing torque of the head. For the adjustment see the paragraph about the capping head.

PROBLEM	CAUSE	SOLUTION
Problems in cap distribution.	Caps fall from the head.	Insufficient gripper pressure. Adjust the pressure of the gripper as described in the paragraph about the closure gripper.
	Incorrect caps gripper.	Check the head height.
		Check the state of working of springs (M) of the caps positioning device. 
		Check that the caps positioning device is perfectly operating. If not, contact t the *Technical Assistance Service.*
		Check that the transfer device is suitable to the cap to handle. If not, replace it.

Performed training sheet

By user care

MACHINE AUTOMATIC SINGLE HEAD

model: _____ serial no. _____

manufacturing year: _____ manufacturer: *AROL S.p.A.*

On _____ at the Company _____
from _____ to _____ a training course concerning the use of machine has been held.

Trainer/s:

Mr. _____

Mr. _____

Mr. _____

Mr. _____

The subject dealt with are the ones included in the “Use and maintenance” manual enclosed to the machine.

A practical training on the machine: has been forseen ☐☐☐ ☐☐

Attendees to the course:

NAME	CHARGE	SIGNATURE

The Attendee's signature implies the understanding of the dealt with subjects.

Trainer/s signature/s:

Mr. _____

Mr. _____

Mr. _____

Mr. _____