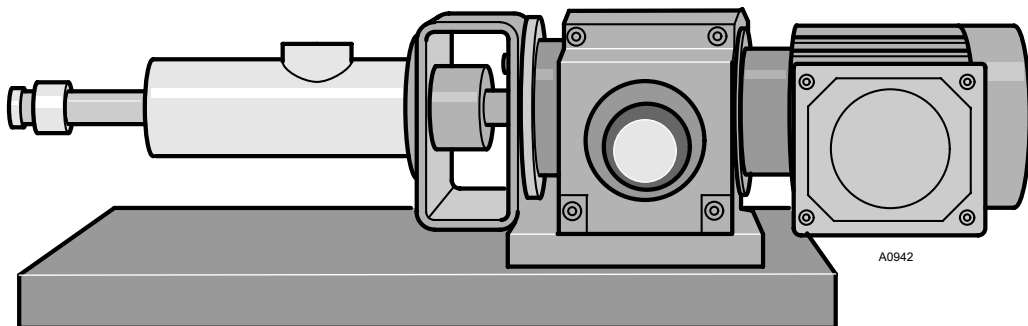


Assembly and operating instructions

ProMinent Spectra

Eccentric screw pump

EN



Year of construction 06/2021 onwards

Target group: at least trained and qualified personnel, unless otherwise required.

**Please carefully read these operating instructions before use. · Do not discard.
The operator shall be liable for any damage caused by installation or operating errors.
The latest version of the operating instructions are available on our homepage.**

General non-discriminatory approach

In order to make it easier to read, this document uses the male form in grammatical structures but with an implied neutral sense. The document is always aimed equally at women, men and gender-neutral persons. We kindly ask readers for their understanding in this simplification of the text.

Supplementary information


➔ Please read the supplementary information in its entirety.

Information



This provides important information relating to the correct operation of the unit or is intended to make your work easier.

Warning information

Warning information includes detailed descriptions of the hazardous situation, see  *Chapter 2.1 'Labelling of Warning Information' on page 6.*

The following symbols are used to highlight instructions, links, lists, results and other elements in this document:

Tab. 1: More symbols


Symbol	Description
1. ➔	Action, step by step.
⇒	Outcome of an action.
	Links to elements or sections of these instructions or other applicable documents.
■	List without set order.
[Button]	Display element (e.g. indicators). Operating element (e.g. button, switch).
'Display/GUI'	Screen elements (e.g. buttons, assignment of function keys).
CODE	Presentation of software elements and/or texts.

Table of contents

1	Function	5
2	Safety and responsibility	6
	2.1 Labelling of Warning Information.....	6
	2.2 User qualification.....	8
	2.3 Intended use.....	8
	2.4 General safety information.....	9
3	Transport and storage	10
	3.1 Packaging.....	10
	3.2 Transport.....	10
	3.3 Storage of the pump.....	10
4	Set-up and installation	11
	4.1 Installation.....	11
	4.2 Base.....	11
	4.3 Space requirement for maintenance and repair.....	12
	4.4 Routing the pipework.....	12
	4.4.1 Nominal widths.....	12
	4.4.2 Supports and pipework connectors.....	13
	4.4.3 Cleaning the pipework prior to installation.....	13
	4.5 Safety and monitoring equipment.....	13
	4.5.1 Overpressure.....	13
	4.5.2 Dry-running protection.....	13
	4.6 Electrical connectors.....	14
5	Commissioning / decommissioning	15
	5.1 Preparation for commissioning.....	15
	5.1.1 Filling the pump with liquid.....	15
	5.1.2 Breaking free the pump.....	15
	5.1.3 Control of the direction of rotation.....	16
	5.2 Commissioning.....	16
	5.3 Decommissioning.....	17
6	Maintenance of the rotor and stator	18
	6.1 General monitoring.....	18
	6.2 Lubricant specification.....	18
	6.3 Maintenance of the axial face seal.....	19
	6.4 Maintenance of the drive motors.....	19
	6.5 Maintenance of the joints.....	19
	6.6 Maintenance of the rotor and stator.....	19
7	Preventative maintenance (dismantling and assembly instructions)	21
	7.1 Dismantling the Spectra AFJ 06 / 08 / 10.....	22
	7.1.1 Dismantling the stator.....	22
	7.1.2 Dismantling the rotor and the rotor-side joint.....	22
	7.1.3 Dismantling the cardan shaft and the drive-side joint.....	22
	7.1.4 Dismantling the axial face seal.....	23
	7.1.5 Dismantling the connecting housing.....	23
	7.2 Assembly of the Spectra AFJ 06 / 08 / 10.....	23
	7.2.1 Installation of the connecting housing.....	24
	7.2.2 Installation of the axial face seal.....	24
	7.2.3 Installation of the drive-side joint and cardan shaft..	25

7.2.4	Installation of the rotor and stator.....	25
7.3	Dismantling the Spectra AFJ 15.1 / 20.1 / 30.1 / 40.1 / 50.1.....	26
7.3.1	Dismantling the stator.....	27
7.3.2	Dismantling the rotor and the rotor-side joint.....	27
7.3.3	Dismantling the rotor and the drive-side joint.....	28
7.3.4	Dismantling the axial face seal.....	29
7.3.5	Dismantling the drive shaft.....	29
7.4	Assembly of the Spectra AFJ 15.1 / 20.1 / 30.1 / 40.1 / 50.1.....	30
7.4.1	Installation of the drive shaft.....	31
7.4.2	Installation of the axial face seal.....	31
7.4.3	Installation of the drive-side joint and cardan shaft..	32
7.4.4	Installation of the rotor and stator.....	33
8	Possible faults and their rectification.....	34
9	Disposal of used parts.....	37
10	Technical data.....	38
10.1	Oil: Filling volumes and specification.....	38
10.2	Pump characteristic lines.....	38
10.2.1	Pump characteristic line for AFJ 06.....	38
10.2.2	Pump characteristic line for AFJ 08.....	39
10.2.3	Pump characteristic line for AFJ 10.....	40
10.2.4	Pump characteristic line for AFJ 15.1.....	41
10.2.5	Pump characteristic line for AFJ 20.1.....	42
10.2.6	Pump characteristic line for AFJ 30.1.....	43
10.2.7	Pump characteristic line for AFJ 40.1.....	44
10.2.8	Pump characteristic line for AFJ 50.1.....	45
11	Spare parts.....	46
11.1	Wear and spare parts.....	46
11.2	Spare parts list for AFJ 06 / 08 / 10.....	46
11.3	Spare parts list for AFJ 15.1 / 20.1.....	48
11.4	Spare parts list for AFJ 30.1 / 40.1 / 50.1.....	50
12	EC Declaration of Conformity for Machinery.....	52
13	Index.....	53

1 Function

The eccentric screw pump is a self-priming rotary displacement pump. The eccentric screw pump is suitable for pumping and metering liquid polymer solutions up to a viscosity of 5000 mPas. Users need to take into account a reduced pump capacity with higher-viscosity polymer solutions.

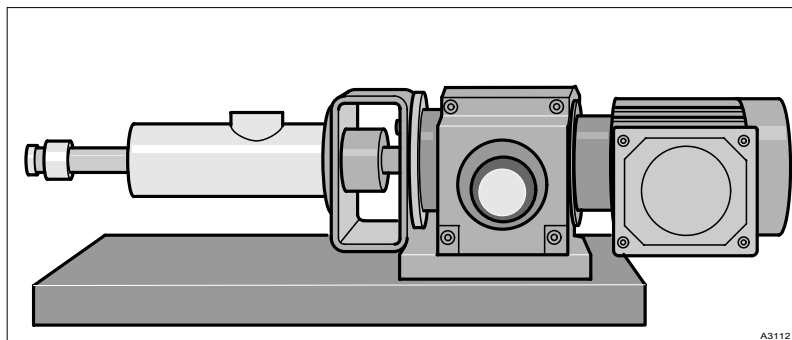


Fig. 1: Eccentric screw pump Spectra

Tab. 2: Pumps with gear motor:

Order no.	Designation	Pump capacity (l/h) at 3 bar	maximum back pressure (bar)
1113128	Spectra AFJ 06 without base plate	2.5 ... 31	12
1113129	Spectra AFJ 08 without base plate	8 ... 70	12
1113130	Spectra AFJ 10 without base plate	21 ... 200	12
1113131	Spectra AFJ 15.1 without base plate	80 ... 580	3
1113132	Spectra AFJ 20.1 without base plate	290 ... 1320	3
1113133	Spectra AFJ 30.1 without base plate	530 ... 2600	3
1113134	Spectra AFJ 40.1 without base plate	1000 ... 5400	3
1113135	Spectra AFJ 50.1 without base plate	3500 ... 12000	3
1113090	Spectra AFJ 06 BP with base plate	2.5 ... 31	12
1113091	Spectra AFJ 08 BP with base plate	8 ... 70	12
1113092	Spectra AFJ 10 BP with base plate	21 ... 200	12
1113093	Spectra AFJ 15.1 BP with base plate	80 ... 580	3
1113124	Spectra AFJ 20.1 BP with base plate	290 ... 1320	3
1113125	Spectra AFJ 30.1 BP with base plate	530 ... 2600	3
1113126	Spectra AFJ 40.1 BP with base plate	1000 ... 5400	3
1113127	Spectra AFJ 50.1 BP with base plate	3500 ... 12000	3

2 Safety and responsibility

2.1 Labelling of Warning Information

Introduction

These operating instructions provide information on the technical data and functions of the product. These operating instructions provide detailed warning information and are provided as clear step-by-step instructions.

The warning information and notes are categorised according to the following scheme. A number of different symbols are used to denote different situations. The symbols shown here serve only as examples.



DANGER!

Nature and source of the danger

Consequence: Fatal or very serious injuries.

Measure to be taken to avoid this danger.

Description of hazard

- Denotes an immediate threatening danger. If the situation is disregarded, it will result in fatal or very serious injuries.



WARNING!

Nature and source of the danger

Possible consequence: Fatal or very serious injuries.

Measure to be taken to avoid this danger.

- Denotes a possibly hazardous situation. If the situation is disregarded, it could result in fatal or very serious injuries.



CAUTION!

Nature and source of the danger

Possible consequence: Slight or minor injuries.
Material damage.

Measure to be taken to avoid this danger.

- Denotes a possibly hazardous situation. If the situation is disregarded, it could result in slight or minor injuries. May also be used as a warning about material damage.



NOTICE!

Nature and source of the danger

Damage to the product or its surroundings.

Measure to be taken to avoid this danger.

- Denotes a possibly damaging situation. If the situation is disregarded, the product or an object in its vicinity could be damaged.



Type of information

Hints on use and additional information.

Source of the information. Additional measures.

- *Denotes hints on use and other useful information. It does not indicate a hazardous or damaging situation.*

2.2 User qualification



WARNING!

Danger of injury with inadequately qualified personnel

The operator of the system / equipment is responsible for ensuring that the qualifications are fulfilled.

If inadequately qualified personnel work on the unit or loiter in the hazard zone of the unit, this could result in dangers that could cause serious injuries and material damage.

- All work on the unit should therefore only be conducted by qualified personnel.
- Unqualified personnel should be kept away from the hazard zone.

The pertinent accident prevention regulations, as well as all other generally acknowledged safety regulations, must be adhered to.

Training	Definition
Instructed personnel	An instructed person is deemed to be a person who has been instructed and, if required, trained in the tasks assigned to him and possible dangers that could result from improper behaviour, as well as having been instructed in the required protective equipment and protective measures.
Trained user	A trained user is a person who fulfils the requirements made of an instructed person and who has also received additional training specific to the system from the manufacturer or another authorised distribution partner.
Trained, qualified personnel	A trained, qualified employee is deemed to be a person who is able to assess the tasks assigned to him and recognize possible hazards based on his training, knowledge and experience, as well as knowledge of pertinent regulations. A trained, qualified employee must be able to perform the tasks assigned to him independently with the assistance of drawing documentation and parts lists. The assessment of a person's technical training can also be based on several years of work in the relevant field.
Electrical technician	An electrical technician is able to complete work on electrical systems and recognise and avoid possible dangers independently based on his technical training and experience as well as knowledge of pertinent standards and regulations. An electrical technician must be able to perform the tasks assigned to him independently with the assistance of drawing documentation, parts lists, terminal and circuit diagrams. The electrical technician must be specifically trained for the working environment in which the electrical technician is employed and be conversant with the relevant standards and regulations.
Service	The Service department refers to service technicians, who have received proven training and have been authorised by the manufacturer to work on the system.

2.3 Intended use

Correct and proper use:

- The pump is intended for the transport of liquids.
- Only use the pump in accordance with the technical data and specifications set out in these operating instructions.

2.4 General safety information



WARNING!

Danger from hazardous substances!

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacture of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.



WARNING!

Hazardous media / contamination of persons and equipment

Possible consequence: fatal or very serious injuries. Material damage.

- Ensure that the unit is resistant to the medium being pumped.
- Always refer to the material safety data sheet for the medium being pumped.
- The material safety data sheet for the medium being pumped is crucial when it comes to initiating countermeasures in the event of leakage of the medium being pumped.
- Note the general limitations regarding viscosity limits, chemical resistance and density.



CAUTION!

Hot surface

The pump can also heat up when pumping hot liquids. The pump can therefore have hot surfaces. Bear this in mind and take appropriate measures to minimise any hazards.



Operation in the open air and outdoors

- *Take appropriate measures to protect the unit from environmental influences when operating it outdoors, such as:*
 - *UV radiation*
 - *Humidity*
 - *Frost etc.*

3 Transport and storage

- **User qualification, transport and storage:** trained user
↳ Chapter 2.2 'User qualification' on page 8

3.1 Packaging

- ➔ Use plugs to seal the suction and discharge side of the pump during transport and storage.

3.2 Transport

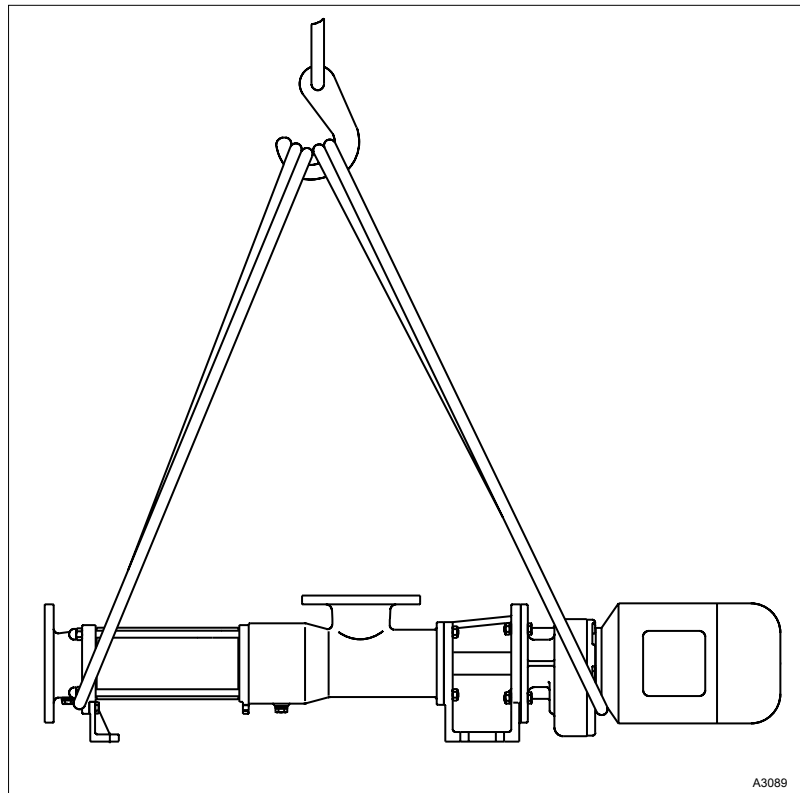


Fig. 2: Fastening the cable slings

1. ➔ Fasten the cable slings as follows when transporting the unit by crane, Fig. 2
2. ➔ Refer to the "Technical data" chapter for the weight of your pump.

3.3 Storage of the pump

Make sure that the unit is fully drained before storage.

Keep any gases that could cause corrosion away from the storage space.

Tab. 3: Permissible storage conditions:

+ 5 °C ... 60 °C

< 70% relative air humidity (non-condensing)

4 Set-up and installation

- **User qualification, installation:** trained and qualified personnel
↳ Chapter 2.2 'User qualification' on page 8
- **User qualification, hydraulic installation:** trained and qualified personnel
↳ Chapter 2.2 'User qualification' on page 8
- **User qualification, electrical installation:** electrical technician
↳ Chapter 2.2 'User qualification' on page 8

4.1 Installation

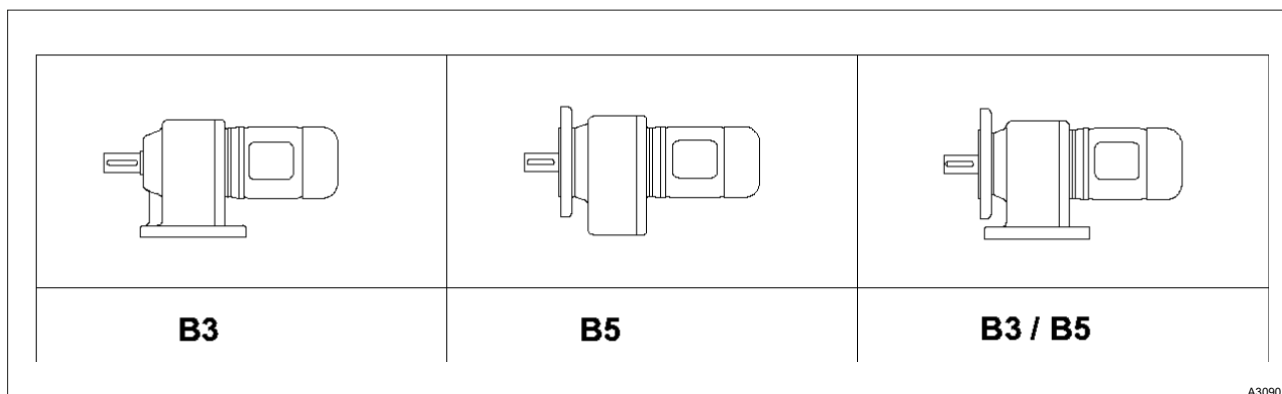


Fig. 3: Installation

The drives of the pumps are supplied as mounting forms B3, B5 and B3/5. Only set up and operate the pumps when installed horizontally. No other types of installation are permitted.

4.2 Base

The configuration of the base is dependent on the model size of the pump/units and the local conditions. Refer to the dimensional drawing for information on the pump / unit dimensions.

Types of base:

- Concrete
- Steel frame

With all base designs, distribute the weight of the pump unit across the total surface of the base. Fix the base plate in a tension-free manner on the base by evenly tightening the fixing bolts.

4.3 Space requirement for maintenance and repair

Make sure that the pump is accessible from all sides to enable the necessary visual inspections as well as maintenance and repair work.

You need to be able to fit and dismantle all pipework without obstructions.

Provide adequate space in front of the pump to dismantle the stator. Refer to following table for the space required to dismantle the stator:

Tab. 4: Stator dismantling dimension I

Spectra	Stator dismantling dimension I in the diagram	Number of stages
AFJ 06 / 06 BP	120 mm	3
AFJ 08 / 08 BP	150 mm	3
AFJ 10 / 10 BP	180 mm	3
AFJ 15.1 / 15.1 BP	100 mm	1
AFJ 20.1 / 20.1 BP	115 mm	1
AFJ 30.1 / 30.1 BP	175 mm	1
AFJ 40.1 / 40.1 BP	230 mm	1
AFJ 50.1 / 50.1 BP	??? mm	1

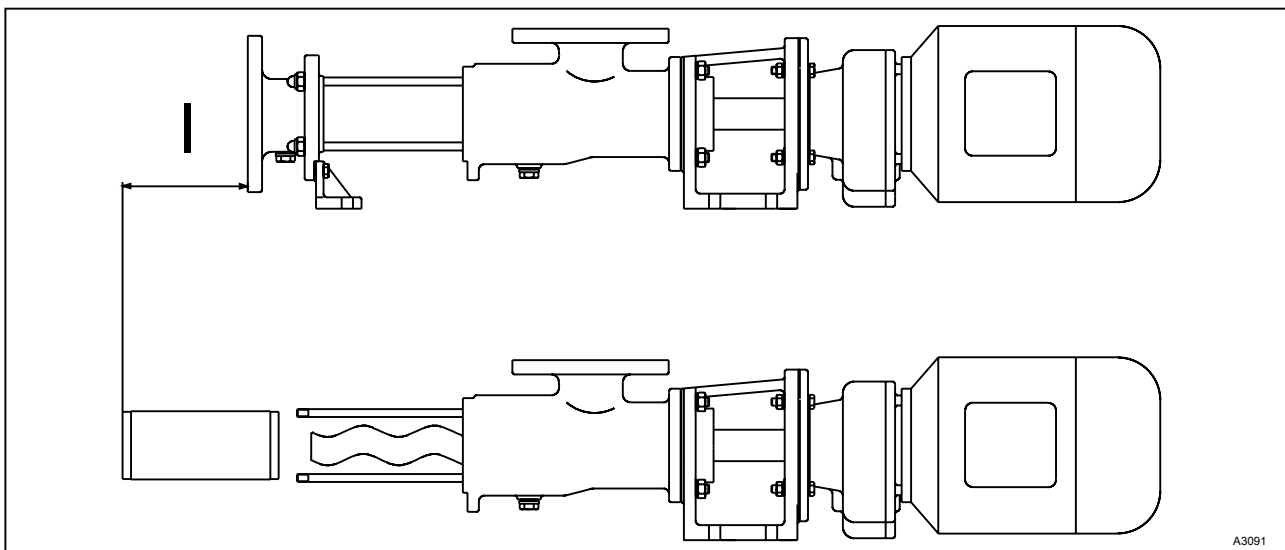


Fig. 4: Stator dismantling dimension I in the table ↪ Tab. 4 'Stator dismantling dimension I' on page 12

4.4 Routing the pipework

4.4.1 Nominal widths

Select the nominal widths of the suction and pressure line according to the pressure losses in the pipework. Avoid rough deviations from the nominal width of the pump nozzles, specifically on the suction side.

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4.4.2 Supports and pipework connectors

Ensure that the suction line is as short as possible and rises constantly towards the pump. Provide support for the pipework close to the pump. Ensure that you can easily screw the pipework to the connecting nozzle of the pump to avoid any tension.

4.4.3 Cleaning the pipework prior to installation

**WARNING!****Danger from hazardous substances!**

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacture of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.

Flush through and/or clean the suction-side pipework, sliders and valves before installing the pump. This will remove any remains from the installation, such as screws, nuts, welding beads and similar metal components, which could damage the interior components of the pump.

4.5 Safety and monitoring equipment

4.5.1 Overpressure

Eccentric screw pumps are rotary displacement pumps and can theoretically generate an endlessly high pressure.

In the event of the pressure line being closed, for instance due to a blockage or accidental closure of the valve, the pump pressure can reach many times more than the permissible pressure of the system. This can lead to irreparable damage to the pump, overloading of the motor or the rupture of lines.

It is the responsibility of the operator to install a safety relief valve or another appropriate component in the pressure line upstream of the shut-off valve directly adjacent to the pump in stationary pump systems.

4.5.2 Dry-running protection

Eccentric screw pumps are very susceptible to running dry. It takes only very few revolutions without medium to first irreparably damage the stator and then also the rotor. Ideally, the suction line should be as short as possible and the product should run automatically to the pump. Always fill the pump with medium during initial commissioning.

Dry-running protection in the form of an appropriate flow monitor offers additional safety. You can fit the flow monitor in the suction or pressure line of the pump.

4.6 Electrical connectors

- ➔ Connect the pump to the on-site electrical installation in accordance with the terminal diagram supplied.

5 Commissioning / decommissioning

- **User qualification, commissioning / decommissioning:** trained and qualified personnel ↪ *Chapter 2.2 'User qualification' on page 8*

5.1 Preparation for commissioning

5.1.1 Filling the pump with liquid

Never allow the pump to run dry!



WARNING!

Danger from hazardous substances!

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacture of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.

With regard to flushing liquids, check and note the corrosion and material resistance of the wetted components.

Fill the pump with pumping liquid through the suction and pressure nozzles during initial commissioning and after longer downtimes. Even a few revolutions without liquid can damage the stator. Filling the pump with water or a pumping liquid helps to lubricate the rotor and stator. The filling process also needs to be repeated after repairs. Once filled, the pump is self-priming. There is no need to bleed the pump.

5.1.2 Breaking free the pump

1. ➤ The rotor and stator can stick prior to initial start-up or after extended downtimes. You can prevent them from sticking by briefly pressing the motor switch several times.
2. ➤ If this measure does not work, use a collet chuck to turn the stator on the rotor. To do so, dismantle the pump nozzle and turn the stator until a bolt can be used to block the drive shaft on the mounting socket.
3. ➤ Now use a collet chuck to turn the stator until the blockage between the stator and rotor has been removed.
4. ➤ You can now reassemble the pump and remove the bolt blocking the drive shaft.

5.1.3 Control of the direction of rotation

You need to define the pumping direction of the pump prior to commissioning. Do not allow the pump to run dry when doing so. Briefly switch on the pump motor and define the direction of rotation of the motor.

The direction of rotation of the motor of model size AF J 06 ... AFJ 10 is counter-clockwise, and the pumping direction of the medium runs from the pump housing to the nozzle.

Due to their construction, both directions of rotation are possible with model sizes AFJ 15.1 / AFJ 20.1 / AFJ 30.1 / AFJ 40.1 / AFJ 50.1.

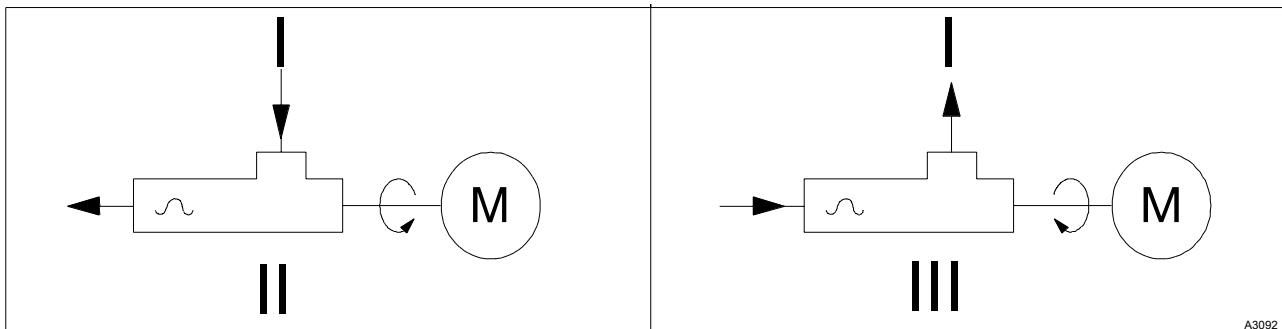


Fig. 5: Control of the direction of rotation

- I Direction of flow
- II counter-clockwise
- III clockwise

5.2 Commissioning



WARNING!

Danger from hazardous substances!

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacture of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.

1. ➤ Open the suction-side and pressure-side shut-off devices.
2. ➤ Switch on the motor.
3. ➤ Use an ammeter to check the power consumption to avoid overloading the motor.
4. ➤ Make sure that the flow of liquid on the suction side never fully stops to prevent the pump from running dry. We recommend fitting an appropriate dry-running protection device if this cannot be ruled out.

5.3 Decommissioning

**WARNING!****Danger from hazardous substances!**

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacture of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.

1. ➤ Switch off the motor.
2. ➤ Clean the pump if decommissioning it for a longer period of time.
3. ➤ Fully drain the pump if there is a risk of frost.

6 Maintenance of the rotor and stator

- **User qualification, maintenance / repair:** trained and qualified personnel ↪ *Chapter 2.2 'User qualification' on page 8*



WARNING!

Danger from hazardous substances!

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacturer of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.

6.1 General monitoring

General monitoring – interval at the discretion of the operator:

The inspection intervals are dependent on the conditions of use. The following applies: Select shorter inspection intervals the larger the pump and the tougher the conditions of use.

1. ▶ Check the suction and discharge lift.
2. ▶ Check whether the motor bearings are heating up and generating noise.
3. ▶ Check the power consumption of the motor.

6.2 Lubricant specification

Grease used

Multi-purpose grease:

- K 2 K – 30
- DIN 51502

Oil used

Industrial gear oil

- CLP DIN 51517 T3
- ISO VG 220

Assignment and quantities of lubricant

Tab. 5: Required quantity of lubricant

Model size	Lubricant	Volume per joint
AFJ 06	Grease	5 g
AFJ 08	Grease	5 g
AFJ 10	Grease	5 g

Model size	Lubricant	Volume per joint
AFJ 15.1	Oil	25 ml
AFJ 20.1	Oil	25 ml
AFJ 30.1	Oil	40 ml
AFJ 40.1	Oil	60 ml
AFJ 50.1	Oil	60 ml

6.3 Maintenance of the axial face seal

The axial face seal is maintenance-free. Replace the axial face seal in the event of severe leakage caused by wear, see *Chapter 7 'Preventative maintenance (dismantling and assembly instructions)' on page 21.*

Only start up the pump when filled to avoid an axial face seal from running dry.

6.4 Maintenance of the drive motors

Refer to the motor manufacturer's operating and maintenance instructions.

6.5 Maintenance of the joints

The joints of the pumps are lubricated by filling them with oil or grease.

Replace the joint lubricant after:

- 8000 hours of operation
- at the latest after 2 years
- whichever occurs first.

Check the leak-tightness of the joint sleeves at regular intervals and/or every time you open the pump. Replace damaged sleeves, O-rings or tensioning straps as quickly as possible.

Replace the joints if you notice axial and/or radial play at the cardan shaft.

6.6 Maintenance of the rotor and stator

Check the stator and rotor and replace them, if necessary, if the pump capacity drops significantly under otherwise constant conditions.

Annual material requirement under normal conditions:

- 1x rotor
- 2x stators

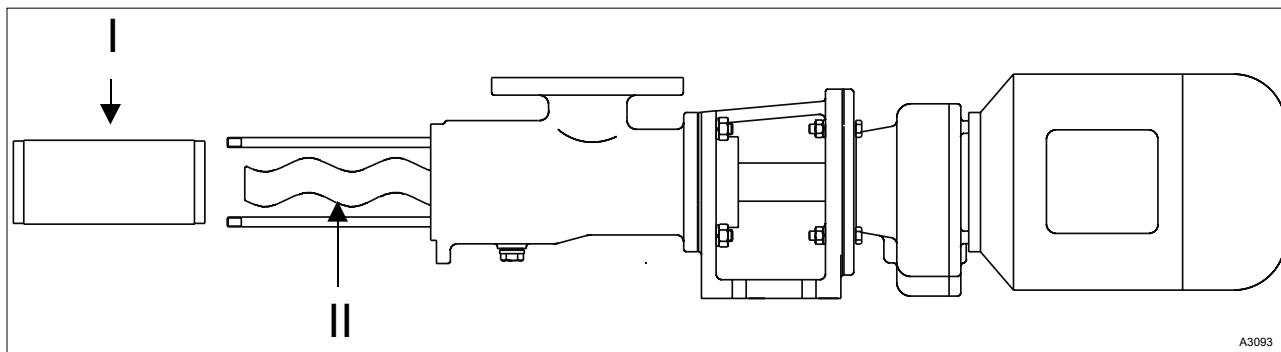


Fig. 6: Rotor and stator

- I. Stator
- II. Rotor

Tab. 6: Spare part, rotor:

Designation	Order number
Rotor 1.4571 for Spectra AFJ06 / AFJ06 BP	1010727
Rotor 1.4571 for Spectra AFJ08 / AFJ08 BP	1010728
Rotor 1.4571 for Spectra AFJ10 / AFJ10 BP	1010729
Rotor 1.4571 for Spectra AFJ15.1 / AFJ15.1 BP	1010730
Rotor 1.4571 for Spectra AFJ20.1 / AFJ20.1 BP	1010731
Rotor 1.4571 for Spectra AFJ30.1 / AFJ30.1 BP	1010732
Rotor 1.4571 for Spectra AFJ40.1 / AFJ40.1 BP	1010733
Rotor 1.4571 for Spectra AFJ50.1 / AFJ50.1 BP	1113192

Tab. 7: Spare part, stator:

Designation	Order number
Stator Viton® for Spectra AFJ06 / AFJ06 BP	1010734
Stator Viton® for Spectra AFJ08 / AFJ08 BP	1010735
Stator Viton® for Spectra AFJ10 / AFJ10 BP	1010736
Stator Viton® for Spectra AFJ15.1 / AFJ15.1 BP	1010737
Stator Viton® for Spectra AFJ20.1 / AFJ20.1 BP	1010738
Stator Viton® for Spectra AFJ30.1 / AFJ30.1 BP	1010739
Stator Viton® for Spectra AFJ40.1 / AFJ40.1 BP	1010740
Stator Viton® for Spectra AFJ50.1 / AFJ50.1 BP	1113193

7 Preventative maintenance (dismantling and assembly instructions)

- **User qualification, maintenance:** trained and qualified personnel ↪ *Chapter 2.2 'User qualification' on page 8*



WARNING!

Danger from hazardous substances!

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacture of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.

1. ➤ Disconnect the pump from the mains power supply.
2. ➤ Depressurise and bleed the hydraulic environment of the pump.
3. ➤ Dismantle the feed and pressure line.
4. ➤ Loosen the pump fixing screws and remove the pump.
5. ➤ Rinse the pump with a suitable medium, referring to the material safety data sheet.
6. ➤ Clean all components so that there is no further risk from the components.

7.1 Dismantling the Spectra AFJ 06 / 08 / 10

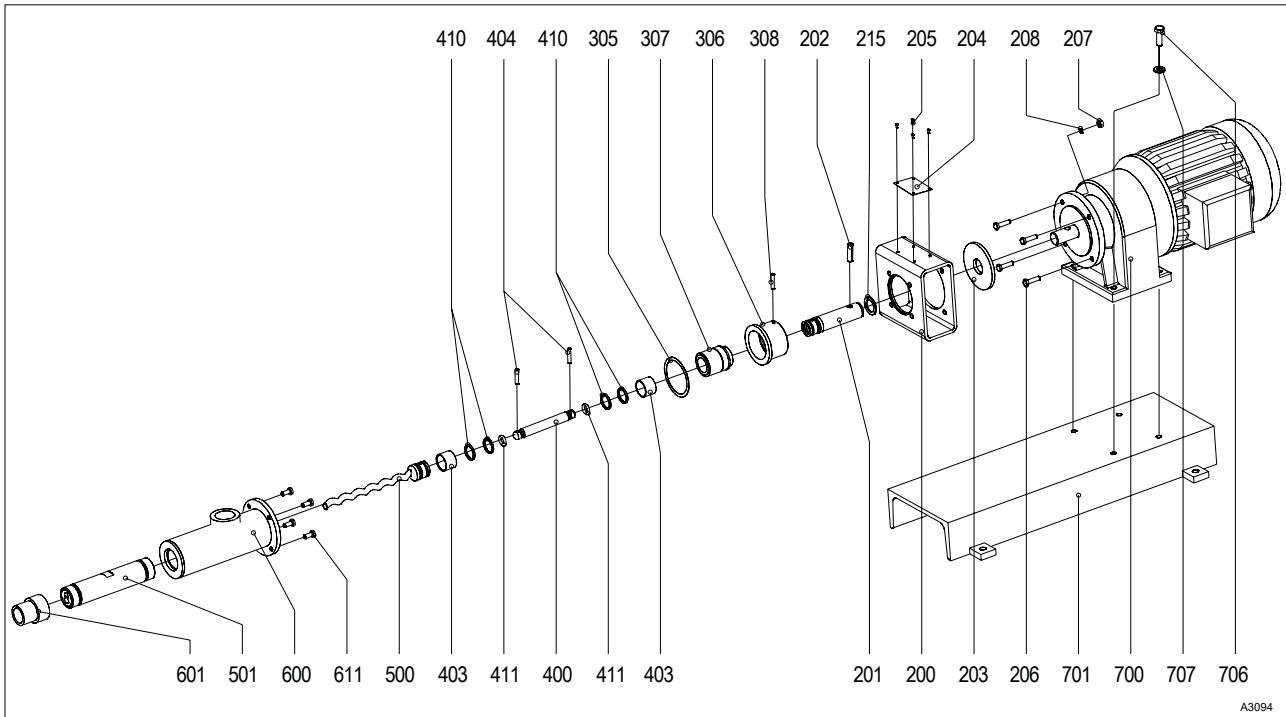


Fig. 7: Dismantling the Spectra AFJ 06 / 08 / 10

7.1.1 Dismantling the stator

1. Use an open-ended spanner to unscrew the stator (501) clockwise from the pump housing (600).
2. Pull the stator (501) from the rotor (500).
3. Unscrew the nozzle (601) from the stator (501).

7.1.2 Dismantling the rotor and the rotor-side joint

1. Remove the hex head screws (611) on the connecting housing (200).
2. Pull the housing (600) with the flat seal (305) over the rotor (500). Take care not to damage the rotor as you do so.
3. Remove the sleeve (403) axially in the direction of the cardan shaft.
4. Use a drift punch to remove the bolt (404).
5. Remove the O-rings (410, 411).
6. Pull the rotor (500) from the cardan shaft (400).

7.1.3 Dismantling the cardan shaft and the drive-side joint

1. Remove the sleeve (403) axially in the direction of the cardan shaft.
2. Remove the O-ring (411) from the cardan shaft (400).
3. Use a drift punch to remove the bolt (404).
4. Remove the cardan shaft (400) from the drive shaft (201).

5. ➤ Remove the O-rings (410).

7.1.4 Dismantling the axial face seal

1. ➤ Use a prism piece to support the drive shaft (201) to prevent damage to the axial face seal (307).
2. ➤ Use a drift punch to drive out the tensioning pin (202).
3. ➤ Pull the drive shaft (201) with the rotating part of the axial face seal from the shaft of the drive unit (700) through the axial face bushing (306).
4. ➤ Pull the rotating part of the axial face seal (307) from the drive shaft (201).
5. ➤ Pull the spacer ring (215) from the drive shaft (201).
6. ➤ Pull the axial face bushing (306) with the fixed part of the axial face seal from the connecting housing (200).
7. ➤ Press the fixed part of the axial face seal evenly out of the axial face bushing (306).
8. ➤ Remove the splash washer (203) from the shaft of the drive unit (700).

7.1.5 Dismantling the connecting housing

1. ➤ Remove the hex head screws (206) on the drive flange.
2. ➤ Remove the connecting housing (200) from the flange of the drive unit (700).

7.2 Assembly of the Spectra AFJ 06 / 08 / 10

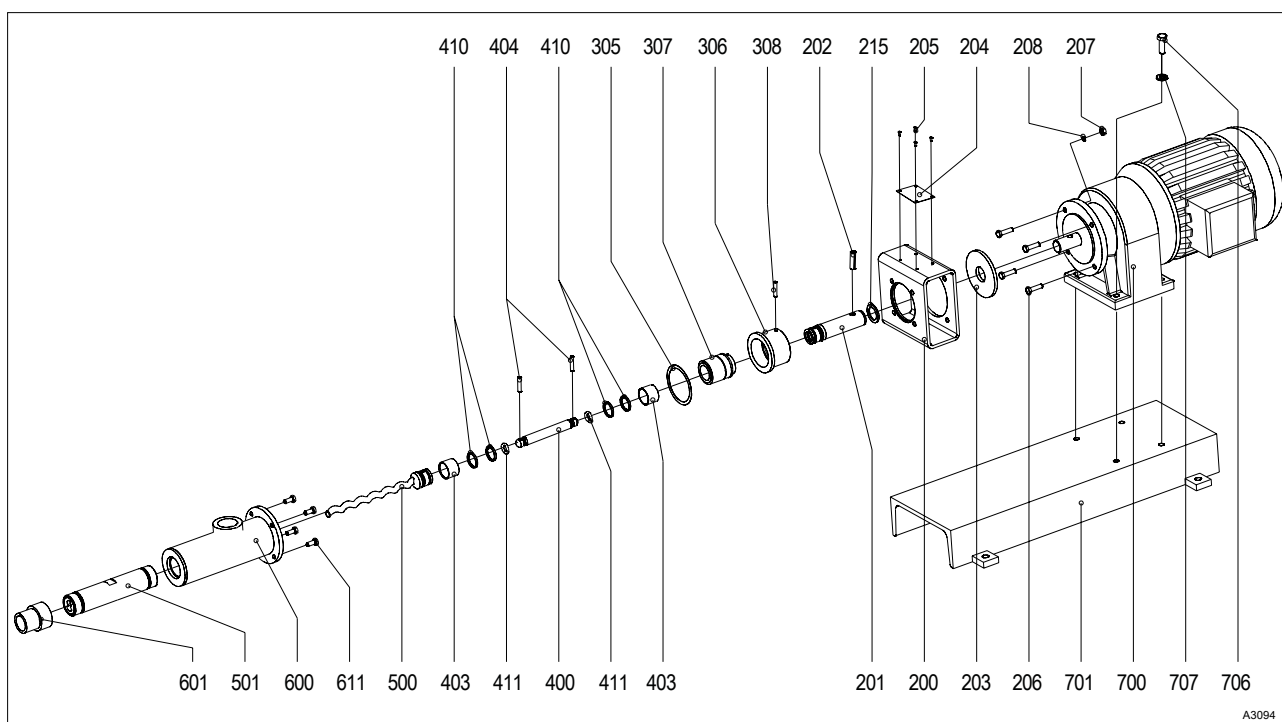


Fig. 8: Assembly of the Spectra AFJ 06 / 08 / 10

1. Carefully clean all components before assembling them.
2. Check all components and replace any damaged or worn components.

7.2.1 Installation of the connecting housing

- Screw the connecting housing (200) to the flange of the drive unit (700).

7.2.2 Installation of the axial face seal

Careful handling and the utmost cleanliness are the prerequisite for correct and proper operation when installing an axial face seal. You may wish to lubricate the O-rings with silicone oil or soft soap for ease of assembly. Avoid the sliding surfaces coming into contact with any type of lubricant.



No mineral grease or oils

Do not use mineral grease or oil.

Only replace components that slide against each other in pairs.

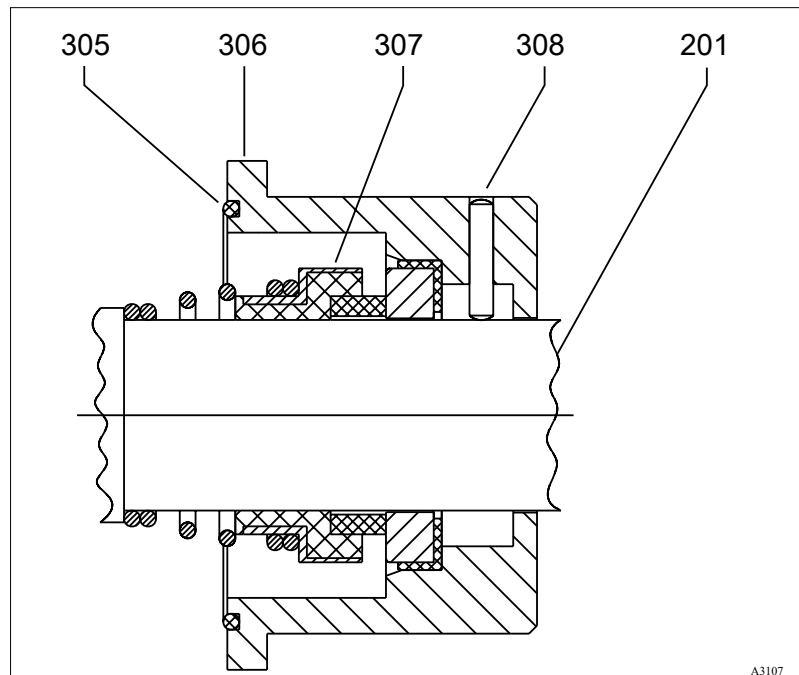


Fig. 9: Installation of the axial face seal

- 201 Drive shaft
- 305 O-ring
- 306 Axial face bushing
- 307 Axial face seal
- 308 Grooved pin

1. Apply silicone oil or soft soap to the drive shaft (201) and the inner diameter of the axial face seal (307).
2. Push the spacer ring (215) onto the drive shaft (201).
3. Use a prism piece to support the drive shaft (201) to prevent damage to the axial face seal (307).

4. ➤ Push the rotating part of the axial face seal onto the drive shaft (201).
5. ➤ Press the fixed part of the axial face seal with the O-ring concentrically into the cleaned axial face bushing (306).
6. ➤ Guide the axial face bushing (306) over the drive shaft (201).
7. ➤ Push the splash washer onto the drive shaft (201).
8. ➤ Push the drive shaft (201) with the axial face seal (307) through the axial face bushing (306) onto the shaft of the drive unit (700).
9. ➤ Use the tensioning pin (202) to pin it all together.

7.2.3 Installation of the drive-side joint and cardan shaft

1. ➤ Fill grease into the joint-side of the drive shaft (201).
2. ➤ Push the O-rings (411) onto the cardan shaft (400).
3. ➤ Press the cardan shaft (400) into the drive shaft (201) and fasten the assembly together with the bolt (404).
4. ➤ Insert the O-rings (410) into the drive shaft (201).
5. ➤ Push the sleeve (403) over the cardan shaft (400) onto the drive shaft (401).
6. ➤ Press the front of the sleeve (403) in place with 3 punch marks. The sleeve (403) is thus secured.

7.2.4 Installation of the rotor and stator



No mineral grease or oils

Do not use mineral grease or oil.

Only replace components that slide against each other in pairs.

1. ➤ Push the sleeve (403) onto the cardan shaft (400).
2. ➤ Fill grease into the joint-side of the rotor (500).
3. ➤ Press the cardan shaft (400) into the rotor (500) and secure with bolts (404).
4. ➤ Insert the O-rings (410, 411).
5. ➤ Push the sleeve (403) onto the rotor (500).
6. ➤ Press the front of the sleeve (403) in place with 3 punch marks. The sleeve (403) is thus secured.
7. ➤ Push the housing (600) with the flat seal (305) over the rotor (500) and cardan shaft (400).
8. ➤ Use the hex head screws (611) to connect the assembly to the connecting housing (200).
9. ➤ Apply silicone oil, glycerin or soft soap to the stator (501) and rotor (500) before installing them.
10. ➤ Wrap Teflon sealing tape around both threaded ends of the stator (501).
11. ➤ Pull the stator (501) onto the rotor (500).
12. ➤ Screw the stator (501) into the housing (600).

13. Screw the nozzle (601) onto the stator (501).

7.3 Dismantling the Spectra AFJ 15.1 / 20.1 / 30.1 / 40.1 / 50.1

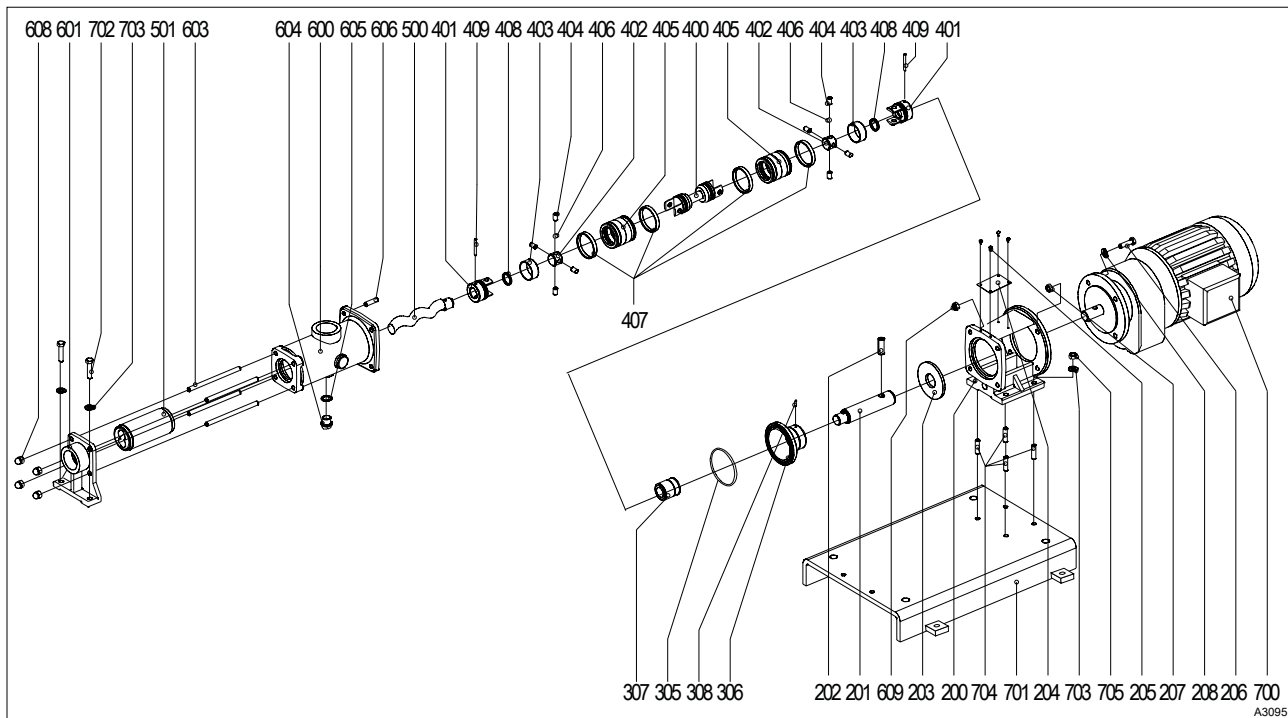


Fig. 10: Dismantling the Spectra AFJ 15.1 / 20.1

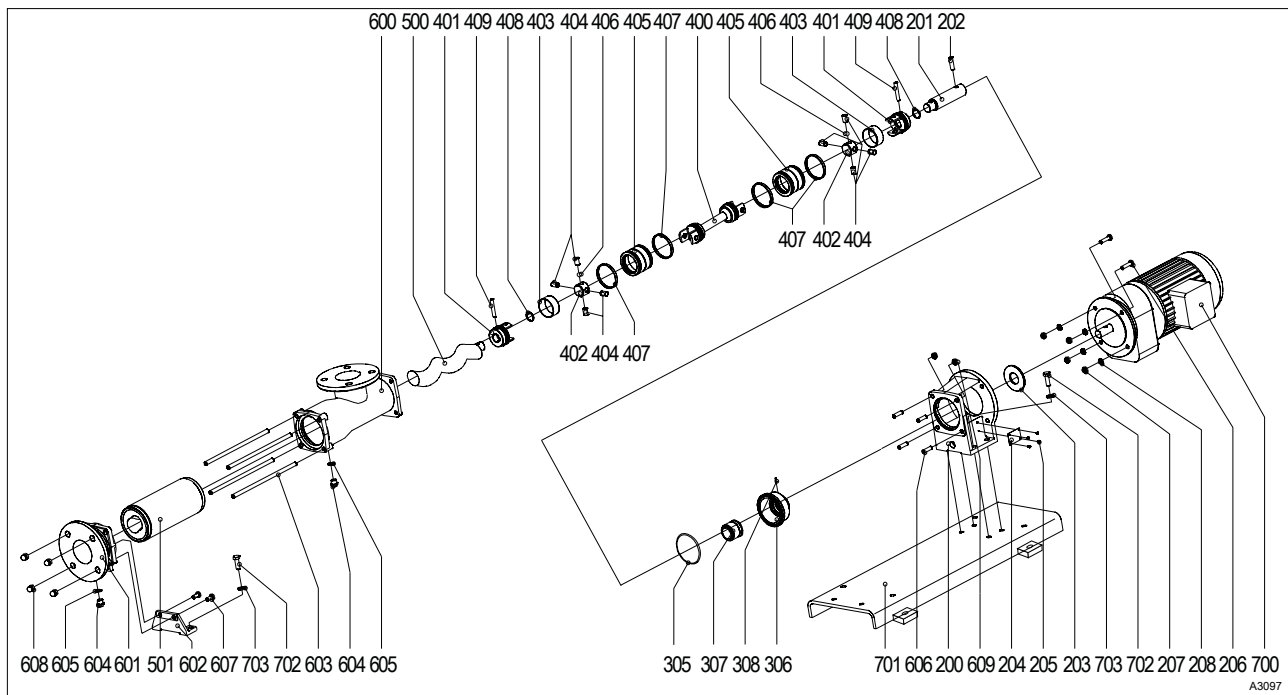


Fig. 11: Dismantling the Spectra AFJ 30.1 / 40.1 / 50.1

7.3.1 Dismantling the stator

1. ➤ Remove the hexagonal domed nuts (608) from the tension rods (603).
2. ➤ Remove the connecting nozzle (601).
3. ➤ Remove the tension rod (603).
4. ➤ Remove the stator (501) from the rotor (500).

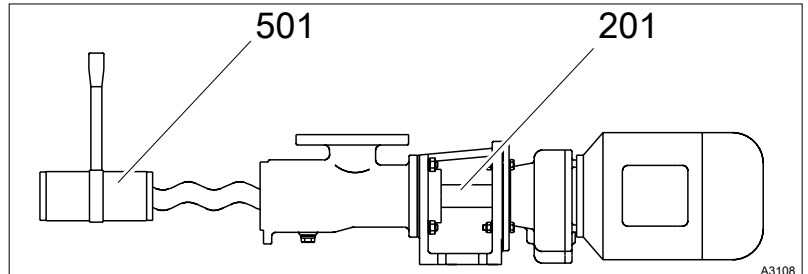


Fig. 12: Poor movement of the stator

5. ➤ Use chain nose pliers to turn the stator (501), and simultaneously block the drive shaft (201) in the event that the stator does not move easily.

7.3.2 Dismantling the rotor and the rotor-side joint

1. ➤ Remove the hex head screws (609) from the studs (606) on the connecting housing socket (200).
2. ➤ Remove the housing (600) over the rotor (500). Take care not to damage the rotor as you do so.
3. ➤ Use special pliers to open the tensioning clamps (407) of the joint sleeve (405).
Remove the tensioning clamp.
4. ➤ Drain the oil and collect the oil in a suitable collecting pan.
5. ➤ Use a screwdriver to lift the joint sleeve (405) and pull the joint sleeve axially towards the cardan shaft (400).
6. ➤ File off the punch marks and remove the sleeve (403).
7. ➤ Use a drift punch to remove the two opposite bolts (404) and remove the ball (406).
8. ➤ Pull the rotor (500) with head piece (401) and joint piece (402) from the cardan shaft (400).
9. ➤ Use a prism piece to support the drive shaft (201) to drive out the tensioning pin (409) to prevent damage to the axial face seal (307).
10. ➤ Drive out the tensioning pin (409) and loosen the head piece (401) from the rotor (500).
11. ➤ Use a drift punch to remove the two opposite bolts (404) and remove the joint piece (402).
12. ➤ Remove the O-ring (408).

7.3.3 Dismantling the rotor and the drive-side joint

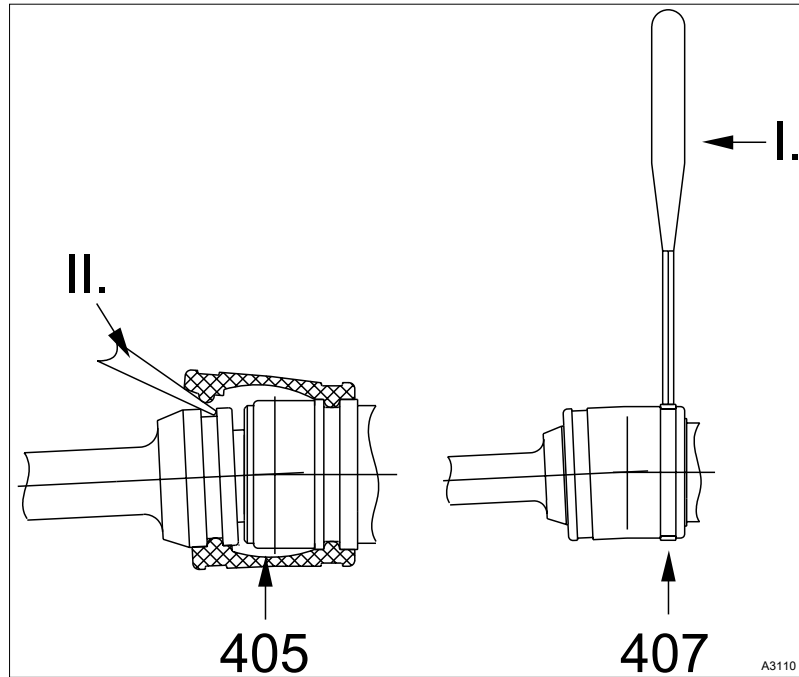


Fig. 13: Dismantling the rotor and the drive-side joint

1. Use special pliers (I.) to open the tensioning clamps (407) of the joint sleeve (405).
Remove the tensioning clamp.
2. Drain the oil and collect the oil in a suitable collecting pan.
3. Use a screwdriver (II.) to lift the joint sleeve (405) and pull the joint sleeve axially down towards the cardan shaft (400).
4. File off the punch marks and remove the sleeve (403).
5. Use a drift punch to remove the two opposite bolts (404) and remove the ball (406).
6. Remove the cardan shaft (400) from the drive shaft (201).
7. Use a prism piece to support the drive shaft (201) to drive out the tensioning pin (409) to prevent damage to the axial face seal (307).
8. Loosen the head piece (401) from the drive shaft (201) by driving out the tensioning pin (409).
9. Use a drift punch to remove the two opposite bolts (404) and remove the joint piece (402).
10. Remove the O-ring (408).

7.3.4 Dismantling the axial face seal

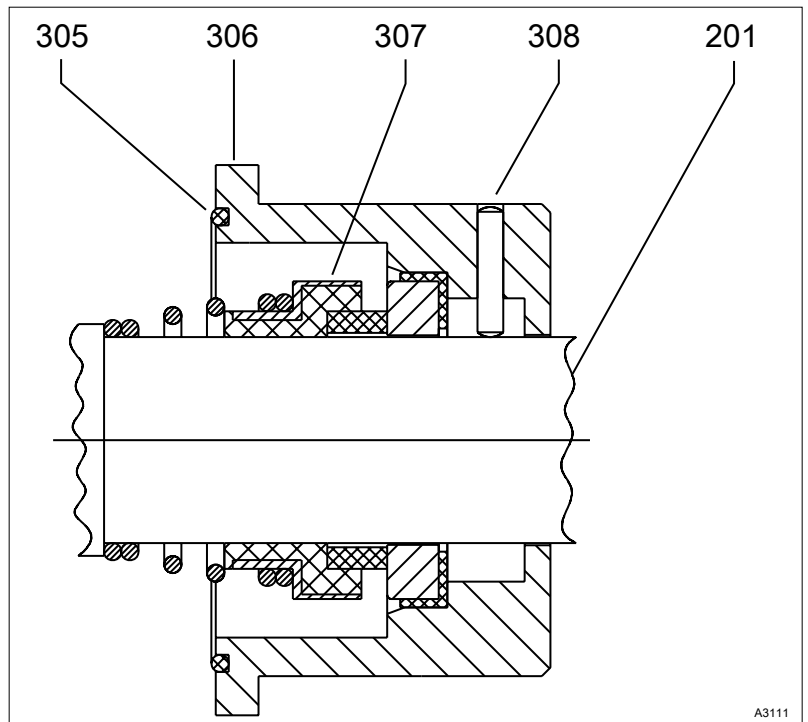


Fig. 14: Dismantling the axial face seal

1. ➤ Remove the O-ring (305) from the axial face bushing (306).
2. ➤ Pull the rotating part of the axial face seal from the drive shaft (201).
3. ➤ Pull the axial face bushing with the fixed part from the drive shaft (201). Do not catch the parts as you remove them.
4. ➤ Press the fixed part evenly out of the axial face bushing (306).

7.3.5 Dismantling the drive shaft

1. ➤ Insert the drive shaft (201) into a prism piece.
2. ➤ Use a drift punch to drive out the tensioning pin (202).
3. ➤ Remove the drive shaft (201) from the shaft of the drive unit (700).
4. ➤ Pull the splash washer (203) from the drive shaft (201).

7.4 Assembly of the Spectra AFJ 15.1 / 20.1 / 30.1 / 40.1 / 50.1

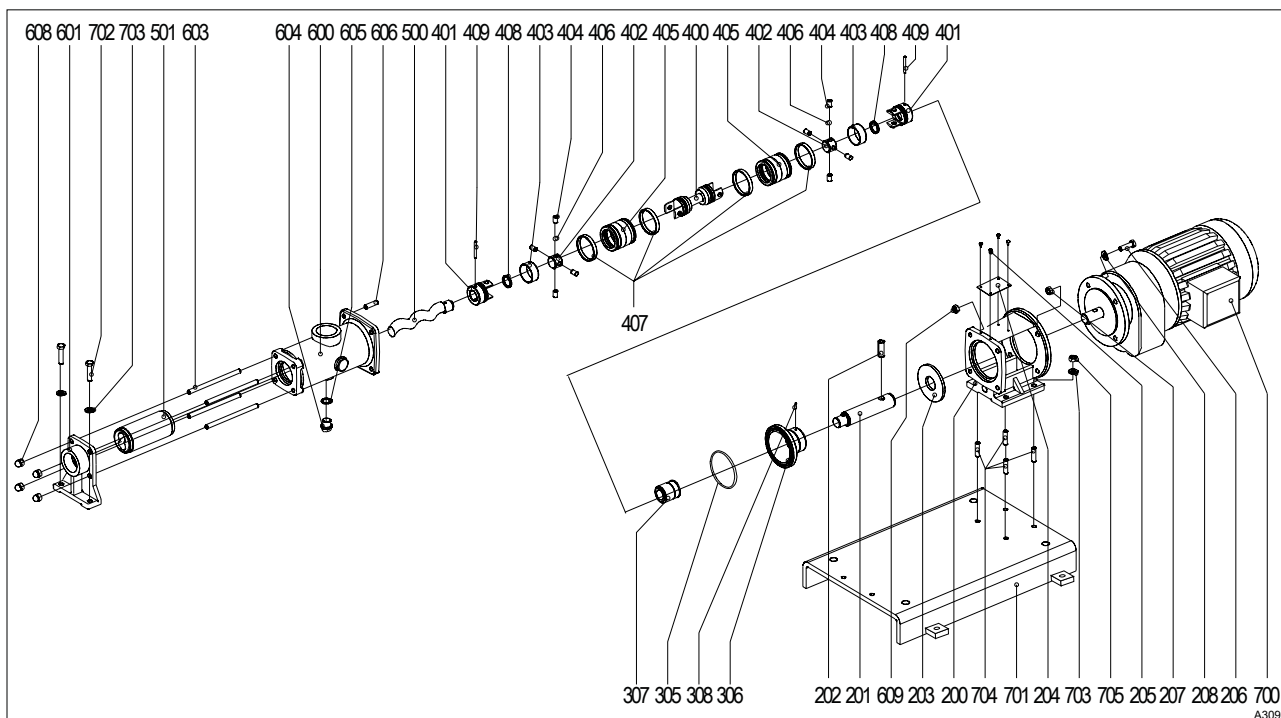


Fig. 15: Assembly of the Spectra AFJ 15.1 / 20.1

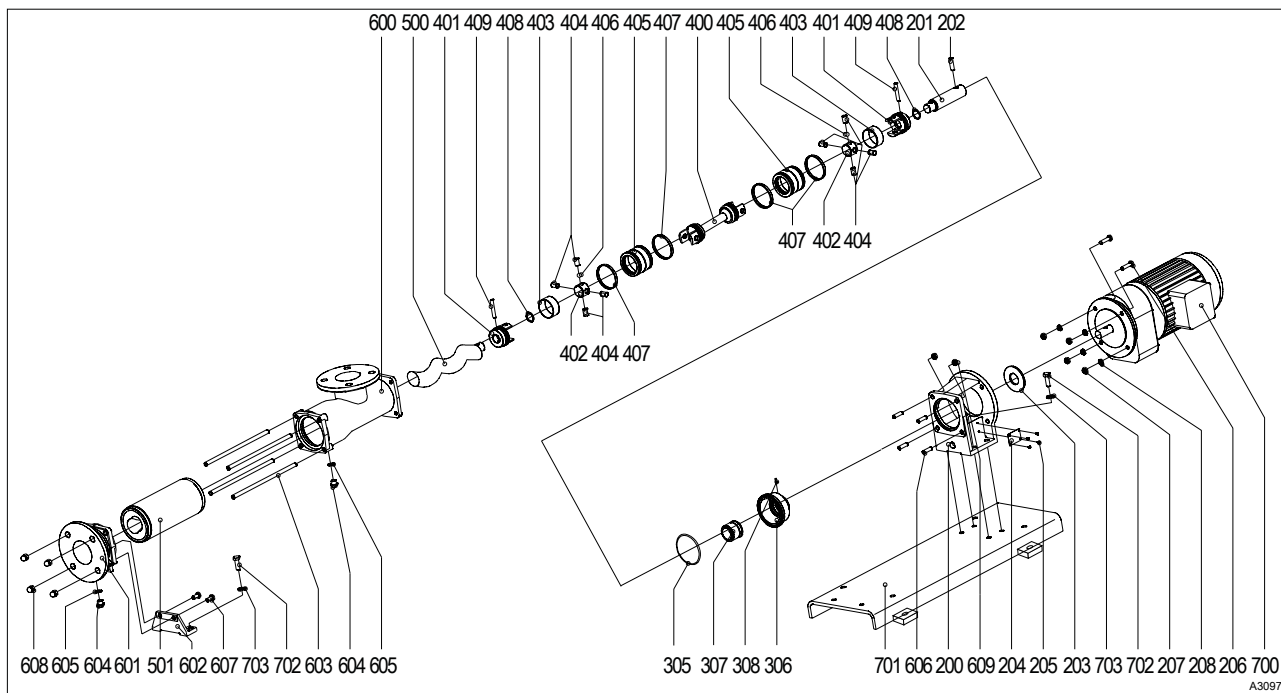


Fig. 16: Assembly of the Spectra AFJ 30.1 / 40.1 / 50.1

1. ➤ Carefully clean all components before assembling them.
2. ➤ Check all components and replace any damaged or worn components.

7.4.1 Installation of the drive shaft

1. ➤ Push the drive shaft (201) onto the shaft of the drive unit (700).
2. ➤ Insert the drive shaft (201) into a prism piece.
3. ➤ Use a drift punch to drive in the tensioning pin (202).
4. ➤ Push the splash washer (203) onto the drive shaft (201).

7.4.2 Installation of the axial face seal

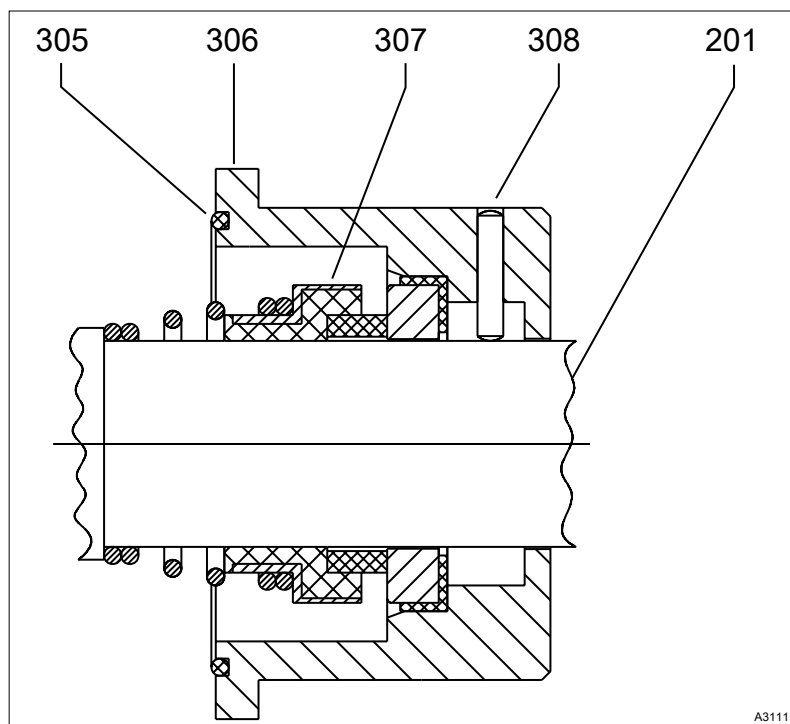


Fig. 17: Installation of the axial face seal

Careful handling and the utmost cleanliness are the prerequisite for correct and proper operation when installing an axial face seal. You may wish to lubricate the O-rings with silicone oil or soft soap for ease of assembly. Avoid the sliding surfaces coming into contact with any type of lubricant.



No mineral grease or oils

Do not use mineral grease or oil.

Only replace components that slide against each other in pairs.

1. ➤ Screw the connecting housing socket (200) onto the drive flange.
2. ➤ Press the fixed part of the axial face seal with O-ring concentrically into the cleaned axial face bushing (306).
3. ➤ Use a prism piece to support the drive shaft (201) to prevent damage to the axial face seal (307).
4. ➤ Push the axial face bushing with the fixed part over the drive shaft (201). Do not catch the parts as you push them on.
5. ➤ Apply silicone oil, glycerin or soft soap to the drive shaft (201) and the inner diameter of the axial face seal (307).

6. ➤ Push the rotating part of the axial face seal onto the drive shaft (201).
7. ➤ Insert the O-ring (305) into the axial face bushing (306).

7.4.3 Installation of the drive-side joint and cardan shaft

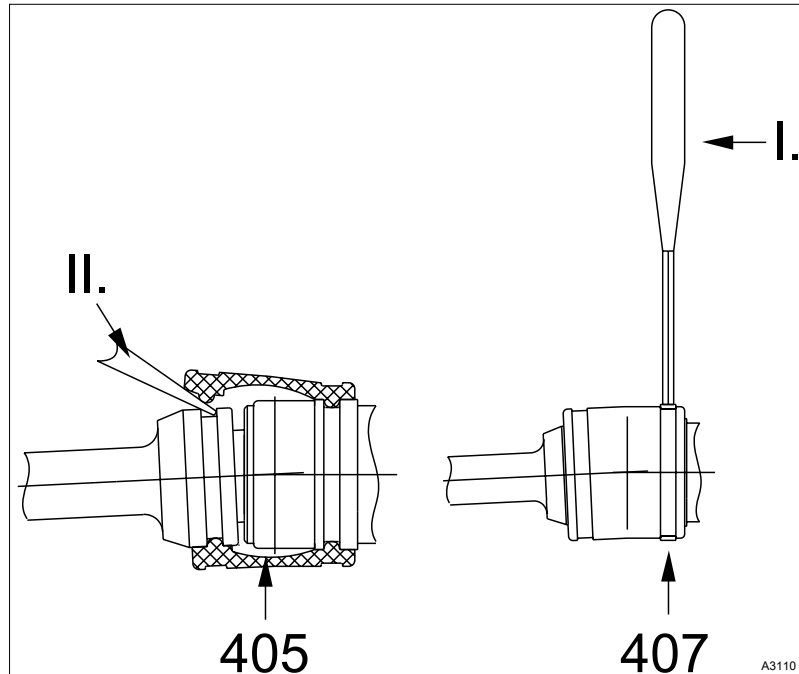


Fig. 18: Installation of the rotor and the drive-side joint

1. ➤ Insert the O-ring (408) into the head piece (401).
2. ➤ Push the head piece (401) onto the drive shaft (201) and pin the head piece with a tensioning pin (409).
3. ➤ Insert the joint piece (402) into the head piece (401) and hammer in the two bolts (404).
4. ➤ Push the joint sleeve (405) and sleeve (403) over the cardan shaft (400).
5. ➤ Press the cardan shaft (400) into the head piece (401) and fasten the assembly together with two opposite bolts (404).
6. ➤ Insert the ball (406) before attaching the 4th bolt (404). Make sure that the chamfer of the bolt faces inwards when inserting.
7. ➤ Push the sleeve (403) onto the head piece (401).
8. ➤ Prevent the sleeve (403) from moving by twice making 3 punch marks (offset by 180 °) on the head piece (401).
9. ➤ Pull on the joint sleeve (405).
10. ➤ Fill the joint with oil. For the volume and specification see
11. ➤ Use the special pliers to attach tensioning clamps (407) to the joint sleeve (405).

7.4.4 Installation of the rotor and stator

**No mineral grease or oils**

Do not use mineral grease or oil.

Only replace components that slide against each other in pairs.

1. ➤ Insert the O-ring (408) into the head piece (401).
2. ➤ Push the head piece (401) onto the rotor (500) and pin the assembly together with the tensioning pin (409).
3. ➤ Insert the joint piece (402) into the head piece (401) and hammer in the two bolts (404).
4. ➤ Push the joint sleeve (405) and the sleeve (403) over the cardan shaft (400).
5. ➤ Push the cardan shaft (400) into the head piece (401) and fasten the assembly together with the two opposite bolts (404).
6. ➤ Insert the ball (406) before attaching the 4th bolt (404). Make sure that the chamfer of the bolt faces inwards when inserting.
7. ➤ Push the sleeve (403) onto the head piece (401).
8. ➤ Prevent the sleeve (403) from moving by twice making 3 punch marks (offset by 180 °) on the head piece (401).
9. ➤ Pull on the joint sleeve (405).
10. ➤ Fill the joint with oil. For the volume and specification see
11. ➤ Use the special pliers to attach tensioning clamps (407) to the joint sleeve (405).
12. ➤ Before screwing, check whether the O-ring (305) has been inserted into the axial face bushing (306).
Push the housing (600) over the rotor (500) and the cardan shaft (400). Use the hex head screws (609) to connect the assembly to the connecting housing socket (200).
13. ➤ Apply silicone oil, glycerin or soft soap to the stator (501) and the rotor (500) before installing them.

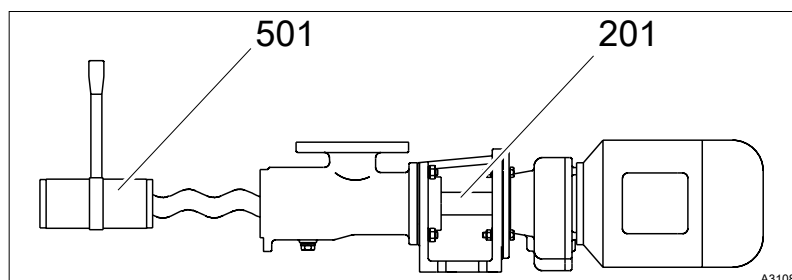


Fig. 19: Poor movement of the stator

14. ➤ Use chain nose pliers to turn the stator (501), and simultaneously block the drive shaft (201) in the event that the stator does not move easily.
Pull the stator (501) onto the rotor (500).
15. ➤ Insert the tension rod (603).
16. ➤ Attach the connecting nozzle (601) and use the hex domed nuts (608) to screw the assembly.

8 Possible faults and their rectification

- **User qualification, possible faults and their rectification:** trained and qualified personnel ↪ *Chapter 2.2 'User qualification' on page 8*



WARNING!

Danger from hazardous substances!

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacture of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.

Tab. 8: Possible faults and their rectification

Type of fault	Possible causes	Rectification of the fault
Pump does not start up. Drive is overloaded.	With a new pump or new stator: the static friction is too great.	Fill the pump and rotate it manually. If necessary, apply glycerin to the stator as a lubricant.
Pump does not start up. Feed rate is too low. Discharge lift is too low. Drive is overloaded.	The electrical data of the pump does not match the mains/ power supply. (2-phase operation).	Check the ordering data and examine the electrical installation.
Feed rate is too low Drive is overloaded. Stator service life is too short. Rotor service life is too short.	The discharge lift is too great.	Use a manometer to measure the discharge lift and compare with the order data.
Pump does not start up. Pump is stuck. Drive is overloaded.	There is a foreign body in the pump.	Remove the foreign body and rectify any damage, if necessary.
Pump does not start up. Pump is stuck. Drive is overloaded. Stator service life is too short. Rotor service life is too short.	The temperature of the feed chemical is too high; the stator is expanding too much.	Use a smaller size of rotor if the temperature of the feed chemical cannot be lowered.

Type of fault	Possible causes	Rectification of the fault
Pump does not start up. Pump is stuck. Drive is overloaded. Stator service life is too short.	The stator is swollen. The elastomer is not resistant to the feed chemical.	Check whether the feed chemical corresponds to the one stated in the order. Change the material of the stator, if necessary.
Pump does not start up. Pump is stuck. Drive is overloaded. Stator service life is too short.	The solids content of the feed chemical is too high and is causing a blockage.	Increase the liquid percentage of the feed chemical.
Pump does not start up. Pump is stuck. Drive is overloaded. Stator service life is too short. Rotor service life is too short. Shaft seal is not leak-tight	The feed chemical is sedimenting or hardening when idle.	Clean the pump and flush it through at the end of each pumping process.
Feed rate is too low. Discharge lift is too low. Pumping is fluctuating.	Air in the suction line.	Increase the suction and fluid levels, prevent intake vortices, prevent inclusions of air.
Pump is not drawing in by suction. Feed rate is too low. Discharge lift is too low. Pumping is fluctuating.	The suction line is not leak-tight.	Check the seals, tighten the pipe connections.
Pump is not drawing in by suction. Feed rate is too low. Discharge lift is too low. Pumping is fluctuating.	The shaft seal is not leak-tight.	Replace the axial face seal.
Feed rate is too low. Discharge lift is too low.	The speed is too low.	With a controllable drive: increase the speed.
Feed rate is too low	The suction lift is too great or	Reduce the suction resistance.
Discharge lift is too low. Pumping is fluctuating. Pump is running noisily, stator service life is too short. Rotor service life is too short.	Feed height too low (cavitation).	Lower the temperature of the feed chemical, install the pump lower.
Feed rate is too low. Discharge lift is too low. Pump is running noisily, pump is stuck. Drive is overloaded. Stator service life is too short.	The pump is running dry.	Fill the pump, provide dry-running protection, route the lines differently.

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Possible faults and their rectification

Type of fault	Possible causes	Rectification of the fault
Pump is not drawing in by suction. Feed rate is too low, discharge lift is too low. Pump is running noisily.	The stator is worn.	Replace with a new stator.
Pump is not drawing in by suction. Feed rate is too low. Discharge lift too low. Pump is running noisily. Stator service life is too short. Rotor service life is too short.	The stator material is brittle.	Replace with a new stator. Check whether the feed chemical corresponds to the one stated in the order.
Pump is not drawing in by suction. Feed rate is too low. Discharge lift is too low. Pump is running noisily. Stator service life is too short.	The rotor is worn.	Replace the rotor. Determine the cause: wear, corrosion, cavitation; if necessary, choose other rotor material.
Pump is running noisily.	The joints are knocked out.	Replace the relevant parts and carefully seal them.
Pump is running noisily, shaft seal is not leak-tight.	The motor roller bearings are irreparably damaged.	Replace the roller bearings with new roller bearings, lubricate and re-seal them. With higher temperatures: note the bearing clearance.
Drive is overloaded.	The speed is too high. The viscosity is too high. The specific weight is too high.	With a controllable drive: set the speed lower. Measure the viscosity and compare it to the one stated in the order. Measure the specific weight and compare it to the one stated in the order.
Pump is not drawing in by suction.	The direction of rotation is incorrect.	Change the electrical connection.
Shaft seal is not leak-tight.	The O-rings of the axial face seal are damaged, swollen or brittle.	Replace the axial face seal.

9 Disposal of used parts

- **User qualification:** instructed user, see [Chapter 2.2 'User qualification'](#) on page 8



NOTICE!

Regulations governing the disposal of used parts

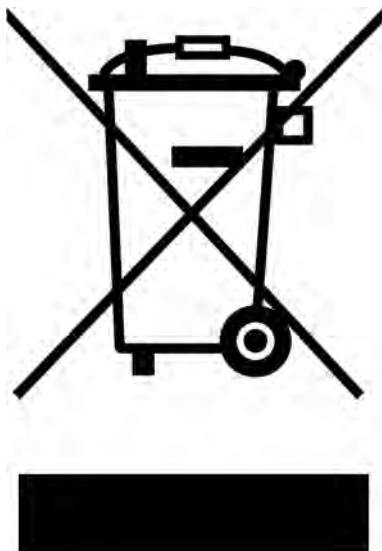
- Note the national regulations and legal standards that currently apply in your country

The manufacturer will take back decontaminated used devices providing they are covered by adequate postage.

Decontaminate the device before returning it for repair. To do so, remove all traces of hazardous substances. Refer to the Material Safety Data Sheet for your feed chemical.

A current Declaration of Decontamination is available to download on the ProMinent website.

Sign indicating EU collection system



In accordance with the European Directive 2012/19/EU on waste electrical and electronic equipment, this device features the symbol showing a waste bin with a line through it. The device must not be disposed of along with domestic waste. To return the device, use the return and collection systems available and observe the local legal requirements.

10 Technical data

10.1 Oil: Filling volumes and specification

Refer to: ↗ Chapter 6.2 'Lubricant specification' on page 18

10.2 Pump characteristic lines

10.2.1 Pump characteristic line for AFJ 06

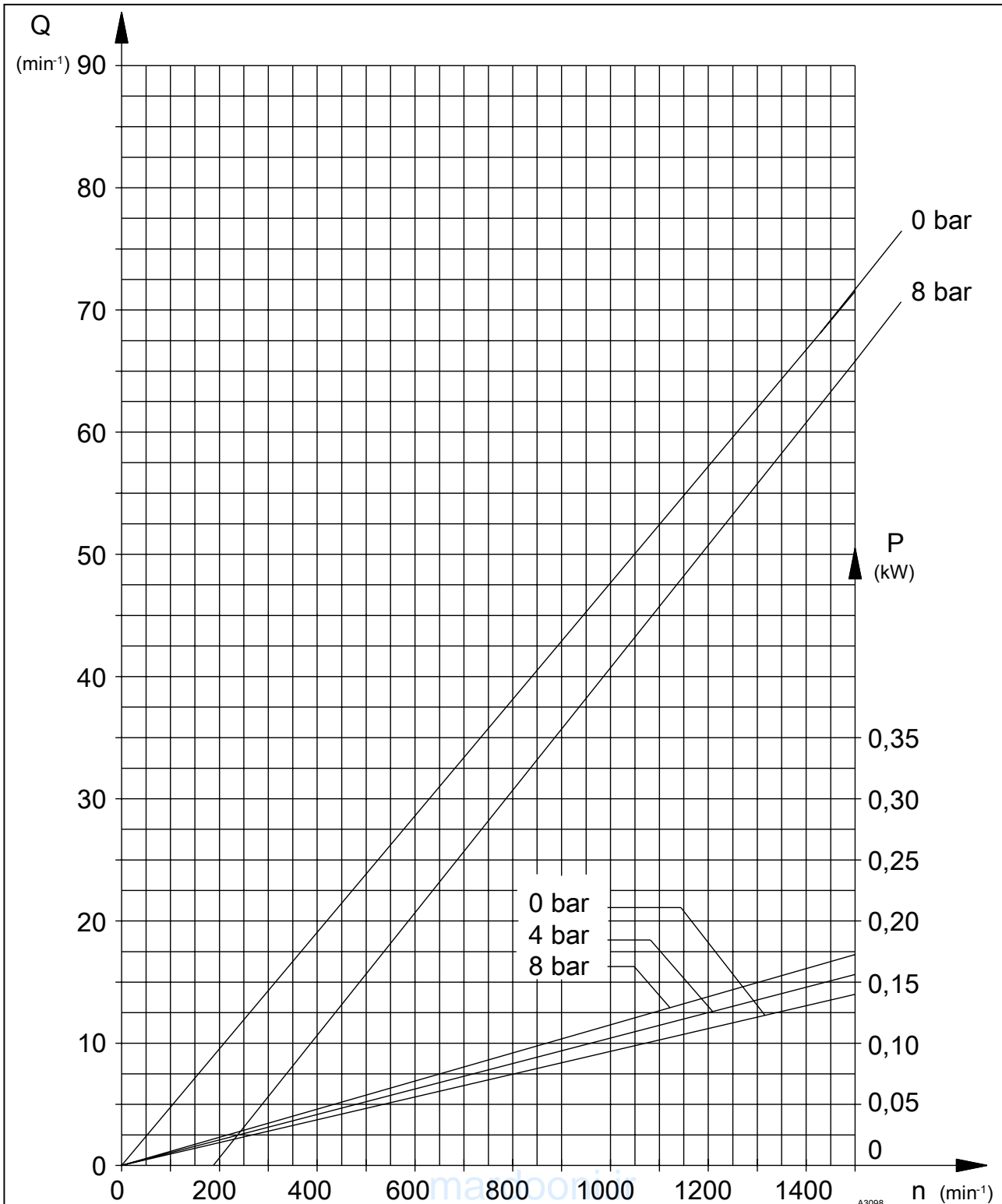


Fig. 20: Pump characteristic line for AFJ 06

10.2.2 Pump characteristic line for AFJ 08

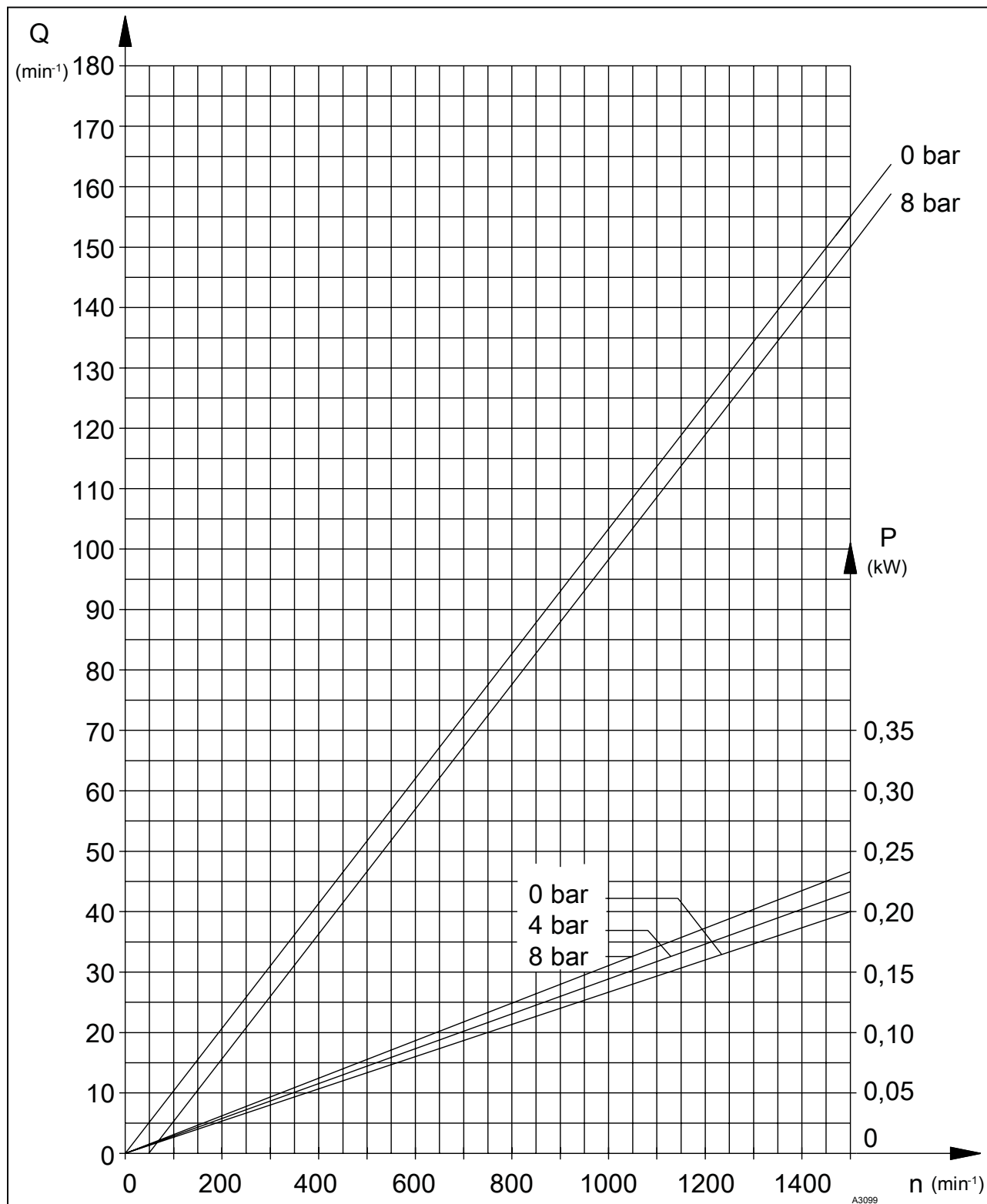


Fig. 21: Pump characteristic line for AFJ 08

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10.2.3 Pump characteristic line for AFJ 10

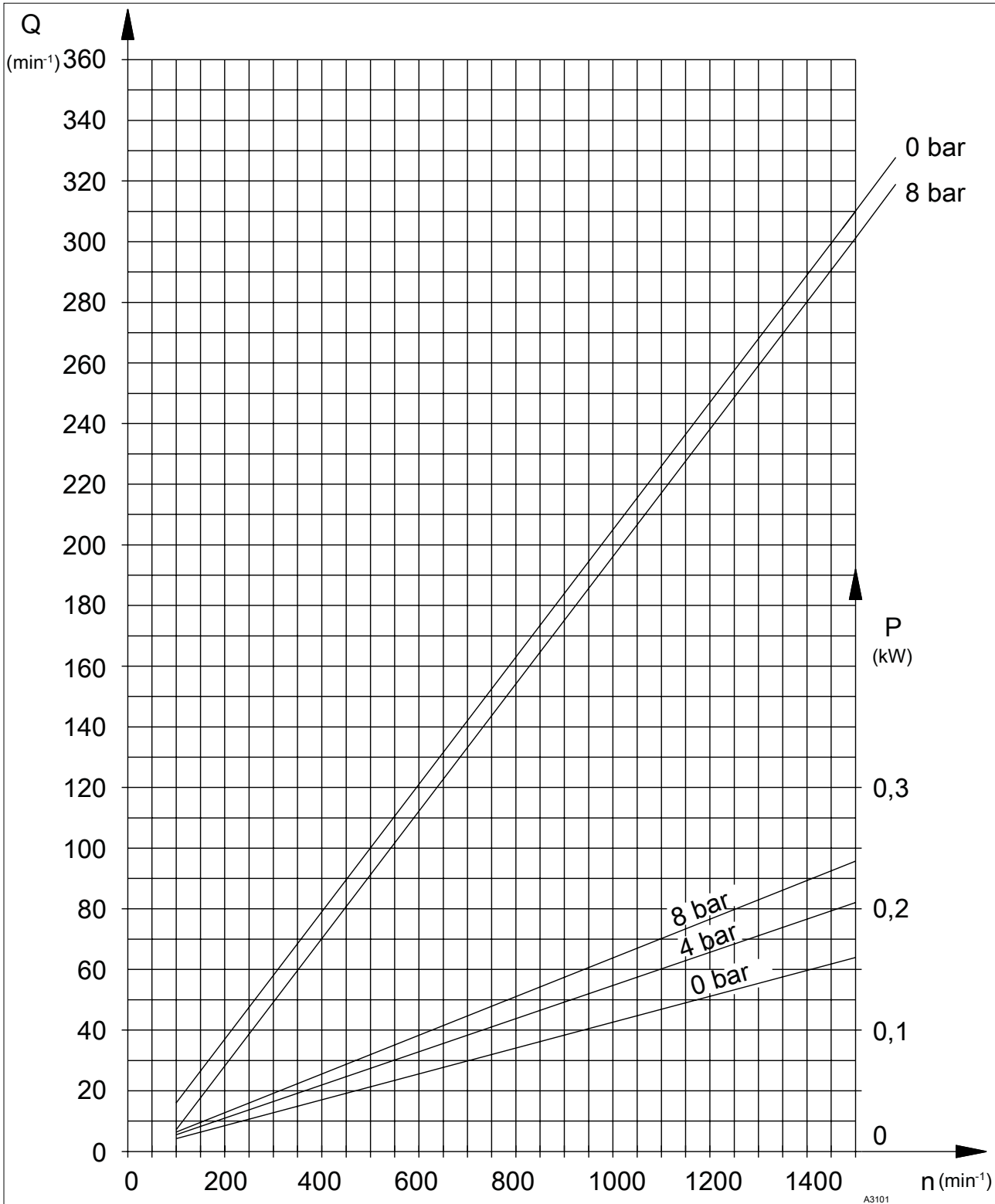


Fig. 22: Pump characteristic line for AFJ 10

10.2.4 Pump characteristic line for AFJ 15.1

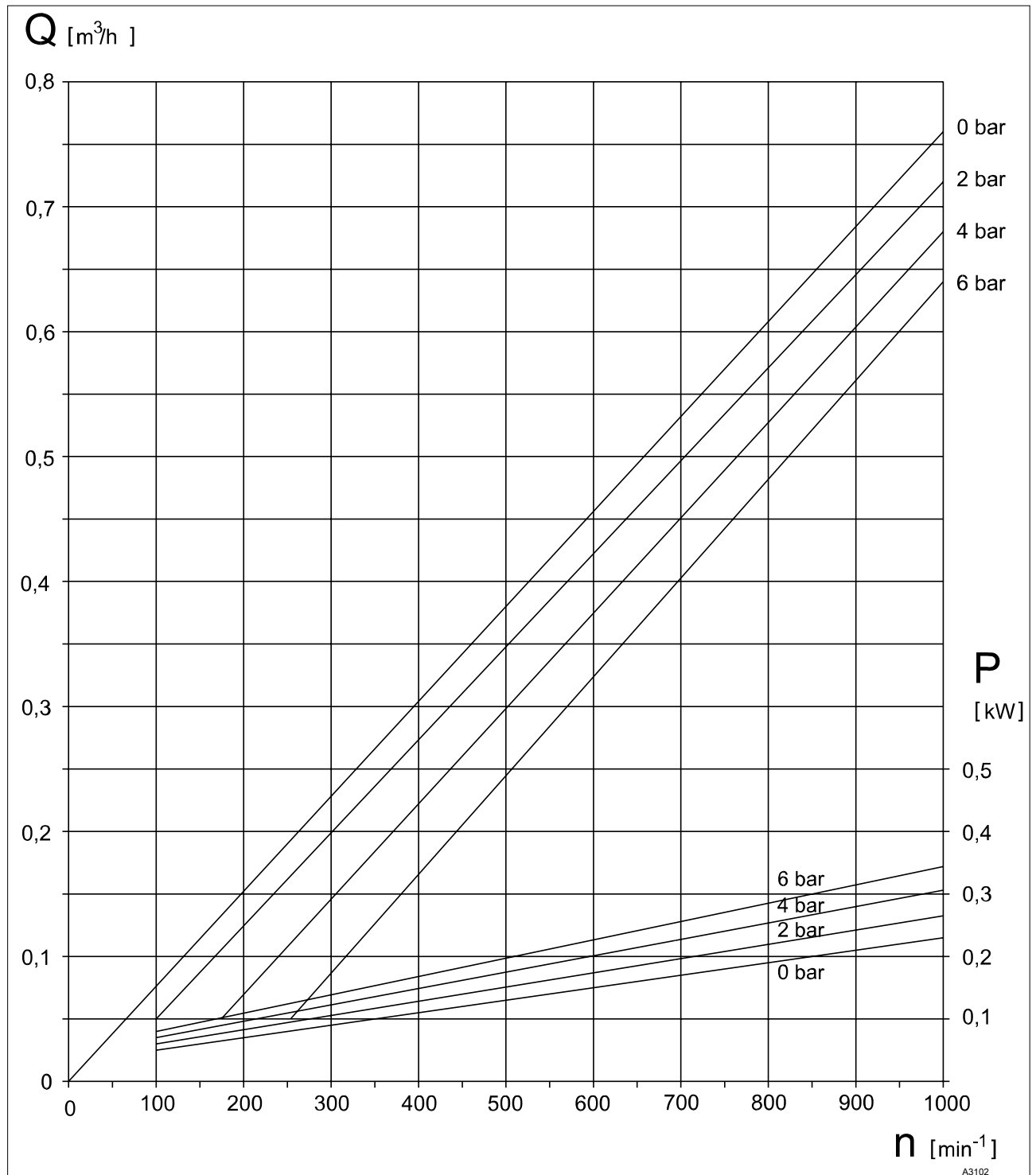


Fig. 23: Pump characteristic line for AFJ 15.1

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10.2.5 Pump characteristic line for AFJ 20.1

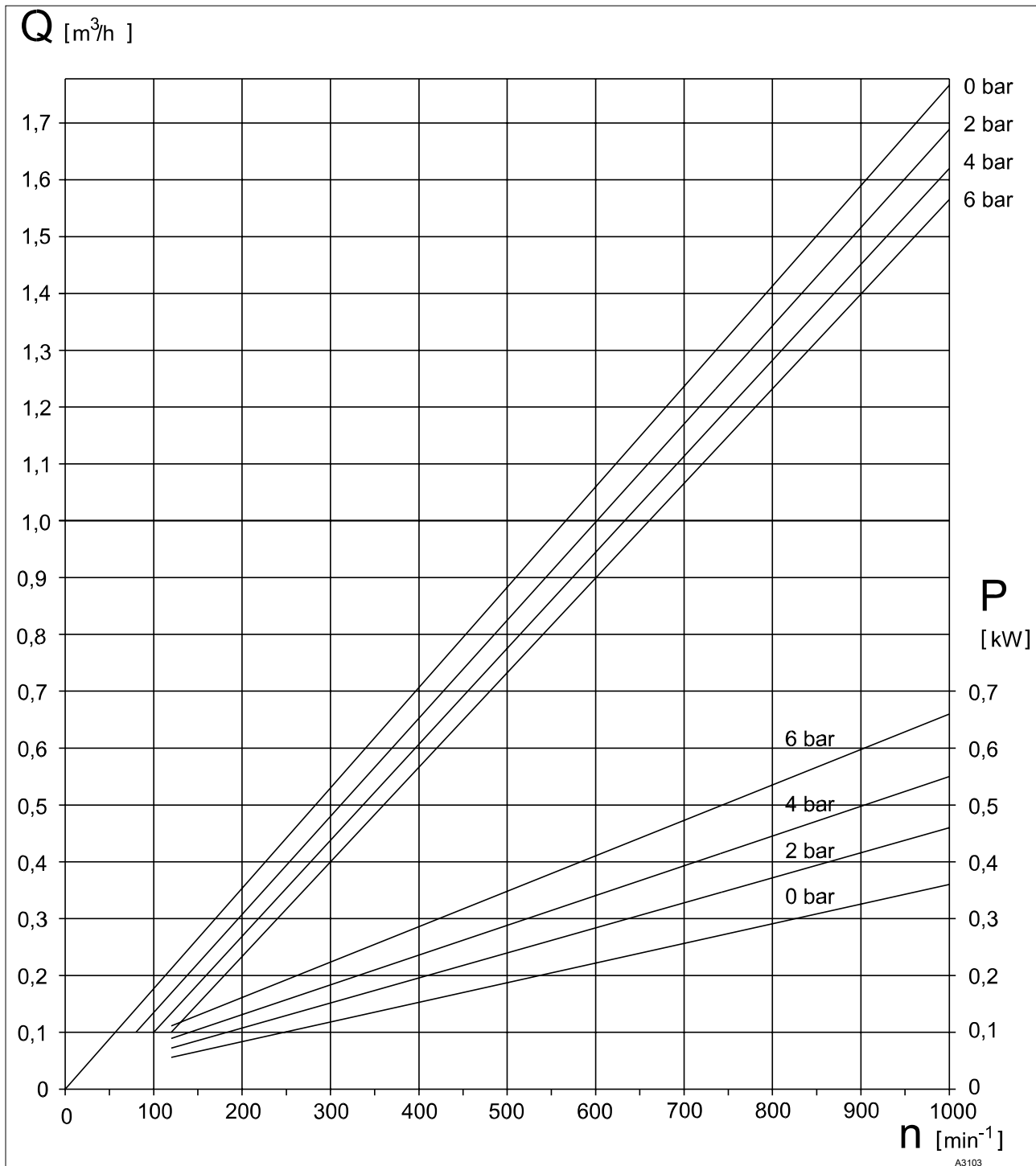


Fig. 24: Pump characteristic line for AFJ 20.1

10.2.6 Pump characteristic line for AFJ 30.1

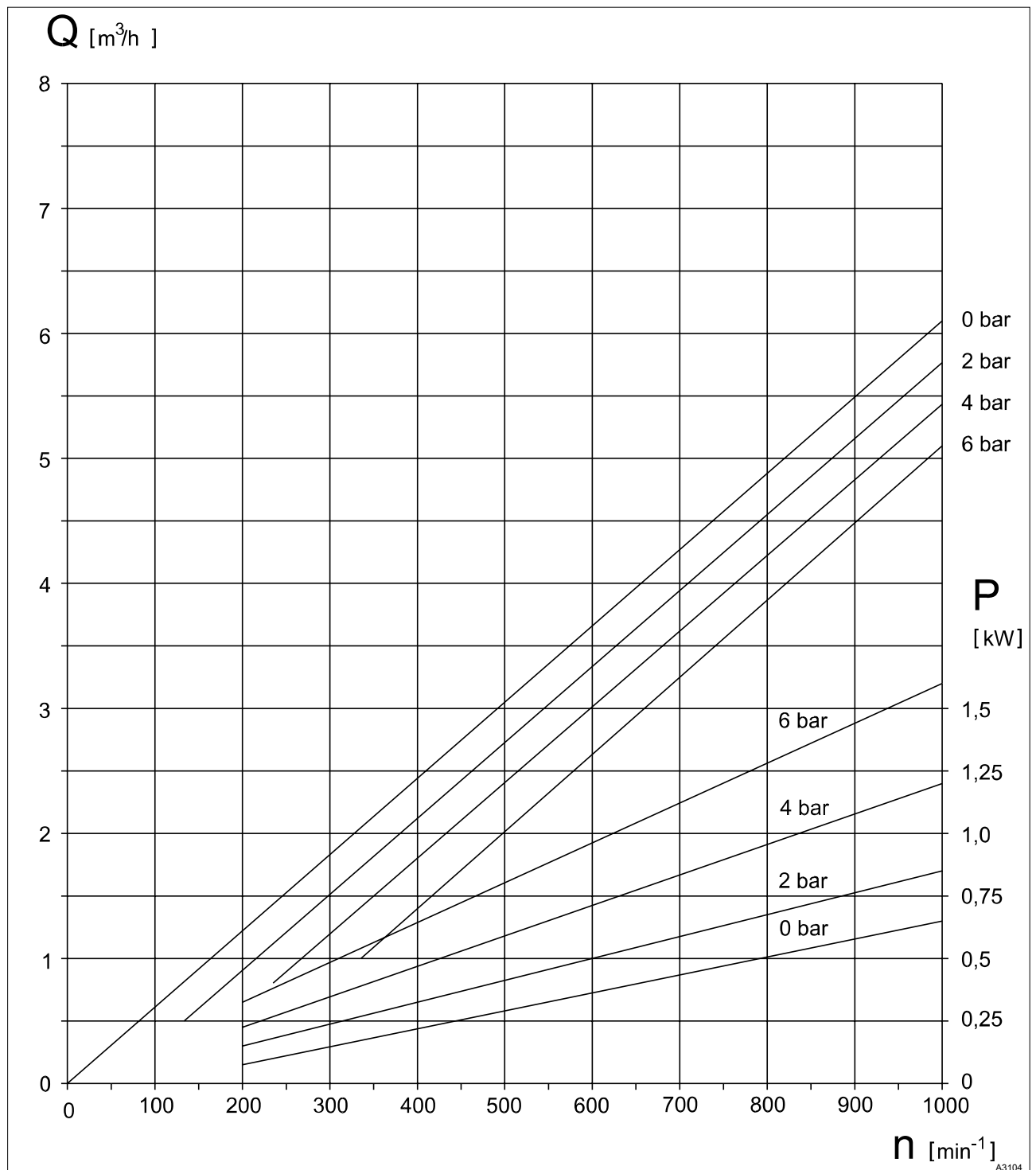


Fig. 25: Pump characteristic line for AFJ 30.1

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10.2.7 Pump characteristic line for AFJ 40.1

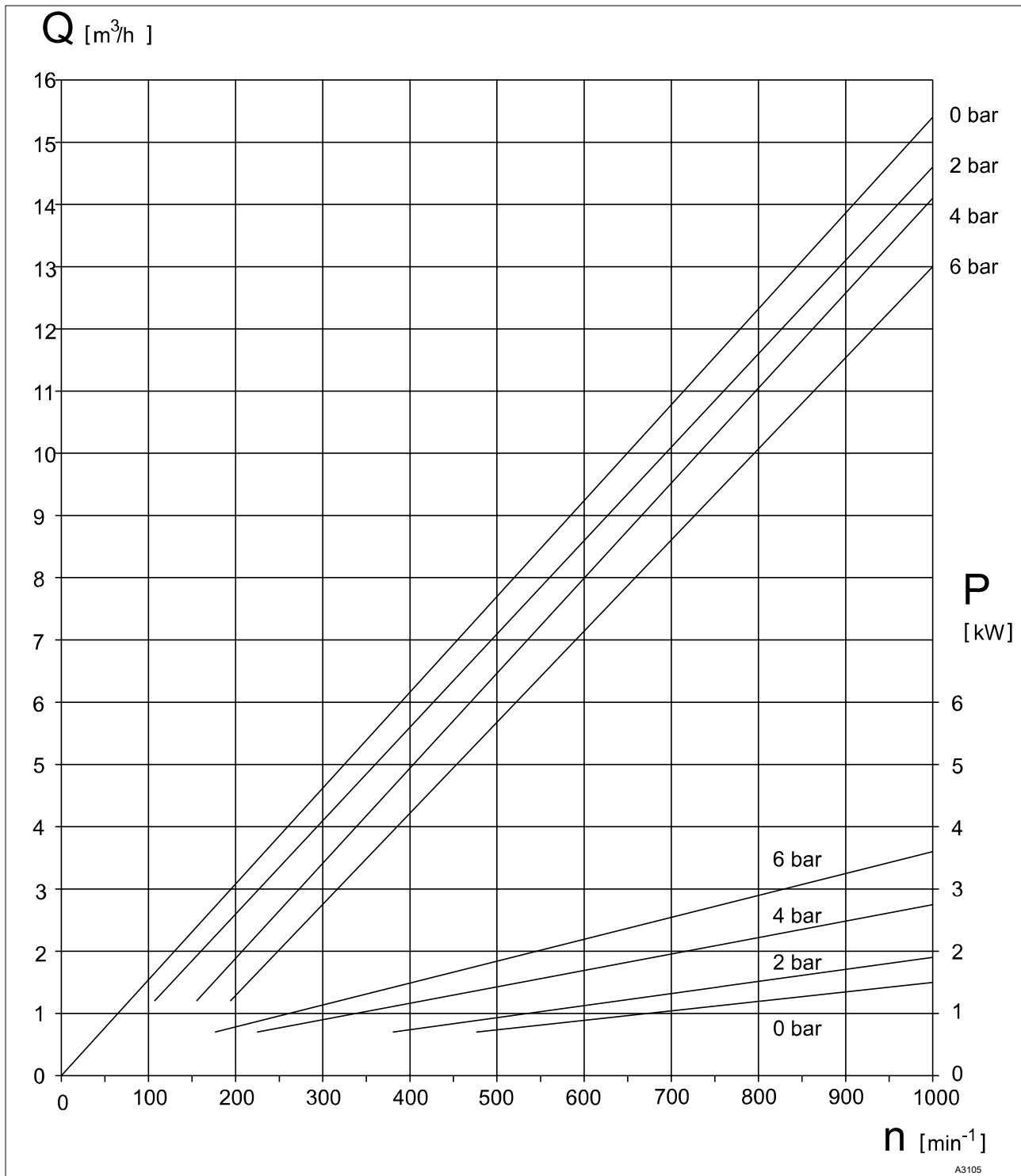


Fig. 26: Pump characteristic line for AFJ 40.1

10.2.8 Pump characteristic line for AFJ 50.1

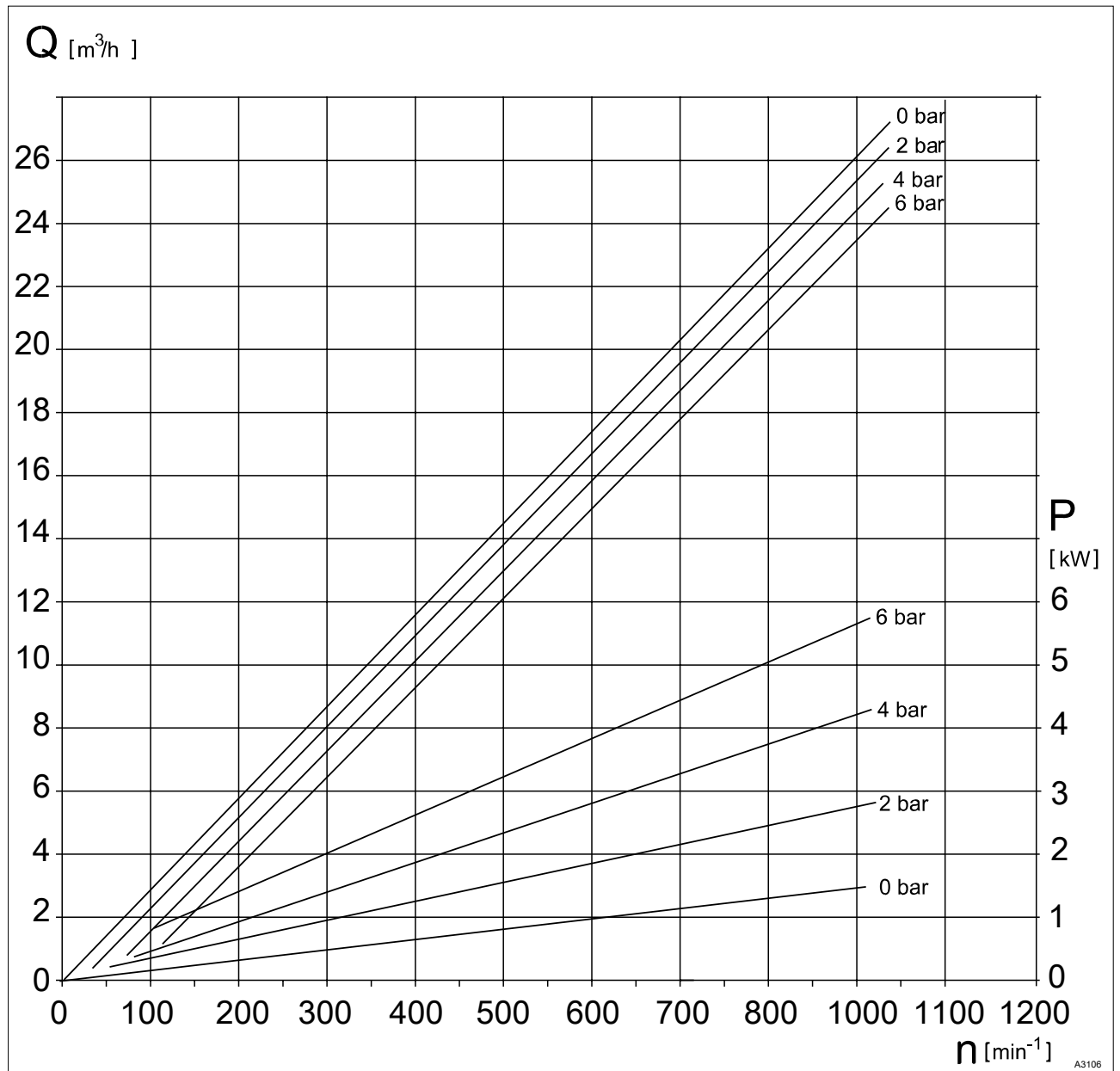


Fig. 27: Pump characteristic line for AFJ 50.1

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11 Spare parts

11.1 Wear and spare parts

Position number	Designation	Wear part	Spare part
500	Rotor	1	1
501	Stator	1	1
405	Joint sleeve		1
404	Bolt		4
400	Cardan shaft		1
305	Circular ring		1
407	Tensioning strap		2
202	Tensioning pin		1
307	Axial face seal	1	1

11.2 Spare parts list for AFJ 06 / 08 / 10

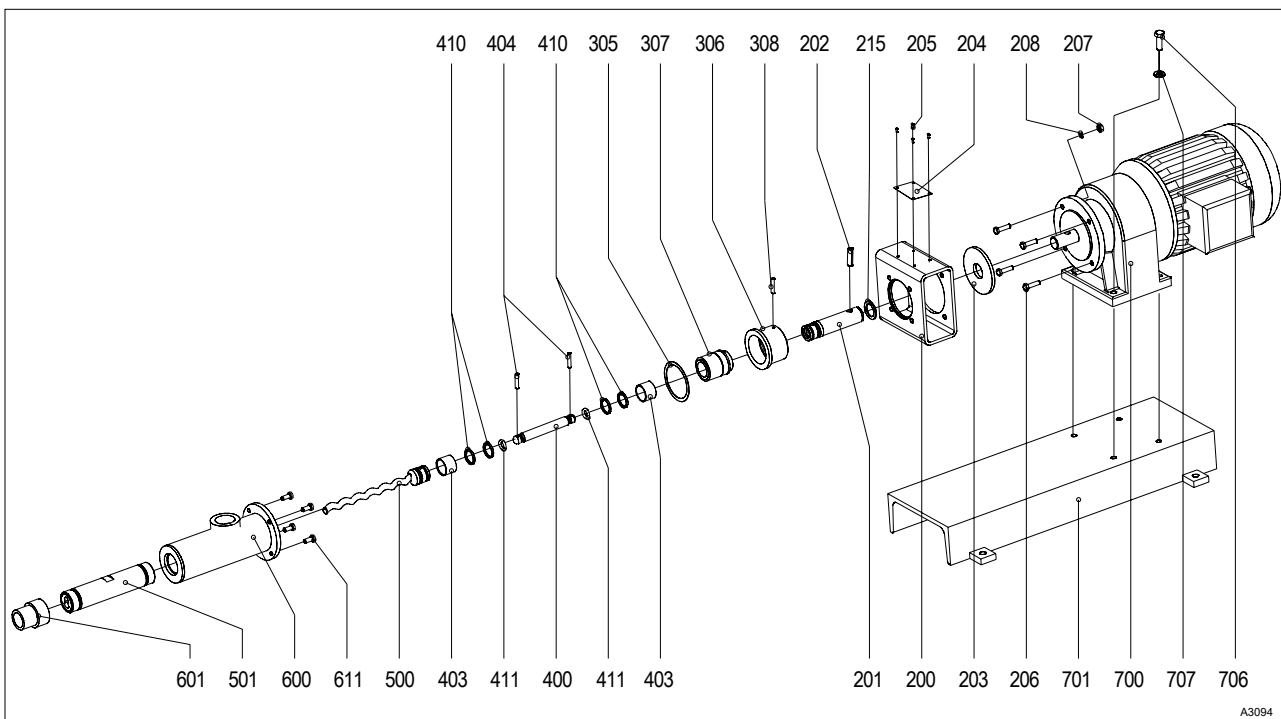


Fig. 28: Spare parts for AFJ 06 / 08 / 10

Pos.	No.	Designation
200	1	Connecting housing
201	1	Drive shaft
202	1	Tensioning pin
203	1	Splash washer
204	1	Nameplate
205	4	Semi-circular grooved pin

Pos.	No.	Designation
206	4	Hex head screw
207	4	Hexagonal nut
208	4	Spring washer
215	1	Spacer ring
305	1	Flat seal
306	1	Axial face bushing
307	1	Axial face seal
308	1	Grooved pin
400	1	Cardan shaft
403	2	Sleeve
404	2	Cylinder pin
410	4	O-ring
411	2	O-ring
500	1	Rotor
501	1	Stator
600	1	Housing
601	1	Nozzle
611	4	Hex head screw
700	1	Drive unit
701	1	Base plate
706	4	Hex head screw
707	4	Washer

11.3 Spare parts list for AFJ 15.1 / 20.1

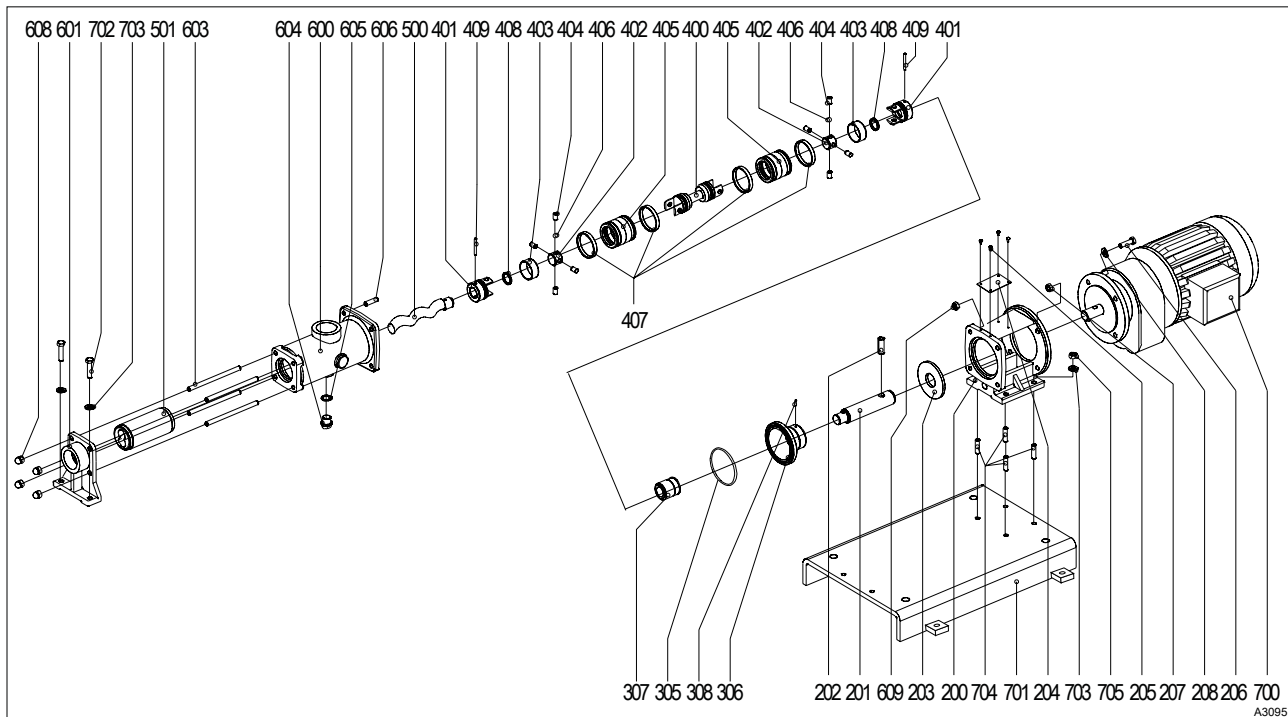


Fig. 29: Spare parts for AFJ 15.1 / 20.1

Pos.	No.	Designation
200	1	Connecting housing
201	1	Drive shaft
202	1	Tensioning pin
203	1	Splash washer
204	1	Nameplate
205	4	Semi-circular grooved pin
206	4	Hex head screw
207	4	Hexagonal nut
208	4	Spring washer
305	1	O-ring
306	1	Axial face bushing
307	1	Axial face seal
308	1	Grooved pin
400	1	Cardan shaft
401	2	Head piece
402	2	Joint piece
403	2	Sleeve
404	8	Bolt
405	2	Joint sleeve
406	2	Ball

Pos.	No.	Designation
407	4	Tensioning clamp
408	2	O-ring
409	2	Tensioning pin
500	1	Rotor
501	1	Stator
600	1	Housing
601	1	Connecting nozzle
603	4	Tension rod
604	2	Locking screw
605	2	Sealing ring
606	4	Stud
608	4	Hex domed nut
609	4	Hexagonal nut
700	1	Drive unit
701	1	Base plate
702	2	Hex head screw
703	6	Washer
704	4	Stud
705	4	Hexagonal nut

11.4 Spare parts list for AFJ 30.1 / 40.1 / 50.1

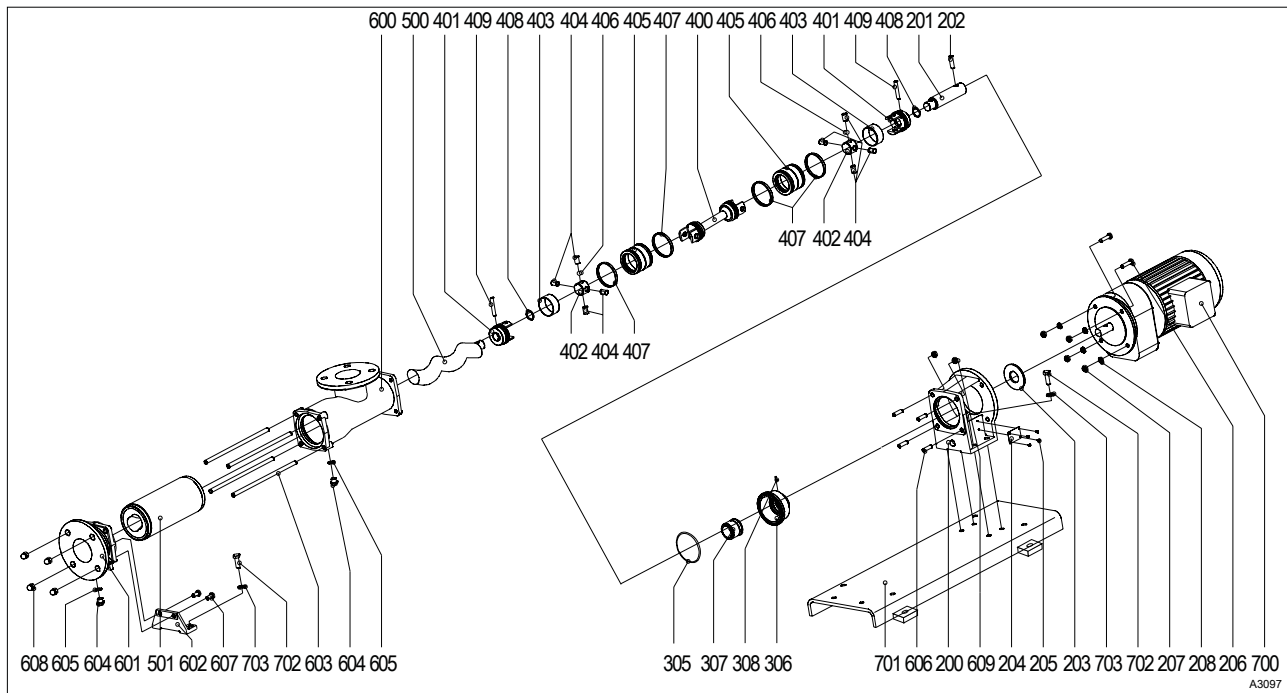


Fig. 30: Spare parts for AFJ 30.1 / 40.1 / 50.1

Pos.	No.	Designation
200	1	Connecting housing
201	1	Drive shaft
202	1	Tensioning pin
203	1	Splash washer
204	1	Nameplate
205	4	Semi-circular grooved pin
206	4	Hex head screw
207	4	Hexagonal nut
208	4	Spring washer
305	1	O-ring
306	1	Axial face bushing
307	1	Axial face seal
308	1	Grooved pin
400	1	Cardan shaft
401	2	Head piece
402	2	Joint piece
403	2	Sleeve
404	8	Bolt
405	2	Joint sleeve
406	2	Ball

Pos.	No.	Designation
407	4	Tensioning clamp
408	2	O-ring
409	2	Tensioning pin
500	1	Rotor
501	1	Stator
600	1	Housing
601	1	Connecting nozzle
602	1	Foot
603	4	Tension rod
604	2	Locking screw
605	2	Sealing ring
606	4	Stud
607	2	Hex head screw
608	4	Hex domed nut
609	4	Hexagonal nut
700	1	Drive unit
701	1	Base plate
702	6	Hex head screw
703	6	Spring washer

12 EC Declaration of Conformity for Machinery

In accordance with DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, Appendix I, BASIC HEALTH AND SAFETY REQUIREMENTS, section 1.7.4.2. C.

We,

- ProMinent GmbH
- Im Schuhmachergewann 5 - 11
- D - 69123 Heidelberg, Germany,

hereby declare that the product specified in the following complies with the relevant basic health and safety rules of the EC/EU Directive, on the basis of its functional concept and design and in the version marketed by us. Any modification to the product not approved by us invalidates this declaration.

Tab. 9: Extract from the EC Declaration of Conformity

Designation of the product:	Eccentric screw pump, Spectra product range
Serial number:	see nameplate on the unit
Relevant EC Directives:	EC Machinery Directive (2006/42/EC) EU EMC Directive (2014/30/EU) Compliance with the protection targets of the Low Voltage Directive 2014/35/EU according to Appendix I, No. 1.5.1 of the Machinery Directive 2006/42/EC EU RoHS Directive (2011/65/EU)
Harmonised standards applied, in particular:	EN ISO 12100:2010 EN 809:1998 + A1:2009 + AC:2010 EN IEC 63000:2018
Place/date:	Heidelberg, 03.03.2021

The EC Declaration of Conformity is available to download on our homepage.

13 Index

A

Action, step by step	2
Annual material requirement	19
Applied harmonised standards	52

C

Cleaning all components	21
CLP DIN 51517 T3	18
Commissioning	15
Contamination of persons and equipment	9
Control of the direction of rotation	16
Correct and proper use	8
Countermeasures	9
Crane	10

D

Decommissioning	15
Designation of the product	52
Direction of flow	16
Direction of rotation of the motor	16
Dry-running protection	13

E

Eccentric screw pump	5
--------------------------------	---

F

Fastening the cable slings	10
--------------------------------------	----

G

Gear motor	5
Gear oil	18
General non-discriminatory approach	2
Grease	18

H

Hazardous media	9
Heating up	18
Hot surface	9

I

Inspection interval	18
Intended use	8
ISO VG 220	18

L

Links to elements or sections of these instructions or other applicable documents	2
---	---

M

Maintenance interval	18
Material safety data sheet	9
More symbols	2
Multi-purpose grease	18

N

Noise generation	18
Non-discriminatory approach	2

O

Oil	18
Operation in the open air and outdoors	9

P

Permissible storage conditions	10
Power consumption of the motor	18
Protection against the pump running dry	13
Pump drive	11

Q

Quantity of lubricant	18
---------------------------------	----

R

Relevant EC directives	52
Risk of frost	17
Rotary displacement pump	5

S

Serial number	52
Set-up and installation	11
severe leakage due to wear	19
Silicone oil	24
Soft soap	24
Spare part, rotor	20
Spare part, stator	20
Stator dismantling dimension I	12
Storage conditions	10
Suction and pressure line, design	12

T

Terminal diagram	14
Types of base	11

U

User qualification	8
------------------------------	---

W

Warning information 6

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