



PEGASUS® CONTINUOUS MIXER

User Manual (rev.F)

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The manufacturer cannot be held responsible for the safety of persons and objects during loading and unloading during transport, installation, use, repair and maintenance when these are not performed according to the instructions as described in this manual.

The manufacturer can also not be held responsible for:

- inaccuracies in this manual
- improper use
- use by unauthorized personnel
- adjustments to the original design
- use of non genuine spare parts
- non-standard and illegal use

Due to technical improvements to the machine it is possible that the information in this manual does not entirely correspond with the delivered product as the documentation is only updated periodically.

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Author: **Dinnissen BV**

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1 Introduction

1.1 **General**

The objective of this manual is to provide information about the operation and use of the Pegasus® continuous mixer that is often referred to as the **Machine** in this manual. We recommend reading this manual carefully. Chapter 2 is, in particular, of vital importance to safeguard the safety of the user.

We recommend following the machine specific training course offered by Dinnissen BV or by an experienced operator to ensure the manual is correctly understood and the machine can be reliably maintained. Pay particular attention to the safety rules and instructions. Personnel that will be working with the machine must be sufficiently familiar with the operating instructions and must be aware of possible hazards and risks. The user must immediately report defects and shortcomings of the machine to the supplier.

Usually, the Pegasus® continuous mixer is part of a larger production line. The mixer is, therefore, in principle supplied without an operating system. This means that the operating functions are not described in this User Manual. The mixer can be provided with its own PLC operating system in special project situations. A specific User Manual is available for such cases.

1.2 **Objective of the System**

The objective of the Pegasus® continuous mixer is to intensively and effectively mix different powders, granules and extruded products without a mechanical load being exerted on the products.

A homogeneous and uniform mixture can be attained for virtually all solid substances with very different bulk densities and industrial designs within 5 to 30 seconds.

The intensive mixing action in combination with a relatively low fill ratio also ensures an optimum process involving sensitive and easily breakable products with only minimum breaking and damage to granules or powder particles.

An additional spray line can be installed to add or yield liquids.

The machine described in this manual can be supplied in a large number of sizes and is modular and, therefore, it can be provided with a number of options. The use and maintenance are also explained in this document insofar as this are applicable. The technical specifications and an overview list of recommended spare parts is supplied as an annex.

Note!

If the machine is suitable for use in a potentially explosive atmosphere, this will be mentioned specifically (see § 1.5 and 2.2).

1.3 Textual Conventions

The terms below have been used to add underline and provide additional emphasis to the specific text:

<u>Tip</u>	Suggestions and recommendations to ensure certain tasks are performed more easily or in a more organised fashion.
<u>Note!</u>	The remark will specify possible issues that the user should be aware of.
<u>Caution!</u>	If the procedures are not carried out carefully, the system may be damaged.
<u>Warning!</u>	If the procedures are not carried out carefully, the user or others may suffer injuries or the system may be seriously damaged.

1.4 Documents

The following documents are also supplied as well as this User Manual:

- Mechanical assembly drawing including a parts list;
- Electro technical diagram;
- Covering documents for the driving motors and other relevant standard components;
- Spare part list;
- Overview of technical specifications;
- Declaration of conformity according Directive 2006/42/EC, Annex II, Sub A;
- ATEX certificate (if applicable) according Directive 2014/34/EU.

The manual is based on the current state of the art. Dinnissen BV reserves the right to introduce changes to the documentation without the obligation to modify previous versions. Keep this manual safe for future reference.

1.5 Codes and Identification Plates

One of the following indication plates has been added to the machine:

- Machine plate that includes the machine number, type and date of construction, CE mark;



- If the machine meets the requirements of the ATEX directive, the **ATEX plate** with the related ATEX classification will have been added:



The location where the indication plate can be found will depend on the form of construction of the machine and of the total line configuration.

Note!

Ensure that the indication plate is legible at all times.

1.6 Use of Symbols

A list of multiple options is specified as follows in this manual:

- Option 1
- Option 2
- ...

Actions to be performed are specified as follows in this manual:

- Step 1
- Step 2
- ...

2 Safety

2.1 General

The Pegasus® continuous mixer has been built in such a way that it can be used and maintained as easily and efficiently as possible. You should, nevertheless, keep the information contained in this manual in mind and act accordingly.

Any person working on the system or in its immediate vicinity must be familiar with these instructions.

The generally applicable safety rules and provisions must be observed at all times as well as the instructions contained in this manual.

2.2 ATEX Standardisation

If the EX symbol has been added to the machine identification plate, this means the machine has been developed for use in potentially explosive atmospheres. The ATEX category as mentioned on the machine plate indicates the allowed ATEX category in and or around the machine.

Tip

Consult the ATEX Directive 2014/34/EU as well as the national rules and regulations for more detailed information regarding zoning and the safety measures to be used.

The following additional preconditions and safety requirements apply in relation to using the machine in potentially explosive atmospheres:

- If different ATEX categories are listed on the machines in one installation, these ATEX categories must at all times align with the ones mentioned in the declaration of conformity
- If a machine contains components with a different ATEX category, the “lowest” ATEX protection level must be complied with at all times.
 Examples: A machine contains different components with
 - II2D Ex IIIB T135°C Db en II3D Ex IIIB T135°C Dc, results in II3D Ex IIIB T135°C Dc;
 - II3D Ex IIIB T135°C Dc en II3D Ex IIIB T200°C Dc, results in II3D Ex IIIB T200°C Dc.
- Product datasheets must be available of all the products used in the system.
- The client must be aware of the possible dangers. For example when using products with a very low MIE (Minimum Ignition Energy) or MIT (Minimum Ignition Temperature).
- Unless a (DEA) Dust Explosion Analysis has been made, the client must prevent the use of products with a low MIE or MIT. (MIE to be ≥ 150 mJ)
- The immediate area of the machine must be regularly cleaned. No visible dust must be on the floor. There is already deemed to be too much dust in an area if footsteps can be observed on the floor.
- Dust formation must be avoided when filling or emptying the vat.
- Avoid sources of ignition such as smoking, naked flames, welding, grinding work, etc.
- Measures have been taken in the machine to ensure sparks cannot occur. Therefore, only perform maintenance or repair work if you are qualified to do so.
- Only use original spare parts as shown on the parts list of this machine.
- Very regularly check the quality of the driving systems and the moving parts. There will be more friction due to wear and/or contamination which will result in more heat being produced.
 Metal parts that touch each other during a rotational movement may also cause sparks!
- All earth connections are vital and may not be removed!

2.3 Used symbols and general safety instructions

The following symbols and safety instructions have been used in this User Manual.

	Only suitably qualified personnel must connect and work with the electrical installation.
	All dangerous areas have been screened using fixed plating to the highest level. However, pay attention, for nipping off or crushing at moving components (if all protections have not been closed).
	Ensure that the machine can only be switched on when all protections have been installed. Ensure the vat and the in-feed and discharge sides for the product are free from obstacles.
	Ensure that the main switch of the line control is not switched on unintentionally. Install a warning sign and lock the main switch with a padlock if required.
	Personal protection: Do not wear loose-fitting clothing and tie your hair back.
	Do not go unnecessarily close to moving machine parts. Never put your head or limbs close to the moving machine parts when the machine is switched on or can be switched on.
	This symbol refers to specific points that require attention if the mixer has been installed in a potentially explosive atmosphere.
	Oil is dangerous to the environment. Dispose of spent oil from the motor reducers at a dump for chemical waste and act according to local rules and regulations.

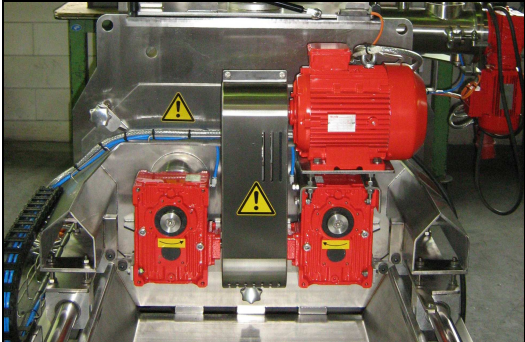
Also keep the following points of particular interest in mind:

- Ensure the working environment is clean and has sufficient light.
- Keep control cabinets closed during normal use.
- Only use original manufacturer's components.
- Ensure that regular and qualitatively responsible maintenance is performed. Consult the instructions in chapters 8 and 9 in relation to this.

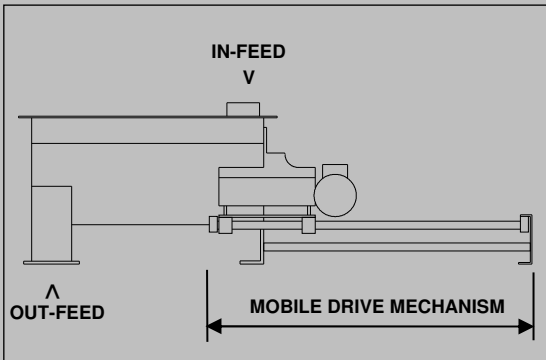
2.4 Machine Safety Provisions

The safety provisions that have been installed on the machine will depend on the construction of the machine.

The list below provides a representative overview.

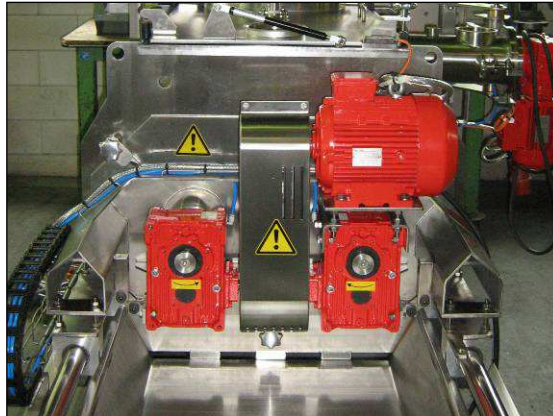
Step	Description	Photo
1.	Fixed protections (sheet-metal work and/or wire mesh) around the drive of the mixing shafts. The protection can only be disassembled by using tools.	
2.	Locked panels for the pneumatically cylinders. The panels can only be opened with tools or a special key.	
3.	In relation to inspection traps with fixing knobs: safety switch with an interlock on the trap (the machine can only be switched on if all traps are closed). The safety risks for the mixer are determined as PL _r "c" (S2, F1, P1) according to NEN-EN-ISO 13849-1:2016.	

Step	Description	Photo
4.	Other inspection traps: the traps can only be opened or removed by using tools.	

<u>Warning!</u>	The user will also have to ensure that the following locations are completely screened to ensure that all possible pinching or crushing dangers can be avoided: ▪ In-feed side ▪ Bottom side ▪ The area around the mobile drive-unit. 
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2.5 Warning Labels on the Machine

Safety labels have been added at all locations where there is a pinching or crushing hazard. They indicate that the relevant guard, the inspection trap or machine door may not be opened when the machine is on or can be switched on (see the photo below for an example).



Warning!

Replace the labels when damaged or lost!

2.6 Sound Level

The sound level of the machine lies below 80 dB(A).

This has been measured at a distance of approximately 1 metre around the housing without containing any product.

The instrument that was used was: Rion NL-04.

The sound level during production will be dependent on the product to be processed, the fill ratio, etc.

If the equivalent sound level is higher than 80 dB(A), the employer must provide suitable hearing protectors. There is, however, no obligation to really wear these (in the Netherlands).

If the equivalent sound level is higher than 85 dB(A), they must be worn (in the Netherlands).

2.7 Personal Protection

When the product characteristics deem it necessary that protective clothing and safety gloves and goggles are worn, follow local safety rules and regulations.

2.8 Specific Use of the System

- The Pegasus® continuous mixer has been developed to mix solid substances such as powders and granules.
- For information on adding liquids (if no specific arrangements have been made): consult Dinnissen BV.
- The supply must be such that it can always be processed correctly by the machine. Therefore, pay attention to the recommended product quantities as specified in chapter 7.
- Ensure the machine is free from unnecessary contamination.
- The machine usually is part of an automated process line; manual intervention when the machine is on must not occur at any time.
- The machine may only be switched on if all safety provisions are available and correct as described in paragraph 2.4.
- The machine may only be switched on if all inspection traps are closed and locked (if interlocking is available).
- Ensure that regular and qualitatively responsible maintenance is performed as described in chapters 8 and 9.
- Always switch off the machine completely when performing maintenance work and resolving failures and faults and block the line control against unintentional activation.
- Fuses and thermal safeguards must be harmonised with the motor power of the machine. Consult the supplied specification sheets in relation to this.
- The machine frame must be earthed with a yellow/green conductor of at least 16 mm².
- The components used to build the machine may only be used in the combination described in this manual. Contact Dinnissen BV for information on other applications.
- The user will be deemed responsible for ensuring that machine transitions are implemented in a safe manner and are correctly harmonised.

2.9 Use to be Avoided

- Do not use the machine for other tasks than described in this manual. Hazardous situations may be created due to the movements of the mixing shafts and the resistance valve.
- Ensure that coarse dirt and sand cannot enter the machine (when the machine has not been specifically built for this purpose). This will lead to excessive wear of drives, the housing and mixing paddles.
- If the machine is being used, people must not be near the drive mechanism drives in relation to possible pinching and/or crushing hazards.
- Do not put unnecessary obstacles or tools on the machine.
- Mechanical machining to the machine such as drilling holes or welding components may result in the system being damaged.

Warning!

**Never grip using the inlet and outlet openings of the machine (for example, for resolving faults or failures)!
Not even when the machine has fully stopped!**

3 Storage and Transportation

3.1 *Receipt*

Check the goods when they are received to ensure no transportation damage has occurred. If transportation damage has occurred, report this immediately to the shipper and your supplier. Take a photo of any damage and keep the packaging for inspection.

3.2 *Storage*

If the machine is not immediately put into operation, we recommend storing it in the original packaging.

Avoid exposure to rain, snow, etc.; cover the machine with at least a tarpaulin and put it under a shelter (if possible).

Avoid any impact and excessive vibrations.

The storage areas must meet the following requirements:

- Atmospheric humidity: 30 - 70 % RH
- Temperature: 5 - 50 °C.

3.3 *Unpacking*

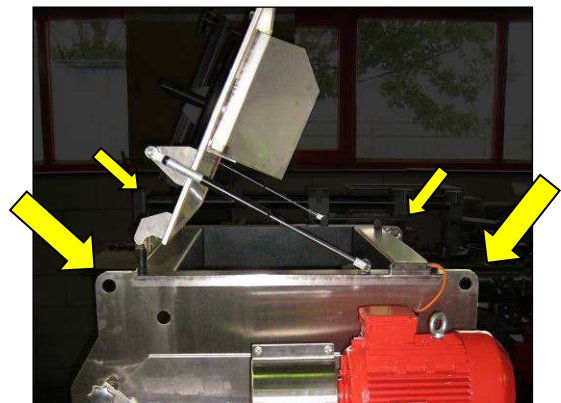
Ensure that components are not damaged when unpacked!

Check that the delivery is complete based on the packing note. Any shortcomings or defects should be reported immediately to the shipper and to Dinnissen BV.

3.4 *Transportation*

If internal transportation of the machine is required, ensure the following:

- The machine is completely disconnected from the electrical system of the area;
- The machine is clean and dry;
- All components have been thoroughly protected against contamination and damage from outside.
- The machine has been provided with at least 4 crane hooks (see the photo). Only use these lifting points to transport the machine in a stable fashion or to position it at the required height.
- Never support the machine on the output-flange.



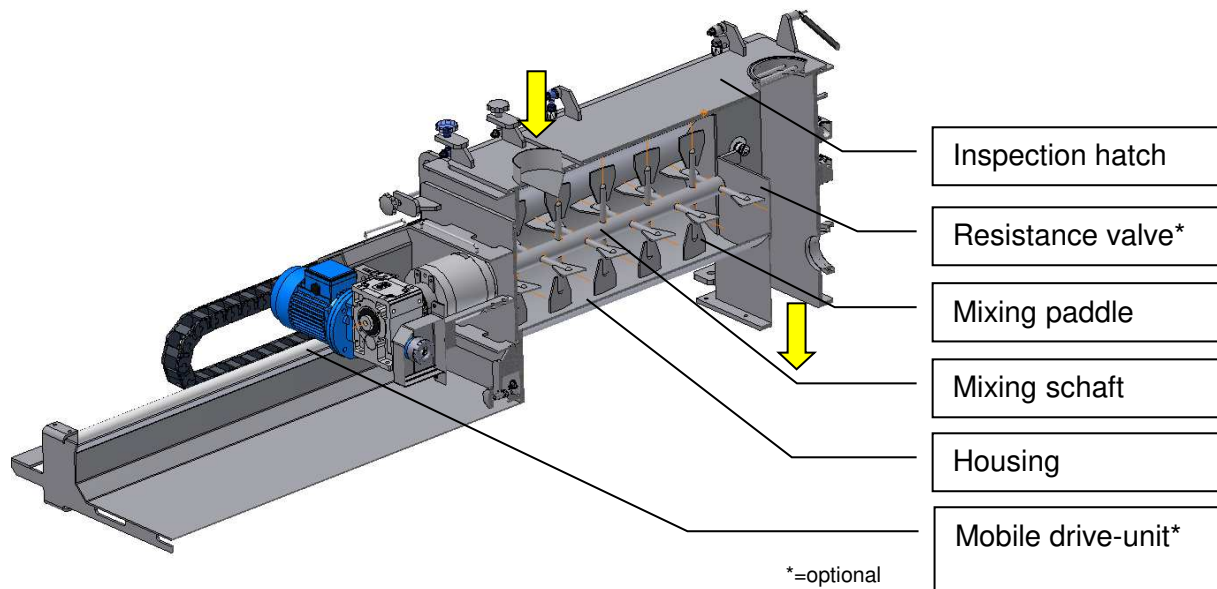
Caution!

- **Always keep the machine straight to ensure that oil cannot leak from the drive systems!**
- **Remember there is a tilting hazard!**
- **Only use reliable and approved lifting and transportation resources!**
- **Keep the weight of the machine in mind as indicated in the technical specifications!**

4 System Description

4.1 General Construction

The composition of the machine is outlined in the diagram below.



The operation is mainly as follows:

As soon as the resistance valve is in closed position. The product which will be mixed, will be inserted in the in-feed at the top of the machine.

In the machine has been assembled two mixing shafts. Every shaft is provided with a number of mixing paddles. Both mixing shafts will turn in opposite direction to each other to ensure that the product is tossed up in the centre of the machine.

If required, additional products (powders, liquids, etc.) can be added during the mixing process to create the endproduct.

After that, the product will be tossed up over the resistance valve into the output of the machine.

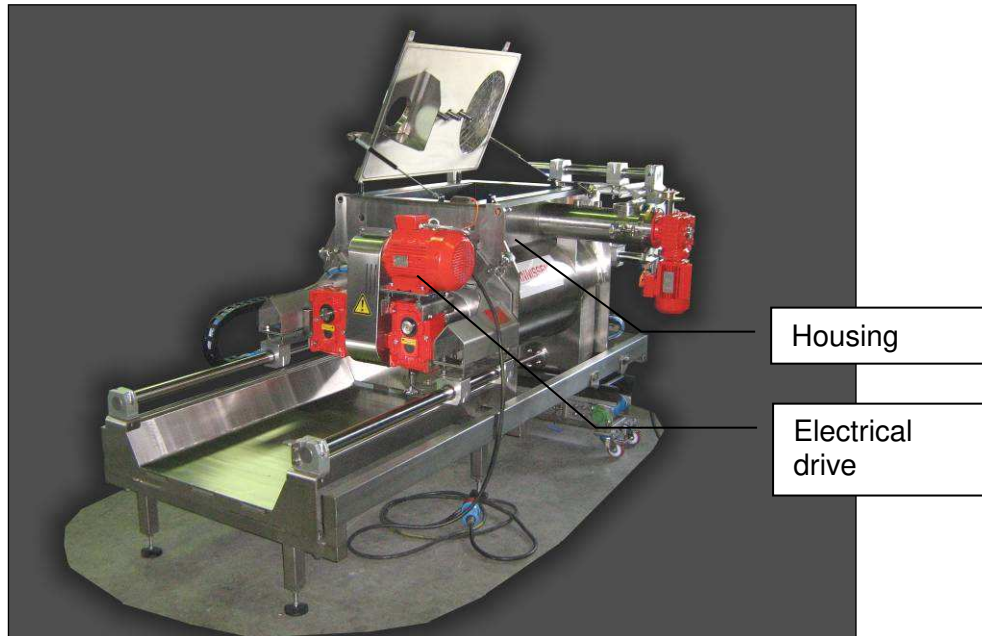
For a total emptying of the machine, the resistance valve can be put into the open position.

In general, the user will be responsible for the following:

- The support of the Pegasus® continuous mixer in conjunction with the discharge of the ready product. The machine can be supported by the flange of the bottom support base or on the supports that have been bolted to the bottom support base.
- The in-feed system on top that is to be installed on the top edge of the vat;
- A bunker, if required, for collecting and/or discharging the mixed end product.

4.2 Vat with Mixing Shafts

The housing is the reservoir in which the actual mixing process takes place.
The mixing shafts protrude over the whole length through the housing.
The electrical drive of both mixing shafts has been installed on the outside of the housing.



5 Available Models and Options

The Pegasus® continuous mixer can be supplied in a broad range of sizes with different drive systems and available models.

This chapter provides an outline description of the types that are used the most. The photos provide a picture of the construction method but this may be different in practice from the actual situation.

5.1 Available Models of the Mixing Shaft Drive

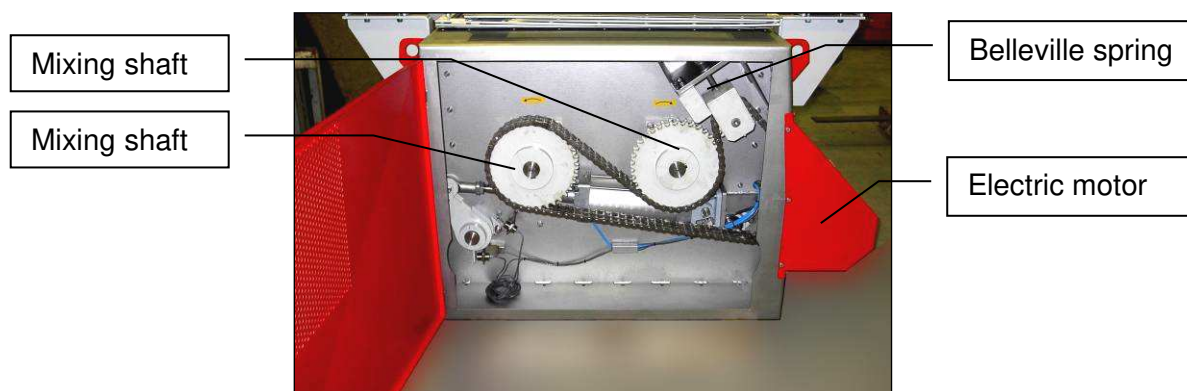
The following systems are available for the drive of the mixing shafts. Every system is based on paddles that turn in opposite directions and the underlying position of both mixing shafts does not vary (the paddles may never touch each other).

Tip

**It applies to all available models that the normal operational temperature of the oil can increase up to 70 - 90°C.
A hot cabinet does not necessarily mean a fault or defect.**

5.1.1 Chain Drive

An electric motor drives both mixing shafts using a chain drive. The chain's tension is maintained permanently by a set of Belleville springs.



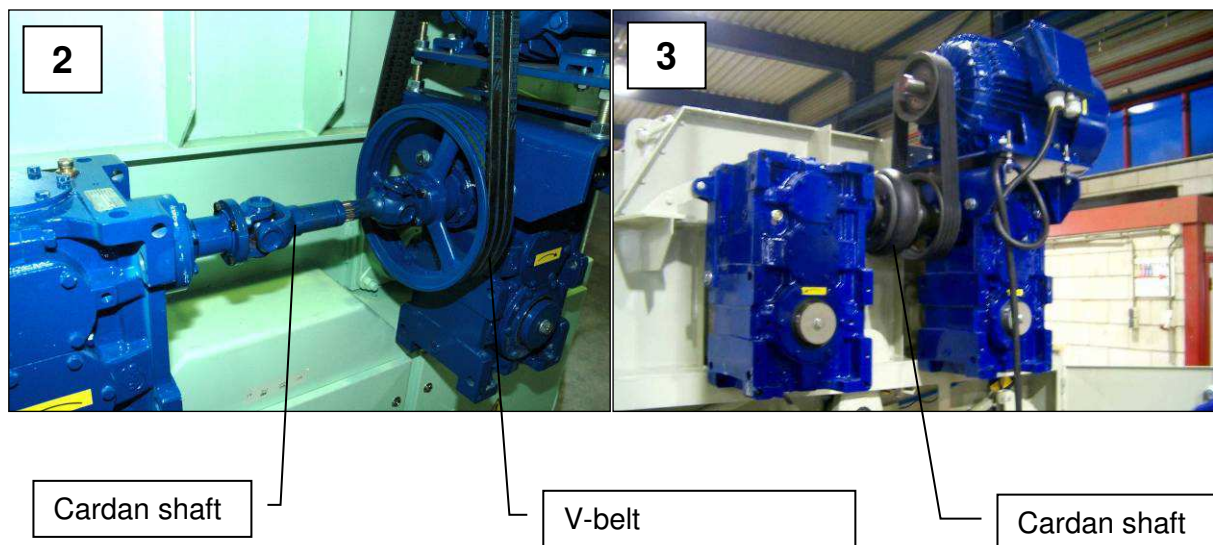
5.1.2 Double Slip-on Gear Mechanism with a V-belt Drive

An angle gearbox has been installed at the ends of both mixing shafts with this model. These boxes are linked to each other through a coupling spindle.

Driving takes place through an electric motor and a V-belt (a set with multiple belts is used with larger systems). V-belt pulleys have been installed directly on to the driven axle of the electric motor and on to the coupling spindle between the gearboxes.



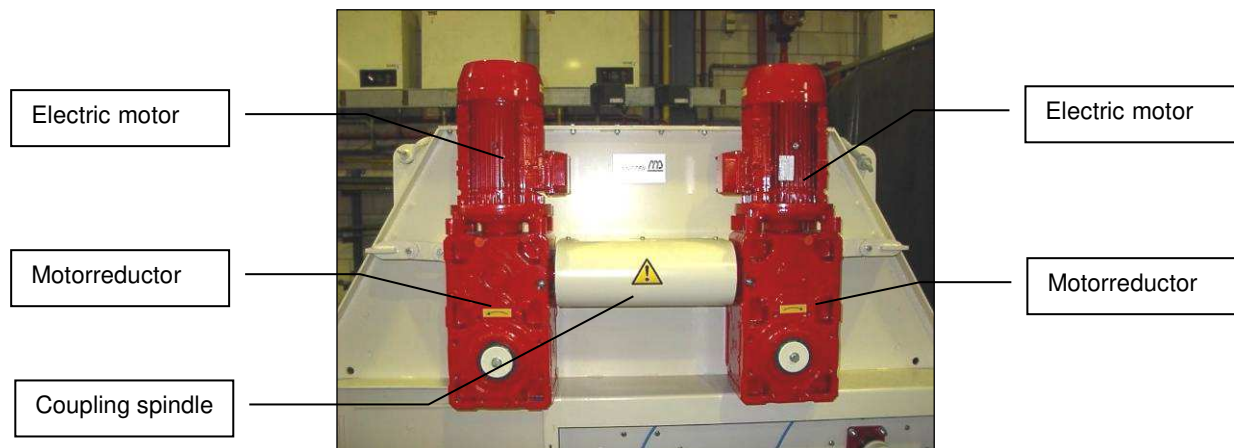
The coupling between both boxes has been provided as a cardan shaft (photo 2) or as a bellows (photo 3).



A fluid coupling can also be provided for systems with extremely large capacities. This will have a dampening effect when the machine starts to run and will, thus, reduce peak loads of the coupling spindle.

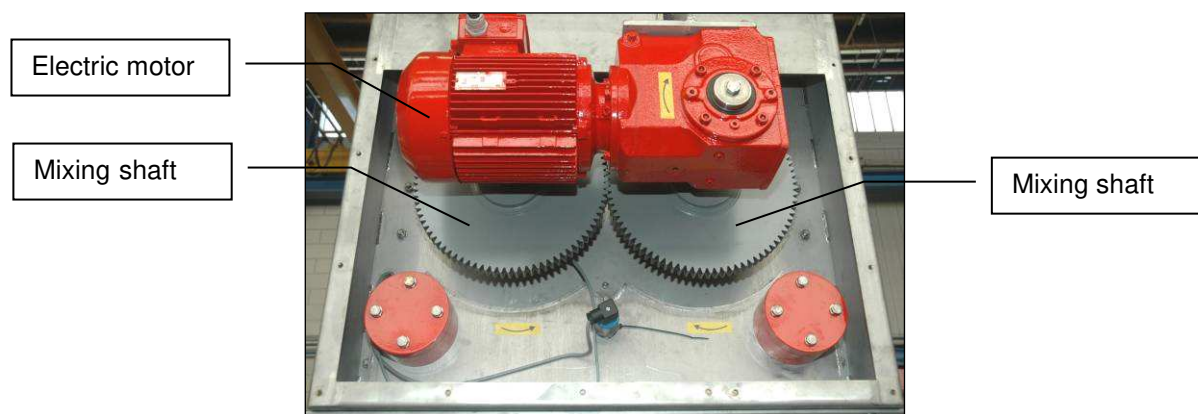
5.1.3 Double Motor Slip-On Cabinet with Coupling spindle

On the ends of both mixing shafts, a motor with gearbox has been installed with this model. Both gearboxes have an opposite rotational direction in relation to each other. Both drives are linked with a coupling spindle (cardan shaft or bellows coupling) to each other to eliminate speed differences.



5.1.4 Gearing

Often one driving motor is used with small systems with a limited in-between space. Both mixing shafts are linked to each other through a direct gear transmission.



5.2 Bearings and Sealing of the Mixing Shafts

The bearing systems described below have been used for the mixing shafts.

5.2.1 Flange Bearings

The bearings have been mounted against the side plate of the housing; (see example photo 1). If the bearings have been equipped with a grease nipple, they must be re-lubricated at least once a year.



5.2.2 Vertical Bearing Blocks

The bearing houses have been installed on the box of the Endplate (see example photo 2) and leave a space between the bearing and the housing seal. If the bearings have been equipped with a grease nipple, they must be re-lubricated at least once a year.



5.2.3 Bearing housing

If high demands are made to hygiene ('food'), or if there will be used vacuum, bearing housings will be used. Those bearing housings will be used too, if a single sided support of the mixing shaft is a fact, such as at a mobile drive-unit. The bearing housings will be assembled to the endplate. (see example photo 3). If the bearings have been equipped with a grease nipple, they must be re-lubricated at least once a year.



5.2.4 Seal of the Mixing Shafts

The housing seal has been integrated behind the bearings. The model will mainly depend on the product to be processed. The following options are possible:

- Gland packing; faulty packings can, in principle, be replaced by the company's own technical service.
- Sealing rings; faulty sealing rings must be replaced by the service department of Dinnissen BV.
- Sealing rings with air flushing*.

* A compressed air line has been installed between 2 sealing rings when sealing rings with air flushing is used. This ensures that any product leaks can be kept in check between the shaft and the sealing ring where the (ring-shaped) slot can be found.

Extra points of particular interest for seals with air flushing:

There must be a certain minimum pressure and flow of the flushing air on the seal to ensure that the sealing rings cannot be damaged and to avoid air ducts from becoming blocked. This is always important with regard to the following:

- Rotating shafts;
- When rotation of shafts has stopped: If there is product before the seals;
- During cleaning of the machine with, for example, air or water.

It is recommendable to install a flow alarm (preferably with metering device) at each connection point to monitor air flow (consult the supplied specifications for the correct information).

The flushing pressure must be at least 0.5 bar above the working pressure in the vat. The system must offer sufficient capabilities to vent the pressure in the vat. It is recommendable to install a pressure regulator.



The following label will have been added next to shafts equipped with seals with air flushing:

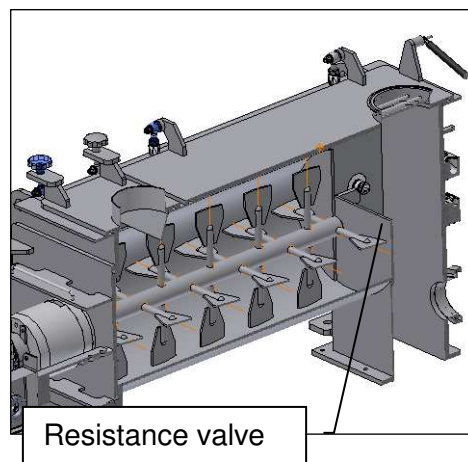
Seal with air flushing

Caution!

Never add oil or grease in the nipple of the flushing air connection!

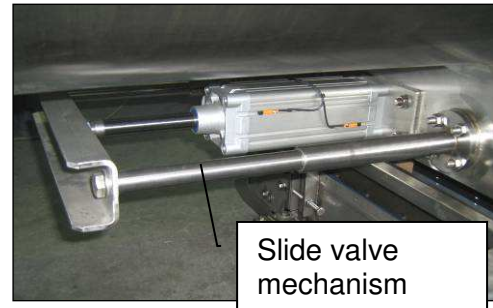
5.3 Resistance valve

To secure that the level of the mixing product is sufficient, there will be placed a resistance valve into the housing of the machine. The following systems are available:



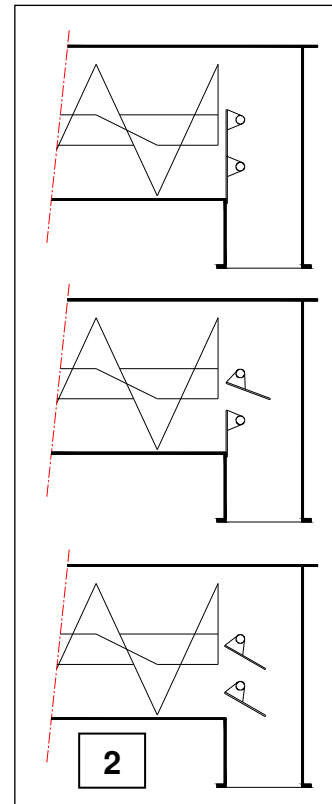
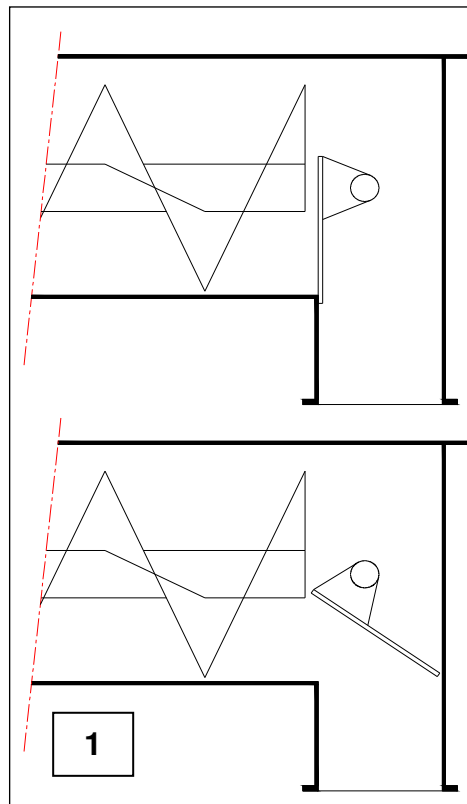
5.3.1 Slide valve

If a total emptying of the machine is necessary, the mixer can be foreseen of a sliding valve (see example photo). When the slide valve is in the open position the product can be into the output of the machine.



5.3.2 Rotating valve

By means of a cylinder with lever, the valve can rotate so that the product can go into the output of the machine. (see example photo 1). To reach different product levels in the machine, there will be placed more valves above each other. These can be opened independently of each other. (see example photo 2).

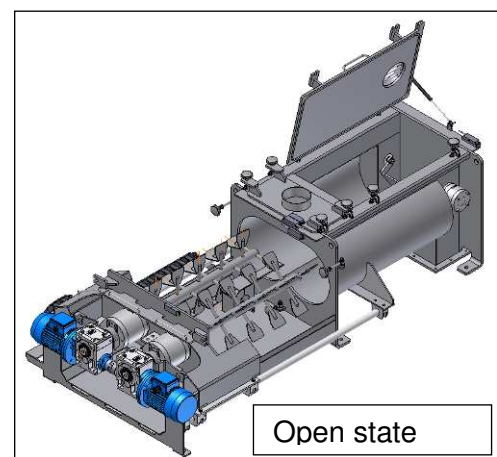
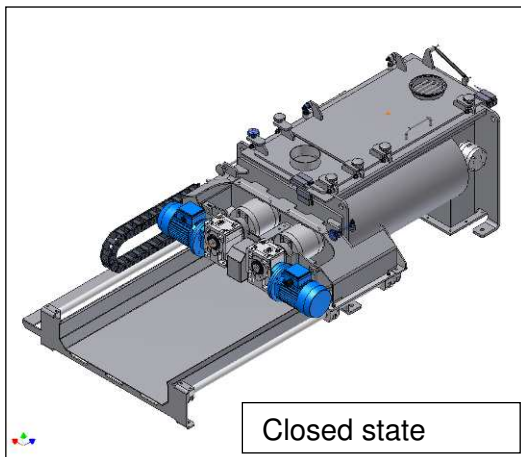


5.4 Options

A few additional options are also possible as well as the different system variations discussed in the previous paragraphs. Below the additional options are listed.

5.4.1 Mobile Drive-unit

For optimum cleaning of the machine, it can be constructed with a drive-unit and mixing shafts that can takeoff over a guidance to the outside of the housing of the machine.



5.4.2 Adjustable Mixing Paddles

If you would like to set the clearance between the paddles and the vat (for example, to make it as small as possible), adjustable paddles can be provided. The paddles will be installed using slotted grooves on the mixing shafts.



This option is not available for machines that are to be used in potentially explosive atmospheres (due to the possible risk of sparks in relation to incorrectly adjusted paddles or paddles that have become loose).



5.4.3 Scrapers

At certain (sticky) products it's required that the inside of the housing will be maximum clean. In that case there will become mounted scrapers at the mixing-paddles. (see example photo).



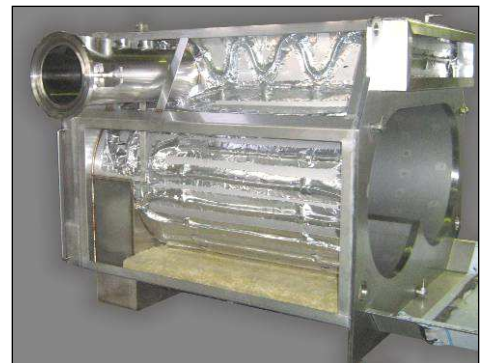
5.4.4 Coating

The inside of the machine can be foreseen of a coating. There are a lot of different coatings, like an anti- abrasive wear coating or anti plaque (PTFE) coating.

5.4.5 Tracing

If a certain temperature is required for mixing the product, then will become the outside of the housing provided of a tracing (see example photo). By means of electrical resistance or heated water the machine will become heated up.

Also, the machine will become insulated by means of glass wool. Which then are covered with panels.



5.4.6 Weighing Cells

The full mixer is positioned on an intermediate frame with 4 weighing cells. These give current information about the quantity of mixing substances in the housing. The weighing cells must be connected to a weighing amplifier.

5.4.7 Speed Regulation (Frequency Regulator)

The driving motors of the mixing shafts can be driven through a frequency regulator if required to ensure different speeds are possible.

6 System and Commissioning

6.1 General

The following points must be taken into consideration with regard to the mechanical system of the machine:

- Consult the information in the drawing set regarding static and dynamic loads. The support construction must be able to compensate for this with sufficient certainty.
- Ensure that all mounting faces are level to ensure mechanical tensions do not occur in the mixer.

Warning!

System and installation work may only be performed by suitably qualified personnel!

You can suffer serious injuries if work is performed on the machine when it cannot be guaranteed that it is fully voltage free!

Ensure the plug is not in the socket and that the main switch has been switched off and blocked against unintentional activation!

Position a sign that should include the text: "Out of service - Maintenance".



Ensure the machine remains accessible from all sides to perform maintenance work and adjustments. If required, install a platform.

The machine must be set up level on a stable base. The maximum out of true alignment should not exceed 0.5°. Ensure a correct attachment to the base.

6.2 Electrical System

The electrical connections will not be the responsibility of Dinnissen BV unless otherwise agreed.

We recommend at least keeping the general points of particular interest given below in mind.

Warning!

Installation work may only be performed by suitably qualified personnel!

You can suffer serious injuries if the electrical connection such as the cable diameter, fuses, earthing connections, etc., have not been harmonised with the power of the machine.



- Always follow the instructions from the low-voltage directive and the local and national rules and regulations.
- Motor speeds may be regulated if required. Keep the maximum permissible torque applicable to the motors in mind in relation to this issue.
- A star-delta connection is not required for the motors. The machine has been designed in such a way that it must immediately start to run when under a load.
- Connect the following components:
 - o Electric motors;
 - o Thermal protections (PTC elements) of the electric motors (if available);
 - o Sensors of the resistance valve (open-close reporting);
 - o Magnetic valve for air cylinders;
 - o If available: safety switch on the inspection trap.

- Consult the supplied electro technical diagrams for detailed information.
- The machine frame and any intermediate frame that may be present for weighing cells must be earthed through the connection points for this purpose.
- Check whether all cables have been reliably finished and screened against mechanical hazards.

Caution!

After completing the installation work: Check the correct rotational direction of all motors.

Caution!

Never independently perform changes or adjustments to the drives but consult the service department of Dinnissen BV if problems arise!

6.3 Commissioning

The following procedure should be followed after a full mechanical and electrical system. The following safety instructions are important for the safety of users and onlookers:

Warning!

- **Ensure that all involved persons are informed about the correct operational instructions and safety aspects!**

**Warning!**

- **Never climb on the mixer.**
- **Nobody must be completely or partially in the machine when the system has been switched on!**

**Warning!**

- **Do not go unnecessarily close to the drives of the mixing shafts endplate.**
- **Ensure the system is free of obstacles.**
- **Never grab anything from inside the machine when the machine is running. Instead use the emergency stop button of the line control when “jamming” occurs!**



- Check whether all safety provisions have been installed and are fully operational (see chapter 2).
- Check the machine to ensure there are no loose bolts (connections may have come loose due to vibration during shipment).
- Check the tension of the V-belts (if applicable), see § 9.2.
- Check whether there are any obstacles in the process line.
- In relation to machines with air-flushed seals: check the pressure (at least 0.5 bar above the vat pressure) and air flow (see Technical Specifications) on all air flushing points.
- The tension of the V-belts (if available) must be checked and must again be adjusted if required a few hours after the first commissioning has taken place (see chapter 9).

6.4 Check to be Performed After the First Week

The following must be carried out after the mixer has been operational for approximately 1 week:

Warning!

The following work may only be performed by suitably qualified personnel!

You can suffer serious injuries if work is performed on the machine when it cannot be guaranteed that it is fully voltage free!

Ensure the plug is not in the socket and that the main switch has been switched off and blocked against unintentional activation!

Position a sign that should include the text: "Out of service - Maintenance".



- Further tighten the bolts of the bearing blocks and/or of the flange bearings.
- Check the tension of the drive chain and/or V-belts (see chapter 9).
- Check and clean (if required) the rubber seal (if available) of the endplate.

7 Use and Operation Recommendation

Apply the following general guidelines in relation to use:

- Only start filling the housing when the resistance valve is completely closed.
- Keep the inspection traps closed during use.
- Ensure sufficient and complete cleaning of the machine such as described in paragraph 8.2.

The following also applies to systems with air-flushed seals:

First pressurise the seals (with a controlling flow) before the machine is started.

The air flushing must be active in the following situations:

- When mixing shafts are rotating;
- When mixing shafts have stopped: If there is product before the seals;
- During cleaning of the machine with, for example, air or water.

Caution!

If the machine is made operational before the overpressure is available on the seals, the sealing rings and the shaft will be damaged after a few minutes.

The seal will not longer work due to blocked ducts.

The seals must be replaced immediately when this is the case!

8 Maintenance

8.1 *General Safety Instructions*

The work described in this chapter must only be performed by authorised and expert personnel.

All of this work is necessary to safeguard the correct operation of the machine during a long period. It will also positively influence the life cycle and fault behaviour of the machine.

<u>Warning!</u>	Any protections that have been removed to perform maintenance work must always be reinstalled after the maintenance work has been performed!	
<u>Warning!</u>	Only perform maintenance work and adjustments when the machine has been switched off and has been locked unless otherwise prescribed!	
<u>Warning!</u>	The following applies to all maintenance: Wear safety goggles that fit properly.	
<u>Note!</u>	All maintenance, inspection and repair work that falls outside the scope of this manual must be left to be performed by the service department of Dinnissen BV.	
<u>Warning!</u>	Also check the quality of the bearings, seals and lubrication of the driving system during all overhauls because excessive heat production and the occurrence of sparks due to banging metallic contact must be avoided. Have the components only replaced by the service department of Dinnissen BV if required.	

8.2 Cleaning

The food, feed and pet food industries set high requirements with regard to hygiene conditions of the production processes. Bacteria will start to develop when there is an accumulation of product residues. This can end up in the process which may have great consequences in relation to the shelf life of the product and the health of the consumer and/or the animal.

Cleaning the area around the vat, the mixing paddles and the bottom support base is vital to avoid this situation. All product residues must be appropriately removed and rinsed away with a great quantity of water.

The machine must also be regularly thoroughly cleaned. This is, in particular, important with regard to machine components that will be in direct contact with the product or that are close to the product.

Foam-creating chemicals may be added to the cleaning water if required to ensure a more thorough cleaning.

Warning!

**When using dirt dissolving products:
Consult the detailed instructions and warnings of the supplier in
relation to the applicability of your products and for the relevant
safety issues involved.**

Clean the machine as follows:

- Ensure that the cleaning water or contaminant residues under the machine can be discharged.
- Ensure that the machine has been switched off and has been blocked against unintentional activation.
- Open the inspection traps.
- First remove all coarse contaminants (for example, by using a spray lance).
- Steam can be used for pre-treating stubborn contamination in relation to stainless steel machines.
- Loosen any caked on residue using a brush if required.
- Use a high-pressure cleaner for further cleaning of the vat and the mixing paddles (food industry).
- Rinse the whole machine properly afterwards (food industry) or use the CIP system (if available).

Note!

**Never spray with high pressure on the motors, bearings, sensors
and the control box!**

The mixing paddles can be rotated in the rinsing water in the housing (when the resistance valve is closed).

- First, of course, ensure that all traps have been closed before activating the machine.
- After dropping the rinsing water the resistance valve (if necessary) have to closed again. So that there can added new cleaning water into the housing.

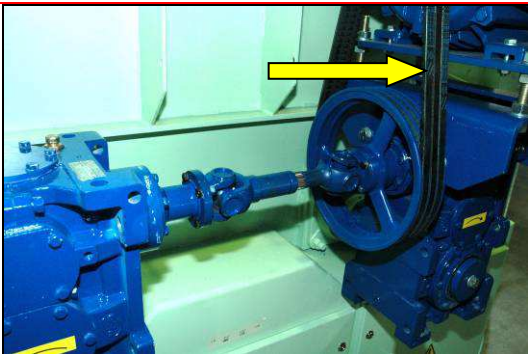
Tip

**Motors can also be briefly activated in the opposite direction if
required.**

8.3 Monthly Maintenance

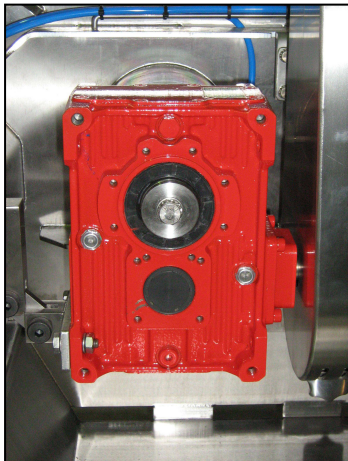
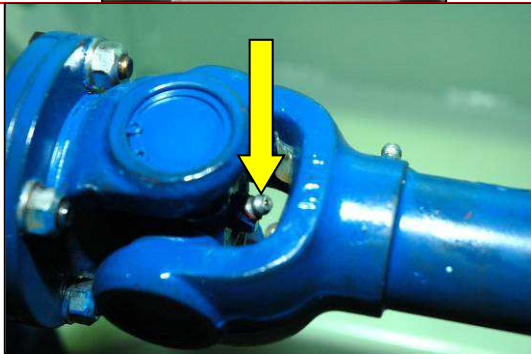
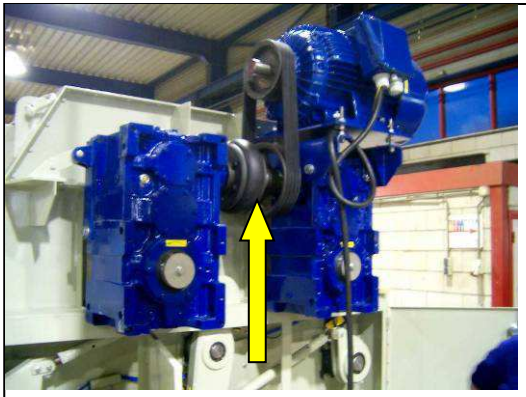
This paragraph describes the required monthly maintenance for the Pegasus® continuous mixer (based on a use of 80 - 120 hours per week).

Step	Method	Photo
1.	➤ Check the condition of the mixing paddles. ➤ If the paddles have been damaged or show wear, consult the service department of Dinnissen BV.	
1.A	➤ In relation to machines in potentially explosive atmospheres: check whether the paddles can still rotate completely freely.	
2.	➤ Clean the seal. ➤ Check the condition of this seal. If this has been damaged, have it replaced by the service department of Dinnissen BV.	
3.	If the housing is cleaned by rinsing water: ➤ Lubricate the bearings of the mixing shafts (only required if provided with a grease nipple).	

Step	Method	Photo
4.	➤ Check the pneumatic system for leaks.	
5.	➤ Check the tension and the condition of the V-belts; also see chapter 9.	
6.	In relation to machines in potentially explosive atmospheres: check whether the flushing is still intact using flow meters. Dirt accumulation will result in additional heat being produced and, therefore, explosion hazards!	
7.	➤ Check the presence and the status of the earth connections.	

8.4 3 Monthly Maintenance

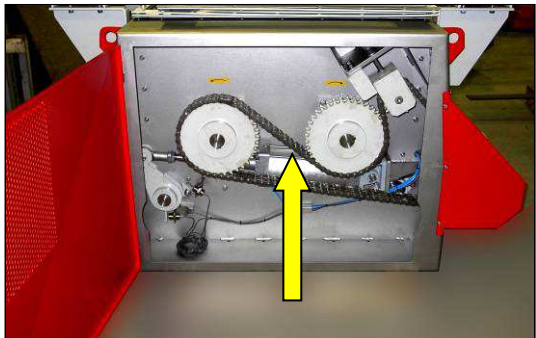
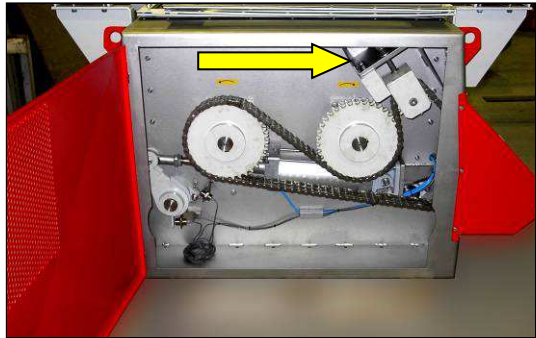
This paragraph describes the required 3 monthly maintenance in relation to the Pegasus® continuous mixer (based on a use of 80 - 120 hours per week).

Step	Method	Photo
1.	When machines are new: ➤ Top up the oil of the gearboxes after the first 3 months. ➤ Consult the specification sheet of the manufacturer for the correct quantity and type (NoTox!) oil.	
2.	➤ Lubricate the cardan shafts (if available).	
3.	➤ Check the condition of the bellows coupling (if available). ➤ Replace the coupling if this has been damaged or it has hardened.	

Step	Method	Photo
4.	When systems have a gear drive: ➤ Lubricate the tooth flanks lightly using grease. Note: Gear wheels must only be lubricated minimally. Excessive lubrication will attract additional contamination and will, therefore, limit the correct life cycle.	

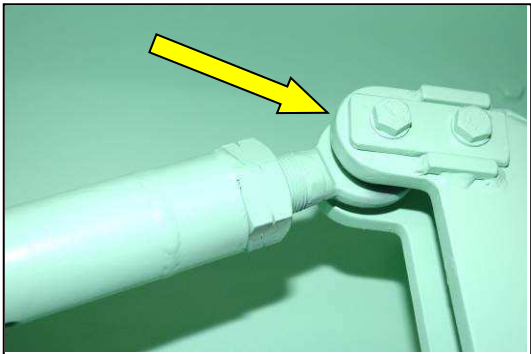
8.5 6 Monthly Maintenance

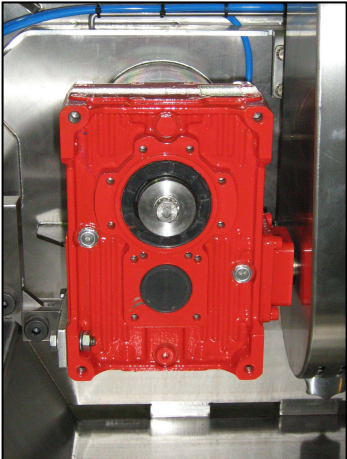
This paragraph describes the required 6 monthly maintenance in relation to the Pegasus® continuous mixer (based on a use of 80 - 120 hours per week).

Step	Method	Photo
1.	In relation to systems with a chain drive: ➤ Lubricate the chain using a good quality (clean) lubricant. Note: The chains may only be lubricated minimally. Excessive lubrication will attract additional contamination and will, therefore, limit the correct life cycle.	
2.	In relation to systems with a chain drive: ➤ Check the chain tension; also see chapter 9.	

8.6 Annual Maintenance

This paragraph describes the required annual maintenance in relation to the Pegasus® continuous mixer (based on a use of 80 - 120 hours per week).

Step	Method	Photo
1.	➤ Lubricate the bearings of the mixing shafts (only required if provided with a grease nipple).	
2.	➤ Lubricate the ball hinges of the cylinders (only required if provided with a grease nipple).	
3.	➤ Top up the oil of the fluid coupling (if available). ➤ Consult the technical information of the manufacturer in relation to this issue.	

Step	Method	Photo
4.	➤ Replace the oil of the gearboxes. ➤ Consult the specification sheet of the manufacturer for the correct quantity and type of oil.	

8.7 Overhaul

We recommend having the mixer checked and adjusted by the service department of Dinnissen BV once a year or every 2 years (depending on use). The following will be performed as well as other work:

- The oil in gearboxes will be checked and if necessary replaced.
- The drive construction will be adjusted.
- The end plate seal will be checked.

8.8 Lubricants

One of the following grease types should be used to lubricate bearings, cardan shafts and ball hinges:

- Esso - Beacon EP2
- SKF - LGEP2
- Mobil - Mobilux EP2
- Shell - Alvania EP2
- Texaco - Texaco EP2
- BP - Energrease LS-EP2
- Chevron - Dura-lith EP2
- Fina - Marson HFF 2 EP
- Gulf - Gulfcrown EP2
- Castrol - Spheerol EPL2

For the food industry, use:

- Rocol - FOODLUBE Extreme

9 Machine Adjustments and Repair

9.1 *General Safety Instructions*

The work described in this chapter must only be performed by authorised and expert personnel.

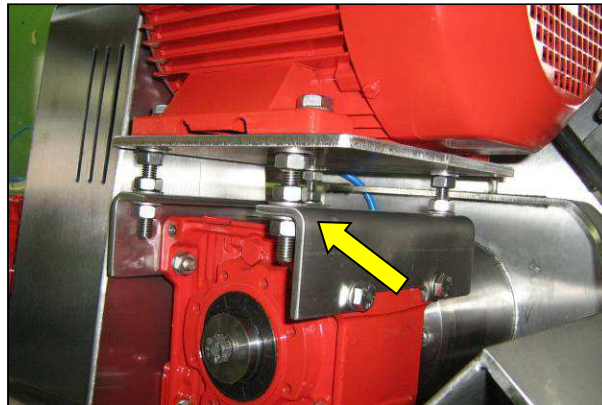
All of this work is necessary to safeguard the correct operation of the machine during a long period. It will also positively influence the life cycle and fault behaviour of the machine.

<u>Warning!</u>	Any protections that have been removed to perform adjustments and repair work must always be reinstalled after the maintenance work has been performed!	
<u>Warning!</u>	Only perform maintenance work, adjustments and repair work when the machine has been switched off and has been locked unless otherwise prescribed!	
<u>Note!</u>	All work that falls outside the scope of this manual must be left to be performed by the service department of Dinnissen BV.	
<u>Warning!</u>	Also check the quality of bearings, seals and mixing paddles when performing any work. Excessive heat and spark production must be avoided at all times. Faulty components must only be replaced, when required, by the service department of Dinnissen BV.	

9.2 Setting the Tension of V-belts

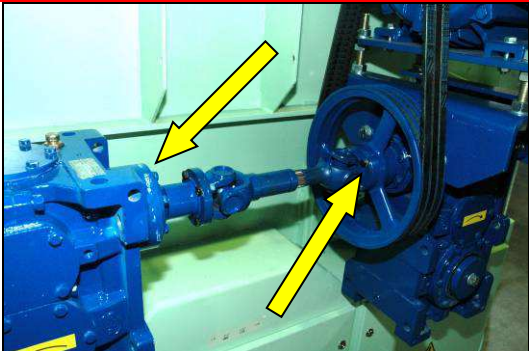
The geared belt tension of the mixing shaft drive may decrease after time and, therefore, the drive power may drop.

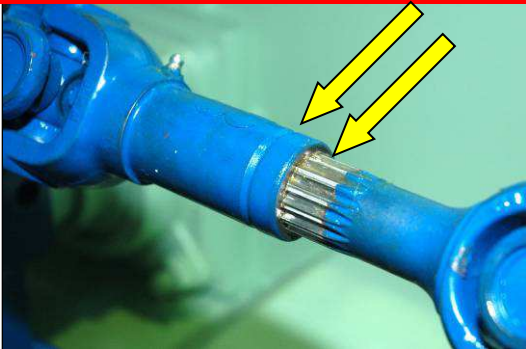
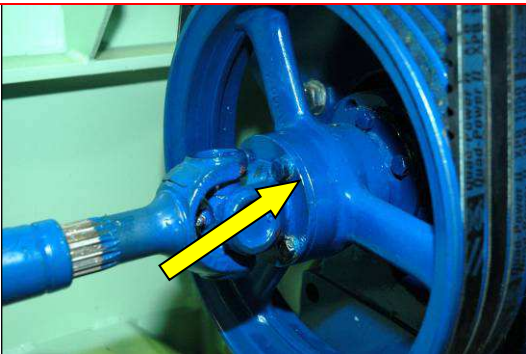
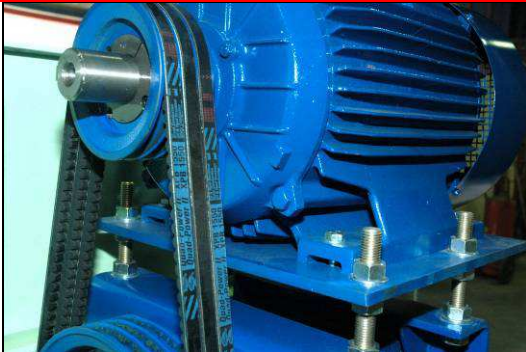
- Tension the V-belts by tightening the adjustment bolts of the support of the electric motor uniformly.
- Again tighten the check nuts correctly.



9.3 Replacing V-belts

If the V-belts have to be replaced, use the following method (based on driving structures with a cardan shaft):

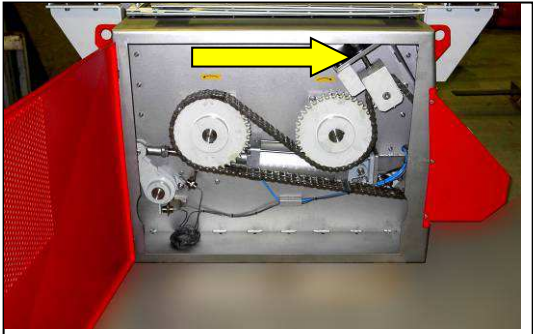
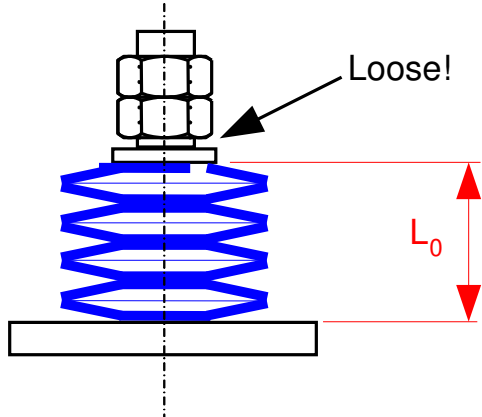
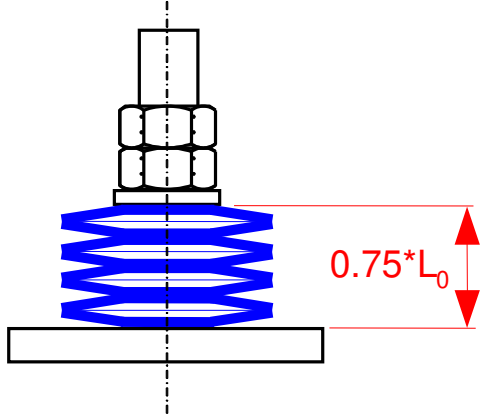
Step	Method	Photo
1.	➤ Loosen the driving motor using the adjustment bolts under the tensioning support. ➤ Disassemble the guards around the V-belt transmission.	
2.	You must take into account that the shafts of both gearboxes must not be turned in relation to each other with regard to the further actions to be performed. If they are, the mixing paddles may start touching each other!	

Step	Method	Photo
3.	➤ Mark both parts of the cardan shaft to ensure that they are slid in the same position in relation to each other when reassembled. ➤ Or: Ensure that both parts do not slide out from each other when being disassembled (for example, tie them together). ➤ The correct position in relation to each other is required to ensure the paddles of both mixing shafts do not jam into each other.	
4.	➤ Unscrew the mounting flange of the cardan shaft of the drive on one side. ➤ Slide the cardan joint slightly more into each other and bang the unscrewed part downwards.	
5.	➤ Remove the old V-belts and install a new set (the V-belts must always be exchanged as a full set).	
6.	➤ Install the cardan joint. ➤ Tension the driving motor. ➤ Check whether the paddles of both mixing shafts are not touching. ➤ Reinstall the protections. ➤ Switch on the machine and check the drive.	

9.4 Setting the Tension of the Chain Drive

The chain may have stretched to such an extent that the Belleville springs do not offer sufficient tension anymore due to wear.

Adjust the tension following the method given below.

Step	Method	Photo
1.	➤ Completely unscrew the check nut and the adjusting nut of the Belleville springs.	
2.	➤ Press the Belleville springs lightly on to each other and measure the (non-tensioned) length (L_0) of the spring set.	
3.	➤ Next, tension the adjusting nut in such a way that the set of Belleville springs is compressed together by approximately 25%. ➤ Tighten the check nut without turning the adjusting nut.	

Caution!

If the chain is tensioned too tightly, it will lead to excessive wear.

10 Disposal

If the Pegasus® continuous mixer is no longer used and must be pulled down, keep the instructions and action sequence below in mind.

- Ensure that the line control has been switched off and has been blocked against unintentional activation.
- Disconnect the electrical main connection.
- Switch off the compressed air supply and disconnect the main connection.
- Disconnect the electrical connections of the electric motors.
- Disassemble the electric motors and the gearboxes and dispose of the oil in accordance with local rules and regulations (NoTox oil has been used in the gearboxes).

Warning!

Remember there is a pinching or crushing hazard in relation to the gear wheels and chain drives!



- Disconnect the other electrical connections (magnetic valve, position detectors).
- Disassemble the system further from the top to the bottom. Use reliable resources and tools and observe safety rules and regulations when doing this.
- All components must be disposed off in accordance with local rules and regulations. By preference, using a company that will recycle the materials.



Note!

These points only refer to those parts that have been supplied by Dinnissen BV and have been described as such in this manual.

In this logbook the following must be noted:

- [illegible]