

TRANSLATION OF
"ISTRUZIONI ORIGINALI"



IMPERIA & MONFERRINA S.p.A.

SOUS-CHEF

Cod. LM12036 e LM12037



APPROVATA



ANSI 8

USER AND MAINTENACE MANUAL

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SOUS-CHEF	English	03/2018	00	FIRST EDITION

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In the case of doubts or difficulty in understanding or interpreting the handbook, the original/official version indicated by "**ISTRUZIONI ORIGINALI**" on the cover, is to be considered the valid version.

We have checked with care and attention that the contents of this documentation correspond to the system in question. However, since possible differences cannot be excluded, we cannot guarantee a perfect consistency. The contents of this documentation are periodically verified and any corrections or modifications will be included in the subsequent editions.

Some of the pictures included in this handbook must be considered as an example; therefore they may not refer to the machine herein described.

HANDBOOK STRUCTURE

The manual is divided into 8 chapters.

CHAPTER 1 – GENERAL INFORMATION

This chapter contains general descriptions regarding the handbook structure.

CHAPTER 2 – SAFETY

This chapter contains a description regarding the standards, working environment conditions, ergonomics, accident prevention devices used, residual risks, warning plates applied to the machine.

CHAPTER 3 – GENERAL DESCRIPTION

This chapter contains the description of the functioning principles, general technical data and description of mechanical, electrical and fluidic units of the machine.

CHAPTER 4 – INSTALLATION

This chapter contains the instructions for the correct installation in the user plant, the connections to the plant power mains, the checks and controls and any adjustments to be made before start-up.

CHAPTER 5 – USE

This chapter is intended for operators and maintenance personnel and contains the instructions for use of the system with the different operating cycles, and describes the controls available for the operator, the more important operating sequences and how to use the diagnostics systems.

CHAPTER 6 – MAINTENANCE

This chapter, addressed to the maintenance technicians contains the system maintenance schedule. It contains the warnings, precautions and instructions to correctly carry out the maintenance operations on the machine.

CHAPTER 7 – SPARE PARTS

CHAPTER 8 – WIRING DIAGRAM

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1. GENERAL INFORMATION

1.1 INTRODUCTION



NOTE

IMPERIA & MONFERRINA S.P.A. the machine manufacturing company, is indicated in the handbook with the name: **Manufacturer**.



NOTE

The Company purchasing the machine, is indicated in the handbook with the name: **Customer**.

The manufacturer recommends a training course for personnel responsible for operating and maintaining the machine to increase familiarity and know-how of the various procedures

This manual contains the features, performances, instructions for use and the references to the preventive and remedial operations of the machine.

The Manufacturer insists that this document is read by the persons assigned to the running and maintenance of the machine, as well as by the persons who carry out the transport and assembly.

This document is the instructions handbook for the:

AUTOMATIC FRESH PASTA MACHINE “SOUS-CHEF”

and has been drawn up in compliance with Directive 2006/42/EC.

The Use and Maintenance Handbook is to be considered an integral part of the system, and is to be kept until final dismantling. It is to be kept by the person in charge of the machining service after the final installation.

1.2 GLOSSARY

Control circuit(of a machine): circuit used to control the machine operation and to protect the power circuits.

Component: part of the electrical equipment, usually specified by its function, but used in various applications.

Machines Directive: DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL concerning the harmonising of the laws of Member States related to machinery.

Device: unit of an electrical system that transmits but does not use electric power.

Control device: device inserted in a control circuit and used to control machine functioning (e.g. position sensors, manual control switches, relays, electromagnetically controlled valves).

Bill of Materials: list of components that are part of mechanical units, fluidic or electrical system, indicated with the quantity, code and name of supplier.

Supplier: body (for example, manufacturer, installation dealer, systems integrator) that supplies the equipment or services associated to the machine (the user can also act as manufacturer for himself).

Machine: a group of parts or components, at least one of which is moving, connected together and possibly with drives, with control and power circuits, etc., integrally connected for a precise application, indicated for conversion, treatment, movement and conditioning of a material. A set of machines and equipment which, in order to achieve the same result, are arranged and operated in such a way as to ensure an integral operation. Interchangeable equipment that changes the function of a machine, procured on the market to be mounted by the operator onto a machine or a series of different machines or on a tractor, within the limits in which this equipment is not a spare part or a tool (Chapter I - Article 1 of Directive 2006/42/EC).

Marking: symbol and wording to identify the machine, applied by the manufacturer. (Chapter III - Article 10 Directive 2006/42/CE).

Safe operating procedure: a working method that reduces risks.

Obstacle: an element intended to prevent direct accidental contact, but that does not impede a direct intentional contact (Item 3.38 of European Standard EN 60204-1).

Operator: person qualified to install, run, adjust, clean and carry out maintenance on the machine. (Annex I - 1.1.1 directive 2006/42/CE).

Hazard: potential source of damage. (Item 3.6 of the European Standard EN ISO 12100).

Exposed person: person who is entirely or partially in a hazardous zone.

Safe operating procedure: a working method that reduces risks.

Safety protections: guard or protection device used as a safety measure to protect the persons against hazards that are present or potential.

Protections (protection criteria): means of protection that uses measures to protect persons against hazards that cannot be rationally eliminated, against risks that cannot be sufficiently reduced by protection measures integrated in the design. (Point 3.20 European standard EN ISO 12100).

Reference person: person responsible for certain operations or assessments that could arise during operation or maintenance.

Risk: combination of probabilities that a damage occurs and the severity of that damage. (Item 3.12 of Standard EN ISO 12100).

Transport: operations involved to transfer the machine from the manufacturer's assembly site to the final workplace of the Customer.

Incorrect use: machine use out of the limits specified in the technical documentation.

User: those who use the machine and associated electrical equipment.



NOTE

The terminology has been taken from the European Standards listed in chapter2 "SAFETY".

1.3 SYMBOLS

Some symbols are used in the handbook to call the attention of the reader and to highlight certain aspects which are especially important.

SYMBOL	MEANING	NOTES
	DANGER	Indicates a hazard with accident risk, even death, for the user. Pay very careful attention to the texts indicated by this symbol.
	WARNING	A warning of possible deterioration or damage to the system and/or equipment. Pay attention to the texts indicated by this symbol.
	CAUTION NOTE	A warning or note regarding key functions or useful information. Pay attention to the texts indicated by this symbol.
	ADDITIONAL INFORMATION	Texts that contain additional information are indicated by this symbol. This information does not relate directly to the description of an operation or to the development of a procedure. It may give reference to other supplementary documentation or to other sections of the handbook.

1.4 ADDRESS OF MANUFACTURER

For any type of information or clarification regarding the use, maintenance, installation etc., the Manufacturer Technical Office is always available for requests from the Customer.

Please state your requests in clear terms, with reference to this handbook, and always indicating the data on the relevant system identification plate.

Requests for interventions, technical assistance in the Customer's works, or explanations regarding technical aspects of this document, are to be addressed to:

IMPERIA & MONFERRINA S.p.A.

Via Statale, 27/A - 14033 – Castell'Alfero (AT) - Italia

Tel: 0039.0141.27.60.11

www.imperiamonferrina.com

1.5 SAFETY MEASURES CONTAINED IN THE MANUAL

The specifications, indications, standards and related safety notes described in the various chapters of the handbook have the purpose of defining a series of actions and obligations to be observed when carrying out the different activities that form the modes of use foreseen of the machine, so as to operate under safe conditions for the workers, the equipment and the surrounding environment. The safety rules included are directed to all the persons authorised, instructed and assigned to carry out the operations regarding:

- Transport
- Installation
- Functioning
- Use
- Management
- Maintenance
- Cleaning
- Putting Out Of Service And Dismantling

1.6 RESPONSIBILITIES OF THE MANUFACTURER

The Manufacturer shall not be held in any way liable for incidents caused by incorrect or improper use of the machine, or for any damage caused by the use of spare parts that are not those specified, by maintenance operations not carried out correctly and/or by tampering on system circuits, components and software.

The responsibility to ensure the application of the safety precautions is that of the technician in charge of the activities to be carried out on the system. The Customer is to ensure that the operators authorised to carry out the required activities are qualified, that they observe and are fully aware of the provisions contained in this document and the general safety standards applied to the system.

Non-observance of safety standards can cause injuries to the personnel and damage to the equipment.

1.7 MACHINE MANAGEMENT

The machine management is only permitted to the authorised operators who have been appropriately instructed, or who have sufficient technical experience.

The operators assigned to the running and maintenance of the system are to be aware that the knowledge and application of safety standards is an integral part of their job.

Operators not authorised to work on the machine are not to have access to the operating.

Never remove, even partially safety protections and devices installed to safeguard the persons in the system hazardous zones.

The same rule is applied to the warning plates.

Safety protection and devices are to be kept in perfect working order, to ensure correct functioning. In the case of malfunctioning or failure on these devices, they are to be immediately repaired or replaced.

1.8 WARRANTY

The manufacturer guarantees, for a period of 12 months from the date of purchase, all parts excluding those subject to normal wear.

The warranty shall no longer be valid if the machine has been repaired by unauthorized third parties or if fixtures, accessories are used that have not been supplied by the manufacturer or have not been recommended or approved by the same, or if the serial number is altered or removed during the warranty period.

The warranty starts from the date of purchase, indicated on the official document at the time of the machine delivery by the dealer.

The manufacturer undertakes to repair or replace free of charge those parts that within the warranty period are found to have manufacturing defects. The warranty does not cover any cleaning of functioning components.

Defects that cannot be clearly attributed to the material or the manufacture shall be examined by the Technical Assistance Centre in the works of the manufacturer.

If the claim should result unjustified, all the costs for the repair and/or replacement shall be debited to the purchaser.

The warranty certificate and the official document shall be assigned to the technical staff that carry out the repair, or who have to accompany the shipped machine for the repair.

The warranty shall not be extended following technical intervention on the machine.

The repair shall be carried out by the Technical Assistance Centre in the works of the manufacturer, and is to arrive in free port (with transport costs covered by the user, unless otherwise agreed).

In any case the following are excluded from the warranty: accidental damage caused by transport, neglect or inadequate treatment, from improper use that does not conform with the warnings indicated in the instructions handbook, and in any case factors that do not arise from normal functioning or use of the machine.

The manufacturer shall not be held in any way liable for any damage to persons or materials caused by wrong or incorrect use of the machine.

1.9 SUGGESTIONS FOR PASTA PRODUCTION

Any type of flour or durum flour or flour/durum flour mixture can be used for the dough. The dough must be kneaded with eggs alone or an eggs/water mix.

The water can be replaced in part by finely-chopped spinach or vegetables to obtain green pastas or tomato puree to obtain red pastas. In these cases it is advisable to use Hard-grain durum flour. For good dough, around 300 ÷ 350 gr. of liquid is required for every kilogram of flour.

This liquid may consist of eggs alone, just water or an egg/water mixture. Since the moistness of the flour varies according to type, climate and where it is stored, the amounts indicated must be adapted to the type of flour being worked by adding or decreasing the quantity of liquid slightly.

The dough is just right when, at the end of kneading, it is in the form of grains the size of coffee beans. If the dough coalesces into an even mass it means that too much liquid has been poured in. In this case, before extruding the dough, add a little more flour and let it mix for a bit longer.

If, however, the dough does not form little balls but remains very floury, add a little more liquid.

Here below we give a few recipes for different types of dough.

Remember that ingredients can at all times be modified and quantities changed according to your experience and taste.

Preparation for pastry for ravioli:

Fine flour 70%

Hard-grain durum flour 30%

5 eggs per Kg of dough + water

Knead for approximately 10 minutes

The moistness of the mixture between eggs and water must be around 32%.

Preparation of dough for tagliatelle:

Fine flour 70%

Hard-grain durum flour 30%

5 eggs per Kg of dough + water

Or

Hard-grain durum flour 100%

5 eggs per Kg of durum flour + water

Knead for around 15 minutes with around 33% moisture.

Preparation of durum flour pasta:

(e.g. rigatoni, fusilli, conchiglie, spaghetti, etc.).

For this type of pasta only hard-grain durum flour with 30 ÷ 33% water is used.

When different types of flour are used it is a good idea to mix them well before adding liquid.

To take account of the customer's taste, salt in the rough measure of 2 gr. per Kg of flour can be added to the dough, taking care to dilute it well in water.

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2. SAFETY

2.1 GENERAL INFORMATION

The Customer shall instruct the personnel regarding accident risks, safety devices installed on the machine and the general rules concerning accident prevention specified by the EU Directives and the laws of the country where the machine is installed.

The operators are to know the position and functioning of all the system controls and the relevant characteristics. Furthermore they are to have read and fully understood the contents of this handbook.

Maintenance operations are to be carried out by qualified operators and only after setting the system in maintenance status.

Unauthorized tampering or replacement of one or more system components, use of accessories that change the use of the same and the use of spare parts that are different to those recommended could cause accident risks.



DANGER

It is strictly forbidden to cut out/tamper with the safety devices on the system.

The Manufacturer declines any responsibility concerning the machine safety if this prohibition is ignored.

2.2 DIRECTIVES APPLIED

The following directives are applied to the machine described in this handbook:

- **2006/42/EC** Machines Directive
- **2004/108/EC** Electromagnetic compatibility Directive
- **2006/95/EC** Low voltage Directive
- **2002/95/CE** Directive concerning the use of certain harmful products in electrical or electronic equipment
- **Regulation (EC) n. 1935/2004** concerning materials and items that shall come into contact with foodstuff products.

2.2.1 Harmonised technical standards

The machine has been designed and tested in conformity with the “essential health and safety requirements” of annex 1 of European directive 2006/42/EC.

The standards used as reference for the design, realisation and inspection of the machine are listed in the technical folder which is available at the manufacturer's premises.

2.2.2 Machine Certification

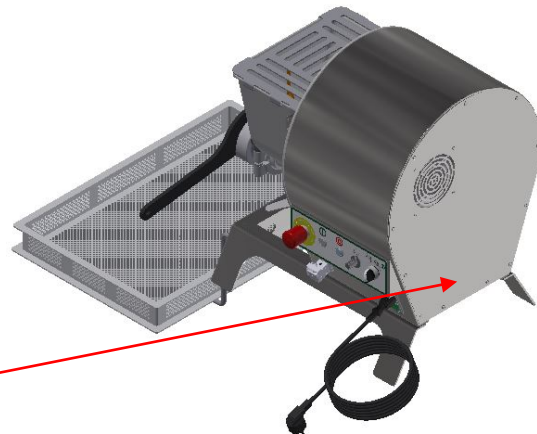
The system is supplied with the **EC** Declaration of Conformity to the essential safety requirements as per Machines Directive 2006/42/EC (annex II A) and the Electromagnetic Compatibility Directive 2014/30/UE.



NOTE

Any modification made to the Machining centre will immediately annul the **EC** certification issued by the Manufacturer.

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Via Vittime di Piazza Fontana 48 - 10024 Moncalieri (TO) ITALY					
Tel. +39 0141 27.60.11					
MODEL					
SERIAL NUMBER					
YEAR	KW	VOLT	PHASE	HZ	KG



2.2.3 Foreseen and Unforeseen Uses

The SOUS-CHEF machine has been designed, built and outfitted exclusively for the production of drawn pasta, obtained from raw materials such as durum wheat flour or bread wheat flour with the addition of water and/or eggs.

The pasta extruders, to obtain the different shapes, may be of two types, in bronze or in Teflon.

The pasta obtained with bronze extruders has a rougher and more opaque surface.

With Teflon extruders, the pasta is smoother and with a more glossy surface.

These extruders are more delicate than those in bronze and the hourly pasta production output is slightly higher.

A different use to that specified shall be considered improper use. In any case, the machine has been designed for professional industrial use.

2.3 ENVIRONMENTAL WORKING CONDITIONS

To permit the best possible environment conditions, it is necessary that the Customer organizes the machine and related systems in the workshop in a manner that provides good ventilation.

The machine is to be installed in an environment equipped with all the safety precautions required by the laws in force in the user country.

The environment temperature range is to be between 20°C and 40°C.

2.3.1 Explosive Atmospheres

The machine is not equipped with its own sprinkler system. Flammable liquids do not circulate freely in the system.



DANGER

In the case of fire, always immediately cut out the power from the main switch of the main electric cabinet.

It is not sufficient to use the emergency pushbuttons, because these do not cut-out the main power of the cabinets/panels.

2.3.2 Lighting

The machine is not fitted with an autonomous lighting system.

2.3.3 Vibrations

The machine does not produce vibrations that are hazardous for the persons operating on it.



WARNING

Excessive vibration can only be caused by a mechanical failure, which is to be immediately notified and removed, to avoid jeopardising the safety of the machine at those who operate on it.

2.3.4 Noise

The noise has been measured in accordance with the requirements of acoustic standard EN ISO 11200 and related standards.

The typical phonometrical data is kept by the Manufacturer.

The machine characteristics are such that, in a dry run, overall noise generated is less than 75 dB (A), measured in the operator workstations.



NOTE

The sound pressure level under actual working conditions will depend on the characteristics, programming of the specific processes and the materials used.



NOTE

Measurement of the noise level to which the operators are exposed is to be carried out by the user, in accordance with the requirements of the laws in force in the relevant country.

2.3.5 Electromagnetic Emissions

The machining centre contains electronic components subject to the Electromagnetic Compatibility standards, subjected to conducted and radiated emissions.

The emission values are kept in compliance with the standard by means of components installed in accordance with the Electromagnetic Compatibility directive, appropriate connections and the installation of filters where necessary.

Therefore the machine is in conformity with the Electromagnetic Compatibility Directive (EMC).



WARNING

Any maintenance activities on electrical equipment carried out in a manner that does not conform, or wrong replacement of components, could jeopardise the efficiency of the equipment.

2.4 SAFETY DEVICES APPLIED ON THE SYSTEM

The machining centre is equipped with safety devices/solutions:

Type of device/solution	Function
Main switch	To cut-out machine electric power
Fixed and mobile protections	Enclosure of machine hazardous zones
Emergency stop	Emergency stop of entire system, or part of the same.
Personal protection devices	Protections for the operator when carrying out the jobs



ADDITIONAL INFORMATION

For information regarding the safety devices installed on the machine, see the specific handbooks.

2.4.1 Energy Cut-out

Function: To cut-out power supplies of the machine.

Characteristics and method: Before starting any type of maintenance job on the system, or part of the same, cut-out the power supplies and discharge any accumulated energy.

Cut-out the machine electrical supply acting on the main switch.



WARNING

For maintenance work, it is not sufficient to press the emergency pushbuttons to cut out the machine power supplies.



2.4.2 Fixed and Mobile Protections

Function: To segregate hazardous zone of the machining centre

Characteristics and method: Protections are fixed and mobile.

Fixed protections:

The purpose of the fixed protections is to prevent access to machine component movements during the operating cycle

The guards (casing) for covering / protecting moving parts are fixed firmly to the structure by means of screws that require a specific tool for removal.

The fixed protections and casings are not controlled and the removal is exclusively subordinated to maintenance operations with the machine power supplies deactivated.

Mobile protections:

On the machine there is a safety cover (1) which stops the processing in case the cover is removed.



WARNING

For maintenance it is not sufficient to open the access door to cut out the system power supplies. The Manufacturer shall not be held liable if the system is put into function with guards that are incomplete, open and/or not installed.



2.4.3 Emergency Stop

Function: Emergency stop by pushing the red emergency push-button on the machine, following a hazard risk for the safety of the operators and/or the system.

Characteristics and method: All automatic motion of the system is stopped.

Pushing this button will deactivate all movements due to the disconnection of the control power of all the actuators of the machine.

If pressed, the emergency push-button remains in low position. To reset, turn the control emergency push-button clockwise.



WARNING

For maintenance work, it is not sufficient to press the emergency push-buttons to cut out the machine power supplies.



WARNING

Check the emergency push-buttons periodically to ensure correct functioning.



2.4.4 Personal protection Devices

Function: To protect the operator when working.

Characteristics and method: The persons operating on the machine are to use personal protection devices to cut the possibility of risks to a minimum.



DANGER

Clothing of those who operate or carry out maintenance on the system, is to conform to the essential safety requirements and the laws in force in the country where the machine is installed.



WARNING

During handling and maintenance operations, the workers are to wear appropriate work clothes to avoid accidents.

To avoid mechanical risks, such as dragging, entrapment or other, never wear bracelets, wristwatches, rings or chains during the work cycle and maintenance operations.

2.5 RESIDUAL RISKS

2.5.1 General information

During the design, all the zones or parts with risks have been assessed, and as a consequence all the necessary precautions have been taken to avoid risks to persons and damage to system components.



NOTE

Periodically check the functioning of all safety devices.
Do not remove the fixed and mobile protections installed on the system.
Do not introduce unnecessary objects and tools in the system working area.

2.5.2 Residual Risks

After carefully considering all possible system risks, all the necessary solutions have been applied to eliminate the risks and limit hazards for the exposed persons. However, although the system is fitted with these safety systems, some risks remain that can be eliminated or reduced by taking the relevant precautions.



WARNING

As a precautionary measure for safety, periodically check correct functioning of safety devices.



WARNING

It is strictly forbidden to make any type of mechanical, electrical or fluidic modification, to avoid creating additional hazards and risks that have not been foreseen.

A list follows of the machine residual risks.

Serious injury risk



DANGER

Never start the machine with fixed and/or mobile guards removed, or not correctly assembled with the specific screws or with guard closed safety device by-passed by tampering.

Never start the machine with safety guards open and safety.

Jamming and machine stop risks



DANGER

Never leave rags, wrenches, tools, screws used for a maintenance job inside the machine.

Before starting the cycle, always carefully check and if necessary remove any foreign objects found inside.

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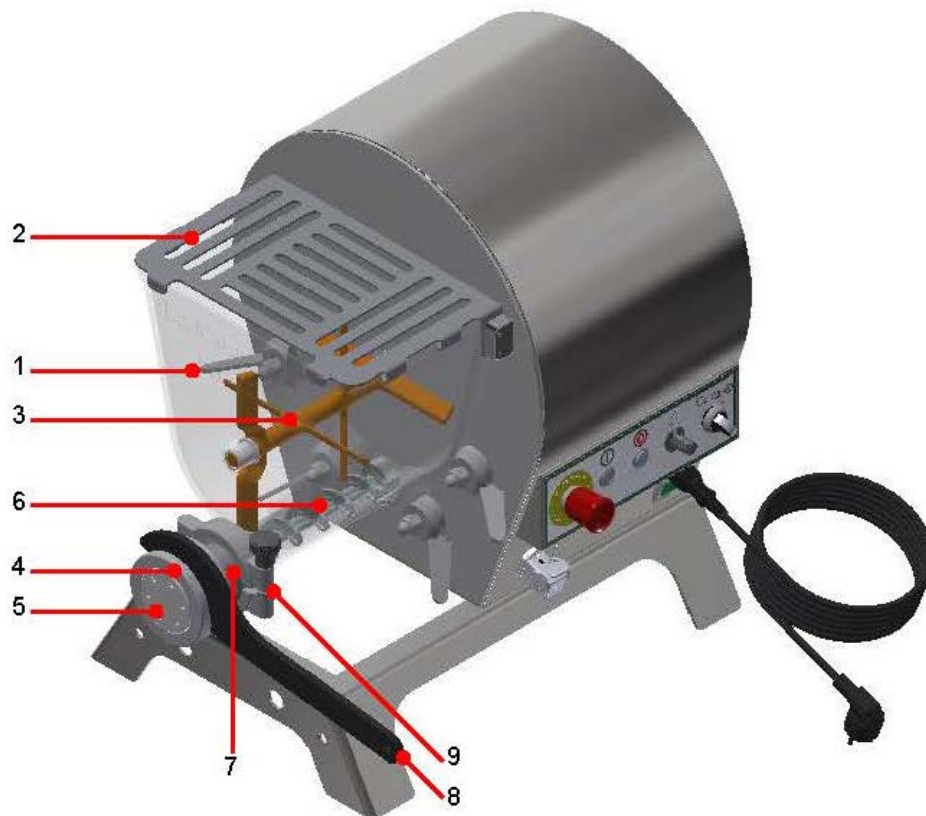
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3. GENERAL DESCRIPTION

3.1 MACHINE MAIN COMPONENTS



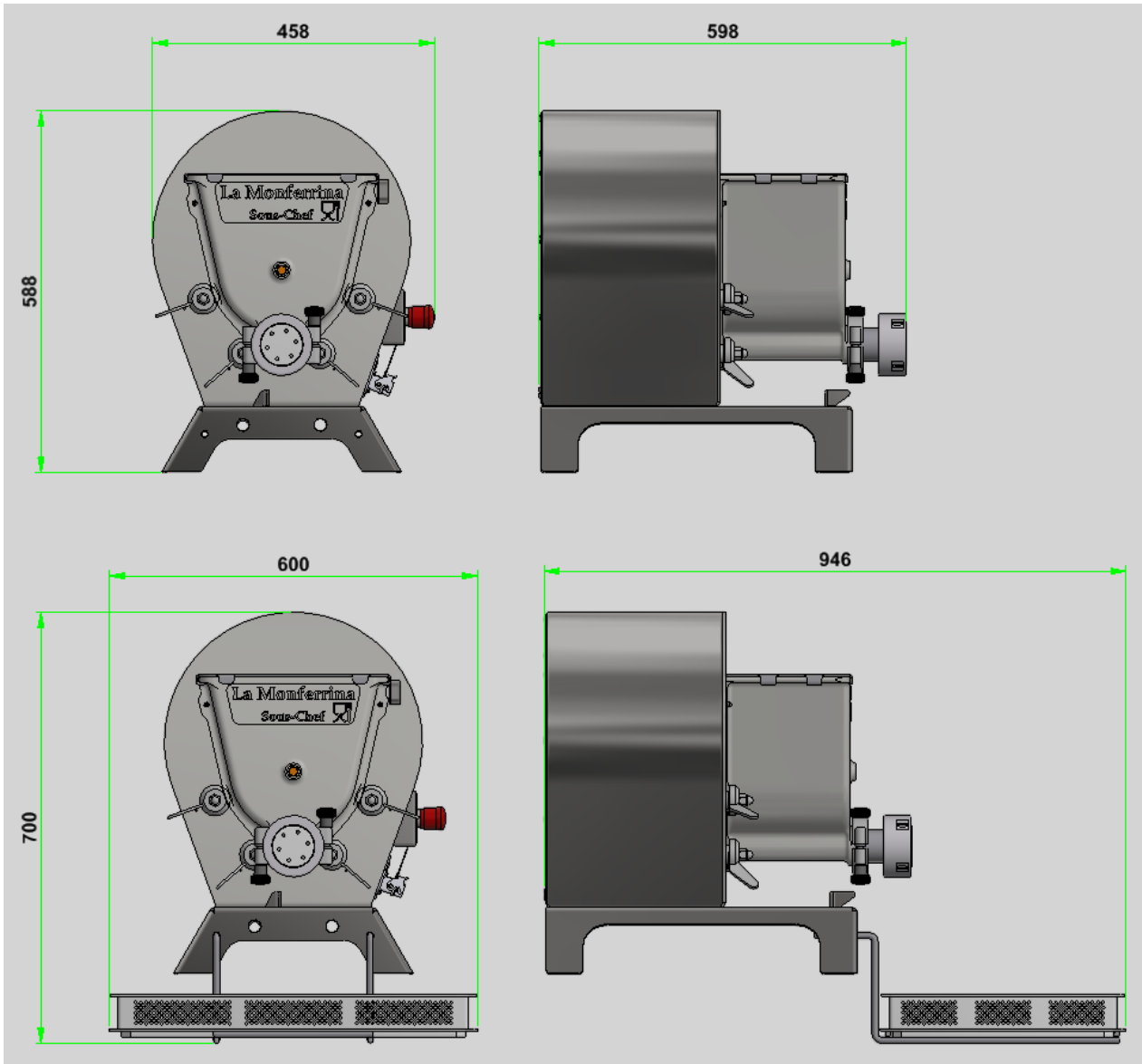
Legend:

- | | |
|---|-----------------------------|
| 1 | Vasca |
| 2 | Tank safety lid |
| 3 | Mixing shaft |
| 4 | Extrusion clamping ring nut |
| 5 | Extrusion draw-plate |
| 6 | Extrusion screw |
| 7 | Extrusion channel |
| 8 | Key for ring nut |
| 9 | Channel fixing joint |

3.2 TECHNICAL SPECIFICATIONS

The following table contains the machine technical data.

General	
Mixing tank capacity	3 Kg
Dough production	8 ÷ 10 Kg/h
Three-phase or single-phase motor	1 Hp / 750 Watt
Weight	65 Kg



3.3 ACCESSORIES SUPPLIED

No. 1 cleaning set



3.4 MAIN COMPONENTS AND ACCESSORIES

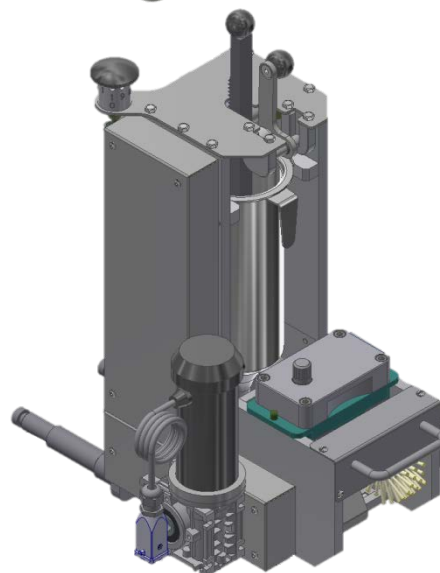
No. 1 knife for four-blade pastry cutter motor



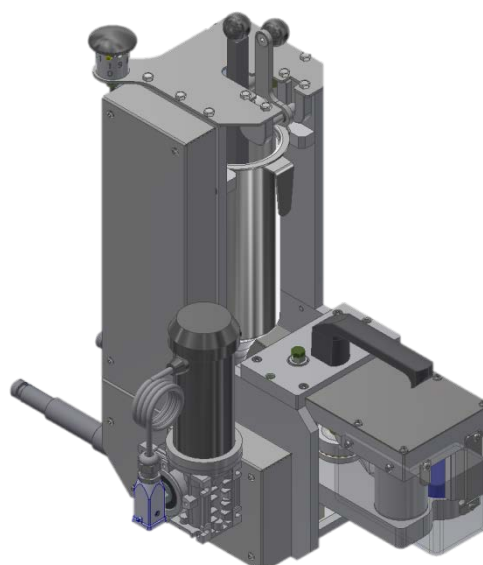
N° 1 pastry cutter motor including a knife with 1 or 2 blades



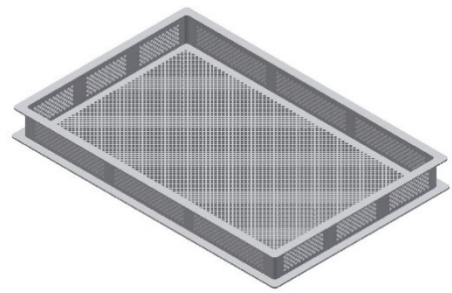
Ravioli machine group (with interchangeable moulds)



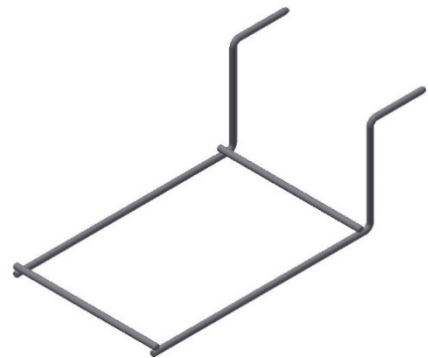
Plin ravioli machine group



Perforated sieve



Sieve holder



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4. GENERAL

Before the installation of the system, it is necessary to:

- Remove the protective packaging;
- Remove any fastening restrictions used for transport.

4.1 INSTALLATION

4.1.1 Positioning



NOTE

Before positioning the machine it is necessary to make a careful visual check in order to identify any damage incurred during transport.

If one or more components are found to be damaged, do not proceed with the installation and notify the manufacturing company of the fault found, agreeing with same on the action to be taken.

The machine will be able to operate according to the foreseen technical parameters providing it is correctly arranged on the workshop floor so that it is stable during operation.

When cleaning, the persons assigned to these operations are to be equipped with the necessary personal protection devices.

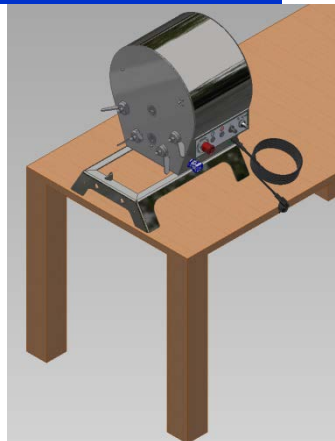
4.1.2 Machine installation



WARNING

All the operations described below are with the tank without the flour.

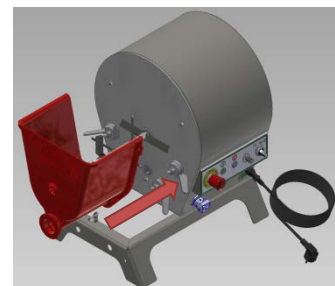
1. Place the body of the machine on the edge of a table perfectly levelled.



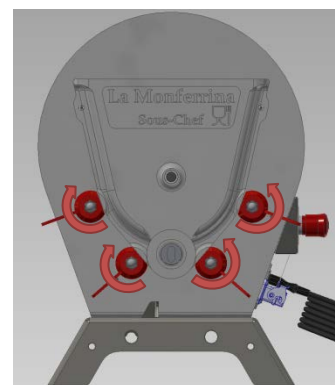
2. Insert the kneading shaft into the machine housing until it comes to a stop



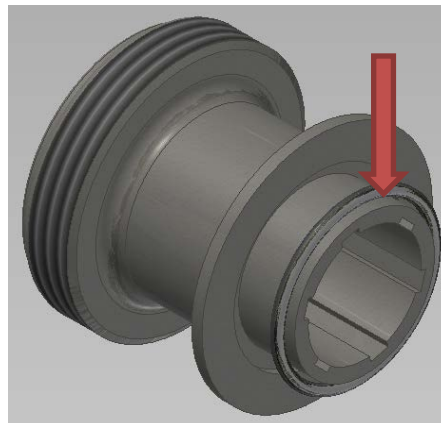
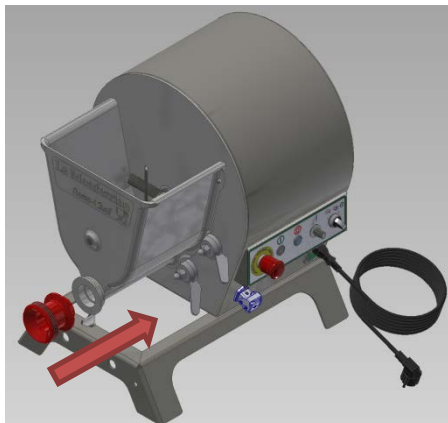
3. Insert the mixing tank by centering the kneading shaft pin with the front side and the rear side and insert the plugs on the machine body until it comes to a stop



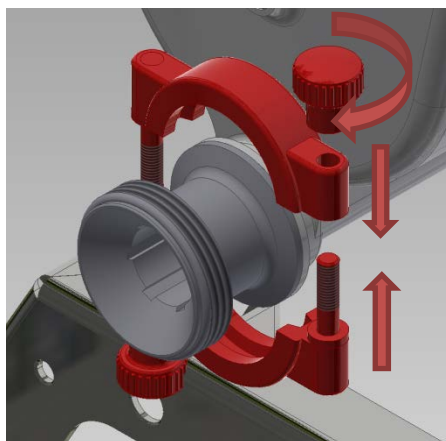
4. Close the tank with the appropriate cams by rotating counterclockwise the ones on the right and clockwise the ones on the left of the machine body, until they are locked.



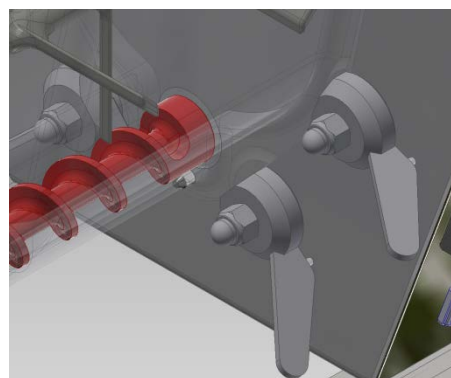
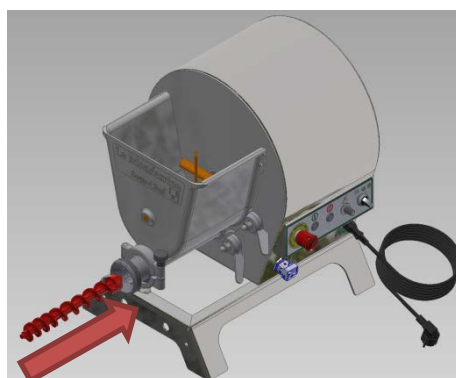
5. Insert the extrusion channel in the front hole of the tank, keeping the gasket on the rear of the tank until it reaches the stop



6. Block the flange of the tank and the extrusion channel with the joint by coupling the two parts and screwing the two locking knobs until they are fully tightened.



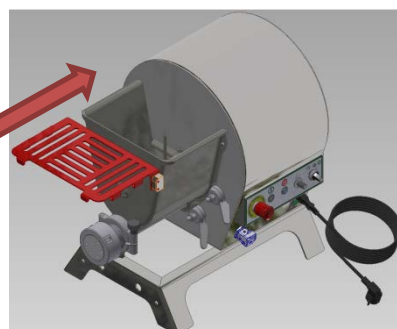
7. Insert the spiral screw inside the extrusion channel until it stops, making sure that it fit perfectly in the appropriate housing



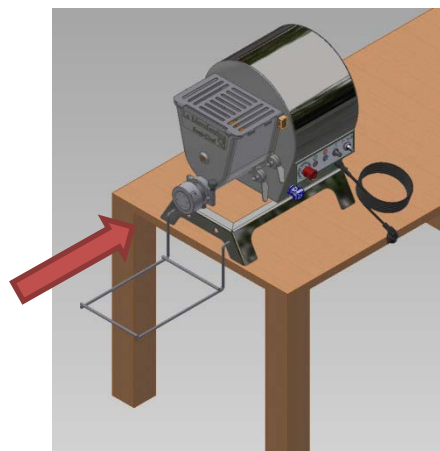
8. Insert the extrusion draw-plate provided inside the locking ring of the draw-plate and press it onto the extrusion channel by turning it clockwise until it is fully locked; if necessary, use the ring wrench supplied with the machine



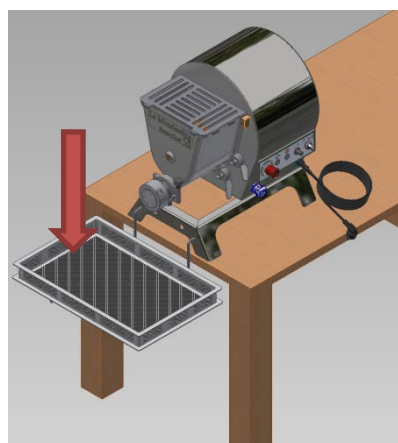
9. Insert the lid on the top by inserting the edge of the tank until it comes in contact with the machine body



10. Insert the sieve holder (optional) into the appropriate slots on the machine



11. Insert the perforated sieve (optional) on the sieve holder



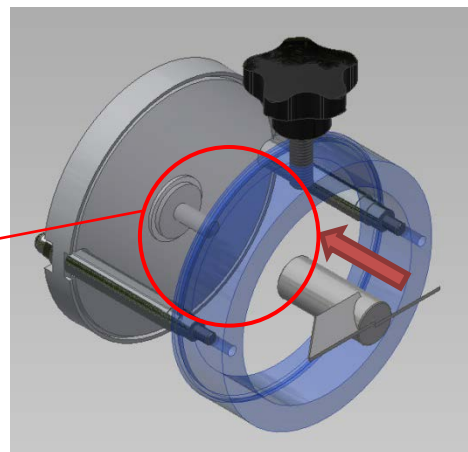
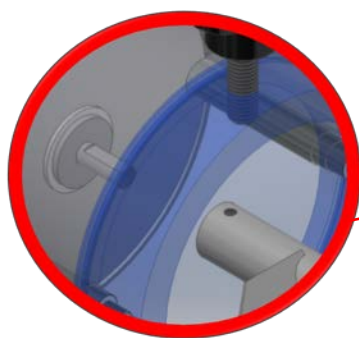
4.1.3 Pastry cutter knife installation



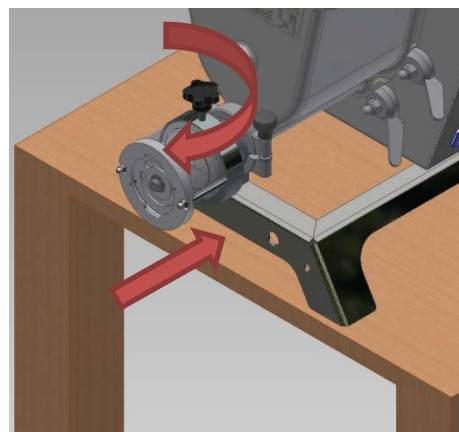
CAUTION

Handle the dough-cutting blades carefully.

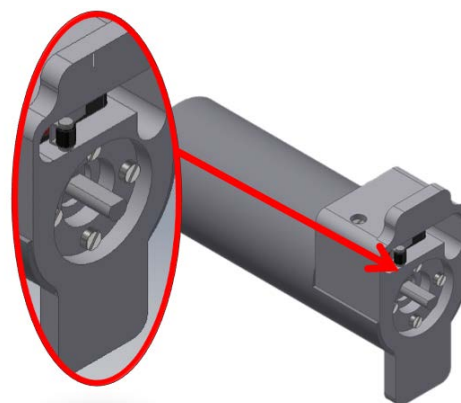
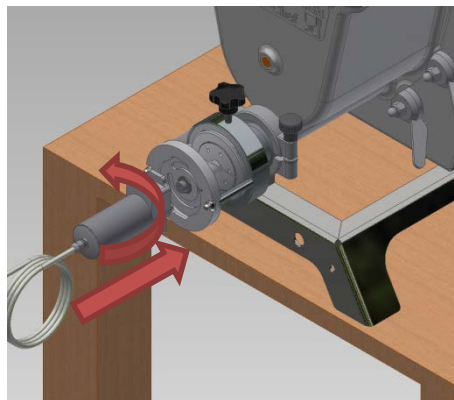
1. Insert one of the knives supplied with the pastry cutter (with 1 or 2 blades) on the pin, as shown in the figure, trying to match the the pin with the knife hole



2. Insert the assembly on the draw-plate locking ring nut by pushing the knife under pressure against the draw-plate and tighten the knob by turning it clockwise until it locks

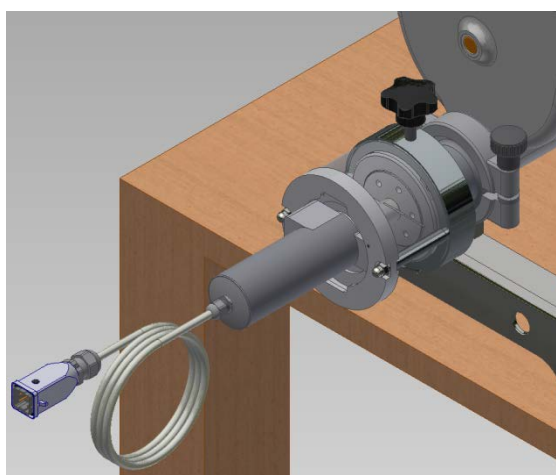


3. Insert the pastry cutter motor into the appropriate housing, matching the motor pin with the hole until it reaches the stop; then turn it counterclockwise until it locks



CAUTION

The knife will only work during the extrusion phase and only in the position shown in the figure



4.2 ELECTRICAL CONNECTION OF THE MACHINE

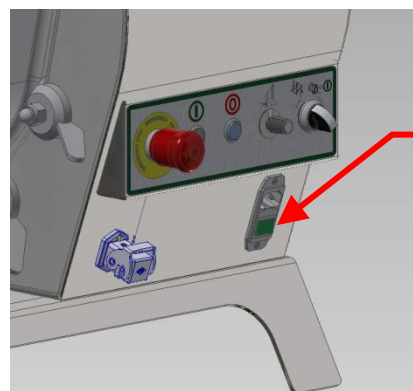
Check that the main switch is in position "0", connect the power cable to the machine and the plug to the mains socket.



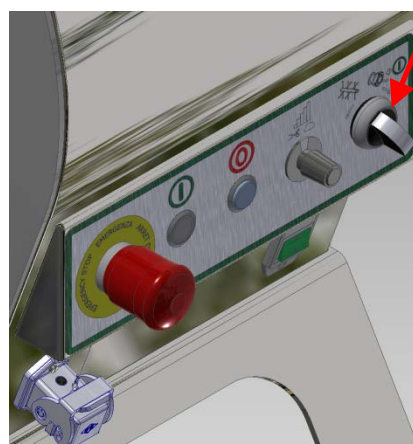
CAUTION

Before starting the machine, make sure the voltage specified on the ID plate corresponds to the mains voltage.

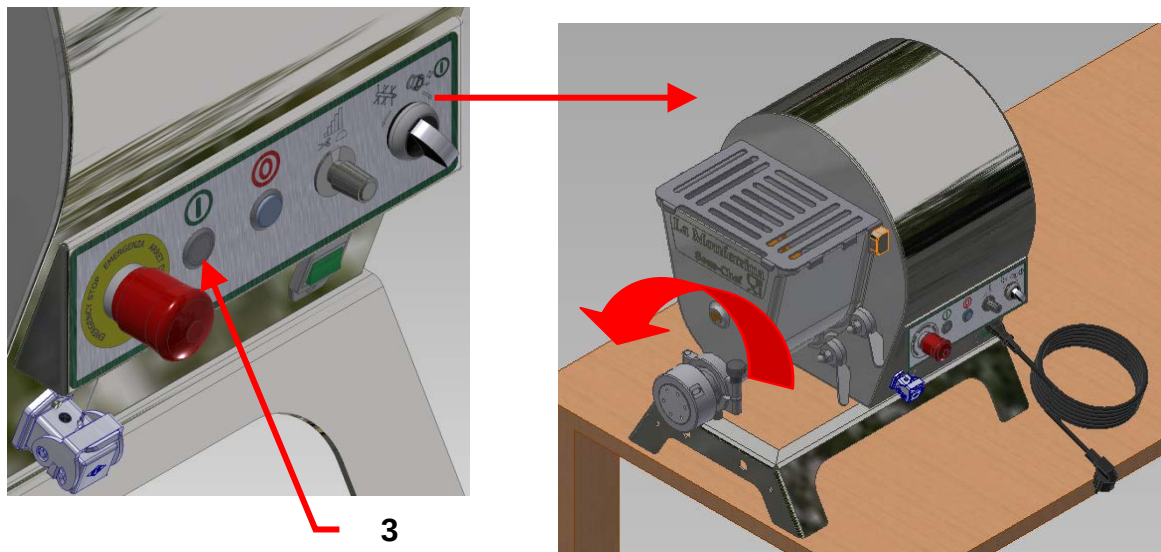
Supply the machine by positioning the main switch (1) in position "I".

**1**

Turn the selector (2) to the left to the KNEAD position.

**2**

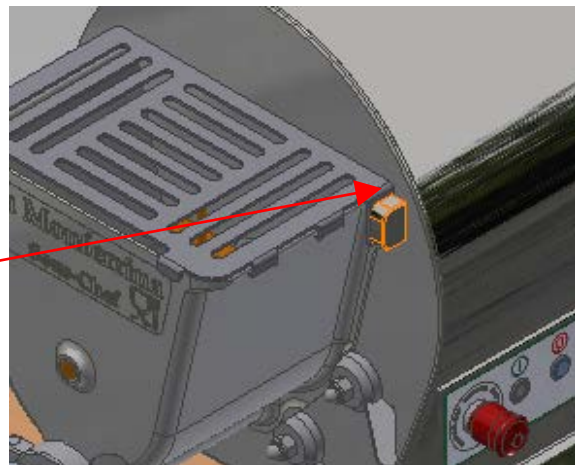
Press the start button (3), the kneading shaft (visible through the top cover) must turn anticlockwise as shown in the figure.



4.2.1 Safety microswitch check

Periodically check the correct functioning of the safety microswitch: in case of removal of the steel tank cover from the rear wall of the machine it must stop its functioning.

Safetymicroswitch



CAUTION

If the machine does not stop when the tank cover is opened, contact an authorized technician urgently to replace the safety microswitch.

4.3 REMOVAL AND DISPOSAL OF PACKAGING

The machine packing consists of:

- Wooden box: usually deal-poplar, recyclable material.
- Protective sack: sack in recyclable aluminium.
- Expanding film: stretch film, polyethylene type, recyclable (LLDPE).
- "Bubble" film: polyethylene film or recyclable material.
- Cardboard: cardboard with air bubbles, recyclable.
- Polystyrene : non-recyclable material



WARNING

All packaging materials are to be disposed of in accordance with the standards in force regarding waste disposal and separated collection.

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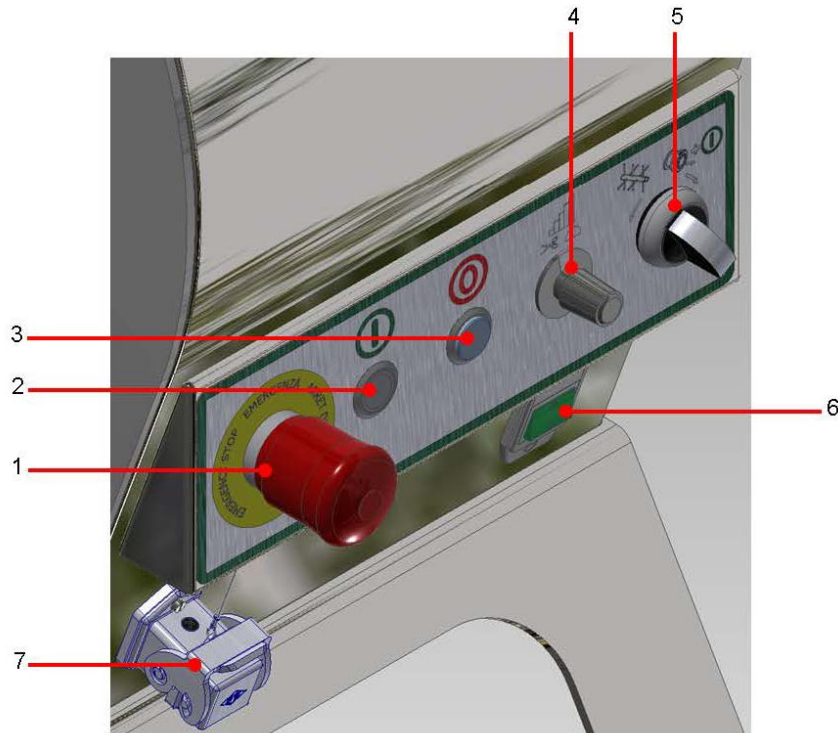
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5. USE

5.1 DESCRIPTION OF THE CONTROLS



Legend

- | | |
|---|--|
| 1 | Emergency stop button |
| 2 | Start button and warning light |
| 3 | Stop button |
| 4 | Pastry cutter and accessories speed adjustment knob |
| 5 | Kneading-drawing selector |
| 6 | General switch with integrated fuse to protect electrical and electronic components with IEC C14 connector for installation of the desired power cable |
| 7 | Accessories socket |

INFORMATION ABOUT THE WARNING LIGHT (2)

- A. Slow flashing and machine stopped - VOLTAGE PRESENCE
- B. Steady light - MACHINE OPERATING IN KNEAD OR DRAW MODE
- C. Fast flashing and machine operating in knead mode - SAFETY THRESHOLD INTERVENTION (the machine in draw mode has reached an abnormal strain and the machine has switched to the kneading function; check the humidity of the dough or make sure that the draw-plate is free).

5.2 WORK CYCLE

Before the cycle

- Check that the main switch (6) is in position "1".
- Make sure you have complied with all the precautions described in the Safety section.

Work cycle

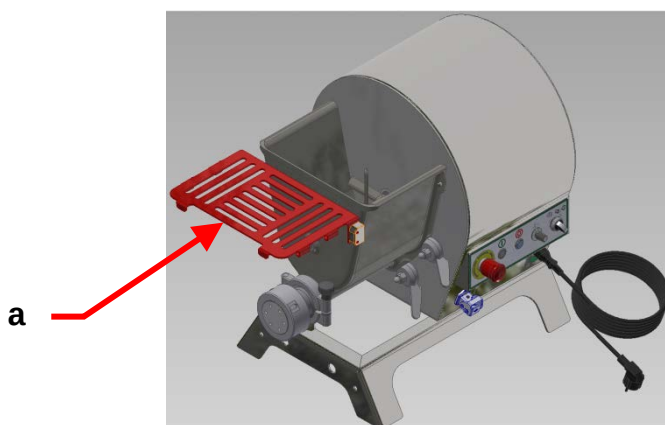
- Open the cover and fill the mixing tank with the basic ingredients flour and/or hard-grain durum flour, water and/or eggs.
- You are recommended always to weigh the flour and/or hard-grain durum flour poured into the tank to be able to determine the precise quantity of liquid (water and/or eggs) to be added.
- Break the eggs into a separate vessel thereby preventing any shell falling into the tank and clogging up the plate.
- It is also advisable to beat the eggs, well mixing egg yolk and egg white.



NOTE

Read the advice concerning pasta production contained in the chapter "Machine description".

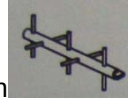
- Close the lid (a).



CAUTION

It is strictly forbidden to tamper with the safety microswitch.

- Turn the selector 5 to the left to the "KNEAD" position.
- Push the start button 2.



NOTE

Never operate the machine with the selector 5 in "DRAW" position before mixing the flour as it could cause serious mechanical damage.

- The friable dough broken up into granules will be ready to be extruded after around 15 minutes.



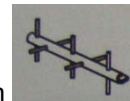
NOTE

Do not wear loose garments or protruding elements that could get caught up in the machine.

To produce long pasta (tagliatelle, spaghetti, etc.)

- Stop the "KNEAD" function by pressing the STOP button "3".

- Turn the selector knob 5 to the right from the previous "KNEAD" position



to the "DRAW" position and hold it in place.

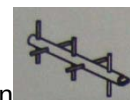
- Press the "RUN" button and release the selector 5.
- Start cutting the dough coming out of the draw-plate, using a spatula or a knife



To produce short pasta

- Stop the "KNEAD" function by pressing the STOP button "3".
- Install the pastry cutter motor (optional) on the draw-plate with the selected knife based on the cutting length and secure it with the safety knob (as described in the chapter "Installation").

- Turn the selector knob 5 to the right from the previous "KNEAD" position



to the "DRAW" position and hold it in place.

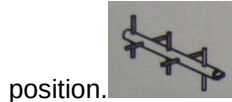
- Press the "START" button and release the selector 5.
- Adjust the rotation speed of the pastry cutter knife using the knob 6.



5.3 CHANGING THE PLATE

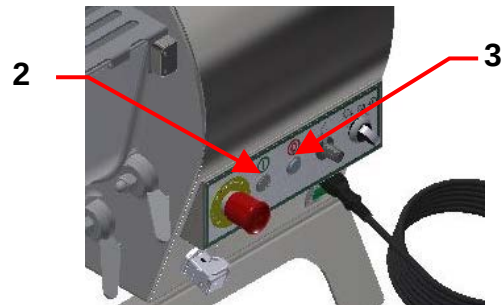
To change the pasta type it is necessary to change the plate in the following way:

- Press the STOP button "3".
- Remove the pastry cutter motor following the sequence described in the chapter "Installation" in reverse order.
- Turn the selector knob 5 to the left "KNEAD"



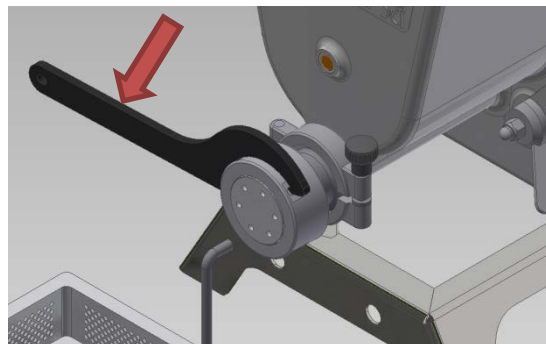
- Press the "START" button (2) and run the machine for about 10 seconds, reducing the pressure inside the draw-plate.
- Stop the machine by pressing the "STOP" button (3).

Turn the selector (5) to the central position.



Disconnect the power supply by turning the main switch (6) to position "0"

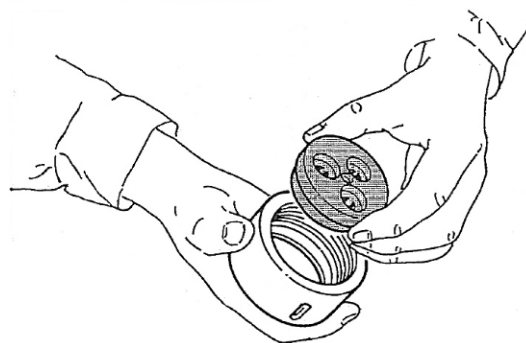
- Loosen the ring nut by turning it anticlockwise, using the appropriate key provided.



- Unscrew and remove the ring nut.

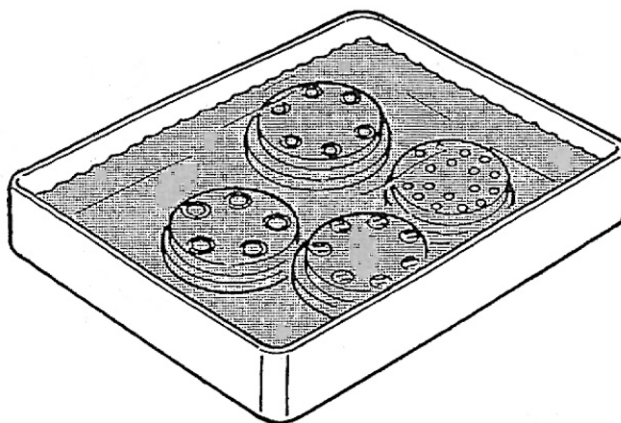


- Remove and replace the draw-plate.



NOTE

After use, the plates must always be immersed in a container full of water to prevent the dough from drying.



NOTE

All operations regarding disassembly and assembly of the extrusion are to be carried out with attention and following the checks and precautions described in the "INSTALLATION" paragraph.



NOTE

When an extruder that was previously immersed in a container with water is refitted, it is necessary to follow the procedure described in the "WORK CYCLE" paragraph. When starting the extrusion place a piece of paper in front of the extruder to collect and dispose of the soft dough that is extruded.

The normal working cycle can be commenced as soon as the product being extruded is as desired.

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6. MAINTENANCE

6.1 GENERAL SAFETY PRECAUTIONS

Operations concerning maintenance, troubleshooting and repairs are only to be carried out by the authorised persons.

The persons who run and carry out maintenance on the system are to be well trained and have in-depth knowledge of accident-prevention rules; unauthorised persons are to remain outside the work area during operations.

The accident-prevention precautions contained in this section are to be scrupulously followed when running and carrying out maintenance on the system to avoid damage to persons and to the equipment.

These precautions will also be found in the handbook with further details, in WARNING and DANGER notes where there is a procedure required having a risk of damage or injury:



DANGER notes precede an operation that, if not performed correctly, could cause an accident.



WARNING notes precede an operation that, if not performed correctly, could cause damage to the equipment.

At the end of each maintenance operation it is mandatory to restore the protections, verifying their proper operation.

6.1.1 General Hazard Notes

- High voltages can cause death upon contact. Always work with maximum caution and in accordance with the accident prevention rules in force in the country.
- When the system is running there are moving parts that can cause serious damage to persons. For this reason cleaning and special maintenance operations that require removal or replacement of components on the machine or control units, are to be carried out with the system off and with no pressure in the systems:
 - The main switch must be in OFF position (OPEN) and, in order to ensure increased safety, the power supply cable must be disconnected.
- Place specific SYSTEM BEING SERVICED - DO NOT POWER ON warning signs on the main switches and air reduction and filtering unit.
- Do not use inflammable or toxic solvents.
- Always wear goggles and protective gloves when carrying out maintenance operations on the equipment.
- Make sure tools to be used are in perfect condition and with isolating grips, where required. Check that insulation of cables and conductors of testing equipment have no signs of breakage or damage.
- Long overloads or failures can cause overheating of electric motors and electrical equipment generating harmful fumes; cut out the power supply immediately and do not approach the equipment until the fumes have been dispersed with adequate ventilation. Do not inhale the fumes remaining inside the equipment during the repair jobs.
- In the case of fire, never spray water on the equipment. Cut out all power supplies and use CO₂ extinguishers.
- Avoid prolonged, excessive or repeated contact of the skin with lubrication products and change clothes immediately if they become impregnated, because lubricants are very harmful for the skin.

6.1.2 General Warnings

- System maximum reliability and minimum maintenance costs are the result of a maintenance and inspection schedule planned and scrupulously followed during the entire system life. Scrupulously observe the maintenance time scales set and time operations according to specific requirements related to the machine production cycle.
- If operations of a certain consistency are necessary, it is advised to contact the Manufacturer for any clarifications regarding the project or technical assistance.
- Before starting checking and maintenance operations, remove dirt from the system.
- Always use perfectly dry air for cleaning, with a pressure that does not exceed 0.2 MPa.
- Always use tools in perfect working order and specifically for the operation to be carried out; use of inappropriate and/or inefficient equipment can cause serious damage.
- Repair operations are to be carried out in clean environments, and where possible without dust. Protect all connection gaps with plastic plugs and carefully cover machined surfaces of dismantled parts, until they are refitted on the machine.
- During disassembly, mark the individual parts with an identification plate, to make sure that they are assembled correctly later.
- After every maintenance operation that requires disconnection of wiring and/or fixed and mobile parts, check the consistency of the number/plate on fixed and mobile part.
- Before restarting the equipment after a failure, inspect the parts carefully and check for any signs of damage.
- Never act, unless there has been a failure, on adjustments and positions of microswitches; tampering with them can cause serious damage to the machine.

6.2 QUALIFICATION OF MAINTENANCE TECHNICIANS



WARNING

The safety warden shall make sure that all the persons operating on the machine have received all the instructions that concern them, contained in this handbook, including the initial installation and start-up operations.

6.2.1 General Tasks

To attain the qualification requirements that continually increase in maintenance for fully automated manufacturing systems, the maintenance technicians shall:

- have knowledge of directives in force regarding prevention of accidents when working on machines with motor transmission, and be able to apply them,
- have read and understood the "Safeties applied to the machining centre",
- know the fundamental construction and functions of the manufacturing system for special workpieces,
- know how to use and consult manufacturing papers and machine documents,
- assume the responsibility to make decisions regarding operations on fully automated manufacturing systems,
- be ready to adapt to technological modifications on the machine,
- note irregularities in the production process and when necessary take the necessary measures.

6.2.2 Tasks of Qualified Operators

The composition and qualifications of the teams indicated in the maintenance plan are those recommended by the Manufacturer.

The operations, if necessary can also be carried out by persons with the same or higher qualifications, who have attended the relevant training courses. The professional figures qualified to take action on the system are the following:

6.2.2.1 Machining centre manager

Typical activities:

Performing preventive maintenance, servicing and, if necessary, repairing operations of mechanical assemblies on fully automatic manufacturing systems, in particular:

- mechanical clearances on guides and kinematic chains adjustment ;
- driving belts replacement ;
- execution of movements check;
- mechanical clearances on shoes and rollers check;
- mechanical unit repairs.

Technical knowledge required:

- good knowledge of mechanical, pneumatic and hydraulic installations;
- familiarity with numeric controls used on the machine ;
- basic knowledge of electrical adjustment and checking techniques ;
- ability to assess results of overhauls and decide the measures to be taken;
- know how to draw up an overhaul report;
- knowledge of measuring and test methods to determine the actual state of the machine/movement.

Qualification required:

- complete training as industrial mechanic with specialisation in technical sector of automated systems;
- experience in maintenance of automatic handling systems. Instruction and training on the machine are assured by the manufacturer.

6.3 SAFETY CONTROL PLAN



WARNING

It is strictly forbidden to electrically or mechanically jumper safety switches of guards, light barriers, safety circuits or tamper with them in any way.

6.3.1 Checks and Functional Tests on Safety Devices

Maintenance technicians have the obligation to periodically check functioning of safety devices.

The operation is to be carried out by competent persons with specific knowledge on the uses of safety devices.

This procedure is to be repeated as a normal routine maintenance practice.

6.4 STOP PROCEDURE FOR MAINTENANCE

Before carrying out the maintenance procedures the operator has to stop the machine and set it in maintenance mode, using this procedure:

- Isolate the power sources of the machine in the event that maintenance operations require to do so.
- Place the "MACHINING CENTRE BEING SERVICED – DO NOT POWER ON - WORK IN PROGRESS, DO NOT PUT IN MOTION" warning sign near the main switches.
- Carry out the maintenance operations described on the relevant cards.
- After the maintenance operations restore the power supplies.
- Before resuming normal operation of the system, recheck the entire system in accordance with the start-up procedures.
- Before resuming system normal functioning, check again the whole system, applying the start-up procedures.

6.5 CLEANING AND MAINTENANCE



CAUTION

Before starting any type of maintenance work, cut out and lock all energy sources and block the machine safeties. Place a warning signboard near the main switch. "MACHINE BEING SERVICED DO NOT POWER ON".

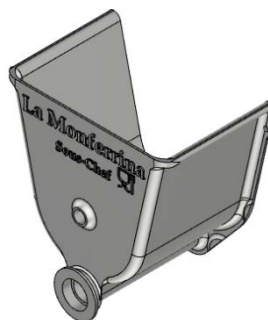
Before putting back into service, recheck the entire system according to the start-up procedures. Ignoring these precautions could cause serious injuries for the personnel

- To facilitate cleaning and make it more effective, all the components that come in contact with the dough can be disassembled and washed with running water.
- Remove all the main components of the machine as indicated in the chapter "Installation" and wash them with running water:

- tank lid



- tank



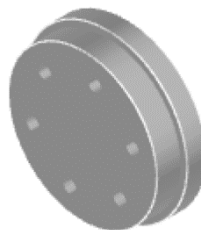
- kneading shaft



- Extrusion clamping ring nut



- extrusion draw-plate



- extrusion spiral screw



- extrusion channel



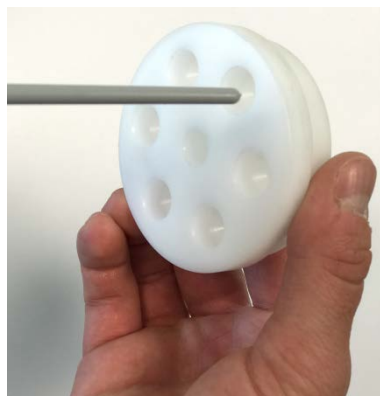
- channel fixing joint



- Carefully clean the extrusion channel with the brush provided



- Carefully clean the extrusion draw-plate using the brush provided



- Clean the wall of the machine body with the brush provided and remove any residual dough with a damp sponge



NOTE

Do not use jets of water to clean the machine. Never fit a plate left out of the water.



CAUTION

Before starting maintenance operations, remove the plug from the mains. Do not start up the machine during maintenance operation such as cleaning, greasing and lubrication!

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7. SPARE PARTS

7.1 COMPONENTS SUBJECT TO WEAR AND MECHANICAL FATIGUE



CAUTION

The components subject to wear caused by the relevant functioning are to be checked at regular intervals and replaced as soon as they show significant signs of wear.

The manufacturer has designed and built the machine for a rational life, taking into account the normal use conditions of the Customer; in any case all these components have to be meticulously checked periodically.

Should “mechanical cracking” or permanent or cyclic structural deformation be found, immediately contact the Manufacturer and expert technicians who will take the necessary action.

Electrical wires, especially if exposed to heat, humidity and/or low temperatures lose their insulating characteristics over time.

With the aid of skilled technicians, check the integrity.

All electrical components with mechanical parts in motion during the work cycle (pushbuttons, selector switches, relays, etc.) are guaranteed by the manufacturer for a certain number of cycles, high, but still limited.

Check their condition frequently and contact skilled technicians for any periodical replacement within the guaranteed working life indicated.



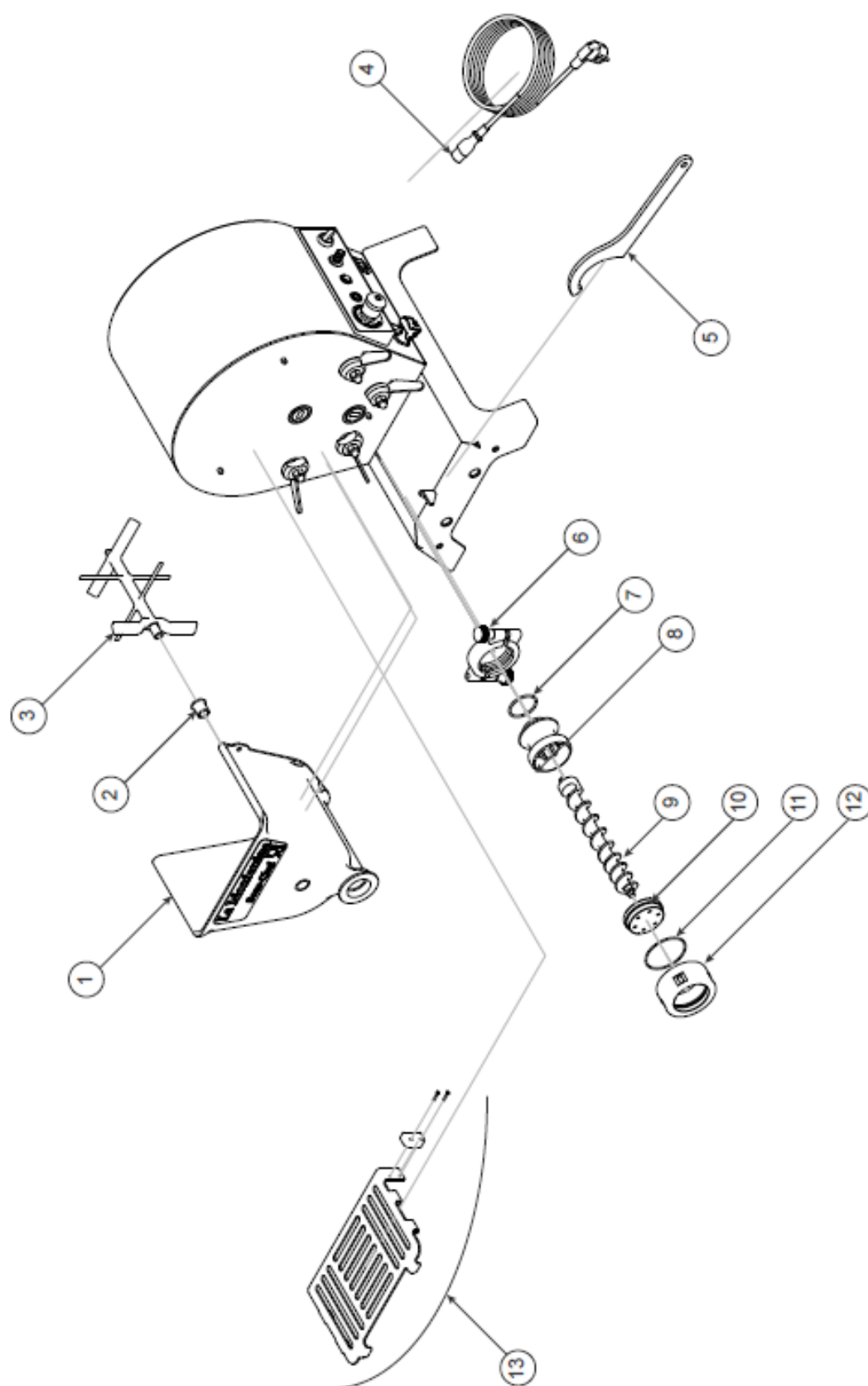
ENVIRONMENT

Removed parts that have been replaced are to be delivered to the specific collection centres for disposal.

7.2 LIST OF RECOMMENDED SPARE PARTS

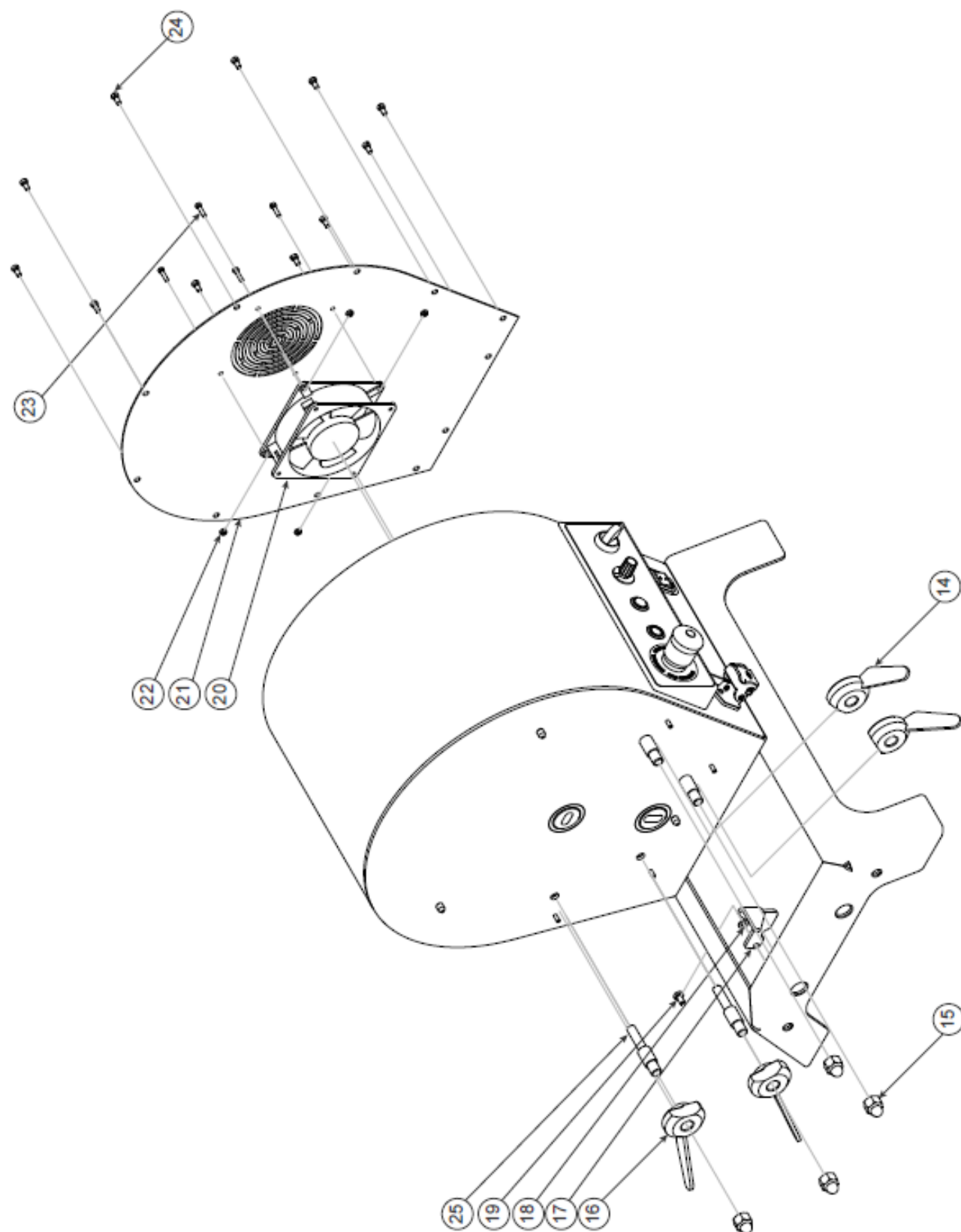
The recommended spare parts are not incorporated in the supply of the machinery, unless provided for in the initial purchasing contract.

7.2.1 Table 1



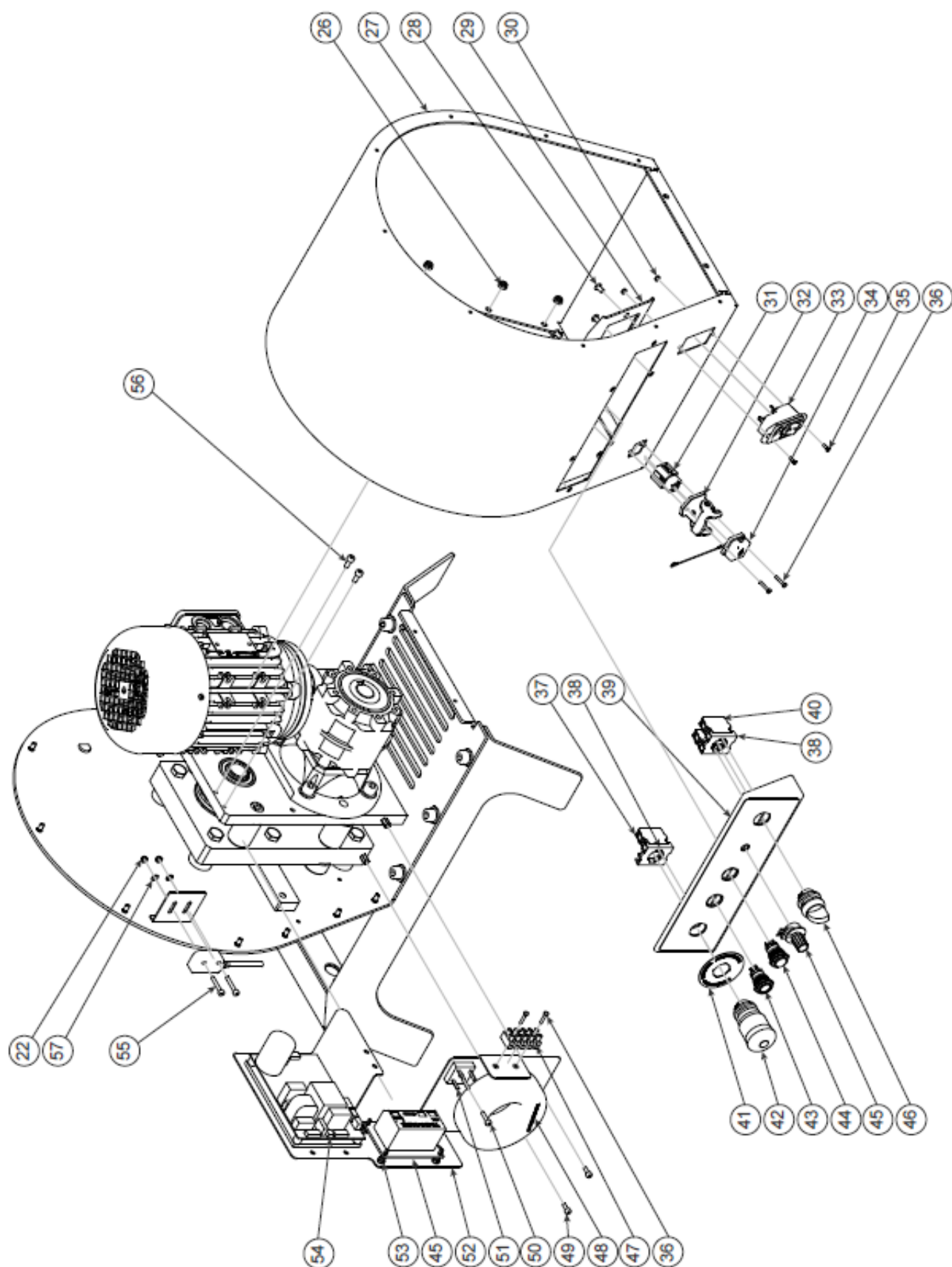
Item	Code	Description	Q.ty
1	LM-19501	Mixing tank	1
2	LM-19514	Centering bush for kneading shaft	1
3	LM-19537	Mixing kneading shaft	1
4	F..PAP 003	Tripolar power cable with schuko and connectorIEC C13	1
	CHF-9-1	Tripolar power cable with 120V plug and connectorIEC C13	1
5	LM-403/1	DIN 1810 98/100 –Sector wrench for Ø95/100	1
6	LM-19560	Joint with knobs	1
7	LM-62504	OR 153 - O-Ring	1
8	LM-19510	Removable sleeve	1
9	LM-19539	Hopper L=280	1
10	LM-15624	Special plastic draw-plate with 6 holes Ø6 mm	1
11	LM-905	OR 3300 - O-Ring	1
12	LM-19511	Extrusion clamping ring nut	1
13	LM-19570	Tank lid with microswitch	1

7.2.2 Table 2



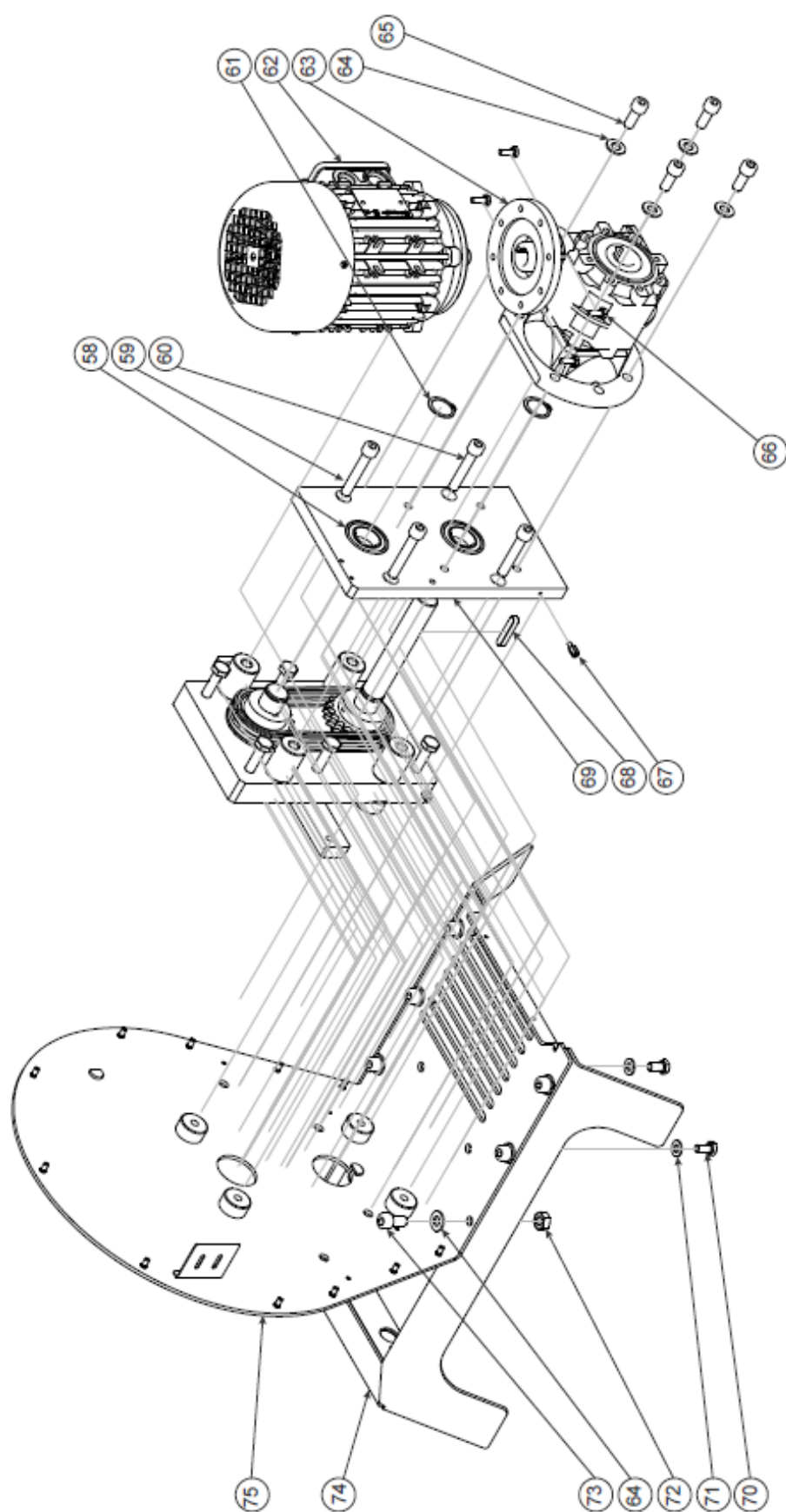
Item	Code	Description	Q.ty
14	LM-19524	Tank locking counter-clockwise cam	2
15	LM-62555	DIN 986 – M12 - Self-locking hexagonal cap nut PG	4
16	LM-19521	Tank locking clockwise cam	2
17	LM-19520	Assembly blocking lever	1
18	LM-495	UNI 6592 – 6,4 x 12,5 – Mild steel - Washer	1
19	LM-62536	UNI 5739 – M6x10 – Stainless steel–Hexagonal head screw	1
20	LM-71043	Fan 119x119x38 230v	1
	LM-71046	Fan 119x119x38 115V	
21	LM-19512	Casing rear closure	1
22	LM-1737	UNI 7437 – Metric M4x0,7 – Galvanized steel - Self-locking hexagonal nut	4
23	LM-62557	UNI 6107 – M4x16 – Mild steel - Slotted cheese head screw	4
24	LM-62556	UNI 6107 – M5x10 – Mild steel - Slotted cheese head screw	11
25	LM-19542	Unified cam support pin	4

7.2.3 Table 3

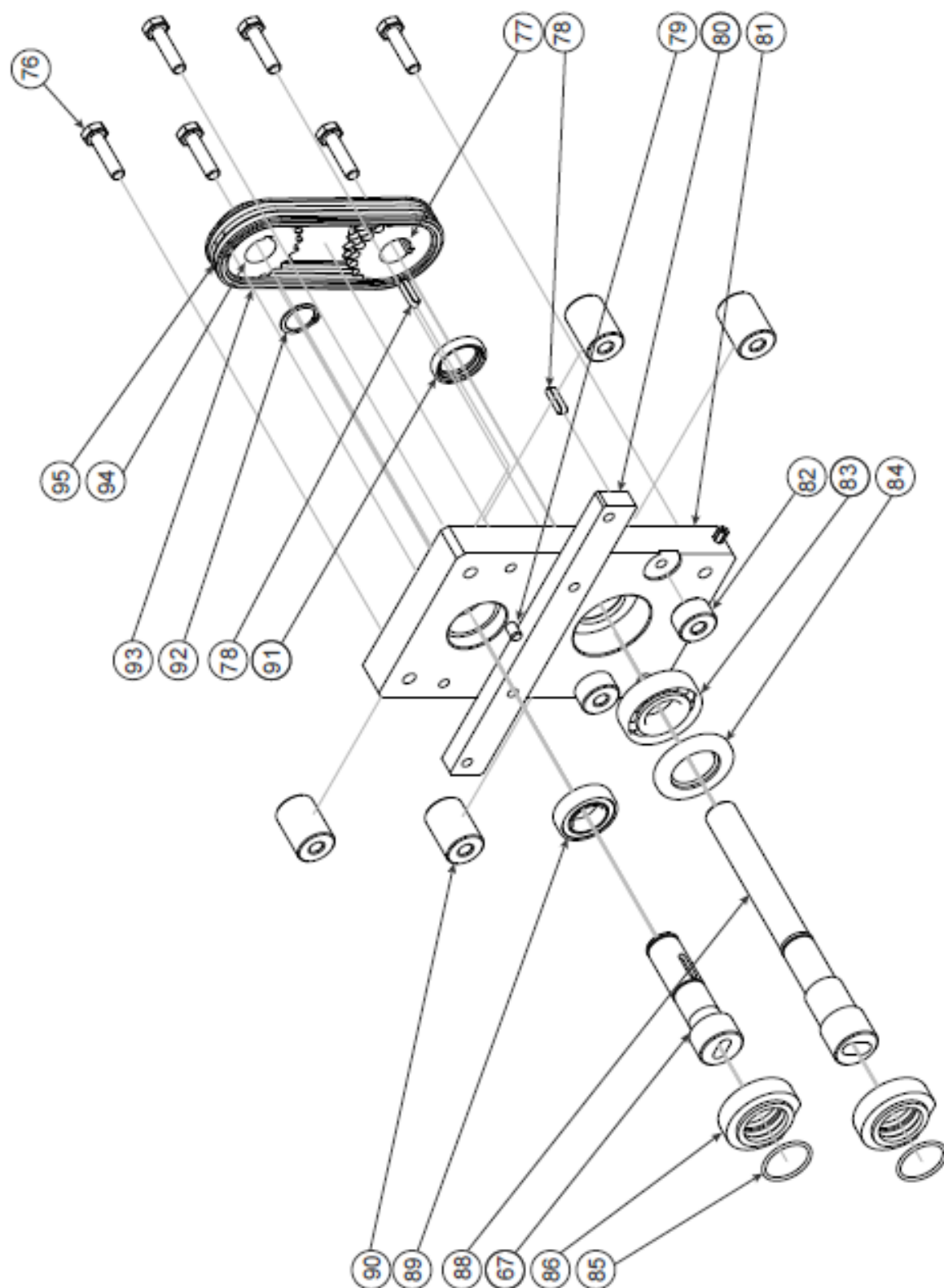


Item	Code	Description	Q.ty
26	LM-62534	DIN 6923 – M5 – Galvanized steel- Hex nut	11
27	LM-19509	Casing closure	1
28	LM-290	ISO 7380-1 – M5x8 – Stainless steel - Button head countersunk hex screw	6
29	LM-19518	Reinforcement frame for push-button panel	1
30	LM-1112	UNI 5588 – M3 - Stainless steel - Hex nut	4
31	LM-73531	Female connector insert 10 A 4 poles + ground	1
32	LM-73529	Recessed housing	1
33	LM-62516	Connector IEC 320 C14 with fuse and switch	1
34	LM-73532	Loose cover	1
35	LM-461	UNI 6109 – M3x10 - Stainless steel - Countersunk head screw	2
36	LM-1718	UNI 6107 – M3x16 - Stainless steel - Slotted cheese head screw	4
37	LM-62275	Normally Closed contact	1
38	LM-68566	Connector insert fastening adapter	2
39	LM-19519	Push-button panel with silk screen printing	1
40	LM-62272	Normally Open contact	2
41	LM-62276	Emergency button label	1
42	LM-68012	Emergency button	1
43	LM-62514	White light push button in stainless steel Ø19	1
44	LM-62513	Protruding push button in stainless steel Ø19	1
45	LM-62526	Speed regulation switch 24 v	1
46	LM-62512	Right return selector switch with 3 positions	1
47	LM-1743/3	Terminal box 4 mm with 12 terminals	1
48	LM-62528	Toroidal transformer IN 115/230V 50/60Hz OUT 2x12V	1
49	LM-953	UNI 5931 – M4x10 - Galvanized steel- Cheese headed screw	2
50	LM-1647	UNI 5931 – M4x16 - Galvanized steel- Cheese headed screw	1
51	LM-62527	Current rectifier diode	1
52	LM-19513	Electrical system support plate	1
53	LM-62529	Self-locking support with threaded shank M4 male/male	4
54	LM-62558	Inverter board 230V 2.2 KW with push button connector	1
	LM-62559	Inverter board 115V 0.75 KW with push button connector	1
55	LM-1650	UNI 5931 – M4x25 - Galvanized steel- Cheese headed screw	2
56	LM-277	UNI 5931 – M5x12 - Galvanized steel- Cheese headed screw	2
57	LM-999	UNI 6592 – 4,3x9 - Galvanized steel- Washer	2
22	LM-1737	UNI 7473 – Metric M4x0,7 - Galvanized steel- Self-locking hexagonal nut	2

7.2.4 Table 4

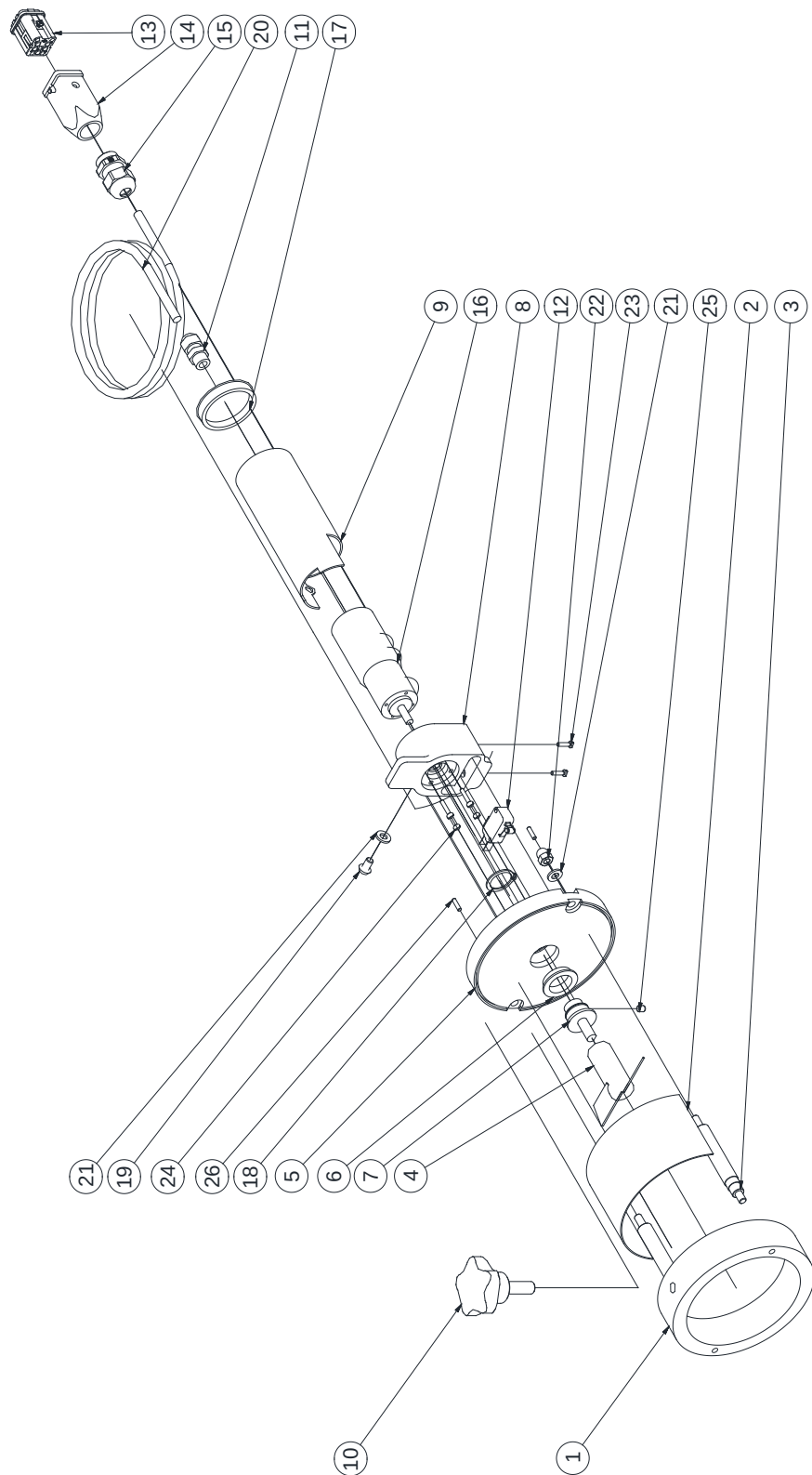


Item	Code	Description	Q.ty
58	LM-1612	6005-2RS1 - Rigid radial bearing with sleeve gaskets	2
59	LM-2113/2	UNI 5931 – M10x60 - Galvanized steel- Cheese headed screw	2
60	LM-71811	UNI 5931 – M10x55 - Galvanized steel- Cheese headed screw	2
61	LM-1645	UNI 7435-75-25 –Mild steel - Stop retaining ring	3
62	LM-71160	Three-phase electric motor size80 0.65KW	1
63	LM-62523	Reducer 1/30 size 50 left flange pam 80B14	1
64	LM-945/1	UNI 6592 – 10,5 x 21 - Stainless steel - Washer	10
65	LM-428	UNI 428 – M10x25 - Galvanized steel- Cheese headed screw	4
66	LM-1699	UNI 5739 – M6x16 - Galvanized steel–Hexagonal head screw	4
67	LM-62530	Hexagonal spacer male/female M4x10	2
68	LM-1604	UNI 6604 – A.8x7x40 –Mild steel - Parallel key	1
69	LM-19534	Rear vertical plate	1
70	LM-952/1	UNI 5739 – M8x16 - Stainless steel - Hexagonal head screw	2
71	LM-1512/1	UNI 6592 – 8,4x17 - Stainless steel - Washer	2
72	LM-1108	UNI 5588 – M10 - Stainless steel - Hex nut	6
73	LM-2095/1	UNI 5931 M10x20 - Stainless steel - Cheese headed screw	6
74	LM-19506	Welded base	1
75	LM-19503	Welded “L” vertical support	1

7.2.5 Detail on table 4

Item	Code	Description	Q.ty
76	LM-62533	UNI 5737 -M10x40 - Stainless steel - Hexagonal head screw	6
77	LM-19533	Primary pinion 3/8" z 22	1
78	LM-1659	UNI 6604 – A 6x6x25 –Mild steel - Parallel key	2
79	LM-2013	ISO 8734 – 8x24 - Steel - Cylindrical plug	1
80	LM-19530	Cross-beam for fixing upper pins	1
81	LM-19531	Bearing holder vertical plate	1
82	LM-19529	Lower pin spacer	2
83	LM-422	7206 BE - Single rim angular ball bearing	1
84	LM-946	Double lip gasket 35/62/7	1
85	LM-921	OR 3137 - O-Ring	2
86	LM-19528	Pulling shaft centring bushing	2
87	LM-19535	Kneader driving shaft	1
88	LM-19540	Spiral screw driving shaft L=280	1
89	LM-1612	Rigid radial bearing with sleeve gaskets	1
90	LM-19532	Plate spacer	4
91	LM-2811	Sealing ring on shaft	1
92	LM-1645	UNI 7435-75-25 –Mild steel - Stop retaining ring	3
93	LM-962F	Double roll chain 3/8" L=438.15 mm	1
94	LM-928F	Pinion for driven shaft	1
95	LM-62953	Joint with multiple clip for chain 3/8"x7/32	1

7.2.6 Pastry cutter assembly with microswitch – LM-19550



Item	Code	Description	Q.ty
1	LM-933	Dough cutter motor support ring	1
2	LM-939	Dough cutter protection	1
3	LM-479	Column for dough cutter motor	2
4	LM-478/A	Knife with 1 blade	1
4	LM-478/B	Knife with 2 blade	1
5	LM-19549	Pastry cutter gear motor support	1
6	LM-19548	Shaft support bushing	1
7	LM-19547	Extension for pastry cutter motor	1
8	LM-19546	Pastry cutter gear motor flange	1
9	LM-19545	Gear motor cover tube	1
10	LM-2064/1	Handwheel ø40 with 7 points and iron pin M10x30	1
11	LM-930	Cable clamp PG7	1
12	LM-1181	Short lever microswitch with wheel	1
13	LM-73534	4-pole plug M10A+ ground connection	1
14	LM-73533	Mobile case for single straight closure	1
15	LM-853	Cable clamp PG11	1
16	LM-62531	Planetary gear motor 1/25 170 giri 24 Vcc 0.6°	1
17	LM-62532	Plated round insert In ABS for tube ø50x1,2	1
18	LM-2032	UNI 7435 - 75-20 – Stop retaining ring	1
19	LM-2055	ISO 7380-1 - M6x10 – Hexagon socket head cap screw	1
20	LM-62101	Cable segment length 1,4 m	1
21	LM-495	UNI 6592 – 6,4x12,5 – Washer	3
22	LM-3018	UNI 5721 - M6 – Hex nut with spherical cap	2
23	LM-1190	UNI 6107 - M3x12 – Slotted cheese head screw	2
24	LM-1718	UNI 6107 - M3x16 – Slotted cheese head screw	4
25	LM-477	UNI 5923 - M5x6 – Socket head cap screw	1
26	LM-1164	ISO 8734-1 - 3x12 – Cylindrical plug	2

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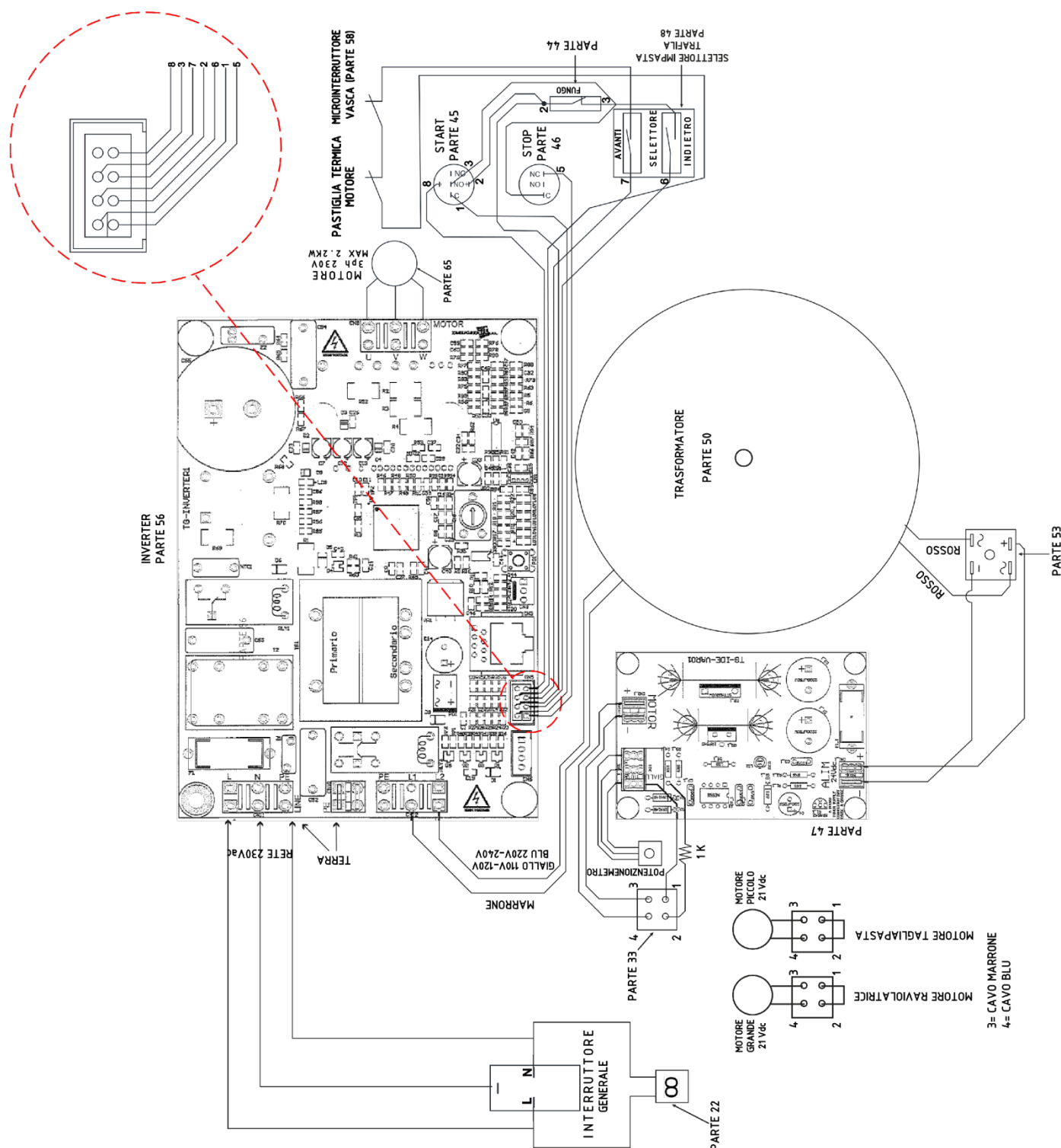
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8. WIRING DIAGRAM

8.1 ONE-PHASE ELECTRIC DIAGRAM 220-240V AND 110-120V



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