



Operating instrucciones Peristaltic Pumps

AMP Series

www.boyser.com

1. Introduction

This instruction manual must accompany the pump at all times for as long as it is in use. The AMP series peristaltic pump is a machine for fluid handling intended to be used in industrial areas, as such the instruction manual is part of the legislative provisions for the safe and correct use of the pump.

This instruction manual does not substitute any installation standard or any additional future standard.

1.1. How to use this manual

This manual is intended as a reference book by means of which qualified users are able to install, commission and maintain the hose pumps mentioned on the front cover.

1.2. Original instructions

The original instructions for this manual have been written in English. Other language versions of this manual are a translation of the original instructions.

1.3. Other supplied documentation


Documentation of components such as motors and inverters is normally not included in this manual. However, if additional documentation is supplied, you must follow the instructions in this additional documentation.

1.4. Service and support

For information with respect to specific adjustments, installation, maintenance or repair jobs which fall beyond the scope of this manual, contact BOYSER. Make sure you have the serial number hose pump at hand.

1.5. Environment and disposal of waste

Enquire within your local government about the possibilities for reuse or environment friendly processing of packaging materials, (contaminated) lubricant

	<p>CAUTION</p> <p>Always observe the local rules and regulations with respect to processing (non reusable) parts of the hose pump.</p>
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2. Safety

2.1. Explanation of the safety information



This symbol identifies the instructions of this manual, which must be observed to avoid failure to meet safety standards.



This symbol identifies the instructions of this manual, which must be observed to avoid compromising electrical safety.



This symbol identifies the instructions of this manual, which must be observed to guarantee the correct operation of the pump.

Other documentation supplied: instructions in all additional documentation supplied with the pump must also be followed (instructions for components such as gearbox, motor, sensor, frequency controller).

2.2. Intended use

The hose pump is exclusively designed for pumping suitable products. Every other or further use is not in conformance with the intended use. In case of doubt it is the use which appears to be its intended use judging from the construction, execution and function of the product. Observing the instructions in the user's documentation also belongs to intended use.

Only use the pump in conformance with the intended use described above. The manufacturer cannot be held responsible for damage or harm resulting from use that is not in conformance with the intended use. If you want to change the application of your hose pump, contact BOYSER.

2.3. Responsibility

The manufacturer does not accept any responsibility for damage or harm caused by not (strictly) observing the safety regulations and instructions in this manual and the also supplied documentation, or by negligence during installation, use, maintenance and repair of the hose pumps mentioned on the front cover. Depending on the specific working conditions or accessories used, additional safety instructions can be required.

2.4. User qualifications

Pumps are machines that can present dangers due to moving parts and the presence of a pressurised fluid within the hose.

THE FOLLOWING CAN CAUSE SERIOUS DAMAGE AND INJURY:

- Improper use

- Removal of the protections and/or disconnection of protective devices
- Lack of inspections and maintenance

The person responsible for safety should therefore guarantee that the pump is transported, installed, put in service, used, maintained and repaired by qualified personnel who should possess:

- Specific training and sufficient experience for the tasks.
- Knowledge of the technical standards and applicable laws.
- Knowledge of the national and local safety and installation standards.

Any work carried out on the electrical part of the pump should be authorized by the person responsible for safety.

Given that the pump is intended to form part of a system, it is the responsibility of whoever supervises the installation of the entire system to guarantee absolute safety, adopting the necessary measures of additional protection.

2.5. General safety information



Live parts

Possible consequence: fatal or very serious injuries.

- Risk mitigation: the device must be disconnected from the power supply before it is opened
- Isolate damaged, faulty or manipulated devices from the mains in order to de-energise.



Lack of emergency stop switch

Possible consequence: fatal or very serious injuries.

An emergency stop switch must be connected for the entire system. This should enable the entire system to be shut down in the event of an emergency in such a way that the overall system can be brought into a safe condition.



Unauthorized access

Possible consequence: Fatal or very serious injuries.

- Risk mitigation: ensure that there can be no unauthorized access to the pump or to the system.



Hazardous media/contamination of persons and equipment

Possible consequences: Fatal / serious injuries, material damage.

- Ensure that the pump hoses are chemically resistant against the media being handled

- Always observe the safety data sheets for the media to be handled. The system operator must ensure that these safety data sheets are available and that kept up-to-date.
- The safety data sheets for the fluid being handled are always decisive for initiating countermeasures and/or first aid in the event of leakage of the fluid.
- Observe the general restrictions in relation to viscosity limits, chemical resistance and density.
- Always switch the pump off before exchanging the pump hose



Incorrect and improper use

Possible consequence: fatal or very serious injuries.

- The unit is not intended to convey or regulate gases or solid media
- Do not exceed the rated pressure, speed or temperature for the pump
- Maximum pressure on suction/inlet side is 3 bar (45 psi approx.) and maximum pressure on suction/inlet side is 0,5 bar (7,25 psi approx.) only in pumps with Norprene, Silicone and Tygon tube).
- The unit may only be used in accordance with the technical data and specifications provided in these operating instructions and in the operating instructions for the individual components
- This pump is NOT supplied for use in areas of risk from explosion. ATEX versions of BOYSER pumps are available and they are supplied with a special ATEX version of the Instruction Manual.
- Only switch the pump on if it has been properly fastened to the floor
- Only switch the pump on if the front cover has been attached.
- Do not carry out any maintenance operations or dismantle the pump without first making sure that the pipes are not under pressure and are empty or isolated.
- In the case of the hose becoming stuck during extraction or fitting it is necessary to reverse the direction of the pump, re-lubricate, and then repeat the operation.
- As the peristaltic pump is volumetric and its functioning is positive displacement, it is necessary to prevent a possible overload of pressure, due to, for example, the accidental closure of a valve. For this reason, it is advisable to fit a safety device such as: a safety valve, pressure limiter, etc.



Operational lifetime of the pump hoses

Possible consequence: fatal or very serious injuries.

The hose has an indeterminate life and due to the possibility of its

breakage or deterioration, the user is responsible for the prevention of a possible (although most unlikely) incorporation of particles from the hose into the product being pumped. This can be achieved by means of filtration, a hose rupture alarm or other means suitable for the respective process

In addition, the operational lifetime of the pump hoses cannot be precisely specified. For this reason, the possibility of fracture and consequential leakage of liquids must be accounted for. If the hose rupture alarm (optional) is fitted, then the pump can be stopped and/or an electrical valve can be activated.



CIP cleaning

In the event of CIP cleaning, it is necessary to obtain information from the manufacturer about correct installation of the pump (a special installation is required) as well as regarding the compatibility of the cleaning agents with the pump hoses and the hydraulic connections.

Cleaning should be undertaken at the recommended maximum temperature.



Direction of rotation/flow direction

Possible consequence: material damage, destruction of the unit.

The pump's direction of rotation in relation to the desired flow direction must be checked prior to every start.



Disconnect the pump from the mains

Possible consequence: personal injury.

Work may only be carried out on the pump after it has previously been switched off and disconnected from the mains.



Environmental influences

Possible consequence: material damage up to destruction of the unit.

- The device is suitable for outdoor operation once it is covered and protected from rain and direct sunlight. Ambient conditions must also be respected, see Section 7.2 & 7.3.
- Take suitable measures to protect the device from environmental influences such as
 - UV rays
 - moisture
 - frost, etc.

3. Functional description

The AMP Series is a positive displacement pump. The feed chemical is conveyed by the rotor squeezing the hose in the direction of flow. No valves are needed for this. This ensures gentle handling of the metered media.

Maximum pressure on suction/inlet side is 3 bar (45 psi approx.) and maximum pressure on suction/inlet side is 0,5 bar (7,25 psi approx.) only in pumps with Norprene, Silicone and Tygon tube).

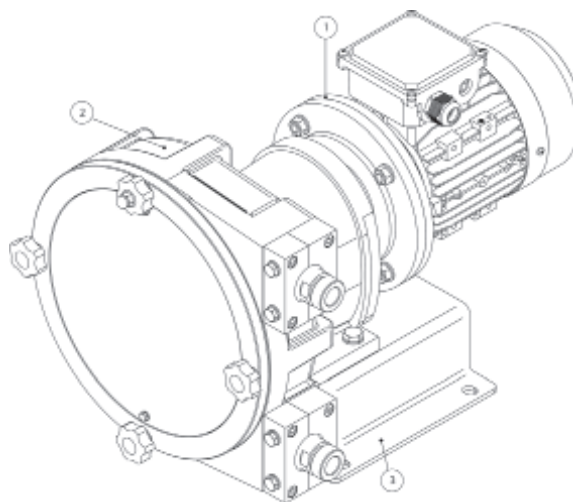
The AMP Series has been designed for safe and uncomplicated operation, as well as straightforward maintenance.

The AMP Series can be used for many different media. However, this pump type is often the optimal solution for abrasive, shear-sensitive and viscous media.

Typical areas of use include processes where only a low discharge pressure is required (max. 8 bar).

3.1. Main modules:

1. Drive Unit
2. Housing
3. Base frame

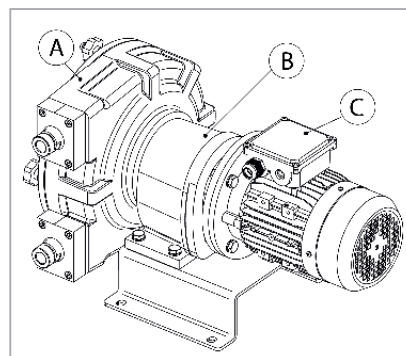


DESCRIPTION	UNIT	AMP-10	AMP-13	AMP-16	AMP-19	AMP-22
Max. capacity continuous	m3/h	0,095	0,160	0,380	0,520	1
	GPM	0,418	0,587	1,393	2,270	3,67
Max. capacity intermittent	m3/h	0,125	0,185	0,440	0,780	1,15
	GPM	0,550	0,678	1,613	3,410	4,22
Capacity per revolution	l/rev	0,023	0,038	0,092	0,123	0,246
	Gal/rev	0,005	0,008	0,020	0,033	0,054
Max. permissible working pressure	bar	8	8	8	2	8
Permissible ambient temperature	°C	-10 to +40	-10 to +40	-10 to +40	-10 to +40	-10 to +40
Permissible product temperature	°C	-10 to +80	-10 to +80	-10 to +80	90	-10 to +80
Sound level at 1m	dB (A)	70	70	70	70	70

4. DESCRIPTION

4.1. Identification of the product

- A: Pump head
- B: Gearbox
- C: Electric motor



4.2. Identification of the pump

- MOD: Type number
- Nº: Serial number
- YEAR: Year of manufacture



4.3. Identification of the gearbox (B)

The gearbox has an identity plate with the model, serial number and manufacturer's details as well as information relevant to its function such as reduction ratio.

4.4. Identification of the electric motor (C)

The motor has an identity plate with the model, serial number and manufacturer's details as well as information relevant to its' function such as electric power.

5. CONSTRUCTION

The pump housing is closed off with a bolted front cover in order to avoid the risk of injury. The motor serves to drive the rotor. Two shoes attached to the rotor serve to press the pump hose against the pump housing.

The rotary movement of the rotor alternately presses and releases the shoes against the pump hose. This serves to suck the media and convey it into the metering line.

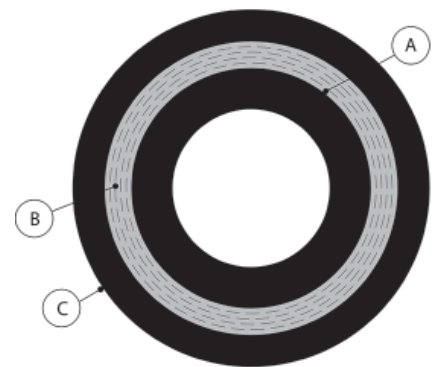
5.1. Diagram of functional principle

1. Housing
2. Rotor
3. Shoes
4. Hose

6. PUMP HOSE

6.1. General

- A: Inner layer
- B: Nylon reinforcement layers
- C: Outer layer



The pump hose liner material should be chemically resistant with the product to be pumped. Depending on the specific requirements of your application a corresponding pump hose must be selected. For each pump model various hose types are available.

The material of inner lines is the part in contact with the media.

HOSE TYPE	MATERIAL INNER LINER	COLOUR STRIPE
NR	Natural rubber	No one (black)
NBR	Nitrile rubber	Red
EPDM	EPDM	Blue
CSM	Hypalon	Green
NBR-A	Nitrile rubber (FDA)	White
NR-A (Available for AMP-10 and AMP-13)	Natural rubber (FDA)	No one (black)

TUBE TYPE	TUBE MATERIAL	COLOUR STRIPE
NORPRENE	Norprene	N/A
SILICONE	Silicone	N/A

7. TRANSPORT AND STORAGE

7.1. Transport

- The pump is protected by cardboard packaging or a wooden crate.
- The packaging materials are recyclable.

7.2. Storage for less than 1 month

- The pump should be in a resting position, rotor in horizontal position.
- Avoid areas open to harsh weather or excessive humidity and temperatures lower than 0°C or higher than 30°C.
- Spare hoses should be stored in a dry place away from direct light.

7.3. Storage for more than 1 month

- Avoid areas open to harsh weather or excessive humidity and temperatures lower than 0°C or higher than 30°C.
- **IMPORTANT** Disassemble one of the shoes (see also section 9.4.1 for instructions):
 - Remove the front cover.
 - Remove a shoe (the shoe that is not touching the pump hose)
 - Mount the front cover.
 - Turn the rotor with the help of the motor so that the remaining shoe is not pressing against the pump hose.
- For storage periods of longer than 30 days, protect the coupling surfaces (clamps, reducers, motors) with adequate anti-rust protection.
- For storage periods longer than 6 months rotate the rotor a few turns to prevent damage to bearings and oil seals and to prevent grease migration.
- Spare hoses should be stored in a dry place away from direct light.

7.4. Elevation

- AMP pumps sizes can be lifted manually. AMP-22 pumps must be lifted by two people.

It is the customer's responsibility to adhere to local workplace legislation.

Weights	AMP-10/-13	AMP-16	AMP-19	AMP-22
Total pump weight	14 kg	23 kg	23 kg	49 kg
	30 lbs	50 lbs	50 lbs	108 lbs
Lifting	1 person	1 person	1 person	2 people

8. ASSEMBLY, COMMISSIONING AND INSTALLATION

8.1. Ambient conditions

Assembly is to be carried out in the following order.

If the pump has to be installed outdoors, then it is to be equipped with protection against sunlight and weather influences.

When positioning the pump, ensure that sufficient room for access is provided for all types of maintenance work.

Limit values for hose temperature and pressure.

Hose Material	Min. Temp. (°C) Feed chemical	Max. Temp (°C) Feed chemical	Min. Temp (°C) Environment	Max. Pressure (bar)
NR	- 10	80*	- 10	8
NBR	- 10	80*	- 10	8
EPDM	- 10	80*	- 10	8
CSM	- 10	80*	- 10	8
NBR-A	- 10	80*	- 10	8
NR-A	- 10	80*	- 10	8

Tube Material	Min. Temp. (°C) Feed chemical	Max. Temp (°C) Feed chemical	Min. Temp (°C) Environment	Max. Pressure (bar)
NORPRENE	- 10	90*	- 10	2
SILICONE	- 10	90*	- 10	2
TYGON	- 10	70*	- 10	2

* At max. temperature, the life of hose is drastically reduced.

Please contact BOYSER for applications with feed chemical temperature higher than 60°.

8.2. Commissioning

8.2.1. Testing prior to commissioning the pump

The following tests are to be carried out:

- Check that the rollers are correctly fitted and fastened.
- Check that the drive and the pump housing are properly lubricated. The specially formulated lubricant can be obtained from BOYSER or from the authorized distributor.
- Only switch the pump on if the front cover has been properly attached.
- Check that the mains voltage is suitable for the motor.
- Check that the thermal overload protection (not included in the delivery scope) corresponds to the value specified on the motor type plate.

- Confirm that pump has been properly earthed.
- Connect the electric motor according to local applicable rules and regulations. The electrical installation work must be carried out by qualified personnel.
- Check that the optional electrical components are connected and are working properly.
- Check whether the direction of rotation is correctly adjusted.

8.3. Correct installation of the pump

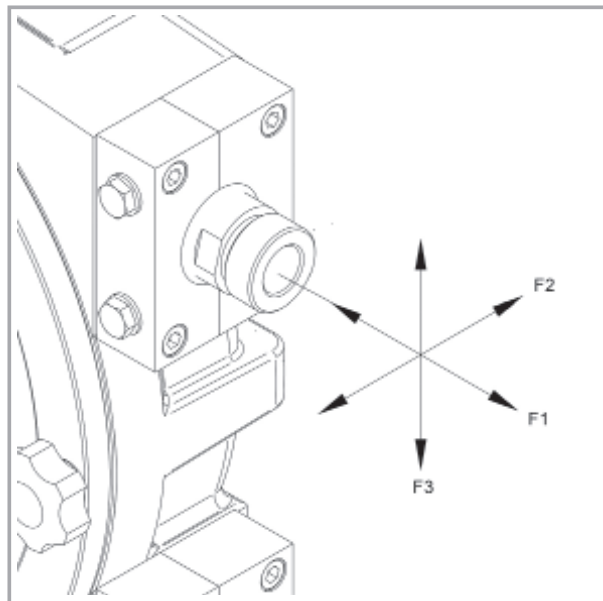
- Ensure that the pump has not been damaged during transportation or storage. Immediately report any damage to the supplier.
- Ensure that all the packaging has been removed.
- Check that the information printed on the identification plate corresponds with the order.
- Check the operating instructions in order to ensure that the flow values, pressures & power consumption of the motor do not exceed rated values.
- Ensure that the hose is suitable for the fluid to be conveyed and that it is not damaged.
- Make sure that the temperature of the liquid does not exceed the recommended temperature range.
- Ensure that there is enough space for free airflow around the motor.
- Ensure that no nearby objects or direct sunshine radiate additional heat to the motor.

8.3.1. Suction side

- Install a manometer in the pressure line if the back-pressure value is unknown. Maximum pressure on suction/inlet side is 3 bar (45 psi approx.) and maximum pressure on suction/inlet side is 0,5 bar (7,25 psi approx.) only in pumps with Norprene, Silicone and Tygon tube).
- The pump is to be positioned as near as possible to the liquid container, so that the suction side is kept as short and straight as possible.
- The suction line must be absolutely airtight and made of a suitable material, so that it does not collapse under vacuum.
- The diameter must correspond to the rated diameter of the pump hose. A larger diameter is recommended in the event of viscous liquids.
- The pump is self-priming and does not require an admission valve.
- The pump is reversible and the suction side can be connected to either hydraulic connection of the pump. Normally the option is selected which is best suited to the physical conditions of the rest of the installation.
- It is recommended to use flexible piping between the fixed pipes and the hydraulic connections of the pump, in order to avoid the transmission of vibrations.

8.3.2. Maximum permissible loads on the pump connection

- Pump must be bolted to floor before applying loads to connections/flanges.



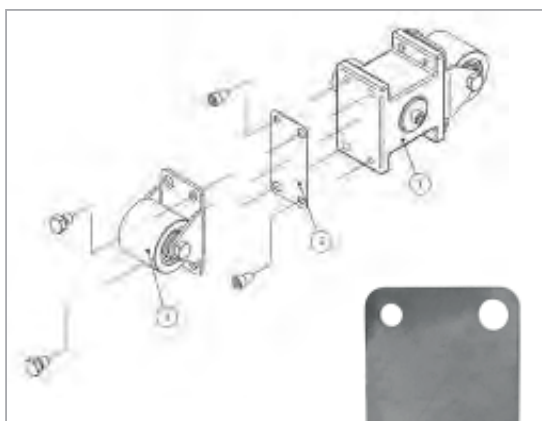
		AMP-10	AMP-13	AMP-16	AMP-19	AMP-22
F1	N	600	600	600	600	600
	lb-f	135	135	135	135	135
F2	N	300	300	300	300	300
	lb-f	67	67	67	67	67
F3	N	300	300	300	300	300
	lb-f	67	67	67	67	37

8.3.3. Discharge side

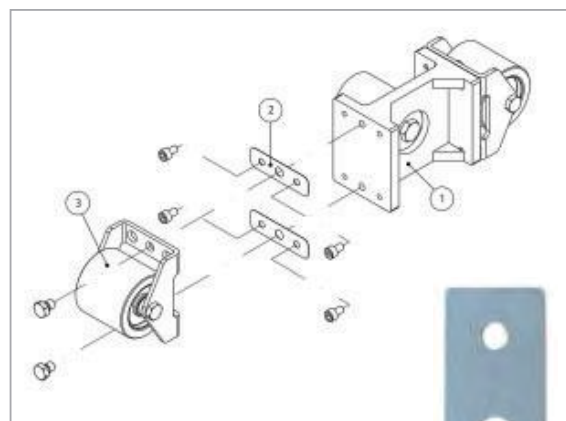
- The discharge line is to be kept as straight and short as possible, in order to avoid performance reduction.
- The diameter must correspond to the rated diameter of the pump hose. A larger diameter is recommended in the event of viscous liquids.
- It is recommended to use flexible piping between the fixed pipes and the hydraulic connections of the pump, in order to avoid the transmission of vibrations.
- Install a pressure relief valve or a pressure switch (or similar device) in the pressure line in order to protect the pump in the event that a valve is unintentionally closed off or the line is blocked in another way.

8.4. Adjusting the roller pressure

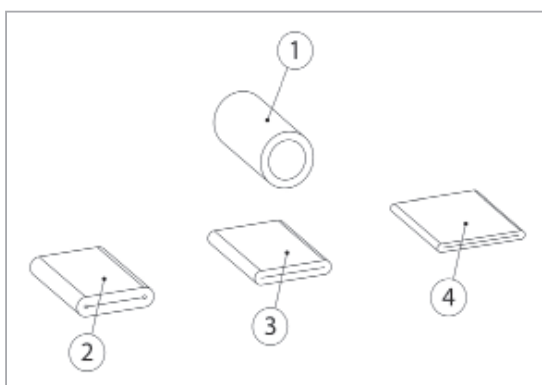
- The peristaltic pump is equipped with shims, in order to adjust the precise distance from the axis of rotation to the roller for correct hose compression (also dependent on speed and operating pressure).
- In order to achieve optimal life of the pump hose, the compression force of the pump hose can be adjusted by placing a number of shims under the pressing roller. The shims (2) are fitted between the rotor (1) and the pressing roller (3). The number of shims will vary for each counter pressure situation.



Shims placement
(AMP-10/13/16/19)



Shims placement
(AMP-22)



Squeezing
the hose

1. Hose in normal shape.
2. Insufficient squeezing (back flowing media in the cavity will destroy the hose within a short period of time).
3. Perfect squeezing.
4. Excessive squeezing (increased wear and tear to pump and hose).

The shims are fitted in the factory. The number of shims can be adapted to the actual operating conditions according to the following tables. Slight variations in colour of polyurethane rollers is normal.

8.4.1. AMP-10 Model

a) NR, NBR, EPDM, CSM, NR-A and NBR-A:

Number of shims of 0,5 mm thickness (part number 102.01.49). NOTE: for fluid temperatures >60°C: reduce shim quantities by 1.

AMP-10		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	1	1	1	1	1
	2,0	1	1	1	1	1
	4,0*	2	1	1	1	1
	6,0	2	2	2	N/A	N/A
	8,0	3	2	N/A	N/A	N/A

*Factory default setting if working pressure is not informed

N/A: Outside standard operating range of pump

b) Norprene / Silicone:

One 2,5 mm shim can be used (part number 102.01.16), alternatively five 0,5 mm shims can be used (part number 102.01.49) for a total of 2,5 mm. NOTE: for fluid temperatures >60°C: reduce shim quantities by 1.

AMP-10		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	1	1	1	1	1
	2,0	1	1	1	1	1

*Factory default setting if working pressure is not informed

8.4.2. AMP-13 Model

a) NR, NBR, EPDM, CSM, NR-A and NBR-A:

Number of shims of 0,5 mm thickness (part number 102.01.49). NOTE: for fluid temperatures >60°C: reduce shim quantities by 1.

AMP-13		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	1	1	1	1	1
	2,0	1	1	1	1	1
	4,0*	2	1	1	1	1
	6,0	2	2	2	N/A	N/A
	8,0	3	2	N/A	N/A	N/A

*Factory default setting if working pressure is not informed - N/A: Outside standard operating range of pump

b) Norprene / Silicone:

One 2,5 mm shim can be used (part number 102.01.16), alternatively five 0,5 mm shims can be used (part number 102.01.49) for a total of 2,5 mm. NOTE: for fluid temperatures >60°C: reduce shim quantities by 1.

AMP-13		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	1	1	1	1	1
	2,0*	1	1	1	1	1

*Factory default setting if working pressure is not informed

8.4.3. AMP-16 Model

a) NR, NBR, EPDM, CSM and NBR-A:

Number of shims of 0,5 mm thickness (part number 101.02.35). NOTE: for fluid temperatures >60°C: reduce shim quantities by 1.

AMP-16		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	1	1	1	1	1
	2,0	1	1	1	1	1
	4,0*	2	1	1	1	1
	6,0	2	2	2	N/A	N/A
	8,0	3	2	N/A	N/A	N/A

*Factory default setting if working pressure is not informed - N/A: Outside standard operating range of pump

b) Norprene / Silicone:

One 2,5 mm shim can be used (part number 101.02.42) plus four 0,5 mm shims can be used (part number 101.02.35) for a total of 4,5 mm. NOTE: for fluid temperatures >60°C: reduce shim quantities by 1.

AMP-16		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	1+4	1+4	1+4	1+4	1+4
	2,0*	1+4	1+4	1+4	1+4	1+4

*Factory default setting if working pressure is not informed

8.4.4. AMP-19 Model

b) Norprene / Tygon:

One 2,5 mm shim is used (part number 101.02.42).

AMP-19		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	1	1	1	1	1
	2,0*	1	1	1	1	1

*Factory default setting if working pressure is not informed

8.4.5. AMP-22 Model

a) NR, NBR, EPDM, CSM and NBR-A:

Number of shims of 0,5 mm thickness (part number 101.02.33). NOTE: for fluid temperatures >60°C: reduce shim quantities by 1.

AMP-22		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	2	2	1	1	1
	2,0	2	2	2	2	2
	4,0*	3	3	2	2	2
	6,0	3	3	3	N/A	N/A
	8,0	4	3	N/A	N/A	N/A

*Factory default setting if working pressure is not informed - N/A: Outside standard operating range of pump

b) Norprene / Silicone:

One 5 mm shim (part number 113.00.37) plus two 0,5 mm shims (part number 113.00.33) can be used for a total of 6 mm. NOTE: for fluid temperatures >60°C: reduce shim quantities by 1.

AMP-22		rev/min				
		0-19	20-39	40-59	60-79	80-99
bar	0,5	1+2	1+2	1+2	1+2	1+2
	2,0*	1+2	1+2	1+2	1+2	1+2

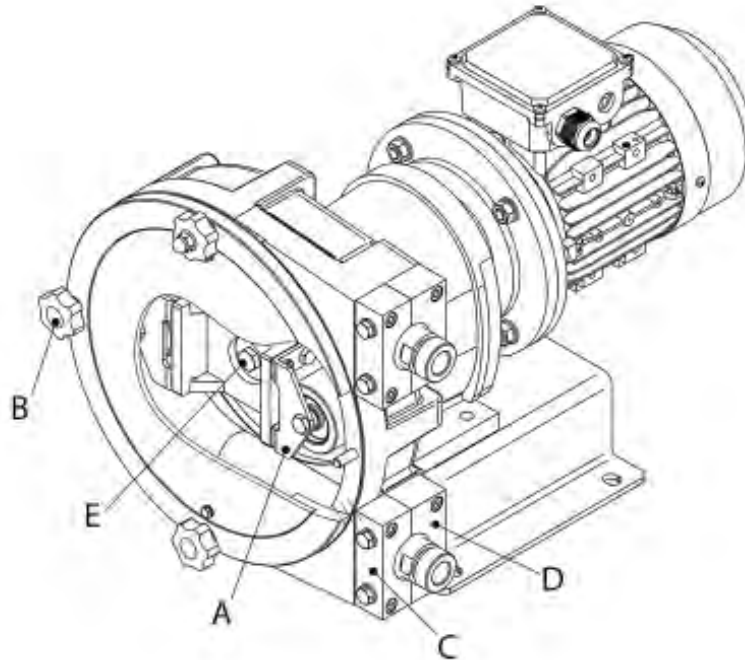
*Factory default setting if working pressure is not informed

9. MAINTENANCE

9.1. Components weights

	AMP-10/-13	AMP-16	AMP-19	AMP-22
Total Weight	14 kg	23 kg	23 kg	49 kg
	30 lbs	50 lbs	50 lbs	108 lbs
Pump Cover	0,11 kg	3,26 kg	3,26 kg	3,58 kg
	0,24 lbs	7,19 lbs	7,19 lbs	7,89 lbs
Roller Sub-Assembly	0,30 kg	0,60 kg	0,60 kg	1,06 kg
	0,66 lbs	1,32 lbs	1,32 lbs	2,34 lbs
Connection	0,08 kg	0,14 kg	0,14 kg	0,20 kg
	0,18 lbs	0,31 lbs	0,31 lbs	0,44 lbs
Press Flange	0,05 kg	0,07 kg	0,07 kg	0,10 kg
	0,11 lbs	0,15 lbs	0,15 lbs	0,22 lbs
Hose	0,16 kg	0,33 kg	0,33 kg	0,70 kg
	0,35 lbs	0,73 lbs	0,73 lbs	1,54 lbs

9.2. Torque values



Description		Units	AMP-10 / 13	AMP-16	AMP-19	AMP-22
A	Roller support bolts	Nm	7 M5 8 mm Spanner	18 M8 13mm Spanner	18 M8 13 mm Spanner	18 M8 13 mm Spanner
B	Cover bolts	Nm	Manual, no bolts	Manual, no bolts	Manual, no bolts	Manual, no bolts
C	Hose clamp	Nm	1 M6 10 mm Spanner	2 M8 13 mm Spanner	2 M8 13 mm Spanner	2 M8 13 mm Spanner
D	Flange bracket bolts	Nm	2 M6 Allen Key, Size 5	4 M8 Allen Key, Size 6	4 M8 Allen Key, Size 6	4 M8 Allen Key, Size 6
E	Drive shaft bolts	Nm	33 M6 Allen Key, Size 5	33 M6 Allen Key, Size 5	33 M6 Allen Key, Size 5	43 M10 17 mm Spanner

9.3. Lubrication

AMP pumps only require a thin film of grease to reduce the friction between the roller and the outer surface of the hose or tube. No other lubrication is necessary.

Lubricant quantity table

	Unit	AMP-10/13	AMP-16	AMP-22
Lubricant	-	BOYSER	BOYSER	BOYSER
Silicone grease quantity	gramme	50-70	50-70	100
	ounce	1,8 – 2,5	1,8 – 2,5	3,5

9.3.1. Changing oil in gearbox

The instructions manual of the gearbox are usually delivered with the IOM of the Boyser pump.

Some models of gearbox are lubricated for life, other models of gear reducers require regular maintenance according to the instructions manual of the gear reducer manufacturer.

In case of doubt, please contact the gearbox manufacturer or their authorised distributor in your country.

9.4. Exchanging the pump hoses

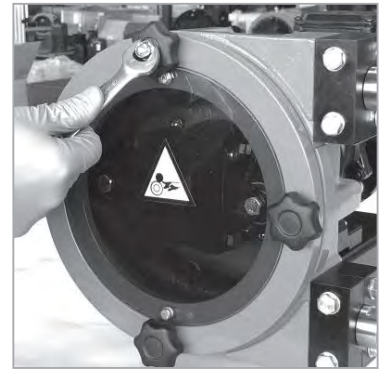
9.4.1. Dismantling

Close off all valves, in order to prevent leakage of the feed chemical.

1. Dismantle the pipes from both discharge and suction sides.



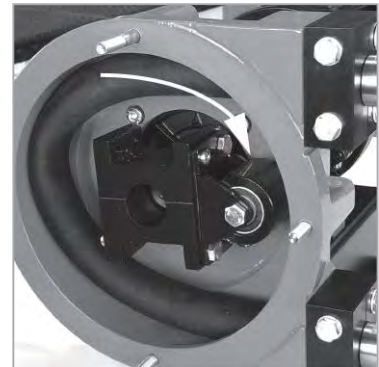
2. Remove the front cover. Front covers of AMP Series can be removed manually (<3 kg).



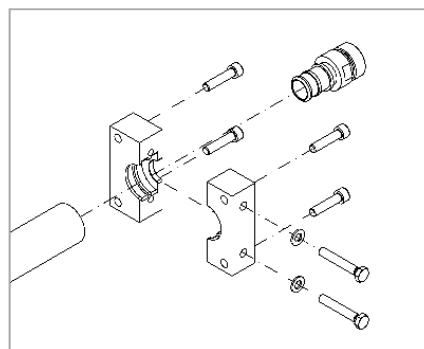
3. Remove the roller incl. roller support (the roller that is not touching the hose).
Check the roller. Ensure that the roller surfaces are not damaged. Otherwise, please substitute the roller.



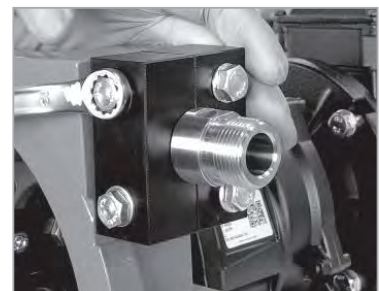
4. Rotate the rotor 180° to liberate the hose.



5. Remove the press and connection and hydraulic connections from pump housing.



Connection



6. Remove the pump hose to be exchanged.



7. Dismount the connections of the hose.



9.4.2. Installation of the new hose

1. Clean the interior surfaces of the pump housing with a clean dry cloth.
2. Lubricate with our original lubricant the internal surfaces of the pump housing.



3. Before lubricating, insert the connections into the replaced tube.

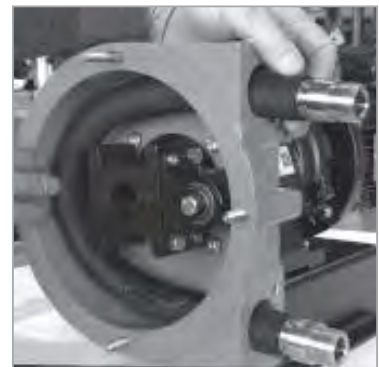


4. Lubricate with our original lubricant the hose and at the contact surfaces between the pump hose and the external part of the new hose.



5. Lay the pump hose into the pump housing through the connection holes.

The hoses of the AMP pumps must be manually inserted through the lower opening up to the point where the hose begins to be compressed by the rotor.

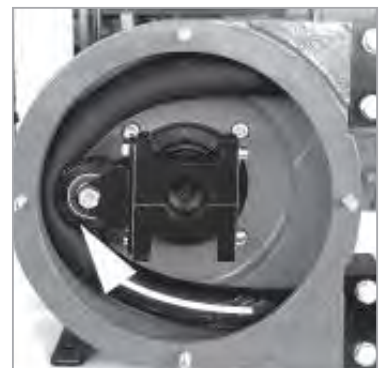


6. Assemble the flanges.



7. Mount the front cover.

8. Turn the rotor with the help of the motor so that the remaining roller presses against the pump hose.



9. Dismount the front cover.

10. Re-attach the second roller with shims back onto the rotor.



11. Apply grease manually to the new hose, as shown in the photo. Rollers will spread grease evenly over hose when rotor rotates.



12. Mount the front cover

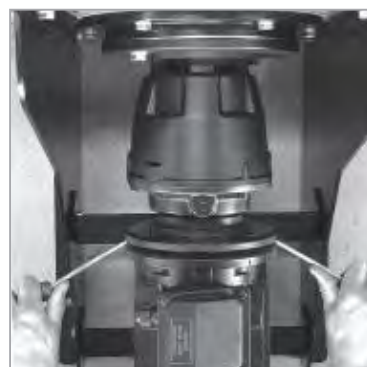


13. Mount the pipes from both discharge and suction sides.

14. Open all of the valves.

9.5. Replacement of electric motor

For repair or replacement of the electric motor they could be disassembled from the pump housing. The pump is stable on its baseplate and will not fall over when the electric motor is disassembled. No support set is necessary.



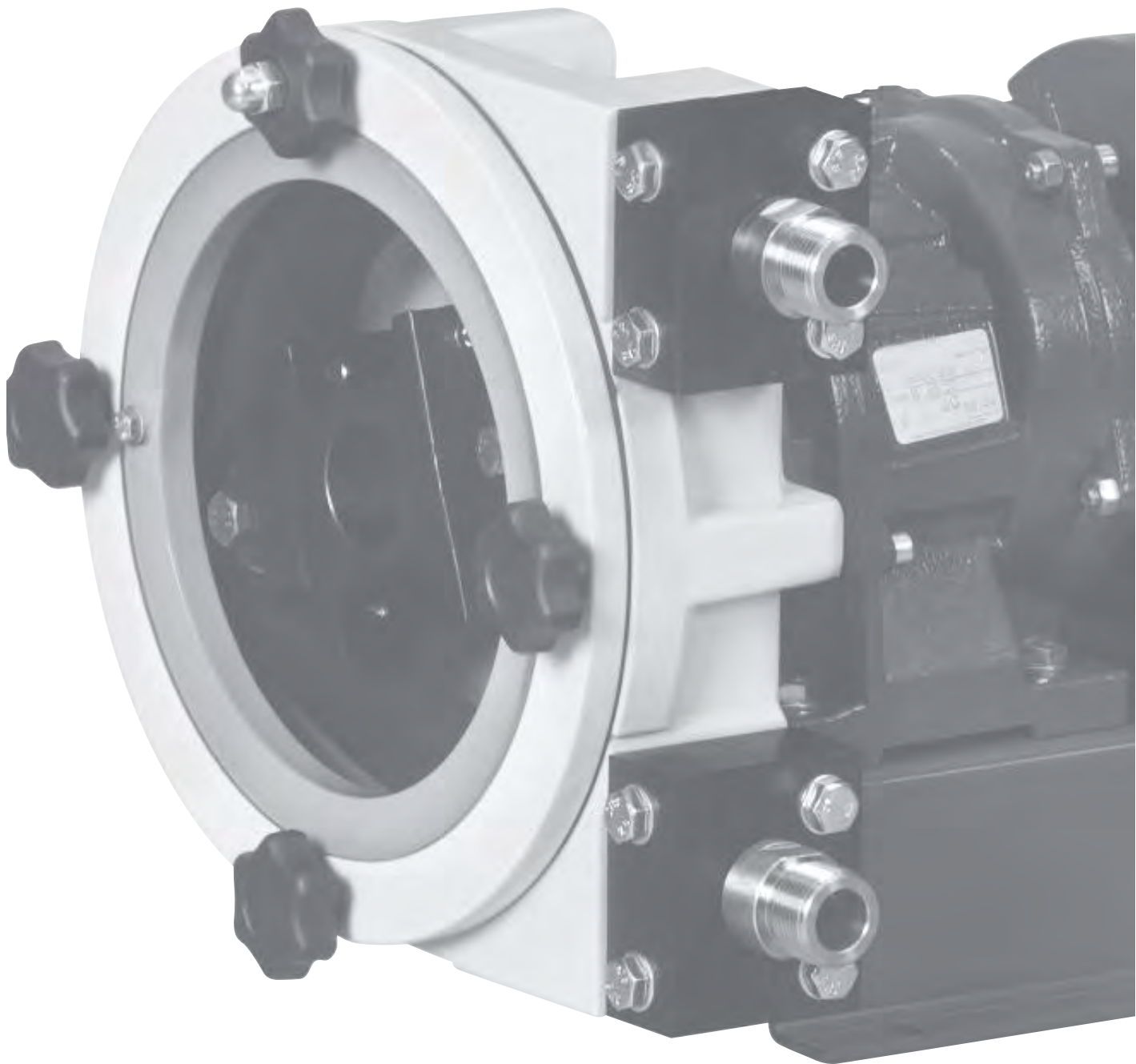
9.6. Addition of leak detection sensor

Detection sensor must be requested in initial order so that an additional hole is drilled in the pump housing.

Standard AMP pump housing is not prepared for retrofitting of leak detection sensor.



AMP SERIES



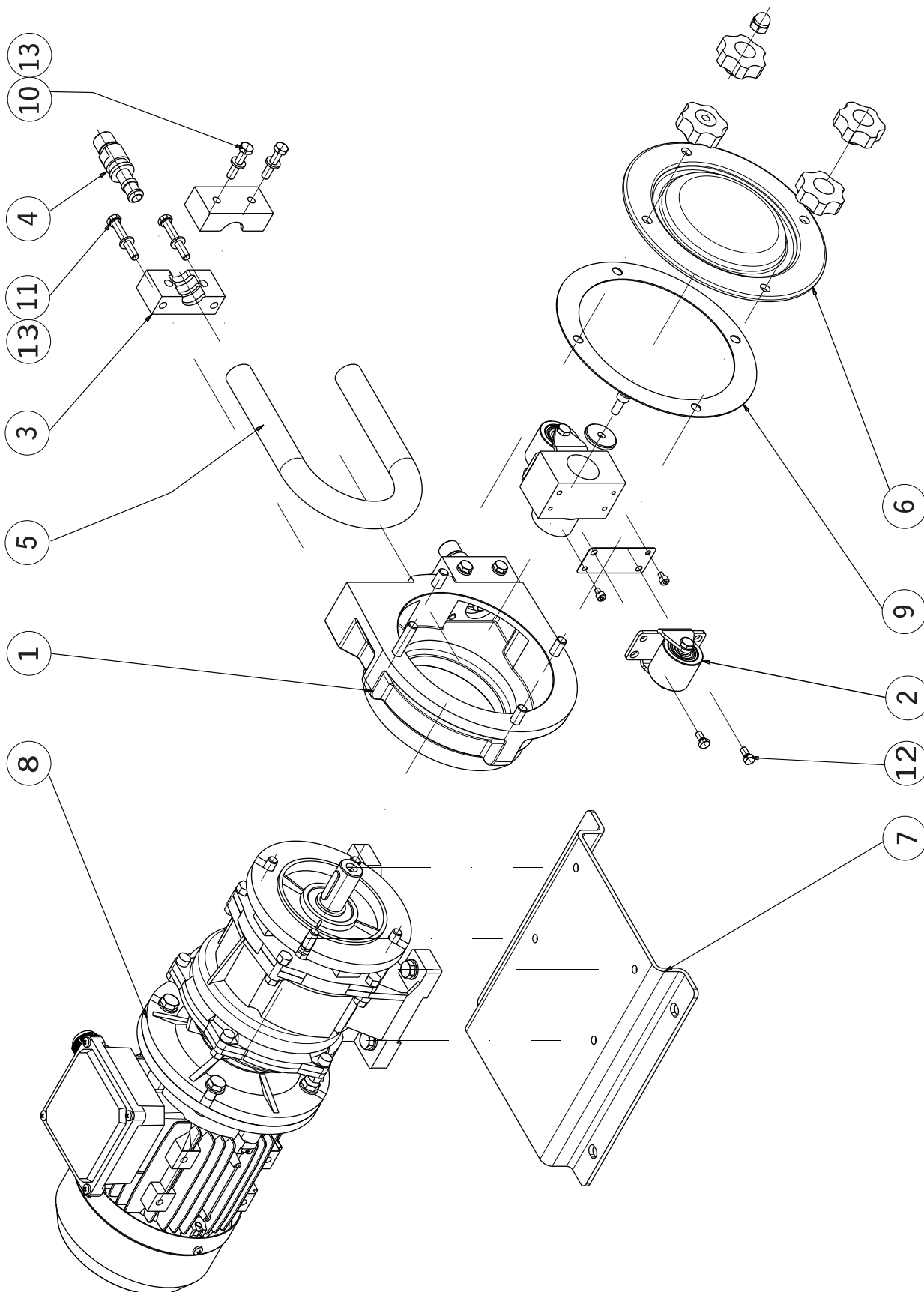
10. Troubleshooting

Problem	Possible cause	Solution
Increased pump temperature	Pump hose has no lubricant	Lubricate pump hose
	Increased product temperature	Reduce product temperature
	Insufficient or poor suction conditions	Check suction line condition
	Pump speed too high	Reduce pump speed
Reduced flow or pressure	Valves on discharge and or suction side completely or partially closed	Open valves
	Pump hose insufficiently compressed	Check number of shims
	Pump hose rupture (the product leaks out into the housing)	Exchange pump hose and clean pump
	Partial blockage of the suction line	Clean pipe
	Insufficient product quantity in storage container	Fill storage container or exchange pump
	Insufficient diameter on the suction side	Increase the diameter on the suction side, as far as possible
	Suction line too long	Shorten the suction line, as far as possible
	High viscosity of medium	Reduce viscosity, as far as possible
	Air introduction in the suction connections	Check connections and accessories for air tightness
	High pulsation on suction	Tighten connections and accessories Mount anti-pulsation equipment Reconsider application (speed, etc.)
Vibrations on pumps and pipelines	The pipes are not correctly fastened	Fasten pipes correctly (e.g. wall brackets)
	Pump speed too high	Reduce pump speed
	Insufficient nominal width of the pipes	Increase nominal width
	Pump base plate loose	Fasten base plate
	Pulsation dampers insufficient or missing	Install pulsation dampers on suction and / or discharge side

Short operational lifetime of the hoses	Chemical exposure	Check the compatibility of the hose with the liquid being conveyed, the cleaning fluid and the lubricant
	High pump speed	Reduce pump speed
	High conveying temperature	Reduce product temperature
	High operating pressure	Reduce operating pressure
	Pump cavitation	Check the suction conditions
	Abnormal elevation of temperature	Check number of shims
	Unsuitable lubricant	Use Boyser lubricant
	Insufficient quantity of lubricant	Reapply lubricant
Pump hose pulled into the pump housing	High inlet pressure (>3 bar)	Reduce inlet pressure
	Pump hose filled with deposits	Clean or replace the pump hose
	Holder (press flange) insufficiently tightened	Re-tighten holder (press flange)
	Insufficient lubricant	Reapply lubricant
The pump does not start up	Insufficient motor performance	Check motor and replace if necessary
	Insufficient output from frequency converter	The frequency converter must match the motor
	Blockage in the pump	Check voltage. Start occurs at minimum 10 Hz
	Blockage in the pump	Check if the suction or discharge side is blocked. Rectify blockage

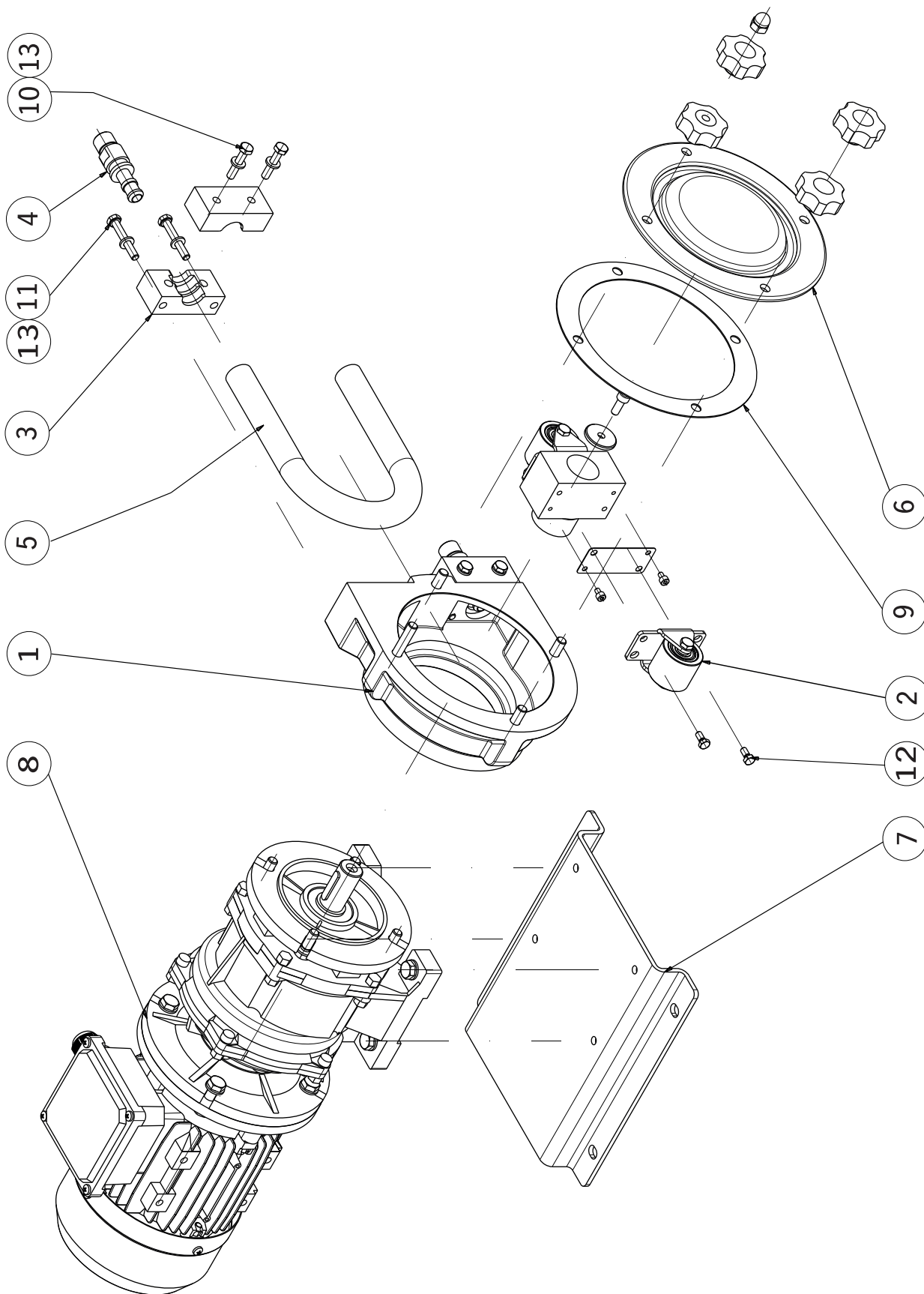
11. Spare parts exploded view AMP-10 model

11.1. Spare parts AMP-10 model



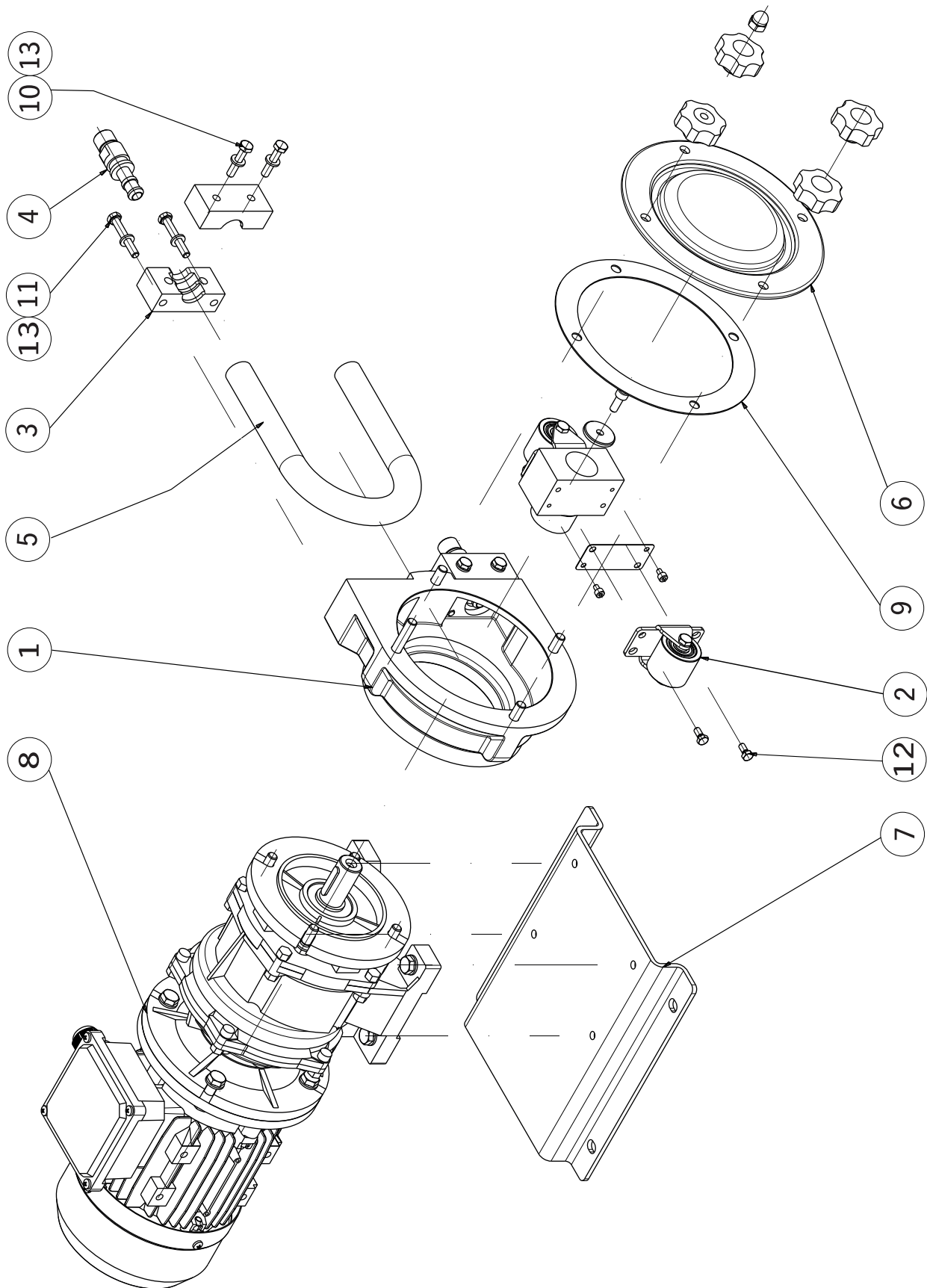
Pos.	Description	Qty	Reference
1	Pump Housing AMP-10B	1	102.01.01
2	Roller Kit	2	102.99.01
3	Press Flange Ø20	2	102.00.11
4	Connection Stainless Steel BSP 3/8" AMP-10B	2	102.00.10
4	Connection Polypropylene BSP 3/8" AMP-10B	2	102.00.15
4	Connection PVDF BSP 3/8" AMP-10B	2	102.00.16
4	Connection SS NPT 3/8" AMP-10B	2	102.00.17
4	Connection PVC NPT 3/8" AMP-10B	2	102.00.36
4	Connection PVDF NPT 3/8" AMP-10B	2	102.00.19
4	Connection Tri-Clamp 1/2" AMP-10B	2	102.00.22
4	Connection SS DIN 11851 NW-10 AMP-10B	2	102.00.20
5	Peristaltic Hose NR AMP-10B	1	102.00.27
5	Peristaltic Hose NR-A AMP-10B	1	102.00.32
5	Peristaltic Hose NBR AMP-10B	1	102.00.28
5	Peristaltic Hose NBR-A AMP-10B	1	102.00.29
5	Peristaltic Hose EPDM AMP-10B	1	102.00.30
5	Peristaltic Hose Hypalon AMP-10B	1	102.00.33
6	Plastic Cover AMP-10B	1	102.02.08
7	Base Plate AMP-10B	1	102.00.12
7	Base Plate, Stainless Steel AMP-10B	1	102.00.24
8	In-Line Helical Gear Reducer	1	
9	Cover Gasket AMP-10B	1	102.01.05
10	DIN 933 Hexagonal Head Cap Screw M6x30 Grade 8.8	4	TORDIN933M6x30
11	DIN 933 Hexagonal Head Cap Screw M6x40 Grade 8.8	4	TORDIN933M6x40
12	DIN 933 Hexagonal Head Cap Screw M5x10 Grade 8.8	4	TORDIN933M5X10
13	DIN 125A Flat Washer M6 Grade 8.8	8	ARANDIN125AM6

11.2. Spare parts exploded view AMP-10 Norprene / Silicone model



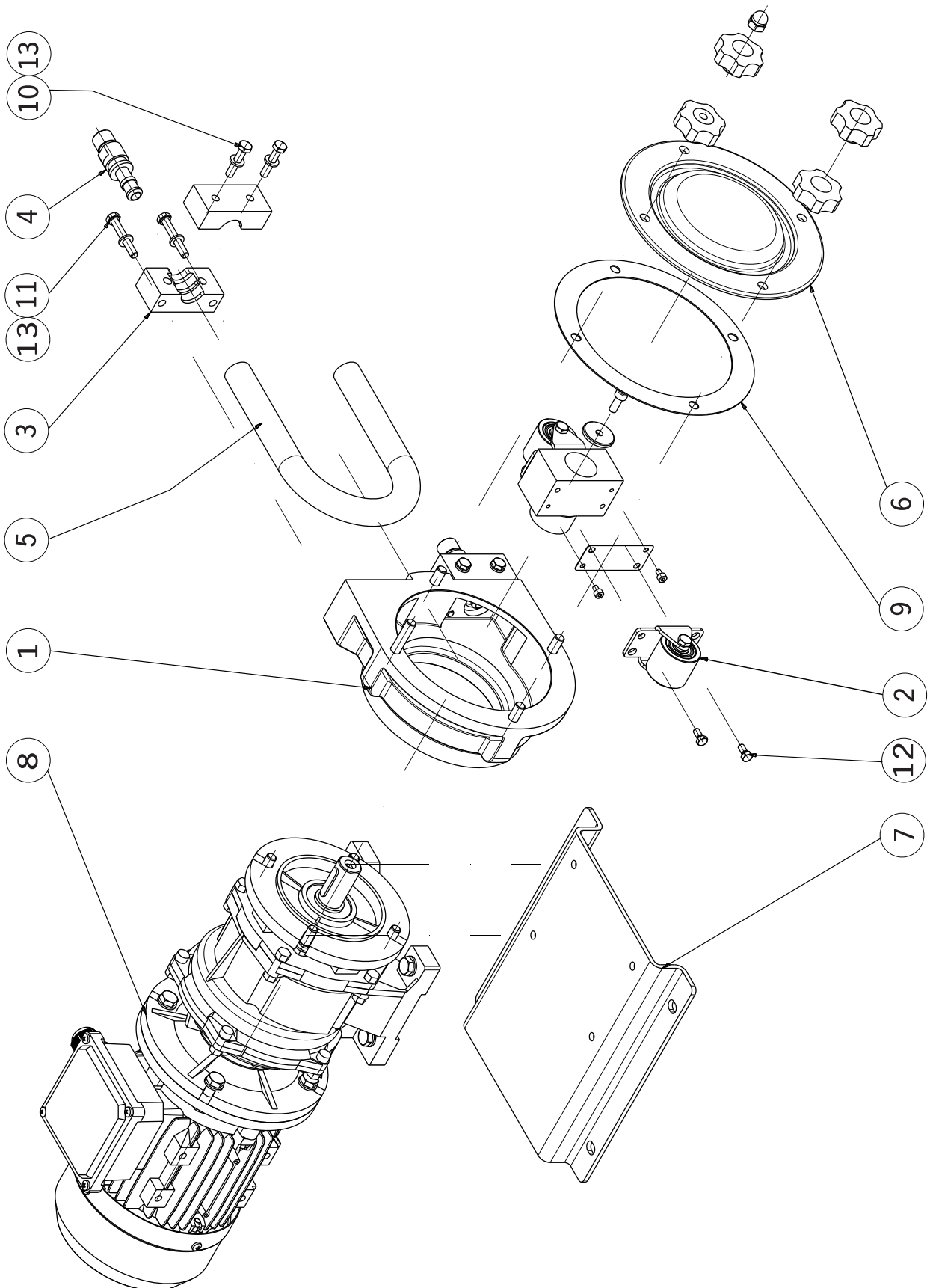
Pos.	Description	Qty	Reference
1	Pump Housing AMP-10B	1	102.01.01
2	Roller kit AMP-10B	2	102.99.01
3	Press Flange Ø18	2	102.00.23
4	Connection Stainless Steel BSP 3/8" AMP-10B	2	102.00.10
4	Connection Polypropylene BSP 3/8" AMP-10B	2	102.00.15
4	Connection PVDF BSP 3/8" AMP-10B	2	102.00.16
4	Connection SS NPT 3/8" AMP-10B	2	102.00.17
4	Connection PVC NPT 3/8" AMP-10B	2	102.00.36
4	Connection PVDF NPT 3/8" AMP-10B	2	102.00.19
4	Connection Tri-Clamp 1/2" AMP-10B	2	102.00.22
4	Connection SS DIN 11851 NW-10 AMP-10B	2	102.00.20
5	Peristaltic Hose NORPRENE AMP-10B	1	102.00.31
5	Peristaltic Hose SILICONE AMP-10B	1	102.00.45
6	Plastic Cover AMP-10B	1	102.02.08
7	Base Plate AMP-10B	1	102.00.12
7	Base Plate, Stainless Steel AMP-10B	1	102.00.24
8	Driver	1	
9	Cover Gasket AMP-10B	1	102.01.05
10	DIN 933 Hexagonal Head Cap Screw M6x30 Grade 8.8	4	TORDIN933M6x30
11	DIN 933 Hexagonal Head Cap Screw M6x40 Grade 8.8	4	TORDIN933M6x40
12	DIN 933 Hexagonal Head Cap Screw M5x10 Grade 8.8	4	TORDIN933M5X10
13	DIN 125A Flat Washer M6 Grade 8.8	8	ARANDIN125AM6

11.3. Spare parts exploded view AMP-13 model



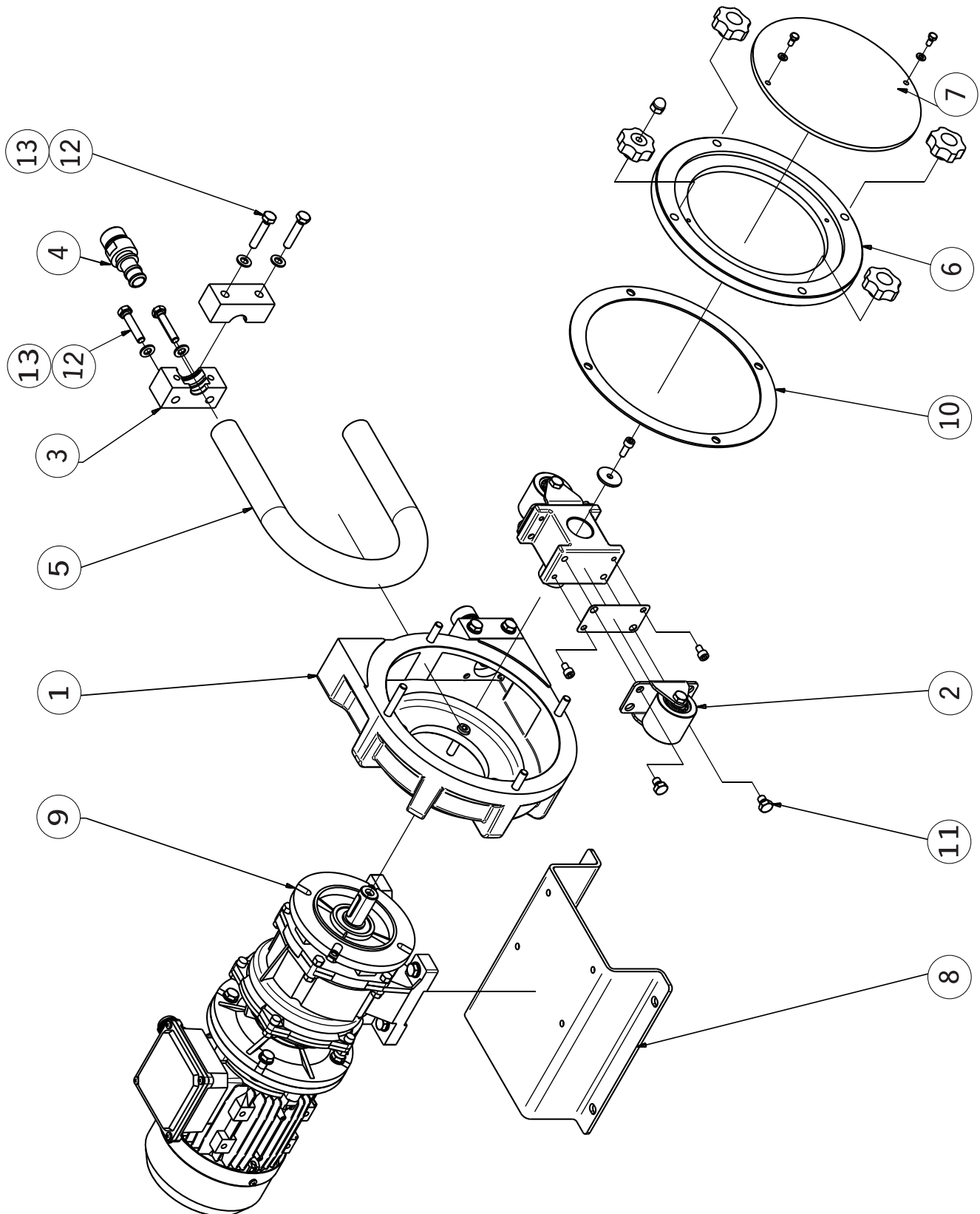
Pos.	Description	Qty	Reference
1	Pump Housing AMP-13B	1	102.01.01
2	Roller kit	2	102.99.01
3	Press Flange Ø23	2	103.00.11
4	Connection SS BSP 3/8" AMP-13B	2	103.00.10
4	Connection PP BSP 3/8" AMP-13	2	103.00.15
4	Connection PVDF BSP 3/8" AMP-13B	2	103.00.16
4	Connection SS NPT 3/8" AMP-13B	2	103.00.17
4	Connection PVC NPT 3/8" AMP-13B	2	103.00.37
4	Connection PVDF NPT 3/8" AMP-13B	2	103.00.19
4	Connection SS TRI-CLAMP 3/4" AMP-13B	2	103.00.22
4	Connection INOX DIN 11851 NW-15 AMP-13B	2	103.00.20
5	Peristaltic Hose NR AMP-13B	1	103.00.27
5	Peristaltic Hose NR-A AMP-13B	1	103.00.33
5	Peristaltic Hose NBR AMP-13B	1	103.00.28
5	Peristaltic Hose NBR-A AMP-13B	1	103.00.29
5	Peristaltic Hose EPDM AMP-13B	1	103.00.30
5	Peristaltic Hose HYPALON AMP-13B	1	103.00.32
6	Plastic Cover AMP-13B	1	102.02.08
7	Base Plate AMP-13B	1	102.00.12
7	Base Plate, Stainless Steel AMP-13B	1	102.00.24
8	Driver	1	
9	Cover Gasket AMP-13B	1	102.01.05
10	DIN 933 Hexagonal Head Cap Screw M6x30 Grade 8.8	4	TORDIN933M6x30
11	DIN 933 Hexagonal Head Cap Screw M6x40 Grade 8.8	4	TORDIN933M6x40
12	DIN 933 Hexagonal Head Cap Screw M5x10 Grade 8.8	4	TORDIN933M5X10
13	DIN 125A Flat Washer M6 Grade 8.8	8	ARANDIN125AM6

11.4. Spare parts exploded view AMP-13 Norprene / Silicone model



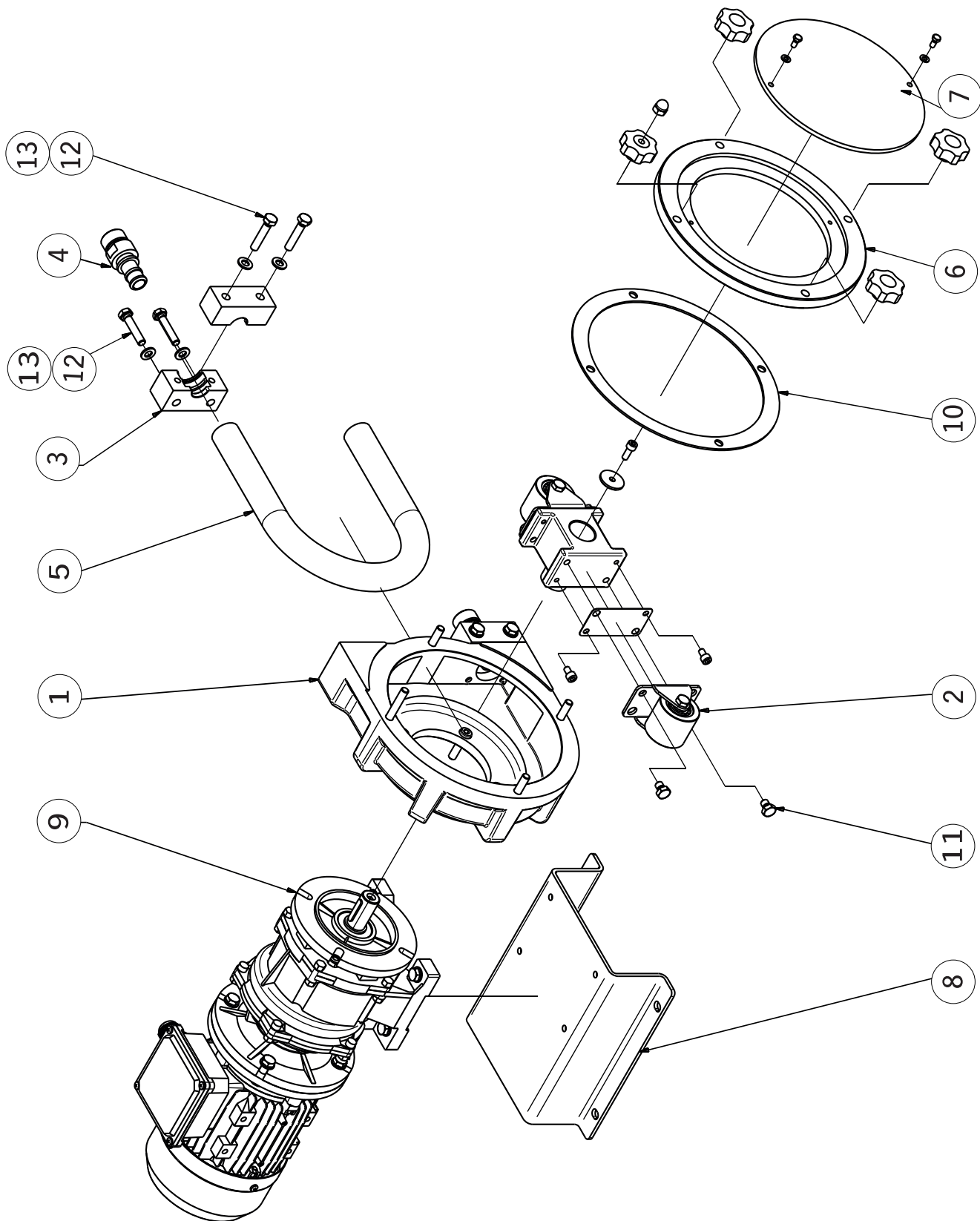
Pos.	Description	Qty	Reference
1	Pump Housing AMP-13B	1	102.01.01
2	Roller Kit	2	102.99.01
3	Press Flange Ø20	2	102.00.11
4	Connection SS BSP 3/8" AMP-13B	2	103.00.10
4	Connection PP BSP 3/8" AMP-13	2	103.00.15
4	Connection PVDF BSP 3/8" AMP-13B	2	103.00.16
4	Connection SS NPT 3/8" AMP-13B	2	103.00.17
4	Connection PVC NPT 3/8" AMP-13B	2	103.00.37
4	Connection PVDF NPT 3/8" AMP-13B	2	103.00.19
4	Connection SS TRI-CLAMP 3/4" AMP-13B	2	103.00.22
4	Connection INOX DIN 11851 NW-15 AMP-13B	2	103.00.20
5	Peristaltic Hose NORPRENE	1	103.00.31
5	Peristaltic Hose SILICONE AMP-13B	1	103.00.38
6	Plastic Cover AMP-13B	1	102.02.08
7	Base Plate AMP-13B	1	102.00.12
7	Base Plate, Stainless Steel AMP-13B	1	102.00.24
8	Driver	1	
9	Cover Gasket AMP-13B	1	102.01.05
10	DIN 933 Hexagonal Head Cap Screw M6x30 Grade 8.8	4	TORDIN933M6x30
11	DIN 933 Hexagonal Head Cap Screw M6x40 Grade 8.8	4	TORDIN933M6x40
12	DIN 933 Hexagonal Head Cap Screw M5x10 Grade 8.8	4	TORDIN933M5X10
13	DIN 125A Flat Washer M6 Grade 8.8	8	ARANDIN125AM6

11.5. Spare parts exploded view AMP-16 model



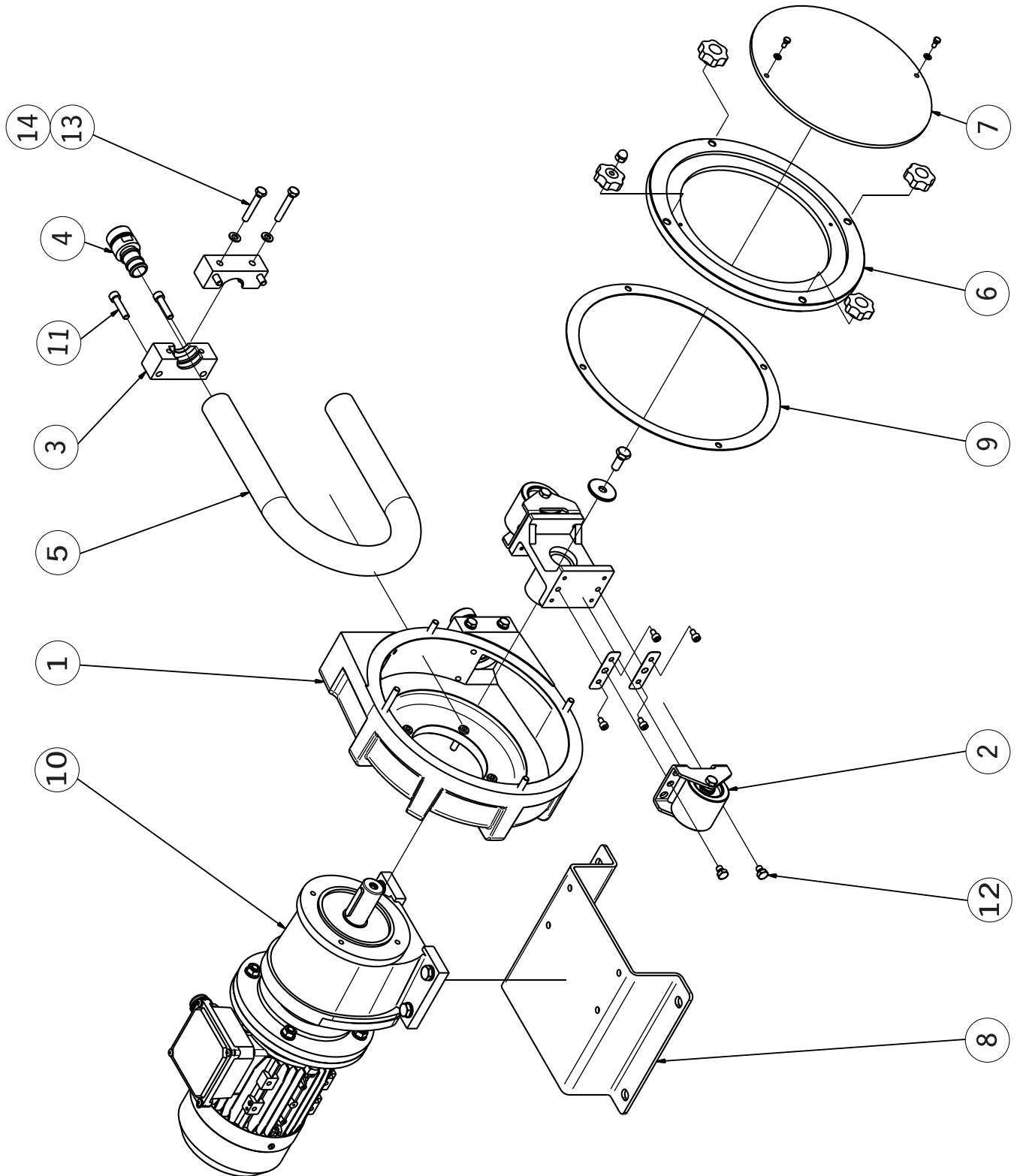
Pos.	Description	Qty	Reference
1	Pump housing	1	101.03.01
2	Roller Kit	2	101.99.01
3	Press Flange Ø28 mm	2	101.03.22
4	Connection S.S. BSP 3/4" AMP-16C	2	101.00.13
4	Connection PP BSP 3/4" AMP-16C	2	101.00.14
4	Connection PVDF BSP 3/4" AMP-16C	2	101.00.15
4	Connection S.S. NPT 3/4" AMP-16C	2	101.00.16
4	Connection PVC NPT 3/4" AMP-16C	2	101.00.34
4	Connection PVDF NPT 3/4" AMP-16C	2	101.00.18
4	Connection S.S. TRI-CLAMP 1" AMP-16C	2	101.00.21
4	Connection S.S. DIN 11851 NW20 AMP-16C	2	101.00.19
5	Peristaltic Hose NR AMP-16C	1	101.00.26
5	Peristaltic Hose NBR AMP-16C	1	101.00.27
5	Peristaltic Hose NBR-A AMP-16C	1	101.00.32
5	Peristaltic Hose EPDM AMP-16C	1	101.00.28
5	Peristaltic Hose HYPALON AMP-16C	1	101.00.33
6	Metallic Cover	1	101.03.11
7	Plastic Cover	1	101.00.12
8	Base Plate	1	101.00.24
8	Base Plate Stainless Steel	1	101.00.25
9	Driver	1	
10	Cover Gasket	1	101.02.40
11	DIN 933 Hexagonal Head Cap Screw M8x10 Grade 8.8	4	TORDIN933M8X10
12	DIN 933 Hexagonal Head Cap Screw M8x40 Grade 8.8	8	TORDIN933M8X40
13	DIN 125A Flat Washer M8 Grade 8.8	8	ARANDIN125AM8

11.6. Spare parts exploded view AMP-16 Norprene / Silicone model



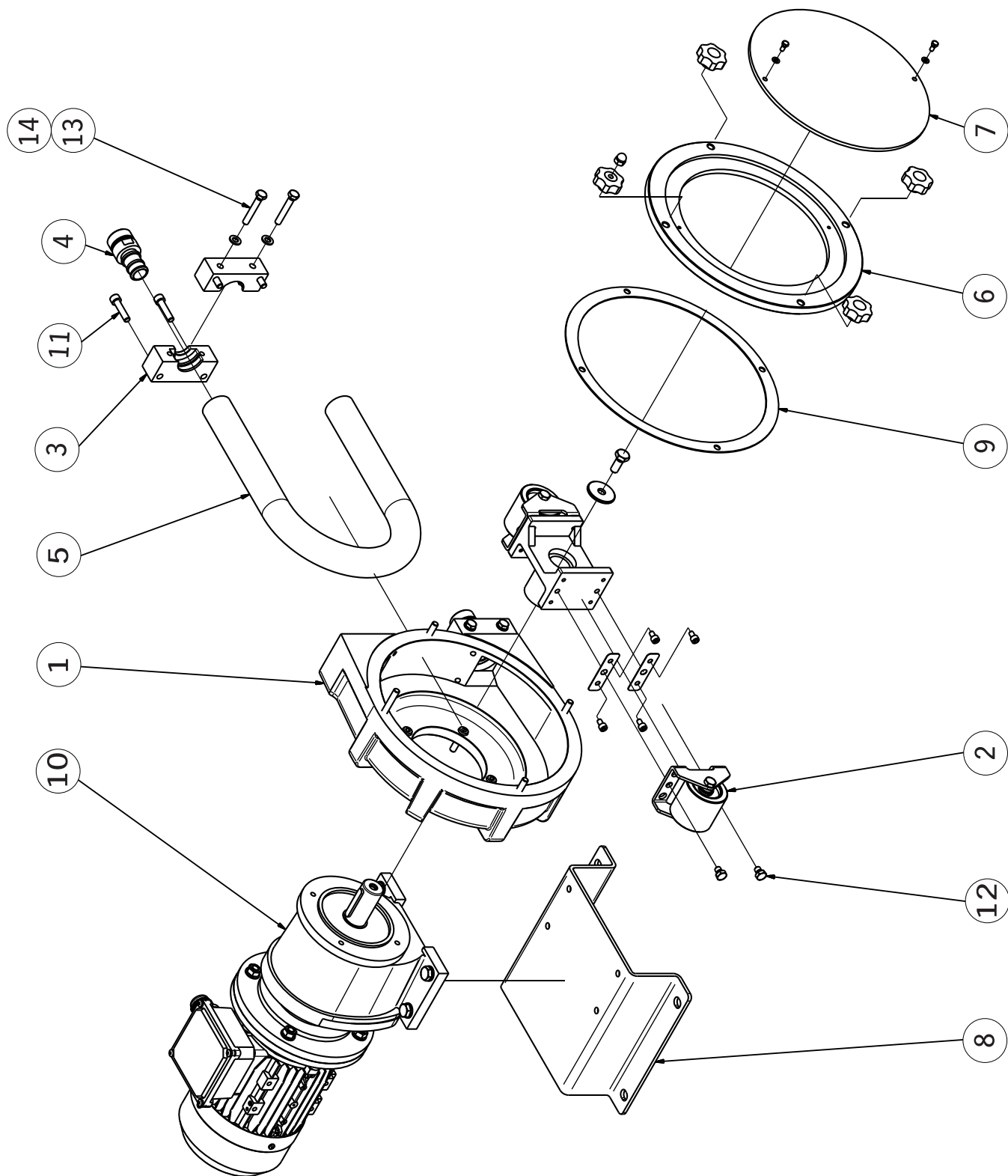
Pos.	Description	Qty	Reference
1	Pump housing	1	101.03.01
2	Roller Kit	2	101.99.01
3	Press flange Ø24 mm	2	101.03.23
4	Connection S.S. BSP 3/4" AMP-16C	2	101.00.13
4	Connection PP BSP 3/4" AMP-16C	2	101.00.14
4	Connection PVDF BSP 3/4" AMP-16C	2	101.00.15
4	Connection S.S. NPT 3/4" AMP-16C	2	101.00.16
4	Connection PVC NPT 3/4" AMP-16C	2	101.00.34
4	Connection PVDF NPT 3/4" AMP-16C	2	101.00.18
4	Connection S.S. TRI-CLAMP 1" AMP-16C	2	101.00.21
4	Connection S.S. DIN 11851 NW20 AMP-16C	2	101.00.19
5	Peristaltic Hose NORPRENE AMP-16C	1	101.00.30
5	Peristaltic Hose SILICONE AMP-16C	1	101.00.54
6	Metallic Cover	1	101.03.11
7	Plastic Cover	1	101.00.12
8	Base Plate	1	101.00.24
8	Base Plate Stainless Steel	1	101.00.25
9	Driver	1	
10	Cover Gasket	1	101.02.40
11	DIN 933 Hexagonal Head Cap Screw M8x10 Grade 8.8	4	TORDIN933M8X10
12	DIN 933 Hexagonal Head Cap Screw M8x40 Grade 8.8	8	TORDIN933M8X40
13	DIN 125A Flat Washer M8 Grade 8.8	8	ARANDIN125AM8

11.7 Spare parts exploded view AMP-22 model



Pos.	Description	Qty	Reference
1	Pump housing	1	113.00.01
2	Roller Kit	2	113.99.01
3	Press Flange Ø37 mm	2	113.00.19
4	Connection S.S. BSP 1" AMP-22	2	113.00.10
4	Connection PP BSP 1" AMP-22	2	113.00.11
4	Connection PVDF BSP 1" AMP-22	2	113.00.12
4	Connection S.S. NPT 1" AMP-22	2	113.00.13
4	Connection PVC NPT 1" AMP-22	2	113.00.40
4	Connection PVDF NPT 1" AMP-22	2	113.00.15
4	Connection S.S. TRI-CLAMP 1" AMP-22	2	113.00.18
4	Connection S.S. DIN 11851 NW25 AMP-22	2	113.00.16
5	Peristaltic Hose NR AMP-22	1	113.00.24
5	Peristaltic Hose NBR AMP-22	1	113.00.25
5	Peristaltic Hose NBR-A AMP-22	1	113.00.26
5	Peristaltic Hose EPDM	1	113.00.27
5	Peristaltic Hose HYPALON AMP-22	1	113.00.30
6	Metallic Cover AMP-22	1	113.01.08
7	Plastic Cover	1	113.00.09
8	Base plate	1	113.00.21
8	Base Plate S.S.	1	113.00.22
9	Cover Gasket	1	113.00.36
10	Driver	1	
11	DIN 912 Socket Cap Screw M8x35 Grade 8.8	8	TORDIN912M8X35
12	DIN 933 Hexagonal Head Cap Screw M8x10 Grade 8.8	4	TORDIN933M8X10
13	DIN 933 Hexagonal Head Cap Screw M8x50 Grade 8.8	4	TORDIN933M8X50
14	DIN 125A Flat Washer M8 Grade 8.8	4	ARANDIN125AM8

11.8. Spare parts exploded view AMP-22 Norprene / Silicone model



Pos.	Description	Qty	Reference
1	Pump housing	1	113.00.01
2	Roller Kit	2	113.99.01
3	Press Flange Ø33 mm	2	113.00.20
4	Connection S.S. BSP 1" AMP-22	2	113.00.10
4	Connection PP BSP 1" AMP-22	2	113.00.11
4	Connection PVDF BSP 1" AMP-22	2	113.00.12
4	Connection S.S. NPT 1" AMP-22	2	113.00.13
4	Connection PVC NPT 1" AMP-22	2	113.00.40
4	Connection PVDF NPT 1" AMP-22	2	113.00.15
4	Connection S.S. TRI-CLAMP 1" AMP-22	2	113.00.18
4	Connection S.S. DIN 11851 NW25 AMP-22	2	113.00.16
5	Peristaltic Hose NORPRENE AMP-22	1	113.00.28
5	Peristaltic Hose SILICONE AMP-22	1	113.00.42
6	Metallic Cover AMP-22	1	113.01.08
7	Plastic Cover	1	113.00.09
8	Base plate	1	113.00.21
8	Base Plate S.S.	1	113.00.22
9	Cover Gasket	1	113.00.36
10	Driver	1	
11	DIN 912 Socket Cap Screw M8x35 Grade 8.8	8	TO RDIN912M8X35
12	DIN 933 Hexagonal Head Cap Screw M8x10 Grade 8.8	4	TORDIN933M8X10
13	DIN 933 Hexagonal Head Cap Screw M8x50 Grade 8.8	4	TORDIN933M8X50
14	DIN 125A Flat Washer M8 Grade 8.8	4	ARANDIN125AM8

12. End-of-Life



WARNING! Danger from hazardous substances!

Possible consequence: Fatal or very serious injuries.

Customer must decontaminate the pump with suitable agents (refer to the material safety data sheet for the fluid).

12.1. Recycling

Once cleaned the following components can be scrapped/recycled:

- Pump housing
- Rotor and rollers
- Baseplate
- Drive

Some specialist disassembly may be required.

12.2. Recycling-Repurposing

The following components even when cleaned must still be prepared for special waste disposal.

Customer is responsible to follow local legislation for reuse or environmentally friendly processing of packaging materials, (contaminated) lubricant, oil and the following components.

- Hose
- Plastic

Once the hose has been cleaned it may be disposed of using the same methods as car tyre disposal **follow local regulations.**



EC DECLARATION OF CONFORMITY

BOMBAS BOYSER, S.L.

C/.Miquel Martí i Pol, s/n Pol. Ind.Pla de la Costa - 08182 Sant Feliu de Codines - (Barcelona) Spain
Company responsible for manufacturing and commercializing the below specified machine:

AMP SERIES PERISTALTIC PUMP

Declare under our sole responsibility:

Its conformity in accordance with all applicable provisions of the Machinery Directive (2006/42/EC), Low Voltage Directive (2014/35/EU), Electromagnetic Compatibility and Repealing Directive (2014/30/EU), national applicable regulations, and with the provisions of the following standards applied:

<u>Reference Standard</u>	<u>Title of the harmonized standard</u>	<u>Publication date</u>
EN-ISO-12100	Safety of machinery - General principles for design - Risk assessment and risk reduction.	2012
EN-614-1	Safety of machinery – Ergonomic design principles- Part 1: Terminology and general principles.	2006+A1/2009
EN- ISO-14120	Safety of machinery-Guards- General requirements for the design and construction of fixed and movable guards.	2016
EN-60204-1	Safety of machinery-Electrical equipment of machines- Part 1: General requirements.	2007/A1:2009
EN-60335-1	Household and similar electrical appliances - Safety - Part 1: General requirements	2012/A11:2014
EN-60034-1	Rotating electrical machines - Part 1: Rating and performance	2010/AC:2010
EN-809	Pumps and pump units for liquids - Common safety requirements.	1999+A1/2010
EN-ISO-14847	Rotary positive displacement pumps- Technical requirements.	1999

This declaration refers only to machines in the state of the market, with exclusion of the elements added and / or operations carried out subsequently by the end user.

The pump should not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 2006/42/EC.


Juan Jofresa
 Managing Director
 Bombas Boyser



www.boyser.com

Set. 2023