

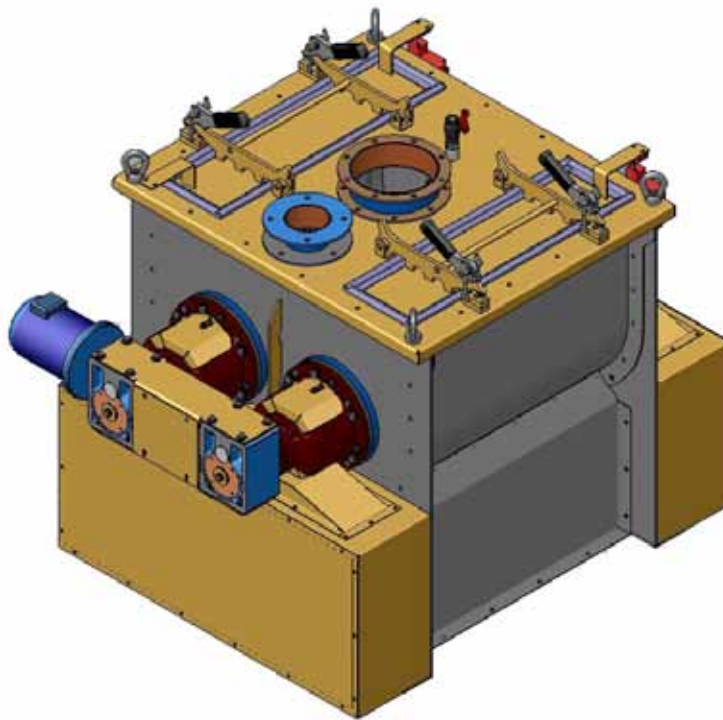


WTS

Twin Shaft Paddle Mixer WTS

2

INSTALLATION OPERATION AND MAINTENANCE



Manual No. MAP.169.--.M.EN Issue: A Latest Update: 03/11

ORIGINAL INSTRUCTIONS IN ENGLISH

WAMGROUP S.p.A.
Via Cavour, 338
41030 Ponte Motta
Cavezzo (MO) - ITALY

☎ + 39 / 0535 / 618111
fax + 39 / 0535 / 618226
e-mail info@wamgroup.com
internet www.wamgroup.com





WAM®

All the products described in this catalogue are manufactured according to **WAMGROUP S.p.A. Quality System procedures**. The Company's Quality System, certified in July 1994 according to International Standards **UNI EN ISO 9002** and extended to the latest release of **UNI EN ISO 9001**, ensures that the entire production process, starting from the processing of the order to the technical service after delivery, is carried out in a controlled manner that guarantees the quality standard of the product.

**This publication cancels and replaces any previous edition and revision.
We reserve the right to implement modifications without notice.
This catalogue cannot be reproduced, even partially, without prior consent.**

SUMMARY

1.0	GENERAL INFORMATION	1
1.1	Scope of the Manual	1
1.2	Symbols	2
1.3	Glossary and terminology	4
1.4	Manufacturer's data and identification of product	5
1.5	Request for assistance	6
1.6	Warranty	6
1.7	Exclusion of responsibilities	6
2.0	INFORMATION REGARDING SAFETY	9
2.1	General safety prescriptions	9
2.2	Safety prescriptions for transport and handling	9
2.3	Safety prescriptions for installation	10
2.4	Safety prescriptions for use and operation	10
2.5	Safety prescriptions for maintenance and replacement of components	10
3.0	TECHNICAL INFORMATION	13
3.1	General description of product	13
3.2	Main components	14
3.3	Operating principle	16
3.4	Permitted use	17
3.5	Improper use not permitted	17
3.6	Noise level	18
3.7	Environmental operating limits	18
3.8	Overall dimensions and technical features	18
3.9	Safety and information signs	19
3.10	Safety devices	20
3.11	Residual risks	22
4.0	INFORMATION REGARDING HANDLING AND TRANSPORT	26
4.1	Type of packing	26
4.2	Factory tests	27
4.3	Reception	27
4.4	Storing the machine	27
4.5	Dimensions and weight of packed machine	28
4.6	Lifting and unloading methods	28
4.7	Handling the machine	28
4.8	Lifting points	29
4.9	Unpacking and disposal of packing material	29

5.0	INSTALLATION AND FIXING	31
5.1	Recommendations for installation	31
5.2	Checking the blocking system of the key locking device with solenoid.....	38
5.3	Connecting ports	39
5.4	Venting with a filter bag	39
5.5	Connecting the heat exchange unit lines (jacketed version).....	43
5.6	Compressed air characteristics	45
5.7	Compressed air supply for discharge port	49
5.8	Electrical connection	49
5.9	Important points the electric installer must observe	50
5.10	Controls	50
5.11	Testing	50
6.0	INFORMATION REGARDING USE	53
6.1	Production Start-up	53
6.2	Clearing the mixer following a blockage.....	53
6.3	Using the machine	54
6.4	How to fill with product	54
6.5	Making the first fills.....	55
6.6	Accidental mixer shutdown	55
6.7	Heat exchange (jacketed mixers).....	56
6.8	Adding additives	57
6.9	How to discharge the product	57
6.10	Liquid injecting device (option).....	58
6.11	Sample draw	60
6.12	Prolonged machine shutdown after assembly.....	61
6.13	Possible reuse after long shutdowns	61
7.0	INFORMATION REGARDING MAINTENANCE	63
7.1	Maintenance.....	63
7.2	Tests and checks to be made on-site	64
7.3	Periodic checks	65
7.4	Cleaning the mixer	66
7.5	Tightening packing in end bearings.....	67
7.6	Tightening the drive belts (found with CI).....	67

8.0	REPLACEMENT OF PARTS.....	70
8.1	Safety recommendations for replacement	70
8.2	Checking parts subject to wear on the flexible coupling	70
8.3	Rotor shaft Bearings	71
8.4	Drive motor side mounting	71
8.5	Installing the end bearing assembly.....	72
8.6	End bearing assembly on side opposite drive motor	74
8.7	Changing the packing	75
8.8	Changing the packing on the end bearing assemblies type "SW"	76
8.9	Sensor adjustment (electro-pneumatic drive)	77
8.10	Adjustment and replacement of the outlet DOOR gasket (electro-pneumatic drive).....	79
8.11	Greasing layout	81
8.12	Greasing.....	83
8.13	Drive lubrication	84
8.14	Scheduled overhaul	85
8.15	Sample draw maintenance (option)	85
8.16	Changing the piston on the manual operated sample draw.....	86
8.17	Changing the piston on the pneumatic sample draw	87
8.18	Cleaning procedure for the liquid injection suction nozzle from the inlet liquid injection lance	87
8.19	Dismantling and taking out of service	88
9.0	INFORMATION REGARDING FAULTS	90
9.1	Trouble-shooting	90
9.2	Check-list in case of fault	91
10.0	TECHNICAL DATA.....	94
11.0	SPARE PARTS	111
A	ATTACHMENTS.....	119
A1	Nuts and bolts tightening torque Table	119
A2	Lubricants and sealants Table	120
A3	Gear box lubricants Table	121
A4	Declaration of Incorporation	122

1.1 Scope of the Manual

This Manual is prepared by the Manufacturer to provide the operating technical information for installation, operation and maintenance of the equipment concerned.

The Manual, which is an integral part of the equipment concerned, must be preserved throughout the life of the equipment concerned in a known easily accessible place, available for consultation whenever required.

If the Manual is lost, damaged or becomes illegible, contact the Manufacturer for a copy specifying the serial number of the mixer.

If the equipment concerned changes ownership, the Manual must be handed over to the new owner as part of the equipment supply.

The Manual is meant for specialist technical personnel appointed and authorized by the Manufacturer, owner and installer to act on the equipment concerned for which specific technical skills in the sector concerned are necessary (electrical, mechanical, etc.).

The illustrations may differ from the actual structure of the equipment concerned but do not interfere with the explanation of the operations.

In case of doubt, contact the Manufacturer for explanations.

The Manufacturer reserves the right to make changes to the Manual without the obligation to provide prior notification, except in case of modifications concerning the safety level.

The technical information contained in this Instruction manual is the property of the Manufacturer and therefore must be considered as confidential.

It is forbidden to use the Manual for purposes other than those strictly linked to the operation and maintenance of the equipment concerned.

This information is provided by the Manufacturer in the original language (English) and can be translated into other languages to satisfy legislative and/or commercial requirements.

1.2 Symbols

To highlight certain parts of the text, for purposes of safety or to indicate important information, certain symbols are used, the meaning of which is described below.

It is important to comply with and scrupulously follow the information highlighted by the symbols.



Danger - Attention

Indicates situations of serious danger which, if ignored, can be risky for the health and safety of persons.



Prudence - Caution








Indicates that appropriate behaviour must be adopted to avoid posing risk for the health and safety of persons and avoid causing economic damage.



Important

Indicates particularly important technical information which must not be ignored.

List of safety and information symbols

Symbol representation	Symbol description
	Danger sign: indicates danger of electric shock because of the presence of live components inside the junction box.
	Obligation: read this Manual before carrying out any action on the equipment concerned.
	Forbidden: indicates that it is forbidden to lubricate or adjust moving parts.
	Danger: indicates danger of serious injury to limbs if the screw or flight is exposed. Before opening the hatch isolate the equipment concerned from the electrical energy sources.
	Information: indicates the direction of rotation of the electric motor.
	Obligation: indicates the hooking points for lifting each section of the equipment concerned.
	It is strictly forbidden to open the port while the mixer operates.

1.3 Glossary and terminology

Operator: person appropriately trained and authorized by the Production Manager for commissioning the equipment concerned and carrying out routine maintenance.

Installer: organization with specialized technicians and appropriate equipment for carrying out risk-free installation and extraordinary maintenance.

Specialist technician: person responsible for and authorized by the Manufacturer, owner or installer to act on the equipment; must have specific technical skills depending on the sector concerned (electrical, mechanical, etc).. The specialist technician, in addition to being familiar with the working of the equipment concerned, must be familiar with the working of the plant or equipment on which the equipment concerned is installed.

Routine maintenance: includes all the actions necessary to keep the equipment in good working conditions, to ensure greater operating durability and to keep the safety requisites constant.

Extraordinary maintenance: all the actions meant to keep the equipment in perfect working order.

Setting in safety conditions: all the precautions the authorized personnel must adopt before acting on the equipment concerned.

The precautions are listed below.

- Make sure the equipment concerned is disconnected from all the energy sources and appropriate devices are used to prevent these from being reconnected accidentally.
- Make sure all the moving parts have come to a complete stop.
- Make sure the temperature of the equipment concerned is such that it does not burn.
- Provide appropriate lighting in the area around the operations.
- Wait for the powder inside the equipment concerned to settle down completely.

1.4 Manufacturer's data and identification of product



Important

**Do not change the data on the identification plate.
Keep the ID plates clean, intact and legible as regards the data they contain.
If the ID plate is damaged or is no longer legible (even just one informative element on it) contact the Manufacturer for a new ID plate and replace.**

The ID plates shown identify the equipment concerned and its main components.
The plates show the reference necessary for operating safety.

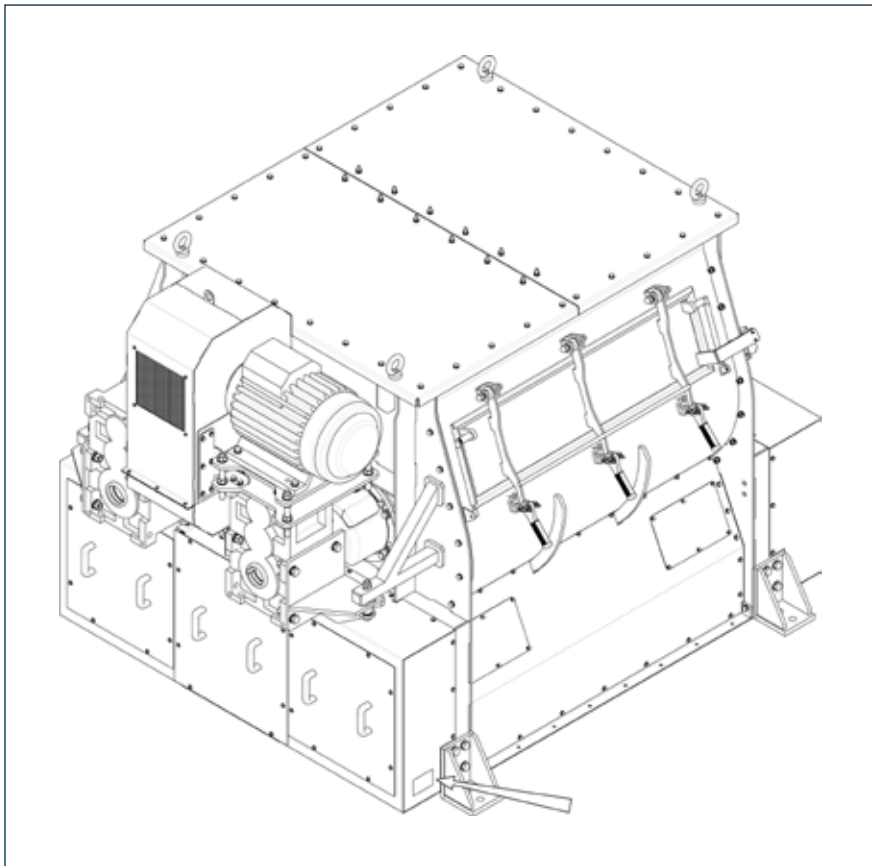
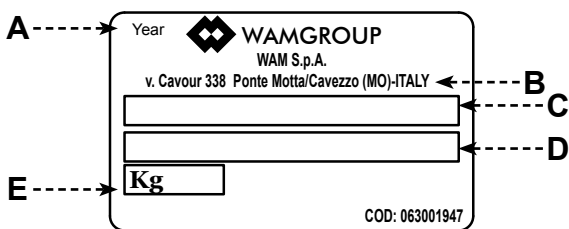
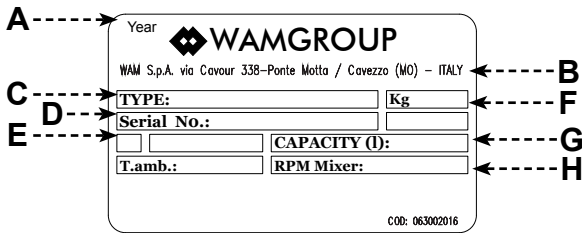


Fig. 1



1 - Gear box identification plate.

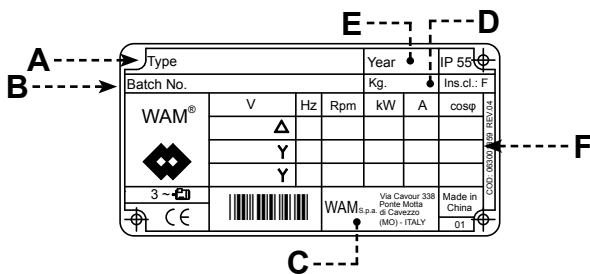
- A) Year of manufacture
- B) Manufacturer's identification
- C) Identification of gear box
- D) Production batch
- E) Weight of gear box



2 - Identification plate of mixer.

The plate is affixed on the mixer or on each section if there are a number of sections.

- A) Year of manufacture
- B) Manufacturer's identification
- C) Type of mixer
- D) Serial No.
- E) Progressive number of section
- F) Weight of the mixer
- G) Mixer holding capacity in liters
- H) Rotation speed of mixer rotor shaft (rpm)



3 - Motor identification tag

- A) Electric motor identification
- B) Production batch
- C) Manufacturer's identification
- D) Weight of electric motor
- E) Year of manufacture
- F) Technical data

1.5 Request for assistance

For all technical assistance, contact the Manufacturer's dealers network.
For all requests, provide the equipment identification data, the type of problem encountered and all other information which could be useful for identifying the problem.

1.6 Warranty

The conditions for validity and applicability of the warranty are specified in the sales contract.

1.7 Exclusion of responsibilities

The equipment is delivered according to the specifications indicated by the Buyer in the order phase and the conditions valid at the time of purchase.

The Manufacturer shall not accept responsibility for safety of persons or objects and failure in the working of the product if the operations involved in loading/unloading from trucks, transport, positioning at the site, use, repairs, maintenance, etc. are not carried out in compliance with the warnings described in this Manual, and in accordance with the national legislation in force.

Likewise, the manufacturer shall not accept any responsibility if the equipment concerned is used:

- improperly;
- by unauthorized persons and/or persons not sufficiently trained for installation, operation and maintenance;

1.0 GENERAL INFORMATION

-
- with modifications made to the original configuration without the Manufacturer's permission;
 - with spare parts that are not genuine or are not specific for the model;
 - without maintenance;
 - non conforming to the regulatory standards and national or local legislation on the matter of occupational safety;
 - non conforming to the recommendations in this Manual or on the warning and danger plates applied on the equipment.

2.1 General safety prescriptions

Read the Instruction Manual carefully, and strictly follow the instructions it contains, especially those regarding safety.

Most accidents at the workplace are caused by negligence, failure to follow the most elementary safety regulations and incorrect and improper use of tools and equipment.

Accidents can be prevented and avoided by taking due care, using suitable equipment and adopting adequate preventive measures.

Apply and comply with the standards in force regarding workplace hygiene and safety.

The personnel trained for and authorized for the operations must have the psychological-physical requisites, experience in the sector concerned and the necessary technical skills for carrying out the operations assigned to them.

All workers involved in any kind of operation must be prepared, trained, informed as regards the risks and the behaviour to be adopted.

Pay attention to the meaning of the notices applied on the equipment, keep these legible and respect the information indicated.

Use instruments, equipment and tools that have been approved and are intrinsically safe, and cannot alter the safety level of the operations or damage the mixer during installation, use and maintenance.

Modifications to the equipment concerned components should not be made for any reason whatsoever, without the Manufacturer's permission.

2.2 Safety prescriptions for transport and handling

Carry out all the handling and transport operations in accordance with the procedures and instructions shown on the packing and in the Manual supplied.

All the operations must be performed by qualified authorized personnel.

Those authorized to carry out the handling operations must have the capabilities and experience required to adopt all the necessary measures to guarantee one's own safety and the safety of persons directly involved in the operations.

The choice of the features of the lifting and handling means (crane, travelling crane, forklift truck, etc.) must take into account the weight to be handled, the dimensions and the gripping points.

During the lifting phases, use only accessories such as eyebolts, hooks, shackles, spring hooks, belts, slings, chains, ropes etc, that have been certified and are suitable for the weight to be lifted.

During the handling phases, respect the prescriptions applicable for handling loads.

Keep the position of the equipment concerned or the sections and the loose components horizontal, keep the load low and make all the necessary movements gently.

Avoid sudden jerks, dangerous oscillations and rotations, accompanying the movements manually and place the load gently on the ground.

2.3 Safety prescriptions for installation

Before starting with installation, a "Safety Plan" must be implemented to safeguard the personnel directly involved and those who carry out operations in the surrounding area.

All the laws must be strictly applied, especially those concerning workplace safety.

Before proceeding with installation operations, mark off the work area to prevent access by unauthorized persons.

The electrical connections must be made in compliance with the standards and laws in force.

The person in charge of making the electrical connections must, before testing, check to ensure the required standards and laws are respected.

2.4 Safety prescriptions for use and operation

Do not tamper with the equipment concerned using any kind of device, to obtain performances different from those of the design.

All unauthorized changes will affect the health of persons, thereby affecting the integrity of the filter.

The operators must exclusively wear protective clothing and must be equipped with appropriate personal protection equipment for carrying out the operations and as required by the safety and accident prevention standards.

Before use, make sure all the safety devices are installed and in correct working order.

During operations, prevent access to the work area by unauthorized persons.

Remove all obstacles or sources of danger from the work area.

2.5 Safety prescriptions for maintenance and replacement of components



Danger - Attention

Before carrying out any operation on the equipment concerned, make sure it is switched off and disconnected from all energy sources and use suitable devices to prevent the possibility of the energy sources being activated accidentally.

Maintain the equipment concerned in the conditions of utmost efficiency by compliance with the maintenance schedule specified by the Manufacturer.

Good maintenance will not only preserve the functional features and essential safety features over time, but will also make it possible to extend the working life of the equipment concerned and achieve the best possible performance.

Strictly follow the procedures indicated in the Manual, especially that concerning safety.

2.0 INFORMATION REGARDING SAFETY

**Make sure all the safety devices are active and in working order.
Mark off the work area in such a manner as to prevent access by unauthorized persons.**

Replace the worn and damaged components exclusively with original spare parts, for which the safety, reliability and interchangeability have been established with certainty.

Apart from invalidation of the warranty, the Manufacturer declines all responsibility for damage to objects and harm to persons deriving from the use of spare parts that are not genuine or due to modifications made during repairs without express written authorization.

Use the oils and lubricants recommended by the Manufacturer.

Do not dump polluting material (oils, greases, paints, plastic, etc.) in the environment, but carry out differential disposal depending on the chemical composition of the various products in compliance with the legislation in force.

On completion of maintenance or replacement operations, before resuming production, check to make sure no foreign bodies (rags, tools, etc) have been left inside the equipment concerned.

3.1 General description of product

The WTS Twin Shaft Paddle Mixer is a Batch Mixer with two parallel drums each with paddles which promote a homogeneous mix independent of particle size and density, with the added efficiency of counter rotation of the overlapping paddles.

The design gives gentle low shear forces but allows a rapid mix with low energy consumption.

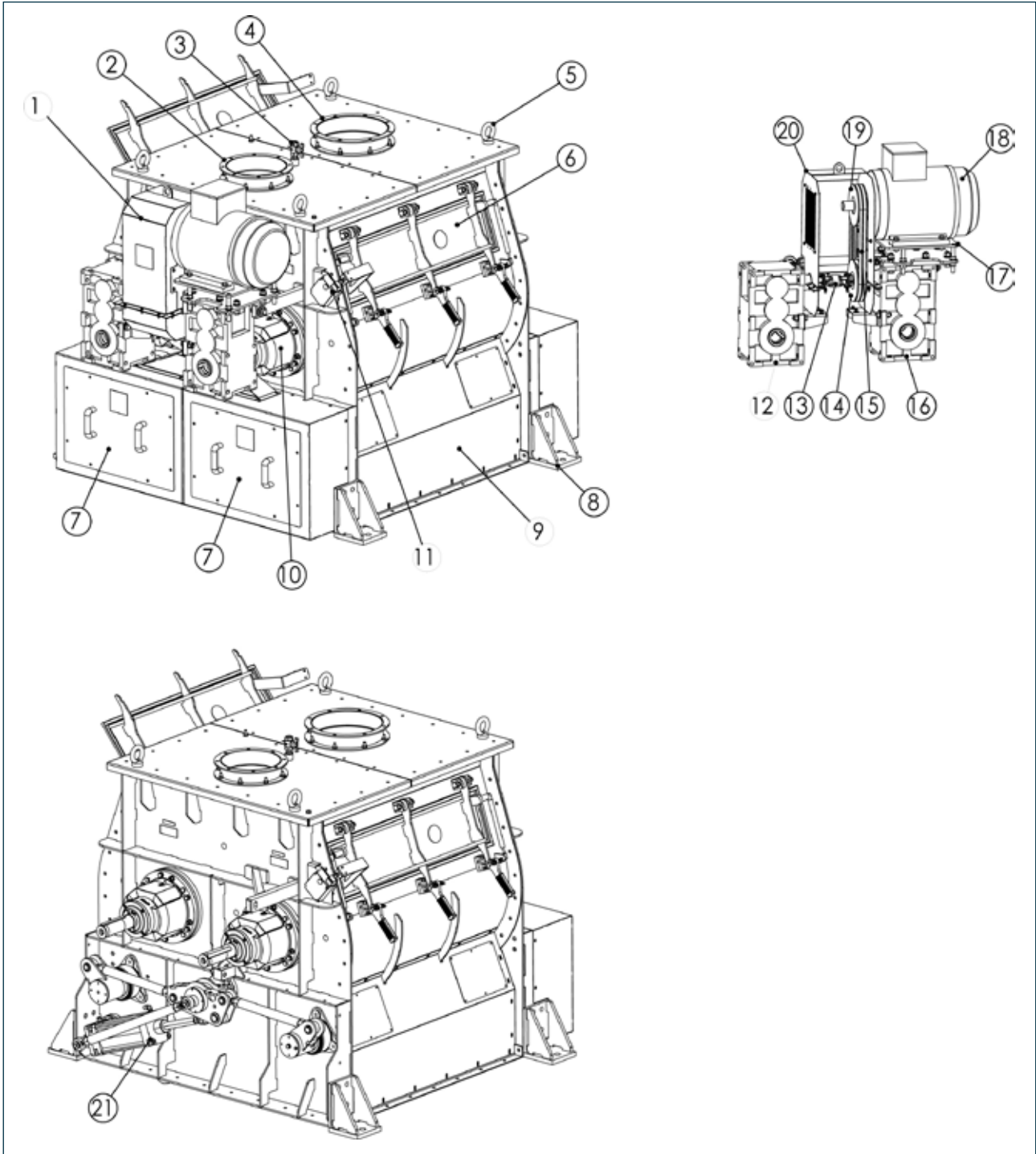
The intensive mixing action guarantees also with sensitive and easy breakable products an optimum process, without forming fines.

The equipment is provided with two parallel drums each with counter-rotating shafts. Both drums are supplied with paddles (their number depends on the dimension of the mixer).

This paddles can be welded to the drum (size 120-500) or bolted to the related shafts (size beyond 1000).

The Mixer can be started under full load.

3.2 Main components

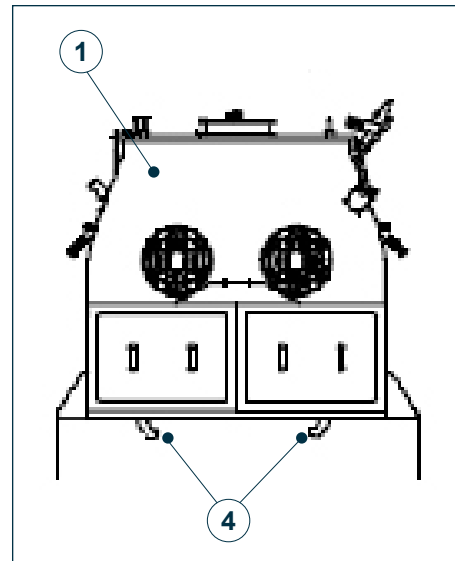
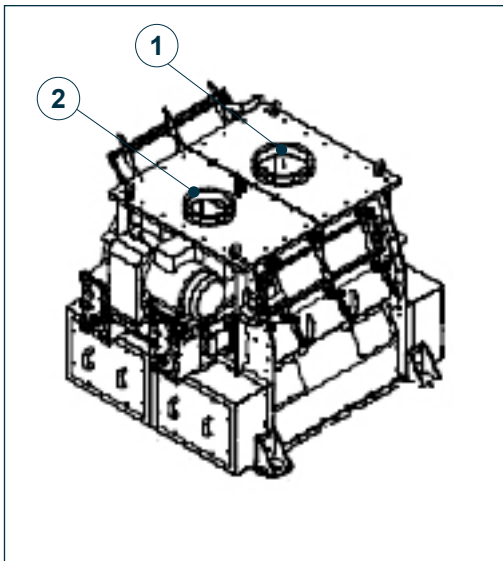


- 1) Drive unit (various solutions possible, depending on size)
- 2) Inlet section (blind cover, cover with spouts or without cover)
- 3) Inspection hatch
- 4) Outlet section
- 5) Safety devices
- 6) Guards

3.0 TECHNICAL INFORMATION

The chamber is equipped with two outlets along the entire length, with 30° outlet angle and a inlet part, consisting of a cover with circular spouts (when the equipment is not supplied as “without cover” version Fig.B)

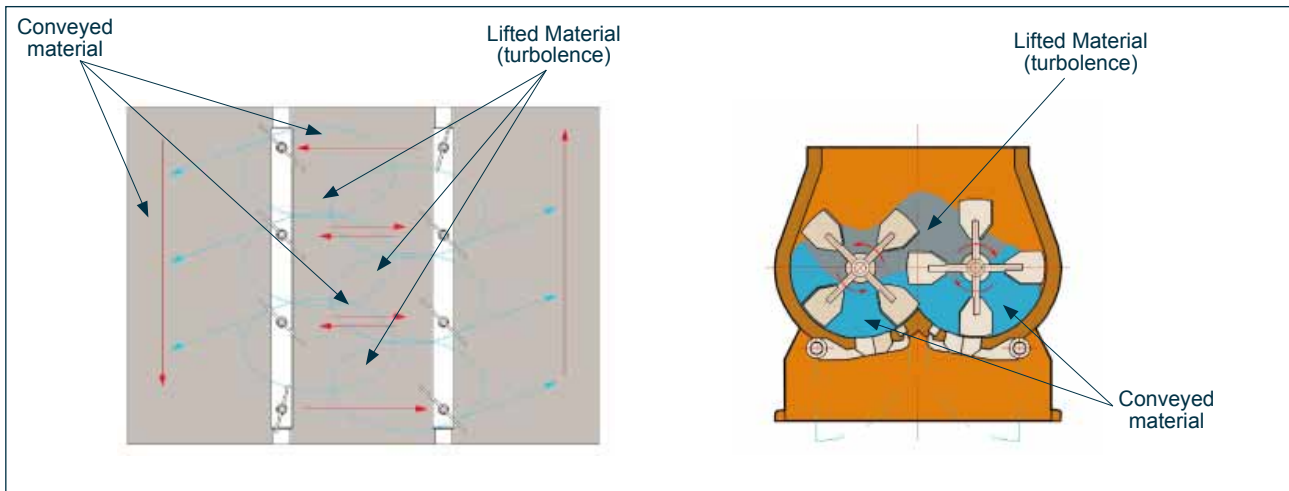
Figure 2 shows an example of the equipment supply with cover provided with spouts. The tube or the hopper for loading product into mixing chamber “3” have to be connected to spout “1”. The outlet “4” (hopper) it has to be connected to the outlet spout.



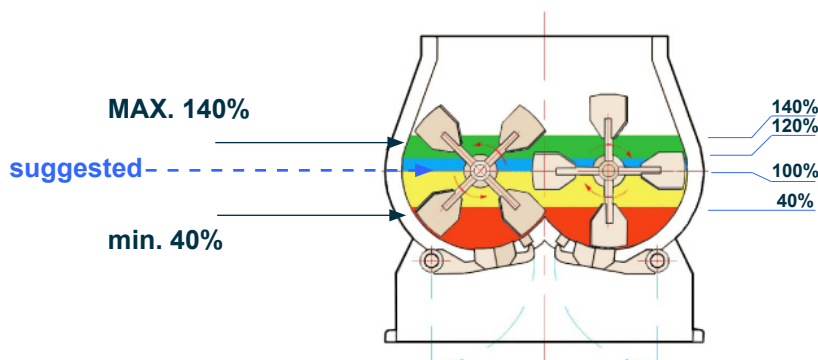
3.3 Operating principle

The WTS creates a fluidized zone with its specialized design and the arrangement of the mixing paddles on both shafts.

This is possible thanks to the two different technologies of mixing, the first in turbulence and the second in conveying, In combination with a low filling ratio, a freely movable mass occurs. In this fluidized zone powders and granules will be optimally dispersed in a very short time so the twin shaft paddle mixer WTS, guarantees high level features in terms of homogeneity and mixing speed.



If we consider as 100% the filling ratio of the machine at shafts level, the WTS mixer can work in a range from a minimum of 40% (to guarantee the conveying action), up to a maximum of 140% (to guarantee the turbulence mixing).



The WTS is studied for all product in general but with particular advantages with:

- Fragile and delicate
- Sticky
- Hard to handle
- Raw material with high level of variation in terms of grain size, weight and flow properties

WTS is a mixer designed for all product development and production virtually in all industries such as:

- Plastics
- Animal Feed
- Pharmaceuticals
- Cosmetics
- Chemicals
- Foods
- Basic Materials
- Building Materials
- Environmental Technology
- Minerals

The new Twin Shaft Paddle Mixer is ideal for all kinds of working in the area of mixing technology. Main application:

- powder + powder = mixing
- powder + liquid = granulation/agglomeration
- powder + liquid = mixing/moistening/coating
- powder + liquid = drying

3.4 Permitted use

This mixer has been designed specifically to handle material in powder form.

It can be used to handle moist material, but the standard version is not suitable for working with completely liquid mixtures. If the machine is to handle this kind of material, this must be specified when the order is placed so that the necessary modifications can be made.

This machine is appropriate for use in an area not classified for the presence of combustible dusts and gases / vapour / mists inflammable and is inappropriate to handle combustible products.

3.5 Improper use not permitted

The mixer may be used solely for the purposes expressly envisioned by the Manufacturer.

Do not use the machine if:

- It has not be anchored correctly to the floor.
- The pipe work has not been correctly connected.
- The connection to the mains electric supply has not been done correctly.
- The connection to the compressed air supply has not been done correctly.
- The mixer has imperfect or not fully sharpened tools. This will reduce the grinding capacity and increase the torque absorbed by the motor.
- Do not climb on top of the mixer even if it is not working. Apart from the danger of falls, there is the real risk of damaging the mixer.
- Do not work on the electric motor unless you have first disconnected the machine from the electric supply source. Electric connections and all electric work must be carried out by qualified personnel only.

There is a real risk of electrocution.

- Do not wash the machine using a jet of water that could come in contact with electric parts.
- Do not use the machine to mix suspicious materials eg, chemically aggressive, flammable, explosive or dangerous for the machine or its operator.
- Do not operate the mixer with its chamber pressurized or under vacuum.
- Do not use the machine in areas where there is risk of fire or explosion.
- Do not pressurize the mixing chamber or create a vacuum inside it because the machine must not be used in these conditions.
- Do not exceed a temperature of +150°C in the mixer for drying purposes.

3.6 Noise level

The noise level of WBH mixers does not exceed 83 dB(A), the value measured at a distance of 1 m, in the most unfavorable position.



Danger - Attention

Depending on the installation site, the installer must adopt suitable systems (barriers, etc.), if necessary, to maintain the noise levels within the legally permitted limits.

3.7 Environmental operating limits

Unless otherwise specified, the equipment concerned must only be used within the limits indicated.

- Altitude: less than 1000 m at sea level
- Environmental temperature: between - 20 and + 40 °C
- Cold climates: with temperature less than 5 °C use oils and lubricants suitable for the operating temperature.

3.8 Overall dimensions and technical features

For exact identification of the equipment concerned, see the identification plate

The transport document shows the serial number and identification codes.

Information regarding the technical features of mixers, depending on their size, is given in Chapter 10.

3.9 Safety and information signs



Danger - Attention

Respect the signs on the plates.

Check to make sure the plates are legible; otherwise clean them and replace the damaged ones, applying them in their original position.



Danger - Attention

Electric equipment can cause death or severe personal injury.

Do not touch the machine when it is moving because there are rotating elements, electrical devices and components that can reach high temperatures.

Observe the warnings written on the stickers. Failure to do so can cause serious personal injury or death.

Check that the stickers are always present and completely readable. If they are not, attach or replace them.

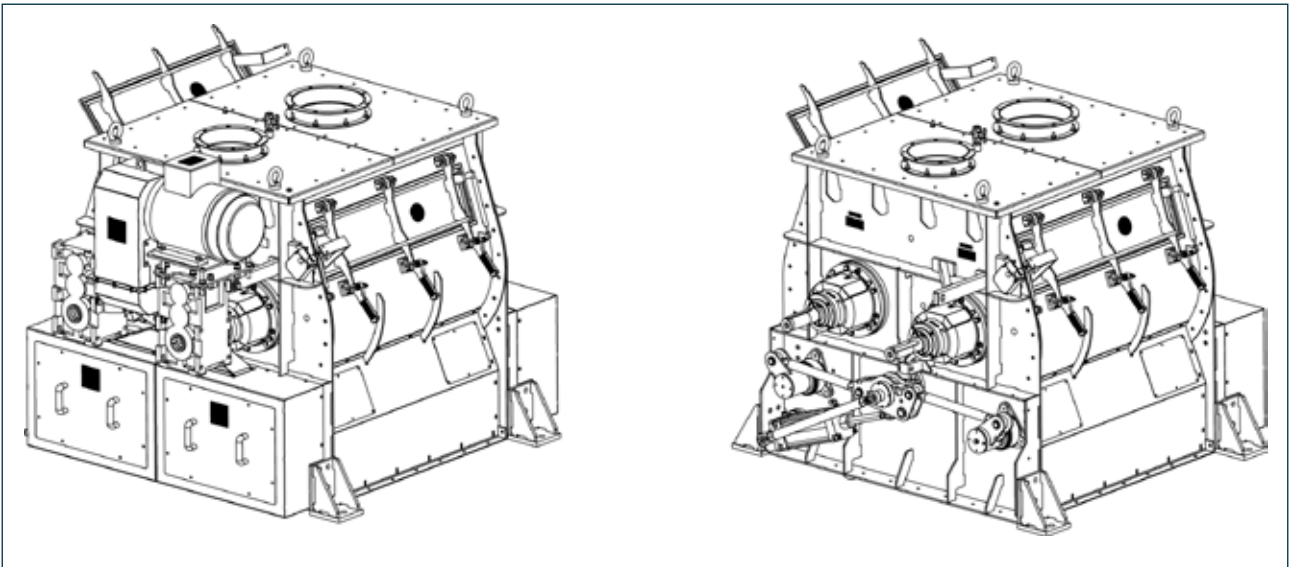


Fig. 4

3.10 Safety devices



Danger - Attention

Before using the machine, check that all safety devices are intact and correctly positioned.

They could have been damaged during transport.

Do not tamper with the safety devices.

At the beginning of each work shift, check that all safety devices are present and working. If this is not the case, inform the maintenance manager.

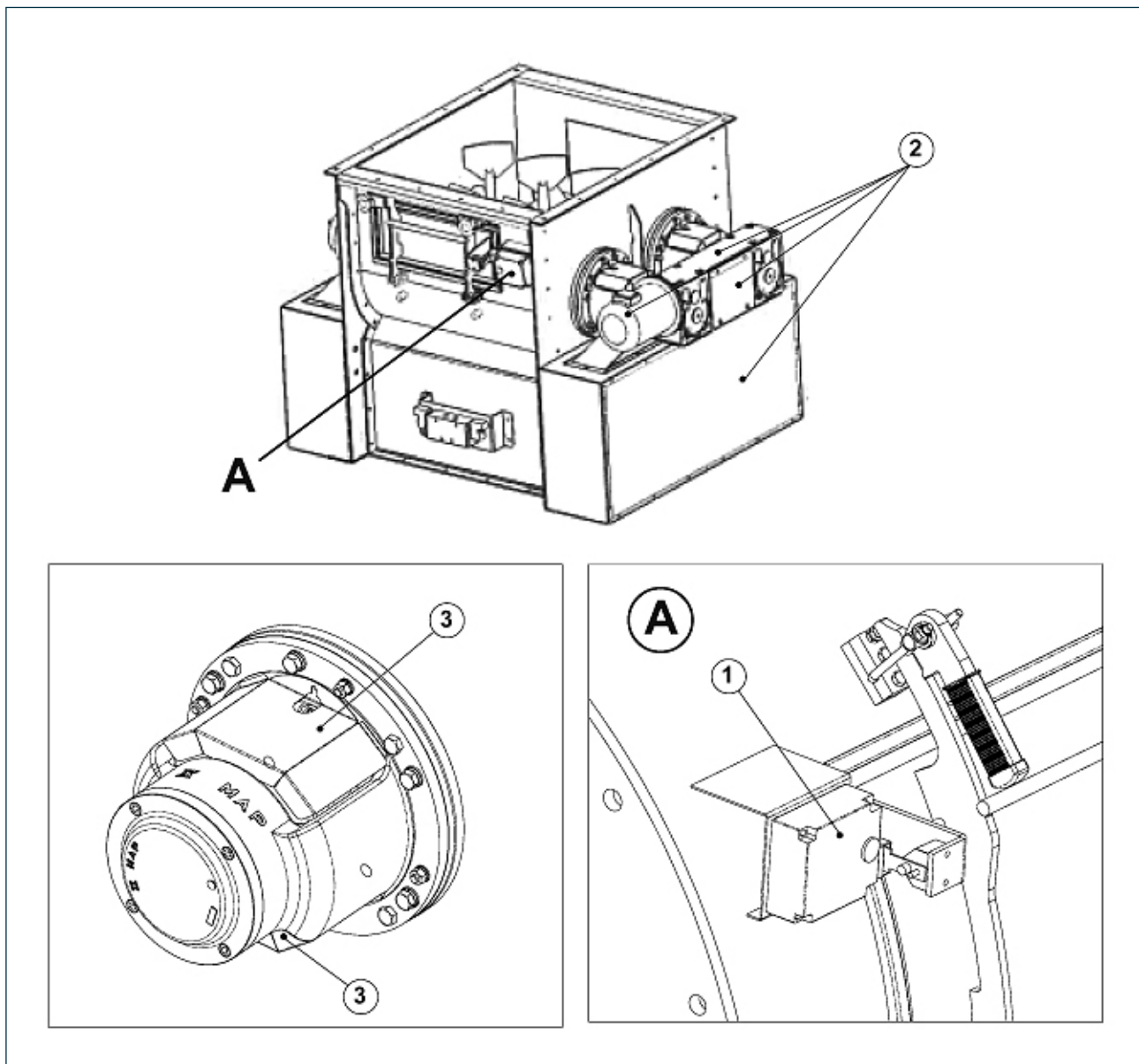


Fig. 5

The access hatches to the inside of the mixer have dual safety devices:

1) Key operated door lock with electromagnet.

Prevents the hatch being opened when the mixer is running.

When the hatch is open the motor will not start.

Before starting up the mixer, check the door lock mechanism is operational.



Danger - Attention

When the mixer is delivered, the electro-magnetic device is not activated. Before using the mixer, the device must be adjusted.

2) Guard to protect moving parts.

All fans, pulleys and couplings are protected by guards to prevent accidental contact.

3) Rotor guards.

These guards prevent accidental contact with the rotor shaft.

Emergency push-button

Install an emergency push-button next to the mixer, in case the control panel is installed far from the machine.

The purpose of this push-button is to stop the machine whenever necessary.

Work station

The operator does not have to be present at all times.

To take action in an emergency, the operator must push one of the Emergency Stop Buttons which must be located in the following positions:

- On the mixer if the power supply control board is fairly distant.
- On the control panel of the mixer (when designed for this).
- On the electric control panel of the plant.

3.11 Residual risks

The main risks that using a mixer might imply are indicated below.

On the basis of the use of the mixer, the installer must inform the operators by means of specific signals, regarding the residual risks:

Mechanical risk

For maintenance operations, it is compulsory for the operator to always use personal protection equipment. Special warning notices on each section of the machine indicate the obligatory personal protection equipment:

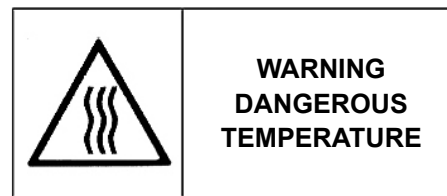
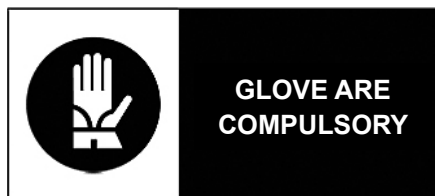


Presence of possible residual high temperature after mixer stop

During the course of maintenance and cleaning operations and in certain operating sections, the operator may enter into contact with very hot parts of the filter, with the machine stopped. Special warning notices, located at strategic points indicate the risk due to the presence of very hot surfaces and the obligation for the operator to wear personal protection equipment, especially protective gloves.

The potentially hot parts (high temperature) are identified as follows:

- Main electrical motor;
- Gear box;
- Rotor supports placed by the bearings
- Agitators placed by the bearings



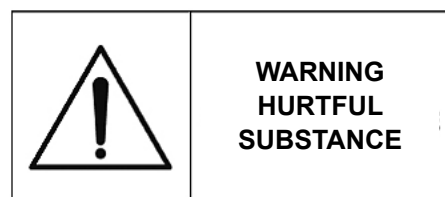
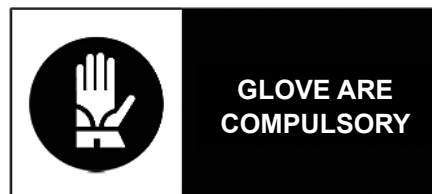
Presence of potentially hazardous dusts

In the event of both routine and extraordinary maintenance, the operator must wear suitable personal protection equipment, particularly, use a safety mask for the respiratory tract depending on the type of dust filtered as well as gloves and clothing.

For more details, refer to the safety chart of the product handled.



In certain handling of dusts, where hazardous substances are present, the operator concerned who has to access the machine for routine and extraordinary maintenance operations must wear suitable protective devices as indicated on the notices provided.



All maintenance operations inside the filter (or outside but with parts of the filter open) **MUST BE** done with the plant stopped and in the absence of airborne dust; it is therefore necessary to open the filter after allowing enough time for the dust to settle. In case of operations involving heating (welding, cutting) it is necessary to clean the filter first, removing all dust deposits (the layers, the deposits and accumulated combustible powder **MUST** be considered like any other source which can result in an explosive atmosphere). Authorization for execution of operations involving heating **MUST** be given by technical personnel specialized and trained in the risk of explosion from powders capable of checking residual risk, suitability of tools and a knowledge of the procedures. The person in charge of the safety shall issue a written "Fire Permit" to the operator.

Hazards deriving from pressurized circuits (hydraulic, pneumatic)

During maintenance and/or repair operations pressure must be discharged from the plants and accumulators (if present), according to the instructions given along-side the components and in the respective user manuals.

Hazard generated by noise

The user and employer shall respect the legal standards as regards protection from daily personal exposure of operators to noise (in Italy L.D.277/91).



4.1 Type of packing

The type of packing is selected according to the type of supply, the transport means used, the quantity of goods shipped and the destination.

To facilitate shipment, the mixer may be packed separately in a number of packages that are suitably protected. An “assembly kit” containing the nuts and bolts and gaskets necessary for correct assembly is supplied together with the mixer.

The mobile parts of the sections of the mixer are secured by means of retainers which must be removed during pre-assembly.

The packages can be loaded separately on the transport vehicle or fixed to a pallet, protected suitably, or inside a container for shipment to a far away destination or for transport by sea or air.

The signs for safe lifting and handling are shown on all the packages.

The list shows the description and symbols envisaged on the packing.

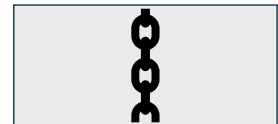
A) Fragile: indicates that the package must be handled and lifted carefully to avoid damage.



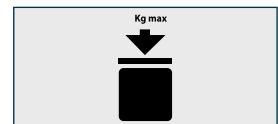
B) Centre of gravity: indicates the position of the centre of gravity of the package.



C) Harness: indicates the correct position of the harness for lifting the package.



D) Stacking limit: indicates the maximum stacking load of the packages.



E) Weight: indicates the maximum weight of the package.



The packing material must be disposed off or recycled in compliance with the standards in force.



The illustration shows the type of packing mostly used for shipping to far away places, by sea or air.

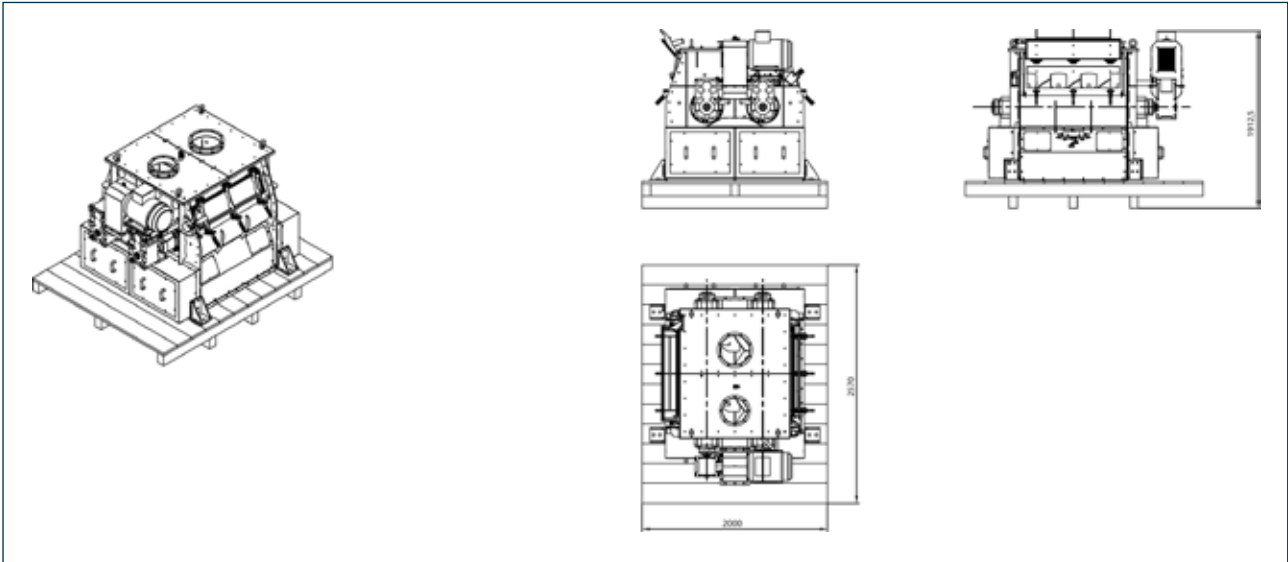


Fig. 6

4.2 Factory tests

The machine in your possession has been tested at our factory to verify that all moving parts function properly.

During these tests, off-load runs have been carried out for approximately one hour.

4.3 Reception

On receiving the goods, check to make sure the type and quantity correspond to the data in the order confirmation.

Damage, if any, must be immediately communicated in writing in the space provided for the purpose in the waybill.

The carrier is obliged to accept the complaint and leave the Customer a copy of the waybill.

If the supply is “ex-destination*” send a copy of the waybill together with the complaint to the Manufacturer or the carriers.

If the damages are not claimed immediately on receipt of the goods, your request may not be accepted.

4.4 Storing the machine

If the machine is not immediately installed, it must be stored in an area that is protected from inclement weather, moisture, extreme temperature changes, and where it is not accessible to authorised personnel.

Make sure that the floor onto which the machine is placed is able to safely support it.



4.5 Dimensions and weight of packed machine

Check the weight of the packed machine in the shipping documents, since the machine dimensions vary according to the versions.

4.6 Lifting and unloading methods



Danger - Attention

Carry out the lifting and handling operations according to the information shown on the equipment and in the Manufacturer's Operation Manual.

The person authorized for unloading operations must make sure all the necessary measures are adopted to ensure his own safety and that of other persons directly involved.

Use means and accessories (ropes, hooks, etc.) suitable for the load to be lifted. Pay attention in the lifting phase to balance the load to avoid uncontrolled movements which could cause accident to persons.

Do not place the packages one on top of the other as they are not sized for stacking.

Do not drag or push the sections of the mixer as it will damage them.

Before lifting and handling the load, read the relevant information shown in the "Information regarding safety" Chapter.

4.7 Handling the machine



Danger - Attention

The machine must be handled with a fork-lift truck if it is anchored onto a pallet or inside a crate.

Hoist the machine using a forklift truck with an adequate carrying capacity.

Widen the forks to obtain for maximum stability of the load during hoisting and transport.

When handling the machine, always keep the load as low as possible to obtain greater stability and visibility.

If the mixer has a heat exchange system, remove the liquid in it.

The machine is anchored to a wooden pallet using bolts which must be removed prior to installation.

Harness the package according to the indications and symbols applied on the package or harness the sections of the equipment concerned on the basis of its structure.

The illustration shows the mixer lifting points according to the configurations envisaged and the lifting points of the motor and gear box when they are supplied separately.



4.8 Lifting points



Danger - Attention

Sling the machine and its drive motor only as shown in fig. 7.

The sling angles must not be more than 30°.

Before lifting a mixer equipped with a heat exchange system, remove the liquid from this latter so as not to strain the hoisting points excessively.

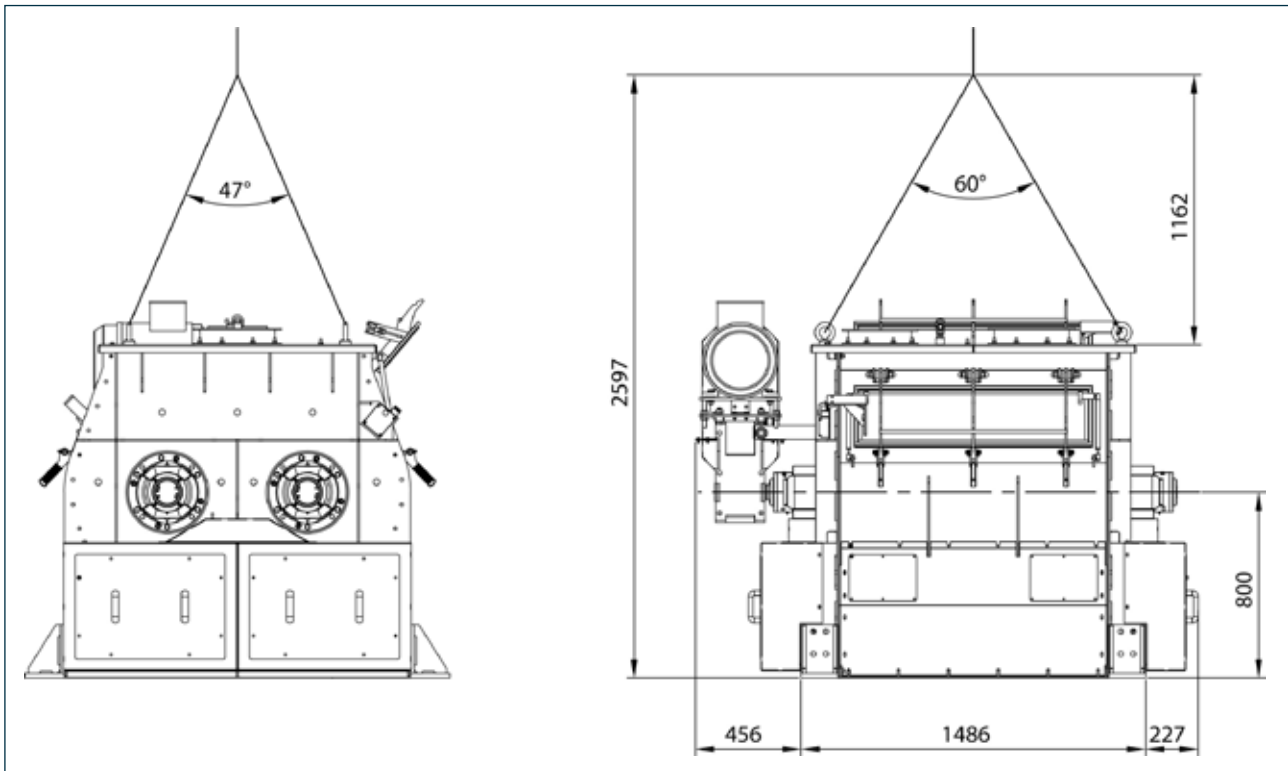


Fig. 7

4.9 Unpacking and disposal of packing material

Remove the nylon wrapping from the machine, along with the pallet or any other packaging material used, and remember that these materials must be disposed off in accordance with the local laws. Also bear in mind that:

- The nylon film, if burned, produces toxic fumes;
- The pallet, such as any other wooden packing material, can be reused.

List of material supplied

The following material is contained inside the packing:

- 2 "Spare Parts Catalogue" manuals;
- 2 "Instruction Manual" manuals;
- 1 can of epoxy paint used to paint the mixer.

5.1 Recommendations for installation



Danger - Attention

The installation operations must be carried out by a technician specialized in such activities

Provided suitable safety measures and use suitable equipment to prevent risk of accident to persons involved in the operations and those in the immediate vicinity

Hoist and handle the sections of the equipment concerned as described and shown in the “Unloading and lifting method” paragraph.

Before starting the installation phase, define a safety plan which complies with the laws in force regarding workplace safety.

The specialist technician, authorized by the installer or owner, must assess whether the area has been prepared correctly and whether the necessary installation equipment is available (crane, etc.).

Preparing the foundations

Following the order, the Manufacturer sends the Client a diagram of the foundations which shows the overall measurements and the distance between centres of the anchoring points.

If the diagram is missing, it must be immediately requested from the Manufacturer, indicating the serial number of the mixer.

Fig. 9 illustrates the typical layout for foundations for a machine with the drive motor “en bloc” with the mixer.

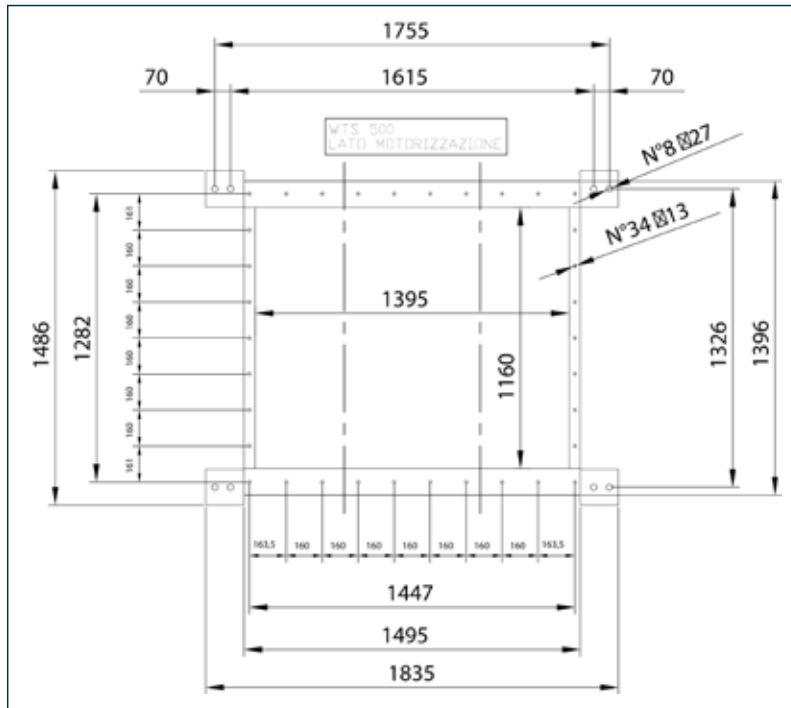


Fig. 9

Concrete foundations

When using concrete support structures, it is necessary to use appropriate anchor bolts (fig. 10).

Where the machine leans on the foundations, steel plates (1), which are the same size as the contact surface of the mixer, must be used (fig. 11).

The size of the support structure must be greater than the contact surface of the mixer (fig. 11).

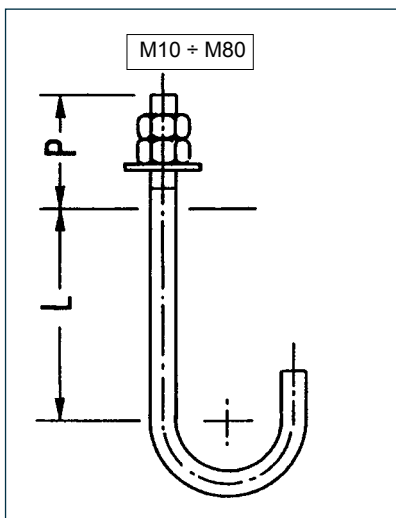


Fig. 10

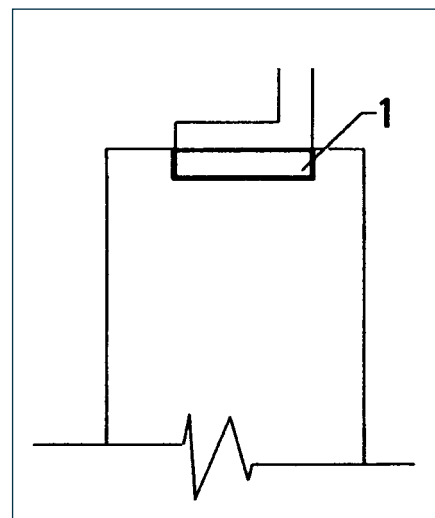


Fig. 11

The foundation must be set up minimum 3 weeks before the mixer is installed to allow for the concrete to settle.

Fabricated foundations

If the machine is installed at an elevated height, there is usually a fabricated supporting structure.



Danger - Attention

Verify the static and dynamic conditions of the beams in relation to the type of mounting procedure carried out.

Drill the holes as shown in the foundation drawing two sizes larger than the anchoring bolts to facilitate installation.



Danger - Attention

Do not weld the drive motor, mixer or both to the fabricated foundation because vibration will not guarantee sure fixing.

Note: when calculating the size of the support structure, take any additional load factors such as hoppers into account. If these loads apply “en bloc” to the mixer, they must be converted into dynamic loads.

Heavy loads applied to the foundations and to the mixer support structures

To correctly size the foundations, consult the values found in the load capacity charts which have been delivered with the drawings for the approval of the project.

There are two types of charts:

- 1) “Total load” chart with motor drive unit integrated to the mixer.
- 2) “Total load” chart with motor drive unit separated from the mixer.

The loads transferred from the mixer to the support structure are all specified in these charts (vertical loads and horizontal loads).

When calculating the size of the support structure and of the foundations, it is important to take into consideration the horizontal loads which are caused by the torque and by the material mixed around inside the mixer.

The nature of the horizontal loads varies in relation to the:

- installed power;
- number of revolutions per minute (rpm);
- number of tools;
- bulk density of the mixed material;
- flow of the mixed material.

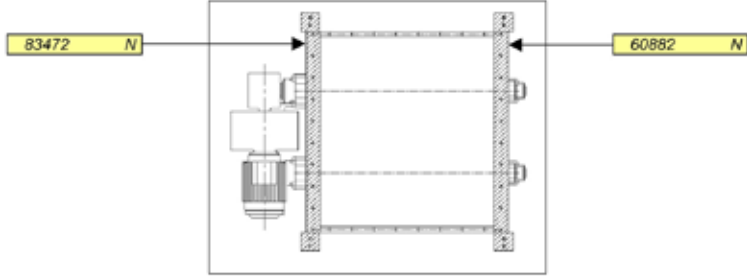
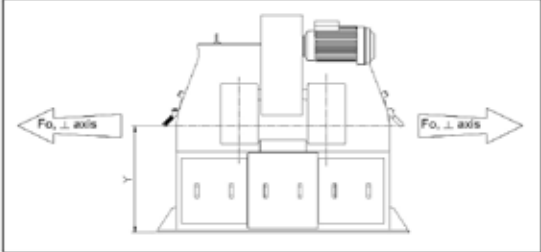
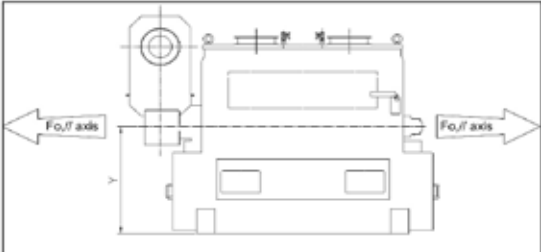
Note: if the load capacity diagram is not delivered, immediately contact and request one from the Manufacturer, specifying the mixer serial number.

The mixer support structure and the foundations must be correctly calculated using the load capacity chart supplied by the Manufacturer.

5.0 INSTALLATION AND FIXING

Example of load capacity chart

WTS 2000					
CARICHI SU FONDAZIONI PER MESCOLATORI CON MOTORIZZAZIONE SOLIDALE					
FUNDAMENTENBELASTUNGEN FÜR MISCHER MIT FEST-ANGEBAUTEM ANTRIEB					
CHARGES SUR FONDATIONS POUR MELANGEURS AVEC MOTORISATION SOLIDAIRE					
LOADS ON FOUNDATION FOR MIXERS WITH INTEGRAL DRIVE UNIT					
Parametri di progetto Kenngröße Paramètres du projet Engineering Parameters	Densità (Kg/dm ³): Schüttdgewicht (Kg/dm ³): Densité (Kg/dm ³): Bulk density (Kg/dm ³):	1,4	Riempimento (%): Füllgrad (%): Remplissage (%): Filling ratio (%):	140	Velocità (g / l'): Geschw. (g / l'): Velocité (g / l'): Shaft speed (g / l'):
					24,5
CARICHI	CARICO STATICO MESCOLATORE CON PRODOTTO				96236 N
SENKRECHTE	STATISCHE BELASTUNG DES MISCHERS MIT PRODUKT				96236 N
CHARGES	CHARGE STATIQUE DU MELANGEUR AVEC PRODUIT				96236 N
VERTICAL	MIXER STATIC LOAD WITH PRODUCT				96236 N
CARICHI	CARICO DINAMICO MESCOLATORE CON PRODOTTO				144354 N
SENKRECHTE	DYNAMISCHE BELASTUNG DES MISCHERS MIT PRODUKT				144354 N
CHARGES	CHARGE DYNAMIQUE DU MELANGEUR AVEC PRODUIT				144354 N
VERTICAL	MIXER DYNAMIC LOAD WITH PRODUCT				144354 N
CARICHI	CARICO DINAMICO ORIZZ. MESCOLATORE (PERPENDICOLARE ALL'ASSE)				12432 N
WAAGERECHT	WAAGERECHE DYNAMISCHE BELASTUNG DES MISCHERS (ACHSENLOT)				12432 N
CHARGES	CHARGE DYNAMIQUE HORIZONTAL DU MELANGEUR (PERPENDICULAIRE A L'AXE)				12432 N
HORIZONTAL	HORIZONTAL MIXER DYNAMIC LOAD (PERPENDICULAR TO THE AXE)				12432 N
CARICHI	CARICO DINAMICO ORIZZONTALE MESCOLATORE (ASSIALE)				12432 N
WAAGERECHT	WAAGERECHE DYNAMISCHE BELASTUNG DES MISCHERS (AXIAL)				12432 N
CHARGES	CHARGE DYNAMIQUE HORIZONTAL DU MELANGEUR (AXIALE)				12432 N
HORIZONTAL	HORIZONTAL MIXER DYNAMIC LOAD (AXIAL)				12432 N

SCHEMA DISTRIBUZIONE DEI CARICHI DINAMICI VERTICALI SUGLI APPOGGI VERTEILUNG DER SENKRECHTEN DYNAMISCHEN BELASTUNGEN AUF AUFLAGEN DISTRIBUTION DES CHARGES DYNAMIQUES VERTICALS SUR LES APPUIS DISTRIBUTION OF VERTICAL DYNAMIC LOADS ON ABUTMENTS	
	
CARICO DINAMICO ORIZZ. MESCOLATORE (PERPENDICOLARE ALL'ASSE) WAAGERECHE DYNAMISCHE BELASTUNG DES MISCHERS (ACHSENLOT) CHARGE DYNAMIQUE HORIZONTAL DU MELANGEUR (PERPENDICULAIRE A L'AXE) HORIZONTAL MIXER DYNAMIC LOAD (PERPENDICULAR TO THE AXE)	
	
CARICO DINAMICO ORIZZONTALE MESCOLATORE (ASSIALE) WAAGERECHE DYNAMISCHE BELASTUNG DES MISCHERS (AXIAL) CHARGE DYNAMIQUE HORIZONTAL DU MELANGEUR (AXIALE) HORIZONTAL MIXER DYNAMIC LOAD (AXIAL)	
	

Locating the machine

Leave enough space at the side of the mixer opposite the side where the drive is installed so that you can dismantle the rotor. An easy way to calculate the space needed is to leave two and a half times the length of the mixing chamber.

Once the machine has been installed, use the paint in the kit to touch up the paintwork as needed.

Check to be certain that the safety devices and guards are complete, operative and in position.

The nature of the horizontal loads varies in relation to the:

- Installed power;
- Number of revolutions per minute (rpm);
- Number of tools;
- Bulk density of the mixed material;
- Flow of the mixed material.

Note: if the load capacity diagram is not delivered, immediately contact and request one from the Manufacturer, specifying the mixer serial number.

The mixer support structure and the foundations must be correctly calculated using the load capacity chart supplied by the Manufacturer.

Locating the machine

Leave enough space at the side of the mixer opposite the side where the drive is installed so that you can dismantle the rotor. An easy way to calculate the space needed is to leave two and a half times the length of the mixing chamber.

Once the machine has been installed, use the paint in the kit to touch up the paintwork as needed.

Check to be certain that the safety devices and guards are complete, operative and in position.

Place the vibration damping plates

Use vibration damping plates only when they are needed to reduce vibration in the mixer support structure.

The rubber vibration damping plates have a very high elastic memory. They must be the same size as the mixer contact footprint, at least 10 mm thick and with a hardness higher than 60 Shore.

Do not use silicone rubber for the vibration dampers since this kind of rubber remains deformed even after it has discharged the load that has crushed it.

The use of vibration damping plates is permitted only if the design calls for a chassis that couples the drive to the mixer "en bloc". The vibrations plates must be installed between the chassis and the foundation.

Tighten the mixer fixing hardware until the thickness of the rubber has been reduced by 1 mm.

Avoid more extensive deformation of the rubber since this will negatively affect the elasticity of the rubber.

When the vibration dampers are installed, all the feed lines to the mixer must be fitted with flexible sleeves to prevent vibration from being transmitted to the lines.

These sleeves must be installed as close to the mixer as possible to reduce the weight of the line on the mixer.

Installing choppers

If the choppers are not installed on the mixer, install them following the instructions given in their respective manuals.

Levelling

Take great care to ensure that the foundations of the machine are level.

The foundation must have good horizontal level performance but it is essential that it is perfectly flat.

Problems with flatness will show up when the mixer is coupled to the drive. The machine's fixing screws would deform the chassis by discharging abnormal stress to the flexible coupling.

Installing choppers

If the choppers are not installed on the mixer, install them following the instructions given in their respective manuals.

Anchoring the machine to the foundation

Once the foundation has been prepared with its link rods, place the machine on it and anchor it firmly

Checking correct flexible coupling alignment

The drive can be coupled to the mixer in the following ways:

A) Drive unit “en bloc” with the mixer by means of the frame.

Flexible coupling alignment has been handled by the Manufacturer. However, once the mixer is installed and before starting it, check everything carefully following the steps detailed in section **B)** before for a drive separate from the mixer.

B) Drive separate from the mixer.

Move the drive up to the mixer and shim its contact points on the foundation until the two pins slide into the half-couplings and are correctly seated.

Use the measurement “**H**” for the type of coupling installed as detailed in the chart on page M.36.

Check parallelism between the faces of the half-couplings at four points 90° from each other using a feeler “**1**” fig. 14 for the distance “**H**”.

Check the half-couplings for concentricity using a gauge as shown in fig. 13.

Under normal conditions, the following are allowed:

- angle out-of-alignment less than 1°
- parallel or radial out-of-alignment calculated with the following formula since it is coupling size-specific.

Out-of-alignment $\leq F/1000$ (mm).

Note: an angle or concentricity error between the two half-coupling will generate excessive stress on pin “**3**”, the mount bearings and the gear unit and will cause these parts to deteriorate rapidly.

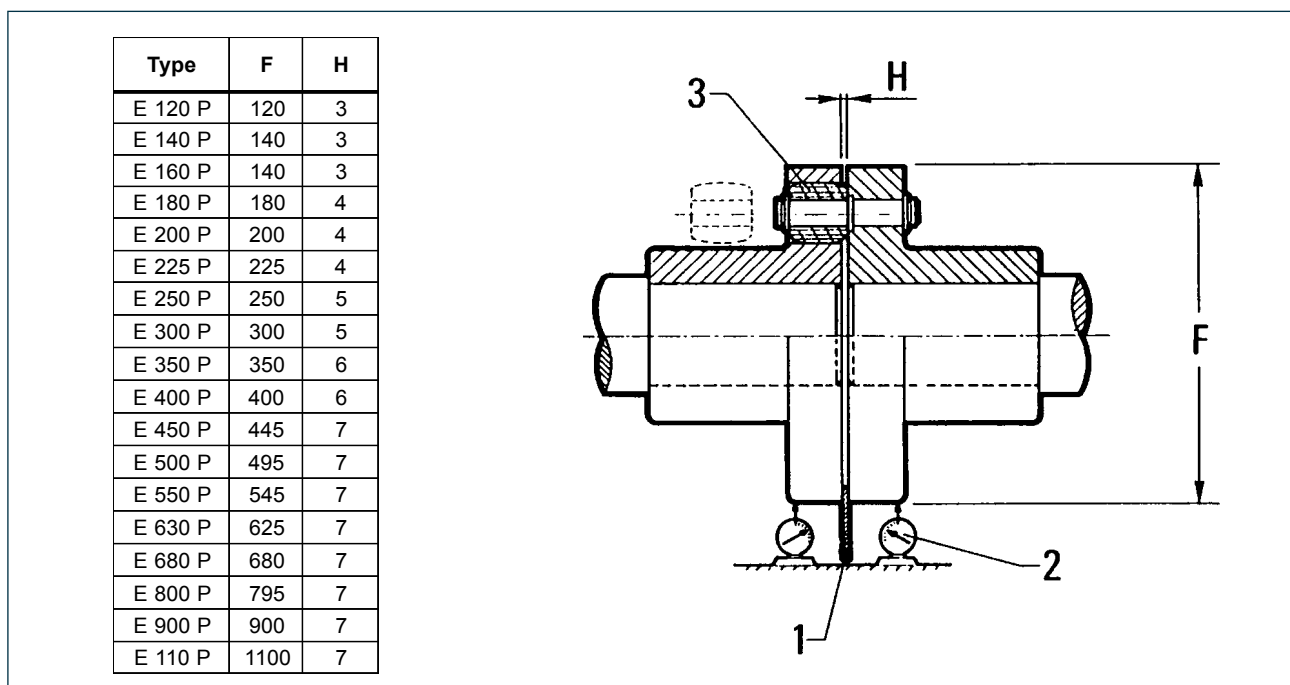
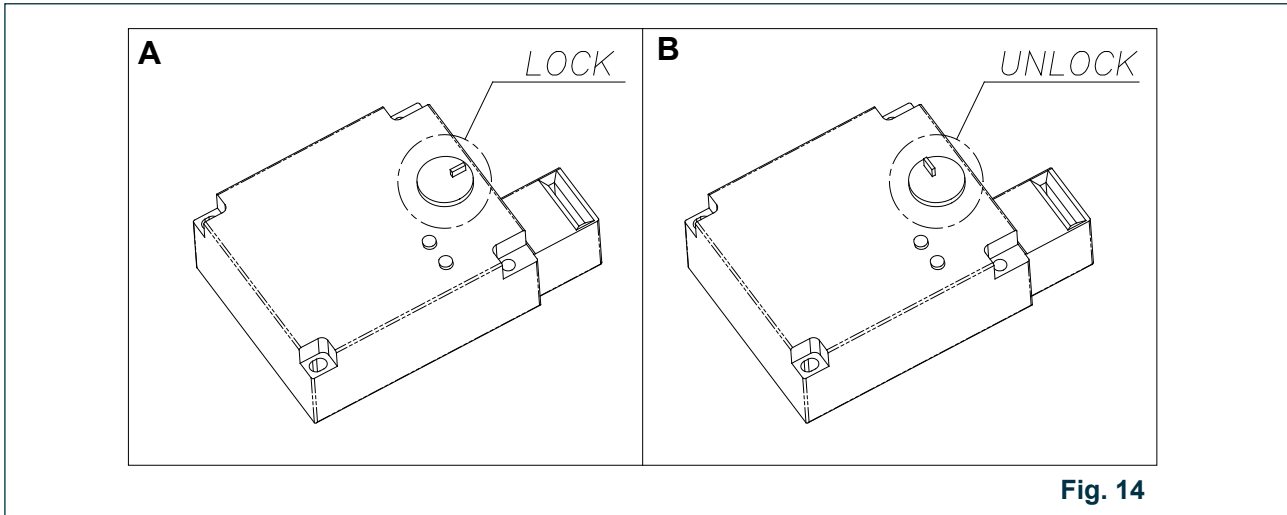


Fig. 13

5.2 Checking the blocking system of the key locking device with solenoid



Danger - Attention

Before starting up the mixer, check pin “1” to ensure it is turned to “lock” position (device activated) fig. 14 A.

If there is a power failure and you have to work inside the mixer, contact a specialist service engineer to cut out the safety device.

To disconnect the device, turn pin “1” to the “unlock” position fig. 14 B.

Apply all necessary safety precautions to guarantee that the work inside the mixer will be carried out safely.

After the necessary operation, activate the safety device (fig. 14 A).

5.3 Connecting ports

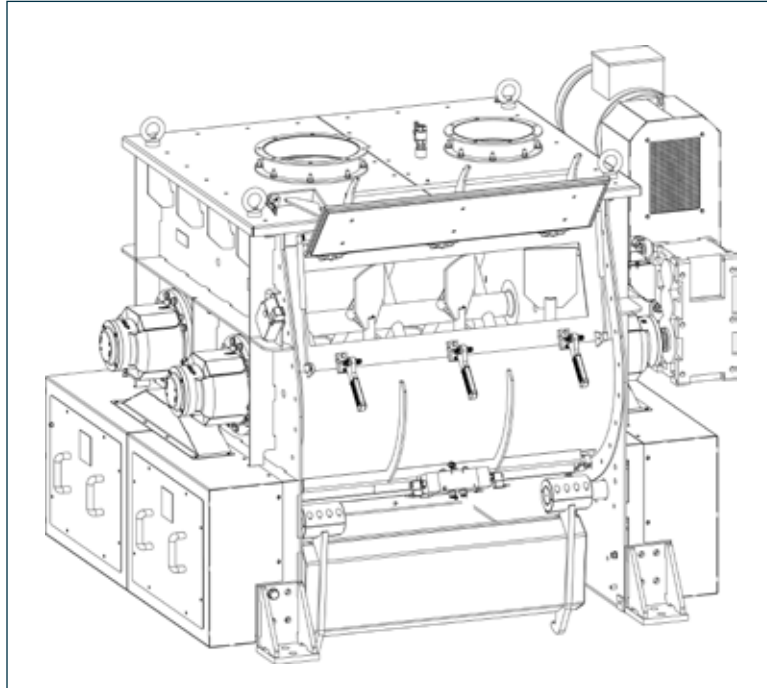


Fig. 15

Each mixer has a number of flanges mounted on the top and bottom and the various supply lines will be connected to these.

- The pipe or hopper to feed the product into the mixer chamber "3" will be connected to the inlet port "2".
- Product discharge (pipe, hopper or screwfeed) will be connected to port "4".
- Port "1" can be used as:
 - Additional loading port (to add additives);
 - Port to vent the air inside the mixer.

Each plant must be fitted with a vent since the machine has an air blowing system inside for the mounts and the blenders.

Furhmore, if the product is discharge from a hopper, when it drops it causes a considerable and sudden increase in pressure and this must be able to be vented through opening "1".

If port "1" is used as an air vent, venting can be:

- With a filter bag;
- With a centralized dust collecting plant.

5.4 Venting with a filter bag

This is the system used with mixers that work for just a few hours per day and deal with granular products that do not generate a lot of dust.

On the other hand, this system is not recommended with large size mixers (mixing large amounts of product) and for intensive use (round the clock).

Clean the filter bag on a regular basis. Frequency will depend on the product mixed and the amount of the time the plant operates.

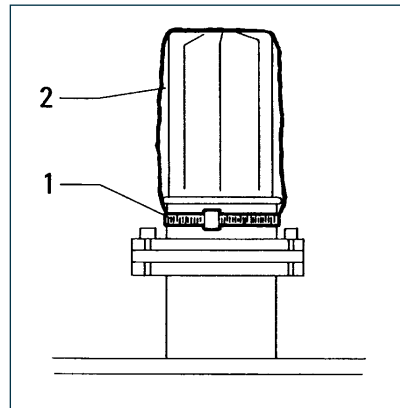


Fig. 16

Release the fixing strap “1”, remove the filter bag “2” and wash thoroughly with an ordinary, non-toxic and non-polluting detergent.

Repeat the washing until the bag is perfectly clean and then dry it



Danger - Attention

**Do not use the filter bag when it is wet. It will not filter efficiently.
Do not operate the mixer without a filter. A large quantity of product will be dispersed into the surrounding work environment.**

Venting with a central filtering plant

This is particularly indicated with medium and large-sized mixers with a fairly intensive work schedule.

The plant must not generate a vacuum at the vent opening and should, therefore, be a static filtering plant.

It must also have a filter element cleaning system to ensure continual filter cleaning.

Discharge hopper connection (excluded from the supply)

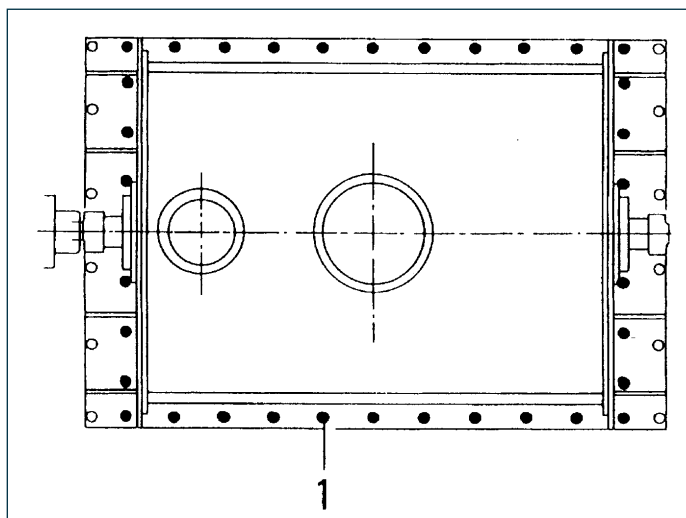


Fig. 33

Note

Mount all the bolts “1” (fig. 33) into the outer holes, provided for in the base, to properly secure the anchor to the hopper.

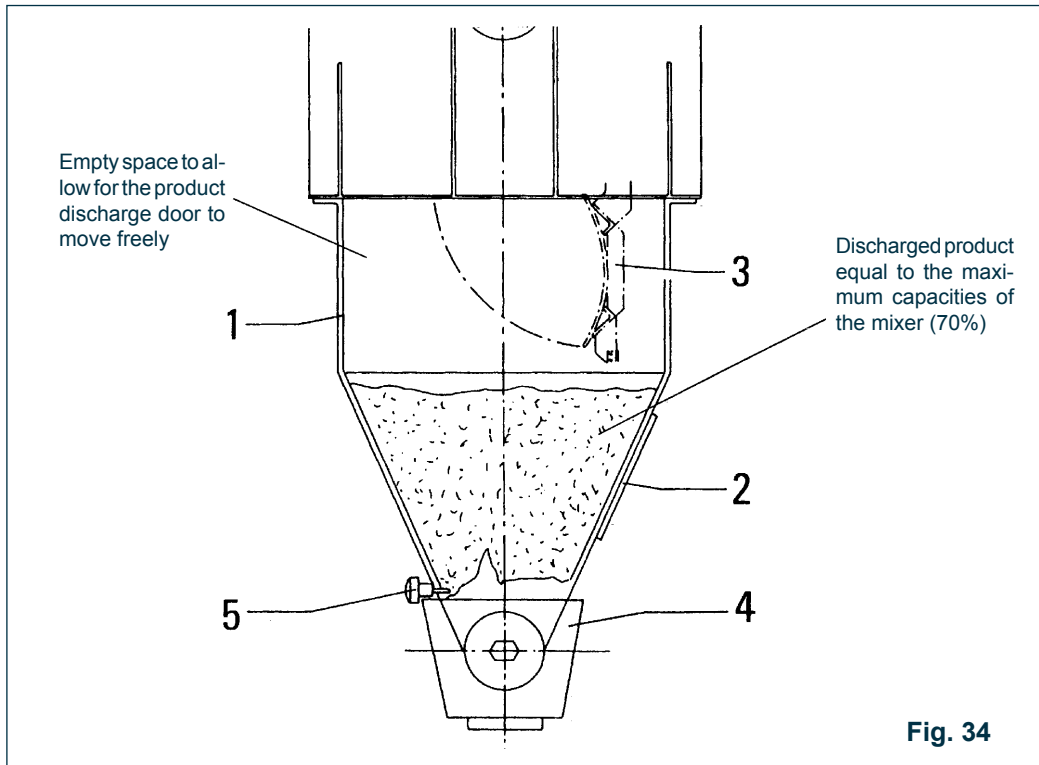
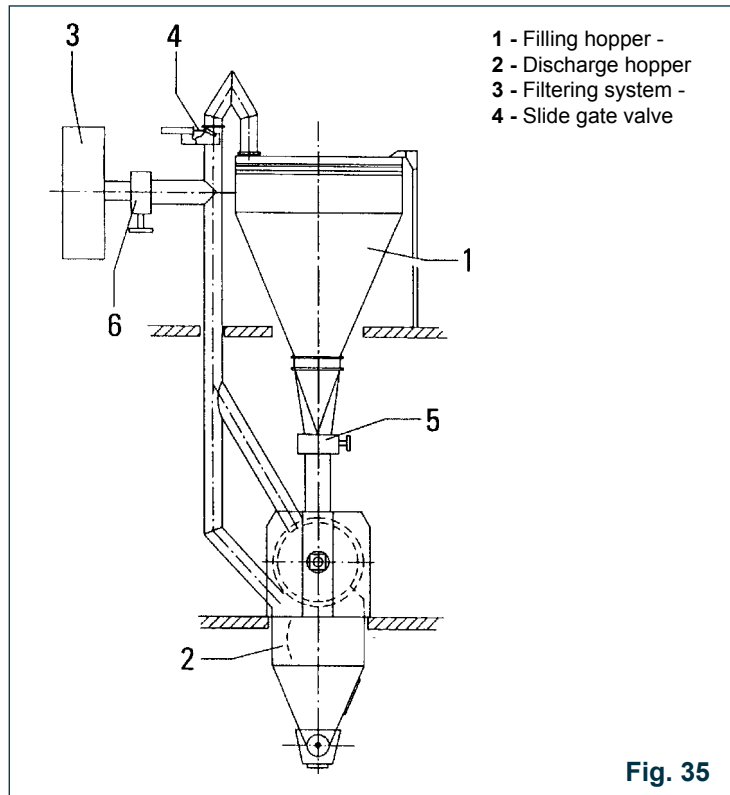


Fig. 34

- The discharge hopper "1" (fig. 34) must have the sufficient dimensions to be able to contain a quantity of product equal to the maximum capacity of the mixer (70% of its volume) and guarantee for the opening of the product discharge door without having it come into contact with the discharged material (see fig. 34).
- The hopper will have to be supplied with an inspection hatch "2", in order to carry out maintenance of the product discharge door.
- Mount the screw feeder "4" fig. 34 (or belt) to the lower flange of the discharge hopper.
- The flanges may be either circular or rectangular in shape.
- The rectangular flange is equal in length to that of the hopper.
- Mount a level indicator "5" onto the lowest point of the hopper so that the discharge door opening is activated only exclusively if the level indicator shows that the hopper is empty.

Venting supply line connection


The mixer must be equipped with a vent to be able to blow out the air which is let into the mixer:

- From the air blowing system in the mounts;
- From the air blowing system in the blenders;
- From the increase in pressure caused by the inflow of the product from the discharge hopper to the mixer.

The classic venting system diagram is represented in fig. 35.

If the product is let into the mixer from the filling hopper "1", the slide gate valve "4" must be open, and the other valve "6" must be closed.

The pressure, generated from the inflow of the product to the mixer, is discharged onto the upper part of the filling hopper and, therefore, favors the inflow of the product to the mixer.

If the product is discharged from the mixer into the discharge hopper, the slide gate valves "4" and "6" must be closed to allow for the pressure that is generated from the product inflow to be discharged into the mixer.

When the mixer mixes the product, the slide gate valves "4" and "5" must be closed, and the slide gate valve "6" must be open to allow the air to be let out through the filtering system "3".

Note

The characteristics of the filter must be compatible with the product to be mixed.

The filter must provide for a backwashing system.

5.5 Connecting the heat exchange unit lines (jacketed version)

On customer request, the mixer can be equipped with a heat exchange jacket to cool or heat the product to be mixed.

Heat exchange is by fluid recirculation. Connect the infeed fluid line to flange “1” and the outfeed fluid line to flange “2”.

Make the connections using lines with rubber sleeves suitable for this purpose to prevent vibration from being transmitted to lines by the machine.

We recommend installing:

- An infeed and outfeed thermometer on the fluid line to be able to check the temperature differential between infeed and outfeed.
- A gauge on the fluid outfeed to check load loss caused by the heat exchanger jacket coil.
- A flowrate gauge on the fluid outfeed line.
- A stop valve on the infeed and outfeed lines to be able to shut the supply off if there is a problem.

When the coil is filled for the first time with the fluid, vent (through the air bleeders) any air in the circuit.

Before bleeding the air from the circuit, run the fluid through the coil and the circuit for a couple of hours.

If the fluid is to be heated, install a pressure release valve on the infeed line or the outfeed line.

This valve should be set for 4 bar.

Locate this valve so that if it discharges, the liquid is drained away and not directed towards the operators.

When the heat exchange liquid exceeds a temperature of +60°C, the mixer chamber, hatches, feed and discharge pipes must be insulated with adequate material to prevent heat loss and protect those who touch the mixer from being burnt.

Installing the inverter

When motor RPM have to be changed, it is best to install an inverter using the soft-start option as this allows a gradual start and replaces the hydraulic coupling.

The inverter should be installed in the drive unit between the electric motor and the direct or offset drive unit.

The inverter is not recommended when the transmission has a hydraulic coupling.

Hooking up the purging system of the shaft seals of the end bearing assemblies

Figs. 19, 20 illustrate some typical pneumatic layouts.

Normal mixer supply includes the end bearing assemblies, while the chopper(s) come as an option.

Note: end bearing assemblies and choppers will almost always require air purging.

Install a small control panel, as shown in fig. 19, to ensure correct air purging (or nitrogen if this is required).

Solenoid “1” to turn the entire system on, must be energized before the product reaches the mixing chamber so ensure that the air can pass through.

Air delivery must continue as long as the product is inside the mixer.

5.0 INSTALLATION AND FIXING

Bear in mind that each chopper uses around 1 Nm³/h of air per hour. The end bearing assemblies use from 1,5 Nm³/h and up to 21 Nm³/h per hour each depending on their size.

- It is forbidden to install grease nipples or lubrication points along the air purging line since this could cause the formation of crusts inside the mixer formed from the product and the lubricant.
- On the contrary, we recommend installing a condensation tap.
- Size the air line for the total hourly consumption by the two end bearing assemblies and the choppers installed.
- Air pressure must be regulated for the product to be mixed (recommended pressure = 1,5 bar).

The user, depending on the product handled, will set the correct pressure.

In general terms, when the product is not fine-grain, the pressure can be set lower.

If the product is finer-grain but with low dust content, the pressure must be kept a little higher.

5.6 Compressed air characteristics

The compressed air, for pneumatic supply and in case end bearings and mixers are provided, shall be:

Clean: with no residues that might damage the solenoid valves of the mixer.

Moisture free: a condensation separator should be employed.

Oil free: oily substances contained in the air might cause the early and irreversible clogging of the components.



Important

Before connecting the compressed air to the mixer, the pipeline shall be emptied out.

**Compressed air supply for outlet door activation
(WBHT 00550 ÷ WBHT 03000)**

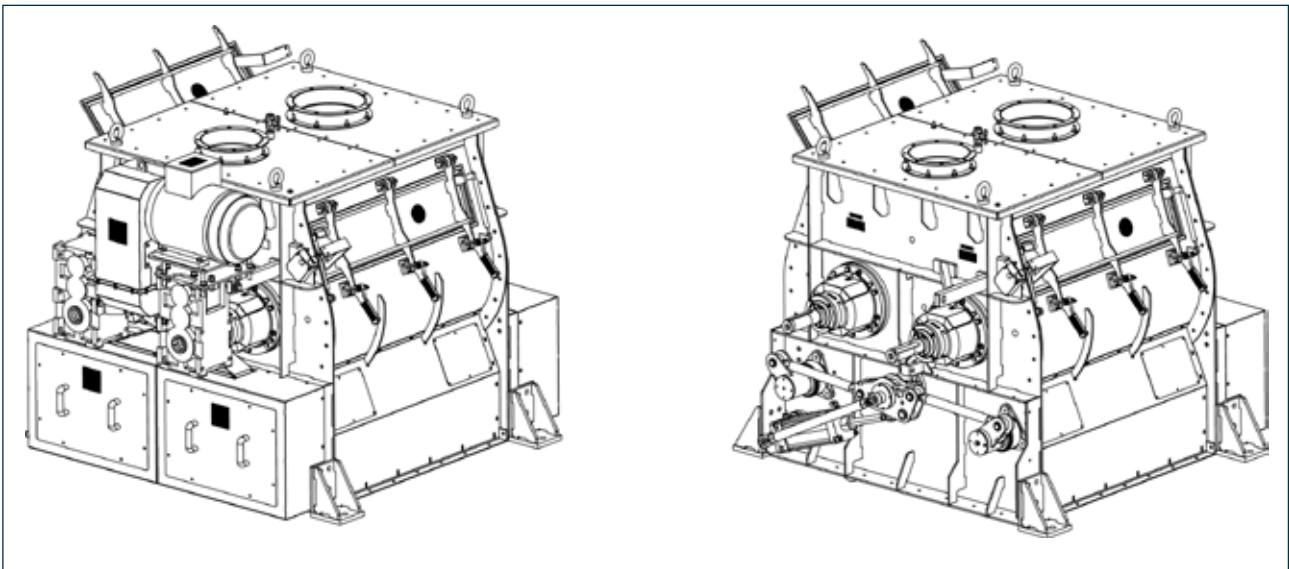


Fig. 36

Install a filter-pressure reducer-lubricator so that the air let into the solenoid valves and the cylinders arrives already dehumidified and lubricated.

Adjust the pressure so that it measures 6 to 8 bar.

Initially, the pressure must be adjusted to a minimum (6 bar).

Increase the pressure gradually up to a maximum of 8 bar, if the cylinders are unable to bring the outlet door to the correct closed position (see Fig. 56 on page 83).

Figure 20 shows an example of the layout of the pneumatic connections to the inlet door movement cylinders control solenoid valve.

Note

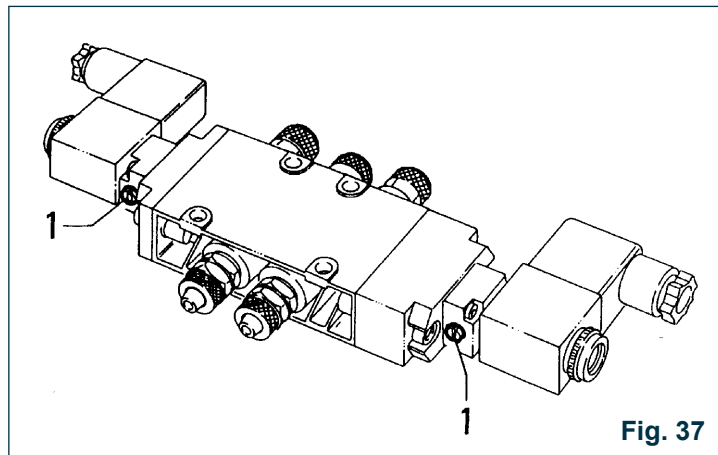
The cross-section of the air supply pipes to the solenoid valve "2" fig. 36 must be at least equal to the sum of the cross-sections of the connecting pipes from the solenoid valves to the cylinders.

Four magnetic sensors "1" Fig. 36 provided with LED (two for each cylinder) are present on the pneumatic cylinders.

The function of the sensors is to check the position of the cylinder rods and thereby the outlet door (open-closed)

Use the shortest possible connecting cable because cable capacitance is directly proportional to its length and this could negatively affect sensor function.

If the electrical current is disconnected, it is possible to open and close the discharge door by rotating the screws "1" fig. 37 of the solenoid valves.



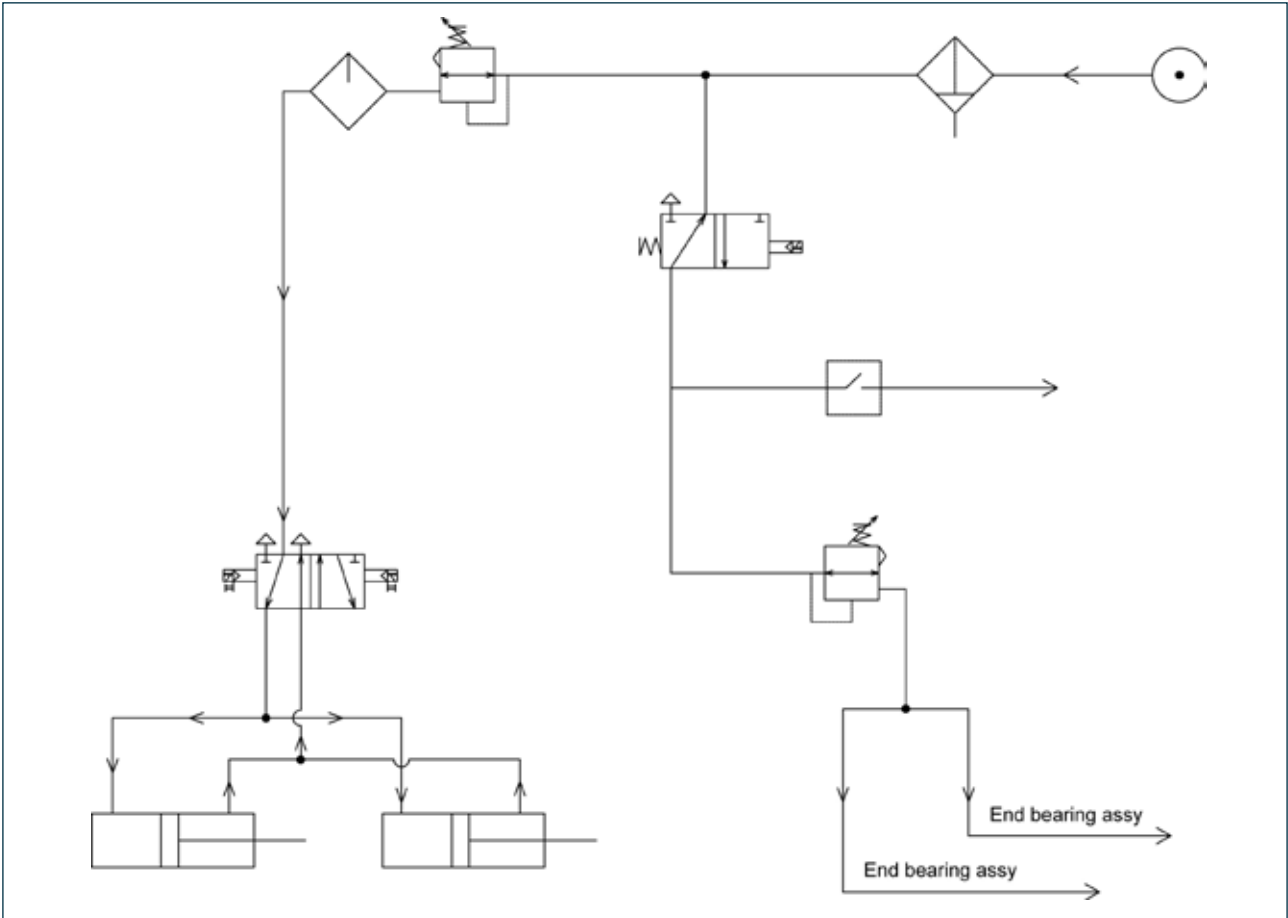
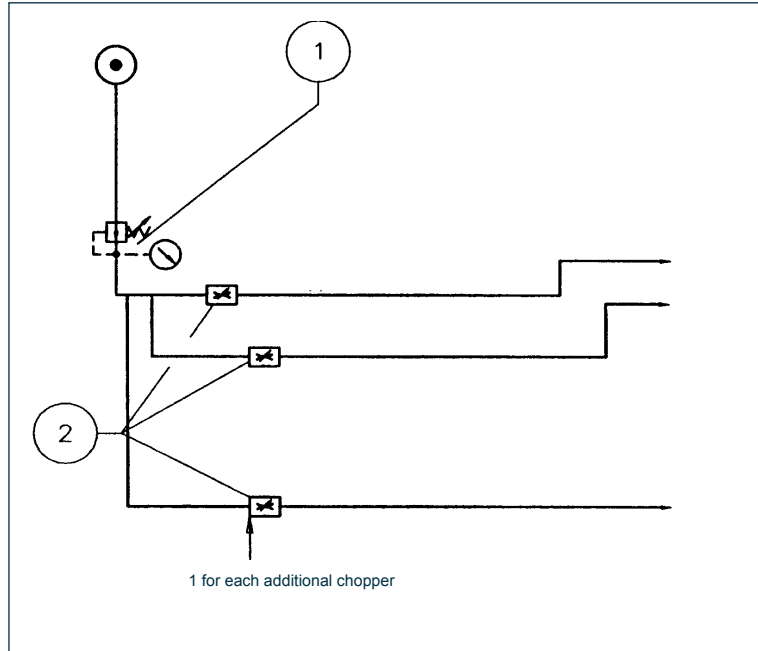
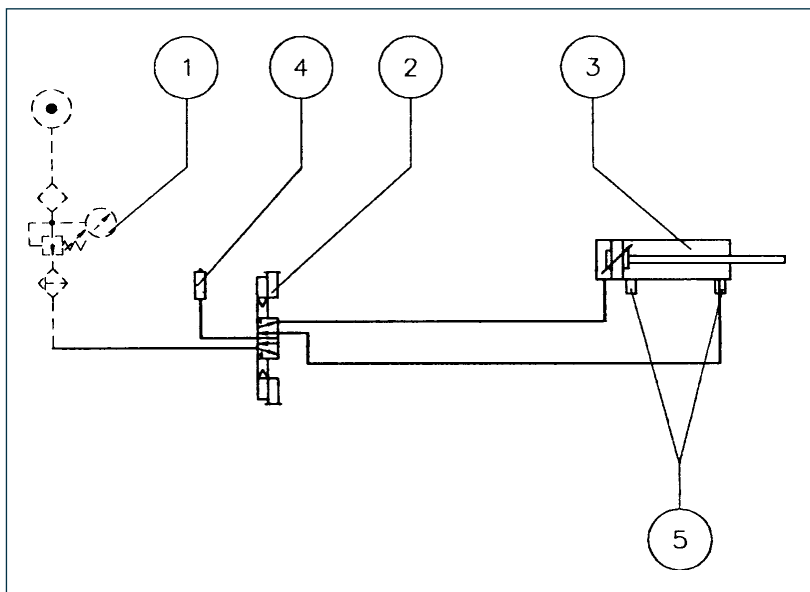


Fig. 18

In order to carry out a correct air (or nitrogen) insufflation, install a small panel, according to drawing 18.

Pneumatic layout for shaft seals of end bearing assemblies and choppers (customer responsibility)

Fig. 19

- 1) Pressure reducer and solenoid, condensation remover and gauge
- 2) Flow meters
- 3) Solenoid
- 4) Coil

Discharge port pneumatic layout

Fig. 20

- 1) Filter unit
- 2) Solenoid
- 3) Actuator
- 4) Coil
- 5) Magnetic limit switch

5.7 Compressed air supply for discharge port

Set the air pressure at 6 bar. This pressure should be increased if the product has a high powder content or when the seals on the door begin to wear and there is a problem with holding the seal.

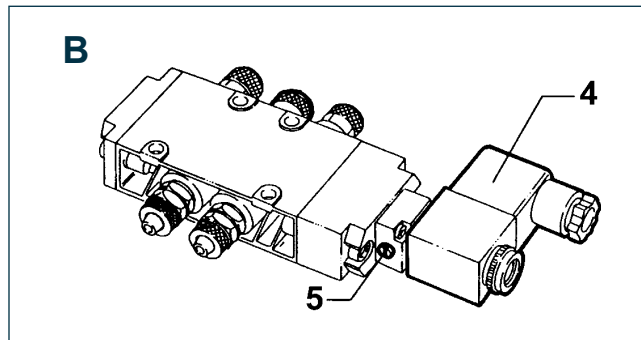


Fig. 22

- Use a "Rylsan" hose whose diameter is adequate for the fitting, connect the air line "A" to fitting "3" on the solenoid and connect the solenoid energizing wires to coil "4". If there is a blackout, the discharge door can still be opened or closed turning screw "5" 90°.
- There are two magnetic limit switches "1" inside box n° 6 that enable the two door open/door close signals to be generated on the electric control board. These limit switches can operate with DC or AC. They give an ON/OFF contact . Don't forget that the limit switches are actually switches and should always be installed in series with a charge (resistive, inductive or condensive).

5.8 Electrical connection



Danger - Attention

The safety device which prevents the inspection door from opening while the machine is running must be adjusted before the electrical connections are carried out.

Check that the electrical mains supply corresponds to the voltage given on the machine's identification plate.

Any installation work, maintenance or repair involving electrical components must be carried out exclusively by specialized and expressly authorized personnel.

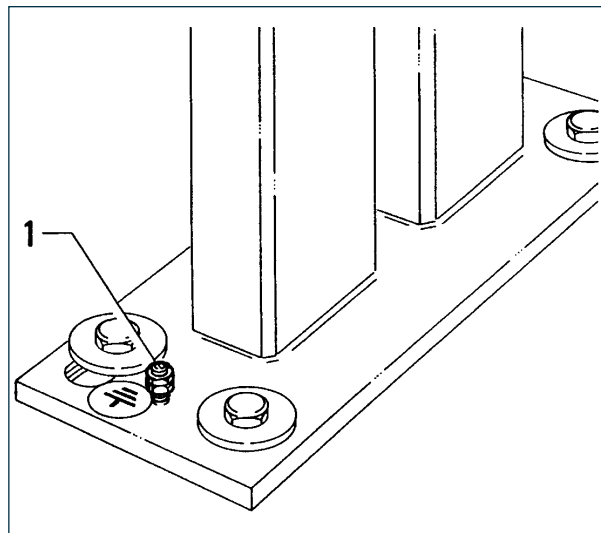
Carry out the electrical connection up to a line with an efficient earthing circuit.

If there are a number of machines connected in series, to calculate the maximum nominal absorption of the installation in terms of current, add up all the absorption in amps given on the identification plates of all the electrical motors.

Remember that at start up, the value obtained can be multiplied as high as seven times.

5.9 Important points the electric installer must observe

- The electrical motor must always be directly started up to allow the mixer to be turned on with a full load (loading).
- A star-delta connection is not recommend.
- The total power absorbed by the mixer must be smaller than the power available on the mains.
- The circuit relays to be installed in the control board at the responsibility of the installer, must be rated for the nominal rating current of the corresponding motors.
- Connect the earthing circuit to all the points (1) specifically foreseen by the Manufacturer.
- Connect to an efficient earthing circuit.



5.10 Controls

General information

Normally, the mixers are not supplied with a control panel, but its controls are included in the main electric control panel that runs the entire plant of which the mixer is a part. It is the responsibility of the installer or user to add on this component and install a main switch that will cut off the electrical power supplied to the mixer.

This switch must have a safety keylock to prevent it from being turned on by accident.

Note: if the mixer has its own control panel, refer to the connections and descriptions of the controls in the enclosed electric manual.

5.11 Testing



Important

When installation is complete, authorized personnel must carry out a general test to make sure the safety conditions have been completely satisfied.

How to start the mixer for the first time

Before starting to use the mixer, always start it the first time under no load conditions making all the checks described below:

- Check that there are no foreign bodies in the mixing chamber such as packing stops, tools, etc.
- Check all electric connections including those for the safety devices.
- Check to ensure that the inspection hatch is installed correctly (see page 37)
- Lubricate all grease nipples as described on page 75.

Greasing and lubricating should always be done when the machine has been inactive for a long time.

- Check to make sure there is oil in the gear unit (refer to the Operating and Maintenance Manual).
- Check to be sure the hydraulic coupling is filled with oil (refer to the Operating and Maintenance Manual).
- Check to be sure the packings are correctly adjusted (see page 65).
- Check to be certain the mixer motor turns in the correct direction. This should be in the direction shown by the arrow on the mixer (see fig. 4 on page 17).
- Check to be certain the sample draw (if installed) is closed (see pag 78).
- Bearing in mind the high rating installed, start the motor with a pulse from the start button. If the moving parts meet no obstacle (they begin to turn), switch the mixer's power supply definitively on.
- Run the machine (empty) for at least an hour to check for any overheating, vibration or abnormal noise.

Check:

- If the temperature of the end bearing assemblies and seals is not higher than 45-50°C;
- The tools are not touching against the walls of the mixer.

The machine can now begin its operation.

Note: if the mixer has choppers installed, before starting the mixer, start the choppers (refer to the Chopper Operating and Maintenance Manual).



Important

A thick gluey substance may be seen to flow out from the bottom of the gear-box.

This is not caused by a fault or defect in the gear box or bearings, but is the excess liquid with which the seals fitted on the final shafts are impregnated.

This treatment ensures a longer lasting sealing.

The leakage may be seen during start up and may continue for a few hours of service before it disappears but it does not affect the correct working of the screw conveyor in any manner whatsoever.

Stopping

To stop the machine in an emergency, press the emergency STOP button on the plant's electric control panel or near the mixer.

In normal conditions, press the "STOP" button and switch the power supply "OFF" at the main switch.

This cuts off power supply to the machine and stops it.

The "power supply on" indicator light will turn off.

6.1 Production Start-up

Before starting up the mixer the operator in charge and authorized for the production must check to make sure the safety devices installed are present, in working order and that the operating conditions are respected (doors closed, inlet and outlet spouts connected correctly or protected, etc.).

Start up the mixer without load and feed product gradually to reach the required production.



Important

In case of excessive noise, strong vibrations, etc. stop the mixer and report the problem to the person in charge authorized to intervene to restore correct working.

Do not use the mixer if there is a fault in it.

6.2 Clearing the mixer following a blockage

If, during normal operation, the mixer motor is found to be moving gradually under force and then comes to a complete stop, it is highly probable that the problem is caused by a blockage.



Danger - Attention

The authorized operator must strictly apply all the laws on the matter of workplace safety and adopt appropriate protective measures against accidents. Specifically, do not insert the hands into the inlet spout, outlet spout and into the screw through the inspection hatch if the screw or flight is not blocked safely using external means.



Danger - Attention

Disconnect the mixer from all electric supplies and use appropriate means to prevent it from being reconnected accidentally.

6.3 Using the machine

Prescriptions



Danger - Attention

The machine must be used exclusively by trained personnel.

First of all, the operator must check that the guards are in position and all safety devices are present and efficient.

Carry out a number of off-load cycles, helped by an expert operator, to gain the experience and knowledge required to run the machine.

Preliminary adjustments

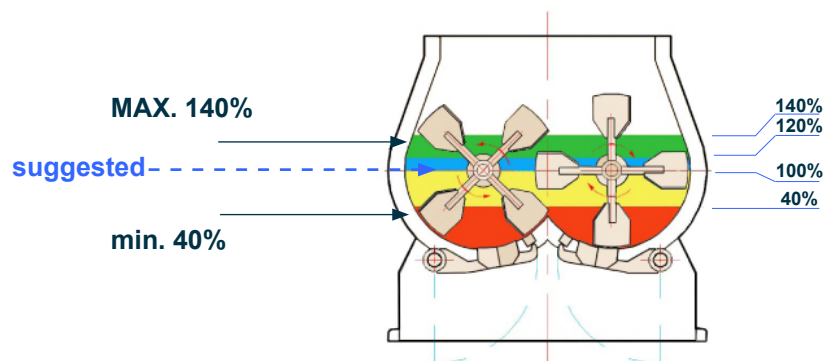
Refer to chapter for Adjustments and Checks to carry out at first start up.

The following pages provide information on how to use the machine correctly.

6.4 How to fill with product

The optimum use of the mixer requires that the product is filled when the tools are in rotation. Starting the mixer filled with product would require a much more powerful drive motor.

If we consider as 100% the filling ratio of the machine at shafts level, the WTS mixer can work in a range from a minimum of 40% (to guarantee the conveying action), up to a maximum of 140% (to guarantee the turbulence mixing).



6.5 Making the first fills

Once the checks and tests described here have been made, the machine is ready for its first work cycle.

- Make the first mixer fill at 30% of its maximum capacity.

Do not leave the machine for the entire mixing cycle so that you can act immediately in any emergency.

- The subsequent loads should be gradually increased from the initial 30% to the full load the mixer is rated at.

Remember that the mixer cannot be filled beyond 70% of its theoretic geometric volume.

- The first eight working hours of the machine should be supervised carefully and all problems such as vibrations, abnormal heating, etc. noted and rectified.

6.6 Accidental mixer shutdown



Danger - Attention

Intervening inside the mixer, entirely or with only parts of your body, is dangerous. Should this be necessary, electrical power must be cut off using the main switch, which must be equipped with a safety key that prevents the mixer from accidentally starting up. This key must be kept by the same person who intervenes on the mixer. In addition, the mixing tool shafts must also be securely blocked by appropriate brake shoes.

To prevent personal injury, the operator must wear appropriate safety gear, such as breathing masks, safety goggles, etc.

If the mixer accidentally stops due to, for example, an emergency or sudden power failure, and since the mixer has not been designed to start up when completely full, then:

- If the rotor shaft does not move, disconnect the power without waiting for the circuit breaker on the main board to trip.
- Wait until the hydraulic coupling (if installed) has cooled down and repeat the starting procedure.

If the total shutdown condition persists, open the inspection hatch and remove the product from inside the mixing drum manually.

Note: to open the hatch when power supply is disconnected.

Now repeat manual start up with the assistance of an expert operator.



Danger - Attention

Trying to unblock the mixer by turning the mixing tool shafts in the opposite direction is strictly prohibited.

6.7 Heat exchange (jacketed mixers)

If the mixer has a heat exchange jacket, it is called a “Mixer-Conditioner” if the product is to be cooled or “Mixer-Drier” if the product has to be heated.

“Mixer-Conditioner” correct heat exchange operations



Danger - Attention

The heat exchange jacket must operate at an internal pressure of 3 bar because it has been tested to 5 bar.

It is forbidden to operate at pressures higher than 3 bar.

To prevent condensation forming in the mixing chamber, the temperature of the cooling liquid must not be much lower than that of the product to be mixed.

Let's suppose, for example, that we have:

- A product infeed temperature of 60°C.
- Required product outfeed temperature of 30°C.
- The temperature of the heat exchange liquid = 5°C.

At these temperatures, it is likely that condensation will be formed inside the mixing chamber (especially when dealing with products with a very high intrinsic moisture content).

The temperature of the heat exchange fluid will have to be raised from +5°C to +17 to 18°C.

In order to leave the mixing cycle time unchanged (or the conditioning time), increase the volume of heat exchange liquid to compensate for the increase in discharge liquid temperature.

“Mixer-Drier” correct heat exchange operations

The standard “Mixer-Drier” is designed to work at temperatures up to +110°C. If higher temperatures have to be handled, this should be specified when the machine is ordered.

Three types of heat exchange fluid are used:

- Hot water: the liquid does not exceed +100°C.
- Steam: used for temperatures above 100°C.
- Diathermic oil: the liquid is used for temperatures above 100°C.



Danger - Attention

If steam or diathermic oil is used as the heat exchange liquid, be careful not to exceed a liquid temperature of +110°C since the standard Mixer-Drier cannot handle higher temperatures.

The Mixer-Drier can be used to maintain the temperature of the product handled constant or to increase the temperature.

6.8 Adding additives



Danger - Attention

Manual addition of additives-eg, through the loading hopper, must be done with eye and respiratory way protection.

The turbulence inside could cause dangerous leakages of powder and sometimes this can be toxic.

To add additives, use the requisite loading openings designed for this.

Similarly, to add liquids, use the nozzles provided precisely for this purpose.

If your mixer does not have these options, contact the Manufacturer for the modifications to the mixer that may be required.

6.9 How to discharge the product

- The products must be unloaded into the mixing chamber with the tools rotating.
- Shut the discharge door only when the mixing chamber is completely empty.
- Closing the door when the product is being discharged can cause excessive strain on the door mechanism and cause early wear on the seal.

6.10 Liquid injecting device (option)

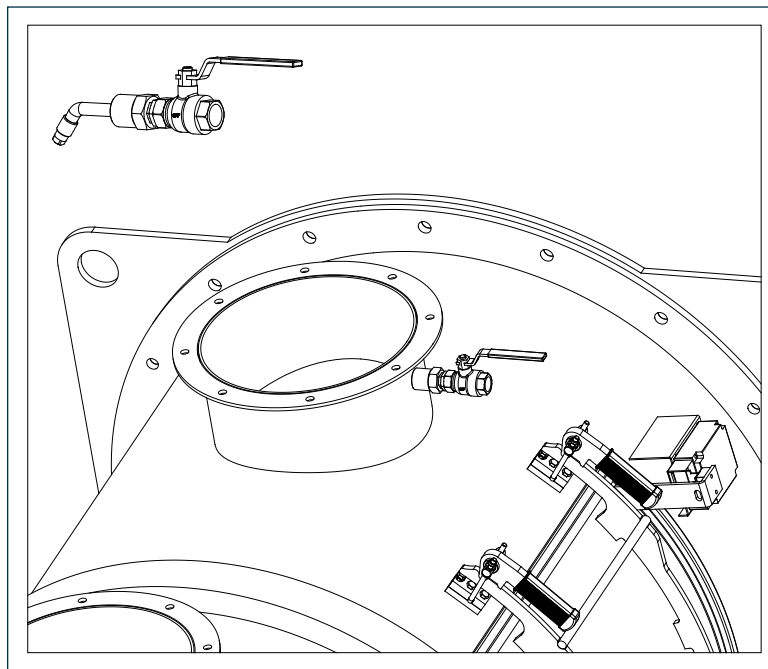
Liquid injection must be done only with the mixer moving.



Danger - Attention

Do not use the system to add flammable, explosive or toxic additives.

Adding liquids through the inlet port

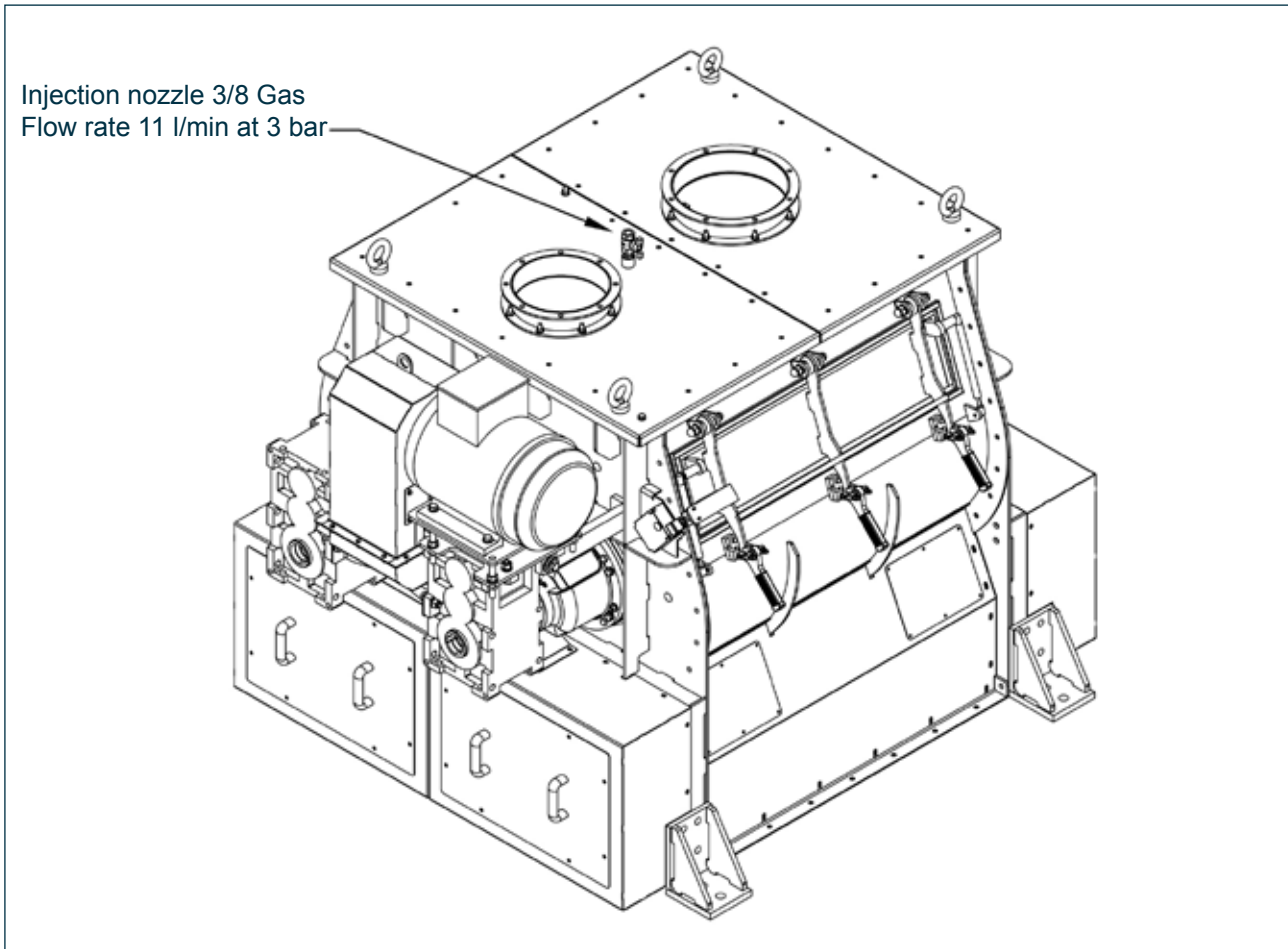


The liquid adding device installed on the inlet or on the cover is particularly suitable when the liquid to be injected has low viscosity (for example, water) in order to increase the moisture content of the product to be mixed.

The pressure of the liquid must be between a minimum 1 and a maximum 10 bar.

Nozzle "1" atomizes the liquid to be injected to prevent the formation of lumps and thus improve the quality of the mixture.

Adding liquids from the mixing chamber



Liquids are added through the mixing chamber when the additives are oily or with a high viscosity. It can also be done by means of a pull-out "injection wand".

On request the ends of the wands are equipped with injection nozzles ("1" fig. 41) which together with the choppers prevent the formation of lumps inside the mixture.

The injection liquid pressure should be between a minimum 3 and a maximum 10 bar.

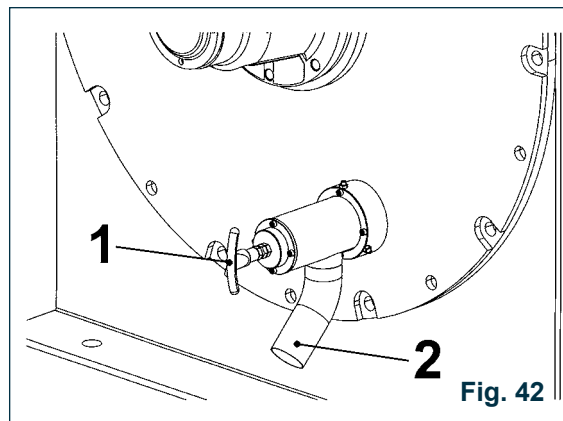
If the injection wand is not used for a long time, dismantle it from the mixer as follows:

- Slacken off nut "2" and remove the wand.
- Close the wand seating "2" with the requisite female plug.
- Reinstall the injection wand following the above steps in reverse order described here to remove it.

6.11 Sample draw

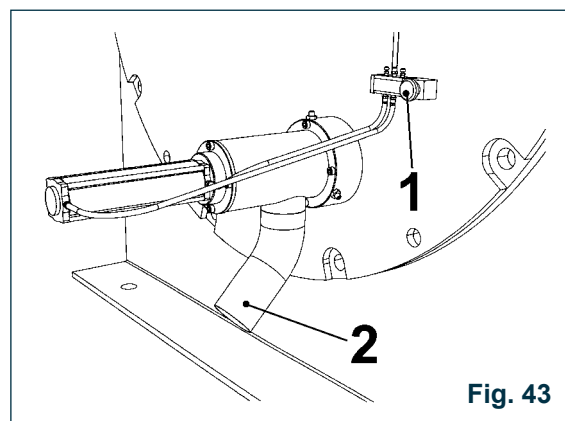
A sample draw (option) will be supplied only if requested when the mixer is ordered. The purpose of the sample draw (when new mixtures or special products are being handled) is to remove part of the product being mixed to check it. Sampling must, therefore, be done when the mixer is in movement.

Manually operated sample draw



Pull the knob "1" to feed product discharge from the outlet "2".
When the sampling is finished, close the outlet valve.

Pneumatic sample draw



Use push-button "1" to remove a sample of product from the outlet

6.12 Prolonged machine shutdown after assembly

- Set the machine in safety condition before startup.
- Before starting up the machine, check the condition of the electrical and pneumatic system and all parts the working of which may be affected by prolonged shutdowns.

6.13 Possible reuse after long shutdowns

- Avoid damp, salty environments during machine shutdowns.
- Place the machine on a wooden platform and store it protected from unfavorable weather conditions.
- Set the machine in safety status before starting it up.
- Before starting up the machine check the conditions of the electrical and pneumatic system components and all parts the working of which may be affected by long shutdowns.
- Before starting up the machine carry out a complete cleaning cycle in accordance with the indications in the powder safety chart.
- If the machine operates in conditions and with materials different from the previous application, check the compatibility of this use according to the indications in the INDICATIONS FOR USE section.

**Danger - Attention**

Before carrying out any maintenance activity, activate all the safety devices for the safety of the persons involved in the operations and those in the vicinity. Set the equipment concerned in safety condition. Wear suitable personal protection equipment; in this regard, consult the person in charge of safety of production activities.

7.1 Maintenance**Danger - Attention**

**Any maintenance work, lubrication or cleaning must be carried out with the machine stopped and disconnected from the electric and compressed air supply sources.
Maintenance and service work must only be done by specialized and authorized service engineers.
All heavy parts must be hoisted and handled using approved lifting equipment with adequate carrying capacity.
Ensure that sections or parts of the machine are held by appropriate slings and hooks.
Check to ensure there are no bystanders in the range of the load to be lifted.**

Remember that careful maintenance in compliance with the recommended schedule and correct use of the machine are essential conditions to guarantee high machine performance.

In order to ensure constant and regular operation of the machine and to avoid cancellation of the warranty, any part replacement must be made exclusively with original spares.

Inspections performed at the factory

Your machine has been fully tested in our factory to ensure it will work correctly when you start it up. In particular, the following checks were made by the Manufacturer:

Tests made before the machine is actually operated:

- The operating voltage corresponds to that requested with the order.
- The serial number is checked.
- Check to make sure all tag plates and stickers are in place.
- Checking the safety mechanisms.
- Check the tightening of all nuts and bolts.
- Drive alignment is checked.
- Dimensional check.
- The paintwork and rust treatment is checked.
- The packing is checked.

Tests made with the machine running

- General functional tests working under no load conditions for about an hour.
- These tests and checks are designed to highlight any problems or defects.

7.2 Tests and checks to be made on-site

To ensure that the machine has not been damaged during transport and installation, make the following checks:

Before starting the machine

- Check to be certain the voltage given on the Serial plate corresponds to that of your mains supply.
- Check the door lock mechanism.
- Check if all the danger and caution plates and stickers are in place and intact.
- Check to make sure the packing gland is not blocked by the end bearing seals. It must be hand tightened without using wrenches.
- Check mixer drive - rotor alignment.

With the machine running

- Check the efficiency and intactness of all protections and safeties. They could have been damaged or their settings altered during transport or installation.
- Check correct tightening level on the packing.
- Check the temperature of the various components when running under normal conditions.

No part should be excessively hot.

- Run the machine under no load conditions (no product in the mixer) for at least an hour and check that all parts work correctly.

Remember that the mixer can handle a very wide range of products.

This means, however, that its expendable materials can wear at considerably different rates.

The recommended maintenance schedule must therefore be flexible.

It is always better to plan routine maintenance work and do it rather than having to intervene in emergency situations. This has advantages from a financial point of view but is also far more convenient to be able to work on the machine without having to stop it during full production times.

Labour costs represent a large part of the expense when a machine has to be dismantled. The actual parts replaced will cost relatively little.

A good solution is to contact the Manufacturer's technical staff and set up a service schedule with your engineers to replace all material subject to wear and tear.

7.3 Periodic checks



Danger - Attention

Before carrying out any operation on the machine, make sure it is set in safety condition.

Before each start-up

- Checking the electromagnetic key operated door lock.
- If there is provision for nitrogen blowing, check the correct flow of the gas from the pipes inside the mixer.
- If the thermocouples are controlled by indicators present on the electric panel, check to make sure they are working.

Before every work shift

- Check that all protections are present and efficient.
- Check the end bearings and agitators for signs of overheating and/or abnormal noise, and replace them if necessary.

After every work shift

- Thoroughly clean the mixer and the mixer chamber.

Weekly (every 50 hours of operation)

- Check the packings. If the stuffing box temperature exceeds 40 to 50°C adjust it again.

If further tightening is not possible, replace the packing.

- Check the tension of the drive belts by following the indications in the relevant manual and check them for wear.
- Check the oil level in the reduction unit.
- Check the locking of the fixing screws of the mixer tools and agitator tools.
- Check to make sure there is no rubbing between the mixing tools and the chamber.
- Check to make sure there is no rubbing between the grinder/agitator bushing and the inside of the chamber.
- Check the wear-proof plastic lining of the mixing tools and/or the chamber if present in the mixer and repair if necessary.
- Remove eventual powder res
- Check the condition of the inflated gaskets and make sure there is no blockage along the pipes.
- Check the condition of the inspection hatch gaskets, make sure they are not worn or encrusted with material. Clean or replace the gaskets, if necessary.

Monthly (every 150 hours of operation)

- Remove the half casing covering the flange and check the end bearing assemblies for leakage.

If you note leakages, tighten the packing or replace it.

Every six months (every 1000 hours of operation)

- Check all wear parts listed below and change them as required:
- Tools
- Inspection hatch seals
- Discharge port seals
- Shaft seal packings

Check that the alignment between the drive unit and the mixer is correct and check the rubber elements in the flexible coupling.

Yearly (every 2000 hours of operation)

- Check and replace as needed, the rubber parts of the hydraulic coupling.

7.4 Cleaning the mixer**Danger - Attention**

Disconnect the machine from the general electric power supply and make sure it cannot be accidentally started.

Use non-flammable and non-toxic detergents.

If the mixer is used for food products, non-toxic detergents suitable for cleaning parts in contact with food products must be used.

Do not point the water jet directly on electric components.

How to carry out the required checks

The text below describes the maintenance procedures.

7.5 Tightening packing in end bearings

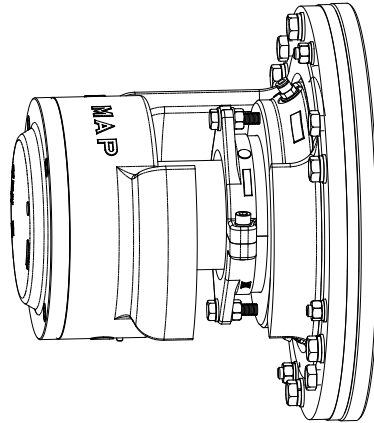


Fig. 44

Check correct seal packing as follows:

- Slacken off locking nuts "1" and tighten screw "2" by hand without using a wrench.
- Start the machine and run it without product for 15-20 minutes with the seal packing tightened manually as described here.
- With the machine running, tighten both the bearing screws "2" through one turn.
- Tighten back locking nuts "1".

Note: adjust the parallelism between the packing gland and seal flange.

7.6 Tightening the drive belts (found with CI)



Danger - Attention

Disconnect the machine from the general electric power supply sources.

Remove the guard to access the belts.

Take the belt with two fingers half way between the pulleys and turn it as much as you can using only those two fingers.

The belt is tensioned correctly when you can turn the belt up to 90° (see fig. 45).

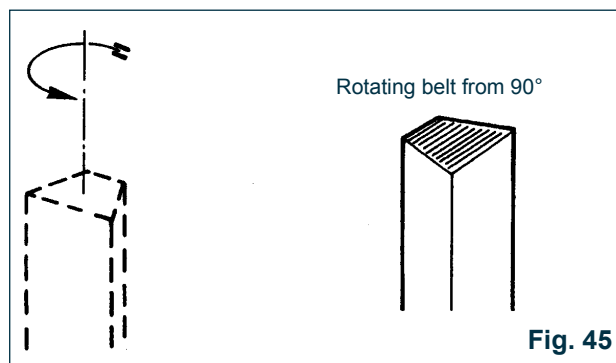
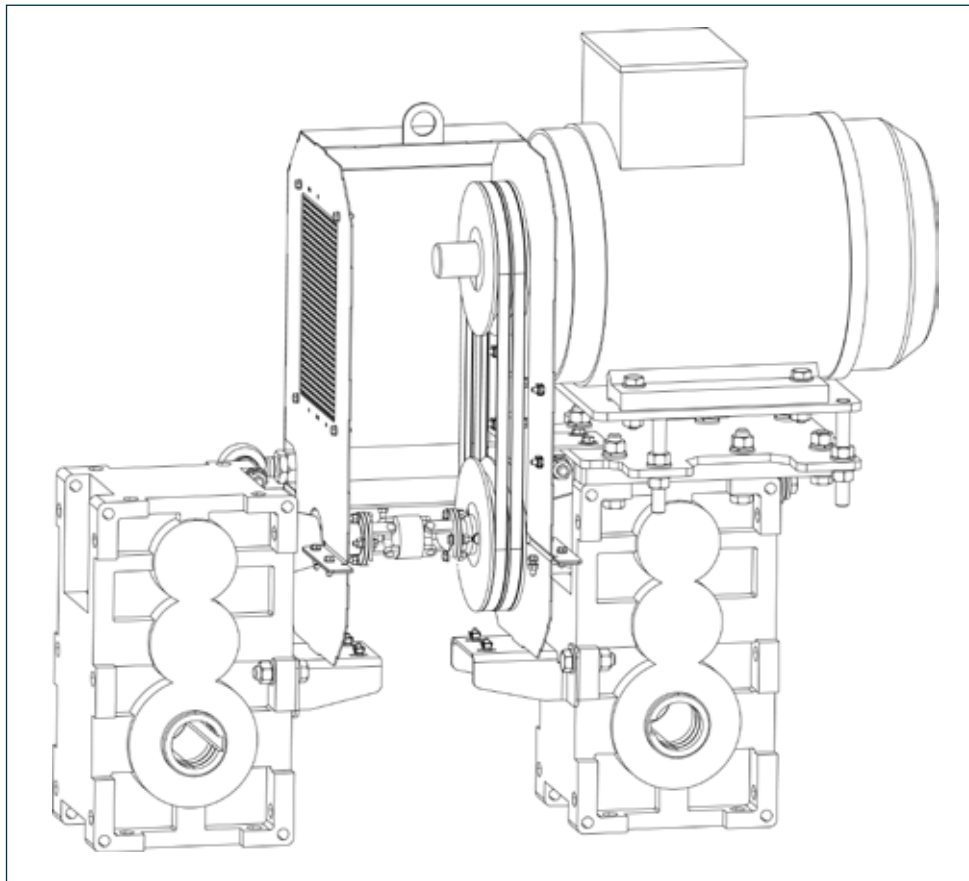


Fig. 45

If you cannot do this, slacken off nuts (1) fig. 46 and tension the belt correctly with nuts (2).

**Danger - Attention**

Before tightening nuts (1) home, check the parallelism between motor support plate (3) and the gear reducer (Fig. 46).

**Fig. 46**

Once the belts have been correctly tensioned, replace the guard.

If the transmission makes abnormal noise, stop the machine and find the cause. Normally a belt transmission is not noisy.

Also try to prevent oil splashing through the guard.

The oil could reach the belts and cause them to slip on the pulley which, in turn, would lead to premature wear.

8.1 Safety recommendations for replacement



Danger - Attention

The replacement operations must be performed by a specialist authorized technician with specific skills in the sector concerned (mechanical, electrical, etc). Before carrying out any operation, provide suitable safety measures and use suitable equipment to prevent risk of accident to persons involved in the operations and those in the immediate vicinity

Activate all the safety devices envisaged and prevent access to controls which, if activated, could cause accident to the persons involved in the operations.

8.2 Checking parts subject to wear on the flexible coupling

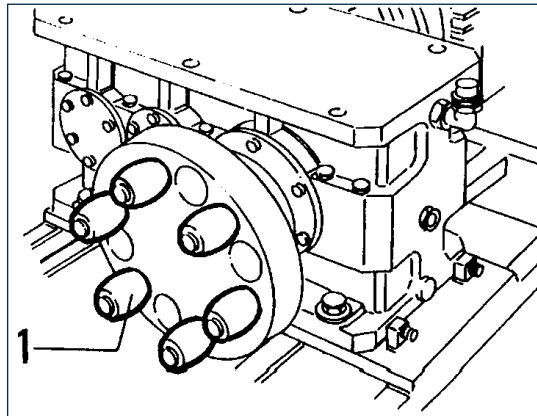


Fig. 47

If flexible coupling alignment was correctly done when the machine was commissioned, the flexible parts "1" will last almost indefinitely.

If this is not the case, these same elements will wear very quickly because they are subjected to abnormal stress.

If the flexible elements are worn:

- Disconnect the machine from the electric power
- Remove the guard
- Change the flexible elements as described in manufacturer's operating and maintenance manual
- Reinstall the flexible coupling and check its alignment
- Replace the casing.

8.3 Rotor shaft Bearings



Danger - Attention

The bearings must be mounted and removed with the machine disconnected from the electrical power mains using the keylock switch. Also disconnect the compress air supply.

The keylock switch key must be kept by the authorized Service Engineer.

If one uses compressed air to clean the machine, always wear safety goggles and never exceed a pressure of 2 bar.

Do not use petrol (gasoline), solvents or other flammable liquids as detergents. Always use authorized non-flammable and non-toxic commercial products.

When the end bearings become too hot or make excessive noise, they will have to be checked.

Note that the bearings in the assemblies, given their low working speed, have been designed to work for a very large number of work hours.

Thus, before changing the bearings, it is standard practice to first check whether the problem (noise) is caused by some other part, for example, continuous noise that does not increase in time or a steady beating, will not come from a bearing.

Once the support has been completely dismantled, clean all parts thoroughly, check for wear or nicks.

In particular, check the condition of the shaft which must not show any abnormal scratching or scoring.

If there is, contact the Manufacturer to assess the damage and decide on possible replacement.

Note: replace all gaskets and seals (even if apparently in good condition) whenever you dismantle the bearing assembly. Any leakage will cause an unscheduled machine shut-down.

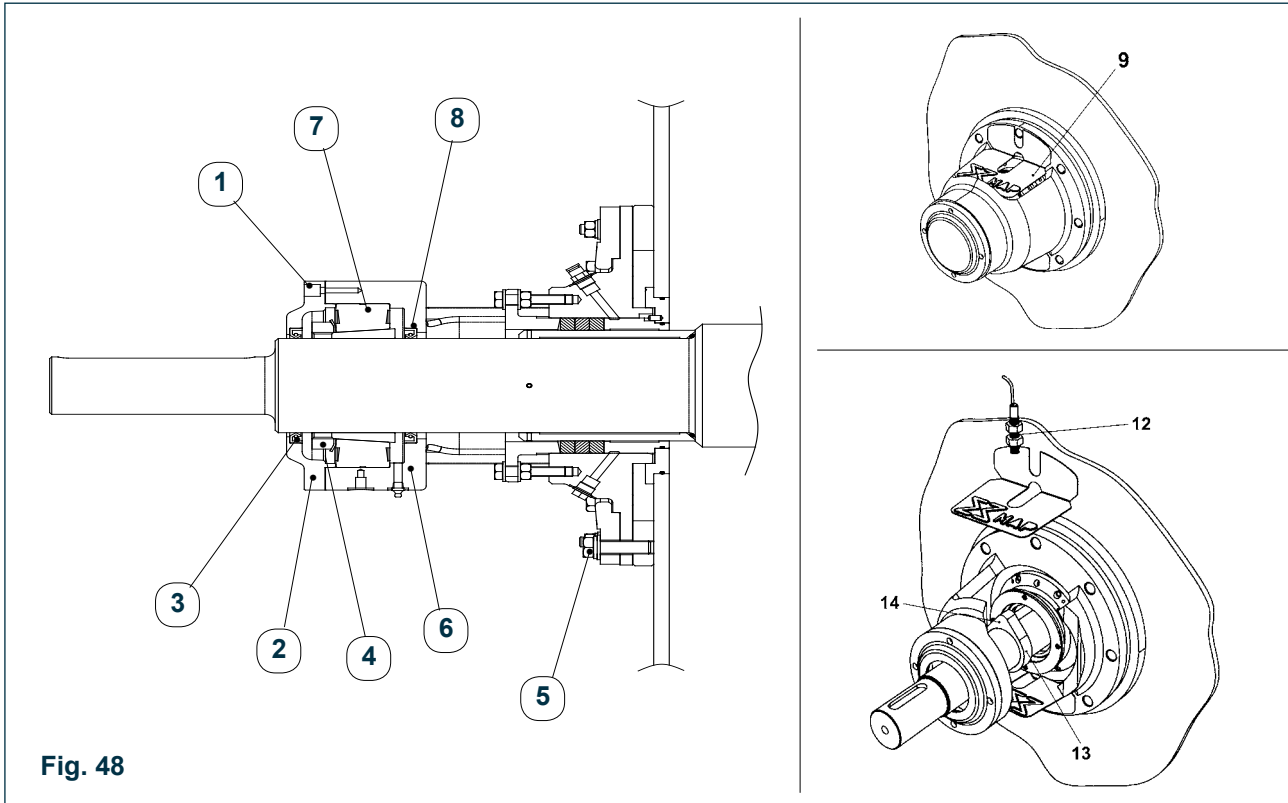
8.4 Drive motor side mounting

Dismantling the end bearing assembly

Note: before dismantling the assembly:

- Disconnect the drive and the flexible pin coupling from the shaft (if present) using an adequately sized extractor.
- Dismantle the two guards "9".
- Screw the seal gland all the way down to eliminate play (due to packing wear) between the packing and the tool carrier rotor. Eliminating this play will enable the packing to support the tool carrier rotor and keep it centered.
- Slacken off screws "1" and remove the cover "2" with the seal "3".
- Straighten the tang on the lock wascher and remove locking ring "4".
- Unscrew bolts "5".
- Dismantle the bearing mount together with bearing "7" and seal "8" using an extractor tool.
- Dismantle bearing "7" from the mounting using the requisite extractor.
- If a rev counter is installed, remove the guard sensor "12" is mounted on.

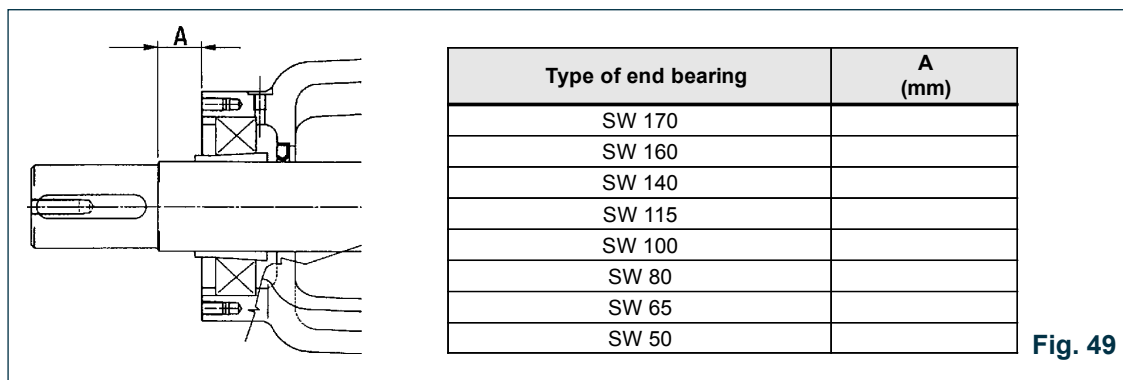
Slacken off screw “13” to release cam “14” from the tool carrier rotor. Normally the rev counter is installed in the mounting opposite the motor drive.


Fig. 48

8.5 Installing the end bearing assembly

Follow these steps to install the end bearing assembly:

- Lubricate with oil: seal “8”, the outside ring of external bearing “7” and their seatings in the casing.
- Install seal “8”.
- Install bearing “7” in the mounting using a press.
- Install the assembly “6” and attach it to the mixer with screws “5”.
- Position the tool carrier rotor so as to observe gap “A” as detailed in Fig. 49.


Fig. 49

- Install the lock washer and manually screw in locking ring "4".
- Adjust internal bearing play as described below.

Regulating taper roller pivoted bearings

This type of bearing is installed in "SW115", "SW140", "SW160" and "SW170" bearing assemblies on motor drive side.

- Use a feeler gauge to check play "B" (fig. 50) on the bearing under the following conditions:

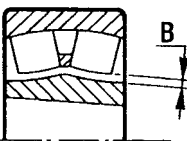
A) not charged: with the locking ring slackened off.

B) Charged: with the locking ring tightened and checking the decrease in play.

The play level for each type of bearing assembly is detailed in Fig. 50.

For example: if we have to adjust the roller bearing for an "SW115" assembly.

- When the locking ring is slackened off, play "B" should be between 75 and 120 microns.
- When the locking ring is tightened, the play should be between 50 and 70 microns. It should never be less than 50 microns.



Type of end bearing	B (µm)		
	Bearing not charged	Reduction in play	Minimum play
SW 170	110 - 170	75 - 100	55
SW 160	75 - 120	50 - 70	50
SW 140	60 - 100	45 - 60	35
SW 115			

Fig. 50

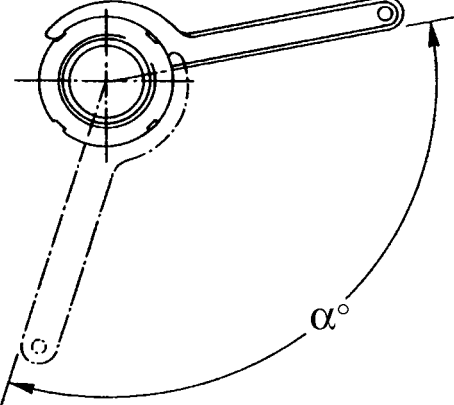
Adjusting pivoted ball bearings

This type of bearing is installed in "SM40", "SM50" and "SM65" assemblies on motor drive side.

Play is adjusted on the basis of locking ring tightening "α".

- Spread grease on the thread and face of the locking ring.
- When the locking ring is turned to angle "α" the bearing is pressed into the tapered seating of the bushing.

Fig. 51 highlights locking ring tightening angles "α".



Type of bearing	α°
SW 100	120
SW 80	90
SW 65	70
SW 50	

Fig. 51

- Lubricate with oil seal “3” and its seating in cover “2”.
- Install seal “3” in cover “2”.
- Install the cover “2” in mounting “6”.
- Fill with grease using the grease pump (refer page M.78 for details on the amount of grease to be used).
- If the bearing assembly has an air-purged seal, to reinstall tube “11” and tighten fitting “10”.
- If it has an RPM counter, clamp cam “14” on the tool rotor shaft using screw “13” (Fig. 48).
- Install the guard with sensor “12”.

8.6 End bearing assembly on side opposite drive motor

Dismantling the bearing

Note: before dismantling the assembly:

- Dismantle the two guards “9”.
- Screw the seal gland all the way down to eliminate play (due to packing wear) between the packing and the tool carrier rotor.

Eliminating this play will enable the packing to support the tool carrier rotor and keep it centered.

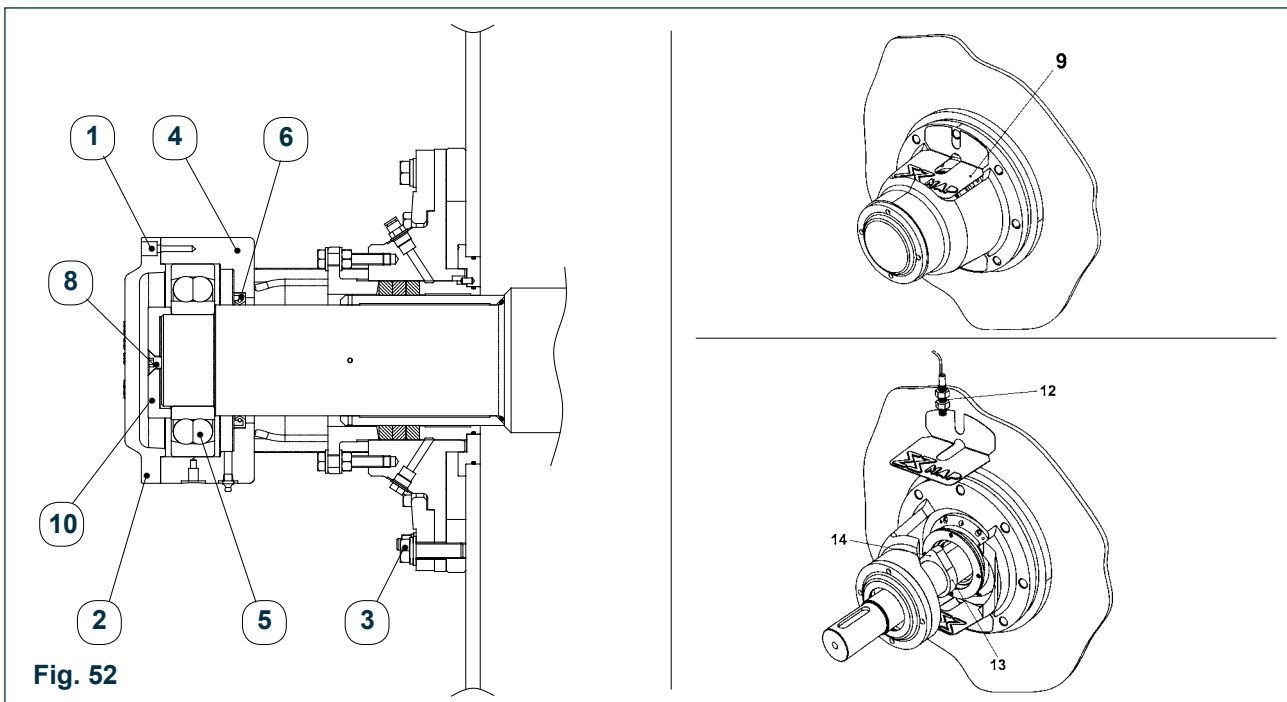


Fig. 52

- Slacken off screws “1” and remove the cover “2”.
 - Unscrew screws “3”.
 - Dismantle the bearing mount “4” together with bearing “5” and seal “6” using an extractor tool.
 - Dismantle bearing “5” from the casing using the requisite extractor.
 - If a rev counter is installed, remove the guard sensor “12” is mounted on.
- Slacken off screw “13” to release cam “14” from the tool carrier rotor. Normally the rev counter is installed in the mounting opposite the motor drive.

Installing the bearing assembly

Follow these steps to install the bearing assembly:

- Lubricate with oil: seal "6", the outside ring of external bearing and their seatings in the casing.
- Install seal "6".
- Install bearing "5" in the mounting using a press.
- Fit bushing "10" by fixing it to rotor using bolt "8".
- Install and screw down cover "2" on the mounting "4" using screws "1".
- Fill with grease using the requisite grease gun.

Refer to pag. 115 for details on the amount of grease to use.

Dismantling and installing of the tool carrier rotor



Danger - Attention

Support the rotor adequately because when the bearings and seals are dismantled, the rotor could drop onto the casing and cause physical harm to the operator or be damaged.

- Remove the bearing from the drive motor side.
- Remove the bearing from the side opposite the drive motor.
- Slacken off the packings at both the drive end and the opposite end and remove the seal assemblies.
- Support the mixing chamber properly and dismantle the end plate on the side opposite the drive unit.
- Change the tool carrier rotor, reinstall the end flange opposite the drive end.
- Install the packing glands and the packing without charging it, on both sides of the mixer.
- Install the drive motor side mounting.
- Install the mounting on the side opposite the drive motor.
- Charge the packing.

8.7 Changing the packing

The packing is a square plaited strip that must be cut to the right length to ensure that the packing box is perfectly filled.

The cut should be made at 45° at both ends so that they overlap exactly. See fig. 53.

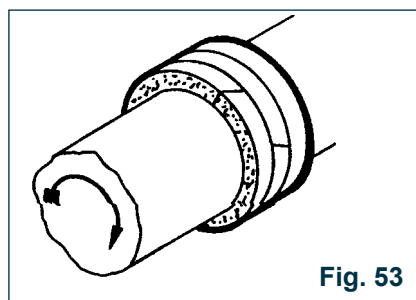


Fig. 53

8.8 Changing the packing on the end bearing assemblies type "SW"

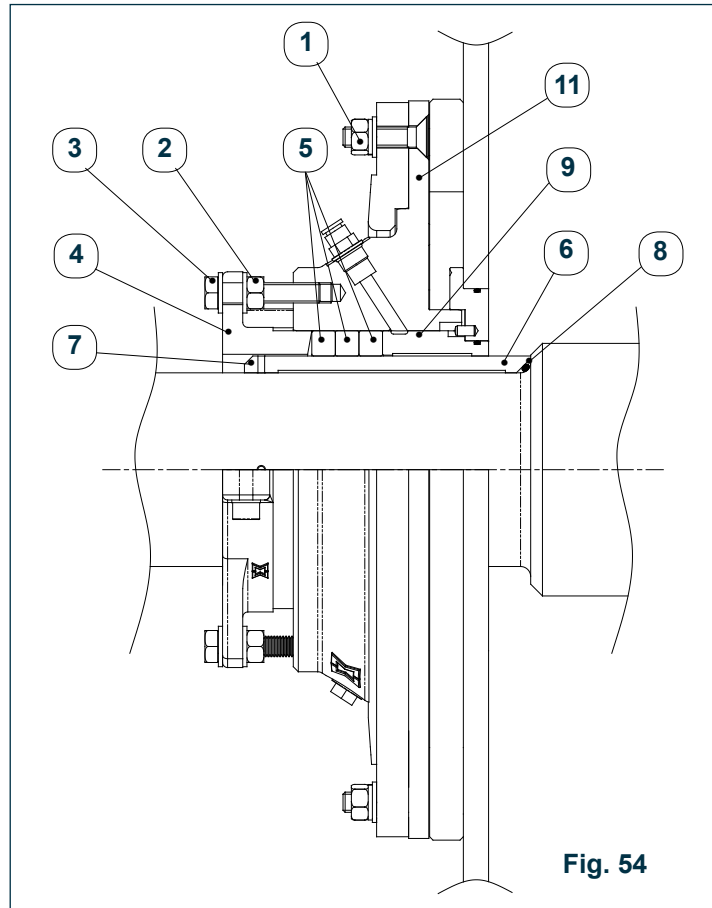


Fig. 54

- Remove packing gland "4" by slackening nuts "2" and unscrewing screws "3";
- Remove packing "5".

Check bushing "6" for wear and replace it, if necessary, as follows:

- Remove the end bearing assembly;
- Remove packing seat "11" and bushing "9" completely;
- Unscrew screws "7" fitted at 90°;
- Remove the old bushing "6" and seal "8";
- Fit new bushing "6" with seal "8" and lock using screws "7";
- Apply a drop of Locktite on the threading of screws "7";
- Fit bushing "9" and packing "5" in sequence;
- Fix packing gland seat "11";
- Fit packing support "4";
- Tighten screws "3" and nuts "2" slightly;
- Tighten the packing gland.

8.9 Sensor adjustment (Electro-pneumatic drive)

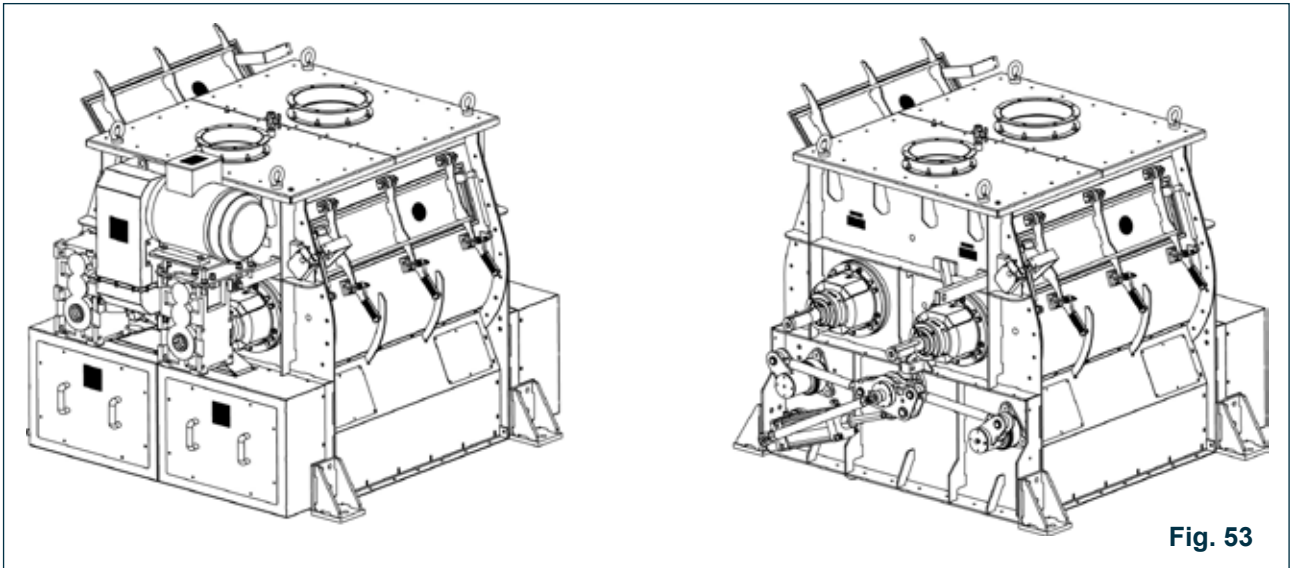


Fig. 53

SENSOR FUNCTIONS

Sensor pos. "2, 2a"

- Emits a function reset signal for the successive cycle.

Sensor pos. "3, 3a"

- Indicates the outlet hatch closed position.
- Emits a consent signal for valve opening for discharging product in mixer;

Note

Each cylinder is provided with two magnetic sensors for a double check.

Sensor adjustments for pos. "2" and "2a" (fig. 54)

Note

Adjust inductive sensors "2" and "2a" with the outlet spout open.

In this condition, the magnetic piston "1" of the cylinder is at the stroke limit.

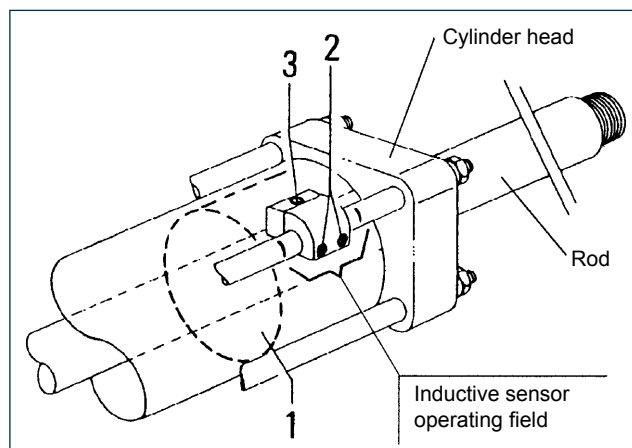


Fig. 54

- Slacken the anchoring bolts “2” of the inductive sensor, then move it longitudinally at approximately 150mm from the cylinder head.
- Move the sensor towards the cylinder head until the LED indicator “3” lights up, then use a felt-tip pen to mark the position.
- Once again, move the sensor towards the cylinder head until the LED indicator “3” turns off, then use the pen to mark the position.
- Position the sensor half way between the two pen marks, then block it into position.

Note

The adjustment procedure is the same for both cylinders.

Sensor adjustments for pos. “3” and “3a” (fig. 55)

Note

Adjust inductive sensors “3” and “3a” with the outlet spout closed.

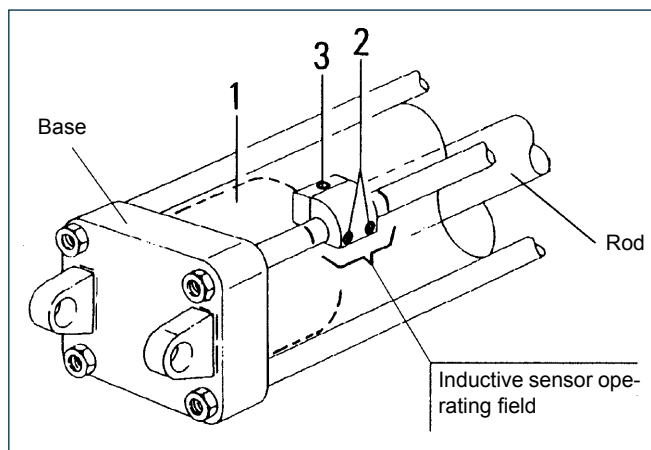


Fig. 55

- Slacken the anchoring bolts “2” of the inductive sensor, then move it longitudinally at approximately 150mm from the base.
- Move the sensor towards the base until the LED indicator “3” lights up, then use a felt-tip pen to mark the position.
- Once again, move the sensor towards the base until the LED indicator “3” turns off, then use the pen to mark the position.
- Position the sensor half way between the two pen marks, then block it into position.

Note

The adjustment procedure is the same for both cylinders.

8.10 Adjustment and replacement of the outlet DOOR gasket (electro-pneumatic drive)



Danger - Attention

Carry out adjustment and replacement operations on the outlet spout gasket with the machine empty, disconnected from the electricity mains by acting on the safety switch.

The switch key must be kept in the custody of an authorized maintenance technician.

Adjusting the gasket

- Open outlet hatch "2" by acting manually on the cylinders control solenoid valve.
- Disconnect the compressed air supply.
- Clean gasket with air at low pressure or using a dry cloth and check its condition; if cut or broken, it must be replaced.
- Connect the compressed air supply and close outlet hatch by acting manually on the cylinders control solenoid valve.
- Make sure the outlet hatch movement lever mechanism is in the block position on both the end plates of the mixer and disconnect the compressed air system.
- Check the entire perimeter for play between gasket and outlet hatch in such a way as to determine the points where adjustments are needed.
- In the sections where there is play, slacken the nuts (do not unscrew completely) which fix gasket in its seat.
- With outlet hatch closed, strike with a rubber mallet in the gasket seat so that gasket makes contact with outlet hatch just enough to reduce the play detected earlier to zero.
- Tighten nuts.
- Check to make sure all nuts are screwed properly.
- Connect the compressed air supply
- Open the outlet hatch and then close it.
- Again check for play between gasket and the outlet hatch.
- Test sealing with the product.

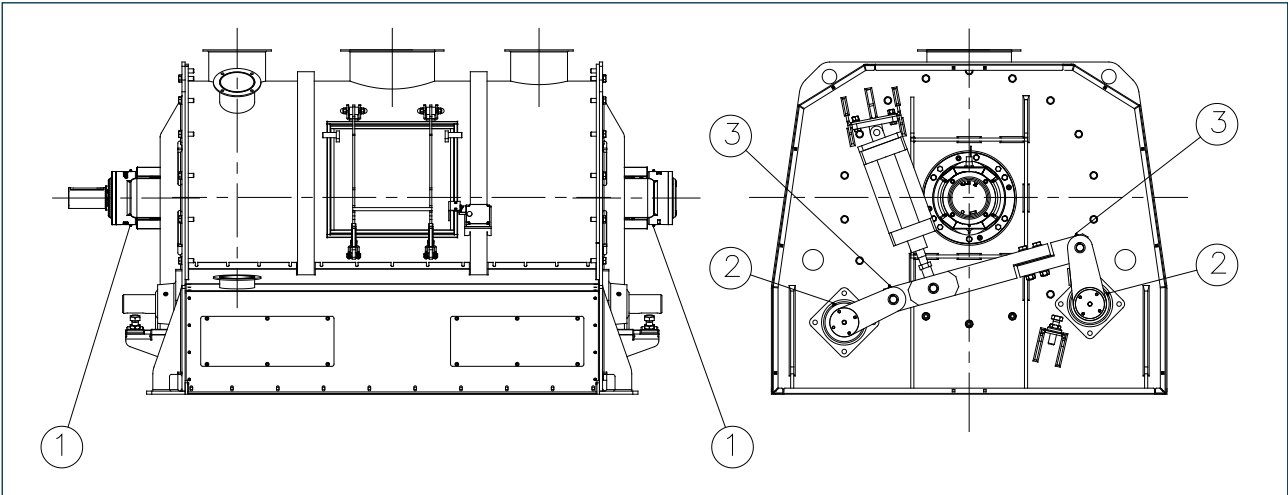
8.0 REPLACEMENT OF PARTS

Replacing the gasket

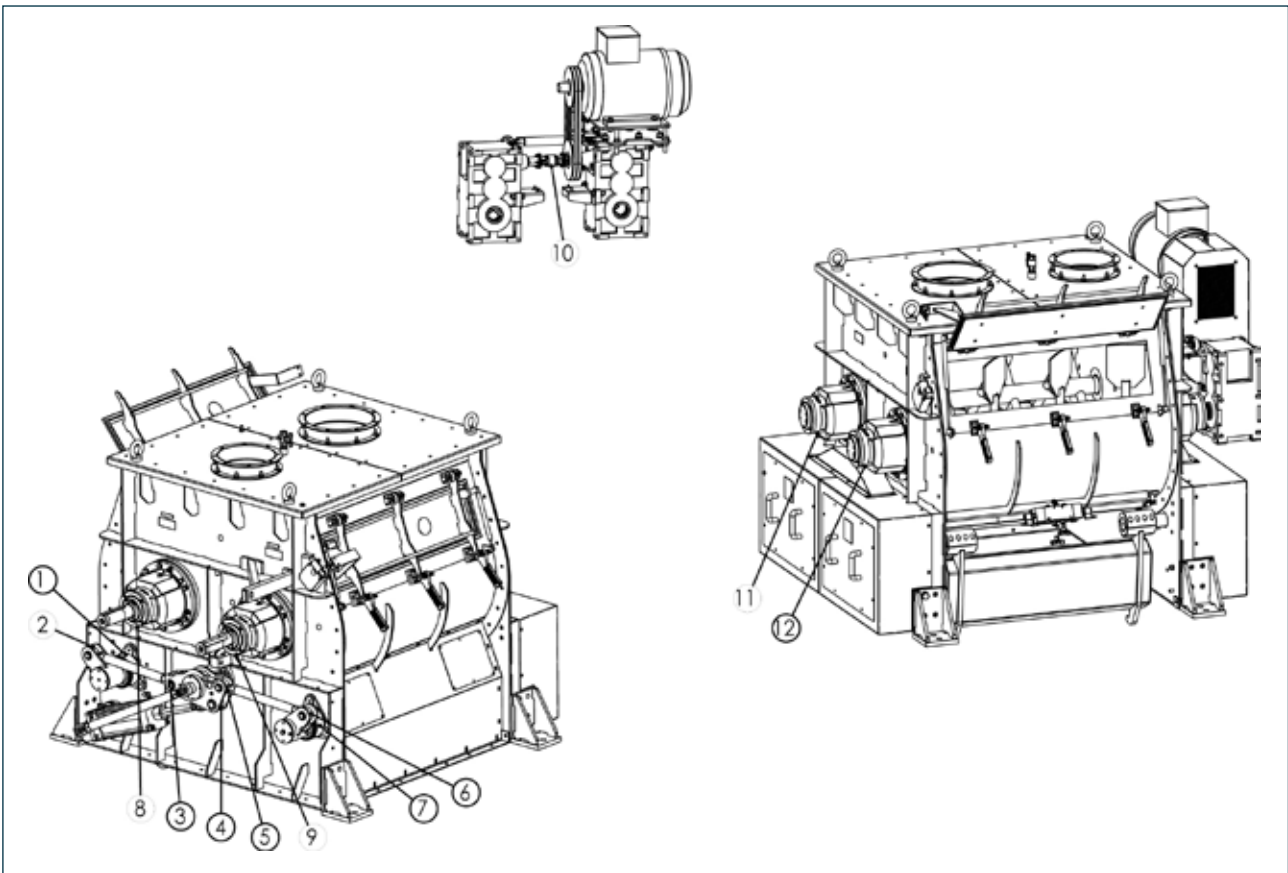
- Open outlet door by acting manually on the cylinders control solenoid valve.
- Disconnect the compressed air supply.
- Slacken nuts and dismantle components of gasket seat, in one section at a time.
- Remove the silicone from the ends of the section of the gasket to be replaced.
- Remove the section of gasket concerned and replace it with one of equal length.
- Refit the components of the seat and partly screw nuts (without tightening).
- Connect the compressed air supply and act manually on the solenoid valve to close the outlet door.
- Disconnect the compressed air supply.
- Strike with a rubber mallet in the gasket seat so that gasket makes contact with outlet door just enough to reduce the play between the two parts to zero.
- Tighten nuts.
- Check to make sure all nuts are tightened properly.
- Connect the compressed air supply and act manually on the solenoid valve to open the outlet door.
- Disconnect the compressed air supply.
- Apply the silicone in the connecting corners of the gasket.
- Seal the two ends of the gasket with silicone to prevent product from entering inside the mixer.
- Wait for the silicone to dry (2-3 hours) leaving the door in the open position.
- Test sealing with product and adjust the gasket, if necessary.

8.11 Greasing layout

Pneumatically-operated discharge door - (WBHT 00550÷WBHT03000)



Hydraulically-operated discharge door (WBHT 04800÷WBHT15000)

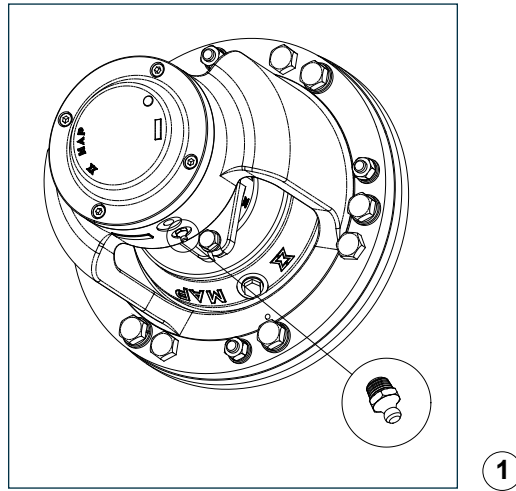


Note

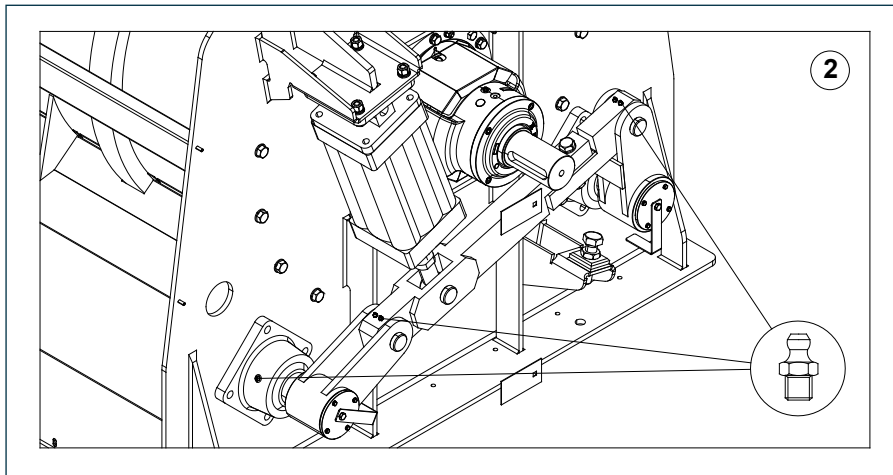
Consult the Operating and Maintenance manual for instructions about blender (if installed) lubrication.

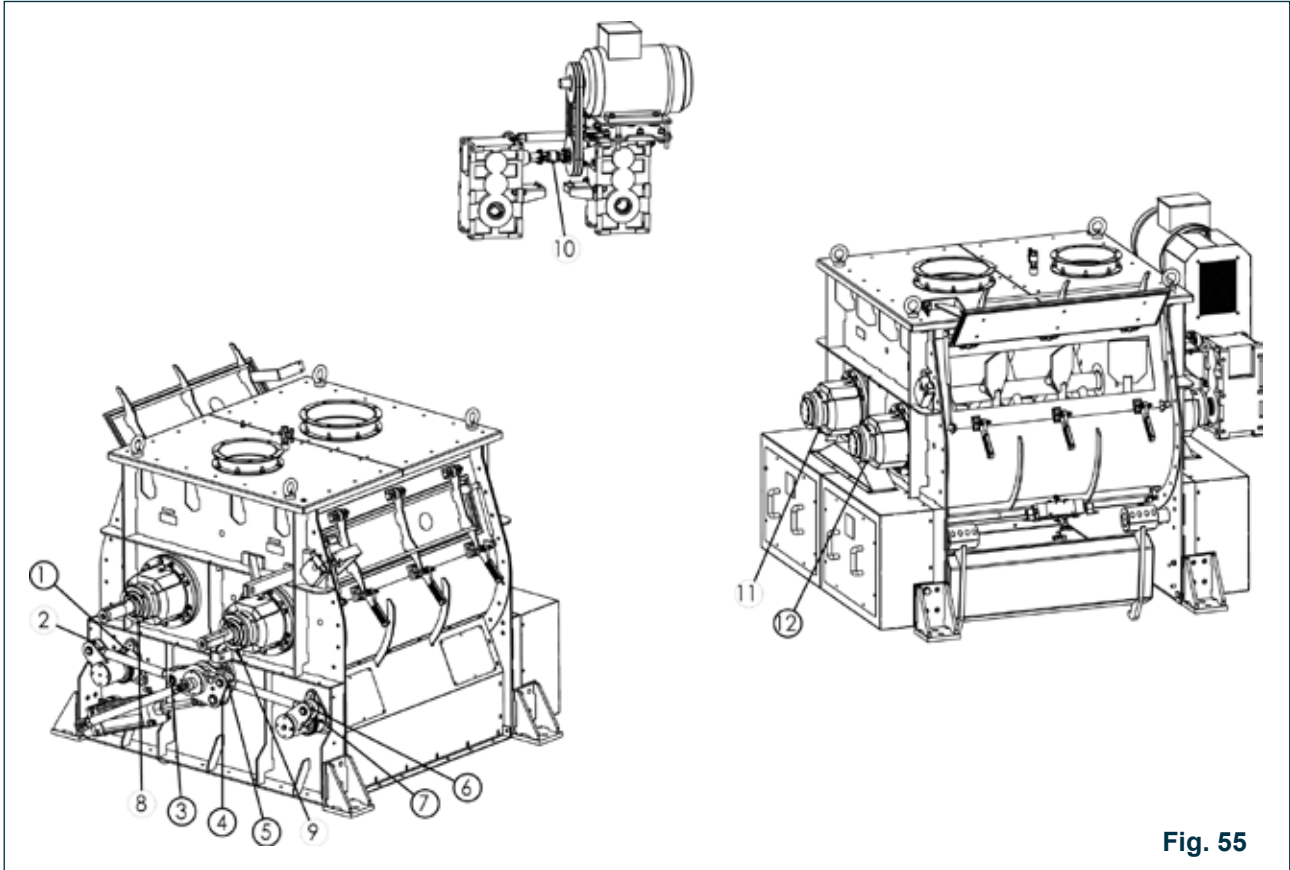
8.0 REPLACEMENT OF PARTS

Mounting



WBHT 00550 ÷ WBHT 03000



8.12 Greasing
Greasing points

Fig. 55

Greasing points	Type of lubricant		Annual lubrication frequency	Quantity
	Grease	Oil		
1	ESSO BEACON 2		3 times -	*

* See table

Table highlights the amount of grease to be used on bearings according to their size.

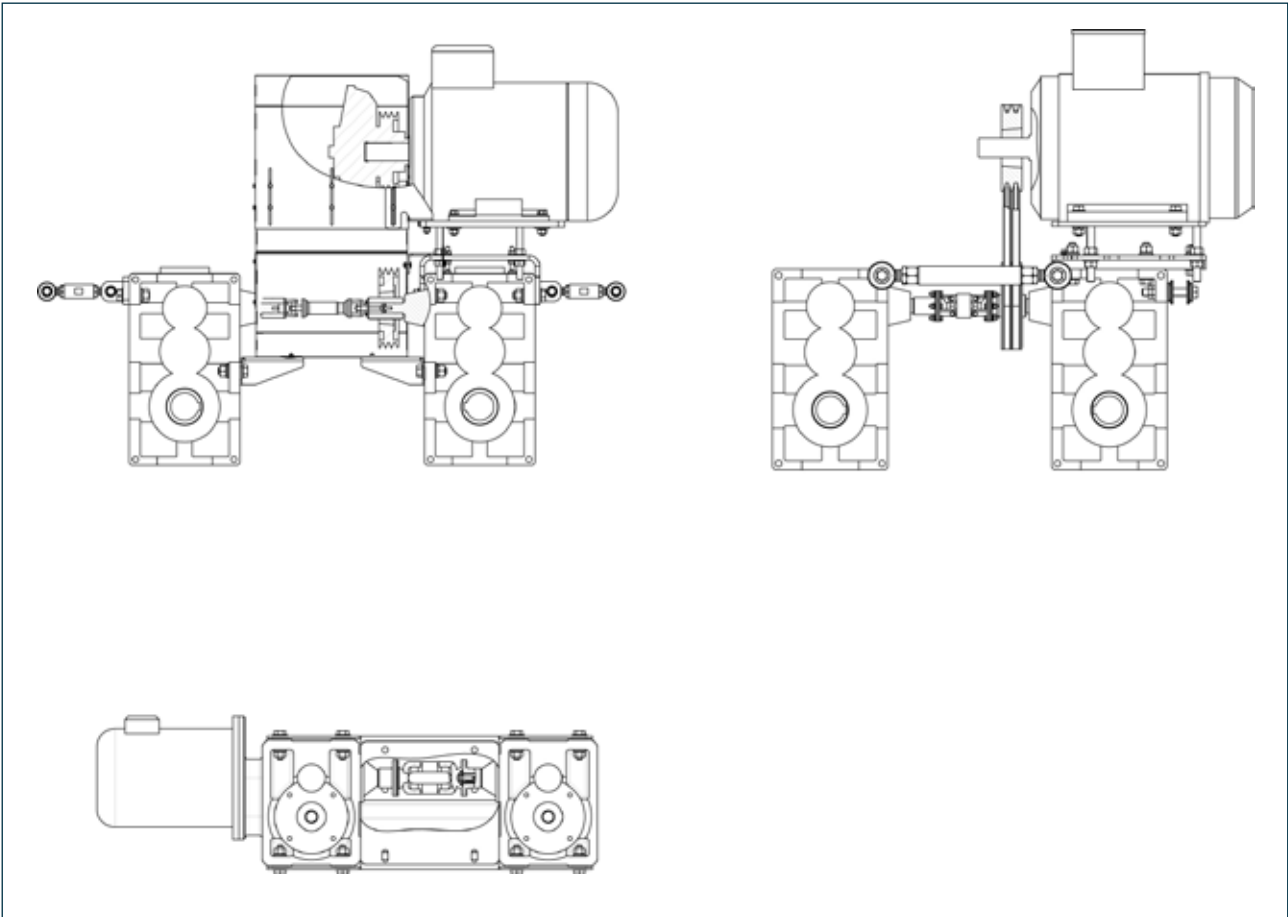
END BEARING ASSEMBLIES (SW)								
Bearing diameter mm	50	65	80	100	115	140	160	170
Amount of grease cc	5	6	8	10	14			

Grease comparison chart

ESSO	ELF	FINA	IP
BEACON 2	ROLEX A2	MARSONER 2	IP ATHESIA PL2

8.13 Drive lubrication

Mixers are available with different drives depending on size and specifications. The illustrations below summarize the available motor drives.



Refer to the information below for details on drive lubrication.

PP / PO

Check the oil level in the gear reducer, and, if installed, grease the electric motor (refer to the manual).

CI

Check the oil level in the gear reducer, the hydraulic coupling and, if installed, grease the electric motor (refer to the manual). Check drive belt tensioning and size. Check the rubber sections of the flexible coupling.

LI

Check the oil level in the gear reducer, the hydraulic coupling and, if installed, grease the electric motor (refer to the manual). Check the rubber elements in the flexible coupling “en bloc” with hydraulic coupling (see instruction manual annexed). Replace the rubber elements at least once a year.

8.14 Scheduled overhaul

It is good standard operating practice, especially with mixers subjected to very intense work, to schedule regular overhauls timed to match up with normal plant downtimes. This kind of overhaul envisages a careful and thorough visual and instrument check-out (as needed) for all parts subject to wear.

In particular, it is very important to replace all rubber parts (seals) on hatches, loading and discharge doors and flexible couplings.

It is equally important to change, all parts especially subject to wear and tear.

Since part wear is largely in relation to the intensity of machine work, in addition to careful maintenance and lubricating, it will be important for the operator to assess the replacement needs and schedule them accordingly.

To reduce maintenance work time, if the mixer is accidentally shut down (a non-scheduled stop), we recommend keep the following parts in stock.

- 1 Kit of mixing tools
- 1 End bearing - motor side
- 1 End bearing - opposite motor side
- 1 Pneumatic actuator
- 1 Solenoid
- 1 Solenoid coil
- 1 Electromagnetic key operated door lock
- 2 End bearing shaft seals
 - Inspection hatch seal
 - Discharge door seal (when envisaged)
- 1 Kit flexible coupling rubber elements (where installed)
- 1 Lit hydraulic coupling rubber elements (where installed)
- 1 Hydraulic coupling fuse plug
- 1 Drive belt kit (where installed)
- 1 Chopper assembly (where installed)
- 1 Chopper tool kit (where installed)

It is best, however, when ordering the mixer, ask for Manufacturer to supply the recommended spare parts for the precise mixer ordered.

8.15 Sample draw maintenance (option)



Danger - Attention

Change the seal or the piston only with the mixer shut down and empty.

Clean all exterior surfaces thoroughly using products suitable for the materials to be mixed.

Take special care not to damage the inside of the sample draw casing.

Do not insert tools into the discharge door since this could damage the sample draw.

8.16 Changing the piston on the manual operated sample draw

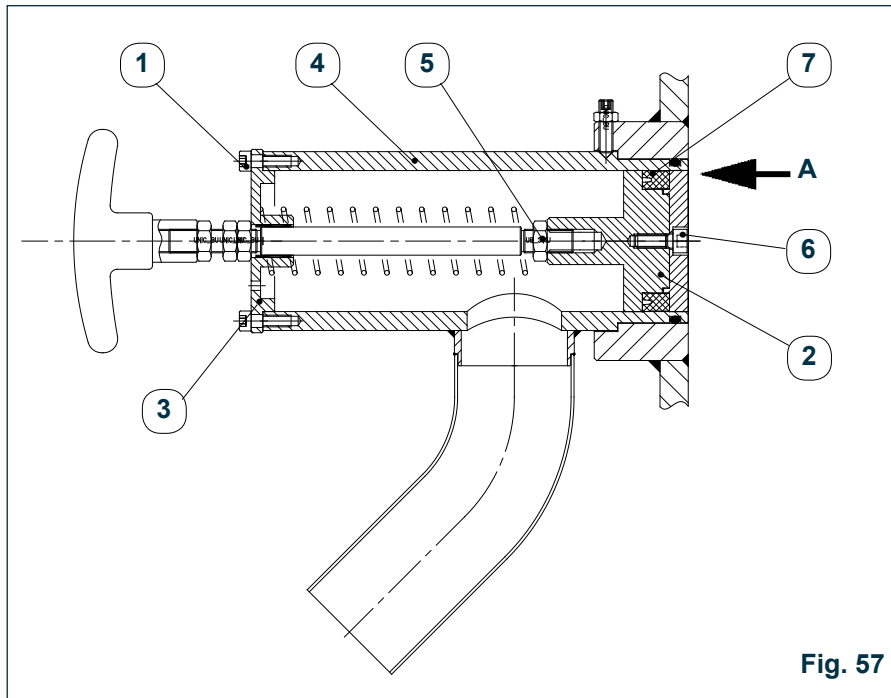


Fig. 57

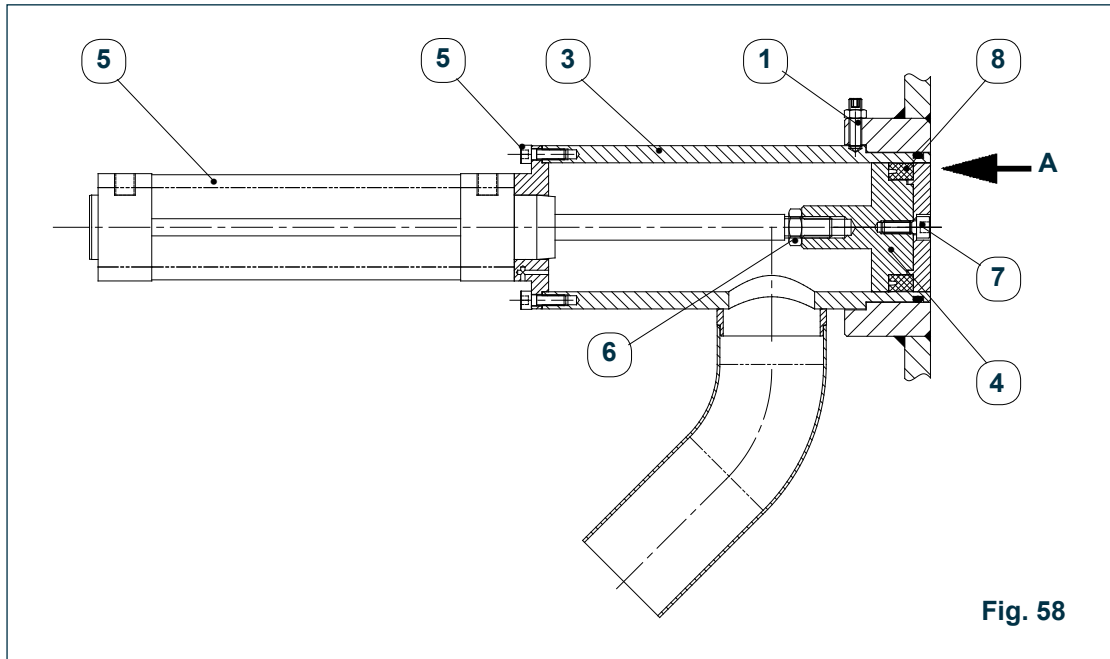
- Unscrew the four screws “1” and remove the cover and the pad from body “4” of the sample taking device.
- Slacken off nuts “5” and unscrew pad “2”.
- Unscrew screws “6” and change gasket “7”.
- Install the sample taking device in the reverse order described above to dismantle it.
- Make some movements in no load conditions.

8.17 Changing the piston on the pneumatic sample draw



Danger - Attention

Release the air pressure in the pneumatic circuit and disconnect the compressed air supply before working on the sample draw.



- Disconnect the pneumatic line from the sample draw cylinder.
- Remove screws "2" and pull out the pad "4" from the sample draw "3" together with its drive cylinder "5".
- Slacken off nut "6" and unscrew piston "4".
- Unscrew screw "7" and change gasket "8"
- Install the new piston and lock it in position checking to make sure that (when the pneumatic cylinder is at its limit switch) the piston is at level "A" of the piston casing.
- Install the sample draw in the reverse order described above to dismantle it.
- Move the piston a little under no load conditions to clamp the seal.

8.18 Cleaning procedure for the liquid injection suction nozzle from the inlet liquid injection lance



Danger - Attention

Use non-toxic and non-flammable detergents or descalers.

If you use compressed air to clean the machine, wear accident prevention goggles to protect your eyes from the solid particulate matter projected by the air jet.

Limit the air pressure to 2 bar.

Remove the liquid injection device and immerse it for the time required in a scale removing solution.

Clean the nozzle with a jet of compressed air or, as needed, change it.

Note: replace the nozzle with another with exactly the same specifications as the old one and made from the same material.

8.19 Dismantling and taking out of service



Danger - Attention

As for installation, dismantling operations required to move the machine or to scrap it must be done by specialized and expressly authorized personnel.

- Disconnect the electric supply upstream and then disconnect the electric motor power cables.
- The mixer can now be dismantled.
- If the machine is to be scrapped, bear in mind that the mixer is made largely from steel, an electric motor with its copper windings and various electric parts.
- Remove and collect the lubricant contained inside the reduction gear unit.
- Proceed in completely dismantling the machine, separating the component parts according to the materials they are made of.
- Send the materials to the nearest differentiated waste collection centres where they will be properly separated, and any pollutant parts will be handled in compliance with the current regulations of the country where the machine was installed.

9.1 Trouble-shooting

Minor problems can be solved without consulting a specialist.

The following Table contains a list of the most common problems, the possible causes and possible remedies.

For particularly difficult actions which are not mentioned in the Table, contact the Manufacturer's Sales Dept. directly.



Danger - Attention

Before carrying out any operation "set the equipment concerned in safety" (see "Glossary and terminology"), operate according to the indications on the "Operation and Maintenance Manual" and in accordance with and in compliance with the standards in force as regards health and safety.

Problem	Possible Reason	Action
The mixer does not start	Fuse(s) on electric control panel blown	Change blown fuse(s)
	Circuit breaker tripped	Reset circuit breaker
	Overload tripped	Reset overload
	Inspection hatch open	Close hatch
	Emergency stop button pressed	Reset emergency button
The mixer does not discharge the product	No air in the pneumatic cylinder	Re-establish compress air supply
	Faulty solenoid coil	Replace coil
The mixer is noisy	Incorrect gap between plough tools and mixing chamber	Call MAP Technical Assistance
	Faulty end bearing	Repair the bearing(s) (see M.62)
The mixer stops during a mixing cycle	The amount of product is more than max. allowed	Remove product from the mixer until the right level is reached
Residue inside the mixing chamber	Worn tools	Change or adjust tools
The mixer does not mix the product properly	Incorrect product processing time inside the mixing chamber	Reset correct processing time
	Excess wear on tools	Replace or adjust tools
Excessive powder leaking from the inspection hatch	Worn seal	Replace seal
Powder leaks from the bearing seals	Seal packings incorrectly registered	Register the packings correctly (see M.58)
	Worn packings	Replace the packing (see M.70)
During mixing, product leaks from the discharge door	Worn seal	Change seal
	Insufficient air pressure	Increase air pressure
	Leak in compressed air circuit	Repair or replace the worn parts
Powder leaks from the chopper seals	Incorrectly registered packings	Regulate the packings (refer to Operating and Maintenance Manual - Choppers)
	Worn packings	Change the packings (refer to Operating and Maintenance Manual - Choppers)

9.0 INFORMATION REGARDING FAULTS

Problem	Possible Reason	Action
Bearings overheat	Worn or damaged bearings	Replace the bearings
Gear unit overheats	Insufficient or excessive oil in gear unit	Fill to correct level
	Worn or damaged bearings	Replace bearings
Electric motor overheats	Worn or damaged bearings	Replace bearings
Excess temperature in the mixing chamber	Excessive mixing time	Reduce mixing time
	Highly abrasive product	Reduce mixing time
	Introduction of products that, when combined, create a chemical reaction	Check to make sure the temperature does not exceed max. permitted (see M.51)
Mixer-drier does not heat the product	Heat exchange liquid is obstructed	Remove the obstruction to reset correct heat exchange liquid circulation
	Air in the heat exchange liquid circuit	Vent the circuit (see M.51)
Mixer-conditioner does not cool the product	Heat exchange liquid is obstructed	Remove the obstruction to reset correct heat exchange liquid circulation
	Air in the heat exchange liquid circuit	Vent the circuit (see M.51)
Product leaks from the sample draw	Worn seal (manual sample draw)	Replace the seal (see M.94)
	Worn pad (pneumatic sample draw)	Replace the piston (see M.95)
Product is not correctly moisturised	Spray nozzles clogged	Clean spray nozzles (see M.96)

9.2 Check-list in case of fault

If you have been unable to solve the problem on the mixer even after having carried out the operations suggested in paragraph "Trouble-shooting" please contact the plant technician/installer/or the Manufacturer.

When technical assistance is required, in addition to the mixer data, the plant technician/installer or manufacturer will also need information concerning the plant in which the mixer is installed, its installation and its working, for better identification of the problem that has occurred on your equipment.

It must be specified that many of the checking operations which are requested have already been performed in the various steps during installation, testing and start-up of the mixer.


Danger - Attention

Before carrying out any operation "set the mixer in safety" (see "Glossary and terminology"), operate according to the indications on the "Operation and Maintenance Manual" and in accordance with and in compliance with the standards in force as regards health and safety.

1) Information necessary

- a) Description of problem
- b) Photo showing the entire mixer and how it is installed
- c) Throughput of mixer

2) Checking the electrical part

- a) Are voltage variations possible due to simultaneous start-up of various equipments?
- b) Is the plant equipped with a current generator?
- c) The electric motor thermal protection inside the panel has delayed action, its adjustment is in line with the data on the motor rating plate!
- d) Check the power input of the motor without load, at breakaway current and when the mixer is operating at full speed!!

3) Checking the mixer

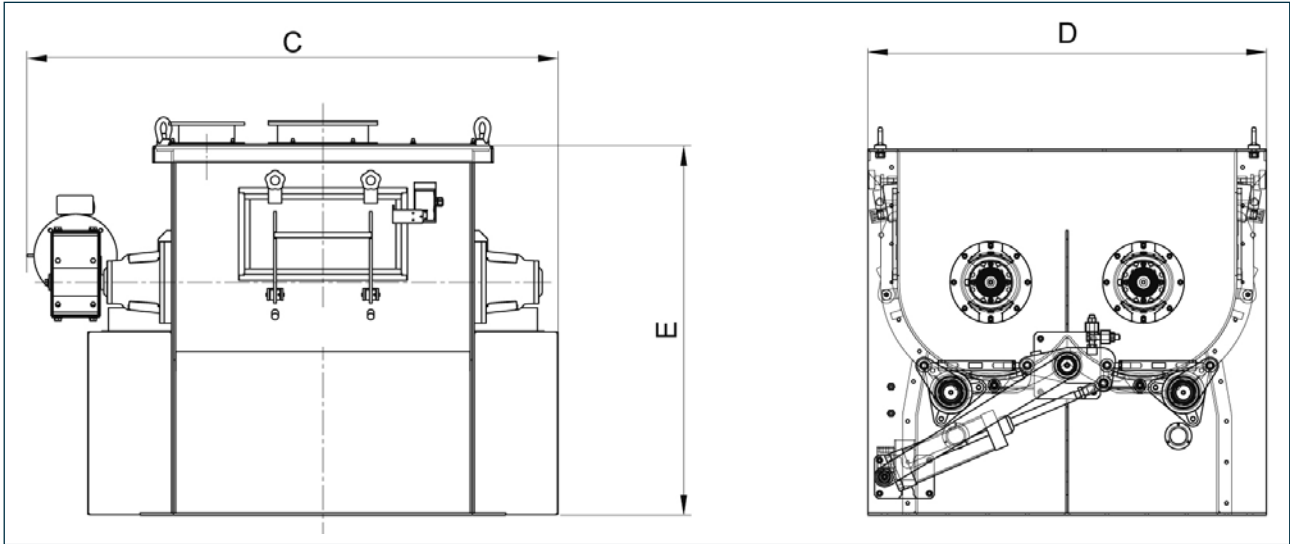
- a) Has the mixer been assembled correctly?
Are all the inspection hatches in the bottom part?
- b) Has the mixer been fixed correctly?
- c) Does the screw bend? The parameters on alignment have been checked.

4) Checking the product

- a) Product description??
- b) Density? (kg/dm³)
- c) Granulometry? (µm/mm)
- d) Moisture? (%)
- e) Flowability?
- f) Compressibility?
- g) Abrasiveness?

Weights and overall dimensions

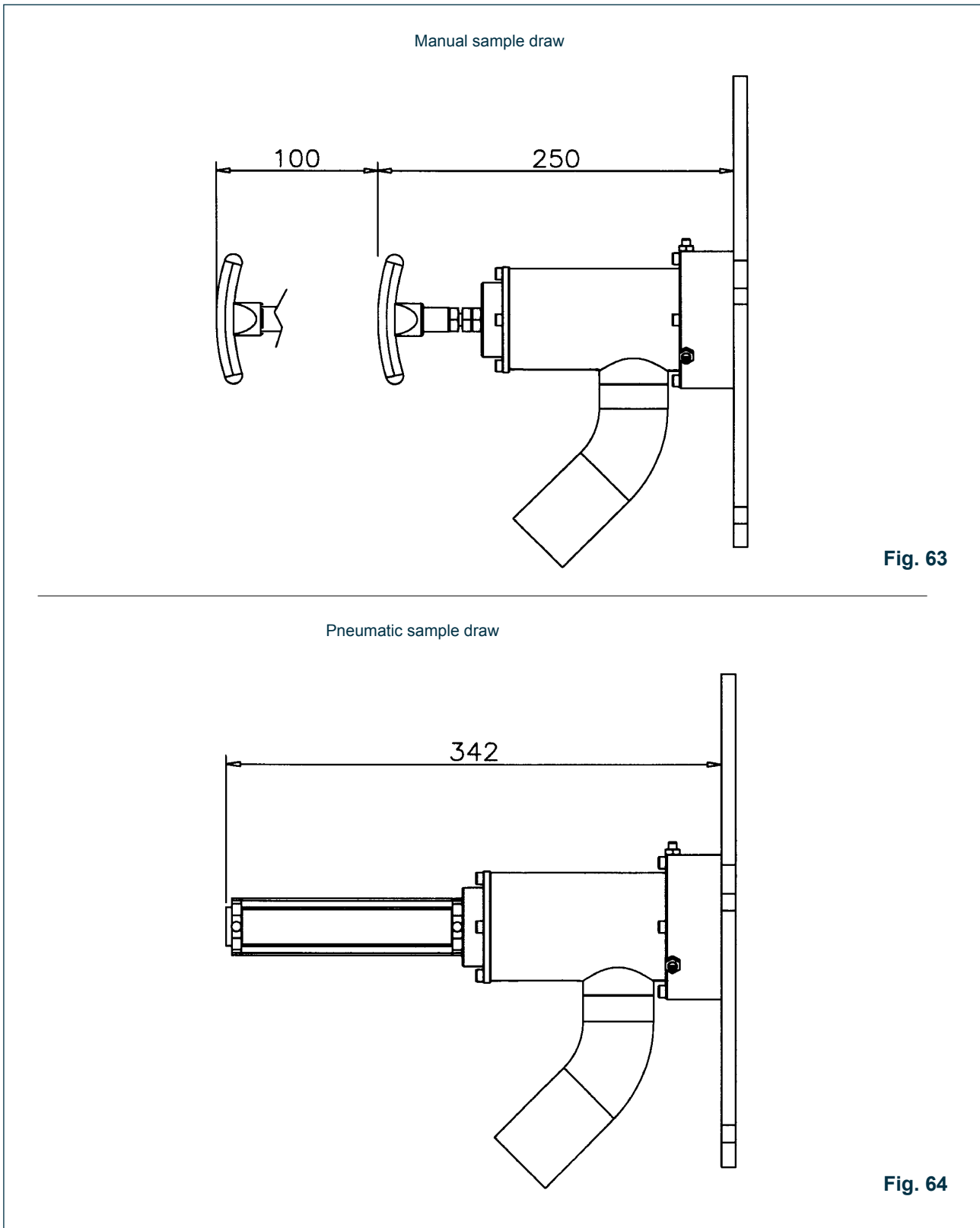
Mixer with direct-mounted drive


Fig. 60

Type	Nominal Volume in liters	Working capacity in liters		C mm	D mm	E mm
		min	max			
WTS 120	120	48	168	1484.5	1059	1004
WTS 250	250	100	350	1784	1363	1104
WTS 500	500	200	700	2169	1835	1630
WTS 1000	1000	400	1400	2690.4	2170	2036.5
WTS 2000	2000	800	2800	3170	2662	2373

Type	Nominal Volume in liters	Drive Power kW	Weight Kg	
			Machine with cover	Machine without cover
WTS 120	120	3	726	691
WTS 250	250	5.5	1226	1176
WTS 500	500	11	2070	2005
WTS 1000	1000	30	3511	3416
WTS 2000	2000	37	5888	5727

Sample draw dimensions



dimensions in mm

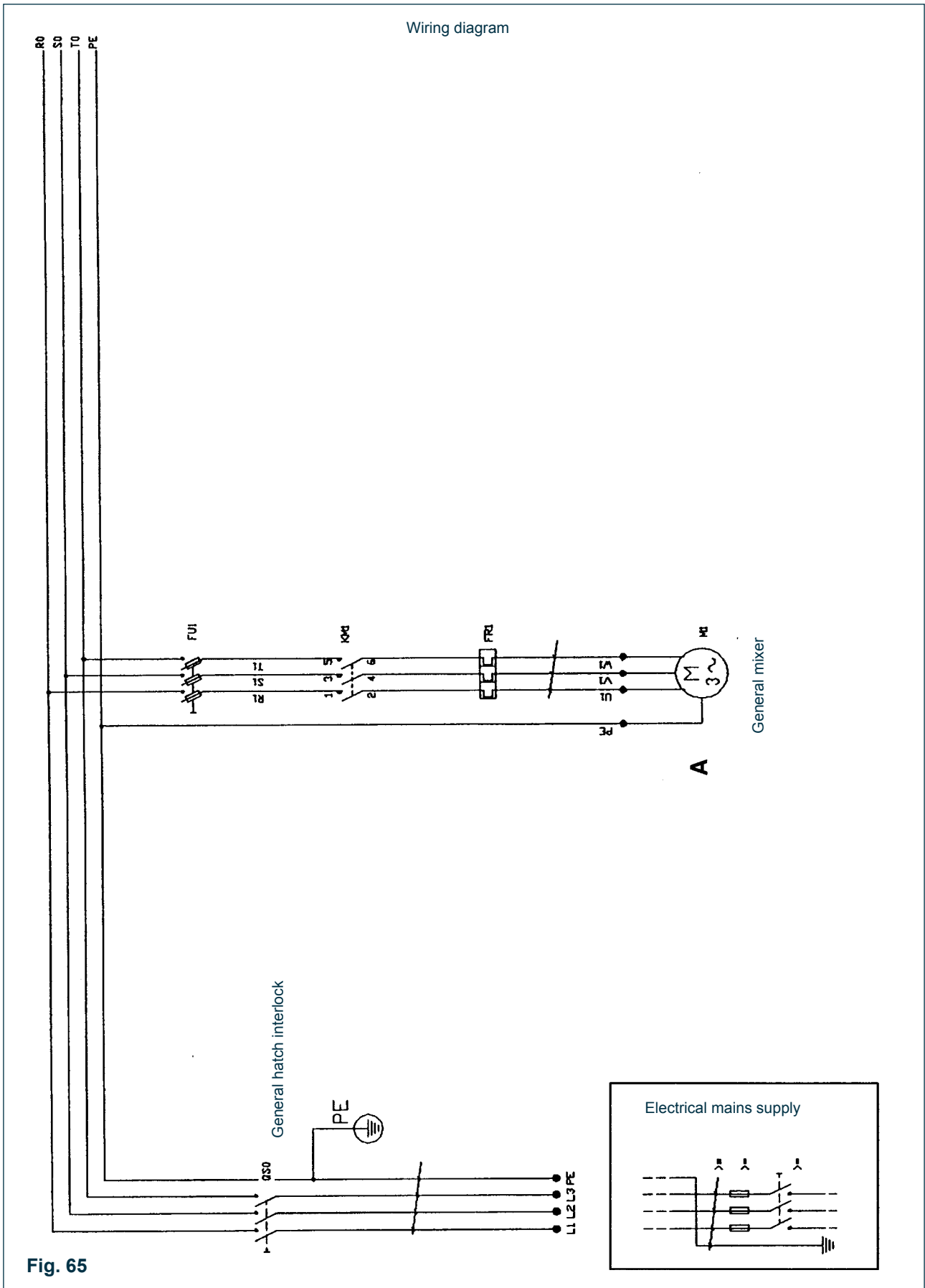
Electric system

The electrical system is manufactured in compliance with the CEI-GENELEC-IEC standards and the symbols used in the diagram also comply with these standards.

If the mixer is supplied with its own electric control board, its wiring diagram is inside the control board.

If the mixer is supplied without a control board, the electric wiring diagram can be requested from the supplier of the control board.

The diagrams given in illustrate typical electrical layouts.



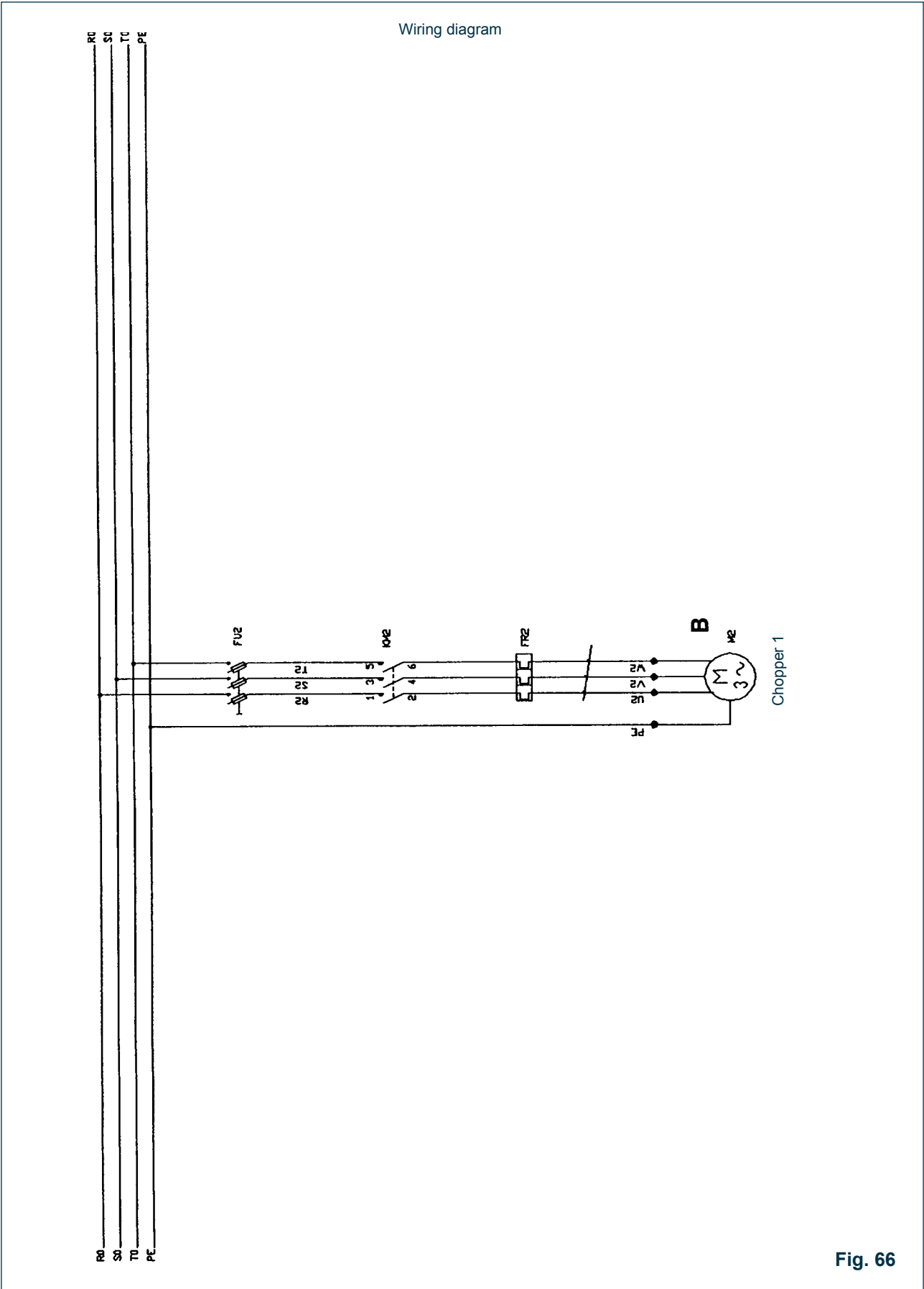
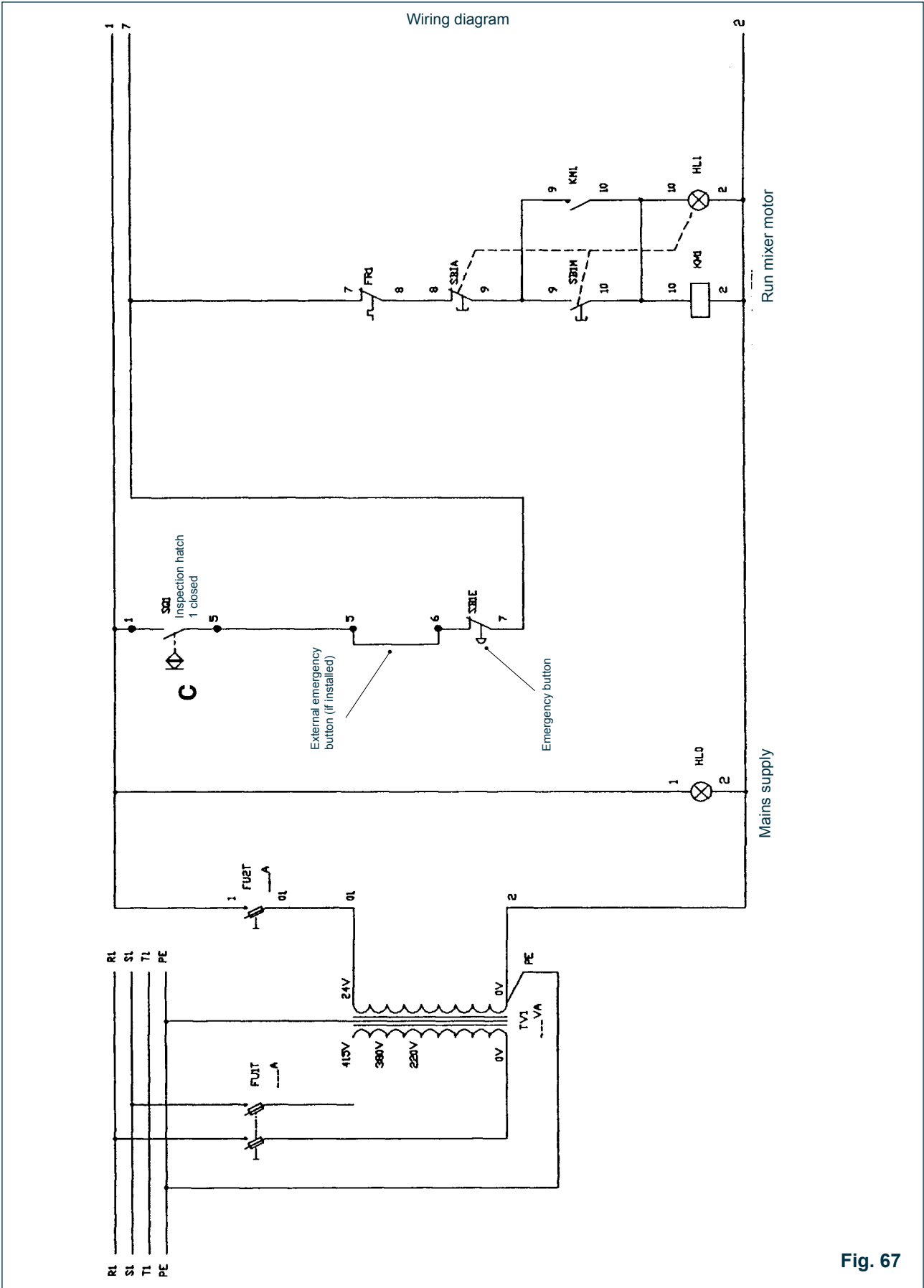


Fig. 66



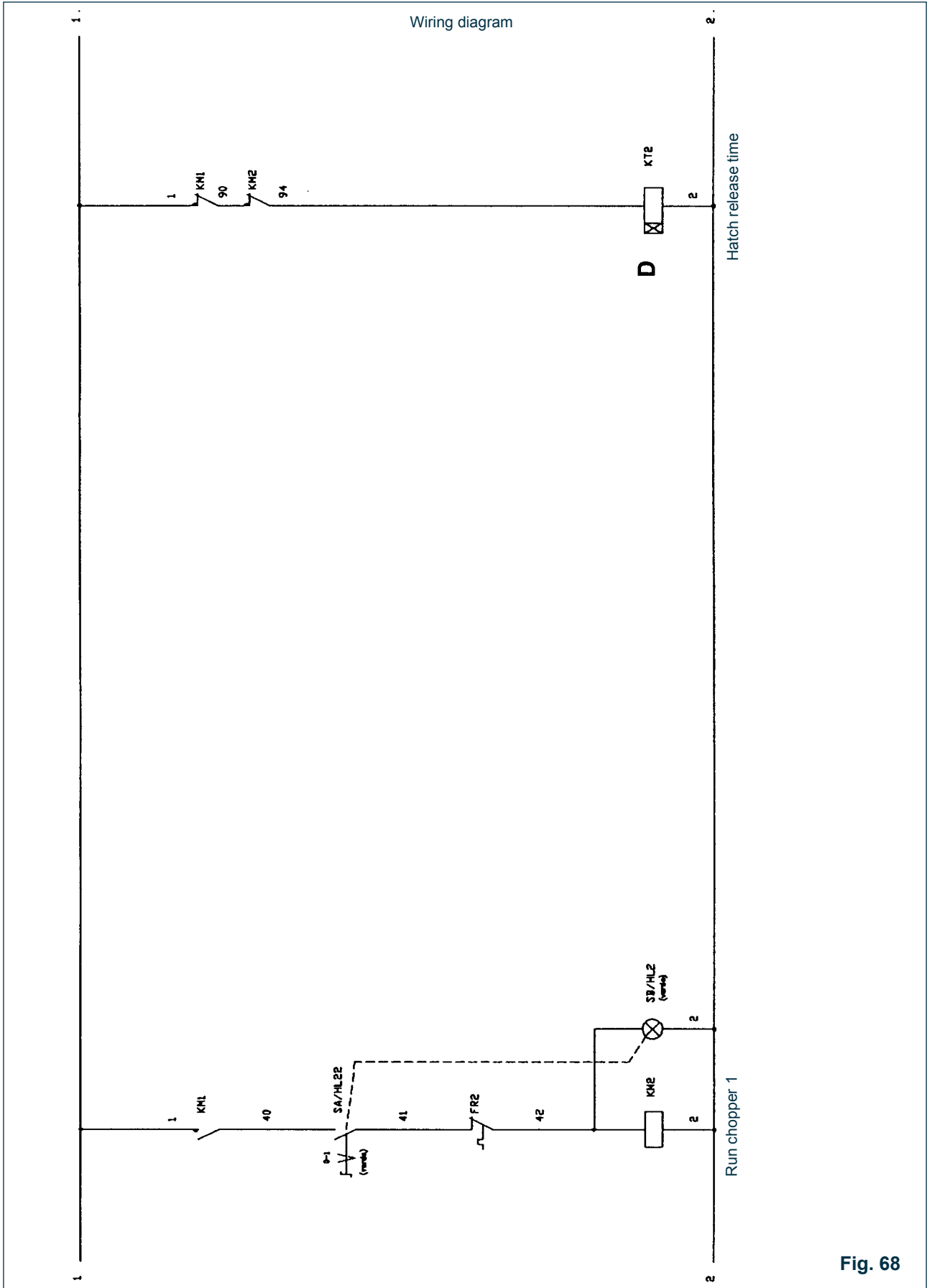


Fig. 68

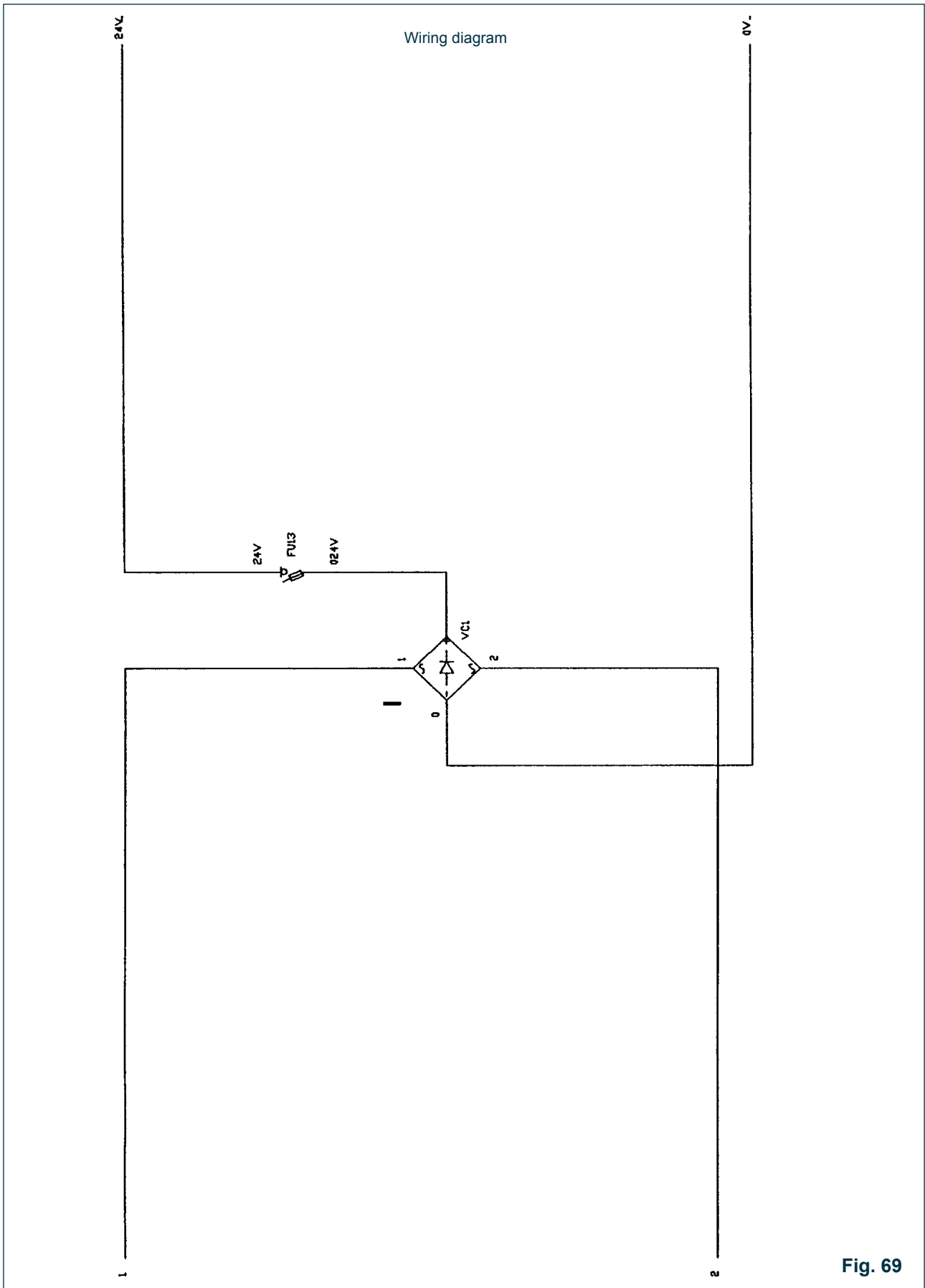
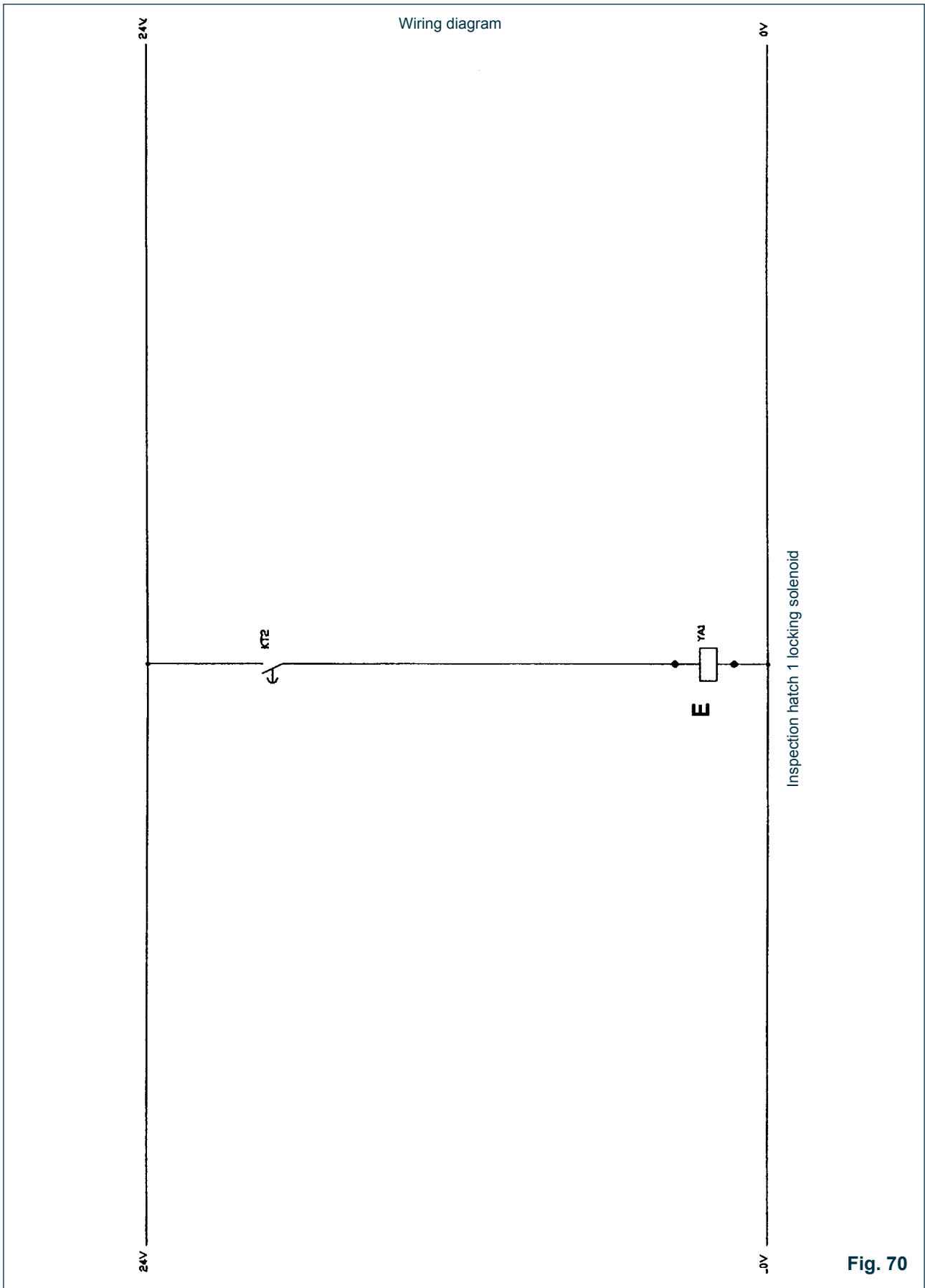


Fig. 69



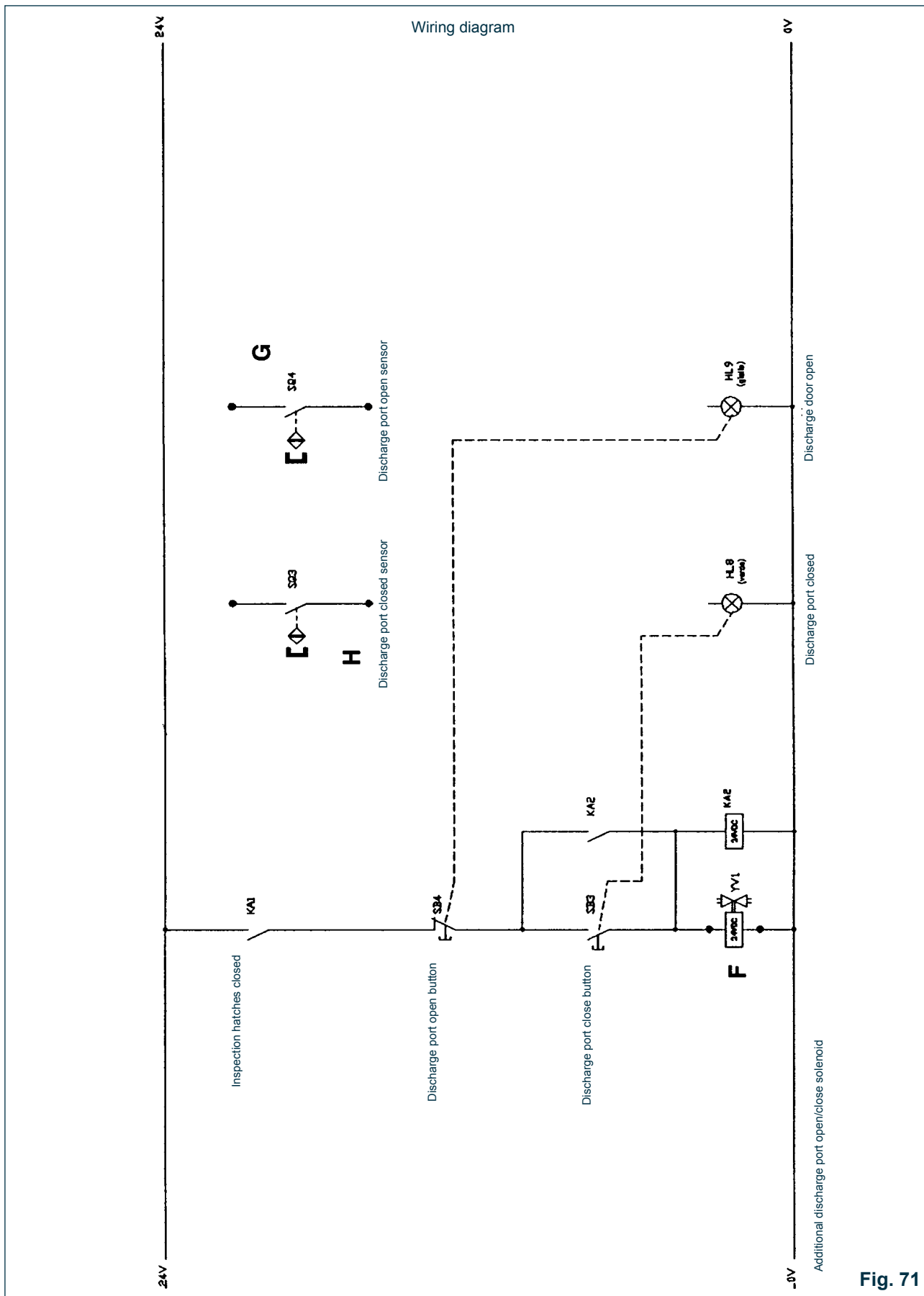


Fig. 71

Electric layout legend

A - Mixer electric motor.

B - Chopper electric motor (1).

C - Inspection hatch limit switch (2).

D -Timer (not supplied by Manufacturer).

The timer is used to set the time for the electromechanical lock trip. It should be set (once you have determined how long the rotor takes to come to a complete stop when the mixer is empty) at a time 30% higher than the rotor stopping time noted).

E - Inspection hatch electromechanical locking (1).

F - 5-way monostable solenoid controls opening/closing of the additional discharge port

G - Induction sensor: additional discharge port open.

H - Induction sensor: additional discharge port closed.

I - Rectifier (not supplied by Manufacturer).

Note:

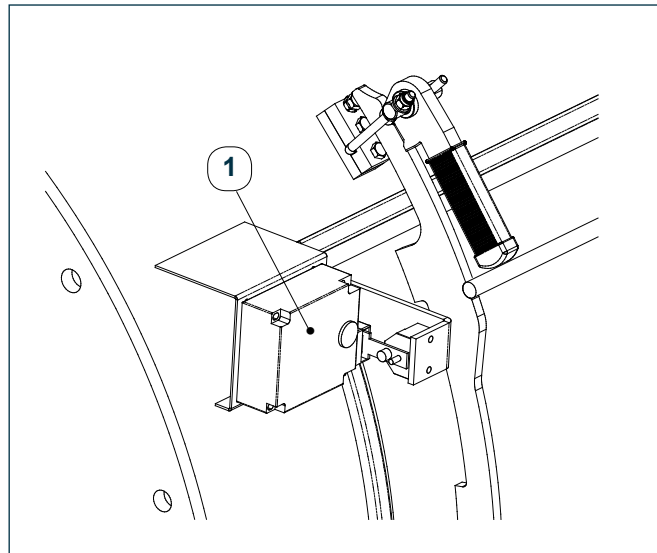
1) The layout illustrates a single part. If there are a number of the same parts, repeat the connection.

2) The layout illustrates the connections for a single limit switch.

If there are a number, repeat the connections in series.

Auxiliary technical information
Mischer with additional discharge port

Note: standard auxiliary connection voltage is 24 V DC.


Fig. 72

Item	Description	Voltage	Installed drive power	Amperage
1	Key door lock mechanism with electromagnet	24 V cc	100 W (starting torque) - 4 W (operating power)	10 A
2	Electromagnet coil	24 V cc	6 W	0.25 A
3	Magnetic sensors (Reed)	3-250 V ca	50 W max	1A max

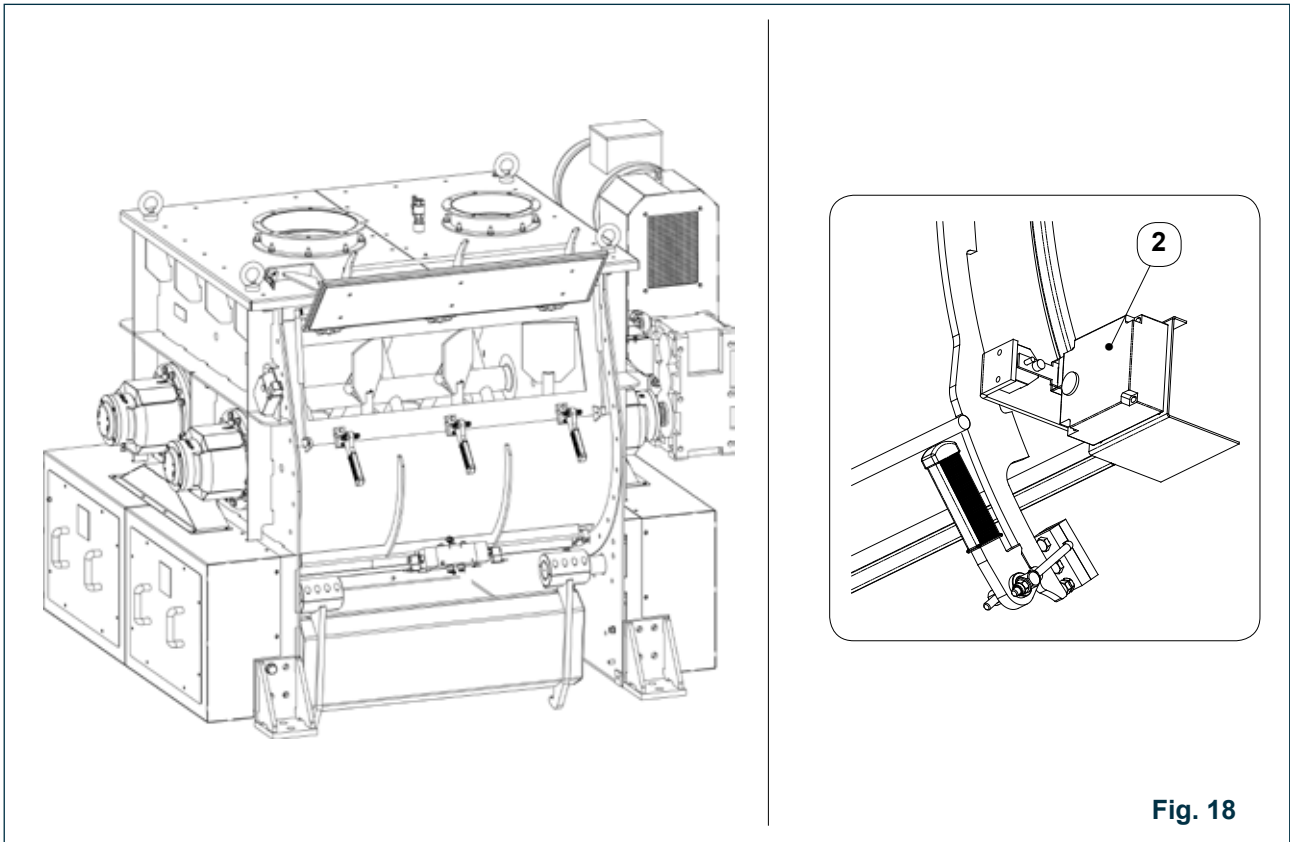
Auxiliary technical information
Note

Standard auxiliary connection voltage is 24V DC.

However, the mixer identification tables, included with this manual, should be consulted in order to verify the input voltage of the auxiliary parts relevant to your specific mixer.

The standard values are shown in the following table.

Voltages different from those indicated in the Table may be supplied on request.


Fig. 18

Item Pos.	Description	Voltage	Installed drive power	Amperage
1	Electromagnet coil	24 V dc	6 W	0.25 A
2	Key door lock mechanism with electromagnet	24 V dc/ac	100 W (starting torque) - 4 W (operating power)	10 A
3	Magnetic sensors (Reed)	3-250 V dc/ac	50 W max	1A max

Pneumatic layout for shaft seals of end bearing assemblies and choppers (customer responsibility)

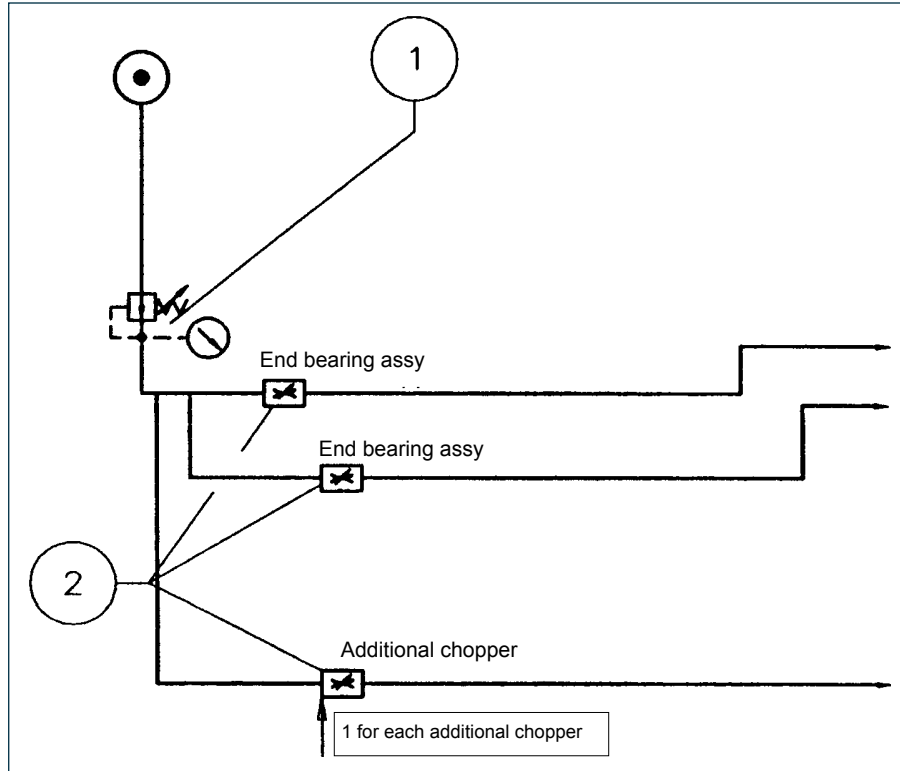


Fig. 19

- 1) Pressure reducer and solenoid, condensation remover and gauge
- 2) Flow meters

Discharge port pneumatic layout

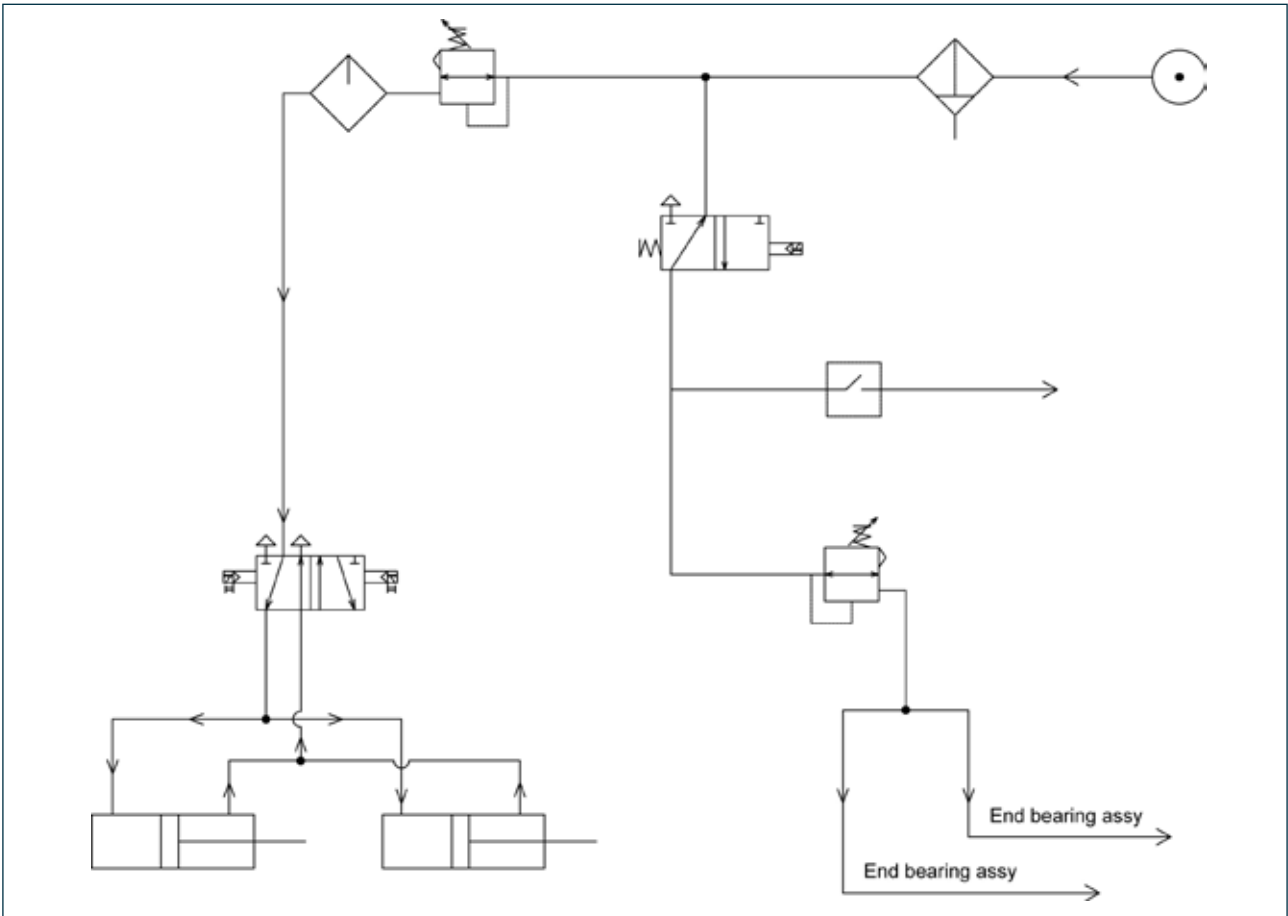


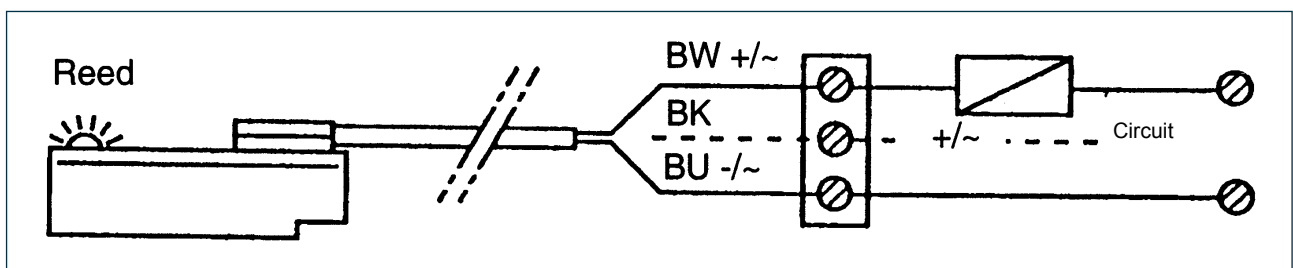
Fig. 20

- 1) Filter unit, Reducer, Condensate separator, Pressure gauge
- 2) Solenoid
- 3) Actuator
- 4) Coil
- 5) Magnetic limit switch
- 6) Lubricator

Sensor connection layout

Fig. 21

The sensors are located on the discharge door operating cylinder.



Tools to be installed on mixer

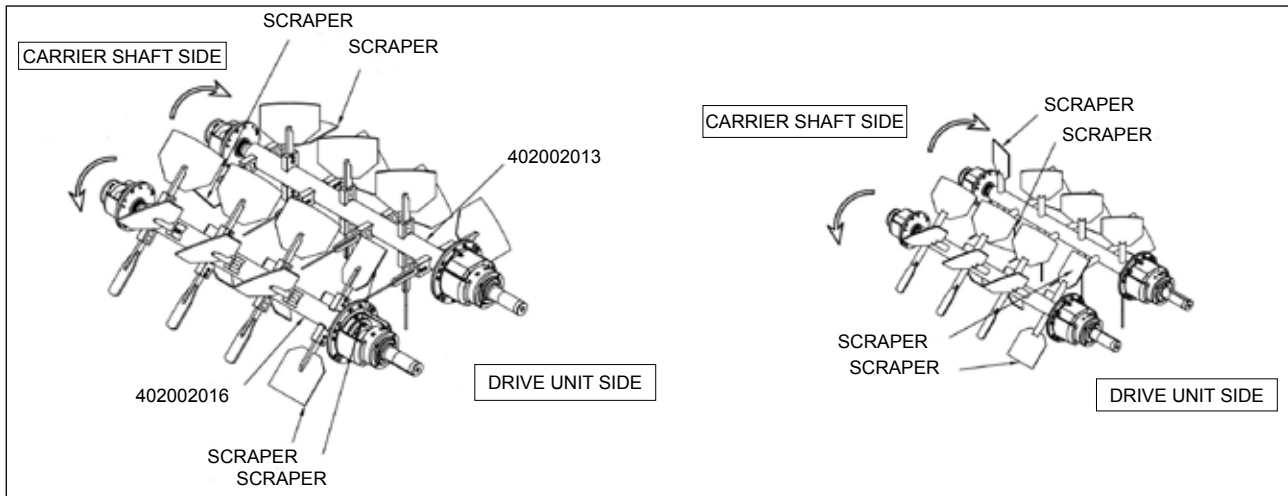


Fig. 73

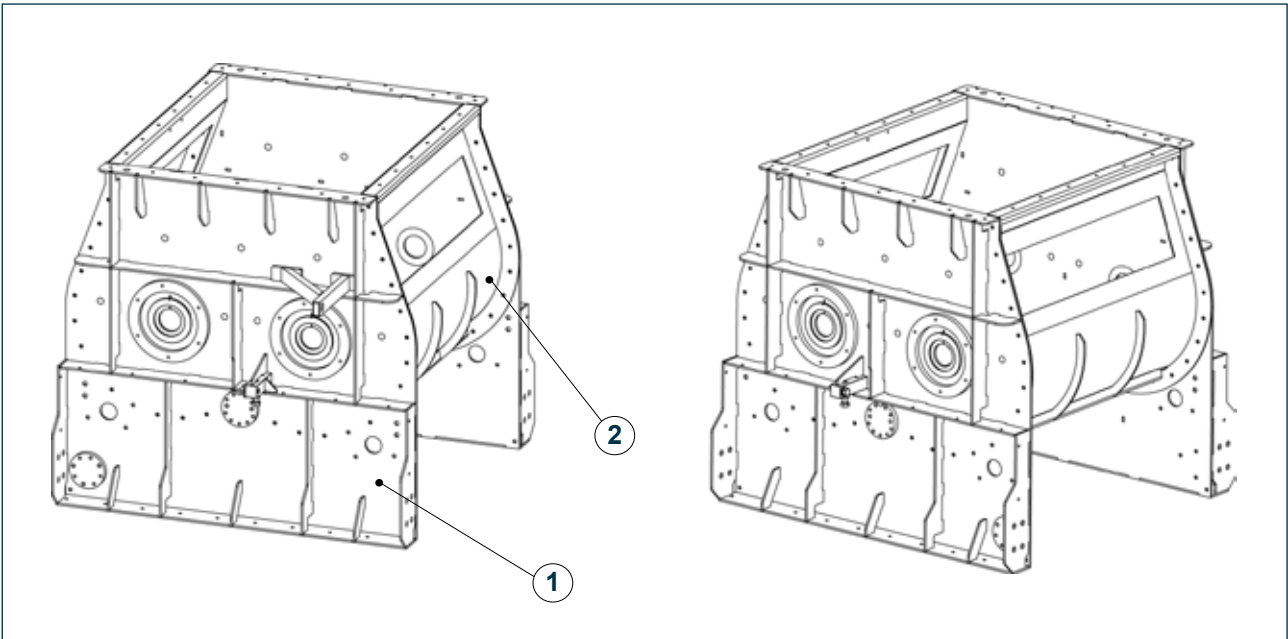
- Plough or blade tools are mounted on the tool carrier shaft "1".
- The tools "3" mounted at the end of the rotor are different from those mounted at the centre "2" because they must also scrape off the product that collects on the end plate.



Danger - Attention

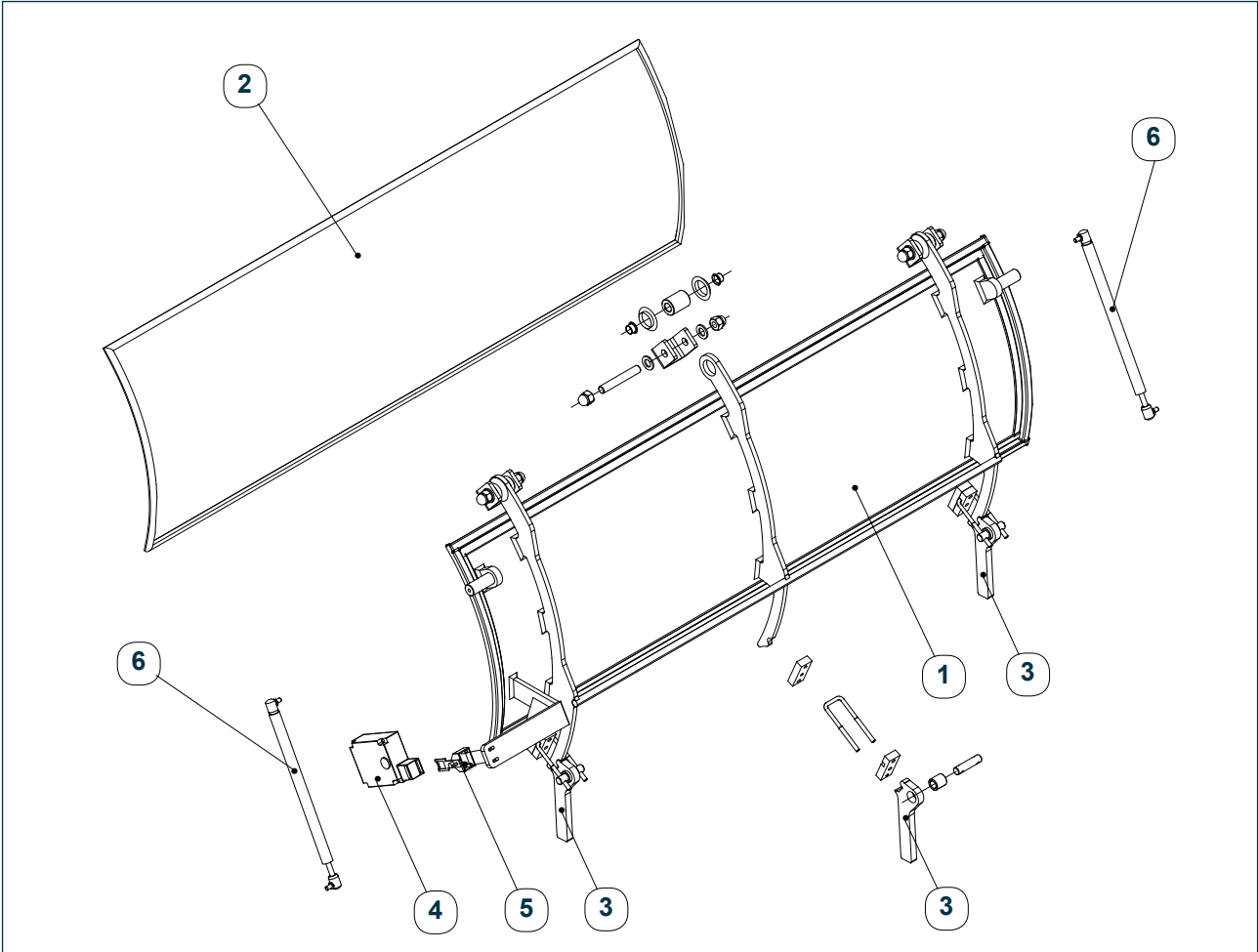
Do not employ tools different from the one already installed, unless authorized by the manufacturer.

Mixing shell



ITEM	QUANT.	DESCRIPTION
1	2	End plate
2	1	Mixing drum

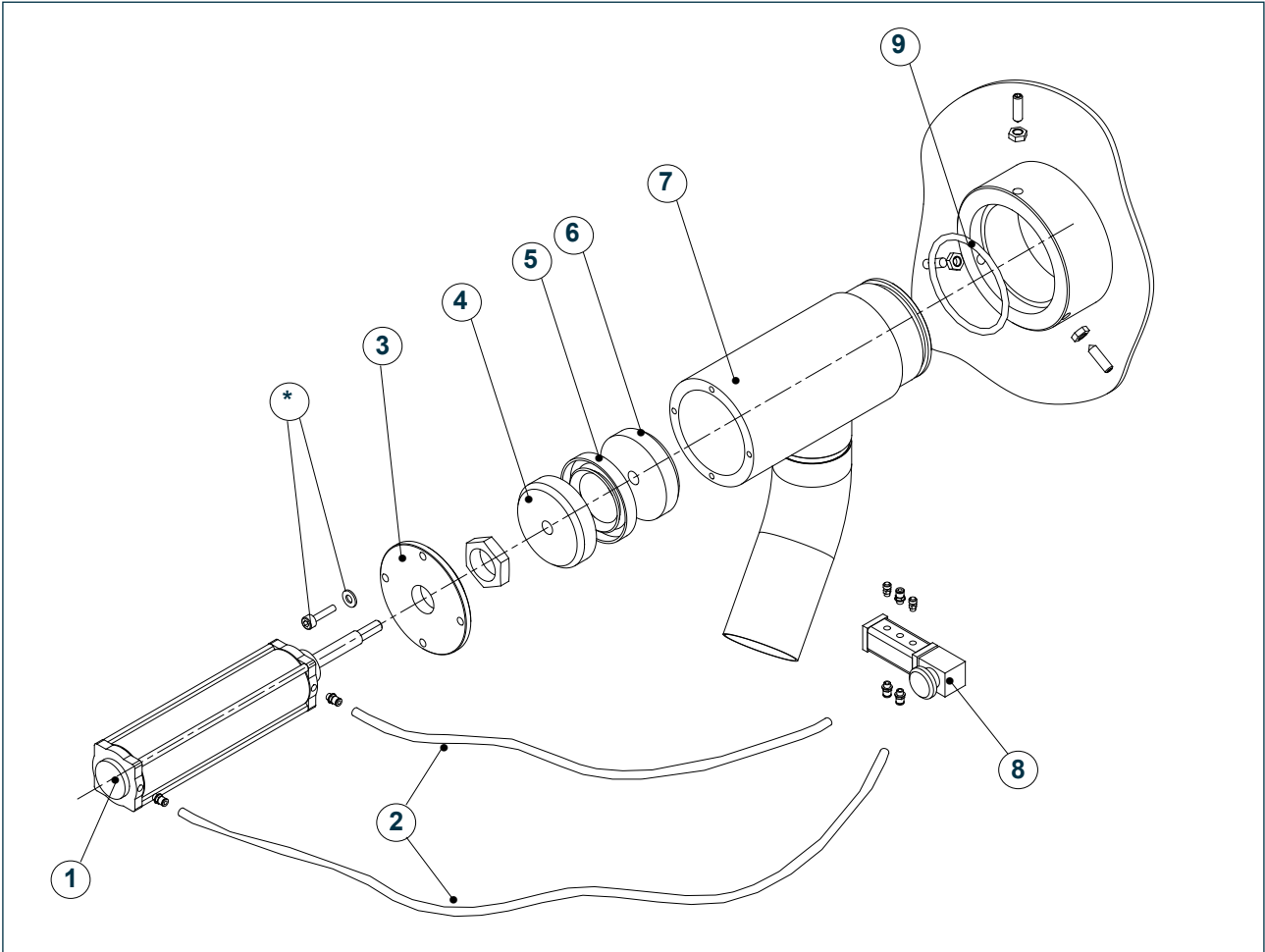
Inspection door



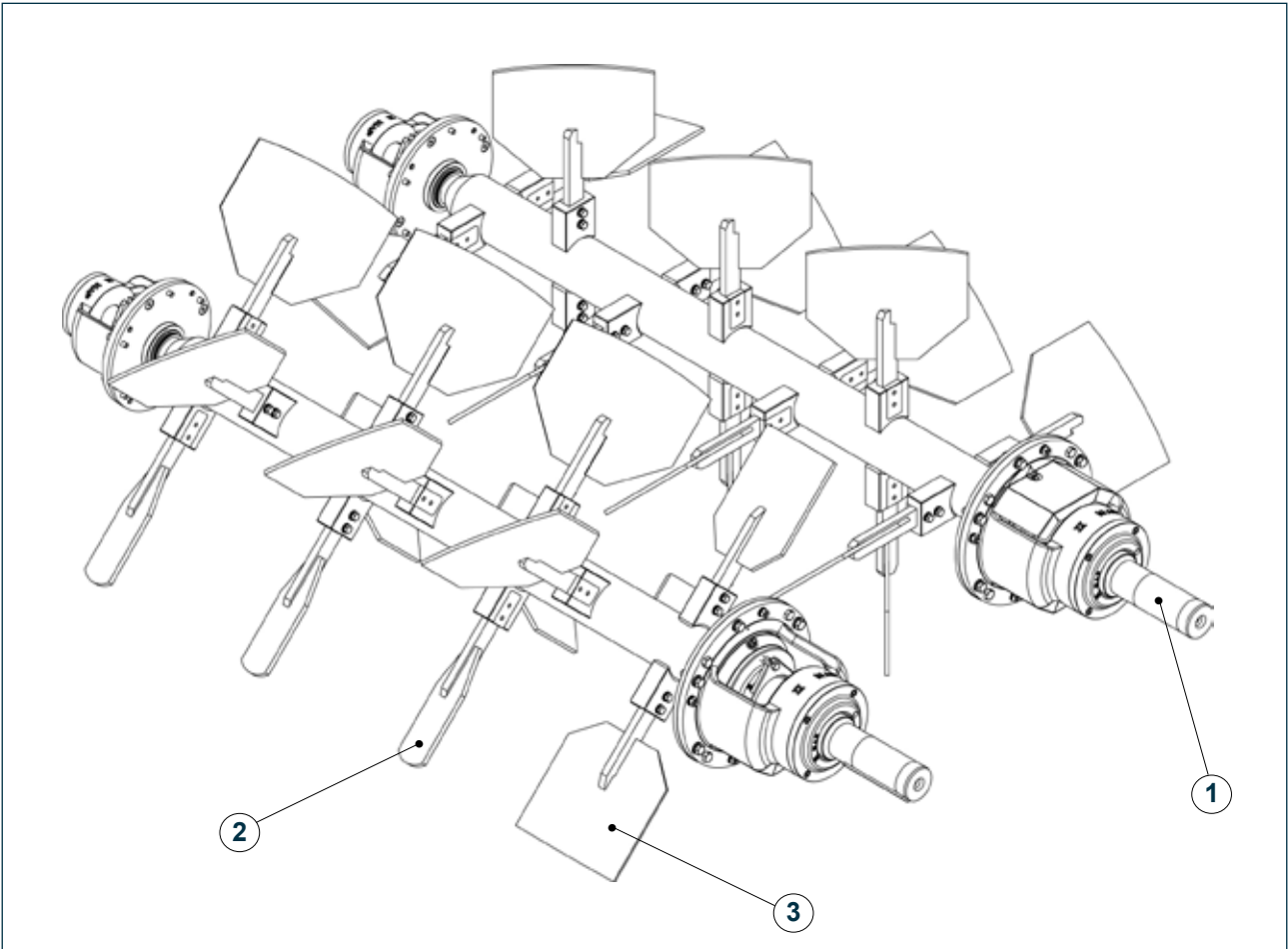
ITEM	QUANT.	DESCRIPTION
1	1	Door
2	1	Seal
3	*	Locking hooks
4	1	Electromagnetic lock
5	1	Key electromagnetic lock
6	2	Gas spring

* Quantity varies according to the hatch dimensions

Pneumatic sample draw



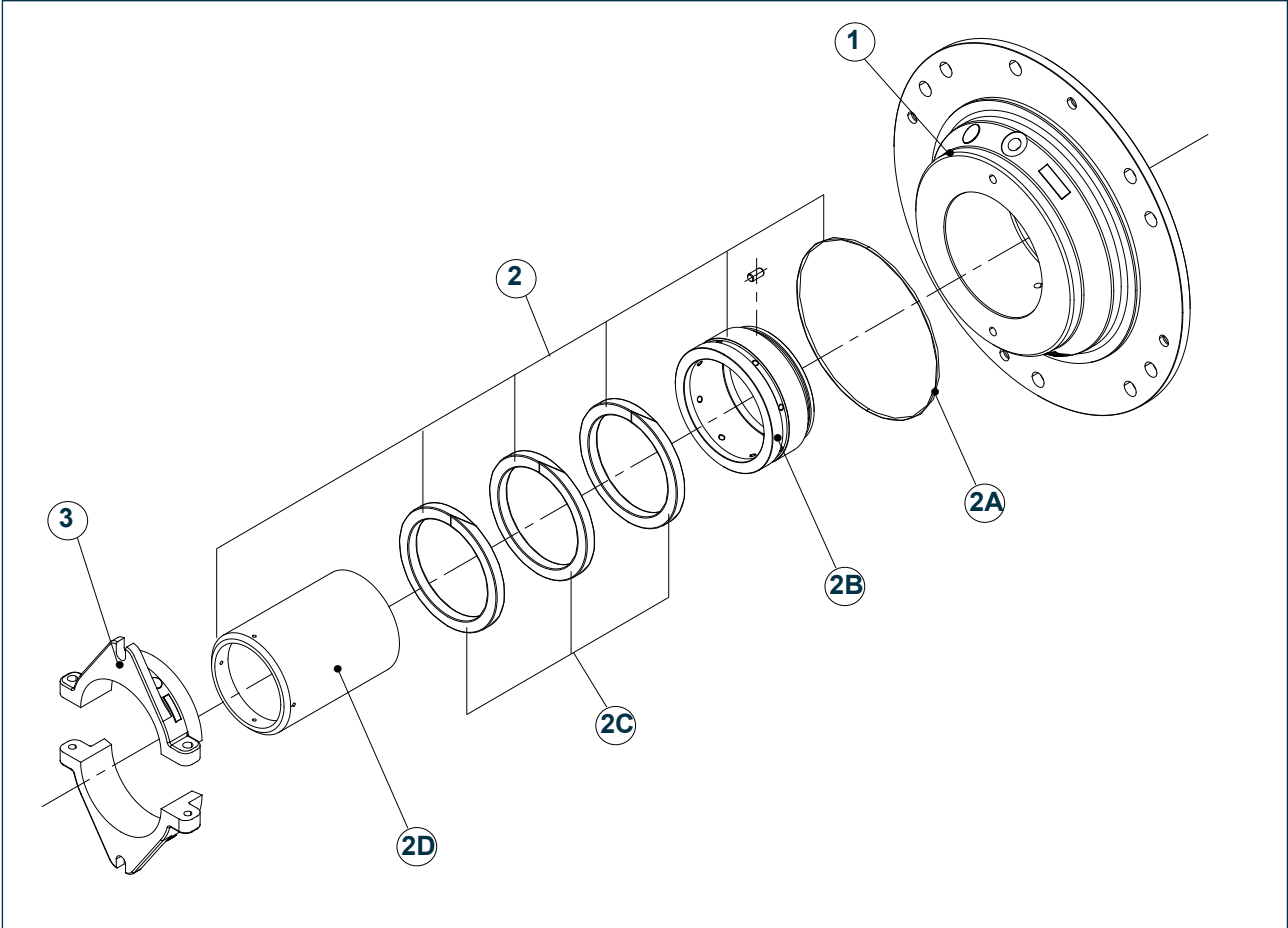
ITEM	QUANT.	DESCRIPTION
1	1	CYLINDER
2	2	TUBE
3	1	FLANGE
4	1	DISQUE DE MÉTAL
5	1	BAGUE DU JOINT À LÈVRE
6	1	DISQUE DE MÉTAL
7	1	BODY
8	1	VALVE
9	1	O-RING
*	1	HARDWAREKIT

Rotor shaft


ITEM	QUANT.	DESCRIPTION
1	1	ROTOR SHAFT
2	**	BLADE
3	2	SCRAPER TOOL
*	1	HARDWAREKIT

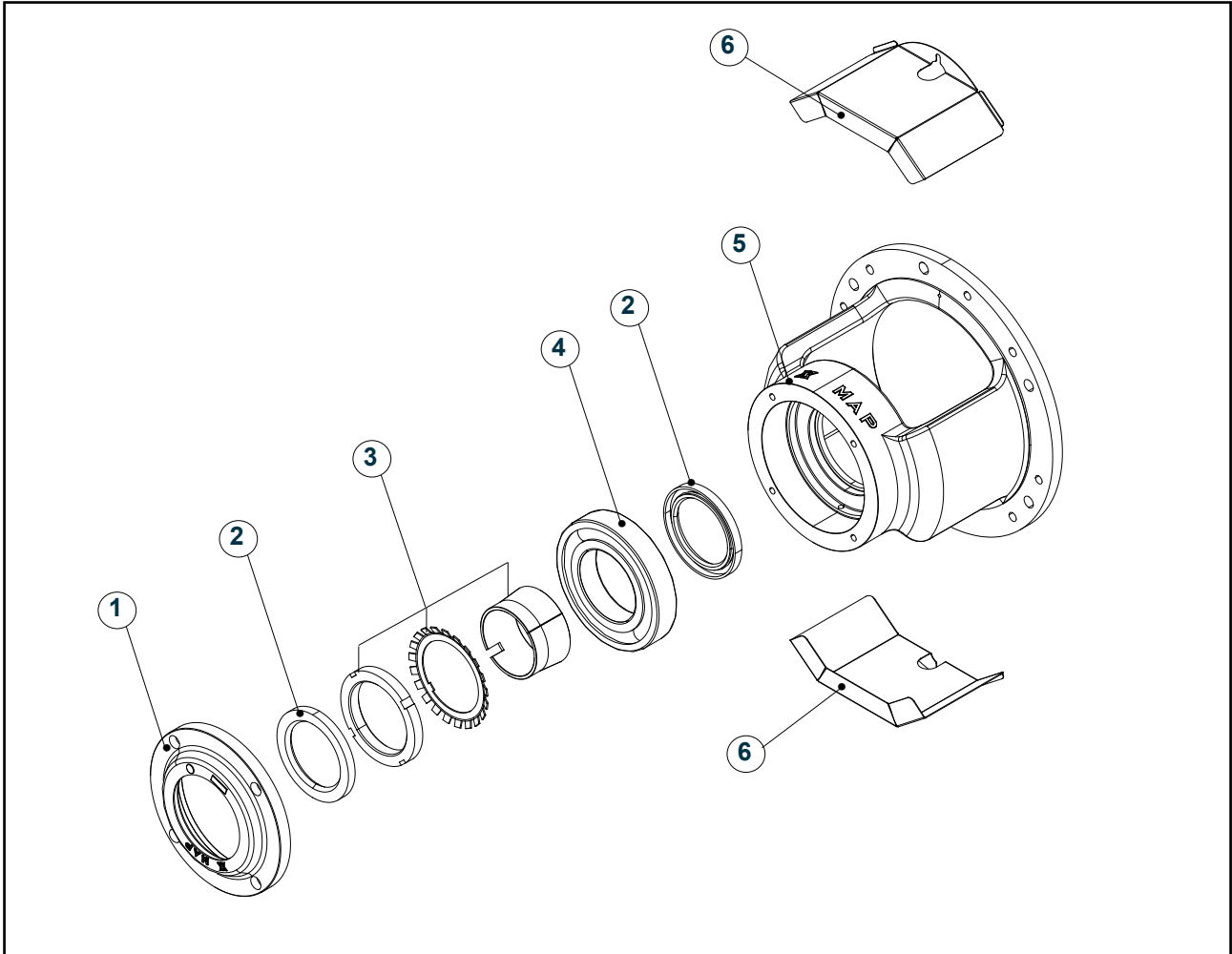
** the quantity depends on the mixer size

Shaft seal end bearing assembly



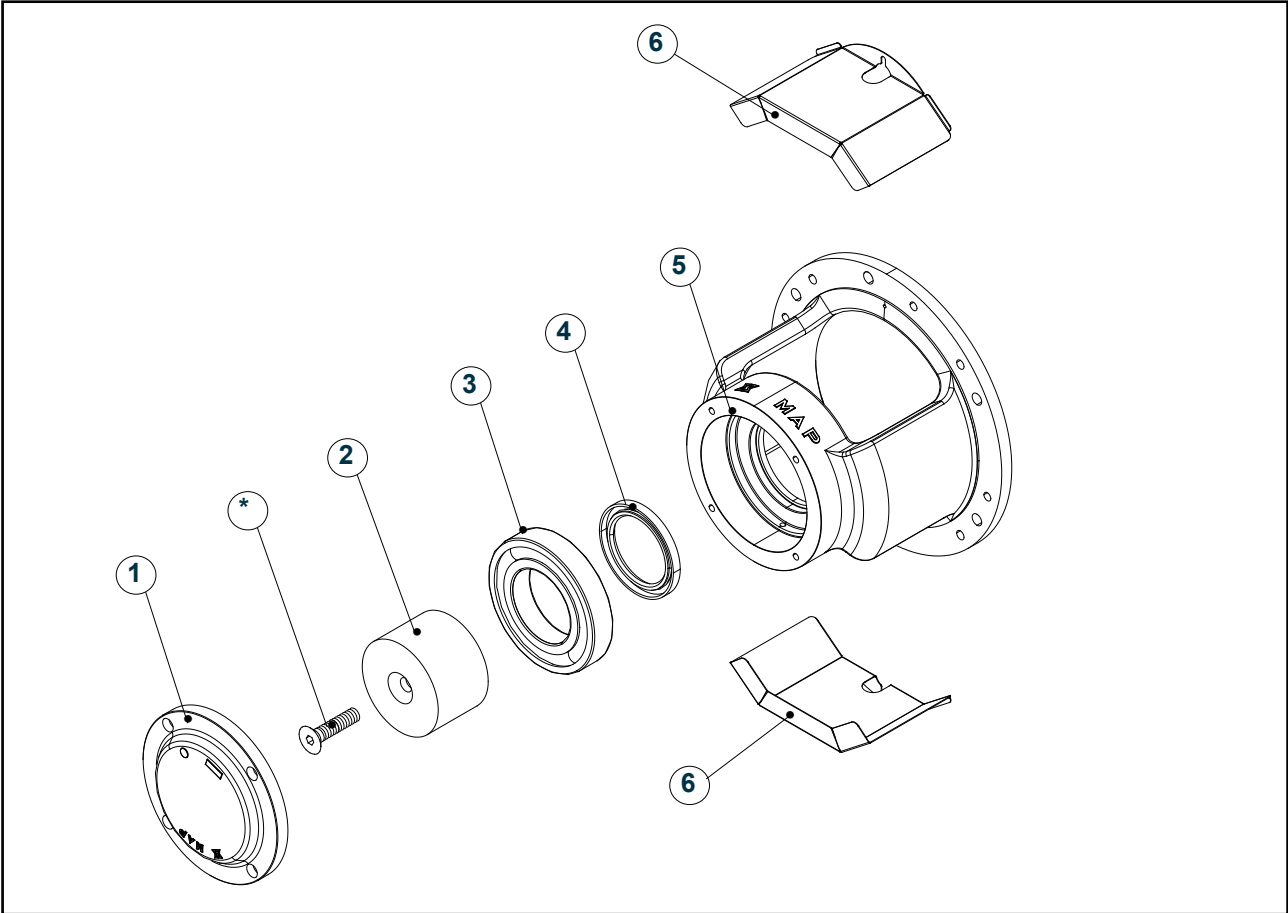
ITEM	QUANT.	DESCRIPTION
1	1	PACKING SEAT
2A	1	OR RING
2B	2	AIR BLOWING BUSH
2C		PACKING
2D	1	SHAFT PROTECTION BUSH
3	1	SEAL GLAND

End bearing assembly drive end



ITEM	QUANT.	DESCRIPTION
1	1	COVER
2	1	SEAL
3	1	BEARING RING NUT
4	1	BEARING
5	1	CASING
6	2	GUARD

End bearing assembly opposite drive end



ITEM	QUANT.	DESCRIPTION
1	1	COVER FLANGE
2	1	BUSH
3	1	BEARING
4	1	SEAL
5	1	CASING
6	2	GUARD
*	1	HARDWAREKIT

A1 Nuts and bolts tightening torque Table

Thread diameter	Tightening torque [Nm]		
	Resistance Class 8.8	Resistance Class 10.9	Resistance Class 12.9
M6	9.5	13.0	16.0
M8	23.0	32.0	39.0
M10	46.0	64.0	77.0
M12	80.0	110.0	135.0
M14	125.0	180.0	215.0
M16	195.0	275.0	330.0
M18	270.0	390.0	455.0
M20	385.0	540.0	650.0
M22	510.0	720.0	670.0
M24	660.0	930.0	1100.0
M27	980.0	1400.0	1650.0
M30	1350.0	1850.0	2250.0

Oil filler, drainage, venting, and level plugs in gear boxes	Tightening torque 16 -18 [Nm]
--	----------------------------------

A2 Lubricants and sealants Table

Lubricant and anti-rust paste for electric motor shaft and gear box bushing	KLUBER-PASTE 46 MR 401
	FLENDER
	MONTAGEPASTE

Sealant for electric motor flange and gear box	LOCTITE 510
	LOXEAL 59-10

Lubricant anti-rust and anti-seizure grease for splined shafts and bushes	APLEC 380	VISCOL S.p.A.
	EP graphite grease	

Flanged head bearings lubricant

Grease containing mineral oil thickened with lithium soap GREASE L2 type. Satisfies the classification requisites DIN 51502 K 2 K - 20	
Grease	Brand
GR - MU2	AGIP
ARALUP HL2	ARAL
BP - ENGERGREASE L 2	BP
CALYPSOLH 433	CALYPSOL
ANDOK B	ESSO
MOBILUX2	MOBIL OIL
MOBIPLEX 47	
ALVANIA2	SHELL
GLISSANDO FL20	TEXACO
MULTIFAX 2	

A3 Gear box lubricants Table

Refer to constructor operation and maintenance information
The table under is only an general indication.

Mineral oil	Brand
BLASIA 220 (*)	AGIP
DEGOL BG220	ARAL
ENERGOL GR - XP220	BP
NL GEAR COMPOUND 220	CHEVRON
SPARTAN EP 220	ESSO
MOBILGEAR 630	MOBIL OIL
OMALLA 220	SHELL
MEROPA 220	TEXACO

(*) First filling oil

For temperatures less than 0 °C replace the mineral oil with synthetic oil having the same viscosity.

In this case:

- change the oil the first time after 2000 hours of operation;
- change the oil subsequently after 10000 hours or every 5 years.

Synthetic oil	Brand
BLASIA S220	AGIP
DEGOL GS220	ARAL
ENERSYN HTX220	BP - MACH
SYNTERMA P20	ELF
GLICOLUBE 220	ESSO
KLÜBERSYNTH GH 6-220	KLÜBER
SHC 630	MOBIL
TIVELA OIL SC220	SHELL
PINNACLE E P 220	TEXACO

The lubricants brands are in alphabetic order without any reference to the product quality.

The list does not cover the entire range of lubricants; therefore other lubricants can be used as long as they have the same technical features.

A4 Declaration of Incorporation



The manufacturer:
WAMGROUP S.p.A.
located in
Strada degli Schiocchi, 12 - 41100 (Mo) - Italy
under its own responsibility declares that:

WTS

Declaration Of Incorporation Of Partly Completed Machinery Annex II B 2006/42/CE Directive
comply with the RES Directive 2006/42/EC
of the European Parliament and the Council of 17 May 2006 on machinery

- | | |
|---|---|
| 1.1.1. - Definitions | 1.5.6. - Fire |
| 1.1.2. - Principles of safety integration | 1.5.7. - Explosion |
| 1.1.3. - Materials and products | 1.5.8. - Noise |
| 1.1.5. - Design of machinery to facilitate its handling | 1.5.9. - Vibrations |
| 1.3.1. - Risk of loss of stability | 1.5.13. - Emissions of hazardous materials and substances |
| 1.3.2. - Risk of break-up during operation | 1.5.15. - Risk of slipping, tripping or falling |
| 1.3.3. - Risks due to falling or ejected objects | 1.6.1. - Machinery maintenance |
| 1.3.4. - Risks due to surfaces, edges or angles | 1.6.2. - Access to operating positions and servicing points |
| 1.3.7. - Risks related to moving parts | 1.6.4. - Operator intervention |
| 1.3.8. - Choice of protection against risks arising from moving parts | 1.6.5. - Cleaning of internal parts |
| 1.3.9. - Risks of uncontrolled movements | 1.7.1. - Information and warnings on the machinery |
| 1.5.4. - Errors of fitting | 1.7.2. - Warning of residual risks |
| 1.5.5. - Extreme temperatures | 1.7.4. - Instructions |

and, where applicable, the requirements imposed by the following EC Directives
Directive 2004/108/EC of the European Parliament and the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility.
Directive 2006/95/EC of the European Parliament and the Council of 12 December 2006 on the approximation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits.

The relevant technical documentation is compiled in accordance with Annex VII B of the Machinery Directive 2006/42/EC

Harmonized standards, national standards and technical regulations in question:
EN ISO 12100-1: 2005 EN ISO 12100-2: 2005

The signing company is committed to provide, in response to a reasoned request by national authorities, relevant information on products covered by this declaration, without prejudice to the rights of intellectual property of the manufacturer. The information will be transmitted directly to the national authorities having requested.

It's forbidden to operate all these products before the machine, in which they will be installed, is declared in conformity with 2006/42/EEC AND SUBSEQUENT AMENDMENTS

Strada degli Schiocchi, 12 - 41100 (Mo) - Italy , 01/01/2010

The person authorized to provide
the technical documentation:
Vainer Marchesini



The legal representative:
Vainer Marchesini



WAMGROUP S.p.A. - Strada degli Schiocchi, 12 - 41100 (Mo) - Italy

