

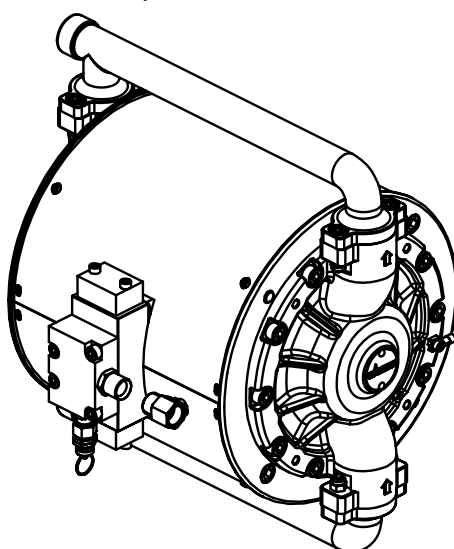


**Translation of the original  
Operating Manual**

**Unica 4-270**

Edition 04 / 2007

**High pressure  
Double diaphragm pump**



II 2G IIB T4



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## 1 ABOUT THESE INSTRUCTIONS

This operating manual contains information about the operation, repair and maintenance of the unit.

→ Always follow these instructions when operating the unit.

### 1.1 LANGUAGES



This operating manual is available in the following languages:

Language:	Part No.	Language:	Part No.
German	ZZB006GER	English	ZZB006ENG
French	ZZB006FRE	Dutch	--
Italian	ZZB006ITA	Spanish	ZZB006SPA
Danish	--	Swedish	--
Portuguese	--	Turkish	--



### 1.2 WARNINGS, NOTES AND SYMBOLS IN THESE INSTRUCTIONS

Warning instructions in this manual point out particular dangers to users and equipment and state measures for avoiding the hazard. These warning instructions fall into the following categories:



**Danger** - imminent danger. Non-observance will result in death, serious injury and serious material damage

 SIHL_0100_GB	 <b>DANGER</b>
	<p><b>This line warns of the hazard !</b> Possible consequences of failing to observe the warning instructions. The signal word points out the hazard level.</p> <p>→ The measures for preventing the hazard and its consequences.</p>

**Warning** - possible danger. Non-observance can result in death, serious injury and serious material damage.

 SIHL_0103_GB	 <b>WARNING</b>
	<p><b>This line warns of the hazard !</b> Possible consequences of failing to observe the warning instructions. The signal word points out the hazard level.</p> <p>→ The measures for preventing the hazard and its consequences.</p>

**Caution** - a possibly hazardous situation. Non-observance can result in minor injury.

 SIHL_0101_GB	 <b>CAUTION</b>
	<p><b>This line warns of the hazard !</b> Possible consequences of failing to observe the warning instructions. The signal word points out the hazard level.</p> <p>→ The measures for preventing the hazard and its consequences.</p>

**Caution** - a possibly hazardous situation. Non-observance can cause material damage.

SIHL_0102_GB	<b>CAUTION</b>
<p><b>This line warns of the hazard !</b> Possible consequences of failing to observe the warning instructions. The signal word points out the hazard level.</p> <p>→ The measures for preventing the hazard and its consequences.</p>	

**Note** - provide information on particular characteristics and how to proceed.

## 2 GENERAL SAFETY INSTRUCTIONS

### 2.1 SAFETY INSTRUCTIONS FOR THE OPERATOR

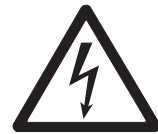
- Keep these operating instructions to hand near the unit at all times.
- Always follow local regulations concerning occupational safety and accident prevention.



#### 2.1.1 ELECTRICAL EQUIPMENT

Electrical plant and unit

- To be provided in accordance with the local safety requirements with regard to the operating mode and ambient influences.
- May only be maintained by skilled electricians or under their supervision.
- Must be operated in accordance with the safety regulations and electrotechnical regulations.
- Must be repaired immediately in the event of problems.
- Must be put out of operation if they pose a hazard.
- Must be de-energized before work is commenced on active parts. Inform staff about planned work, observe electrical safety regulations.



#### 2.1.2 PERSONNEL QUALIFICATIONS

- Ensure that the unit is operated and repaired only by trained persons.

#### 2.1.3 A SAFE WORK ENVIRONMENT

- Ensure that the floor of the working area is anti-static in accordance with EN 50053 Part 1 §7-2, measurement in accordance with DIN 51953.
- Ensure that all persons within the working area wear anti-static shoes, e.g. shoes with leather soles.
- Ensure that during spraying, persons wear anti-static gloves so that they are earthed via the handle of the spray gun.
- Customer to provide paint mist extraction systems conforming to local regulations.
- Ensure that the following components of a safe working environment are available:
  - Material/air hoses adapted to the working pressure
  - Personal safety equipment (breathing and skin protection)
- Ensure that there are no ignition sources such as naked flame, glowing wires or hot surfaces in the vicinity. Do not smoke.



### 2.2 SAFETY INSTRUCTIONS FOR STAFF

- Always follow the information in these instructions, particularly the general safety instructions and the warning instructions.
- Always follow local regulations concerning occupational safety and accident prevention.



### 2.2.1 SAFE HANDLING OF WAGNER SPRAY UNITS

The spray jet is under pressure and can cause dangerous injuries.

Avoid injection of paint or cleaning agents:

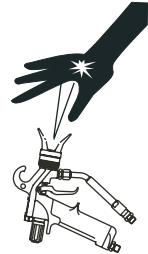
- Never point the spray gun at people.
- Never reach into the spray jet.
- Before all work on the unit, in the event of work interruptions and functional faults:
  - Switch off the energy/compressed air supply
  - Secure the spray gun against actuation.
  - Relieve the pressure from the spray gun and unit.
  - By functional faults: Identify and correct the problem, proceed as described in chap. „Trouble shooting“.

In the event of skin injuries caused by paint or cleaning agents:

- Note down the paint or cleaning agent that you have been using.
- Consult a doctor immediately.

Avoid danger of injury through recoil forces:

- Ensure that you have a firm footing when operating the spray gun.
- Only hold the spray gun briefly in any one position.



### 2.2.2 EARTH THE UNIT

Electrostatic charges can occur on the unit due to the electrostatic charge and the flow speed involved in spraying. These can cause sparks and flames upon discharge.

- Ensure that the unit is earthed for every spraying operation.
- Earth the workpieces to be coated.
- Ensure that all persons inside the working area are earthed, e.g. that they are wearing antistatic shoes.
- When spraying, wear antistatic gloves to earth yourself via the spray gun handle.



### 2.2.3 MATERIAL HOSES

- Ensure that the hose material is chemically resistant to the sprayed materials.
- Ensure that the material hose is suitable for the pressure generated in the unit.
- Ensure that the following information is visible on the high-pressure hose:
  - Manufacturer
  - Permissible operating overpressure
  - Date of manufacture.
- The electrical resistance of the complete high-pressure hose must be less than 1 MOhm.



## 2.2.4 CLEANING

- De-energize the unit electrically.
- Disconnect the pneumatic supply line.
- Relieve the pressure from the unit.
- Ensure that the flash point of the cleaning agent is at least 5 K above the ambient temperature.
- To clean, use only solvent-free cloths and brushes. Never use hard objects or spray on cleaning agents with a gun.

An explosive gas/air mixture forms in closed containers.

- When cleaning units with solvents, never spray into a closed container.
- Earth the container.



## 2.2.5 HANDLING HAZARDOUS LIQUIDS, VARNISHES AND PAINTS

- When preparing or working with paint and when cleaning the unit, follow the working instructions of the manufacturer of the paints, solvents and cleaning agents being used.
- Take the specified protective measures, in particular wear safety goggles, protective clothing and gloves, as well as hand protection cream if necessary.
- Use a mask or breathing apparatus if necessary.
- For sufficient health and environmental safety: Operate the unit in a spray booth or on a spraying wall with the ventilation (extraction) switched on.
- Wear suitable protective clothing when working with hot materials.



## 2.2.6 TOUCHING HOT SURFACES

- Touch hot surfaces only if you are wearing protective gloves.
- When operating the unit with a coating material with a temperature of >43°C; 109.4°F:
  - Identify the unit with a warning label that says „Warning - hot surface“.



### Order No.

9998910 Information label

9998911 Safety label

## 2.3 CORRECT USE

WAGNER accepts no liability for any damage arising from incorrect use.

- Use the unit only to work with the materials recommended by WAGNER.
- Operate the unit only as an entire unit.
- Do not deactivate safety equipment.
- Use only WAGNER original spare parts and accessories.





## 2.4 USE IN AN EXPLOSION HAZARD AREA

### 2.4.1 CORRECT USE

The unit is suitable for working liquid materials in accordance with the classification into explosion classes.

### 2.4.2 EXPLOSION PROTECTION IDENTIFICATION

As defined in the Directive 94/9/CE (ATEX 95), the unit is suitable for use in areas where there is an explosion hazard.



CE:	Communautés Européennes
Ex:	Symbol for explosion protection
II:	Unit class II
2:	Category 2 (Zone 1)
G:	Ex-atmosphere gas
IIB:	Explosion class
T4:	Temperature class: maximum surface temperature < 135°C; 275°F.



### 2.4.3 MAX. SURFACE TEMPERATURE

Max. surface temperature:	same as the permissible material temperature
Permissible ambient temperature:	see under Technical data, Section 4.3.2

### 2.4.4 SAFETY REGULATIONS

#### Safe handling of WAGNER spray units

The maximum surface temperature of the pump can be reached if it runs dry.  
→ Ensure that the pump is filled with sufficient working or cleaning medium.

Mechanical sparks can form if the unit comes into contact with metal.

In an explosive atmosphere:

- Do not knock or push the unit against steel or rusty iron.
- Do not drop the unit.
- Use only tools that are made of a permitted material.

#### Ignition temperature of the pumped material

- Check that the ignition temperature of the pumped material is higher than the max. allowable surface temperature.

#### Medium supporting atomizing

- To atomize the material, use only weakly oxidizing gases, e.g. air.

**Surface spraying, electrostatic**

→ Do not spray unit parts with electrostatic (e.g. electrostatic spray gun).



**Cleaning**

If there are deposits on the surfaces, the unit may form electrostatic charges. Flames or sparks can form if there is a discharge.

→ Remove deposits from the surfaces to maintain conductivity.

→ Use only a damp cloth to clean the unit.



	 <b>WARNING</b>
	<p><b>Gas mixtures can explode if there is an incompletely filled pump!</b> Danger to life from flying parts.</p> <p>→ Ensure that the piston pump and suction system are always completely filled with cleaning agent or working medium. → Do not spray the unit empty after cleaning.</p>

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### **3 PRODUCT LIABILITY AND WARRANTY**

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#### **3.1 IMPORTANT NOTES ON PRODUCT LIABILITY**

As a result of an EC regulation, effective as from January 1, 1990, the manufacturer shall only be liable for his product if all parts come from him or are approved by him, and if the devices are properly fitted, operated and maintained.

If other makes of accessory and spare parts are used, the manufacturer's liability could be fully or partially null and void.

The usage of original WAGNER accessories and spare parts guarantees that all safety regulations are observed.

#### **3.2 WARRANTY**

This unit is covered by our warranty on the following terms:

We will at our discretion repair or replace free of charge all parts which within 36 months in single-shift, 18 months in 2-shift or 9 months in 3-shift operation from date of receipt by the Purchaser are found to be wholly or substantially unusable due to causes prior to the sale, in particular faulty design, defective materials or poor workmanship.

The terms of the warranty are met at our discretion by the repair or replacement of the unit or parts thereof. The resulting costs, in particular shipping charges, road tolls, labour and material costs will be borne by us except where these costs are increased due to the subsequent shipment of the unit to a location other than the address of the purchaser.

This warranty does not cover damage caused by:

Unsuitable or improper use, faulty installation or commissioning by the purchaser or a third party, normal wear, negligent handling, defective maintenance, unsuitable coating products, substitute materials and the action of chemical, electrochemical or electrical agents, except when the damage is attributable to us.

Abrasive coating products such as redlead, emulsions, glazes, liquid abrasives, zinc dust paints and similar reduce the service life of valves, packings, spray guns, nozzles, cylinders, pistons etc. Any wear resulting from the aforementioned causes is not covered by this warranty.

Components not manufactured by Wagner are subject to the warranty terms of the original maker.

The replacement of a part does not extend the warranty period of the unit.

The unit should be inspected immediately upon receipt.

To avoid loss warranty, any apparent defect should be notified to us or the dealer in writing within 14 days from date of sale of the unit.

The right to commission warranty services to a third party is reserved.

Warranty claims are subject to proof of purchase by submitting an invoice or delivery note.

If an inspection finds damage not covered by the present warranty, the repair will be carried out at the expense of the purchaser.

Note that this warranty does not in any way restrict legally entitled claims or those contractually agreed to in our general terms and conditions.

J. Wagner AG

**3.3 CE-CONFORMITY**

Herewith we declare that the supplied version of:  
Pneumatic pump with article no.:

Mod. Unica 4-270
U580.00

Complies with the following provisions applying to it:

98/37/CE	94/9/CE Atex-directives	
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Applied standards, in particular:

UNI EN 292-1	UNI EN 809	UNI EN 1127-1
UNI EN 292-2	UNI EN 1050	EN 12621
UNI EN 563	UNI EN ISO 3746	UNI EN ISO 13463-1

Marking:

  II 2G IIB T4

**EC Certificate of Conformity**

The certificate is enclosed with this product. The certificate of conformity can be reordered from your WAGNER representative, quoting the product and serial number.

**Part number:**

Unica 4-270      ZDI.15

## 4 DESCRIPTION

### 4.1 FIELD OF APPLICATION

#### 4.1.1 USING IN ACCORDANCE WITH THE INSTRUCTIONS

The pneumatic diaphragm pump can be used with various fluids. Before proceeding to use the pump with a certain fluid, make sure that the compatibility between said fluid and the materials used for the fluid unit (Paragraph 4.3.1) is given.

### CAUTION

#### **Abrasive materials and pigments!**

Greater wear of the parts carrying the material.

→ Use suitable combinations of devices (packages, valves etc.).

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#### 4.1.2 EXAMPLES OF APPLICATION AREAS

The main use of the Unica 4-270 pump is for transferring liquids inside the service circuit. Other typical applications are given below.

Application	Unica 4-270
Furniture industry	↗
Kitchen manufactures	↗
Joinery	↗
Wooden hood manufacturers	↗
Metal industries	⇒

Legend

recommended ↗

limited suitability ⇒

less suitable ↘

## **4.2 EXTENT OF DELIVERY**

Double-diaphragm pneumatic pump composed of:

- Integrated pneumatic motor
- Pumping stage

CE-conformity see

Operating manual in english

Operating manual for the other language see

Chapter 3.3

Part No.: ZZB006ENG

Chapter 1.1

The delivery note shows the exact scope of delivery.

Accessories: see chapter 7.

## **4.3 DATA**



### **4.3.1 MATERIALS USED FOR COMPONENTS IN CONTACT WITH THE PRODUCT**

Suction ducts	Stainless steel EN 1.4301 (X 5 CrNi 18-10, AISI 304)
Valves balls	Stainless steel EN 1.4028 (X 30 Cr 13, AISI 420)
Valves seats	Stainless steel EN 1.4301 (X 5 CrNi 18-10, AISI 304)
Valve bodies	Acetal (POM)
Diaphragms	PTFE
O-rings	PTFE

**4.3.2 TECHNICAL DATA**

Description	Unit	Unica 4-270
Transmission ratio		4,5 :1
Flow volume per double stroke (DS)	cm <sup>3</sup> (cc)	270
Max. operating pressure	MPa bar psi	2,7 27 391.6
Max. peak pressure	MPa bar psi	3 30 435.1
Max. recommended operating speed	DH/min DC/min	22
Min. - Max. air inlet pressure	MPa bar psi	0.2-0.6 2-6 29-87
Ø air inlet connection (male)	Zoll Inch	G 1/2"
Min. Ø compressed air hose	mm Inch	13 0.512
Air consumption at 0.6 MPa; 6 bar; 87 psi per DS	nl scf	16
Noise level* with max. allowable air supply pressure	dB(A)	77.5
Ø piston of air motor	mm Inch	200 8.0
Material inlet connection (female)	Zoll Inch	G 3/4"
Material outlet connection (female)	Zoll Inch	G 3/4"
Weight	kg lb	46 101.2
Material pH value	pH	3.5 ÷ 9
Max. material pressure at pump inlet	MPa bar psi	2 20 90
Range of material temperature	°C; F	+5° ÷ +80°; (+41 ÷ +176)
Range of the ambient temperature	°C; F	+4° ÷ +40° ; (+39.2 ÷ +104)
Allowable sloping position at work	°	± 10
Necessary fluid quantity	l	0.7

\* A rated sound pressure level measured at 1m distance according to UNI EN ISO 3746-1997.

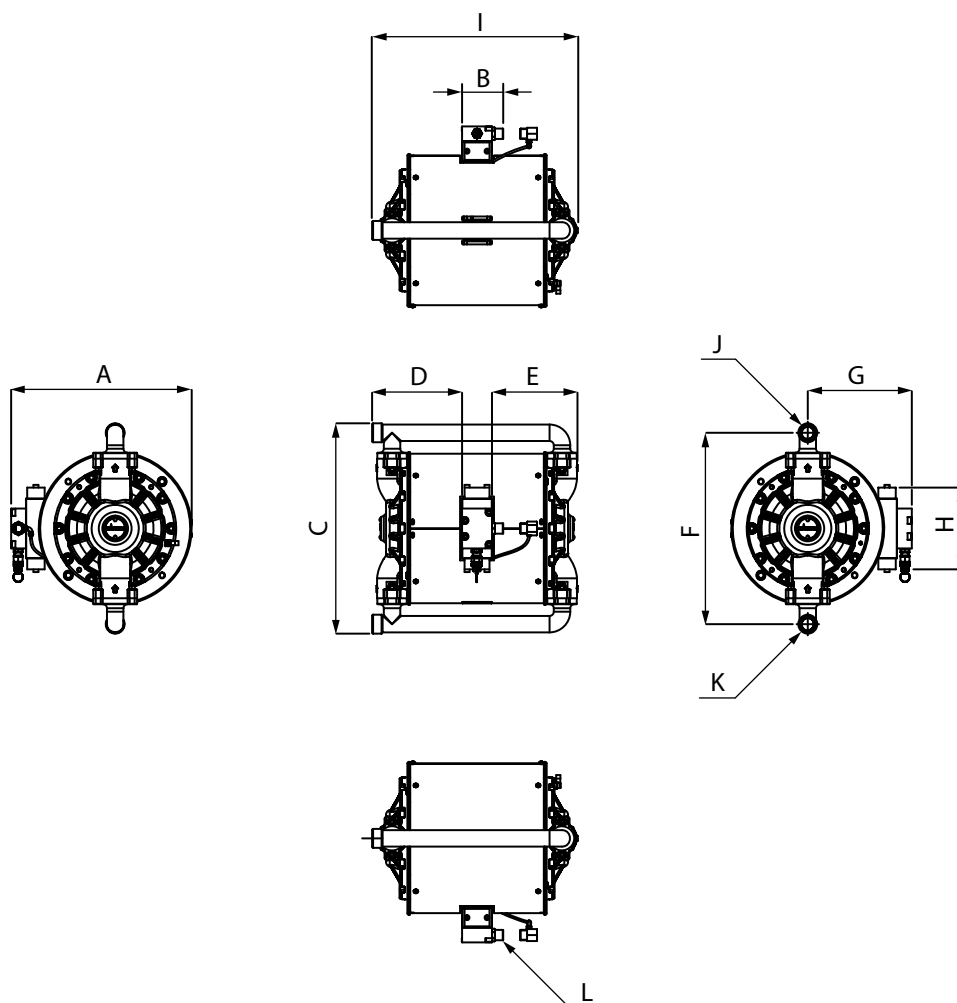
	<div data-bbox="660 427 943 488"> <b>WARNING</b></div> <div data-bbox="427 501 759 533"><b>Outgoing air containing oil!</b></div> <div data-bbox="427 533 735 564">Risk of poisoning if inhaled.</div> <div data-bbox="427 564 735 595">Function problem airmotor</div> <div data-bbox="427 629 1174 692">→ Provide water-free and oil-free compressed air (quality standard 5.5.4 as per ISO 8573.1) 5.5.4 = 40 µm / +7 / 5 mg/m<sup>3</sup>.</div>
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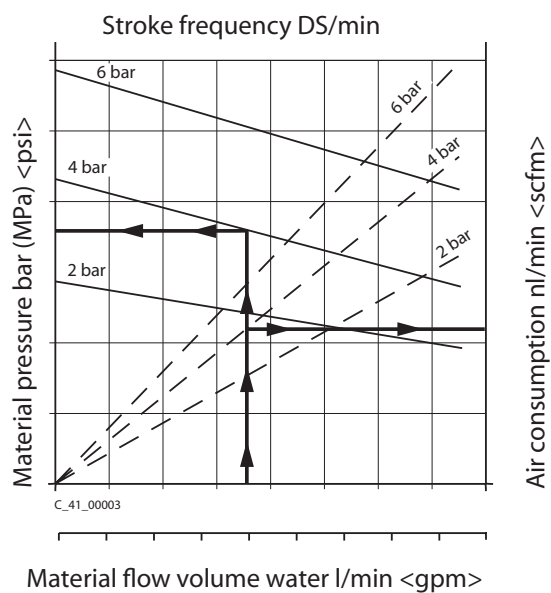
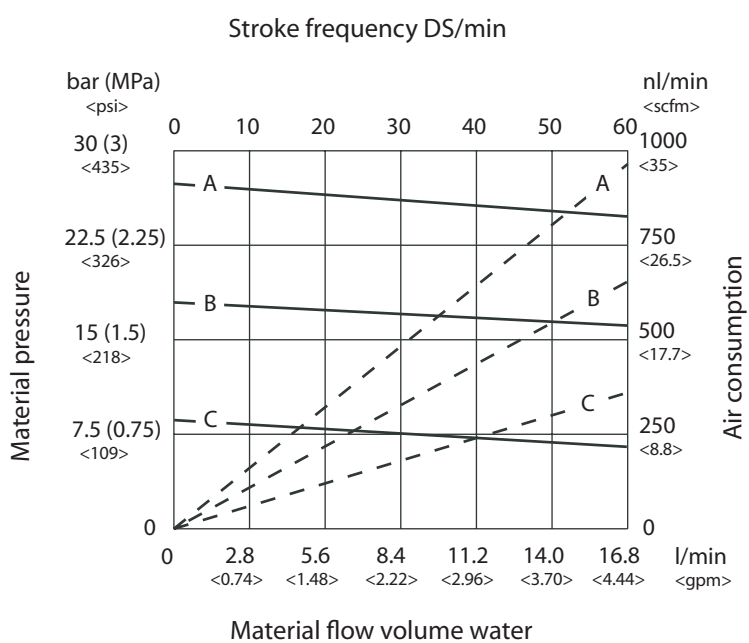
**4.3.3 DIMENSIONS AND CONNECTIONS**

	Unica 4-270 mm; inch		Unica 4-270 mm; inch
A	362; 14.3	G	209; 8.2
B	83; 3.3	H	164; 6.5
C	422; 16.6	I	412; 16.2
D	180.5; 7.1	J	G 3/4"
E	171.5; 6.8	K	G 3/4"
F	384; 15.1	L	G 1/2"



**4.3.4 PERFORMANCE DIAGRAMS**

Example

**Diagram Unica 4-270**

A = 8 bar; 0.8 MPa; 116 psi Air pressure

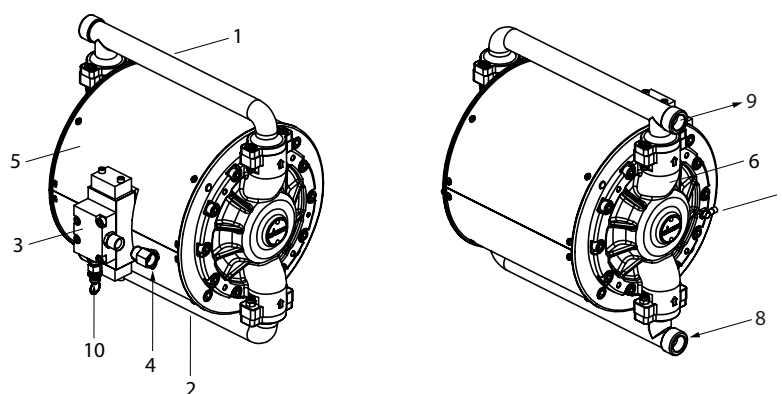
B = 6 bar; 0.6 MPa; 87 psi Air pressure

C = 4 bar; 0.4 MPa; 58 psi Air pressure

## 4.4 FUNCTIONING

### 4.4.1 PUMP

- 1 Product delivery manifold
- 2 Product suction manifold
- 3 Reversing valve unit
- 4 Compressed air inlet fitting
- 5 Pneumatic motor protection
- 6 Fluid section
- 7 Grounding connection
- 8 Product inlet fitting
- 9 Product outlet fitting
- 10 Safety valve



#### Generalities

The double-diaphragm pump is operated by a compressed-air reciprocating engine. The diaphragm movement inside the fluid section (6) is obtained by a hold-and-grasp system that makes them integral with the motor stem.

At the end of each phase the compressed air is directed to the opposite chamber by dedicated commutating valves named feelers. The motor has a tandem configuration: two pistons simultaneously push the pump stem.

During each stem stroke, the paint is sucked and pumped into the delivery ducts at the same time.

#### Pneumatic motor

Thanks to its inversion system (3) the pneumatic motor needs no lubrication. The compressed air supply is obtained by a pressure controller and a ballcock available on request with the pump.



The pneumatic motor is equipped with a safety valve containing a pre-loaded spring. The safety valve is mounted and calibrated in the factory. When the pressure exceeds the max. allowed operating value, the valve opens and discharges the exceeding pressure.

#### Safety valve

Besides having the aim to limit the max. inlet pressure of compressed air into the pneumatic motor, the safety valve (10) also serves as a depressurizing valve for the motor. To depressurize the motor, just pull the dedicated exhaust ring with closed ballcock (part n°3 in the diagram in Paragraph 4.4.2). The ring on the safety valve also allows to check the good performance of the valve itself.

Use the safety valve ring to depressurize the pneumatic motor, in addition to the pressure outlet procedure in the fluid side.

Depressurize the pneumatic motor before any pump disassembly or maintenance work.

	<div data-bbox="683 427 963 488" style="text-align: center;"> <b>WARNING</b></div> <div data-bbox="427 501 1165 616"><p><b>Overpressure!</b> Risk of injury from bursting components. → Frequently check the safety valve efficiency by pulling the ring.</p></div>
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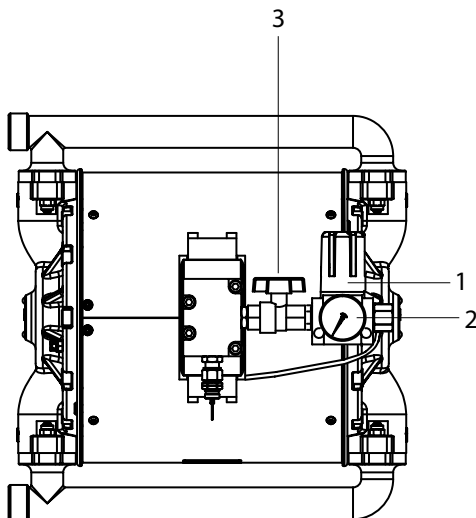
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**Fluid section**

The fluid section has been designed to work as a double-diaphragm pump with interchangeable suction and delivery valves.

**4.4.2 AIR SUPPLY UNIT (OPTIONAL)**

- 1 Pressure regulator
- 2 Control air gauge
- 3 Motor air shut-off cock



## 5 STARTING UP AND OPERATING

### 5.1 INSTALLATION AND CONNECTION

The Unica 4-270 diaphragm pump can be wall-mounted or floor-mounted. For a diagram of the typical installations, see Paragraph 5.1.6. The diagram does not represent the most suitable solution in all situations and is given as mere example. Please apply to a Wagner authorised engineer for further information about the best mounting solution for each user's special needs.

To make pump operation and maintenance easier install the device so that the pneumatic supply inlet and the pneumatic supply/suction fittings of the pump are easily accessible.

Install the pump in a horizontal position.

For support to integrate the pump in a pre-existing plant or for a customised location, please apply to a Wagner authorised engineer.

Always use original Wagner spare parts.

#### 5.1.1 PUMP WALL-INSTALLATION

The Unica 4-270 pump installation kit for wall-mounting can be supplied on request.

**Part number:**

Wall mounting kit: T6151.00

For information regarding the kit contents and assembling, please see the relevant paragraph in chapter 7 - Accessories.



#### 5.1.2 PUMP INSTALLATION ON GROUND FRAME

The Unica 4-270 pump installation kit on a ground frame can be supplied on request.

**Part number:**

Ground frame kit: T6148.00

For information regarding the kit contents and assembling, please see the relevant paragraph in chapter 7 - Accessories.

	 <b>WARNING</b>
	<p><b>Inclined surface!</b> Risk of accidents if the unit rolls away/falls.</p> <ul style="list-style-type: none"> <li>→ Place the frame with the pump horizontally.</li> <li>→ Lock the frame.</li> </ul>

### **5.1.3 COMPRESSED AIR SUPPLY CIRCUIT**

Firmly install all components of the compressed air supply circuit, by anchoring them on a wall or frame. Make sure the system is correctly connected to a grounding terminal. Install a general air shut-off valve (A), so that the compressed air flow in the supply circuit can be controlled.

Mount a compressed air line filter (B). Its function is to remove eventual dirt and condensate residues from the supply line.

Connect the S462.00A hose to the high-pressure special control fitting (L) on the pneumatic inlet of the Unica 4-270 pump before the pressure controller.

Install a pressure controller (C) on the pump regulating the pressure of the air entering the pneumatic motor and allowing to choose the desired running speed. The Unica 4-270 pump conveys the working fluid at a pressure of 4.5 times the supply air pressure, with peak pressure values of 30 bar.

Install a motor air shut-off valve (D) downstream the pressure controller; this allows to open/shut off the air flow supplying the pneumatic motor.

### **5.1.4 SUCTION CIRCUIT**

Use electrically conductive pipes (see Paragraph 2.2.3).

Connect the working fluid suction system to the pump by means of a system of pipes and fittings (E). For the correct pump inlet thread diameters, please see Paragraph 4.3.2 - Technical Data. Use a system of pipes suitable for the working conditions.

Make sure that the height difference between the product level in the tank and the pump suction unit does not exceed the max. allowed suction height given for the pump (see Paragraph 4.3.2 - Technical Data).

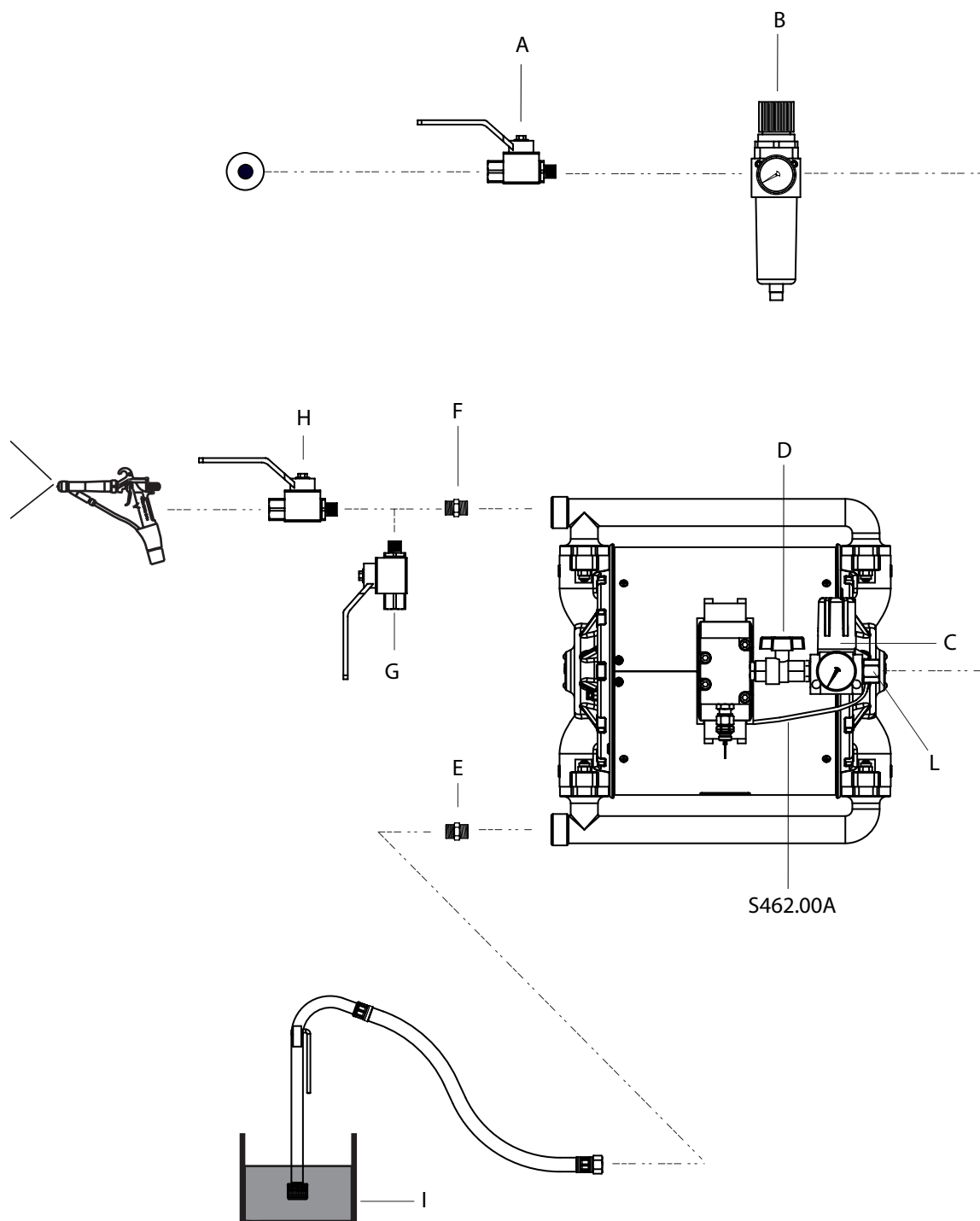
### **5.1.5 DELIVERY CIRCUIT**

Use electrically conductive pipes (see Paragraph 2.2.3).



Connect the pump to the delivery circuit through a system of pipes and fittings (F). For the correct pump outlet thread diameters, please see paragraph 4.3.2 - Technical Data.

Install a purge valve (G) for the fluid, which allows to easily release the remaining pressure inside the system in case the working session stops. The risks deriving from an unattended system under pressure are thus reduced.



Install a product shut-off valve (H) allowing to isolate the pump from the service circuit.

**5.1.6 EXAMPLE OF TYPICAL INSTALLATION**

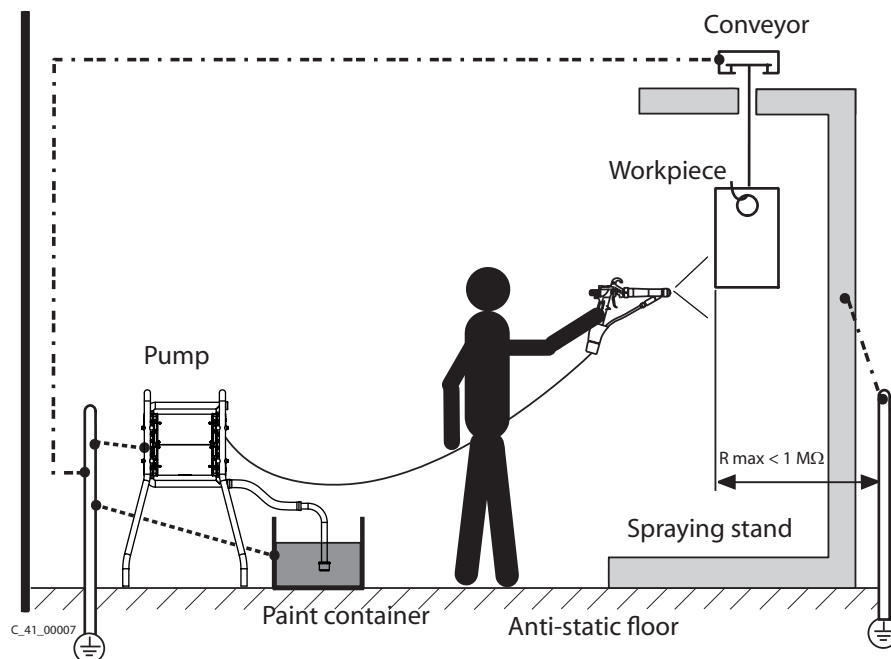
**5.1.7 EARTHING**

	 <b>WARNING</b>
	<p><b>Discharge of electrostatically charged components in atmospheres containing solvents!</b> Explosion hazard from electrostatic sparks.</p> <p>→ Clean the piston pump only with a damp cloth.</p>

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	 <b>WARNING</b>
	<p><b>Heavy paint mist if earthing is insufficient!</b> Risk of poisoning. Insufficient paint application quality.</p> <p>→ Earth all unit components. → Earth the workpieces being painted.</p>

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**Earthing schema (example per painting applications)**

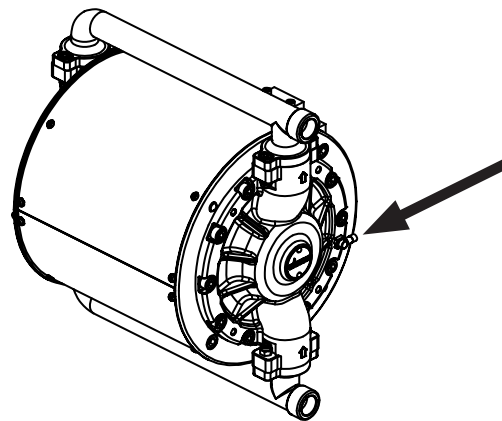


**Cable cross sections**

Pump	4 mm <sup>2</sup> ; AWG 11
Paint container	6 mm <sup>2</sup> ; AWG 10
Conveyor	16 mm <sup>2</sup> ; AWG 5
Spraying booth	16 mm <sup>2</sup> ; AWG 5
Spraying stand	16 mm <sup>2</sup> ; AWG 5

**Procedure:**

1. Screw on earthing cable with eye.
2. Clamp the earthing cable clip to a earth connection on site.
3. Earth the material (paint) container to a local earth connection.
4. Earth the other parts of the system to a local earth connection.

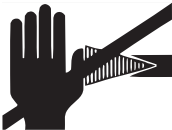


## 5.2 START UP


### 5.2.1 SAFETY REGULATIONS

Every time before starting up the following points should be observed as laid down in the operating instructions:


- That it is possible to observe the safety regulations in Chap. 2.
- The starting up procedure, has been carried out properly.

	<div style="text-align: center;"><b>! WARNING</b></div> <p><b>High-pressure spray jet!</b> Danger to life from injecting paint or solvent.</p> <ul style="list-style-type: none"> <li>→ Never reach into the spray jet.</li> <li>→ Never point the spray gun at people.</li> <li>→ Consult a doctor immediately in the event of skin injuries caused by paint or solvent. Inform the doctor about the paint or solvent used.</li> <li>→ Never seal defective high-pressure parts, instead relieve the pressure from them and replace.</li> </ul>
---	--

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	<div style="text-align: center;"><b>! WARNING</b></div> <p><b>Toxic and/or flammable vapor mixtures!</b> Risk of poisoning and burns.</p> <ul style="list-style-type: none"> <li>→ Operate the unit in a spraying booth approved for the working materials.</li> <li>-or-</li> <li>→ Operate the unit on an appropriate spraying wall with the ventilation (extraction) switched on.</li> <li>→ Observe national and local regulations for the outgoing air speed.</li> </ul>
---	---

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	<div style="text-align: center;"><b>! WARNING</b></div> <p><b>Gas mixtures can explode if there is an incompletely filled pump!</b> Danger to life from flying parts.</p> <ul style="list-style-type: none"> <li>→ Ensure that the piston pump and suction system are always completely filled with cleaning agent or working medium.</li> <li>→ Do not spray the unit empty after cleaning.</li> </ul>
---	---

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Before every start-up, the following points should be observed as laid down in the operating manual:

- Check the permissible pressures
- Check all connections for leaks
- Check hose for damage

It should be ensured that the unit is in the following state before carrying out any work on it:

- Interrupt compressed air supply.
- Depressurise the pump and the product delivery circuit.

**Emergency stop**

In case of unexpected events, it is necessary to immediately close the compressed air supply and discharge the pressure from the pump service circuit.

### **5.2.2 PRESSURE RELEASE PROCEDURE**

1. Interrupt the pump compressed air supply.
2. Open the usage and discharge the remaining pressure inside the pump and circuit.
3. To guarantee a complete depressurisation of the pneumatic motor, pull the ring on the safety valve (see Paragraph 4.4.1).

### **5.2.3 PUMP WASHING**

The Unica 4-270 pump is tested in the factory with oil.

In case eventual testing fluid residues may contaminate the working material, carry out a preliminary washing using a solvent compliant with the product. To perform the washing follow the instructions in the following paragraph, considering the solvent instead of the working material.

### **5.2.4 FILLING WITH WORKING FLUID**

In this description reference is made to the exemplifying diagram given in Paragraph 5.1.6.

1. Make sure the pump is correctly connected to a grounding terminal. Please see Paragraph 5.1.7 - "Grounding" for further information.
2. Check the tightness of all fittings and make sure they are tight enough.
3. Connect the pump suction duct to the tank with the working fluid (I). For example, if a drip-in pipe is used, dip it in the barrel of the product to be pumped.
4. Connect the pump delivery duct to the usage. If a washing is in progress, direct the product outlet pipe into the container collecting the solvent.
5. Close the pump air pressure controller (C), pressurise the compressed air supply line and open the air shut-off valve on the pump (D).
6. Slowly open the air pressure controller on the pump (C) until it starts to work. Have the pump work slowly until all the air left inside the suction and delivery circuits has been discharged. Continue until the pump has correctly primed.
7. Only if the pump is being washed with solvent, have it cycle until the clean solvent flows inside the delivery circuit. Then close the pump air pressure controller (C).

### **5.2.5 PUMP STOP**

For a short-term stop, perform the pressure release procedure (Paragraph 5.2.2).

For a permanent stop, such as for example an overnight standstill:

1. Clean the pump fluid section by washing it with a compliant solvent.
2. Leave the solvent inside the pump fluid section.
3. Perform the pressure release procedure (Paragraph 5.2.2).

For a stop preceding maintenance or disconnection of the pump, see the instructions given in Paragraph 5.3.



### 5.3 FINISHING WORK AND CLEANING

**Note**

The device should be cleaned for maintenance purposes, etc. Ensure that no remaining material dries and sticks.



**Procedure:**

1. Follow the procedure foreseen to stop the pump -> chapter 5.2.5
2. Follow the procedure foreseen for washing -> chapter 5.2.3.
3. Clean and check the suction system and, in particular, the suction filter.
4. When using a high-pressure filter: Clean and check the filter insert
5. Clean the outside of the system.

	 <b>WARNING</b>
	<p><b>Brittle filter pressure regulator!</b>          The container on the filter pressure regulator becomes brittle through contact with solvents and can burst. Flying parts can cause injury.</p> <p>→ Do not clean the container on the pressure regulator with solvent.</p>

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6. Fill the system with detergent following the instructions given in paragraph 5.2.4 "Filling with working fluid".

	 <b>WARNING</b>
	<p><b>Gas mixtures can explode if there is an incompletely filled pump!</b>          Danger to life from flying parts.</p> <p>→ Ensure that the piston pump and suction system are always completely filled with cleaning agent or working medium.</p> <p>→ Do not spray the unit empty after cleaning.</p>

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### 5.4 STORING FOR LONGER PERIODS OF TIME

When storing the device for longer periods of time it is necessary to thoroughly clean it and protect it from corrosion. Replace the water or the solvent in the pump delivery circuit with a suitable preservative oil.

**Procedure:**

1. Carry out Paragraph 5.3 „Shutting down and cleaning“, points 1 through 6.
2. Fill the system with conservative liquid following the instructions given in paragraph 5.2.4.
3. Protect the air motor with pneumatic oil: connect an oiler to the compressed air inlet and run for a few double strokes.

## 6 FAULT LOCATION, MAINTENANCE AND REPAIR

### 6.1 TROUBLE SHOOTING AND SOLUTION

Problem	Cause	Solution
<b>The pump does not work</b>	• Air motor does not work or stops	• Open and close ball valve on the pressure regulator unit or disconnect compressed air supply shortly
	• No pressure indication (pressure regulator defect)	• Disconnect the compressed air supply for a short time or repair or replace the pressure controller.
	• In painting applications, obstruction of the spraying nozzle	• Clean nozzle as laid down in the instructions
	• Insufficient supply of compressed air	• Overhaul the pneumatic delivery plant
	• In painting applications, obstruction of the cartridge filter inside spray gun or of the high-pressure filter	• Clean the parts and use a suitable working material
	• Obstruction of the pump fluid section or of the high-pressure pipes (for example, hardened products inside the delivery pipes)	• Dismantle the pump and clean, replace high-pressure hose
	• Lack/excess of grease inside the reversing valve spool (the pneumatic motor stops at end stroke)	• Grease/remove grease in excess. Check the reversing valve body.
<b>In painting applications, unsatisfactory spraying quality</b>	• Please see instructions for use of the spraying device (for example, a spraygun)	

#### IMPORTANT:

In all cases where pump parts or pressurized pipes need to be disassembled, follow the pressure release procedure as described in Paragraph 5.2.2 before performing maintenance.

**Trouble shooting and solution**



<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
<b>Irregular working cycle of the pump; in painting applications the material jet gives away (pulsation)</b>	• Excessive material viscosity	• Dilute working material
	• Spraying pressure too low	• Increase air inlet pressure, without ever exceeding the max. value on plate. Use smaller nozzle.
	• Product valves lock	• Clean pump fluid section, if necessary let the detergent act inside it for some time.
	• Foreign body in suction valves	• Remove the obstructed suction valves, clean and check the valve seats.
	• Insufficient diameter of compressed air supply pipe	• Mount a pneumatic supply pipe with larger diameter -> technical data, paragraph 4.3.2
	• Worn valves, seals or diaphragms	• Replace the worn components
	• Obstructed control air filter or working air filter.	• Check filters and if necessary clean them
<b>The pump works regularly but does not suck the working fluid</b>	• The connections on the suction system leak and the pump sucks air	• Tighten the fittings and remove leaks
	• Obstructed suction filter	• Clean filter
	• Obstructed suction valves	• Clean the pump fluid section with detergent and if necessary let the detergent act for some time (in case, purge the device)
<b>Pump runs when the gun is closed</b>	Packings, valves worn	Replace parts
<b>Loss of power due to ice formation in the pneumatic motor</b>	Presence of large quantities of condensate in the compressed air supply circuit	Install a drier in the compressed air supply circuit or, if already existing, check its performance

**IMPORTANT:**

In all cases where pump parts or pressurized pipes need to be disassembled, follow the pressure release procedure as described in Paragraph 5.2.2 before performing maintenance.

If the problem is not listed above consult your WAGNER Service Center.

## 6.2 MAINTENANCE

	 <b>WARNING</b>
	<p><b>Incorrect maintenance/repair!</b> Danger to life and equipment damage.</p> <ul style="list-style-type: none"> <li>→ Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.</li> <li>→ Only repair and replace parts that are listed in the chapter "Spare parts catalog".</li> <li>→ Before all work on the unit and in the event of work interruptions:             <ul style="list-style-type: none"> <li>- Disconnect the control unit from the mains.</li> <li>- Relieve the pressure from the spray gun and unit.</li> <li>- Secure the spray gun against actuation.</li> </ul> </li> <li>→ Observe the operating and service instructions when carrying out all work.</li> </ul>

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### 6.2.1 LUBRICATION

No lubrication is required for the pneumatic motor. An excessive lubrication may cause system failure.

Regularly check the condition of compressed air filters mounted on the pneumatic motor pilot system (parts nr. 25 in the diagram in Paragraph 8.3). Replace them if necessary.

### 6.2.2 WASHING AND STORING

Before stopping the pump for a period of time in which the fluid may harden inside the circuit and damage the system, carry out a washing with compliant solvent. Please see Paragraph 5.3 "Disconnection and cleaning" for the relevant procedure.

### 6.2.3 REGULAR CHECK OF SEALING AND TIGHTNESS

Before each usage of the pump:

1. Make sure that all fluid conveying pipes have no wear signs or damages. Replace them if necessary.
2. Check sealing and tightness of all threaded fittings. Make sure there are no leaks.

Check screws tightness at least once every two months. Please see this manual for information about the correct tightening torques.

### 6.2.4 PLAN OF PREVENTIVE MAINTENANCE

Work out a plan of preventive maintenance including the above checks, basing on the usage history of the pump. The wear of components depends on the using conditions. It is important to replace the parts subject to wear (e.g. valve seats or membranes) in due time, in order not to have the system damaged, which can be avoided by means of a plan of preventive maintenance.



### 6.3 PUMP REPAIR

Before carrying out any maintenance measure:

1. Possibly wash the pump fluid section(see Paragraph 5.2.3)
2. Release the pressure inside the pump following the procedure described in Paragraph 5.2.2.
3. Disconnect the pump from the compressed air supply line and disconnect the fluid section from the external suction and service circuits.
4. Remove the pump from the installation site and take it to a suitable place for the maintenance work.

#### How to carry out a repair

Ordinary and extraordinary maintenance is to be carried out according to the schemes and procedures given in this manual for Use and Maintenance,

In all cases:

1. Apply to a Wagner authorised engineer.
2. Use only Wagner original spare parts.
3. Before assembling parts, make sure they are clean and, if necessary, lubricated.
4. Avoid damaging gasket sealing surfaces during maintenance.
5. Whenever the pump is assembled, replace all o-rings in the fluid section which have already been subject to previous tightening.
6. Avoid using silicone-based or silicone-containing lubricants.

#### 6.3.1 MAINTENANCE OF THE HYDRAULIC CIRCUIT

The Unica 4-270 pump includes a fluid-mechanical conservation system granting the best possible performance of the diaphragms under normal working conditions.

The hydraulic circuit is normally full of working fluid filled in the factory. The safety card of the working fluid can be supplied on request

Before carrying out any maintenance involving the hydraulic circuit, the working fluid is to be extracted as described in Paragraph 6.3.1.1.

The quantity of working fluid necessary to fill the circuit is about 1 l. It is advisable to use only Wagner spare fluid:

#### Order number

Hydraulic fluid Unica 4-270 pump (1-litre bottle)

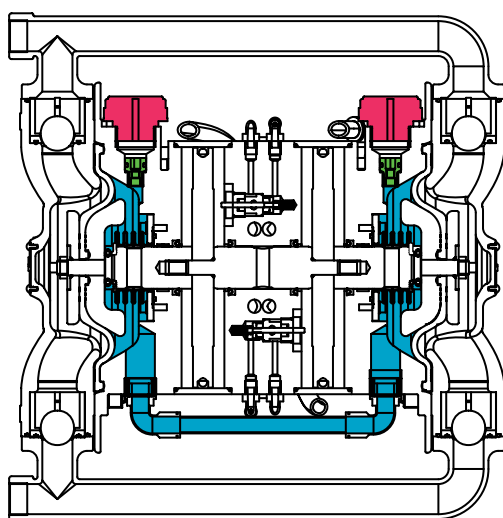
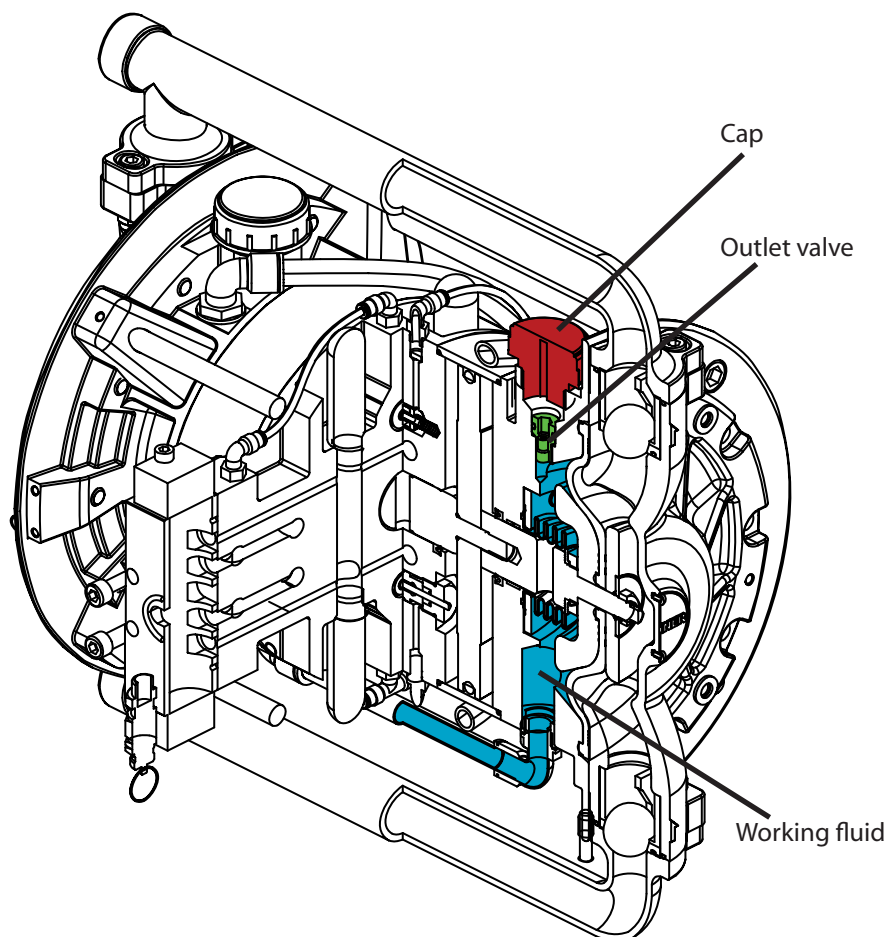
Z126.00

The fluid-mechanical system inside the hydraulic circuit needs no maintenance and the circuit doesn't usually need disassembling. The need to disassemble it may arise in case it is necessary to add parts inside the pump which are subject to maintenance.

If lacking Wagner spare fluid after carrying out the maintenance, it is possible to temporarily fill the hydraulic circuit with water; however, it is advisable to replace it with Wagner working fluid soonest possible. For further information please apply to a Wagner authorised engineer.

An explanatory picture is given below.

The assembling diagram of the hydraulic circuit is given in Paragraph 8.4.



**6.3.1.1 OPERATIONS ON THE HYDRAULIC CIRCUIT DURING MAINTENANCE**

- If the pump is subject to maintenance regarding the fluid section not implying disassembling the diaphragm covers (parts °16 given in the diagram in Paragraph 8.5), the hydraulic circuit system does not undergo any particular changes and the following operations are not necessary.
- If the maintenance in the fluid section concerns components whose access to or disassembly of require disassembling the pump covers (diagram Paragraph 8.5), then the following operations to empty and fill up the hydraulic circuit with working fluid are necessary.
- If the maintenance concerns the pneumatic motor or the hydraulic circuit itself, the following operations are necessary.

**WARNING:** the best possible performance of the vacuum system inside the hydraulic circuit is important to guarantee the longest possible life of the membranes. The following operations are hence to be carried out only by Wagner authorised engineers.

**6.3.1.2 HYDRAULIC CIRCUIT EMPTYING**

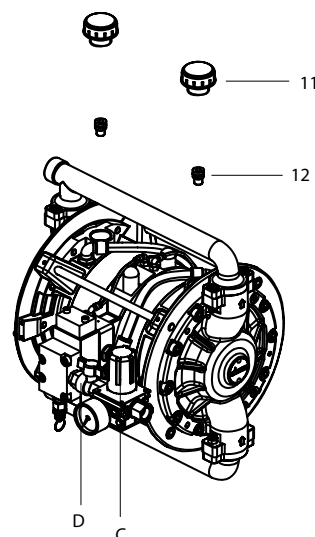
Referring to the assembling diagram in Paragraph 8.4:

1. Get a container to collect the hydraulic fluid and place it under the pump.
2. Disconnect pipe nr. 17 from quick coupling nr. 10 and extract the hydraulic fluid collecting it in the dedicated container. Dispose of the fluid in compliance with the local law regulation.

**6.3.1.3 HYDRAULIC CIRCUIT FILLING**

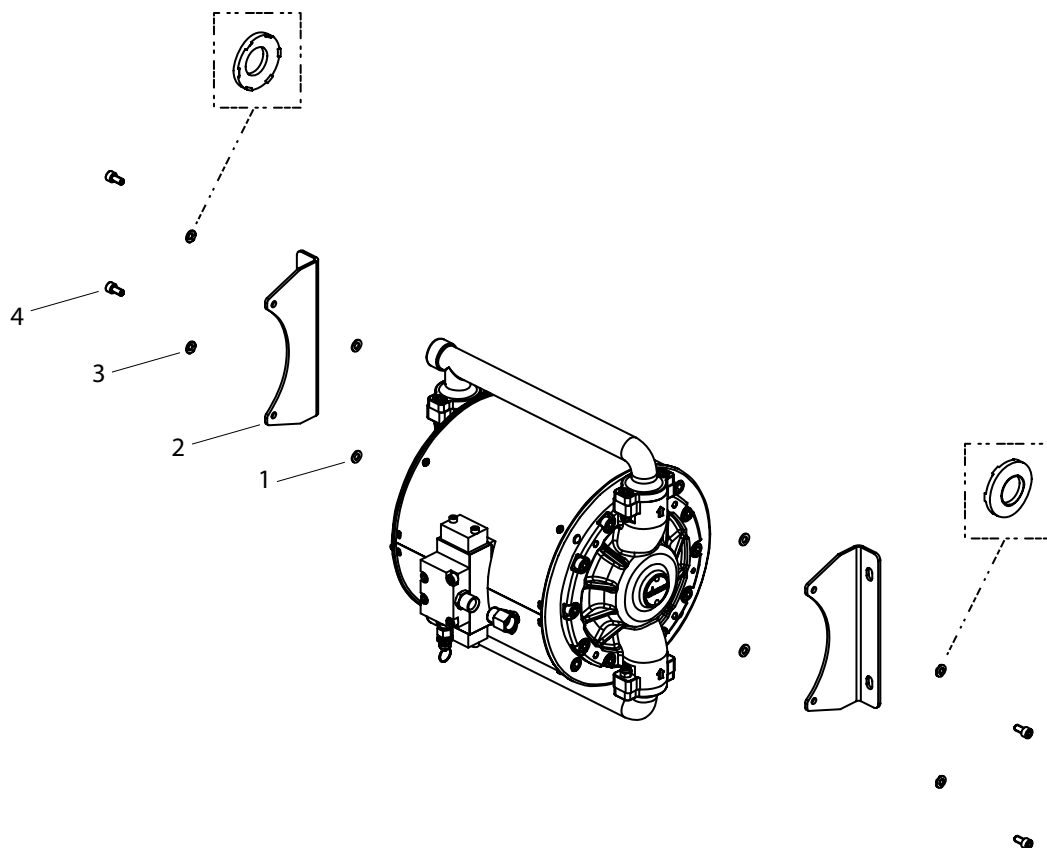
After maintenance, remount the various pump sections except the outer protections (parts 3 and 4 in the diagram in Paragraph 8.2), connect the pump to the compressed air supply line, see diagram given in Paragraph 8.4 and proceed as follows:

1. Unscrew caps nr. 11 and valve bodies nr. 12.
2. Fill the pump hydraulic circuit with working fluid.
3. Completely close the pump air pressure reducer and open the motor air shut-off valve (parts C and D, diagram in Paragraph 5.1.6).
4. Paying great attention to squirts, slowly open the air pressure reducer and run one/two cycles of the pneumatic motor. Then close the pressure controller. This operation allows emptying the residual air in the hollows of the hydraulic circuit.
5. Refill the hydraulic circuit with working fluid.
6. Remount valves nr. 12.
7. Run the pump for about one minute, collecting the excess hydraulic fluid discharged by valves nr. 12 in the previously used container.
8. Remount caps nr. 11 and the rest of the pump.



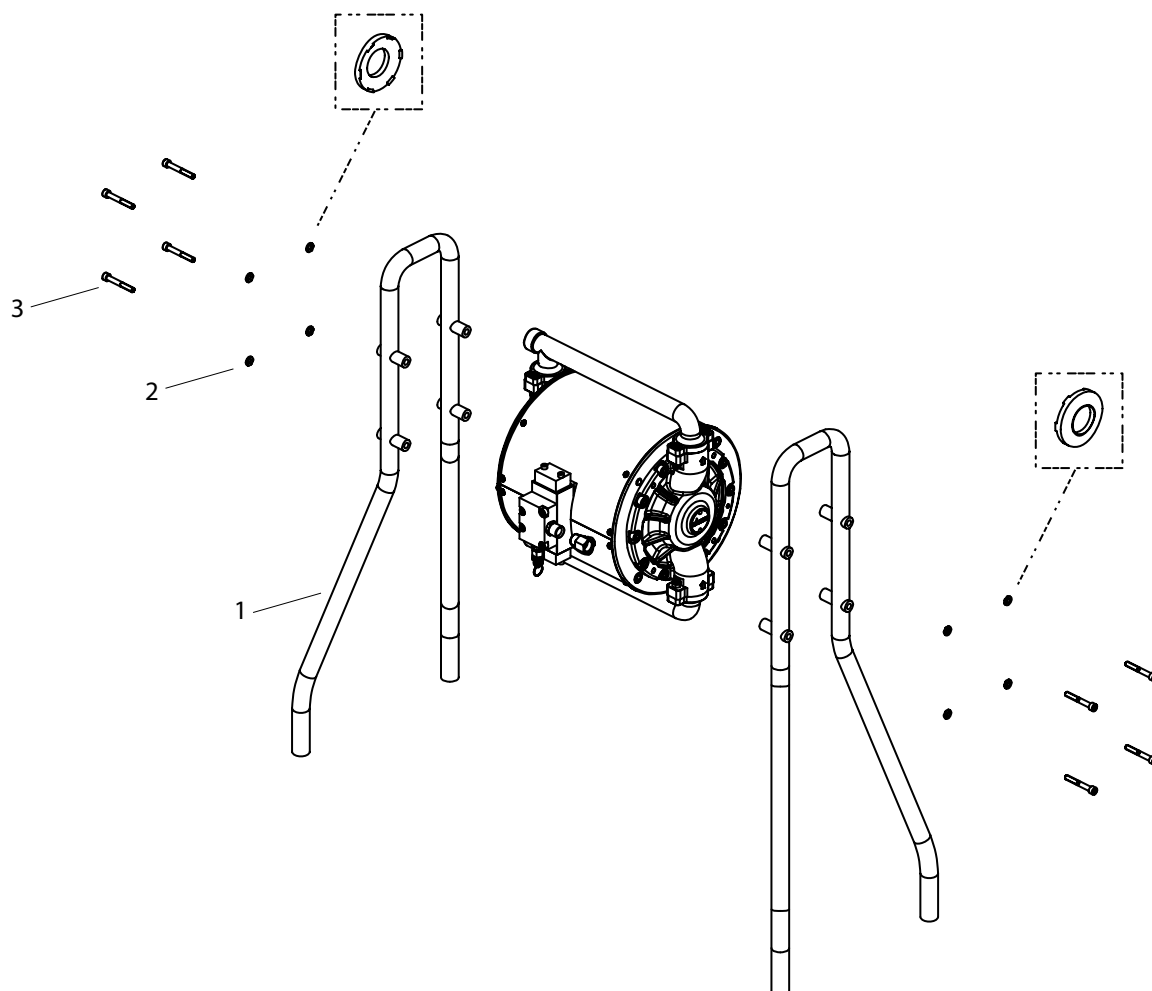
## 7 ACCESSORIES

### 7.1 WALL MOUNTING KIT



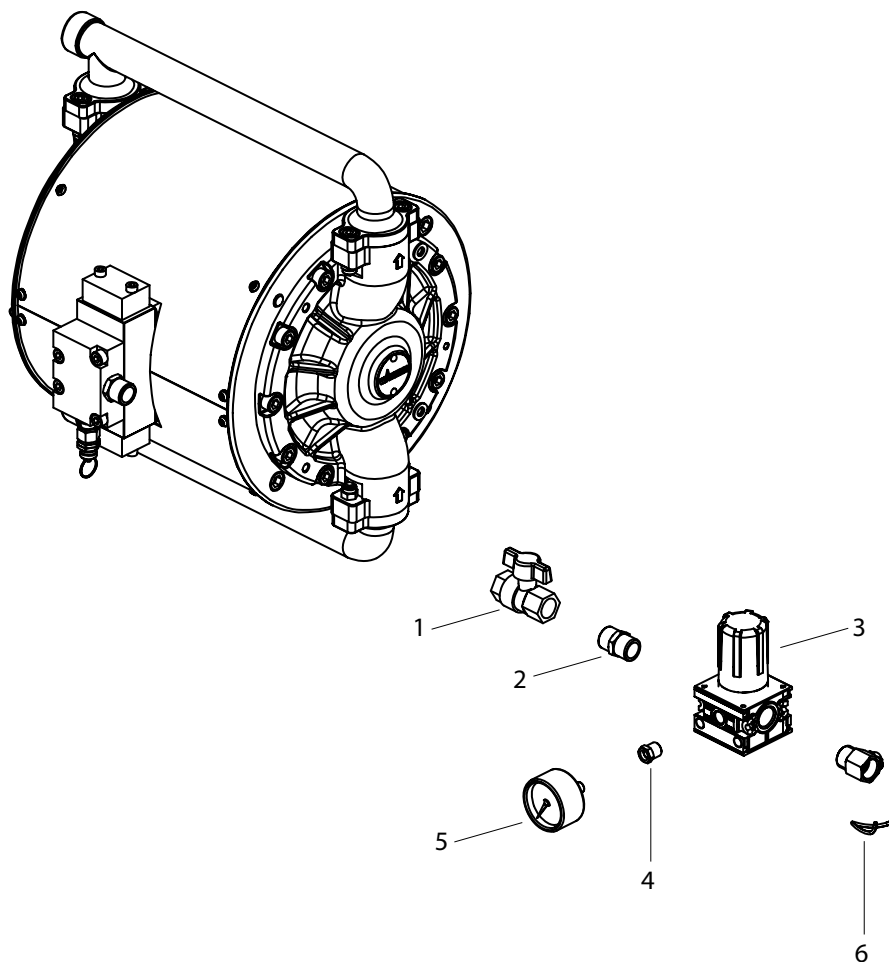
Pos.	K	Qty.	Description	No.
			Wall mounting kit	T6151.00
1		4	Washer	K509.62
2		2	Wall bracket	E3239.62
3		4	Contact washer	K572.62
4		4	M8x20 screw	K120.62

◆ = Wearing part

**7.2 STAND KIT**

Pos.	K	Qty.	Description	No.
			Stand kit	T6148.00
1		2	Stand frame	E3238.92
2		8	Contact washer	K572.62
3		8	M8x70 screw	K193.62

◆ = Wearing part

**7.3 COMPRESSED AIR SUPPLY KIT**

Pos.	K	Qty.	Description	No.
			Compressed air supply kit	T6152.00
1		1	Air cut-off valve	M104.00
2		1	Nipple	M206.04
3		1	Pressure regulator	9999312
4		1	Reduction unit	M203.04
5		1	Pressure gauge	P903.00
6		1	Hose nylon d4 L=370 mm	S462.00A

◆ = Wearing parts

## 8 SPARE PARTS

### 8.1 HOW TO ORDER SPARE PARTS

Always supply the following information to ensure delivery of the right spare part:

#### Part Number, description and quantity

The quantity need not be the same as the number given in the „Quantity“ column. This number merely indicates how many of the respective parts are used in each subassembly.



The following information is also required to ensure smooth processing of your order:

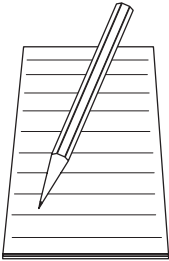
- Address for the invoice
- Address for delivery
- Name of the person to be contacted in the event of any queries
- Type of delivery required (air freight or mail, sea route or overland route, etc.)

#### Marks in spare parts lists

Note to column „K“ in the following spare parts lists.

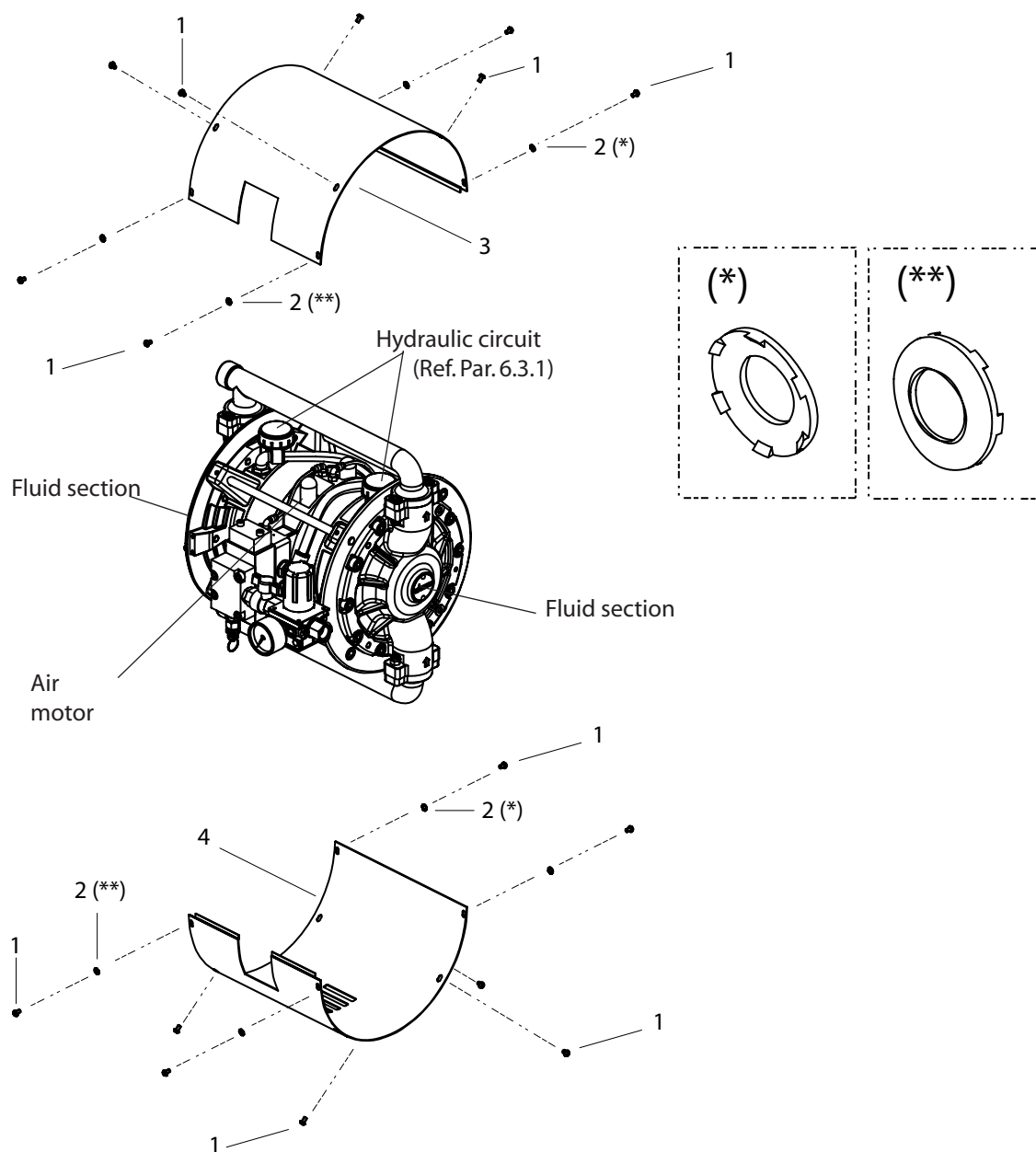
- ◆ = Wearing parts  
**Note:** No liability is assumed for wearing parts
- = Not part of standard equipment, available, however, as additional extra.

	<div style="text-align: center;">  <b>WARNING</b> </div> <p><b>Incorrect maintenance/repair!</b> Risk of injury and damage to the equipment.</p> <ul style="list-style-type: none"> <li>→ Repairs and part replacement may only be carried out by specially trained staff or a WAGNER service center.</li> <li>→ Before all work on the unit and in the event of work interruptions:             <ul style="list-style-type: none"> <li>- Switch off the energy/compressed air supply.</li> <li>- Relieve the pressure from the spray gun and unit.</li> <li>- Secure the spray gun against actuation.</li> </ul> </li> <li>→ Observe the operating and service instructions when carrying out all work.</li> </ul>
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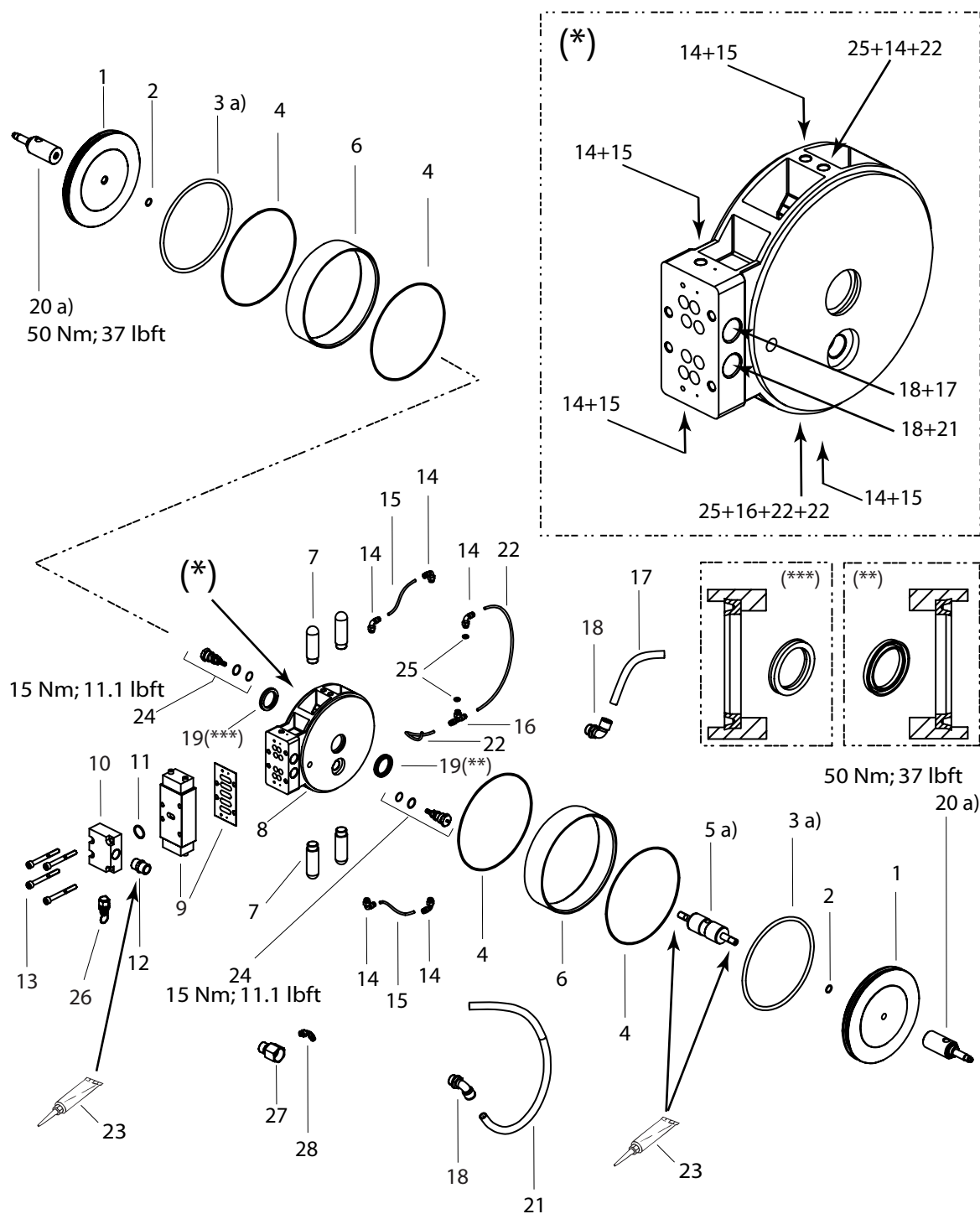
A series of horizontal lines for writing, starting from the top of the page and extending down to the bottom, providing a space for notes or additional information.



**8.2 OVERVIEW MODULES**

Pos.	K	Qty.	Description	No.
1		16	5x8 screw	K1072.03
2		8	Contact washer	K571.62
3		1	Pump upper protection	E3235.71
4		1	Pump lower protection	E3236.71

◆ = Wearing parts

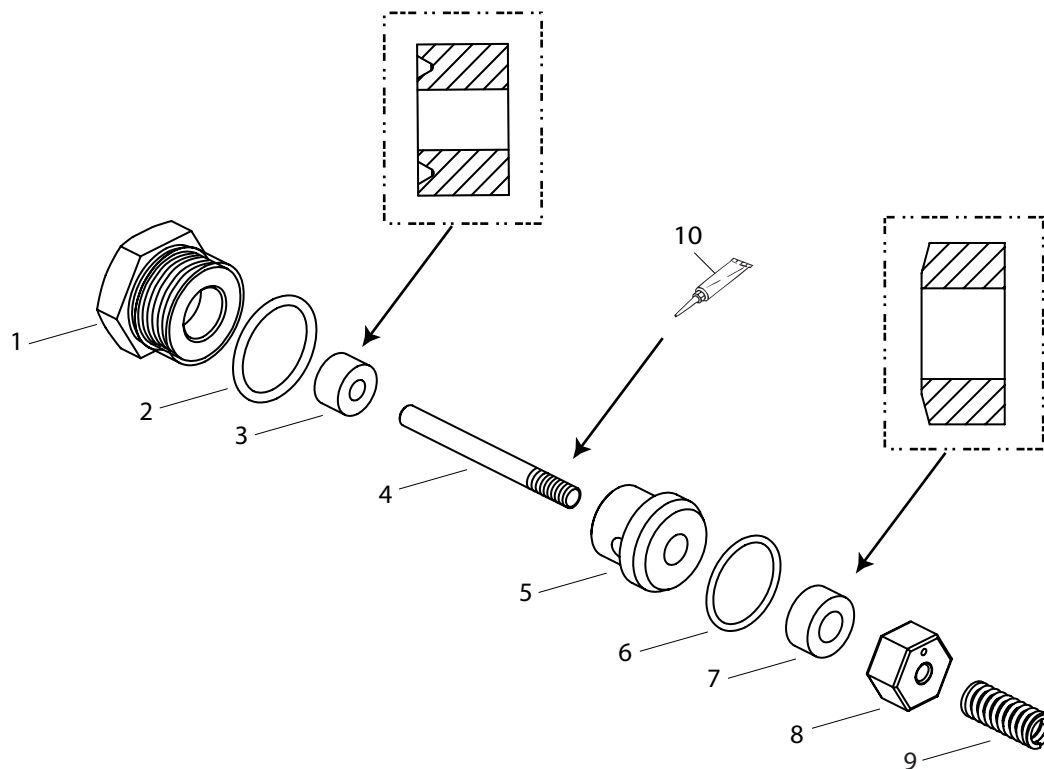
**8.3 AIR MOTOR**

a) Apply a small quantity of grease

Pos.	K	Qty.	Description	No.
1		2	Motor piston	B0329.01
2	◆ ★	2	NBR O-Ring seal	L115.06
3	◆ ★	2	NBR O-Ring seal	L224.06
4	◆ ★	4	NBR O-Ring seal	L145.06
5		1	Motor rod	D449.03
6		2	Motor cylinder	D635.12
7	◆	4	Muffler	H527.07
8		1	Motor body	F1012.01
9	◆	1	Reversing valve unit ISO 3	P497.00A
10		1	Air inlet block	B0330.71A
11	◆ ★	1	NBR O-Ring seal	L105.06
12		1	Conical nipple 1/2"	M206.04
13		4	M8x75 SS Socket screw	K106.62
14		5	Fast fitting L 1/8x4	M335.00
15		2	Hose nylon d4 L=130 mm	S462.00
16		1	Fast fitting T 1/8"x4	M348.00
17		1	Hose PU d14x10 L=210 mm	S463.00
18		2	Fast fitting L 1/2x14	M415.00
19	◆ ★	2	Lip seal	L481.06
20		2	Pump rod	D450.03
21		1	Hose PU d14x10 L=610 mm	S463.00A
22		1	Hose nylon d4 L=370 mm	S462.00A
23			Loctite 542 50ml; 50cc	Z201.00
24		1	Pneumatic feeler	T714.00
25	◆ ★	2	Filter	0367314
26		1	Safety valve	P484.00C2
27		1	Air fitting 1/2"	M428.00
28		1	Fitting M5x4	M303.00
			Pneumatic motor service set	T9089.00

◆ = Wearing parts

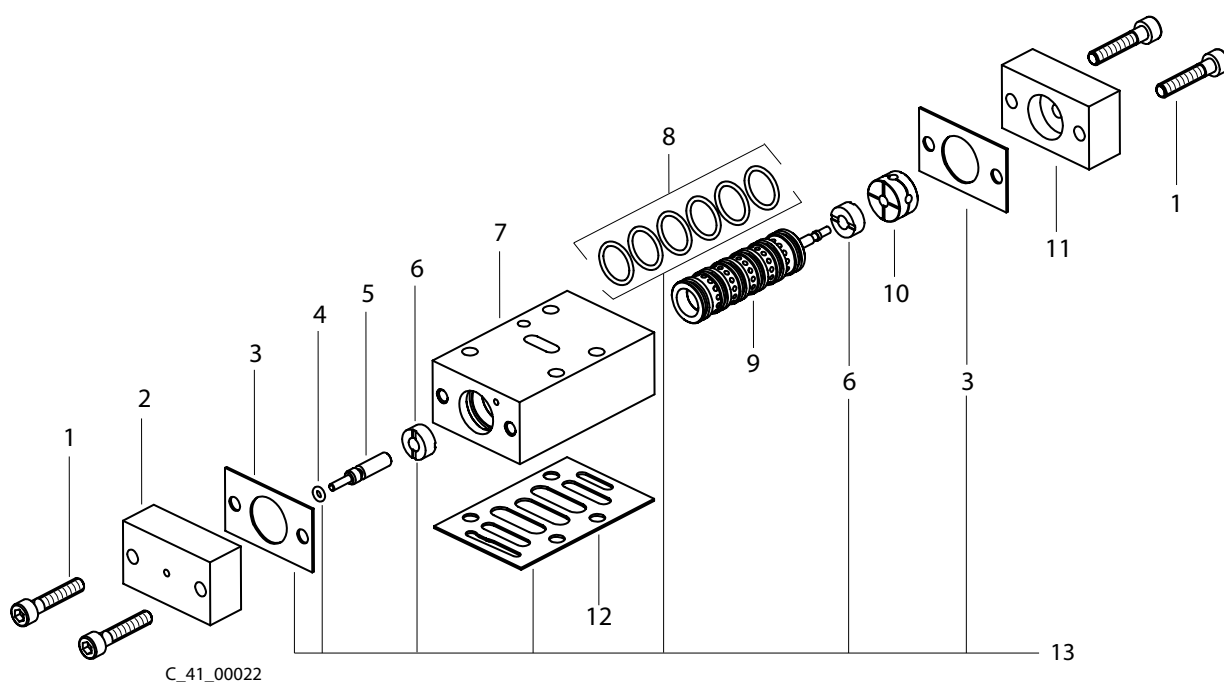
★ = Included in motor service set T9089.00

**8.3.1 PNEUMATIC FEELER**

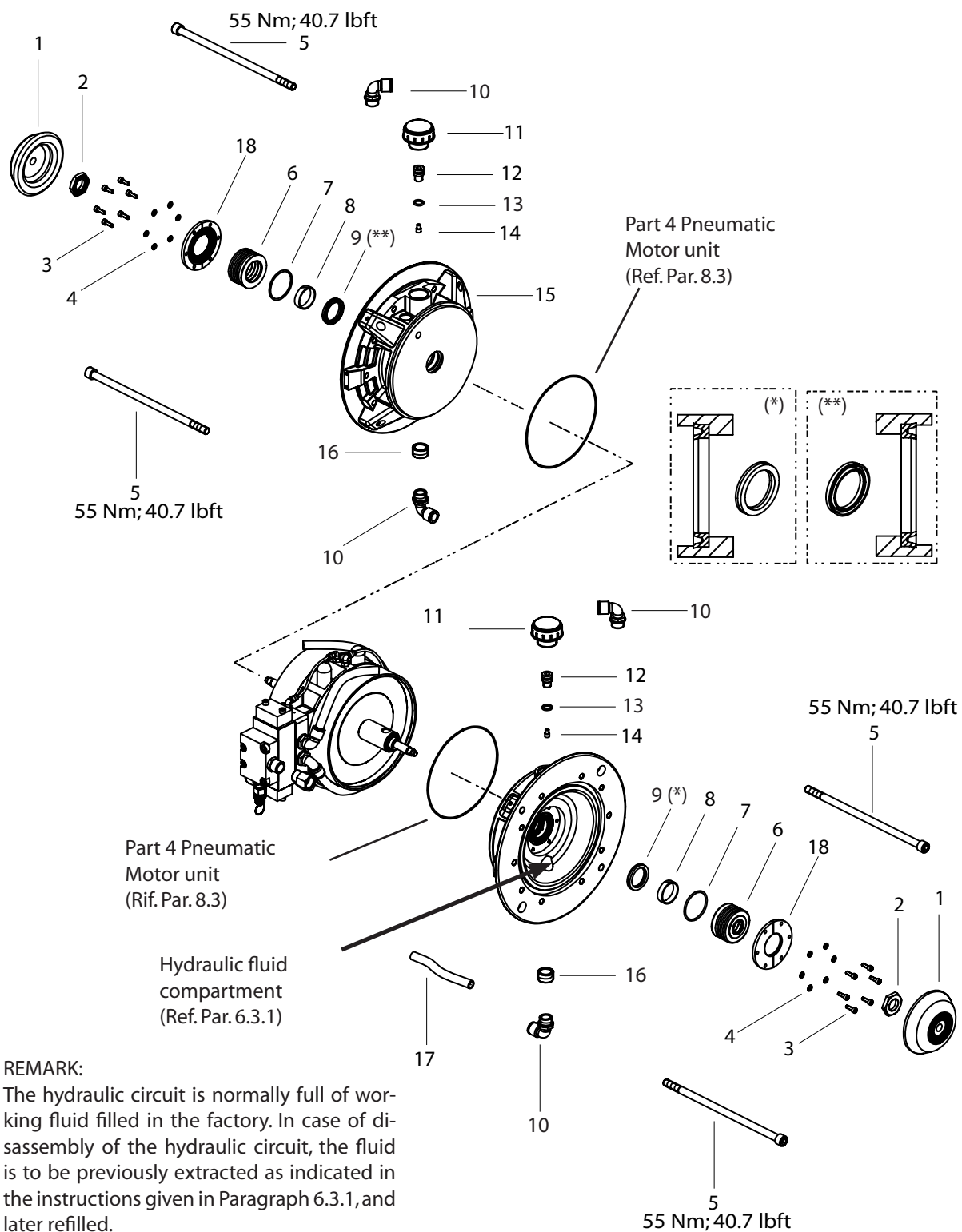
Spare parts list Feeler				No.
Pos.	K	Qty.	Description	
			Pneumatic feeler	T714.00
1		1	Feeler cap	B0331.04
2	◆★	1	NBR O-Ring seal	L118.06
3	◆★	1	Seal gasket	L420.06
4		1	Feeler rod	B0333.03
5		1	Feeler body	B0332.04
6	◆★	1	NBR O-Ring seal	L230.06
7	◆★	1	Seal gasket	G602.06
8		1	Feeler shutter	A144.04
9		1	Feeler spring	H202.03
10			Loctite 542 50ml; 50cc	Z201.00

◆ = Wearing parts

★ = Included in motor service set T9089.00

**8.3.2 REVERSING VALVE**

Spare parts list Reversing valve				
Pos	K	Qty.	Description	No.
			Reversing valve	P497.00A
1		4	Socket screw	K183.62
2		1	Rod cover	B0055.71A
3		2	Cover seal gasket	G7010.07B
4		1	O-Ring seal	L172.06
5		1	Rod	B0049.04B
6		2	Damper	P519.00A
7		1	Valve body	B0053.71A
8		6	O-Ring seal	L199.06
9		1	Spool assembly	P519.00B
10		1	Detent	P519.00E
11		1	Detent cap	B0054.71A
12		1	Valve seal gasket	G737.06BA
13		1	Pos. seal gasket set 3,4,6,8,12	T9076.00A

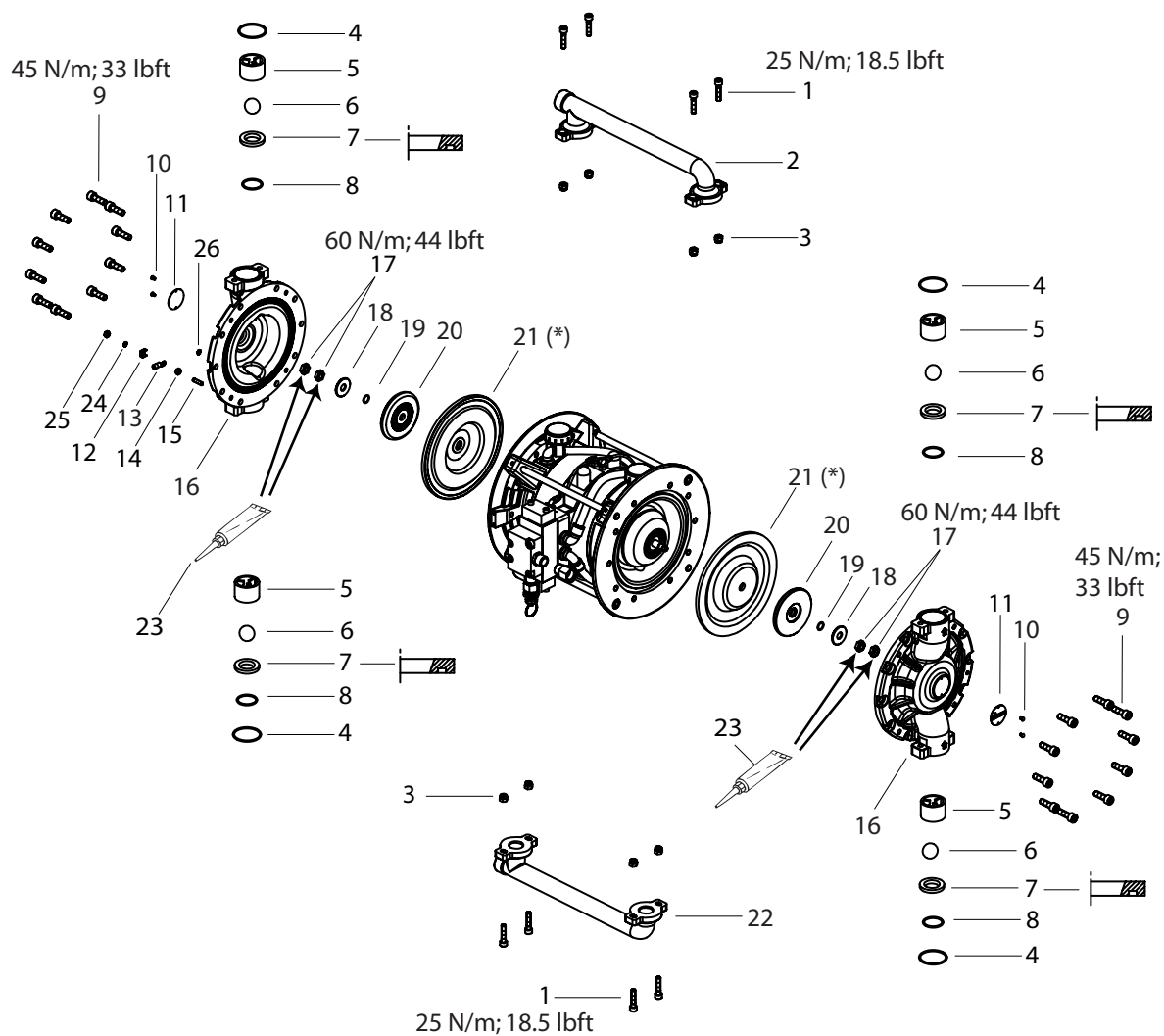
**8.4 HYDRAULIC CIRCUIT**

Pos.	K	Qty.	Description	No.
1		2	Inner diaphragm disc	B0337.01
2		2	Bellows ring	B0335.03
3		12	5x16 screw	K114.03
4		12	Washer 5	K515.03
5		4	12x270 screw	K1071.62
6	◆■	2	Bellows	G010.07
7	◆■	2	NBR O-Ring seal	L137.06A
8	◆■	2	Slip band	L823.08
9	◆■	2	Lip seal	L481.06
10		4	Fast fitting 1/2x14	M415.00
11		2	Bleed plug	M071.07
12		2	Check valve housing	B0336.03
13	◆■	2	NBR O-Ring seal	L225.06
14	◆	2	Check valve	T132.00
15		2	Inner flange	F1013.71
16		2	Reduction unit 3/4x1/2	M427.00
17		1	Hose PU d14x10 L=210 mm	S463.00
18		2	Bellows flange (2 parts)	B0334.03
	■	1	Hydraulic fluid (1L bottle)	Z126.00

◆ = Wearing parts

■ = Included in the cpl. hydraulic circuit service-set T9093.00

## 8.5 FLUID SECTION



(\*) The diaphragms are the outer walls of the hydraulic circuit, which is normally filled with working fluid. Before removing them, extract the fluid as described in Paragraph 6.3.1.



Pos.	K	Qty.	Description	No.
1		8	M8x35 socket screw	K138.62
2		1	Delivery manifold	F1015.03M
3		8	M8 self-locking nut	K312.62
4	◆ ▼ ▲ ●	4	PTFE O-Ring seal	L228.05
5	◆ ▲	4	Ball rest	0368507
6	◆ ▲	4	1 1/8" ball	K814.03
7	◆ ▲	4	Ball seat	B0339.03
8	◆ ▼ ▲ ●	4	PTFE O-Ring seal	L227.05
9		20	10x30 socket screw	K105.62
10		4	Self-threading rivet	K1041.62A
11		2	Plate	Z5026.00
12		1	Anti-rotation bracket	E0042.62
13		1	Eyelet terminal	Y622.00B
14		1	Square nut 6	K343.62A
15		1	Grub screw 6x25	K040.02D
16		2	Outer cover	F1014.03
17		4	M12x1,25 nut	B0346.03
18		2	12x36 washer	K536.03
19	◆ ▼ ▲ ●	2	PTFE O-Ring seal	L229.05
20		2	Outer diaphragm disc	B0338.03
21	◆ ●	2	Diaphragm	G930.07
22		1	Suction manifold	F1015.03A
23			Loctite 542 50ml; 50cc	Z201.00
24		1	Washer	K562.02
25		1	Nut 6	K316.62
26		1	Stick label	Z510.00

◆ =Wearing parts

● = Included in cpl. diaphragms service-set T9092.00

▲ = Included in cpl. valve service-set T9090.00

▼ = Included in product o-ring set T9091.00

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