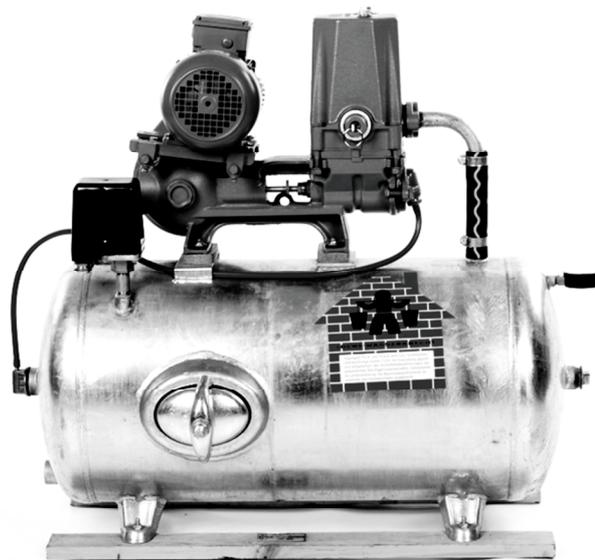


Pistonpump WL, WN / Kolbenpumpe WL, WN

Installation and operating instructions / Montage- und Betriebsanleitung



WL, WN Kolbenpumpen und Kolbenpumpen-Aggregate

Installation and operating instructions

4

GB

Montage- und Betriebsanleitung

27

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CONTENTS

1. Symbols used in this document	4
2. Delivery and handling	4
2.1 Delivery	4
2.2 Handling	4
2.3 Weights	4
3. Application	4
3.1 Pumped liquids	5
4. Technical data	6
4.1 Sound pressure level	6
5. Installation	6
5.1 Installation of motor and belt guard	6
5.2 Place of installation	7
5.3 Installation	7
5.4 Pipework	7
5.5 Air control	8
6. Electrical connection	9
7. Start-up	9
7.1 Filling the motor with oil	9
7.2 Pump priming	9
8. Maintenance	9
8.1 Lubrication	9
8.2 Stuffing box	10
8.3 Replenishing of air in air chamber and pressure tank	10
8.4 Frost protection	10
8.5 V-belts	10
8.6 Automatic pressure relief unit, K	10
9. Fault finding chart	12
10. Repair	13
10.1 Replacement of valves	13
10.2 Replacement of piston, cylinder and stuffing box	13
10.3 Replacement of snifter valve rubber lip	13
10.4 Air controller	13
10.5 Replacement of automatic pressure relief unit	13
10.6 Replacement of V-belts	13
11. Accessories	13
12. Warranty	13
13. Disposal	13
14. Spare parts	14
14.1 WL 1002-2402	14
14.2 WL 2502-3002	16
14.3 WL 4000-5000	18
14.4 FILIA, FILIUS	20
14.5 WN 201-301	21
14.6 WN 500	23
15. Sectional drawings	24
15.1 WL 1002-2402	24
15.2 WL 2502-3002	24
15.3 WL 4000-5000	25
15.4 FILIA, FILIUS	25
15.5 WN 201-301	26
15.6 WN 500	26

1. Symbols used in this document



Warning

If these safety instructions are not observed, it may result in personal injury!



If these safety instructions are not observed, it may result in malfunction or damage to the equipment!



Notes or instructions that make the job easier and ensure safe operation.

2. Delivery and handling

2.1 Delivery

All pumps:

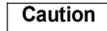
These Installation and Operating Instructions together with motor pulley, belt guard and the necessary mounting materials.

All units:

These Installation and Operating Instructions, the necessary manufacturer's certificates and a pressure gauge.

2.2 Handling

The pumps are delivered from the factory in a carton with a wooden bottom, which is specially designed for transport by fork-lift truck or a similar vehicle.



During handling, the pump should be oriented as when installed. Pumps which are packed in a carton may be lifted by the punched-out handles.

2.3 Weights

Mounting dimension	Weight of pump without motor, packaged, in kg
WL 1002	23
WL 1502	23
WL 2002	25
WL 2402	25
WL 2502	39
WL 3002	39
WL 4000	62
WL 5000	63
WN 201	34
WN 301	39
WN 500	108
FILIA 1002	53
FILIA 1502	64
FILIUS 2002	76
FILIUS 2402	106
FILIUS 2502	120
FILIUS 3002	120

3. Application

The self-priming WL/WN piston pumps are designed for a wide range of applications, e.g.:

- water supply and booster systems for single- and multifamily houses
- in industry and agriculture
- garden sprinkling and irrigation of farmlands
- supply of drinking water and water for sanitary purposes on board ships
- dosing systems
- heating systems

The SWL range is suitable for pumping sea water.

The FILIA, FILIUS domestic waterworks, ready for connection, are distinguished by their long working life, quiet and almost maintenance-free operation. They are used for

- connection to wells
- water supply for single- and multi-family houses.

Warning

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

These instructions apply to the pump types WL, WN and the FILIA, FILIUS domestic waterworks fitted with motors.

The FILIA, FILIUS units have been granted type approval, and they comply with all the rules and regulations that apply to safe operation. The FILIA, FILIUS units are not available in sea water version (SWL).



TIM0393293807

Fig. 1 FILIA, FILIUS unit

Pos.	Description
	Pressure switch, threepole, for switching pressures (bar)
1	Vessel On-off 4 bar 1.5 - 3.0 6 bar 3.0 - 5.0
2	E-motor
3	Belt guard
4	piston pump, type WL
5	Automatic relief pressure unit serving as safety valve
6	Connecting line
7	Air controller with special relief valve, air controller hose and air controller valve
8	Pressure vessel, service pressure 4 bar, fully galvanized, type-tested
9	Inspection hole

3.1 Pumped liquids

WL/WN: Drinking water · SWL: Sea water.

4. Technical data

Maximum permissible total head:	60 m
Preset relief pressure - red cap:	4 bar
Preset relief pressure - blue cap:	6 bar
Maximum permissible operating pressure [PS]:	3.5 bar and 5.5 bar respectively
Min. - maximum permissible temperature of pumped liquid [TS]:	0 - 50 °C
Suction lift:	max. 7.5 m vacuumetric

Q (l/h)	Required motor output (kW)		Suction port	Discharge-port	Cylinder □ (mm)	Rated number of strokes (min ⁻¹)
	H _{ges} = 4 bar	H _{ges} = 6 bar				
WL 1002	1000	0.25	G 1	G 1	33	375
WL 1502	1500	0.33	G 1	G 1	40	375
WL 2002	2000	0.37	G1 1/4	G 1	45	375
WL 2402	2500	0.55	G1 1/4	G 1	50	375
WL 2502	2500	0.55	G1 1/4	G 1	55	280
WL 3002	3000	0.75	G1 1/4	G 1	55	340
WL 4000	4000	0.75	G1 1/2	G1 1/4	75	296
WL 5000	5000	1.1	G1 1/2	G1 1/2	75	296
WN 201	2000	0.55	G 1 1/2	G1	55	125
WN 301	3000	0.75	G 1 1/4	G1	65	125
WN 500	5000	1.1	G 1 1/2	G 1 1/2	82	125

For use in a 4 pole motor with a r.p.m. of 1450 per min. If using the motor with a frequency of 60 Hz a special motor driving pulley (available on request) must be used. The rated number of strokes given in the list must be adhered to.

Motor base and belt guard are designed for the following motor sizes in accordance with DIN 42 673 as well as for intermediate sizes:

Pump	Motor size	Required V-belts*
WL 1002 - 2402	71 - 80	2 x 10 x 6300
	90 - 100	2 x 10 x 670
WL 2502 - 3002	80 - 100	2 x 10 x 9800
WL 4000 - 5000	90	2 x 13 x 1075
WN 201 - 301	80 - 90	1 x 13 x 8500
WN 500	90	3 x 13 x 1120

* It is recommended to use V-belts, make Optibelt Super TX, notched and cogged, in accordance with DIN 2215.

4.1 Sound pressure level

The sound pressure level of all WL and WN piston pumps is lower than 70 dB (A).

5. Installation

Note

Before the pump is taken into operation, the complete machinery into which the pump is to be incorporated must be declared in accordance with all relevant regulations.

5.1 Installation of motor and belt guard



The belt guard supplied with the pump must always be fitted during operation. The pump must not be operated if the belt guard is defective.

Installation instructions for motor and belt guard:

The belt guard meets DIN 31 100.

1. If necessary, slacken the screws holding the belt guard wall so much that the guard can be turned, thus allowing the motor to be aligned.
2. Fit the motor pulley to the shaft end. Tighten the screw.
3. Place the motor on the base and pass the shaft end with pulley through the belt guard wall. Align the motor and the pulleys using a straight-edge. Secure the motor to the base by screws.

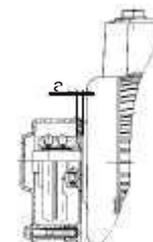
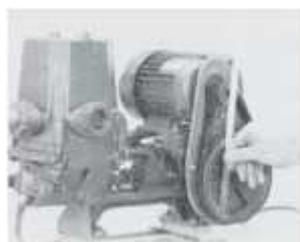


Fig. 2 Installation of motor and belt guard

Type	a
WL 1002 - 3002	6
WN 201 - 500	11

4. Fit the V-belt and tighten using the adjusting screw of the base.
5. Align the rear belt guard wall and tighten the screws.

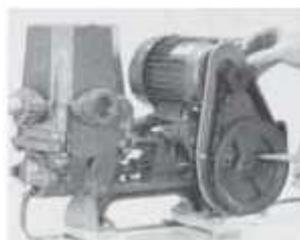


Fig. 3 WL 1002 - 2402 and WL 2502 - 3002

6. Fit the guard and secure by screws.

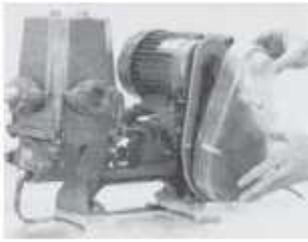


Fig. 4 Fitting of guard

7. Install the WL 4000 - 5000 belt guard in accordance with the instructions provided.

5.2 Place of installation

The pump should be installed in a well ventilated, dry and frost-free position. It must be easily accessible to ensure unimpeded maintenance work.

If the pump is installed in a well, an oil pan should be provided. In order to avoid condensation, the well should be well ventilated.

5.3 Installation

Pump system with vertical pressure tank

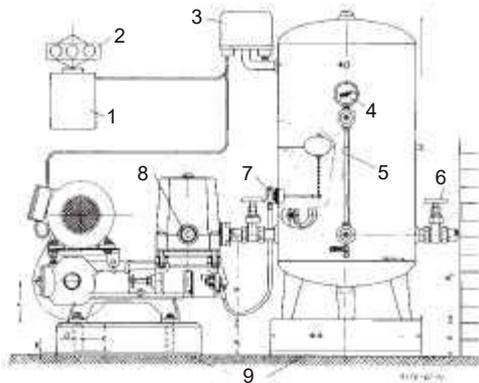


Fig. 5 Pump system with vertical pressure tank

Pos.	Description
1	Safety switch
2	Fuses
3	Pressure switch
4	Pressure gauge
5	Water level
6	Gate valve
7	Air controller
8	Automatic relief pressure
9	Isolation

An air controller must be installed to ensure automatic adjustment of the air cushion in the pump and pressure tank. All pressure tanks, with the exception of the FILIA, FILIUS units, should be equipped with a water level indicator.

Caution

Furthermore, a pressure gauge with marking line to indicate the maximum permissible operating pressure in the tank should be fitted. The required safety valve is built into the pump air chamber (automatic pressure relief unit K).

This or a similar plant is subject to the pressure tool regulations RL 97/23/EG. It may only be assembled and put into operation by authorised personnel. Before starting up the plant, local safety regulations must be observed.

FILIA, FILIUS units

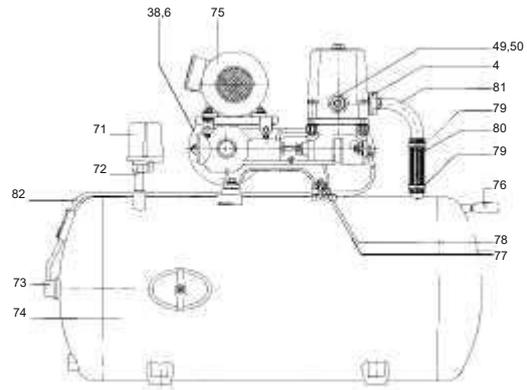


Fig. 6 FILIA, FILIUS unit

The aggregates are in accordance with the pressure tool regulations RL 97/23/EG. This is documented by the named authority of the German TÜV-Nord under the examination No. CE0045.

Parts under pressure that do not have the CE sign are in accordance with article 3, paragraph (3) of the DGRL (pressure tool regulations) and have been planned and constructed in accordance with good engineering practice. The respective declaration of conformity is included in each unit.

The air controller may replace a water level indicator.

To avoid corrosion damages on galvanized pressure tanks, it is necessary to follow DIN 1988, part 7, point 3, concerning the installation.

5.4 Pipework

5.4.1 Suction pipe

Reliable pump operation mainly depends on the correct and careful installation of the suction pipe.

In order to avoid air locks, the suction pipe should rise towards the pump. No elbows should be used, only pipe bends, if required. Fit a foot valve or non-return valve at the end of the non-leaking suction pipe.

The pipe diameter should be at least the same as the pump suction port. For suction pipes over 20 m long, an additional air chamber (10 l capacity for flow rates up to 3.000 l/h) should be fitted and the suction pipe should be the next bigger pipe dimension.

Suction lift and inlet pressure

Measured by means of a vacuum-meter, the suction lift at the pump air chamber should be between 2 and 7.5 m.

Note

If the vacuometric suction lift is lower than 2 m, the snifter valve no longer functions correctly and pump operation is no longer smooth.

If the suction lift exceeds 7.5 m, the head in the suction pipe may cause cavitation or drastically reduce the flow.

If there is an inlet pressure or an insufficient vacuum, a throttling disc should be fitted as described in the drawing below.

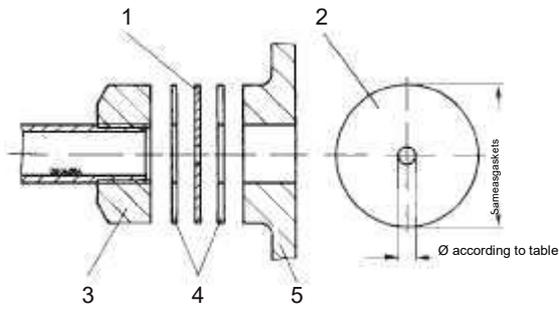


Fig. 7 Fitting of throttling disc

Pos.	Description
1	Throttling disc
2	Throttling disc, approx. 2 mm thick, made of copper or brass
3	Suction flange
4	Gaskets
6	Suction socket

Throttling disc bore diameter table

Flow rate l/h	At 0 - 2 m suction lift d □ in mm	At 0 - 3 m inlet pressure d □ in mm	At 3 - 10 m inlet pressure d □ in mm
1000	9	7.5	5
1500	10	9	6
2000	12	10	7
2500	13	12	8
3000	15	13	10
4000	17	14	12
5000	19	16	14

If the inlet pressure fluctuates by more than 0.5 bar, it is not sufficient to throttle by means of the throttling disc. In this case, an open intermediate tank should be installed.

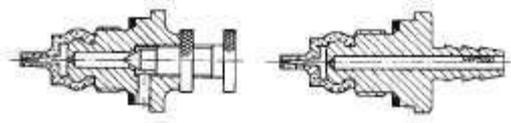
5.4.2 Discharge pipe

The discharge pipe should be as short as possible. No elbows should be used, only pipe bends, if required. It is not recommended to install a non-return valve as this will cause unnecessary resistance and hammering. The pump valves are designed as non-return valves, so that the water does not flow backwards - unless of course the rubber discs of the valve are defective. On systems with vertical pressure tank, it is recommended to fit an isolating valve in order to avoid having to drain the pressure tank when the pump or the suction or discharge pipes are to be repaired.

5.5 Air control

5.5.1 Snifter valve and air controller

The snifter valve ensures air supply to the pump air chamber and the pressure tank. There are two versions:



Standard valve for manual air supply

Special valve for automatic air supply

Fig. 8 Standard and special valve

We urgently recommend to operate pump systems with an air controller. This is the only method to ensure that the consumed air cushion of the pump air chamber and the pressure tank is replenished. In case of insufficient air supply to the pump air chamber, the automatic pressure relief unit (safety valve) will be activated.

Caution

Replenishing of air in pump systems with standard snifter valve

In order to replenish the air cushion, the lock nut of the snifter valve should be loosened and the adjusting screw slackened approximately two turns. The correct water and air cushion levels are illustrated in the figure below:

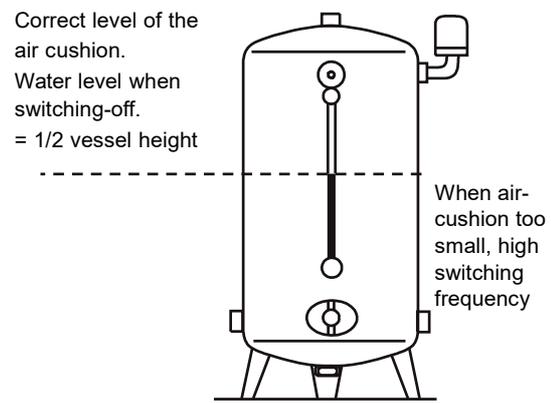


Fig. 9 Correct water and air cushion levels

Replenishing of air in pump systems with special snifter valve and air controller

The air controller automatically adjusts the air cushion of the pressure tank to the optimum level. Depending on the water level, the float is lifted by rising water level, thus opening a valve in the air controller, meaning that the pump draws in air via the suction inlet of the air controller and passes it on to the tank. If there is sufficient air in the pressure tank, the water level stops rising. The float is not lifted any further and the air suction inlet remains closed.

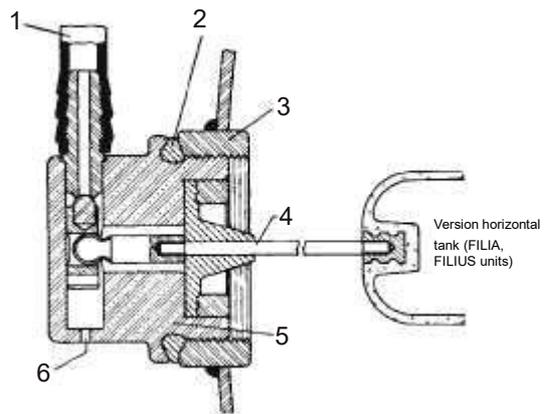


Fig. 10 Replenishing of air

Pos.	Description
1	Hose for special pump snifter valve
2	O-ring
3	Tank sleeve
4	Lever
5	air controller
6	Suction inlet

6. Electrical connection



Before removing the terminal box cover and before any removal/dismantling of the pump, make sure that the electricity supply has been switched off.

The electrical connections should be carried out by an authorized electrician in accordance with local regulations and the wiring diagram shown below. The required pressure switch should be connected to the 1/2" sleeve of the tank.

Maximum cut-out pressure for pumps with built-in automatic pressure relief unit:

3.5 bar for 4-bar pumps and tanks, 5.5 bar for 6-bar pumps and tanks.

Caution

The pressure switch should never be installed in the discharge pipe as the pressure switch will flutter due to the intermittent operation of the piston pump. In order to modify the cut-out pressure, follow the operating instructions of the pressure switch.

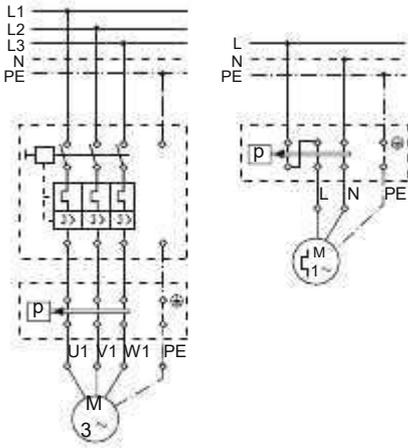


Fig. 11

Caution

The motor starter overload should be set to the rated current.



In case of power failure and open water taps, air may slip into the system. When starting up again, the air will escape under pressure.

7. Start-up



When pumping drinking water, the pump should be flushed through with clean water before start-up in order to remove any foreign matters such as preservatives, test liquid or grease.

In the first few days after start-up, it is normal that the rubber seals leak because the rubber seals must swell at first, e.g. the upper and lower seal on the valve plate.

7.1 Filling the motor with oil

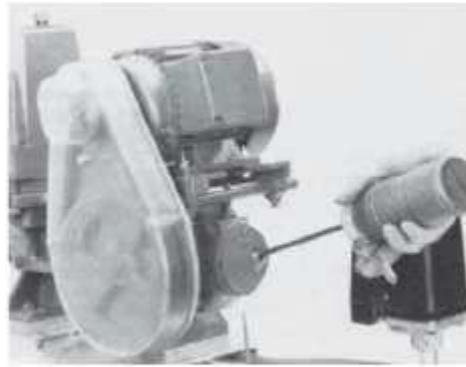


Fig. 12 Filling the motor with oil

Fill the motor with oil through the dipstick hole until the upper dipstick mark. Use branded oil having a viscosity of SAE 30.

WL 1002 - 2404: ca. 0.12 l WN 201: ca. 0.55 l

WL 2502 - 3003: ca. 0.45 l WN 301: ca. 0.55 l

WL 4000 - 5000: ca. 0.80 l WN 500: ca. 1.80 l

7.2 Pump priming

Fill water into the air chamber through the filling holes. During this process, the pump pulley should be turned several times by hand in order to fill the cylinder compartment with water. After filling, replace and tighten the lock screw, start the pump and check the direction of rotation (the pump should rotate counter-clockwise when looking at the pump pulley - indicated by an arrow on the housing).



Fig. 13 Pump priming

8. Maintenance



Before starting work on the pump, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.

The tank pressure should be released. This maintenance work must only be carried out by qualified persons!

8.1 Lubrication

The oil level should be checked every three months. Fill up, if required. Carry out the first oil change three month after start-up and after this every two years. If the system is operated continuously, change oil every six months. Drain off the old oil by unscrewing the oil drain plug.



When changing or draining off oil, make sure to collect the oil in a suitable container in order to protect the groundwater.

8.2 Stuffing box

The integrated stuffing box consists of a seal ring, a piston rod guide ring and high-pressure packing rings. The stuffing box should be allowed to drip slightly in order to protect the piston rod and the packing. If the box drips excessively, the stuffing box element should be carefully tightened. If this is not sufficient remedy, replace the stuffing box (see repair instructions).

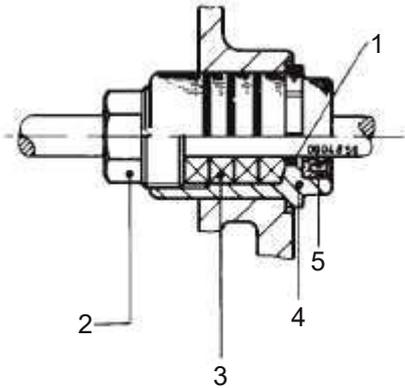


Fig. 14 Stuffing box

Pos.	Description
1	Guide ring
2	Stuffing box element
3	Packing rings
4	Stuffing box
5	Seal ring

8.3 Replenishing of air in air chamber and pressure tank

If an air controller is built into the pressure tank - standard on FILIA, FILIUS units - it is maintenance-free, as the air cushion will automatically be replenished. If no air controller is fitted, the air must be replenished by hand by opening the snifter valve. This means that the intervals and the duration of the air-replenishment process relates to the operating time of the pump.

8.4 Frost protection

Pumps which are not installed in a frost-free position should be fully drained if they are not being used during periods of frost. Drain the pump by unscrewing the drain plug in the rear cylinder compartment and by removing the cylinder over in the front compartment. Furthermore, loosen the filling plug of the suction chamber and start the pump for a short period.

Caution Before restarting, seal and prime the pump.

8.5 V-belts

Adjust the V-belts so that after tightening they will deflect approx. 1 cm. If the value is not achieved, the V-belts should be re-tightened. The V-belts and the pulleys must be kept free from lubricant and grease, otherwise the belts will slip and be destroyed.



Remember to fit the belt guard after tightening the V-belt.

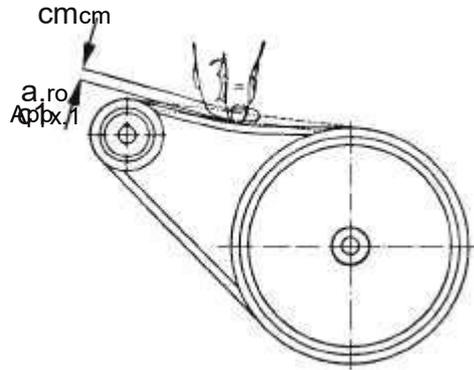


Fig. 15 V-belt

8.6 Automatic pressure relief unit, K

The automatic pressure relief unit K is incorporated in the pump air chamber to protect the pump and pressure tank against overpressure.

The parts have been examined and are in accordance with the regulations for pressure tools RL 97/23/EG. The result is documented by the examination No. CE0045 on the pressure stop cap of the named authority of the TÜV-Nord.

If the automatic pressure relief unit, K breaks down it must be completely exchanged. Single parts must not be exchanged. Piston pumps with an output of Q>3000 l. per hour are equipped with the pressure safety valve. As the casing is a constructional part of the middle plate of the air chamber if a break down occurs here then the complete air chamber including the pressure safety valve must be exchanged.

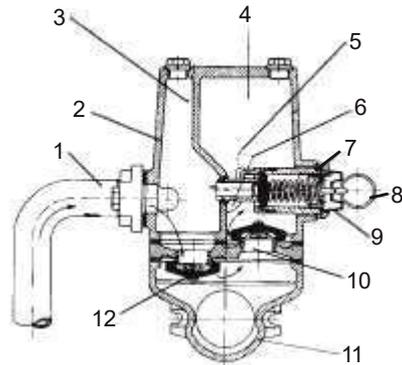


Fig. 16 Automatic pressure relief unit, K

Pos.	Description
1	Suction pipe
2	Discharge chamber
3	Suction chamber
4	Air chamber
5	Liquid circulation in case of overpressure after cut-out
6	Discharge pipe
7	automatic pressure relief unit K, type approved
8	Handle
9	Cap with type symbol
10	Pressure valve
11	Cylinder compartment
12	Suction valve

Pressure relief setting: 4.0 bar:
 Red cap, maximum cut-out pressure 3.5 bar.
 Pressure relief setting: 6.0 bar:
 Blue cap, maximum cut-out pressure 5.5 bar.

Check the automatic pressure relief unit every six months by lifting the valve cone by the handle while the pump is running.

Caution

The automatic pressure relief unit trips when the pressure in the pump air chamber is 4.0 and 6.0, respectively. Never judge on the basis of a pressure gauge reading of 4.0 bar in the pressure tank, as the resistance in the discharge pipe, the inertia of the pressure switch and peak loads are not accounted for in the reading.

The unit may trip prematurely if:

1. The air cushion in the pump air chamber is insufficient.
See section 9. for remedy.
2. The discharge pipe is long or resistance in it is high.
See section 9. for remedy.

Alterations to the pressure relief valve adjustments may only be carried out in the factory. The adjustment and examination must be carried out in accordance with the valid test specifications.

FILIA, FILIUS units



Before starting repair and maintenance work, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on. The pressure in the tank and pipes should be released.

Depending on the pressure, the units can start independently if they have not been switched off.

9. Fault finding chart



Before removing the terminal box cover and before any removal/dismantling of the pump, make sure that the electricity supply has been switched off.

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Fault	Cause	Remedy
1. The pump has not been primed or the pump gives no or too little water.	a) The pump has not been primed sufficiently.	Stop the pump and refill. If the suction pipe is long or the suction lift is high, it may be necessary to fill the pump several times. If, in spite of filling the pump several times, operation is not perfect, measure the suction lift using a mano-vacuummeter (see section 5.4.1).
	b) Valves stuck or leaky.	Remove the pump air chamber and clean the valves (including the bores of the pressure valve rubber discs). If any valve discs are defective, replace. Note: Take care that the valve plate and gaskets are in their proper positions when reassembling the pump.
	c) Suction lift too high.	Call in an installer.
	d) Leaky stuffing box. Piston and cylinder worn.	Re-tighten or replace the stuffing box. Replace any defective parts and check whether sand has caused wear. Improve conditions in the well. Replace the filter.
2. Noise in pump.	a) No air cushion in the pump air chamber.	<ul style="list-style-type: none"> • Check the pump air chamber for leaks. If the gasket of the plug (discharge chamber) is defective, replace the gasket. • Suction lift is insufficient or there is a positive suction head; the snifter valve does not work. Make sure to have 2 m vacuum on the suction side by throttling the isolating valve on the suction side or fitting a throttling disc, see section 5.4.1. • Replace the rubber lip, see section 10.3. • Check the air controller and repair, if necessary.
	b) Suction lift too high.	Call in an installer.
	c) Pressure relief cone out of true.	<ul style="list-style-type: none"> • Air cushion in air chamber is insufficient. Replenish the air cushion or reduce the cut-out pressure. • Resistance on the discharge side is too high. Call in an installer.
	d) Drive hammers.	<ul style="list-style-type: none"> • Have an installer replace defective drive parts or send the pump back to the factory for repair. • Worn parts due the insufficient lubrication. Wrong direction of rotation or oil saponified due to condensation. Have an installer replace defective parts. Check the direction of rotation and reverse, if required. Improve ventilation in pump room.
3. Oil leaking from pump pulley or bearing.		Check the oil level. A seal ring may be defective and have to be replaced.
4. Water leaking from air controller or snifter valve.	a) Rubber lip of snifter valve is defective.	Replace the rubber lip, see section 9.3
5. Faults in systems with pressure tank.	a) The pump starts at the slightest water consumption.	<ul style="list-style-type: none"> • When starting up for the first time, the air volume is not reached, as the required air volume is not readily available. In the course of time the air cushion is automatically replenished by the air controller. If no air controller is fitted, the snifter valve has to stay open for a prolonged period of time. • Use soap suds to locate possible leaks and remedy. • Rubber lip of snifter valve is stuck. Replace the rubber lip.
	b) Air escapes from tap due to excess of air in pressure tank.	Release air from the pressure tank and check whether the pump takes in air through a leaky gasket on the suction side of the pump air chamber. Water consumption may also be bigger than the pump output. Have an installer overhaul the system.

10. Repair



Before starting repair work, make sure that the electricity supply has been switched off and the system pressure has been released, if necessary. When starting up the system again, make sure to follow all the directions in sections 6. And 7.

10.1 Replacement of valves

Loosen the suction and discharge flanges, remove the pump air chamber, replace the valves or the complete valve plate.

When reassembling the pump, make sure that the valve plate and gaskets are in their proper positions.

Caution

Note the notches on the side and the "TOP" text. Fit new gaskets and clean the seal faces.

10.2 Replacement of piston, cylinder and stuffing box

WL 1002 - 2402

a. Dismantling:

Remove the cylinder cover and unscrew the piston from the piston rod using a socket wrench. If the stuffing box is to be replaced, the piston should normally be removed. Screw off the cylinder with a special tool. The stuffing box can now be loosened by means of a punch (brass or synthetic material) and pressed out from the pump drive side towards the cylinder cover.

b. Re-assembly:

Clean the pump housing and the sliding faces of the piston rod for the packing rings. Fit a new stuffing box with gasket and knock it into place using a pipe. Screw on the piston and refit the cylinder cover.

WL 2502 - 3002, WL 4000 - 5000, WN 201 - 500

a. Dismantling:

Remove the cylinder cover and unscrew the piston from the piston rod using a socket wrench. Screw off the cylinder and remove the stuffing box housing. Replace the supporting ring with seal ring, the piston rod guide ring and the stuffing box packings. Clean the piston rod.

b. Re-assembly:

Fit the stuffing box housing. Fit the stuffing box housing gasket and the cylinder and secure by screws. Screw on the piston and refit the cylinder cover.

10.3 Replacement of snifter valve rubber lip

Standard valve:

- Release the pressure.
- Unscrew the snifter valve and blow through bore.
- Fit replacement lip.
- Do not forget the gasket!

Special valve:

- Release the pressure.
- Disconnect the hose.
- Unscrew special snifter valve and blow through bore.
- Fit replacement lip.
- Blow through hose (in order to remove any water) and reconnect.

10.4 Air controller

Operational test:

1. Lack of air in tank: Holding a moist finger to the suction inlet, check whether the running pump draws in air. If it does not draw in air, this may be due to the following faults: Dirty suction inlet; defective float; air controller stuck in closed position; blocking of special snifter valve or rubber lip stuck.
2. Too much air in tank: Air controller piston stuck in open position. Remove the air controller and make the air chamber piston function.
3. Water leaking from air controller inlet: Replace the snifter valve rubber lip.

10.5 Replacement of automatic pressure relief unit

Unscrew the unit using a special tool. Install a new, factory-set valve. Note the cut-out pressure: red sleeve 4 bar, maximum cut-out pressure is 3.5 bar; blue sleeve 6 bar, maximum cut-out pressure is 5.5 bar.

The setting of the pressure relief unit must not be changed!

10.6 Replacement of V-belts

Remove the belt guard. Slacken the belt using the adjusting screw on the motor base. Install a new V-belt and tighten. Refit the belt guard.

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11. Accessories

Air controller

Air controllers V/1 and VI/1 consist of valve, lever, chain, corrosion-resistant float, hose and special snifter valve.

Air controllers V/2 and VI/2 consists of valve, lever and corrosion-resistant float.

Part no.	Air controller	Inlet/ outlet	For vertical pressure tank	
			for air supply	for air release
S5130443	V/1	G 1/2	Accord. to DIN 4810 old	-
96548888	VI/1	G 1 1/4	Accord. to DIN 4810 new	-
S5130460	V/2	G 1/2	-	Accord. to DIN 4810 old
96548889	VI/2	G 1 1/4	-	Accord. to DIN 4810 new

Tools for piston pumps

Pump type	Special key for pressure relief unit	Part no. key for cylinder removal	Key for supporting ring
WL 1002	96590288	S5550329	
WL 1502	96590288	S5550310	
WL 2002	96590288	S5550299	
WL 2402	96590288	S5550264	
WL 2502	96590288	S5548820	S9548782
WL 3002	96590288	S5548820	S9548782
WL 4000	-	S5548839	S9548782
WL 5000	-	S5548839	S9548782
WN 201	96590288	S5548820	S9548782
WN 301	96590288	S5548928	S9548782
WN 500	-	S5548855	S9548782

12. Warranty

These products are subject to the warranty clause of our general terms and conditions of delivery. We shall, however, not be liable for any damage resulting from faulty installation, electrical connection or application nor for any consequent damage.

13. Disposal

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact Steffens Pumpen-Fachhandel GmbH.

14. Spare parts

14.1 WL 1002-2402

Pos.	Description	Spare part number	No./pump
1	Piston T-DUO D33	96550364	1
	Piston T-DUO D33 SWL	96550365	1
	Piston T-DUO D40 SWL1502	96550367	1
	Piston T-DUO D45 WL2002	96550368	1
	Piston T-DUO D45 SWL2002	96550369	1
	Piston T-DUO D50	96550370	1
	Piston T-DUO D50 SWL2402	96588839	1
	Piston T-DUO D40 WL1502/1501	96550366	1
2	Cylinder WL1002+1001 D33	96590317	1
	Cylinder SWL1002+1001 D33	S5598631	1
	Cylinder SWL1502+1501 D40	96590322	1
	Cylinder WL2002+2001 D45	96590325	1
	Cylinder SWL2002+2001 D45	S5598674	1
	Cylinder WL2402+2501 D50	96590326	1
	Cylinder SWL2402+2501 D50	S5598690	1
3	Cylinder WL1502+1501 D40	96590321	1
	Air chamber WL1002/4 bar cpl.	S5571709	1
	Air chamber WL1002/6 bar cpl.	S5571717	1
	Air chamber SWL1002/4 bar cpl.	S5593370	1
	Air chamber SWL1002/6 bar cpl.	S5593389	1
	Air chamber SWL1502/4 bar cpl.	S5593397	1
	Air chamber SWL1502/6 bar cpl.	S5593400	1
	Air chamber WL2002/4 bar cpl.	96588799	1
	Air chamber WL2002/6 bar cpl.	96588810	1
	Air chamber SWL2002/4 bar cpl.	S5593419	1
	Air chamber SWL2002/6 bar cpl.	S5593427	1
	Air chamber WL2402/4 bar cpl.	S5552577	1
	Air chamber WL2402/6 bar cpl.	S5552585	1
	Air chamber SWL2402/4 bar cpl.	S5552950	1
Air chamber WL1002/1502 machined	S5530859	1	
4	Flange oval R1" (WL/WN)	S5540110	1
	Flange oval R1" SWL 1002-3002	S5540129	1
	Suction flange R1 1/4" WL2002/2402	S5504360	1
	Suction flange R1 1/4" SWL2002/2402	S5598992	1
5	Rubber gasket 50/30 x 3	S5519553	1
	Gasket 50/30 X 3	S5518441	1
	Rubber gasket 56/35 x 3	96549044	1
	Gasket 56/35 X 3	S5599018	1
6	V-belt pulley WL1002-2002 45 x 14 2 x 10	S5598569	1
	V-belt pulley WL1502-2402 45 x 19 2 x 10	S5598577	1
7	Motor base bolt 13 x 182 M8	96588843	1
	Motor base bolt 13 x 182	96588844	1
8	Connecting rod WL1002-2402 cpl.	96549014	1
9	Crosshead bolt 12 x 38	96550477	1
10	Crosshead D40 M8 WL1002-2402	96550363	1
11	Shaft seal 20/10 DU x 6	96550593	2
12	Seal washer D40 WL1002-2402	96588847	1
13	Drip disc 30/8 x 5	96550473	1
14	Piston rod WL1002-2402 D10 x 200	96588829	1
	Piston rod WL1002-2402 D10 x 200 NIRO	S5598617	1
15	Gasket 75/61 X 2	S5598615	1
	Spec. snifter valve G 3/8 A	96550694	1
16	Blow valve G3/8" A-G cpl.	96550692	1
	Air valve G3/8" A cpl.	96550690	1

Pos.	Description	Spare part number	No./pump
17	Cylinder cover SWL1002-2402	96590309	1
	Cylinder cover WL1002-2402	96590308	1
18	Lower gasket SWL1002-2402 NP-MULTI	96548934	1
	Lower gasket WL1002-2402	S5520128	1
19	Valve plate WL1000-2501 cpl.	96549009	1
20	Pressure valve cpl. WL1002-2402	96590211	2
21	Valve spring 28/1,5 x 43 1.4310	96550458	4
22	Spring cup SWL1002-5000 stainless steel	S5517143	4
23	Pressure valve cone SWL1002-2402	96590213	2
24	Suction valve cone SWL1002-2402	96588857	2
	Valve rubber SWL1002-2402 D47 x 7	96550474	4
25	Valve rubber "S" WL1002-2402	S5516430	2
	Valve rubber "D" WL1002-2402	S5516457	2
26	Valve plate with valve seats SWL1002-2402	S5500771	1
27	Gasket 22/16,5 x 1,5	S7518352	2
28	Suction valve cpl. WL1002-2402	96590210	2
29	Upper gasket WL1002-2402 WN201	S5520454	1
	Upper gasket SWL1002-2401 NP-MULTI	96548936	1
30	Guide ring for piston rod D10	96588838	1
31	HD-packing ring 22/10 x 6	S5524190	4
32	Stuffing box insert MS- M 24 x 1.5 stuffing	96550715	1
34	Rubber clip 3/8 Z	96550371	1
35	Valve rubber WL1002-2402	S5516430	1
36	Belt guard rear panel WL1002-2402	96548990	1
37	Gasket 14/10 x 1	S3518301	2
38	V-belt 10/6 x 652 LP WL1002-2402	S5524638	2
	V-belt 10/6 x 660 LP WL1002-2402	S5524637	2
39	Pump pulley WL1002-2402 165 x 16 2 x 10	96590307	1
40	Flange bearing WL1002-2402	S5598518	1
	Bearing flange WL1002-2402 cpl.	96549029	1
41	Gasket - Manila 58 / 48 X 0,2	S5598470	1
42	Crank shaft WL1002-2402 MACH.	96588852	1
43	Deep groove ball 6204,47/20 x 14-DIN	96588774	1
44	Housing cover DIA 60 plastics	96550717	1
45	Deep groove ball bearing 6202-NR,35/15 x 11-D	96588775	1
46	Housing cover D35 plastics	96550716	1
47	Deep groove ball bearing 6203,40/17 x 12-DIN	96588773	1
48	Motor base R/L WL1002-2402	96588841	2
49	Pressure relief valve 4.0 bar	91043530	1
50	Pressure relief valve 6.0 bar	91043529	1
51	Bush 24/20 x 14	96590274	1
52	Gasket 50/30 X 3	S5518441	2
	Rubber gasket 50/30 x 3	96549044	2
53	Shaft sealing ring D26 x 16 x 7	96550686	1
54	Key 5/5 x 20	S5511030	1
55	O-ring D15 x 2.5	S5522716	1
56	Gasket 48/39 x 2 for pressure relief 4 + 6 bar	S5598976	1
57	Stuffing box WL1002 - 2402 cpl.	96549013	1

Gasket kit (WL complete), 96549044, contains pos.nos 5,15,18,25, 29, 31,34, 35, 52.

14.2 WL 2502-3002

Pos.	Description	Spare part number	No./pump
1	Piston T-DUO D55	96550452	1
	Piston-T-DUO D55 SWL2502/3002	S5530451	1
2	Cylinder WL2502/3002 D55	96590276	1
	Cylinder SWL2502/3002 D55	S5538639	1
3	Air chamber WL2502/4 bar cpl.	S5551058	1
	Air chamber WL2502/6 bar cpl.	96588788	1
	Air chamber WL3002/4 bar cpl.	S5593516	1
	Air chamber WL3002/6 bar cpl.	S5593524	1
	Air chamber SWL2502/3002 4 bar cpl.	S5593486	1
	Air chamber SWL 2502/3002 6 bar cpl.	S5593494	1
4	Flange oval R1" SWL 1002-3002	S5540129	1
	Flange oval R1" (WL/WN)	S5540110	1
	Flange oval R11/4" WL2502-4000	S5540137	1
	Flange OV. R11/4" SWL2502-4000	S9540145	1
5	Rubber gasket 60/35 x 3	96549046	1
	Gasket 60 / 35 X 2	S5518492	1
6	V-belt pulley WL3002/6BAR 60HZ 60 x 24 2 x	S5501816	1
	V-belt pulley WL2502 60 x 19 2 x 10	S5501352	1
	V-belt pulley WL3002/6 bar 70 x 24 2 x 10	S5500100	1
	V-belt pulley WL3002/4 bar 70 x 19 2 x 10	S5500097	1
7	Motor base bolt 13 x 182 M8	96588843	1
	Motor base bolt 13 x 182	96588844	1
8	Connecting rod WL2502/3002 cpl.	96549004	1
9	Crosshead bolt 16 x 54	96550591	1
10	Crosshead D55 M10 WL2502/3002	96548967	1
11	Shaft seal ring 22/12 DU x 6	S5520870	2
12	Seal washer D62 WL2000-3002	96588848	1
13	Drip disc 40/10 x 5	96550470	1
14	Piston rod WL2502/3002 D12 x 238	96588836	1
15	Gasket 84 / 63 X 2	S5518620	1
	Rubber gasket 84/63 x 2	S5519626	1
16	Blow valve G3/8" A-G cpl.	96550692	1
	Spec. snifter valve G 3/8 A	96550694	1
	Air valve G3/8" A cpl.	96550690	1
17	Cylinder cover SWL 2502/3002	S5593508	1
	Cylinder cover WL2502/3002	96590273	1
18	Lower gasket SWL2502/3002 NP-MULTI	96548935	1
	Lower gasket WL2502/3002	96549046	1
19	Valve plate WL2-3002	96549000	1
20	Pressure valve cpl. WL2502/3002	96590219	2
21	Valve spring 28/1,5 x 43 1.4310	96550458	4
22	Spring cup SWL1002-5000 stainless steel	S5517143	4
23	Pressure valve cone bronze	96590215	2
24	Suction valve cone, bronze	96590214	2
25	Valve rubber SWL2502/3002 D56 x 7	96550475	4
	Valve rubber "S" WL2502/3002	96549046	2
	Valve rubber "D" WL2502/3002	96549046	2
26	Valve plate with valve seats SWL2502/3002	S5500798	1
27	Gasket 22/16.5 x 1.5	96549046	5
28	Suction valve cpl. WL2502/3002	96590218	4
29	Upper gasket SWL2502/3002 NP-MULTI	96548937	1
	Upper gasket WL2502/3002	96549046	1
30	Guide ring for piston rod D12	96588828	1
31	HD-packing ring 24/12 x 6	S9524204	5
32	Stuffing box insert G3/4"	96549897	1
33	Gasket 22/16.5 x 1.5	S7518352	5

Pos.	Description	Spare part number	No./pump
35	Valve rubber WL2502/3002	96549046	1
38	V-belt 10/6 x 980 WL2502/3002	96548941	2
39	Pump pulley WL2502/3002 280 x 25 2 x 10	96590281	1
40	Flanged bearing WL2502/3002 machined	S5530344	1
	Flanged bearing WL2000/2500/2502/3002 cpl	S5600075	1
42	Crank shaft WL2502/3002	S5530883	1
	Crank shaft WL2502/3002, WL2500 cpl.	S5600067	1
44	Housing cover DIA 75 sheet metal 0.8 mm	96590248	1
48	Motor base R/L, WL 2502 / 3002 cpl.	S9608394	1
49	Pressure relief valve 4.0 bar	91043530	1
50	Pressure relief valve 6.0 bar	91043529	1
51	Bush 24/20 x 14	96590274	1
52	Gasket 50/30 X 3	S5518441	1
	Rubber gasket 50/30 x 3	96549046	1
53	Shaft sealing ring D40 x 30 x 8	96550683	1
54	Parallel key 8/7 x 32	S5511226	1
55	O-ring D15 x 2.5	S5522716	1
56	Gasket 48/39 x 2 for pressure relief 4 + 6 bar	S5598976	1
57	Stuffing box WL2000/2500/2502/3002 cpl.	96548994	1
	Stuffing box SWL2502/3002 cpl.	S5593478	1
58	Oil drip washer WL2502/3002	S5539368	1
59	Gasket Manila 78/62,5 X 0,2	S5519146	1
60	Thrust ring cpl.	S5551279	1
61	Cylinder box WL2502/3002 machined	96590265	1
	Cylinder box SWL 2502/3002	S5530441	1
62	Distance tube R 14/1 x 8	S5547213	1
63	Gasket - Manila 67 / 55,5 X 0,2	S5519294	2
64	Passageway bearing WL2502/3002, machined	96588785	1
65	Belt guard WL2502-3002 cpl.	S9608408	1
	Belt guard hood WL 2502/3002	S5539341	1
66	Oil dipstick WL2502/3002,WL1000/1500 cpl.	96590289	1

Gasket kit (WL complete), 96549046, contains pos nos. 5, 15, 18, 25, 27, 29, 31, 35, 52, 59.

14.3 WL 4000-5000

Pos.	Description	Spare part number	No./pump
1	Piston T-DUO D75 WL 4/5000	96548960	1
	Piston T-DUO D75 SWL 4/5000	S5530948	1
2	Cylinder WL 4000/5000 D75	96590278	1
	Cylinder SWL 4000/5000 D75	S5538663	1
3	Air chamber WL 5000, 6 bar cpl.	96588794	1
	Air chamber WL 5000, 4 bar cpl.	96588792	1
	Air chamber WL4000, 6 bar cpl.	96588793	1
	Air chamber WL4000, 4 bar cpl.	96588791	1
	Air chamber SWL 4000	S5530794	1
	Air chamber SWL 5000, 4 bar cpl.	91043975	1
	Air chamber SWL 5000, 6 bar cpl.	91043976	1
4	Flange oval R11/2" WL4/5000	S5540161	2
	Flange oval R11/2" SWL4/5000	S5540170	2
	Flange oval R11/4"WL2502-4000	S5540137	1
	Flange oval R11/4" SWL2502-4000	S9540145	1
5	Gasket 65/40 x 3	S5519588	2
	Gasket 65/40 X 2	S5518522	2
	Gasket 65/40 x 3	S5519588	2
	Gasket 60 / 35 X 2	S5518492	1
6	V-belt pulley WL4/5000 70 x 24 2 x 13	96590221	1
	V-belt pulley WL4000/4 70 x 19 2 x 13	S5501379	1
7	Motor base bolt D16 x 200 M10	S5538450	1
	Motor base bolt D16 x 200	S5538523	1
8	Connecting rod WL4/5000 cpl.	96588837	1
9	Crosshead bolt 16 x 65	96550592	1
10	Crosshead D68 M16 WL4/5000	96590285	1
11	Shaft sealing ring 30/16 DU x 10	S5520985	1
12	Oil seal cap D68 x 19	96549898	1
13	Drip disc 30/8 x 6	96550471	1
14	Piston rod WL4/5000 D16 x 307	96588835	1
15	Gasket 150/85 x 2 SWL4/5000	S5518697	1
	Gasket 105/83 x 2	S5519693	1
16	Blow valve G3/8" A-G cpl.	96550692	1
	Air valve G3/8" A cpl.	96550690	1
17	Cylinder cover SWL4/5000	S5530719	1
	Cylinder cover WL4/5000	S5530700	1
18	Lower gasket SWL4/5000 NP-MULTI	S5520268	1
	Lower gasket WL4/5000 WN500	S5520250	1
19	Valve plate SWL 4/5000 cpl.	S9607851	1
	Valve plate WL4/5000 WN500 cpl.	96549001	1
21	Valve spring 28/1.5 x 43 1.4310	96550458	4
22	Spring cup SWL1002-5000 stainless steel	S5517143	4
23	Pressure valve cone SWL4/5000 BZ	S5530778	2
24	Suction valve cone SWL4/5000	S5531766	2
25	Valve rubber "D" WL4/5000	S5516490	2
	Valve rubber 62 x 9.0 DU	96550476	4
	Valve rubber "S" WL4/5000	S5516503	2
26	Valve plate with valve seats SWL4/5000	S5500810	1
27	Gasket 22/16.5 x 1.5	S7518352	4
29	Upper gasket SWL4/5000 NP-MULTI	S5520578	1
	Upper gasket WL4/5000	S5520560	1
31	HD-packing ring 30/16 x 7	S5524212	4
32	Stuffing box insert G1 WL4/5000	96549901	1
34	Rubber clip 3/8 Z	96550371	1
35	Valve rubber WL4/5000	S5516511	4
38	V-belt 13 x 8 x 1075 WL4/5000	S5524581	2

Pos.	Description	Spare part number	No./pump
39	Pump pulley WL4/5000 315 x 30 2 x 13	96590282	1
40	Flanged bearing WL4/5000 machined	96588776	1
42	Crank shaft WL5000	96588850	1
	Crank shaft WL4000	96588849	1
44	Housing cover WL4/5000 DIA 85	96590361	1
48	Motor base kit WL4/5000 cpl.	S5600172	1
52	Rubber gasket 60/35 x 3	S5519561	1
53	Shaft sealing ring D56 x 35 x 10	96550685	1
56	Gasket 70 / 59.5 X 0.5	S5519979	1
57	Stuffing box WL4000/5000 cpl.	96548995	1
58	Oil washer D60	96590258	1
59	Gasket-Manila 90/75.5 x 0.2	S5519286	1
60	Supporting ring WL4/5000	S5800047	1
60	Thrust ring cpl.	96550712	1
61	Cylinder box WL4/5000 machined	96590266	1
	Cylinder box SWL 4/5000	S5530689	1
63	Gasket - Manila 80 / 68.5 X 0.1	S5519279	2
	Gasket - Manila 80 / 68.5 X 0.2	S5519278	2
64	Passageway bearing WL4/5000 machined	96588777	1
65	Belt guard WL4000/5000 cpl.	96590226	1
66	Oil dipstick WL4/5000 cpl.	96548996	1
67	Shaft sealing ring 26/16 x 7	S5518299	1
68	Half belt guard, top	S5543446	1
69	Half belt guard, bottom	S5543454	1
70	Stuffing box SWL4/5000	S5530654	1

Gasket kit (WL complete), 96588821, contains pos. nos 5, 15, 18, 25, 27, 29, 31, 34, 35, 52, 59.

14.4 FILIA, FILIUS

Pos.	Description	Spare part number	No./pump
4	Flange oval, G 3/4", SWL, FILIA, FILIUS	S5540308	1
	Flange oval, G 3/4", all FILIA, FILIUS	S5540307	1
6	V-belt pulley, WL1002-2002, 45 x 14, 2 x 10	S5598569	1
	V-belt pulley, WL1502-2402, 45 x 19, 2 x 10	S5598577	1
	V-belt pulley, WL2502, 60 x 19, 2 x 10	S5501352	1
	V-belt pulley, WL 3002/4 bar, 70 x 19, 2 x 10	S5500097	1
	V-belt pulley, WL 3002/6 bar, 70 x 24, 2 x 10	S5500100	2
	V-belt, 10/6 x 652 LP, WL1002-2402	S5524638	2
38	V-belt, 10/6 x 660 LP WL1002-2402	S5524637	2
	V-belt, 10/6 x 980, WL 2502/3002	S5524484	1
49	Pressure relief valve, 4 bar, cert.	91043530	1
50	Pressure relief valve 6 bar, cert.	91043529	1
71	Pressure switch MDR 5/5 - G 1/2	96548951	1
	Pressure switch MDR 5/8 - G 1/2	96548953	1
72	Long fitting, G 1/2 x 80	S5535087	1
73	Air control V for FILIA, FILIUS	96590287	1
	Automatic air control V, G1¼", CPL, FILIA	96549010	1
74	Pressure tank, 100 l, 4 bar, horizontally	96588858	1
	Pressure tank, 150 l, 4 bar, horizontally	96588860	1
	Pressure tank, 200 l, 4 bar, horizontally	96588861	1
	Pressure tank, 250 l, 4 bar, horizontally	96590196	1
	Pressure tank, 150 l, 6 bar, horizontally	96590194	1
75	MG071A, 3 x 400D-4, .25 kW, B03-14	87103384	1
	MG071B 3 x 400D-4, .37 kW, B03-14	87103385	1
	MG080A 3 x 400D-4, .55 kW, B03-19	87103386	1
	MG080B 3 x 400D-4, .75 kW, B03-19	87103387	1
	MG090SA 3 x 400D-4, 1.1 kW, B03-24	96588439	1
	Motor 1 x 220 V-4, 0.25 kW, B3 HANNING packed	96591765	1
	Motor 1 x 220 V-4, 0.37 kW, B3 HANNING packed	96550628	1
	Motor 1 x 220 V-4, 0.55 kW, B3 HANNING packed	96550629	1
Motor 1 x 220 V-4, 0.75 kW, B3 HANNING packed	96588856	1	
76	Pressure gauge, 0-10 bar, G 1/4, 63	S5211206	1
	Pressure gauge, 0-6 bar, G 1/4, 63 D	96588823	4
77	Hose, D11/7 X 10 for FILIA, FILIUS	96590259	4
78	Rubber gasket 26/9, 5 x 4, FILIA, FILIUS	96588812	1
79	Hose clamp, 34-37 DIA X 7	96590255	1
	Hose clamp, 37-40 DIA X 10	S5510726	1
80	Hose, D35/25 x 270	96590261	1
	Hose, D35/25 x 180	S5526010	1
81	Bend, G 3/4" x 60	96550456	1
	Bend, R 3/4 " x 100	96550457	1
82	Hose, 10/6 x 1500 for air control	96590263	1

14.5 WN 201-301

Pos.	Description	Spare part number	No./pump
1	Piston T-DUO D55 - M10	96550452	1
	Piston T-DUO D65 - M10	96550453	1
2	Cylinder WN201 D55	96590253	1
	Cylinder WN301 D65	96590254	1
3	Air chamber WN201/4 bar cpl.	S5552550	1
	Air chamber WN201/6 bar cpl.	S5552607	1
	Air chamber WN301/4 bar cpl.	S5552569	1
	Air chamber WN301/6 bar cpl.	S5552755	1
4	Suction flange R11/4" WN201 bear	S5504360	1
	Flange oval R11/4" WN301	S5540137	1
	Flange oval R1" (WL/WN)	S5540110	1
5	Rubber gasket 60/35 x 3	S5519561	1
	Rubber gasket 56/35 x 3	S5599000	1
6	V-belt pulley WN201/301 82 x 19 1 x 13	96590222	1
	V-belt pulley WN301/6 bar 82 x 24 1 x 13	96590223	1
7	Motor base bolt 13 x 182 M8	96588843	1
	Motor base bolt 13 x 182	96588844	1
8	Connecting rod WN201/301 cpl.	96549005	1
9	Cross head bolt 13 x 43	96550590	1
10	Crosshead D45 M10 WN201/301	96548896	1
12	Seal plate D45 x 13	96590246	1
13	Drip disc 40/10 x 5	96550470	1
14	Piston rod WN201/301 D12 x 274	96588825	1
15	Rubber gasket 75/61 x 2	S5598607	1
	Rubber gasket 88/73 x 3 WN301	S5505234	1
16	Air valve G3/8" A cpl.	96550690	1
17	Cylinder cover WN201	96590308	1
	Cylinder cover WN301	96588840	1
18	Lower gasket WN201	S5520128	1
	Lower gasket WN301	S5520144	1
19	Valve plate WN201 cpl.	96549009	1
	Valve plate WN301 cpl.	96549000	1
20	Pressure valve cpl. WN201	96590211	2
	Pressure valve cpl. WN301	96590219	2
25	Valve rubber "D" WN201	S5516457	2
	Valve rubber "D" WN301	S5516465	2
	Valve rubber "S" WN201	S5516430	2
	Valve rubber "S" WN301	S5516481	2
27	Gasket 22/16.5 x 1.5	S7518352	2
28	Suction valve cpl. WN201	96590210	2
	Suction valve cpl. WN301	96590218	2
29	Upper gasket WN201	S5520454	1
	Upper gasket WN301	S5520470	1
30	Guidering for piston rod D12	96588828	1
31	HD-packing ring 24/12 x 6	S9524204	5
32	Stuffing box insert G3/4"	96549897	1
35	Valve rubber WN201	S5516449	1
	Valve rubber WN301	S5516473	1
36	Belt guard backwall WN201/301	S5544060	1
38	V-belt 13/8 x 850 WN201/301	S5524506	1
39	Pump pulley WN201/301 225 x 16 1 x 13	96590252	1
44	Gear cover WN201/301 plastics	96548891	1
45	Deep groove ball bearing 6202-NR, 35/15 x 11-D	96588775	1
46	Housing cover D35 plastics	96550716	1
47	Deep groove ball bearing 6203-RS, 40/17 x 12	96550450	1

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Pos.	Description	Spare part number	No./pump
48	Motor rail, on t. right WN201/301	S5502200	1
	Motor rail left side, WN201/301	S5502260	1
49	Pressure relief valve 4.0 bar	91043530	1
50	Pressure relief valve 6.0 bar	91043529	1
51	Bush 24/20 x 14-DWK	96590274	1
52	Rubber gasket 50/30 x 3	S5519553	1
53	Shaft sealing ring D26 x 16 x 7	96550686	1
54	Key 6/6 x 20	S5511080	1
	Parallel key 5/5 x 25	S5511439	1
55	O-ring D15 x 2.5	S5522716	1
56	Gasket 48/39 x 2 for pressure relief 4 + 6 bar	S5598976	1
58	Oil washer d35	96550454	1
59	Gasket Manila 78/62.5 X 0.2	S5519146	1
60	Thrust ring cpl.	S5551279	1
61	Cylinder box WN201 machined	96590229	1
	Cylinder box WN301 machined	96590240	1
63	Gasket Manila 58/30 X 0,1	S5501875	1
	Gasket Manila 58/30 X 0.2	S5501883	4
65	Belt guard COVER WN201/301	S5544116	1
66	Oil dipstick WN201/301 cpl.	96549280	1
67	Shaft seal ring 22/12 DU x 6	S5520870	1
83	Crank cog wheel ci arrow-toothed	96590242	1
84	Bearing cover WN201/301	96588771	1
85	Gear pinion WN201/301	96549281	1
86	Gasket Manila 56/41 X 0.2	S5501859	1
87	Pivot bearing WN201/301 machined	96590241	2
88	Gasket 14/10 x 1	S3518301	2
91	Counter shaft WN201/301	96590228	1

Gasket kit (WN201 complete), 96588817, contains pos. nos 5, 15, 18, 25, 27, 29, 31, 35, 52.

Gasket kit (WN301 complete), 96588818, contains pos. nos 5, 15, 18, 25, 27, 29, 31, 35, 52.

14.6 WN 500

Pos.	Description	Spare part number	No./pump
1	Piston T-DUO D82 WN500	96549011	1
2	Cylinder WN500 D82	96590279	1
3	Air chamber WN500/4 bar cpl.	S5552399	1
	Air chamber WN500/6 bar cpl.	96588796	1
4	Flange oval R11/2" WN500	S5540161	2
6	V-belt pulley WN500 89 x 24 3 x 13	S5501484	1
7	Motor base bolt D16 x 200	S5538523	1
	Motor base bolt D16 x 200 M10	S5538450	1
8	Connecting rod WN500 cpl.	96590303	1
9	Cross head bolt 16 x 65	96550592	1
10	Crosshead D68 M16 WN500	96590285	1
12	Oil seal cap D68 x 19	96549898	1
13	Drip disc 30/8 x 6	96550471	1
14	Piston rod WN500 D16 x 444	96588831	1
15	Gasket 118/98 x 3	S5519715	1
16	Air valve G3/8" A cpl.	96550690	1
17	Cylinder cover WN 500	S5531952	1
18	Lower gasket WN500	S5520250	1
19	Valve plate WN500 cpl.	96549001	1
25	Valve rubber "S" WN500	S5516503	2
	Valve rubber "D" WN500	S5516490	2
27	Gasket 22/16.5 x 1.5	S7518352	4
29	Upper gasket WN500	S5520560	1
31	HD-packing ring 30/16 x 7	S5524212	5
32	Stuffing box insert G1 WN500	96549901	1
34	Rubber clip 3/8 Z	96550371	1
35	Valve rubber WN500	S5516511	4
38	V-belt 13 x 8 x 1120 WN500	S5524530	3
39	Pump pulley WN500 275 x 25 3 x 13	S5539457	1
48	Motor base cpl.	S5531685	1
52	Gasket 65/40 x 3	S5519588	2
53	Shaft sealing ring D40 x 25 X10	96550682	1
54	Parallel key 8/7 x 40	S3511234	1
56	Gasket 70 / 59.5 x 0.5	S5519979	1
57	Stuffing box WN500 cpl.	96548999	1
58	Oil washer D60	96590258	1
59	Gasket-Manila 90/75.5 x 0.2	S5519286	1
60	Supporting ring WN500	S5800047	1
61	Cylinder box WN500 machined	96590272	1
64	Passageway bearing WN500, machined	S5531871	1
65	Belt guard, cpl. - WN 500	S5130966	1
66	Oil dipstick WN500 cpl.	96590302	1
67	Shaft sealing ring 26/16 x 7	S5518299	1
83	Eccentric crank cog WN500	S5538353	1
85	Gear pinion WN500	96548975	1
87	Pivot bearing WN500	S5531880	2
89	Gasket-Manila 73 / 50 X 0.2	S5519421	4
90	Flanged bearing with bush WN 500	S5500860	1
91	Lay shaft WN500 machined	96588851	1
92	Key 6/6 x 32	S0511129	1

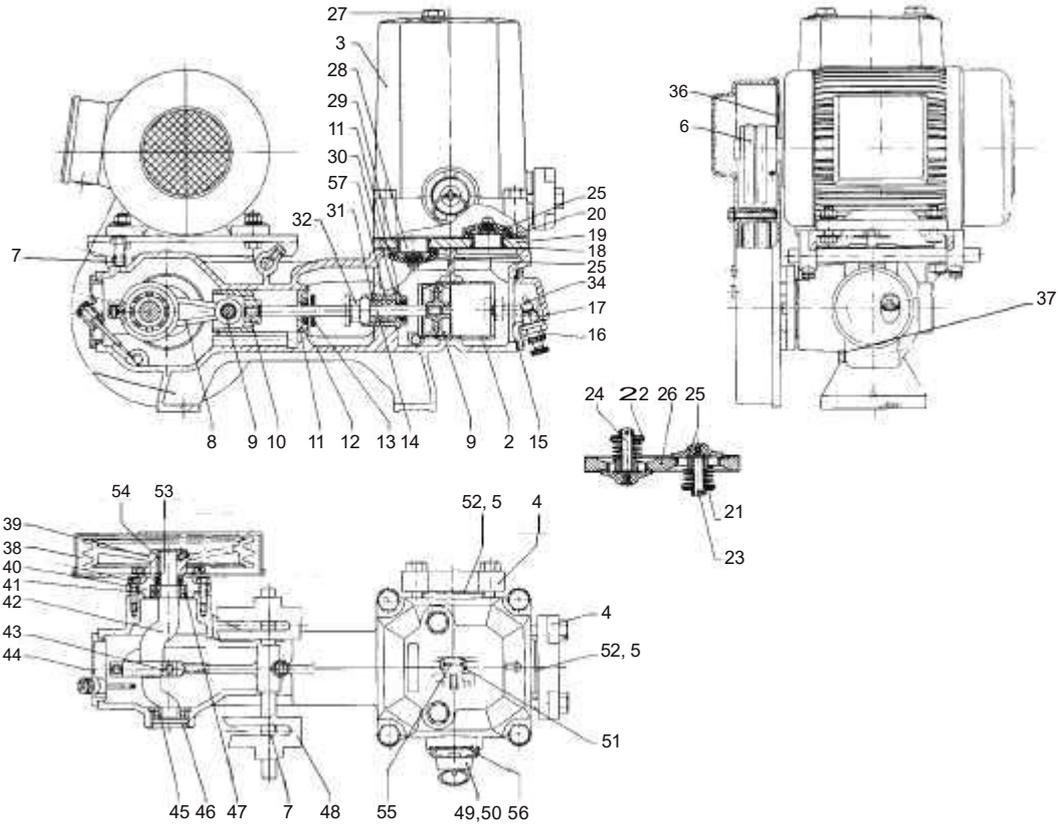
Gasket kit (WN500 complete), 96588819, contains pos. nos 15, 18, 25, 27, 29, 31, 34, 35, 52.

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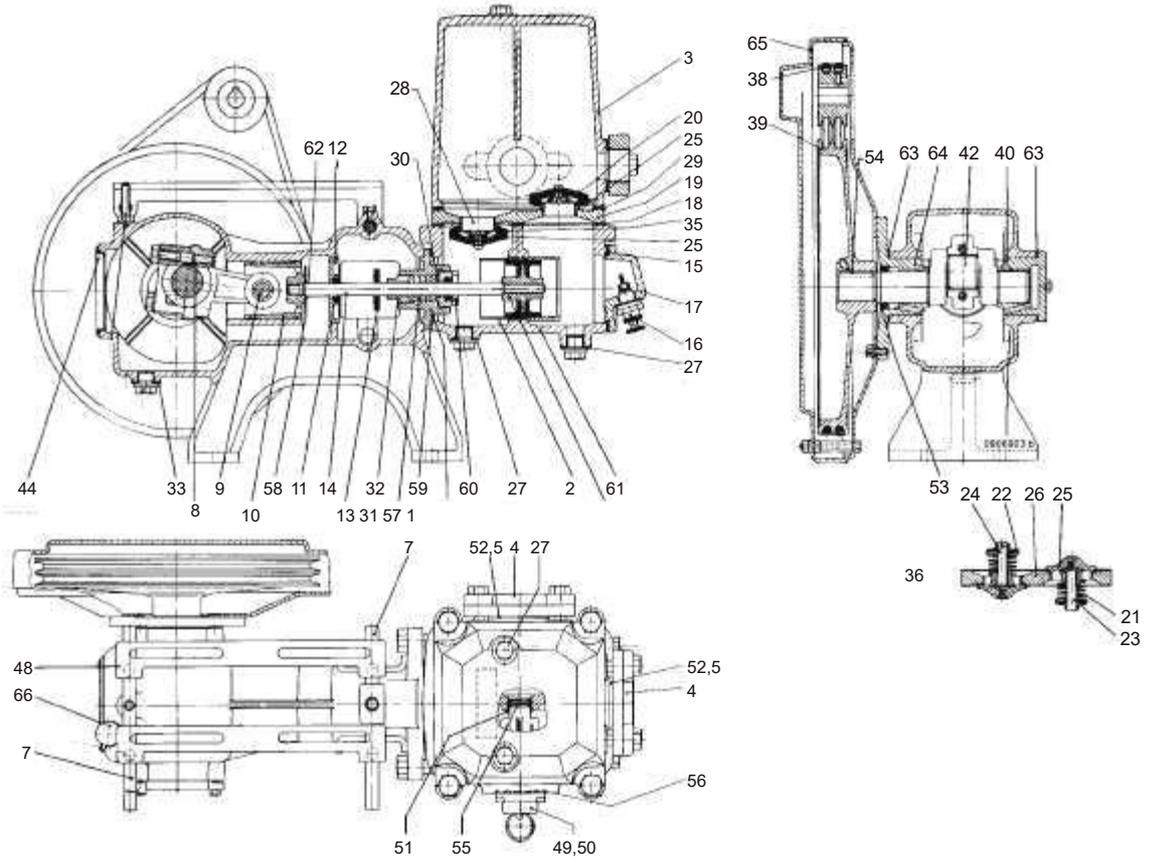
15. Sectional drawings

15.1 WL 1002-2402

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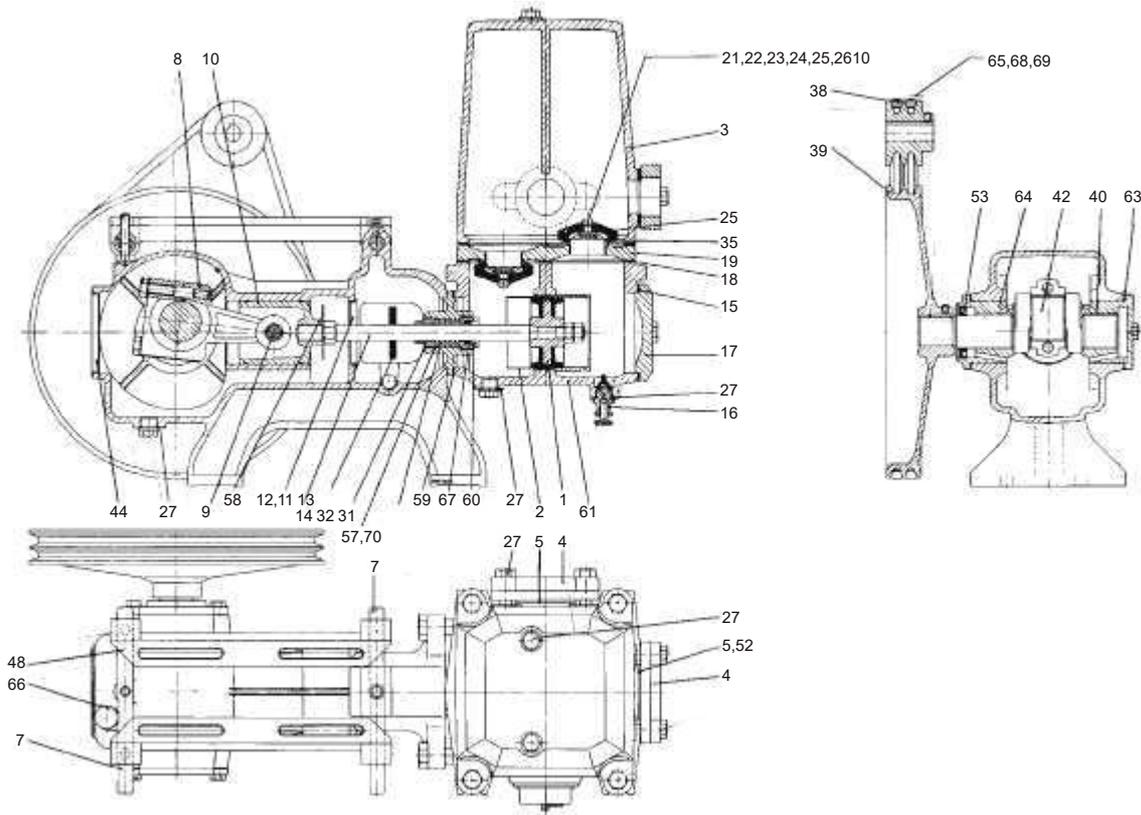
15.2 WL 2502-3002



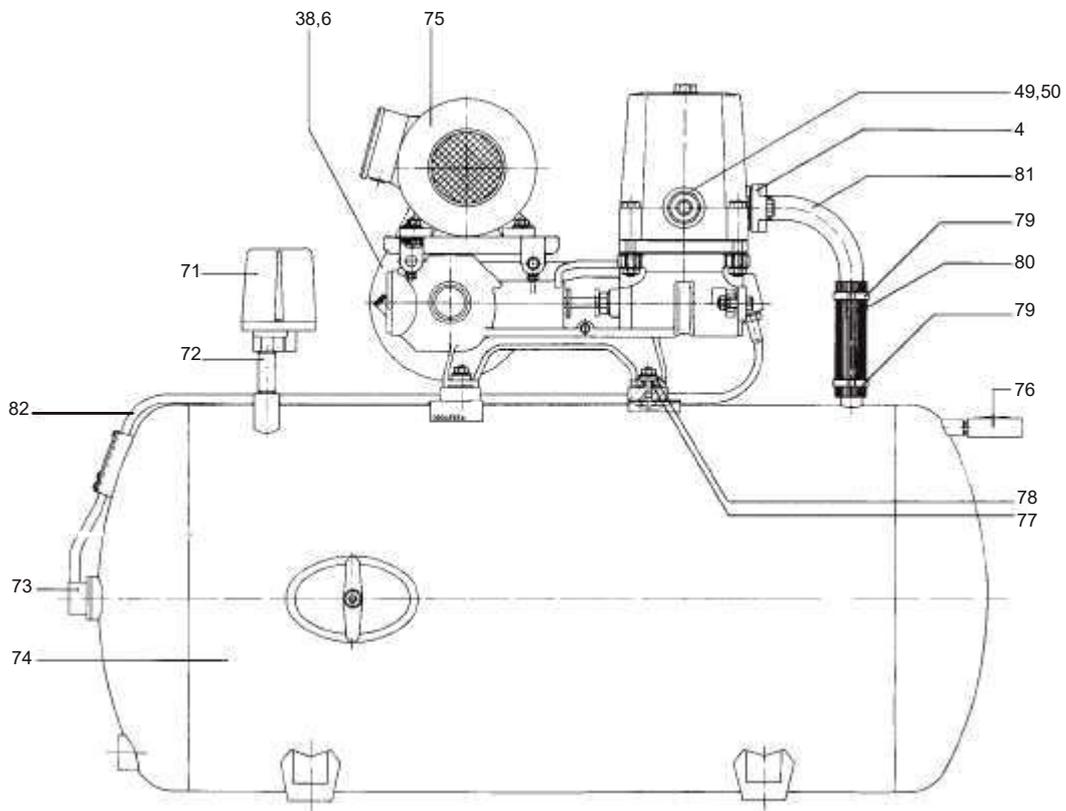
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15.3 WL 4000-5000



15.4 FILIA, FILIUS



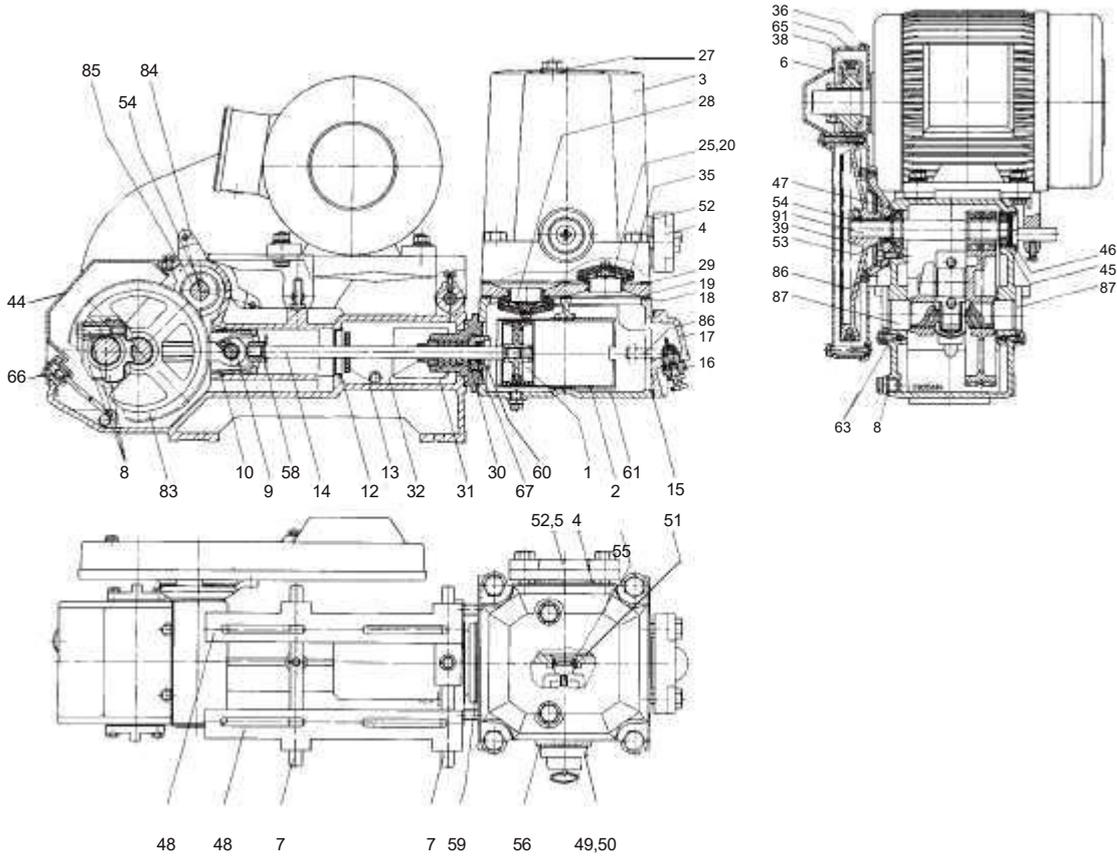
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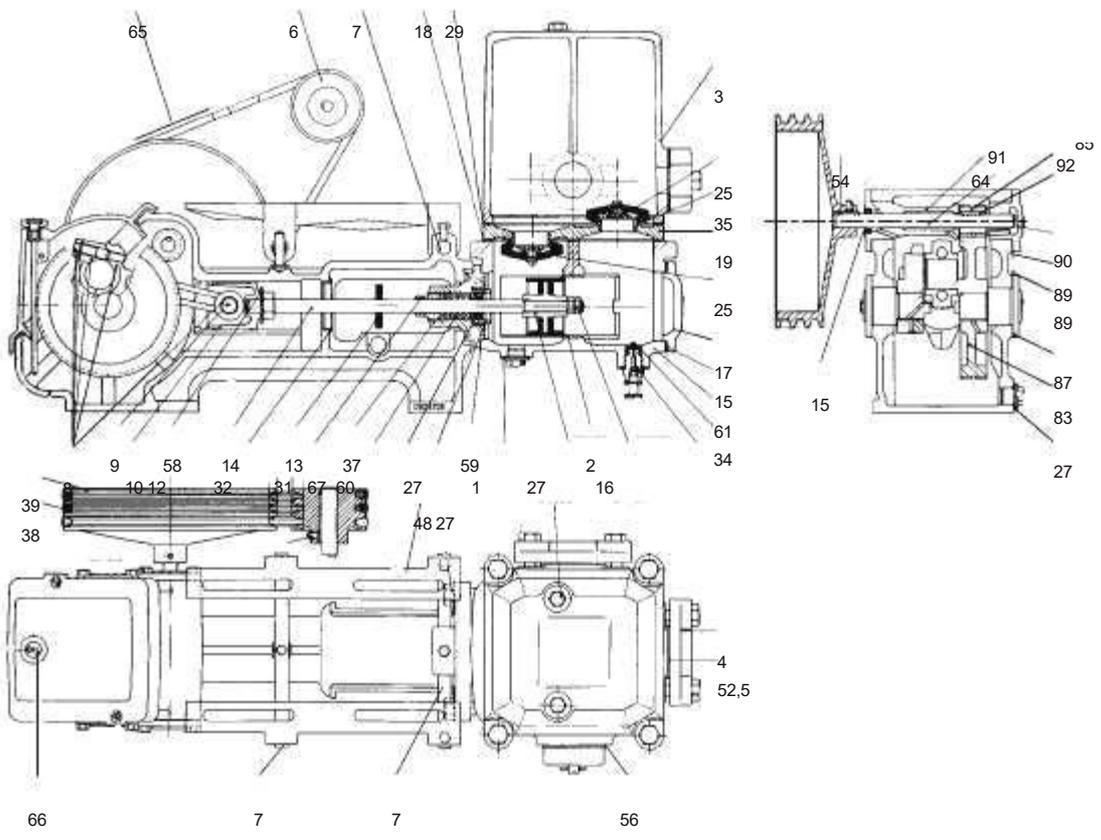
15.5 WN 201-301

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15.6 WN 500



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Subject to alterations.