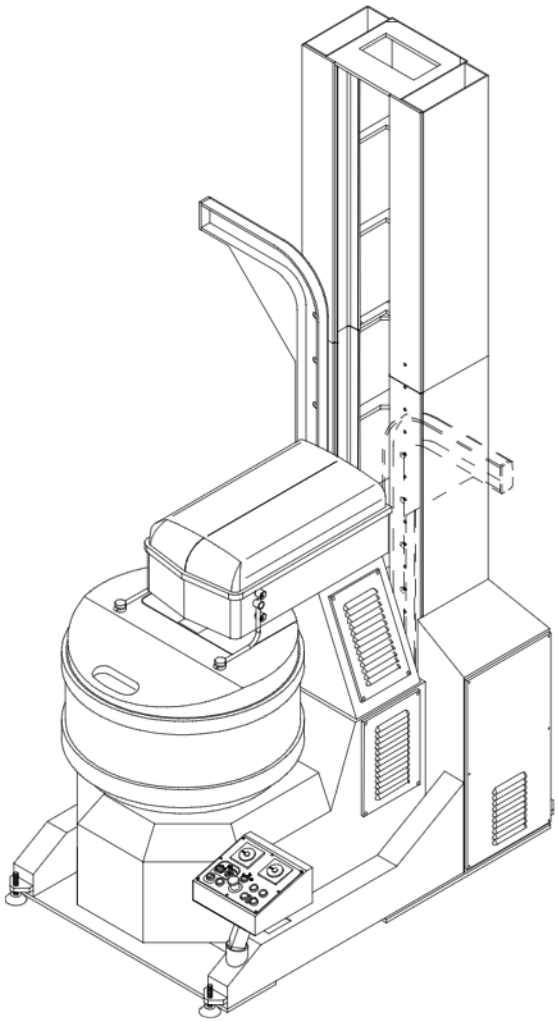
INSTRUCTION AND MAINTENANCE MANUAL

MODEL 160/200 AR 2V

208 V 60 Hz

OVERTURNABLE SPIRAL MIXER WITH FIXED BOWL



MAN037.00

CHAPTER

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1 USING THIS MANUAL

1.1 PURPOSE OF THE MANUAL

Using the manual

The manual for the use and maintenance of the machine, forms an integral part of the machine. It must be preserved for the full life of the machine and must be passed on to any subsequent users.

The layout of the manual clearly identifies the chapters and the topics dealt with therein, allowing for efficient consultation.

Caring for the manual

The manual must be handled with care in order to prevent it from being damaged. It should be filed in a place which will ensure its safekeeping but at the same time which will allow it to be easily accessible for consultation.

Consulting the manual

The manual begins with a contents page, listing the various chapters and the topics contained therein.

It is necessary to strictly respect both the specified precautions before switching on the machine and the instructions concerning safety measures.

1.2 UPDATING THE MANUAL

Whenever modifications are made to the machine or the user purchases optional equipment, the manufacturer will either supply a new, complete manual or only the specific documentation related to the parts to be added or replaced.
In the latter case of partial documentation, instructions will be given on the correct procedure to replace and/or complete:

- the documentation;
- the contents page;
- the enclosures.

2 GENERAL INFORMATION

2.1 CONDITIONS OF GUARANTEE

Validity

The guarantee period begins from the corresponding invoice date.
This guarantee is valid for a period of:

- six months, for electrical parts and motors;
- twenty-four months, for mechanical parts and other components.

An essential condition to ensure the validity of the guarantee in the above specified periods, is that accurate routine maintenance has been carried out, in accordance with the instructions specified in chapter 9.

Guarantee services

Defective pieces still under guarantee must be returned with no transport costs charged to the manufacturer.
The manufacturer, after having verified that the parts are truly defective, will forward the spare parts to be replaced; the transport costs will be charged to the consignee.

The manufacturer cannot be held responsible for any situations arising from incorrect or inappropriate use of the machine by the user, which could compromise the safety of the machine and of the user.
For example:

- a lack of maintenance;
- the installation of tools on the machine which do not belong to it or which are not allowed to be used on the machine.

2.2 TECHNICAL SERVICES

During the warranty period

If a technical intervention is required for special maintenance or to repair a fault, then it is obligatory to consult the manufacturer before carrying out any operations related to the aforesaid cases.

Technical services in general

In addition to routine maintenance, it is recommended that scheduled maintenance also be carried out by suitably qualified personnel, in the manner specified in chapter 9.

2.3 GENERAL SAFETY WARNINGS

Safety and precautionary measures for which the user is responsible

The personnel assigned to the operation of the machine, must be able to carry out all the tasks necessary for the basic operation of the machine. That is, they must have a good working knowledge of:

- the work cycle and the safety devices;
- the procedures for the loading of the ingredients and the unloading of the dough;
- the procedures for the cleaning of the machine and the workplace.

For additional information on this topic refer to sections 6.4 and 8.

During the kneading process, it is necessary not to exceed the maximum quantities of dough allowed for the specific machine being used.
The quantities of the ingredients can vary, depending on the respective percentages of the ingredients to be used.

Other safety measures

It is necessary to observe the local safety standards and codes currently in force at all times.

Under no circumstances must the personnel assigned to the machine operate without the safety guards and safety systems installed.
It is absolutely forbidden to tamper with or modify the safety devices and circuits.

3 PLANNED USES OF THE MACHINE

The machine has been designed and constructed for the purpose of making bread or pastry dough.

3.1 WORK ENVIRONMENT

In addition to the obligatory requirement of operating in an environment which is suitable for the production of foodstuffs, it is also necessary to respect other conditions, such as:

- the absence of ventilation during the loading and initial phase of the work cycle;
- the use of suitable containers and tools which come into contact with foodstuffs;
- sufficient access to the machine for all cleaning and routine maintenance operations.

3.2 MATERIALS TO BE USED

The purpose of the machine

The machine and all its parts have been designed for the processing of foodstuffs (bread and pastry dough). This machine allows for the production of an homogeneous mixture of water, flour and other ingredients (yeast, salt...) required for bread dough or pastry dough.

Description of ingredients which can be used

All types of flour,
Water,
Yeast,
Fats- Butter,
Sugar,
Flavourings,
Salt,
Liqueurs and other ingredients used to make bread or pastry dough.

Percentages of ingredients

The maximum quantities of ingredients which can be placed into the bowl depend on the percentages of the ingredients in the mixture.
For information on the machine dough capacity and on the percentage of flour and water, refer to chapter 13/14.

3.3 INSTRUCTIONS TO AVOID IMPROPER USE OF THE MACHINE

The following conditions constitute improper use of the machine and are forbidden:

- Loading quantities which exceed the specified maximum quantities for the machine being used;
- Removing or changing the position of safety systems, such as fixed and mobile safety guards, limiting device microswitches;
- Using unsuitable ingredients;
- Cleaning with tools which can scratch the bowl;
- Using the machine in unsuitable environments.

4 HANDLING THE MACHINE

4.1 WARNING

When lifting and moving the machine, it is necessary to strictly adhere to the instructions specified in this chapter and in the chapter related to safety (refer to chapter 8).

4.2 UNPACKING THE MACHINE

As shown in Figure 4-1, the machine rests on a wooden pallet (pos. A, Figure 4-1).
The machine is held in place by bolts fitted through the mixer feet (pos. B, Figure 4-1). In the case when the machine is supplied with 4 standard chromium-plated feet without a bolt fastening position (pos. D, Figure 4-2), then, it is fastened to the pallet by bolts fitted through the floor fastening positions (E, Figure 4-2).

The machine always rests on a pallet and can then be packed in one of the following ways:
- machine placed in a wooden crate;
- machine placed in a wooden box.

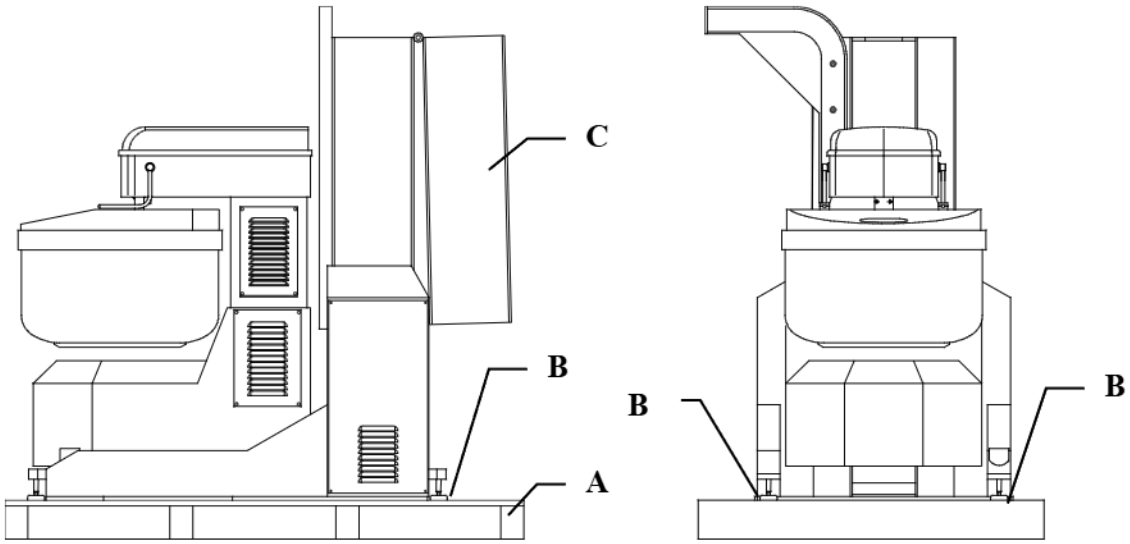


Figure 4-1

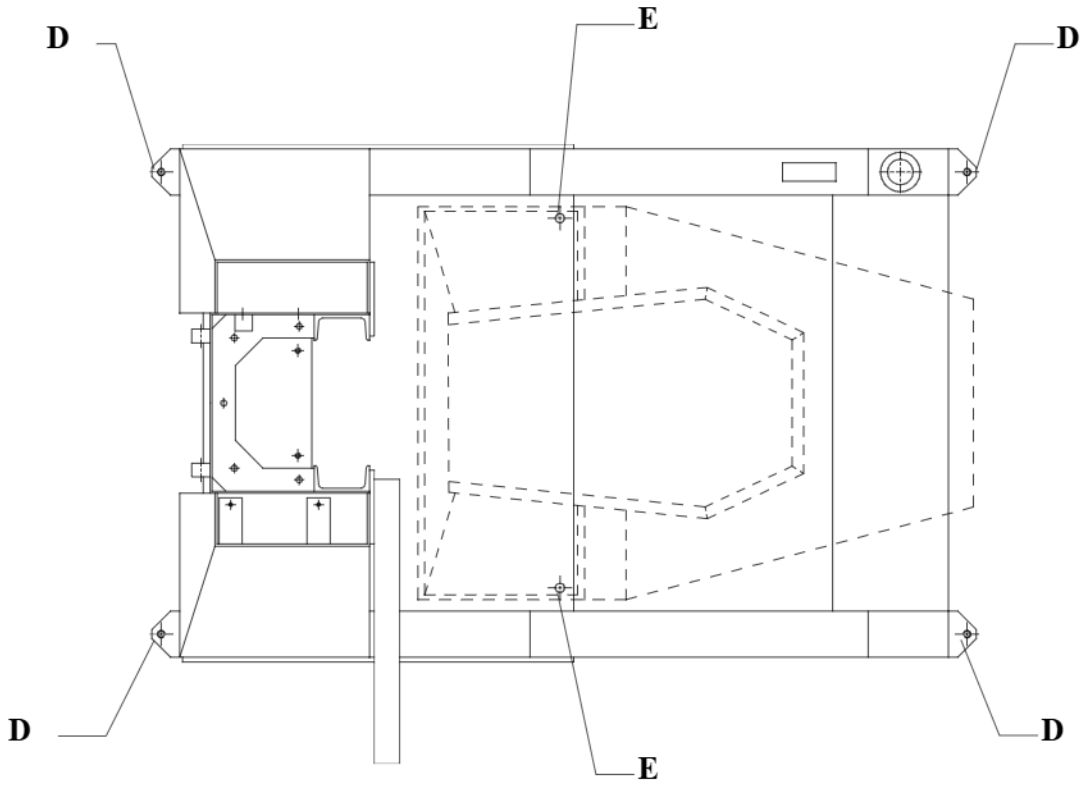


Figure 4-2

The information concerning the gross weight appears on the outside of the packaging.

Once the outer packing material has been removed, in order to unpack the machine, it is first necessary to remove the fastening bolts (pos. B in Figure 4-1, or pos. E in Figure 4-2).

In order to lift the unpacked machine from the pallet, use:

1. an overhead crane of appropriate lifting capacity, hooking the belt to the column, as indicated in Figure 4-5, bearing in mind that the mixer tends to lean forward;
2. an appropriate fork lift truck, first inserting an appropriate tube through the belt suitably placed around the mixer and then resting the tube itself on the forks suitably positioned, as indicated in Figure 4-6, bearing in mind that the machine tends to lean forward.

For additional information on the procedure for lifting the unpacked machine from the pallet and placing it in the chosen position, refer to the next section.

All the material used for the packaging, excluding the fastening bolts, can be recycled or disposed of as ordinary urban waste.

4.3 LIFTING AND MOVING THE MACHINE

Lifting the machine with packaging

Before starting, check the total weight of the machine with packaging and then use appropriate equipment to lift the packed machine. In the case when a transpallet or fork lift truck is used, the machine must be lifted by inserting the forks into the pallet in the positions indicated in the corresponding figures (Figure 4-3 and Figure 4-4).

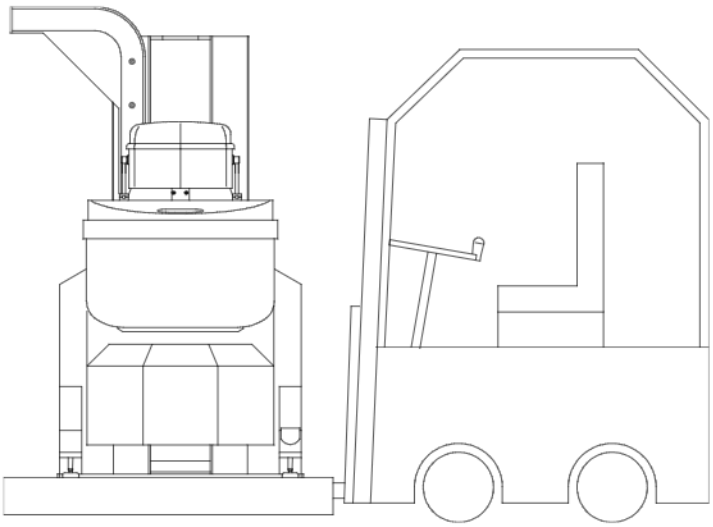


Figure 4-3

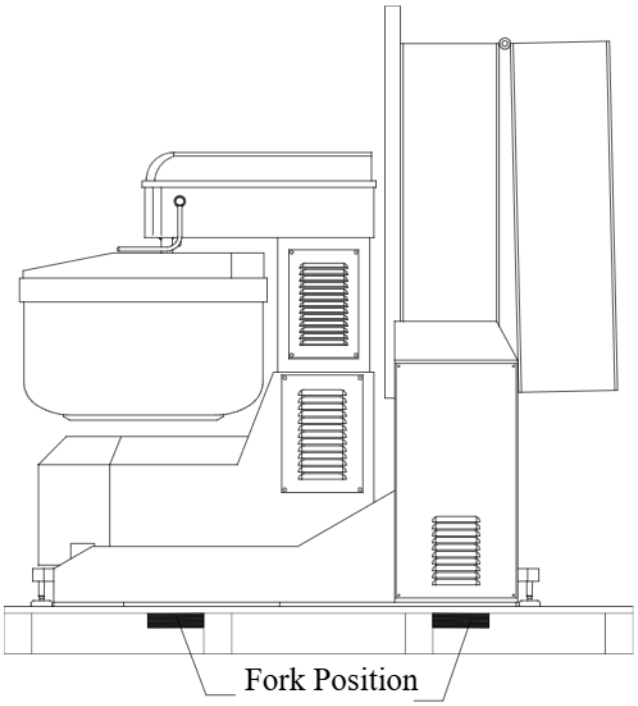


Figure 4-4

Lifting the machine without packaging

The unpacked machine can be lifted from the pallet and positioned using a suitable overhead crane or fork lift truck, in the manner shown in Figure 4-5 and Figure 4-6 respectively.

- *Using an overhead crane:*

  The machine can be lifted from the pallet and placed in the chosen position using an overhead crane, by positioning a suitable belt around the mixer column, as indicated in Figure 4-5.

  During the lifting process, the machine is in an inclined position since the centre of gravity has been shifted, however, this does not compromise the safety of the people or of the machine itself.

  Avoid oscillations during this operation.

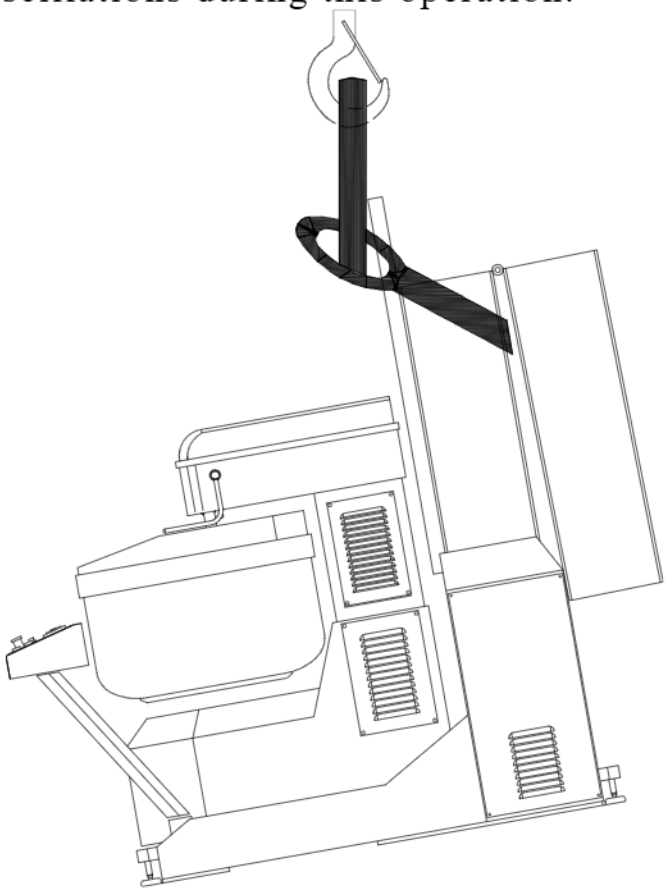


Figure 4-5

- *Using a fork lift truck:*

  The machine can be lifted from the pallet and placed in the chosen position using a fork lift truck, by positioning a suitable belt around the mixer column, as indicated in Figure 4-6.

  As in the previous case, also in this case, the machine tends to lean forward in an inclined position as is shown in Figure 4-5, however, this does not compromise the safety of the people or of the machine itself.

  Avoid oscillations during this operation.

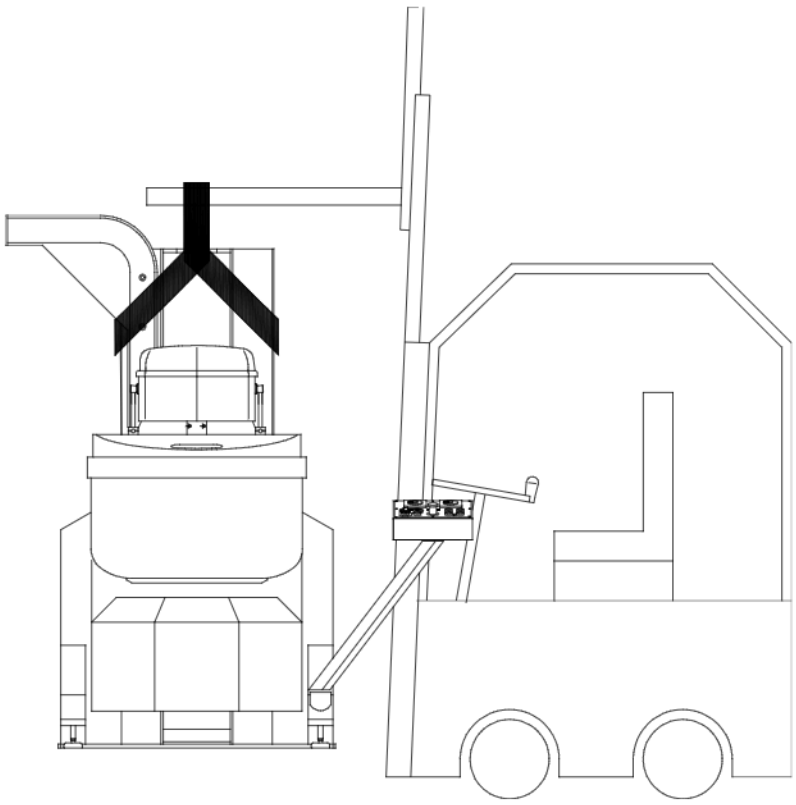


Figure 4-6

Placing the machine without packaging in the chosen position

In the case when neither an appropriate overhead crane nor an appropriate fork lift truck is available inside the workplace to place the machine in the required position, then it is necessary to lower the mixer, using appropriate means and observing all the safety standards and codes in force, onto small, manual trolleys, as indicated in Figure 4-7. Once the machine has been brought to the position required inside the workplace, then it is necessary to remove these trolleys with the assistance of levers and spacers, to ensure that the machine is lowered gradually to the floor.

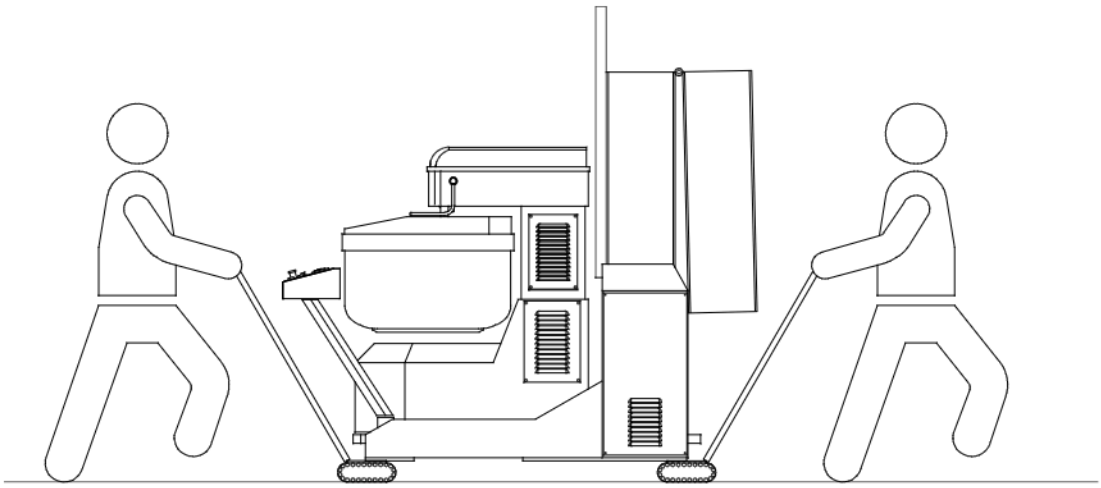


Figure 4-7

5 INSTALLING THE MACHINE

5.1 WARNING

Place the machine in the workshop in a position which allows for easy loading of the ingredients and removal of the dough. Provide sufficient space around the machine to allow both the maintenance and cleaning operations to be carried out (refer to Figure 5-1).

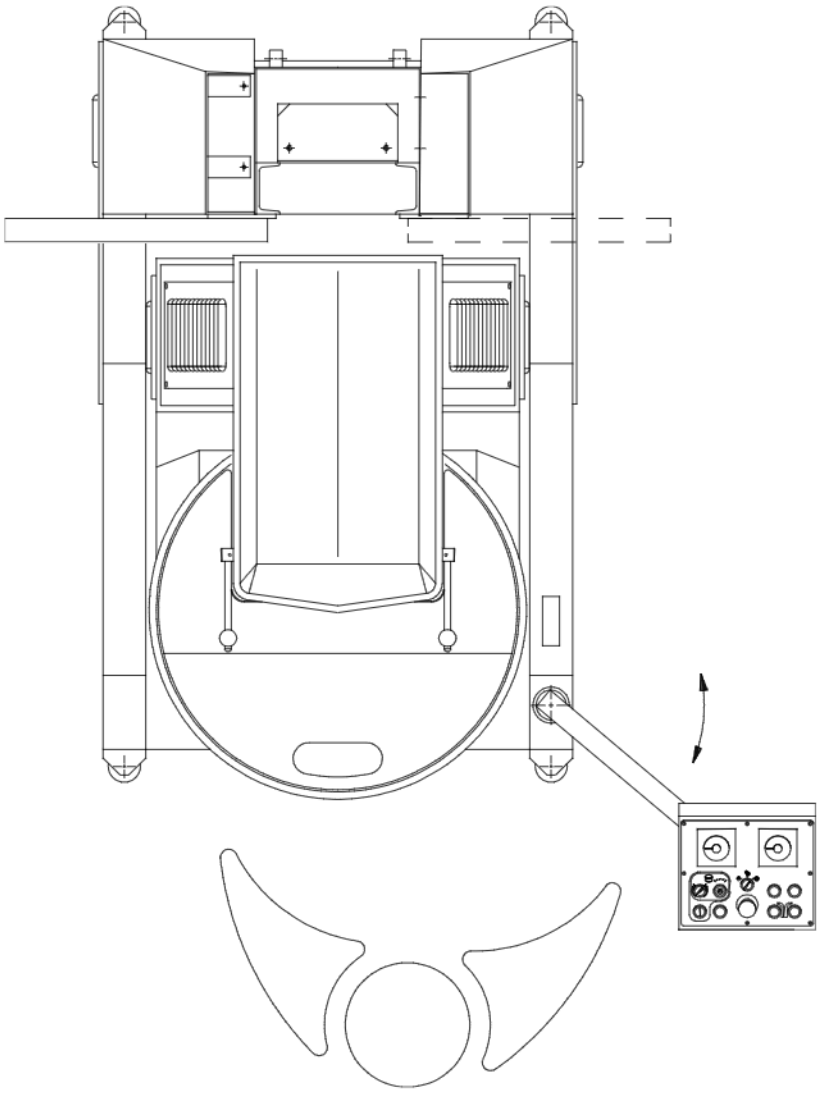


Figure 5-1

5.2 ENVIRONMENTAL CONDITIONS

The machine has been designed for use in bakeries or pastry-making confectioneries and therefore for use in environments with extremely variable humidity and temperature. Avoid excessive ventilation of the environment itself, which could lead to flour powder escaping from the bowl during the initial phase of amalgamation of the ingredients.

5.3 POSITIONING AND FIXING THE MACHINE IN PLACE

Once the machine has been placed in the chosen position, it must be fixed in place by adjusting the 4 feet A (Figure 5-2).
For safety reasons, once the machine position has been correctly adjusted, it is necessary to fasten the feet to the ground using the supplied screws, in order to avoid any movement of the machine structure during the work cycle.

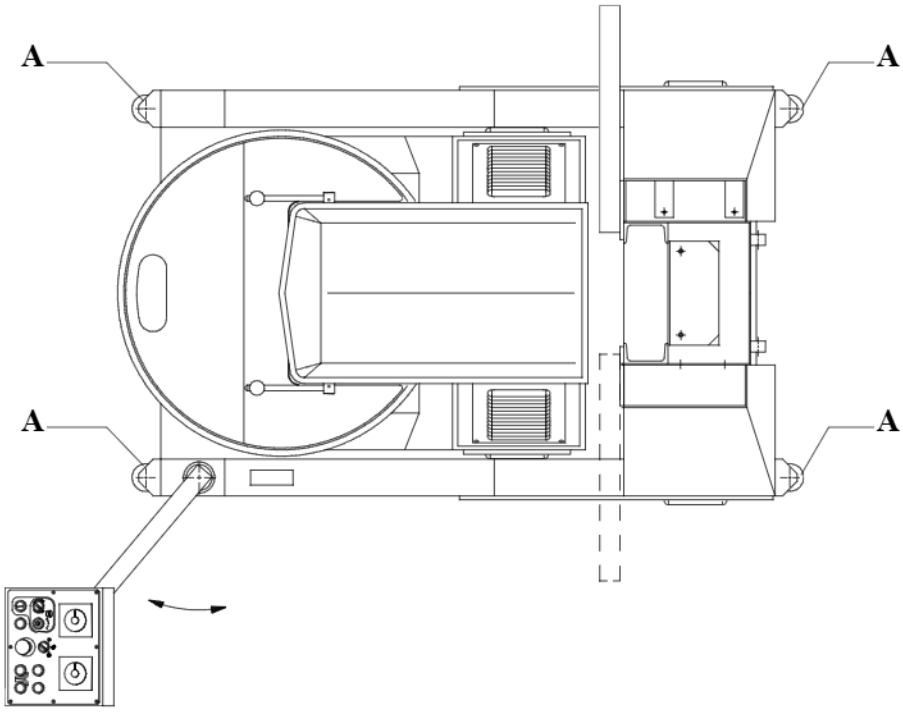


Figure 5-2

In the case when the machine is supplied with 4 standard chromium-plated feet A (Figure 5-3) without a screw fastening position, then, it is absolutely necessary to fasten the machine to the floor using M20 expansion plugs in the prepared positions B (Figure 5-3); once again, this is required in order to prevent any possible movement of the machine structure during the work process.

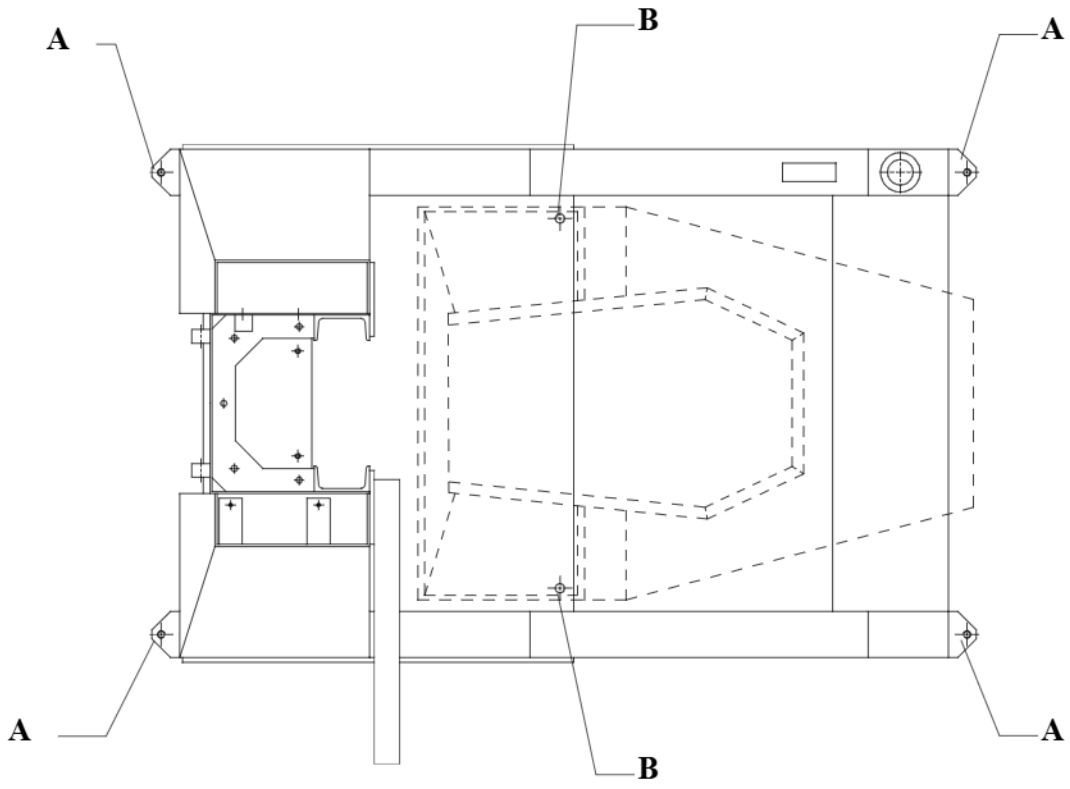


Figure 5-3

Note:
- The floor where the machine is positioned must be level.
- For safety reasons the machine must be fastened to the ground.

Once the machine has been correctly positioned and fastened to the ground, it is necessary to straighten the upper half of the column and adjust the discharge tracks (refer to Figure 5-4).

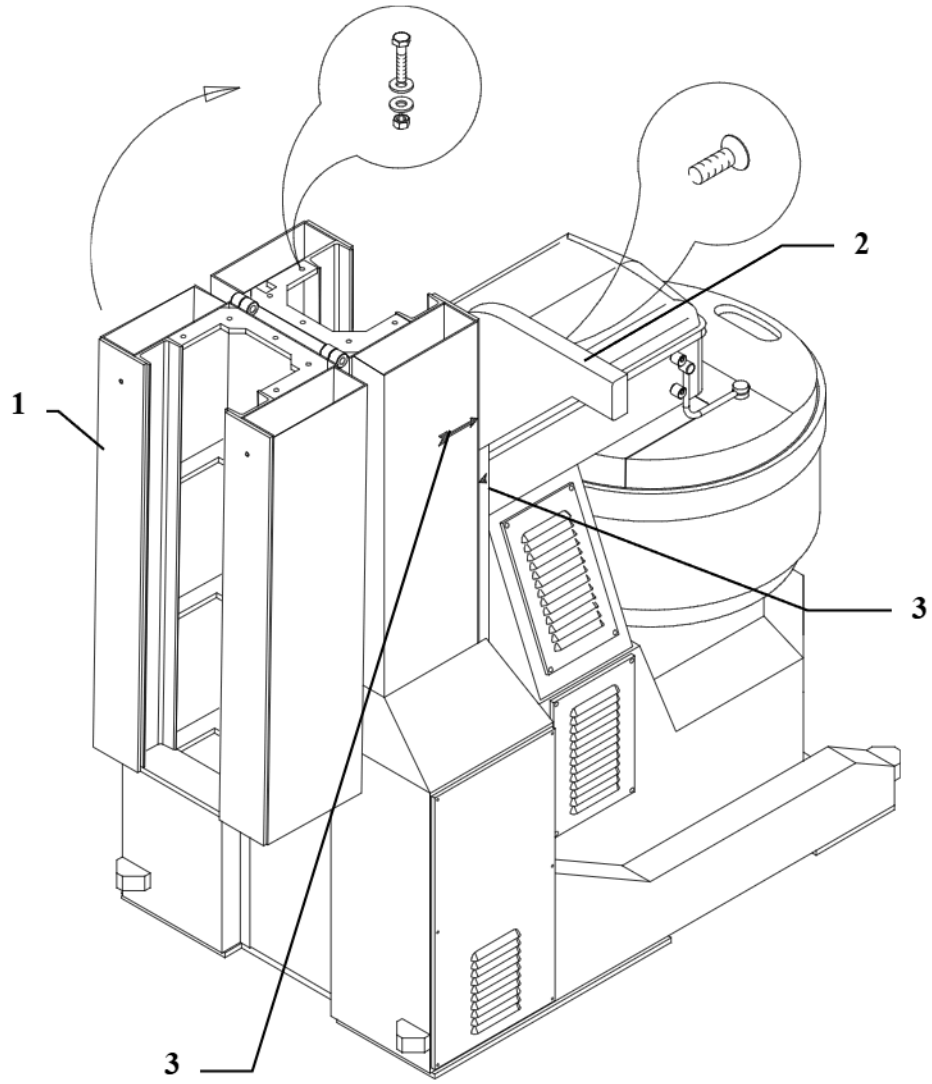


Figure 5-4

Rotate the column “1” in the direction indicated by the arrow, then fasten the column in position using the special bolts which have been supplied with the machine.
Remove the screws in the track “2” to enable it to be moved so that the arrows in position “3” are correctly aligned. Fasten the track “2” in position using the special screws which have been supplied with the machine.
When the arrows in position “3” are correctly aligned, the machine will discharge at the required height.

6 PREPARING THE MACHINE FOR USE

6.1 WARNING

It is absolutely necessary to observe the local safety standards and codes when operating on the machine.
For a correct use of the machine, it is necessary to carefully check the type of ingredients which make up the dough to be kneaded and their quantities; the quantities of ingredients must not exceed the maximum quantities allowed for the specific machine being used (chapter 13/14).

6.2 ADJUSTING THE MACHINE

Machine stability

Once the machine has been correctly installed and securely fastened to the ground, as explained in section 5.3, then there are no longer any problems of stability.

Safety mechanism related to the opening of the mobile protective cover

The minimum opening of the cover, which activates the safety mechanism to stop the machine, and the maximum opening of the cover allowed, are adjusted during the test phase carried out at the manufacturer's workshop.

The mobile protective cover (A) is opened automatically by pressing in the up-arrow push button (B) also used to raise and tip the mixer. If the mobile protective cover (A) is opened while the machine is running, then the cam (C), positioned inside the machine head, activates a microswitch (D) which in turn triggers the stop signal.

The cam is adjusted so that the microswitch is activated as soon as the mobile protective cover starts to lift.

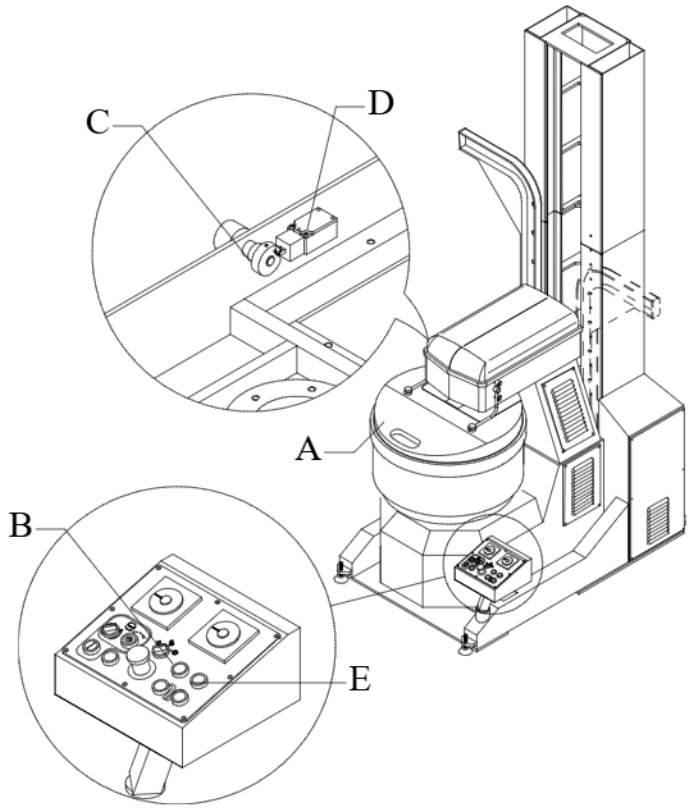


Figure 6-1

ATTENTION:

- If the up-arrow push button (B, Figure 6-1) is kept pressed in after the mobile protective cover has been completely opened, then the machine will be raised from the ground and will start to move upwards to the discharge position.
- The machine is equipped with a torque-limiting joint which also permits the mobile protective bowl cover to be opened manually. In this case, the safety of the operator while the machine is functioning is still ensured by the cam (C, Figure 6-1) and microswitch (D, Figure 6-1), as explained above.
- The mobile protective bowl cover can be lowered by pressing in the down-arrow push button (E, Figure 6-1) and keeping it pressed in until the machine has been completely lowered to the floor and the bowl cover has been completely closed.

6.3 CONNECTING THE MACHINE TO THE POWER SUPPLY

Check that the voltage, frequency and number of phases specified on the machine plate correspond with that of the power supply to be used, because an incorrect connection will damage the machine and will invalidate the guarantee. Then, connect the power cable (pos. A, Figure 6-2) to the appropriate socket. For ETL approved mixers, the cable installed is of size AWG 6, and, according to NFPA79, Table 11, has a maximum current capacity of 65 Amps. Therefore, the nearest standard value of the branch circuit breaker device required will be 63 Amps. Turn on the main switch (pos. B, Figure 6-2).

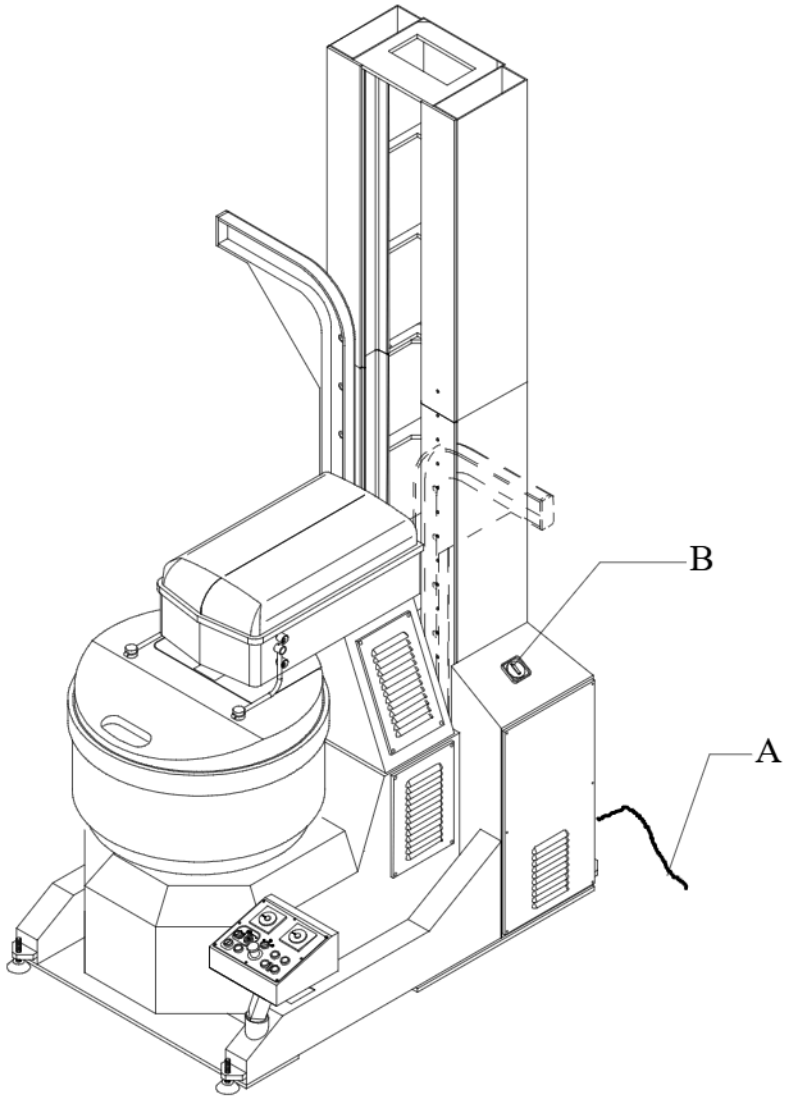


Figure 6-2

6.4 CLEANING THE MACHINE

The machine has been designed for use in the production of foodstuffs, therefore it is indispensable that it be cleaned thoroughly each day.

To carry out any type of cleaning operation on the machine, it is indispensable to first disconnect the machine from the power supply and to observe all the local safety standards and codes in force.

Body of the machine

It must only be cleaned using a sponge which has been soaked in water and sufficiently wrung out.

Bowl

To remove the dough residue which has accumulated in the bowl, use only water and a suitable plastic spatula.

Bowl Guide Roller Unit

It is necessary to *periodically* remove the bowl guide roller unit (composed of parts no. 74-78 in Table 3 of section 15) for cleaning. It can be cleaned by using a light jet of air and/or a sponge which has been soaked in water and sufficiently wrung out.

7 USING THE MACHINE

7.1 WARNING

Strict observance of the local safety standards and codes is indispensable for the starting up and use of the machine.

7.2 PRELIMINARY CHECKS BEFORE STARTING

Before starting the work process, check:

- that the machine is in a stable position;
- that it has been correctly connected to the electric socket;
- that the parts are clean.

7.3 DESCRIPTION OF THE WORK PROCESS

Loading the ingredients to be kneaded

With the machine turned on, the bowl can be simply accessed by pressing in the up-arrow push button (B, Figure 7-1) to lift the mobile protective cover (A). With the machine turned off, the bowl can be simply accessed by manually lifting the mobile protective bowl cover (A).

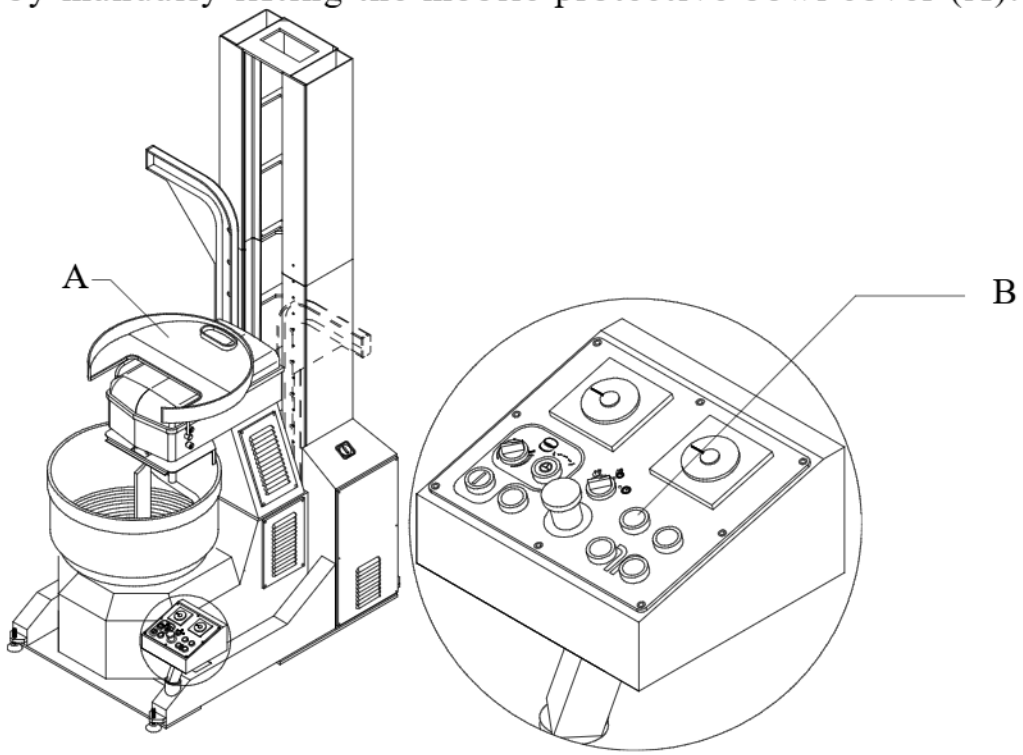


Figure 7-1

The ingredients (exclusively those suitable for the production of bread and pastries) are added to the bowl in the required quantities, which must not exceed the maximum quantities specified for the machine being used (refer to chapter 13/14).

Starting the work process

Only after the mobile protective cover has been lowered, by pressing in the down-arrow push button (C, Figure 7-2), can the mixer be started.
Selecting the manual cycle, it is possible to start, select the required speed and stop the machine manually, by pressing the corresponding buttons on the control panel (refer to section 7.4).

To use the automatic or semi-automatic cycle, it is first necessary to set the pre-mixing and mixing times using the timers, after which the cycle can be started by pressing the required speed button on the panel (refer to section 7.4).
During the entire work cycle, the window (A) located on the mobile protective cover allows the state of the dough to be checked visually. Furthermore, it allows samples of dough to be extracted and small quantities of ingredients to be added to correct the mixture, if this should be necessary.

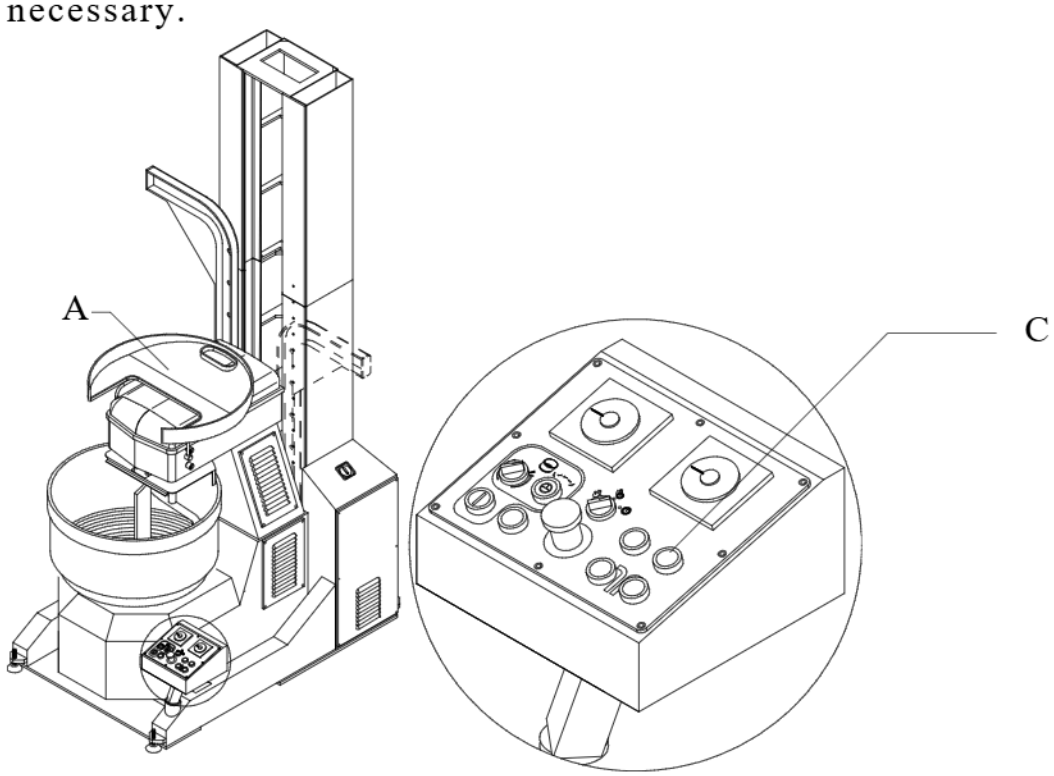


Figure 7-2

Unloading the dough

At the end of the cycle, it is possible to automatically empty the dough from the bowl by proceeding in the following manner:

- press in the up-arrow push button (B, Figure 7-3) to automatically lift the mobile protective cover;
- keep the up-arrow push button (B, Figure 7-3) pressed in after the mobile protective cover has been completely opened to automatically lift the mixer off the ground, raise it to the discharge position and tip it over;
- use the jog bowl button and bowl rotation selector (refer to section 7.4) to assist in the emptying of the dough when the mixer is in the discharge position;
- lower the mixer to the ground, once the dough has been automatically emptied from the bowl, by pressing in the down-arrow push button (C, Figure 7-3) for the time necessary.

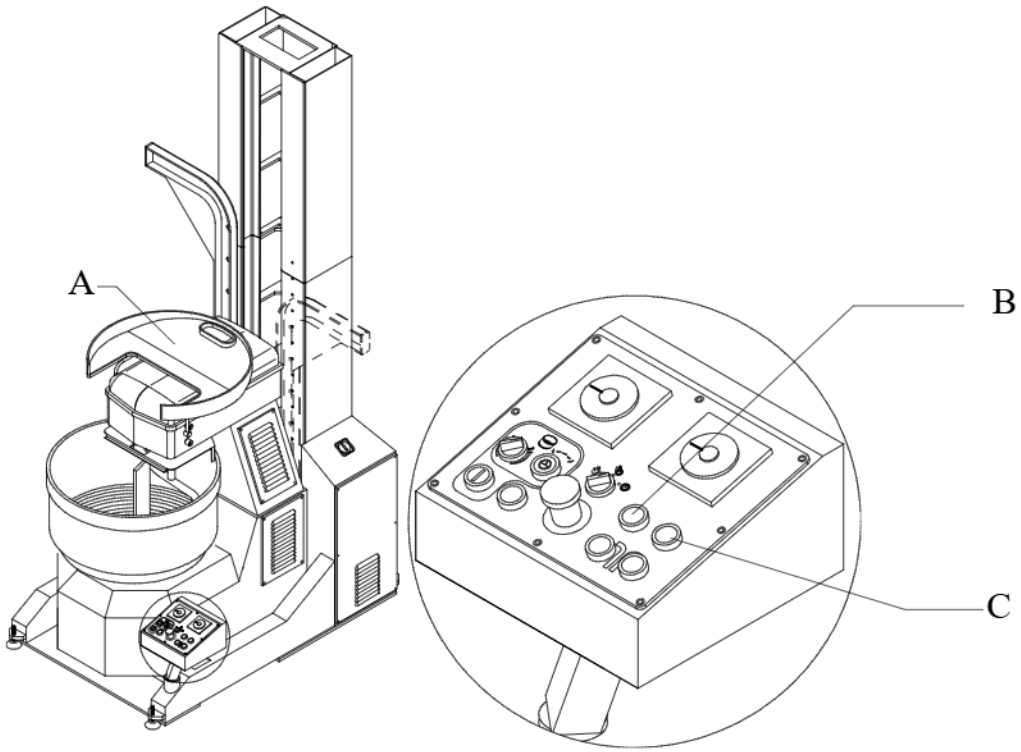


Figure 7-3

7.4 DESCRIPTION OF THE FUNCTIONS FOR OPERATING THE TWO-SPEED MODEL

All the controls for the functions required to operate this machine are located on the control panel mounted on the end of a swivel arm.

The specific function of each button and selector is clearly indicated by graphic symbols located on or next to these controls.
Figure 7-4 shows the control panel for the two-speed model.

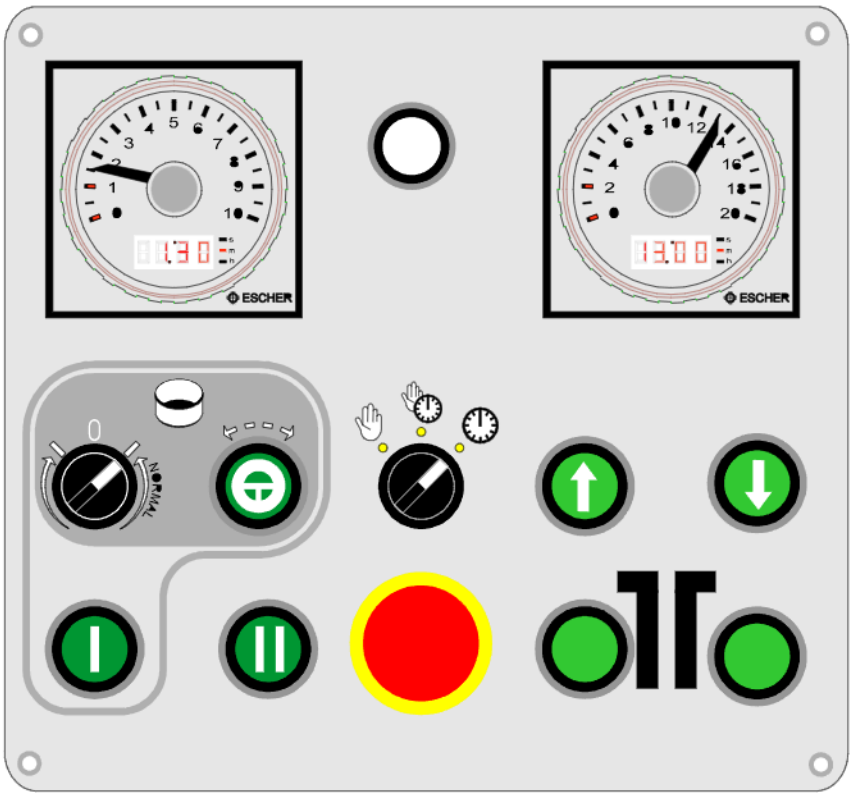


Figure 7-4

Description of push button control panel



Figure 7-5

BOWL ROTATION SELECTOR

Selects the direction of rotation of the bowl in the jog mode and first speed operating mode. (In the NORMAL position, the bowl rotates in the same direction as the spiral).



Figure 7-6

MANUAL JOG BOWL BUTTON

Impulsively rotates the bowl.
The bowl rotation direction is selected using the "bowl rotation selector".



Figure 7-7

1st SPEED START BUTTON

Starts mixing the ingredients at the first speed.
The bowl rotation direction is selected using the "bowl rotation selector".



Figure 7-8

2nd SPEED START BUTTON

Starts kneading the dough at the second speed.
The bowl rotation direction is NORMAL (same direction of rotation as that of the spiral).



Figure 7-9

MANUAL, SEMI-AUTOMATIC, AUTOMATIC CYCLE SELECTOR

- Manual cycle: the timers are disabled.
- Semi-automatic cycle: allows the mixer to operate in 1st speed or in 2nd speed.
- Automatic cycle: the mixer automatically switches from the 1st to the 2nd speed.



Figure 7-10

POWER ON LIGHT

Indicates that the power is on.



Figure 7-11

EMERGENCY-STOP

All operations can be stopped by pressing the emergency button.
To restart the machine, it is necessary to first remove the emergency condition, by rotating the same push button clockwise until it is released, and then to press the required button.
The timers are reset.



Figure 7-12

DOWN BUTTON
- LOWER MIXER/CLOSE BOWL COVER

Lowers the mixer from the discharge position, after the dough has been emptied out.
Once the mixer has reached the ground, it closes the mobile bowl cover.



Figure 7-13

UP BUTTON
- OPEN BOWL COVER / RAISE MIXER

Opens the mobile bowl cover.
Once the bowl cover is completely open, it raises the mixer to the discharge position to allow the dough to be emptied out.



Figure 7-14

LEFT DISCHARGE LUMINOUS GREEN BUTTON

Selects the discharge position for the dough emptying process.
It is enabled only when the machine is on the ground and only lights up when it has been pressed, in order to select discharge of the dough to the left hand side.



Figure 7-15

RIGHT DISCHARGE LUMINOUS GREEN BUTTON

Selects the discharge position for the dough emptying process.
It is enabled only when the machine is on the ground and only lights up when it has been pressed, in order to select discharge of the dough to the right hand side.

Operating modes

The mixer can run in three modes when it is on the ground with the mobile bowl cover closed:

- Manual mode;
- Semi-automatic mode;
- Automatic mode.

Relationship between the timer settings and the operating modes:

- If the pointer of the first speed timer is set below the zero marking, then this timer switches off (only the green LED indicating that the units of measurement are minutes remains on). With this setting, if the first speed start button is pressed, then the machine works in manual mode in first speed, even if the operating cycle selector (Figure 7-9) has been set to automatic mode.

- If the pointer of the second speed timer is set below the zero marking, then this timer switches off (only the green LED indicating that the units of measurement are minutes remains on). With this setting, if the first speed start button is pressed, then the machine carries out the first speed cycle for the time set on the first speed timer, after which the machine stops. If the second speed button is subsequently pressed, then the machine will work in manual mode in second speed, even if the operating cycle selector (Figure 7-9) has been set to automatic mode.

- If the pointers of both timers are set below the 0 marking, then both timers switch off (only the green LEDs indicating that the units of measurement are minutes remain on). With this setting, the machine works in manual mode, even if the operating cycle selector (Figure 7-9) has been set to automatic mode.

Manual Mode



Figure 7-16

- Turn the selector to the manual cycle position (Figure 7-16). The timers switch off.
- Press the “first speed” push button on the control panel (Figure 7-7) to start running at the first speed in order to amalgamate and pre-mix the ingredients.
- It is possible to select the reverse bowl rotation direction (Figure 7-5) - option only available in the first speed - to accelerate the process of mixing the ingredients. Before changing the bowl rotation direction, wait 1 second with the selector in the central position (0), in order to stop the rotation.
- Press the “second speed” push button on the control panel (Figure 7-8) to start running at the second speed to finish off the mixing process.
- Press the “emergency-stop” push button (Figure 7-11) to end the manual cycle.
- Once the kneading cycle has been completed and the dough is ready, it is possible to automatically open the bowl cover and raise the mixer to the required discharge position by first selecting the discharge side (Figure 7-14 / Figure 7-15) and then pressing in the UP arrow button (Figure 7-13).
- When the mixer has reached the discharge position, the dough emptying procedure can be simplified by using the jog bowl button (Figure 7-6) and the bowl rotation selector (Figure 7-5).
- Before a new kneading cycle can be started, it is necessary to first lower the mixer to the ground and close the mobile bowl cover by pressing in the DOWN arrow button (Figure 7-12).

Semi-automatic Mode



Figure 7-17

- Turn the selector to the semi-automatic cycle position (Figure 7-17).
- Programme the first and/or second speed timer according to the speed at which the cycle is required to be executed.

To work in the first speed

- Press the “first speed” push button (Figure 7-7) on the control panel to start running at first speed in order to amalgamate and pre-mix the ingredients.
- It is possible to select the reverse bowl rotation direction (Figure 7-5) - option only available in the first speed - to accelerate the process of mixing the ingredients. Before changing the bowl rotation direction, wait 1 second with the selector in the central position (0), in order to stop the rotation.
- The end of cycle is determined by the first speed timer. At the end of the cycle, the machine is stopped automatically.
- If the “second speed” push button (Figure 7-8) on the control panel is pressed, then the machine switches to the second speed. The end of cycle will then be determined by the second speed timer.

To work in the second speed

- Press the “second speed” push button (Figure 7-8) on the control panel to start running at the second speed. The end of cycle is determined by the second speed timer.

To empty the dough from the bowl

- Once the kneading cycle has been completed and the dough is ready, it is possible to automatically open the bowl cover and raise the mixer to the required discharge position by first selecting the discharge side (Figure 7-14 / Figure 7-15) and then pressing in the UP arrow button (Figure 7-13).
- When the mixer has reached the discharge position, the dough emptying procedure can be simplified by using the jog bowl button (Figure 7-6) and the bowl rotation selector (Figure 7-5).
- Before a new kneading cycle can be started, it is necessary to first lower the mixer to the ground and close the mobile bowl cover by pressing in the DOWN arrow button (Figure 7-12).

Automatic Mode



Figure 7-18

- Turn the selector to the automatic cycle position (Figure 7-18).
- Programme the two timers for the first and second speed.

To work with both the first and second speed

- Press the “first speed” push button (Figure 7-7) on the control panel to start running at the first speed in order to amalgamate and pre-mix the ingredients.
- It is possible to select the reverse bowl rotation direction (Figure 7-5) - option only available in the first speed - to accelerate the process of mixing the ingredients. Before changing the bowl rotation direction, wait 1 second with the selector in the central position (0), in order to stop the rotation.
- The first end of cycle is determined by the first speed timer. At the end of this first cycle, the machine automatically switches to the second speed and the second end of cycle is subsequently determined by the second speed timer.
- If you press the “second speed” push button (Figure 7-8) on the control panel during a first speed cycle, then the machine will switch to the second speed. The end of cycle will then be determined by the second speed timer.

To work in the second speed

- Press the “second speed” push button (Figure 7-8) on the control panel to start running at the second speed. The end of cycle is determined by the second speed timer.

To empty the dough from the bowl

- Once the kneading cycle has been completed and the dough is ready, it is possible to automatically open the bowl cover and raise the mixer to the required discharge position by first selecting the discharge side (Figure 7-14 / Figure 7-15) and then pressing in the UP arrow button (Figure 7-13).
- When the mixer has reached the discharge position, the dough emptying procedure can be simplified by using the jog bowl button (Figure 7-6) and the bowl rotation selector (Figure 7-5).
- Before a new kneading cycle can be started, it is necessary to first lower the mixer to the ground and close the mobile bowl cover by pressing in the DOWN arrow button (Figure 7-12).

Remarks

- If you open the protective bowl cover while a kneading cycle is being carried out, the machine will stop and the timers will not be reset. To restart the mixer, it is necessary to close the protective bowl cover and press the required speed start button.

- The jog bowl button (Figure 7-6) allows only the bowl to be rotated and is enabled even when the protective bowl cover is open. However, for safety reasons, to use it, it is necessary to keep the “jog bowl” push button pressed in.

- It is always possible to switch to the second speed when the machine is running at the first speed.

- The reverse bowl rotation direction option is automatically disabled when the machine is running at the second speed.

- In the automatic cycle, when the time set for the first speed cycle has elapsed and the bowl rotation direction has been set in the direction opposite to the normal direction of rotation (selector in Figure 7-5), then the bowls stops for approximately 1,5 seconds, after which the machine switches to the second speed (in which the number of revolutions of the spiral is increased and the bowl rotates in the normal direction). This pause occurs in order to allow the bowl rotation direction to be changed and is necessary to avoid sudden changes in the direction of rotation of the bowl motor, which in the long term would damage the motor itself.

7.5 STOPPING THE MACHINE NORMALLY

In manual mode, the work cycle can be stopped normally, by pressing the “emergency-stop” button (Figure 7-11) located on the control panel.

If the machine is operating in automatic or semi-automatic mode, then in the former case, the machine stops when the second speed timer reaches the end of the programmed time and in the latter case, the machine stops when the first or second speed timer reaches the end of the programmed time, depending on the speed at which the work cycle is carried out.

7.6 STOPPING THE MACHINE IN AN EMERGENCY

Any movement can be stopped by pressing the “emergency” button.
To restart the machine, it is necessary to first remove the emergency condition, by rotating the same push button clockwise until it is released, and then to press the button corresponding to the operation required (restart the mixing process by pressing the speed start button, open the bowl cover and raise the mixer, lower the mixer and close the bowl cover).

7.7 DESCRIPTION OF THE SAFETY SYSTEMS

Mobile protective cover

If the protective bowl cover is lifted at any time, then the microswitch will stop the machine.

Emergency push button

The emergency button, located on the control panel, can be used to immediately stop any movement.

7.8 EFFICIENCY OF THE SAFETY SYSTEMS

When one of the safety systems is activated, the time taken for the spiral and bowl rotation to stop is not more than 4 seconds; this time interval is a result of the inertia.

An immediate stop would cause stresses and fatigue failures.

8 SAFETY INSTRUCTIONS

8.1 WARNING

The machine has been designed and constructed to guarantee maximum safety.
The safety guards and safety systems, which are operational when the machine functions, do not in any way detract from the functionality and efficiency of the machine itself.

8.2 GENERAL CRITERIA

The mechanical parts and, above all, the moving members, have been designed to function in absolute safety and reliably for long periods of time.
The electrical components, both in terms of the single components and the connections guarantee safety.

8.3 RISKS TO PERSONS

If the machine is used in accordance with the local safety standards and codes, in the correct manner, using suitable ingredients and respecting the maximum quantities specified for the machine, then there are no risks for the operators assigned to use the machine.

Maintenance

All maintenance and repair operations must be carried out in accordance with the instructions specified in chapter 9.

These operations must only be carried out by suitably qualified and authorised personnel and in strict observance of the local safety standards and codes in force.

8.4 ENVIRONMENTAL CONDITIONS AND NOISE

Other than the requirements explained in chapter 5 for the location of the machine, there is only one additional requirement:
Ensure that the floor in the area to be occupied by the machine is level.

The noise to which the operator may be subject is, in the most severe conditions, always less than *70* dB.

9 MAINTENANCE AND REPAIRS

9.1 WARNING

To carry out any type of maintenance on the machine, it is indispensable to first disconnect the machine from the power supply.

All maintenance and repair operations must be carried out by suitably qualified personnel, using suitable equipment and observing the local safety standards and codes in force.

Clean the machine daily in the manner specified in section 6.4. Thorough cleaning prevents the build up of material and flour which, in the long term, can damage the moving members.

9.2 MAINTENANCE

The preventive maintenance consists in checking the tension and wear of the belts and should be carried out monthly.

The driving belts must be replaced when they are frayed or under excessive tension, *before* they actually break.
When a driving belt needs to be replaced, it is necessary to replace the entire set of belts related to that specific drive.

The bearings are also subject to wear and may therefore also require replacement; this operation must be carried out by a suitably qualified technician using suitable equipment.

9.3 INSTRUCTIONS FOR THE ADJUSTMENT OF THE BELT TENSION AND THE REPLACEMENT OF THESE BELTS

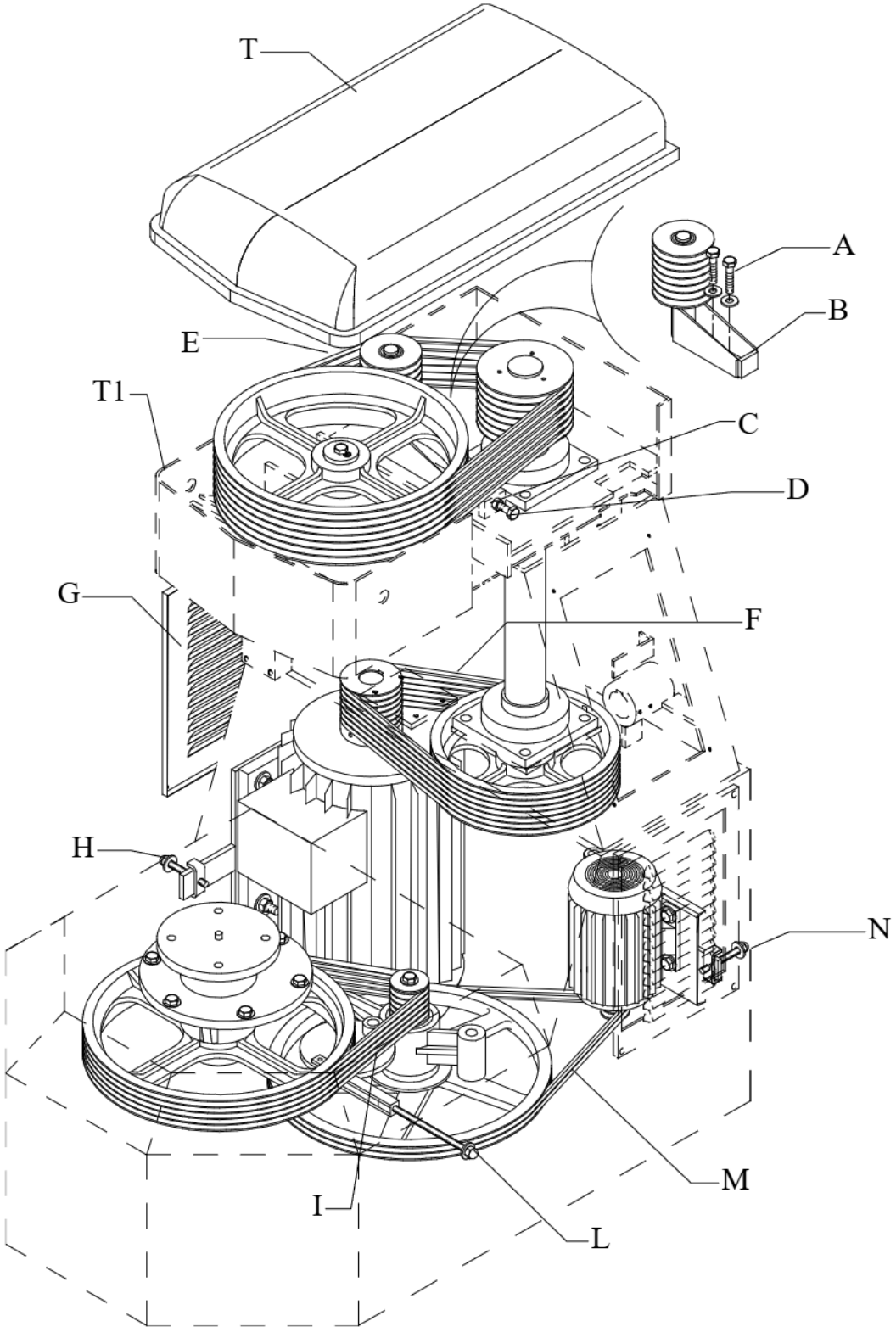


Figure 9-1

Replacing and adjusting the tension of the spiral transmission belts in the mixer head

(Refer to Figure 9-1)

The belt tension must be adjusted when it is noticed that the rotation of the spiral tool tends to slow down during the work cycle.

1. Lift the head casing (pos. T).
2. Loosen the nut (pos. C), to allow the loose pulley support (pos. B) to be moved.
3. Loosen the two screws (pos. A) in the support (pos. B), without unscrewing them completely.
4. If it is necessary to replace the belts (pos. E), then proceed in the following manner:
   - Unscrew the screw (pos. D), to allow the support (pos. B) to be moved up to it.

   As a result of the above operations, the belts are now loosened and it is possible to replace them. Before replacing them, it is necessary to ensure that the new belts have the same characteristics as those installed by the manufacturer of the machine.
5. If it is necessary to adjust the belt tension of the belt set E, then tighten (to increase the tension) or loosen (to decrease the tension) the screw (pos. D) accordingly.
6. Tighten the two screws (pos. A) of the support (pos. B).
7. Fasten the nut (pos. C).
8. Place the casing (pos. T) back in the correct position, so that it closes onto the head (pos. T1).

ATTENTION:
When the belt set E located in the mixer head is checked, it is also necessary to check the belt set F located in the mixer base.

Adjusting the tension of the transmission belts in the base of the mixer

(Refer to Figure 9-1)

When the belt set E is checked, it is also necessary to check the belt set F. This can be done by proceeding in the following manner:

1. Remove the side casing (pos. G) located on the left hand side of the mixer. The spiral motor and belt set F can now be seen.
2. To increase the tension of the belt set F tighten the nut (pos. H), located on the left hand side of the mixer, accordingly.

If it is noticed that the rotation of the bowl tends to slow down during the kneading process, then proceed in the following manner:

1. To tension the belts of the bowl driving gear (pos. I), turn the nut (pos. L) clockwise, using a suitable spanner.

2. To tension the belts of the motor driving gear (pos. M), turn the nut (pos. N) clockwise, using a suitable spanner.

Replacing the transmission belts in the base of the mixer

To provide better access to the mixer base, in order to replace the transmission belts located in the base itself, it is necessary to raise the mixer from the ground, along its column. If the discharge position is not too high, then it is even better to raise the mixer to the discharge position (Figure 9-2).

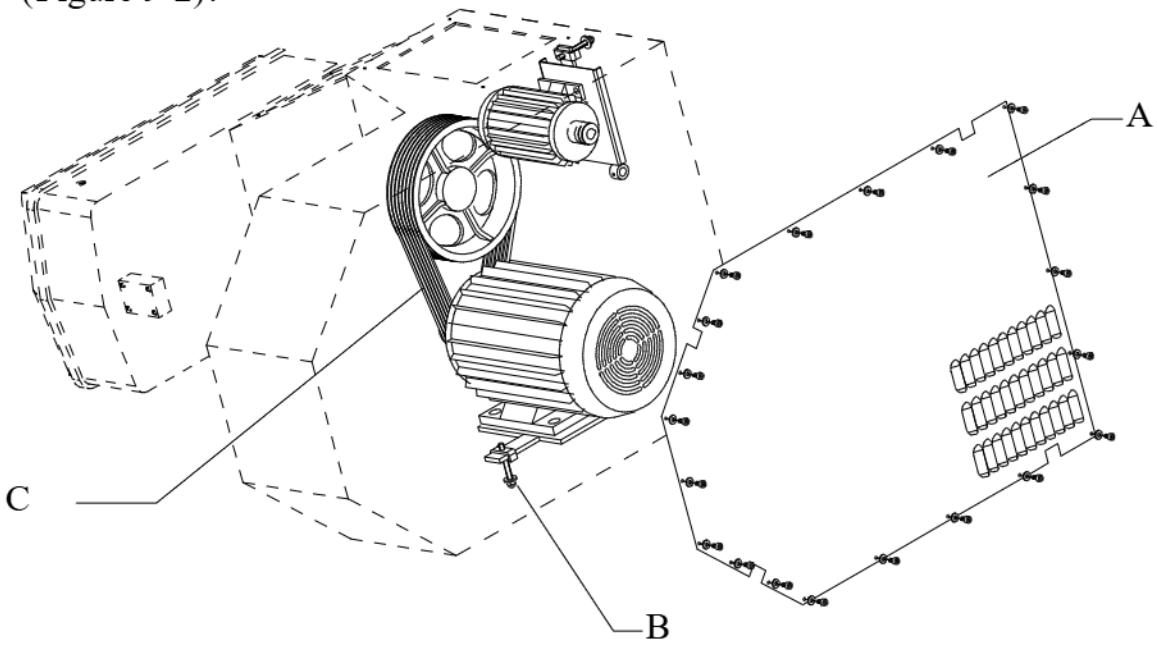


Figure 9-2

To replace the spiral transmission belts (pos. C, Figure 9-2), proceed in the following manner:

1. Remove the base casing (pos. A).
2. Loosen the nut (pos. B), located on the left hand side of the mixer.

As a result of the above operations, the belts are now loosened and it is possible to replace them. Before replacing them, it is necessary to ensure that the new belts have the same characteristics as those installed by the manufacturer of the machine.

To tension the replaced belts, tighten the nut (pos. B) by turning it clockwise.

3. Place the base casing (pos. A) back in the correct position.

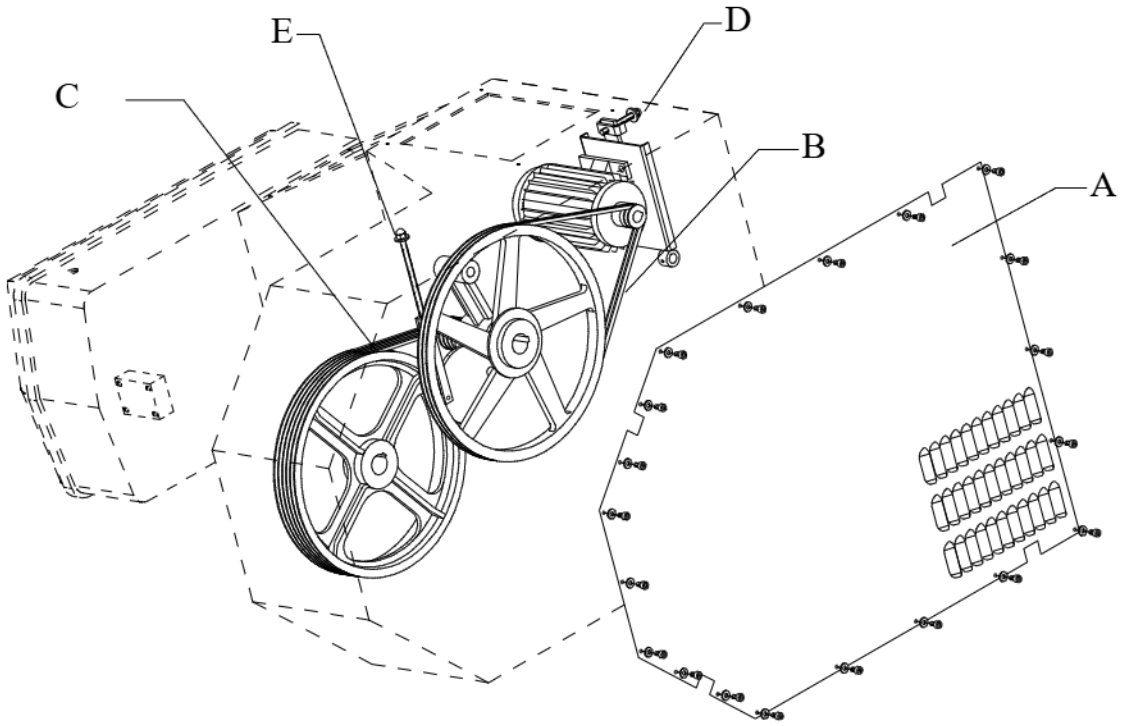


Figure 9-3

To replace the bowl transmission belts (pos. B and pos. C, Figure 9-3) proceed in the following manner:

1. Remove the base casing (pos. A).
2. Loosen the nut (pos. D), located at the back of the mixer.
3. Loosen the nut (pos. E), located on the right hand side of the mixer.

As a result of the above operations, the belts are now loosened and it is possible to replace them. Before replacing them, it is necessary to ensure that the new belts have the same characteristics as those installed by the manufacturer of the machine.

4. First replace the set of belts C. Tension these belts by turning the nut (pos. E), which is located on the right hand side of the mixer, clockwise.
5. Then replace the set of belts B. Tension these belts using the nut (pos. D), which is located at the back of the mixer.
6. Place the base casing (pos. A) back in the correct position.

9.4 DESCRIPTION OF THE HYDRAULIC UNIT FOR THE 160/200 AR MIXER

Type : AR CORSA 2500
Motor : 1,5 kW 1450 revolutions/min.
Type of pump : KV2 P 14
Working pressure: 50 bar

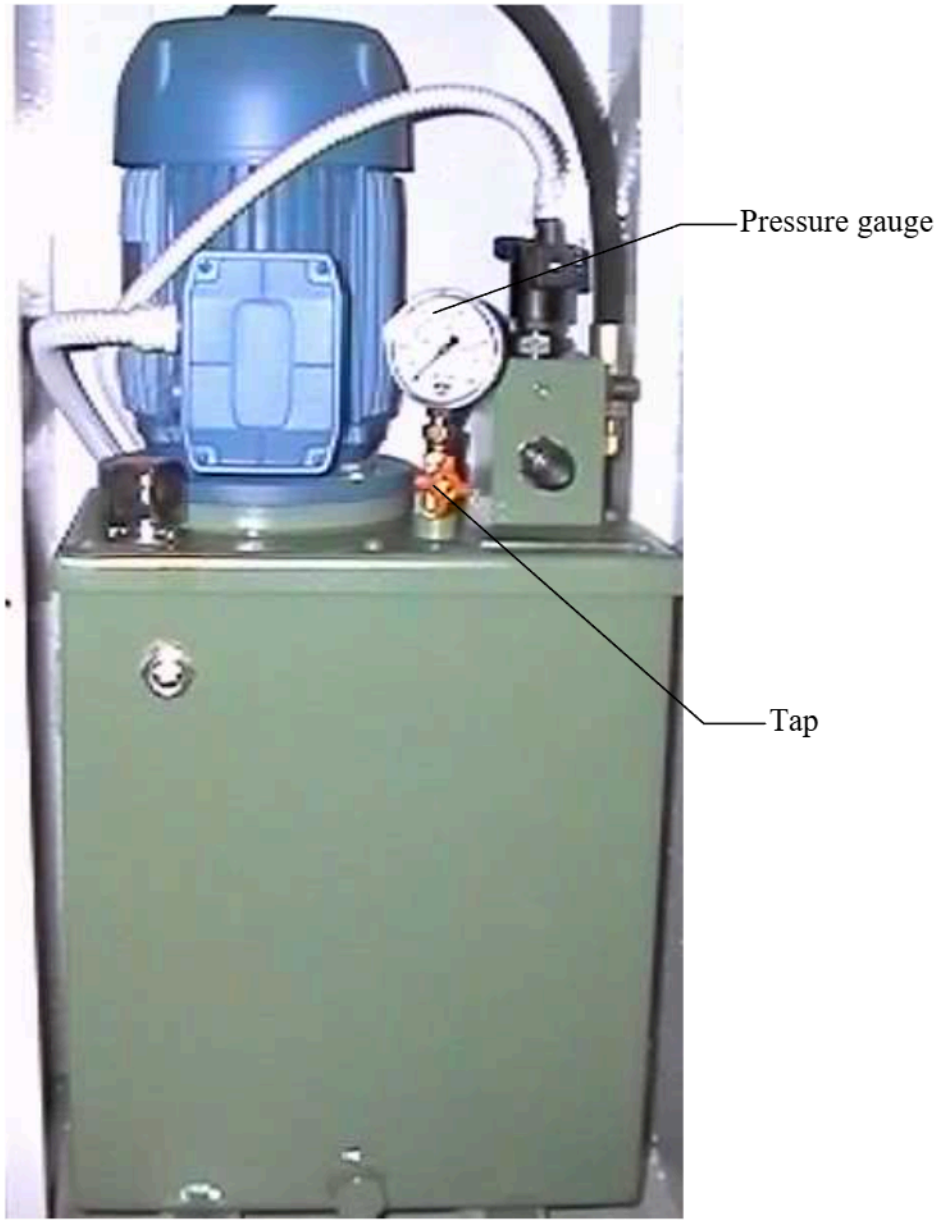


Figure 9-4

Access can only be gained to the hydraulic unit (Figure 9-4) after having removed the corresponding machine column casing, located on the side of the machine column.

The hydraulic unit which has been installed on the machine is ready for use when the machine is started up. However, it is recommended that during the first few hours of operation the operator check that no foam forms in the tank. The presence of foam in the tank occurs when air enters into the pump and the end of the discharge tube is fully immersed in the oil; therefore check the oil level in the tank.

SCHEDULED MAINTENANCE		
Description of Operation	**Frequency**	**Date of Operation**
Clean exterior of hydraulic unit	every four months	
Top up oil	when oil level reaches minimum level	
Replace oil	every 3000 hours of operation	
Clean interior of hydraulic unit	every 3000 hours of operation	
Clean intake filter	every two months	

Recommended spare parts for routine maintenance

Description	
Filter cartridge:	FAM 20 MN;
Joint ring:	R62,
Pressure gauge:	MG 63 0-100;
Coil	BT CS 24/AC.

Recommended Oils

The oil used in the factory is : Roloil LI/32
Hydraulic oil
anti-wear
viscosity: ISO VG 32
DIN: 51524/2

Alternatively, you can use one of the following oils:

MANUFACTURER	TYPE
AGIP	OSO 35
ROLOIL	LI/32
ARAL	GFU TU 508
AVIA	AVILUB RSL 7/UV
BP	ENERGOL HLP 80
	OLEX HLP-D 80
CASTROL	HYSPIN AWS 32
CHEVRON	EP Hydr. Oil 32
DEFROL	HLP 25
ESSO	NUTO H44
FINA	HYDRAN 31
FUCHS	RENOLIN MR10
	RENOLIN B10
GULF	Harmony 43 AW
MOBIL	DTE 24
ÖMV	MLP 730
SHELL	TELLUS OEL 927
TEXACO	Rando Oil HD A
VALVOLINE	M5 - C 600 B
VEEDOL	Andarin 46
Oil for engine	SAE 10 W

If the temperature of the environment is too hot, you can replace the oil with one having a much higher viscosity (e.g. VG46).
If the temperature of the environment is too cold, you can replace the oil with one having a much lower viscosity(e.g. VG22).

Maintenance

Before proceeding with any operation, ensure that the power supply has been disconnected from the machine.

During the scheduled maintenance program, visually check whether the filter is blocked and if so, clean the wire mesh filter element and, if necessary, replace the filter cartridge.

Periodically take and check samples of the oil, to establish whether the effects of impurities, heat, water and air require a stricter control of the characteristics of the oil used or require the oil to be changed.

If the tank is emptied, then carefully remove all impurities and, if necessary, restore the protective coating of the tank itself.

After these operations, close all the openings, unless oil is going to be poured immediately into the tank.
In the latter case, ensure that the breathers with oil filters, the covers, etc. are correctly positioned.

For the maintenance operations to be carried out on the units, it is useful to consult the guidelines specified in the corresponding Table 1.

The most common causes of trouble among those listed in Table 1 are those highlighted in boldface, located in positions 1 - 5 - 11 - 12 - 16 - 17 - 23 - 28 - 29.
If problems arise in the operation of the unit, then first check these items, in the order in which they are listed in the maintenance guidelines, before moving on to the other items.
Avoid dismantling the new equipment without authorisation, since this will invalidate the manufacturer's guarantee.

If an oil accumulator has been installed, then before removing or opening the circuit, ensure that the discharge tap is open and that there is no pressure.

N.B.: It is recommended that all the maintenance operations be carried out by suitably qualified personnel.

Troubles which may arise in an oil-hydraulic system and the possible causes

The probable causes of troubles which may arise in a complete oil-hydraulic unit can be of two types: external or internal.

External causes

- **Problem: Loss of static or dynamic torque**
- **Possible causes:**

a) incorrect choice of oil;
b) safety valve calibrated to values which are too low;
c) safety valve jams in the open position;
d) distributing slide valve is jammed;
e) the pump does not deliver at the required pressure;
f) air circulation;
g) obstructions in the hydraulic system;
h) strained or incorrectly aligned connection between the motor shaft and the pump;
i) incorrectly assembled pipes.

- **Problem: Drop in speed**
- **Possible causes:**

a) the pump does not deliver as required;
b) obstructions in the hydraulic system;
c) valve jams in the open position;

- **Problem: Irregular operation when functioning at a low number of revolutions**
- **Possible causes:**

a) faulty pump or hydraulic circuit;
b) incorrect connection between the motor shaft and the pump;
c) pressure too low in the auxiliary members.

- **Problem: Overheating**
- **Possible causes:**

a) oil viscosity too high;
b) contractions in the pipes;
c) relief valves calibrated to values which are too low;
d) valve or pipe cross-sections too small;
e) cooling system functions irregularly or tank is too small.

Problem: Significant loss of oil at drainage point

- **Possible causes:**

a) low degree of viscosity in the oil, due to an incorrect choice of the oil used or due to an excessive increase in the operating temperature.

- **Problem: Noise**
- **Possible causes:**

a) cavitation phenomena in the pump;
b) air present in the circuit.

Only move on to the possible internal causes when all the above specified possible external causes of trouble have been carefully checked.

Internal causes

- **Problem: Loss of static or dynamic torque**
- **Possible causes:**

a) distributor, or possibly the couplings, are worn;
b) bearings have not been precisely mounted on the shaft.

- **Problem: Drop in speed**
- **Possible causes:**

a) couplings are worn resulting in significant losses of oil at the drainage point.

- **Problem: Irregular operation when functioning at a low number of revolutions**
- **Possible causes:**

a) distributor is worn;
b) couplings are worn.

- **Problem: Significant losses of oil at drainage point**
- **Possible causes:**

a) distributor is worn;
b) couplings are worn;
c) distributor or cylinder gaskets are broken or incorrectly mounted.

- **Problem: Excessive wear**
- **Possible causes:**

a) oil contains foreign objects (filters have deteriorated);
b) oil viscosity is too low;
c) pressure, speed, or temperature exceed the maximum prescribed values;
d) air bubbles in the circuit.

- **Problem: Overheating**
- **Possible causes:**

e) oil viscosity is too high;
f) loss of oil at the couplings.

Table 1
Guidelines for the maintenance of the oil-hydraulic unit

Problems	Possible Causes	Cases of intervention
INSUFFICIENT PRESSURE or drop in the pressure with respect to the value specified for the circuit	1) max. pressure valve is semi-open	1 a) calibrated pressure is too low b) sealing points are worn c) impurities are present under the seal d) spring is broken
	2) fault in pump	2 refer to points 5 - 11
	3) excessive internal leakage	3 a) seals in the cylinders or in the hydraulic motors are worn b) valves and distributors are worn c) oil viscosity is too low
	4) excessive loss of force	4 a) oil viscosity is too high b) dimensions of oil passages are incorrect c) oil passages are partially blocked
FAULTY PUMP OPERATION due to no delivery or extremely low delivery with respect to the normal specified values	5) inhibited intake	5 a) intake filter is small or blocked b) intake tube is blocked c) intake tube is small or follows a complex path
	6) entrance of air	6 a) through the intake in the tank b) through the intake connections c) through the seal on the pump shaft d) through the intake of oil with foam
	7) hermetically sealed tank	7 breather in tank is blocked
	8) faulty operation	8 a) check the connection b) speed too high or too low
	9) oil viscosity too high	9 refer to the pump specifications

	10) internal faults in the pump	10 a) internal gaskets are broken b) blades, plates or pistons are glued together c) pump head has not been tightened d) broken internal parts need to be replaced
FAULTY PUMP OPERATION due to no delivery or extremely low delivery with respect to the normal specified values	**11)** pump excessively worn	11 pump needs to be replaced
NOISY PUMP abnormally noisy (e.g., it is normal for certain gear pumps to be noisy)	**12)** cavitation	12 a) inhibited intake: refer to point 5 b) high viscosity: refer to point 9
	13) entrance of air	13 refer to point 6
	14) internal wear	14 excessive clearance in the supports and in the plates
	15) vibration of the system	15 incorrect installation, resonance
OVERHEATING that is, the oil temperature exceeds the safety limit of 50° - 60°C	**16)** maximum pressure too high	16 excessive calibration of the valve
	17) power used inefficiently	17 a) cut-out valve is inefficient b) short circuit at end of cycle does not function c) hydraulic circuit needs to be modified
	18) excessive internal leakage	18 refer to point 3
	19) excessive loss of force	19 refer to point 4
	20) insufficient oil in tank	20 size of oil tank needs to be increased
	21) insufficient cooling	21 a) need to add an artificial cooling system b) coolants which may be present are not efficient
	22) excessive friction	22 a) internal assembly of the pump is incorrect b) lack of lubrication, where it is required c) use of oil with poor lubricating properties
INCORRECT MOVEMENTS of the hydraulically driven members, with respect to the programmed movements	**23)** air in the circuit	23 a) let out the air bubbles from the high points b) remove the points where the air may enter: refer to point 6

	24) valves are blocked	24 a) valves are blocked at the output by rubber or other substances b) valves are semi-open due to the presence of impurities
INCORRECT MOVEMENTS of the hydraulically driven members, with respect to the programmed movements	25) cylinders are blocked	25 a) internal assembly of the cylinder is incorrect b) loads normal to the axis are not allowed c) seizure of connecting pins
	26) excessive loss of force	26 refer to point 4
	27) variable pressure at the accumulators	27 a) insufficient accumulator capacity b) increased demand from the circuit due to internal leakage
EXCESSIVE WEAR that is, excessively rapid compared to the actual time of operation and the maintenance carried out	**28)** oil contains abrasives	28 a) oil is too old b) inefficient filters have been used
	29) insufficient lubrication	29 a) poor quality oil has been used b) oil which is too liquid at the working pressure has been used
	30) high working pressure	30 relative to the maximum pressure allowed for the pump and for the valves
	31) faulty connections	31 abnormal stress on the shafts

10 PERSONNEL TRAINING

10.1 WARNING

The operator must have a good working knowledge of all the functions on the control panel and of all the safety guards and safety systems installed on the machine. The operator must be instructed about the local safety standards and codes in force.

10.2 PERSONNEL ASSIGNED TO THE MACHINE

Operator

In addition to all the functions on the control panel, the safety guards and the safety systems, the operator must also have a good working knowledge of the work cycles, the ingredients which can be used and the maximum quantities of ingredients allowed for the specific machine being used.

Maintenance engineer

The maintenance and repair operations must be carried out by suitably qualified personnel, using suitable equipment (following the instructions specified in chapter 9) and observing the local safety standards and codes in force.

11 ADDITIONAL IMPORTANT INSTRUCTIONS FOR THE USE OF THE MACHINE

Before starting the machine:

The voltage, frequency and number of phases of the power supply network must correspond to the ones specified on the plate located on the rear of the machine.

Check that the machine is in a stable position and that it is level (refer to chapter 5).

It is absolutely forbidden to tamper with or remove any of the safety guards and safety systems installed on the machine.

Loading the ingredients:

The machine is able to knead maximum quantities of ingredients, as specified in chapter 13/14, and these maximum quantities must not be exceeded.

While the machine is running:

When the machine is running, all the safety guards are installed and all the safety systems are connected.
The duration of the reverse bowl rotation operation during the first speed running cycle is determined by the operator.
Repeated interruption of the work cycle can lead to overheating of the motor and, in the long term, can compromise its efficiency.

12 ETL REFERENCE STANDARDS

The machine model described herein complies with the ETL requirements of the following reference standards:

- ETL Listing No. 95696 “Motor Operated Commercial Food Preparing Machines” – Conforms to UL STD. 763;
- ETL Sanitation Listing “Commercial Powered Food Preparation Equipment” – Conforms to STD. NSF-8;
- C-ETL Listing “Motor Operated Food Processing Appliances (Household and Commercial) - Conforms to CSA C22.2 No. 195 - M1987.

12.1 ETL PLATE

The ETL plate is located on the back of the machine. This plate is shown in Figure 12-1.



Figure 12-1

13 TECHNICAL MACHINE SPECIFICATIONS – 160 AR 2V

Kneading capacity (Max.):	160 kg	352 lb
Flour capacity (Max.):	100 kg	220 lb
Litres of water (Max.):	60 l	16 gal
Bowl volume:	266 l	70 gal
Bowl diameter:	850 mm	33 in
Floor to bowl rim height:	1140 mm	44.9 in
Length (Max.):	2150 mm	84.6 in
Width (Max.):	1900 mm	75 in
Height (Max.):	3265 mm	128.5 in
Weight:	1720 kg	3784 lb
Motor for spiral tool:	5,9/10,3 kW	8/14 hp
Motor for bowl:	0,75 kW	1 hp
Total power:	11,05 kW	15 hp
Spiral tool speed:	92/184 rpm	92/184 rpm
Bowl speed:	14 rpm	14 rpm

Supply:	208 V, 60 Hz, 3 Phase
Maximum full load current:	45 A

External dimensions and weight with packaging

Wooden box:	230 x 155 x 242(h)	cm	2.180 kg

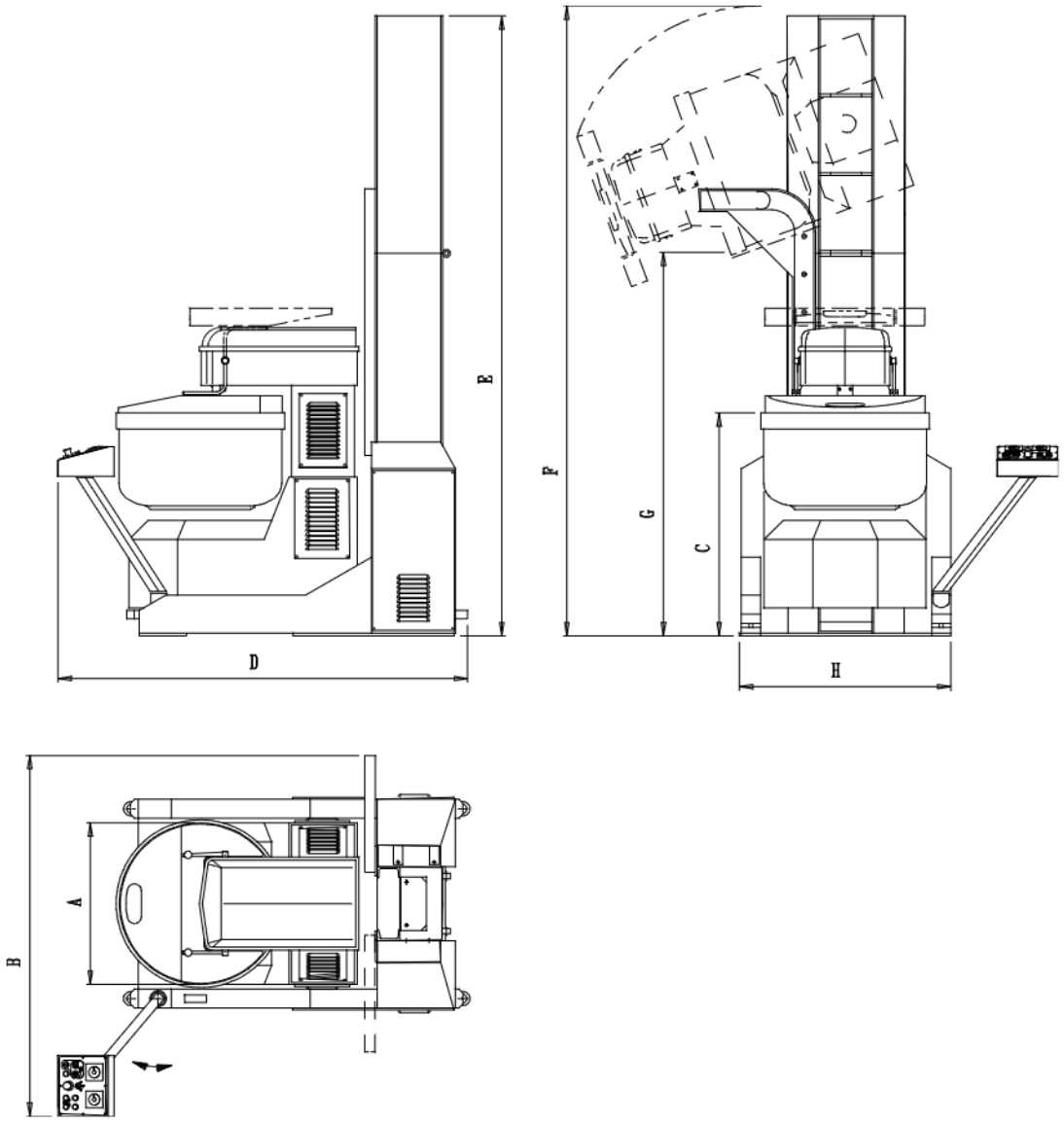
14 TECHNICAL MACHINE SPECIFICATIONS – 200 AR 2V

Kneading capacity (Max.):	200 kg	441 lb
Flour capacity (Max.):	125 kg	276 lb
Litres of water (Max.):	75 l	20 gal
Bowl volume:	305 l	81 gal
Bowl diameter:	910 mm	36 in
Floor to bowl rim height:	1140 mm	44.9 in
Length (Max.):	2150 mm	84.6 in
Width (Max.):	1900 mm	75 in
Height (Max.):	3265 mm	128.5 in
Weight:	1755 kg	3861 lb
Motor for spiral tool:	5,9/10,3 Kw	8/14 hp
Motor for bowl:	0,75 Kw	1 hp
Total power:	11,05 Kw	15 hp
Spiral tool speed:	92/184 rpm	92/184 rpm
Bowl speed:	14 rpm	14 rpm

Supply:	208 V, 60 Hz, 3 Phase
Maximum full load current:	45 A

External dimensions and weight with packaging

Wooden box:	230 x 155 x 242 (h) cm	2.215 kg



Legend:

	160 AR	200 AR
A	mm. 850	mm. 910
B	mm. 1.900	mm. 1.900
C	mm. 1.140	mm. 1.140
D	mm. 2.150	mm. 2.150
E	mm. 3.265	mm. 3.265
F	mm. 3.340	mm. 3.340
G	mm. 2.020	mm. 1.990
H	mm. 1.110	mm. 1.110

15 ASSEMBLY DRAWINGS FOR SPARE PARTS AND WIRING DIAGRAMS

Drawings

1st	Drawing:	exploded view of head group
2nd	Drawing:	exploded view of base group
3rd	Drawing:	exploded view "A" of machine structure
4th	Drawing:	exploded view "B" of machine structure
5th	Drawing:	hydraulic wiring diagram
6th	Drawing:	power wiring diagram for discharge on one side only
7th	Drawing:	control wiring diagram A for discharge on one side only
8th	Drawing:	control wiring diagram B for discharge on one side only
9th	Drawing:	power wiring diagram for discharge on two sides
10th	Drawing:	control wiring diagram A for discharge on two sides
11th	Drawing:	control wiring diagram B for discharge on two sides

Instructions for requesting spare parts

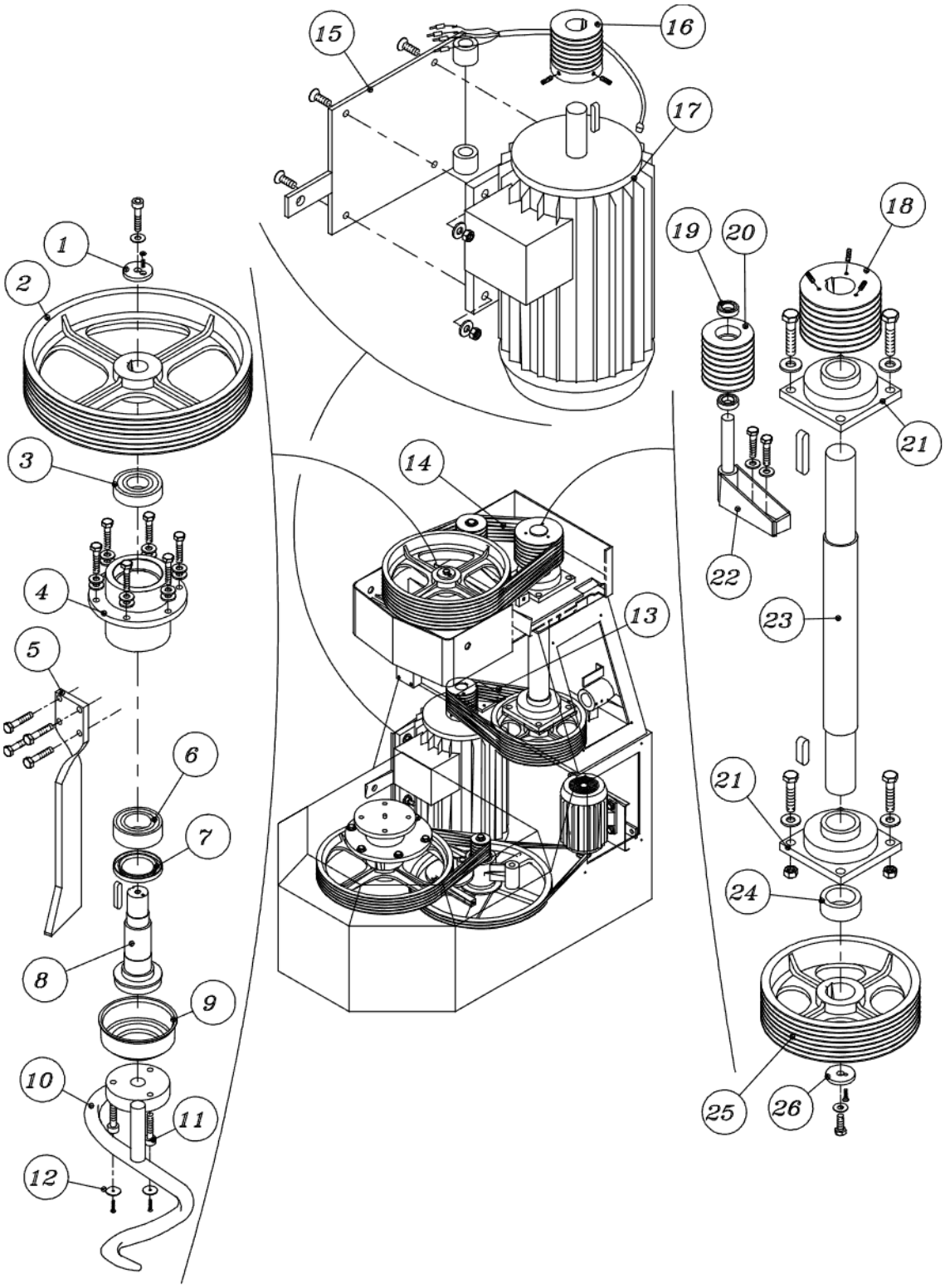
When requesting spare parts, it is necessary to specify the following details:

- machine model;
- machine serial number;
- drawing number;
- position of part in drawing;
- description of part;
- quantity required;

If possible, a copy of the corresponding assembly drawing should be enclosed with the request.

1st TABLE: Exploded view of head group

code 290551

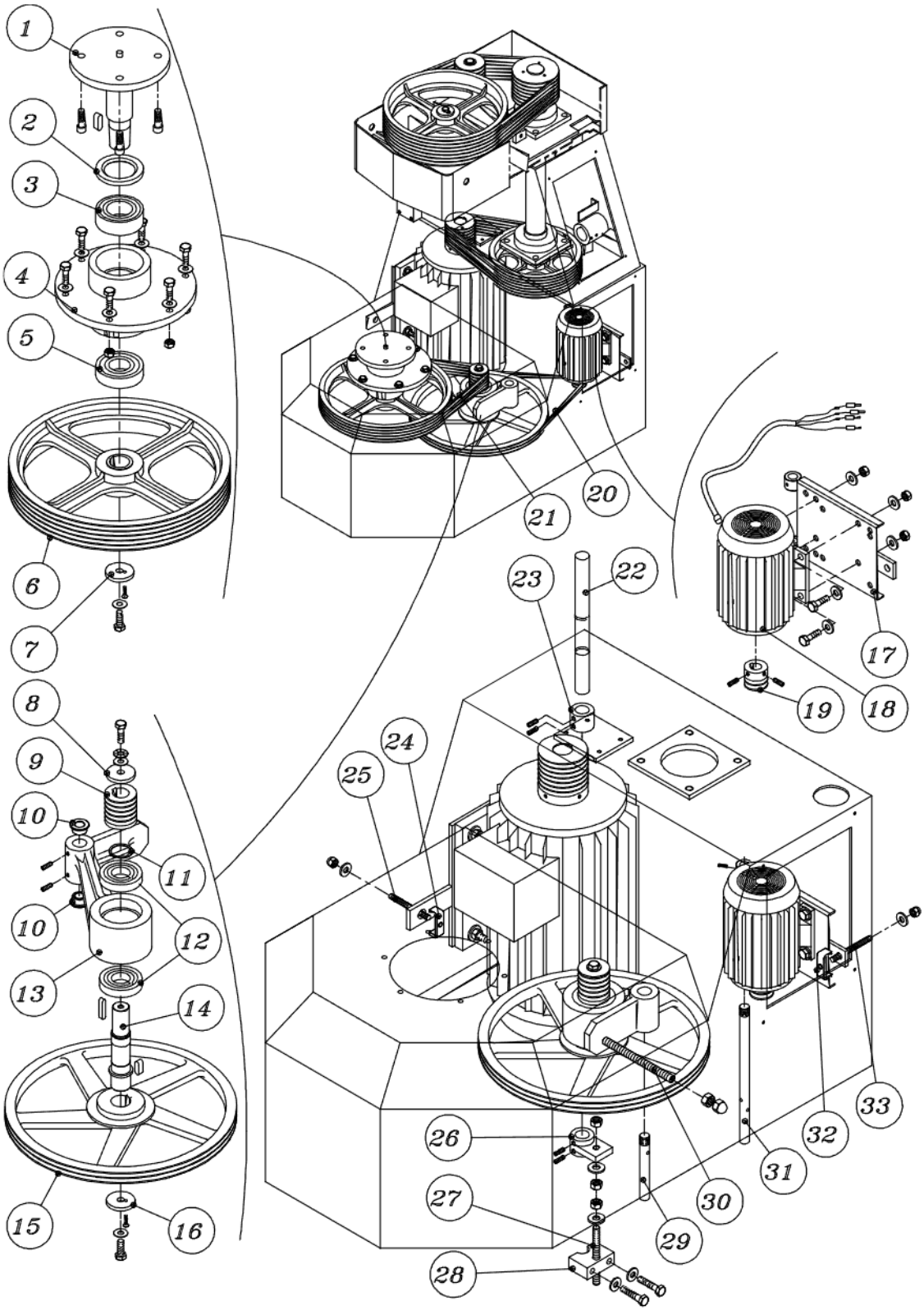


1st TABLE

Pos.	Description	Qty	Code
1	Washer 17/80x10	1	211.006
2	Pulley	1	180.037
3	Bearing 6312 2RS	1	C00112
4	Spiral shaft support	1	216.011
5	Breaking column	1	177.015
6	Bearing 3215	1	C00100
7	Ring MIM 95/130x12	1	C00095
8	Spiral shaft	1	100.006
9	Cup	1	135.002
10	Spiral tool	1	220.004
11	Special screw	3	266.000
12	Screw cap	3	128.000
13	Toothed V-type belt SPZ 1237	7	C00138
14	V-type belt SPA 1700	7	C00707
15	Spiral motor sliding plate	1	231.011
16	Pulley	1	183.052
17	Motor	1	*
18	Pulley	1	183.053
19	Bearing 6205 2RS	2	C00721
20	Pulley	1	183.051
21	Support with bearing	2	C00706
22	Support	1	216.057
23	Head transmission shaft	1	100.040
24	Spacer	1	143.032
25	Pulley	1	180.036
26	Washer 17/80x10	1	211.006

2nd TABLE: exploded view of base group

code: 290552

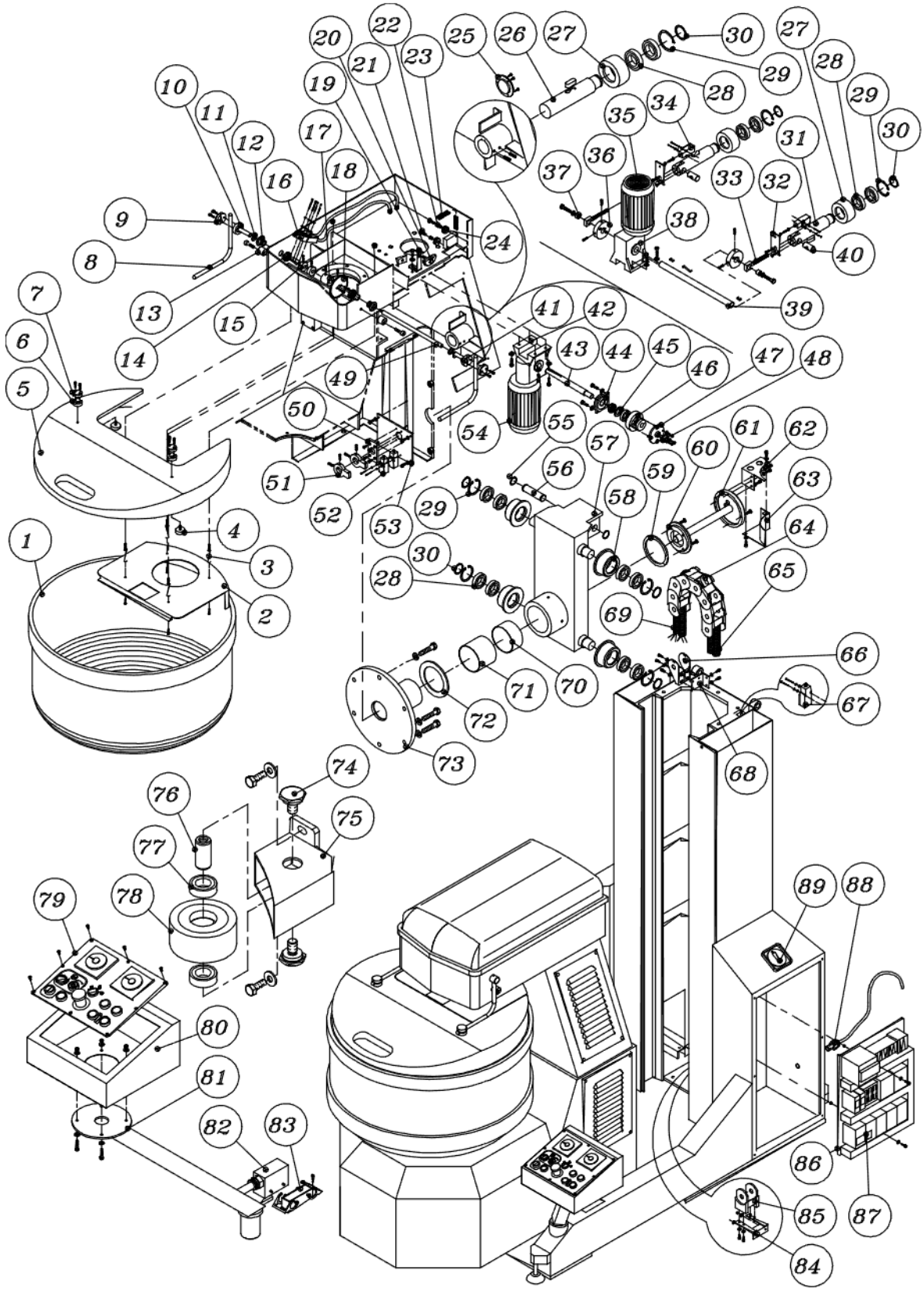


2nd TABLE

Pos.	Description	Qty	Code
1	Bowl shaft	1	100.009
2	Ring MIM 85/120x12	1	C00094
3	Bearing 3213	1	C00099
4	Bowl shaft support	1	213.003
5	Bearing 6311 2RS	1	C00111
6	Pulley	1	180.007
7	Washer 17/80x10	1	211.006
8	Washer 15/60x8	1	211.012
9	Pulley	1	183.007
10	Bush	2	116.026
11	Snap ring E40 UNI 7435	1	C00058
12	Bearing 6308 2RS	2	C00191
13	Bowl driving gear support	1	213.007
14	Bowl driving gear shaft	1	100.003
15	Pulley	1	180.004
16	Washer 15/60x8	1	211.000
17	Bowl motor sliding plate	1	231.000
18	Motor	1	*
19	Pulley	1	183.008
20	Toothed V-type belt SPZ 1700	2	C00157
21	Toothed V-type belt SPZ 1700 (160 AR)	7	C00157
21	Toothed V-type belt SPZ 1750 (200 AR)	7	C00158
22	Spiral motor slide pin	1	186.064
23	Bush	1	116.034
24	Spiral motor plate U strap	1	234.017
25	Threaded bar M16 C 40 – 0,2 m	1	C00128
26	Slide stop block 90x50x40	1	113013
27	Threaded bar M14 – 0,2 m	1	C00169
28	Reinforcement plate for slide shaft	1	188.081
29	Driving gear support pin	1	186.001
30	Screw STEI M16x200 UNI 5927	1	C00915
31	Bowl motor slide pin	1	186.002
32	Bowl motor plate U strap	1	154.000
33	Threaded bar M10 – 0,6 m	1	C00055

3rd TABLE: exploded view "A" of machine structure

code: 290553



3rd TABLE

Pos.	Description	Qty	Code
1	Bowl (160 AR)	1	261.006
1	Bowl (200 AR)	1	261.007
2	Fixed bowl cover	1	205.038
3	Fixed bowl pin	4	186.013
4	Cover pin	2	186.048
5	ABS mobile bowl cover (160 AR)	1	202.049
5	ABS mobile bowl cover (200 AR)	1	202.050
6	Lower bush	2	116.004
7	Upper bush	2	116.003
8	Arm	2	118.058
9	Upper bush for head arm	2	116.005
10	Pin for mobile bowl cover	1	186.078
11	Fifth wheel	2	C00240
12	Bush for threaded head	2	116.040
12	Self-lubricating bush 16/18x25	2	C00864
13	Eccentric bush	2	116.006
14	Self-locking nut M25x1,5	2	C00839
15	Cam	2	131.001
16	Safety microswitch	2	*
17	Lap joint	1	252.013
18	Cogged wheel	1	157.003
19	Support bracket	1	234.010
20	Idler	1	C00805
21	Hexagonal pin	2	186.029
22	Self-lubricating bush 10/12x12	2	C00410
23	Chain	1	C00803
24	Chain driving gear bush	2	116.035
25	Closing cap (discharge on one side only)	1	128.004
26	Driving shaft (discharge on one side only)	1	100.042
27	Driving roller:- discharge on one side only: - discharge on two sides:	1 2	200.004
28	Bearing 6008 2RS:discharge on one side only: discharge on two sides:	10 12	C00396
29	Snap ring I68 UNI 7437: - discharge on one side only: - discharge on two sides:	 5 6	C00719
30	Snap ring E40 UNI 7435: - discharge on one side only: - discharge on two sides:	 5 6	C00058
31	Driving shaft (discharge on two sides)	2	100.031

3rd TABLE (cont.)

Pos.	Description	Qty	Code
32	Plate (discharge on two sides)	2	234.008
33	Pin (discharge on two sides)	2	186.035
34	Safety microswitch discharge on two sides:	2	*
35	Motor (discharge on two sides)	1	*
36	Cam for change of discharge side (discharge on two sides)	2	131.002
37	Bush for rod (discharge on two sides)	2	116.018
38	Gear motor (discharge on two sides)	1	C00342
39	Shaft for change of discharge side (discharge on two sides)	1	100.030
40	Rod clutch pin (discharge on two sides)	2	186.036
41	Pin for mobile bowl cover	1	186.018
42	Gear motor	1	C00342
43	Bowl opening shaft	1	100.044
44	Support with bearing	1	C00795
45	Joint	1	C00817
46	Disk	1	142.006
47	Disk for cogged wheel	1	142.007
48	Cogged wheel	1	157.002
49	Pin for mobile bowl cover	1	186.079
50	Sliding plate	1	188.039
51	Cam: - discharge on one side only: - discharge on two sides:	1 2	131.003
52	Safety microswitch -discharge on one side only: -discharge on two sides:	 1 2	*
53	Microswitch holding plate	1	188.098
54	Motor	1	*
55	Snap ring E30 UNI 7435	2	C00057
56	Cylinder clutch pin	1	186.037
57	Carriage	1	140.004
58	Carriage wheel	4	200.005
59	Nylon ring	1	211.009
60	Sealing flange	1	151.005
61	Flanged, cam-carrying shaft	1	100.029
62	Upper box	1	237.029
63	Lower box	1	237.030
64	Cable-carrying chain (high) m. (low) m.	3,3 2,7	C00797
65	Motor cables (high, UL) (low, UL)	1	E00519 E00539
66	Cable connecting set	1	C00798

67	Safety microswitch	1	*

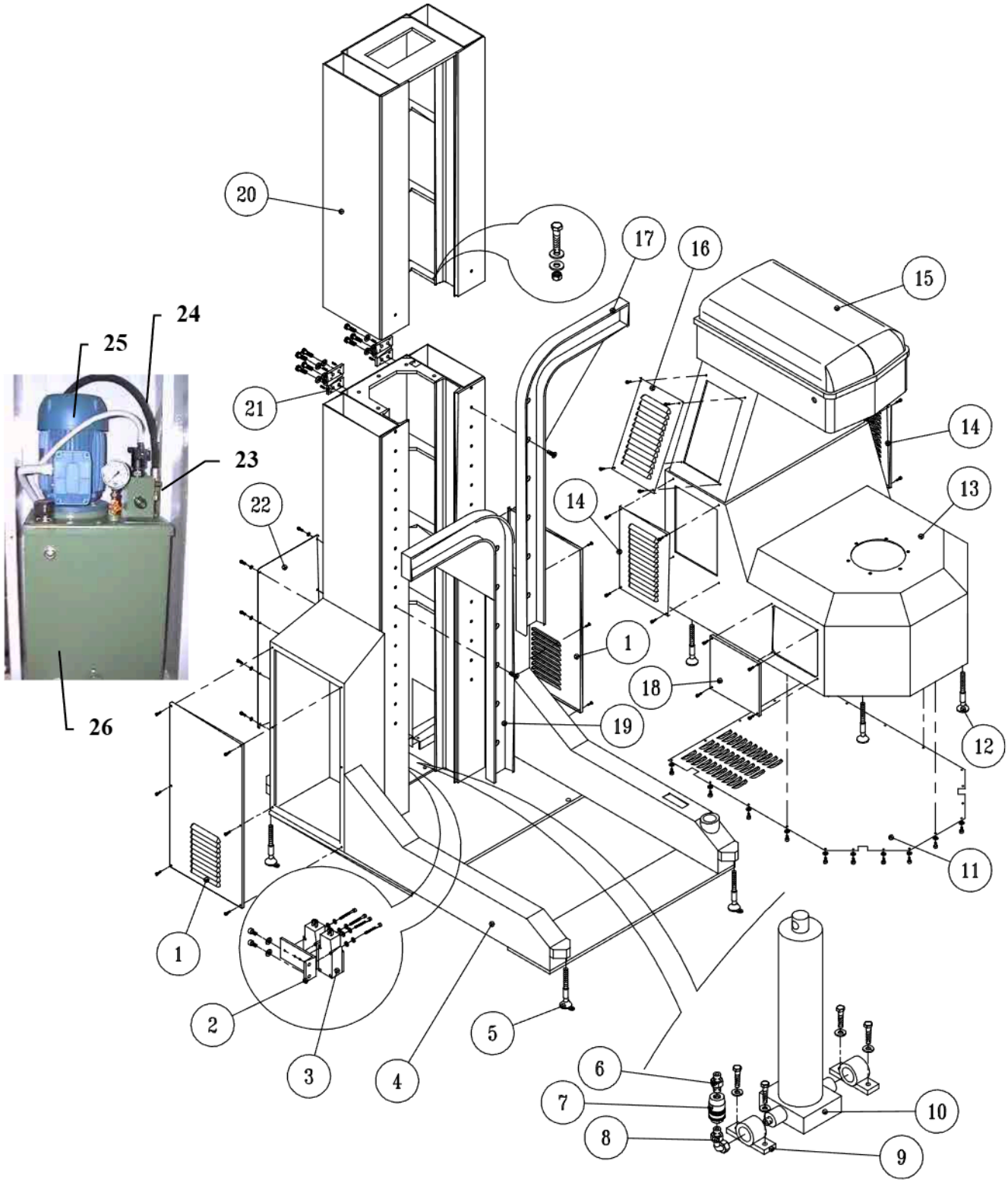
3rd TABLE (cont.)

Pos.	Description	Qty	Code
68	Cable-carrying chain fastening plate	1	234.016
69	Cables to mixer -discharge on one side only: (high, UL) (low, UL) -discharge on two sides: (high, UL) (low, UL)	1	 E00521 E00538 E00520 E00607
70	Self-lubricating bush 120/125x60	1	C00277
71	Self-lubricating bush 120/125x100	1	C00278
72	Nylon ring	1	211.008
73	Flanged hub	1	133.000
74	Hexagonal pin	4	186.021
75	Thrust roller support	2	216.017
76	Pin	2	186.025
77	Bearing NA2204 2RSDZ	4	C00906
78	Thrust roller	2	200.007
79	Control panel	1	239.019
80	Control panel box	1	171.002
81	Control panel box arm	1	118.049
82	Connector ILME CH124 + CNF24	1	E00009
83	Connector ILME CHO24 + CNM24	1	E00010
84	Cable-carrying chain fastening plate	1	234.015
85	Front attachment for cable-carrying chain	1	C00799
86	Base plate for electrical components	1	159.053
87	Electrical system	1	*
88	Brass cable connector	1	E00061
89	Main switch	1	*

* Refer to electric materials legend

4th TABLE exploded view "B" of machine structure

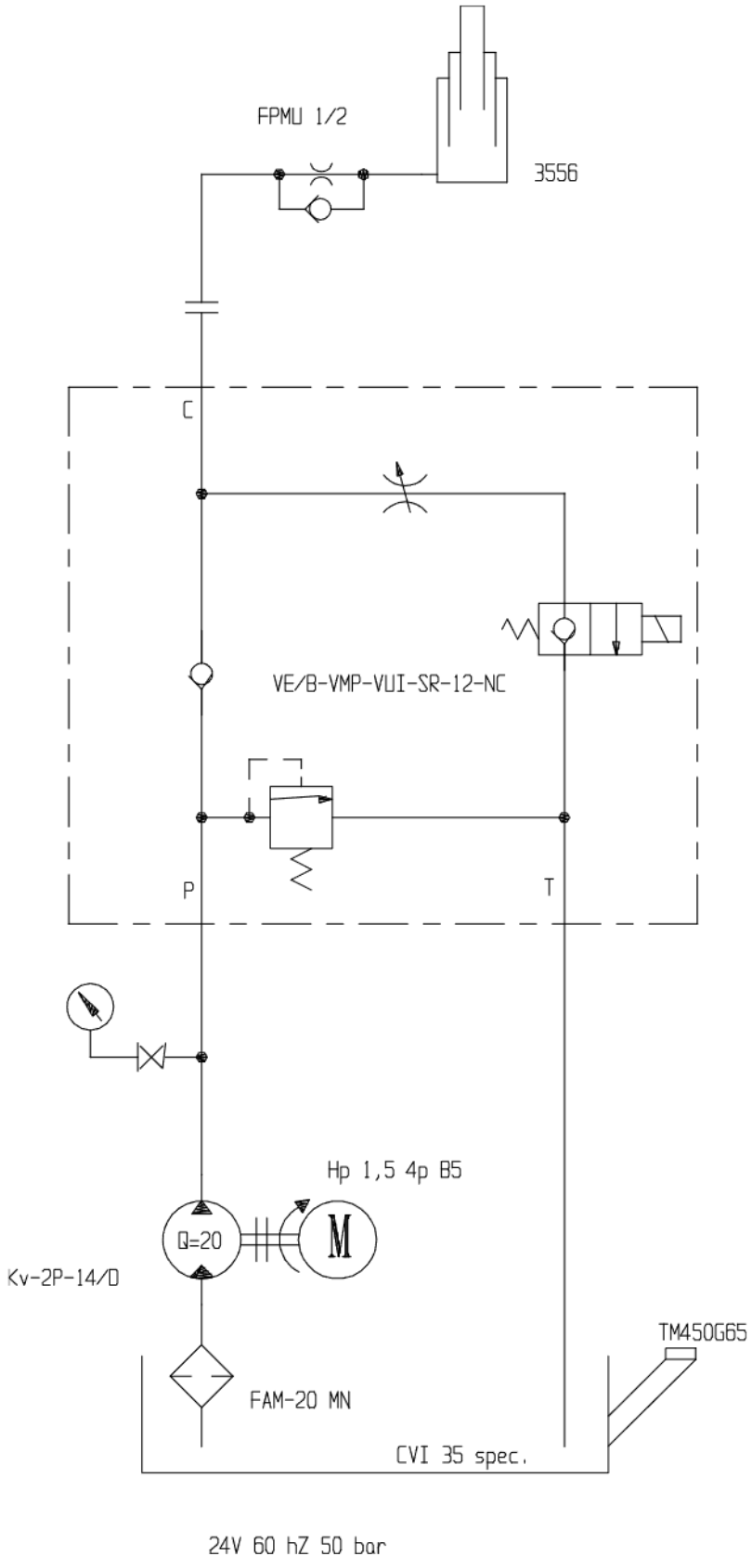
code: 290554



4th TABLE

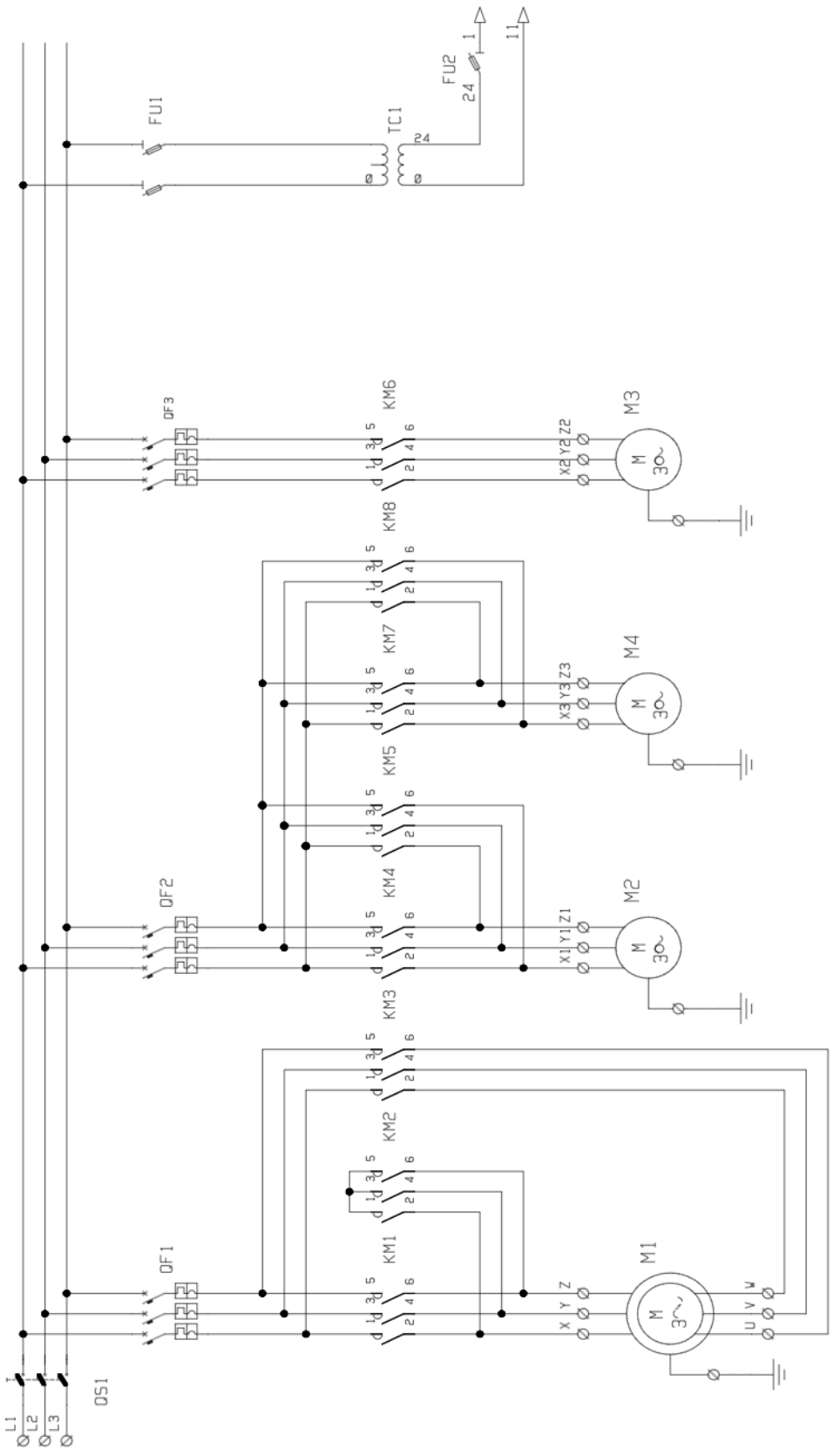
Pos.	Description	Qty	Code
1	Side column casing	2	208.052
2	Microswitch holding plate	1	234.019
3	Safety microswitch - discharge on one side only - discharge on two sides	 1 2	*
4	Base column	1	122.031
5	Column resting foot	4	C00829
6	Hydraulic connection M/M ½-½ straight	1	C00302
7	Oil flow regulator ½	1	C00724
8	Hydraulic connection M/F ½-½ 90°	1	C00725
9	Cylinder support	2	C00722
10	Hydraulic cylinder (high) (low)	1	C00344 C00904
11	Base plate	1	159.056
12	Machine resting foot	4	C00827
13	Body	1	285.043
14	Side base casing	2	208.050
15	Head cover	1	125.035
16	Side column casing	2	208.024
17	Right discharge guide rail	1	121.001
18	Side casing	1	208.002
19	Left discharge guide rail	1	121.000
20	Upper column (high) (low)	1	122.017 122.032
21	Column hinge	2	234.025
22	Rear column casing	1	159.041
23	Hydraulic connection M/M ½-½ 90°	1	C00868
24	Pipe l 1100 ½.	1	C00723
25	Motor Kw 1,5 UL 208 V 60 Hz	1	E00461
26	Hydraulic unit	1	C00716

5th TABLE: hydraulic wiring diagram



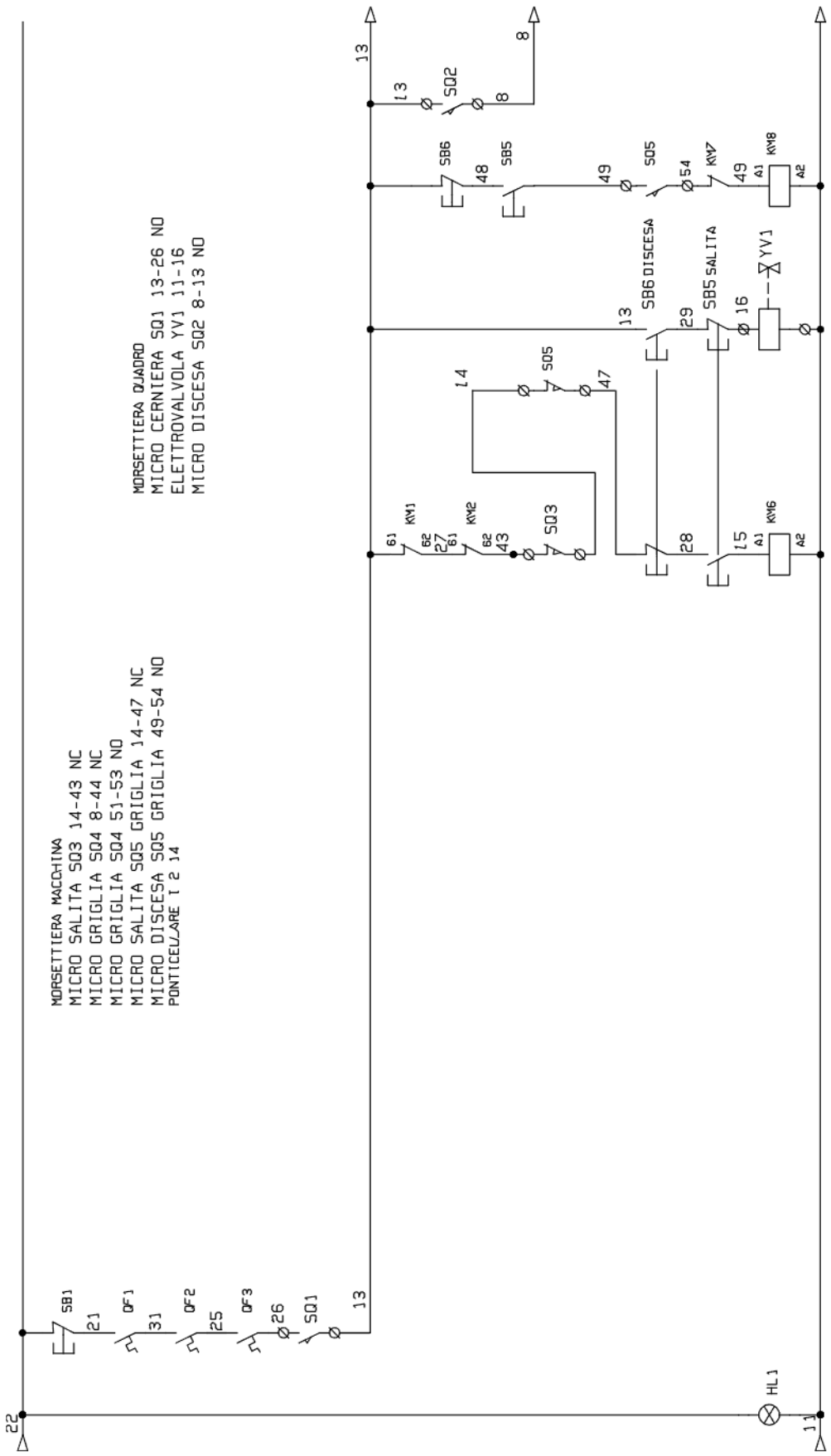
6th TABLE: Power wiring diagram for discharge on one side only

(316019)



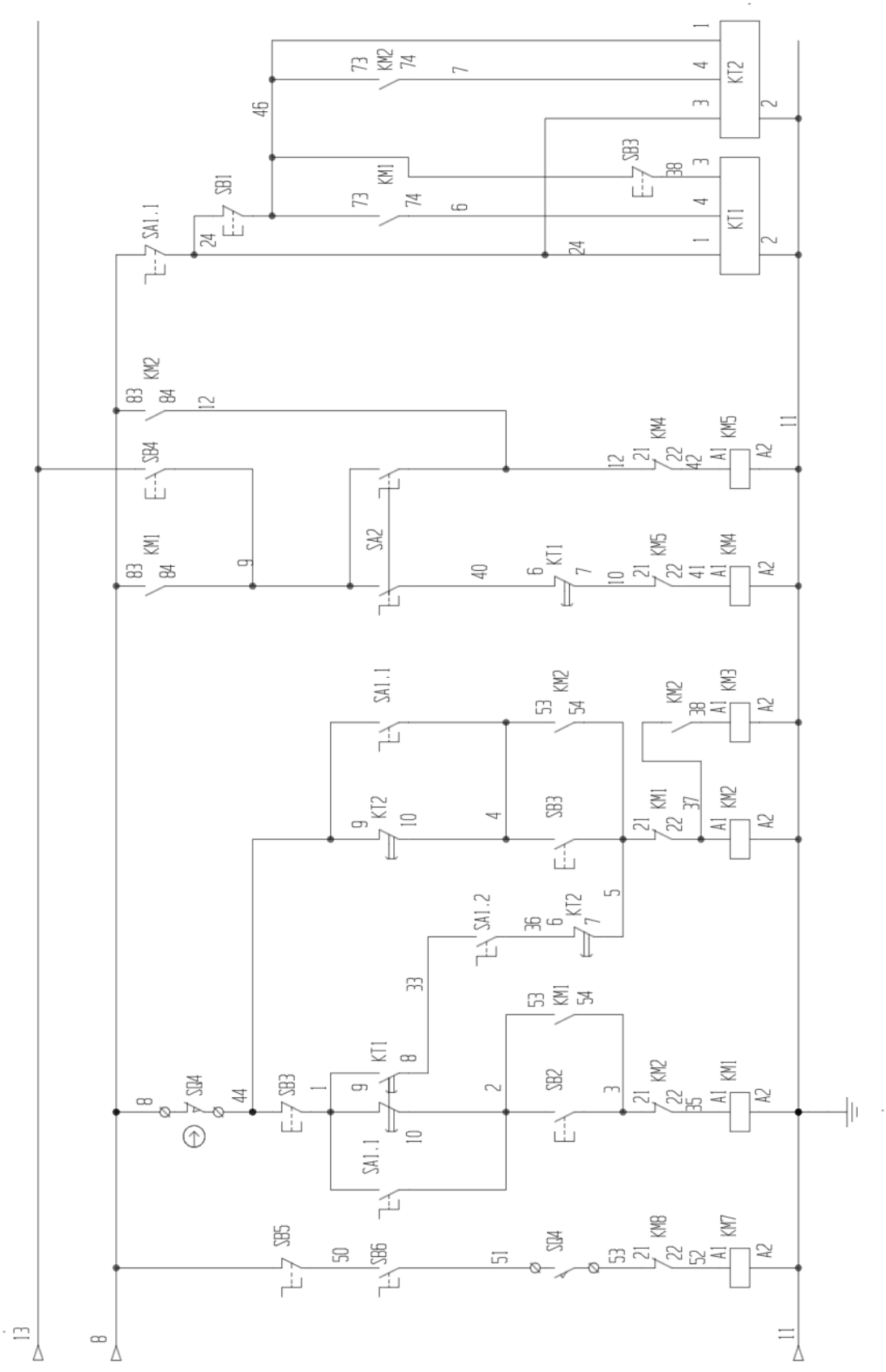
7th TABLE: Control wiring diagram A for discharge on one side only

(317024)



8th TABLE: Control wiring diagram B for discharge on one side only

317026B



ELECTRIC MATERIALS LEGEND FOR 160/200 AR WITH DISCHARGE ON ONE SIDE ONLY AND AUTOMATIC OPENING FOR BOWL COVER 208V 60 Hz SYSTEM

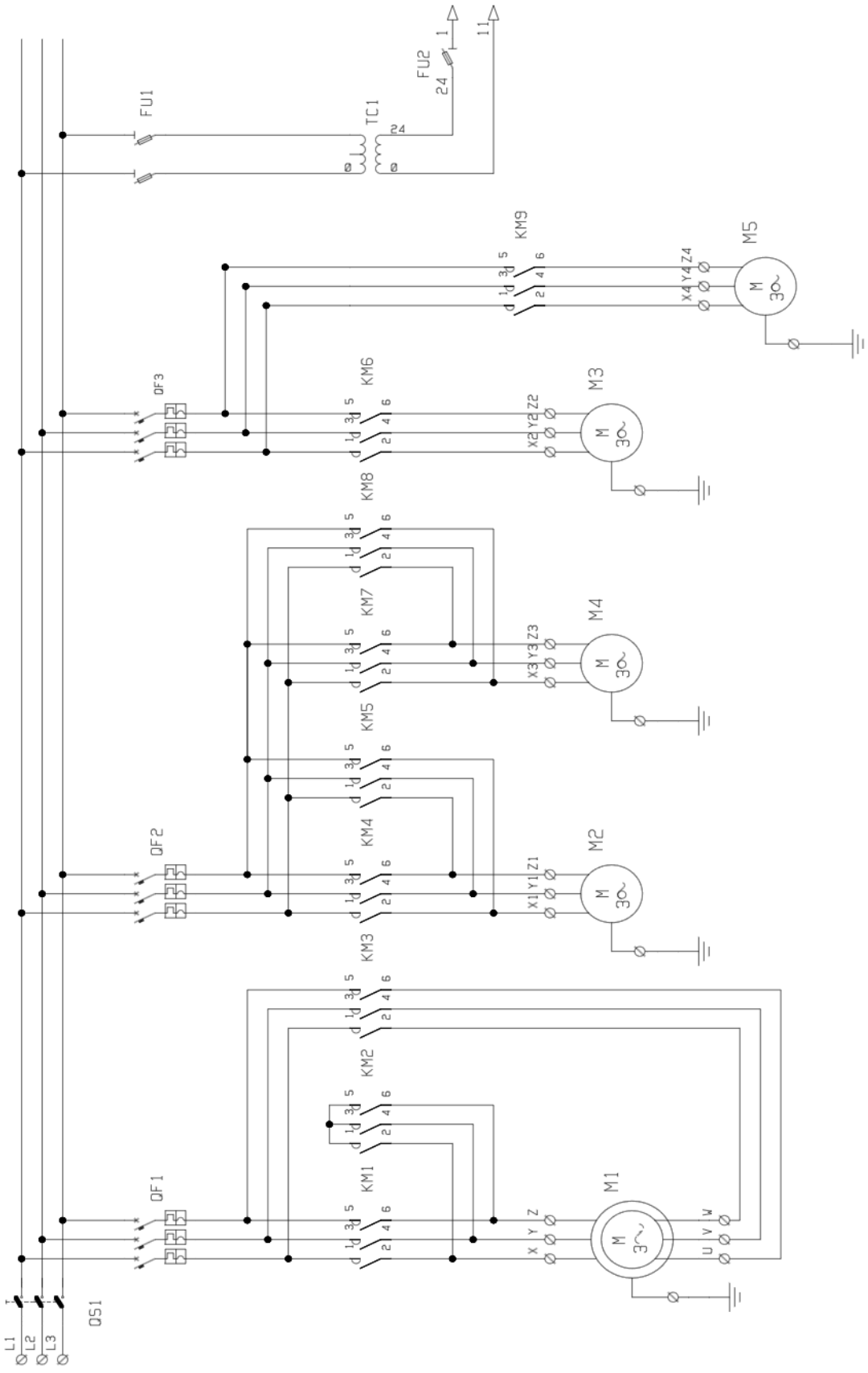
(code: 334062)

ID	Description	Qty	Code
BUILT-IN PANEL			
M1	Spiral tool motor 5,9/10,3 kW	1	
M2	Bowl motor 0,75 kW	1	
M3	Hydraulic pump motor 1,5 kW	1	
M4	Mobile bowl cover motor 0,25 kW		
QS1	Main switch SONTHEIMER NLT 63/3V/Z33	1	
TC1	Transformer CED 300 VA 0.195.208.220 0.24	1	
KM1	Contactor TELEMEC. LC1 D40B7 TELEMEC. LAD N31 or LAD N20 or LAD N40	1	
KM2	Contactor TELEMEC. LC1 D25B7 TELEMEC. LAD N31 or LAD N20 or LAD N40	1	
KM3	Contactor TELEMEC. LC1 D50B7	1	
KM4	Contactor TELEMEC. LC1 D09B7	1	
KM5	Contactor TELEMEC. LC1 D09B7	1	
KM6	Contactor TELEMEC. LC1 D09B7	1	
KM7	Contactor TELEMEC. LC1 D09B7	1	
KM8	Contactor TELEMEC. LC1 D09B7	1	
QF1	Thermal overload device TELEMEC. GV3 ME63	1	
	TELEMEC. GV3 A01	1	
QF2	Thermal overload device TELEMEC. GV2 ME10	1	
	TELEMEC. GV AN11	1	
QF3	Thermal overload device TELEMEC. GV2 ME14	1	
	TELEMEC. GV AN11	1	
FU1	Fuse BUSS 2A NON	2	
FU2	Fuse BUSS 10A NON	1	
-	Fuse holder BUSS H25030-3S	1	
J1	24-pole connector ILME CHI24+CNF24 or HARTING-SCAME 9300240301+9330242701 or WEIDMULLER HDC-HB-24-AVU + HDC-HE-24BS	1	
CONTROL PANEL			
KT1	1st speed timer SITEC scale 0-10	1	
KT2	2nd speed timer SITEC scale 0-20	1	
SB1	Emergency push button TELEMECANIQUE ZB5-AS844 + ZB5-AZ102	1	
SB2	1st speed push button TELEMECANIQUE ZB5-AA131 + ZB5-AZ103 + ZBE-102	1	
SB3	2nd speed push button TELEMECANIQUE ZB5-AA136 + ZB5-AZ101 + ZBE-102	1	
SB4	Jog bowl push button TELEMECANIQUE ZB5-AA345 + ZB5-AZ101 + 2*ZBE-102	1	
SB5	Ascent push button TELEMECANIQUE ZB5-AA335 + ZB5-AZ101 + ZBE-101 + 2*ZBE-102	1	

ID	Description	Qty	Code
CONTROL PANEL (cont.)			
SB6	Descent push button TELEMECANIQUE ZB5-AA335 + ZB5-AZ101 + ZBE-101 + 2*ZBE-102	1	
SA1	3-position selector TELEMECANIQUE ZB5-AD3 + ZB5-AZ103	1	
SA2	3-position selector TELEMECANIQUE ZB5-AD3 + ZB5-AZ101 + 2*ZBE-102 + 2*ZBE-101	1	
HL1	Power On light TELEMECANIQUE ZB5-AV013 + ZB5-AVB1	1	
J1	24-pole connector ILME CHO24+CNM24 or HARTING-SCAME 9340100501+9330242601 or WEIDMULLER HDC-HB-24-TSVU1/21 + HDC-HE-24SS	1	
OTHER COMPONENTS			
SQ1-SQ5	Limit switch TELEMEC. XCKN2103G11 or XCKN2103P20	1	
YV1	Solenoid valve	1	
	Terminal blocks: WK 4/U, WKN 16/U		
	Earth/Ground terminal blocks: WK 4 SL/U, WKN 16 SL/U		
	Protective push button covers TELEMECANIQUE ZBPO	5	

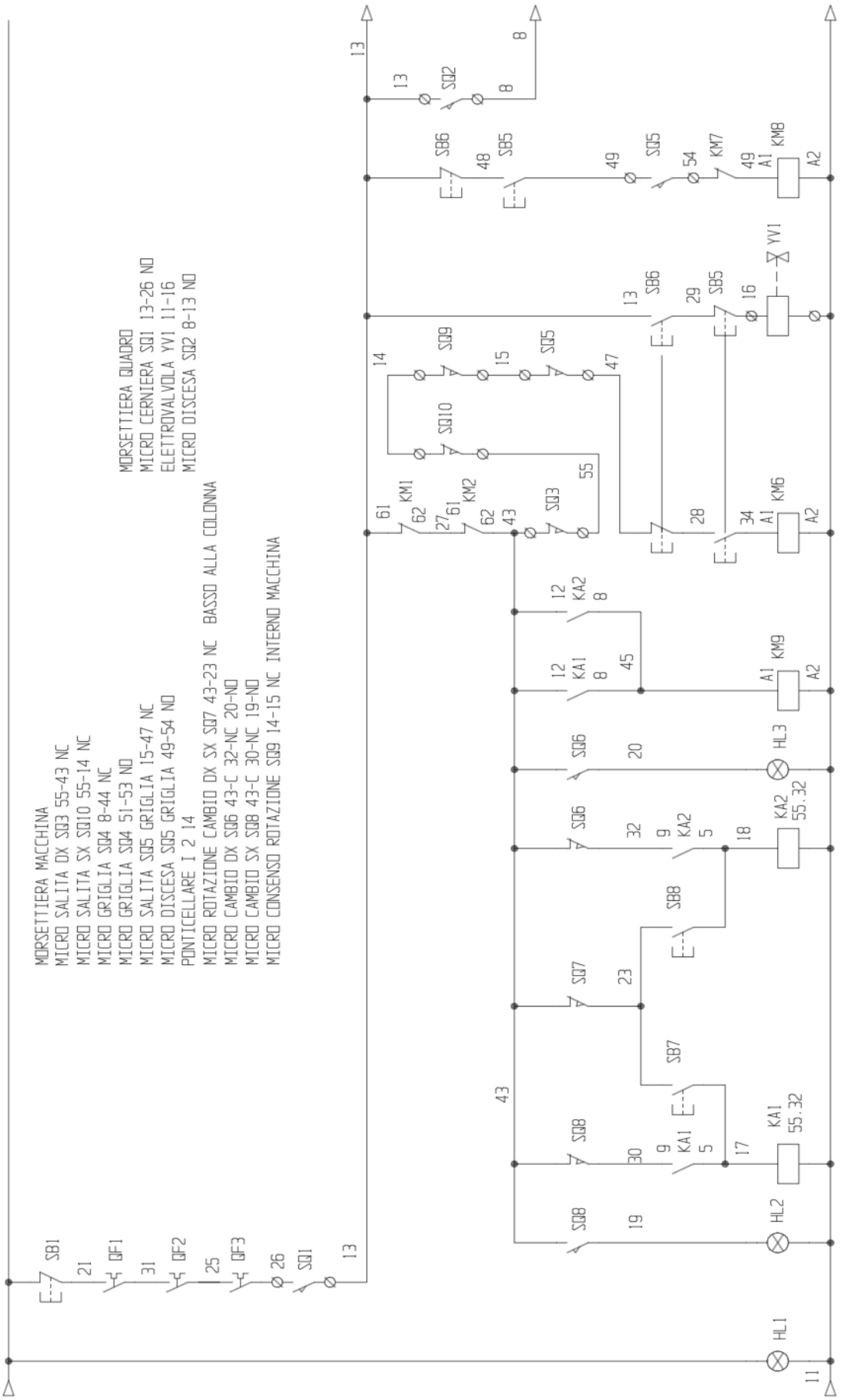
9th TABLE: Power wiring diagram for discharge on two sides

(316018)



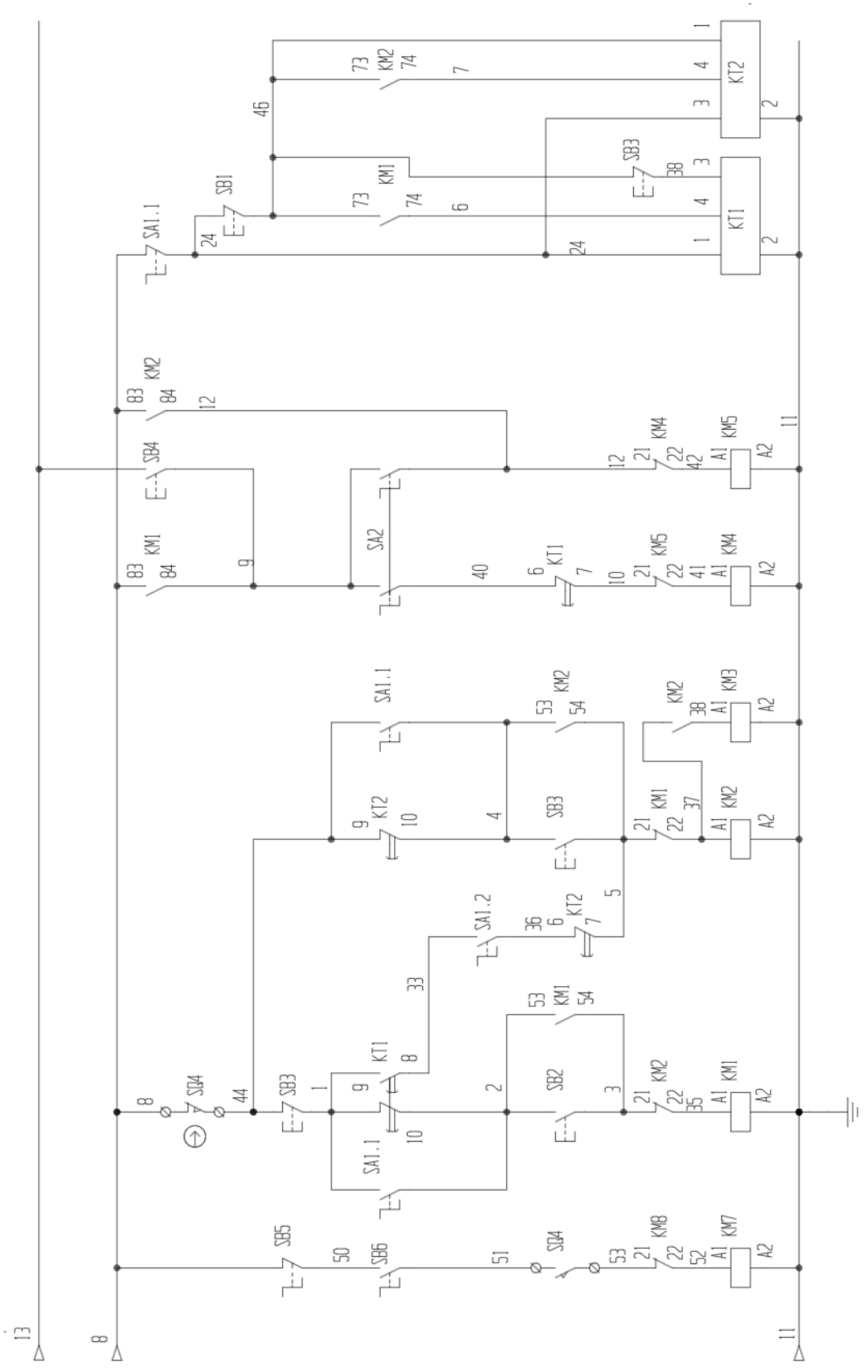
10th TABLE: Control wiring diagram A for discharge on two sides

(317025)



11th TABLE: Control wiring diagram B for discharge on two sides

(317026B)



ELECTRIC MATERIALS LEGEND FOR 160/200 AR WITH DISCHARGE ON TWO SIDES AND AUTOMATIC OPENING FOR BOWL COVER
208V 60 Hz SYSTEM

(code: 334071)

ID	Description	Qty	Code
BUILT-IN PANEL			
M1	Spiral tool motor 5,9/10,3 kW	1	*
M2	Bowl motor 0,75 kW	1	*
M3	Hydraulic pump motor 1,5 kW	1	*
M4	Mobile bowl cover motor 0,25 kW		*
M5	Discharge side motor 0,25 kW		*
QS1	Main switch SONTHEIMER NLT 63/3V/Z33	1	
TC1	Transformer CED 300 VA 0.195.208.220 0.24	1	
KM1	Contactor TELEMEC. LC1 D40B7 TELEMEC. LAD N31 or LAD N20 or LAD N40	1	
KM2	Contactor TELEMEC. LC1 D25B7 TELEMEC. LAD N31 or LAD N20 or LAD N40	1	
KM3	Contactor TELEMEC. LC1 D50B7	1	
KM4	Contactor TELEMEC. LC1 D09B7	1	
KM5	Contactor TELEMEC. LC1 D09B7	1	
KM6	Contactor TELEMEC. LC1 D09B7	1	
KM7	Contactor TELEMEC. LC1 D09B7	1	
KM8	Contactor TELEMEC. LC1 D09B7	1	
KM9	Contactor TELEMEC. LC1 D09B7	1	
QF1	Thermal overload device TELEMEC. GV3 ME63	1	
	TELEMEC. GV3 A01	1	
QF2	Thermal overload device TELEMEC. GV2 ME10	1	
	TELEMEC. GV AN11	1	
QF3	Thermal overload device TELEMEC. GV2 ME14	1	
	TELEMEC. GV AN11	1	
FU1	Fuse BUSS 2A NON	2	
FU2	Fuse BUSS 10A NON	1	
-	Fuse holder BUSS H25030-3S	1	
J1	24-pole connector ILME CHI24+CNF24 or HARTING-SCAME 9300240301+9330242701 or WEIDMULLER HDC-HB-24-AVU + HDC-HE-24BS	1	
J2	6-pole connector ILME CHI06 + CNF06	1	
CONTROL PANEL			
KT1	1st speed timer SITEC scale 0-10	1	
KT2	2nd speed timer SITEC scale 0-20	1	
SB1	Emergency push button TELEMECANIQUE ZB5-AS844 + ZB5-AZ102	1	
SB2	1st speed push button TELEMECANIQUE ZB5-AA131 + ZB5-AZ103 + ZBE-102	1	
SB3	2nd speed push button TELEMECANIQUE ZB5-AA136 + ZB5-AZ101 + ZBE-102	1	
SB4	Jog bowl push button TELEMECANIQUE ZB5-AA345 + ZB5-AZ101 + 2*ZBE-102	1	

ID	Description	Qty	Code
CONTROL PANEL (cont.)			
SB5	Ascent push button TELEMECANIQUE ZB5-AA335 + ZB5-AZ101 + ZBE-101 + 2*ZBE-102	1	
SB6	Descent push button TELEMECANIQUE ZB5-AA335 + ZB5-AZ101 + ZBE-101 + 2*ZBE-102	1	
SB7 + HL2	Right discharge button TELEMECANIQUE ZB5-AW333 + ZB5-AVB3+ ZBE-101	1	
SB8 + HL3	Left discharge button TELEMECANIQUE ZB5-AW333 + ZB5-AVB3 + ZBE-101		
SA1	3-position selector TELEMECANIQUE ZB5-AD3 + ZB5-AZ103	1	
SA2	3-position selector TELEMECANIQUE ZB5-AD3 + ZB5-AZ101 + 2*ZBE-102 + 2*ZBE-101	1	
HL1	Power On light TELEMECANIQUE ZB5-AV013 + ZB5-AVB1	1	
KA1	Relay FINDER 55.32 24VAC + socket 94.72 or OMRON MY2 + socket PYF08-A	1	
KA2	Relay FINDER 55.32 24VAC + socket 94.72 or OMRON MY2 + socket PYF08-A	1	
J1	24-pole connector ILME CHO24+CNM24 or HARTING-SCAME 9340100501+9330242601 or WEIDMULLER HDC-HB-24-TSVU1/21 + HDC-HE-24SS	1	
J2	6-pole connector ILME CHO06+CNM06	1	
OTHER COMPONENTS			
SQ1-SQ5, SQ7, SQ9-SQ10	Limit switch TELEMEC. XCKN2103G11 or XCKN2103P20	1	
SQ6, SQ8	Limit switch Pizzato MS20 (250V, 5A (AC15))	1	
YV1	Solenoid valve	1	
	Terminal blocks: WK 4/U, WKN 16/U		
	Earth/Ground terminal blocks: WK 4 SL/U, WKN 16 SL/U		
	Protective push button covers TELEMECANIQUE ZBPO	7	

N.B.
(i) The technical data is not binding. The data can be changed in order to improve the product.
(ii) Drawings and illustrations are only indicative.

16 WARNING AND SAFETY LABELS

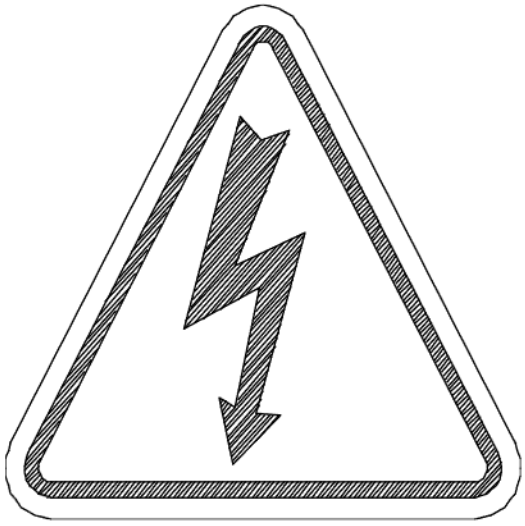
LABEL:

LABEL DESCRIPTION:



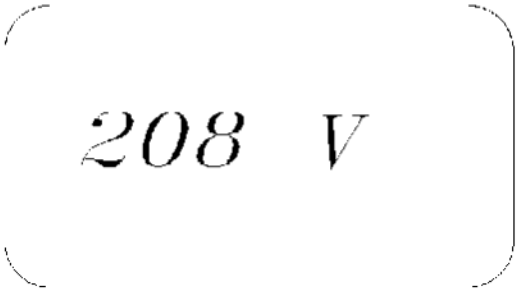
WARNING !

Disconnect power
before servicing



DANGER !

Live



WARNING !

Machine voltage