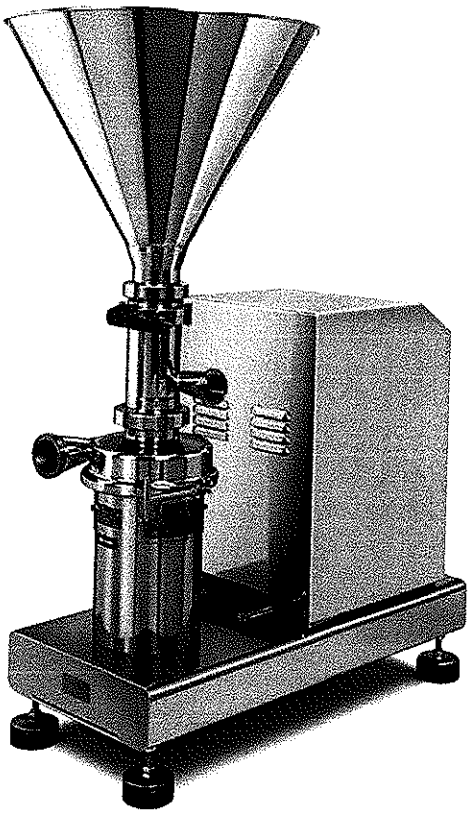
INOXPA®

INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

M-25 / 38 / 40 BLENDER



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INOXPA®

EC Declaration of Conformity

The manufacturer:

INOXPA, S. A.
c/ Telers, 54
17820 Banyoles (Girona) - Spain

Hereby declares, that the blenders

BLENDERS	**M-25 / 38 / 40**	**2004**
Name	Type	Manufacturing year

Are in conformity with the essential requirements of the Machinery Directive 89/392/EEC and with its modifications and additions according the Council Directives: 91/368/EEC, 93/44/EEC, 93/68/EEC and 73/23/EEC, and are adapted to the harmonised norms:

EN 292 part 1
EN 292 part 2
prEN 809: 1998

Year of CE marking : CE 95

Banyoles, January 1995

Josep Maria Benet
Technical Manager

INOXPA®

Manufacturer Declaration

According the EC directive about machines 89/392/EEC, Annex II B

The Manufacturer:

INOXPA, S. A.
c/ Telers 54
17820 Banyoles (Girona) - Spain

Hereby declares, that the blenders

BLENDERS	**M-25 / 38 / 40**	**2004**
Name	Type	Manufacturing year

Comply with the pertinent disposition, in the execution supplied by **INOXPA, S. A.** for the incorporation in a machine or installation, or for the assembly with other machines as a subunit of other higher order machine.

Harmonised norms used, particularly:

EN 292 part 1
EN 292 part 2
prEN 809: 1998

The machine above must not be put into service until the machinery into which it has been incorporated have been declared in conformity with the EC Machinery Directive. It must meet, particulary, the standards EN 294, EN 563, EN 809 and EN 953 in its respective current editions.

Year of CE marking : CE 95

Banyoles, January 1995

Josep Maria Benet
Technical Manager

1. Safety Instructions.

SAFETY INSTRUCTIONS.

This instruction manual contains the basic indications that should be complied with during installation, start-up and maintenance. Consequently, it is essential that, before installation, both the installer and the plant technical manager read this instruction manual and that it is permanently available alongside the blender or corresponding installation.
Not only must the detailed safety instructions in this chapter be complied with, but so also should the special measures and recommendations added in the other chapters of this manual.

SYMBOLS USED

The safety instructions included in this manual, whose non-compliance may cause risk to persons or to the machine and its correct operation, are expressed by means of the symbols indicated below:

Danger to people in general.

Electrical hazard.

Danger of injury caused by the blender.

Danger due to suspended charges.

Danger for the blender and its correct functioning.

General obligation.

GENERAL SAFETY INSTRUCTIONS.

- Read the instructions in this manual before installing the **blender** and before starting it up.
- The installation and use of the **blender** must always be in accordance with the rules applying to health and safety.
- Before starting it up, make sure that the **blender** and the piping are clean, unobstructed, free of waste and that all the suction and discharge valves are open. Check that all the piping is connected, airtight, that there are no leaks and their alignment is perfect. The blender may have serious mechanical problems if the connections are badly aligned and/or are subjected to excessive pressure.

- Specialised personnel should carry out all electrical work.
- To control the engine characteristics and its control panel, especially in areas where there is a risk of fire or explosion, the user company's technical manager shall establish danger areas (area 1 – 2 – 3).
- Do not spray the motor directly during cleaning.
- Do not disassemble the **blender** without previously disconnecting the power supply. Remove the fuses and disconnect the motor feed cable.

- The **blender** cannot operate without the housing or the diffuser system with the hopper properly assembled. Do not put the **blender** into operation if the revolving parts are incorrectly assembled or are not covered by the protection system.
- The **blender** has rotating parts. Do not put hands or fingers into a **blender** whilst it is operating. This may cause serious injury.
- Do not touch any of the parts of the **blender** that are in contact with liquid whilst in operation. If the **blender** works with hot products at temperatures exceeding 50 °C, there is a risk of burns. In these cases, collective protective measures should be put in order of priority (distance, protective screen, heat resistance), or –failing this possibility- to provide individual protection (gloves).
- Do not disassemble the **blender** before having emptied the suction and discharge piping. The liquid builds up in the housing of the **blender**. If the **blender** has to operate with hot and/or hazardous products, take all the precautions required and put into practise all the regulations currently in force where the safety of the workers and products is concerned.

- Take all possible precautions in lifting the **blender**. Always ensure that it securely attached when being transported by crane or any other lifting mechanism.

- While the **blender** is operating do not close the liquid discharge and suction valves, because otherwise the **blender** will operate with no liquid flowing, the liquid will heat up, and there is a risk of the **blender** being damaged if the temperature reaches boiling point.
- Withdraw all the tools used in mounting before starting up the **blender**.

- Do not let the **blender** exceed the pressure limit, the operating rate or the maximum operating temperature. Do not modify the operating parameters that have originally been set for the **blender** without receiving prior authorisation in writing from **INOXPA**.
- The **blenders** and their installation may cause noise levels that exceed 85 dB (A) in some unfavourable operating environments. In such cases, operators should wear hearing protection.

WARRANTY.

We wish to point out that any warranty issued will be null and void and that we are entitled to an indemnity for any civil liability claim for products which might be filed by third parties if:

- operation and maintenance work has not been done following the corresponding instructions; the repairs have not been made by our personnel or have been made without our written authorization;
- modifications are made to our material without prior written authorization;
- the parts or lubricants used are not original INOXPA parts/lubricants;
- the material has been improperly used due to error or negligence or have not been used according to the indications and the intended purpose.
- None of the parts subject to wear and tear are included in the guarantee.

The General Delivery Terms which you have already received are also applicable.

INSTRUCTIONS MANUAL.

The information provided in the instruction manual refers to updated data.
We reserve the right to modify the design and/or manufacturing specifications of our products as required, devoid of any obligation on our part to adapt any product supplied prior to such alteration.
The technical information made available in this instruction manual, together with the graphs and technical specifications provided, shall continue to belong to us and should not be used (except for starting up this installation), copied, photocopied, made available or otherwise given to third parties without our prior written consent.
INOXPA is reservation the right to modifying this instructions manual without previous notice.

INOXPA SERVICE.

In the event of doubt or should you require a fuller explanation on particular data (adjustment, assembly, disassembly...), please do not hesitate to contact us.

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8. Disassembly and assembly

9. Technical specifications

10. Cleaning and Disinfection

2. Reception, storage and transport.

RECEPTION.

On reception of the blender, check the packing and its contents to ensure that it agrees with delivery note. **INOXPA** packs the blenders completely assembled except for the hopper. Ensure that the blender has not suffered any damage. In the case of it being found not to be in correct condition and/or some part(s) are missing, the transporter shall have to prepare a report as quickly as possible.

The blender is taken in its packaging as close as possible to the work site and it is left in its box until just before it is mounted.

STORAGE.

If the blender is not immediately installed, it must be stored in an appropriate place. No treatment is given to the blenders to conserve them. If they are to be stored for considerable periods before assembly, VG 46 mineral oil must be applied to the internal parts.

TRANSPORT.

Take all possible precautions in lifting the blender. Always use the sling hooks when moving the blender with a crane or any other type of lifting equipment.

The blenders are too heavy to be stored by hand. Use an adequate means of transport. When raising the blender, follow the instructions shown in the drawing.

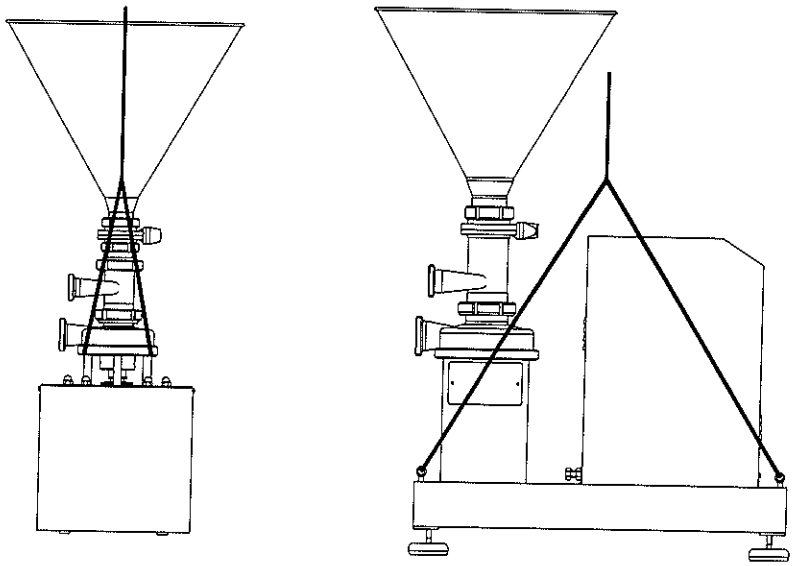


Figure 2.1.

Type	Weight [Kg]
M-25	70
M-38	260
M-40	285
M-25 / 20	135
M-38 / 35	325
M-40 / 38	365

3. Identification, description and use.

IDENTIFICATION.

The blender is identified by means of a plate its characteristics attached to the support or the casing. The type of agitator and serial number are on the plate. See figure 3.1.

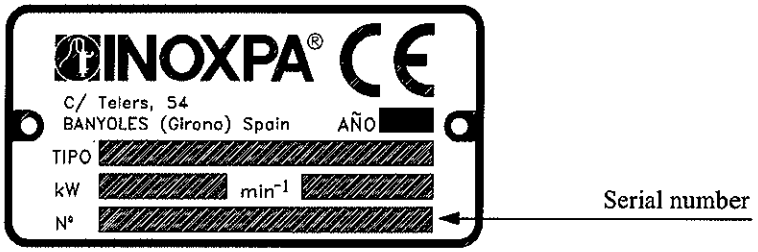


Figure 3.1: Characteristics plate.

DESCRIPTION.

The blender is designed in three distinct parts or zones, which indicate how it is constructed and how it operates.
The top part is the hopper, a zone made of solid material, and the powder is added through a butterfly valve with an adjustable handle. As an alternative, the butterfly valve can be supplied by a pneumatic actuator.
The mixing chamber is in the intermediate zone, which contains the diffuser and where the liquid flows in.
The mixing chamber, lying at the bottom of the machine, contains the liquid and the powder which are mixed.
The M-25 blender is a compact construction, the hydraulic part is joined to the motor, and the connections are of the sanitation type. The hydraulic part and the motor come separately on the M-38 and M-40 models, and both are mounted on a baseplate. The motor is pulley-driven and the pulleys are located below the baseplate.
The standard motor is designed in accordance with the IEC Standard, with IP-55 protection and Class F insulation. If ordered, the motors can be supplied suitable for operating in atmospheres where there is a risk of explosion.
All the parts that come into contact with the product are made of AISI – 316, with an electro-polished surface finish.

USE OF THE BLENDER.

M-25 / 38 / 40 blenders can be used in any situation where powder is first added to and then dissolved in liquid. Usages include:

- Powdered milk.
- Powdered whey.
- Lactose.
- Chocolate.
- Stabilizers, mixed with milk.
- Sauces.
- Brine.
- Fertilizer.
- Pesticides, etc.

SHAFT SEALING.

The following options for the mechanical seal are applicable to the entire range of pumps.

- Single sanitary mechanical seal.
- Double cooling mechanical seal.
- Mechanical seal in cooled tandem.

Table 3.1: materials for faces exposed to friction and internal mechanical seal elastomers

	Rotating part	Stationary part	Elastomers
standard	Stainless steel	Graphite	EPDM
optional	Silicon carbide	Graphite	EPDM
	Silicon carbide	Silicon carbide	EPDM

The elastomers of the mechanical seal options can be of EPDM or viton.

OPERATING PRINCIPLES.

The blender basically consists of a housing and an impeller for a centrifugal pump wheel mounted vertically. The suction is equipped with a 2-walled ring-shaped tube, which keeps the liquid and the powder apart, until such time as they flow into the mixing chamber. The tube prevents the powder from humidification (see figure 3.2).
The suction caused by the blender impeller sucks the powder from the hopper and down through the diffuser tube into the mixing chamber.
The other tube is used to make the liquid flow to the impeller. The liquid flows at a tangent onto the impeller blades where the blender pressure gradient is zero (see figure 3.3). The liquid flows at a tangent into the mixing chamber, in the same direction as the impeller is rotating, which ensures that the powder of inlet pipe becomes dry while the blender is operating.
If it is observed that the inlet pipe is blocked, a check must first be made to see if the impeller is rotating in the right direction and, then, to see that the inlet tee is properly assembled. To check that the tee is correctly installed, draw an arrow all the way from the inlet to the outlet, without changing direction (see figure 3.4). Under normal operation, the vortex is formed at the centre of the impeller, and this vortex sucks the powder through the diffuser tube, which remains dry. If no vortex is formed, the powder might get damp and lumps may form in the mixture, and this could even lead to blocking the inlet pipe.

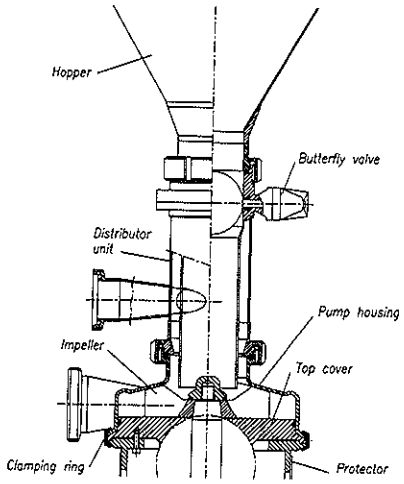


Figure 3.2

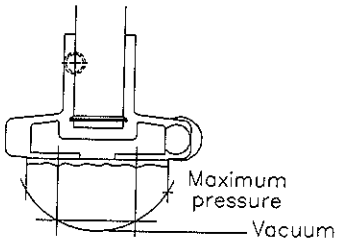


Figure 3.3

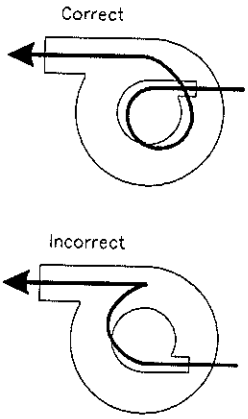


Figure 3.4

The powder might become damp for any of the following reasons:

- **Inadequate inflow of liquid**. If the discharge and/or the pressure is very high this could destroy the vortex inside, and the blender will not be able to pump the liquid fast enough. This could also happen if the discharge is too slow, because this will cause a build-up of powder on the impeller, making it impossible for the vortex to form at the centre of the impeller.

- **High viscosity.** A viscous product naturally causes a counterpressure. If one adds the counterpressure caused by the grid, the pressure could be very high. It is advisable to remove the grid, an optional extra, when mixing products that are very viscous.

- **High discharge pressure.** If the discharge pipe is too long or its diameter is too small, or if the viscosity level is very high, the counterpressure will also be very high.

These problems will be overcome if the pipe is the right size, or if necessary, a pump can be installed inside the blender outlet. It can be a centrifugal pump, but its pumping capacity is limited if an optimum performance is to be obtained from the mixture. If the counterpressure increases inside the blender, the vortex becomes smaller, thereby reducing the capacity to mix the solid and liquid ingredients.

It is difficult to calculate beforehand the amount of powder to add, because the ratio depends on a large number of variables. Some of the major variables, are:

- Fluidity.
- Moisture content.
- Moisture.
- Content of fatty material.
- Microscopic texture (smooth, rough).
- Density.
- Fluidity (volume of air in the product).
- Type of powder (granular, flakes, aggregates, etc.)

The vacuum that is formed in the blender is created at the centre of the impeller and sucks the powder from the hopper. To a certain extent, this vacuum is a variable that can be controlled, and in mainly depends on the flow and the temperature.
The graph shows the vacuum curve depending on the flow, for three models of blenders (see figure 3.5).

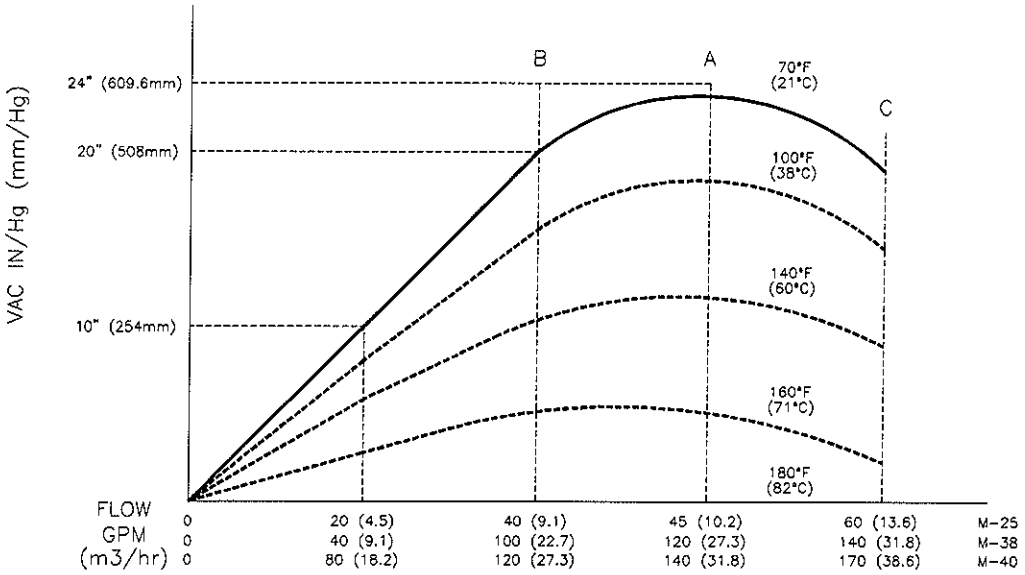


Figure 3.5

AUXILIARY PUMPS.

The flow and the choice of auxiliary feed and extraction pumps for the blender are major factors that determine whether the device will operate correctly.

The pumps must be selected to guarantee the recommended flow at the final viscosity. Where centrifugal pumps are concerned, the desired flow, before the powder is added, has to be between points A and B on the graph. The upper limit, point C on the graph, must never be exceeded. Point C is the power threshold required by the blenders.
If the product flow at the final viscosity falls below point B, the powder flow will drop. This problem can be overcome by installing two displacement pumps, one at the intake and the other at the blender outlet. These pumps will keep the flow regular, even if the viscosity increases.

When displacement pumps are used, the flows are not necessarily as indicated, in the graph, for obtaining the maximum vacuum. If the discharge pump - extraction - revolves more quickly than the suction pump - feed -, the vacuum created by the extraction pump can be used to increase the depression - vacuum - inside the blender. Smaller and less expensive displacement pumps may be used to achieve the same results.

The graph also shows the effects that the temperature has upon the vacuum. The maximum temperature for aqueous products is 60 °C. If the temperature is greater, the vacuum makes the water evaporate quickly. This evaporation is enough to have a considerable effect on the vacuum and dampen the inner surfaces of the blender. This dampening effect can cause the powder to build up, which causes a risk of blocking the diffuser tube. A temperature of 70 °C can cause air to be released through the hopper and the powder. At 80 °C, hardly any vacuum is formed inside the blender.
Non-aqueous solutions can have different temperature limits, depending on the liquid vapour level.

SELECTION OF THE AUXILIARY PUMPS.

The choice of feed and extraction pumps is the best guide to ensuring that the blender operates properly. The capacity for adding powder and the degree of mixing depend on the choice of auxiliary pumps.
It is important to keep the blender supplied with a constant flow of liquid. The vacuum remains constant if the flow is kept constant. If the vacuum is not constant the powder adding capacity is not even. Therefore, pumps must be chosen on the basis of the final viscosity of the product to be pumped.
As a result, the most important factor is to know the final viscosity of the product. Other data that have to be known in order to determine the final viscosity of the product, are the temperature and the mixing time.
The simplest design uses a centrifugal feed pump at the blender intake, to achieve a final viscosity of less than 500 cPs and a discharge height of less than 7.6 m. A centrifugal extraction pump has to be installed at the blender outlet, in order to obtain a final viscosity of approximately 500 cPs and/or a discharge height of approximately 7.6 m.
The feed pump is always a low velocity pump, because the blender requires a low-pressure flow to mix correctly and reduce splashing to a minimum.
The feed flows for blenders equipped with centrifugal pumps are:

Type	Flow [l/h]	Pressure [bar]
M-25	9.000 ÷ 10.000	0,3 ÷ 0,7
M-38	25.000 ÷ 27.000	0,7 ÷ 1,3
M-40	30.000 ÷ 32.000	0,7 ÷ 1,3

Do not exceed the flows so as not to overload the motors.
In most cases, it is necessary to install two displacement pumps when the viscosity is greater than 500 cPs, in order to keep the flow constant at the blender input and output.
The extraction pump rate must be faster than the feed pump rate, in the following circumstances:

- If a larger amount of product has to be pumped, and,
- If the vacuum in the blender has to be increased in order to add powder.

It is advisable to install the pump with a device for adjusting the vacuum to the powder flow, by regulating the rate.
The feed flows for the blenders equipped with displacement pumps are as follows:

Type	Flow [l/h]
M-25	9.000 ÷ 10.000
M-38	10.000 ÷ 12.000
M-40	14.000 ÷ 16.000

The extraction pump has to be installed close to the blender. The pumping rate has to be fast enough to form the right depression, but not too fast, otherwise cavitation will take place. The operator will note that the depression is insufficient, or that the temperature of the product is very high, when the air is puffed out through the powder in the hopper. In such circumstances, the powder flow is very slow or almost negligible.
It is not advisable to install one centrifugal pump at the intake and a displacement pump at the blender outlet. It is extremely difficult to balance the flow for the two pumps, because as the dust is added the viscosity of the product increases, and this causes variations in the flow.
The final viscosity of the product is what gives the operator an idea or a criterion for choosing the feed and extraction pumps. It is important to know this, but it is also necessary to know the dry material percentage.
This criterion is not valid for all the uses, as is the case with products like stabilisers and thickeners at very low concentrations. In this case, 2 % is required to install two displacement pumps. Another exception, but in the opposite sense, would by the case of aqueous sugar solutions, where the viscosity of the sugar depends on the temperature; when the temperature is high and concentrations are greater than 50 %, centrifugal pumps can be used.

PRODUCTS THAT WE MUST AVOID USING.

Abrasive products. These products are detrimental to the mechanical seals and the impellers.
Effervescent products. The gas that they release prevents the vacuum from forming and prevents the powder falling from the hopper.
High temperatures. Products must be mixed at temperatures greater than 60 °C. As a result, the steam that is released blocks the diffuser tube.
Very high viscosity. The blenders cannot pump highly viscous products. The maximum viscosity for the blenders is 25.000 cPs.
Incompatible products. Any products that are not compatible with the different mechanical seals and elastomers.

POWDER FLOW.

The powder flow envisaged for the three blenders is as follows:

Type	Flow [Kg / h]
M-25	1.380
M-38	2.700
M-40	4.000

These are estimated flows and cannot be applied to all the products in general. The flowability, the type of powder, the density and the texture all affect the flow. Certain powders, such as stabilisers, have to be added slowly if the perfect mixture is to be achieved. It is then possible to reach powder flows of less than 50 % of the rated flow.
The opposite occurs for other uses, where it is possible to double the theoretical flows in the case of granular products, such as sugar. Other products that have a high fat-content, such as powdered chocolate, do not flow readily and do so with difficulty, so a larger blender has to be used with a tighter angle for the hopper. With these products, we can improve the results, if possible, by adding other products that flow much more easily.

USE ON LINE OR RECIRCULATION.

- On line.

The M-25 blender requires a flow of 10.000 l/h or approximately 10.000 Kg/h of liquid. If we pour in 1380 Kg/h of powder, the maximum percentage of solids that we obtain is:

$$1.380 : 10.000 \times 100 = 13.8\ \%$$

The M-38 blender requires a flow of 12.000 l/h or approximately 12.000 Kg/h of liquid. If we pour in 2700 Kg/h of powder, the maximum percentage of solids obtained is:

$$2.700 : 12.000 \times 100 = 22.5\ \%$$

The M-40 model requires a flow of 16.000 l/h or approximately 16.000 Kg/h of liquid. If we mix in 4000 Kg/h of powder, the maximum percentage of solids obtained is:

$$4.000 : 16.000 \times 100 = 25\ \%$$

In extreme cases, the powder can find its way into the displacement pump for extraction purposes and damage the lobes and the housing. This problem can be overcome by reducing the powder flow-rate by operating the butterfly valve on the hopper.

- Recirculation.

The mixture that is re-circulating is the one that yields the best results and makes it possible to reach 60 % of solids in the most favourable conditions.

4. Installation and assembly.

INSTALLATION AND ASSEMBLY.

If the blender is supplied without a motor, the purchaser or the user is responsible for assembling it, installing, start-up and operation.

SITE.

Position the blender as close as possible to the intake, below the level of the liquid if possible, or even lower in relation to the tank, so that the static intake pressure height is at a maximum.
The blender has to be installed on a foundation surface that is rigid, horizontal, flat and shockproof. The blender is designed with adjustable legs, which enables the operator to level it once installed, if this proves necessary. Place the blender as close as possible to a drainage outlet.
Install the blender in such a way that it is easy to gain access to both the blender and the actuator, so it will be easy to carry out inspections and servicing activities. Leave enough room around the blender to enable maintenance personnel and operators to work in comfort, and carry out repairs, assembly and maintenance work. It is very important to make it possible to gain easy access to the electricity connection device, even when it is in operation.

PIPES.

The suction and discharge pipes has to be as short as possible, with a minimum of bends and accessories, so that load loss due to friction can be reduced to a minimum. A load loss of 0,65 bars at the intake must be considered.
Whenever it is possible, the diameter of the suction piping has to be greater than the diameter for the blender connection, so an eccentric reduction must be used to make it easier for the liquid to flow in and to reduce turbulence to a minimum. This will improve the suction conditions, so the blender will perform in an optimum way.
The suction and discharge pipes must be carefully aligned and supported so that the blender is not subjected to any stress.

ELECTRICAL CONNECTION.

Before connecting the electric motor to the mains, check the local regulations and the corresponding standards regarding electrical safety. Take special account of those parts referring to command and control of the blender. Check the manufacturer's instruction manual for connecting it to the mains.

Let the electrical connection of the motors to qualified personnel. Take the necessary measures in order to prevent any type of breakdown.

The motor should be protected with devices against overload and short-circuits.

It is not possible to use the blender in areas of risk of fire or explosion if this has not been included in the order. Risk areas (zones 1 -2 - 3).

5. Start-up and operation.

Blender start-up shall be able to be carried out if the detailed instructions in the section on installation and assembly have previously been realised.

CLEANING.

The blenders operate with food products, so they have to be cleaned before they are started up. There are two different ways of approaching the cleaning process:

- Washing the parts by hand, once the blender has been disassembled.
- By means of an "in situ" cleaning process, CIP "Cleaning In Place".

The blender has to be operating during the CIP process, so that optimum cleaning can be achieved.
This cleaning process is necessary in the following cases:

- Before the blender is used for the first time.
- After spare parts have been assembled when these come into contact with the product.
- After a service, when it is going to be out of use for a prolonged period.
- Before the blender is started up again after one of these long periods of inactivity.

Before it is started, make sure that the piping and the blender are completely clean and free of traces of welding or other foreign bodies.

STARTING UP PROCEDURE.

- Check the electricity supply to make sure that it is as indicated on the motor instruction plate.
- Check that the suction and discharge piping is connected up, airtight and leakproof.
- Check that the impeller rotates without rubbing, taking into account the mechanical seal and the transmission belts (for M-38 / M-40).
- All the protection devices for the rotating parts have to be in place.
- To control the correcting operation of the blender, open the suction valve for the liquid and let it run for a moment. Check the rotation direction and that it does not make a noise.

The blender can NEVER work without a product.

Make sure the blender rotates as indicated by the arrow stuck to the motor, or refer to Chapter 3. The blender will not operate properly if it is rotating in the wrong direction.

OPERATION.

Do not modify the operating parameters for which the blender was initially selected without prior written consent of INOXPA.

Do not put solid objects or raw materials into the blender hopper, because this could break the impeller or other mechanical parts, and jeopardise safety or the validity of the guarantee.

The blender can be used as soon as it has been started up. There are three possible operating modes:

- Blender loaded, without the auxiliary pump.
- Blender with a centrifugal pump at the intake.
- Blender with feed and extraction displacement pumps.

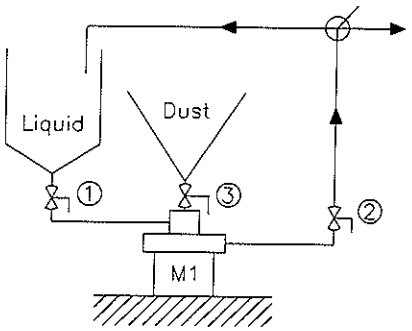
BLENDER LOADED, WITHOUT AN AUXILIARY PUMP.

Starting the blender up:

- Butterfly valve with adjustable handle ③ closed.
- Start up the blender (M1).
- Open butterfly valve of the discharge ②.
- Open the intake valve ①.
- Check that the liquid flow is correct.
- Gradually open the butterfly valve ③ until the desired powder flow is obtained.

Stopping the blender:

- Close the butterfly valve ③.
- Close the suction valve ①.
- Close the discharge valve ②.
- Stop the blender M1.



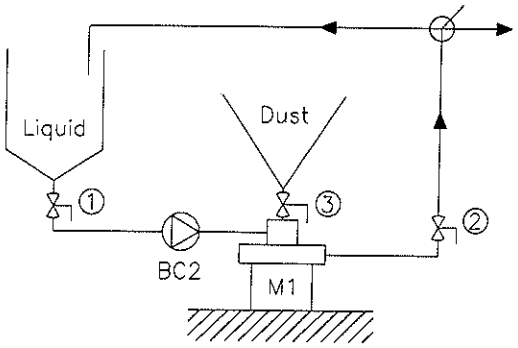
BLENDER WITH CENTRIFUGAL PUMP AT THE INTAKE.

Starting up the blender and the centrifugal pump:

- Butterfly valve with adjustable handle ③ closed.
- Start up the blender (M1).
- Open the discharge butterfly valve ②.
- Open the intake valve ① at the same time.
- Start up the centrifugal pump (BC2).
- Check that the liquid flow is correct.
- Gradually open the butterfly valve ③ until the desired powder flow is obtained.

Stop the centrifugal pump and the blender pump:

- Stop the centrifugal pump (BC2).
- Close the butterfly valve ③.
- Close the intake valve ①.
- Close the discharge valve ②.
- Stop the blender (M1).



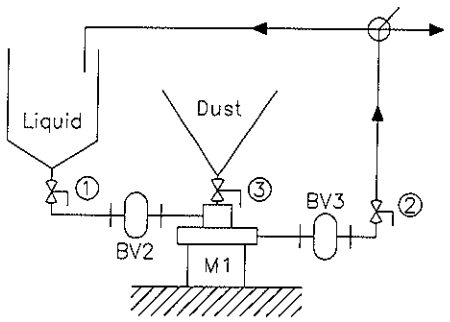
BLENDER WITH FEED AND EXTRACTION DISPLACEMENT PUMP.

Starting up the blender and the displacement pumps:

- Open the discharge valve ②.
- Butterfly valve with adjustable handle ③ closed.
- Start up the blender (M1).
- Start up the displacement pump (BV3) for the discharge.
- Open the intake valve ①.
- Start up the displacement pump (BV2).
- Check that the flow rate for the liquid is correct.
- Gradually open the butterfly valve ③ until the desired powder flow is obtained.

Stopping the displacement pump (BV2), for the blender (M1) and the displacement pump (BV3):

- Stop the displacement pump BV2.
- Close the butterfly valve ③.
- Stop the blender M1.
- Close the intake valve ①.
- Stop the displacement pump BV3.
- Close the discharge valve ②.



6. Maintenance and conservation.

Maintenance work can only be carried out by qualified personnel that are trained and equipped with the resources necessary for carrying out this work.

Before starting the maintenance work, make sure that the electric motor is disconnected and the piping is empty.

MAINTENANCE.

- Inspect the blender regularly.
- Do not fail to keep the blender clean.
- Check the state of the mechanical seal and the O-ring seals.
- Check the state of the bearings and the belts for models M-38 and M-40.
- Check the state of the motor.

LUBRICATION.

The blenders are not equipped with parts that must be lubricated in short periods of time. The hydraulic part for models M-38 and M-40, is mounted on a support for the bearing support and greased for its entire working life, so it requires no maintenance; whereas the hydraulic part for model M-25 is joined to the motor. Maintenance for the motor is carried out according to the manufacturer's instructions, (see instructions manual).
Blenders provided with supports for the bearings can be re-greased by dismantling the support, cleaning the existing grease off the bearings or replacing them, and doing the same for the bearing housings, and then applying fresh grease (50 - 70 %).
When re-greasing, use only special grease for ball bearings with the following properties:

- Lithium-based or made up of high quality lithium.
- Viscosity 100 - 140 cSt at 40 °C.
- Consistency NLGI grade 2 or 3.
- Continuous work temperature - 30 °C to + 120 °C.

MECHANICAL SEAL.

- An exact description of the single mechanical seal supplied is given when the order is confirmed.
- When large amounts of the product leak or spill out, the mechanical seal must be checked and, when the reason has been found, the damaged part will be replaced.

The single mechanical seals work with the product to be pumped. However, their area of use can be extended if they are equipped with a "Quench" washing device. It is the type that is recommend for use with mechanical seals if a liquid without pressure and other than the one being pumped is used on the ring on the exterior of the mechanical seal. It is used when:

- The mechanical seal is not a suitable solution for the purpose.
- When a double mechanical seal is not necessary.

It is recommended in the following cases:

- Operating in vacuum - dry friction conditions -.
- For liquids or products that have to be isolated from the atmosphere.

The pressure in the washing chamber behind the mechanical seal must not be greater than the pressure of the product being pumped, because if it is, the mechanical seal stationary ring will come out of its housing.
The washing liquid must flow out freely.

SPARE PARTS.

To order spare parts it is necessary to indicate the type and serial number that are included on the blender's characteristics plate, as well as the position and description of the part as found in chapter 9, technical specifications.

CONSERVATION.

If the blender is going to be out of use for a long time:

- Empty the blender and wash it.
- The internal parts must be coated with VG46 mineral oil.
- The blender must either be handled briefly once a week or the blender shaft must be turned manually. This will ensure that the protective oil moves as it should.

7. Operating problems: causes and solutions.

Operating problems	Probable causes
It will not draw.	1, 2, 3, 4, 5, 6, 7.
Insufficient pressure at the discharge.	8, 9, 10.
Motor overload.	11, 12.
Noise.	13, 14, 15.
Vibrations.	15, 16, 17.
Peakage.	6, 7, 18, 19, 20.

	Probable causes	Solutions
1	Unsuitable feed pump.	Select the right size of pump for that use. See Chapter 3.
2	Rotating in the wrong direction.	Change the direction that the motor is rotating.
3	Diffuser unit badly mounted.	Check the diffuser and mount it as indicated in Chapter 8.
4	Percentage of powder too high.	See Chapter 3.
5	Very high temperature.	Lower the temperature to less than 60 °C.
6	Leak in the feed pump intake.	Check the intake piping and all its connections.
7	Mechanical seal worn.	Replace the mechanical seal for the blender and / or the feed pump.
8	Very high percentage of solids for working with the grid in place.	Remove the grid.
9	Insufficient liquid.	Check the feed pump.
10	Product very viscous or discharge height too great.	Equip it with an extraction pump.
11	High percentage of solids for mixing with the grid in place.	Remove the grid.
12	High percentage of solids.	Install an extraction pump.
13	Motor bearings worn.	Replace the bearings, as indicated in the manufacturer's instruction manual.
14	Blender bearings worn.	Replace the bearings; inspect the blender.
15	Foreign bodies inside the blender.	Disassemble the blender and remove the foreign bodies. Check the housing, the impeller and the mechanical seal.
16	The blender is not level.	Correct the blender level and its alignment.
17	The impeller is damaged.	Replace the impeller.
18	O-ring seals unsuitable for the liquid.	Equip it with the right O-ring seals, after having got in touch with the manufacturer.
19	Tension of the mechanical seal spring too low.	Adjust as indicated in this manual.
20	Clamping ring loose.	Tighten the clamping ring.

If the problems persist stop using the agitator immediately. Contact the agitator manufacturer or the representative.

8. Disassembly and assembly.

The blenders must be both assembled and disassembled by qualified personnel, and only suitable tools must be used in suitable working conditions.

ELECTRICAL SAFETY.

Ensure that the motor starter is turned off when carrying out disassembly or assembly work on the agitator.

- Place the blender switch in the "off" position.
- Block the electrical panel and put a warning notice on it.
- Take out the fuses and take them with you to the work area.

BLENDER HOUSING, IMPELLER AND COVER. DISASSEMBLY.

- Close the intake and discharge valves.

ATTENTION! The liquid might spill out when the housing is removed.

- Remove the parts from the top of the body (3) systematically: hopper (6), butterfly valve (52), distributor unit (4) and the inlet unit (4A, only for M-25), by loosening the nuts that joint these parts together.
- Take out the clamping ring (19) with a suitable tool.
- Check that the O-ring (55) is still in good condition.
- Remove the housing (3).
- Remove the protector (17) and the screws (70).
- Place a spanner on the shaft planes (10), to stop it from revolving.
- Remove the blind nut (18) and the O-ring (54).
- Take out the impeller (7). If necessary, give a blow with a plastic mallet to extract the cone.
- Extract the rotating part of the mechanical seal (51).
- Remove the top cover (2). The stationary part of the mechanical seal (53) remainsattached to the top cover. For the M-38/40, take out the allen keys (56).

MECHANICAL SEAL. SINGLE MECHANICAL SEAL DISASSEMBLY.

Before disassembly the mechanical seal, follow the instructions shown above.

- When the impeller is removed, the rotating part of the mechanical seal (51) remains attached to the shaft of the blender. Check that the sealing surface of the rotating face and the seal are in good condition.
- When the blender cover is disassembled, the stationary part of the mechanical seal (53) comes off from the cover. Check to see that the sealing surface and the O-ring are not damaged.

MECHANICAL SEAL. SINGLE MECHANICAL SEAL ASSEMBLY.

- Assembly the top cover (2) in the lantern / support (1). For the M-38/40 assemble the allen screws (56). First, the fixed part of the mechanical seal (53) has to be placed in the cover housing. Check the position of the pivot for the fixed part of the seal.
- Check that the assembly measurements are as indicated in Table 8.1.
- Slide the rotating part of the mechanical seal (51) over the shaft, making sure that the pivot that drives the shaft is positioned in its housing, See Figure 8.1.
- Assemble the impeller and the housing as indicated in the section concerned.

Table 8.1 : Single mechanical seal assembly position

Seal diameter	A [mm]
1"	26
1 ½"	31

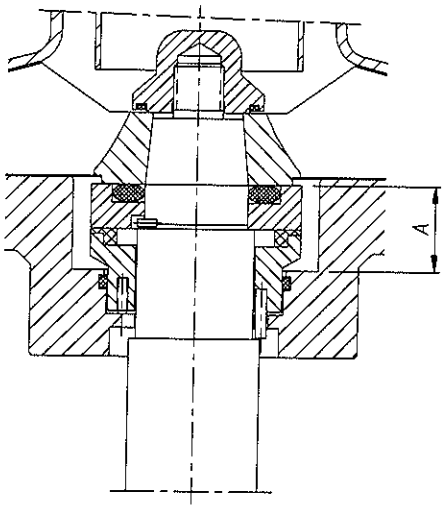


Figure 8.1 : single mechanical seal

BLENDER HOUSING, IMPELLER AND COVER. ASSEMBLY.

Assemble the mechanical seal as shown in the section concerned.

- Slide the impeller (7) over the shaft (10) as far as the rotating part of the mechanical seal (51).
- Place a spanner on the shaft planes (10), to prevent it from rotating.
- Assemble the O-ring (55) in the groove at the base of the blind nut (45). Make sure that the O-ring is not assembled the wrong way around.
- Tighten the nut (45).
- Check that the clearance between the impeller (7) and the cover (2) is between 0.3 - 0.5 mm., so that the working pressure of the seal is correct. See Figure 8.2.

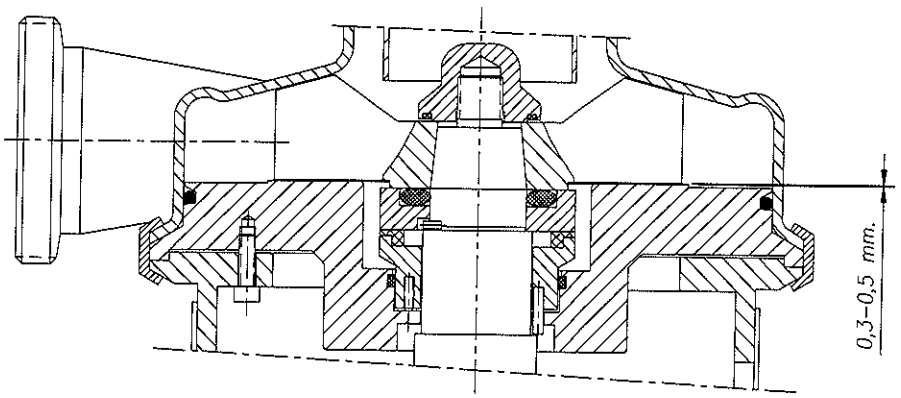


Figure 8.2: Clearance between impeller and cover.

- When the housing has been assembled, the clamping ring (19) has to be put in place and the bracket tightened with a suitable tool.
- Assemble the distributor unit (4) and the inlet unit (4A, only for M-25), then the butterfly valve (52) and finally, the hopper (6), tightening up the nuts at the joints.

The mounting position for the housing and the distributor unit / inlet unit must be as shown in Figure 3.4, in the M-25 model is a piece that we can invert in the mounting.

MECHANICAL SEAL. MECHANICAL SEAL IN COOLED TANDEM DISASSEMBLY.

Disassembly the internal mechanical seal, as shown in the section "Disassembly the single mechanical seal".

- For Model M-25, when dismantling the top cover (2), the stationary part of the external mechanical seal (57) remains in the rear housing of the top cover (2). Check that the surface covered by the seal and the O-ring itself are not damaged.
- For Model M-38/40, the bottom cover (58), which is attached to the top cover (2), must be dismantled first, using the allen screws (20). The stationary part of the external mechanical seal (57) will be housed in the bottom cover (58). Check that the surface covered by the seal and the O-ring itself are not damaged.
- The rotating part of the external mechanical seal (78) remains hanging in the blender shaft. Check that the surface covered by the rotating side and the O-ring are in good condition.

MECHANICAL SEAL. MECHANICAL SEAL IN COOLED TANDEM ASSEMBLY.

(For Model M-25)

- Slide the rotating part of the external mechanical seal (78) over the shaft (10); for the assembly measurements see table 8.2 and figure 8.3.
- Assemble the top cover (2) in the lantern (1). The stationay part of the external mechanical seal (57) must first be placed in the rear housing for the cover. The internal seal is assembled as shown in the section "Assembling the single mechanical seal".

(For Models M-38/40)

- Slide the rotating part of the mechanical seal exterior (78) over the shaft (10) until it touches it.
- Assemble the bottom cover (58) in the centring for the top cover (2) and secure it with the allen screws (20).
- Place the stationary part of the external mechanical seal (57) in the rear housing of the bottom cover (58).
- Assemble the set of two covers in the support (1). The internal seal is assembled as shown in the section "Assembling the single mechanical seal".

Table 8.2 : cooled seal assembly position.

Diameter internal seal	Diameter external seal [mm]	A [mm]
1"	35	41
1 ½"	50	-

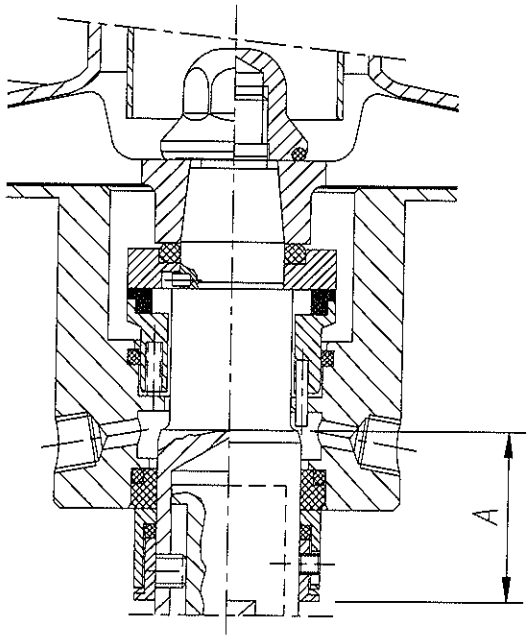


Figure 8.3 : Mechanical seal in cooled tandem.

MECHANICAL SEAL. COOLED MECHANICAL SEAL M-38/40 DISASSEMBLY.

Disassembly the housing and the impeller, as shown in the section "Disassembly blending housing, impeller and cover".

- Disassembly the bottom cover (58), which is fixed to the top cover (2) using the allen screws (20). Secure the bottom cover (58) so it does not fall or damage the mechanical seal.
- Carefully raise the top cover (2) because the fixed part of the internal mechanical seal (53) is housed there.
- Lift out the rotating part of the internal mechanical seal (51) and check that the surface covered by the seal and the O-ring itself are not damaged.
- Take out the allen studs (77) and the end ring (79).
- Take the bottom cover (58) out over the shaft (10), because that cover contains the entire external mechanical seal (78,57). Check that the sealing surfaces and the O-rings are in good condition.

MECHANICAL SEAL. COOLED MECHANICAL SEAL M-38/40 ASSEMBLY.

- Place the stationary part of the external mechanical seal (57) in the housing for the bottom cover (58).
- Assemble the bottom cover (58) inside the shaft (10) supporting it on the shaft ledge, but do not remove the housing seating from the cover (58).
- Insert the rotating part of the external mechanical seal (78) into the shaft (10).
- Assembly the end ring (79), mount it at the height indicated in Figure 8.4.
- Slide the rotating part of the internal mechanical seal (51) over the shaft (10).
- Put the stationary part of the internal mechanical seal (53) into the top cover housing (2).
- Carefully assemble the top cover (2) over the support (1).
- Bring the holes for the two covers (2, 58) face to face, put the allen screws (20) into the cover (58) and tighten the 4 screws one after another until contact is made with the top cover (2).

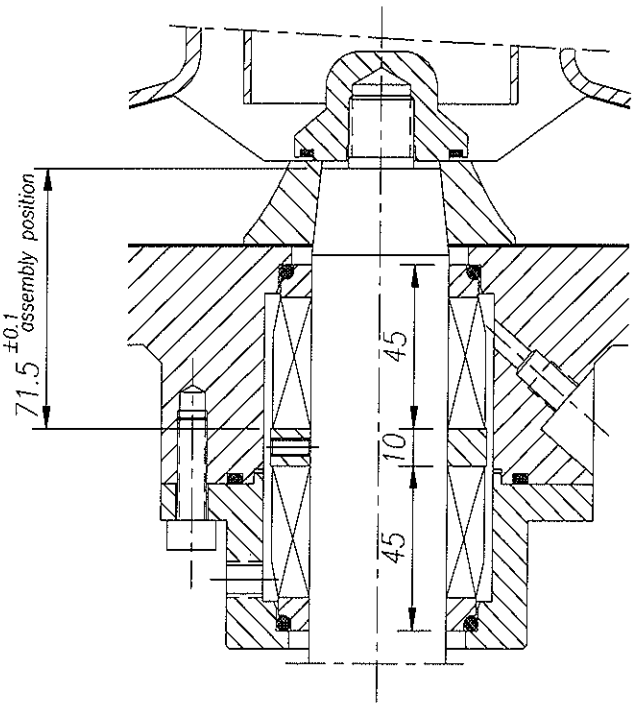


Figure 8.4 : Cooled mechanical seal

WARNING! When fitting the new seals, be sure to wet the O-rings with soapy water so that the fixed parts slide easily into their locations and the rotating parts onto the shaft.

CHANGING THE BELTS AND PULLEYS (M-38/40).

- Slacken the transmission belts (66) by loosening the 2 tightening rods (13) to make extracting the belts (66) easy.
- Remove the 3 belts (66).
- Remove the hexagonal screw (91), washer (82) and pulley (84) on the bearing support side and the hexagonal screw (80), washer (81) and pulley (65) on the motor side (50).
- When assembling the new belts (66), they must be properly tightened. After they have been working for a few hours, check that they have not slackened.

Do not tighten the belts too much, because damage the support bearings and motor bearings.

CHANGING BEARINGS (M-38/40).

Follow the instructions shown in the sections "Disassembly the blender housing, impeller and cover", "Disassembly the mechanical seal concerned" and "Changing the belts and pulleys".

- Take out the bearing support unit from above the baseplate (15) removing the hexagonal screws (64) and washers (71). See Figure 8.5.
- Remove the elastic ring (63) under the bottom bearing (61) (baseplate side) using suitable pliers.
- Remove the leak mechanism (8).
- Take out the bearing over (9) and the allen screws (60).
- Extract the shaft (10) with the bearings with the upper by gently tapping the bottom of the shaft with a plastic mallet. The lower bearing will not come out and will remain inside the support (1).
- The bearing is removed from the inside of the support by:
  - Laying the bearing horizontally in the hole (See Figure 8.6).
  - Putting a thick plastic stopper on the bearing through the upper bearing housing, and using a lever to pull downwards until the bearing comes out (See Figure 8.7). A press is recommended for this process.

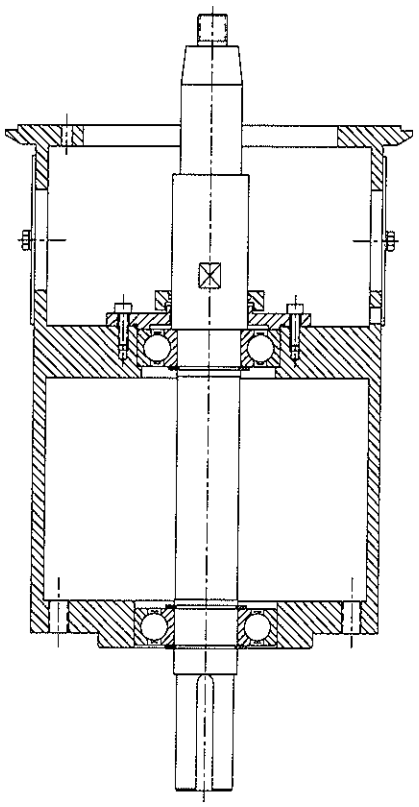


Figure 8.5: Bearing support.

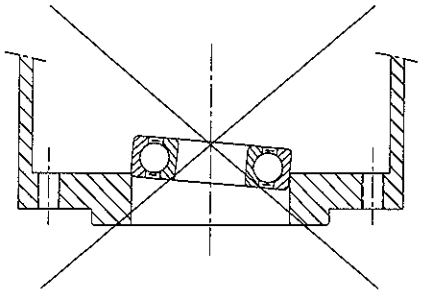


Figure 8.6: Lay the horizontally.

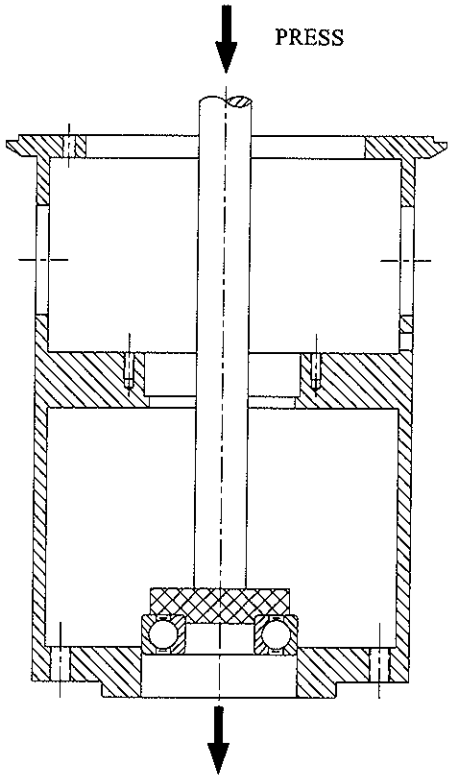


Figure 8.7: Take out the bearing.

- Take out the elastic rings (63) and the bearing (61) that are in the shaft (10).

MOTOR REPLACEMENT.

When changing the motor (50), follow the instructions in the section "Disassembly the blender housing, impeller and cover".

(For Model M-25)

- Take out the leak mechanism -rotating part- (9A) removing the allen stud (77).
- Take out the other leak mechanism -stationary part- (9) using pliers.
- Remove the stud bolt (76) and extract the shaft (10).
- Remove the screws (69A), washers (69) and the shroud (12).
- Take out the 4 screws (64A), blind nuts (64C) and washers (64B) that support the motor (50) on the lantern base (1). Hold up the motor at the same time so it does not fall.
- Take out the motor from under the legs (85).

(For Models M-38/40)

Follow the instructions in the section "Changing the belts and pulleys".

- Take out the screws (69A) and washers (69) to remove the shroud (12).
- Remove the nuts and bolts that secure the motor flange to the baseplate (15) and platform (11): through the 2 baseplate side holes, the 2 hexagonal nuts (86) and, above the motor flange, the hexagonal screws (67,68) and washers (87,88).
- Remove the tightening rods out backwards (13) until the rod is not inside the hole in the platform (11).
- Take out the motor (50) using slings because of its weight. Support the platform (11) at the same time, so it does not rise when the motor (50) is lifted.

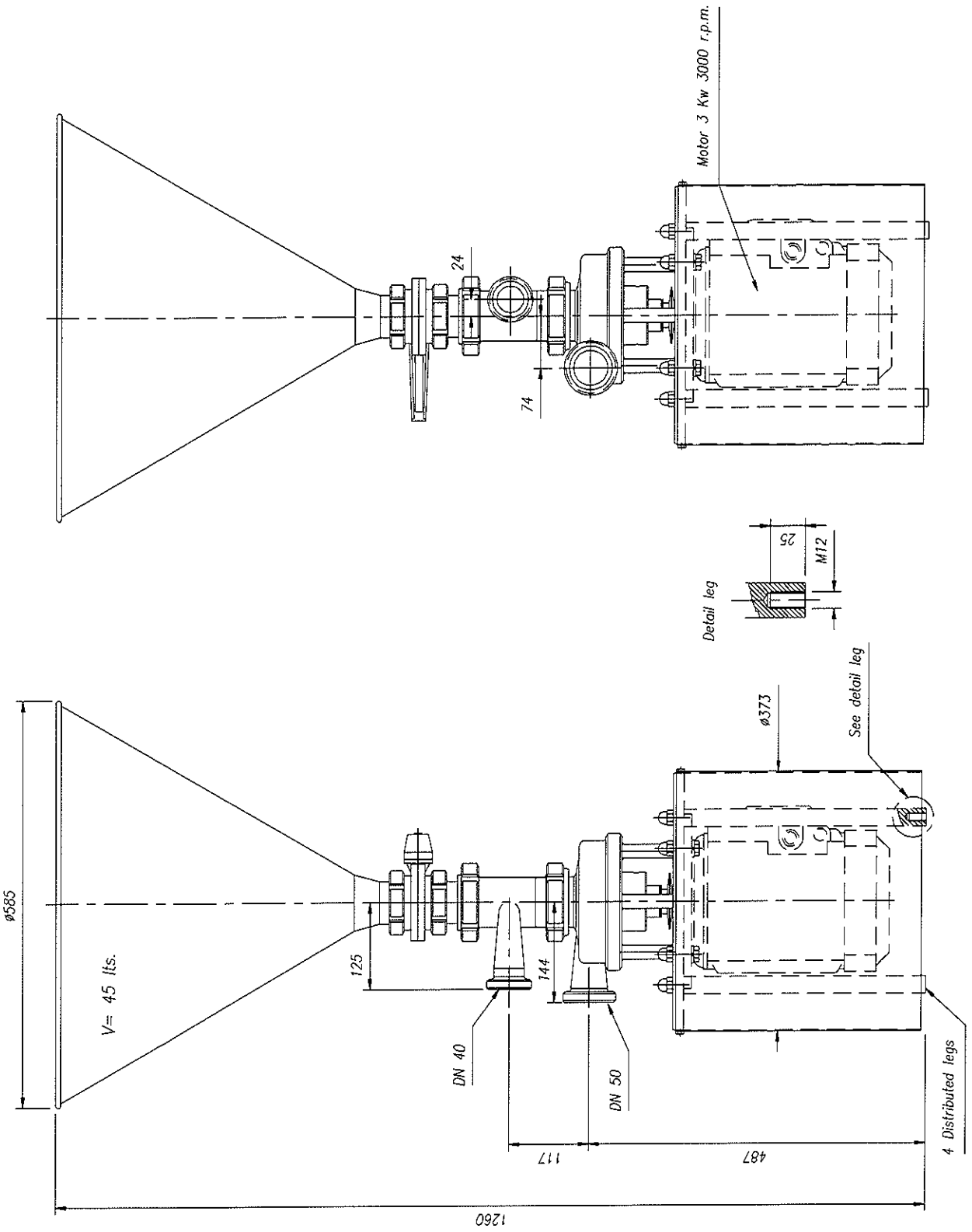
Changing the motor or the motor bearings following the manufacturer's instructions in the manual

9. Technical specifications.

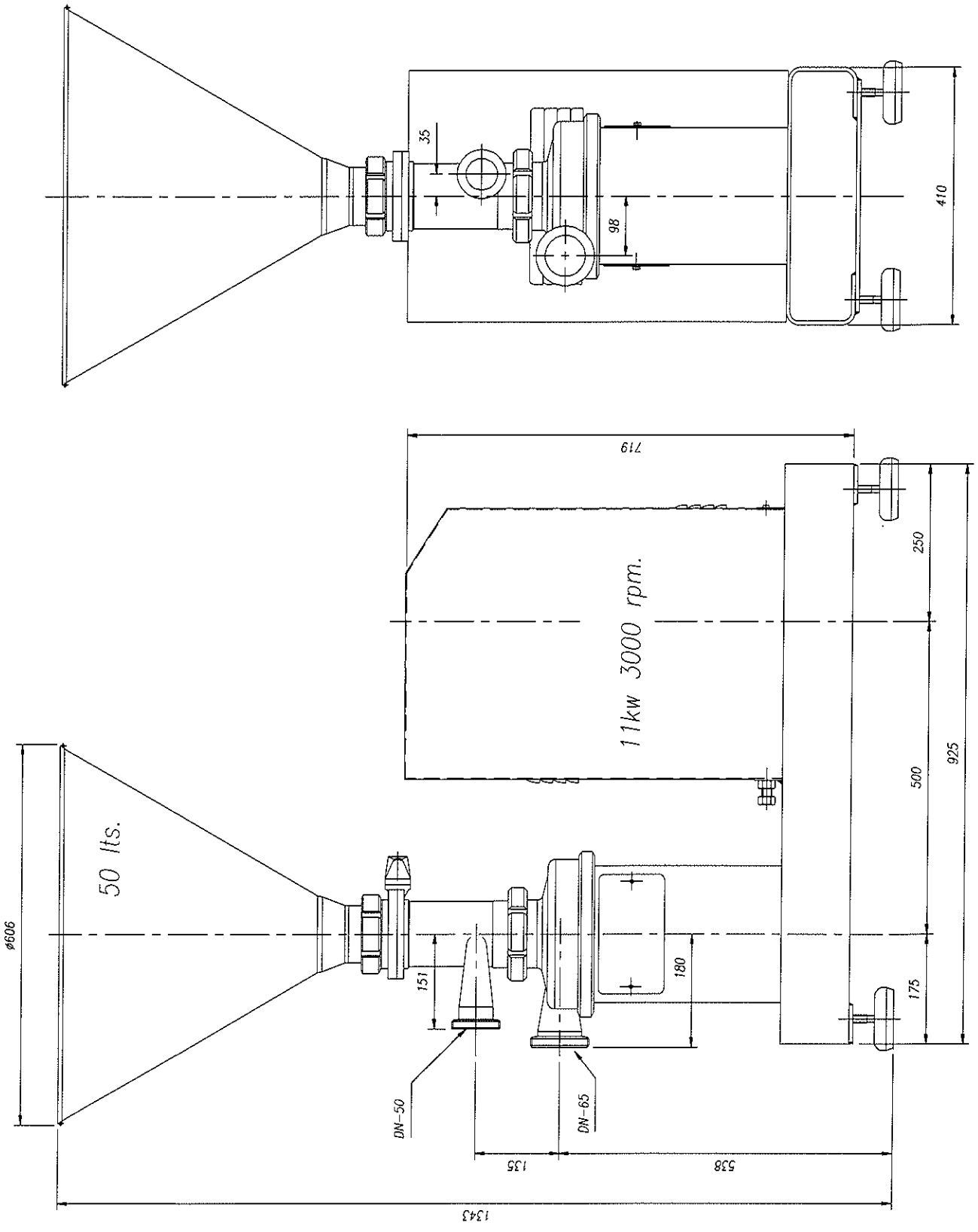
TECHNICAL DATA.

Blender model	**M-25**	**M-38**	**M-40**
Motor	3 kW 3000 rpm	11 kW 3000 rpm	18,5 kW 3000 rpm
Inlet Outlet	Male DIN-11851 DN-40 Male DIN-11851 DN-50	Male DIN-11851 DN-50 Male DIN-11851 DN-65	Male DIN-11851 DN-50 Male DIN-11851 DN-65
Liquid flow Solid intake	9000-10.000 liters/hour 1380 [kg/h]	25000-27.000 liters/hour 2700 [kg/h]	30000-32.000 liters/hour 4000 [kg/h]
Hopper capacity	45 liters	50 liters	80 liters
Net weight of the equipment	70 Kg.	260 Kg.	285 Kg.
Blender model with auxiliary pump	**M-2520**	**M-3835**	**M-4038**
Pump model	S-20	S-35	S-38
Pump motor	1,5 kW 1500 rpm	2,2 kW 1500 rpm	4 kW 1500 rpm
Net weight of the equipment	135 Kg.	325 Kg.	365 Kg.

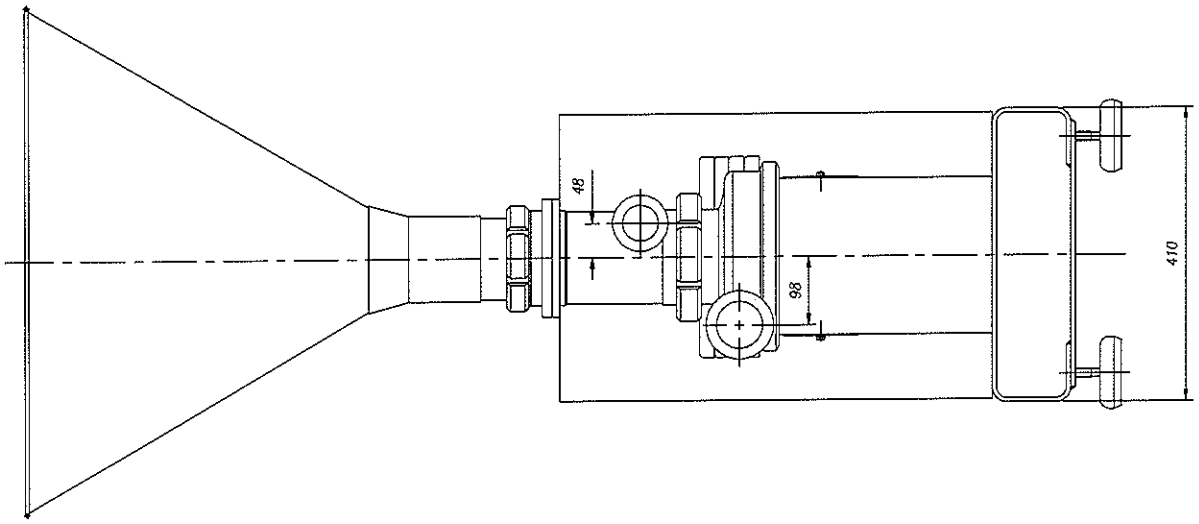
M-25 dimensions.

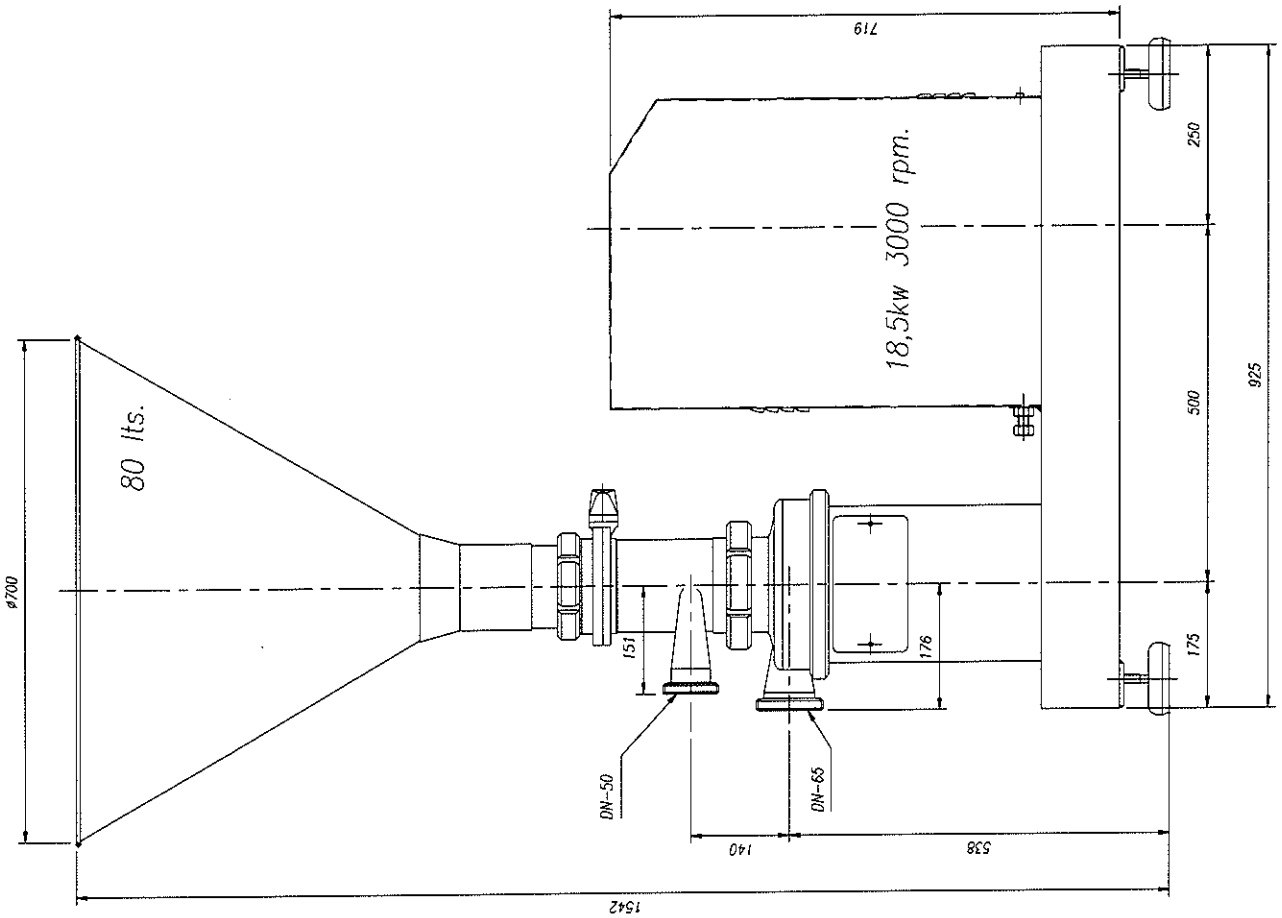


M-38 dimensions.

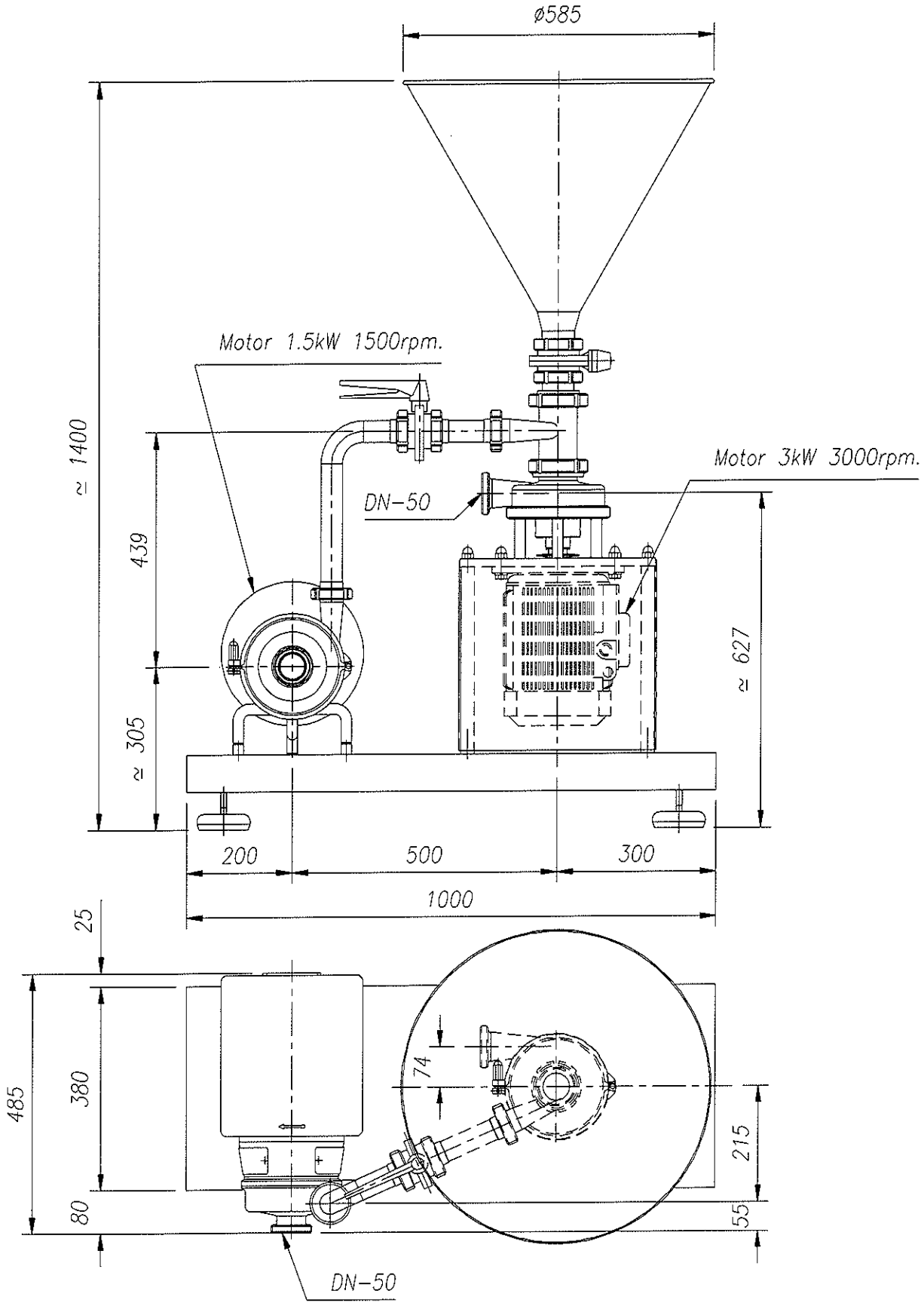


M-40 dimensions.

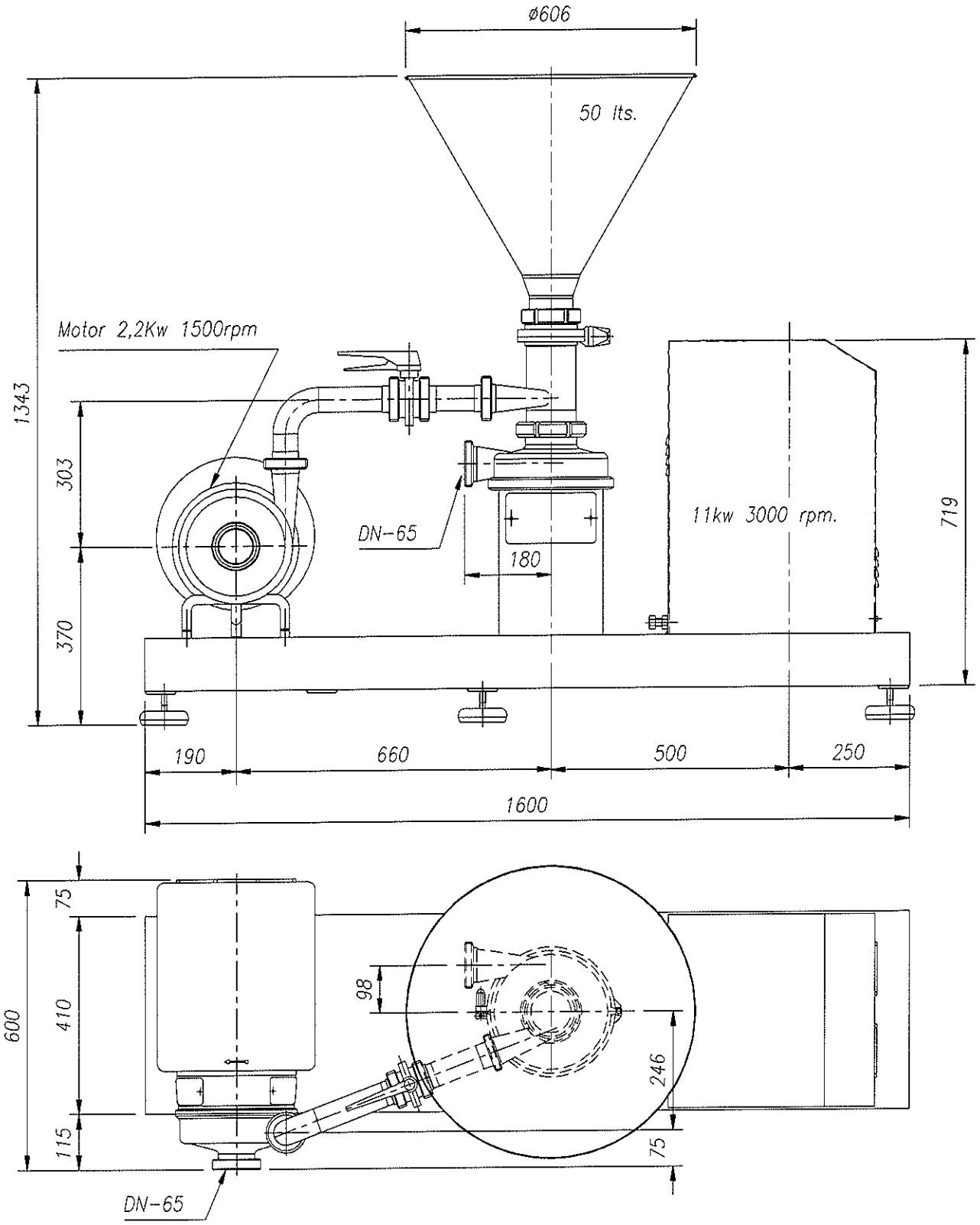




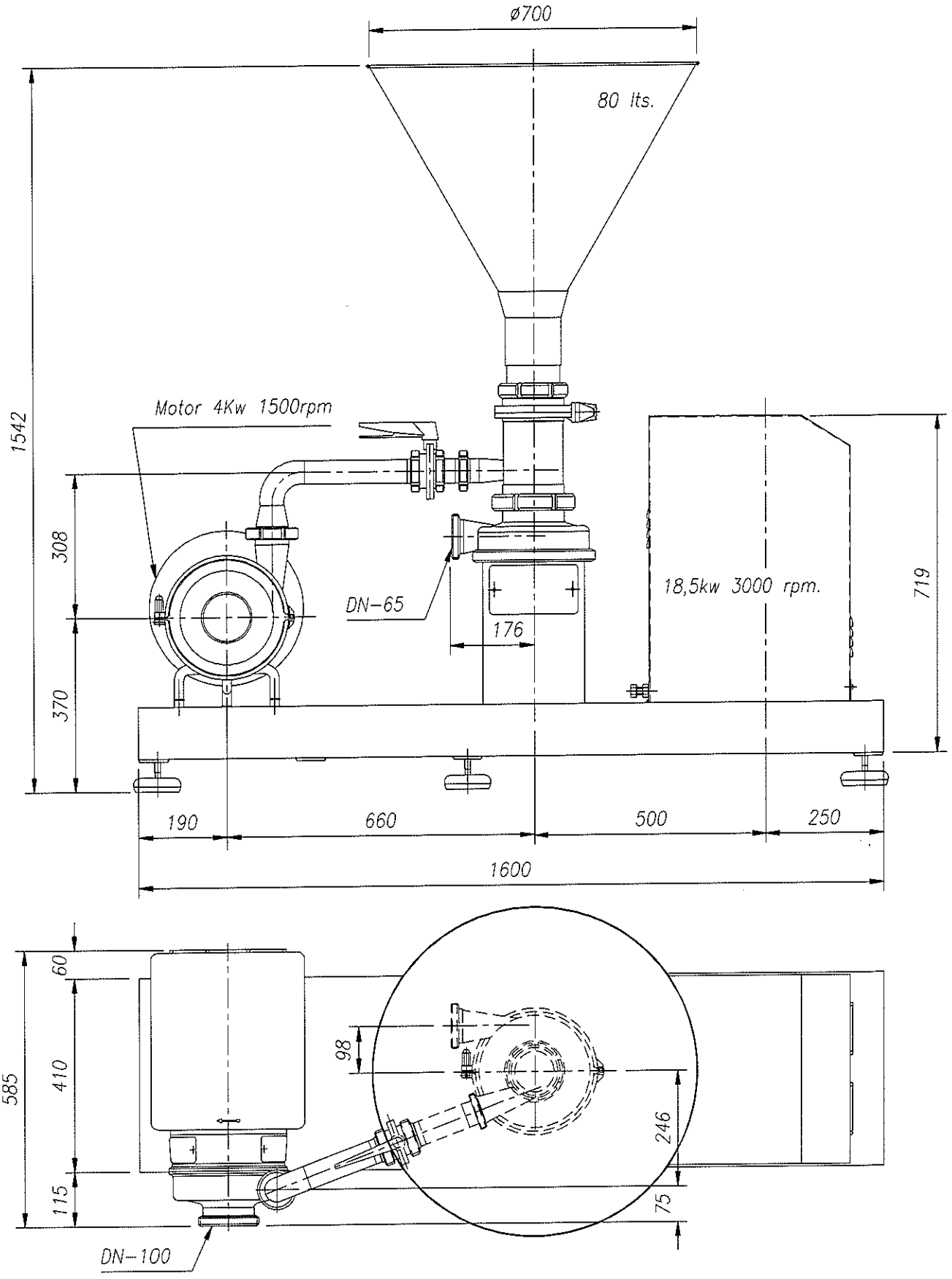
M-2520 dimensions.



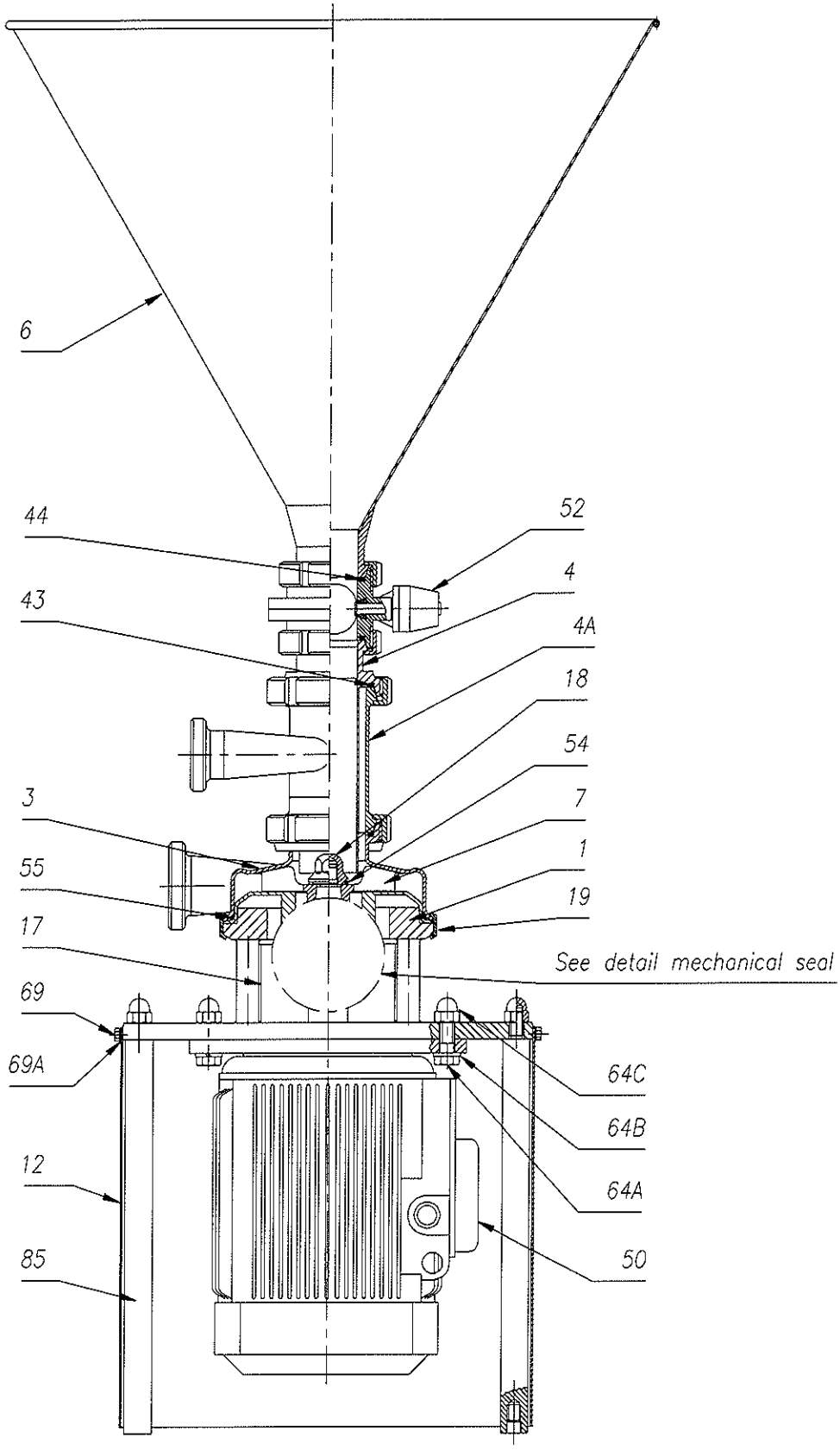
M-3835 dimensions.



M-4038 dimensions.



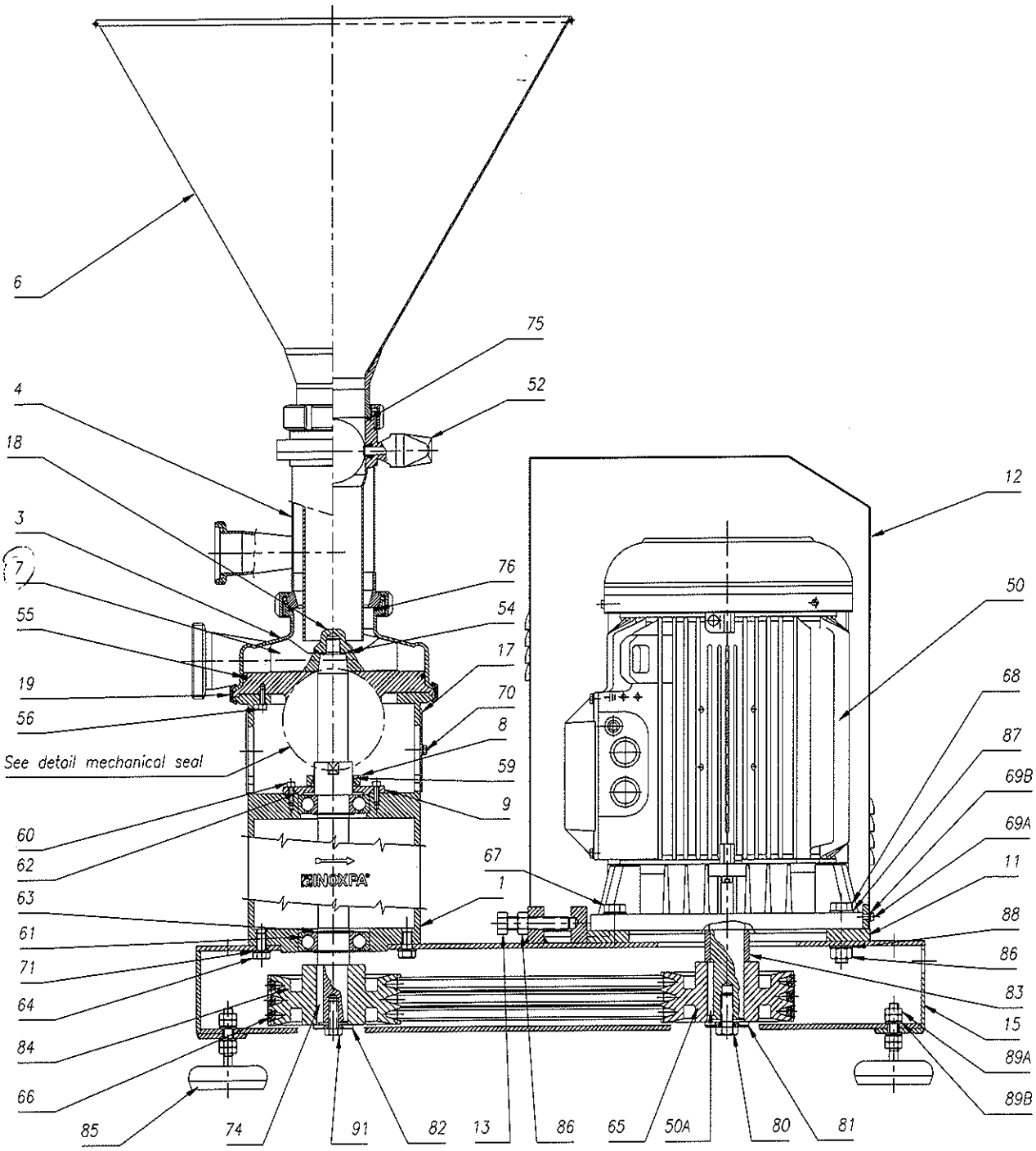
Technical section M-25.



Parts list M-25.

Position	Quantity	Description	Material
1	1	Lantern	AISI-304
3	1	Blender housing	AISI-316
4	1	Distributor unit	AISI-316
4A	1	Inlet unit	AISI-316
6	1	Hopper	AISI-316
7	1	Impeller	AISI-316
12	1	Motor shroud	AISI-304
17	1	Lantern protector	Plastic
18	1	Blind nut	AISI-316
19	1	Clamping ring	AISI-304
43	2	Gasket	EPDM
44	2	Gasket	EPDM
50	1	Motor	-
52	1	Butterfly valve	-
54	1	O-ring	EPDM
55	1	O-ring	EPDM
64A	4	Hexagonal screw	A2
64B	4	Spring flat	A2
64C	8	Blind nut	A2
69	4	Hexagonal screw	A2
69A	4	Flat washer	A2
85	4	Blender leg	AISI-304

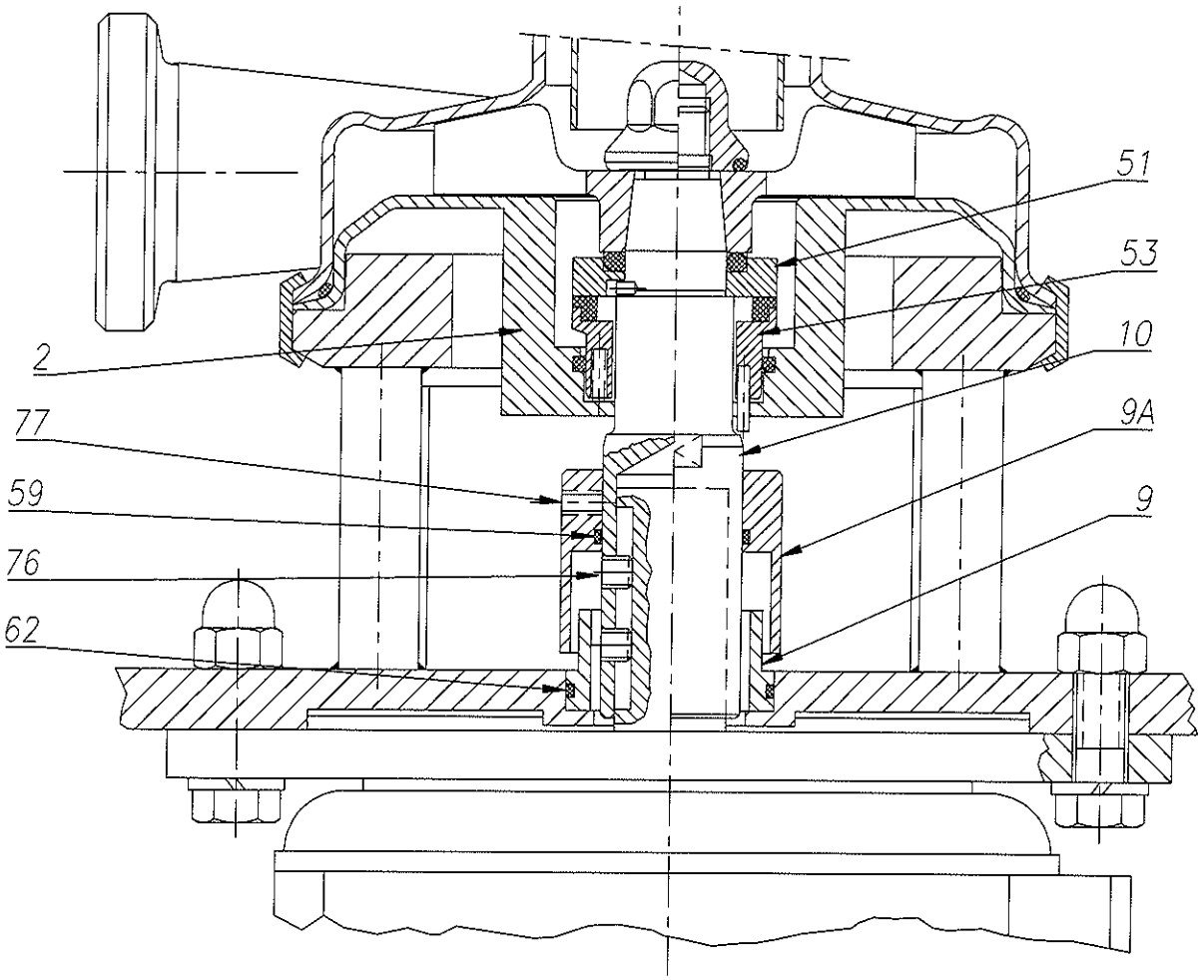
Technical section M-38 / M-40.



Parts list M-38 / M-40.

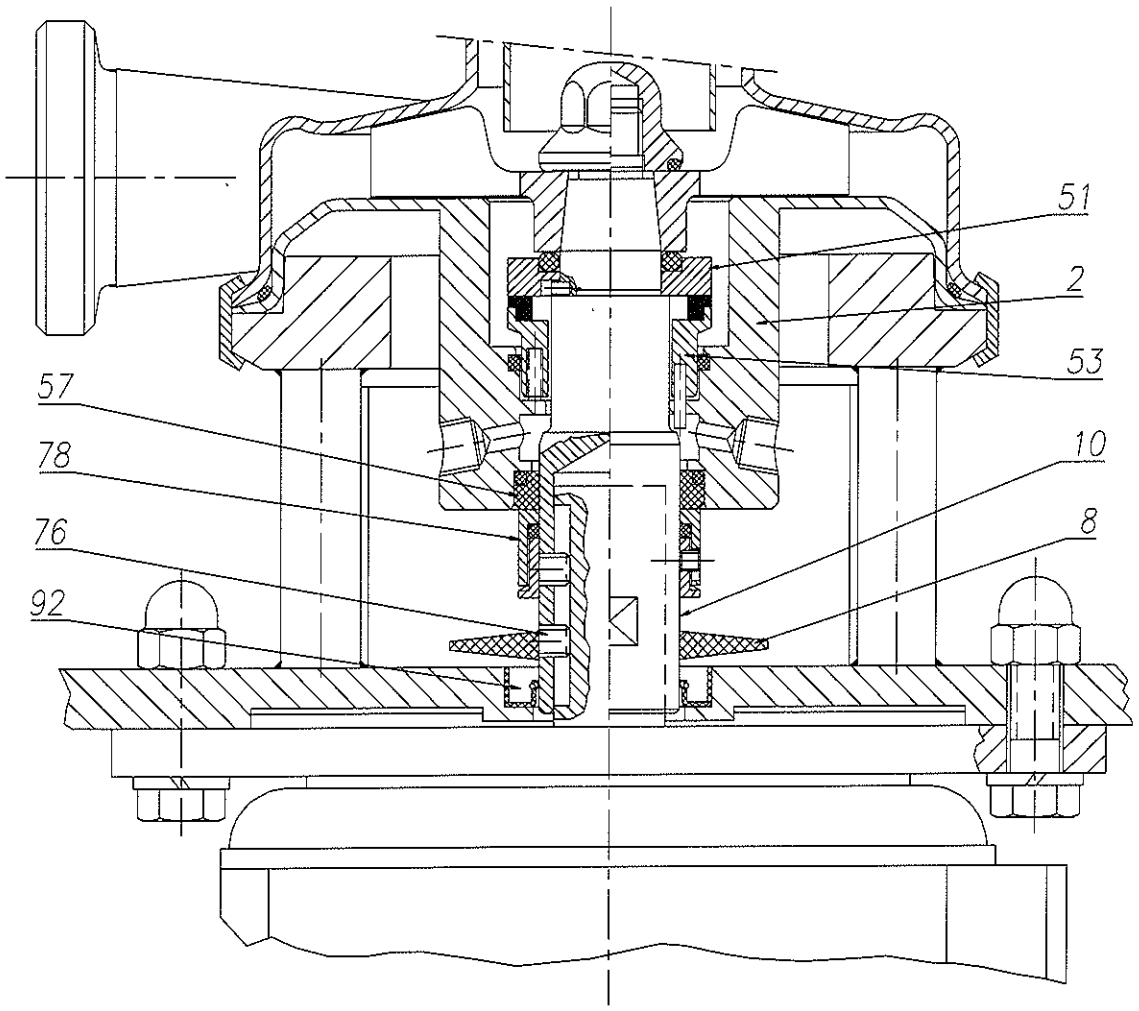
Position	Quantity	Description	Material
1	1	Support	AISI-304
3	1	Blender housing	AISI-316
4	1	Distributor unit	AISI-316
6	1	Hopper	AISI-316
7	1	Impeller	AISI-316
8	1	Leak mechanism	Delrin
9	1	Bearings cover	AISI-304
11	1	Platform	AISI-304
12	1	Motor shroud	AISI-304
13	2	Tightening rod	AISI-304
15	1	Base plate	AISI-304
17	2	Support protector	Plastic
18	1	Blind nut	AISI-316
19	1	Clamping ring	AISI-304
50	1	Motor	-
50A	1	Motor key	F-1140
52	1	Butterfly valve	AISI-304
54	1	O-ring	EPDM
55	1	O-ring	EPDM
56	2	Allen screw	A2
59	1	O-ring	NBR
60	4	Allen screw	A2
61	2	Ball bearing	-
62	1	O-ring	NBR
63	3	Elastic ring	Steel
64	4	Hexagonal screw	A2
65	1	Pulley	-
66	3	Transmission belt	-
67	2	Hexagonal screw	A2
68	2	Hexagonal screw	A2
69A	4	Hexagonal screw	A2
69B	4	Flat washer	A2
70	4	Hexagonal screw	A2
71	4	Flat washer	A2
74	1	Blender key	F-1140
75	1	Gasket	EPDM
76	1	Gasket	EPDM
80	1	Hexagonal screw	A2
81	1	Washer (limit)	F-1140
82	1	Washer (limit)	F-1140
83	1	Sleeve (limit)	F-1140
84	1	Pulley	-
85	4	Shockproof legs	AISI-304
86	4	Hexagonal nut	A2
87	4	Spring flat	A2
88	2	Flat washer	A2
89A	16	Hexagonal screw	A2
89B	16	Flat washer	A2
91	1	Hexagonal screw	A2

Single mechanical seal M-25.



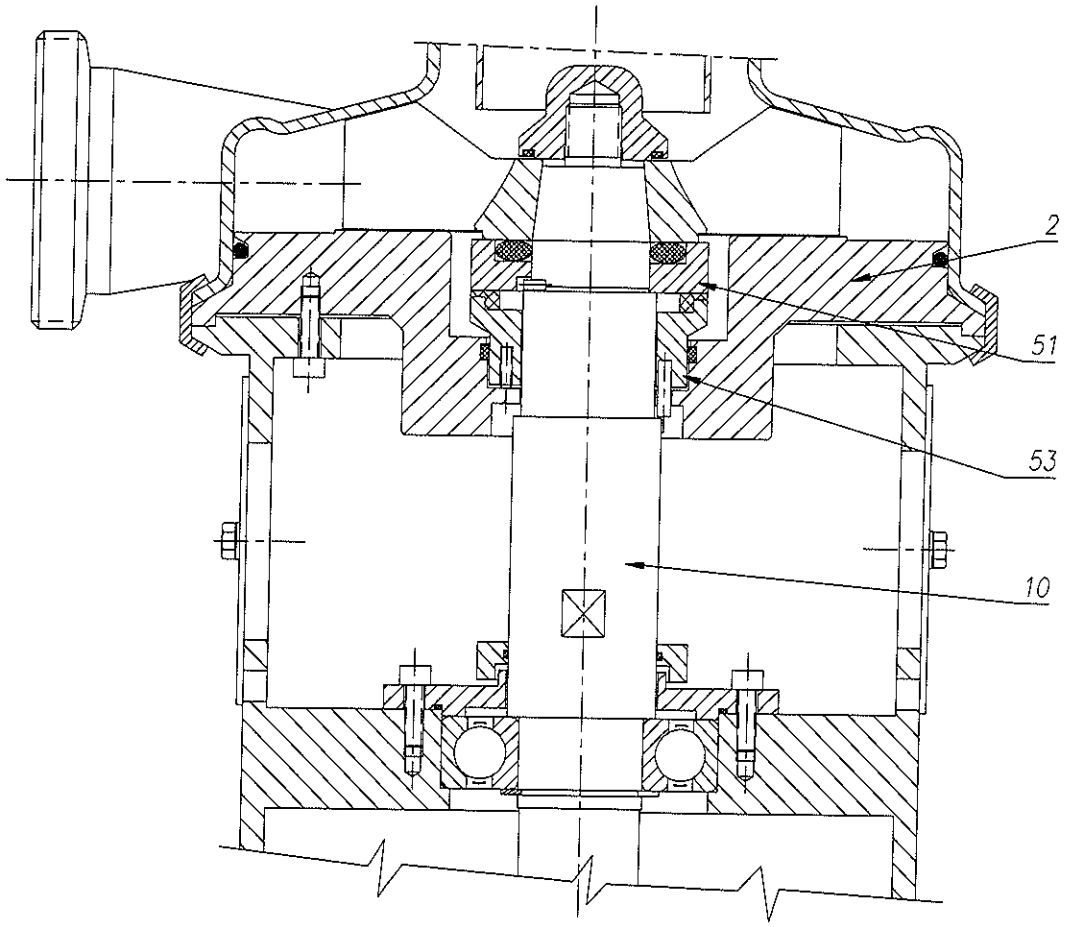
Position	Quantity	Description	Material
2	1	Top cover	AISI-316
9	1	Leak mechanism (stationary part)	AISI-316
9A	1	Leak mechanism (rotating part)	AISI-316
10	1	Shaft	AISI-316
51	1	Mechanical seal -rotating part-	-
53	1	Mechanical seal -stationary part-	-
59	1	O-ring	EPDM
62	1	O-ring	EPDM
76	2	Allen stud	A2
77	1	Allen stud	A2

Mechanical seal in cooled tandem M-25.



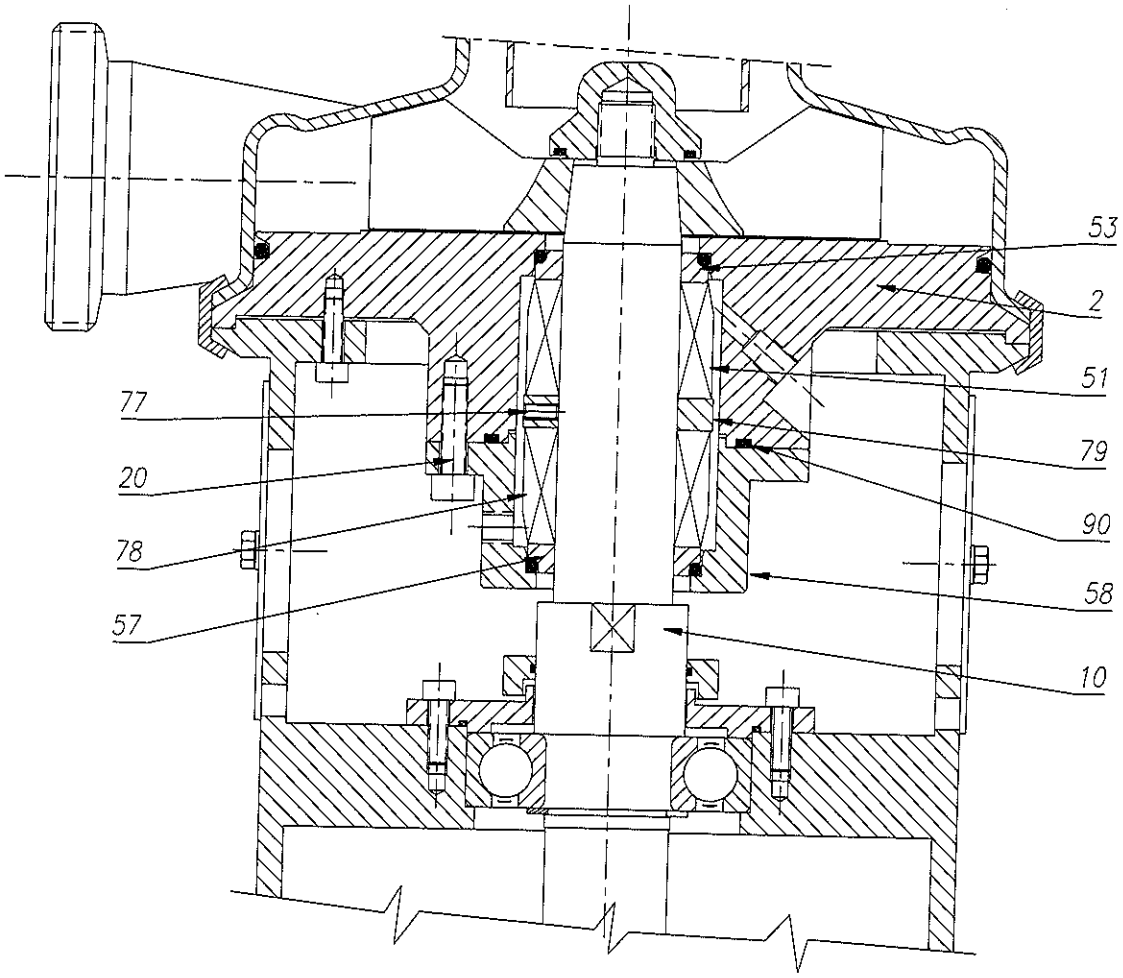
Position	Quantity	Description	Material
2	1	Top cover	AISI-316
8	1	Splash ring	EPDM
10	1	Shaft	AISI-316
51	1	Internal mechanical seal -rotating part-	-
53	1	Internal mechanical seal -stationary part-	-
57	1	External mechanical seal -stationary part-	-
76	2	Allen stud	A2
78	1	External mechanical seal -rotating part-	-
92	1	Lip seal	NBR

Single mechanical seal M-38 / M-40.



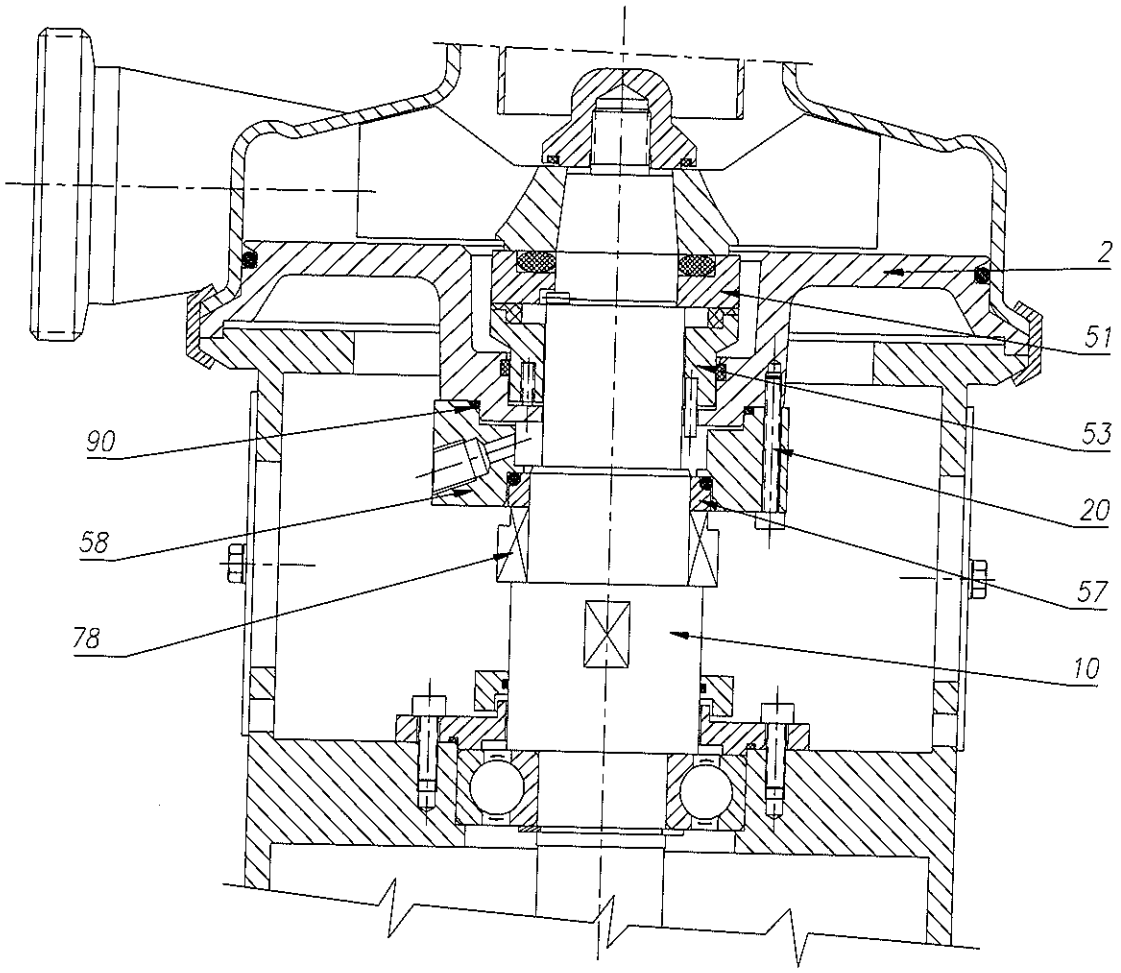
Position	Quantity	Description	Material
2	1	Top cover	AISI-316
10	1	Shaft	AISI-316
51	1	Mechanical seal -rotating part-	-
53	1	Mechanical seal -stationary part-	-

Double pressurised mechanical seal M-38 / M-40.



Position	Quantity	Description	Material
2	1	Top cover	AISI-316
10	1	Shaft	AISI-316
20	4	Allen screw	A2
51	1	Internal mechanical seal -rotating part-	-
53	1	Internal mechanical seal -stationary part-	-
57	1	External mechanical seal -stationary part-	-
58	1	Bottom cover	AISI-316
77	3	Allen stud	A2
78	1	External mechanical seal -rotating part-	-
79	1	End ring	AISI-316
90	1	O-ring	EPDM

Mechanical seal in cooled tandem M-38 / M-40.



Position	Quantity	Description	Material
2	1	Top cover	AISI-316
10	1	Shaft	AISI-316
20	4	Allen screw	A2
51	1	Internal mechanical seal -rotating part-	-
53	1	Internal mechanical seal -stationary part-	-
57	1	External mechanical seal -stationary part-	-
58	1	Bottom cover	AISI-316
78	1	External mechanical seal -rotating part-	-
90	1	O-ring	EPDM

10. Cleaning and disinfection.

GENERAL CONSIDERATIONS.

Cleaning and disinfection of the installations is necessary and mandatory on completing any manufacturing process in the food industry. The use of an installation which is NOT cleaned or disinfected can cause contamination of the products.
The cleaning cycles as well as the chemical products and procedures used will vary depending on the product and the manufacturing process.
It is the user's responsibility to establish an appropriate cleaning or disinfection program according to his needs. Such a program needs to take into account all applicable laws, regulations and standards pertinent to public health protection and safety in the use of chemical products.

HYGIENE.

Special attention has been given to hygiene and cleaning and disinfection operations in the design of the blender. The number of grooves and dead spaces have been kept to a minimum. The materials used in making the blender have been selected for their resistance to corrosion and so as not to contaminate the liquid to be pumped.

Cleaning.

The blender can be cleaned easily and thoroughly in one of two ways:

- without disassembling it, for ex., using steam or water, referred to as CIP ("Cleaning in Place).
- Through the simple dismantling of the hopper, distributor unit, impeller and mechanical seal (See assembly and disassembly).

It is important that the blender be running during the CIP process in order to obtain the most thorough cleaning.
During the automated CIP processes the blender could be started up unexpectedly because of some remote signal. This could cause serious damage to anyone who is in contact with the blender.

NEVER disassembly the blender during the CIP cleaning process.
Disconnect the electrical supply to the blender and take those steps which are needed for safety before beginning any manual cleaning operation on the blender.

Direct contact with cleaning or disinfecting solutions can provoke burns due to chemical agents or high temperatures.

Provide personnel responsible for cleaning operations with adequate protective equipment --clothing, footwear, safety glasses– in order to avoid any hazard.

Train personnel in the safe use and handling of chemical solutions and high working temperatures.

Disinfection.

Disinfection cycles are used to kill bacteria on the surfaces in contact with the product before the manufacturing process takes place. Disinfecting solutions are extremely corrosive, especially those which contain halogen components (chloride, bromide, iodine) or strong acids (nitric, hydrochloric).

When metal parts are allowed to remain in contact for a longer period of time with the solutions containing chemical agents, even these attack the stainless steel parts of a blender. To avoid serious damage:

- Do NOT disinfect the blender earlier than 15 minutes before beginning production.
- Do NOT leave disinfecting solutions in prolonged contact with blender surfaces or the outside of it. Drops of dried solution are more concentrated and can provoke corrosion points or pitting.
- Do NOT use strong concentrations, high temperatures or exposure times over and above those required to obtain an effective disinfection.

SAFETY IN CLEANING AND DISINFECTION.

Manual cleaning.

- **Disconnect the motor starting system before cleaning the blender.**
- **Provide cleaning personnel with the most appropriate protective equipment -clothing, footwear, safety glasses.**
- **Do not use toxic or inflammable solvents for cleaning the blender.**
- **Clean up any water spilled around the blender as soon as possible.**
- **With the blender running, NEVER clean it by hand.**

CIP Procedure.

- **Make sure that all cleaning circuit connections are securely tightened so as to avoid splashing of hot water or cleaning solutions.**
- **Establish a safety device in the event of any failure in the automatic process and avoid automatic start-up.**
- **Check that the hopper, distributor unit, housing, nuts and clamping ring are well placed and tightened.**
- **Do not disassemble any pipes, fittings or the blender without being sure that the cleaning cycle is completely finished.**

For reference purposes for the user, the cleaning methods and products used can be those mentioned in the DIN 11483 standard