



Operating manual

# **Pneumatic pump**

DP 15

Item No.: 120 420 000, 120 420 100, 120 420 200

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## **Important!**

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**The operating manual is always to be read before commissioning the equipment. No warranty claim will be granted for faults and damage to the equipment arising from insufficient knowledge of the operating manual.**

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(0,14 €/Min: on the German landline network, Mobile telephone max. 0,42 €/Min.)

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## Table of content

1.	Safety instructions.....	4
2.	General information .....	6
2.1.	Description / Appropriate use.....	6
2.2.	Product versions.....	6
2.3.	Permitted media .....	6
2.4.	Technical data.....	7
2.5.	Accessories .....	7
3.	Assembly instructions/commissioning.....	8
3.1.	Mobile equipment.....	8
3.2.	Stationery equipment .....	8
4.	Fault display – What to do when ... ?.....	10
5.	Maintenance.....	11
5.1.	General .....	11
5.2.	Leak test .....	11
5.3.	Filter.....	11
5.4.	Changing the drum.....	11
5.5.	Cleaning the system.....	11
5.6.	Compressed air motor.....	11
5.7.	Pump tube.....	12
6.	Spare parts .....	14
7.	Disposal.....	14
8.	Declaration of Conformity.....	15

## 1. Safety instructions

The device is a state of the art piece of equipment and has been constructed according to recognised safety specifications. It is nevertheless possible that use of the device will present hazards to the operator or to third parties, or may damage the device or other property. It is therefore essential to act in accordance with these safety instructions, and in particular with those sections identified as warnings.

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### Warning notices and symbols

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In the operating manual, the following signs are used for highlighting important information.



**Special information for economical use of the equipment.**



**Special information or "dos and don'ts" for damage prevention.**



**Information or "dos and don'ts" for the prevention of damage to persons or equipment.**

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### Appropriate use

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The device may only be used if it is in perfect condition, and then only for its intended purpose, in compliance with all safety regulations, with an awareness of the potential risks, and according to the operating manual. Any faults that may impair the safety must be rectified immediately.



The device and its components are only to be used for handling the liquids listed and the purpose described. Using the machine for any other purpose would constitute inappropriate use. The manufacturer is not responsible for any loss arising as a result of this, the risk for this is borne only by the operating company.

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### Organisational measures

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This operating manual should always be kept readily available at the site of operation! Each person concerned with the assembly, commissioning, maintenance and operation of the equipment must have read and understood the entire operating manual. It is essential that the type plate and the warning notices attached to the device are observed, and are maintained in a fully readable condition.

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### Qualified personnel

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The operating, maintenance and assembly personnel must be appropriately qualified for their work. The areas of responsibility, competences and supervision of the personnel must be precisely regulated by the operating company. If the personnel do not have the required knowledge, they must be trained and instructed. The operating company must also ensure that the contents of the operating manual are properly understood by the personnel.

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### Waters protection

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The device has been designed to handle water hazardous substances. The regulations on the operating place (e.g. Water Resources Act WHG, = ordinance on installations for handling of substances hazardous to water VAWS) must be adhered to.

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## Hydraulics

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Only persons with special knowledge and experience with hydraulic systems may carry out work on hydraulic parts and equipment. All lines, hoses and screw joints should regularly be checked for leaks and visible external damage. Any damage must be rectified immediately. Any oil spurting out can cause injuries and fire. The relevant safety regulations for the product must be followed when handling oils, greases or other chemical substances!

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## Maintenance and Service

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According to the regulations of the water resources law only authorized services may work on devices for flammable and/or water endangering substances. During such works, appropriate tools are to be used (avoid sparking). Before any kind of work on the device, all fuel lines are to be completely emptied and aerated. Do not make any changes. Modifications or additions to the device which may affect the safety cannot be carried out without consent of the manufacturer. Exclusively genuine spare parts made by the manufacturer may be used.

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## Electric power

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Work on the electrical equipment may only be carried out by a qualified electrician or by trained persons under the guidance and supervision of a qualified electrician according to electro-technical guidelines. Machine or system components, on which inspection, maintenance or repair work is to be carried out must be de-energised.

## 2. General information

### 2.1. Description / Appropriate use

The compressed air-driven liquid pump comprises two main components: a double-action piston motor which drives a double-action liquid pump. The liquid is sucked in the pump tube through the intake valve on the upward movement of the piston. Liquid is pumped during both the upward and downward movements. The ratio between the pneumatic piston surface and the pump piston surface gives the pressure amplification. The pressure ratio is 1:1 so that the theoretical pressure when the pump is at rest is the same as the air supply pressure. The exhaust air escapes through a silencer made of sintered brass.



**The DP 15 must not be used with combustible or explosive liquids with a flash point below 55 °C (hazard classes AI, AII and B). The device must not be used for liquids with a flash point above 55 °C (hazard class A III), if they are heated above their flash point.**

### 2.2. Product versions

The following product variants are available:

Item No.	Description
120 420 000	With long suction pipe, immersion depth: 840 mm
120 420 100	With short suction pipe, immersion depth: 200 mm
120 420 200	With suction hose, immersion depth: 1600 mm

### 2.3. Permitted media

The pump is designed to handle non-corrosive and petroleum-based liquids such as oils and liquid greases. All variants of the DP 15 pneumatic pumps can be used to pump engine oil up to SAE 50.



**Caution! The pump contains zinc and aluminium which react with certain solvents to form explosive gases.**



**Cannot be used to pump any other media!**



**Please check the safety data sheet for your medium.**

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## 2.4. Technical data

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	<b>120 420 000</b>	<b>120 420 100</b>	<b>120 420 200</b>
<b>Pressure ratio</b>	1:1	1:1	1:1
<b>Immersion depth</b>	840 mm	200 mm	1600 mm
<b>Overall length</b>	1185 mm	495 mm	495+1600 mm
<b>Pipe diameter</b>	50 mm	50 mm	50 mm
<b>Weight</b>	4.4 kg/9.7 lbs	2.8 kg/6.2 lbs	5.1 kg/11.24 lbs
<b>Max. air pressure</b>	10 bar/145 psi	10 bar/145 psi	10 bar/145 psi
<b>Min. air pressure</b>	2 bar/29 psi	2 bar/29 psi	2 bar/29 psi
<b>Max. liquid pressure</b>	10 bar/145 psi	10 bar/145 psi	10 bar/145 psi
<b>Bursting pressure</b>	Min. 70 bar/ 1000 psi	Min. 70 bar/ 1000 psi	Min. 70 bar/ 1000 psi
<b>Freely dispensed flow of liquid*</b>	approx. 40 l/min	approx. 40 l/min	approx. 40 l/min
<b>Air connection</b>	BSP ¼" internal thread / thread ¼"	BSP ¼" internal thread / thread ¼"	BSP ¼" internal thread / thread ¼"
<b>Liquid outlet</b>	BSP 3/4" internal thread / thread ¼"	BSP 3/4" internal thread / thread ¼"	BSP 3/4" internal thread / thread ¼"
<b>Liquid intake</b>	Slot	BSP 3/4" internal thread / thread 1"	DN 19 hose
<b>Noise emission at 0.7 MPa (7 bar)</b>	78 dB	78 dB	78 dB
<b>Drum connection</b>	BSP thread 2"	BSP thread 2"	BSP thread 2"

\*Depending on viscosity and system

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## 2.5. Accessories

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The following items can be used as accessories depending on the application:

	<b>Item-No.</b>
Hose set , 2,5 m hose DN 19x4 and nozzle LZV 16 M	<b>321 425 000</b>

### 3. Assembly instructions/commissioning

#### 3.1. Mobile equipment

Remove the protective packaging from the pump and safety stopper from the liquid outlet. Remove the drum connection from the pump tube. Attach the drum connector to the 2" thread of the drum or to the wall mounting.

Place the pump vertically into the drum and rotate until the outlet is facing in the correct direction.

Connect the outlet hose to the pump outlet.

You should always fit a shut-off valve before installing the air hose, filter, regulator or manometer in the airline.

The pump is pre-lubricated with silicone grease. Under normal operating conditions it requires no further lubrication.

Connect the compressed air supply via the quick coupling to commission the equipment.



**If an air lubricator has been fitted and is or has been connected upstream of the pump then it must be switched on constantly as it flushes out the silicone grease. If this additional lubrication is interrupted, the pneumatic pump may become worn and damaged.**



**All connected components must be present and must be suitable for the system operating pressure.**

#### 3.2. Stationery equipment

In addition to information given for the mobile equipment, note the following:

The pipework system must be designed according to the relevant pipe-laying requirements and the regulations of the relevant authorities for this type of equipment.

Never mount pump directly onto a metal wall or similar structure acting as a resonator and which could amplify the normal noise level of the pump.

A hose connector must be installed between the outlet connector of the pump and the pipework. It must be long enough to enable the pump to be inserted into and removed from the drum without difficulty.

A shut-off valve must be fitted at the start of the pipework for ease of maintenance and to stop the flow when required.

A shut-off valve must be installed at every junction and upstream from every hose reel. It is also recommended to fit an oil filter at these points. The shut-off valve and oil filter should have the same pressure class as corresponds to the working pressure of the system.

All measurement equipment and shut-off valves must be opened on first commissioning to allow the air contained in the system to escape. If the air is compressed and then a valve or network is opened, measurement equipment can be damaged and people may be injured. In some cases it may be necessary to open up a high-level coupling or connector to vent air pockets. It can be difficult to get rid of these air pockets. However it is necessary in order for measurement equipment and solenoid valves to operate correctly and without interruption. In a monitoring system it is essential to remove any air from the pipework.



The filters installed in the system must be checked and cleaned regularly. Change the filter insert if this is felt necessary. If there is no filter fitted in the system to filter out any particles of dirt when changing the drum or when filling tanks, a temporary filter should be fitted for the restart of operation. This prevents particles of dirt from being washed into the pipework system.

Do not allow the pump to overrun at the start of operation or when changing the drum if the pipework is being refilled. Start the pump by reducing the air pressure during initial priming and increase the air pressure gradually until the system is prepared. When filling, check that the system is not leaking.



**Never direct the outlet valve or other outlet openings towards a part of the body or towards other persons. The liquid could cause minor damage to the skin or eyes. If however liquid does penetrate the skin or eyes, visit your GP immediately.**



**Switch off the compressed air supply to the pump when the equipment is unsupervised.**



**Pressurise the pipework to 1.3 times the system operating pressure before starting equipment. Always keep the pressure test log together with these operating instructions.**



**Install a safety valve if there is a risk of the liquid pressure increasing due to heating of pipes or because hoses are driven over. This should be installed in the hole provided in the discharge housing or between the pump and the pipework as close to the pump outlet as possible.**

#### 4. Fault display – What to do when ... ?

<b>Fault</b>	<b>Probable cause</b>	<b>Corrective action</b>
Pump is not working.	No, or insufficient compressed air supply.	Check valve, regulator and quick coupling in the compressed air line.
	Worn or damaged compressed air motor.	Check compressed air motor mechanism and required seals and replace damaged parts.
	Foreign bodies blocking movement of the central rod.	As previously, check piston valve is moving freely and is not blocked by foreign bodies.
Pump is running but is not pumping oil.	Drum is empty.	Check the liquid level in the drum and compare to immersion depth, if necessary change drum.
	Float valve has jammed (if fitted).	Ensure that float valve can move freely.
	Foot valve not working.	Check that spring and ball are seated and are working correctly. Check for blockage by foreign bodies.
	Worn piston valve or seals.	Check position of piston valve. Check seals for wear and damage.
Pump is running noisily.	Suction resistance is too great.	Lower air pressure to reduce the pump speed.
Oil is leaking through silencer.	The seal between the air motor and the silencer is worn or damaged.	See section 5.6 Maintenance of compressed air motor.
Pump is running although the outlet is closed.	The seal on the lower piston is worn or damaged.	See section 5.7 Maintenance of pump tube.
	Dirt in the foot valve or in lower piston.	See section 5.7 Maintenance of pump tube.



**In case of excessive noise development, further operation is only permitted after elimination of the cause!**

## 5. Maintenance

The following work should be carried out regularly to guarantee trouble-free operation.

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### 5.1. General

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For personal safety during any maintenance work the compressed air motor should be disconnected from the compressed air network and the system must be depressurised.

A collecting vessel should be ready to hand for depressurising or disconnection of the pipework.

All screws and threaded components have a right hand thread unless otherwise specified.

Use petroleum oil or other liquids to clean the parts. If a water-based liquid is used, parts must be immediately and carefully dried after cleaning to prevent corrosion.

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### 5.2. Leak test

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The device and the other components of the system are to be checked regularly for leaks and damage and sealed if necessary.

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### 5.3. Filter

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Condensation and dirt should be regularly removed from the air filter.

If compressed air lubrication is installed, this must always be filled with air tool oil or similar. You can use normal SAE 10 oil based engine oil. You must not use synthetic or other engine oils.

In the case of products supplied with suction hose the sieve insert in the dirt trap should be cleaned after changing the drum several times. Disconnect the pump from the air network for cleaning, remove the sieve insert, wash, blow-out with compressed air and reinstall. Replace any damaged sieve inserts.

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### 5.4. Changing the drum

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When changing the drum, take particular care to keep the pump tube and the foot valve away from the floor and from contaminants. Dirt can otherwise get into the pump and contaminate the oil and possibly ultimately damage the pump.

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### 5.5. Cleaning the system

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Keep the place of installation and equipment clean and free from dirt to minimise the risk of contaminants from getting into the pump.

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### 5.6. Compressed air motor

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**!** The following maintenance work is carried out only if it can be assumed that any problems e.g. as mentioned in chapter 4, can be remedied by maintenance work on the compressed air motor.

The pump outlet housing should be clamped upright in a vice with the pump tube pointing downwards. Unfasten the four screws (pos. 2) which hold the compressed air cylinder (pos. 7) onto the outlet housing and remove the compressed air cylinder. Check the air valve mechanism (pos. 5) for wear and damage.

There must be no damage to the sealing lips or to the small sealing surfaces on the air valve mechanism or to the large sealing surfaces which form a seal with the cylinder wall.

Check that no oil has penetrated the packing sleeve (pos. 9) through the seals (pos. 19).

If it is necessary to change seals (pos. 8) or the air compression mechanism, pull out the central rod (pos. 16) until the hole structure in the packing sleeve (pos. 9) is revealed.

At the same time the outlet hole in the central rod must be aligned to one of the holes. This allows a suitable tool to be inserted into the outlet hole of the central rod and the air mechanism to be slackened with a special tool (pos. 1).

If the special tool is not available, you can hold and remove the mechanism with the aid of a work glove. Work carefully so as not to scratch or damage the surface of the central rod.

To check the central rod and the packing sleeve, you first need to remove the air valve mechanism. Once removed, you can check for wear and damage and replace any worn parts. Once the worn and damaged parts have been replaced, you can reassemble the pump in the reverse order.



**The pump cannot function properly if the central rod is scratched or damaged.**

It is important that you always grease all sliding and sealing surfaces with silicone grease before assembly.



**No other grease may be used.**

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## 5.7. Pump tube

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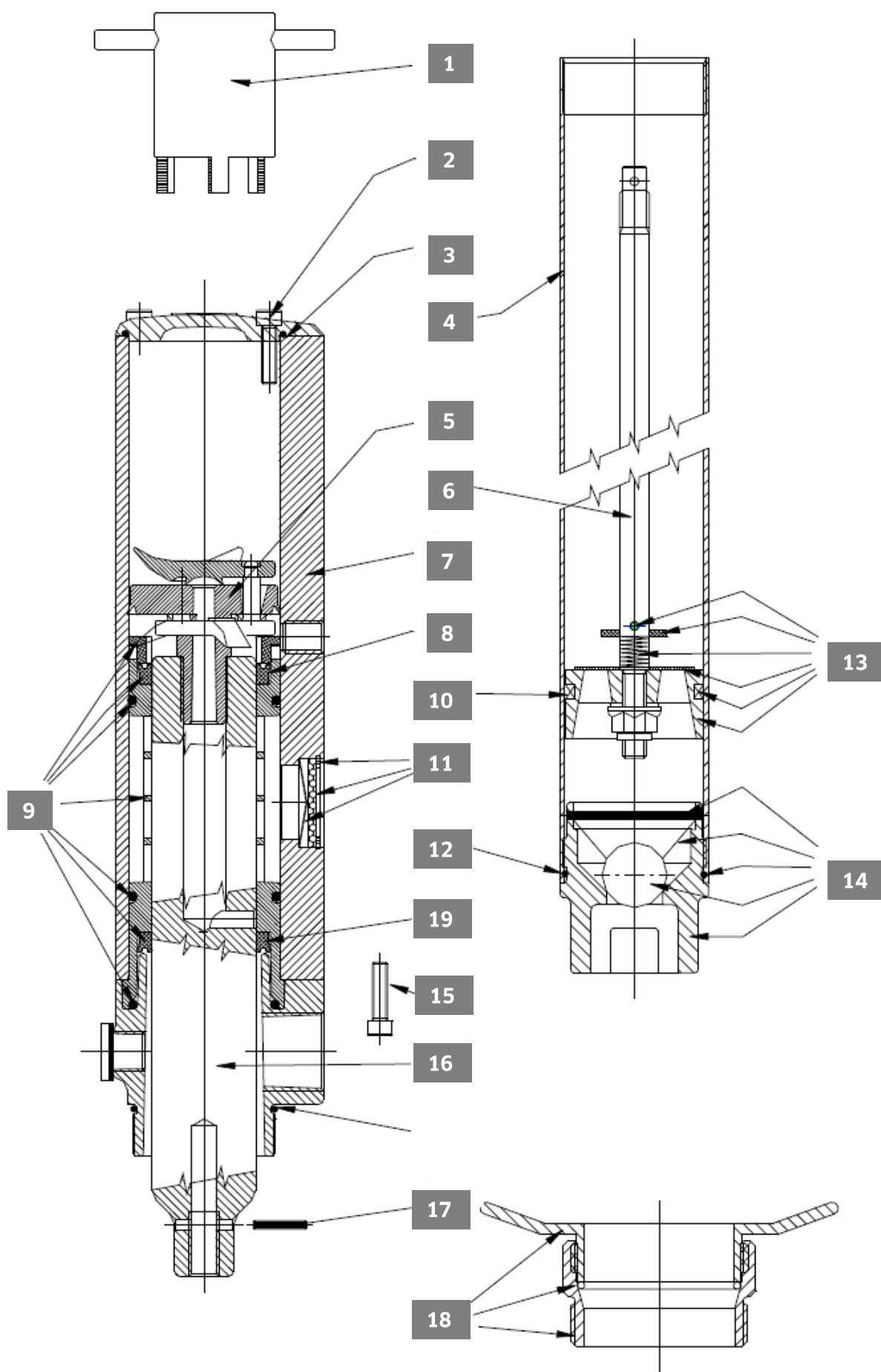
**Never unfasten the pump tube unless you suspect that the cup seal (pos. 10) on the lower piston is worn or damaged. Once the pump tube has been removed, the cup seal will be damaged and must be replaced. (Never try to reuse the cup seal when the pump is reassembled.)**

Clamp the pump outlet housing in a vice with the pump tube placed horizontally. Unfasten the pump tube (pos. 4) with a strap wrench. There is a risk of damaging the pump tube if you use a pipe wrench.

Pull off the pump tube and replace the cup seal and the O-ring (pos. 12). The O-ring is located between the pump tube and the outlet housing.

Take care that the piston and other parts contain no particles or other contaminants. Replace any parts which are worn or damaged.

If you suspect that the foot valve (pos. 14) contains dirt and contaminants, you can remove it for inspection. If you remove the foot valve, you must replace the O-ring (pos. 12) between the tube and the foot valve.



## 6. Spare parts

The following spare parts are available:

	Position	Item-No.
Mounting tool	1	499 900 076
Set of seals	8, 10, 12, 17	499 900 022
Air motor repair kit	2, 3, 9, 15, 16, 17	499 900 077
Valve mechanism assembly	5	499 900 058
Air cylinder	7	499 900 034
Silencer kit	11	499 900 078
Pump tube repair kit	12, 13, 17	499 900 079
Threaded drum connector	18	499 900 069
Pressure reducing valve		409 002 700
For 120 420 000 only:		
Foot valve	14	499 900 577
Long pump tube	4, 10, 12, 17	499 900 578
Piston rod assembly	6, 18	499 900 579
For 120 420 100 only:		
Foot valve	14	499 900 080
Short pump tube	4, 10, 12, 17	499 900 045
Piston rod assembly	6, 17	499 900 073
For 120 420 200 only:		
Short pump tube	4, 10, 12, 17	499 900 045
Suction hose assembly		234 400 900

**! Only use manufacturer's original spare parts.**

## 7. Disposal

The device is to be emptied completely and the liquids properly disposed of in case it is taken out of service.

The equipment is to be disposed of properly when taken permanently out of service:



- Return old metal for recycling.
- Return plastic parts for recycling.
- Return electronic waste for recycling.



**The water legal regulations are to be followed.**

## 8. Declaration of Conformity



### Konformitätserklärung *Declaration of Conformity*

Hiermit erklären wir, dass die Bauart  
*We herewith declare that the construction type*

Typ:	<b>Druckluftpumpe DP 15</b>
Type:	<b>Air pump DP15</b>
Bezeichnung:	<b>Druckluftbetriebene Ölpumpe</b>
Designation:	<b>Air operated oil pump</b>
Artikel-Nr.:	<b>120420000, 120420100, 120420200</b>
Item No.:	

in der von uns gelieferten Ausführung folgenden einschlägigen Bestimmungen entspricht:  
*in the form as delivered by us complies with the following applicable regulations:*


- Maschinenrichtlinie 2006/42/EG  
*Machinery safety 2006/42/EC*

Angewendete harmonisierte Normen:  
*Applied harmonised standards:*

EN ISO 12100-1, -2

EG-Dokumentationsbevollmächtigter:	Jörg Mohr	Horn GmbH & Co. KG
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04.04.2011  
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