



USE AND MAINTENANCE MANUAL

Translations of the original instructions

INDUSTRIAL GRINDER

MAC5

Type
00000

Serial number
0000000

Customer
00000000



Read the instructions carefully

Manufacturing in Italy



Introduction



This manual provides you with all of the information needed for the use and maintenance of your machine. Correct operation and its duration will depend on good maintenance and attention during use.

Before leaving the production site, this specific model has undergone a strict test to ensure maximum reliability, however it is necessary to ensure that the machine has not been structurally damaged during transportation which could be detrimental to its operation and safety. This manual is to be considered an integral part of the machine and must accompany it until it is destroyed.

If it gets lost or damaged contact **COLOMBINI** for a replacement copy.

The technical information contained in this manual is the property of **COLOMBINI** and must be considered confidential.

Reproduction, even partial, of the graphic design, text and illustrations is prohibited by law.

Some of the parts depicted in the illustrations, present in this manual and on the relative tutorial videos, may be different than those on your machine. Some components may have been removed to make sure the illustrations are clear.

To make the instructions more complete, the Colombini Service Technical Assistance Service has made a series of video tutorials available that can be obtained with the QR Codes shown on this manual in correspondence with certain operations.

However, it is first necessary to carefully read all the instructions provided in this manual. The videos do not replace these instructions.

This manual has been divided into sections to make it easier to consult; each section is identified with a specific graphic symbol.

The subjects covered in this manual are those expressly required by the “EC Directive 2006/42” and the technical specifications provided are those supplied by the manufacturer at the time of writing.

This manual must be kept in a place accessible to all personnel assigned to running and doing maintenance work on the machine.

The court of TURIN (Italy) has jurisdiction for any disputes.

COLOMBINI
SERVICE
service@colombini.srl

Our technicians are at your complete disposal for any problem.

Tel.: 0039.011.8211407
Fax: 0039.011.8958221

THIS MANUAL MUST ACCOMPANY THE MACHINE IF IT IS RESOLD!

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DECLARATION



OF CONFORMITY

(For machines not included in annex IV according to Italian Presidential Decree no. 17 of 27/01/2010)
EC Directive 2006/42, Annex II part A



The manufacturer

COLOMBINI s.r.l.

Via De Francisco 130/16 - 10036 - SETTIMO TORINESE (TO) - ITALY

Tel. 0039.011.8211407 Fax 0039.011.8958221

E-mail: info@colombini.srl

DECLARES

under its own responsibility that the machine model

INDUSTRIAL GRINDER series MAC 5

Type

0000

Serial n°

0000

Year of manufacture

0000

to which this declaration refers conforms to the essential safety requirements contained from the directives:

EC Directive 2006/42 - Machinery Directive

EC Directive 2014/30 - Electromagnetic compatibility,

EC Directive 2014/35 - Low voltage.

The harmonised legislation used as a reference for designing, manufacturing and testing of the machine are listed in the technical file stored at Colombini S.r.l.

The person authorised to construct the technical file is Mr. Paolo Colombini at Colombini in Via De Francisco 130/16 - Settimo Torinese (Turin)

**his declaration shall lose its validity in the event of modifications made on the machine,
performed without the authorisation of Colombini s.r.l.**

Settimo Torinese (TO),

The legal representative

COLOMBINI s.r.l.
Paolo Colombini
Amministratore

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FCMs DECLARATION

*Declaration of conformity for materials and objects intended
to come into contact with foodstuffs*

The manufacturer

00000000

The manufacturer

COLOMBINI s.r.l.

Via De Francisco 130/16 - 10036 - SETTIMO TORINESE (TO) - ITALY

Tel. 0039.011.8211407 Fax 0039.011.8958221

E-mail: info@colombini.srl

Hereby

DECLARES

**under its own responsibility that the machine model
INDUSTRIAL GRINDER series MAC 5**

Type

00000

Serial n°

0000

Year of manufacture

0000

is compliant

with the following EU legislation:

EC regulation 1935/2004;

EC regulation 1985/2005;

EC regulation 2023/2006;

and the following Italian law: Ministerial Decree 21/03/1973.

The grinder is designed and built to reduce granular,
organic and inorganic products to powder through the use of cutting tools.

Settimo Torinese (TO),

The legal representative

COLOMBINI s.r.l.
Paolo Colombini
Amministratore

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*The electrical diagrams are located inside the electrical enclosure
in a specific container.*

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1. INFORMATION SECTION



MACS
by COLOMBINI

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1.1 Machine description

The purpose of COLOMBINI grinders is to pulverise organic and inorganic granular products by means of cutting discs. Because the results obtained from ground product depend not only on its granulometric distribution, but also on the intrinsic properties of the powder, we did not limit our study and design of grinders and tools to granulometry: we also focused on how the product is pulverised, so that the particles can best maintain their organic properties and, in case of powders for infusions, so that the preserved substances can be easily released. Therefore, a large number of grinding issues can be handled and solved, since the system makes it possible to obtain:

- the best yield in the use of powders
- excellent preservation of organoleptic properties
- minimum energy consumption
- high precision, and repeatability of results
- reduction in weight decrease
- relatively low working temperatures
- a wide range of granulometries

These advantages suggest the use of new grinders in the food industry, even if the machines have a valid application for grinding inorganic products.

The MAC 5 Grinder is intended for pulverising organic and inorganic products, in the presence of fluids, with low consumption since it supplies a work room of relatively small dimensions. The machine can work at low temperature, using nitrogen in liquid or gaseous state; the liquid flow rate can be automatically regulated using a proportional valve located upstream from the grinder on the liquid nitrogen feed line. The liquid nitrogen plenum chamber must be equipped with instruments for setting and automatically regulating the temperature and pressure (from -160 °C to 0 °C and from 2 bar to 5 bar).

The use of cryogenics with COLOMBINI grinders makes it possible to:

- set the work temperature and keep it constant
- obtain highly fine granulometries,
- increase the yield from work units
- improve granulometry uniformity

Inert gas is used for processing in non-oxidising atmosphere and cryogenics is used for processing those products that, due to their specific characteristics and degree of desired fineness, require drastically lowering the working temperature-

COLOMBINI grinders basically consist of a support structure or base, a stainless steel or light alloy body, a unit for differentiated micrometric setting of the distance between the rough grinding and fine grinding discs, an adequately sized electric motor, a closed-circuit lubrication system for the main shaft, a metering/rough grinding unit, a pair of fine grinding discs, a hopper (with static magnetic metal separator and electric control panel) to feed beans.



The layout of the discs at the lower end of the work shaft ensures a constant heat dispersion in the direction opposite that of powder discharge thus eliminating all obstacles to free product flow near the discs. The ground product is no longer affected by the concentration of heat generated by friction against the walls of collection chambers or of forced discharge chutes; therefore, no cooling system is needed. An increase in the head body temperature is perfectly normal and does not affect the set granulometry. The grinder and work units are designed to ensure that the interior of the grinder remains clean. Due to the reduced dimensions compared to the high hourly production, 1200 kg/h, the MAC 5 operating units can be applied directly on packaging machines or storage silos, thus making it possible to create highly functional systems and at a relatively reduced cost.

The product is pulverised in two uninterrupted steps:

- “pre-breaking” by a conical metering/rough grinding unit,
- “fine grinding” by means of a pair of cutting tools with opposing flat or conical discs.

Special attention is paid to the choice of materials used for the work units: tempered alloy steels are used for the metering/roughing units, and fine grinding tools are made exclusively of sintered hard metal, with extremely high hardness and resistance to wear. COLOMBINI has supplied this grinder for single-type productions, i.e., specifically for the type of product requested by the customer. Consequently, the tools and work settings are valid ONLY for grinding that type of product. The grinder is supplied with a fixed speed based on the type of product requested for grinding (single-type), it can be equipped with a speed variator upon request to optimise the cutting conditions of the work units.

The grinder is controlled by electrical equipment that via a programmable logic system is able to manage all the operating cycle sequences, requested by the Customer and memorise them on a specific program.

The machine is fitted with fixed guards to protect the transmission parts.

Some mobile elements involved in processing, cannot be enclosed by guards due to their conformation. However, safety is ensured by the machine characteristics and operator's intervention on specific controls (emergency button).

The machine controls are located on the main push button panel on the front of the electric panel. It is used to perform all the controls related to the machine cycle and monitors, through indicator lights, the machine status. The mushroom head button for general emergency is present in the right centre part. The general panel also includes the displays of the measurement instruments and instruments for recording some machine parameters.

1.2 Manufacturer's identification information

COLOMBINI s.r.l.

Via De Francisco 130/16 - 10036 - SETTIMO TORINESE (TO) - ITALY

Tel. 011.8211407

Fax 011.8958221

E-mail: info@colombini.srl



1.3 Identification plates

For any communication with the manufacturer always quote the information shown on the machine identification plate.

1.3.1 Machine identification plate/EC Marking

 	
via A. De Francisco 130/16 10036 Settimo t.se (TO) ITALIA +390118211407 info@colombini.srl	
TIPO/TYPE	
MATRICOLA/SERIAL NUMBER	
ANNO DI COSTRUZIONE/YEAR MANUFACTURING	
PESO/WEIGHT	

(Located on the machine structure)

1.3.2 Electric panel identification plate/EC marking (low voltage)

 	
via A. De Francisco 130/16 10036 Settimo t.se (TO) ITALIA +390118211407 info@colombini.srl	
IP	
Power supply	
Max load current	
Serial number	
Manufacturing Year	
Phase	
Frequency	
Ics	
Machine	

(Located on the electric panel)

The declaration of conformity of the electric panel supplied by the manufacturer is filed in the technical file at **COLOMBINI Srl**.



1.4 Intended uses

This specific model grinder is designed, built and protected to reduce granular, organic and inorganic products to powder through the use of cutting tools.

The characteristics of the product are listed in the technical specifications attached to this manual.

Any use other than that specified by the customer's order and/or manufacturer's technical specifications is considered **IMPROPER**.

The machine is intended for professional industrial use.

1.5 Permitted ambient conditions

To ensure the correct operation of the machine it must be positioned sheltered from atmospheric agents (rain, hail, snow, fog, suspended dust, etc.) with an operating ambient temperature of $\leq 30^{\circ}\text{C}$ and relative humidity not greater than 70 %.

The work environment must be clean, sufficiently luminous and without an explosive atmosphere.

1.6 Noise level

Noise level measurements were performed according to what is established by Standard UNI EN ISO 11202 : 2021.

The sound power level tests performed on this specific machine model with no load operation report a sound pressure of:

$L_{pa} < 60\text{ dB}$



WARNING!

Pursuant to the articles of Italian Legislative Decree 277/91, workers exposed to sound pressure levels higher than 85 dBA must be protected by specific personal protection equipment.



Therefore, if processing includes the use of such conditions, it is necessary to provide workers with homologated individual hearing protection devices and inform them on the risks resulting from exposure to noise.



1.7 Technical specifications

1.7.1 Grinder technical specifications

WIDTH:	938 ÷ 1300 mm
DEPTH:	1103 mm
HEIGHT:	1452 mm
WEIGHT:	550 Kg
PRODUCT LOADING SURFACE:	2548 mm
PNEUMATIC SYSTEM OPERATING PRESSURE:	6 bar
COMPRESSED AIR CONSUMPTION:	normal litres < 2
NITROGEN SYSTEM OPERATING PRESSURE:	PA (BAR) 0.5
NITROGEN FEED TEMPERATURE:	ambient
OPERATING VOLTAGE:	400 V THREE PHASE 50 HZ + NEUTRAL
TOTAL INSTALLED POWER	30 kW
ROUGH GRINDING DISC ROTATION SPEED:	Minimum speed 50 RPM Max speed 1000 RPM
UPPER DISC ROTATION SPEED:	Minimum speed 400 RPM Maximum speed 1200 RPM
LOWER DISC ROTATION SPEED:	Minimum speed 400 RPM Maximum speed 1600 RPM



1.7.2 Electrical cabinet technical specifications

General specifications

Dimensions:	1200x500x1700
Weight:	160 Kg
Rated voltage:	400 V AC
Phases:	3 + N + earth
Maximum current absorbed at full load:	80 A
Higher load current:	36 A
Maximum inrush current:	125 A

Ambient conditions

Ambient temperature	0 °C min. / + 40 °C max
Relative humidity	50 % (with 40 °C max)



The manufacturer shall not be held liable if the electrical equipment is used outside these limit conditions. Specifically, use in explosive and/or flammable atmospheres is prohibited.

Protection equipment against overcurrents

Disconnection power < 16 kA

Electric panels

Protection against penetration of powders, liquids, etc. IP 54

Protection of components against direct contact IP 2X

Manual circuit breaker

Door lock control.

Power supply conductors

Attach the following to the terminals connected in the panel and marked with:

R for phase 1

S for phase 2

T for phase 3

PE for protection conductor

N for neutral

Control circuits

Voltage 24 V d/c

Fan 220 V ac

Power supply line requirements

Rated voltage: 400 V AC

Phases: 3 + N + earth

Current: 80 A

Conductor minimum cross section: 25 mm²

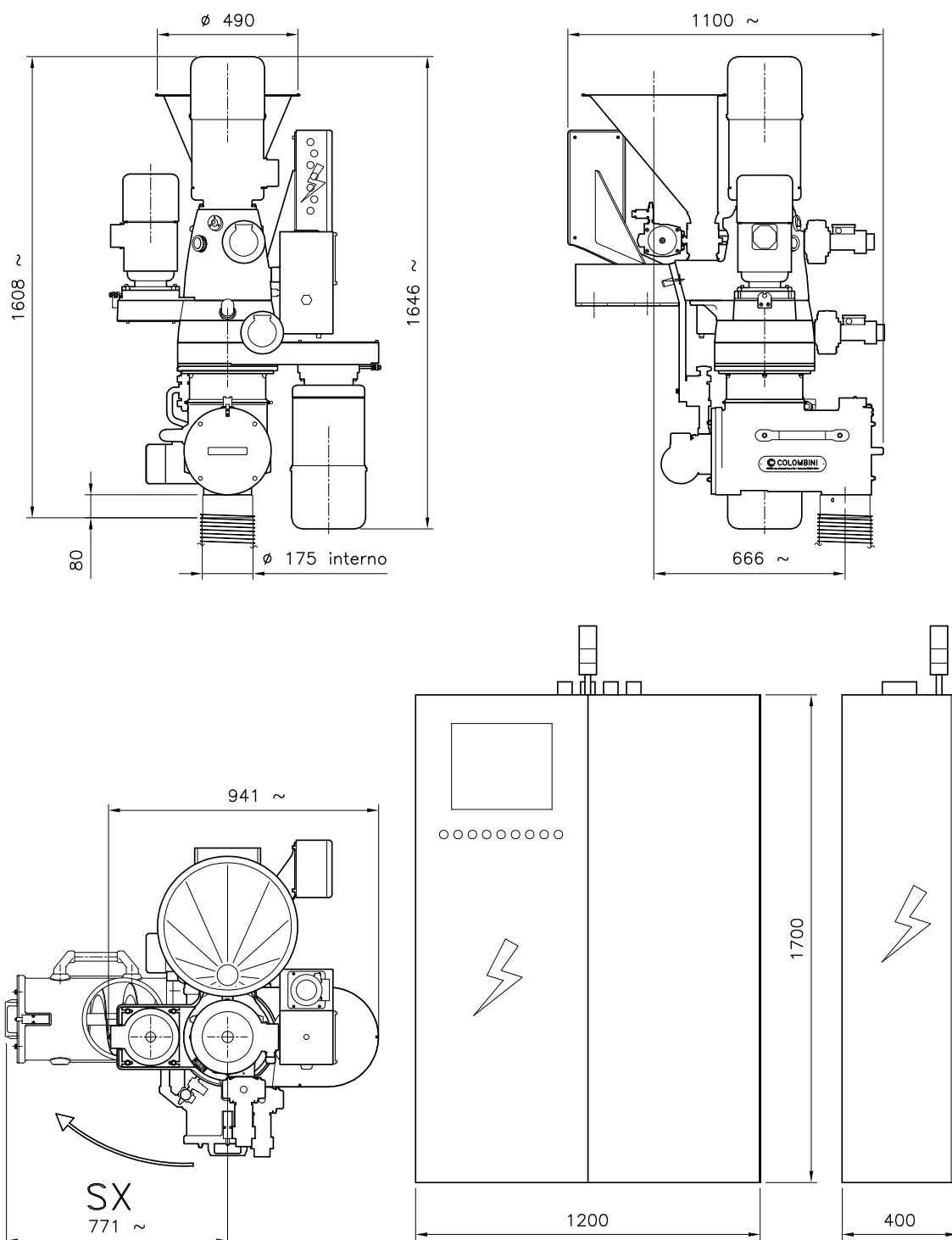


The user must install a protection device against overcurrents on the line with the following specifications:

Disconnection power < 16 kA



1.8 System overall dimensions

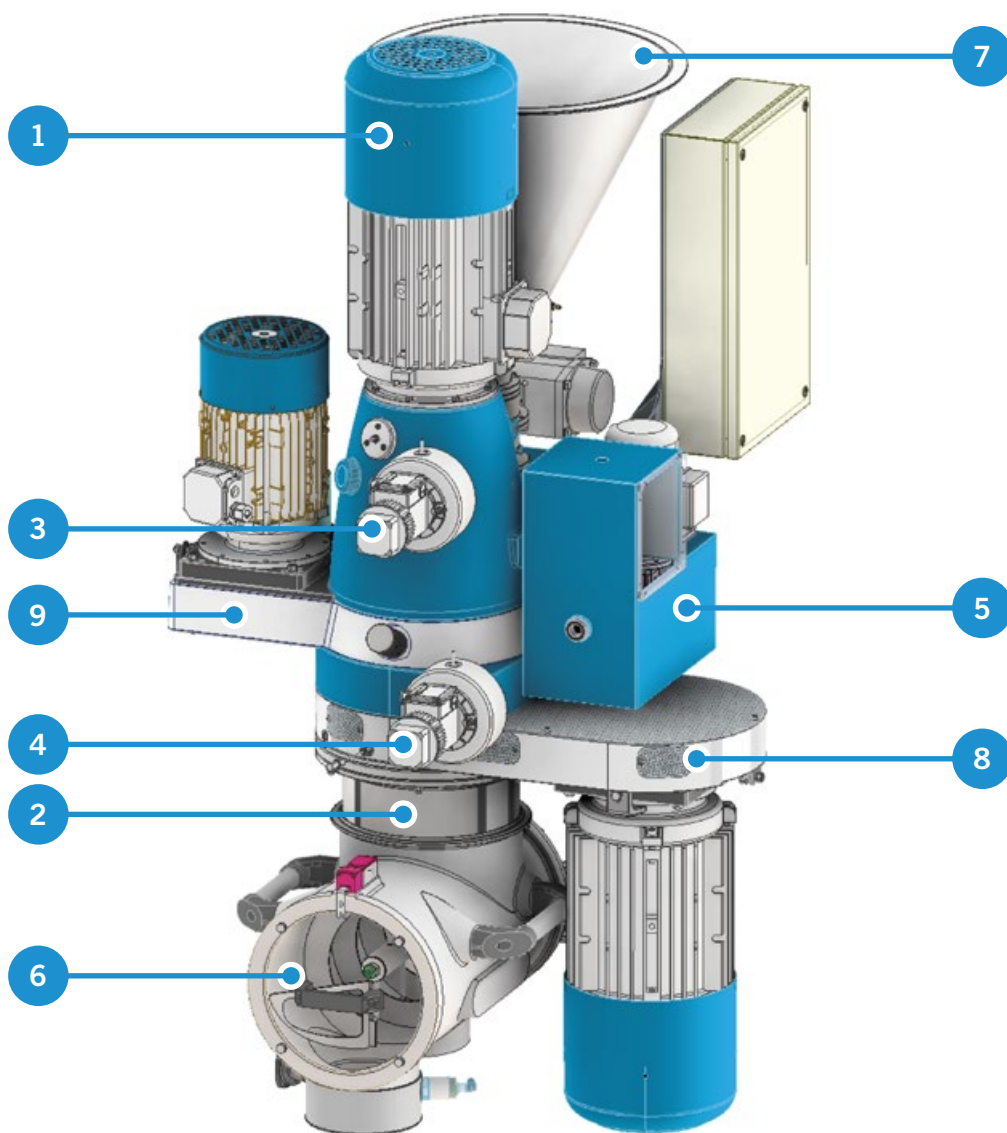




1.9 Identification main group

Grinder MAC 5 is composed of the following units:

- 1) Lower burr – Main shaft group - cod. G0SUPP.07
- 2) Grinding group – cod. G0.LOU5.02
- 3) Adjustment motorized burrs distance – cod. G0.CR15.01
- 4) Adjustment motorized pre-breakers distance – cod. G0.CR15.02
- 5) Lubrication group – cod. G0.LUBR.03
- 6) Screw conveyor group – cod. G0.ESTR.01
- 7) Product loading hopper – cod. G0.ALCC.02
- 8) Upper burr - Rotation group – cod. G0.TRMAC.01
- 9) Rough grinding group – cod. G0.TRSG.01
- 10) Electric panel unit





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1.10 Storage

Open the mobile guards and remove all foreign parts from the machine, then clean the surfaces.
Use a brush to cover all of the mechanical parts, including fixing devices, with a protective lubricant to remove for re-installation with an alkaline degreaser (sodium hydroxide).
Lubricate the mechanical parts.
Cover the surfaces with protective lubricant.
Group the parts and fix them on specific pallets with reference to the delivery packing list, following the instructions for handling the machine.
Place bags of silica gel hygroscopic salt on the pallets.
Store everything in a place away from atmospheric agents with a temperature between 0° C and 40° C, protecting the parts so as to avoid an accumulation of dust.

1.11 Demolition of the grinder

Demolition of the machine at the end of its operating life must be entrusted to specialised and equipped personnel.

Before starting disassembly it is necessary to create sufficient space around the machine so that all movements can be made without risks for personnel.

Some fundamental phases for carrying out the demolition are listed below.

- Disconnect the grinder nitrogen supply.
- Disconnect the grinder pneumatic supply.
- Disconnect the grinder electrical supply.
- Collect the oil present in the grinder pump unit and put it in a specific container for later disposal.
- Disassemble the various grinder components separating them by type of material as much as possible. For example, it is necessary to separate the parts in plastic, which must be sent to recycling, from all the rest in compliance with current legislation.

The same thing is valid for the components of the electrical parts, while for most of the metallic part it is sufficient to divide the steel parts and those in other metals and alloys to correctly send them for recycling by melting.

- Disposal of the materials obtained from demolition must be sent to authorised companies.



WARNING!

Bear in mind that some parts with significant dimensions and weight may be handled only using lifting equipment.

Pay utmost attention because falling grinder components or parts during the demolition phase may constitute a danger for operators.



1.12 Warranty

COLOMBINI guarantees, unless otherwise agreed in writing, that the machine is supplied and built perfectly, with good material and agrees to exchange at no cost ex-works, for a period of twelve months all mechanical parts and six months all electric parts (excluding electric motors) that are defective or due to the material used or manufacturing, as long as the defective parts are sent free of charge to its address in Settimo Torinese (TO) - 10036 - Via De Francisco, 130/16.

The warranty shall start from the day the supply is shipped and is reduced by half when the machine works day and night.

The following are excluded from the warranty:

- grinder discs
- defects and faults due to neglected maintenance
- defects and faults due to incorrect manoeuvres
- defects and faults due to normal wear
- in particular the machine parts normally subject to periodic replacement.

The warranty shall be invalid if:

- repairs or modifications are made by the Customer or on behalf of the Customer without prior authorisation of COLOMBINI
- the machine is used for purposes other than that for which it was sold
- spare parts are replaced with non-original parts,
- the sharpening of the work units is modified,
- the payment terms and conditions are not respected.

The warranty provided by COLOMBINI is intended limited to what is stated in this article, and that is without any other liability for COLOMBINI nor the Customer's right to any compensation for damages.

The measurements, weights, illustrations and drawings present in the manual are intended to be indicative and not binding, since they are subject to change and improvements according to COLOMBINI technical criteria.

COLOMBINI is not required to apply to products already manufactured or in the process of being manufactured and intended for the Customer, any modifications that may occur on a date after the date of the order.



1.13 Professional figures authorised to work on the machine

After having received all of the necessary instructions contained in this manual, only and exclusively can the following professional figures work on the machine:

- Safety officer

The safety officer is in charge of protecting and preventing company risks, as specified by European Directive 89/391 EEC (Safety at work), implemented in Italy with the Legislative Decree 81/08.

The safety officer will check that all of the people working on the machine have received all of the instructions that regard them contained in this manual.

- Operator

The machine operator must have acquired experience under the guidance of expert personnel.

He may only perform the operations reserved for him described in this manual.

Use of the machine by inexperienced personnel must absolutely be avoided.

- Mechanical maintenance technician

The mechanical maintenance technician must have general mechanical experience and specific experience on this machine model.

He may only perform the operations reserved for him indicated in this manual.

- Electrical maintenance technician

The electrical maintenance technician must have general experience on electric panels and specific experience on the electric panel and components of this machine.

He may only perform the operations reserved for him indicated in this manual.

- Manufacturer

For every other operation not expressly included in this manual or assigned to a professional figure different than those above, contact COLOMBINI.

2. SAFETY SECTION



MACS
by COLOMBINI

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2.1 Safety information



The safety officer has the obligation to inform the workers on the risks connected with the use of the machine (Legislative Decree 81/08).

Moreover, there is an obligation to provide for worker training so that they are able to protect their own safety and that of others.

Failure to comply with the basic safety rules and precautionary measures could cause accidents during operation, maintenance and repair of the machine. An accident can often be avoided by recognising potential hazardous situations before they occur. The operator must pay attention to potential hazards and possess the training, skills and instruments for performing these duties correctly.

COLOMBINI cannot be held liable in any case for accidents or damages consequent to using the machine by personnel that is not adequately instructed or used it incorrectly, as well as failure, including partial, to comply with the safety rules and intervention procedures contained in this manual.

Safety precautions and warnings are indicated in this manual and on the product itself.

If these danger messages are not heeded, the operator runs the risk of accidents with serious consequences for himself and other people. Safety messages are indicated with the following symbols:



WARNING!

These messages may cause injury to the operator if not observed.



WARNING!

These messages may cause damage to the machine if not observed.

COLOMBINI cannot predict every possible circumstance able to lead to a potential danger.

Therefore the warnings present in this publication and on the product are not complete.

If equipment, procedures, work methods or work techniques are used that are not explicitly recommended by the COLOMBINI company it is necessary to ascertain that there are no dangers for yourself or others.

Only use COLOMBINI original spare parts.

COLOMBINI shall not be held liable for use of non-original spare parts.



Safety section

2.2 Safety instructions



WARNING!

Bear in mind that some parts with significant dimensions and weight may be handled only using lifting equipment.

Pay utmost attention because falling grinder components or parts during the demolition phase may constitute a danger for operators.

- The presence of a technical assistant may be necessary during particular operations.
This is only allowed if the assistant and the operator work within sight of each other. The operator in charge must check that the assistant technician is working in safe conditions.
If an unexpected processing or intervention is to be performed, following a procedure different from that indicated in the manual, consult with COLOMBINI before starting.
- With the exception of the operator, people or animals must never be present in the machine operating range.
- If the Customer installs equipment not supplied by COLOMBINI on the machine, it is necessary to make sure that the safety conditions required by EC Directive 2006/42 are maintained. COLOMBINI shall not be held liable for any problems resulting from use of such part.
- The machine must not be operated in a corrosive or explosive atmosphere.
- Keep the machine free from foreign material such as dirt, oil, tools and other objects that could damage its operation and injure people.



- An oily, wet or greasy floor may cause accidents. Immediately dry and accurately clean any spills of liquid or grease that form during an intervention on the machine.
- Avoid using flammable or toxic solvents for cleaning, such as petrol, benzene, ether and alcohol.
- Avoid prolonged contact with solvents and inhaling their fumes. Avoid the use of open flames or sources of heat in the vicinity; make sure there is adequate ventilation.
- Prolonged overloads or faults may cause overheating of the electric motors and electrical equipment with the development of harmful fumes; disconnect the power immediately and do not go near the machine until the fumes have dissipated by means of adequate ventilation.
- In the event of a fire do not use water on the machine, use CO² extinguishers.





- The operator, assistance technician (if present) and maintenance technician must wear suitable protective garments such as a helmet, safety goggles and masks against the projection of any shards if compressed air is used during machine cleaning.

If necessary use protective gloves and safety shoes and hearing protection devices if the sound pressure in the workplace exceeds 85 dB (A).

Wear suitable work clothing.

Use specific hair nets for long hair to prevent the risk of being drawn in.

- The responsibilities for the various activities in terms of machine operation must be established clearly as indicated in the chapter “Professional figures authorised to work on the machine”.



- The manual must always be kept on hand, in order to be able to consult it to verify the correct operating cycle any time one has doubts. If this manual is lost or damaged contact COLOMBINI for a replacement copy.

- Structural damages, modifications, alterations or incorrect repairs may modify the protection capacities of the machine therefore cancelling this certification.

Modification interventions shall only be performed by COLOMBINI technicians.

- Always remember that, if any red light goes on, it corresponds to a machine anomaly, thus assess the entity of the anomaly before continuing.

- A sign indicating “**MAINTENANCE WORK, DO NOT START MACHINE**” needs to be placed on the machine, possibly near the control panel, during maintenance operations.

- If you allow specialist technical maintenance, inspection or repair operations to be performed, the assigned personnel must deactivate (partly or completely) the safety devices, open or close the protective guards, it is their precise duty at the end of the operations to immediately restore the operation of the concerned safety components or guards.

- Climbing on the machine is prohibited.

- Do not touch electrical wires, switches, buttons, etc. with wet hands.

- A red mushroom head emergency button is located on the control panel used to stop the machine in class 0 as required by CEI EN 60204-1.

- Pay utmost attention not to mix air and hydraulic oil to prevent the formation of explosive mixtures.



Safety section

2.3 Safety plates and symbols

Plates are affixed on the machine bearing safety symbols and/or messages.



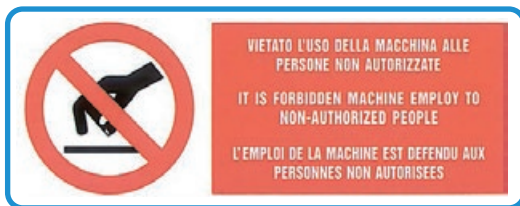
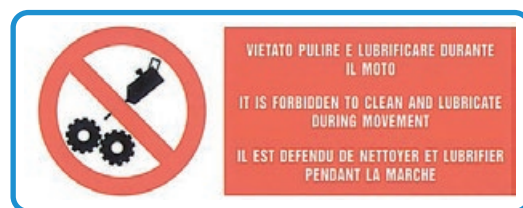
WARNING!

Make sure all safety messages are legible.

Clean them using a cloth, water and soap. Do not use solvents, diesel or petrol.

Replace damaged plates by requesting them from COLOMBINI.

If a plate is on a part that is replaced, make sure that a new plate is affixed on the new part.





2.4 Safety devices



WARNING!

The emergency button causes all of the machine motor parts to stop but does not disconnect the voltage from the electric panel.

The grinder has a red mushroom head emergency button **(A)**, located on the front part of the electric panel and near the grinder.

An emergency stop is performed by pressing the red mushroom head button which acts on a safety circuit causing all movements to be deactivated.

Check the operation of the emergency button periodically.

- **Main switch with lockable door lock (B)**

Located on the electric panel.



The MAC 5 grinder is not equipped with fixed perimeter doors and guards since its external structure protects the operators from any hazardous internal moving part (e.g. product grinding blades or mixer extractor impeller) of the machine.



Safety section

2.5 Residual risks

The accurate risk analysis performed by the manufacturer and filed in the **technical file**, made it possible to eliminate most of the risks connected with the machine use conditions.

The manufacturer recommends scrupulously following the instructions, procedures and recommendations contained in this manual and current safety laws, including the use of required protection equipment, both built in the machine and personal.



WARNING!

As a precautionary measure for safety it is necessary to periodically make sure that the safety devices operate normally.

It is strictly prohibited to make any type of mechanical, electrical or pneumatic modification in order not to create unexpected additional hazards and consequent risks.

A summary is provided below of the risks that remain in the MAC 5 grinder found by the manufacturer during the automatic and manual operation phases, setting, fine-tuning and maintenance.

- Risk of circuit fault concerning the emergency stop and guard control safety circuits with possible lowering of their safety level during the automatic operation phase, fine tuning and setting.
- Risk of breakage or damage, with possible lowering of the safety level, of electrical equipment components, following a short circuit.
- Risk of accident following breakage or detachment of pneumatic system hoses during the automatic operation phase, fine tuning and setting.
- Risk of breakage or damage, with possible lowering of the safety level, of electrical equipment components, following a short circuit.



CAUTION!

Before connecting, make sure the AC current in the installation point is not higher than that stated on the circuit breakers.

If not, the user is obligated to provide for the specific limiter devices at his own expense.

- Risk of accident following breakage or detachment of pneumatic system hoses during the automatic operation phase, fine tuning and setting.



WARNING!

Breakage or damage of the pneumatic system hoses can cause twisting of the hoses.

It is mandatory to periodically check the fastenings and wear of the hoses and replace them periodically.

It is forbidden to use the hoses to stand on.



- Risk of cutting, laceration and crushing following access to machine moving parts due to removal of the fixed guards or overriding the safety devices during the automatic operation phase, fine tuning and setting.



WARNING!

The exposure of personnel to machine moving parts may cause seriously hazardous situations for their safety.

It is strictly prohibited to start the machine until all of the fixed guards have been regularly installed.

It is strictly prohibited to tamper with, by-pass or override the guard interlocking devices by using personal keys.

- Risk of cutting, laceration and crushing during the maintenance, cleaning and tool change phase.



WARNING!

The operator must use specific protection gloves in leather or other similar material during tool replacement operations.



It is mandatory to disconnect and lock all energy sources before accessing the machine and to follow the maintenance procedures described in this manual.

- Possibility of 24 V voltage arriving from external machines.
- Lack of own lighting. Use a portable lamp supplied with 24 volts if the machine is in a dark area (only for maintenance operations).
- Electrical risks during maintenance caused by the need for working with power on.
Pursuant to Legislative Decree 81/08 working with the power on is only allowed for trained electricians and in compliance with double insulated to earth.
- Risk of improper use in the presence of explosive and flammable substances. The machine has been designed and assembled in such a way that it cannot be used in a classified area, according to Directive 1999/92/EC. Therefore it must not be used in ambients containing substances in a liquid form that can vaporise at ambient temperature and flammable powders and gases.



Safety section

2.6 Applied directives

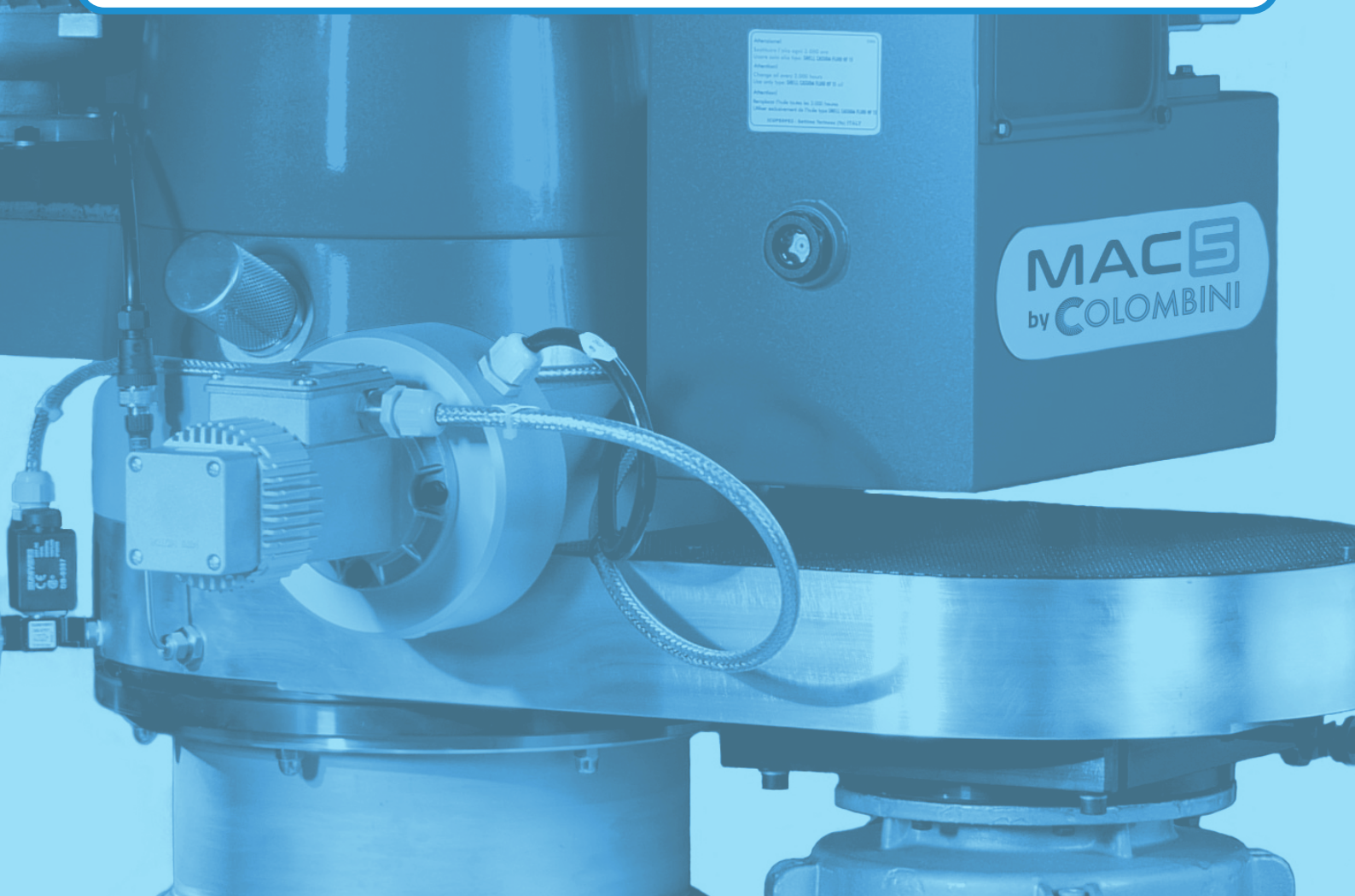
The machine has been designed and manufactured considering the safety requirements indicated in:

- **MACHINE DIRECTIVE 2006/42/EC**
- **LOW VOLTAGE DIRECTIVE 2014/35/EU,**
- **ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2014/30/EU.**

2.6.1 Applied standards

UNI EN ISO 4414:2012	Pneumatics - General rules and safety requirements for systems and their components
UNI EN ISO 12100:2010	Safety of machinery - General principles for design Risk assessment and risk reduction
UNI EN ISO 13849-1:2015	Safety of machinery - Safety-related parts of control systems Part 1: General principles for design
UNI EN ISO 13850:2015	Safety of machinery. Emergency stop function. Principles for design.
UNI EN ISO 13854:2020	Machine safety - Minimum clearances to prevent crushing of body parts
UNI EN ISO 13857:2019	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
UNI EN ISO 14118:2018	Safety of machinery - Prevention of unexpected start-up
UNI EN ISO 14119:2013	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection
UNI EN ISO 14120:2015	Safety of machinery - Guards - General requirement for the design and construction of fixed and movable guards
CEI EN 60204-1:2018	Safety of machinery. Electrical equipment of machines. Part 1: General requirements.
CEI EN 55011:2018	Industrial, scientific and medical equipment (ISM) Radio-frequency disturbance characteristics Limits and methods of measurement
CEI EN 61000-6-2:2016	Electromagnetic compatibility (EMC). Part 6-2: Generic standards Immunity standard for industrial environments

3. TRANSPORTATION AND HANDLING SECTION



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3.1 Transportation

The machine, with its electrical cabinet and any accessories, reaches the Customer's premises duly packaged, positioned and secured to special pallets designed for lifting and handling by forklift truck.

3.2 Handling

Using a forklift truck rated for the weight of the parts, first lift the crate containing the grinder slightly, then the electrical cabinet and check that the load is well-balanced and stable.

Once a perfect balance has been achieved, the parts can be lifted and handled.

Place the grinder, the electrical cabinet and any accessories in the area previously arranged for subsequent positioning operations.



When moving with a forklift, lift the load 200 mm from the ground and tilt it back.

Take into account the height of the work environment when lifting loads.

Travel up ramps or raised areas going backwards.

The stability of the forklift decreases when driving in descent with a load in the front.

Make sure the passage area is free and that there are no mobile objects on the machine before starting to move.

Ropes and chains must be protected from sharp edges by using staff angles, edge protectors or other protections (rags or wood).



WARNING!

When the crate has been lifted to a height over 50 mm the workers must stay at a safety distance from its perimeter greater than 2 metres.

Breakage of the lifting system or an uncontrolled movement constitute a serious danger for the safety of personnel.



Transportation and handling section

3.3 Dimensions and weights of the parts to be handled

The machine is generally shipped to the customer divided into 3 units:

- A) Grinder
- B) Electric panel
- C) Hopper



Grinder

DIMENSION	WEIGHT
Width: 938 ÷ 1300 mm Height: ~ 1608 mm Depth: ~ 1100 mm	Weight: ~ 550 Kg



Electric panel

DIMENSION	WEIGHT
Width: ~ 1200 mm Altezza: ~ 1700 mm Depth: ~ 400 mm	Weight: ~ 270 Kg

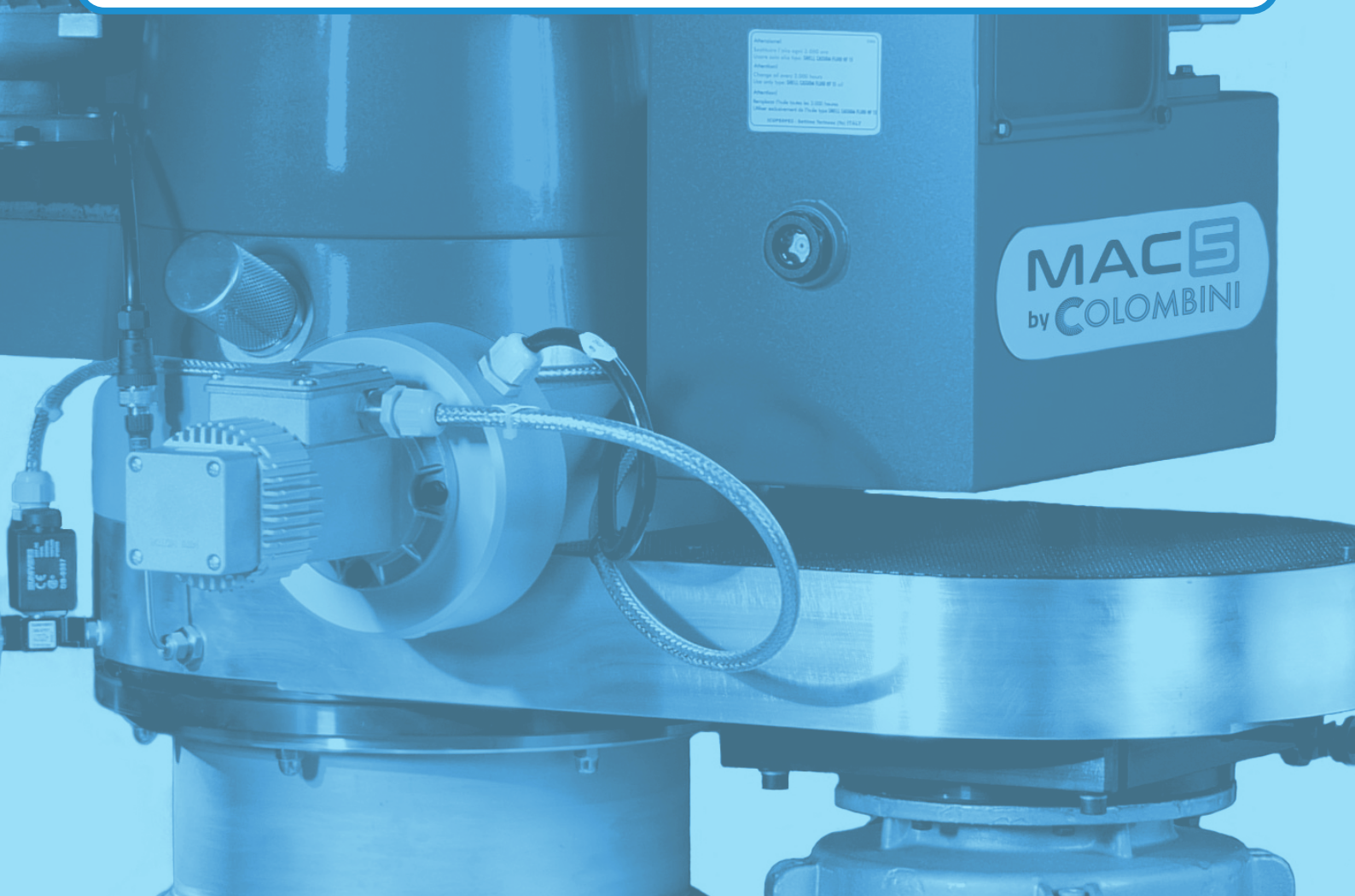
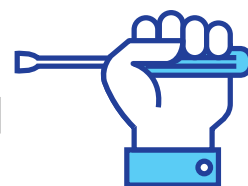


Hopper

DIMENSION	WEIGHT
Width: Ø 490 mm Height: 600 mm Depth: 500 mm	Weight: 35 Kg

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4. INSTALLATION SECTION



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4.1 Positioning



WARNING!

Before positioning the machine, it is necessary to perform a careful preventive inspection in order to identify any damages sustained during the transportation phase.

If one or more of the components is damaged it is indispensable to stop the installation and report the fault found to the company COLOMBINI making arrangements with the same on the actions to take.

As long as it is stably secured to the production plant during operation, the machine can operate in compliance with the envisaged technical parameters.

The Customer is responsible for verifying that the support surface is adequate for the machine weight.

Make sure the area selected for the installation is compatible with the overall dimensions included in the lay-out and the required ambient conditions are observed.



WARNING!

Position the components so that there is sufficient space around the machine to be able to perform maintenance work and visual inspections.

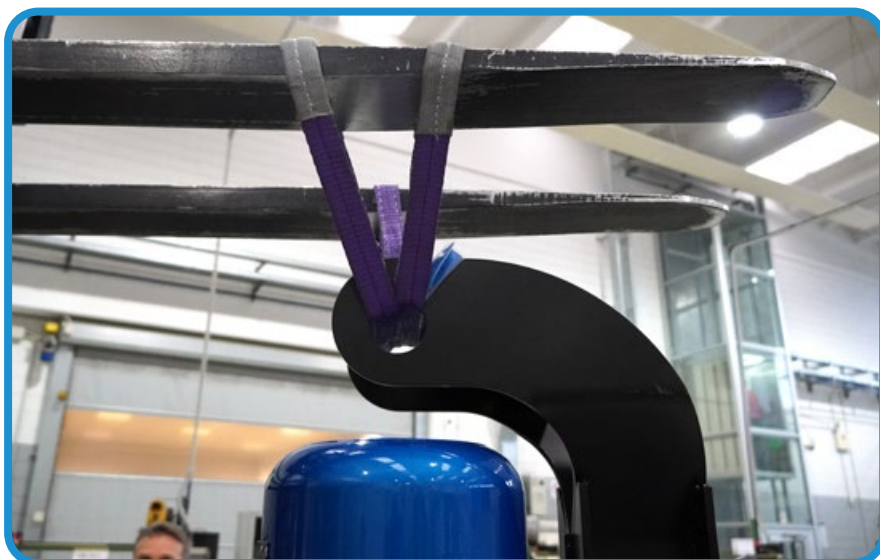
Harness the grinder using a forklift truck or other lifting system. Use safety straps that must be passed through the two holes in the grinder lifting unit.



WARNING!

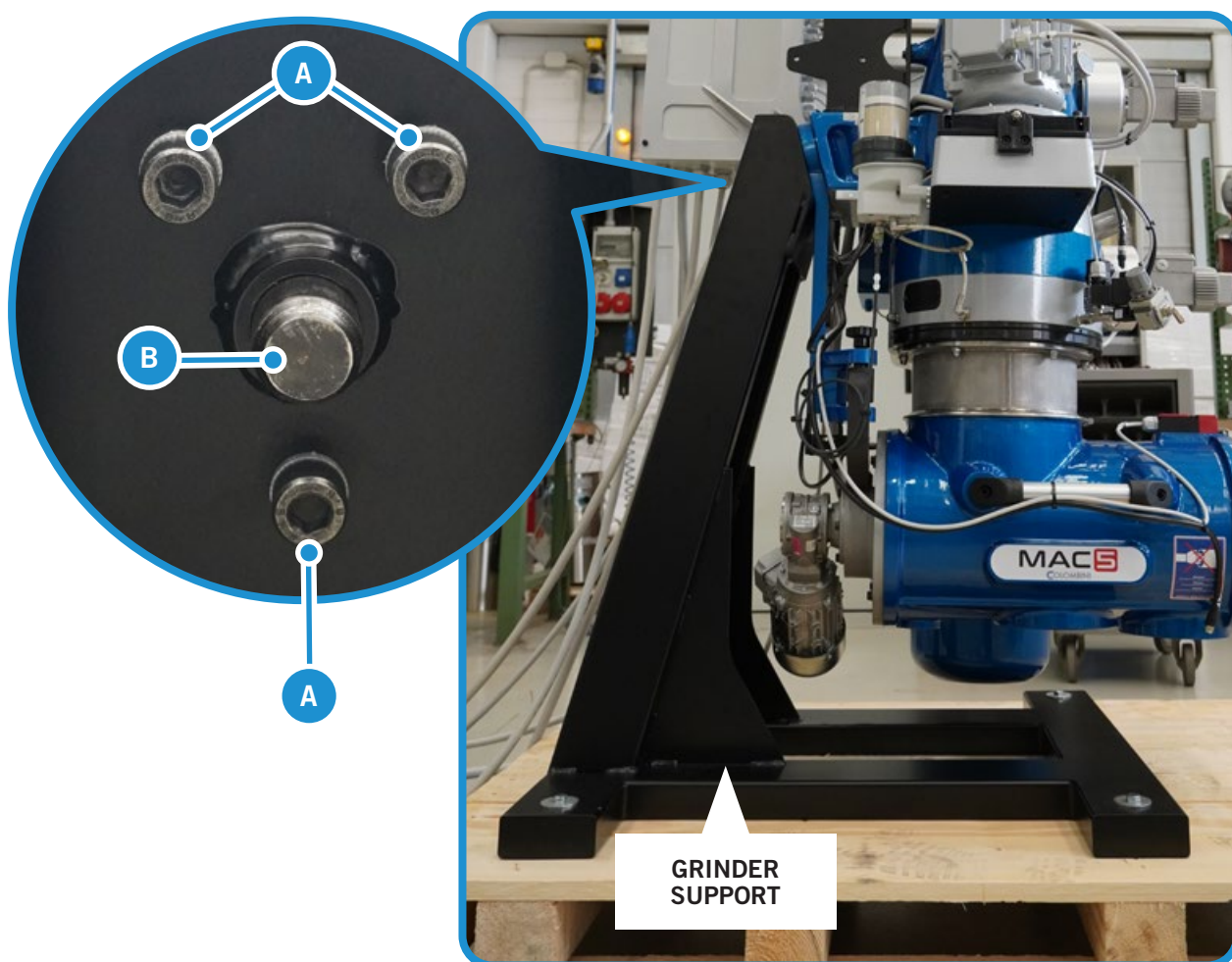
Use lifting devices, ropes, belts, hooks rated for a weight greater than that of the grinder.

Raise the forklift truck forks until the straps are taut but **without lifting the grinder off the ground.**





Installation section



Unscrew the three bolts **(A)** with their washers and remove them from the grinder support.

Free the support pin **(B)** and move the support, with its platform, away from the grinder. The grinder is well balanced and ready to be lifted.

Harness the grinder using a forklift truck or other lifting system. Use safety straps that must be passed through the two holes in the grinder lifting unit.

Lift the grinder and set it in the area arranged in the plant.



Colombini has previously provided a template so that the customer can correctly drill the securing holes in the support.

Use this as a reference for correct positioning of the pin **(B)** on the grinder; the pin must fit into the arranged securing hole.

Use the previous bolts **(A)** with their washers to secure the grinder to the production plant.

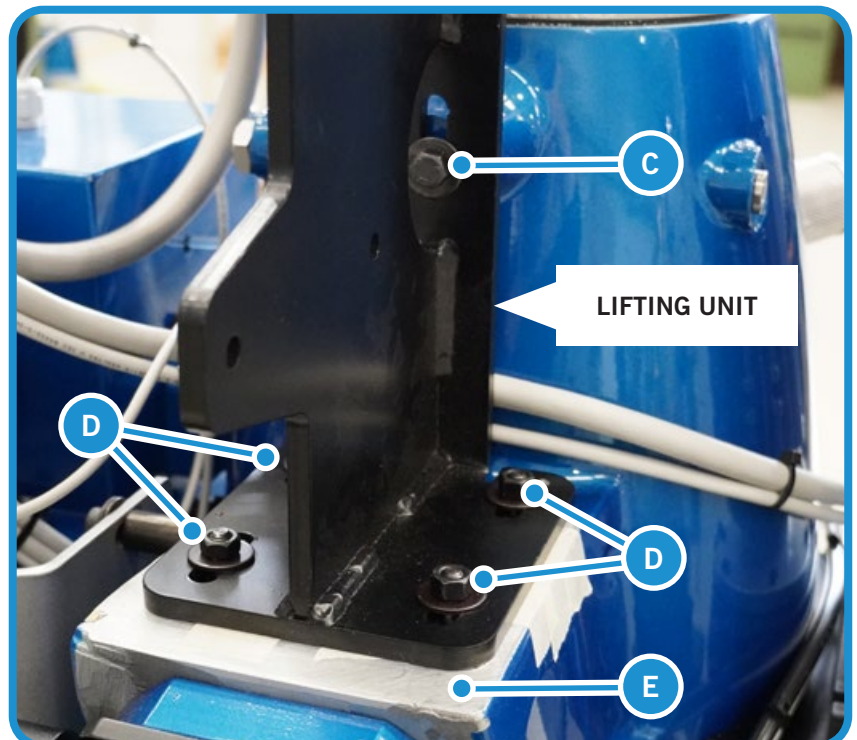
SUPPORT
ARRANGED
ON PLANT
BY CUSTOMER



Unscrew bolt **(C)**, with its washer, and the four nuts **(D)**, with their washers, and remove them.

Raise the lifting unit and remove it from the grinder.

Remove the protective film **(E)** from the product inlet hole and install the hopper, securing it with bolt **(C)**, with its washers, and the four nuts **(D)**, with washers, that were previously removed from the support.





Installation section

4.2 Equipment to be kept

The customer must carefully store the support, with its pallet, and the lifting unit so it can be used if the grinder needs to be moved in the future.

Moreover, it may also prove necessary to remove and handle the grinder for specific maintenance operations.

4.3 Electrical connection



WARNING!

The connection of the electrical power supply system must be done by specialised personnel who must comply with laws concerning occupational safety and accident prevention. Use the necessary personal protection equipment while making the electrical connection of the machine.

The electrical connection must be performed in compliance with the safety laws and regulations in effect in the country where the machine is used.

The maximum power required by the machine is 30 kW at 400 V three phase 50 Hz for an electrical power supply with earth connection.



CAUTION!

It is advisable to install an automatic circuit breaker starting from the power supply line to simplify maintenance operations.

The minimum cross-section of the conductors to use for general power connection is as follows:

CONDUCTOR	CROSS-SECTION
PHASE R - S - G + N	25 mm ²
EARTH	25 mm ²

The connection of the 4 power supply cords must be made inside the power electric panel on the main switch. The connection of the earth conductor must be attached directly to the earth terminal located next to the main switch. The cross-sections of the cords indicated in the table are valid for a maximum length of 20 metres. It is necessary to consider an adequate disconnection power on the circuit breakers upstream from the machine.

Power drops must be taken into account beyond this length and consequently increase the conductor cross-section.



4.4 Pneumatic connection



WARNING!

The connection of the pneumatic system must be done by specialised personnel who must comply with laws concerning occupational safety and accident prevention. Use the necessary personal protection equipment while making the pneumatic connection of the machine.

The pneumatic power supply line supplied by the user's plant must be able to distribute **non lubricated filtered compressed air with pressure between 6 and 7 bar** to allow regular operation of the pneumatic rotary actuator installed on the hopper unit.

Connect a hose with a resistance greater than the maximum pressure of the compressed air network in the fast connection fitting of the solenoid for moving the butterfly valve indicated in the figure.

The external diameter of the hose must be 6 mm.

In addition to the supply hose, the Customer must install a gate valve, near the machine, to be able to connect and disconnect the compressed air.





Installation section

4.5 Nitrogen supply connection

Add nitrogen in a gaseous state, if necessary, in the point indicated by the arrow, checking that the pressure is 0.5 bar on the pressure gauge.





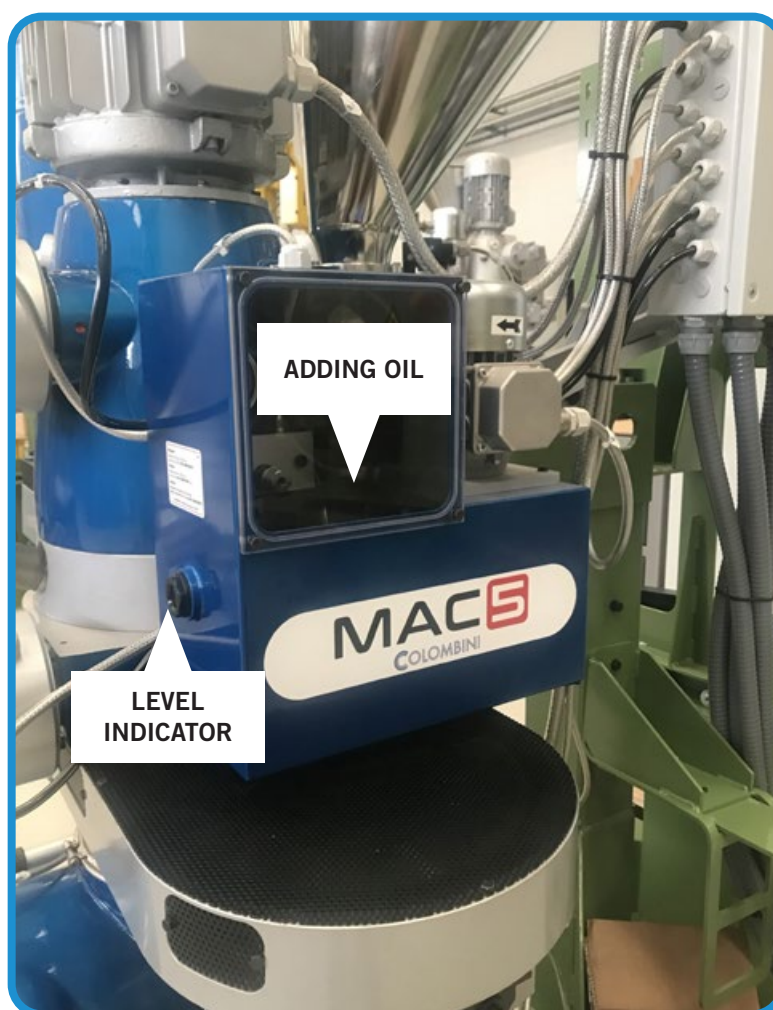
4.6 Commissioning

4.6.1 Addition of oil for lubrication

The machine requires the addition of SHELL CASSIDA FLUID 15 type oil in the pump unit lubrication tank.

The oil is supplied by COLOMBINI for the first commissioning.

Use a funnel to add oil in the point indicated in the photo until reaching the level as indicated in the photo.





Installation section

4.6.2 Preparation and controls before starting up

The MAC 5 Grinder manufactured by COLOMBINI is supplied to the user Customer tested and ready for operation. Despite this it is necessary to perform a series of checks before starting it up in order to avoid risks of faults or operating problems: checks on the product to grind and functional checks on the machine.

It is necessary to check and ensure that:

1. All of the warnings have been complied with for feeding the product to process and transport of the ground product.
2. The conical magnet is positioned in the hopper or filler spout of the bean product supply silo,
3. All of the machine units are perfectly mounted and aligned to the working axes, connected and fixed to the base unit.
4. All of the utilities are perfectly connected.
5. All of the safety systems are efficient and operating.
6. The pneumatic system supply pressure is correct.
7. The nitrogen supply pressure and temperature are correct.
8. Connection of the electric motors is performed according to the line voltage; unless expressly requested the connections are always for power supply at 400 volts 50 Hz.
9. The lubrication oil is at the correct level, otherwise top up with that supplied by the Manufacturer.



WARNING!

Make sure that there are no obstacles (cords, pipes, etc.) around the machine that can get in the way or be hazardous for personnel.

Connection and disconnection operations of the electrical, pneumatic and nitrogen supplies must be performed exclusively by specialised personnel and subordinate to adoption of the necessary protection equipment.



4.6.3 Machine supply (extraction of ground product)

For correct use of the COLOMBINI grinders it is necessary to comply with a few rules for feeding the product in beans:

- Feed of the product must work constantly, be free-falling, and must be done with intact product.
- An efficient purification system must be installed upstream from the grinding systems that eliminates any foreign bodies: the magnetic metal separator supplied by the Manufacturer, has the sole purpose of checking the efficiency of the purification system which remains the Customer's responsibility.
- It is advisable to reduce the transport of powders to a minimum, taking care to adopt systems that do not change the granulometric distribution and the ground product characteristics.
- The capacity of the ground product transport systems must be over-dimensioned ($\geq 50\%$), compared to the maximum hourly production of the grinding unit.
- The connecting duct to the transport system, must have dimensions greater than or equal to those of the grinder discharge chute.
- Prevent electrostatic charging of the product upstream and downstream from the grinder with a suitable earthing device.



CAUTION!

Failure to comply with the warnings above may cause: overheating of the product, anomalous wear or breakage of the discs, decrease in production, uncontrolled and irreversible changes of the granulometry and change of the organoleptic properties.

4.6.4 General unit checks

Given the limited dimensions of the grinder it is possible to make a general visual inspection of the various units that compose it, checking that there are no particular mechanical anomalies, foreign bodies and any safety limit switches not correctly positioned. Also check the tightening of the screws and nuts of the main grinder components



WARNING!

Adjustments of the units must be performed with the machine stopped and energy sources deactivated.



4.6.5 Checking correct system connection

Once the general checks are completed and after having checked the compliance of the elements to process, a specific test of the systems is carried out, specifically:

Electrical system

Check:

- fastening of cords and terminals
- the correct supply voltage (400 V 3 phases + N + earth 50 Hz)
- the correct power supply connection
- the earth connection between the electric panel and the on-board system, between the power panel and the power supply network

Pneumatic system

Check:

- correct fastening of the pneumatic system hose to the pneumatic rotary actuator of the hopper unit.

NITROGEN distribution system

Check:

- correct fastening of the nitrogen supply hose connected to the crio unit inlet.



CAUTION!

All of these checks must only be performed by qualified personnel assigned to machine maintenance.

4.6.6 Checking the electrical system/control panel

Switch the **main switch** to position “1” on the power panel to enable the machine electricity.

Use the main push button panel to check the following:

1. Check that the **emergency button** is not pushed;
2. Make sure the “**Power on**” light goes on.
3. Press the “**RESET EMERGENCY**” button.
4. Make sure the “**Power on**” light goes off.



4.6.7 Checking the safety systems

Before using the machine in the automatic cycle it is necessary to check the safety systems it is equipped with.

This procedure must be adopted as a normal maintenance procedure.

Emergency buttons

Press the **BLUE “RESET EMERGENCY”** button.

Press the emergency button located on the main push button panel and check that the **“ALARM”** light on the tower goes on. Reset the emergency each time by pressing the **BLUE “RESET EMERGENCY”** button.

Door safety limit switch

Open the doors of the electrical cabinet located behind the machine.

Make sure the **RED** light on the tower goes on.

Close the doors, press the **BLUE “RESET EMERGENCY”** button, and check the Off status of the RED light on the tower.

4.6.8 Nitrogen system setting

The nitrogen pressure regulator is already set by the factory, for safety purposes make sure the pressure gauge indicates 0.5 bar.

4.6.9 Mechanical unit setting

The MAC 5 Grinder comes already set, tested and acceptance tested at the manufacturer and is supplied to the user Customer in perfect working order.

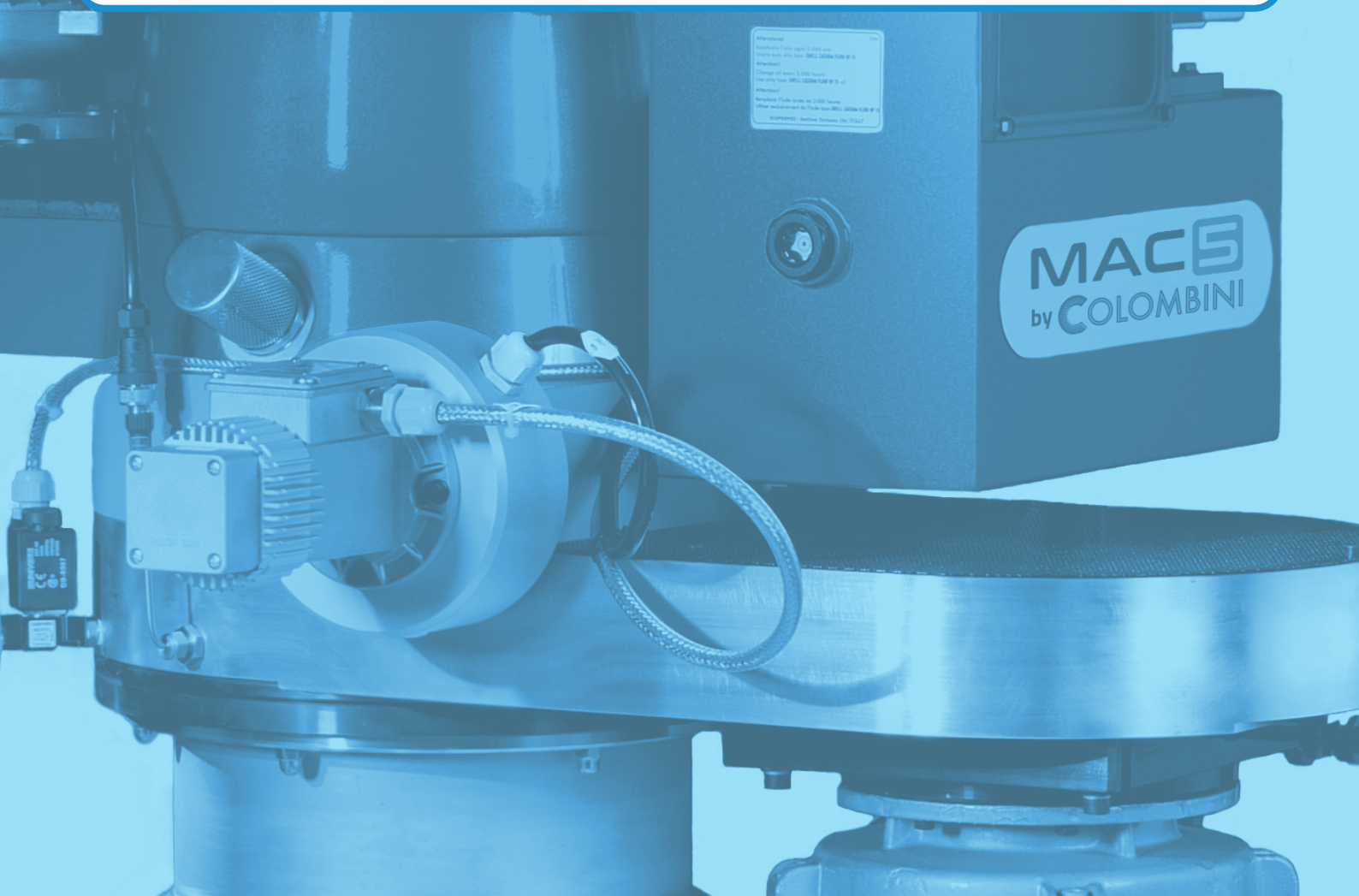
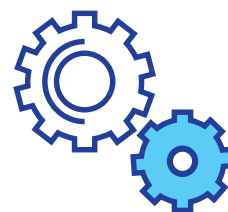
The machines are delivered to the Customer after an acceptance test of at least 50 hours of grinding tests. They are supplied with oil for lubrication and ready to operate.



The Customer does not need to make any mechanical settings.

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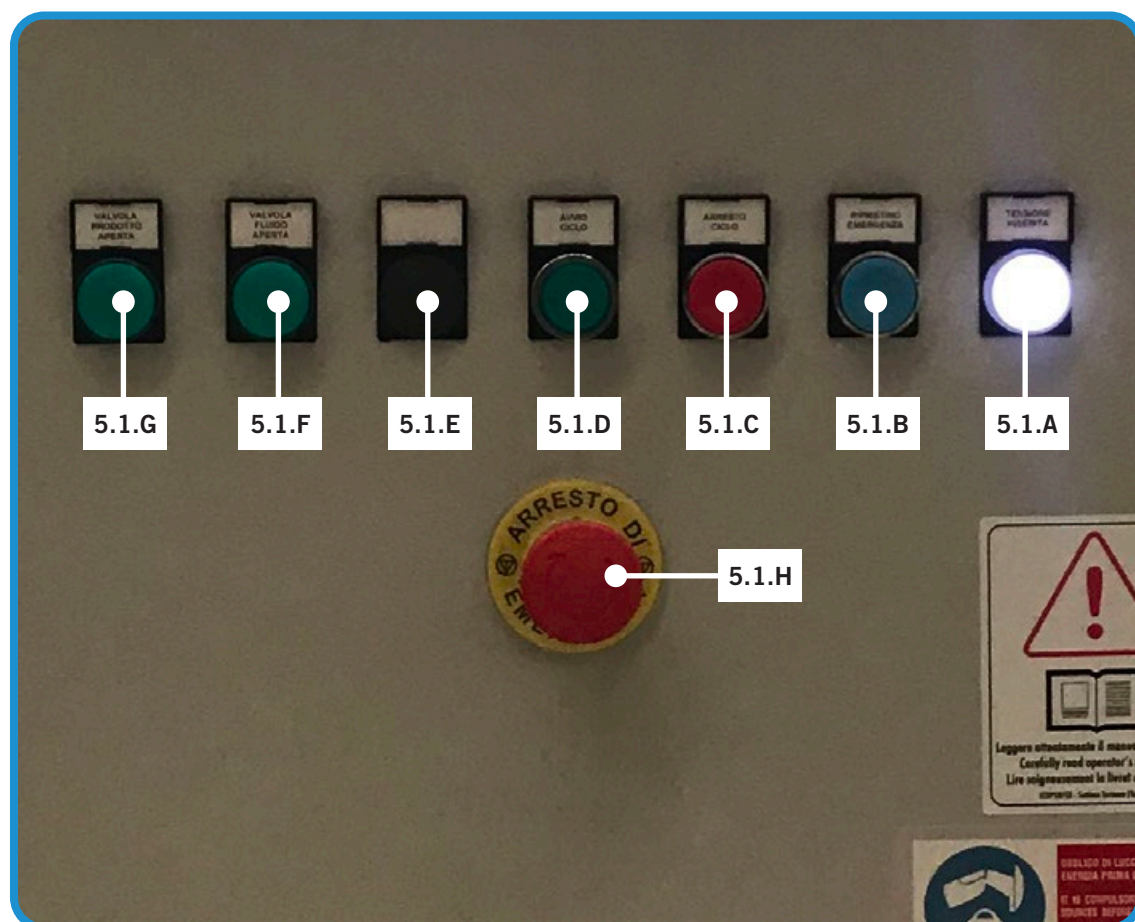
5. OPERATING SECTION



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5.1 Description of controls on the electrical cabinet



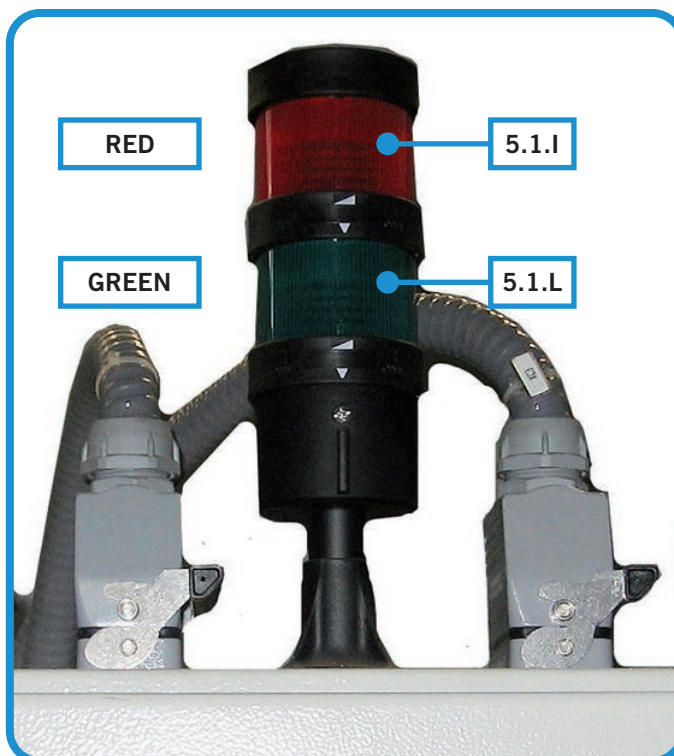
5.1.A	POWER ON	WHITE LIGHT	On indicates voltage at panel
5.1.B	RESET EMERGENCY	BLUE BUTTON	Resets the emergency signal when pushed
5.1.C	STOP CYCLE	RED BUTTON	Stops the grinder when pushed
5.1.D	START CYCLE	GREEN LUMINOUS BUTTON	Starts the grinder when pushed
5.1.E OPTIONAL	REMOTE LOCAL CONTROL	TWO POSITION KEY SELECTOR	Enables local controls when turned to local Enables remote controls when turned to remote
5.1.F	FLUID VALVE OPEN	GREEN LIGHT	Indicates opening of fluid valve when on
5.1.G	PRODUCT VALVE OPENING	GREEN LIGHT	Indicates opening of product valve when on
5.1.H	EMERGENCY	MUSHROOM HEAD BUTTON	Stops the machine in emergency when pushed



Operating section

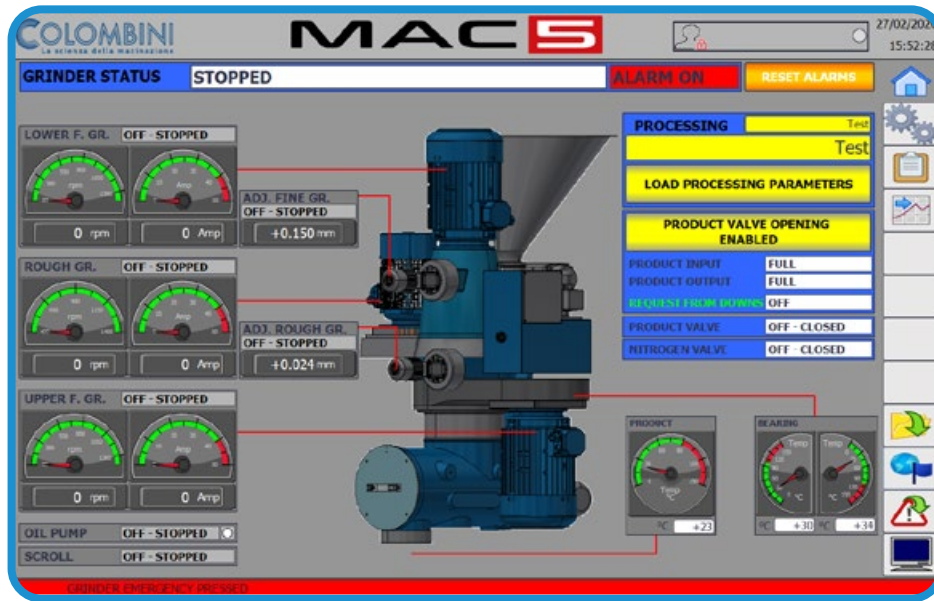
5.2 Illuminated signalling tower

5.1.I	ALARM	RED SEMAPHORE LIGHT	Indicates emergency stop of the system when on fixed
5.1.L	PRODUCT VALVE OPENING	GREEN SEMAPHORE LIGHT	Indicates opening of product valve when on fixed





5.3 Supervision and control panel



The software uses a series of motorised and pneumatic actuators and detection sensors to control the industrial grinder MAC5 during setting and grinding.

The supervision and control panel ("HMI") manages all of the system work data, the software was developed on TIA PORTAL SIEMENS WINCC application and installed on HMI SIEMENS TP1200 module interfaced to a PLC SIEMENS S7-1200.

Use of the supervision and control panel:

The HMI panel is a touch-screen type therefore to activate a control (button, change page, etc. just touch the part identifying the control, to enter data (for example numeric) just touch the data entry area and a keyboard screen will open automatically on the panel, from here touch the specific areas to type the desired value. **Warning: use the touch-screen panel with clean hands only and without the use of foreign devices, incorrect use could damage it, pens for touchscreen devices can be used.**

Programmable controller:

The programmable controller ("PLC") manages all the actuators and controls and dialogues with the HMI panel, the software was developed on a TIA PORTAL SIEMENS STEP7 application.

CAUTION!



Before starting the machine, or making any movement, make sure that no anomalies exist in order to prevent damaging the machine.

Ask for the intervention of technical assistance to eliminate the cause of the anomaly, if it is a technical problem that is not the machine operator's responsibility.

Before cancelling any anomaly check the cause and eliminate it.

In the event of malfunctions or faults, ask for the intervention of technical assistance.

Operator position:

Whoever operates the machine must always be positioned in front of the control panel (electrical cabinet) where there is an emergency button for stopping the machine.



5.4 System operation

5.4.1 Operating principle

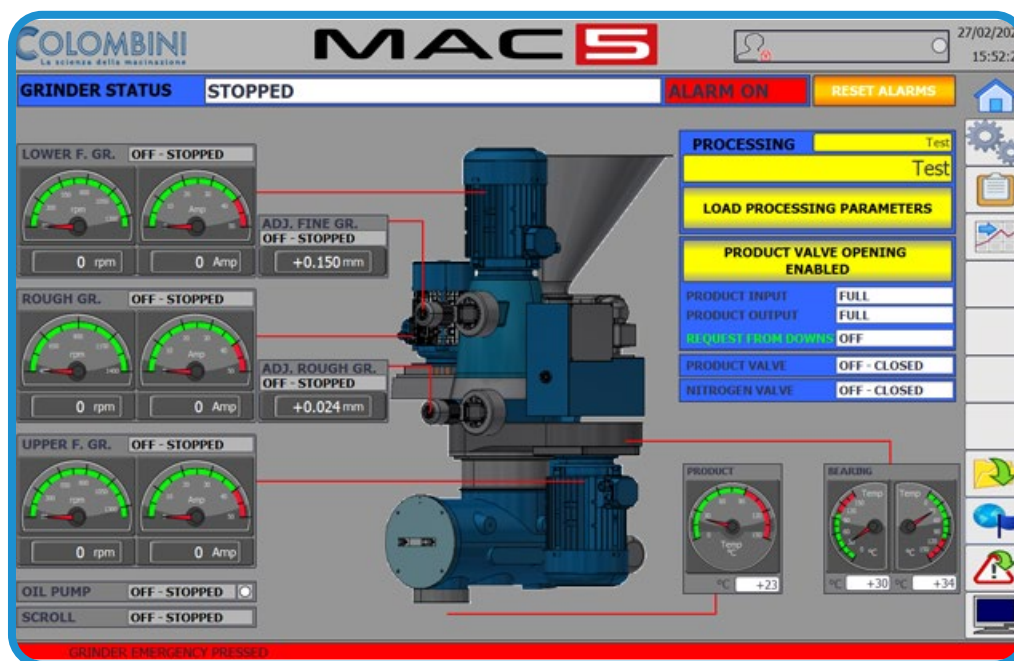
When the system is turned on the PLC performs the initialisation routine, then the operator uses the HMI panel to check the state of the system, adequately programs the applied control limits and the type of control and activation of the grinding cycle.

The system start-up starts the grinding preparation functions in sequence, i.e. the lubrication pump and the three grinding motors (ROUGH GRINDING, LOWER FINE GRINDING, UPPER FINE GRINDING) and places the discs at the programmed distance (possible LAUNCH of PROCESSING RECIPE and/or manual setting by the operator), once these operations are completed it is ready to receive the product to grind (i.e. from this time on opening of the PRODUCT valve is enabled, the pneumatic gate that opens the product passage towards the discs) based on the external and/or operator request.

5.4.2 System start

The main system start phases are as follows:

1. Voltage on to electric panel via the main circuit breaker located on the electrical cabinet door
2. System status visual inspection (system in order, no maintenance in progress, etc.)
3. HMI online panel with PLC standby (for display of system pages see "HOME PAGE")



4. General emergency reset (any guards closed and EMERGENCY button not pushed) using the "RESET EMERGENCY" button on the electrical cabinet.
5. Alarm reset indicated on the HMI panel with the button to the upper right.
6. RESET ALARMS (if alarms remain active indicated by the word ANOMALY in the box next to the button just pushed have them analysed and eliminated to be able to start the grinder)

Now the system is on and ready for processing operations.



5.4.3 Operating cycles

Operation of the system by default is set in AUTOMATIC, i.e. the actuators are managed and controlled in sequence by the software to perform the grinding operations, but MANUAL can also be selected, i.e. the single actuators can be controlled by the operator for test functions (for display of system pages see “MANUAL CONTROLS” page):

1. Automatic (in normal operation) set for each time the electrical cabinet goes on
2. Manual (only for manual handling operations for setting and/or control) set only by operator request

5.4.4 Automatic cycle start

The processing operations with automatic cycle, once the emergency has been reset and any anomalies eliminated, are as follows (a detailed description of the pages mentioned is provided later):

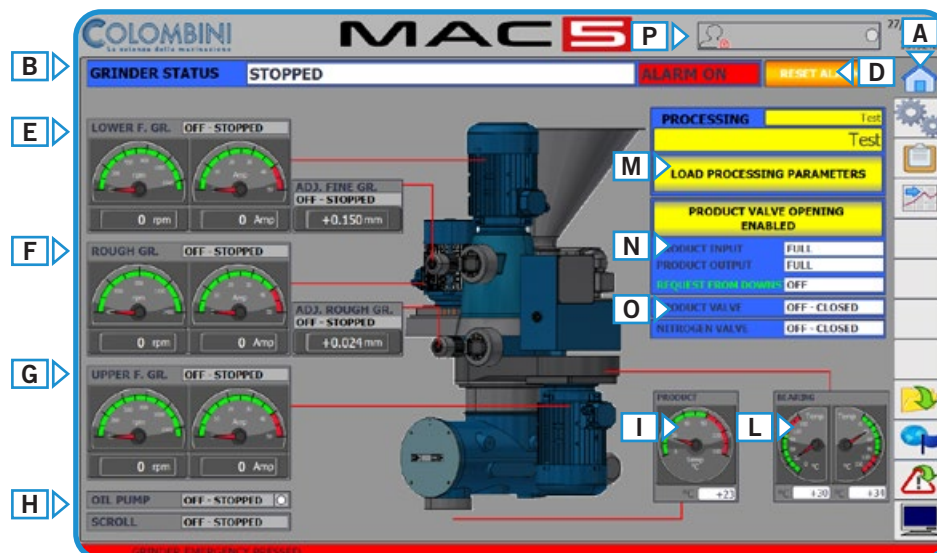
- Press the “START GRINDING” button on the electrical cabinet
- Wait until start-up is completed (indication in the GRINDER STATUS box above, “STARTING UP” and then “STARTED UP”)
- Select a processing recipe if desired (load grinding setting parameters from the DATABASE, for display of system pages see the “RECIPE SELECTION” page)
- Return to the “HOME” page and start the grinding set-up to the loaded recipe parameters with the “LOAD PROCESSING PARAMETERS” button under the box that indicates the selected recipe
- Wait until setting is completed (indication in the GRINDER STATUS box above, “STARTED UP, RECIPE SETTING” and then “STARTED UP”)
- If you do not want to use a recipe and manually set the grinding settings or correct the parameters loaded with the recipe press near the grinding setting data on the HOME page (indicator band on the left) to open the popup of setting controls, for display of system pages see “GRINDER PARAMETER MANUAL SETTING” page, manually act on the single buttons for the setting and at the end press in the same area again to close the popup.
- If all of the setting parameters correspond to what is requested press the “PRODUCT VALVE OPENING ENABLED” button, for display of system pages see “HOME PAGE”.
- Now grinding is started up and the product valve ready for opening according to the “PRODUCT CALL” external signals.



Operating section

5.4.5 Home page

System start-up page and it is automatically displayed when turned on, it shows the main operating indications and provides access to all the other pages.



A. Change page buttons

Lateral change page dropdown buttons, the description is valid for all the pages which show the page where you are indicated by the dark grey background of the selection key.

IDENTIFIER	DESCRIPTION
	Access to HOME page, main page (the one described here)
	Access to SETUP page, page of main setups (parameter programming, special parameters, recipe programming, disc reset, manual controls, factory setup, cycle controls)
	Access to processing recipe selection page
	Access to page displaying the trend of motor and temperature parameters
	Access to ARCHIVE page, electrical diagram, manual, software information
	Change language, pressing cyclically changes the panel language, currently ITALIAN, ENGLISH, FRENCH, SPANISH, GERMAN
	Access to ALARMS page, alarm display and reset
	Access to SETUP HMI page, special HMI panel setup page



B. Grinder status display

The grinder status is displayed here, indicating:

- STOPPED, grinder not started up
- STOP IN PROGRESS, the “STOP GRINDING” button has been pressed stop procedure in progress
- STARTING UP, the “START GRINDING” button has been pressed start-up procedure in progress
- STARTED UP, start-up procedure completed, grinder started up
- STAND-BY, STAND-BY FOR PRODUCT REQUEST, if the stop function for inactivity is enabled when the set time is exceeded grinding stops, when the product is called it restarts and then product passage is enabled for grinding
- STARTED UP, RECIPE SETTING, grinder started up but in the work parameter setting phase (speed of the three discs and/or position of the FINE and ROUGH GRINDING DISCS) for the operator to send a recipe

C. Anomaly display

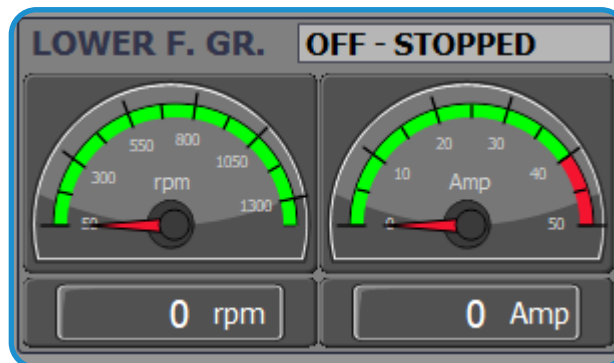
Displays the presence or lack of anomalies, for details see the ALARMS page

D. Reset alarms

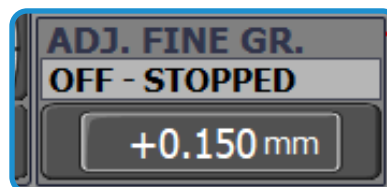
All of the alarms are memorised, and remain active even if the cause is eliminated. To eliminate the alarm signal with consequent machine stop, it needs to be reset using the RESET ALARMS button. The same button is also present on the ALARMS page.

E. Lower Fine Grinding data display

Displays the grinding motor status in the upper box (OFF, ON, ANOMALY) and processing measurements in the lower boxes (RPM and AMP absorption)



Displays the motor status and disc position setting (OFF, ON, ANOMALY) and position (mm).

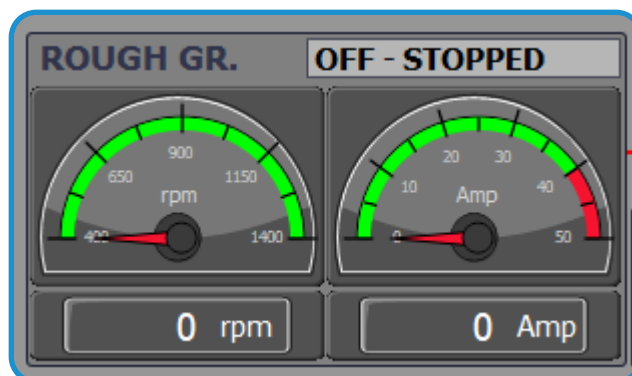




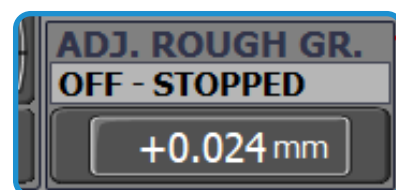
Operating section

F. Rough grinding data display

Displays the grinding motor status in the upper box (OFF, ON, ANOMALY) and processing measurements in the lower boxes (RPM and AMP absorption).

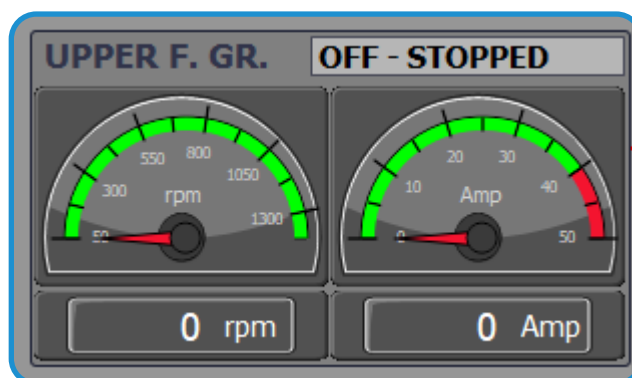


Displays the motor status and disc position setting (OFF, ON, ANOMALY) and position (mm)



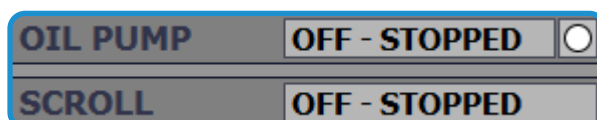
G. Upper fine grinding data display

Displays the grinding motor status in the upper box (OFF, ON, ANOMALY) and processing measurements in the lower boxes (RPM and AMP absorption)



H. Oil pump and scroll data display

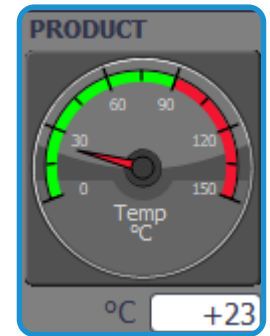
Displays the motor status (OFF, ON, ANOMALY), next to OIL PUMP indication of the oil pressure status (WHITE=OFF, GREEN=ON).





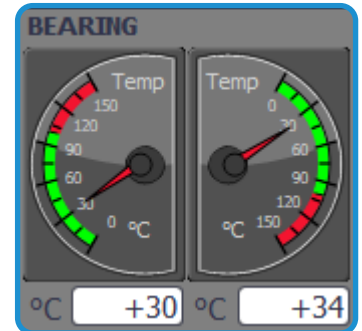
I. PRODUCT TEMPERATURE display

Displays the output product temperature (the output temperature sensor is an optional feature, if not included the box is not visible. If installed, when a threshold is exceeded set on the GENERAL SETUP page it is indicated and the product valve is closed and reopened only when the measured temperature drops below another threshold (see GENERAL SETUP page).



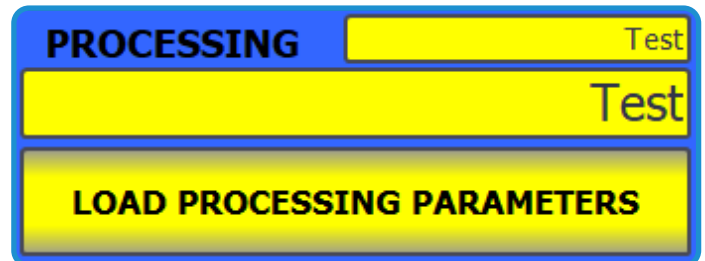
L. BEARING TEMPERATURE display

Display of the bearing temperature, measured in two points, if the temperature exceeds the set threshold it is indicated and the time interval of their lubrication is reduced, if a higher threshold is exceeded the BEARING HIGH TEMPERATURE ALARM is generated and grinding is stopped (see the MANUFACTURER SETTING page).



M. Processing in progress data, recipe

The box next to PROCESSING indicates the recipe (if any) being processed on the disc, the bigger box below indicates the new recipe loaded but not yet being processed on the disc, the “LOAD PROCESSING PARAMETERS”

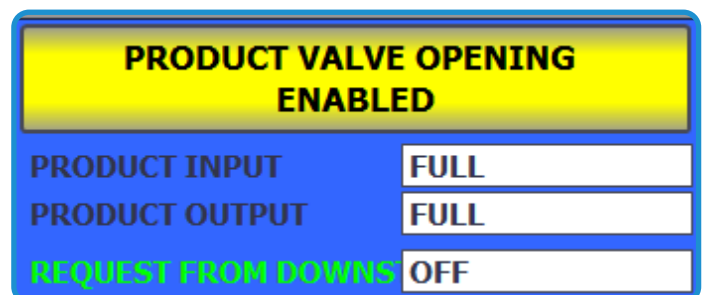


button sends the loaded recipe to processing, sending a recipe to processing is only possible with PRODUCT VALVE DISABLED and closed, i.e. it is not possible to send a new recipe when product is being ground. The button can also be used to return the machine to the recipe parameters after a manual correction. For recipe parameters see the RECIPE PROGRAM page and SELECT RECIPE page

N. PRODUCT VALVE control data

Enables the product valve and displays the controls connected to it.

The three boxes on the left indicate the status of the levels connected to valve operation and the request for ground product from downstream.





Operating section

The “PRODUCT VALVE OPENING” button if not pressed is “DISABLED” and is:

- red, i.e. regardless of the requests the product valve does not open, this condition is useful for temporarily stopping grinding or changing the grinding recipe.

The “PRODUCT VALVE OPENING” button if pressed is “ENABLED” and is:

- yellow, i.e. valve enabled but closed due to the presence of ground product downstream (discharged product level FULL) or lack of downstream request (request from downstream OFF)
- green, i.e. valve open due to the lack of ground product downstream (product output EMPTY) or downstream request (request from downstream ON)

O. PRODUCT VALVE and NITROGEN VALVE status display

Valve status display:

OFF – CLOSED

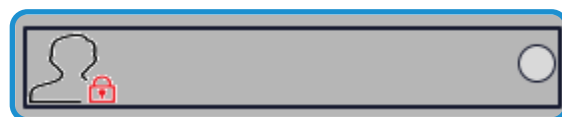
ON – OPEN

ANOMALY



P. USER AUTHORISED status display

The access to certain setting and setup functions is protected by LOGIN (entry of USER and PASSWORD for authorisation), there are different authorisation levels that give access to different functions, this displays the USER name of the authorised user (name next to the operator symbol) and any authorisation in progress (lock and dot opposite GREEN for authorisation ON, RED for authorisation OFF). By accessing the field the LOGIN window is accessed, for its description, see the description on the *SETUP* page.





5.4.6 General set-up page:

Page for programming general setting parameters and processing recipes, as well as for setting the “disc reset” setting and other factory settings.



Indications on different access levels are shown below

A. Access buttons for PROCESSING PARAMETER SETTING PAGES

BUTTON	LOGIN REQUIRED	DESCRIPTION
GENERAL MACHINE SETTING	Operator	Access GENERAL MACHINE SETTING page, settings on product valve, nitrogen valve, scroll, grinding inactive setting
ADVANCED MACHINE SETTING	Service	Access ADVANCED MACHINE SETTING page, lubrication setting, disc motor absorption limit setting, 1st turn-on sequence reset
"AUTOTUNE" FUNCTION	Service	Access AUTOTUNE FUNCTION page, enables some disc autotune functions
RECIPES PROGRAMMING	Service	Access RECIPES PROGRAMMING page
RESET TOOLS (GRINDING DISC)	Service_2	Access to RESET TOOLS page operation to perform in the event of disc replacement
MANUAL MAINTENANCE CONTROLS	Service_2	Access to MANUAL MAINTENANCE CONTROLS page, possibility to control each actuator individually for test operations or maintenance adjustments
SET COSTRUTTORE		Access to MANUFACTURER SETTINGS page, used by COLOMBINI S.r.l.

WARNING: If the access buttons are not green it means that no LOGIN has been performed and thus their operation is inhibited.



Operating section

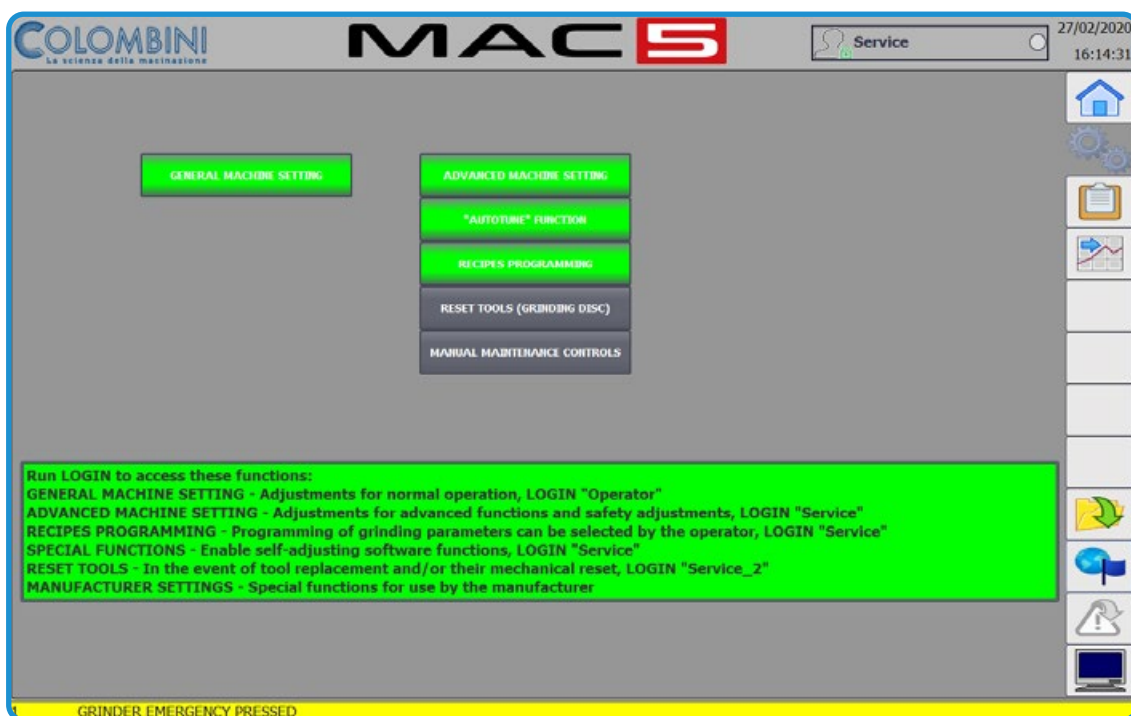
B. "LOGIN" display

The user registration USER and PASSWORD is displayed and/or entered to access the protected areas described above, specifically we have 4 password levels:

LEVEL	USER	PASSWOR D
1	Operator	1111
2	Service	2222
3	Service_2	3333
4	Costruttore	

The highest level corresponds to the greatest access. By pressing the field above with the operator symbol a window opens for entering the USER and PASSWORD, by accessing the single box an alphanumeric keyboard will appear to use for data entry, always press ENTER after filling in each box and after having filled in both press the LOGIN button to confirm, if everything is entered correctly both the lock and dot will become green as well as the buttons below based on the entered access level.

Example of correct "Service" LOGIN with authorisation for permitted pages



Page for programming the basic parameters for grinding which however once they are set they are not normally modified based on the type of processing.

COLOMBINI
La scienza della macinazione

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Service_2

27/02/2020 16:31:10

GENERAL GRINDER SETUP **RESET ALARMS**

ENABLE PRODUCT VALVE	ON	PRODUCT TEMPERATURE LIMIT TO STOP GRINDING	°C	150
ENABLE NITROGEN VALVE	ON	PRODUCT TEMPERATURE RESTART GRINDING	°C	148
ENABLE SUCTION		DELAYED STOP OF GRINDING DISC AFTER STOP	Sec	15
		DELAYED STOP OF GRINDING DISC DUE TO INACTIVITY	Sec	0
		DELAYED START OF PRODUCT/NITROGEN VALVE OPERATION	Sec	5
		DELAYED STOP OF PRODUCT/NITROGEN VALVE OPERATION	Sec	5
		MAX DURATION PRODUCT/NITROGEN VALVE OPENING	Sec	0
		SCROLL DELAYED STOP	Sec	10

A

B GRINDING TIME SINCE LAST RESET

RESET 0 : 7 : 22

Indications on different access levels are shown below

A. Grinder general setup table

FUNCTION	DESCRIPTION
ENABLE PRODUCT VALVE	Function that may seem redundant compared to the enable button on the HOME page, actually here the authorisation level is higher and under LOGIN, therefore if it is necessary to definitely suspend product valve opening without an accidental action being able to enable it, here it is possible to do so. Use the corresponding button. ON = GREEN = ENABLED OFF = RED = DISABLED
ENABLE NITROGEN VALVE	Use the corresponding button. ON = GREEN = ENABLED - OFF = RED = DISABLED
ENABLE VACUUM CLEANER (IF PRESENT)	Use the corresponding button. ON = GREEN = ENABLED - OFF = RED = DISABLED
PRODUCT TEMPERATURE LIMIT TO STOP GRINDING	If the product temperature sensor is present (see display on HOME page) here it is possible to set a temperature limit beyond which the system stops grinding, restarting is automatic based on what is described below.
PRODUCT TEMPERATURE RESTART GRINDING	Based on the above, here it is possible to set a temperature limit below which the system restarts grinding.
DELAYED STOP OF GRINDING DISC AFTER STOP	Disc rotation time setting in case of grinding STOP both intentional and following an anomaly (with the exclusion of a serious anomaly or EMERGENCY that stops everything at the same time) after closing of the product valve, in order not to leave grinding residue at the stop.



Operating section

FUNCTION	DESCRIPTION
DELAYED STOP OF GRINDING DISC DUE TO INACTIVITY	Setting for maximum product valve opening standby time, if exceeded without opening actions and the function is enabled (ON=GREEN OFF=GREY) the grinder stops changing to STAND-BY (also indicated on the HOME page), in the event of product request the discs are restarted and with discs restarted the product valve opens thus cancelling the STAND-BY phase, a useful function for energy savings in the event of non-continuous work.
DELAYED START OF PRODUCT/NITROGEN VALVE OPERATION	It is possible to add a delay to opening of these two valves compared to start-up of the scroll consequent to product request from downstream level and external request.
DELAYED STOP OF PRODUCT/NITROGEN VALVE OPERATION	Parameter not used on this type of system
MAX DURATION PRODUCT/NITROGEN VALVE OPENING	Here it is possible to enter a maximum time value for product valve opening, even if the opening request conditions remain when this time is reached the valve is closed, the closing is indicated with PRODUCT VALVE CLOSING DUE TO MAXIMUM OPENING TIME, to reset the opening must be disabled and re-enabled from the button on the HOME page. This parameter is entered as a safety on the product discharge level if there is a risk that it is faulty and remains blocked when called, thus preventing clogging. Set to "0" if you want to disable the function (for example for continuous grinder operation)
SCROLL DELAYED STOP	is possible to enter a delay on the scroll stop, the value entered here allows the scroll to rotate for this time when the grinder stops, in order to empty the discharge tunnel.

B. Total grinding time since last reset

Count of hours: minutes: seconds: of actual disc rotation, useful for checking the hours of life for sharpening them, the button resets the count starting from zero, it needs to be pressed when a new group of discs is mounted.



5.4.8 Advanced grinder setup:

Page for programming the advanced parameters for grinding which however once they are set they are not normally modified based on the type of processing. Indications on different access levels are shown below.

A. Grinder advanced settings table

FUNCTION	DESCRIPTION
DELAYED LUBRICATION OIL PRESSURE CHECK	Stand-by time after starting up of the lubrication pump to check the lubrication oil pressure gauge status, if lacking a NO OIL PRESSURE ALARM is generated with consequent stop of the grinder, necessary for filling the circuit at pump start-up.
LOWER FINE GRINDING CURRENT RANGE TO START TIME COUNTER	Lower fine grinding current limit which must be exceeded to enable the disc time counter described in the previous paragraph, this parameter makes it possible to discriminate empty disc rotation from that with product, the latter is useful for the hours used for sharpening.
MAX AMP LIMIT LOWER FINE GRINDING FOR PRODUCT VALVE OFF	Lower fine grinding maximum current level, the value detected by the inverter is compared with this, if it is exceeded it triggers a count of holdings beyond the limit (parameter on the next line), if elapsed the product valve is closed (even if product call is active), the PRODUCT VALVE CLOSED FOR EXCEEDING LOWER FINE GRINDING CURRENT LIMIT status is indicated.



Operating section

FUNCTION	DESCRIPTION
LOWER FINE GRINDING TIME WAITING STOP FOR AMP > MAX AMP	Setting of the interval in which the motor current must be maintained above the motor current threshold to stop grinding (see line above)
LOWER FINE GRINDING TIME WAITING START FOR AMP < MAX AMP	Setting of the time interval in which the motor current must be maintained below the threshold to restart grinding (see line above)
MAX AMP LIMIT ROUGH GRINDING FOR PRODUCT VALVE OFF	Lower fine grinding maximum current limit, the value detected by the inverter is compared with this, if it is exceeded it triggers a count of holdings beyond the limit (parameter on the next line), if elapsed the product valve is closed (even if product call is active), the PRODUCT VALVE CLOSED FOR EXCEEDING ROUGH GRINDING CURRENT LIMIT status is indicated.
ROUGH GRINDING TIME WAITING STOP FOR AMP < MAX AMP	Setting of the interval in which the motor current must be maintained above the motor absorption threshold to stop grinding (see line above)
ROUGH GRINDING TIME WAITING START FOR AMP < MAX AMP	Setting of the time interval in which the motor current must be maintained below the threshold to restart grinding (see line above)
MAX AMP LIMIT UPPER FINE GRINDING FOR PRODUCT VALVE OFF	Lower fine grinding maximum current limit, the value detected by the inverter is compared with this, if it is exceeded it triggers a count of holdings beyond the limit (parameter on the next line), if elapsed the product valve is closed (even if product call is active), the PRODUCT VALVE CLOSED FOR EXCEEDING UPPER FINE GRINDING CURRENT LIMIT status is indicated.
HIGHER FINE GRINDING TIME WAITING STOP FOR AMP < MAX AMP	Setting of the interval in which the motor current must be maintained above the motor current threshold to stop grinding (see line above)
HIGHER FINE GRINDING TIME WAITING START FOR AMP < MAX AMP	Setting of the time interval in which the motor current must be maintained below the threshold to restart grinding (see line above)

B. Bearing lubricated, interval count reset

The bearings require lubrication every 2,000 hours set by the factory, the lubrication interval is halved if a bearing temperature greater than the factory set limit (>70°C) is exceeded, when 50 hours is left before reaching the limit time the following alarm is generated: "WARNING: BEARING LUBRICATION REQUIRED, STOP GRINDING IN ---" where the last missing 50 hours are counted, when the maximum limit is reached grinding is stopped as well as the discs and the following alarm is generated "WARNING: GRINDER STOPPED FOR MANDATORY BEARING LUBRICATION". Once the lubrication is performed access this field to reset the count and the system, when the reset request button is pressed two new buttons appear and the operator is asked to CONFIRM or CANCEL.



WARNING!

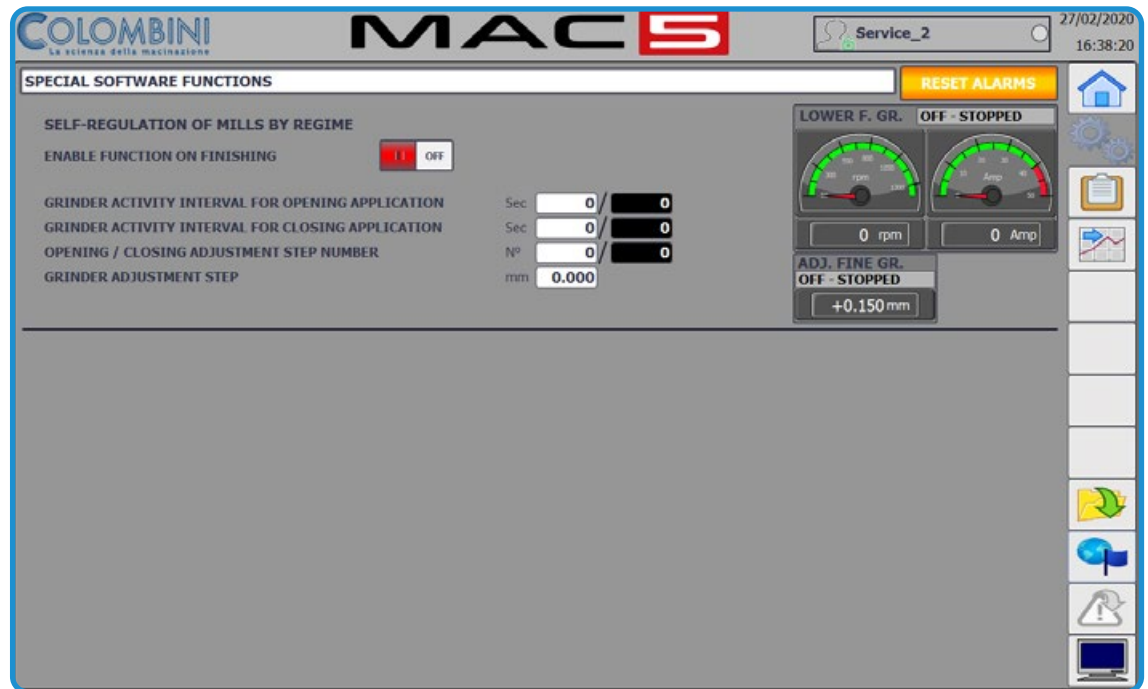
This operation is the operator's responsibility, any inappropriate resets or not after an adequate lubrication can create significant damage detected later during machine analysis.



5.4.9 “Autotune” functions

Page to enable the parameter setting of certain disc autotune functions based on parameters detected during grinding.

At present these functions have not been implemented on this grinder yet.



DISC AUTOTUNE FOR FULL OPERATION

If enabled the function is used to automatically open the discs by a certain distance. The operator can set the setting distance, the disc work time that must elapse between one setting and the next and the maximum number of settings to apply. This function is used to correct any dilation of the discs started cold following their heating; in the same way if the function is enabled in the event of inactivity (and thus cooling of the discs) the steps are performed backwards by closing the discs to the starting position.

The following need to be programmed:

DISC ACTIVITY INTERVAL FOR OPENING APPLICATION expressed in seconds

DISC INACTIVITY INTERVAL FOR CLOSING APPLICATION expressed in seconds

NUMBER OF SETTING STEPS IN OPENING/CLOSING (i.e. repetition of the settings)

DISC SETTING STEP expressed in 0.000, i.e. the change in position to apply when the time elapses.



Operating section

5.4.10 Recipe programming

Page for programming processing recipes in order to call them up when needed without manually having to set every single parameter each time.

COLOMBINI MAC S Service_2 27/02/2020 16:41:30

RECIPE PROGRAM RESET ALARMS

Type of processing: A

Parametro	Value
LOWER_FINE GRINDING_SPEED	0.000
LOWER_FINE GRINDING_SPEED	0
ROUGHT GRINDING_POS	0.000
ROUGHT GRINDING_SPEED	0
UPPER_FINE GRINDING_SPEED	0

? [Icons] C Ready

Indications on different access levels are shown below

A. Recipe name selection and/or entry

Casella con accesso a tendina (tasto freccia verso il basso nell'angolo a destra), nel caso siano presenti ricette è possibile selezionarne una per modificarla, copiarla, cancellarla, etc...

COLOMBINI MAC S Admin 27/02/2020 17:11:20

SELECT RECIPE RESET ALARMS

Type of processing: TEST

TEST
TEST_2

Parametro	Value
LOWER_FINE GRINDING_SPEED	750
ROUGHT GRINDING_POS	0.030
ROUGHT GRINDING_SPEED	100
UPPER_FINE GRINDING_SPEED	700

if the box in the left part is selected an alphanumeric keyboard opens for entering the name you want to give to the recipe (20 characters max.).

Parametro Value

LOWER_FINE GRINDING_POS	0.000
LOWER_FINE GRINDING_SPEED	
ROUGHT GRINDING_POS	
ROUGHT GRINDING_SPEED	
UPPER_FINE GRINDING_SPEED	

Keyboard layout: 1-0, QWERTY, A-Z, X-C, V-B, N-M, ., -, ESC, Num, ITA, Ctrl, Alt, F1, Help, Alt Gr, Ctrl.



Once a present recipe is selected or a new name is entered access the fields below (description on left, access to field on right) for their programming.

B. Grinding parameters in the recipe

FUNCTION	DESCRIPTION
LOWER FINE GRINDING POSITION	Position programming in mm with thousandths of the lower disc position, access the box for entering using the numeric dropdown keyboard, confirm with ENTER, a small number corresponds to fine grinding.
LOWER FINE GRINDING SPEED	Rotation speed programming in rpm of the lower disc, proceed as above, a high number corresponds to a high speed.
ROUGH GRINDING POSITION	Position programming in mm with thousandths of the rough grinding disc position, access the box for entering using the numeric dropdown keyboard, confirm with ENTER, a small number corresponds to fine grinding.
ROUGH GRINDING SPEED	Rotation speed programming in rpm of the rough grinding disc, proceed as above, a high number corresponds to a high speed.
UPPER FINE GRINDING SPEED	Rotation speed programming in rpm of the upper disc, proceed as above, a high number corresponds to a high speed.

C. Recipe management buttons

Buttons for actions on a filled in recipe, to use after filling in:

IDENTIFIER	DESCRIPTION
	Any description info for the parameter control
	Add recipe
	Save recipe
	Save recipe with name
	Delete recipe
	Rename recipe

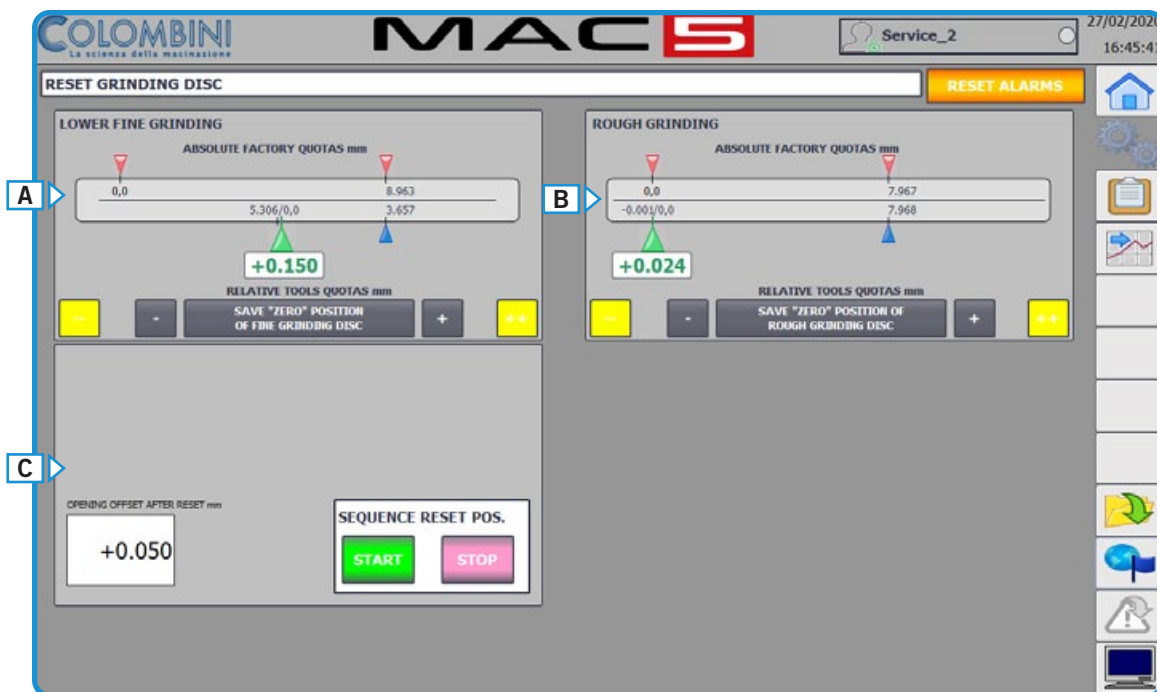


Operating section

5.4.11 Disc resetting

Page for disc mechanical settings, it memorises the minimum closing point (ZERO) from which the measurements starts of the disc opening for grinding settings. The available travel (maximum travel setting indicated by the blue arrow to the bottom on the right) depends on the mechanical resetting of the unit performed in the manufacturer's factory.

However, this action is MANDATORY when discs are replaced or remounted following grinding by the manufacturer.





A. Grinding disc zero sequence

LOWER FINE GRINDING ADJ OFF - STOPPED SPEED rpm 0 POSITION mm +0.116	LOWER FINE GRINDING OFF - STOPPED SPEED rpm 0	SEQUENCE STARTED DETECTED BLOCK KO DETECTED BLOCK OK END SEQUENCE OK	OK/KO OK/KO OK/KO
OPENING OFFSET AFTER RESET mm +0.050		OVERFLOW POSITION mm +0.000 NEW "ZERO" POSITION mm +0.000	
SEQUENCE RESET POS. START STOP			

The grinder has an automatic disc reset function which can be use every time it is necessary to reset the discs being used.

To activate the function, the grinder must be powered, with no active anomalies, but not started (green START CYCLE button off and mushroom head emergency button not pressed)

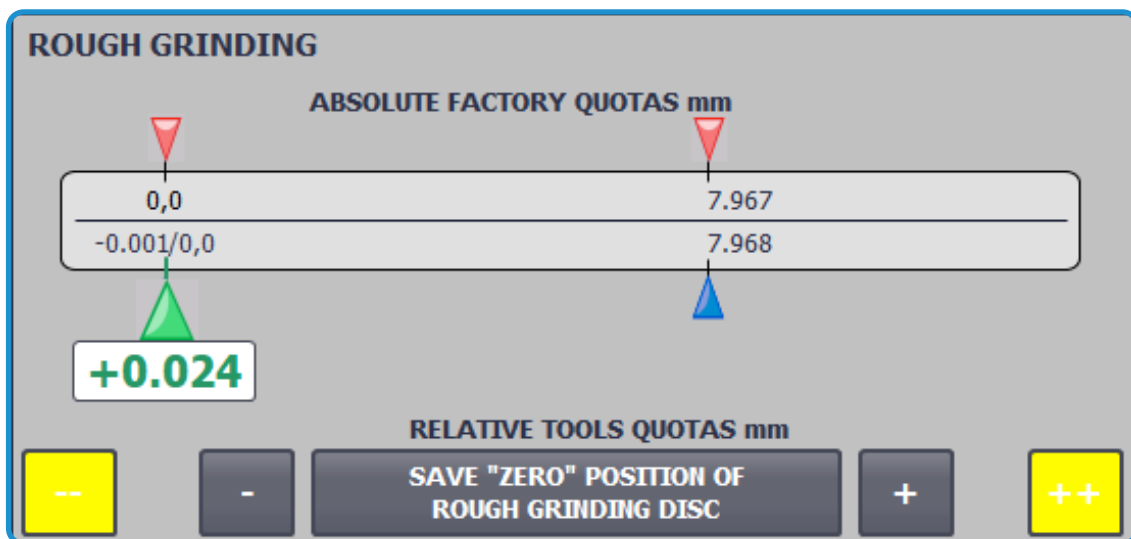
1. Press the START button to start the procedure
2. The upper disc is started for an instant to check the operation of the rotation control module and then stopped
3. The lower disc is started at low rpm
4. The setting of the lower disc is closed at slow speed
5. When dragging of the upper disc is detected (complete disc closing and dragging) the disc closing setting is stopped and the position reset.
6. The lower disc setting is opened until the disc reaches the OFFSET value entered in the window OPENING OFFSET AFTER RESETTING, here reset again
7. The procedure is finished, the lower disc is stopped, the discs are reset

During the procedure the window displays a series of data useful for checking the procedure status.



Operating section

B. Rough grinding disc resetting procedure



Follow the procedure below to reset the disc:

1. Start the grinder with the product valve disabled
2. Reduce the disc opening by using the button – (at the same time the green arrow with the measurement will move towards the left) paying attention to carefully listen for when the typical pinging of the discs is reached when they start to touch, immediately stop the action here
3. Reopen the discs using the button + and moving them in positive direction by 0.050 mm
4. Press the SAVE ZERO POSITION button

If the operations have been performed correctly, the green arrow will go to the 0.000 position

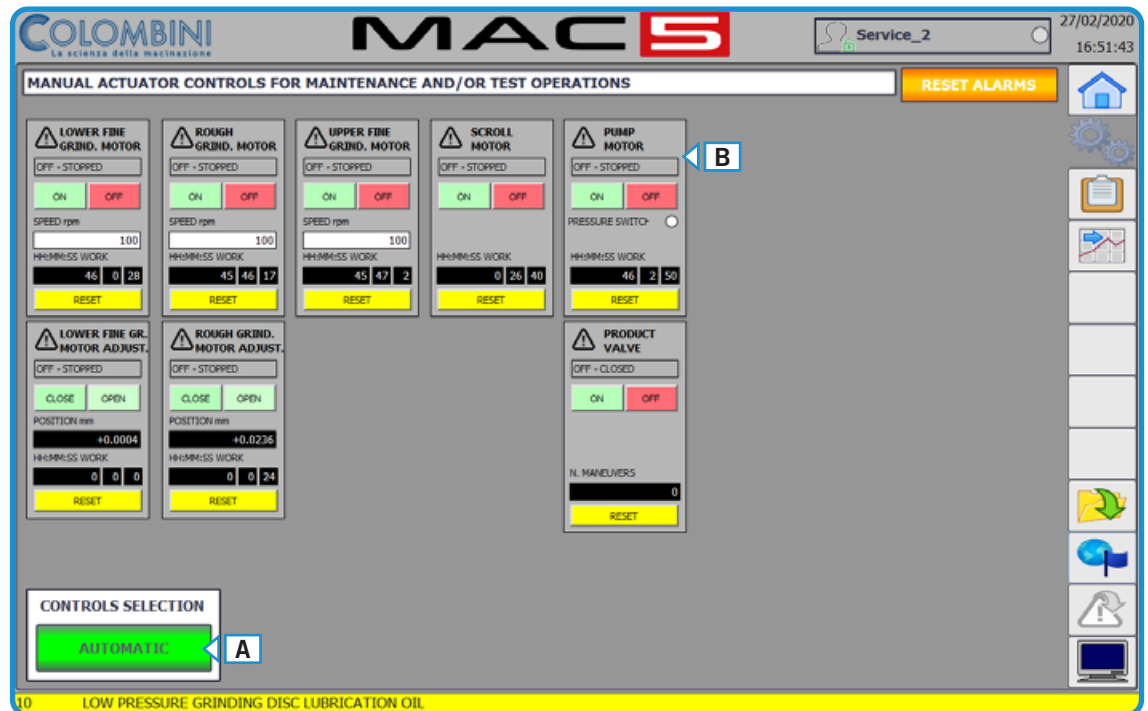
The button ++ brings the discs to the maximum opening position automatically, this function is useful if total opening is required for cleaning the disc area.



5.4.12 Manual controls for maintenance

Page for manual controls of the single actuators for maintenance and/or test operations.

Some of the controls are enabled only if the necessary conditions are present, for example start-up of the single discs is only possible after having started the lubrication pump and scroll.

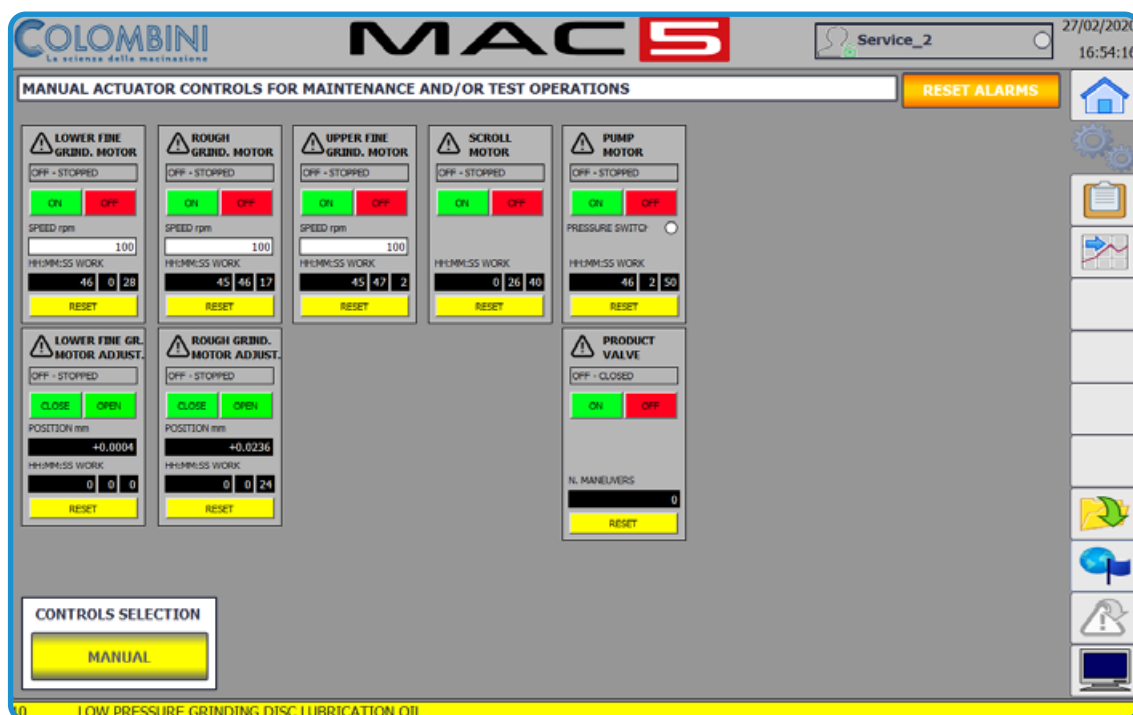


A. Manual/automatic control selection

Automatic is pre-selected when the machine is turned on, manual selection is only made by the operator after LOGIN and access to this page, press the button to change the MANUAL/AUTOMATIC selection. With the AUTOMATIC control selection the manual controls are disabled (identified by the pale colour of the control buttons).



B. Actuator manual control



Once MANUAL controls are selected it is possible to use the controls of the single actuators, in addition to the controls, the status and detected measurements (position, rpm, etc.) are indicated for each actuator.

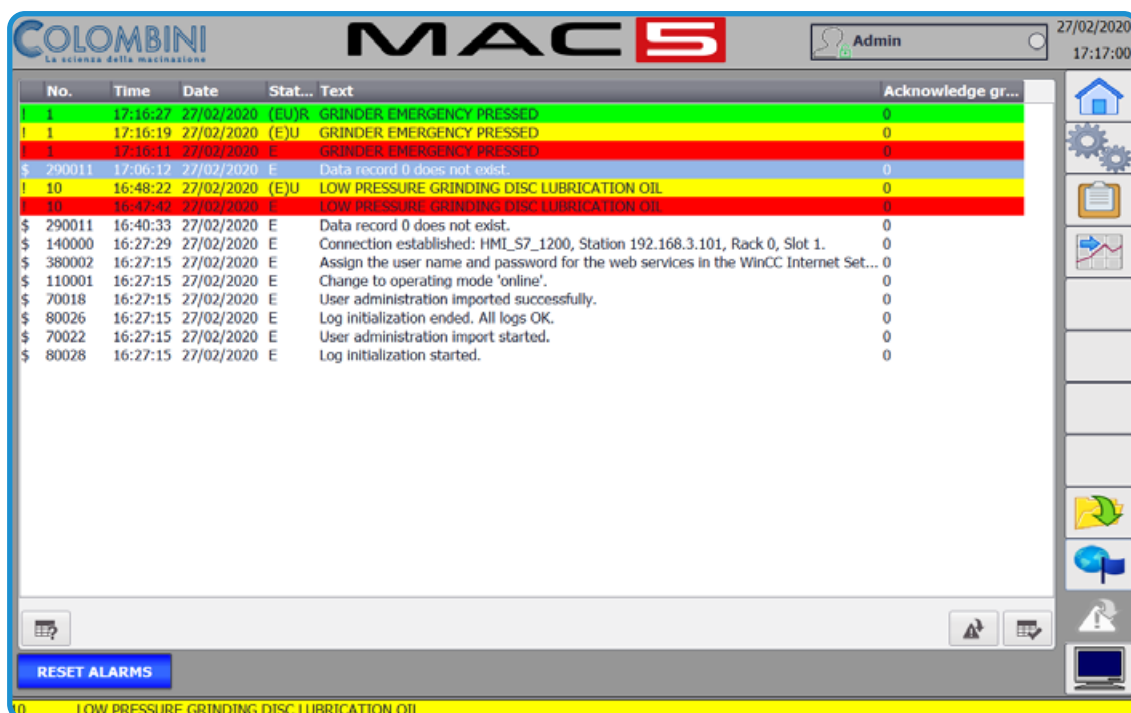
Each actuator is also equipped with an operation counter or manoeuvre counter useful for maintenance analysis.

5.4.13 Manufacturer settings

Page for the factory setups made by the manufacturer, the indications on this page are part of the manual for the manufacturer's internal use.



5.4.14 Alarms



The page is used to display the alarms, the button to the lower right in the dropdown menu if pressed indicates that the operator has seen the alarm, coding of the colours is as follows:

ALARM PRESENT	RED	<i>BLOCK OF THE CORRESPONDING FUNCTION OR MACHINE BASED ON THE ALARM</i>
ALARM NOT PRESENT OR RESET	YELLOW	<i>NO BLOCK</i>
ALARM PRESENT BUT RECOGNISED	RED	<i>BLOCK OF THE CORRESPONDING FUNCTION OR MACHINE BASED ON THE ALARM</i>
ALARM NO LONGER PRESENT OR RESET AND RECOGNISED	GREEN	<i>NO BLOCK</i>



Operating section

Alarm list

1. GRINDER EMERGENCY BUTTON PRESSED
2. FRONT SAFETY LIMIT SWITCH OPEN
3. REAR SAFETY LIMIT SWITCH OPEN
4. EXTERNAL LINE EMERGENCY BUTTON PRESSED
9. ANOMALY IN THE CONTROL OF GRINDING DISC PHASES
10. LOW PRESSURE GRINDING DISC LUBRICATION OIL
11. ANOMALY IN THE DRIVE OF THE LOWER FINE GRINDING MOTOR
12. ANOMALY IN THE DRIVE OF THE ROUGH GRINDING MOTOR
13. ANOMALY IN THE DRIVE OF THE UPPER FINE GRINDING MOTOR
14. THERMAL-MAGNETIC BREAKER FOR GRINDING DISC LUBRICATION OIL PUMP TRIPPED
15. THERMAL-MAGNETIC BREAKER TRIPPED ON SCREW
16. THERMAL-MAGNETIC BREAKER FOR LOWER FINE GRINDING MOVEMENT TRIPPED
17. THERMAL-MAGNETIC BREAKER FOR ROUGH GRINDING MOVEMENT TRIPPED
18. THERMAL-MAGNETIC BREAKER TRIPPED ON VACUUM EXTRACTOR
19. ANOMALY IN THE DRIVE FOR LOWER FINE GRINDING MOVEMENT
20. THERMAL-MAGNETIC BREAKER FOR SERVO LOWER FINE GRINDING TRIPPED
21. THERMAL-MAGNETIC BREAKER FOR SERVO ROUGH GRINDING TRIPPED
22. THERMAL-MAGNETIC BREAKER FOR SERVO UPPER FINE GRINDING TRIPPED
23. THERMAL-MAGNETIC BREAKER TRIPPED ON CHILLER
25. FULL SCREW OUTPUT
26. FULL GRINDING DISC OUTPUT
27. DISC INLET EMPTY
28. TIME-OUT FOR POSITIONING FINE GRINDING AS PER RECIPE
29. TIME-OUT FOR POSITIONING ROUGH GRINDING AS PER RECIPE
33. NO PNEUMATIC CIRCUIT AIR PRESSURE
34. NO NITROGEN PRESSURE IN COOLING CIRCUIT
35. LUBRICATION UNIT FAILURE
36. CHILLER UNIT FAILURE
73. WARNING: MISSING FACTORY ZERO MEMORY LOWER FINE GRINDING DISC
74. WARNING: MISSING FACTORY ZERO MEMORY ROUGH GRINDING DISC
75. WARNING: AUTOMATIC DISC RESETTING CANCELLED DUE TO DRAG UNIT ANOMALY
81. WARNING: GRINDER NOT ENABLED, CARRY OUT FIRST START-UP PROCEDURE
82. WARNING: GRINDER STOPPED DUE TO HIGH TEMPERATURE OF BEARINGS



83. WARNING: REDUCED LUBRICATION INTERVAL DUE TO HIGH BEARING TEMPERATURE
84. WARNING: BEARING LUBRICATION NECESSARY
85. WARNING: GRINDER STOPPED FOR MANDATORY LUBRICATION OF BEARING
86. WARNING: GRINDER STOPPED DUE TO PROLONGED MAX POWER ABSORPTION BY LOWER FINE GRINDING DISC
87. WARNING: GRINDER STOPPED DUE TO PROLONGED MAX POWER ABSORPTION BY ROUGH GRINDING
88. WARNING: GRINDER STOPPED DUE TO PROLONGED MAX POWER ABSORPTION BY UPPER FINE GRINDING DISC
89. WARNING: PRODUCT VALVE CLOSED DUE TO HIGH PRODUCT TEMPERATURE
90. WARNING: PRODUCT VALVE CLOSED DUE TO MAXIMUM OPENING TIME LIMIT
91. WARNING: PRODUCT VALVE CLOSED DUE TO MAXIMUM LOWER FINE GRINDING ABSORPTION
92. WARNING: PRODUCT VALVE CLOSED DUE TO MAXIMUM ROUGH GRINDING ABSORPTION
93. WARNING: PRODUCT VALVE CLOSED DUE TO MAXIMUM UPPER FINE GRINDING ABSORPTION
94. WARNING: PRODUCT VALVE DISABLED BY GENERAL MACHINE SETUP
95. WARNING: NITROGEN VALVE DISABLED BY GENERAL MACHINE SETUP
96. WARNING: VACUUM EXTRACTOR DISABLED UNDER GENERAL MACHINE SETUP
97. WARNING: GRINDER STOPPED, LOWER FINE GRINDING INVERTER NOT READY
98. WARNING: GRINDER STOPPED, ROUGH GRINDING INVERTER NOT READY
99. WARNING: GRINDER STOPPED, UPPER FINE GRINDING INVERTER NOT READY
100. WARNING: GRINDER STOPPED, REGULATION LOWER FINE GRINDING INVERTER NOT READY



5.4.15 Alarm diagnostics

When a problem occurs, diagnostics must be performed using the table below, the electrical component tags indicated refer to the wiring diagram attached to the grinder.



NOTE 1:

If the MAC 5 has stopped suddenly while grinding, **DO NOT** start it up again with the product inside. Follow the indications given in the table below to determine the cause of the alarm, then move the discs by 0.800 mm away so as to prevent straining the drive shaft and compromising the bearing and support assembly.



NOTE 2:

The conditions required for product call are given below: I8.2 and I9.2, respectively, product call and discharge level. The status of these two inputs can be seen on the HMI panel under **DOWNSTREAM REQUEST** (for I8.2, the “DOWNSTREAM REQUEST” message turns green when active) and “**PRODUCT DISCHARGE**” (for I9.2, the “PRODUCT DISCHARGE” message turns green when active).



1	GRINDER EMERGENCY BUTTON PRESSED
Consequence	
The machine cannot be started or run commands, even manual commands.	
Problem	
The emergency safety modules have detected a circuit interruption (see module E1/E2/E3 wiring diagram). Red light on electrical panel door and on column at top of panel (if the latter is present).	
Possible causes	
Emergency button SB1 on main panel or one of the additional emergency buttons has been pressed. If the emergency is caused by safety limit switches or external line signals, the descriptions in the following points (2 and 3) apply.	
Solutions	
1. Identify which emergency button has been tripped and reset it, returning it to the operating position 2. Reset the emergency circuit by pressing RESET EMERGENCY DEVICE SB3 button 3. Reset the corresponding alarm on the HMI by pressing the button on the HOME page or the "RESET ALARMS" button on the alarms page. NOTE: If all emergency points have been positioned correctly and the above procedure still does not eliminate the alarm, check correct operation or electrical connection of modules E1/E2/E3 against the wiring diagram.	
2	FRONT SAFETY LIMIT SWITCH OPEN
Consequence	
The machine cannot be started or run commands, even manual commands.	
Problem	
The emergency safety modules have detected a circuit interruption.	
Solutions	
• Screw cover open. • Limit switch at top of screw - identified as S1 - does not make proper contact with cover.	
Rimedi	
1. Close the screw cover 2. Reset the emergency circuit by pressing RESET EMERGENCY DEVICE SB3 button 3. Press the RESET ANOMALIES button on the HMI	



Operating section

3	REAR SAFETY LIMIT SWITCH OPEN
Consequence	
The machine cannot be started or run commands, even manual commands.	
Problem	
The emergency safety modules have detected a circuit interruption.	
Possible causes	
Screw open. Limit switch at the back of screw - identified as S2 - does not make proper contact with surface of screw flange.	
Solutions	
1. Close the screw and check whether the limit switch makes contact with the surface of the screw flange 2. Reset the emergency circuit by pressing RESET EMERGENCY DEVICE SB3 button 3. Press the RESET ANOMALIES button on the HMI	

4	EXTERNAL LINE EMERGENCY BUTTON PRESSED
Consequence	
The machine cannot be started or run commands, even manual commands.	
Problem	
The emergency safety modules have detected a circuit interruption. The external line emergency button has been pressed.	
Possible causes	
Emergency situation detected outside grinder (see wiring diagram, emergency circuit section).	
Solutions	
1. Check the status of line emergency buttons 2. Reset the emergency button 3. Reset the emergency circuit by pressing RESET EMERGENCY DEVICE SB3 button 4. Press the RESET ANOMALIES button on the HMI	

The operator panel has a diagnostics page dedicated to the emergency line, access it by clicking Documents → Network Diagnostics → Emergency Slot
Follow the legend on the operator panel.



9	ANOMALY IN THE CONTROL OF GRINDING DISC PHASES
Consequence	
The machine cannot be started or run commands, even manual commands.	
Problem	
Phase control does not give the signal to start the grinder. The red phase control LED must be on steady. The phase control is identified as A1 on the electrical panel.	
Possible causes	
Phases reversed during hook up to electrical panel.	
Solutions	
Reverse the phases and try to start the grinder once more.	

10	LOW PRESSURE GRINDING DISC LUBRICATION OIL
Consequence	
The machine cannot be started or run any command, even manual commands, the sole exception being the command for the oil pump.	
Problem	
The pressure switch, located in the oil tank near the pressure gauge, does not detect pressure when pump is started up.	
Possible causes	
• No oil in tank. • Pressure too low. • Pressure switch damaged.	
Solutions	
• Check level of oil in tank, if necessary topping up to restore correct level. • Replace pressure switch. • Check pump operation	



Operating section

11	ANOMALY IN THE DRIVE OF THE LOWER FINE GRINDING MOTOR
Consequence	
The machine cannot start or run manual disc rotation commands and therefore cannot operate product valve and close disc adjustment.	
Problem	
The lower, fine grinding disc inverter has detected an anomaly.	
Possible causes	
See inverter technical manual.	
Solutions	
Try resetting the alarm using the RESET ANOMALIES button on the HMI. If the alarm does not disappear, try turning the electrical panel off, waiting a few minutes and then rebooting it. If the anomaly persists, check the inverter technical manual.	

12	ANOMALY IN THE DRIVE OF THE ROUGH GRINDING MOTOR
Consequence	
The machine cannot start or run manual disc rotation commands and therefore cannot operate product valve and close disc adjustment.	
Problem	
Rough grinding disc inverter has detected an anomaly.	
Possible causes	
See inverter technical manual.	
Solutions	
Try resetting the alarm using the RESET ANOMALIES button on the HMI. If the alarm does not disappear, try turning the electrical panel off, waiting a few minutes and then rebooting it. If the anomaly persists, check the inverter technical manual.	



13

ANOMALY IN THE DRIVE OF THE UPPER FINE GRINDING MOTOR

Consequence
The machine cannot start or run manual disc rotation commands and therefore cannot operate product valve and close disc adjustment.
Problem
Fine grinding disc inverter has detected an anomaly.
Possible causes
See inverter technical manual.
Solutions
Try resetting the alarm using the RESET ANOMALIES button on the HMI. If the alarm does not disappear, try turning the electrical panel off, waiting a few minutes and then rebooting it. If the anomaly persists, check the inverter technical manual.

14

THERMAL-MAGNETIC BREAKER FOR GRINDING DISC LUBRICATION OIL PUMP TRIPPED

Conseguenza
The machine cannot start or run manual disc rotation commands and therefore cannot operate product valve and close disc adjustment.
Problem
Thermal-magnetic breaker QF6 has tripped
Possible causes
• Excessive pump motor power absorption. • Circuit breaker incorrectly calibrated. • Oil filter in oil tank plugged. • Lubrication assembly compromised.
Solutions
• Reset the thermal-magnetic breaker and check that it is set correctly. • The oil pump thermal-magnetic breaker setting must be 0.4 A. • Use the RESET ANOMALIES button on the HMI to reset the alarm. • Start the machine once more. • If the problem persists, check the condition of the oil filter and replace it if necessary.



Operating section

15	THERMAL-MAGNETIC BREAKER TRIPPED ON SCREW
Consequence	
The machine cannot start or run manual disc rotation commands and therefore cannot operate product valve and close disc adjustment.	
Problem	
Thermal-magnetic breaker QF7 has tripped	
Possible causes	
• Excessive pump motor power absorption. • Circuit breaker incorrectly calibrated. • The screw is plugged. • Coffee discharge plugged • Gearmotor not functioning properly	
Solutions	
1. Reset the thermal-magnetic breaker and check that it is set correctly. 2. Screw thermal-magnetic breaker setting must be 1.4 A. 3. Open cover and empty screw 4. Use the RESET ANOMALIES button on the HMI to reset the alarm. 5. Start the machine once more. 6. If the problem persists, check that gearmotor rotates correctly.	
16	THERMAL-MAGNETIC BREAKER FOR LOWER FINE GRINDING MOVEMENT TRIPPED
Consequence	
Fine grinding disc cannot move in either automatic (recipes, adjustments, autotune, zero auto, etc.) or manual mode	
Problem	
Thermal-magnetic breaker QF3 has tripped	
Possible causes	
Excessive fine grinding disc motor power absorption. Circuit breaker incorrectly calibrated. Foreign material lodged between discs.	
Solutions	
1. Reset the thermal-magnetic breaker and check that it is set correctly. 2. Fine grinding disc setting must be 0.15 A. 3. Use the RESET ANOMALIES button on the HMI to reset the alarm. 4. Go to manual controls, check that fine grinding disc adjustment is free to move in both directions. 5. If closure is blocked but opening is possible, open the discs as far as possible, check that there is no foreign material present, clean the discs and repeat the axis reset procedure as indicated in the manual.	



17	THERMAL-MAGNETIC BREAKER FOR ROUGH GRINDING MOVEMENT TRIPPED
Consequence	
Fine grinding disc cannot move in either automatic (recipes, adjustments, autotune, etc.) or manual mode	
Problem	
Thermal-magnetic breaker QF4 has tripped	
Possible causes	
1. Excessive fine grinding disc motor power absorption. 2. Circuit breaker incorrectly calibrated. 3. Rough grinding axis zero setting not performed correctly; upper breaker and rotary breaker may be in contact.	
Solutions	
• Reset the thermal-magnetic breaker and check that it is set correctly. • Rough grinding disc thermal-magnetic breaker setting must be 0.15 A. • Use the RESET ANOMALIES button on the HMI to reset the alarm. • Go to manual controls, check that rough grinding adjustment is free to move in both directions. • If unit can only be opened, open it until the mechanical parts are free; run rough grinding axis zero setting procedure once more as indicated in the manual.	
18	THERMAL-MAGNETIC BREAKER TRIPPED ON VACUUM EXTRACTOR
Consequence	
Extraction cannot be started	
Problem	
Thermal-magnetic breaker QF8 has tripped	
Possible causes	
1. Excessive fine grinding disc motor power absorption. 2. Circuit breaker incorrectly calibrated.	
Solutions	
• The vacuum thermal-magnetic circuit breaker setting must be 4.5 A. • Use the RESET ANOMALIES button on the HMI to reset the alarm. • Check that extraction cycle is performed correctly (see Nifilsk manual)	



Operating section

19	ANOMALY IN THE DRIVE FOR LOWER FINE GRINDING MOVEMENT
Consequence	
Fine grinding disc cannot move in either automatic (recipes, adjustments, autotune, zero auto, etc.) or manual mode	
Problem	
The lower, fine grinding disc inverter has detected an anomaly	
Possible causes	
See inverter technical manual.	
Solutions	
Try resetting the alarm using the RESET ANOMALIES button on the HMI. If the alarm does not disappear, try turning the electrical panel off, waiting a few minutes and then rebooting it. If the anomaly persists, check the inverter technical manual.	

20	THERMAL-MAGNETIC BREAKER FOR SERVO LOWER FINE GRINDING TRIPPED
Consequence	
Machine cannot be started or run manual disc commands and therefore cannot operate product valve	
Problem	
Thermal-magnetic breaker QF8 has tripped	
Possible causes	
Overcurrent surge during servoventilation	
Solutions	
• Reset thermal-magnetic breaker. • Use the RESET ANOMALIES button on the HMI to reset the alarm. • Start machine once more and check that lower fine grinding disc fan is turning correctly.	



21

THERMAL-MAGNETIC BREAKER FOR SERVO ROUGH GRINDING TRIPPED

Consequence
Machine cannot be started or run manual disc commands and therefore cannot operate product valve
Problem
Thermal-magnetic breaker QF9 has tripped
Possible causes
Thermal-magnetic breaker QF9 has tripped
Solutions
• Reset thermal-magnetic breaker. • Use the RESET ANOMALIES button on the HMI to reset the alarm. • Start machine once more and check that rough grinding disc fan is turning correctly.

22

THERMAL-MAGNETIC BREAKER FOR SERVO UPPER FINE GRINDING TRIPPED

Consequence
Machine cannot be started or run manual disc commands and therefore cannot operate product valve
Problem
Thermal-magnetic breaker QF10 has tripped
Possible causes
Overcurrent surge during servoventilation
Solutions
• Reset thermal-magnetic breaker. • Use the RESET ANOMALIES button on the HMI to reset the alarm. • Start machine once more and check that upper fine grinding disc fan is turning correctly.



23	THERMAL-MAGNETIC BREAKER TRIPPED ON CHILLER
Consequence	
Machine cannot be started or run manual disc commands and therefore cannot operate product valve	
Problem	
Thermal-magnetic breaker QF12 has tripped	
Possible causes	
Overcurrent during refrigeration phase	
Solutions	
• Reset thermal-magnetic breaker. • Use the RESET ANOMALIES button on the HMI to reset the alarm. • Start machine once more and check that refrigeration cycle is run correctly (see chiller manual)	

25	FULL SCREW OUTPUT
Consequence	
Product valve cannot be opened to load.	
Problem	
Screw outlet level sensor detected that level was exceeded and thus reads unit as "full". If sensor is not present, a jumper is installed by the manufacturer.	
Possible causes	
Product level has exceeded sensor, thus it is read as full. Jumper was not made.	
Solutions	
• Check CPU inlet level as per diagram, inlet I9.3. • Check terminal board for jumper (see wiring diagram, section on PLC signals).	



26	FULL GRINDING DISC OUTPUT
Consequence	
Product valve cannot be opened to load.	
Problem	
Disc outlet level sensor detected that level was exceeded and thus reads unit as “full”. If sensor is not present, a jumper is installed by the manufacturer.	
Possible causes	
Product level has exceeded sensor, thus it is read as full. Jumper was not made.	
Solutions	
• Check product outlet for input I9.2 on the HMI. It must read empty. • Check terminal board for jumper (see wiring diagram, section on PLC signals).	

27	DISC INLET EMPTY
Consequence	
Product valve cannot be opened to load.	
Problem	
Disc inlet level sensor detected no product present. If sensor is not present, a jumper is installed by the manufacturer.	
Possible causes	
Product level has not reached the sensor. Jumper was not made.	
Solutions	
• Check product inlet for input I9.1 on the HMI. It must read empty. • Check terminal board for jumper (see wiring diagram, section on PLC signals).	



Operating section

28	TIME-OUT FOR POSITIONING FINE GRINDING AS PER RECIPE
Consequence	
Recipe parameters not met signal sent to operator.	
Problem	
After a certain period of time, if fine grinding settings are not met, an alarm is emitted.	
Possible causes	
Recipe's fine grinding settings are not compatible with limits set for machine parameters.	
Solutions	
• Check recipe settings and check that position falls within maximum stroke limits and that speed is within the factory-set limits for motor. • Use the RESET ANOMALIES button on the HMI to reset the alarm.	

29	TIME-OUT FOR POSITIONING ROUGH GRINDING AS PER RECIPE
Consequence	
Recipe parameters not met signal sent to operator.	
Problem	
After a certain period of time, if fine grinding settings are not met, an alarm is emitted.	
Possible causes	
Recipe's fine grinding settings are not compatible with limits set for machine parameters.	
Solutions	
• Check recipe settings and check that position falls within maximum stroke limits and that speed is within the factory-set limits for motor. • Use the RESET ANOMALIES button on the HMI to reset the alarm.	



33	NO PNEUMATIC CIRCUIT AIR PRESSURE
Consequence	
Set-up only.	
34	NO NITROGEN PRESSURE IN COOLING CIRCUIT
Consequence	
Automatic pulsed lubrication cannot be performed	
Problem	
Automatic lubrication unit anomaly.	
Possible causes	
When bearing lubrication is called, CPU does not receive input I9.6.	
Solutions	
• Check that automatic lubrication unit is properly installed and loaded. • Try to reset alarm using the RESET ANOMALIES button on the HMI. • Call up manual controls page and pulse lubricate manually. • If problem persists, see lubrication unit technical manual.	
35	LUBRICATION UNIT FAILURE
Consequence	
Automatic pulsed lubrication cannot be performed	
Problem	
Automatic lubrication unit anomaly.	
Possible causes	
When bearing lubrication is called, CPU does not receive input I9.6.	
Solutions	
• Check that automatic lubrication unit is properly installed and loaded. • Try to reset alarm using the RESET ANOMALIES button on the HMI. • Call up manual controls page and pulse lubricate manually. • If problem persists, see lubrication unit technical manual.	



36	CHILLER UNIT FAILURE
Consequence	
Refrigeration cycle cannot be run in automatic mode	
Problem	
Refrigeration unit anomaly.	
Possible causes	
• Chiller failure. • CPU does not receive input IO.2	
Solutions	
• Check that refrigeration cycle is run correctly. • Try to reset alarm using the RESET ANOMALIES button on the HMI. • If problem persists, see refrigeration unit technical manual. • Check CPU for green light on IO.2.	

73	WARNING: MISSING FACTORY ZERO MEMORY LOWER FINE GRINDING DISC
Consequence	
Automatic product valve opening command cannot be run.	
Problem	
Initial factory start-up: "0" and "Maximum mechanical stroke" have not yet been checked and entered. Or CPU has been replaced and thus factory settings for parameters have been lost.	
Possible causes	
Factory-set lower and upper mechanical limits have not been set (and thus saved); this is done before the discs are installed.	
Solutions	
• Contact technical service.	



74

WARNING: MISSING FACTORY ZERO MEMORY ROUGH GRINDING DISC

Consequence

Automatic product valve opening command cannot be run.

Problem

Initial factory start-up: "0" and "Maximum mechanical stroke" have not yet been checked and entered, or CPU has been replaced and thus factory settings for parameters have been lost.

Possible causes

Lower and upper limits - to ensure that drive shaft does not exceed safety limits - have not been set (and thus saved)

Solutions

- Contact technical service.

75

WARNING: AUTOMATIC DISC RESETING CANCELLED DUE TO DRAG UNIT ANOMALY

Consequence

Automatic fine grinding zero setting cannot be run

Problem

Rotation detection module - used for automatic zero setting procedure - has detected an anomaly.

Possible causes

During test performed before zero setting, rotation detection module failed to detect rotation of upper fine grinding disc or module is damaged.

Solutions

- Provare a resettare l'allarme con il pulsante sul HMI RESET ANOMALIE.
- Rilanciare la procedura di azzeramento automatico.
- Se il problema persiste contattare l'assistenza.



Operating section

81

WARNING: GRINDER NOT ENABLED, CARRY OUT FIRST START-UP PROCEDURE

Consequence

Machine does not start.

Problem

Initial factory start-up: initial start-up procedure for bearing run-in has not yet been performed, or CPU has been replaced and thus factory settings for parameters have been lost.

Possible causes

- Initial machine start-up.

Solutions

- Contact technical service

82

WARNING: GRINDER STOPPED DUE TO HIGH TEMPERATURE OF BEARINGS

Consequence

Machine cycle cuts out

Problem

Temperature of bearing driving upper disc is too high, causing grinder to cut out.

Possible causes

Operating conditions have generated such strain as to raise temperature above limit indicated by manufacturer. Bearing temperature limits are set by manufacturer.
Inadequate greasing.

Solutions

- Machine cuts out to let the bearing cool down and ensure normal operating conditions.
- Wait for unit to cool down and try resetting alarm using the RESET ANOMALIES button on the HMI.
- Contact technical service.



83 WARNING: REDUCED LUBRICATION INTERVAL DUE TO HIGH BEARING TEMPERATURE

Consequence
Halve maximum lubrication interval.
Problem
Temperature of bearing driving upper disc is too high. Machine has an automatic lubrication unit that pulse lubricates at a set, programmable interval. In all cases, a maximum lubrication interval is set (in case of unit anomaly); if the bearing temperature exceeds the failure limit, this interval is to be halved.
Possible causes
Operating conditions have generated such strain as to raise temperature above limit indicated by manufacturer. Bearing temperature limits are set by manufacturer. Inadequate greasing.
Solutions
• Wait for unit to cool down and try resetting alarm using the RESET ANOMALIES button on the HMI. • If problem persists, contact technical service.

84 WARNING: BEARING LUBRICATION NECESSARY

Consequence
Signal preceding machine shutdown by 50 hours is issued for alarm ID 85.
Problem
The bearing driving the upper disc must be lubricated after a certain number of hours of operation.
Possible causes
Signal indicating that the limit number of hours without lubrication has been reached.
Solutions
• If automatic lubrication is managed by the CPU, the grease cartridge must be replaced because it has run out or the unit is damaged (alarm ID35 appears). • Once lubrication has been performed, reset the alarm using the RESET ANOMALIES button on the HMI



Operating section

85

WARNING: GRINDER STOPPED FOR MANDATORY LUBRICATION OF BEARING

Consequence
Machine cycle cuts out.
Problem
The bearing driving the upper disc requires periodic lubrication
Possible causes
• Limit number of hours of operation has been reached.
Solutions
• Lubricate the bearing to ensure normal operation.

86

WARNING: PROLONGED MAX POWER ABSORPTION BY LOWER FINE GRINDING DISC CAUSES GRINDER TO CUT OUT

Consequence
Machine cycle cuts out.
Problem
LOWER FINE GRINDING DISC motor power absorption reading has exceeded the threshold for alarm ID91 - which can be set on the HMI - for an extended period of time, even after the product valve has been closed by the system following alarm ID91.
Possible causes
Possible mechanical problem due to incorrect disc positioning or motor malfunction or gripping against the UPPER FINE GRINDING DISC.
Solutions
• The system reads the motor power absorption. If it exceeds the threshold set on the HMI operator panel (ADVANCED SETUP page - LOWER FINE GRINDING MAX AMP LIMIT FOR PRODUCT OFF), even with the valve closed after the delay (ADVANCED SETUP page - LOWER FINE GRINDING START DELAY FOR AMP > MAX AMP), the grinder cuts out. • If the alarm occurs again, check that the 15 HP motor rotates freely (unhindered) and check the electrical absorption; if necessary, contact the manufacturer.



87	WARNING: GRINDER STOPPED DUE TO PROLONGED MAX POWER ABSORPTION BY ROUGH GRINDING
Consequence	
Machine cycle cuts out.	
Problem	
ROUGH GRINDING DISC motor power absorption reading has exceeded the threshold for alarm ID92 - which can be set on the HMI - for an extended period of time, even after the product valve has been closed by the system following alarm ID92.	
Possible causes	
Possible mechanical problem due to incorrect disc positioning or motor malfunction or gripping against the ROUGH GRINDING disc.	
Solutions	
• The system reads the motor power absorption. If it exceeds the threshold set on the HMI operator panel (ADVANCED SETUP page - ROUGH GRINDING MAX AMP LIMIT FOR PRODUCT OFF), even with the valve closed after the delay (ADVANCED SETUP page - ROUGH GRINDING START DELAY FOR AMP > MAX AMP), the grinder cuts out. • If the alarm occurs again, check that the 3 HP motor rotates freely (unhindered) and check the electrical absorption; if necessary, contact the manufacturer.	

88	WARNING: GRINDER STOPPED DUE TO PROLONGED MAX POWER ABSORPTION BY UPPER FINE GRINDING DISC
Consequence	
Machine cycle cuts out.	
Problem	
UPPER FINE GRINDING DISC motor power absorption reading has exceeded the threshold for alarm ID93 - which can be set on the HMI - for an extended period of time, even after the product valve has been closed by the system following alarm ID93.	
Possible causes	
Possible mechanical problem due to incorrect disc positioning or motor malfunction or gripping against the UPPER FINE GRINDING DISC.	
Solutions	
• The system reads the motor power absorption. If it exceeds the threshold set on the HMI operator panel (ADVANCED SETUP page - UPPER FINE GRINDING MAX AMP LIMIT FOR PRODUCT OFF), even with the valve closed after the delay (ADVANCED SETUP page - UPPER FINE GRINDING START DELAY FOR AMP > MAX AMP), the grinder cuts out. • If the alarm occurs again, check that the 10 HP motor rotates freely (unhindered) and check the electrical absorption; if necessary, contact the manufacturer.	

**89****WARNING: PRODUCT VALVE CLOSED DUE TO HIGH PRODUCT TEMPERATURE****Consequence**

Product valve closure.

Problem

The temperature of the product coming out of the grinder has exceeded the threshold set on the general settings page.

Possible causes

- Possible problem due to fine grinding adjustment.

Solutions

- The system reads the motor power absorption. If it exceeds the threshold set on the HMI operator panel (GENERAL SETUP page - LIMIT PRODUCT TEMPERATURE TO STOP GRINDING), the product valve closes.
- The product valve will remain closed until the threshold set on the HMI operator panel is reached (GENERAL SETUP page - PRODUCT TEMPERATURE TO RESTART GRINDING).
- Check fine grinding adjustment.

90**WARNING: PRODUCT VALVE CLOSED DUE TO MAXIMUM OPENING TIME LIMIT****Consequence**

Product valve closure.

Problem

Timer managing the product valve has reached its maximum count, a threshold that can be set on the HMI.

Possible causes

Uninterrupted product call causes timer to reach its maximum count.

Solutions

- If count is not adequate, change the parameter (GENERAL SETUP - MAX TIME FOR SAFE OPENING OF PRODUCT/NITROGEN VALVE).



91

ATTENZIONE: CHIUSURA VALVOLA PRODOTTO PER ASSORBIMENTO MAX FINITURA INFERIORE

Consequence
Product valve closure.
Problem
LOWER FINE GRINDING DISC motor power absorption reading exceeds threshold that can be set on HMI.
Possible causes
LOWER FINE GRINDING DISC position setting or rotation speed incorrect for product being processed. If, after this alarm, alarm ID 86 appears, the problem could be of a mechanical nature.
Solutions
- The system reads the motor power absorption. If it exceeds the threshold set on the HMI operator panel (ADVANCED SETUP page - LOWER FINE GRINDING MAX AMP LIMIT FOR PRODUCT OFF) for an amount of time equal to that set on the page itself (ADVANCED SETUP page - LOWER FINE GRINDING STOP DELAY FOR AMP > MAX AMP), the product valve closes, thus lowering motor absorption to below the threshold. After the set delay time has elapsed (ADVANCED SETUP page - LOWER FINE GRINDING START DELAY FOR AMP > MAX AMP), the product valve reopens. - If the alarm reoccurs, correct the position and/or speed of the LOWER FINE GRINDING DISC and/or check the quality of the product being ground.

92

WARNING: PRODUCT VALVE CLOSED DUE TO MAXIMUM ROUGH GRINDING ABSORPTION

Consequence
Product valve closure.
Problem
ROUGH GRINDING DISC motor power absorption reading exceeds threshold that can be set on HMI.
Possible causes
ROUGH GRINDING DISC position setting or rotation speed incorrect for product being processed. If, after this alarm, alarm ID 87 appears, the problem could be of a mechanical nature.
Solutions
- The system reads the motor power absorption. If it exceeds the threshold set on the HMI operator panel (ADVANCED SETUP page - ROUGH GRINDING MAX AMP LIMIT FOR PRODUCT OFF) for an amount of time equal to that set on the page itself (ADVANCED SETUP page - ROUGH GRINDING STOP DELAY FOR AMP > MAX AMP), the product valve closes, thus lowering motor absorption to below the threshold. After the set delay time has elapsed (ADVANCED SETUP page - ROUGH GRINDING START DELAY FOR AMP > MAX AMP), the product valve reopens. - If the alarm reoccurs, correct the position and/or speed of the ROUGH GRINDING DISC and/or check the quality of the product being ground.



Operating section

93	WARNING: PRODUCT VALVE CLOSED DUE TO MAXIMUM UPPER FINE GRINDING ABSORPTION
Consequence	
Product valve closure.	
Problem	
UPPER FINE GRINDING DISC motor power absorption reading exceeds threshold that can be set on HMI.	
Possible causes	
• UPPER FINE GRINDING DISC position setting or rotation speed incorrect for product being processed. • If, after this alarm, alarm ID 88 appears, the problem could be of a mechanical nature.	
Solutions	
• The system reads the motor power absorption. If it exceeds the threshold set on the HMI operator panel (ADVANCED SETUP page - UPPER FINE GRINDING MAX AMP LIMIT FOR PRODUCT OFF) for an amount of time equal to that set on the page itself (ADVANCED SETUP page - UPPER FINE GRINDING STOP DELAY FOR AMP > MAX AMP), the product valve closes, thus lowering motor absorption to below the threshold. After the set delay time has elapsed (ADVANCED SETUP page - UPPER FINE GRINDING START DELAY FOR AMP > MAX AMP), the product valve reopens. • If the alarm reoccurs, correct the position and/or speed of the UPPER FINE GRINDING DISC and/or check the quality of the product being ground.	

94	WARNING: PRODUCT VALVE DISABLED BY GENERAL MACHINE SETUP
Consequence	
Automatic product valve opening command cannot be run.	
Problem	
The product valve has been disabled under general setup, thus preventing the product valve from opening.	
Possible causes	
Selected by operator.	
Solutions	
• In the general setup section on the HMI, enable the product valve.	



95

WARNING: NITROGEN VALVE DISABLED BY GENERAL MACHINE SETUP

Consequence

The automatic nitrogen valve opening command cannot be performed.

Problem

The nitrogen valve has been disabled under general setup, thus preventing the nitrogen valve from opening.

Possible causes

Selected by operator.

Solutions

- In the general setup section on the HMI, enable the nitrogen valve.

96

WARNING: VACUUM EXTRACTOR DISABLED UNDER GENERAL MACHINE SETUP

Consequence

Automatic vacuum extraction not possible.

Problem

The vacuum extractor has been disabled under general setup. If a vacuum extractor is present, this prevents it from operating

Possible causes

Selected by operator.

Solutions

- If the vacuum extractor needs to be managed by the CPU, enable the vacuum extractor by pressing the virtual key in the general setup section on the HMI.

**97****WARNING: GRINDER STOPPED, LOWER FINE GRINDING INVERTER NOT READY****Consequence**

Machine cannot be started or run manual disc rotation commands and therefore cannot operate product valve.

Problem

Lower fine grinding disc inverter is not yet in stand-by

Possible causes

- Under “cold” start conditions, the inverter may take a few seconds to enter stand-by.

Solutions

- Try resetting the alarm using the RESET ANOMALIES button on the HMI. If the alarm does not disappear, wait a few seconds and then try RESET ANOMALIES once more. If the anomaly persists, check the inverter technical manual.

98**WARNING: GRINDER STOPPED, ROUGH GRINDING INVERTER NOT READY****Consequence**

Machine cannot be started or run manual disc rotation commands and therefore cannot operate product valve.

Problem

Rough grinding disc inverter is not yet in stand-by

Possible causes

Under “cold” start conditions, the inverter may take a few seconds to enter stand-by.

Solutions

- Try resetting the alarm using the RESET ANOMALIES button on the HMI. If the alarm does not disappear, wait a few seconds and then try RESET ANOMALIES once more. If the anomaly persists, check the inverter technical manual.



99

WARNING: GRINDER STOPPED, UPPER FINE GRINDING INVERTER NOT READY

Consequence

Machine cannot be started or run manual disc rotation commands and therefore cannot operate product valve.

Problem

Upper fine grinding disc inverter is not yet in stand-by

Possible causes

Under "cold" start conditions, the inverter may take a few seconds to enter stand-by.

Solutions

- Try resetting the alarm using the RESET ANOMALIES button on the HMI. If the alarm does not disappear, wait a few seconds and then try RESET ANOMALIES once more. If the anomaly persists, check the inverter technical manual.

100

WARNING: GRINDER STOPPED, REGULATION LOWER FINE GRINDING INVERTER NOT READY

Consequence

The machine cannot be started or run manual grinder adjustment commands.

Problem

Lower fine grinding disc inverter is not yet in stand-by

Possible causes

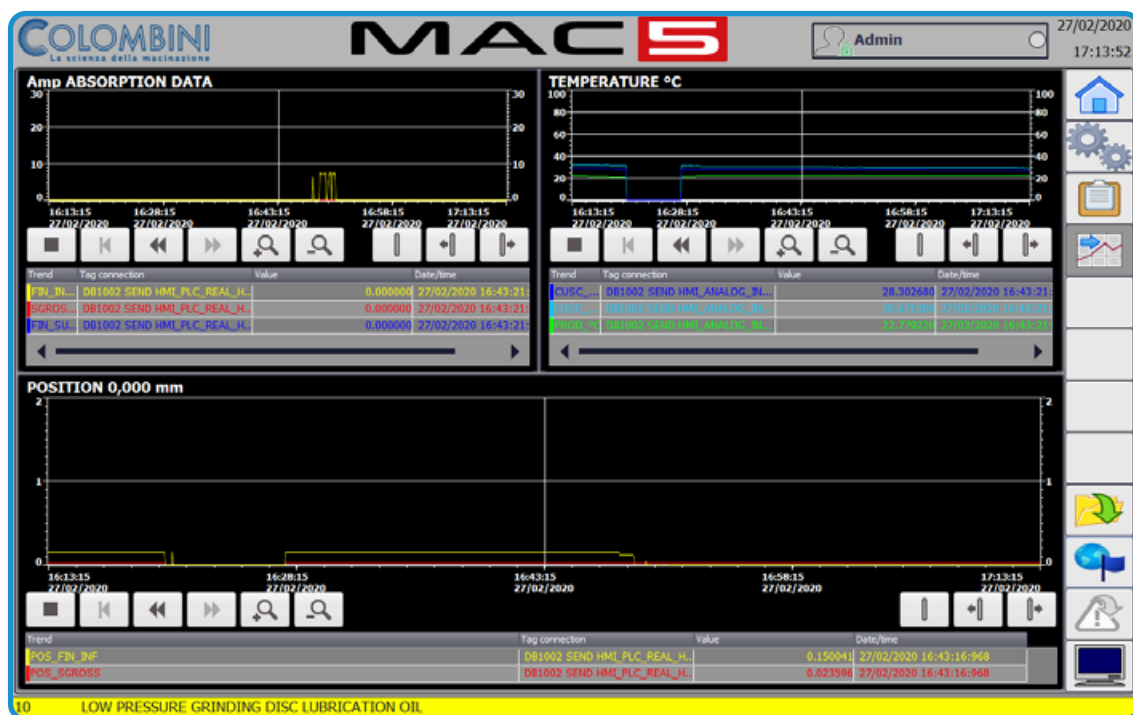
Under "cold" start conditions, the inverter may take a few seconds to enter stand-by.

Solutions

- Try resetting the alarm using the RESET ANOMALIES button on the HMI. If the alarm does not disappear, wait a few seconds and then try RESET ANOMALIES once more. If the anomaly persists, check the inverter technical manual.



5.4.15 Graphs



This screen can be used to display the trend of motor absorptions and bearing temperatures based on the disc positions and elapsed time.



5.4.16 Documents



This screen can be used to display the version of the grinder and the software installed as well as access the two documents in pdf format with the two buttons “ELECTRICAL DIAGRAM” and “USER MANUAL”.

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6. MAINTENANCE SECTION



Extraordinary maintenance on the machine is only to be performed by technicians from the manufacturer's company. A training course has been performed to provide the customer with basic instructions for routine maintenance.



CAUTION!

The maintenance technician must note all interventions performed on the machine on the attached register.

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6.1 Informative notes



This section describes the routine control and maintenance operations indispensable for ensuring regular operation of the machine.

Any other intervention that becomes necessary to eliminate faults or malfunctions must be expressly authorised by the manufacturer.

In these cases always quote the identification data (model, serial number, identifier of the electrical and pneumatic systems, etc.).

For important repairs it is advisable to contact COLOMBINI, its specialised personnel, in possession of all the technological knowledge of the original factory construction, is always available and able to intervene promptly.

For the maintenance or replacement of commercial components installed on the machine follow the instructions provided directly by the Manufacturer and included in their specific manuals or catalogues.

6.2 General safety rules

Maintenance work must be performed by specialised technicians trained in the specific sectors which for this machine are:

- Mechanical maintenance technician
- Electrical system maintenance technician

It is the precise duty of the Safety Officer to verify the professional level and expertise of such individuals. Before starting a maintenance job the safety officer must:

- Clear any foreign material and unnecessary people from the work area.
- Make sure that any necessary equipment is on hand for the maintenance technician and in good conditions.
- Make sure the lighting is sufficient and provide portable lamps, if necessary.
- Make sure that the maintenance technician has all of the homologated personal protection equipment necessary for the specific operation (gloves, goggles, shoes, etc.).
- Make sure that the maintenance technician has carefully read the instructions contained in this manual and is perfectly familiar with the machine's operation.
- Before starting a maintenance job the maintenance technician must:
- Disconnect all of the power supplies (electrical and hydraulic) and put the machine in safe locked conditions.





Maintenance section



WARNING!

If it is absolutely necessary to work with the power on and with the parts moving the maintenance technician must maintain a safety distance, and have stop buttons within reach.

The main switch needs to be in the “0” position and secured with a lock to prevent accidental restarting.

The maintenance technician needs to keep the key for the lock.

At the end of the job and before restarting operation, the maintenance technician must re-test the entire work cycle, operation of the safety devices and condition of the guards.

Work on the motors or other electrical components must only be performed by the Electrical maintenance technician who is specifically trained and authorised by the Safety Officer.



WARNING!

The Safety Officer is required to check the safety conditions of the machine and its protection devices after each maintenance job.

It is advisable to hang a sign prohibiting any operations on the control panel during maintenance jobs.

The maximum machine reliability and minimum maintenance cost are the result of a planned maintenance and inspection programme that is scrupulously followed for the entire life of the machine.

Scrupulously observe the established maintenance time intervals and schedule the jobs based on the specific needs in relation to the machine production cycle.

Always use equipment in perfect conditions and specifically created for the operation to carry out; the use of unsuitable and inefficient equipment can cause serious damage.

Unless specifically required to eliminate a fault, never work on the settings and positioning of the limit switch microswitches: tampering with them may cause serious damage to the machine.

Mark the single parts in relation to each other during disassembly to ensure that they are later reassembled correctly.

Before mounting a unit always spread a thin layer of oil on the internal parts and coupling surfaces. Replace all of the seals and gaskets with original parts before remounting the components.

Always make sure earth connections are present and comply with the standards.

Before operating the machine always make sure that the personnel assigned to maintenance is at a safe distance and equipment or materials have not been left near the machine.



6.3 Cleaning

Before starting testing and maintenance operations, it is necessary to accurately remove all dirt present on the machine by suctioning and with appropriate solvents, avoiding the use of compressed air jets which could create areas with an accumulation of dirt.

Remove every trace of persistent dirt with dry, soft cloths that do not leave lint, or brushes with very flexible bristles.

If the dirt is encrusted and difficult to remove with dry cloths or brushes, use an adequate liquid solvent, which has a low toxicity level and is not flammable.

Purchase solvents suitable for manual use only. Check the specifications stated by the manufacturer.



WARNING!

Use the solvents for cleaning away from open flames and make sure the environment is well ventilated. Avoid prolonged exposure of personnel to solvent fumes.

Failure to comply with these rules may cause injury to personnel.

6.4 Mechanical part maintenance

Disassemble and handle heavy parts (over 30 kg) using hoists, cranes or bridge cranes.

If detailed designs, cross-sections, etc. are not available mark every part and note down its position in order to prevent errors during reassembly.

Always use spanners with an appropriate measurement.

Immediately replace screws and bolts that show signs of wear.

Do not apply pipes or extensions in general to the spanners to increase the force during unscrewing and screwing operations. If torque wrenches and special tools are used, make sure the calibration is adequate for the component.

Special attention needs to be paid when using pneumatic and hydraulic tools.

Spray appropriate liquid (Svitol, etc.) on particularly oxidised units before disassembling them.

Before remounting, spread a thin layer of oil on all the coupling surfaces.



Maintenance section

Pay particular attention when assembling locking devices used by the manufacturer (flat washers, spring lock washers, etc.), always replacing worn parts.

Specifically, the lock nuts and ferrules equipped with a plastic locking ring, must be replaced every disassembly since worn material loses its function.

Always carefully check and test the efficiency of lubrication systems and devices.



WARNING!

Always uses gloves and safety shoes.



6.5 Electrical system maintenance

Disconnect the equipment upstream power (main switch of the power supply line) before working on the electrical components.

Always carefully check the insulating cladding, terminal boards and sealing of enclosures.

This must always be compliant with the protection code declared by the manufacturer.

Immediately replace any ruined gaskets and sheaths.

Check the identification labels and bands of wires and components and restore if necessary, following the instructions shown on the diagrams.

Make sure the danger warnings and explanatory plates required by the standards are perfectly legible and correctly secured.

Do not use compressed air for cleaning. Only use vacuum cleaners.

The replacement of faulty control components must always be done with parts compliant with the contents of Standard EN 60204-1 (colours, dimensions, guards, etc.).



6.6 Hydraulic and pneumatic system maintenance

Pay utmost attention not to mix air and hydraulic oil in the machine when pressurised to prevent the formation of explosive mixtures.

Always make sure that the systems are not pressurised before performing any maintenance operation on the components.

Move away from the discharge holes and taps during system pressure discharge operations.

Protect the connection lights with plastic caps after disassembly.

Carefully inspect all of the fittings making sure they are free from powder/dust, oil, dirt or defects on threading, before making the connections.

Make sure that all of the fittings and joints are correctly tightened before pressurising the systems, after a repair job.

Always discharge the air of the hydraulic systems after reassembly.

Do not handle hydraulic fluid in the presence of electric sparks or open flames.

Prevent the hydraulic fluid from being heated to temperatures too close to the flash point.

Immediately change your clothing if they get wet with hydraulic fluid, it is highly damaging to skin.

Always keep a distance from any component that can be put in motion by hydraulic pressure, if it has not been completely discharged from the systems.



WARNING!

Always use goggles and protective gloves.





6.7 Preventive maintenance

Preventive maintenance is defined as all of the operations performed at established intervals or according to prescribed criteria and aimed at reducing the probability of a fault or deterioration of the operation of a machine. Preventive maintenance includes the operations described below.

Setting

Setting operations of the main nominal operating values of the system, for example:

- nitrogen infeed pressure and temperature
- pneumatic system pressure

Cleaning

Cleaning operations of a mechanical, fluid or electrical unit, for example:

- cleaning of the product passage areas
- bleeding of the pneumatic system condensate

Lubrication

Lubrication operations of a mechanical unit when the equipment for performance are included (filling cap, grease lubricator, etc.), for example:

- restoring the oil level in the pump tank
- filling or changing of the oil in the pump tank

Replacement

Replacement operations for particularly critical mechanical or electrical parts that are subject to wear at the specified time interval, for example:

- replacement or sharpening of grinding discs



6.8 Overhaul

Overhaul is defined as all of the operations used to determine and assess the actual operating situation of a machine (or another technical device). Overhaul includes the operations described below.

Operating test
Operating to test the operation of a mechanical unit/device. This can be done on-site or after removal of the unit, for example: • testing the effectiveness of the lubrication • testing the safety switches located on the machine body
Control
Operating control operations of the status of a mechanical unit, for example: • control of grinding discs • control of motor heating • control of abnormal noise • control of current absorption by electric motors



Always compare the overhaul results with:

the results of previous overhauls to become aware of any differences and establish the stock of consumables (that wear out) still available in the considered mechanical unit.

The nominal status of the considered unit to determine the possible causes of defect and take the most opportune measures (e.g. repair).



6.9 Repair

Repairs are defined as all operations used to return a machine to the nominal operating status. Repair includes the operations described below.

Repair
Repair operations of the operating conditions or replacement of a defective or worn mechanical unit, for example: • units or parts of units composing the machine • cutting discs



Frequency of repair jobs:

Based on the state of wear: a repair job is performed after assessment of the results of a preliminary overhaul, in order to prevent the mechanical unit in question from being damaged.

After a fault or deterioration: an overhaul, during which the fault or deterioration is determined, precedes the repair.

The repair is performed after assessment of the overhaul results



6.10 Lubricants

The MAC 5 Grinder requires three types of lubrication:

1. Changing of the oil in the pump unit lubrication tank.

Oil: **FUCHS CASSIDA FLUID HF15**

quantity: ~ **9 litres**

recommended changing times: **2000 hours of work**

2. Greasing of the thrust bearing present in the support unit.

grease: **SKF LGMT (OR EQUIVALENT)**

operation interval: **3,000 hours**

3. Upper disc rotation bearing gears

grease: **KLÜBERSYNTH UH1 64-62**

operation interval: **Automatic**



6.11 Maintenance sheets

The sheets in question regard cleaning and lubrication operations, tests, small repairs and replacement of machine parts (spare parts).

The aim of this maintenance plan is to guide and help the maintenance technician to intervene on the machine in order to keep the degree of machine efficiency high. The intervention frequency of the maintenance sheets is shown in the tables.

The time intervals indicated on these maintenance sheets are reference values related to machine operation with a daily work cycle considered of 22.5 hours. These reference values have been estimated based on experience and with the intent to establish them as accurately as possible, however it is not possible to consider them absolutely exact.

Observe the production cycle in its operating conditions with utmost attention and change the indicated time intervals based on the experience acquired.

The factors that affect these time intervals are:

- ambient conditions (temperature in the building, humidity, air pollution, etc.),
- assembly precision or required processing

Cleaning of the system must be performed at regular time intervals.



WARNING!

Put on adequate protective clothing, goggles and/or gloves based on the work to perform before starting any maintenance or cleaning operation.

Disconnect and lock all energy sources and put the machine in safe locked conditions before starting any maintenance operation. Place a sign near the main switch

**MACHINE BEING SERVICED
DO NOT TURN ON THE POWER**

Before restarting operation, recheck the entire system according to the start-up procedures.

Run a few test cycles in manual after every maintenance operation to check its operation.

Failure to comply with these precautionary measures may cause serious injury to personnel.

It is prohibited for cleaning personnel to remove machine protection devices.



ATTENTION:

On the maintenance sheets there is a QR CODE with which it is possible to access specific video tutorials for the operations to be performed via smartphone.

Before performing the operations indicated in the video tutorials, it is essential to have read the safety instructions reported in this manual and on each individual sheet.



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REMOVING AND REINSTALLING THE LOWER FINE GRINDING MOTOR



WARNING!

The operations described in this technical data sheet and those contained in the relative video tutorials which can be captured via QR CODE must only be performed by qualified technicians and only after having read the safety information contained in sections 2 and 6 of the Use and Maintenance manual.

When in doubt, do not interpret! Instead directly contact the Colombini Srl technical assistance service at +39 011 8211407 service@colombini.srl

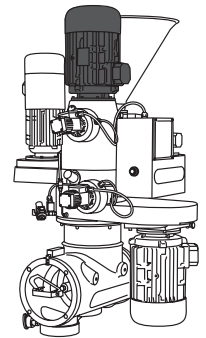
Motor characteristics:

Weight: Kg. 60

Power: kW 11

Power supply: 400 V. - 50 Hz.

Spare part number: E1.0158



To remove/reinstall the lower fine grinding motor, the following are required:

- a) lifting system with safety hook
- b) lifting tool supplied by the manufacturer (code G0.SOLL.01)
- c) Phillips screwdriver
- d) socket screwdriver - 10 mm
- e) wrench - 10 mm
- f) wrench - 13 mm
- g) wrench - 17 mm
- h) Allen wrench - 5 mm



REMOVING THE MOTOR

- Remove the machine power supply by turning the main switch to 0.
- Close the pneumatic power supply cock and disconnect the supply hose using the quick coupling.
- Disconnect the electric power coil.



- Using a 13 mm wrench, unscrew the four bolts and remove them with their washers.
- Withdraw the hopper and close the product access compartment with adhesive tape.



WARNING!

The hopper weighs approximately 20 kg. Be careful when handling it.

- Unscrew the motor fan power connector and remove it.
- Using a 5 mm wrench, unscrew the four Allen screws and remove the cover from the motor electrical box.



WARNING!

Save/photograph the position and colour of the three power supply cables for subsequent reassembly.

- Using a 10 mm socket screwdriver, unscrew the three nuts and remove them with their washers, and then withdraw the three power supply cables.



- Unscrew the upper screw and remove it with its washer and then withdraw the yellow-green earth cable.
- Unscrew the four screws and withdraw the motor fan.



- At the bench, mount the lifting tool supplied with the machine. (code G0.SOLL.01).
- Do not fully tighten the eyebolt.



- Mount the lifting tool on the motor using the two bolts and washers supplied with the tool. Use the threaded holes found on the sides of the motor.
- Using a 17 mm wrench, tighten the two bolts.
- Fully tighten the eyebolt.



WARNING!

Use an appropriate lifting system compliant with the standards and rated for the load.

Weight of the motor: Kg. 60.

- Save/photograph the correct position of the motor for subsequent reassembly.
- Using a 10 mm wrench, unscrew the eight bolts securing the motor to the machine and remove them with their washers.
- Lift and handle the motor in compliance with the standards.

REINSTALLING THE MOTOR



- Position the motor correctly on the machine using the lifting tool provided (code G0.SOLL.01).



WARNING!

Be careful when inserting the motor.

The contour on the shaft must line up with the contour on the support unit.



WARNING!

If a new motor is to be installed, we recommend greasing the end of the shaft.

- Remove the sling used to handle the motor.
- Loosen the eyebolt.
- Unscrew and remove the two bolts with their washers and remove the tool supplied by the manufacturer.
- Tighten the eight bolts with their washers to secure the motor.
- Reinstall the motor fan.
- Hook up the fan power supply connector and secure it with its screw.
- Make the electrical connections on the motor and reinstall the cover on the electrical box.
- Remove the adhesive tape previously set over the product access compartment and install the hopper.
- Reinstall the coil and the pneumatic power supply hose.

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REMOVING THE UPPER FINISHING MOTOR



WARNING!

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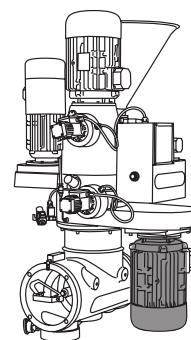
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service@colombini.srl*

Motor characteristics:

Weight: Kg. 60 / 55

Power: kW 11 / 7,5

Spare part number: E1.0158 / E1.0151



To remove/reinstall the upper fine grinding motor the following are required:

- a) Phillips screwdriver
- b) wrench - 8 mm
- c) wrench - 13 mm
- d) wrench - 17 mm
- e) Allen wrench - 5 mm
- f) 4 and 6 mm Allen wrenches

REMOVING THE MOTOR



WARNING!

Removal of the motor is a dangerous operation. Make certain that the operator wears suitable protective gloves and crush-resistant footwear.

- From the operator panel, move away the lower fine grinding discs to a value of 0.600 mm.
- Remove the machine power supply by turning the main switch to 0.



- remove the cover for the upper fine grinding motor belt. Using a 8 mm wrench, unscrew and remove the three bolts.
- Using a 4 mm Allen wrench, unscrew and remove the three screws securing the gear wheel guard disc. Remove the guard disc.
- Using a 6 mm Allen wrench, loosen the four screws securing the motor support to the timing belt frame.



- The position of the motor support vs. the timing belt frame is fixed by the locking position of a worm screw located under the frame. Using a 13 mm wrench, loosen the worm screw locking bolt and loosen the two securing nuts that prevent the screw from moving longitudinally in its seat.



- Push the motor block towards the body of the machine, loosening the timing belt — tensioned on the gear wheel inside the frame — just enough so that it acquires some play.



WARNING!

The motor weighs approximately 60 kg. Be careful when handling it.

- Using a 5 mm Allen wrench, loosen the six Allen screws on the gear wheel and remove the gear wheel from its seat.
- Make certain that the transmission timing belt on the upper fine grinding discs is free to move in its seat.



- Using a 5 mm Allen wrench, loosen the four Allen screws and remove the cover from the motor electrical box.



WARNING!

Save/photograph the position and colour of the three power supply cables for subsequent reassembly.

- Using a 7 mm socket screwdriver, unscrew and remove the three nuts, with their washers, and withdraw the three power supply cables.
- Unscrew the upper screw and remove it with its washer and then withdraw the yellow-green earth cable.
- Disconnect the fan power supply connector using a Phillips screwdriver.
- Using a Phillips screwdriver, unscrew the four screws securing the lower motor cooling fan.
- Remove the cooling fan assembly.



WARNING!

Secure the fan assembly with a suitable support or with the aid of another person so that it cannot fall and be damaged.

- Completely unscrew the previously loosened bolt and nut securing the worm screw located under the transmission belt block.
- Using a 5 mm Allen wrench, unscrew the two screws securing the worm screw support flange. Remove the two screws and the two related washers.
- Unscrew the nut still present on the worm screw, manually accompanying the flange that intercepts the screw until both nut and flange are completely removed from the screw.
- Free the worm screw from all constraints.



WARNING!

The motor is heavy. To remove it, make certain that it is supported by a lifting device compliant with current safety regulations.

- Move the motor so that the upper part can pass through the central hole.
- Using a forklift, position the blades under the motor so that it is properly supported when the screws securing it to the grinder are loosened.



- Unscrew the four screws holding the motor support suspended from the transmission belt frame. Use a 6 mm Allen wrench.



WARNING!

The motor is heavy and must be unscrewed carefully. During the operation, make certain that the motor rests firmly on the forklift blade which must bear the full weight of the motor.

- Unscrew the four Allen screws and remove them completely.
- Once freed from all constraints, the motor rests solely on the forklift blades.
- Save/photograph the correct position of the motor for subsequent reassembly.
- Lower the forklift blade so that the upper part of the motor is lowered, passing through the circular passage in the transmission belt support frame, so it can be moved freely.
- Remove the upper fine grinding motor in compliance with the safety standards.



Maintenance section

REINSTALLING THE MOTOR



- Correctly position the motor under the transmission belt support frame, making certain that the motor shaft is coaxial to the circular passageway and the motor support flanges are correctly positioned in relation to the machine. Make reference to the position saved during removal.



WARNING!

Be careful when inserting the motor.

Observe the safety standards for handling: the motor is heavy.

The motor shaft must enter the transmission frame. WARNING!.



WARNING!

If a new motor is to be installed, we recommend greasing the end of the shaft.

- Using the forklift, lift the motor, making sure that the shaft passes through the hole.
- Tighten the four bolts and washers securing the motor support to the transmission frame. Use a 6 mm Allen wrench.
- Without tightening the four bolts, make certain that the motor is supported and the forklift truck can be removed.
- Remove the forklift truck.
- Insert the worm screw locking flange that adjusts the position of the motor so that the nut present is located between the two sides of the component. Adjusting the nut as needed, position the flange so that the position lines up with the transmission frame securing holes.
- Using a 5 mm Allen wrench, tighten the two bolts with washers to secure the flange.
- Make the electrical connections on the motor and reinstall the cover on the electrical box.
- Secure the lower motor body, making certain that the openings and threaded holes line up. Tighten with four Phillips screws.
- Hook up the fan power supply connector and secure it with its screw.
- Position the gear wheel in its housing inside the transmission frame, making certain that it is correctly positioned above the motor shaft and that the screw through-holes and threaded holes on the motor line up.



WARNING!

Make certain that the timing belt does not get pinched under the gear wheel but is, instead, arranged correctly around it.

- Using a 5 mm Allen wrench, tighten the six gear wheel securing screws.
- Adjust the belt so that the belt teeth and gear wheel cogs are aligned correctly.



- Tighten the worm screw stud nut so that the entire motor block shifts in its seat, correctly tensioning the transmission timing belt.



WARNING!

While tensioning the belt, move the gear wheel to ensure that the transmission shows no slippage and that, on the contrary, the tension is not so high as to compromise correct transmission of the movement.

- Insert the gear wheel guard disc and secure it with its three screws.
- Reinstall the cover grille and secure it with its three screws.



- Replace the second nut and securing bolt on the worm screw. Tighten the securing bolt using a 13 mm wrench.
- Fully tighten the four Allen screws supporting the motor to the transmission frame.



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REMOVING AND REINSTALLING THE ROUGH GRINDING MOTOR



WARNING!

The operations described in this technical data sheet and those contained in the relative video tutorials which can be captured via QR CODE must only be performed by qualified technicians and only after having read the safety information contained in sections 2 and 6 of the Use and maintenance manual.

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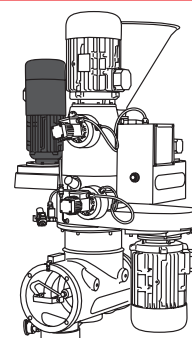
Motor characteristics:

Weight: Kg. 20

Power: kW 2,2

Power supply: 400 V. - 50 Hz.

Spare part number: E1.0140



To remove/reinstall the rough grinding motor, the following are required:

- a) Phillips screwdriver
- b) socket screwdriver - 7 mm
- c) wrench - 10 mm

REMOVING THE MOTOR

- Remove the machine power supply by turning the main switch to 0.



- Using a Phillips screwdriver, unscrew the four screws and open the cover of the motor electrical box.



WARNING!

Save/photograph the position and colour of the power supply cables for subsequent reassembly.

We recommend using a cable tie to group together the electrical cables located in the zone to the right.

- Using a 7 mm socket screwdriver, unscrew and remove the nuts with their washers, and then withdraw the power supply cables.
- Unscrew the upper screw and remove it with its washer and then withdraw the yellow-green earth cable.
- Using a 10 mm wrench, unscrew the eight bolts securing the motor to the machine and remove them with their washers.
- Save/photograph the correct position of the motor for subsequent reassembly.



WARNING!

Wear suitable slip-resistant gloves.

- Manually lift and handle the motor in compliance with the standards.



REINSTALLING THE MOTOR



WARNING!

Wear suitable slip-resistant gloves.

- Correctly position the motor on the machine (motor code E1.0140).



WARNING!

Be careful when inserting the motor.

The tab on the shaft must line up with its seat on the support unit.



WARNING!

If a new motor is to be installed, we recommend lubricating the end of the shaft.

- Tighten the eight bolts with their washers and secure the motor.
- Make the electrical connections on the motor and reinstall the cover on the electrical box. Remove the additional tie which was applied during removal.

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REMOVING THE ROUGH GRINDING AND FINE GRINDING DISCS

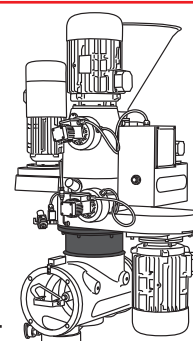


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To remove the grinding discs, the following are required:

- a) Allen wrench - 5 mm
- b) Allen wrench - 4 mm
- c) wrench - 10 mm
- d) wrench - 27 mm
- e) supplied service wrench (code E0.0345)



WARNING!

This instruction describes how to remove both the rough grinding and fine grinding discs. However, it may be advisable to replace only a part of these.



WARNING!

From the operator panel, move away the lower fine grinding discs to a value of 0.600 mm.



WARNING!

Disconnect the machine electric power supply.



WARNING!

Use cut-resistant gloves.



- 1
 - Using a 5 mm Allen wrench, unscrew the screw blocking the sealing ring and remove it from its seat.
 - Turn the extractor unit fully outwards.
 - Using a 13 mm wrench, loosen the six blind nuts securing the duct.
 - Turn the duct slightly to the right and withdraw it by pulling downwards.



- 2
 - Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc leftward all the way to the stop.
 - Release the central nut using a 27 mm wrench.
 - Turn the disc to the right and remove the service wrench.



- Unscrew the central nut while supporting and removing the assembly consisting of the lower fine grinding and rough grinding discs.



WARNING!

We recommend that a second person support the grinding discs throughout removal operations.



- Using a 4 mm Allen wrench, unscrew the three Allen screws holding the upper rough grinding breaker and then withdraw it from its seat.



- Using a 5 mm Allen wrench, unscrew the six Allen screws securing the upper fine grinding disc; then support the disc and withdraw it from its seat.



- At the bench, using a 5 mm wrench, unscrew the six Allen screws and separate the lower fine grinding disc from the breaker support disc.



WARNING!

Be careful when handling the disc.

- Turn the disc upside down and place it on the wooden side supports; use a punch and hammer on the side holes to separate the breaker from the support disc.



WARNING!

Protect the jaws of the vice.

- Use a vice to secure the bushing and use a rubber mallet to separate the breaker from the bushing.
- The machine is now ready to be outfit with a new set of grinding discs.

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REMOVING AND REINSTALLING THE ROTARY BREAKER BEARING

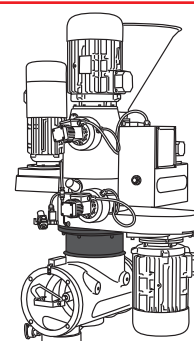


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To remove/reinstall the rotary breaker bearing, the following are required:

- a) Allen wrench - 3 mm
- b) Allen wrench - 5 mm
- c) socket wrench - 5 mm
- d) wrench - 13 mm
- e) wrench - 27 mm
- f) supplied service wrench (code E0.0345)



REMOVING THE ROTARY BREAKER BEARING



WARNING!

From the operator panel, move away the lower fine grinding discs to a value of 0.600 mm.



WARNING!

Disconnect the machine electric power supply.



WARNING!

Use cut-resistant gloves.



- 1
 - Using a 5 mm wrench, unscrew and remove the Allen screw securing the seal ring and remove it from its seat.
 - Turn the extractor unit fully outwards.
 - Using a 13 mm wrench, loosen the six blind nuts securing the duct.
 - Turn the duct slightly to the right and withdraw it by pulling downwards.



- 2
 - Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc leftward all the way to the stop.
 - Release the central nut using a 27 mm wrench.
 - Turn the disc to the right and remove the service wrench.



WARNING!

We recommend that a second person support the grinding discs throughout removal operations.

- Unscrew the central bolt while supporting and removing the assembly consisting of the lower fine grinding and rough grinding discs.



- At the bench, using a 5 mm wrench, unscrew the six Allen screws and separate the lower fine grinding disc from the breaker support disc.



WARNING!

Be careful when handling the disc. The use of cut-resistant gloves is mandatory.

- Turn the disc upside down and place it on the wooden side supports; use a punch and hammer on the side holes to separate the breaker from the support disc.
- Using a 3 mm Allen wrench, unscrew and remove the grub screw securing the bearing.



- Insert a punch into the seat of the previously removed grub screw; then unscrew the ring securing the bearing (turning it to the left) and remove the ring.



WARNING!

Protect the jaws of the vice.

- Clamp the assembly in a vice and use a screwdriver to remove the bearing from its seat.

INSTALLING THE NEW BEARING

- Position the new bearing (Code E0.0465) in its seat.



- Using a bushing and rubber mallet, push it all the way in.
- Fully tighten in the previously removed locking ring nut, turning it to the right.
- Using a 3 mm Allen wrench, insert and fully tighten the grub screw.
- Insert the rotary breaker and secure it using a rubber mallet.



WARNING!

Reinstall the lower grinding disc assembly as indicated in sheet no. 07.

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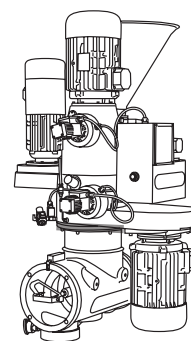
REMOVING BEARING UNIT ZKLDF180



WARNING!

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To remove/reinstall the bearing unit, the following are required:

- a) Allen wrenches - 3 mm, 4 mm, 5 mm, 6 mm, 8 mm
- b) wrenches - 8 mm, 13 mm and 27 mm
- c) supplied service wrench (code E0.0345).
- d) wrench - 17 mm



WARNING!

From the operator panel, move away the lower fine grinding discs to a value of 0.600 mm.



WARNING!

Disconnect the machine electric power supply.



WARNING!

Use cut-resistant gloves.



- Using a 5 mm Allen wrench, unscrew and remove the screw securing the sealing ring and remove it from its seat .
- Turn the extractor unit fully outwards.
- Using a 13 mm wrench, loosen the six blind nuts securing the duct.
- Turn the duct slightly to the right and withdraw it by pulling downwards.



- Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc leftward all the way to the stop.
- Release the central nut using a 27 mm wrench.
- Turn the disc to the right and remove the service wrench.



- Unscrew the central nut while supporting and removing the assembly consisting of the lower fine grinding and rough grinding discs.



WARNING!

We recommend that a second person support the grinding discs throughout removal operations.



- Using a 5 mm Allen wrench, unscrew the six screws securing the upper fine grinding disc; then support the disc and withdraw it from its seat.



- Using a special wrench, insert two 5 mm Allen screws into two free threaded holes at the opposite sides of the bearing protection ring (if present). Do not tighten the screws, just insert them into the threaded holes.
- Unscrew the six Allen screws securing the ring in its seat. However, once freed from the securing screws, the ring will remain stuck in its position since interference with the machine body forces it into its seat. To unscrew, use a 5 mm Allen wrench.
- Slowly tighten the two inserted screws so as to progressively force the ring to detach from the body of the machine. Support the ring and withdraw it from its seat.



- Locate the Allen screws supporting the upper rough grinding disc.
- Using a 4 mm Allen wrench, unscrew the three screws supporting the upper rough grinding disc; then support the disc and withdraw it from its seat.



- Remove the blue nitrogen/air supply hose from the coupling on the pressure switch on the side of the machine body. This is done using a wrench.
- Unscrew and remove the coil controlling the pressure switch.
- Using a Phillips screwdriver, unscrew the IP valve supply connector (if present).
- Unscrew the screw connector on the front thermocouple located beside the pressure switch.
- Using a 13 mm wrench, unscrew the nut locking the probe in place, remove it from its threaded seat and gently pull the probe out of its housing on the side.
- Using a wrench, remove the lubrication feed hose from its quick coupling on the side of the machine body.
- Using a 17 mm wrench, unscrew the greasing nozzle and remove it from its seat. Pull it out carefully.



WARNING!

The threaded hole on the nozzle and body of the machine have coloured marks indicating their position where they line up; identify these marks as these will be useful when repositioning the parts during reassembly.

- Using a 13 mm wrench, unscrew the nut locking the second thermocouple probe in place beside the greasing nozzle.
- Carefully withdraw the probe.
- Remove the cover for the upper fine grinding motor belt. Using an 8 mm wrench, unscrew and remove the three screws.
- Using a 4 mm Allen wrench, unscrew and remove the three screws securing the gear wheel guard disc. Remove the guard disc.



Maintenance section

8

- Using a 6 mm Allen wrench, loosen the four Allen screws securing the motor support to the timing belt frame.
- The position of the motor support vs. the timing belt frame is fixed by the locking position of a worm screw located under the frame. Using a 13 mm wrench, loosen the worm screw locking nut and loosen the two securing nuts that prevent the screw from moving longitudinally in its seat.
- Push the motor block towards the body of the machine, loosening the timing belt - tensioned on the gear wheel inside the frame - just enough so that it acquires some play.



WARNING!

The motor weighs approximately 60 kg. Be careful when handling it.

- Using a 5 mm Allen wrench, loosen the six Allen screws on the gear wheel and remove the gear wheel from its seat.
- Make certain that the transmission timing belt on the upper fine grinding discs is free to move in its seat.

9

- Using a 3 mm Allen wrench, unscrew the two screws securing the black gear wheel side ventilation grille. Remove the grille.
- Using a 3 mm Allen wrench, also unscrew the screws securing the second side ventilation grille and remove it.
- Using an 8 mm Allen wrench, unscrew the ten Allen screws securing bearing assembly ZKLDF180 to the machine body.



WARNING!

The grinding disc bearing assembly is heavy. Before unscrewing the screws, to ensure safe handling during removal, place a mobile support compliant with the standards under the assembly; to this purpose, we recommend using the blades of a forklift truck as this permits both vertical movement and general handling.

- Completely remove the Allen screws, making certain that the bearing assembly rests gently on the forklift truck blades.
- Remove the assembly.

REINSTALLING THE BEARING ASSEMBLY

10



WARNING!

Make certain that the timing belt does not get pinched under the gear wheel but is, instead, arranged correctly around it.

- Position bearing assembly ZKLDF180 in its housing inside the transmission frame and make certain that it is correctly positioned above the motor shaft and that the screw through-holes and threaded holes on the motor line up.



WARNING!

Be careful when inserting the assembly into its seat. There are two pins on the machine body. Locate the corresponding holes on the bearing assembly, i.e. those smaller than the ones for the ten securing screws.

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- Using the forklift truck, position the bearing assembly under the body of the machine. Line up the pins with the holes identified on the disc.
- Lay out the belt in its place.
- Insert the assembly.



WARNING!

The correct position of the assembly in its seat is the one where the yellow mark on the side lines up with the mark on the threaded hole on the lubrication injector.

- Use an 8 mm Allen wrench to tighten the ten bearing assembly securing screws.
- Make certain that the screws are secured and then remove the forklift truck.
- Make certain that the belt is inserted in the gear wheel and can slide freely in its seat.



- Insert the second gear wheel.
- Position the gear wheel in its housing inside the transmission frame, making certain that it is correctly positioned above the motor shaft and that the screw through-holes and threaded holes on the motor line up.



WARNING!

Make certain that the timing belt does not get pinched under the gear wheel but is, instead, arranged correctly around it.

- Using a 5 mm Allen wrench, tighten the six Allen screws securing the gear wheel.
- Adjust the belt so that the belt teeth and gear wheel cogs are aligned correctly.



- Tighten the worm screw stud nut so that the entire motor block shifts in its seat, correctly tensioning the transmission timing belt.



WARNING!

While tensioning the belt, move the gear wheel to ensure that the transmission shows no slippage and that, on the contrary, the tension is not so high as to compromise correct transmission of the movement.

- Insert the gear wheel guard disc and secure it with its three Allen screws. Use a 4 mm Allen wrench.
- Reinstall the cover grille and secure it with its three screws.



- Replace the second nut and securing bolt on the worm screw. Tighten the securing bolt using a 13 mm wrench.
- Fully tighten the four Allen screws supporting the motor to the transmission frame.
- Replace the black belt ventilation grille in its seat and tighten its securing screws. Use a 3 mm Allen wrench.
- Using a 14 mm wrench, screw the pressure switch assembly back in its seat.
- Insert the IP electrical connector into its seat and tighten.
- Insert the power supply valve coil and tighten.
- Insert the blue nitrogen/air hose into the quick-coupling.
- Insert the probe into its seat and secure it using a 13 mm wrench to tighten the special nut.
- Screw the electrical connector back onto the probe.
- Tighten the six nuts on the screws located under the bearing assembly.
- Reposition and secure the second black belt ventilation grille, tightening its two screws using a 3 mm Allen wrench.
- Insert the second probe into its seat and secure it by tightening the locking nut.
- Screw the electrical connector back onto the second probe.
- Insert the lubrication injector into its seat, tightening it with a 17 mm wrench.
- Insert the lubrication hose into the quick coupling at the end of the hose.
- Replace the upper rough grinding disc in its seat and secure it with its own Allen screws.
- Position the cover disc (if present) in its seat in the lower portion of the machine.



WARNING!

Be careful when inserting the disc.



Maintenance section

- Tighten the six 5 mm Allen screws securing the disc in its seat.
- The disc must be forced into its seat because the coupling involves some slight interference.
- Make certain that the seat of the upper fine grinding disc is clean. If necessary, use a soft cloth to remove any residues.
- Remove the upper fine grinding disc.
- Make certain that the surface of the disc is clean, using a soft cloth if necessary.
- Using a 5 mm Allen wrench, loosen the six Allen screws securing the upper fine grinding disc to its seat.



WARNING!

We recommend that a second person support the upper fine grinding disc throughout positioning and securing operations.



WARNING!

Pay attention to the toothed contour on the transmission shaft. When reinstalling the group composed of the lower rough grinding and fine grinding discs, make certain that the contour on the unit lines up with the contour on the shaft.

- Insert the lower rough grinding and fine grinding assembly.
- Tighten the central nut, holding the unit in the correct position.
- Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc rightward all the way to the stop.
- Lock the central nut in place using a 27 mm wrench.
- Move the duct located above the extractor unit closer to the unit and fit it into the six supporting blind nuts.
- Turn the duct to the left as far as necessary so that it remains suspended on the blind nuts.
- Using a 13 mm wrench, tighten the six blind nuts and secure the duct onto the machine.
- Turn the extractor unit inward all the way.
- Position the extractor unit sealing ring in its seat and lock it in place by tightening the special screw.

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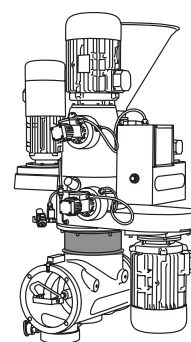
REINSTALLING THE GRINDING DISCS



WARNING!

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To remove/reinstall the grinding discs, the following are required:

- a) Allen wrench - 5 mm
- b) Allen wrench - 4 mm
- c) wrench - 13 mm
- d) wrench - 27 mm
- e) supplied service wrench (code E0.0345)



WARNING!

Before being removed, the lower fine grinding discs must be moved apart by up to 0.600 mm.



WARNING!

Disconnect the machine electric power supply.



WARNING!

Use cut-resistant gloves.



REINSTALLING THE GRINDING DISCS

- Arrange the breaker on a wooden support.
- Insert the bushing into its seat using a rubber mallet. Make certain the bushing is all the way in.
- Place the breaker support disc on a wooden support.



WARNING!

Make certain that the disc is firmly seated on the wooden supports.

- Insert the breaker, complete with its bushing, into its seat on the support. Use a rubber mallet to ensure that the breaker is all the way in on the support.
- Check that the surfaces are clean. If necessary, use a soft cloth to remove any residues.
- Remove the lower fine grinding disc.



Maintenance section

- Make certain that the lower surface of the grinding disc is clean. If necessary, use a soft cloth to remove any residues.
- Position the lower fine grinding disc in its seat on the support, ensuring that the six securing through-holes line up with the respective threaded holes on the support.
- Using a 5 mm Allen wrench, tighten the six Allen screws securing the grinding disc to the support.



WARNING!

Be careful when handling the disc.



- Make certain that the seat of the upper fine grinding disc is clean. If necessary, use a soft cloth to remove any residues.
- Remove the upper fine grinding disc.
- Make certain that the surface of the disc is clean, using a soft cloth if necessary.
- Using a 5 mm Allen wrench, loosen the six Allen screws securing the upper fine grinding disc to its seat.



WARNING!

We recommend that a second person support the upper fine grinding disc throughout positioning and securing operations.

- Insert the rough grinding breaker into its seat and, using a 4 mm Allen wrench, secure it with the three Allen screws.



WARNING!

Pay attention to the toothed contour on the transmission shaft. When reinstalling the group composed of the lower rough grinding and fine grinding discs, make certain that the contour on the unit lines up with the contour on the shaft.

- Insert the lower rough grinding and fine grinding assembly.
- Tighten the central nut, holding the unit in the correct position.
- Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc rightward all the way to the stop.
- Lock the central nut in place using a 27 mm wrench.
- Move the duct located above the extractor unit closer to the unit and fit it into the six supporting blind nuts.
- Turn the duct to the left as far as necessary so that it remains suspended on the blind nuts.
- Using a 13 mm wrench, tighten the six blind nuts and secure the duct onto the machine.
- Turn the extractor unit inward all the way.
- Position the extractor unit sealing ring in its seat and lock it in place by tightening the special screw.

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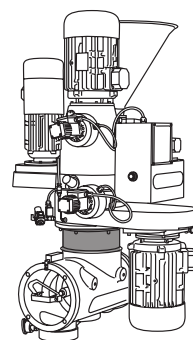
TOOL ZERO-SETTING



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No equipment is required for tool zero-setting.

GRINDING DISC ZERO CALIBRATION

- Switch on the unit from the main panel.
- Press the gear wheel button at the top right-hand side of the screen.



- The initial access screen appears on the control unit touch screen.
- Press the user field and enter your username and password.



WARNING!

The username and password are set by the user.



WARNING!

All calibration operations must be performed while the machine is running. Adopt the most suitable safety procedures.

- On the next screen, press the green “Tools (grinding disc) Reset” button.
- Pressing the button calls up the grinding disc calibration screen. The left side of the screen shows the fine grinding disc calibration status, the right side shows the status of the rough grinding discs.



- Press the green button at the bottom of the screen, in the “Grinding disc reset sequence” field.
- Once the command is given, the lower grinding disc calibration process starts: this process can be followed by observing the progressive movement of the green cursor on the graduated scale and the grinding discs can be heard as they progressively move in and interfere slightly.
- The process stops automatically when the optimal distance between grinding discs is reached.



Maintenance section



- Press the green start button on the machine.
- Press the grey “-” key in the middle of the dedicated rough grinding disc calibration status screen to reduce the distance of the rough grinding disc.
- Keep the grey button pressed to gradually reduce the distance.



ATTENZIONE!

Listen carefully to the sound the machine makes. The optimum distance is just slightly greater than the minimum distance which can be recognised because the machine will start buzzing: this sound is caused by interference between the rough grinding discs.

- When the minimum distance between grinding discs is reached, the sound changes.
- Increase the distance between grinding discs by a few hundredths using the grey “+” key.
- Once the proper distance has been set, press the central “Store grinding disc zero position” key and keep it pressed until the value under the green cursor reads 0.000 mm.

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REMOVING THE SUPPORT ASSEMBLY

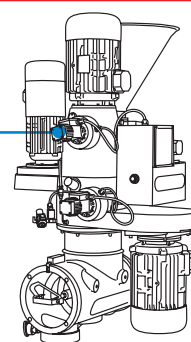


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FINE GRINDING



To remove/reinstall the support assembly, the following are required:

- a) lifting system with safety hook
- b) lifting tool supplied by the manufacturer (code G0.SOLL.01)
- c) Phillips screwdriver
- d) Socket screwdriver - 10 mm
- e) wrenches - 4 and 8 mm
- f) wrenches - 5 and 10 mm
- g) wrenches - 3 and 13 mm
- h) wrenches - 17 and 27 mm
- i) Allen wrenches - 3 mm and 5 mm
- j) socket screwdriver - 17 mm
- k) magnetic grinder
- l) supplied service wrench (code E0.0345)
- m) support assembly lifting hook (Code FT.IO.0005)



REMOVING THE LOWER FINE GRINDING MOTOR



WARNING!

Before being removed, the lower fine grinding discs must be moved apart by up to 0.600 mm.

- Remove the machine power supply by turning the main switch to 0.
- Close the pneumatic power supply cock and disconnect the supply hose using the quick coupling.
- Disconnect the electric power coil.



- Using a 13 mm wrench, unscrew the four bolts and remove them with their washers.
- Withdraw the hopper and close the product access compartment with adhesive tape.



WARNING!

The hopper weighs approximately 20 kg. Be careful when handling it.



Maintenance section

- Unscrew the motor fan power connector and remove it.
- Using a 5 mm wrench, unscrew the four Allen screws and remove the cover from the motor electrical box.



WARNING!

Save/photograph the position and colour of the three power supply cables for subsequent reassembly.

- Using a 10 mm socket screwdriver, unscrew and remove the three nuts, with their washers, and withdraw the three power supply cables.
- Unscrew the upper screw and remove it with its washer and then withdraw the yellow-green earth cable.
- Unscrew the four screws and withdraw the motor fan.



- At the bench, mount the lifting tool supplied with the machine. (code G0.SOLL.01).
- Do not fully tighten the eyebolt.



- Mount the lifting tool on the motor using the two bolts and washers supplied with the tool. Use the threaded holes found on the sides of the motor.
- Using a 17 mm wrench, tighten the two bolts.
- Fully tighten the eyebolt.



WARNING!

Use an appropriate lifting system compliant with the standards and rated for the load.

Weight of the motor: Kg. 60.

- Using a 10 mm wrench, unscrew the eight bolts securing the motor to the machine and remove them with their washers.
- Save/photograph the correct position of the motor for subsequent reassembly.
- Lift and handle the motor in compliance with the standards.
- Using a 3 mm wrench, unscrew the three Allen screws securing the lubricator.



- Release the quick coupling to disconnect the grease feed hose from the valve and remove both support and valve.
- Withdraw the lubrication hose from the inside and, using your hands for leverage, lift off the white grease distribution disc attached to the hose.



- Move to the oil lubrication control unit. Unscrew the four screws, with washers, securing the transparent Plexiglas protection panel in front of the control unit. Use an 8 mm wrench.
- Disconnect the lubrication hose from its quick coupling inside the control unit.
- Withdraw the oil feed hose from inside the control unit by pulling it outwards.



- Withdraw the oil lubrication hose from inside the support assembly.



WARNING!
Wear protective gloves.

WITHDRAWING THE FINE GRINDING MICROMETRIC ADJUSTMENT WHEEL



9

- Unscrew and remove the red silicone caps protecting the internal screws.
- Using a 3 mm Allen wrench, unscrew and remove the upper screw and remove the side screw with a 4 mm wrench.
- Remove the complete assembly.

REMOVING THE LOWER FINE GRINDING DISC



10

- Unscrew and remove the Allen screw securing the seal ring and remove it from its seat. Use a 5 mm Allen wrench.
- Turn the extractor unit fully outwards.
- Using a 13 mm wrench, loosen the six blind nuts securing the duct.
- Turn the duct slightly to the right and withdraw it by pulling downwards.



11

- Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc leftward all the way to the stop.
- Release the central nut using a 27 mm wrench.
- Turn the disc to the right and remove the service wrench.



12

- Unscrew the central nut while supporting and removing the assembly consisting of the lower fine grinding and rough grinding discs.



WARNING!
We recommend that a second person support the grinding discs throughout removal operations.

REMOVING THE SUPPORT ASSEMBLY



13

- Locate the three bolts securing the drive shaft inside the body of the support assembly.
- Using a 17 mm socket wrench, unscrew the three bolts.



14

- Position the support lifting hook (code FT.IO.0005) inside the threaded hole on the shaft and secure it using the Allen screw and a 10 mm Allen wrench.
- Partially withdraw the support assembly from the base.



WARNING!
Make certain that oil does not leak from the support assembly.



Maintenance section

15

- Fully withdraw the support assembly from the machine.

REINSTALLING THE SUPPORT ASSEMBLY



WARNING!

Wear suitable slip-resistant gloves.

- Thoroughly clean the inner compartment.

16



WARNING!

Be careful when inserting the support assembly.

The slot on the support assembly must line up with the indicated hole in the compartment (the larger hole).

- Insert the support assembly all the way into the compartment, unscrew and remove the upper Allen screw.
- Remove the tool used for extraction and reassembly.
- Using a magnetic grinder, position the three securing bolts and tighten them using a 17 mm socket wrench.

17

- Insert the transparent hose connected to the support assembly into the passing hole inside the compartment and then into the passing hole on the oil control unit.
- Insert the hose into its quick coupling inside the control unit box.
- Properly lay out the hose at the bottom of the housing.



WARNING!

**Reinstall the encoder for the fine grinding micrometric adjustment wheel.
(See sheet no. 15).**

18

- Connect the lubrication hose to the quick coupling inside the control unit box.
- Insert the white grease distribution disc and pass the hose connected to the disc out through the special hole.
- Connect the grease hose to the quick coupling on the lubricator support flange.

19

- Install the flange with lubricator using the three 3 mm Allen screws.

20



WARNING!

Reinstall the lower fine grinding motor. (See sheet no. 01).

If necessary, reinstall the rough grinding motor. (See sheet no. 03).



WARNING!
Run mechanical fine grinding zero calibration.
(See sheet no. 13).



WARNING!
Reinstall the lower fine grinding disc.
(See sheet no. 07).



WARNING!
Run the grinding disc reset procedure.
(See sheet no. 08).

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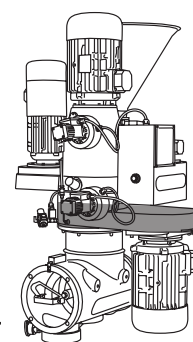
REMOVING THE FINE GRINDING BELT



WARNING!

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When in doubt, do not interpret! Instead directly contact the Colombini Srl technical assistance service at +39 011 8211407 service@colombini.srl



To remove/reinstall the fine grinding belt, the following are required:

- a) Allen wrenches - 3 mm, 4 mm, 5 mm, 6 mm, 8 mm and 10 mm
- b) socket wrench - 7 mm
- c) wrenches - 8 mm, 10 mm, 13 mm, 14 mm and 27 mm
- d) socket screwdriver - 10 mm
- e) supplied service wrench (code E0.0345).
- f) wrench - 17 mm
- g) Phillips screwdriver



WARNING!

From the operator panel, move away the lower fine grinding discs to a value of 0.600 mm.



WARNING!

Disconnect the machine electric power supply.



WARNING!

Use cut-resistant gloves.



- 1
 - Using a 5 mm Allen wrench, unscrew and remove the screw securing the sealing ring and remove it from its seat.
 - Turn the extractor unit fully outwards.
 - Using a 13 mm wrench, loosen the six blind nuts securing the duct.
 - Turn the duct slightly to the right and withdraw it by pulling downwards.



- 2
 - Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc leftward all the way to the stop.
 - Release the central nut using a 27 mm wrench.
 - Turn the disc to the right and remove the service wrench.



- Unscrew the central nut while supporting and removing the assembly consisting of the lower fine grinding and rough grinding discs.



WARNING!

We recommend that a second person support the grinding discs throughout removal operations.



- Using a 5 mm Allen wrench, unscrew the six screws securing the upper fine grinding disc; then support the disc and withdraw it from its seat.



- Using a special wrench, insert two 5 mm Allen screws into two free threaded holes at the opposite sides of the protection ring. Do not tighten the screws, just insert them into the threaded holes.
- Unscrew the six Allen screws securing the ring in its seat. However, once freed from the securing screws, the ring will remain stuck in its position since interference with the machine body forces it into its seat. To unscrew, use a 5 mm Allen wrench.
- Slowly tighten the two inserted screws so as to progressively force the ring to detach from the body of the machine. Support the ring and withdraw it from its seat.



- Locate the Allen screws supporting the upper rough grinding disc.
- Using a 4 mm Allen wrench, unscrew the three screws supporting the upper rough grinding disc; then support the disc and withdraw it from its seat.



- Remove the blue nitrogen/air supply hose from the coupling on the pressure switch on the side of the machine body. This is done using a wrench.
- Unscrew and remove the coil controlling the pressure switch.
- Using a Phillips screwdriver, unscrew the IP valve supply connector (if present).
- Unscrew the screw connector on the front thermocouple located beside the pressure switch.
- Using a 13 mm wrench, unscrew the nut locking the probe in place, remove it from its threaded seat and gently pull the probe out of its housing on the side.
- Using a wrench, remove the lubrication feed hose from its quick coupling on the side of the machine body.
- Using a 17 mm wrench, unscrew the greasing nozzle and remove it from its seat. Pull it out carefully.



WARNING!

The threaded hole on the nozzle and body of the machine have coloured marks indicating their position where they line up; identify these marks as these will be useful when repositioning the parts during reassembly.

- Using a 13 mm wrench, unscrew the nut locking the second thermocouple probe in place beside the greasing nozzle.
- Carefully withdraw the probe.
- Remove the cover for the upper fine grinding motor belt. Using an 8 mm wrench, unscrew and remove the three screws.
- Using a 4 mm Allen wrench, unscrew and remove the three screws securing the gear wheel guard disc. Remove the guard disc.



Maintenance section

8

- Using a 6 mm Allen wrench, loosen the four Allen screws securing the motor support to the timing belt frame.
- The position of the motor support vs. the timing belt frame is fixed by the locking position of a worm screw located under the frame. Using a 13 mm wrench, loosen the worm screw locking nut and loosen the two securing nuts that prevent the screw from moving longitudinally in its seat.
- Push the motor block towards the body of the machine, loosening the timing belt — tensioned on the gear wheel inside the frame — just enough so that it acquires some play.



WARNING!

The motor weighs approximately 60 kg. Be careful when handling it.

- Using a 5 mm Allen wrench, loosen the six Allen screws on the gear wheel and remove the gear wheel from its seat.
- Make certain that the transmission timing belt on the upper fine grinding discs is free to move in its seat.

9

- Using a 3 mm Allen wrench, unscrew the two screws securing the black gear wheel side ventilation grille. Remove the grille.
- Using a 3 mm Allen wrench, also unscrew the screws securing the second side ventilation grille and remove it.
- Using an 8 mm Allen wrench, unscrew the ten Allen screws securing bearing assembly ZKLDF180 to the machine body.



WARNING!

The grinding disc bearing assembly is heavy. Before unscrewing the screws, to ensure safe handling during removal, place a mobile support compliant with the standards under the assembly; to this purpose, we recommend using the blades of a forklift truck as this permits both vertical movement and general handling.

- Completely remove the Allen screws, making certain that the bearing assembly rests gently on the forklift truck blades.
- Remove the assembly.

10

- Using 4, 6 and 10 mm Allen wrenches, unscrew the four Allen screws securing the positioning block. Remove the block.
- Remove the timing belt.

REINSTALLING THE TIMING BELT

- Insert the timing belt in its seat.

11

- Position the belt laid out well inside its compartment, it must rest on the external surfaces and there must not be any folds that could interfere with subsequent positioning of the gear wheels. Reinsert the positioning block and screw in place. Use the 4, 6 and 10 mm Allen wrenches.



WARNING!

Be careful when inserting bearing assembly ZKLDF180 into its seat. There are two pins on the machine body. Locate the corresponding holes on the bearing assembly, i.e. those smaller than the ones for the ten securing screws.

12

- Using the forklift truck, position the bearing assembly under the body of the machine. Line up the pins with the holes identified on the disc.
- Lay out the belt in its place.



- Insert the assembly.



WARNING!

The correct position of the assembly in its seat is the one where the yellow mark on the side lines up with the mark on the threaded hole on the lubrication injector.

- Use an 8 mm Allen wrench to tighten the ten bearing assembly securing screws.
- Make certain that the screws are secured and then remove the forklift truck.
- Make certain that the belt is inserted in the gear wheel and can slide freely in its seat.



13

- Insert the second gear wheel.
- Position the gear wheel in its housing inside the transmission frame, making certain that it is correctly positioned above the motor shaft and that the screw through-holes and threaded holes on the motor line up.



WARNING!

Make certain that the timing belt does not get pinched under the gear wheel but is, instead, arranged correctly around it.

- Using a 5 mm Allen wrench, tighten the six Allen screws securing the gear wheel.
- Adjust the belt so that the belt teeth and gear wheel cogs are aligned correctly.



14

- Tighten the worm screw stud nut so that the entire motor block shifts in its seat, correctly tensioning the transmission timing belt.



WARNING!

While tensioning the belt, move the gear wheel to ensure that the transmission shows no slippage and that, on the contrary, the tension is not so high as to compromise correct transmission of the movement.

- Insert the gear wheel guard disc and secure it with its three Allen screws. Use a 4 mm Allen wrench.
- Reinstall the cover grille and secure it with its three screws.



15

- Replace the second nut and securing bolt on the worm screw. Tighten the securing bolt using a 13 mm wrench.
- Fully tighten the four Allen screws supporting the motor to the transmission frame.
- Replace the black belt ventilation grille in its seat and tighten its securing screws. Use a 3 mm Allen wrench.
- Using a 14 mm wrench, screw the pressure switch assembly back in its seat.
- Insert the IP electrical connector into its seat and tighten.
- Insert the power supply valve coil and tighten.
- Insert the blue nitrogen/air hose into the quick-coupling.
- Insert the probe into its seat and secure it using a 13 mm wrench to tighten the special nut.
- Screw the electrical connector back onto the probe.
- Tighten the six nuts on the screws located under the bearing assembly.
- Reposition and secure the second black belt ventilation grille, tightening its two screws using a 3 mm Allen wrench.
- Insert the second probe into its seat and secure it by tightening the locking nut.
- Screw the electrical connector back onto the second probe.
- Insert the lubrication injector into its seat, tightening it with a 17 mm wrench.
- Insert the lubrication hose into the quick coupling at the end of the hose.
- Replace the upper rough grinding disc in its seat and secure it with its own Allen screws.



16

- Position the cover disc (if present) in its seat in the lower portion of the machine.



Maintenance section



WARNING!

Be careful when inserting the disc.

- Tighten the six 5 mm Allen screws securing the disc in its seat.
- The disc must be forced into its seat because the coupling involves some slight interference.



- Make certain that the seat of the upper fine grinding disc is clean. If necessary, use a soft cloth to remove any residues.
- Remove the upper fine grinding disc.
- Make certain that the surface of the disc is clean, using a soft cloth if necessary.
- Using a 5 mm Allen wrench, loosen the six Allen screws securing the upper fine grinding disc to its seat.



WARNING!

We recommend that a second person support the upper fine grinding disc throughout positioning and securing operations.



WARNING!

Pay attention to the toothed contour on the transmission shaft. When reinstalling the group composed of the lower rough grinding and fine grinding discs, make certain that the contour on the unit lines up with the contour on the shaft.

- Insert the lower rough grinding and fine grinding assembly.
- Tighten the central nut, holding the unit in the correct position.
- Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc rightward all the way to the stop.
- Lock the central nut in place using a 27 mm wrench.
- Move the duct located above the extractor unit closer to the unit and fit it into the six supporting blind nuts.
- Turn the duct to the left as far as necessary so that it remains suspended on the blind nuts.
- Using a 13 mm wrench, tighten the six blind nuts and secure the duct onto the machine.
- Turn the extractor unit inward all the way.
- Position the extractor unit sealing ring in its seat and lock it in place by tightening the special screw.

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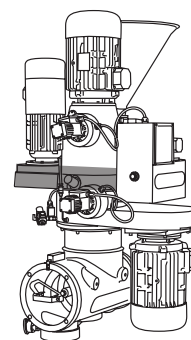
REMOVING THE ROUGH GRINDING BELT



WARNING!

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When in doubt, do not interpret! Instead directly contact the Colombini Srl technical assistance service at +39 011 8211407
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To remove/reinstall the rough grinding belt, the following are required:

- a) Allen wrenches - 3 mm, 4 mm, 5 mm, 6 mm, 8 mm and 10 mm
- b) socket wrench - 7 mm
- c) wrenches - 8 mm, 10 mm, 13 mm, 14 mm and 27 mm
- d) socket screwdriver - 10 mm
- e) supplied service wrench (code E0.0345).
- f) wrench - 17 mm
- g) Phillips screwdriver



WARNING!

From the operator panel, move away the lower fine grinding discs to a value of 0.600 mm.



WARNING!

Disconnect the machine electric power supply.



WARNING!

Use cut-resistant gloves.



- Using a 5 mm Allen wrench, unscrew and remove the screw securing the sealing ring and remove it from its seat.
- Turn the extractor unit fully outwards.
- Using a 13 mm wrench, loosen the six blind nuts securing the duct.
- Turn the duct slightly to the right and withdraw it by pulling downwards.



- Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc leftward all the way to the stop.
- Release the central nut using a 27 mm wrench.
- Turn the disc to the right and remove the service wrench.



Maintenance section

 **3**

- Unscrew the central nut while supporting and removing the assembly consisting of the lower fine grinding and rough grinding discs.



WARNING!

We recommend that a second person support the grinding discs throughout removal operations.

 **4**

- Using a 5 mm Allen wrench, unscrew the six screws securing the upper fine grinding disc; then support the disc and withdraw it from its seat.

 **5**

- Using a special wrench, insert two 5 mm Allen screws into two free threaded holes at the opposite sides of the bearing protection ring (if present). Do not tighten the screws, just insert them into the threaded holes.
- Unscrew the six Allen screws securing the ring in its seat. However, once freed from the securing screws, the ring will remain stuck in its position since interference with the machine body forces it into its seat. To unscrew, use a 5 mm Allen wrench.
- Slowly tighten the two inserted screws so as to progressively force the ring to detach from the body of the machine. Support the ring and withdraw it from its seat.

 **6**

- Locate the Allen screws supporting the upper rough grinding disc.
- Using a 4 mm Allen wrench, unscrew the three screws supporting the upper rough grinding disc; then support the disc and withdraw it from its seat.

 **7**

- Remove the blue nitrogen/air supply hose from the coupling on the pressure switch on the side of the machine body. This is done using a wrench.
- Unscrew and remove the coil controlling the pressure switch.
- Using a Phillips screwdriver, unscrew the IP valve supply connector (if present).
- Unscrew the screw connector on the front thermocouple located beside the pressure switch.
- Using a 13 mm wrench, unscrew the nut locking the probe in place, remove it from its threaded seat and gently pull the probe out of its housing on the side.
- Using a wrench, remove the lubrication feed hose from its quick coupling on the side of the machine body.
- Using a 17 mm wrench, unscrew the greasing nozzle and remove it from its seat. Pull it out carefully.



WARNING!

The threaded hole on the nozzle and body of the machine have coloured marks indicating their position where they line up; identify these marks as these will be useful when repositioning the parts during reassembly.

- Using a 13 mm wrench, unscrew the nut locking the second thermocouple probe in place beside the greasing nozzle.
- Carefully withdraw the probe.
- Remove the cover for the upper fine grinding motor belt. Using an 8 mm wrench, unscrew and remove the three screws.
- Using a 4 mm Allen wrench, unscrew and remove the three screws securing the gear wheel guard disc. Remove the guard disc.



8

- Using a 6 mm Allen wrench, loosen the four Allen screws securing the motor support to the timing belt frame.
- The position of the motor support vs. the timing belt frame is fixed by the locking position of a worm screw located under the frame. Using a 13 mm wrench, loosen the worm screw locking nut and loosen the two securing nuts that prevent the screw from moving longitudinally in its seat.
- Push the motor block towards the body of the machine, loosening the timing belt — tensioned on the gear wheel inside the frame — just enough so that it acquires some play.



WARNING!

The motor weighs approximately 60 kg. Be careful when handling it.

- Using a 5 mm Allen wrench, loosen the six Allen screws on the gear wheel and remove the gear wheel from its seat.
- Make certain that the transmission timing belt on the upper fine grinding discs is free to move in its seat.

9

- Using a 3 mm Allen wrench, unscrew the two screws securing the black gear wheel side ventilation grille. Remove the grille.
- Using a 3 mm Allen wrench, also unscrew the screws securing the second side ventilation grille and remove it.
- Using an 8 mm Allen wrench, unscrew the ten Allen screws securing bearing assembly ZKLDF180 to the machine body.



WARNING!

The grinding disc bearing assembly is heavy. Before unscrewing the screws, to ensure safe handling during removal, place a mobile support compliant with the standards under the assembly; to this purpose, we recommend using the blades of a forklift truck as this permits both vertical movement and general handling.

- Completely remove the Allen screws, making certain that the bearing assembly rests gently on the forklift truck blades.
- Remove the assembly.

10

- Using 4, 6 and 10 mm Allen wrenches, unscrew the four Allen screws securing the positioning block. Remove the block.
- Remove the timing belt.

11

- Using a Phillips screwdriver, unscrew the four screws and remove the cover of the electrical box on the upper fine grinding motor.



WARNING!

Save/photograph the position and colour of the three power supply cables for subsequent reassembly.

- Using a 10 mm socket screwdriver, unscrew and remove the three nuts, with their washers, and withdraw the three power supply cables.
- Unscrew the upper screw and remove it with its washer and then withdraw the yellow-green earth cable.
- Using a Phillips screwdriver, unscrew the four screws securing the motor cooling fan.
- Remove the fan.



WARNING!

Secure the fan with a suitable support or with the aid of another person so that it cannot fall and be damaged.



Maintenance section

- Completely unscrew the previously loosened nuts securing the worm screw located under the transmission belt block.
- Using a 5 mm Allen wrench, unscrew the two screws securing the worm screw support flange. Remove the two Allen screws and the two related washers.
- Unscrew the nut still present on the worm screw, manually accompanying the flange that intercepts the screw until both nut and flange are completely removed from the screw.
- Free the worm screw from all constraints.



WARNING!

The motor is heavy. To remove it, make certain that it is supported by an adequate device compliant with current safety regulations.

- Move the motor so that the upper part can pass through the hole in the transmission belt frame.
- Using a forklift, position the blades under the motor so that it is properly supported when the screws securing it to the grinder are loosened.



- Unscrew the four screws holding the motor support suspended from the transmission belt frame. Use a 6 mm Allen wrench.



WARNING!

The motor is heavy and must be unscrewed carefully. During the operation, make certain that the motor rests firmly on the forklift blades which must bear the full weight of the motor.

- Unscrew the four Allen screws and remove them completely.
- Once freed from all constraints, the motor rests solely on the forklift blades.
- Save/photograph the correct position of the motor for subsequent reassembly.
- Lower the forklift blades so that the upper part of the motor is lowered, passing through the hole in the transmission belt support frame, and can be moved freely.
- Remove the upper fine grinding motor in compliance with the safety standards.



- Unscrew the pressure switch assembly. Use a 14 mm wrench.
- Using a 10 mm Allen wrench, unscrew the three screws supporting the frame.



WARNING!

Secure the frame with a suitable support or with the aid of another person so that it cannot fall and be damaged.

- Unscrew the micrometric adjustment wheel and remove it.



WARNING!

See sheet no. 15 for removal of the fine grinding micrometric adjustment wheel.

- Using a 10 mm Allen wrench, unscrew the four screws securing the rough grinding assembly and get help in handling it.



- Unscrew and remove the filter.
- Unscrew the four Allen screws securing the lower protection grille for the rough grinding timing belt. Use a 4 mm wrench.



- Unscrew the power supply screw connector for the bearing lubrication control unit.
- Using a 5 mm Allen wrench, unscrew the two screws securing the lubrication control unit and remove the component.



WARNING!

Save/photograph the position and colour of the power supply cables for subsequent reassembly.

- Using a 7 mm socket screwdriver, unscrew and remove the nuts with their washers, and then withdraw the power supply cables.
- Unscrew the upper screw and remove it with its washer and then withdraw the yellow-green earth cable.
- Using a 10 mm wrench, unscrew the eight bolts securing the motor to the machine and remove them with their washers.
- Save/photograph the correct position of the motor for subsequent reassembly.



WARNING!

Wear suitable slip-resistant gloves.

- Manually lift and handle the motor in compliance with the standards.
- Unscrew the four 8 mm Allen screws and washers securing the motor base to the box of the rough grinding timing belt.
- Loosen the nuts and worm screw tightening bolt determining the position of the base. This is done while keeping the timing belt taut. Use a 13 mm wrench.
- Move the base of the motor a few millimetres towards the body of the machine which will loosen tension on the timing belt.
- Remove the base from its seat.
- Locate the timing belt and make certain that it is free to move in its seat.
- Using a 10 mm Allen wrench, unscrew the four Allen screws supporting the rough grinding frame.



WARNING!

Remove the frame. As the frame is quite bulky, this operation requires the help of another person to ensure support and safe handling.

- Remove the belt from its seat.

REINSTALLING THE ROUGH GRINDING TIMING BELT



- Position the belt correctly in the rough grinding frame. Make certain that it is correctly connected to the gear wheel present in the seat.
- Insert the timing belt frame in its seat.



WARNING!

Be careful when inserting the frame.

It is advisable to obtain assistance so as to handle the piece safely.



WARNING!

Wear protective gloves and crush-resistant footwear during the operation.

- Tighten the four Allen screws on the rough grinding frame.
- Make certain that the timing belt turns freely and transmits movement to the rough grinding drive shaft.
- Insert the rough grinding motor support and the base of the motor into their seats over the box.



Maintenance section

17

- Adjust the timing belt so that it engages correctly with the gear wheel located under the base of the rough grinding motor.
- Turn the nut on the worm screw attached to the base of the motor to adjust the position of the component. The position must be such that it ensures correct belt tension, which must correctly transmit motion to the rough grinding drive shaft.
- Tighten the four 8 mm Allen screws and secure the base of the motor.
- Insert and tighten the lock nuts securing the worm screw that adjusts the position of the motor. Use a 13 mm wrench.
- Correctly position the motor on the machine (motor code E1.0140).



WARNING!

Be careful when inserting the motor.

The tab on the shaft must line up with its seat on the support unit.



WARNING!

If a new motor is to be installed, we recommend lubricating the end of the shaft.

- Tighten the eight bolts with their washers and secure the motor. Use the 10 mm wrench.
- Make the electrical connections on the motor and reinstall the cover on the electrical box. Use the 7 mm wrench.
- Reinstall the lubrication control unit and secure it with the two Allen screws. Use the 5 mm wrench.
- Retighten the control unit power supply hose.
- Reinsert the black grille closing the bottom of the rough grinding frame and tighten it. Use the 4 mm Allen wrench.
- Screw the filter back into place.

18



WARNING!

Under the rough grinding frame, locate the two pins used to position the rough grinding assembly. Locate the respective holes on the assembly.

- Insert the rough grinding assembly and tighten the four Allen securing screws. Use the 10 mm wrench.
- See sheet no. 15 for reinstallation and securing of the rough grinding micrometric adjustment wheel.

19



WARNING!

Under the rough grinding assembly, locate the two pins used to position the fine grinding belt frame. Locate the respective holes on the fine grinding frame.

- Insert the box for the fine grinding belt and and tighten it using a 10 mm wrench.
- Insert the fine grinding belt in its seat.
- Reinsert the belt positioning block and tighten it using the 4, 6 and 10 mm Allen wrenches.

20

- Correctly position the upper fine grinding motor under the transmission belt support frame, making certain that the motor shaft is coaxial to the circular passageway and the motor support flanges are correctly positioned in relation to the machine. Make reference to the position saved during removal.



WARNING!

Be careful when inserting the motor.

Observe the safety standards for handling: the motor is heavy.

The motor shaft must enter the transmission frame.



WARNING!

If a new motor is to be installed, we recommend greasing the end of the shaft.

- Using the forklift, lift the motor, making sure that the shaft passes through the hole.
- Tighten the four bolts and washers securing the motor support to the transmission frame. Use an 8 mm Allen wrench.
- Without tightening the four Allen screws, make certain that the motor is supported and the forklift truck can be removed.
- Remove the forklift truck.
- Insert the worm screw locking flange that adjusts the position of the motor so that the nut present is located between the two sides of the component. Adjusting the nut as needed, position the flange so that the position lines up with the transmission frame securing holes.
- Using a 5 mm wrench, tighten the two Allen screws with washers to secure the flange.
- Make the electrical connections on the motor and reinstall the cover on the electrical box.
- Mount the lower engine fan by making sure that the openings match the threaded holes. Tighten with four star screws.
- Hook up the fan power supply connector and secure it with its screw.



WARNING!

Make certain that the timing belt does not get pinched under the gear wheel but is, instead, arranged correctly around it.

- Position bearing assembly ZKLDF180 in its housing inside the transmission frame and make certain that it is correctly positioned above the motor shaft and that the screw through-holes and threaded holes on the motor line up.



WARNING!

Be careful when inserting the assembly into its seat. There are two pins on the machine body. Locate the corresponding holes on the bearing assembly, i.e. those smaller than the ones for the ten securing screws.



- Using the forklift truck, position the bearing assembly under the body of the machine. Line up the pins with the holes identified on the disc.
- Lay out the belt in its place.
- Insert the assembly.



WARNING!

The correct position of the assembly in its seat is the one where the yellow mark on the side lines up with the mark on the threaded hole on the lubrication injector.

- Use an 8 mm Allen wrench to tighten the ten bearing assembly securing screws.
- Make certain that the screws are secured and then remove the forklift truck.
- Make certain that the belt is inserted in the gear wheel and can slide freely in its seat.



- Insert the second gear wheel.
- Position the gear wheel in its housing inside the transmission frame, making certain that it is correctly positioned above the motor shaft and that the screw through-holes and threaded holes on the motor line up.



Maintenance section



WARNING!

Make certain that the timing belt does not get pinched under the gear wheel but is, instead, arranged correctly around it.

- Using a 5 mm Allen wrench, tighten the six Allen screws securing the gear wheel.
- Adjust the belt so that the belt teeth and gear wheel cogs are aligned correctly.



24

- Tighten the worm screw stud nut so that the entire motor block shifts in its seat, correctly tensioning the transmission timing belt.



WARNING!

While tensioning the belt, move the gear wheel to ensure that the transmission shows no slippage and that, on the contrary, the tension is not so high as to compromise correct transmission of the movement.

- Insert the gear wheel guard disc and secure it with its three Allen screws. Use a 4 mm Allen wrench.
- Reinstall the cover grille and secure it with its three screws.



25

- Replace the second nut and securing bolt on the worm screw. Tighten the securing bolt using a 13 mm wrench.
- Fully tighten the four Allen screws supporting the motor to the transmission frame.
- Replace the black belt ventilation grille in its seat and tighten its securing screws. Use a 3 mm Allen wrench.
- Using a 14 mm wrench, screw the pressure switch assembly back in its seat.
- Insert the IP electrical connector into its seat and tighten.
- Insert the power supply valve coil and tighten.
- Insert the blue nitrogen/air hose into the quick-coupling.
- Insert the probe into its seat and secure it using a 13 mm wrench to tighten the special nut.
- Screw the electrical connector back onto the probe.
- Tighten the six nuts on the screws located under the bearing assembly.
- Reposition and secure the second black belt ventilation grille, tightening its two screws using a 3 mm Allen wrench.
- Insert the second probe into its seat and secure it by tightening the locking nut.
- Screw the electrical connector back onto the second probe.
- Insert the lubrication injector into its seat, tightening it with a 17 mm wrench.
- Insert the lubrication hose into the quick coupling at the end of the hose.
- Replace the upper rough grinding disc in its seat and secure it with its own Allen screws.



26

- Position the cover disc (if present) in its seat in the lower portion of the machine.



WARNING!

Be careful when inserting the disc.

- Tighten the six 5 mm Allen screws securing the disc in its seat.
- The disc must be forced into its seat because the coupling involves some slight interference.



27

- Make certain that the seat of the upper fine grinding disc is clean. If necessary, use a soft cloth to remove any residues.
- Remove the upper fine grinding disc.
- Make certain that the surface of the disc is clean, using a soft cloth if necessary.
- Using a 5 mm Allen wrench, loosen the six Allen screws securing the upper fine grinding disc to its seat.



WARNING!

We recommend that a second person support the upper fine grinding disc throughout positioning and securing operations.



WARNING!

Pay attention to the toothed contour on the transmission shaft. When reinstalling the group composed of the lower rough grinding and fine grinding discs, make certain that the contour on the unit lines up with the contour on the shaft.

- Insert the lower rough grinding and fine grinding assembly.
- Tighten the central nut, holding the unit in the correct position.
- Insert the supplied service wrench (Code: E0.0345) into the arranged hole and turn the disc rightward all the way to the stop.
- Lock the central nut in place using a 27 mm wrench.
- Move the duct located above the extractor unit closer to the unit and fit it into the six supporting blind nuts.
- Turn the duct to the left as far as necessary so that it remains suspended on the blind nuts.
- Using a 13 mm wrench, tighten the six blind nuts and secure the duct onto the machine.
- Turn the extractor unit inward all the way.
- Position the extractor unit sealing ring in its seat and lock it in place by tightening the special screw.

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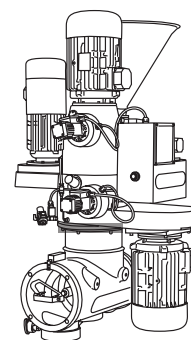
REMOVING THE BEARING PROTECTION RING



WARNING!

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To remove/reinstall the bearing protection ring, the following are required:

- a) Allen wrench - 5 mm
- b) wrench - 13 mm



WARNING!

From the operator panel, move away the lower fine grinding discs to a value of 0.600 mm.



WARNING!

Disconnect the machine electric power supply..



WARNING!

Use cut-resistant gloves.



- Using a 5 mm Allen wrench, unscrew and remove the screw securing the sealing ring and remove it from its seat.
- Turn the extractor unit fully outwards.
- Using a 13 mm wrench, loosen the six blind nuts securing the duct.
- Turn the duct slightly to the right and withdraw it by pulling downwards.



- Using a special wrench, insert two 5 mm Allen screws into two free threaded holes at the opposite sides of the ring. Do not tighten the screws, just insert them into the threaded holes.
- Unscrew the six Allen screws securing the ring in its seat. However, once freed from the securing screws, the ring will remain stuck in its position since interference with the machine body forces it into its seat. To unscrew, use a 5 mm Allen wrench.
- Slowly tighten the two inserted screws so as to progressively force the ring to detach from the body of the machine. Support the ring and withdraw it from its seat.



REINSTALLING THE BEARING PROTECTION RING



- Position the ring in its seat in the lower portion of the machine.



WARNING!

Be careful when inserting the ring.

- Tighten the six 5 mm Allen screws locking the ring in its seat.
- The ring must be forced into its seat because the coupling involves some slight interference.



- Move the duct located above the extractor unit closer to the unit and fit it into the six supporting blind nuts.
- Turn the duct to the left as far as necessary so that it remains suspended on the blind nuts.
- Using a 13 mm wrench, tighten the six blind nuts and secure the duct onto the machine.
- Turn the extractor unit inward all the way.
- Position the extractor unit sealing ring in its seat and lock it in place by tightening the special Allen screw.

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MECHANICAL FINE GRINDING AND ROUGH GRINDING ZERO CALIBRATION



WARNING!

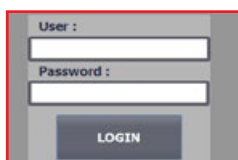
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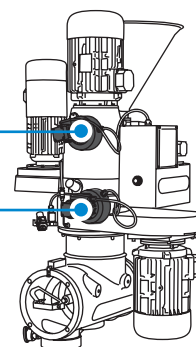
WARNING!

The manufacturer will supply a **USERNAME** and **PASSWORD** for these operations.



FINE GRINDING

ROUGH GRINDING



WARNING!

Fine grinding and rough grinding mechanical zero calibration have already been set by the manufacturer. New calibration operations are not required until the support assembly is replaced.

For the calibration operations, the following are required:

- a) wrench - 10 mm
- b) crank supplied by the manufacturer (code GO.MANO.01)

MECHANICAL FINE GRINDING ZERO CALIBRATION



- From the operator panel, press HOME to call up the Home page.
- From the operator panel, press SET UP to call up the Set Up page.
- Enter the USERNAME and PASSWORD supplied by Colombini and run the LOGIN.
- From the operator panel, press SET MANUFACTURER.
- From the operator panel, press the LIGHT BLUE ARROW at the bottom right of the page.
- From the operator panel, under LOWER FINE GRINDING, press GATE OFF and enable GATE ON.
- Using a 10 mm wrench, unscrew the 4 bolts and remove the motor of the upper fine grinding encoder.



- Insert the supplied crank into the hole on the encoder, being careful to line up the tab on the crank with its seat on the encoder.
- Turn the crank clockwise until the rotation meets resistance.



- Turn the crank counter-clockwise, making 10 complete revolutions.
- Press the green FINE GRINDING DEFAULT "ZERO" button.



 **4**

- Turn the crank counter-clockwise until the rotation meets resistance.
- Turn the crank clockwise, making 10 complete revolutions.
- Press the green FINE GRINDING DEFAULT “MAX” button.

 **5**

- Withdraw the crank.
- Insert the motor, being careful to line up the tab on the shaft with its seat on the encoder.
- Position the motor correctly (the electrical box must be in the upper area).
- Using a 10 mm wrench, secure the motor with the 4 bolts.

 **6**

- From the operator panel, press GATE ON and set GATE OFF.
- From the operator panel, press HOME to call up the Home page.

MECHANICAL ROUGH GRINDING ZERO CALIBRATION

 **7**

- From the operator panel, press HOME to call up the Home page.
- From the operator panel, press SET UP to call up the Set Up page.
- Enter the USERNAME and PASSWORD supplied by Colombini and run the LOGIN.
- From the operator panel, press SET MANUFACTURER.
- From the operator panel, press the LIGHT BLUE ARROW at the bottom right of the page.
- From the operator panel, under ROUGH GRINDING, press GATE OFF and enable GATE ON.
- Using a 10 mm wrench, unscrew the 4 bolts and remove the motor of the lower rough grinding encoder.

 **8**

- Insert the supplied crank into the hole on the encoder, being careful to line up the tab on the crank with its seat on the encoder.
- Turn the crank clockwise until the rotation meets resistance.

 **9**

- Turn the crank counter-clockwise, making 10 complete revolutions.
- Press the green ROUGH GRINDING DEFAULT “ZERO” button.

 **10**

- Turn the crank counter-clockwise until the value of + 8,000 (approx.) is reached.
- Press the green ROUGH GRINDING DEFAULT “MAX” button.

 **11**

- Withdraw the crank.
- Insert the motor, being careful to line up the tab on the shaft with its seat on the encoder.
- Position the motor correctly (the electrical box must be in the upper area).
- Using a 10 mm wrench, secure the motor with the 4 bolts.



Maintenance section



- From the operator panel, press GATE ON and set GATE OFF.
- From the operator panel, press HOME to call up the Home page.

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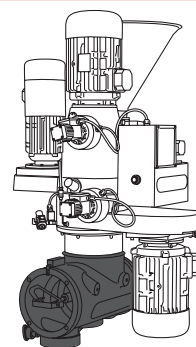
REMOVING AND REINSTALLING THE EXTRACTOR



WARNING!

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To remove/reinstall the extractor, the following are required:

- a) Allen wrench - 5 mm
- b) socket wrench - 22 mm
- c) wrench - 13 mm

REMOVING THE EXTRACTOR IMPELLER



WARNING!

Disconnect the machine electric power supply.



WARNING!

Use cut-resistant gloves.



- Using a 5 mm wrench, unscrew and remove the Allen screw securing the seal ring and remove it from its seat.
- Turn the extractor unit fully outwards.
- Using a 13 mm wrench, unscrew the four bolts securing the plexiglass cover and remove them.
- Remove the plexiglass cover.
- Using a 22 mm socket wrench, unscrew the central nut and washer securing the impeller and remove it.



WARNING!

Set a suitable tray under the extractor unit to collect any product.

- Remove the impeller from its seat and clean it using a cloth.



Maintenance section



- Thoroughly clean the inside of the extractor compartment of any residues of the material processed.

REINSTALLING THE EXTRACTOR IMPELLER



WARNING!

Use cut-resistant gloves.



- Return the extractor to its operating position and, using a 5 mm wrench, secure the sealing ring with the Allen screw.
- Insert the impeller into its seat.
- Insert the washer and nut that were previously removed and, using a 22 mm socket wrench, tighten the nut to lock the impeller in place.
- Insert the round plexiglass cover, making certain that the contact on the cover fits inside the safety switch.
- Using a 13 mm wrench, secure the cover with the four bolts.

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REMOVING THE FINE GRINDING AND ROUGH GRINDING MICROMETRIC ADJUSTMENT WHEEL ASSEMBLIES AND REMOVING THE ENCODERS.



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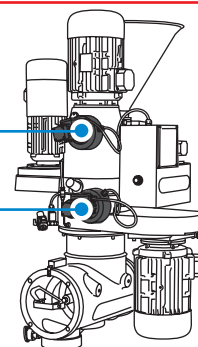
For the operations described below, the following are required:

- a) small slotted screwdriver
- b) Allen wrenches - 2 mm / 3 mm / 4 mm
- c) wrench - 10 mm

Each unit consists of a motor and an encoder.

FINE GRINDING

ROUGH GRINDING



REMOVING THE FINE GRINDING MICROMETRIC ADJUSTMENT WHEEL ENCODER (This operation is also valid for removing the rough grinding encoder)



- Using a 10 mm wrench, unscrew the four bolts and remove the motor.
- Using a 10 mm wrench, unscrew the four bolts and remove the encoder protection lid.



- Using a 2 mm wrench, unscrew the two grub screws and remove the encoder.

INSTALLING THE FINE GRINDING MICROMETRIC ADJUSTMENT WHEEL ENCODER (This operation is also valid for installing the rough grinding encoder)



WARNING!

Be careful when inserting the encoder.

The screw protruding from the flange on the machine must fit into the slot on the encoder.

- Insert the encoder on the shaft.
- Using a 2 mm Allen wrench, secure the encoder using the two grub screws.
- Using a 10 mm wrench, install the protection lid and secure it with the four bolts, paying attention to the electrical cable.
- Using a 10 mm wrench, install the motor and secure it with the four bolts.



WARNING!

The motor electrical box must be positioned facing upwards.



WITHDRAWING THE FINE GRINDING MICROMETRIC ADJUSTMENT WHEEL



- Unscrew and remove the red silicone caps protecting the internal screws.
- Using a 3 mm Allen wrench, unscrew and remove the upper screw and remove the side screw with a 4 mm wrench.
- Remove the complete assembly.

WITHDRAWING THE ROUGH GRINDING MICROMETRIC ADJUSTMENT WHEEL

- Unscrew and remove the red silicone caps protecting the internal screws.
- Using a 3 mm Allen wrench, unscrew and remove the upper screw and remove the side screw with a 4 mm wrench.
- Remove the complete assembly.

INSERTING THE ROUGH GRINDING MICROMETRIC ADJUSTMENT WHEEL



WARNING!

Be careful when inserting the adjustment assembly. The hole on the shaft of the assembly must line up with the hole on the machine.

The motor electrical box must be positioned facing upwards.

- Insert the adjustment assembly and secure it from above with a 3 mm Allen screw and from the side with a 4 mm Allen screw.

INSERTING THE FINE GRINDING MICROMETRIC ADJUSTMENT WHEEL



WARNING!

Be careful when inserting the adjustment assembly. The hole on the shaft of the assembly must line up with the hole on the machine.

The motor electrical box must be positioned facing upwards.

- Insert the adjustment assembly and secure it from above with a 3 mm Allen screw and from the side with a 4 mm Allen screw.
- Protect the screw compartments with silicone.

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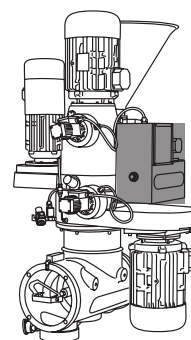
ADJUSTING THE LUBRICATION CONTROL UNIT



WARNING!

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For the lubrication control unit adjustment operations, the following are required:

- a) wrench - 8 mm.
- b) wrench - 17 mm.
- c) Allen wrench - 5 mm.

ADJUSTMENT

- Power the machine by turning the main switch to I.



- Press the green grinding disc start button on the control panel.
- Locate the pressure gauge inside the lubrication control unit housing (the value indicated is low).
- After indicating a low value for a few seconds, the reading on the lubrication control unit pressure gauge drops further to approximately zero. The machine is blocked.
- Unscrew the four bolts and washers securing the plexiglass protection on the control unit box and remove them using an 8 mm wrench.
- Remove the plexiglass cover.
- Set the 17 mm wrench on the control unit adjustment nut, located below the pressure gauge. At the same time, insert a 5 mm Allen wrench into the shaped hole in the nut itself.
- Loosen the adjustment nut by turning the 17 mm wrench half a turn to the left.



- On the electrical control panel touch screen, press the alarm reset button at the top right-hand side of the screen.
- Press the green grinding disc start button, the LED goes on and flashes for a few seconds and then remains on steady.
- While holding the 17 mm wrench in place, turn the Allen wrench inserted in the nut to the right.



Maintenance section



WARNING!

Turn the Allen wrench to bring the pressure reading on the pressure gauge up to a value of 0.7/0.8 bar (approx. 11 psi) and then stop turning. The machine no longer locks out.



- While holding the Allen wrench in the position reached, using the 17 mm wrench, turn the adjustment nut to the right until it is fully tightened.
- Reinstall the plexiglass panel and secure it using an 8 mm wrench to tighten the four bolts at the ends.

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REMOVING THE LUBRICATION PUMP



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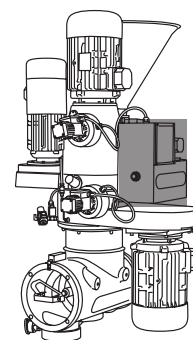
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Characteristics of the pump and motor system:

Weight: 5 kg

Power: 0.09 kW

Spare part number: GV.LUBR.01



To remove/reinstall the lubrication pump, the following are required:

- a) Phillips screwdriver.
- b) socket wrench - 7 mm.
- c) socket wrench - 8 mm.
- d) wrench - 8 mm.
- e) Allen wrench - 5 mm.

REMOVING THE PUMP

- Remove the machine power supply by turning the main switch to 0.
- Locate the lubrication pump motor: it is located beside the lubrication control box.



- Unscrew the four screws holding the electrical connection protection box on the pump and remove them. Use a Phillips screwdriver.
- Remove the cover of the electrical box.



WARNING!

Save/photograph the position and colour of the three power supply cables for subsequent reassembly.

- Using a 7 mm socket screwdriver, unscrew the three nuts and remove them with their washers, and then withdraw the three power supply cables.
- Unscrew the upper screw and remove it with its washer and then withdraw the yellow-green earth cable.
- Unscrew the four pump securing screws on the body of the machine. Use a 8 mm socket wrench.



WARNING!

Wear protective gloves suitable for handling loads.



Maintenance section

- Lift the pump motor out of its housing, being careful to completely remove the underlying assembly which consists of the pump and lubricant feed hoses.
- Disconnect the lubricant feed hose using the quick coupling on the inside of the lubrication control box. This is done using a wrench.
- Remove the filter at the other end of the feed hose using a wrench to turn the quick coupling.
- Using an 8 mm wrench, unscrew the four bolts securing the lubrication pump to the base of the motor. Remove the bolts and their washers.
- Separate the motor from the pump.
- Using a 5 mm Allen wrench, unscrew the two Allen screws securing the pump to its support. Remove the screws and their grover washers.
- Separate the pump from its support.

REINSTALLING THE PUMP



WARNING!

If a new PUMP is installed, it is advisable to grease the end of the shaft.

- Insert the pump into its support.
- Using a 5 mm Allen wrench, tighten the two Allen screws and grover washers securing the pump to support
- Couple the motor to the pump, making certain that the labels of the two components face the same direction.
- Screw in the four bolts with washers and secure the two components together. Use a 8 mm wrench.



WARNING!

The pump has two quick couplings for connection to the lubricant inlet and outlet hoses. The label clearly marks the inlet connection "IN" and the outlet connection "OUT" and the direction in which the lubricant flows through the component.

- Locate the lubricant inlet hose in the pump.
- Fit the filter to the free end of this hose by simply inserting the hose into the existing quick coupling.
- Locate the outlet pipe.



- After having passed the hose through the hole in the machine body where the pump is located, connect the outlet hose to the quick coupling in the lubrication unit control box.
- Insert the motor and pump in their seats on the body of the machine.
- Using an 8 mm wrench, tighten the four screws securing the motor to its seat.
- Connect the earth and electric power supply to the terminals on the motor, in the positions previously saved. This is done using a Phillips wrench for the earth and a 7 mm socket wrench for the electrical phases.
- Close the electrical box and, using the Phillips screwdriver, tighten the screws.

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REPLACEMENT OF ROTATING CLEANER UNIT

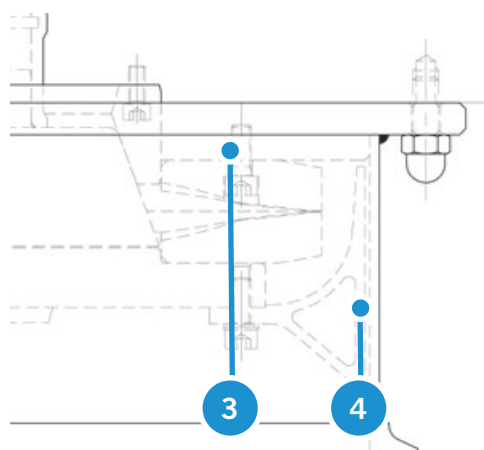
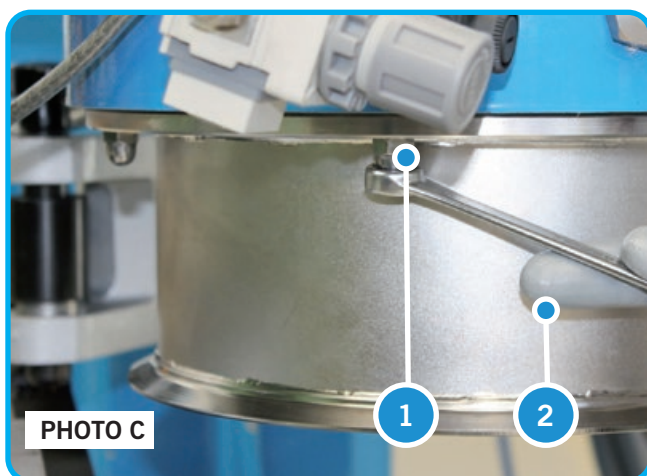


WARNING!

ALWAYS USE CUT PROTECTION GLOVES FOR THESE OPERATIONS



- Disconnect the main switch.
- Unscrew the Allen screw of the support connection (**PHOTO A**) and turn the extractor (**PHOTO B**).
- Loosen the six cap nuts (**1**), turn and remove the chute (**2**). (**PHOTO C**).
- Unscrew the screws (**3**) and replace the scraper (**4**).



REPLACEMENT OF THE OIL LUBRICATION PUMP

It is easy to understand the extreme importance played by adequate lubrication on the grinder.

The MAC 5 grinder requires adding/changing the oil in the PUMP UNIT lubrication tank.

The required characteristics are: **FUCHS CASSIDA FLUID HF15** type



Do not use oils with different characteristics

The system is closed circuit with total oil recovery.

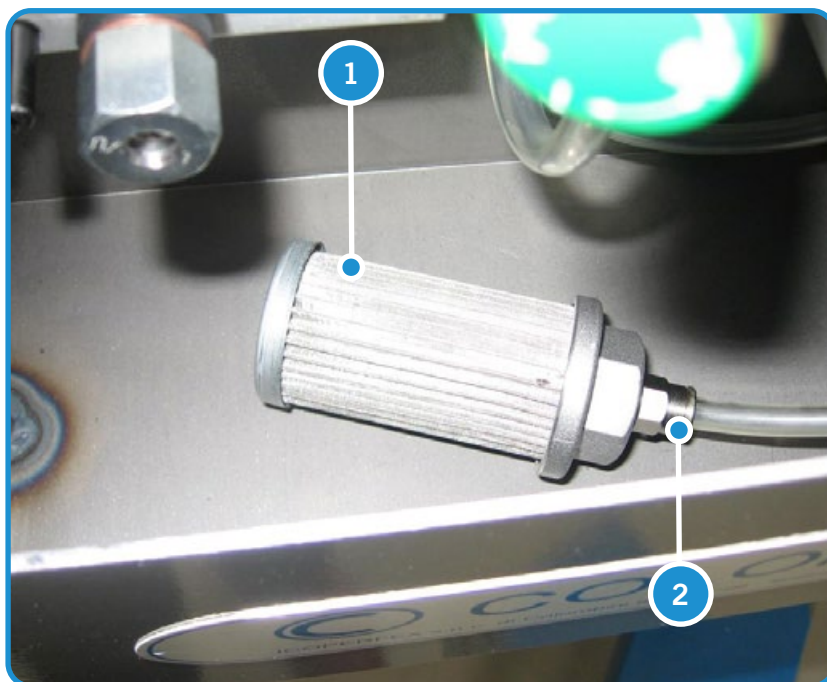
To change the oil, unscrew the cap (1) located on the collection tray (2) (once the tray is emptied, re-screw the cap), to add open the cover by unscrewing the two screws (A) and add (around) 3 litres of oil, until reaching the level on the specific indicator (3) and close the cover (3) again.

If too much oil is added by accident, the extra amount will flow out of a specific safety hole (4) into the lower part of the collection tray. The main shaft is mounted on sintered self-lubricating bronze bushes, therefore the machine can work for a certain time even without lubricant: the automatic lubricating system is a guarantee for keeping the precision conditions unaltered for a long time, essential for ensuring the repeatability and grinding quality results.



FILTER CLEANING

- Stop the machine and clean the filter **(1)** once a month and when the oil is changed.
- To disassemble the filter and clean it, use the fast fitting **(2)**.



GREASING THE THRUST BEARING

The operation entails applying the supplied grease lubricator supplied in the specific point **(A)** indicated in the figure by turning the grease lubricator screw 4/5 times.

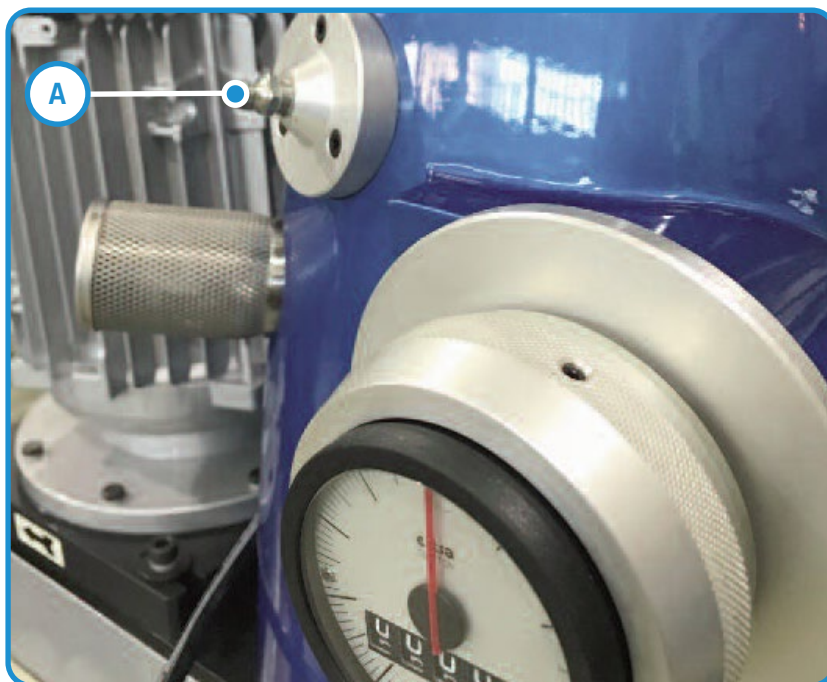
The required characteristics are:

SKF LGMT (or equivalent)

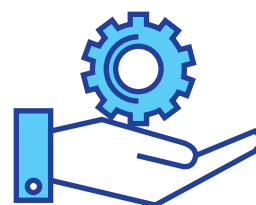


WARNING!

Always use cut protection gloves for these operations



7. SPARE PARTS SECTION



Components subject to wear (Recommended spare parts)

A request to order spare parts can be sent by fax, by making a copy of the attached form or by e-mail.



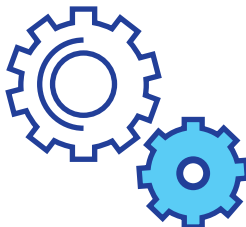
0039.011.8211407



info@colombini.srl

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Dear:



COLOMBINI s.r.l.

Via De Francisco 130/16 - 10036

SETTIMO TORINESE (TO) - ITALY

Tel. +39.011.8211407 - Fax +39.011.8958221

info@colombini.srl

Date

Page

of

Type or print

INDUSTRIAL GRINDER series MAC 5 type 0000

Customer 0000

Serial number 0000

Year 0000

Transmitted by

Tel.

SPARE PARTS DESTINATION

Address

Town/city

Province

Country

Tel.

Unit drawing

Part drawing

Description

Quantity

Unit drawing

Part drawing

Description

Quantity

Unit drawing

Part drawing

Description

Quantity

Unit drawing

Part drawing

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Unit drawing

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Description

Quantity

Unit drawing

Part drawing

Description

Quantity

Unit drawing

Part drawing

Description

Quantity



Spare parts section

In **preventive maintenance** (as well as in safety and risk management), the levels **Low - Medium - High** indicate the **risk assessment** related to a potential failure or hazard.

They are the result of the combination of two main factors:

- **Likelihood (Probability)** ---> how likely the event/failure is to occur.
- **Severity (Consequence/Impact)** ---> how serious the consequences are if it happens (e.g., machine downtime, safety risks, high costs).

Risk assessment (Low - Medium - High)

Consequence/Impact	Low	Low	Low	Medium
	Medium	Low	Medium	High
	High	Medium	High	High
		Low	Medium	High
		Probability		

Summary:

Risk Low

- Rare event and/or minor consequences.
- Example: a warning light bulb burns out ---> no safety issue, does not stop the machine.
- Action: preventive maintenance with low priority.

Risk Medium

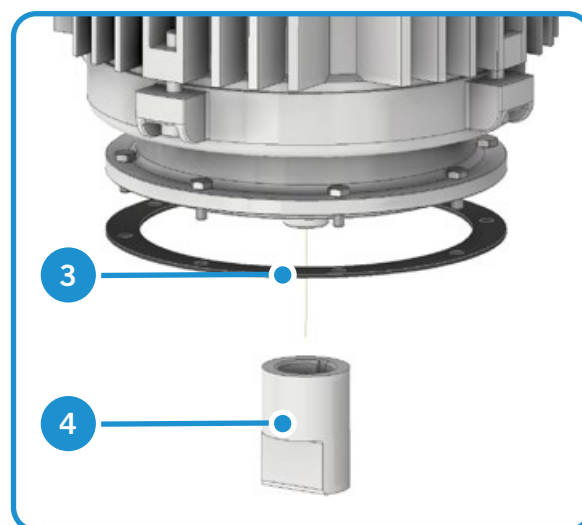
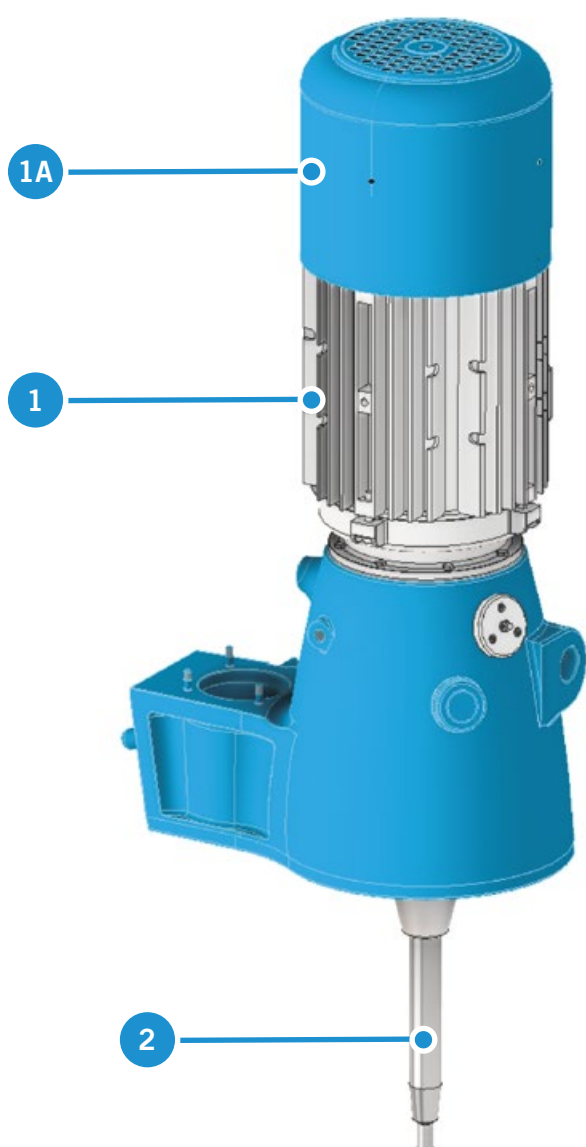
- Possible event with moderate impact.
- Example: belt wear ---> may cause downtime but no safety hazard.
- Action: scheduled maintenance, regular inspections.

Risk High

- Likely event and/or severe consequences (operator safety, major downtime, high costs).
- Example: brake system failure in handling equipment ---> high risk of accident.
- Action: high-priority maintenance, early replacement, extra monitoring.

**1 - LOWER BURR - MAIN SHAFT GROUP (COD. G0SUPP.07)**

REF.	CODE	NAME	QUANTITY	RISK
1	E1.0158	ELECTRIC MOTOR WITH MOTOR FAN 11 KW (FOR LOWER BURR)	1	MEDIUM
1A	FT.SERVO.02	MOTOR FAN (ONLY)	1	HIGH
2	GV.SUPP.07	MAIN SHAFT GROUP	1	HIGH
3	E0.0330	MOTOR GASKET	1	LOW
4	IO.0050	COUPLING FOR ELECTRIC MOTOR DRIVE	1	MEDIUM

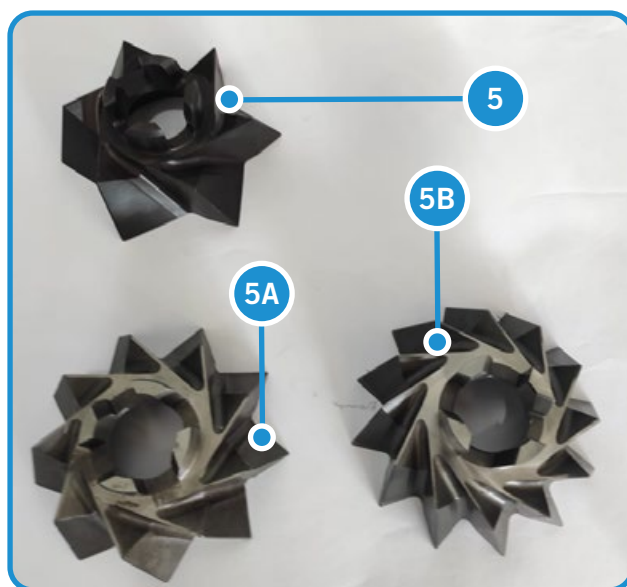




Spare parts section

2 - GRINDING GROUP (COD. G0.LOU5.02)

REF.	CODE	NAME	QUANTITY	RISK
1	IO.1270	PAIR OF BURRS U6	1	HIGH
2	IO.0415	CLEANER UNIT	1	MEDIUM
3	E0.0465	BEARING	1	HIGH
4	IO.0265	FIXED UPPER BREAKER F24	1	HIGH
5	IO.1400	ROTATING LOWER BREAKER R6	1	HIGH
5A	IO.1401	ROTATING LOWER BREAKER R9	1	HIGH
5B	IO.1402	ROTATING LOWER BREAKER R12	1	HIGH
5C	IO.1555	ROTATING LOWER BREAKER R0.6	1	HIGH





3 - ADJUSTMENT MOTORIZED BURRS DISTANCE (COD. G0.CR15.01)

REF.	CODE	NAME	QUANTITY	RISK
1	E1.0195	GEAR MOTOR RPM 47	1	MEDIUM
2	E1.0006	INCREMENTAL ENCODER	1	MEDIUM



4 - ADJUSTMENT MOTORIZED PRE-BREAKERS DISTANCE (COD. G0.CR15.02)

REF.	CODE	NAME	QUANTITY	RISK
1	E1.0195	GEAR MOTOR RPM 47	1	MEDIUM
2	E1.0006	INCREMENTAL ENCODER	1	MEDIUM

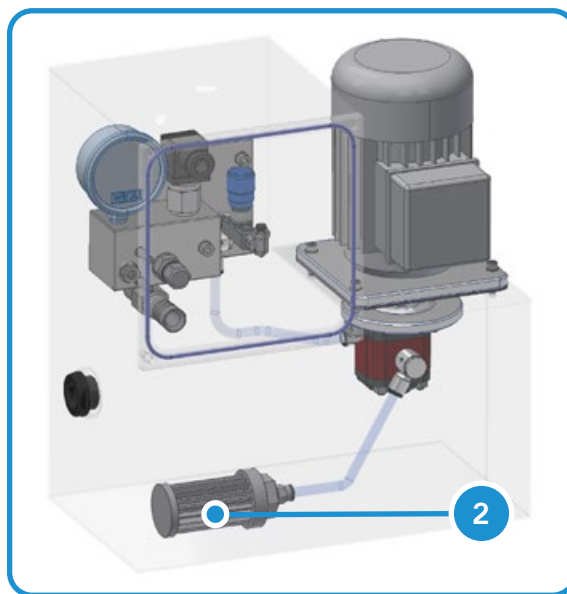
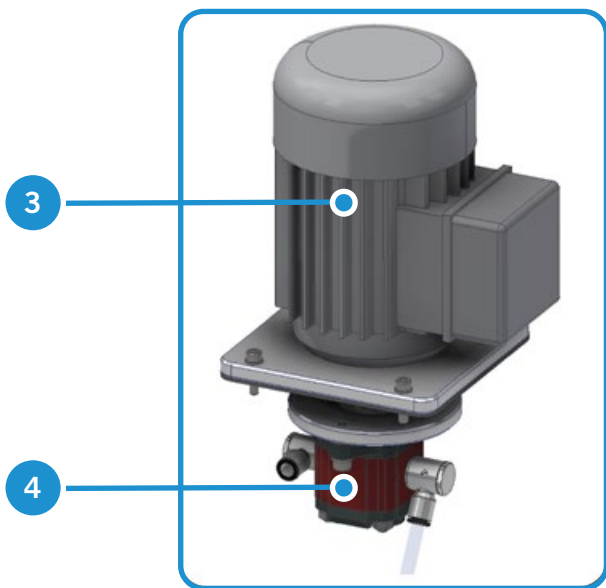
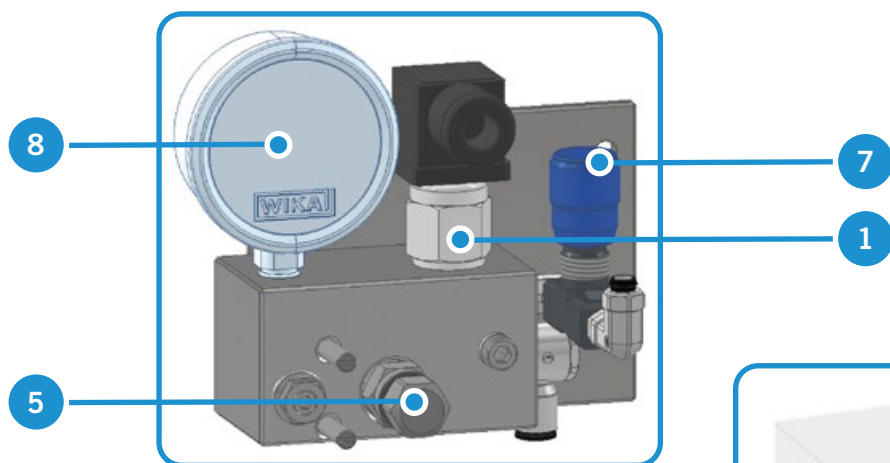




Spare parts section

5 - LUBRICATION GROUP (COD. G0.LUBR.03)

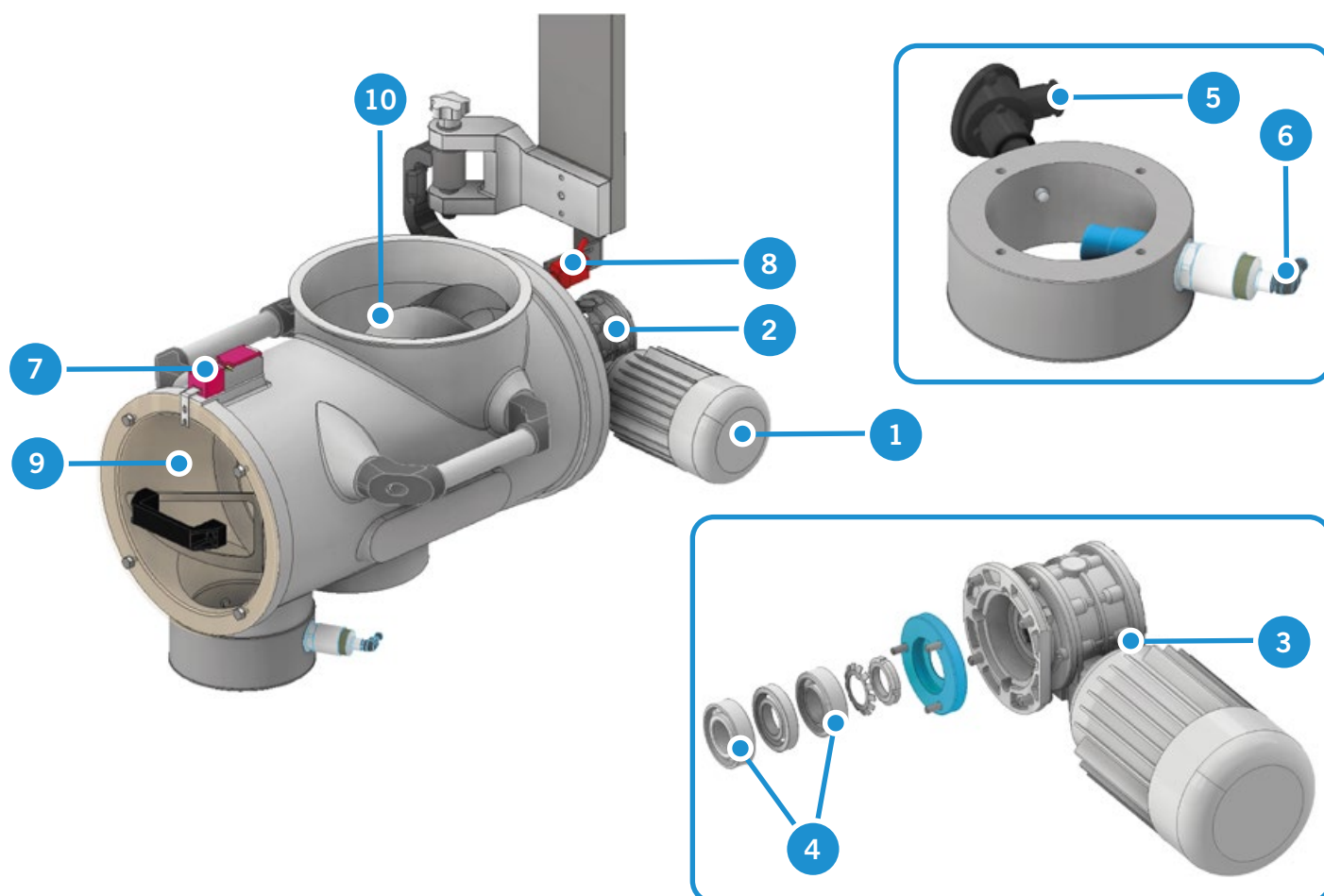
REF.	CODE	NAME	QUANTITY	RISK
1	E0.0066	PRESSURE SWITCH	1	LOW
2	E0.0075	OIL FILTER	1	LOW
3	E1.0165	MOTOR KW 0.09	1	HIGH
4	E0.0040	GEAR OIL PUMP	1	HIGH
5	E0.0045	MAXIMUM PRESSURE VALVE	1	MEDIUM
6	GV.LUBR.01	ELECTRICAL MOTOR + GEAR PUMP LUBRICATION GROUP	1	HIGH
7	E0.0355	OIL FLOW REGULATOR	1	MEDIUM
8	E0.0060	OIL PRESSURE GAUGE	1	MEDIUM





6 - SCREW CONVEYOR GROUP (COD. G0.ESTR.01)

REF.	CODE	NAME	QUANTITY	RISK
1	E1.0170	MOTOR 0.37 KW	1	HIGH
2	E0.0120	GEAR BOX	1	HIGH
3	GV.MTRD.01	MOTOR GEAR BOX GROUP	1	HIGH
4	E0.0110	BEARING	1	LOW
5	E1.0030	PROBE TEMPERATURE	1	LOW
6	E1.FTI26-I1265/0	LEVEL SENSOR	1	LOW
7	E1.XCS-PA991	SAFETY SWITCH	1	LOW
8	E1.XCSM4102L2	SAFETY LIMIT SWITCH	1	LOW
9	IO.0830	TRANSPARENT CLOSING COVER	1	LOW
10	IO.0750	SCREW CONVEYOR	1	LOW

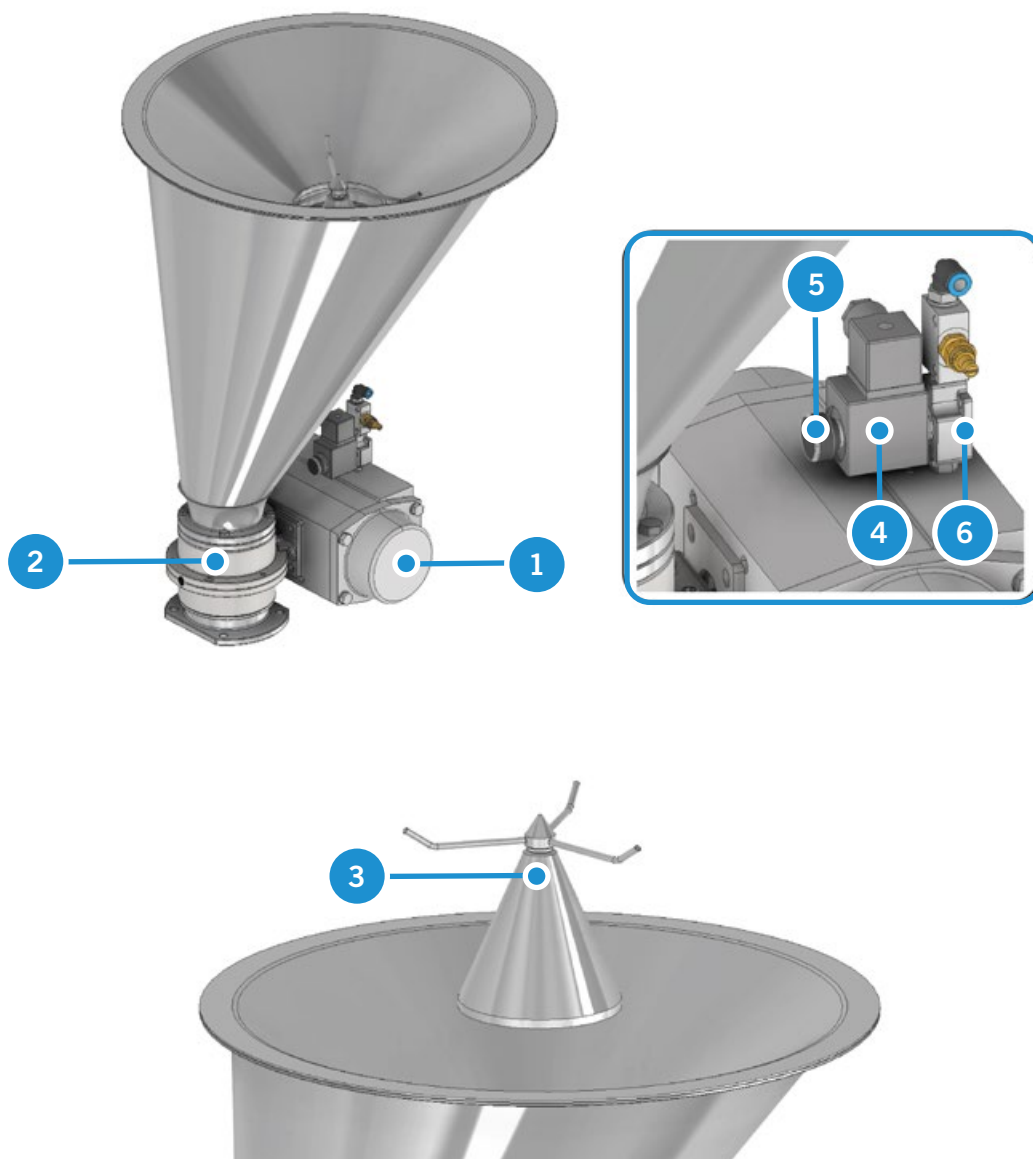




Spare parts section

7 - PRODUCT LOADING HOPPER (COD. GO.ALCC.02)

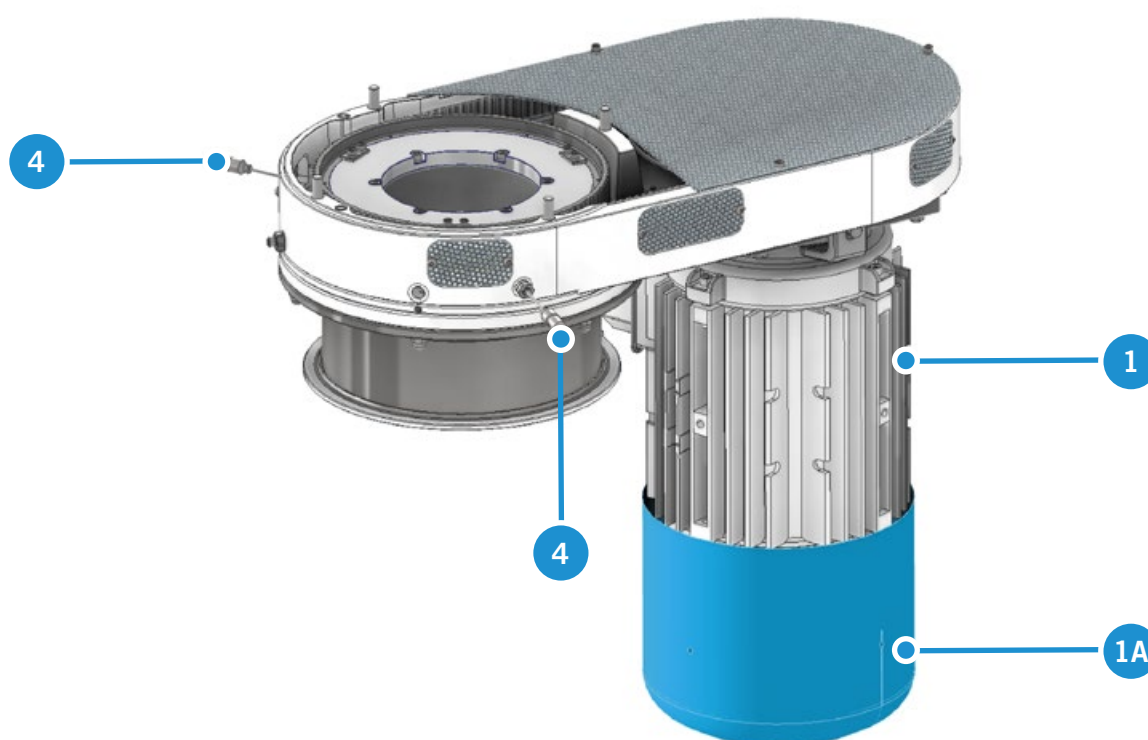
REF.	CODE	NAME	QUANTITY	RISK
1	E0.0135	PNEUMATIC ACTUATOR SE	1	HIGH
2	E0.0145	BUTTERFLY VALVE	1	HIGH
3	GV.CLM.01	MAGNETIC GROUP	1	LOW
4	E1.0115	COIL	1	MEDIUM
5	E1.0125	LOCKING RING	1	MEDIUM
6	E1.0135	ELECTRO PILOT	1	MEDIUM





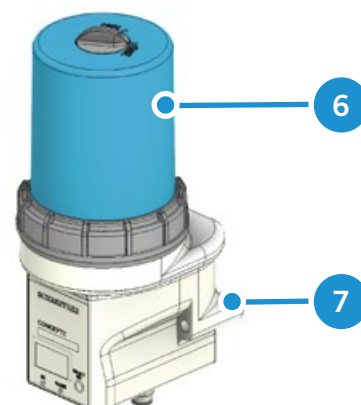
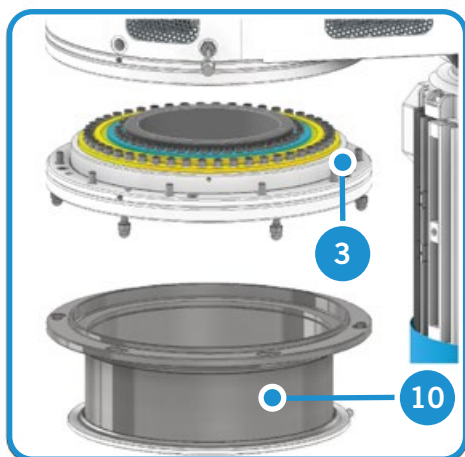
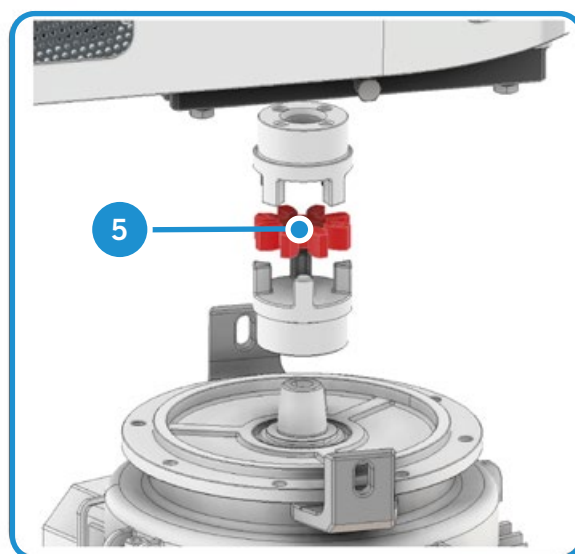
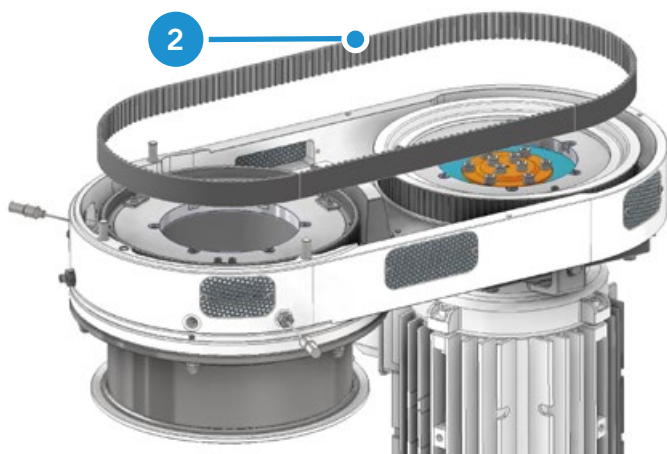
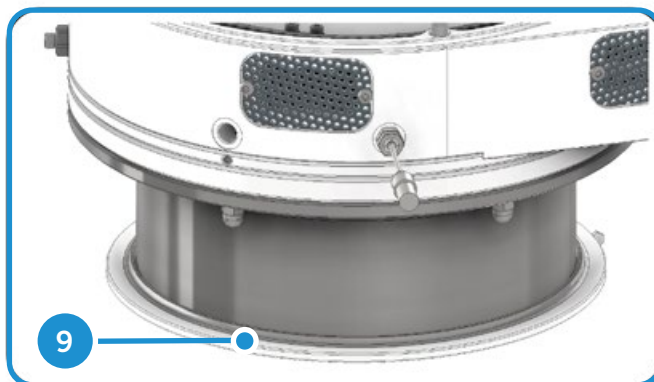
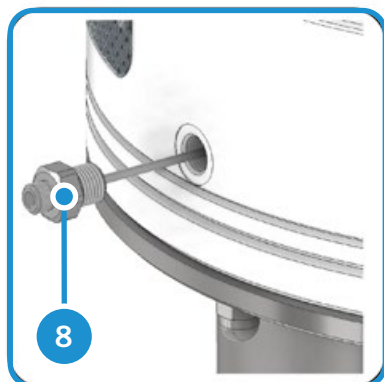
8 - UPPER BURR ROTATION GROUP (COD. G0.TRMAC.01)

REF.	CODE	NAME	QUANTITY	RISK
1	E1.0158	ELECTRIC MOTOR SERVO-VENTILATED 11 KW (FOR UPPER BURR)	1	MEDIUM
1A	FT.SERVO.02	MOTOR FAN	1	HIGH
2	E0.0447	TIMING BELTS	1	LOW
3	GV.CUSC.180	BEARING GROUP	1	HIGH
4	E1.0600	THERMOCOUPLE	1	LOW
5	E0.0605	FLEXIBLE COUPLINGS	1	MEDIUM
6	E0.0532	GREASE CARTRIDGE	1	HIGH
7	E0.0530	MULTI POINT LUBRICATION SYSTEM	1	LOW
8	IO.1692	GREASE NOZZLE	1	MEDIUM
9	IO.1125	CLAMP	1	LOW
10	IO.0472	BURRS PROTECTION DUCT	1	LOW



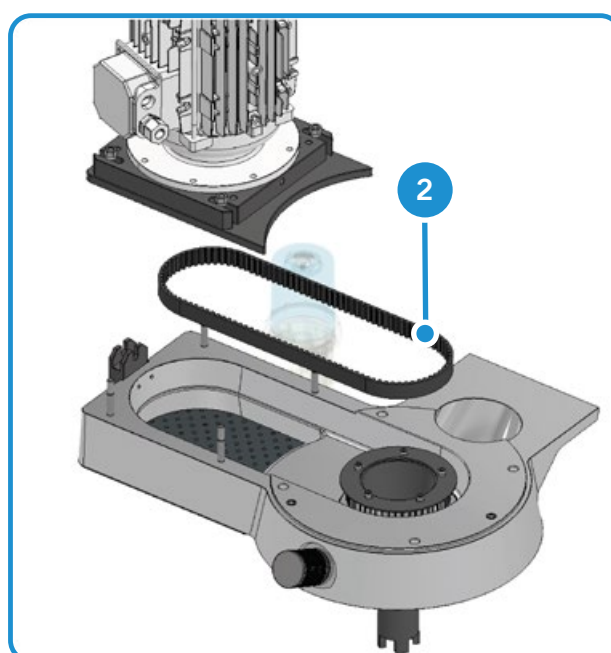
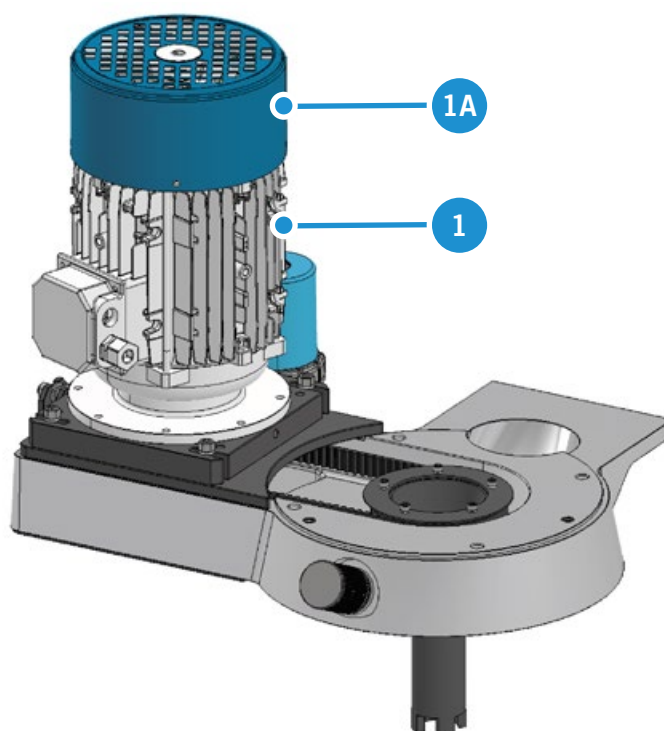


Spare parts section

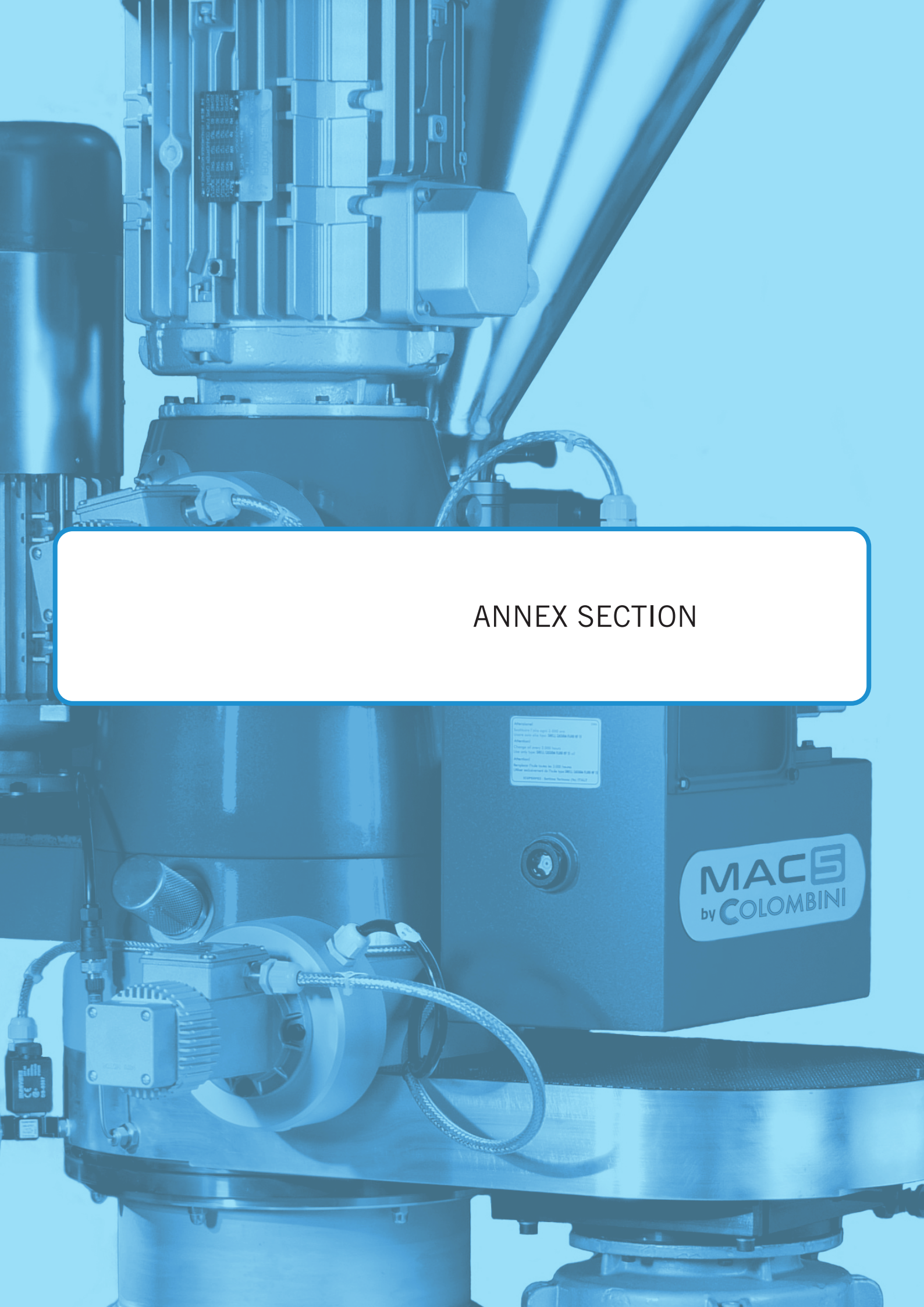


**9 - ROUGH GRINDING GROUP (COD. G0.TRSG.01)**

REF.	CODE	NAME	QUANTITY	RISK
1	E1.0142	ELECTRICAL MOTOR WITH MOTOR FAN 2.2 KW	1	MEDIUM
1A	FT.SERVO.01	MOTOR FAN (ONLY)	1	HIGH
2	E0.0446	TIMING BELTS	1	LOW



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ANNEX SECTION

MACS
by **COLOMBINI**

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TECHNICAL ASSISTANCE REQUEST FORM

This request must be filled in by the Customer and sent by fax to the company COLOMBINI s.r.l.
COLOMBINI will retransmit the present via fax, indicating the date scheduled for the technician intervention.

INDUSTRIAL GRINDER series MAC 5 type 0000

Customer 0000

Serial number 0000

Year 0000

Transmitted from:

Tel.

Fax

Reason for the technician intervention

Warning: do not write in the area below

Intervention code

Estimated date

Procedure

Warranty ☐ YES ☐ NO

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TEST REPORT

Goods as per contract _____ of _____ delivered on _____

With D.D.T (transport document) _____ invoice no. _____ of _____

The day _____ at _____ COLOMBINI declares to have successfully carried out

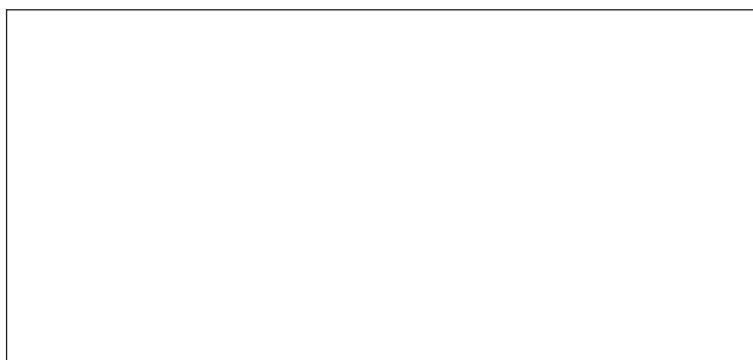
the acceptance test operations and that the goods in question operate regularly.

The Customer _____ confirms the above and therefore accepts the goods

without exceptions or reservations of any kind.

Customer stamp and signature

COLOMBINI stamp and signature



COLOMBINI Srl

Via De Francisco 130/16 - 10036 - SETTIMO TORINESE (TO) - ITALY

Tel. 011.8211407 - Fax 011.8958221 - E-mail: info@colombini.srl