

Maintenance



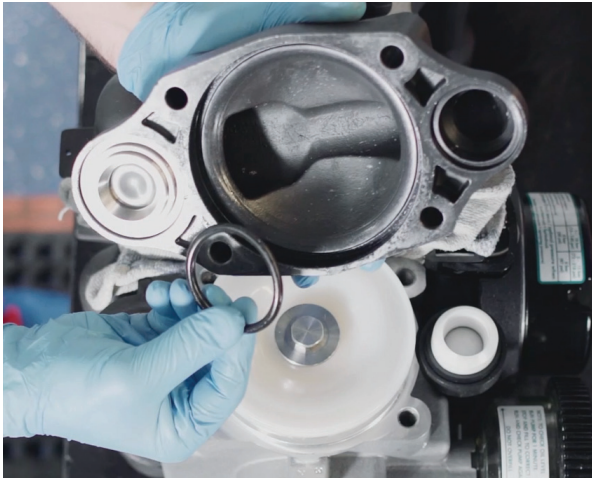
Piston-Diaphragm Pumps





# Maintenance

## Piston-Diaphragm Pumps



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## 1. Contents

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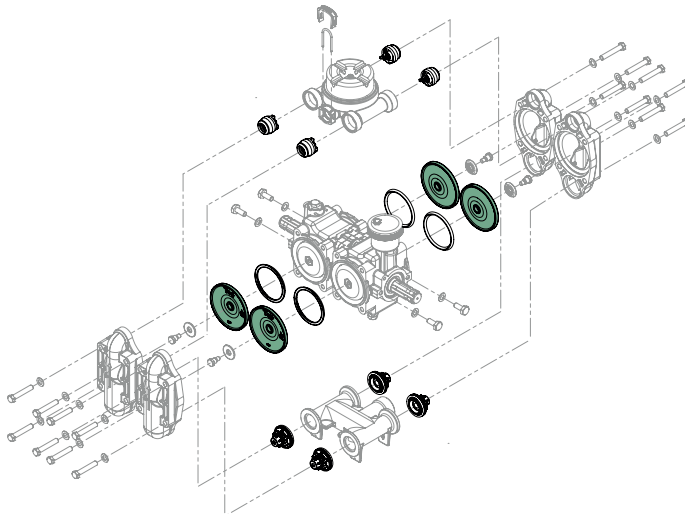
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## 1. BASIC MAINTENANCE INSTRUCTIONS


Everyone who is called upon to work on the altek product must have read and understood the operating instructions before starting. This also applies to people who only carry out work on the altek product occasionally.


Please also follow the manufacturer's operating instructions enclosed with other elements and components.

Accident prevention regulations and safety rules issued by employers' liability insurance associations and accident insurance providers are also to be observed.

### 1.1. Symbols and notices

In these operating instructions you will come across the following symbols and references:

 *The pointing finger prompts you to perform an action.*

 The arrow shows you the result of your action.

#### WARNING

This notice warns about a dangerous situation which – if not avoided – may result in death or serious injury.

#### CAUTION

This notice warns about a dangerous situation which – if not avoided – may result in slight or moderate injury.

#### ATTENTION

This notice warns about material damage.

#### ATTENTION - ENVIRONMENT

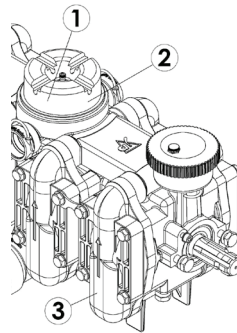
This notice warns about environmental damage.

#### INFORMATION

This notice provides you with additional information or tips.

## 1.2. SYMBOLS ON THE ALTEK PUMP

Standard parameters / Type plate (1)



- Pump pressure (P in bar / psi)
- Pump rotation (N in min<sup>-1</sup> / rpm)
- Flow rate (l/min / gpm)
- Pump type, Address of producer

Spüldruck (spraying pressure)	1 – 10 bar (1.5 – 14.5 psi)	5 – 15 bar (7.2 – 21.8 psi)
Speicherdruck (accumulator pressure)	4 bar (58 psi)	5 bar (87 psi)
Optimaler Druck wenn / optimal pressure when Speicherdruck = Spüldruck (accumulator pressure = spraying pressure)		

Pressure accumulator (2)

- Spraying pressure (bar / psi)
- minimum required spraying pressure (bar / psi)

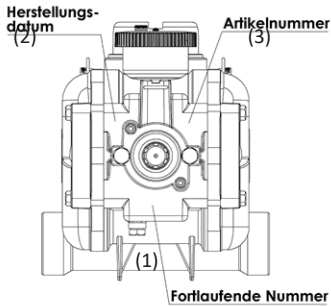


Oil (3)

- Pump type
- Oil type
- maximum filling capacity (l / oz)

### Label

- serial number (1)
- week / year of producing
- article code



### **⚠ WARNING**

#### **Danger of injury.**

- Refrain from any working methods which may endanger safety.
  - Attach and secure heavy components and large assemblies to suitable lifting equipment. Do not stand beneath suspended loads.
  - Depressurise the entire system before maintenance and repair work.
  - Protection devices which have been removed for repair, maintenance and cleaning work must be replaced immediately after completing this and checked for proper functioning.
  - Check protection devices regularly.
  - Replace damaged protection devices with new ones.
  - Observe the notes on maintenance in the operating instructions for any other units installed.
  - When handling oils, greases and other chemical substances, follow the corresponding safety instructions.
  - Follow the instructions and advice of the relevant spraying agent manufacture.
- Danger of injury due to inadvertent machine

start-up.

- Before repair, maintenance and cleaning work, switch off the pump drive and secure it against being inadvertently switched on.
- Danger of poisoning by exhaust gases.
- Only operate combustion engines in closed spaces with appropriate exhaust gas extraction equipment.

### **⚠ ATTENTION**

Loss of guarantee if repair and maintenance work is not carried out correctly.

- Defective maintenance results in reduced performance. Have regular maintenance carried out by specialist workshops or expert personnel authorised by equipment manufacturers (field sprayers, etc.).
- The use of spare parts, accessories and additional equipment which did not originally come from altek and have not been checked and approved by altek may alter the construction-related properties of altek products or their functional efficiency in a negative way, thereby having an adverse influence on active and/or passive work safety (accident prevention).
- Do not make any modifications, additions or conversions on the altek product.
- Observe all warning and information labels affixed to altek products. Keep warning and information labels in a legible condition. Missing or damaged labels are to be replaced immediately.
- Only use high-quality brands of oil or specified assembly grease.
- Do not use any aggressive cleaning agents. Use fibre-free cleaning cloths.
- Check all bolts and screws for tightness regularly and tighten if necessary. Observe the tightening torque for bolts.

### **⚠ ATTENTION - ENVIRONMENT**

When handling oils, greases and other che-

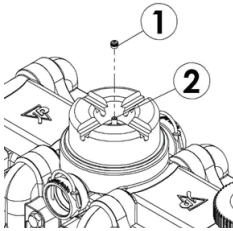
mical substances, follow the corresponding safety instructions.

- Follow the instructions and advice of the relevant spraying agent manufacturer.
- Dispose of all consumables and spraying agent in an environmentally responsible manner according to legal regulations.
- Store consumables and spraying agent in an environmentally responsible manner according to legal regulations.
- Dispose of defective components (valves, diaphragms, valve covers, etc.) which are contaminated with spraying agent in an environmentally responsible manner according to legal regulations.
- Take advantage of recycling possibilities.

### 1.3. INITIAL COMMISSIONING

#### Pressure accumulator

- ☞ Remove the cap (1) from the pressure accumulator control valve (2).
- ☞ Connect the air pump to the pressure accumulator control valve (2).



#### INFORMATION

**Optimum accumulator pressure = spraying pressure**

- ☞ Apply the desired air pressure + 0.5 bar (7 psi) to the pressure accumulator.
- ☞ Quickly detach the air pump from the valve.
- ☞ When detaching the air pump, let approx. 0.5 bar (7 psi) escape
- the desired accumulator pressure has been achieved.

- ☞ Screw on the cap of the pressure accumulator control valve (2)

### 1.4. CHECK OIL LEVEL

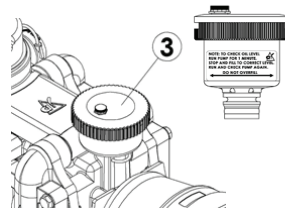
#### INFORMATION

Check the oil level once the pump has been working for a approx 1 minute.

Always make a visual check of the oil level when the pump is running as, for technical reasons, the oil level drops when the pump is stopped.

Use the oil specified! – see NOTIFICATION ON PUMP!

- ☞ Fill the spray tank with a sufficient quantity of water.
- ☞ Close the spraying valves and control unit.
- ☞ Start the Altek pump drive.
- ☞ Allow the Altek pump to work for 1 min.
- ☞ Make a visual check of the oil level and, if necessary, stop the drive + top up the oil.
- ☞ Close the oil reservoir (3).



- ☞ Restart the drive and make another visual check.
- ☞ If necessary, repeat the process (oil top-up).

The marking on the oil reservoir shows the oil level required when the pump is running. As soon as the pump is switched off, the oil level drops for technical reasons meaning that it is no longer visible in the oil reservoir.

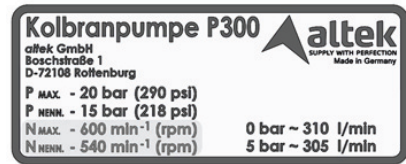
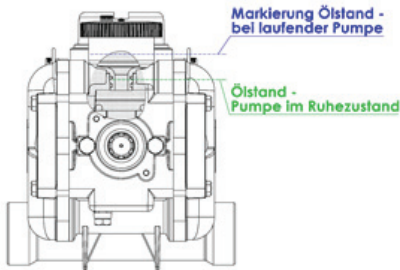
Topping up the oil under these conditions may cause the oil reservoir to overflow when the pump starts to operate.

Therefore – only check the oil level when the pump is running.

⚡ The Altek Altek pump is ready for operation.

Oil level mark – pump running

Oil Level – pump idle



–In no case must the maximum speed (NMAX.) be exceeded.

☞ Follow the instructions and advice of the relevant spraying agent manufacturer.

## 1.7. AFTER OPERATION

Flush out the system thoroughly.

### ⚠ ATTENTION

Corrosion damage in the system and accelerated wearing of the diaphragm.

–Before taking the Altek pump out of operation for a long period, rinse it thoroughly with clear water.

## 1.8. IF FROST THREATENS

### ⚠ ATTENTION

Frost damage to the Altek pump.

–Always drain the Altek pump and lines after rinsing if frost threatens.

–Fill with standard commercial antifreeze agent (e.g. glycol or similar).

☞ Switch off the Altek pump drive.

☞ Remove the suction and pressure lines of the Altek pump.

☞ Start the Altek pump drive.

☞ Let the Altek pump work until no more liquid comes out.

☞ Clean and grease the suction and pressure line connections.

☞ Install the suction and pressure line connections on the Altek pump.

⚡ The Altek pump is protected against frost.

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## 1.5. BEFORE ANY OPERATION

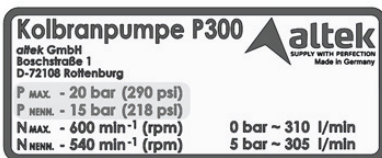
- ☞ Check the accumulator pressure
- ☞ Check the oil level after the Altek pump has been operating for a short time
- ☞ Check the Altek pump and pipe work is secure.

## 1.6. DURING OPERATION

### ⚠ ATTENTION

Damage to the Altek pump.

–Only increase the continuous operating pressure (PNENN.) for short periods



–In no case must the maximum operating pressure (PMAX.) be exceeded.

### ⚠ ATTENTION

Damage to the Altek pump.

–Only increase the operating speed (NNENN.) for short periods

## 2. MAINTENANCE – AT LEAST 1 x YEAR

### 2.1. OIL CHANGE

#### ⚠ WARNING

Danger of injury by liquids escaping under pressure.

–Depressurise the entire system before maintenance and repair work.

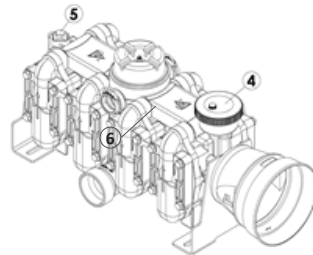
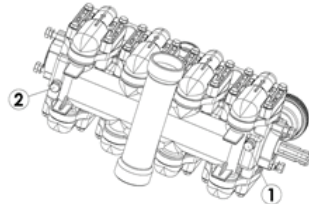
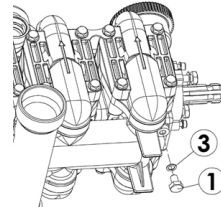
#### ⚠ ATTENTION

Dispose of used grease, oil and solvents in an environmentally responsible manner according to legal regulations.

- ☞ Fill the spray tank with a sufficient quantity of water.
- ☞ Close the spraying valves and control unit.
- ☞ Start the Altek pump drive.
- ☞ Let the Altek pump work for 5 min.
- ☞ The oil is slightly warmed up and flows better.
- ☞ Switch off the Altek pump drive.
- ☞ Take the cover off the oil reservoir (4) and open the bleed screw plug (5) on the ventilation opening.
- ☞ Open the front oil drain screw (1) – drain the oil.
- ☞ Open the rear oil drain screw (2) (not P70 / P100 / P120) – drain the oil.
- ☞ Clean the sealing surfaces on both oil drain screws and housing openings.
- ☞ Replace the gaskets (3) (12×18×2 mm; art. no. 02628) with new ones.
- ☞ Screw in the oil drain screw with new gaskets.
- ☞ Tighten the oil drain screws to a tightening torque of 40 N·m (30 lbf·ft).
- ☞ Before refilling ensure both drain plugs are refitted using new sealing washers
- ☞ The pump can be refilled through the reservoir. Leaving the vent plug out to prevent

air lock.

- ☞ When oil appears through the vent port of the pump the vent plug should be replaced.
- ☞ Tighten the screw plug (5) to 30 N·m (22 lbf·ft) and close the cover.
- ☞ Refit the Oil Reservoir lid
- ☞ Start the pump - checking that the pump has the correct level should be carried out after the pump has been running for a minimum of 1 minute
- ☞ If no oil is seen in the reservoir after 1 minute running oil can be added by removal of the reservoir cover. DO NOT OVERFILL
- ☞ If necessary repeat the process.



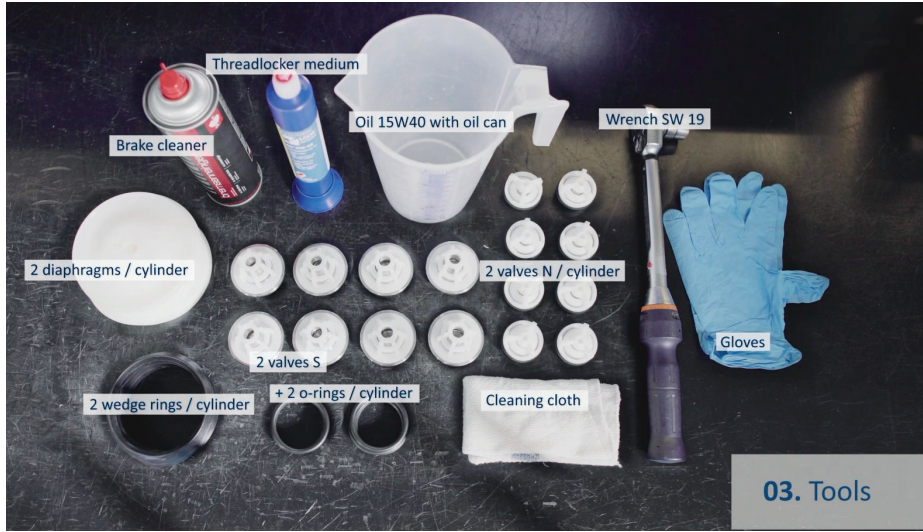
#### ℹ INFORMATION

- Use the prescribed oil – see label (6)
- ☞ Checking the oil level of the Altek pump – see note on oil gauge
- The Altek pump is ready for operation.

## 2.2. REPLACING THE DIAPHRAGM

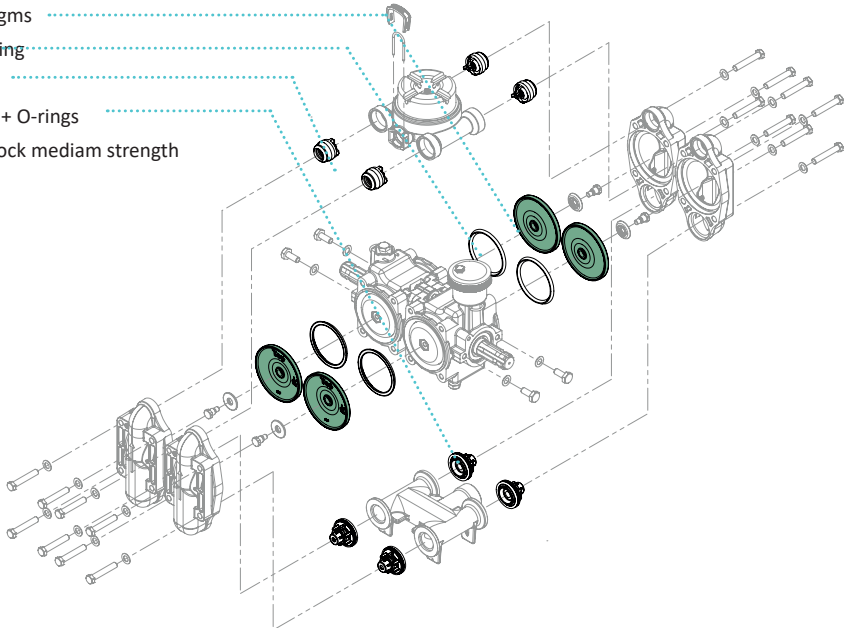
Please note that in some cases the components illustrated in this section can only serve as examples and may deviate from your Altek

product. However, the corresponding steps for assembly, maintenance etc. are the same for all types unless stated otherwise.



03. Tools

- Diaphragms
- wedge ring
- valves N
- valves S + O-rings
- thread lock medium strength
- oil



## INFORMATION

The diaphragm replacement described below is performed on the Altek pump when dismantled.

When replacing a diaphragm on an installed Altek pump it is essential to observe the following:

- Switch off the drive.
- Secure the drive against being switched on (e.g. take out the ignition key).
- Remove the drive shaft from the drive shaft connection of the Altek pump.
- Drain the oil. It is not essential to do this if the Altek pump is dismantled.
- Always dismantle only 1 valve cover at a time. This will ensure that the suction connection and pressure accumulator remain fixed and cannot fall out.**

Suction and pressure valves can be accessed when the valve cover is removed!

–Perform the following actions:

Dismantle the Altek pump

- ☞ Drain the oil – see Oil change
- ☞ Remove suction and pressure line connections from the Altek pump.
- ☞ If necessary remove the drive shaft.
- ☞ Loosen and remove the bracket screws.
- ☞ Remove the Altek pump and lay it on a stable support (e.g. work bench) in its side, on the valve covers.

Replacing diaphragms

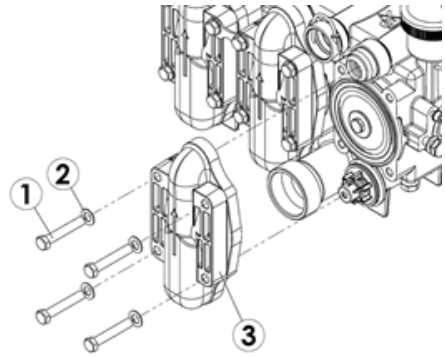
**The suction connection and pressure accumulator are no longer fixed if all valve covers on one side are removed at the same time.**

## CAUTION

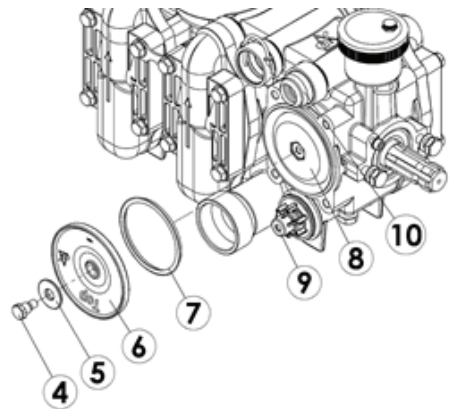
Danger of accidents due to components coming loose.

–Never lift the Altek pump by the suction connection or pressure accumulator!

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- ☞ Loosen the valve cover bolts (1).
- ☞ Remove the valve cover bolts, washers (2) and valve cover (3).



- ☞ Loosen the diaphragm screw (4). ATTENTION – diaphragm screws are bonded with medium strength screw locking!
- ☞ Remove diaphragm screw, washer (5), diaphragm (6) and wedge ring (7).
- ☞ Clean the diaphragm screw of screw locking residues.
- ☞ Clean the wedge ring (7).
- ☞ Clean the sealing surfaces of the diaphragm on the pump housing and diaphragm seating of the valve cover.
- ☞ Clean the piston head (8).
- ☞ Remove and clean the suction (9) and

## Maintenance Piston Diaphragm Pumps

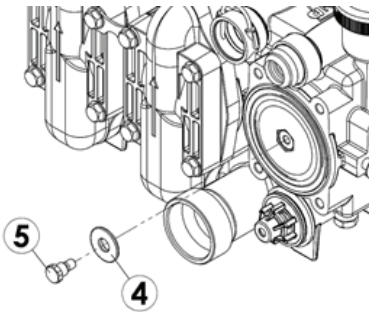
pressure valve (10).

- ☞ Check the suction (9) and pressure valve (10), if necessary replace with new part.
- ☞ Check the sealing rings of the valves, if necessary replace with new part.
- ☞ Check the wedge ring (7), if necessary replace with new part.
- ☞ Clean the sealing surfaces of the sealing rings on the pump housing and valve cover.



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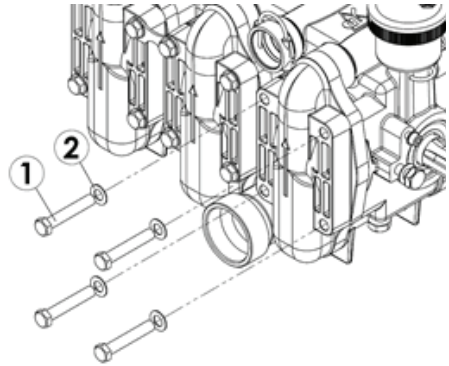
- ☞ Rotate the drive shaft connection until the piston is in the upper position (OT).
- ☞ Insert the suction and pressure valve.
- ☞ Insert the wedge ring.
- ☞ Install a new diaphragm. Check the correct position of the diaphragm!
- ☞ Insert the diaphragm screw (5) and washer (4) with medium strength screw locking.



- ☞ Tighten the diaphragm screw to a tightening torque of 25-30 N·m (18-22 lbf·ft).
- ☞ Rotate the drive shaft connection until the piston is in the lower position (UT).
- ☞ Place the valve cover over the diaphragm. Check the correct position of the valve cover!
- ☞ Push the diaphragm into the diaphragm

seating of the valve cover.

- ☞ Put on the valve cover.
- ☞ Insert the valve cover bolts (1) and washers (2).



- ☞ Tighten the valve cover bolts in a crosswise sequence to a tightening torque of 90 N·m (67 lbf·ft).
- ☞ Repeat this process with all other diaphragms.
- ☞ The diaphragm replacement is complete.

### 2.3. REFILLING THE OIL

- ☞ Before refilling ensure both drain plugs are refitted using new sealing washers
- ☞ The pump can be refilled through the reservoir. Leaving the vent plug out to prevent air lock.
- ☞ When oil appears through the vent port of the pump the vent plug should be replaced.
- ☞ Refit the Oil Reservoir lid
- ☞ Start the pump - checking that the pump has the correct level should be carried out after the pump has been running for a minimum of 1 minute



☞ If no oil is seen in the reservoir after 1 minute running oil can be added by removal of the reservoir cover. DO NOT OVERFILL

### 3. SPARE PARTS

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Contact your local sprayer specialist to get the correct spare parts for your product.

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