



INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

Table blender MM-1, MM-2, MM-3



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Original Manual

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EC Declaration of Conformity

The manufacturer: **INOXPA, S.A.**
c/ Telers, 54
17820 Banyoles (Girona), Spain

herewith declares that the machine:

Table blender MM-1 / 2 / 3

with the serial number: _____

conforms to the relevant provisions of the following directives:

Machinery Directive 2006/42/EC (RD 1644/2008)
Low voltage Directive 2006/95/EC
Electromagnetic Compatibility Directive 2004/108/EC

Applicable harmonised Standards:

UNE-EN ISO 12100:2012
UNE-EN 809:1999+A1:2010

Identification of the person empowered to draw up the Declaration on behalf of the manufacturer, and qualified to compile the technical file established by the Community:

Banyoles, 8 January 2014

A handwritten signature in black ink, appearing to read 'David Reyer Brunet', is written over a light grey rectangular background.

David Reyer Brunet
Technical Office Manager

1. Safety

1.1. INSTRUCTION MANUAL

This manual contains information regarding the reception, installation, operation, assembly, disassembly and maintenance of the MM table blender.

The information published in the instruction manual is based on updated data.

INOXPA reserves the right to modify this instruction manual without prior notice.

1.2. INSTRUCTIONS FOR START-UP

This instruction manual contains essential and useful information for the correct handling and maintenance of your blender.

Carefully read the instructions prior to starting the blender, familiarise yourself with the installation, operation and correct use of the table blender and strictly follow the instructions. These instructions should be kept in a safe location near the installation area.

1.3. SAFETY

1.3.1. Warning symbols



Safety hazard for people in general



Danger of injury caused by rotating equipment parts



Electric hazard



Danger! Caustic or corrosive agents.



Danger! Suspended loads



Danger for the correct operation of the equipment



Mandatory to ensure safety at the workplace



Mandatory use of safety goggles

1.4. GENERAL SAFETY INSTRUCTIONS



Read the instruction manual carefully before installing and starting the table blender. Contact INOXPA in case of doubt.

1.4.1. During the installation



The *Technical Specifications* of Chapter 8 should always be observed.

Never start the blender before connecting it to the lines.

Do not operate the blender if the pump cover is not fitted.

Check for proper specifications of the motor, especially if its working conditions create an explosion hazard.



During the installation, all the electric work should be carried out by authorised personnel.

1.4.2. During operation



The *Technical Specifications* of Chapter 8 should always be observed. Under no circumstances can the specified limit values be exceeded.

NEVER touch the blender or the pipework during operation if the pump is being used for transferring hot liquids or during cleaning.



The blender contains moving parts. Never place your fingers inside the blender during operation.



NEVER operate with the suction and discharge valves closed.

NEVER spray water directly on the electrical motor. The standard motor protection is IP-55: protection against dust and water spray.

1.4.3. During maintenance



The *Technical Specifications* of Chapter 8 shall always be observed.

NEVER disassemble the table blender until the pipes have been emptied. Remember that liquid will remain inside the pump's body and you need to empty through the drain. Bear in mind that the pumped liquid may be hazardous or extremely hot. Consult the regulations in effect in each country for these cases.

Do not leave loose parts on the floor.



ALWAYS disconnect the electrical power to the blender before to carrying out any maintenance. Remove the fuses and disconnect the cables from the motor's terminals.

All electrical work must be carried out by authorised personnel.

1.4.4. Compliance with the instructions

Not following the instructions may impose a risk for the operators, the environment and the machine, and may result in the loss of the right to claim damages.

This non-compliance may result in the following risks:

- Failure of important machine/plant functions.
- Failure of specific maintenance and repair procedures.
- Possible electrical, mechanical and chemical hazards.
- Risk to the environment due to the type of substances released.

1.4.5. Warranty

Any warranty will be void immediately and lawfully; additionally, INOXPA will be compensated for any civil liability claims submitted by third parties, in the following cases:

- The service and maintenance work have not been carried out in accordance with the service instructions, the repairs have not been carried out by our personnel or have been carried out without our written authorisation;
- Modifications have been carried out on our material or equipment without written authorisation;
- The parts or lubricants used are not INOXPA genuine parts;
- The material or equipment has been improperly used, has been used negligently, or has not been used according to the instructions and their intended;
- The blender parts are damaged because they have been subjected to high pressure due to not having used a safety valve.

The General Conditions of Delivery already in your possession are also applicable.



The machine may not undergo any modification without prior approval from the manufacturer. For your safety, only use original spare parts and accessories.

The usage of other parts will relieve the manufacturer of any liability.

Changing the service conditions can only be carried out with prior written authorisation from INOXPA

Please do not hesitate to contact us in case of doubts or if further explanations are required regarding specific data (adjustments, assembly, disassembly, etc.).

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3. General Information

3.1. DESCRIPTION

This blender is comprised of a centrifugal pump that as an option feeds an in-line mixer. A device is installed at the pump's intake that is used for introducing solids, which are suctioned from the hopper incorporated on the frame.

This unit is approved for use with food products.

3.2. PRINCIPLE OF OPERATION

The suction created at the pump's intake, suction the powder added to the fluid from the hopper. Subsequently, the flow passes through the centrifugal pump where a pre-mixture of the solid is created. Then, the flow passes through the In-line mixer, where the mixing or dissolving is completed and if any lumps are present, it is completely destroyed.

The adding of solids can be regulated by means of a butterfly valve located at the base of the hopper.

The powder inlet pipe is dry during the operation of the blender.

If the inlet pipe is obstructed, first verify that the blender rotates in the proper direction and then verify that the flow is sufficient.

The reasons why the powder can be moistened or wet down are the following:

- **Improper liquid inlet flow.** When the flow is low, which is normally created by the equipment feed backpressure being too high, the flow may not be able to sweep the solids that are being added or even the liquid may not be able flow up the pipe and into the hopper.
- **Improper pressure.** The differential pressure of the blender must be low (6-9 m), the same as the pressure at the inlet to the blender, which must be negative but without resulting in cavitation since this would be counterproductive.
- **High viscosity.** By nature, a viscous product causes a backpressure that can cause the equipment to move an improper flow for its operation. A centrifugal pump drastically minimizes its flow if the viscosity of the product increases.
- **High feed pressure.** A feed line that is too long or has a diameter that is too small, or if the viscosity is too high will generate a very high backpressure.

To solve this problem the line should be properly sized. It is important that a negative pressure be maintained at the inlet to the blender.

The amount of powder that can be added is very difficult to predict since it depends on a large number of variables. Some of the most important variables are:

- Humidity.
- Fat content
- Microscopic texture (soft, rough).
- Density.
- Fluidity (volume of air in the product)
- Powder type (granular, flakes, fines, etc.)



The amount of powder that can be dissolved in the blender depends on the characteristics of the product.

3.3. PRODUCTS TO AVOID

Abrasives: These products deteriorate the mechanical seals and the impellers.

Effervescent: The gas these emit prevents the vacuum from forming and prevents the powder from falling from the hopper.

High temperatures: Working at more than 65 °C, is not recommended since vapours can be released, which may obstruct the diffuser. Also, they may cause cavitation of the blender since this temperature is close to the boiling point.

Very high viscosities: The blenders are not able to pump products with a high viscosity. The maximum viscosity of the blenders is 400 cps.

Incompatible products: Products incompatible with the different mechanical seals and elastomers.

3.4. APPLICATION

These blenders can be used in any process where first powder is added and then it is dissolved in a liquid. Examples:

- Powdered milk.
- Powdered serum.
- Milkshakes.
- Sauces.
- Brines.
- Fertilizers.
- Lactose.
- Syrups.
- Stabilizers, mixed with milk.



The field of application for each type of blender is limited. The blender is usually selected for certain working conditions present at the time it is ordered. INOXPA will not be liable for any damage that may occur if the information provided by the buyer is incomplete (specifications of the liquid, RPM, etc.).

4. Installation

4.1. RECEPTION OF THE BLENDER

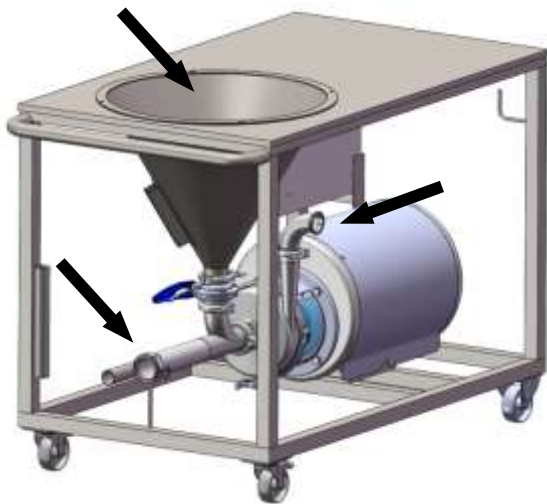


INOXPA will not be liable for any deterioration of the material due to transport or unpacking. Visually check that the packaging has not been damaged.

The following documentation is included with the blender:

- Shipping documents.
- Instructions and Servicing manual for the table blender.
- Instructions and Servicing manual for the motor (*).
- (*) If the blender has been supplied with a motor from INOXPA.



Unpack the blender and check the following:



- The suction and discharge connections and the hopper of the blender, removing any remaining packaging material.
- Check that the pump and mixer (if there is) have not suffered any damage.
- If not in good material condition and/or if not all the parts are included, the shipping carrier should submit a report as soon as possible.

4.1.1. Identification of the blender

Each blender has a nameplate with the basic data required to identify the model.

INOXPA S.A.
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GIRONA (SPAIN) - www.inoxpa.com

Serial number → S/N YEAR

MODEL

○ TYPE ○

kW V Hz

DESCRIPTION

Table blender plate

4.2. TRANSPORT AND STORAGE



The blenders incorporate wheels so they can be moved but in case of being stored for shipping, refer to the diagram for lifting the unit

Lift the blender as indicated below:



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ATTENTION!

Make sure that the blender is secured to prevent overturn it.

4.3. LOCATION

Place the blender in a position that allows enough space around it to provide access to all the skid. (Refer to Section 8. [Technical Specifications](#) for dimensions and weights.)

Place the blender on a flat and level surface.



Install the blender so that it can be properly ventilated.

If the blender is installed outdoors, it must be sheltered under a roof. Its location must allow for easy access during any inspection or maintenance tasks.

4.4. PIPES

- As a general rule, install the suction and discharge lines in straight sections, with the minimum possible number of elbows and fittings in order to reduce any pressure losses that may be caused by friction.
- Make sure that the blender's ports are properly aligned with the pipework and have a diameter similar to that of the pump connections.
- Place the blender as close as possible to the suction tank and whenever possible below the liquid level, or even below the tank level in order to achieve the largest possible static head for suction.
- Install support brackets for the lines as close as possible to the blender's suction and discharge ports.

4.4.1. Shut-off valves

The table blender may be isolated for maintenance. To accomplish this, shut-off valves must be installed and connected to the blender's suction and discharge connections.

These valves must ALWAYS be open during operation of the blender.

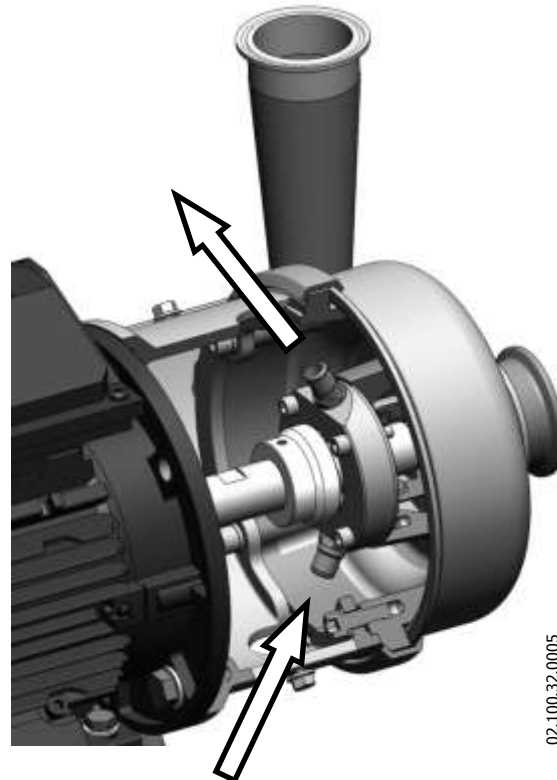
4.5. DOUBLE MECHANICAL SEAL

Models with double mechanical seal may require the installation of auxiliary cooling circuit for them. As shown in next figure, will be assembled the inlet connection on the bottom and the outlet on the top ensuring that the chamber is full of liquid.



The recommended flow of cooling liquid is around 0,25-0,6 l/min and a working pressure of 0-1 bar.

ALWAYS connect the cooling inlet on the bottom connection of the seal chamber and the outlet connection on the top.



4.6. ELECTRICAL INSTALLATION



Only qualified personnel can connect the electric motors.

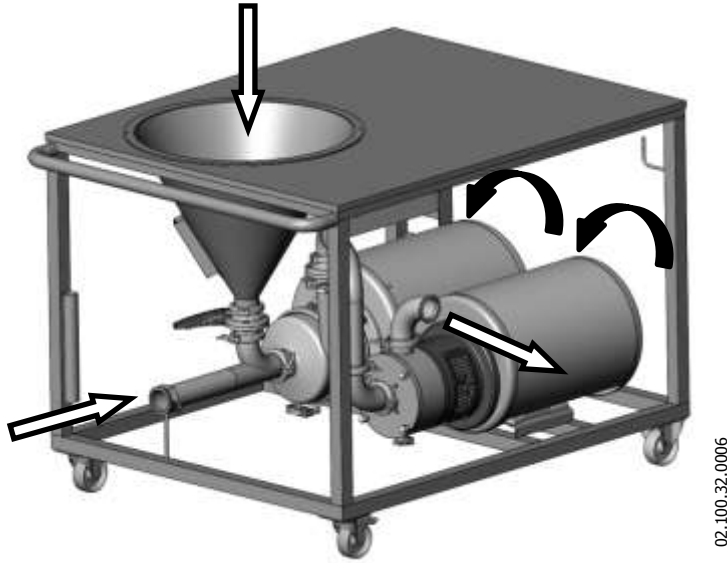
Take the necessary measures to prevent damage to cables and connections.



Electrical equipment, terminals and components of the control systems may still carry current when they are disconnected. Contacting them may impose a hazard to operators or cause irreparable material damage.

Prior to handling the blender, make sure that the electrical panel is disconnected.

- Connect the motor in accordance with the instructions supplied by the motor manufacturer.
- Check the direction of rotation.



ATTENTION!
See indicator label on the pump
and/or the mixer.

Start and stop the pump and/or mixer motor momentarily. Make sure, looking at the pump from behind, that the motor fan rotates in a clockwise direction.



ALWAYS check the direction of rotation of the motor with liquid inside the blender.

For models with a seal chamber, ALWAYS ensure that it is full of liquid prior to checking the direction of rotation.

5. Starting the blender



Prior to starting the blender, carefully read the instructions in Section 4. *Installation*.

5.1. START-UP



Carefully read Section 8. *Technical Specifications*. INOXPA will not be liable for improper use of the equipment.



NEVER touch the blender or the lines if hot liquids are being pumped.

5.1.1. Checks before starting the table blender

- Completely open the shut-off valves on the suction and discharge lines.
- If liquid does not flow towards the pump, fill it with the liquid to be pumped.



The blender must never turn dry.

- Check that the direction of rotation of the motor is correct.
- If the blender has double mechanical seal, check that the cooling circuit are connected.

5.1.2. Checks when starting the table blender

- Check that the blender is not making any strange noises.
- Check if the absolute inlet pressure is sufficient to prevent cavitation in the blender. Check the curve to obtain the minimum required pressure above the vapour pressure (NPSHr).
- Control the discharge pressure.
- Check for leaks in the sealing areas.



A shut-off valve shall not be used to regulate the flow in the suction line. All shut-off valves must be fully open during operation.



Control the motor consumption to prevent an electrical overload.

Reduce the flow rate and the electrical power consumed by the motor:

- By regulating the blender's discharge flow.
- By decreasing the motor speed.

7. Maintenance

7.1. GENERAL CONSIDERATIONS

This blender, just like any other machine, requires maintenance. The instructions contained in this manual cover the identification and replacement of spare parts. The instructions are aimed at maintenance personnel and those responsible for the supply of spare parts.



Carefully read Chapter 8. *Technical Specifications*.



ALWAYS disconnect the blender before beginning any maintenance work.

7.1.1. Check the mechanical seal

Periodically check that there are no leaks around the shaft. If leakage is detected through the mechanical seal, replace it following the instructions in the section Assembly and Disassembly from specific instruction's pump or mixer.

7.2. STORAGE

Before storing the blender it should be completely drained. Prevent as far as possible exposing the parts to excessively humid environments.

7.3. CLEANING



The use of aggressive cleaning products such as caustic soda and nitric acid may burn the skin.

Use rubber gloves during the cleaning process.



Always use protective goggles.

7.3.1. CIP (Clean-in-Place) cleaning

If the blender is installed in a system with a CIP process, its removal will not be required. If an automatic cleaning process is not available, disassemble the blender as indicated in the section *Assembly and Disassembly*.

Cleaning solutions for CIP processes.

Only use clear water (chlorine-free) to mix with the cleaning agents:

a) Alkaline solution: 1% by weight of caustic soda (NaOH) at 70°C (150°F)

1 kg NaOH + 100 litres of water = cleaning solution

or

2.2 litres of 33% NaOH + 100 litres of water = cleaning solution

b) Acid solution: 0.5% by weight of nitric acid (HNO₃) at 70°C (150°F)

0.7 litres of 53% HNO₃ + 100 litres of water = cleaning solution



Check the concentration of the cleaning solutions; incorrect concentrations may lead to deterioration of the blender seals.

To remove any traces of cleaning products, ALWAYS perform a final rinse with clean water at the end of the cleaning process.

7.3.2. SIP (Sterilization-in-Place) cleaning

Sterilization with steam is applied to all equipment including the blender.



Do NOT use the equipment during the steam sterilization process.

The parts/materials will not be damaged if the indications specified in this manual are observed.

Make sure that no cold liquid enters the system until the temperature of the blender is lower than 60°C (140°F).

The blender generates an important pressure loss through the sterilization process. We recommend the use of a branch circuit with a discharge valve to ensure that steam / superheated water sterilizes the integrity of the circuit.

Maximum conditions during the SIP process with steam or overheated water

- a) **Max. temperature:** 140°C / 284°F
- b) **Max. time:** 30 min.
- c) **Cooling:** Sterile air or inert gas
- d) **Materials:** EPDM

7.4. DISASSEMBLY / ASSEMBLY OF THE TABLE BLENDER

7.4.1. Hopper, venturi tube and discharge tube (only in mixer option)

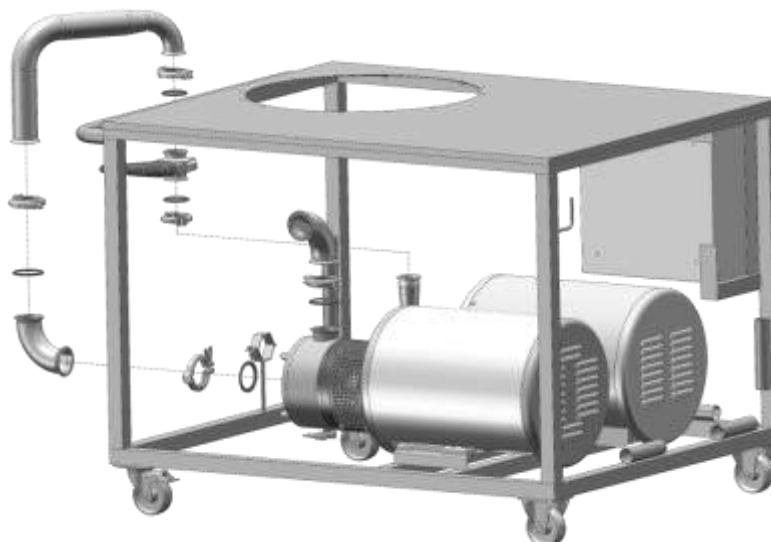
⇒ Disassembly

1. Remove the clamp (91) from the bottom of the hopper.
2. Remove the blind nuts (54) and the flat washers (53). Extract the hopper (101) by moving it upward, taking into account that the flat washer (18) and the clamp seal (91B) will be unattached.
3. Remove the butterfly valve (96) removing the clamp (91) and the seal (91C) below it.
4. Open the tube clamp (38A) to loosen the venturi tube (102). Then, remove the clamp (91) and seal (91B) that fasten the venturi tube (102) to the pumpcasing.



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5. Remove discharge tube (98) that connects the pump (01) to the elbow clamp (91F) from the mixer entrance (02) by removing clamp (91D) and seal (91E) from the outlet pump, and the clamp (91A) and seal (91C) from the mixer entrance.
6. Then, remove the discharge valve (96A) from the outlet pump by removing the clamp (91D) and seal (91E).



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⇒ **Assembly**

1. Install the discharge valve (96A) on the pump by means of seal (91E) and clamp (91D).
2. Attach the discharge tube (98) to the elbow clamp from mixer's entrance by means of seal (91C) and clamp (91A).
3. Finally, fasten the discharge tube (98) to the discharge valve (96A) using seal (91E) and clamp (91D).
4. Position the venturi tube (102) on the tube clamp (38A) but do not tighten down. Then, join the venturi tube (102) to the pump by means of seal (91B) and clamp (91). Subsequently, finish fastening the venturi tube to the frame by strongly tightening down the tube clamp (38A).
5. Join the butterfly valve (96) to the venturi tube (102) by means of seal (91B) and clamp (91).
6. To assembly the hopper, put the flat washer (18) on the frame (38) by aligning the seal drill holes with those on the frame.
7. Place the hopper (101) on the frame (38) aligning the threaded studs used for fixing the hopper (101) with the drill holes on the frame (38) and the seal (18).
8. Join the hopper to the butterfly valve (96) by means of seal (91B) and clamp (91).
9. Fasten the hopper (101) to the frame (38) using washers (53) and blind nuts (54).

7.4.2. Pump and/or mixer

Proceed to maintenance, disassembly and assembly of the pump and/or mixer according the specifications from own instruction of each component.

ATTENTION! When installing the new seal on the pump or mixer, use soapy water when fitting the different parts and gaskets to allow them to slide better; apply to the stationary as well as the rotating parts.

8. Technical Specifications

8.1. TECHNICAL SPECIFICATIONS

Maximum operating pressure	1000 kPa (10 bar)
Temperature range	-10 to 120 °C (EPDM)
Maximum speed	3000 rpm (50 Hz) 3600 rpm (60 Hz)
Noise level	61 to 80 dB (A)

Materials

Parts in contact with the product	AISI 316L (1.4404)
Other steel parts	AISI 304 L (1.4306)
Gaskets in contact with the product	EPDM (standard) (other materials available upon request)
Interior surface finish and hopper	Polished Ra<0,8 µm
Frame surface finish and upper base	Satin polished

Mechanical seal

Type	Internal single or double seal, balanced
Material of rotating part	Silicon carbide (SiC) (standard)
Material stationary part	Silicon carbide (SiC) (standard))
Gasket material	EPDM (standard)
Water consumption (double seal)	0.25 to 0.6 l/min
Pressure (double seal)	from atmospheric to 100 kPa (1 bar)



When the sound pressure level in the operating area exceeds 80 dB(A), appropriate personal protective equipment must be used.

SIZE	Centrifugal pump		Mixer in-line		Working flow (m ³ /h)	Powder intake (kg/h)				Hopper volume (L.)
	Model	Power (kW)	Model	Power (kW)		Sugar to 25°brix	Sugar to 50°brix	Milk powder 20%	Thickener to 400 cP	
MM-1	HCP 50-150	3	-	-	25	1650	1350	950	300	45
MM-1M			ME-4105	4						
MM-2	HCP 50-190	7.5	-	-	40	3700	2400	3300	450	45
MM-2M			ME-4110	7.5						
MM-3	HCP 80-205	18.5	-	-	95	12800	8900	9200	600	75
MM-3M			ME-4125	18.5						

8.2. TIGHTENING TORQUES

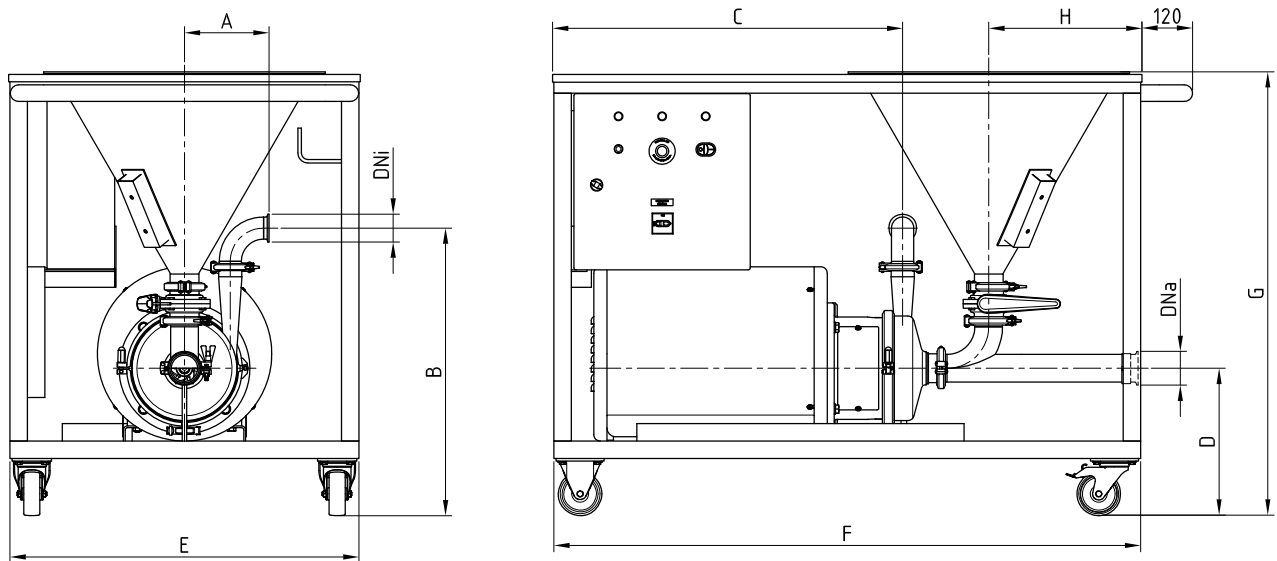
If not stated otherwise, the torques listed in the following table should be applied on the nuts and bolts of this blender.

Size	Nm	lbf·ft
M6	10	7
M8	21	16
M10	42	31
M12	74	55
M16	112	83

8.3. WEIGHTS

Size	kg	lbs
MM-1	130	287
MM-2	185	408
MM-3	355	783
MM-1M	220	485
MM-2M	305	673
MM-3M	630	1390

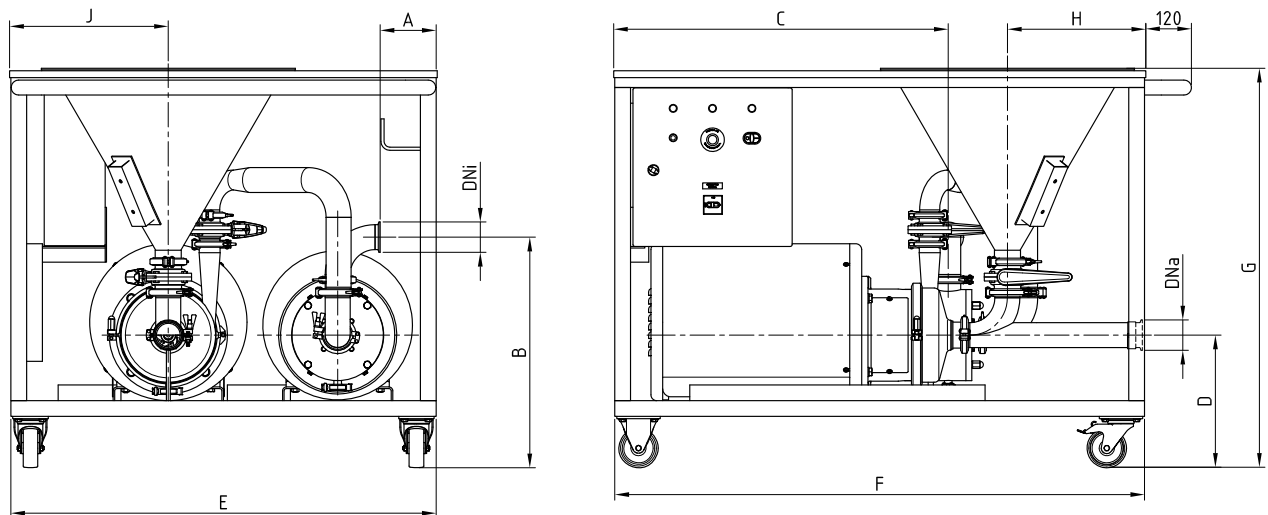
8.4. TABLE BLENDER DIMENSIONS MM-1 / MM-2 / MM-3



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SIZE	DN _a	DN _i	A	B	C	D	E	F	G	H
MM-1	2 ½"	2"	161	603	648	320	770	1190	1000	352
MM-2	2 ½"	2"	194	660	802	337	800	1345	1017	
MM-3	4"	3"	240	801	1055	422	950	1780	1228	455

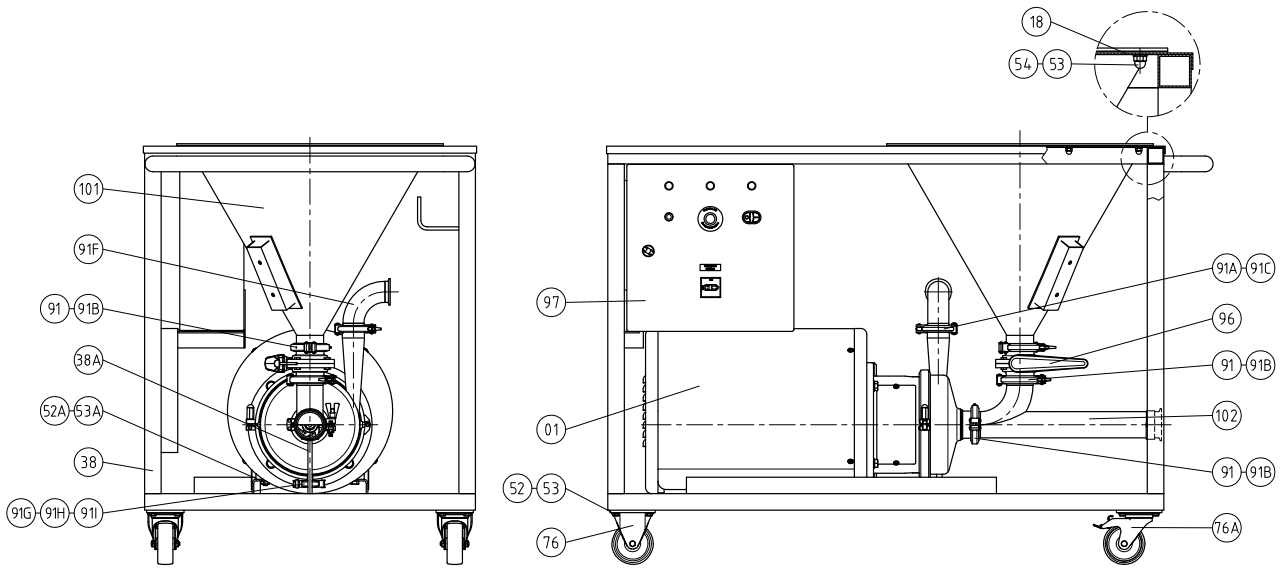
8.5. TABLE BLENDER DIMENSIONS MM-1M / MM-2M / MM-3M



02.100.32.0010

SIZE	DN _a	DN _i	A	B	C	D	E	F	G	H	J
MM-1M	2 ½"	2"	133	564	701	320	1000	1190	1000	352	387
MM-2M	2 ½"	2 ½"	137	588	849	337	1080	1345	1017		407
MM-3M	4"	3"	176	725	1089	422	1330	1780	1228	455	479

8.6. CROSS SECTION MM-1 / MM-2 / MM-3

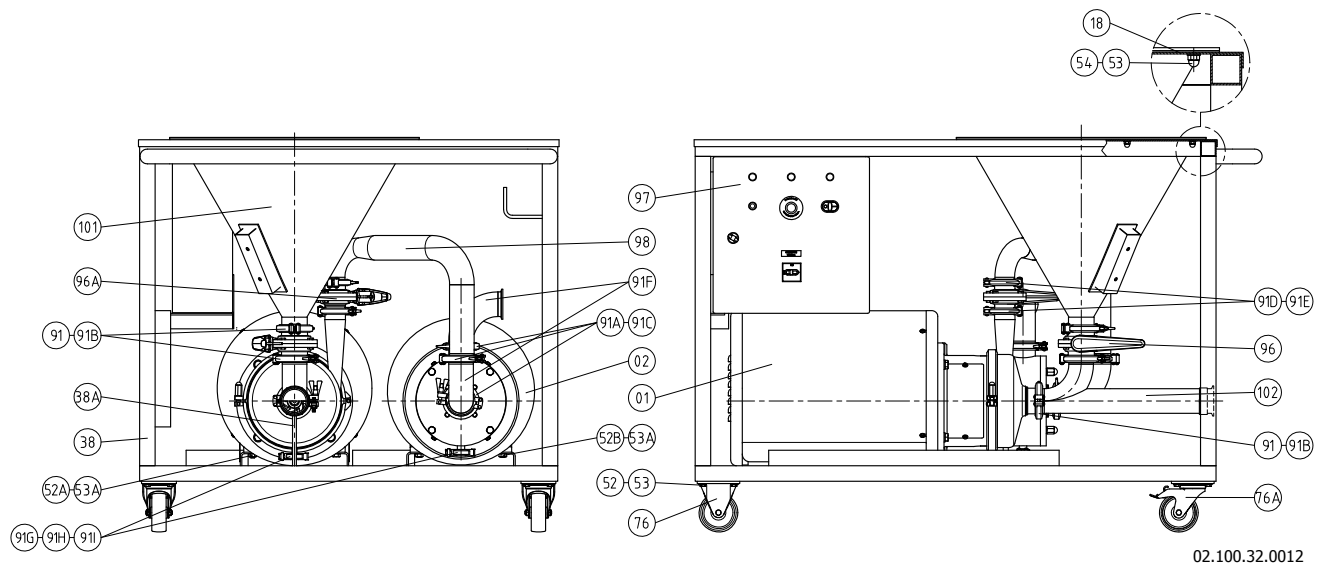


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8.7. MM-1 / MM-2 / MM-3 PARTS LIST

Position	Description	Quantity	Material
01	Pump	1	-
18	Flat washer	1	EPDM
38	Frame	1	AISI 304L
38A	Pipe clamp	1	AISI 304L
52	Hexagonal screw	16	A2
52A	Hexagonal screw	4	A2
53	Flat washer	24	A2
53A	Flat washer	4	A2
54	Blind nut	8	A2
76	Fixed wheel	2	Nylon
76A	Rotating wheel	2	Nylon
91	Clamp	3	AISI 304L
91A	Clamp	1	AISI 304L
91B	Clamp seal	3	EPDM
91C	Clamp seal	1	EPDM
91F	90° elbow clamp	1	AISI 316L
91G	Clamp	1	AISI 304L
91H	Blind clamp ferrule	1	AISI 316L
91I	Clamp seal	3	EPDM
96	Butterfly valve	1	AISI 316L
97	Electrical panel	1	AISI 304L
101	Hopper	1	AISI 316L
102	Venturi tube	1	AISI 316L

8.8. CROSS SECTION MM-1M / MM-2M / MM-3M



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8.9. MM-1M / MM-2M / MM-3M PARTS LIST

Posición	Descripción	Cantidad	Material
01	Pump	1	-
02	Mixer	1	-
18	Flat washer	1	EPDM
38	Frame	1	AISI 304L
38A	Pipe clamp	1	AISI 304L
52	Hexagonal screw	16	A2
52A	Hexagonal screw	4	A2
52B	Hexagonal screw	4	A2
53	Flat washer	24	A2
53A	Flat washer	8	A2
54	Blind nut	8	A2
76	Fixed wheel	2	Nylon
76A	Rotating wheel	2	Nylon
91	Clamp	3	AISI 304L
91A	Clamp	3	AISI 304L
91B	Clamp seal	3	EPDM
91C	Clamp seal	3	EPDM
91D	Clamp	2	AISI 304L
91E	Clamp seal	2	EPDM
91F	90° elbow clamp	2	AISI 316L
91G	Clamp	1	AISI 304L
91H	Blind clamp ferrule	1	AISI 316L
91I	Clamp seal	3	EPDM
96	Butterfly valve	1	AISI 316L
96A	Discharge pump valve	1	AISI 316L
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