

EcoRAM 200

Pump station for High Viscosity Medias

Operation manual

MSU00036EN, V03

N68540002V

Information about the document

This document describes the correct handling of the product.

- Read the document prior to every activity.
- Prepare the document for the application.
- Pass on the product only together with the complete documentation.
- Always follow safety instructions, handling instructions and specifications of every kind.
- Illustrations can deviate from the technical construction.

Validity range of the document

This document describes the following product:

N68540002V
EcoRAM 200



Applicable documents

Pump documentation

MPU00003* - **EcoPump** VP 250 360

MPU00024* - **EcoPump** VPS 210 360

Controls documentation

MCU00020* - **EcoHVMP**

MCU00021* - **EcoHVMP2**

Documentation - Pneumatic two hand operation



An asterisk (*) in the document number replaces the symbol of the language variant.

Hotline and Contact

If you have queries or would like technical information, please contact your dealer or sales partner.

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1 Product overview

1.1 Overview

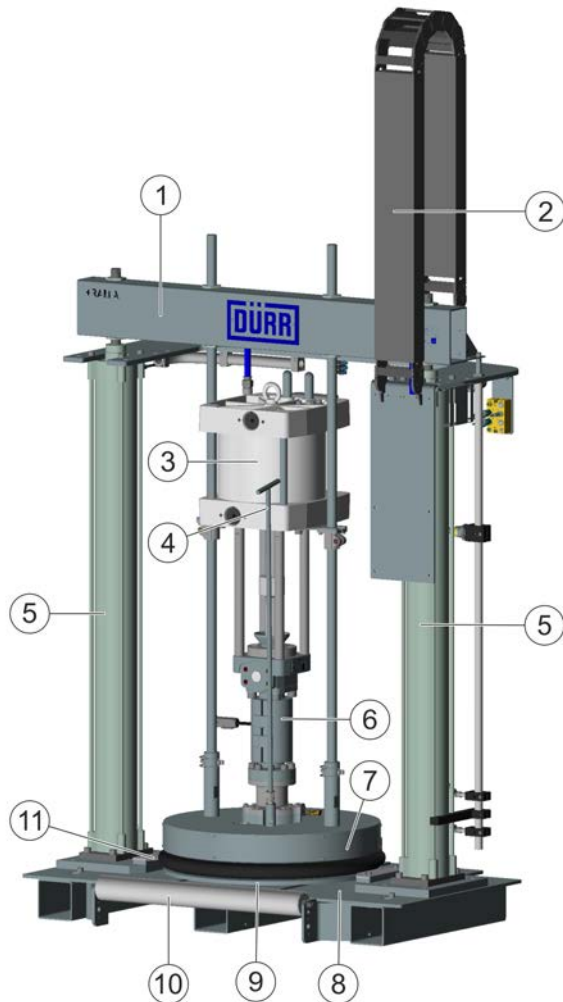


Fig. 1: Product overview Pump station

- 1 Traverse
- 2 Cat track
- 3 Air motor
- 4 Locking rod
- 5 Pneumatic cylinder
- 6 Fluid part of the pump
- 7 Follower plate
- 8 Base plate
- 9 Barrel support
- 10 Roller or roller conveyor (optional)
- 11 Barrel support

The displayed product is not complete. Additional components are required for the operation.

1.2 Short description

The **EcoRAM** (in the following “pump station”) conveys highly viscous material from a barrel to the application technology. The pressure of the follower plate moves the material to the pump.

Optional:

- The pump station is controlled electrically or pneumatically.
- Electrically controlled pump station: A heating system maintains the temperature of the material during operation to allow pumping. After longer down times, the heating system heats the material until it reaches the processing temperature again.
- In double pump stations, the heater can be switched on shortly prior to the barrel change.
- 3 different pneumatic pumps

2 Safety

2.1 Presentation of Notes

The following notes can appear in this instruction:

DANGER!
High risk situation that can lead to serious injuries or death.

WARNING!
Medium risk situation that can lead to serious injuries or death.

CAUTION!
Low risk situations that can lead to minor injuries.

NOTICE!
Situations that can lead to material damage.

ENVIRONMENT!
Situations that can lead to environmental damage.

Additional information and recommendations.

2.2 Intended Use

Use

EcoRAM is a conveying unit for conveying highly viscous media. The pump station is only intended for use with insulating, sealing and adhesive materials for connecting to an application system. The pump station is not permitted for use in an Ex-zone.

The pump station is not equipped with a control system. Only use control systems approved by Dürr Systems. The following control systems are approved for operation with the pump station:

- Electrical control system
The electrically controlled pump station is only intended for industrial use.
 - **EcoHVMP**
 - **EcoHVMP2**
- Pneumatic two hand operation, approved by Dürr
The pneumatically controlled pump station is intended for use in industry and trade.

The use is only permitted within the specified technical data ↪ 12 “Technical data”.

Misuse

If used incorrectly, it can cause serious injuries or death.

Examples of wrong use are:

- Use in explosive areas
- Use in other than industrial areas
- Operation with media temperatures of above 60°C
- Operating the pump station by several operators
- Operation with heated material and pneumatic two hand operation
- Use of unapproved materials
- Unauthorized modifications

2.3 Safety devices

2.3.1 Overview

The operator must install safety related devices securing the operation and conforming to the health requirements and safety requirements according to EC Machinery Directive 2006/42/EC.

This could be, for example, the following safety related devices for the complete system:

- Fire protection
- Technical ventilation
- Emergency stop function

2.3.2 Commissioning by operator

If the pump station is not integrated with an external system (none-Dürr system), the operating company or an integrator commissioned by the operating company is responsible for the integration.

The integrator is responsible for the assembly and initial commissioning and they must ensure that all requirements to the safe operation of the pump station are met and properly implemented.

Parent control

The integrator must provide a parent control for the “sealing system” or “gluing system” in total. The control system is set up in accordance with all relevant, applicable safety requirements and it adheres the applicable standards for the application type and application process.

Pump station control system

Operate the pump station with the following control systems by Dürr only:

The following components are optionally available:

- Control cabinet **EcoHVMP**
- Control cabinet **EcoHVMP2**
- Pneumatic two hand operation, approved by Dürr

The control system monitors the pressure in the barrel; the pressure must not exceed the maximum pressure of 0.5bar. The pressure is regulated, for instance, via a safety valve on the air side upstream of the pump. The safety valve limits the pressure on the material side to a maximum of 250 bar (manufacturer’s specification).

Lifting and lowering the follower plate outside of the barrel may only be carried out with a two hand operation approved by Dürr.

A sensor checks if the follower plate is in the barrel. If the follower plate is in the barrel, it is possible to start “Automatic” operation if there is an electrically controlled pump station.

Emergency stop function

The pump station must be integrated into the emergency stop function of the Station.

The emergency stop function affects as follows the Pump station:

- Compressed air supply is paused. There can still remain a residual pressure in the compressed air lines.
- Air motor stops.
- Valves are connected and vented. Lifting and lowering is not possible.

⚠ WARNING!

Voltage

After actuating the emergency stop function, the Station is not in an operating mode suitable for maintenance, reconditioning or cleaning. It can cause serious injuries or death.

- Observe the working steps described in the instructions, to switch off the Station.
- If the Station is again in proper state, acknowledge emergency stop of the Station.
- Enter the Station only if the “Cleaning” or “Maintenance” operating mode is active.

Temperature monitoring

The temperature monitoring in combination with heating elements is optionally available. The material temperature is monitored using the temperature of the heating.

The temperature monitoring is situated in the control cabinet and therefore customer-specific.

Material supply

If the pump station is integrated in a material supply system, the maximum pressures must be adhered to, ↪ 12 “Technical data”.

2.4 Safety signs

The following safety signs are attached to the pump station:

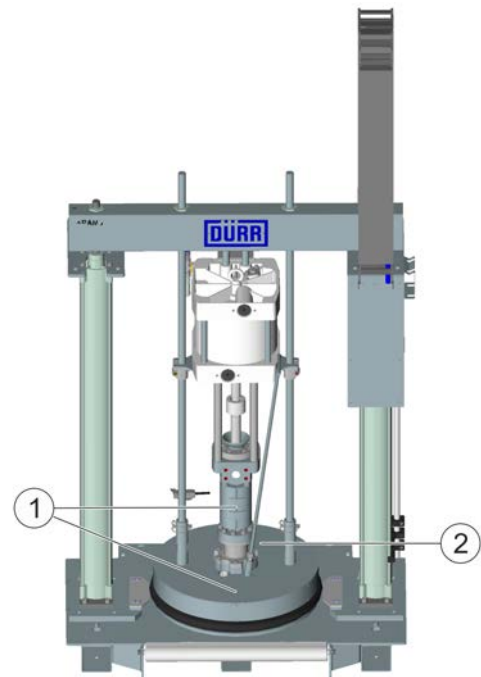


Fig. 2: Pump station safety signs

Item	Symbol	Meaning
1		Hot surfaces
2		Voltage

2.5 Residual risks

Danger from harmful or irritant substances

Serious injuries or death can result if you come into contact with dangerous fluids or steam.

- Pump station Check regularly for leakage. Observe local regulations and maintenance schedule.
- Ensure that the forced ventilation is operational.
- Follow the safety data sheet.
- Wear specified protective equipment.

Material

Material leaking under high pressure can cause serious injury.

Before carrying out any work:

- Switch off material supply system. Secure against reconnection.
- Depressurize the lines.
- Wear specified protective equipment.

Movable components

There is a risk of death if components or equipment in the vicinity move unexpectedly.

- Switch off and lock out all system components against being switched on again before working on the product.

Moving parts

When moving the follower plate, see that body parts are not crushed or cut off. Serious injury and death could be the consequence.

- When in manual operation, make sure that no people are in the area of the follower plate and the pneumatic cylinder.

Noise

The sound pressure level during commissioning and operation may cause severe hearing damage.

- Wear ear protection, depending on the pump used; refer to the operation manual of the pump.
- Do not spend more time than necessary in the work area.
- Operate pump station with functioning sound mufflers only.

Hot surfaces

During operation, the surfaces of components can get extremely hot. Contact with it can cause burns.

- Do not touch hot surfaces.
- Before carrying out any work:
 - Let components cool down.
 - Wear protective hand gloves.

2.6 Property damage

Replacement parts

Replacement parts that are not approved by Dürr Systems may not withstand the full operational loads.

Injury, property damage and production disruption can result.

- Use exclusively original replacement parts.

2.7 Conduct in the event of a hazardous situation

Conduct in case of danger depends on the operator's installation situation.

Basically:

- Switch off power supply and compressed air supply.
- Secure against reconnection.
- Verify no current is present.
- Close media lines.
- Relieve the lines.

2.8 Staff qualification

WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a "+".

This document is intended for qualified personnel in industry and craftsmanship.

Cleaning staff

The cleaning staff receives regular instructions from the operator about the following contents:

- Using the product
- Handling cleaning tools
- Handling cleaning agents
- Technical Measures for occupational safety and health

Electrician

Electricians assemble, install, service and repair electrical systems in a professional manner.

Furthermore, electrical engineers have the following knowledge:

- Guidelines, Standards and Rules of Engineering
- Local conditions
- Electrical Systems and Their Loading Limits
- Technical Measures for occupational safety and health

Mechanic

The mechanic is trained specifically for the field of work in which he works.

Furthermore, he has the following knowledge:

- Guidelines, Standards and Rules of Engineering
- Local conditions
- Technical Measures for occupational safety and health

The mechanic is responsible for the following activities on equipment and components:

- Assembly
- Waiting
- Maintenance
- Disassembly

System operator

The system operator is trained specifically for the field of work in which he works.

The system operator has knowledge in the following specialized areas:

- System-specific process engineering
- Knowledge of the application processes regarding the application medium used
- Local technical measures for occupational safety and health

The system operator is responsible for the following tasks on equipment and components:

- Operate and monitor the system.
- Introduce measures in the event of faults.
- Clean the system.

Dürr Systems offers special product training for ↪ “Hotline and Contact”.

2.9 Personal protective equipment

Wear the required personal protective equipment when working. Provide the following personal protective equipment:



Eye protection

Protects eyes from dust, paint drops and particles.



Protective gloves

Protect the hands from:

- mechanical forces
- Thermal forces
- Chemical effects



Protective workwear

Tight fitting workwear with low tear strength, tight sleeves and no hanging parts.



Respirator mask

Protects from hazardous gases, vapors, dust and similar materials and media.



Safety boots

Protect feet from crushing, falling items and slipping.



Use ear protection

Protects from auditory damage due to noise.

3 Design and Function

3.1 Overview

The pump station can be configured using the following components:

- Pneumatic cylinder
 - Barrel carrier
 - RAM carrier
 - Preparation for control system
 - Follower plate
 - Pump
 - Heating of pump
 - Query of sensor system
 - Attachment side left or right
- The pump station is located to the left or right of the separate control system.



The pump station can be expanded using additional components:

- Control
- Second pump station

3.2 Design

3.2.1 Lifting device

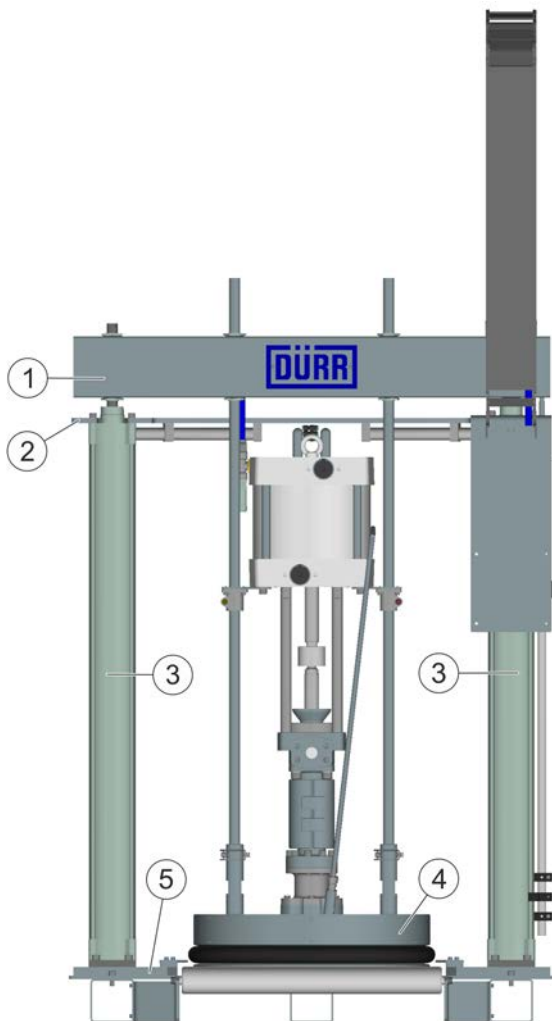


Fig. 3: Lifting device (example)

- 1 Traverse
- 2 Stabilizer
- 3 Pneumatic cylinder
- 4 Follower plate
- 5 Base plate

The pneumatic cylinders (3) make up the framework of the lifting device. The pneumatic cylinders (3) are connected by the stabilizer (2), a U shaped sheet part. The lifting device is mounted to the base plate (5).

The lifting device lifts and lowers the follower plate (4) from and to the material in the barrel. Two air cylinder (3) conduct the movement of the lifting device. The pneumatic cylinders are secured against unintentional lowering by an unlockable non-return valve.

3.2.2 Pneumatic cylinder

Pneumatic cylinder for lifting and lowering the follower plate

- Pneumatic cylinder, Ø100mm (Standard)
- Pneumatic cylinder, Ø160mm
Pneumatic cylinder for materials requiring a higher contact pressure.

i The barrel is provided by the customer. The operator is responsible for using only barrels that are suitable for the containers and the pressure used.

3.2.3 Barrel carrier

The barrel carrier is available in the following versions:

Slide rails (Standard)

Standard bearing for reducing the friction of the barrel and protecting the paint of the base plate. Slide rails improve the sliding and positioning of the barrel. Slide rails are simply replaceable consumable.

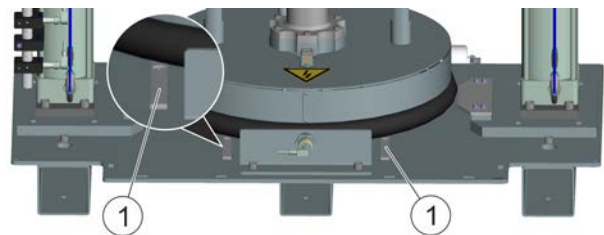


Fig. 4: Barrel carrier, slide rail

- 1 Slide rails

Packing plate (optional)

For positioning the barrel, the packing plate is smaller than the barrel diameter. As a result, the bottom of the barrel is directly on the plate, and not the sheet metal fold. This prevents the barrel from bulging, so that less remaining material remains in the barrel.

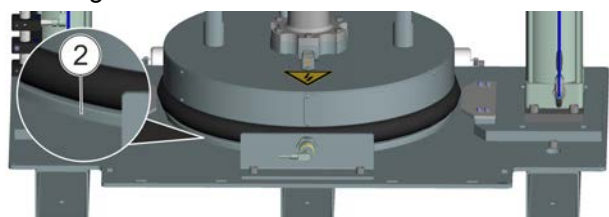


Fig. 5: Barrel carrier, packing plate

- 2 Packing plate

3.2.4 RAM carrier

Without (Standard)

If the following prerequisites are met, the pump station can be directly attached to the floor:

- Level hall floor
- No transport means must be beneath the pump station.

The pump station without RAM carrier has transport eyelets on the top side.

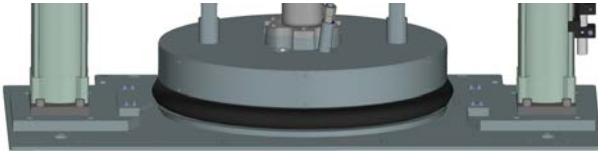


Fig. 6: Without RAM carrier

RAM carrier (1)

The RAM carrier can be configured depending on the custom-side requirements.

The RAM carrier lifts the pump station, so that a transport means fits beneath.

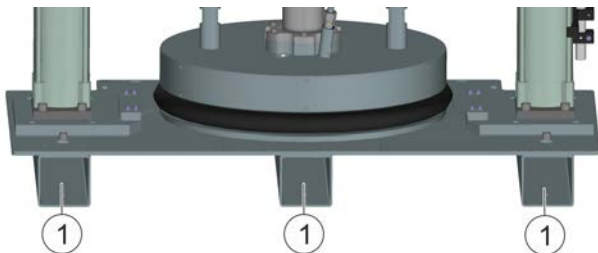


Fig. 7: RAM carrier

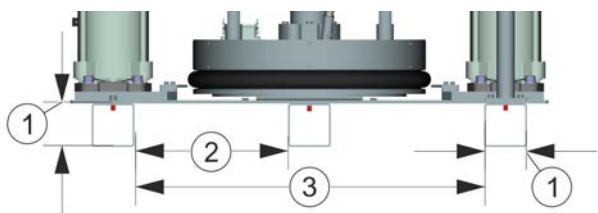


Fig. 8: Dimensioning of RAM carrier

- 1 100mm
- 2 360mm
- 3 820mm

RAM carrier with one roller (2)

A roller facilitates conveying the barrel from the trolley to the pump station.

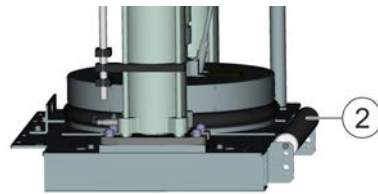


Fig. 9: RAM carrier with one roller

RAM carrier with roller conveyor (3)

The RAM carrier is supplemented by a roller conveyor (3) to move the barrel onto the pump station. The roller conveyor can be folded up, and it can be locked in the upper end position by a spring-loaded bolt (4).

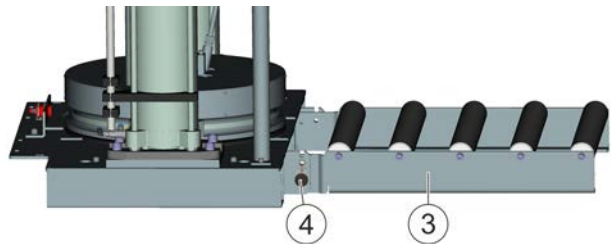


Fig. 10: RAM carrier with roller conveyor

i The lockable bolt (4) is attached to the side to prevent the roller conveyor (3) from falling onto the operator.

3.2.5 Preparation of control system

The optimum control system is pre-assembled depending on the design with the following attachment angles:

- Attachment angle for pneumatic two hand control
- Attachment angle for **EcoHVMP** or **EcoHVMP2**

i The control system is not included in the product. For information regarding the control system, see the operating instructions of the relevant control system.

3.2.6 Follower plate

The basic design of the follower plate is always identical. There are 4 versions of the follower plate:

- cold with sealing ring and wipe ring
- warm with sealing ring
- warm with sealing ring and wipe ring
- hot with sealing ring

A wipe ring is required for media which are separating themselves and leak out individual components. For example, the plasticizer contained in PVC may leak out. The viscosity of plasticizers is much lower than those of the other components. The sealing ring alone will not be sufficient in case of a low viscosity.

All follower plates are equipped with a bleeding rod, a tube with a threaded connection, for screwing into the follower plate.

Follower plate, cold (Standard)

Cold materials suitable for pumping allow to use the cold follower plate.

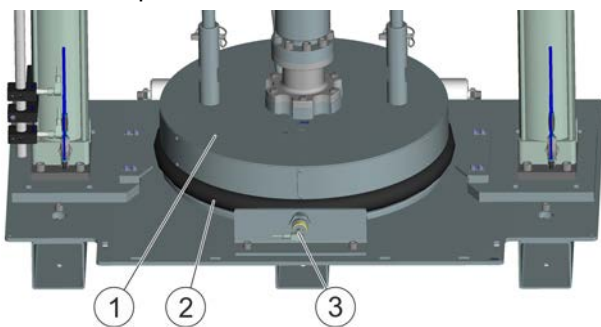


Fig. 11: Follower plate, cold

- 1 Follower plate
- 2 Seal
- 3 Limit switch

The cold follower plate can be upgraded to a warm follower plate.

Follower plate, warm

Areas of application for heated follower plates:

- Make material pumpable.
- Increase material flow

A separate heating system heats the follower plate. The heating system is attached to the pump in the shape of a sleeve.

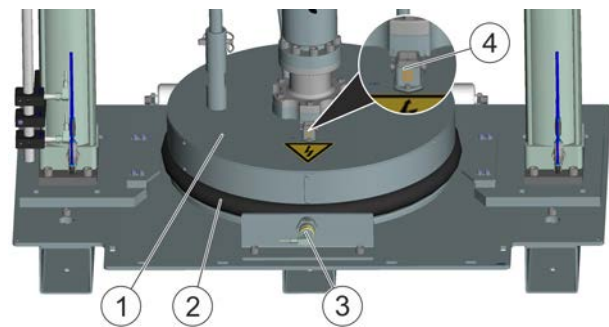


Fig. 12: Follower plate with connection for a heating system

- 1 Follower plate
- 2 Seal
- 3 Limit switch
- 4 Connection for heating system

A heating system heats the follower plate (1). The warm follower plate is equipped with a 1-phase heating system. The seal (2) of the follower plate (1) cleans and seals off the barrel.

The limit switch (3) detects if the barrel is present. 3 more limit switches query the position of the follower plate (1).

Follower plate, hot

The hot follower plate is equipped with a 3-phase heating system.

3.2.7 Pump

The pump station can be operated with ball pumps and chop check pumps. Highly viscous materials require a mechanical supply of the material in the form of a chop check in order to convey the desired material into the material circuit.

The pumps are a stand-alone product. For more information about the pumps, please refer to the respective operation manual.

The following pumps are suitable:

- EcoPump VP 250
- EcoPump VPS 216
- EcoPump VPS 210

To ensure a maximum output pressure of 250bar, safety valves are mounted to the air side of the pump according to the translation ratios.

EcoPump VP 250 360

- Double-acting ball pump with 250cm³
- Maximum material pressure 360bar

The ball pump is for low viscosity media as the ball pump suctions the material.

EcoPump VPS 216 360 ST

- Double-acting chop check pump with 216cm³
- Maximum material pressure 360bar

The chop check pump is used for high viscosity media as the chop check at the pump shovels the material into the pump.

EcoPump VPS 210 360 SST PE and EcoPump VPS 210 360 SST PU/PE

- Pneumatic, vertical chop check pump
- Maximum material pressure 360bar
- Material: PE/PU or PE/PE

The chop check pump is used for high viscosity media as the chop check at the pump shovels the material into the pump.

3.2.8 Heating of pump

The pump heating is attached to the pump in the shape of a sleeve.

High viscosity media require a heating to make the material suitable for pumping or improve the flow volume.



It can be upgraded with a heating.

3.2.9 Sensors

Pneumatic actuation

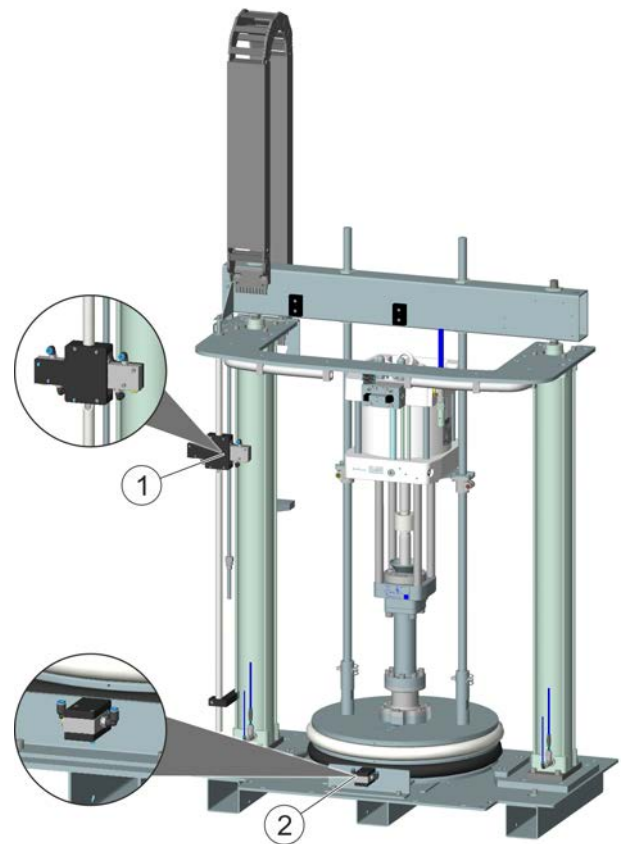


Fig. 13: Sensors, pneumatic

The sensors query the following positions:

- Switching tag with 1 switch point
 - “Follower plate in the barrel” (1), roller plunger valve
- “Barrel present” (2), tappet valve
Checks, if a barrel is present.

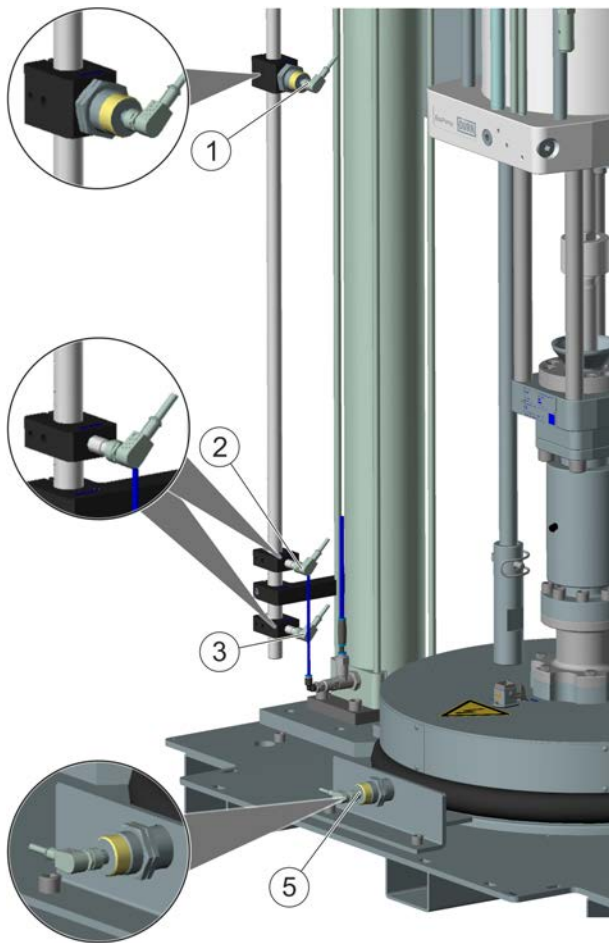
Electric actuation


Fig. 14: Sensors of the pump stations

The sensors query the following positions:

- Switching tag with 3 switch points
 - “Follower plate in the barrel” (1), sensor
 - “Prewarning 10%” (2), sensor
Adjustable, reacts to tiny amounts in the barrel.
 - “Barrel empty” (3), sensor
When the follower plate reaches the sensor, the pump switches off.
- Barrel present (4)

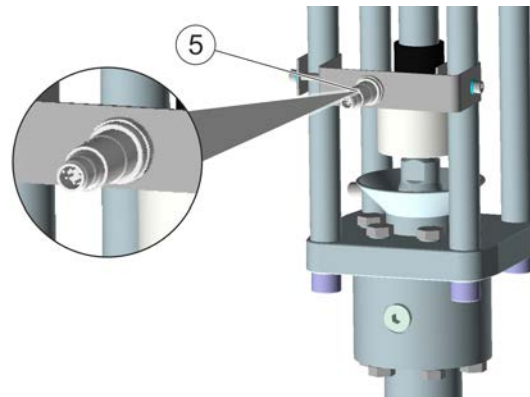
Optional pump stroke (5)


Fig. 15: Pump stroke sensor

The sensor queries the stroke frequency of the pump. The pump stroke sensor (5) allows for information regarding leakage, air in the system or an empty barrel.

- Requirement: electric actuation
- Sensor is pump-specific.
- Sensor is always active.

Optional: Analog fill level monitoring

The analog fill level monitoring provides the control system with an analog value on the fill level in the barrel.

- Requirement: electric pump station
- To the process monitoring

Optional: Switchover to second pump station

If the sensor has reached “Prewarning” (2), the barrel heating of the second pump station is switched on.

If the sensor has reached “Barrel empty” (3), the control system switched automatically to the second pump station.

- Requirement: electric actuation

3.2.10 Control system


The control system is not included in the scope of supply.

The following control systems are available for the pump station:

- HVSS
- EcoHVMP
- EcoHVMP2

3.3 Operation

The operator can lower the lifting device and therefore the follower plate with attached pump unit into the barrel. The seal on the follower plate seals off the barrel. If the follower plate is in the barrel, 2 proximity switches are queried successively. If the switching requirements are met and the follower plate rests on the material surface, the operator can activate the “Automatic” operation at the control system.

Requirements for “Automatic” operation:

- Barrel present
- Follower plate in the barrel
- Material is pumped and vented

In “Automatic” operation, the follower plate presses the material to the pump entry in the center of the follower plate. The pneumatically driven pump conveys the material in up stroke and down stroke. When the follower plate reaches the lower end position, an electrical limit switch switches off the pump and the follower plate stops.

Requirements for barrel change:

- Remove locking rod.
- Screw in bleeding rod.

If the barrel is empty, remove the locking rod and screw in the bleeding rod. After that, the lifting device lifts the follower plate and the pump unit up using the pressure in the barrel. The remaining compressed air escapes when the follower plate leaves the barrel. The pneumatic cylinder are switched on as well. If the follower plate is completely moved upwards, the barrel can be replaced.

Optional heating system:

A heating system maintains the temperature of the material during operation to the processing temperature. After longer down times, the heating system heats the material until it reaches the processing temperature again.

Optional switching to 2. Pump station:

If the limit switch has reached “Prewarning”, the barrel heating of the second pump station is switched on. If the limit switch has reached “Barrel empty”, the control system switches automatically to the second pump station.

3.4 Interfaces

The pump station has interfaces with:

- Compressed air
- Medium (e.g. insulating, sealing and adhesive materials)

The interfaces are on the follower plate and the pump of the pump station.

4 Transport, scope of supply and storage

4.1 Unpacking


Personnel:

- Mechanic

Protective equipment:

- Protective workwear
- Protective gloves
- Safety boots

1. Check the packaging of the assemblies for damage.
⇒ Report damage immediately ↪ “Hotline and Contact”.
2. Remove foils outside of potentially explosive areas.
3. Remove packaging material from all assemblies.
- 4.

 Use aids suitable for transport, such as hoists. The pump station has transport eyelets on its top side. Observe the weight of the product ↪ 12.1 “Dimensions and weight”.

Transport assemblies with suitable hoists to the installation location.

4.2 Transport



WARNING!

Tilting pump station

Improper transport of the pump station may cause the pump station to tilt, which can result in serious injuries.

- Use transport eyelets only for short distances.
- Bolt pump station onto a pallet.
- Secure pump station from tipping over.

⚠ WARNING!

Lifting heavy loads

Lifting heavy loads could cause back injuries, crushing or compression. Serious injuries can be the consequence.

- Lift heavy loads only by using suitable hoists.
 - ↳ 12.1 “Dimensions and weight”
- Conduct work with two persons present only.

Personnel:

- Mechanic

Protective equipment:

- Protective workwear
- Protective gloves
- Safety boots

Requirements:

- Product has been disassembled ↳ 11.2 “Disassembly”.
 - Transport paths are free of obstacles, etc.
1. Use the original packing for transporting. If the original packing is no longer available, the packing used must meet the following requirements:
 - Comprehensive protection from vibrations
 - Protection from dirt
 - Protection from moisture
 2. Fasten suitable hoist to transport eyelets.
 3. Place product onto a pallet using a suitable hoist.
 4. Bolt product onto a pallet using wood screws.
 5. Lash product with a lashing strap on the pallet.
 6. Label packaging twice and indicate both contents and weight.

4.3 Scope of delivery

The pneumatic pump station is pre-assembled upon delivery.

- Optional components are separately available.
- Inspect delivery on receipt for completeness and integrity.
- Report defects immediately ↳ “Hotline and Contact”.



The control system is not included in the scope of supply.

Interfaces of the pneumatic pump station:

- Open pump outlet
- Open pneumatic lines
- Open sensors
- Open heating cables

4.4 Handling of packaging material



ENVIRONMENT!

Incorrect disposal

Incorrectly disposed packaging material can damage environment.

- Dispose of material no longer required in an environment-friendly manner.
- Observe local disposal specifications.

4.5 Storage

Storage provisions:

- Do not store outdoors.
- Store Pump station only when dry.
- Store in a dust-free place.
- Do not expose to aggressive media.
- Protect from solar radiation.
- Avoid mechanical vibrations.
- Temperature: 10°C to 40°C
- Relative humidity: 35% to 90%

5 Assembly

5.1 Safety recommendations



WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a “+”.

! WARNING!

Lifting heavy loads

Lifting heavy loads could cause back injuries, crushing or compression. Serious injuries can be the consequence.

- Lift heavy loads only by using suitable hoists.
 - ↳ 12.1 “Dimensions and weight”
- Conduct work with two persons present only.

! CAUTION!

Electrostatic charging

The pump station may become electrostatically charged due to fluid streaming or mechanical movement. The voltage discharges in case of touching the pump station. This can cause minor injuries.

- Ground the pump station as specified.
 - The potential equalization to the surroundings must be conducted and checked according to IEC 60204-1.
- Check connection of grounding cable.

5.2 Requirements for the Installation point.

Floor mounting

- For floor mounting, prepare a flat, smooth concrete foundation with sufficient bearing capacity.
 - When making the concrete foundation, pay attention to the bearing capacity of the underground and to the country-specific construction provisions. There must not be any insulating layers or screed between the mounting plates and the concrete foundation.
- It must be possible to disconnect the compressed air supply and secure it against reconnection.
- The pump station must be integrated in a closed process.
- The pump station must be installed in an area with forced ventilation and suitable fire protection.
- Lines, seals and screw connections must meet the requirements of the pump station, refer to ↳ 12.4 “Operating values”.
- There must be a suitable grounding point at the installation site.
- The pump station must be accessible for maintenance when installed.

5.3 Assembly

i Assembly and initial commissioning is conducted by qualified personnel.

Standard without steel beam

Personnel:

- Mechanic

Protective equipment:

- Protective gloves
- Safety boots

Requirements:

- The floor surface must meet the designated requirements.

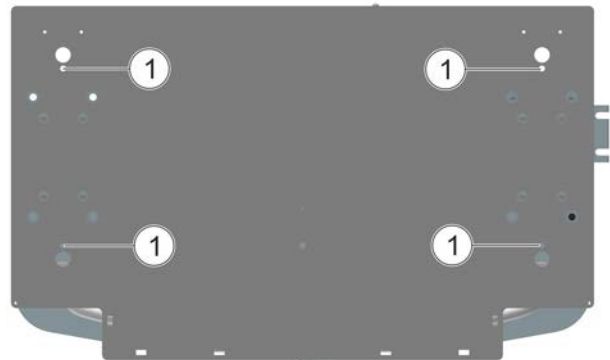


Fig. 16: Assembly without steel beam

1. Insert four ground anchors (M10) into the bores (1) of the base plate.
2. Tighten ground anchors.
 - ⇒ The base plate is fastened to the floor.

Optional: with steel beam

Personnel:

- Mechanic

Protective equipment:

- Protective gloves
- Safety boots

Requirements:

- The floor surface must meet the designated requirements.

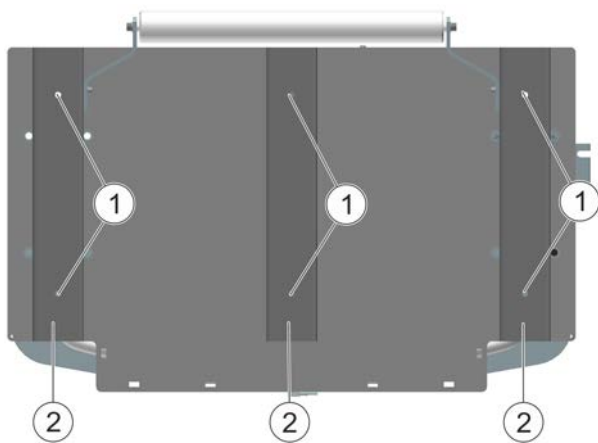


Fig. 17: Assembly with steel beam

1. Insert six ground anchors (M10) into the bores (1) of the opening height (2).
2. Tighten ground anchors.
⇒ The base plate is fastened to the floor.

5.4 Connecting

i All media lines and their connections are uniquely labeled and described using the corresponding technical documentation. The piping must be conducted in accordance with these specifications.

Personnel:

- Mechanic

Protective equipment:

- Protective gloves

Requirements:

- Compressed air supply is closed and secured against reconnection.

1. Connect media lines to the outlet of the pump.

i Depending on the pump used, refer to the operation manual of the pump

2. Connect hose package, including connection to the compressed air supply, to the control system.

i Depending on the control system used, refer to the operation manual of the control system

5.5 Ground the Pump station

⚠ CAUTION!

Electrostatic charging

The pump station may become electrostatically charged due to fluid streaming or mechanical movement. The voltage discharges in case of touching the pump station. This can cause minor injuries.

- Ground the pump station as specified.
The potential equalization to the surroundings must be conducted and checked according to IEC 60204-1.
- Check connection of grounding cable.

Personnel:

- Electrician

Protective equipment:

- Protective workwear
- Safety boots
- Protective gloves

i Pump station is supplied pre-assembled. The grounding must start at the base plate.



Fig. 18: Grounding connections

1. Connect grounding cable to the grounding connections (1) on the base plate.
2. Connect the grounding cable to the external potential equalization.
3. Measure volume resistivity.
⇒ Pump station is grounded.

6 Commissioning

6.1 Safety Instructions



WARNING!

Electrostatic charging due to missing grounding

If the pump station is not properly grounded or the potential equalization fails, components can become electrostatically charged. The pump station discharges in case of contact. Electrostatic discharge can cause sparks potentially causing a fire or an explosion. Serious injuries can be the consequence.

- Ground pump station as specified at the grounding point.

The potential equalization to the surroundings must be conducted and checked according to IEC 60204-1.

- Check connection of grounding cable.
- Measure volume resistivity.



WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a “+”.



WARNING!

Hot surface

During operation, the surfaces of components can get extremely hot. Contact with it can cause burns.

- Do not touch hot surfaces.
- Before carrying out any work:
 - Let components cool down.
 - Wear protective hand gloves.



WARNING!

Danger of crushing from follower plate

When lowering the follower plate, see that body parts are not crushed or cut off. Serious injury and death could be the consequence.

- Lift and lower the follower plate outside of the barrel only in combination with a two hand operation approved by Dürr Systems.
- Ensure that there are no persons present at the follower plate.



WARNING!

Operation by several persons

If the pump station is operated by several persons, persons present in the danger zone can be overlooked. When lowering the follower plate, see that body parts are not crushed or cut off. Serious injury and death could be the consequence.

When working on the pump station

- Danger zone must be visible.
- Have work done by one person.



WARNING!

Falling roller conveyer

If the roller conveyer is not secured, it may fall down. This may cause injuries.

- Operate roller conveyer from one side only.
- Fold roller conveyer upwards. Secure with a spring-loaded bolt if in the upper end position.



WARNING!

Material escaping under pressure

If the pump station is operated with an input pressure that is too high, supply lines may become damaged. Escaping material under pressure can cause serious injuries.

- The integrator is responsible for maintaining the specified pump input pressures, refer to the operation manual of the pump.



WARNING!

Lifting heavy loads

Lifting heavy loads could cause back injuries, crushing or compression. Serious injuries can be the consequence.

- Lift heavy loads only by using suitable hoists.
 - ↳ 12.1 “Dimensions and weight”
- Conduct work with two persons present only.



WARNING!

Risk of injury due to noise

The sound pressure level during commissioning may cause severe hearing damage.

- Wear ear protection, refer to the operation manual of the pump.
- Put the pump only with assembled sound muffler into operation.

CAUTION!

Risk of tripping due to the roller conveyor

If the roller conveyor is down, there is a risk of tripping. This can cause minor injuries.

- After barrel change fold the roller conveyor upwards.
- Secure roller conveyor in the upper end position with a spring-loaded safety pin.

6.2 Check safety devices

Check present parent safety devices. For further information, see the corresponding operating instructions.

6.3 Final checks

For information regarding commissioning, see the parent operating instructions or the corresponding operating instructions of the components.

1. Check prior to commissioning:
 - All components are fully assembled
 - Optional heating sleeve:
The texture sheath of the heating sleeve is assembled.
 - Correct screw connection of the product, in accordance with the relevant operation manual of the component
 - Check tightness of the lines
 - Check if the maximum input pressures are met.
 - Check system pressure, refer to the operation manual of the relevant pump.
 - Connect existing material supply.
 - Connect control system, refer to the operation manual of the relevant control system.
2. Perform functional check:
 - Lifting and lowering function
 - Stop position without lowering the follower plate.
 - Pump function

7 Operation

7.1 Safety recommendations

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous chemicals can cause serious injuries.

- Follow safety data sheets.
- Wear specified protective clothing.

WARNING!

Hand over safety related devices

Several operators working on the pump station simultaneously can cause serious injury.

- Only one person is permitted to conduct the barrel change.
- The two hand operation ensures that the operator is not inside of the danger zone.

WARNING!

Risk of injury from whipping hoses

If hoses under pressure come off loose, the hoses can lash around and cause injuries.

- Check that the hose connections are seated tightly.
- Check hoses for damage.
- Before carrying out any work:
 - Depressurize hoses.
 - Secure the system against reconnection.

WARNING!

Hot surface

During operation, the surfaces of components can get extremely hot. Contact with it can cause burns.

- Do not touch hot surfaces.
- Before carrying out any work:
 - Let components cool down.
 - Wear protective hand gloves.

 **WARNING!**

Danger due to freezing

The pneumatic drive unit can cool down significantly. Contact with it can result in frostbite.

- Wear protective hand gloves.
- Before conducting any maintenance and cleaning work, ensure that the pneumatic drive unit has room temperature.

 **WARNING!**

Danger of crushing from follower plate

When lowering the follower plate, see that body parts are not crushed or cut off. Serious injury and death could be the consequence.

- Lift and lower the follower plate outside of the barrel only in combination with a two hand operation approved by Dürr Systems.
- Ensure that there are no persons present at the follower plate.

 **WARNING!**

Excessive input pressure

Exposing the pump to excessive input pressure can damage the pump. Serious injury and death could be the consequence.

- The integrator is responsible for maintaining the specified pump input pressures, refer to the operation manual of the pump.
- Charge the pump with low pressure at the time of commissioning.
- Before increasing the pressure, check that hoses and connections are seated tightly.
- Increase pressure gradually, until the maximum input pressure is reached.
- Do not exceed maximum input pressure ↪ 12.4 “Operating values”.

 **WARNING!**

Risk of injury due to noise

The sound pressure level during normal operation may cause severe hearing damage.

- Wear ear protection, refer to the operation manual of the pump.
- Put the pump only with assembled sound muffler into operation.

 **WARNING!**

Falling roller conveyor

If the roller conveyor is not secured, it may fall down. This may cause injuries.


- Operate roller conveyor from one side only.
- Fold roller conveyor upwards.
Secure with a spring-loaded bolt if in the upper end position.

 **WARNING!**

Overpressure in the compressed air supply

Exceeding the limit values may cause injuries. It may cause product damages and production interruptions.

- Use the pressure controller or the overpressure valve to ensure that the maximum pneumatic pressure is not exceeded. Do not exceed limit values.
- Check and replace safety valve in accordance with the local regulations.
- Integrate pump station into the parent emergency stop concept, ↪ 2.3 “Safety devices”.

 **CAUTION!**

Risk of tripping due to the roller conveyor

If the roller conveyor is down, there is a risk of tripping. This can cause minor injuries.

- After barrel change fold the roller conveyor upwards.
- Secure roller conveyor in the upper end position with a spring-loaded safety pin.

 **NOTICE!**

Overpressure in the barrel

Exposing the pump to excessive input pressure can damage the pump.

- Operate pump station only with control system. The control system ensures that the ventilation of the barrel does not exceed a maximum pressure of 0.5bar. For instance, via a safety valve

! NOTICE!

Overpressure in the barrel

Lowering the follower plate causes the pressure in the barrel to increase. If the lowering pressure is too high, the barrel may become damaged and burst.

- The lowering pressure of the pneumatic cylinders, which applies to the follower plate, must be set in the control system.
 - The translation ratio resulting from the pressure may not exceed the maximum allowable pressure of the material used.
 - Observe the maximum operating parameters of the pump and the material.
- Use appropriate components (e.g. pressure controller, overpressure valve) in the pneumatic supply to ensure that the maximum pneumatic pressure of the components does not exceed 6bar.

! NOTICE!

Imploding barrel due to negative pressure

Lifting the follower plate causes negative pressure in the barrel. If the negative pressure becomes too high, the barrel may implode.

- For lifting the follower plate, screw in the bleeding rod in order to equalize the pressure through supply air.
- If the follower plate rises from the material, remove bleeding rod to maintain the atmospheric pressure in the barrel.
- Lift the follower plate only in combination with a two hand operation approved by Dürr Systems.

! NOTICE!

Collision

If the follower plate is not centered when being lowered into the barrel, the barrel will get damaged.

- Center barrel under the follower plate before lowering the follower plate.

7.2 General notes

Personnel:

- Mechanic

Protective equipment:

- Eye protection
- Use ear protection
- Protective gloves
- Safety boots

Check for unusual noises during operation. Perform visual inspections:

- Cleanliness
 - Ensure there are no material residues and other contaminants.
 - Damage and leaks can be detected better on clean components.
- Tightness
 - Check tightness of the connections and cables.
- Connections
 - Check pneumatic and electrical connections.
- Temperature
 - Check operating temperature ↪ 12 “Technical data”.
- Operating pressure
 - Check settings on the pressure control valves and pressure gages ↪ 12 “Technical data”.

Perform further checks during down time, if you notice unusual or loud noises.

7.3 Operating

During operation, the pump station is controlled by the parent control system.

7.4 Replacing barrel

7.4.1 General notes

Immersing a barrel is possible in the “Manual” operating mode.

! WARNING!

Hand over safety related devices

Several operators working on the pump station simultaneously can cause serious injury.

- Only one person is permitted to conduct the barrel change.
- The two hand operation ensures that the operator is not inside of the danger zone.

! NOTICE!

Corrugated barrels are not suited for the pump station.

A barrel change must be followed by an automatic release. For further information on the automatic release, see the operating instructions of the control system.

7.4.2 Lifting the follower plate

! NOTICE!

Imploding barrel due to negative pressure

Lifting the follower plate causes negative pressure in the barrel. If the negative pressure becomes too high, the barrel may implode.

- Prior to lifting the follower plate, remove locking rod in order to equalize the pressure through supply air.
- Optional: Screw in bleeding rod for support. If the follower plate rises from the material, remove bleeding rod to maintain the atmospheric pressure in the barrel.
- Lift the follower plate only in combination with a two hand operation approved by Dürr.

Personnel:

- System operator

Protective equipment:

- Eye protection
- Protective gloves

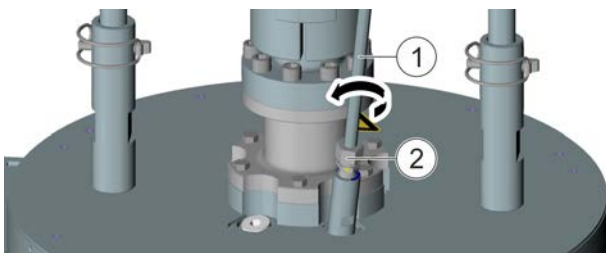


Fig. 19: Release locking rod

1. Release the locking rod (1) from the connection (2) in the direction of the arrow.
2. Move lifting device upwards.
 - ⇒ The lifting operation is interrupted shortly before the follower plate leaves the barrel.
 - Follower plate remains in the position.
 - If the follower plate cannot be lifted,
 - ↳ 10.3.2 “Screw in bleeding rod”.
3. Restart lifting operation.
 - ⇒ The follower plate reaches the end position of the lifting cylinder.
4. Clean the follower plate ↳ 8.4 “Cleaning the follower plate”.

7.4.3 Replacing barrel

Personnel:

- System operator

Protective equipment:

- Eye protection
 - Protective workwear
 - Protective gloves
 - Safety boots
- Follower plate has been moved up.
 - New barrel is intact.

Optional roller conveyor:

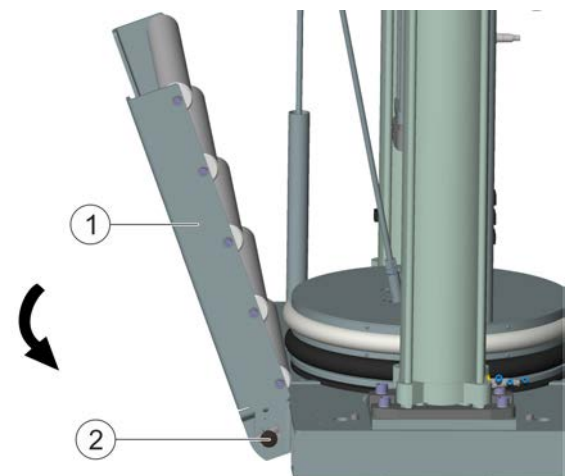


Fig. 20: Roller conveyor, top

1. Pull at the side of the pawl (2).
2. Fold roller conveyor (1) down.
3. Push empty barrel onto a suitable transport means.
4. Dispose of the empty barrel.

🌱 ENVIRONMENT!

Follow the details provided by the manufacturer.- on the data sheet.

5. Keep new barrel ready.

! NOTICE!

Damages to the barrel walls deform and destroy the sealing lip on the follower plate.

- Position new barrel with transport means in front of the pump station.

The label with the information of the barrel contents and the due date must point forward.

- Open new barrel.
- Check barrel contents for contaminants.

Follow manufacturer information.

- Push new barrel under the follower plate. Center barrel.

! NOTICE!

Collision

If the follower plate is not centered when being lowered into the barrel, the barrel will get damaged.

- Center barrel under the follower plate before lowering the follower plate.

- Grease barrel and seal.

Optional roller conveyor:

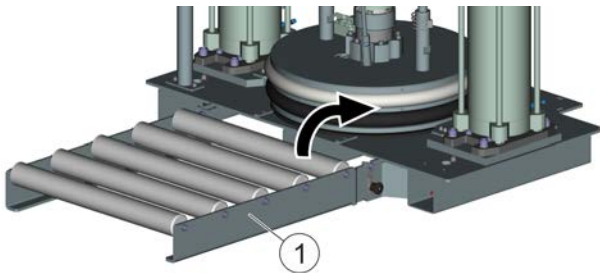


Fig. 21: Fold up roller conveyor

- Fold roller conveyor upwards.

The roller conveyor can be locked with a spring-loaded bolt if in the upper end position.

⇒ Roller conveyor latches in place.

To reduce the down time when replacing a barrel, the double-pump stations are separately available as well. Double-pump stations allow switching to the second barrel during operation.

7.4.4 Lowering the follower plate

! WARNING!

Danger of crushing from follower plate

When lowering the follower plate, see that body parts are not crushed or cut off. Serious injury and death could be the consequence.

- Lifting and lowering the follower plate outside of the barrel is permitted only with a two hand operation approved by Dürr.
- Ensure that there are no persons present at the follower plate.
- If the follower plate is in the barrel, the follower plate can be lowered automatically.

Personnel:

- System operator

Protective equipment:

- Eye protection
- Protective workwear
- Protective gloves
- Safety boots

Requirements:

- Follower plate is clean.

- Remove bleeding rod.

! NOTICE!

Overpressure in the barrel

Lowering the follower plate causes the pressure in the barrel to increase. If the lowering pressure is too high, the barrel may become damaged and burst.

- The lowering pressure of the pneumatic cylinders, which applies to the follower plate, must be set in the control system. Observe the maximum operating parameters of the pump and the material.

- Cover connection opening of the bleeding rod with a cloth.

- Lower follower plate until the follower plate rests on the material. Two sensors recognizes the follower plate in the container.

Move down the lifting device.

⇒ Follower plate moves downwards.

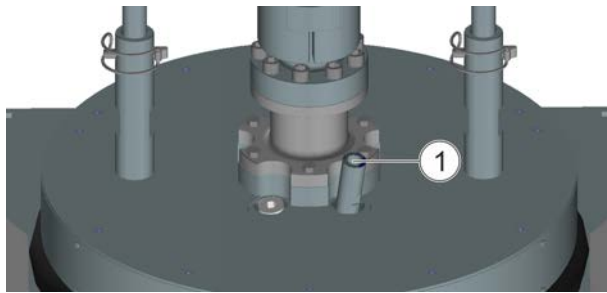


Fig. 22: Follower plate connection

4. Observe the rise of the material in the connection (1) after fitting the follower plate. Leave two to three threads free.
 - ⇒ The material climbs up.
5. Pause the lowering operation.
 - ⇒ Follower plate remains in the position.
6. Grease threads of the locking rod.
7. Screw the locking rod into the connection.
 - ⇒ Automatic release “Barrel ready” is active.

8 Cleaning

8.1 Safety recommendations

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous chemicals can cause serious injuries.

- Follow safety data sheets.
- Wear specified protective clothing.

WARNING!

Hot surface

During operation, the surfaces of components can get extremely hot. Contact with it can cause burns.

- Do not touch hot surfaces.
- Before carrying out any work:
 - Let components cool down.
 - Wear protective hand gloves.

WARNING!

Danger due to freezing

The pneumatic drive unit can cool down significantly. Contact with it can result in frostbite.

- Wear protective hand gloves.
- Before conducting any maintenance and cleaning work, ensure that the pneumatic drive unit has room temperature.

WARNING!

Risk of injury due to escaping material and compressed air

Escaping compressed material can cause serious injury.

Before working on the product:

- Disconnect the system with the product from compressed air.
- Secure the system against being switched on again.
- Depressurize the lines.

WARNING!

Unsuitable replacement parts

Replacement parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

WARNING!

Live Components

Electrical shocks and discharges pose a risk of injury when working on live components and lines. It can cause serious injuries or death.

- Have only qualified electricians carry out work on the live components and electrical cables.
- Before carrying out any work, disconnect electrical supply.
- Secure electrical supply against being switched on again.
- Verify that no current is present on the electrical components and cables.

! NOTICE!

Unsuitable Cleaning Tools

Unsuitable cleaning tools can cause damage.

- Only use cloths, soft brushes and paintbrushes.
- Do not use abrasive cleaning tools.
- Do not use compressed air for cleaning.
- Do not use any thinner spray guns.
- Do not use high pressure for cleaning agents.

! NOTICE!

Unsuitable cleaning agents

Unsuitable detergents can cause material damage.

- Only use cleaning agents approved by the material manufacturer.
- Follow safety data sheets.

8.2 General notes

Only trained and instructed staff may conduct cleaning work.

Detailed information about the cleaning is given in the operating instructions of the individual components.

Before conducting any work, verify the following:

- Disconnect assemblies from the energy supply (e.g. compressed air, electricity). Secure against reconnection.

Before working on the product:

- Wear suitable protective equipment (e.g. gloves, protective goggles and safety boots).
- Use suitable cleaning tools.
- Check product for contamination in order to avoid larger, stubborn contaminants.

Check prior to recommissioning:

- Product is free from contaminants.
- All assemblies are fully assembled (e.g. covers).
- All hoses and lines are connected.
- Check hoses and lines for leakage.
- Correct grounding of the assemblies
- Volume resistance test was carried out.
- No aids (e.g. tools) are lying around in the danger zone
- Technical ventilation is in operation.
- Safety related devices are functioning.

8.3 Cleaning

Personnel:

- Cleaning staff

Protective equipment:

- Protective gloves
- Safety boots

- Eye protection
- Respirator mask

Requirements:

- Via control system: Operating mode “Maintenance” is active.
 - Pump station is secured against reconnection.
1. Clean the follower plate ↪ 8.4 “Cleaning the follower plate”.
 2. Wipe down assemblies and components with a cleaning agent and a moist, lint-free cloth.
 3. Remove hardened material on connections and relief valve using a scraper. Wipe down surfaces with a cleaning agent and a moist, lint-free cloth.

! NOTICE!

Non-conductive materials such as compressed air hoses and media lines, must be cleaned using a moist cloth.

4. Clean compressed air hoses and media lines using a moist cloth.

8.4 Cleaning the follower plate

Personnel:

- Cleaning staff

Protective equipment:

- Protective gloves

1. Remove material residues from the top and bottom of the follower plate using a scraper.
2. Wet cloth with an appropriate cleaning agent.
3. Wipe sealing with the wetted cloth.

! NOTICE!

Unsuitable operating and auxiliary materials

If you use unsuitable operating and auxiliary materials, it can result in property damage.

- Use authorized operating and auxiliary materials only ↪ 12.7 “Operating and auxiliary materials”.

4. Grease the seal on the follower plate ↪ 12.7 “Operating and auxiliary materials”.

9 Maintenance

9.1 Safety notes

WARNING!

Electrostatic charging due to missing grounding

If the pump station is not properly grounded or the potential equalization fails, components can become electrostatically charged. The pump station discharges in case of contact. Electrostatic discharge can cause sparks potentially causing a fire or an explosion. Serious injuries can be the consequence.

- Ground pump station as specified at the grounding point.
The potential equalization to the surroundings must be conducted and checked according to IEC 60204-1.
- Check connection of grounding cable.
- Measure volume resistivity.

WARNING!

Live Components

Electrical shocks and discharges pose a risk of injury when working on live components and lines. It can cause serious injuries or death.

- Have only qualified electricians carry out work on the live components and electrical cables.
- Before carrying out any work, disconnect electrical supply.
- Secure electrical supply against being switched on again.
- Verify that no current is present on the electrical components and cables.

WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a “+”.

WARNING!

Unsuitable replacement parts

Replacement parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

WARNING!

Risk of injury due to escaping material and compressed air

Escaping compressed material can cause serious injury.

Before working on the product:

- Disconnect the system with the product from compressed air.
- Secure the system against being switched on again.
- Depressurize the lines.

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous chemicals can cause serious injuries.

- Follow safety data sheets.
- Wear specified protective clothing.

WARNING!

Hot surface

During operation, the surfaces of components can get extremely hot. Contact with it can cause burns.

- Do not touch hot surfaces.
- Before carrying out any work:
 - Let components cool down.
 - Wear protective hand gloves.

WARNING!

Danger due to freezing

The pneumatic drive unit can cool down significantly. Contact with it can result in frostbite.

- Wear protective hand gloves.
- Before conducting any maintenance and cleaning work, ensure that the pneumatic drive unit has room temperature.



WARNING!

Falling roller conveyor

If the roller conveyor is not secured, it may fall down. This may cause injuries.

- Operate roller conveyor from one side only.
- Fold roller conveyor upwards.
Secure with a spring-loaded bolt if in the upper end position.



WARNING!

Lifting heavy loads

Lifting heavy loads could cause back injuries, crushing or compression. Serious injuries can be the consequence.

- Lift heavy loads only by using suitable hoists.
↳ 12.1 “Dimensions and weight”
- Conduct work with two persons present only.



CAUTION!

Risk of tripping due to the roller conveyor

If the roller conveyor is down, there is a risk of tripping. This can cause minor injuries.

- After barrel change fold the roller conveyor upwards.
- Secure roller conveyor in the upper end position with a spring-loaded safety pin.



NOTICE!

Unsuitable Cleaning Tools

Unsuitable cleaning tools can cause damage.

- Only use cloths, soft brushes and paintbrushes.
- Do not use abrasive cleaning tools.
- Do not use compressed air for cleaning.
- Do not use any thinner spray guns.
- Do not use high pressure for cleaning agents.



NOTICE!

Unsuitable cleaning agents

Unsuitable detergents can cause material damage.

- Only use cleaning agents approved by the material manufacturer.
- Follow safety data sheets.

9.2 General notes

Only trained and instructed staff may conduct maintenance work.

Detailed information about the maintenance is given in the operating instructions of the individual components.

Before conducting any work, verify the following:

- Disconnect assemblies from the energy supply (e.g. compressed air, electricity). Secure against reconnection.

Before working on the product:

- Wear suitable protective equipment (e.g. gloves, protective goggles, safety boots).
- Use suitable aids (e.g. slings) and tools.
- Use only approved replacement parts and accessories, ↳ 13 “Replacement parts and accessories”.
- The specified maintenance intervals must be adhered to and documented.
- Check product for contamination in order to avoid larger, stubborn contaminants.

Check prior to recommissioning:

- Product is free from contaminants.
- All assemblies are fully assembled (e.g. covers).
- All hoses and lines are connected.
- Check hoses and lines for leakage.
- Correct grounding of the assemblies
- Volume resistance test was carried out.
- No aids (e.g. tools) are lying around in the danger zone
- Technical ventilation is in operation.
- Safety related devices are functioning.

9.3 Maintenance schedule



The specified maintenance intervals are recommendations only. The intervals may vary depending on the operating conditions.

Interval	Maintenance work
daily	Sealing package piston rod <ul style="list-style-type: none"> Check for tightness, replace seal packet if necessary, refer to the operation manual of the relevant pump.
monthly	Lines and connections: <ul style="list-style-type: none"> Check for contamination, clean if necessary ↪ 8.3 "Cleaning". Check for damage. Replace defective components. Check connections for firm seat. Check pipes for damages. If necessary, replace ↪ 9.5 "Replace hoses". Check safety valve for proper functioning, replace if necessary. Refer to the operation manual of the relevant pump.
annually	Pump <ul style="list-style-type: none"> Check for tightness, replace when leaking ↪ 9.7 "Replace pump.". Refer to the operation manual of the relevant pump.

9.4 Replace seals

Personnel:

- Mechanic

Protective equipment:

- Eye protection
- Protective gloves
- Safety boots

Requirements:

- Follower plate is cleaned ↪ 8.4 "Cleaning the follower plate".
- Follower plate is removed ↪ 9.8 "Dismantling".

Upper seal:

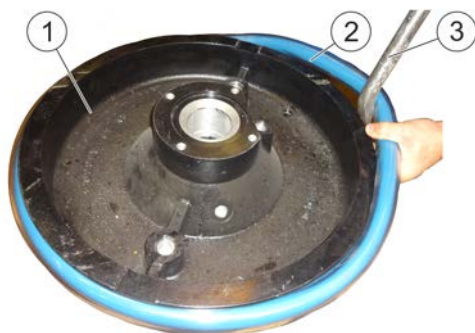


Fig. 23: Remove seal (example)

- Lift upper seal (2) over the follower plate (1) using a tire lever (3).

Lower seal:

- Turn over follower plate.
- Lift lower seal over the follower plate (1) using a tire lever (3).
 - ⇒ Seals are removed.

Assemble new seals:

! NOTICE!

Damage to the seal

Seals can be damaged if assembled using a sharp-edged tire lever.

- Do not use a sharp-edged tire lever.



Fig. 24: Assemble lower seal

- Lift lower seal (1) onto the reversed follower plate (2) using a tire lever.
- Fix with hose clamps.

6. Turn over follower plate.

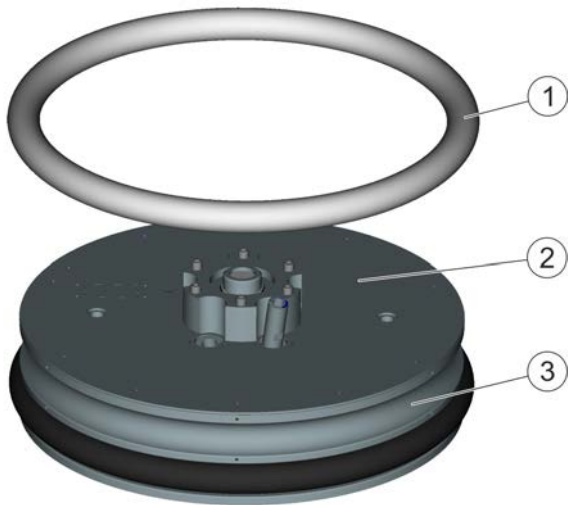


Fig. 25: Assemble upper sealing rings

7. Lift upper sealing ring (1) onto the recess (3) of the follower plate (2) using a tire lever.
⇒ Upper sealing ring is assembled.

The seals must be aligned in a way that the connections (1) and (2) face each other.



Fig. 26: Seals (example)

8. Align seals.

9. Position seals using a plastic hammer.

! NOTICE!

Unsuitable operating and auxiliary materials

If you use unsuitable operating and auxiliary materials, it can result in property damage.

- Use authorized operating and auxiliary materials only ↪ 12.7 “Operating and auxiliary materials”.

10. Grease seals ↪ 12.7 “Operating and auxiliary materials”.

⇒ Seals are replaced.

11. Position follower plate onto the barrel support.

12. Assemble Pump station ↪ 9.9 “Assembly”.

9.5 Replace hoses

Personnel:

- Mechanic

Protective equipment:

- Protective workwear
- Safety boots
- Eye protection
- Protective gloves

Requirements:

- All lines have been rinsed and de-pressurized.
- Connections are disassembled.

New chemical-resistant hose, acc. to parts list

1. Remove damaged hose.
2. Determine hose length.
3. Cut the new hose with a hose cutter at a 90° angle.
4. Press the new hose up to the stop in the corresponding connection or screw it in; see ↪ 5.4 “Connecting”.
5. Perform the following checks:
 - Check connection for tightness.
 - Check hose for flexing.
 - Observe allowable bend radii of the hose.
 - Check error-free traverse of the hose without tensile load.

9.6 Bleed pump

After replacing the pump, the pump suctions air. Before commissioning, vent pump.

The relief valve is not included in the scope of supply of the pump station.

Personnel:

- System operator

Protective equipment:

- Eye protection
- Protective gloves

1. Place remnants tray below the material outlet.
2. Open the ball valve on the relief valve.
⇒ The material flows into the collecting tray. If the material has no air inclusions, the pump has been vented.
3. Close ball valve on the relief valve.
4. Switch on pump.
⇒ Pump has been vented.

9.7 Replace pump.

WARNING!

Risk of injury due to residual pressure

After switching off the pump, there may be residual pressure inside of the pipes and the pump. Serious injuries due to escaping compressed air and material can be the consequence.

Before working on the pump:

- Disconnect the system, in which the product is installed, from compressed air and material supply.
- Secure the system against being switched on again.
- Depressurize the lines.
- Ensure that the pump is unpressurized.
- Install appropriate pressure release device, e.g. valve or ball valve, to ensure safe depressurization.

Personnel:

- Mechanic

Protective equipment:

- Protective gloves
- Safety boots

Requirements:

- Barrel is removed.
- Wooden pallet is ready.

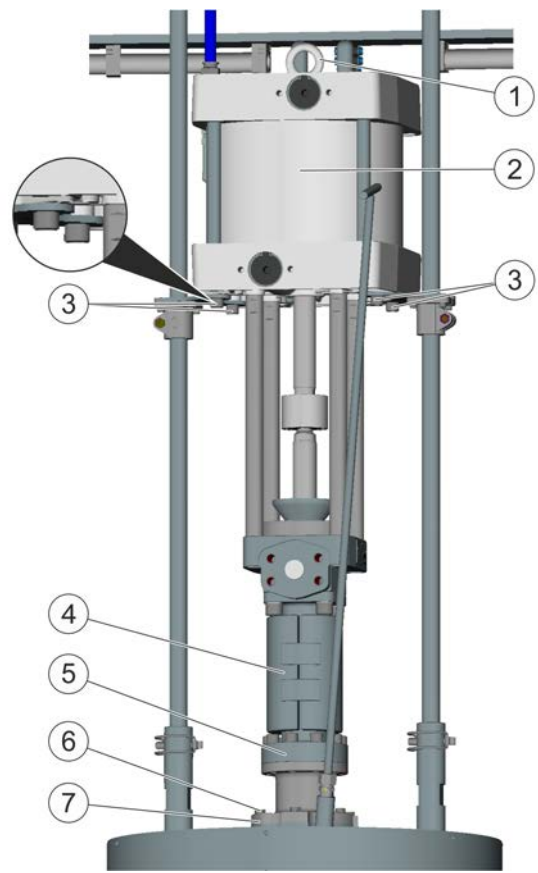


Fig. 27: Replace pump

1. Lower follower plate ↪ 7.4.4 “Lowering the follower plate”.
2. Depressurize the pump.
3. Optional:
Remove heating sleeve (4).

4. Loosen four screws (3) on the motor (2).

Loosen fluid part (5).

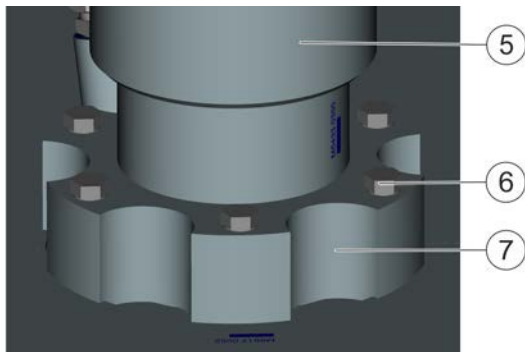


Fig. 28: Fluid part in flange

5. Loosen six screws (6) from flange (7).

Use hoisting device with sufficient load capacity for transporting the pump.

6. Position hoisting device above the motor (2).
7. Fasten hoisting device to the transport eyebolt (1). Remove pump (fluid part (5) and motor (2)).
8. Position new pump above the flange (7) by using the hoisting device.
9. Align pump (2) to the follower plate.
10. Tighten six screws (6) on the flange (7).
11. Attach four screws (3) to the motor (2).
12. Slowly lower motor flange with motor (1).
13. Connect the connections to the motor (cables, tubes, hoses etc.).
14. Perform functional check.
⇒ Pump has been replaced.
15. Remove transport means.

Optional:

16. Disassemble heating sleeve (4).

9.8 Dismantling

Personnel:

- Mechanic

Protective equipment:

- Safety boots
- Protective workwear

Requirements:

- Product is cleaned ↪ 8.3 “Cleaning”.
- Roller conveyor is folded down.
- Barrel is removed.
- Follower plate is lowered.
- Locking rod is unscrewed.
- Product is secured against reconnection.
- All lines have been rinsed and de-pressurized.
- Connections are disassembled.

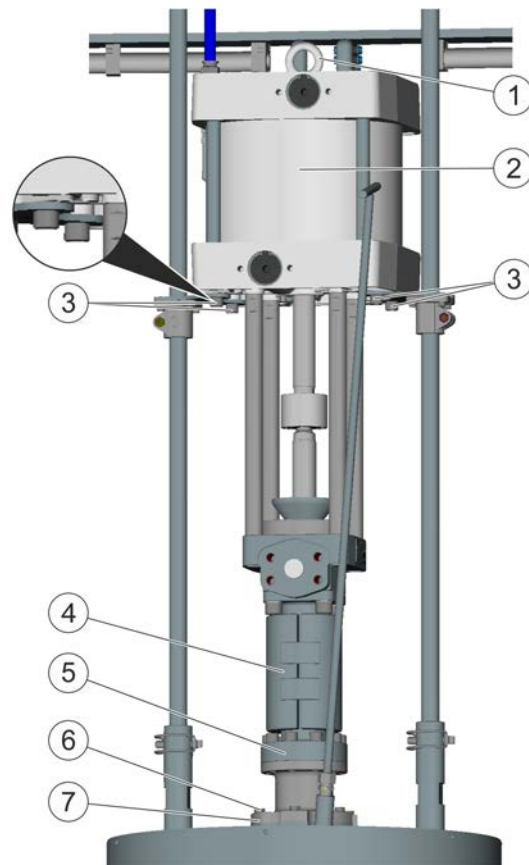


Fig. 29: Removing pump

1. Optional:
Remove heating sleeve (4).

2. Loosen four screws (3) on the motor (2).

Loosen fluid part (5).

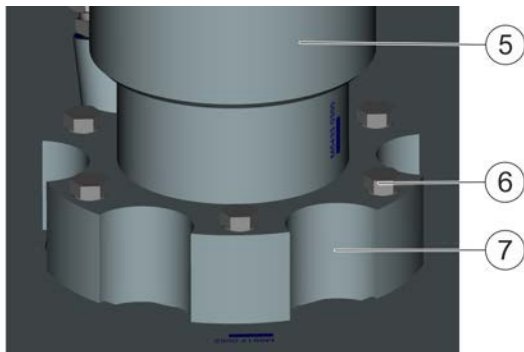


Fig. 30: Fluid part in flange

3. Loosen six screws (6) from flange (7).

Use hoisting device with sufficient load capacity for transporting the pump.

4. Position hoisting device above the motor (2).

Only: **EcoPump VP 250**,
EcoPump VPS 210

5. Fasten hoisting device to the transport eyebolt (1). Remove pump (fluid part (5) and motor (2)).

Remove follower plate

6. Loosen clamping elements of the retaining rods.

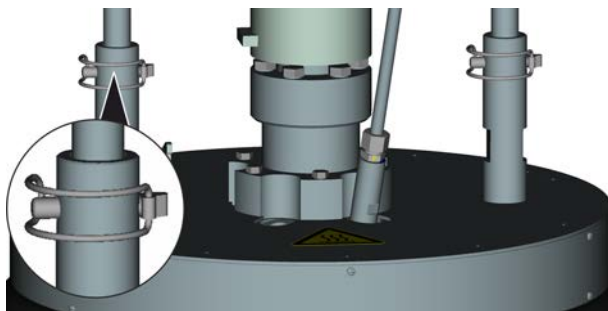


Fig. 31: Loosen quick connectors of tube clip

7. Loosen and remove tube clip.

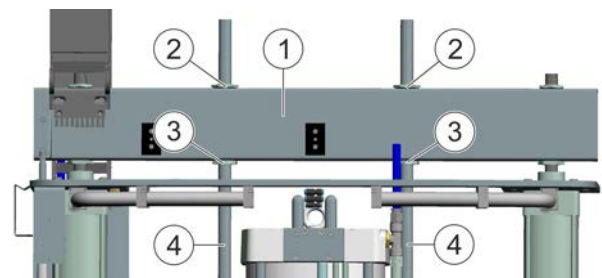


Fig. 32: Loosen retaining rods

8. Loosen nuts (3) on traverse (1).

9. Push nuts (3) downwards.

10. Push retaining rods (4) upwards.

11. Readjust nuts (2) until they rest on the traverse.

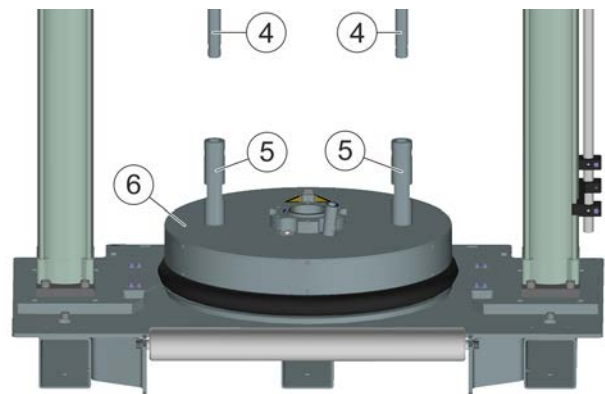


Fig. 33: Retaining rods loosened, top

12. Loosen sleeves (5).

13. Remove sleeves (5) from the follower plate (6).

14. Remove follower plate (6).

Remove retaining rods

15. Loosen and remove upper nuts (3) of the retaining rods (4).

16. Remove retaining rod (4) downwards.

Disassemble barrel support

Personnel:

- Mechanic

Protective equipment:

- Safety boots
- Protective workwear

Standard Slide rails

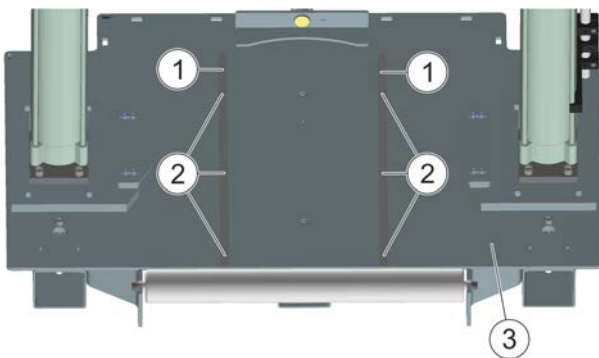


Fig. 34: Disassemble slide rails

1. Loosen three screws each (2) from the slide rails (1).
2. Remove slide rails (1).
⇒ The barrel support has been disassembled.

Optional: Packing plate

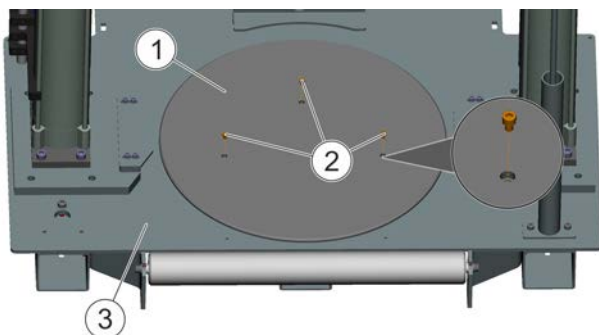


Fig. 35: Disassemble packing plate

3. Loosen three screws (2) from the packing plate.
4. Remove packing plate (1).
⇒ The barrel support has been disassembled.

Dismantle roller or roller conveyor

Personnel:

- Mechanic

Protective equipment:

- Safety boots
- Protective workwear

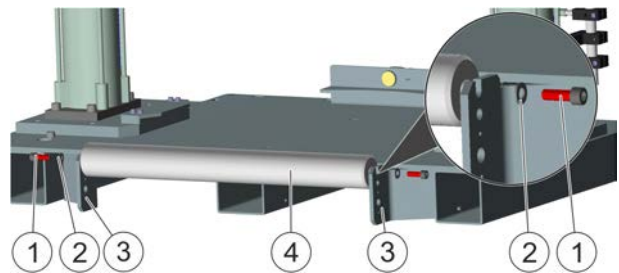


Fig. 36: Disassemble roller conveyor

1. Unscrew two screws (1).
2. Remove screws and washers.
3. Remove roller (4) with both screw shanks from the support bracket (3).
4. Unscrew screws (1).

Disassemble roller support bracket

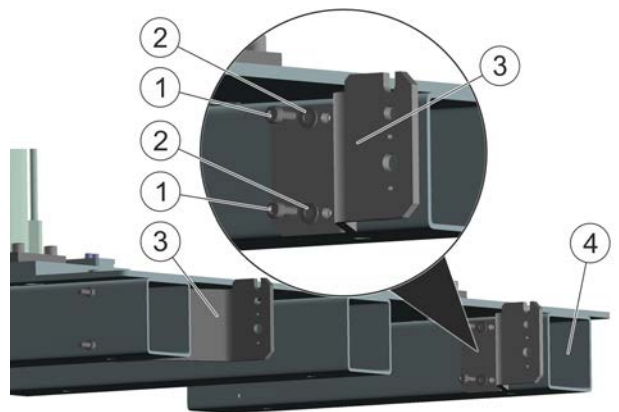


Fig. 37: Disassemble support bracket (view from below)

5. Loosen screws (1).
6. Remove screws (1) and washers (2).
7. Remove support bracket (3).

9.9 Assembly

Assemble roller support bracket

Personnel:

- Mechanic

Protective equipment:

- Safety boots
- Protective workwear



Fig. 38: RAM dismantled

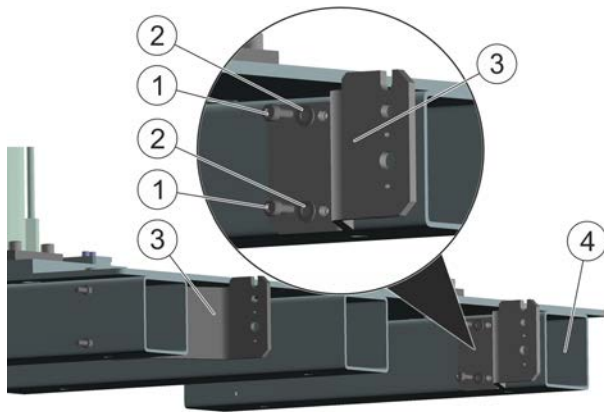


Fig. 39: Assemble support bracket (view from below)

1. Position support bracket (3) aligned to the bores on the outside of the steel beam (4).
2. Insert screws (1) and washers (2).

3. Fasten support bracket (3) with the washers (2) and screws (1).
4. Tighten screws (1) crosswise.
Tightening torque 25Nm
⇒ The support bracket is assembled.

Install roller or roller conveyor

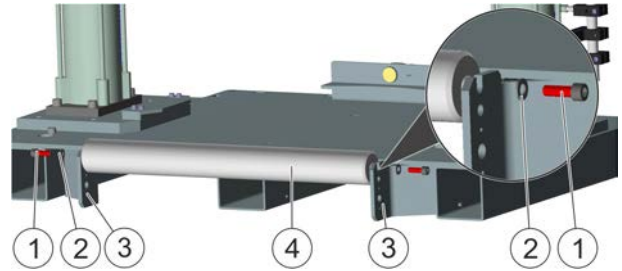


Fig. 40: Assemble roller conveyor

5. Insert screws (1) and washers (2) into the roller (4).
6. Tighten screws (1) a few turns.
7. Tighten screws (1) a few turns.

8. Tighten screws (1) crosswise.
Tightening torque 49Nm
9. Check functioning. The roller can be easily turned by hand.
⇒ The roller is assembled.

Assemble barrel support

Personnel:

- Mechanic

Protective equipment:

- Safety boots
- Protective workwear

Standard Slide rails

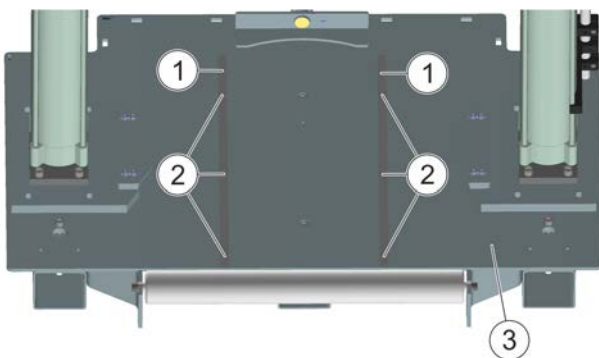


Fig. 41: Assemble slide rails

1. Position slide rails (1) aligned to the bores on the base plate (3).
2. Insert three screws each (2) into the bores of the slide rails and the base plate.
3. Tighten screws (2).
Tightening torque 10Nm
⇒ The barrel support has been assembled.

Optional: Packing plate

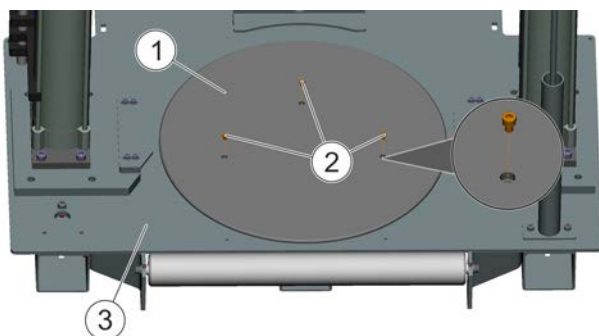


Fig. 42: Assemble packing plate

4. Position packing plate (1) aligned to the bores on the base plate (3).
5. Insert three screws (2) into the bores of the packing plate and the base plate.
6. Tighten screws (2).
Tightening torque 10Nm
⇒ The barrel support has been assembled.

Personnel:

- Mechanic

Protective equipment:

- Safety boots
- Protective workwear

Insert retaining rods

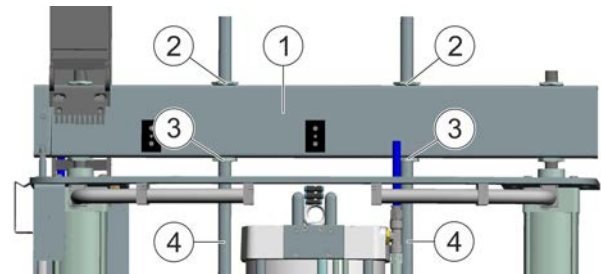


Fig. 43: Fasten retaining rods

1. Push retaining rods (4) from below into the traverse (1).
2. Loosen nuts (2) and turn upwards.
3. Turn nuts (3) upwards until they touch the traverse.

Assemble follower plate

4. Position follower plate (6) onto the barrel support.

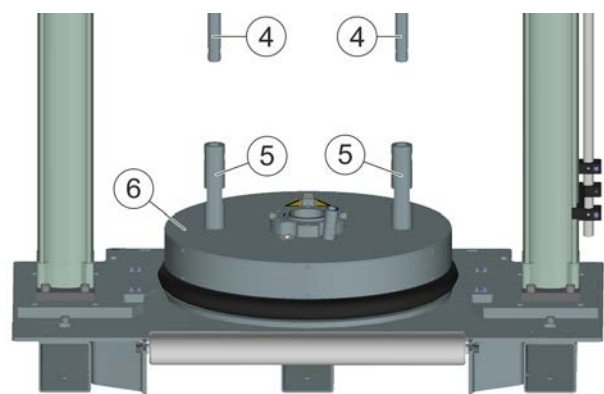


Fig. 44: Assemble sleeves

5. Insert sleeves (5) into the follower plate (6).

6. Lightly tighten sleeves (5).
7. Adjust retaining rods (4) with the nuts (2 and 3) downwards until they are in the sleeve (5).
8. Turn retaining rods (4) aligned to the bores to the sleeve (5).

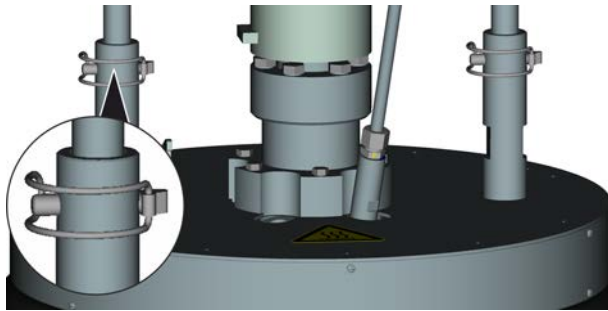


Fig. 45: Insert quick connectors of tube clip

9. Insert tube clip.
10. Close bracket of the tube clip splint.
⇒ Retaining rods are assembled.
11. Tighten clamping elements of the retaining rods.
Tightening torque 164Nm

Start with tightening the lower clamping elements.
⇒ Follower plate is assembled.

Assemble pump and fluid part

1. Only: **EcoPump VP 250**,
EcoPump VPS 210
Fasten hoisting device to the transport eyebolt (1).
2. Position motor in the follower plate using a suitable hoist.

Fasten fluid part (5)

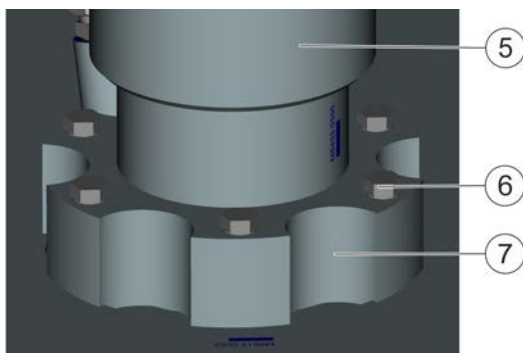


Fig. 46: Fluid part in flange

3. Tighten flange (7) with six screws (6) diagonally.

Tightening torque 25Nm

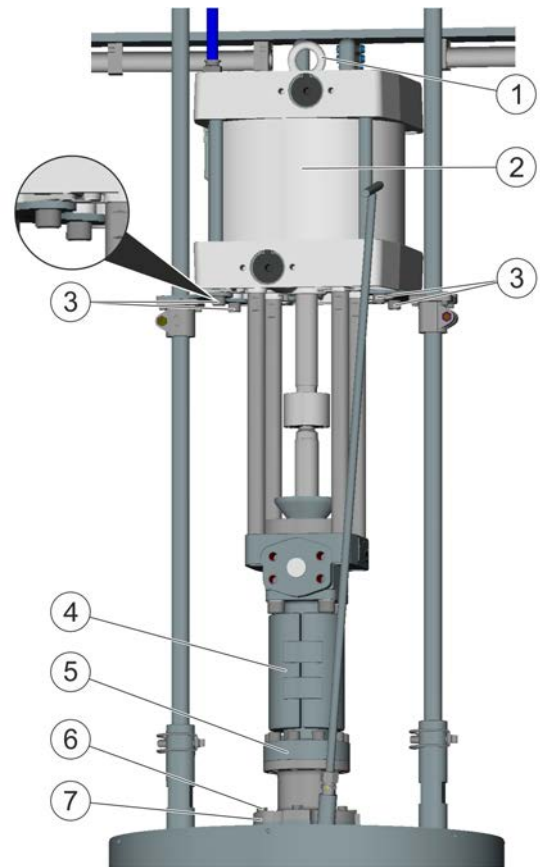


Fig. 47: Installing the pump

4. Fasten motor (2) with four screws (3).
5. Optional:
Fasten heating sleeve (4).

10 Faults

10.1 Safety recommendations

WARNING!

Hot surface

During operation, the surfaces of components can get extremely hot. Contact with it can cause burns.

- Do not touch hot surfaces.
- Before carrying out any work:
 - Let components cool down.
 - Wear protective hand gloves.

WARNING!

Danger due to freezing

The pneumatic drive unit can cool down significantly. Contact with it can result in frostbite.

- Wear protective hand gloves.
- Before conducting any maintenance and cleaning work, ensure that the pneumatic drive unit has room temperature.

WARNING!

Danger of crushing from follower plate

When lowering the follower plate, see that body parts are not crushed or cut off. Serious injury and death could be the consequence.

- Lift and lower the follower plate outside of the barrel only in combination with a two hand operation approved by Dürr Systems.
- Ensure that there are no persons present at the follower plate.

10.2 Defects table

Fault description	Cause	Remedy
When lowering the follower plate, the barrel gets deformed.	Follower plate position is incorrect.	Align follower plate ↪ 10.3.1 "Aligning follower plate".
	Barrel is not suitable.	Only use suitable barrels.
Material exits between follower plate and barrel.	Sealing ring is defective.	Replace sealing ring ↪ 9.4 "Replace seals".
	Follower plate position is incorrect.	Align follower plate ↪ 10.3.1 "Aligning follower plate".
	Contact pressure is too high.	Reduce contact pressure, refer to the operation manual of the relevant pump.
	Barrel is not suitable.	Only use suitable barrels.
Follower plate does not move when lifting.	There is overpressure, negative pressure, vacuum in the barrel. Air flow is cut off.	Screw in bleeding rod ↪ 10.3.2 "Screw in bleeding rod".
Noise during operation	Sound muffler of the pump is defective	Replace sound muffler, refer to the operation manual of the pump.

10.3 Troubleshooting

10.3.1 Aligning follower plate

Personnel:

- Mechanic

Protective equipment:

- Protective gloves
- Safety boots

Requirements:

- Barrel is removed ↪ 7.4 "Replacing barrel".
- Follower plate is cleaned ↪ 8.4 "Cleaning the follower plate".

1. Lower follower plate ↪ 7.4.4 "Lowering the follower plate".

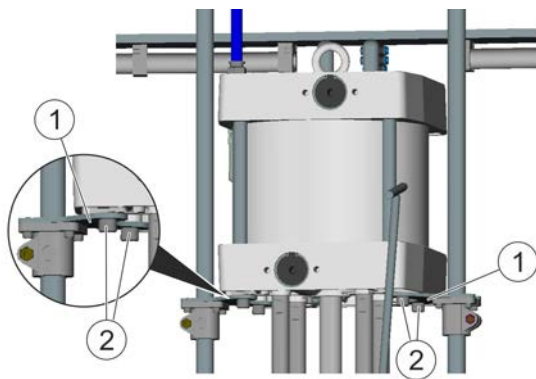


Fig. 48: Screws on the motor flange

2. Loosen four screws (2) on the motor flange (1).

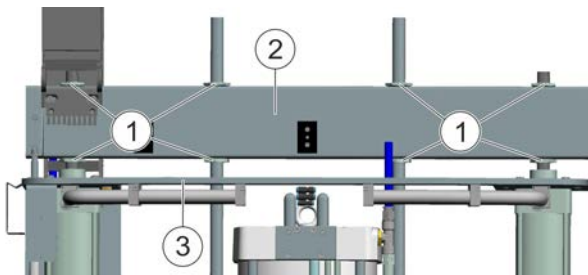


Fig. 49: Traverse

3. Loosen eight nuts (1) from the traverse (2).
4. Align all parts horizontally without mechanical stress.

Observe clearance between traverse (2) and stabilizer (3).

- With pneumatic cylinder, 100mm: 47.5-48mm
- With pneumatic cylinder, 160mm: 63.5-64mm

5. Screw in eight nuts (1) into the traverse (2).

Torque

- With pneumatic cylinder, 100mm: 164Nm
- With pneumatic cylinder, 160mm: 379Nm

6. Screw in four screws (2) into motor flange.
⇒ Follower plate has been aligned.

10.3.2 Screw in bleeding rod

If the follower plate does not move during the lifting operation, the bleeding rod is used to support the movement.

- Follower plate does not move when lifting.
- Locking rod is removed.

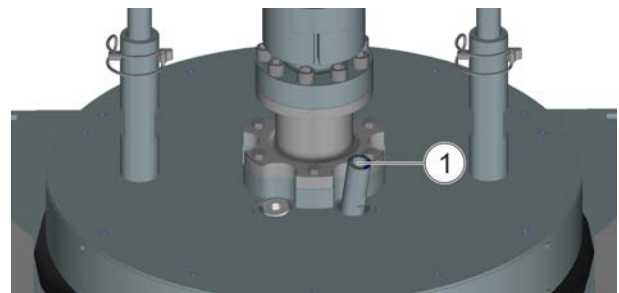


Fig. 50: Follower plate connection

1. Screw bleeding rod onto the connection (1) at the fluid part.
2. Move lifting device upwards.
⇒ Follower plate does move.
3. Pause the lifting operation.
⇒ Follower plate remains in the position.
4. Unscrew bleeding rod.
⇒ The lifting operation can be assumed again in a normal manner.

11 Disassembly and Disposal

11.1 Disconnecting connections

All media lines and their connections are uniquely labeled and described using the corresponding technical documentation. The piping must be conducted in accordance with these specifications.

⚠ WARNING!

Live Components

Electrical shocks and discharges pose a risk of injury when working on live components and lines. It can cause serious injuries or death.

- Have only qualified electricians carry out work on the live components and electrical cables.
- Before carrying out any work, disconnect electrical supply.
- Secure electrical supply against being switched on again.
- Verify that no current is present on the electrical components and cables.

WARNING!

Risk of injury due to escaping material and compressed air

Escaping compressed material can cause serious injury.

Before working on the product:

- Disconnect the system with the product from compressed air.
- Secure the system against being switched on again.
- Depressurize the lines.

Personnel:

- Mechanic

Protective equipment:

- Protective workwear
- Safety boots
- Protective gloves

Requirements:

- Pump station is switched off and secured against reconnection.
- Connections and lines are depressurized.

1. Disconnect media lines from the outlet of the pump.

Depending on the pump used, refer to the operation manual of the pump

2. Disconnect hose package from the control system.

Depending on the control system used, refer to the operation manual of the control system

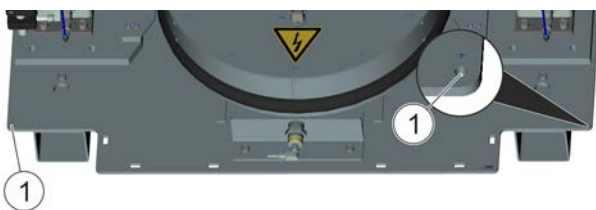


Fig. 51: Grounding connections

3. Disconnect grounding cable (1) from the base plate.
 - ⇒ Connections are disconnected.

11.2 Disassembly

WARNING!

Hot surface

During operation, the surfaces of components can get extremely hot. Contact with it can cause burns.

- Do not touch hot surfaces.
- Before carrying out any work:
 - Let components cool down.
 - Wear protective hand gloves.

WARNING!

Danger due to freezing

The pneumatic drive unit can cool down significantly. Contact with it can result in frostbite.

- Wear protective hand gloves.
- Before conducting any maintenance and cleaning work, ensure that the pneumatic drive unit has room temperature.

Personnel:

- Mechanic

Protective equipment:

- Protective workwear
- Safety boots
- Protective gloves

Requirements:

- Pump station is switched off and secured against being switched on again.
- Connections are separated ↪ 11.1 “Disconnecting connections”.
- Pump station is cleaned of all residues ↪ 8.3 “Cleaning”.

1. Remove ground anchors.
2. Remove Pump station using a suitable hoist.
 - ⇒ Pump station is disassembled.

11.3 Disposal

ENVIRONMENT!

Improper barrel disposal

Improper waste disposal threatens the environment and prevents re-use and recycling.

- Dispose of empty barrels properly. Follow manufacturer information.
- If an inliner bag is used, keep inliner bag in a suitable container. Have a specialist company pick it up.

ENVIRONMENT!

Improper waste disposal

Improper waste disposal threatens the environment and prevents re-use and recycling.

- Clean components before their disposal.
- Always dispose of components in accordance with their characteristics.
- Collect leaked out utilities and auxiliaries completely.
- Dispose of work equipment soaked in coating materials or operating substances according to the disposal provisions in force.
- Dispose of utilities and auxiliaries according to the disposal provisions in force.
- In case of doubt, refer to the local disposal authorities.

12 Technical data

12.1 Dimensions and weight

EcoRAM		200L
Length [mm]		1120
Width [mm]	Without rollers	680
	With one roller	751
	With roller conveyor	1443
Height moved in [mm]	Without RAM carrier	2234
	With RAM carrier	2334
Height during barrel change [mm]	Without RAM carrier	2786
	With RAM carrier	2886
Weight [kg]		approx. 360 (depending on design)

12.2 Operating conditions

Detail	Value
Min. ambient temperature	10 °C
Max. ambient temperature	40 °C
Operating temperature, min.	20 °C
Operating temperature, max.	40 °C
Min. relative humidity	20 %
Relative humidity, max.	80 %

12.3 Emissions

Detail	Value
Sound level of the pump during operation, max.*	85dB(A)

* on the basis of the pump approved with the highest sound-level during operation of an single pump station
The emission values depend on the pump used. For more information about the pump, refer to the relevant operation manual.

12.4 Operating values

Pressures and temperatures	
Detail	Value
Pneumatic pressure, min.	3 bar
Pneumatic pressure, max.	6bar
Continuous operating pressure max.	5bar
Media pressure, max.	250bar
Temperature of compressed air, max.	+ 35°C
Temperature of compressed air, min.	+ 5°C
Temperature for bright metallic surfaces, max.	+ 67°C

Pressure values

The pressure values can be set on the control system.

- **EcoHVMP:** One value can be set for each action (lifting, lowering, venting) and for the air motor.
- **Two hand operation:** A common value can be set for lifting and lowering. The air motor is set via a pressure controller.

Power		
Detail	Value	
Follower plate, warm	1600W	
Follower plate, hot	5500W	
Pump sleeve:	EcoPump VPS 216	125W
	EcoPump VPS 210	250W
Sensors	30W	

- Voltage
- Frequency
- Rated current
- Power

The performance values depend on the components used. For the performance values, see the relevant operation manual.

Quality of compressed air

Detail	Value
Purity classes according to ISO 8573 - 1:2010	4:3:2

12.5 Material specification

Suitable material

- PVC-, epoxide-, PU or water-based, non-flammable fluid coating materials and well as their cleaning agents and purging media, which do not attack the material of the parts coming into contact with the media.

Suitable cleaning agents

- Cleaning agents, which do not attack the material of the parts coming into contact with the media.

Media and media temperatures vary depending on the pump used.

	EcoPump VP 250	EcoPump VPS 210 and 216
Media	<ul style="list-style-type: none"> ▪ PVC Plasti-sole ▪ Acrylates ▪ Rubber insulating material 	<ul style="list-style-type: none"> ▪ Epoxide adhesive ▪ PU adhesives ▪ Space filler material / gap filler heat sink compound
Media temperature, min.	15°C	15°C
Media temperature, max.	50 °C	60°C

12.6 Type plate

The type plate is attached to the traverse and features the following details:

- Product name
- Material number
- Year of manufacture
- Serial number
- Maximum air pressure
- Manufacturer

12.7 Operating and auxiliary materials

Material	Specification
Seal lubricant	Technical petroleum jelly (W321120003)

13 Replacement parts and accessories

13.1 Replacement parts

 **WARNING!**

Unsuitable replacement parts

Replacement parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

Retrofitting kit for bucket barrels

The pump station can be retrofitted for the use of bucket barrels. The retrofitting kit is customer-specific and will be configured by Dürr ↪ "Hotline and Contact".

Assembly	Item	Denomination	Quantity	Material number
Pump station EcoRAM 200	1	EcoPump VP 250 360 SST PU	1	N24170014
	2	EcoPump VPS 216 360 St	1	N24270002
	3	EcoPump VPS 20-906-011 → N24270005	1	N24270003
	4	EcoPump VPS 210 360 SSSt PE	1	N24270004
	5	EcoPump VPS 210 360 SST PE/PU	1	N24270005
	6	Safety valve G1/2"a DN10 3.3bar Ms	1	M54390074
	7	Safety valve G1/2"a DN10 4bar Ms	1	M54390075
	8	Safety valve G1/2"a DN10 4.6bar Ms	1	M54390080
	9	Heating sleeve D62/110 L120 VPS216	1	F10400044
	10	Heating sleeve D65 L160 300W 90°	1	F10400067
	11	Protective sleeve, touch protection for F10400067	1	M59160043
	12	Bus module HM GEN2	1	E50060006
N29810020 Pneumatic unit, lifter D160 EcoRAM 200	13	Cylinder, pneumatic system D160 HUB1100 long	2	N41220242
	14	Linchpin D10.5/40 Z S	2	M62020015
	15	Sealing ring 3/4"	4	M08010549
	16	Non-return valve 1/4" 10bar	2	M54360174
	17	Quick escape valve D6i-i INLINE	4	M54600021
N29810055 Pneumatic unit, lifter 2 D100 EcoRAM 200	18	Cylinder, pneumatic system D100 HUB1100 long	2	N41220241
	19	Linchpin D10.5/40 Z S	2	M62020015
	20	Sealing ring 1/2"	4	M08010550
	21	Non-return valve 1/4" 10bar	2	M54360174
	22	Quick escape valve D6i-i INLINE	4	M54600021
N17400005 Roller conveyor, 1 roller EcoRAM 200	23	Roller D63.5 EL610	1	M36010035
N17400006 Roller conveyor EcoRAM 200	24	Roller D63.5 EL610	5	M36010035



Fig. 52: N03620063 attachment initiator switching tag mechanical

Assembly	Item	Denomination	Quantity	Material number
N03620063 Attachment initiator switching tag M.BARREL EcoRAM 200	25	Proximity switch Sn8 M12x1 inductive	2	E07030389
	26	Sensor SAFETY.INDUCT.M30x1.5 M12 GI712S	2	E35020111
	27	I/O CARD DSI8 DI2 DO2 2A DO4-PP SAFETY	1	E03440044



Fig. 53: N03620064 attachment initiator switching tag pneumatic

Assembly	Item	Denomination	Quantity	Material number
N03620064 Attachment initiator switching tag pneumatic EcoRAM 200	28	3/2 VALVE MECH.G1/8" M.ROLLER LEVER	2	M54510047
	29	"Barrel present" stopper	1	M47060319
	30	3/2 VALVE MECH.G1/8" M.PLUNGER	1	M54510049

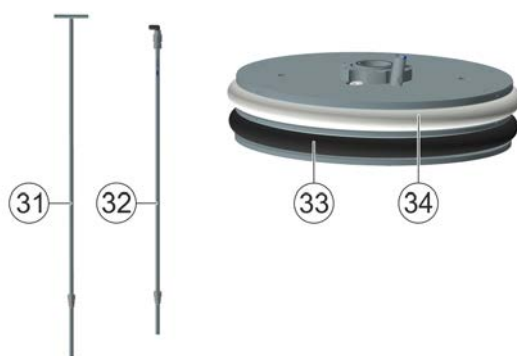


Fig. 54: N13070002 follower plate, cold

Assembly	Item	Denomination	Quantity	Material number
N13070002 Follower plate EcoRAM 200, cold	31	Locking rod, follower plate 200	1	M50120002
	32	Air tube, follower plate RED	1	N31020018
	33	Seal 25x39, follower plate 200	1	M08280092
	34	Wiper ring D571 for follower plate 200	1	M08040026
N13070003 Follower plate EcoRAM 200, hot 5500W	35	Locking rod, follower plate 200	1	M50120002
	36	Air tube, follower plate RED	1	N31020018
	37	Seal 25x39, follower plate 200	1	M08280092
N13070008 Follower plate EcoRAM 200, warm 1600W	38	Locking rod, follower plate 200	1	M50120002
	39	Air tube, follower plate RED	1	N31020018
	40	Seal 25x39, follower plate 200	1	M08280092
N13070009 Follower plate EcoRAM 200, warm 1600W, 2 rings	41	Locking rod, follower plate 200	1	M50120002
	42	Air tube, follower plate RED	1	N31020018
	43	Seal 25x39, follower plate 200	1	M08280092
	44	Wiper ring D571 for follower plate 200	1	M08040026
N03620058 Attachment initiator stroke counter VPS 216 360	45	Retro-reflective light barrier 3...200MM LED	1	F11030013
N24970011 Pump accessories stroke counter drive VP	46	Proximity switch Sn1.5 M5x0.5 10-30VDC	1	E07030281

Wear parts

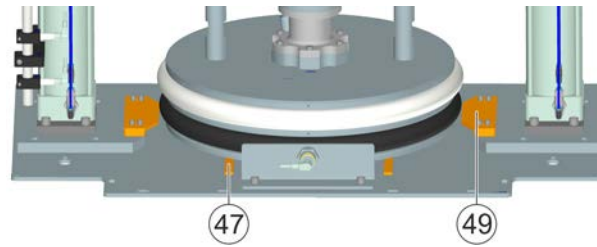


Fig. 55: Wear parts

Item	Denomination	Quantity	Material number
47	Slide rail KPL	1	M12050062
48	Inlet for barrel support 200L	1	N44010022
49	Fixing plate, downholder side*	2	M33150052

* Suitable for pneumatic unit lifter D100 and D160

13.2 Order

WARNING!

Unsuitable replacement parts

Replacement parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

Ordering replacement parts, tools and accessories as well as information on products that are listed without order number → “Hotline and Contact”.

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