Poseidon 7

ALTO®

Total Cleaning Confidence™

Service Manual

Index

TsJ 6-03.02

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Poseidon

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Poseidon 1200

Primary data	Unit	General	Nominal values						Tolerances
Voltage	VAC		200	240	400	415	440	440	+6/-10%
Frequency	Hz			50	50	50	50	60	
Motor coupling									
Number of phases	Pce.				3	3	3	3	
Power consumption	A				12				+-1.5
High voltage	KV	2.4 in 2 sec.							
Leakage current	mA	0.75							
Resistance in ground circuit	Ohm	0.2							
Absorption power	kW				6.7				
Axel power	kW				5.5				
Revolutions	Min-1				1440				1420-1470
Control voltage	VAC		200	240	400	415	440	440	+-10%
Signal voltage microprocessor	VAC	5							+-10%
IP classification		45							
Bypass time auto start/stop	Sec	20							
Bypass time manual	Min	5							
Water volume, high-pressure	l/min				17.6				
Water volume, low-pressure	l/min				19.1				
Machine's pressure gauge	Bar				175				+-8.5%
Pump pressure, high-pressure	Bar				158				
Pressure, h-p pump outlet	Bar				152				
Opening pressure, pump outlet	Bar				185				+-7
Bypass pressure	Bar				11				+-4
Suction capacity	Bar				0.17				
Suction height, primed	m				3				
Max. water inlet temperature	°C				85				
Max. water inlet pressure	Bar	10							
Reaction force, max.	N	54							
Acoustic pressure level	dBA	75.4							
Oil volume	Litre				0.5				
Oil type		Pump oil 100							

Poseidon 1280

Primary data	Unit	General	Nominal values						Tolerances
Voltage	VAC		200	240	400	415	440	440	+6/-10%
Frequency	Hz			50	50	50	50	60	
Motor coupling									
Number of phases	Pce.				3	3	3	3	
Power consumption	A				13				+-1.5
High voltage	KV	2.4 in 2 sec.							
Leakage current	mA	0.75							
Resistance in ground circuit	Ohm	0.2							
Absorption power	kW				8.3				
Axel power	kW				6.5				
Revolutions	Min-1				1440				1420-1470
Control voltage	VAC		200	240	400	415	440	440	+-10%
Signal voltage microprocessor	VAC	5							+-10%
IP classification		45							
Bypass time auto start/stop	Sec.	20							
Bypass time manual	Min	5							
Water volume, high-pressure	l/min				18.6				
Water volume, low-pressure	l/min				20.3				
Machine's pressure gauge	Bar				195				+-8.5%
Pump pressure, high-pressure	Bar				178				
Pressure, h-p pump outlet	Bar				170				
Opening pressure, pump outlet	Bar				200				+-7
Bypass pressure	Bar				12				+-4
Suction capacity	Bar				0.17				
Suction height, primed	m				3				
Max. water inlet temperature	°C				85				
Max. water inlet pressure	Bar	10							
Reaction force, max.	N								
Acoustic pressure level	dBA	75.4							
Oil volume	Litre				0.5				
Oil type		Alphasyn T 150							

Poseidon 720

Primary data	Unit	General	Nominal values						Tolerances
Voltage	VAC		230						+6/-10%
Frequency	Hz		50						
Motor coupling			3						
Number of phases	Pce.		1						
Power consumption	A		12						+-1.5
High voltage	KV	2.4 in 2 sec.							
Leakage current	mA	0.75							
Resistance in ground circuit	Ohm	0.2							
Absorption power	kW		2.9						
Axel power	kW		2.1						
Revolutions	Min-1		1430						1420-1470
Control voltage	VAC		230						+-10%
Signal voltage microprocessor	VAC	5							+-10%
IP classification		45							
Bypass time auto start/stop	Sec	20							
Bypass time manual	Min	5							
Water volume, high-pressure	l/min		11.5						
Water volume, low-pressure	l/min		12.5						
Machine's pressure gauge	Bar		105						+-8.5%
Pump pressure, high-pressure	Bar		101						
Pressure, h-p pump outlet	Bar		93						
Opening pressure, pump outlet	Bar		125						+-7
Bypass pressure	Bar		10.5						+-4
Suction capacity	Bar		0.17						
Suction height, primed	m		3						
Max. water inlet temperature	°C		85						
Max. water inlet pressure	Bar	10							
Reaction force, max.	N	54							
Acoustic pressure level	dBA	75.4							
Oil volume	Litre		0.5						
Oil type		Pump oil 100							

Frame

The frame is built of Ø25mm steel pipes. One nozzle can be stored on each side of the machine.

2, Ø250mm wheels and 1, Ø100mm swivel wheel are mounted to the frame.

A bent bar is attached to the front of the frame to protect hose attachments. The bar is also used for lifting the machine both manually and by crane.

The back bar is equipped with fixtures for mounting hose reel, a U-bar for placing nozzles, and winding reel for electrical cable.
The steering handle is made of plastic.

Cabinet

The cabinet is made of vacuum-shaped plastic.
On the cabinet's top side there is room for storing small auxiliary articles.
All hoses are connected through the hole at the front of the cabinet.

Motor/pump

The motor/pump unit is attached to the frame with four taptite screws in the electric motor's stator. This way the pump can be accessed from the front of the machine, and those parts of the pump susceptible to wear are easily serviced.

The pump is a 4-cylinder axial piston pump with a wobble disc system and solid ceramic pistons. Suction and pressure valves are made of stainless steel.

The oil system is closed, and the oil level can be checked through a liquid indicator on the side of the cabinet.

The pump's water connection is mounted using ¾" quick-acting coupling.
The pump's pressure outlet is mounted with a 3/8" quick-acting coupling nipple.

The pump pressure can be read in bars (CPA) on an adapted pressure gauge.

Start/stop system

The machine's start/stop system is controlled by a microprocessor that stops/interrupts the signal from a reed switch. The reed switch is activated by the flow of a magnetic piston mounted in the pump outlet's flow control through the pump.

The start switch has 3 settings:

0 = Machine stopped.

I = Aut. start/stop. Machine stopped with automatic stop function if the spray handle is not activated after 20 seconds.

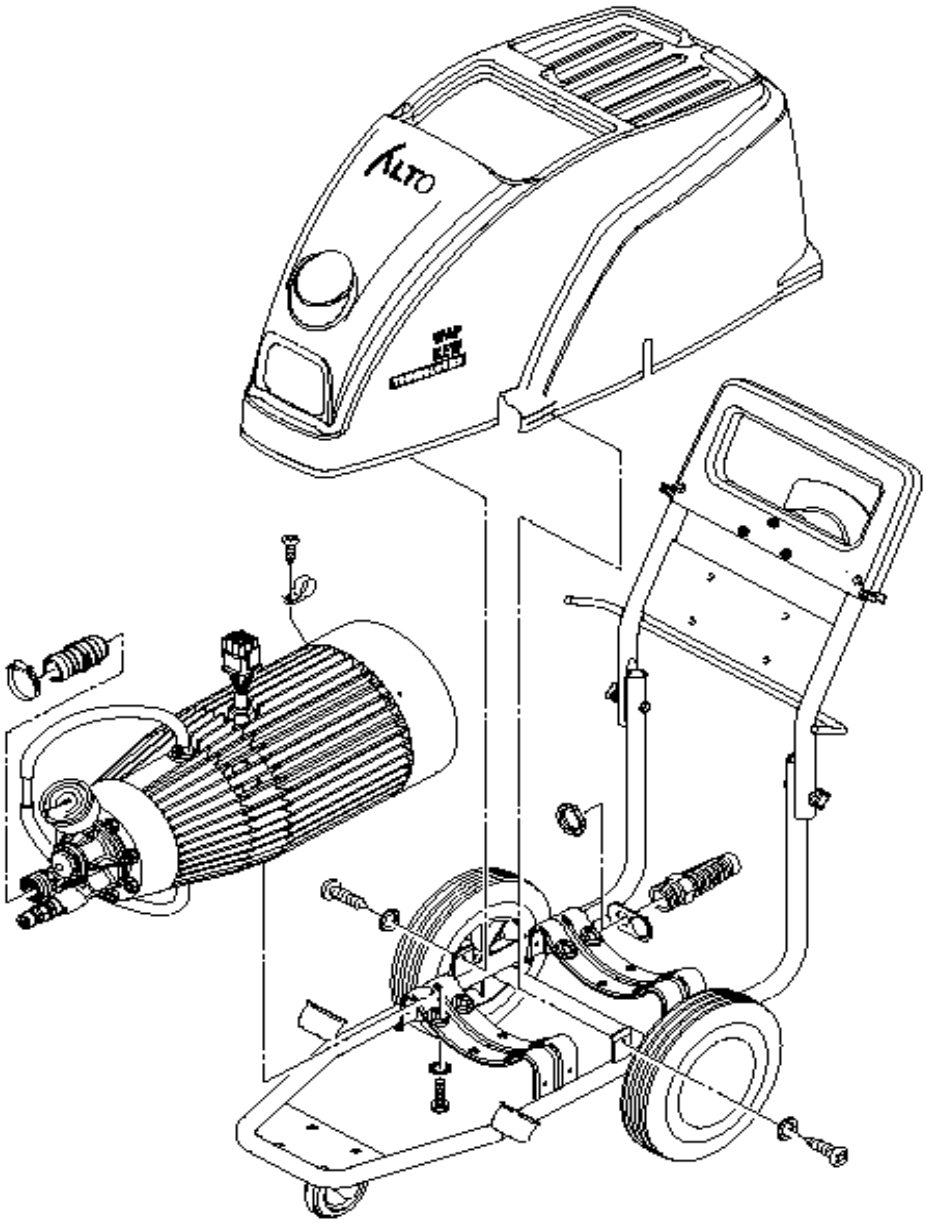
Man = Manuel. Machine started in manual position. The machine stops automatically, however, if the spray handle is not activated after 5 minutes.
Use the manual position if the machine is set to suction without water inlet pressure.

Electrical system

The electrical system is located in electrical casing placed on the motor/pump unit.
All automatic functions are controlled by a microprocessor built into a circuit board.

Equipment

The machine's standard equipment consists of:
Ergo 3000 spray handle.
10 mtr. Double wire high-pressure hose.
Tornado nozzle.
¾" quick coupling nipple.



Pump Function

The illustration below shows a cross-section of the Poseidon pump.

The pump's job is to move a given amount of water from the suction side to the high-pressure nozzle. The volume of water depends on the pistons' quantity, diameter, impact length, and number of impacts per minute.

When wobble disc A is turned, the piston is pulled down with the help of retracting spring B, and water is sucked through suction valve C.

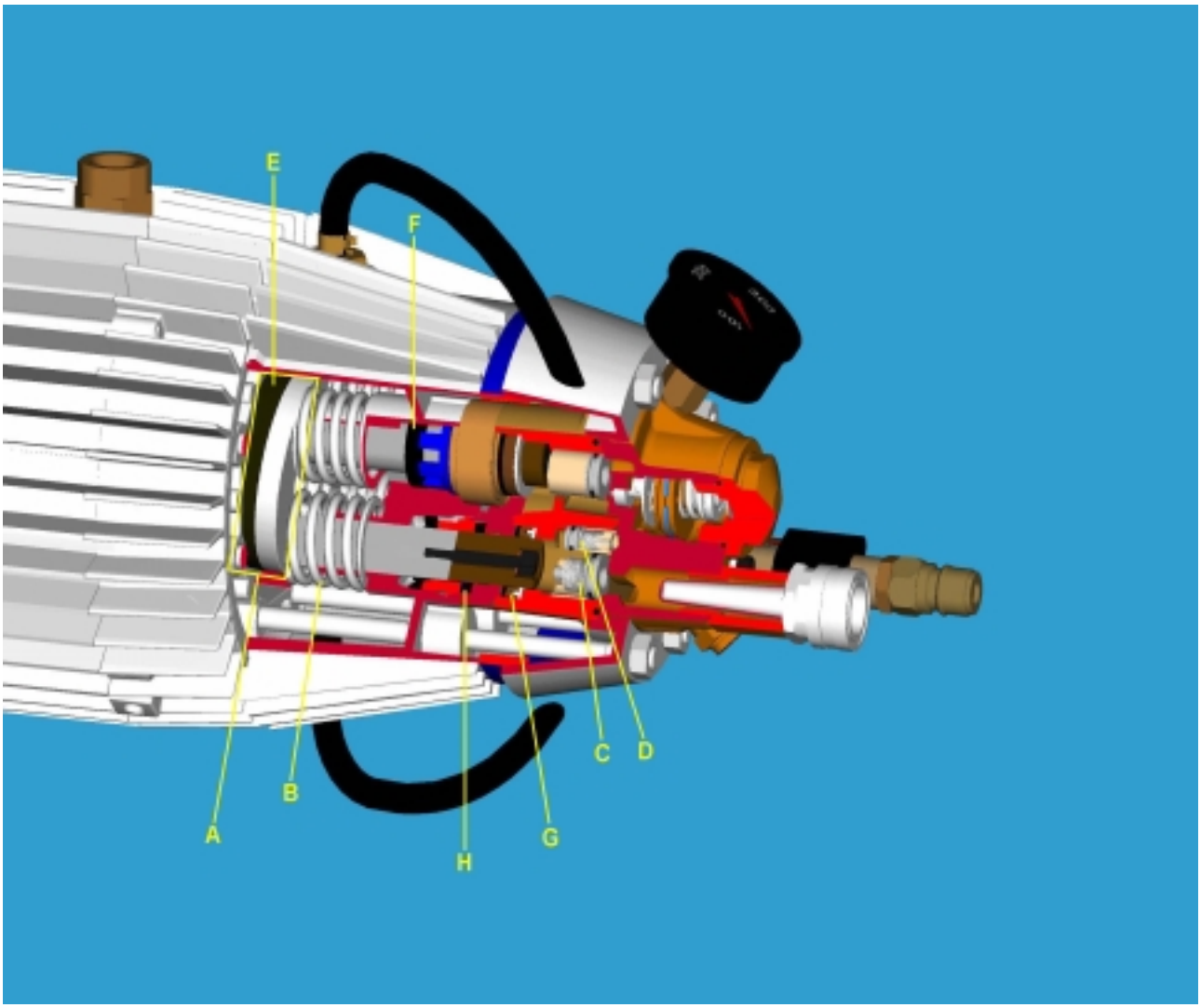
When the piston rises again, the suction valve closes, and pressure valve D opens.
From here, water is propelled towards the pump's bypass valve.

Because of the high-pressure nozzle's small opening, considerable force is needed to move the pistons forward.

In order to reduce lost friction, the force of the motor is transferred to the pistons via the wobble disc's oil-soaked E roller bearings.

The pistons are composed of a stainless steel portion, which is controlled by the cylinder and sealed with oil sleeve F. The upper portion of the piston is ceramic, the seal on the water side consists of a gasket system.

At the top is textile sleeve G, which seals out high-pressure. A smaller leakage current passes down to low-pressure sleeve H, and between these two sleeves, the lubrication is drained back to the suction side through a small channel.



Bypass Valve Function

The bypass valve has 4 functions:

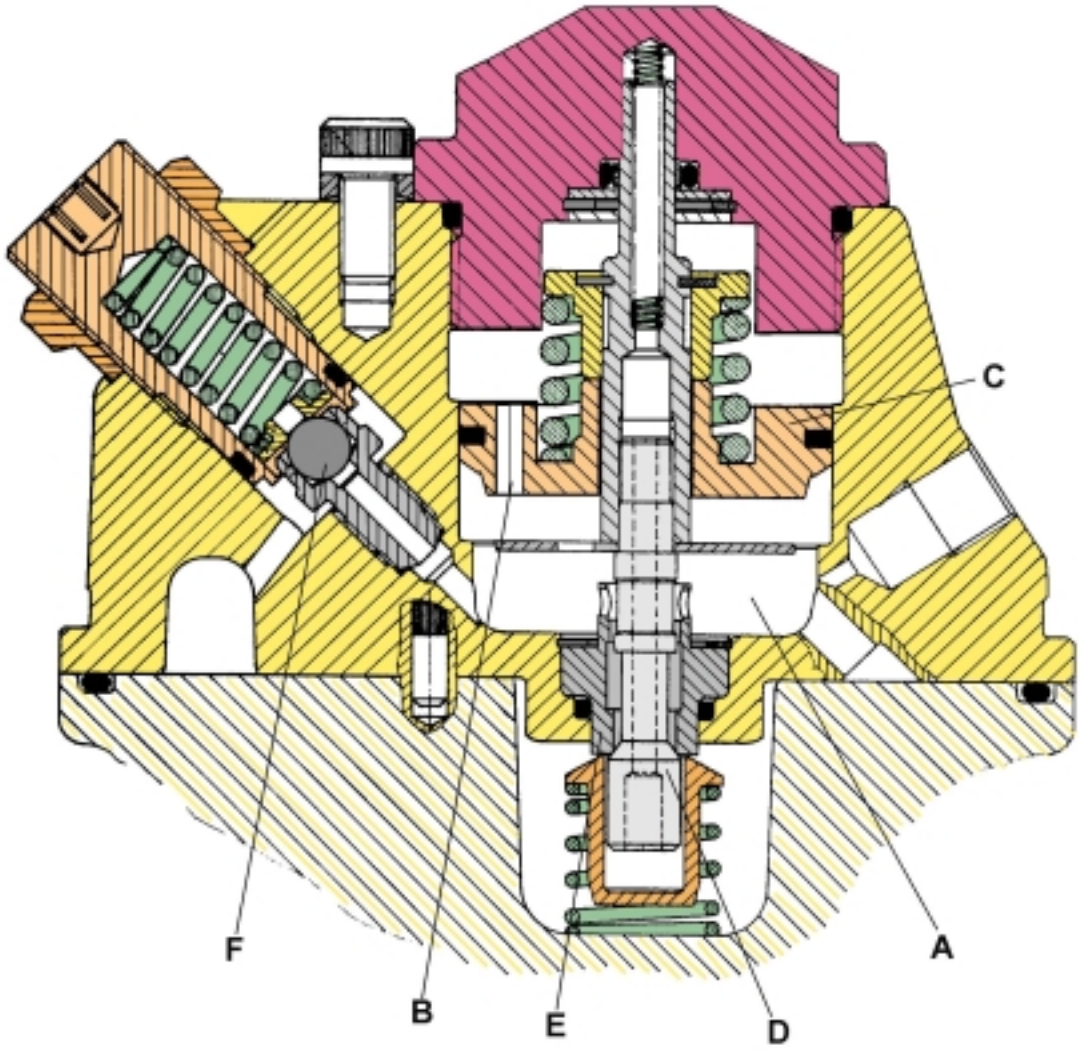
1. Protect the machine against excess pressure.
2. Relieve the pressure in bypass.
3. Fast conversion to high-pressure.
4. Ensure 0 pressure when the machine is stopped.

Operation:

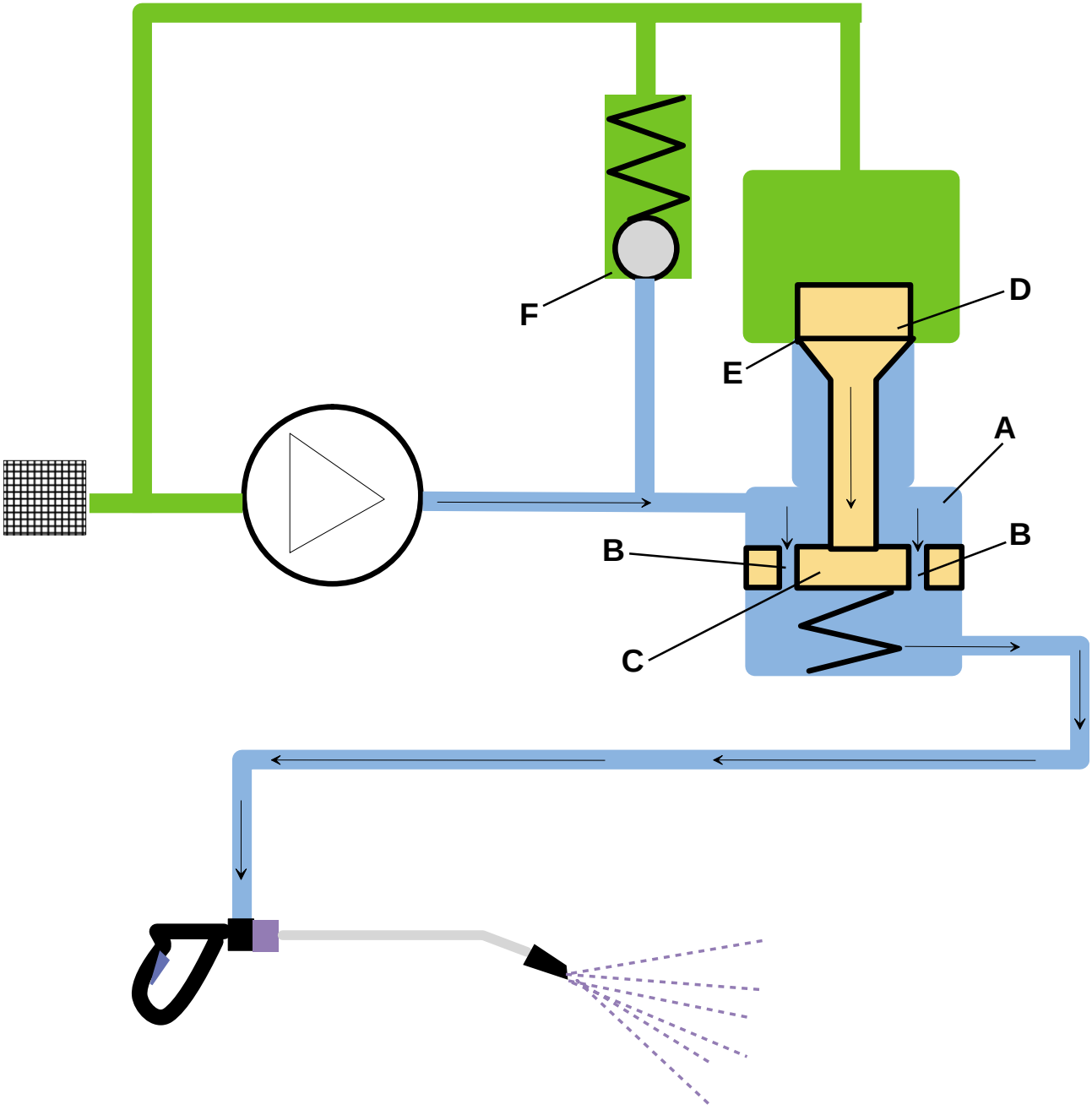
The water from the pump is led into chamber A of the bypass valve.
From there, the water passes through hole B in piston C and out of the machine.
This leads to a pressure imbalance in piston C, which keeps valve disc D closed to valve seat E.

Bypass:

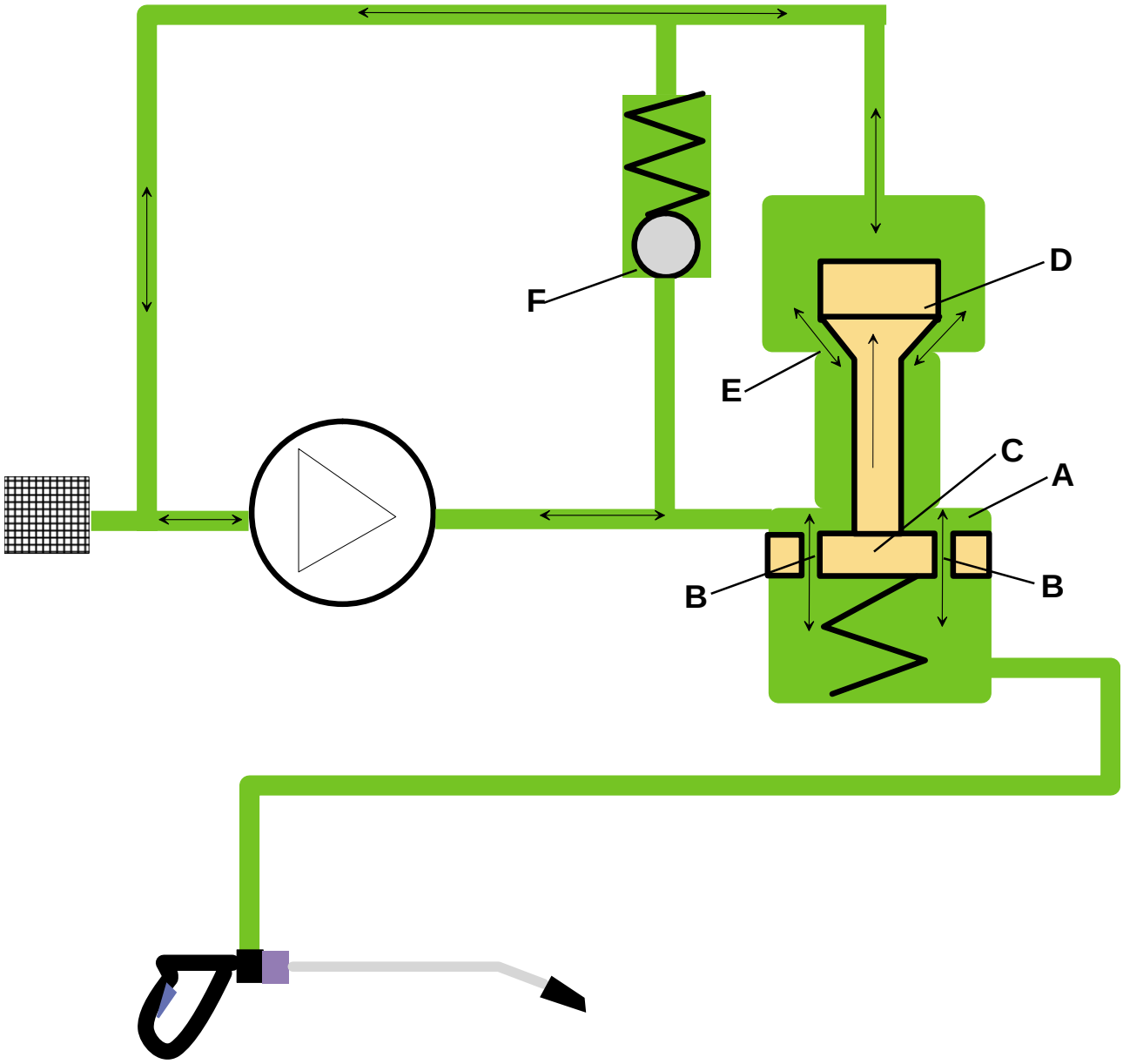
When water consumption stops (the spray handle is released), pressure increases briefly until safety valve F opens upon reaching the pressure setting, which should be adjusted to 25-30 bars over working pressure. This causes the pressure drop in piston C to disappear, and valve disc D moves from valve seat E. The machine is now running in bypass.



POSEIDON SPRAY



POSEIDON BY- PASS



Flow Control

Flow control consists of:

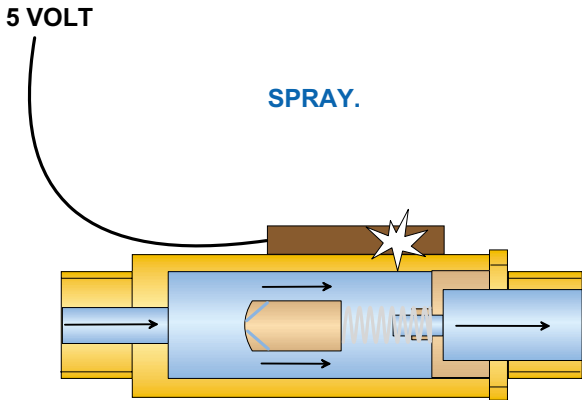
1. Casing
2. Piston w/ magnet
3. Spring
4. Reed switch

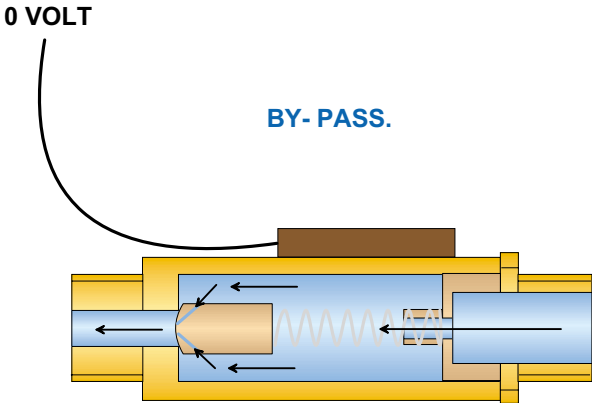
Operation:

A drop in pressure in the piston pushes the piston forward, causing the magnet to activate the reed switch.
A drop in pressure on the piston's end face causes the piston to remain in this position.

Bypass:

When water is not being consumed, the drop in pressure in the piston stops, and the piston is pushed back by the spring, deactivating the reed switch.
The pressure is balanced out through the hole in the piston, and the force of the spring holds the piston in a neutral position.





PC Board

The circuit board has the following functions:

1. To start the electric motor when starting the machine.
2. To stop the electric motor when operation of the machine is finished.
3. To record and store data concerning the machine's work situations, operation, and bypass.

The circuit board is protected against excess pressure thanks to a circuit breaker (0.63A- SLOW) placed on the board.

Start switch positions

0:
The machine is not in operation; there is no power from the Start/Stop switch to print and the contactor's magnetic pole.

1:
The machine is set to automatic start/stop operation.

When you activate the spray handle and water is flowing through the machine, the flow sensor's reed switch signals the circuit board's microprocessor, and the machine runs uninterrupted.

When you release the spray handle, and water flow through the machine stops, the signal to the PC board's microprocessor is interrupted. After a 20-second delay, power to the contactor's magnetic pole is cut off, and the electric motor stops.

Man:

The machine is set to manual operation.

The flow sensor is monitored via the reed switch but is not active.

The electric motor runs uninterrupted regardless of whether or not the reed switch registers water flow.

When you release the spray handle and the water flow through the machine stops, the power to the Start/Stop switch and to the contactor's magnetic pole is cut off after 5 minutes.
The machine must then be restarted using the Start/Stop switch.

Service functions:

1. Identification of machine and software type.
2. Read-out of number of starts.
3. Read-out in hours/minutes of operating time under flow.
4. Read-out in hours/minutes of bypass time.

These read-outs are made with ALTO SB Datalogger .

A description of SB Datalogger will be added later.

Operating Requirements

To ensure error-free operation, the following requirements must be met:

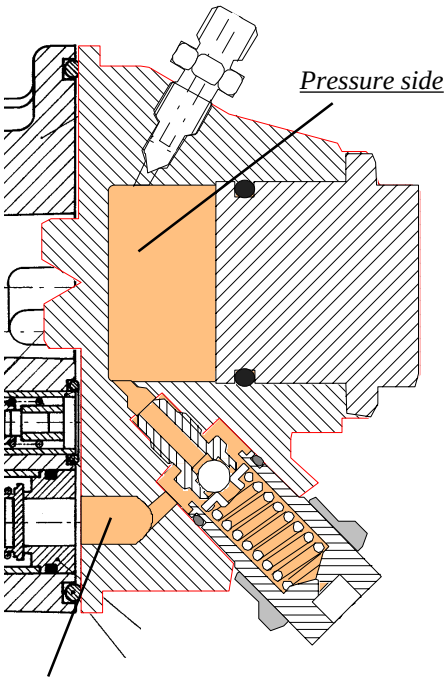
1. Machine and equipment must be free of air and without leaks.
2. Water temperature must not exceed 85°C when inlet pressure on water supply.
3. In suction mode, water temperature must be significantly lower, depending on the suction height. Make sure the pump does not cavitate (water boils under vacuum).
4. Water quality must be free of impurities > 50 µ.
5. Water supply must be sufficient at all times.
6. Ambient temperature must not exceed 40°C.
7. Supply voltage must not vary by more than 6% of the given value.

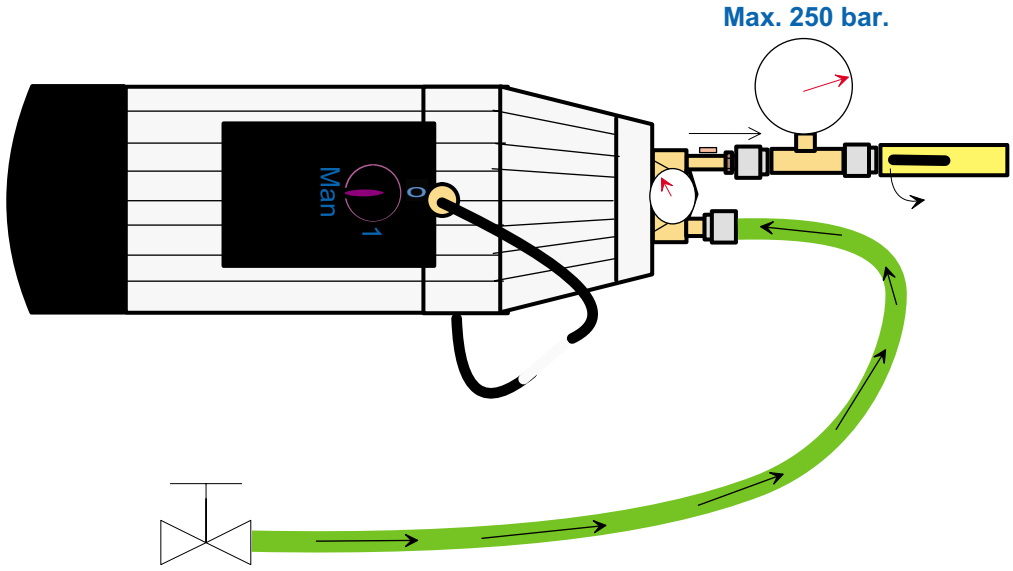
Poss. cause/ Check	Circuit breakers	Contactor + coil	Electrical connections + plug	Temperature sensor in motor	Start switch	Print + reed switch	Piston for bypass valve	Pump pressure + h-p nozzle	Suction valve + seat	Pressure valve + seat	Leaks in hoses	Bypass valve + disc	O-ring in cylinder head	Water filter	Pressure sleeve	Air in pump	Safety valve	Water supply	Water temperature	Suction height	Suction cup on bypass valve	Oil sleeve + oil hoses	Suction sleeve	Flow control
Symptom:																								
Motor doesn't start	X	X	X	X	X	X																		X
Motor doesn't stop																								X
Motor stops	X	X	X	X		X		X																
Max. pressure too high								X																
Max. pressure too low							X	X	X	X	X	X	X	X	X	X	X	X						
Max. pressure irreg. in suction									X		X			X		X			X	X	X		X	
Max. pressure 50-70 bars								X									X	X						
Max. pressure pulsating										X				X				X						
Bypass pressure too high							X					X									X			
Oil consumption too high																						X		
Pump run only bypass							X										X							
Bypass valve "thumps"							X	X									X							
Uneven pressure during operation							X										X							
Pump doesn't go into bypass							X					X												

Safety valve

The safety valve's factory setting for opening pressure = working pressure + 25 to +30 bars.
Upon each service inspection the setting must be tested and, if necessary, adjusted.
When mounting, affix ball and pressure plate to the spring with lubrication.
The seat is screwed on using a 10mm socket wrench (no gasket required).
Before testing with a pressure gauge, make sure that two threads are visible behind the locknut.

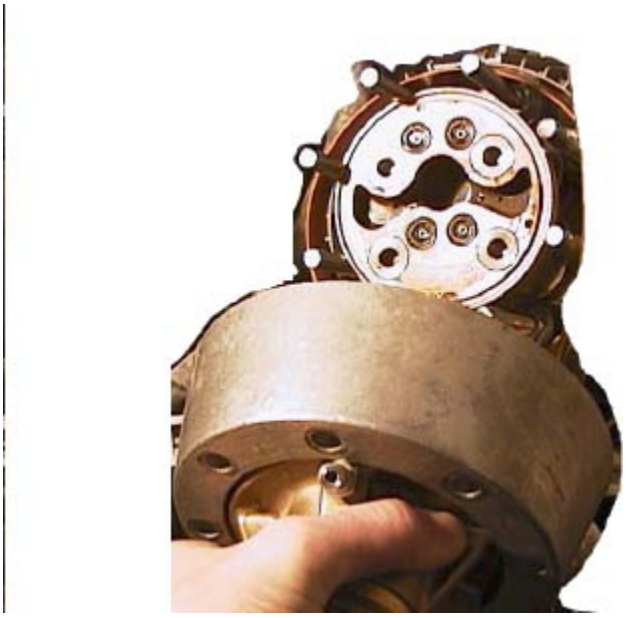
Warning: Before starting the pump, check that the test manometer valve is open. Close the valve slowly; pressure must never exceed 250 bars.

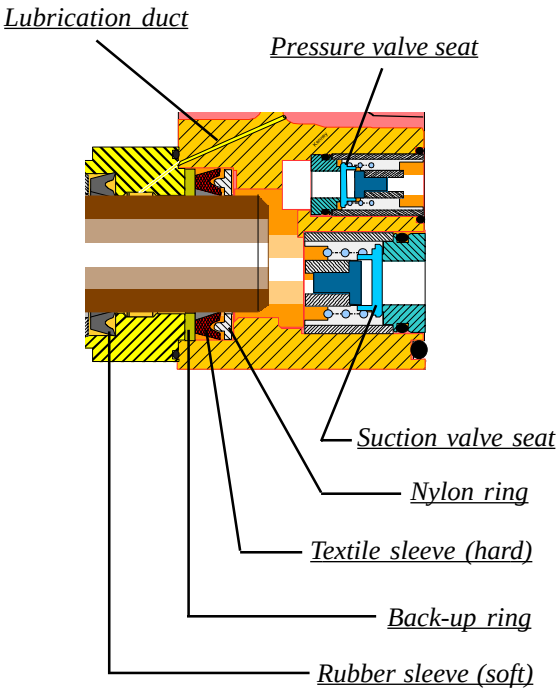




Valve cylinder head 1

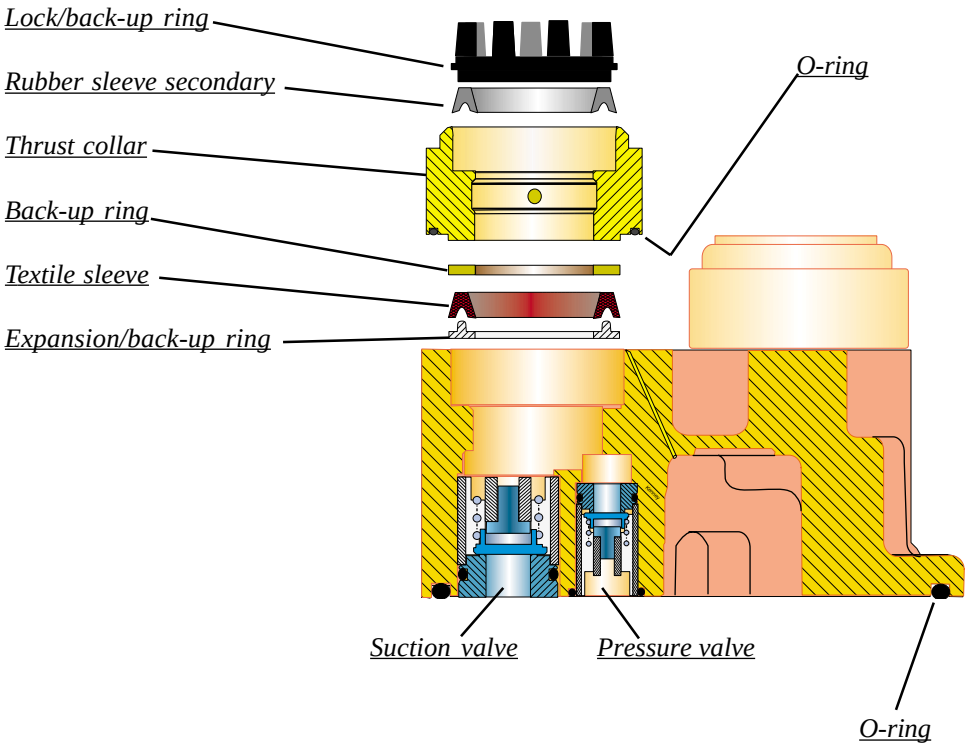
Removal and mounting is done manually.
Lubricate the large O ring with grease.





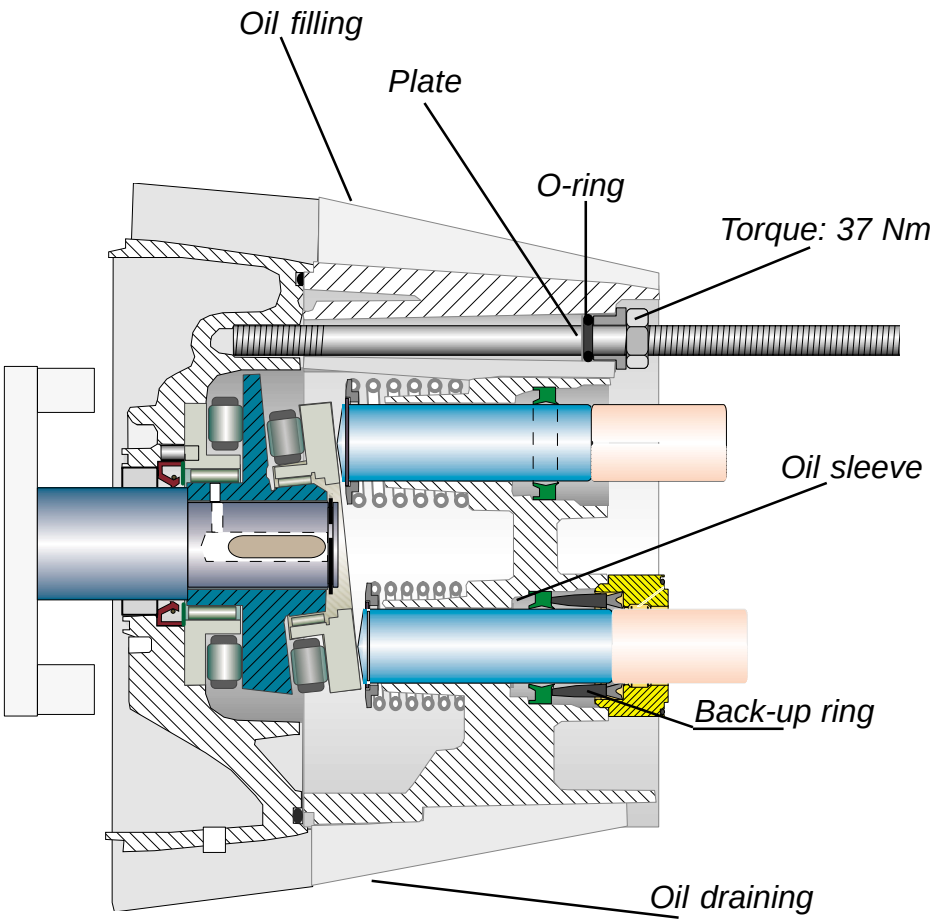
Remove the suction valve seat using impact piercer no. 1216506.
Press out the pressure valve using a 2 mm piercer.
Check valve seats.
Mount again with fingers.

Valve cylinder head 2



When mounting textile sleeves, use tool no.: 1220090.
It helps to place the sleeves in a water bath 3-4 hours before mounting.
Remember to blow through the lubrication ducts with compressed air.

Cylinder block 1



Drain the oil by loosening the plug at the bottom of the cylinder block.
Loosen the 8 nuts evenly in consideration of the pressure from the piston springs.
Use special head no. 1206762.
Mount new O rings on stay bolts using tool no. 1206812.

When changing the oil, loosen the hose connection above the cylinder block.
Oil (0.5 litres) is poured into the threaded hole.

Testing has shown that the pump does not consume oil during normal operation.
In other words, under normal circumstances you do not need to refill oil in the pump.
Nevertheless, the oil level and quality must be checked regularly through the liquid indicator.

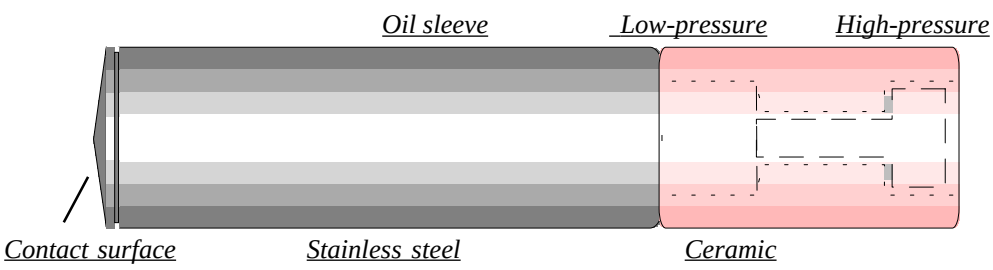
Always replace secondary sleeves when replacing pressure sleeves.
Check for free passage in the thrust collar's drainage holes.

Cylinder block 2

Carefully lift the oil sleeves out with a suitable screwdriver and dispose of them.
Be careful not to scrape the surface.

Before inserting the new sleeves, it is a good idea to moisten the sleeves with soapy water.
Insert new oil sleeves using piercer no. 1220429.

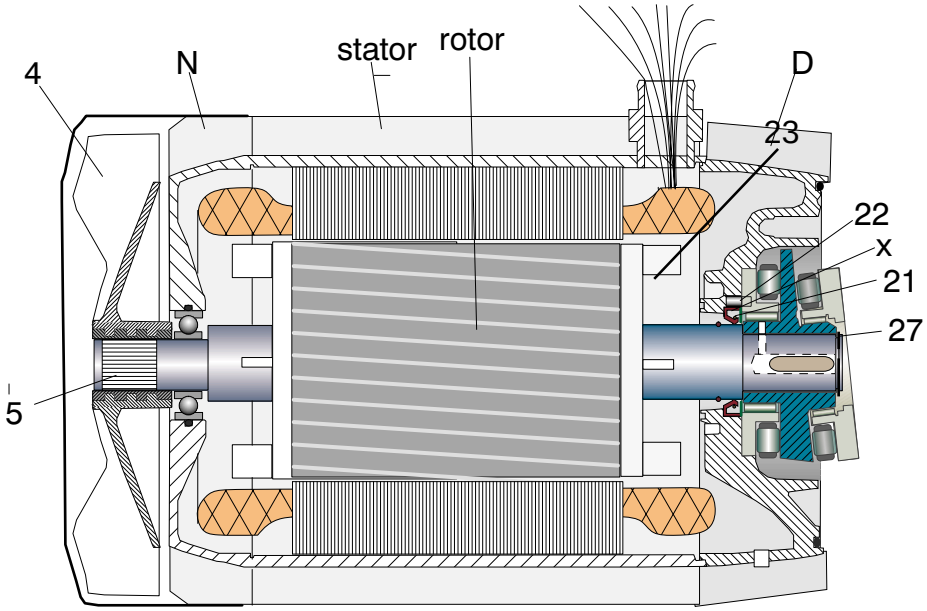
Gently tap or press in.



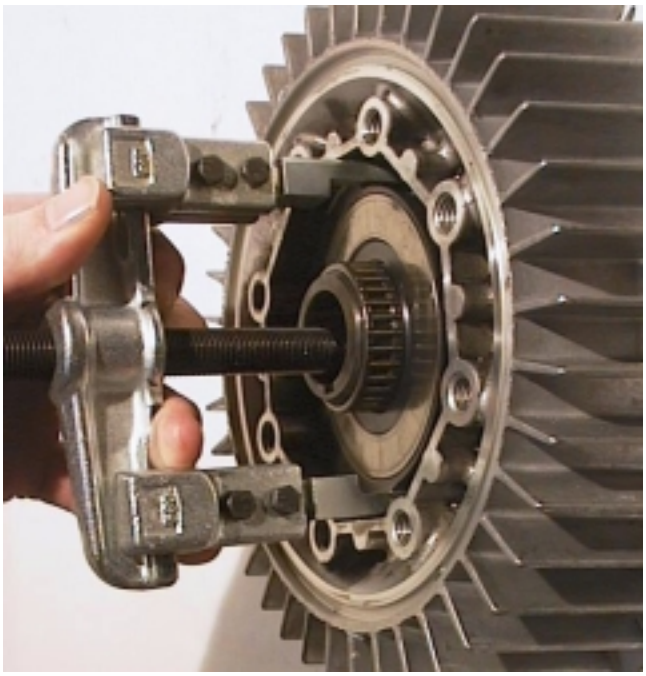
Inspect the piston for wear on the contact surface and in the area for oil sleeves. Examine the ceramic for cracks, and wipe clean any deposits.

Motor / wobble disc 1

The motor consists of a stator with windings, a rotor with an axel that is held in place with a bearing in the N-bearing cover and the wobble disc's innermost needle bearing in the D-bearing cover.
Ventilator 4 is pressed onto the rotor over locking bush 5 and is mounted with two screws.
The wobble disc's pressure plate 23 is held in place with peg 22. Plate 21 ensures that needle bearing 24 is held apart from oil sleeve X.

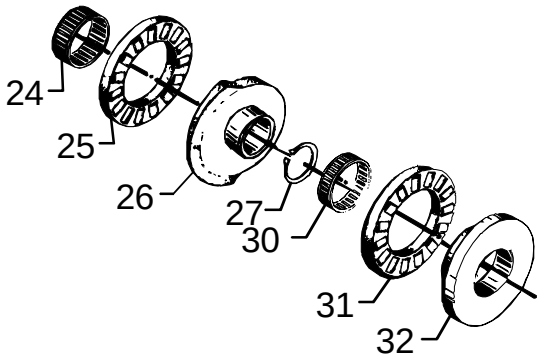


Remove locking ring 27.
The wobble disc is easily removed with wheel dresser no. 1205715 and special leg no.1206150/1206168.
Remember to remove parallel key 17 before removing D-bearing cover.
Check bearing surfaces for wear.
If in doubt, replace set 28 completely.



Motor / wobble disc 2

When mounting complete D bearing cover, protect the oil sleeve using tool no. 1206598, and place it on the axel before mounting



When mounting the wobble disc, lubricate the bearings with oil. The large roller bearings 25 and 31 are identical. Remember to place locking ring 27 on the axel.

No. 26

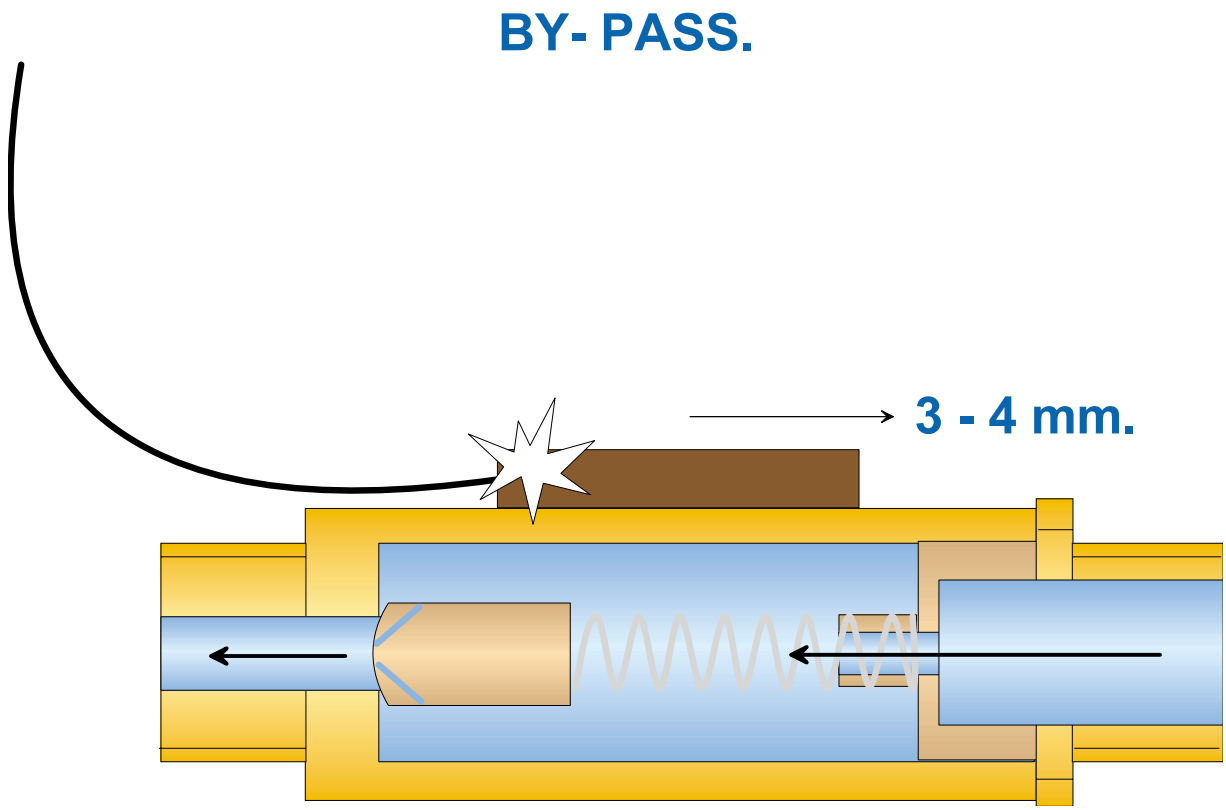
No. 32

Inspect the bearing surfaces for wear. As long as there is only regular wear without holes or ridges, as in the pictures above, the wobble disc can be used again.

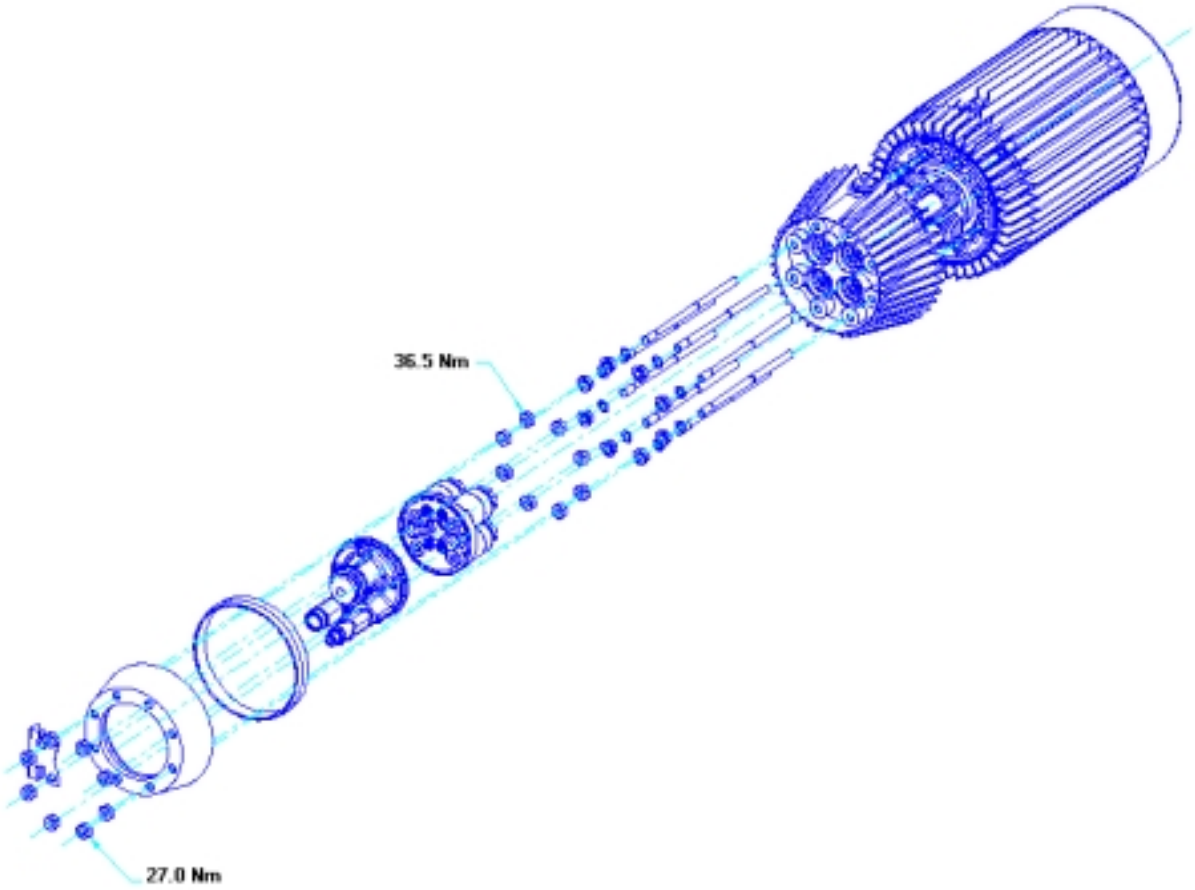
Adjustment of reed switch

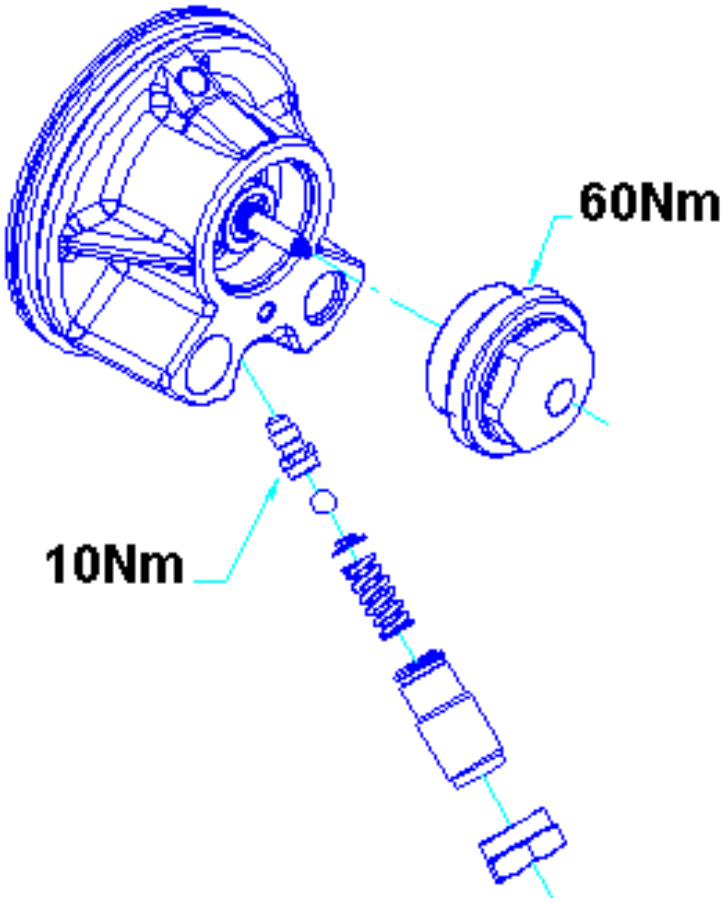
Place the reed switch in the plastic case with the screw loose enough so that the switch can still be moved back and forth.
Place the reed switch as far forward in the direction of the water outlet as possible.
Start the machine on setting 1, without a water connection.
After approx. 20 seconds, the machine stops, and you can then adjust the reed switch.
Slowly push the reed switch back until the machine starts.
Next pull the reed switch approx. 3 mm away from the machine, and tighten the screw in the plastic casing.
Finally, test the start/stop function with a water connection to the machine.

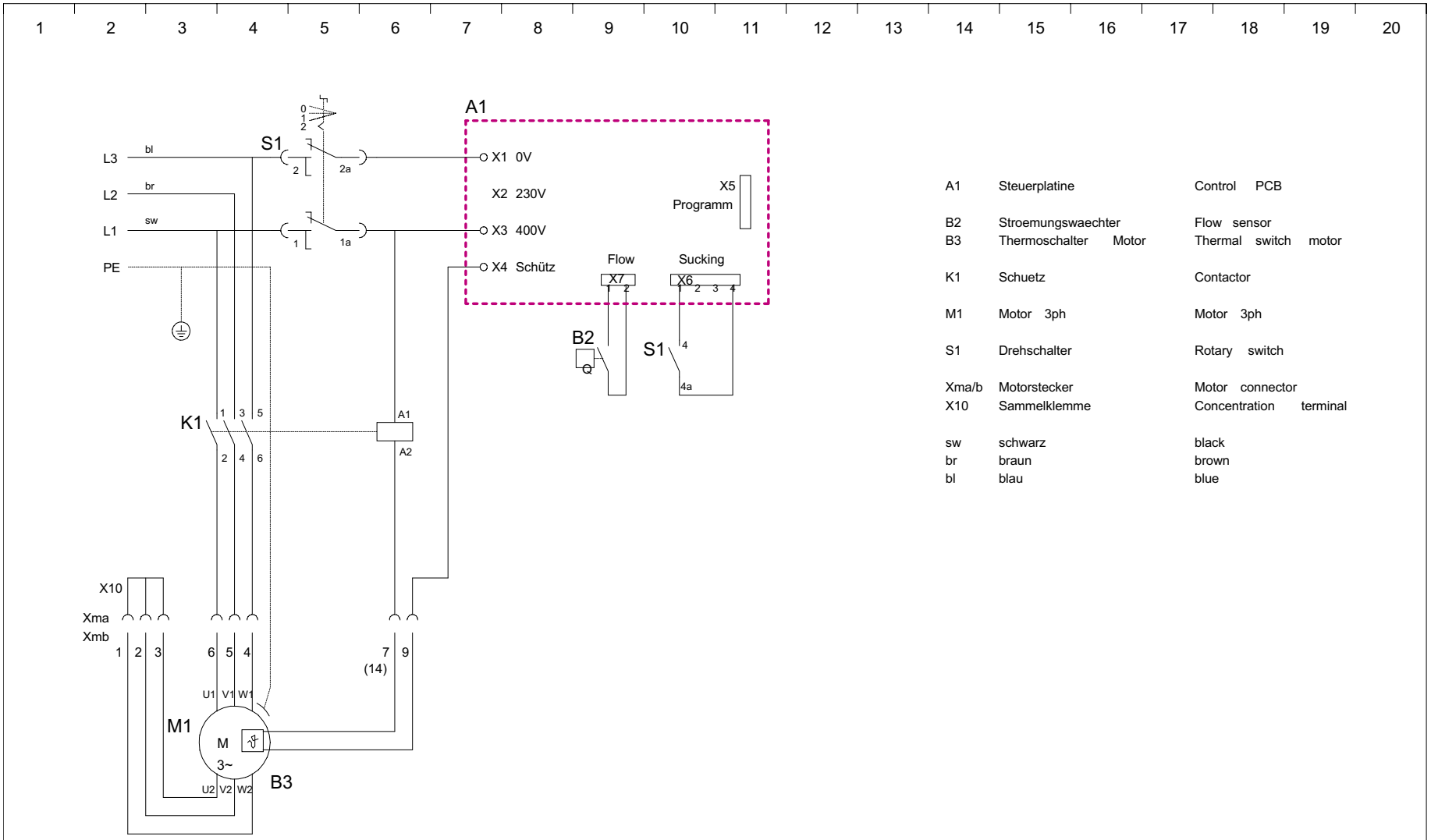
This adjustment can also be made with an ohmmeter. In that case, remember to disconnect the machine from the power source.



Torque







A1	Steuerplatine	Control PCB
B2	Stroemungswaechter	Flow sensor
B3	Thermoschalter Motor	Thermal switch motor
K1	Schuetz	Contactor
M1	Motor 3ph	Motor 3ph
S1	Drehschalter	Rotary switch
Xma/b	Motorstecker	Motor connector
X10	Sammelklemme	Concentration terminal
sw	schwarz	black
br	braun	brown
bl	blau	blue

	Änderung	Datum	Name		Datum	Name
				gez.	27.09.01	Poeschl
				gep.		

Bez. 3ph Stern

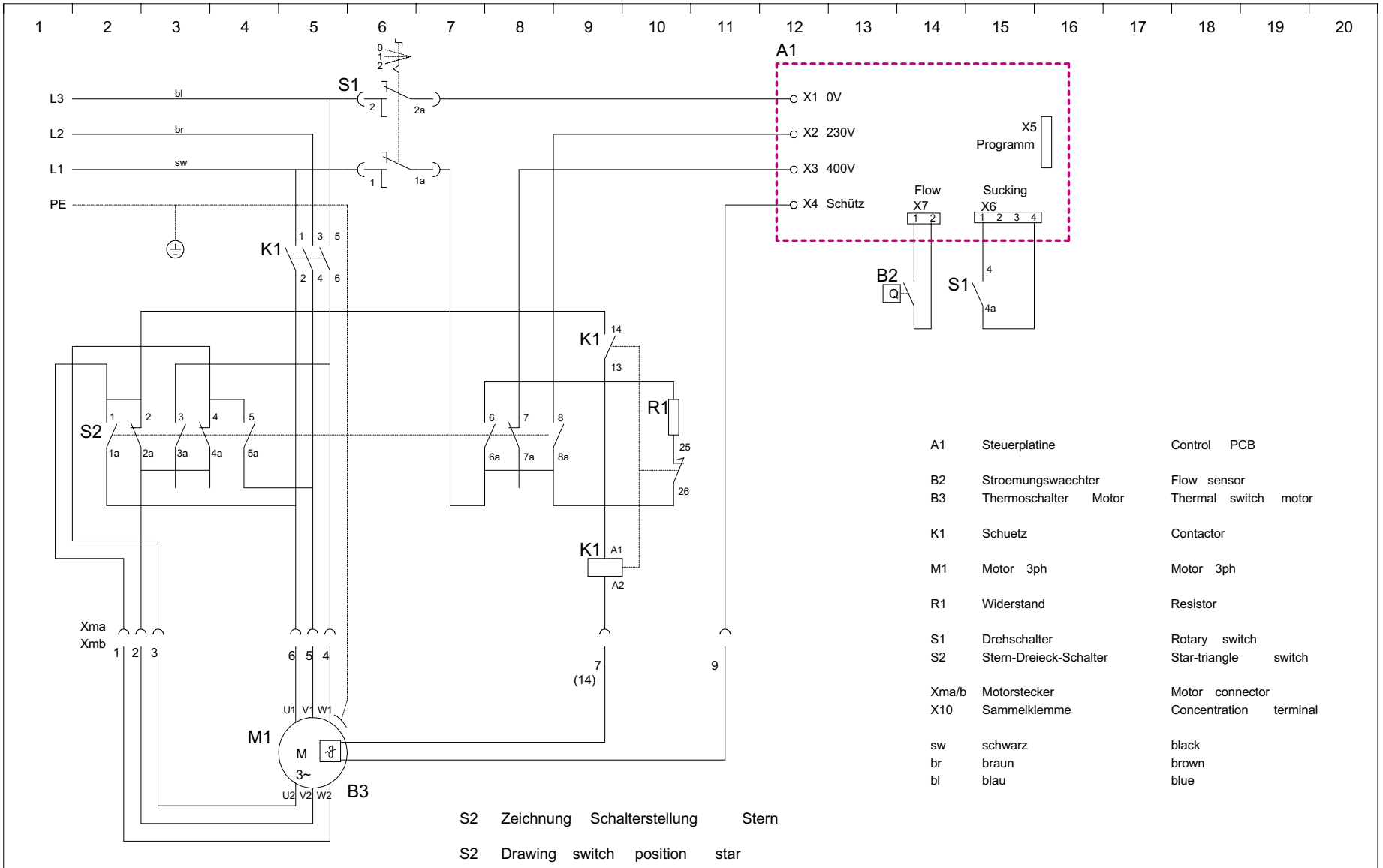
Zeichn.-Nr.: 71186

Projektbez. Poseidon

Bl. 1 von 1

Wiring Diagrams

G



A1	Steuerplatine	Control	PCB
B2	Stroemungswaechter	Flow	sensor
B3	Thermoschalter Motor	Thermal switch	motor
K1	Schuetz	Contactor	
M1	Motor 3ph	Motor 3ph	
R1	Widerstand	Resistor	
S1	Drehschalter	Rotary	switch
S2	Stern-Dreieck-Schalter	Star-triangle	switch
Xma/b	Motorstecker	Motor	connector
X10	Sammelklemme	Concentration	terminal
sw	schwarz	black	
br	braun	brown	
bl	blau	blue	

S2 Zeichnung Schalterstellung Stern

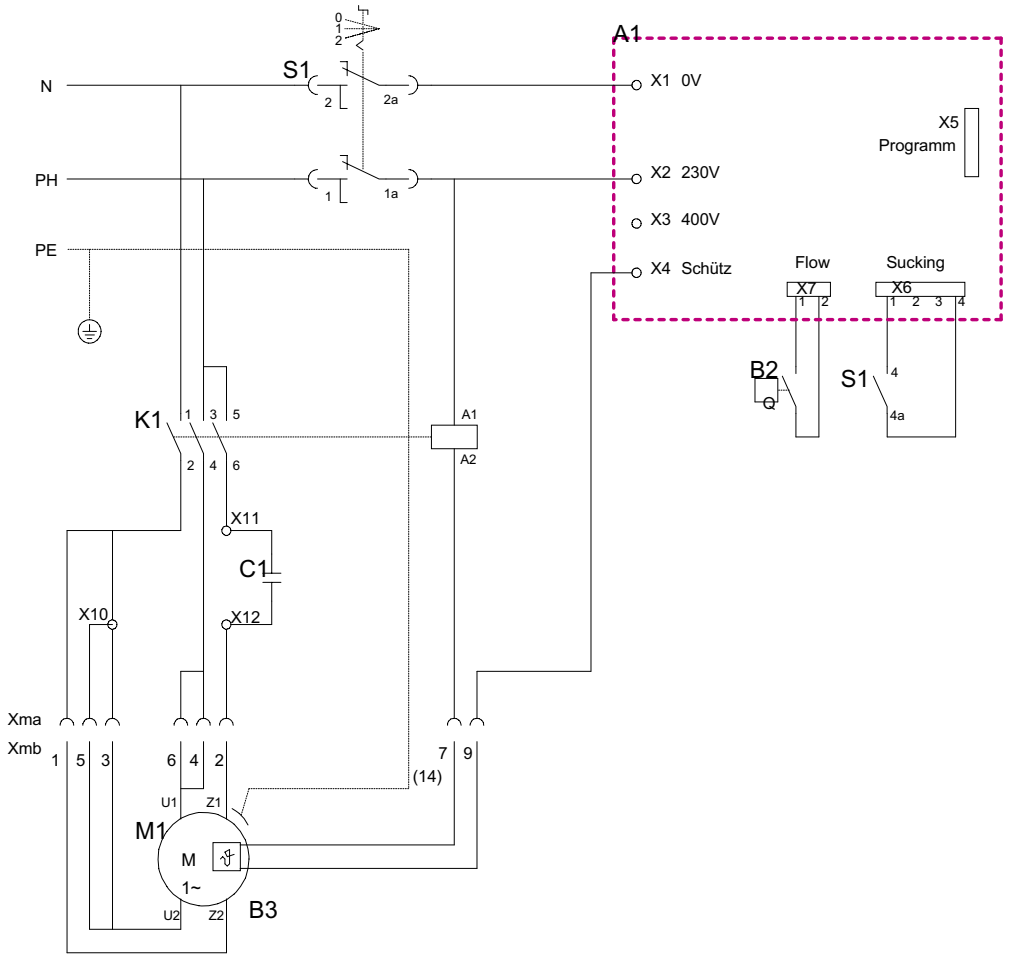
S2 Drawing switch position star

	Änderung	Datum	Name		Datum	Name
				gez.	16.11.01	Poeschl
				gep.		

ALTO

Bez. 3ph umschaltbar | Zeichn.-Nr.: 71199 | Bl. 1

Projektbez. Poseidon | von 1

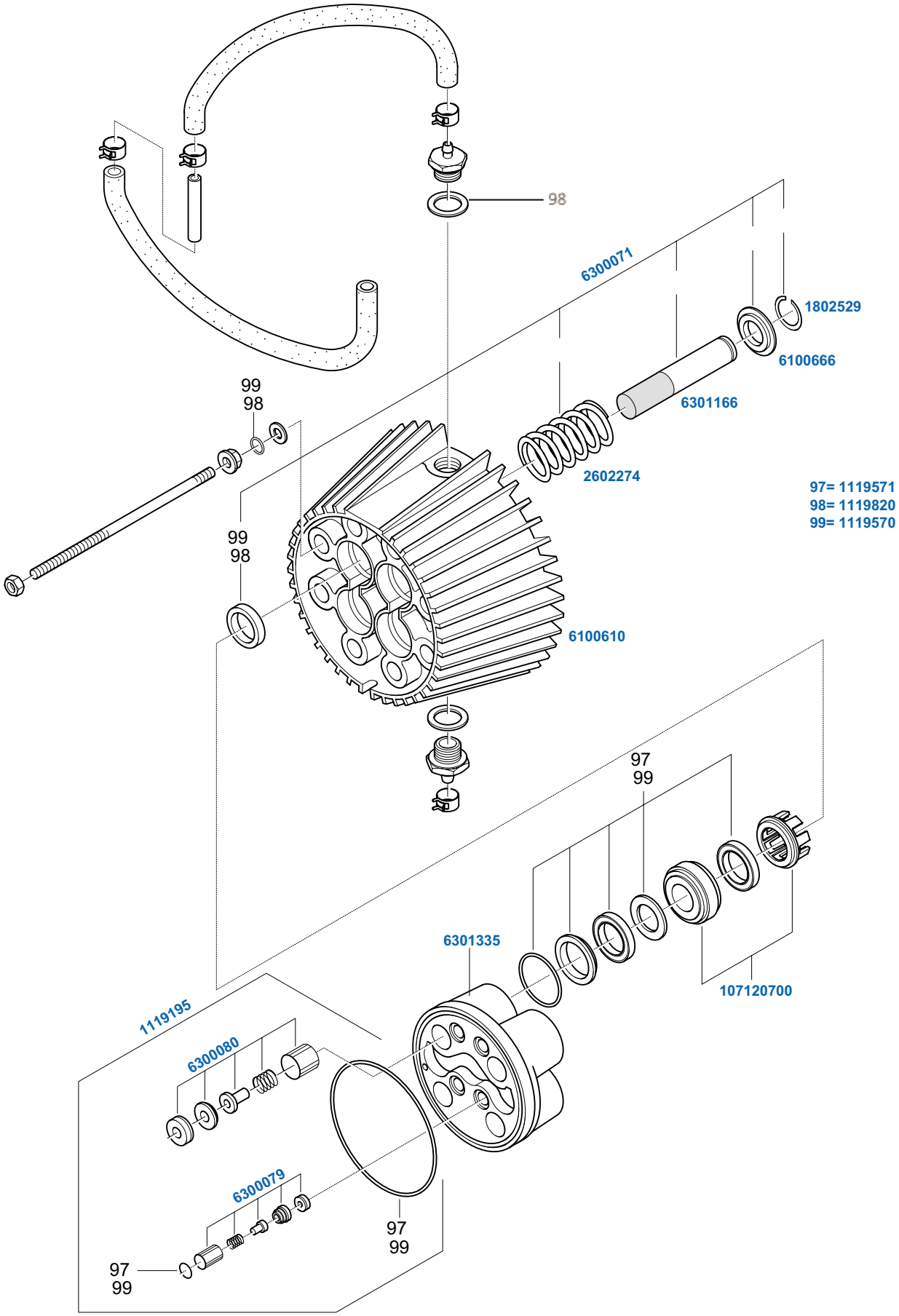


A1	Steuerplatine	Control	PCB
B2	Stroemungswaechter	Flow	sensor
B3	Thermoschalter Motor	Thermal	switch motor
C1	Betriebskondensator	operating	capacitor
K1	Schuetz	Contactor	
M1	Motor 1ph	Motor	1ph
S1	Drehschalter	Rotary	switch
Xma/b	Motorstecker	Motor	connector
X10	Sammelklemme	Concentration	terminal
X11/12	Reihenklemme	Terminal	Strip

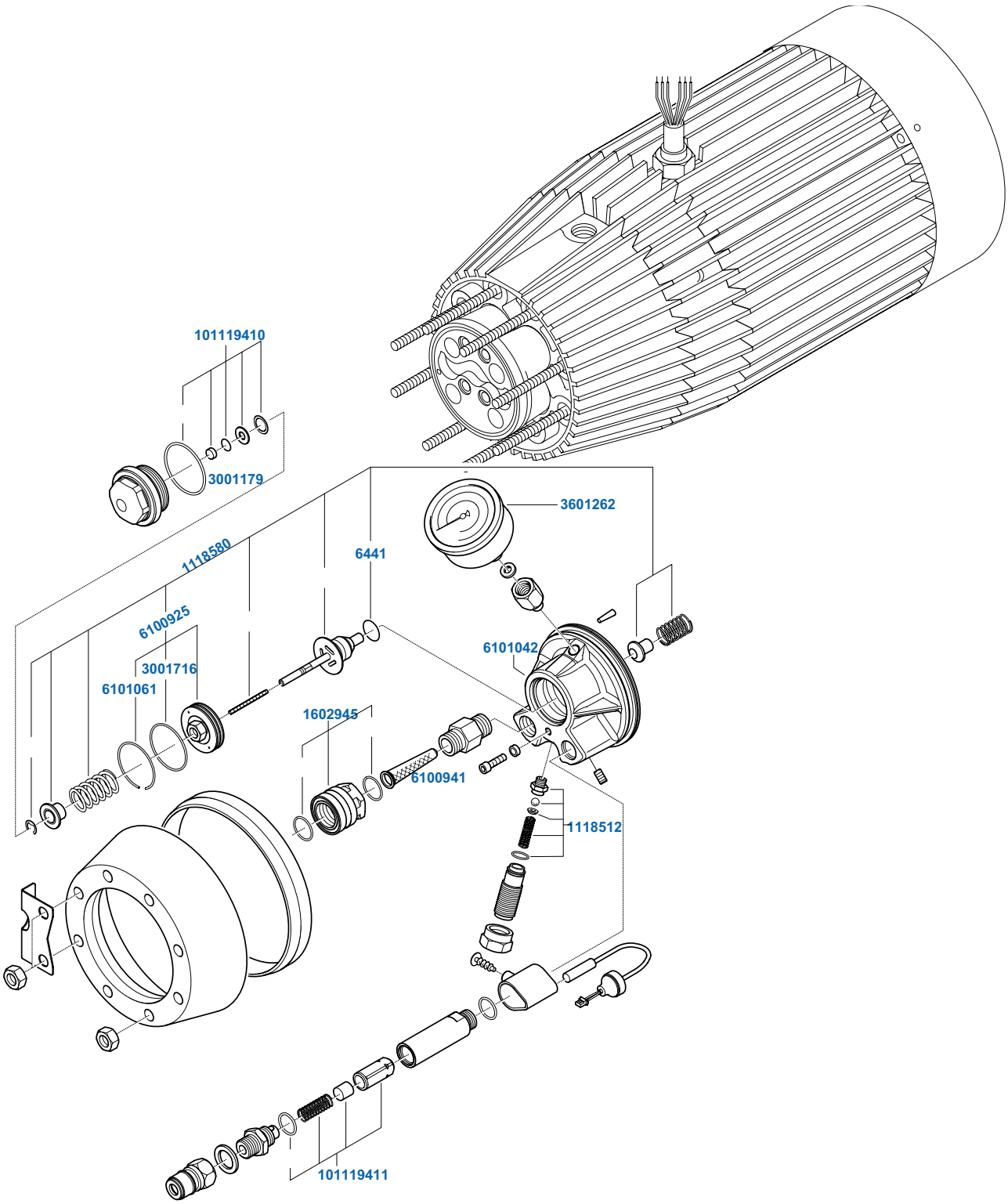
	Änderung	Datum	Name		Datum	Name
				gez.	28.01.02	Poeschl
				gep.		

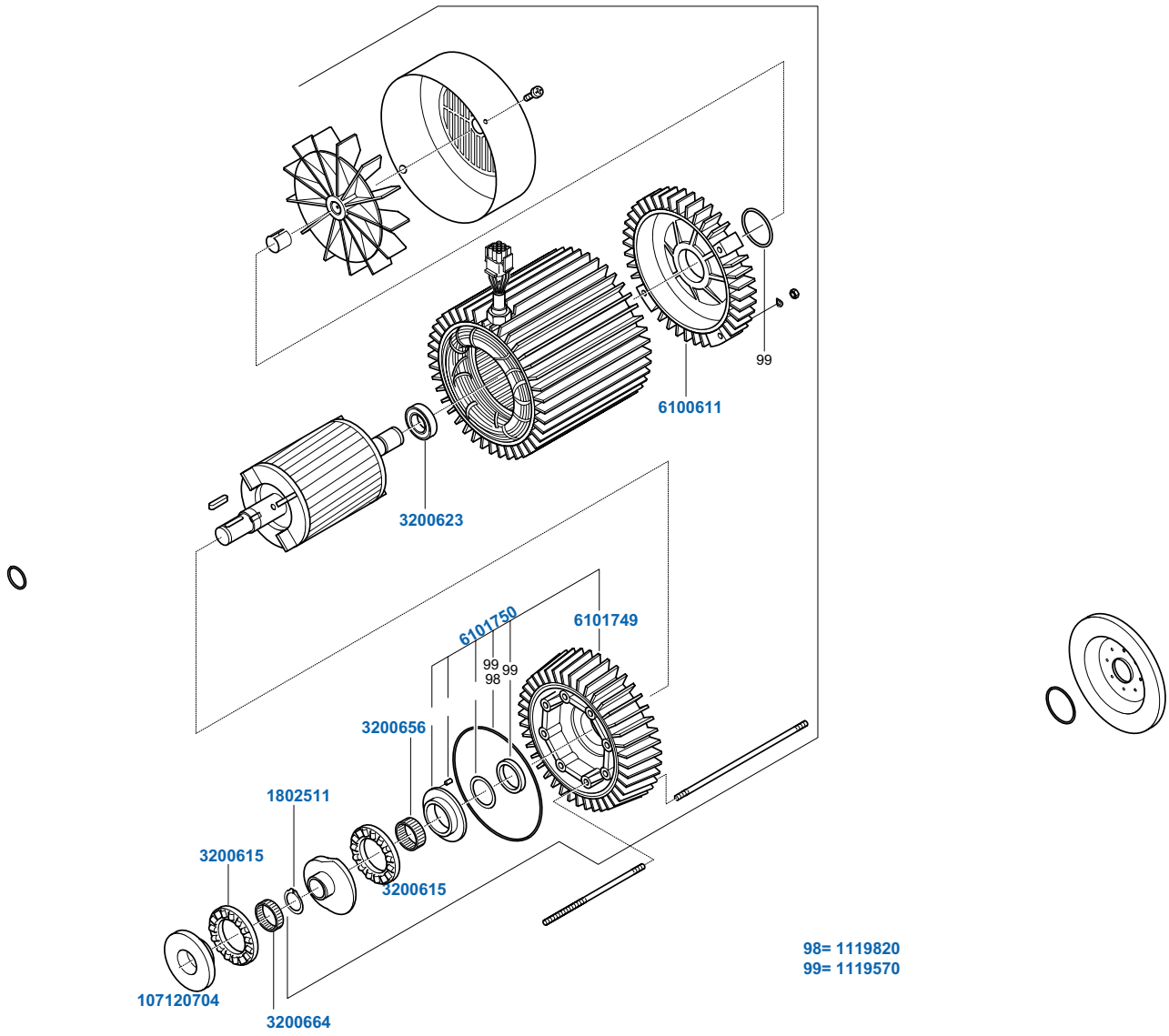
Bez.	1ph Standard	Zeichn.-Nr.:	71205
Projektbez.	Poseidon	Bl.	1
		von	1

Spare Parts Proposal



Spare Parts Proposal

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