

PSP 21 - PSP 22 - PSP 23

Electropumps

Installation and maintenance

PSP 21 - PSP 22 - PSP 23

Electropumps

GENERAL INFORMATION

1 - GENERAL INFORMATION

The PSP 21, PSP 22 and PSP 23 electropumps must be installed in accordance with the instructions in this manual. They must not be used for operating conditions other than those given in this document.

Failure to comply with the information in this manual, or any modification made to the equipment, without LEROY-SOMER's agreement, will invalidate the warranty. LEROY-SOMER accepts no responsibility in the event of failure to comply with the instructions given in this document.

This manual does not take account of safety rules and regulations in force for the location where the equipment is installed, which the user is responsible for enforcing and complying with.

2 - USE

PSP series electropumps are designed to pump water, oil and any clear, non-contaminated, non-abrasive, non-corrosive and non-explosive liquid, compatible with the materials of which the pump is constructed.

For other liquids to be pumped: please consult Leroy-Somer.


- Maximum temperature of pumped liquid: 110°C
- Minimum temperature of pumped liquid: - 10°C
- Maximum viscosity of pumped liquid: 20 centistokes or 3° Engler
- Maximum ambient temperature: 40°C
- Maximum duty pressure of the pump (delivery): 6 bar
- Density of pumped liquid: 1.

3 - CHARACTERISTICS

Each electropump is fitted with two identification plates. One defines the hydraulic unit, and the other, the motor.


3.1 - Hydraulic characteristics

The hydraulic characteristics are guaranteed to comply with international standard ISO 9906 level 2, for series production pumps.

	TYP	PSP 23 T	Electropump type
	N [∞]	A 950371	Electropump serial no.
	H max	42 m.	Maximum total manometric head in metres

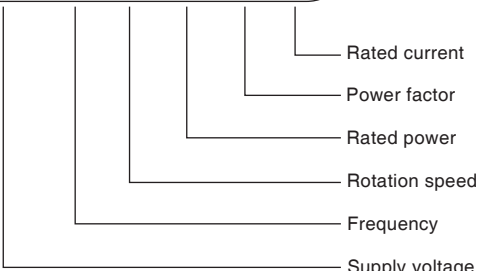
MOTEURS LEROY-SOMER

3.2 - Electrical characteristics

		N 343566DG		1995		Motor serial number
		Mot 3 ~ LS 71				Motor type
IP 55	I.cl. F 40C	C	μf			V
S1	%	c/h	C	μf	V	

V	Hz	min ⁻¹	kW	cos φ	A
220/230	50	2780	0,3	0,9	1,55
240	50	2780	0,3	0,8	1,55
380/400	50	2780	0,3	0,9	0,9
415	50	2780	0,3	0,8	0,9

MADE IN FRANCE



4 - HANDLING

The electropumps must be handled and unpacked carefully.

5 - STORAGE

Storage under correct conditions avoids the electropumps deteriorating in any way.

They must be stored protected from adverse weather conditions, dust, vibrations and impacts, in a dry, closed location.

If there is a risk of frost at the storage location, make sure the pump is drained.

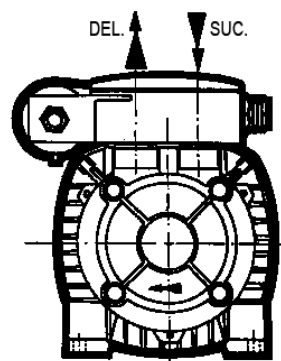
Before starting or restarting an electropump unit, follow the directions given in this manual.

6 - INSTALLATION

An electropump must be installed by people qualified for this type of work.

Place the electropump as close as possible to the water supply in an easily accessible place.

The intake and outlet ports are arranged in accordance with the diagram below.



PSP 21 - PSP 22 - PSP 23

Electropumps

ELECTRICAL CONNECTION

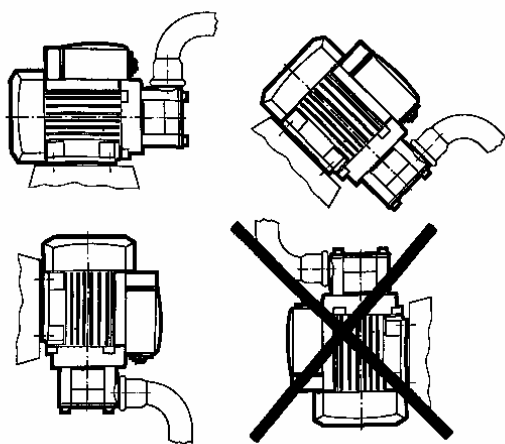
Intake port on the right, seen from the pump side end.
As the hydraulic unit is symmetrical, the intake and outlet ports can be reversed when it is fitted with a 3-phase motor, and only in this case.

Make sure then that the motor turns in the correct direction.
The suction and discharge pipework must be mounted so as not to create mechanical forces on the pump body.

The pump has been designed for connections to the intake and outlet ports with 3-part connectors with an external diameter not exceeding 35 mm.

The tightening torque on the connection ports must not exceed 3 m daN.

It is recommended to fix the electropump to its support.
The electropump can be installed in various positions, except for motor underneath the pump (see sketch below).



The electropump must be installed in a ventilated room, protected from adverse weather.

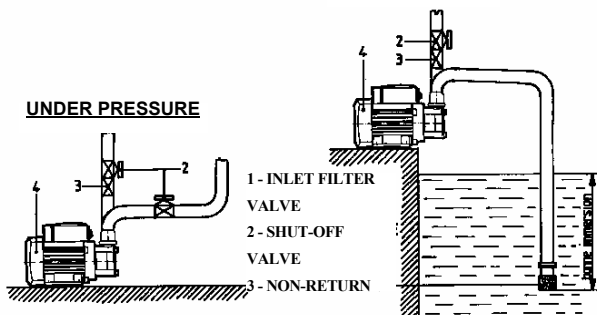
6.1 - Suction pipework

This pipework must have a diameter sufficient so as not to create head losses that are too great. It must be completely leakproof, capable of withstanding low pressure and not having any high point.

A leakproof inlet filter valve must be mounted at its end.
A slope of 2% upward towards the pump is recommended in order to bleed the pipe properly.

The inlet filter must not allow the passage of particles larger than 2 mm. It must be situated at a depth below the level of the lowest water, not permitting siphoning of the external air, and be well away from the walls and bottom of the well or tank.
If the electropump is working under pressure, the inlet valve is replaced by a shut-off valve for isolating the pump.

SUCTION MODE



UNDER PRESSURE

6.2 - Discharge pipework

The diameter of this must be chosen after carefully calculating the head losses of the installation.
On this pipe, provide a flow adjustment valve with a non-return valve placed upstream of it.

6.3 - Prior to first start-up

Make sure that the electropump turns freely without sticking.
To do this, remove the fan cover and turn the fan a few revolutions by hand.

Fill the suction pipework and the pump taking care to bleed the air via the outlet port. Perform this operation by turning the electropump rotor until the water comes out with no air bubbles.

Check that the inlet filter valve is completely leakproof by making sure there is no drop in level via the outlet port.

7 - ELECTRICAL CONNECTION

The electrical connection must be done by a qualified electrician, complying with the current regulations.

If the electropump has been left in a damp atmosphere, check the insulation resistance of the motor before making any electrical connections. This must not be less than 10 Megohms when cold at 500 volts for 60 seconds.

7.1 - Power supply

Make sure that the supply voltage shown on the motor nameplate corresponds to that of the mains supply.
Check that the cross-section of the incoming and outgoing conductors of the meter is sufficient to provide a correct power supply for the electropump.

7.2 - Connections

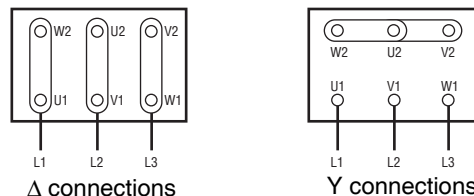
Standard construction motors are supplied connected as follows:

3-phase

Δ 230 / Y 400 V at 50 Hz

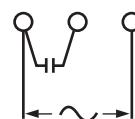
Make quite sure that the connections match the mains voltage.

They must be done in accordance with the diagram below which is contained in the cover of the terminal box.



Single-phase

230 V single-phase at 50 Hz



PSP 21 - PSP 22 - PSP 23

Electropumps

STARTING THE ELECTROPUMP

7.3 - Protection

Make the earth connection in accordance with the current regulations.

To maintain the validity of the warranty, it is essential to protect the motor electrically using a thermal magnetic circuit breaker placed between the isolating switch and the motor.

This circuit breaker may be combined with fuses.

Before starting the electropump, the circuit breaker must be temporarily set at the current indicated on the identification plate for the corresponding mains supply voltage.

The permanent setting shall be made in accordance with the information in section 8.

So as not to subject the electropump to temperature rises that are too great, a maximum of 40 starts per hour must not be exceeded.

This number of starts must be spread over the entire hour.

8 - STARTING THE ELECTROPUMP

An electropump must never operate dry. The quality of the friction surfaces and correct sealing of the mechanical seal depend on this.

– Open the intake valve (pump under pressure situation).
– Fill the pump and suction pipework with liquid to be pumped.

– Close the discharge flow adjustment valve.

– For electropumps with a 3-phase motor, make sure that the direction of rotation is the same as that shown by the arrow on the fan cover. To do this, run the motor for a few revolutions. If the direction of rotation is reversed, change the connection at the motor terminal block by reversing two power supply wires.

– After starting, when the motor has reached its steady speed, make sure that the discharge pressure is normal and not subject to significant fluctuations. If this is not the case, stop the unit and fill the pump again. If the fault persists, look for air inputs in the suction pipework.

– If the motor speed is insufficient, check the connections.

– Gradually open the discharge valve to the required flow/pressure point.

Take care not to leave the discharge valve closed for more than 2 minutes.

– With the electropump operating normally, read the maximum currents drawn from each phase. Permanently set the circuit breaker for a current slightly greater than the maximum read. This must never exceed the current shown on the motor nameplate.

– Check that the voltage at the motor terminals is correct.

– Any difference is an indication of abnormal operating conditions of the unit (voltage drop, open-circuit phase, incorrect adjustment, foreign body in the pump, sludge, etc.).

– The electropump must turn steadily, without vibrating.

– Never operate with a valve closed (intake or discharge).

Under no circumstances is dry operation permitted.

9 - STOPPING THE UNIT

– Turn off the motor's electrical power supply.

– If the unit is to be stopped for a lengthy time and/or there is a risk of frost, drain the suction and discharge pipes and the pump or protect it against frost by suitable means.

10 - SERVICING

There is practically none.

The bearings are sealed and greased for life and require no servicing. The mechanical seal must be changed if there is pronounced wear or a leak. Electropumps installed as backup must be run once a week for a short time, in order to make sure they are working correctly.

Dismantling of the electropump after 2 years or 10,000 hours' operation is recommended so that parts subject to wear (mechanical seal, turbine, etc.) can be examined and replaced if necessary. After a lengthy period of stoppage, check that the pump is not seized (turn it using the fan side shaft extension).

11 - DISMANTLING - REASSEMBLY

Dismantling and reassembly of an electropump must be carried out by personnel qualified for this type of work.

Where one or more components of the electropump are replaced (spare parts), it is essential to refit parts supplied by LEROY-SOMER, otherwise the warranty will be invalidated and the manufacturer will decline responsibility. Any work carried out on an electropump makes the person carrying out the work responsible.

Before any work is carried out on the electropump:

– Disconnect the motor's electrical power supply

– Close the intake and discharge valves

– Make sure that the pump body is not under pressure

– Drain the pump

11.1 - Dismantling

After dismantling the suction and discharge pipework, proceed as indicated below. Remove:

– The 4 screws (83) and their washers (2.83).

– The cover (19) with its 'O' ring (81).

– The turbine (26).

11.2 - Changing the mechanical seal

After dismantling the hydraulic unit as indicated above, remove:

– The Woodruff key (54).

– The circlip (85) and the plain washer (67).

– The slip-ring (71).

– The spacer ring (72).

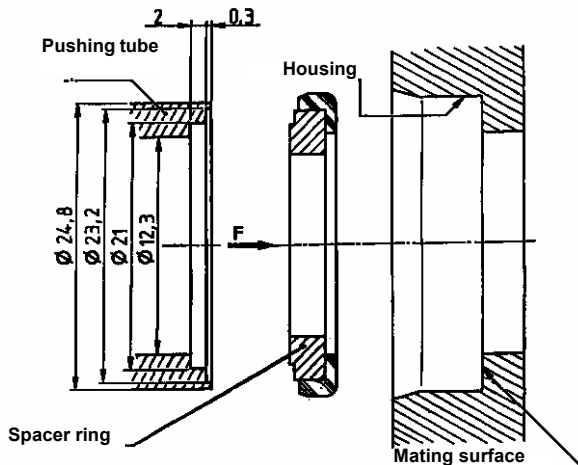
PSP 21 - PSP 22 - PSP 23

Electropumps

SPARE PARTS

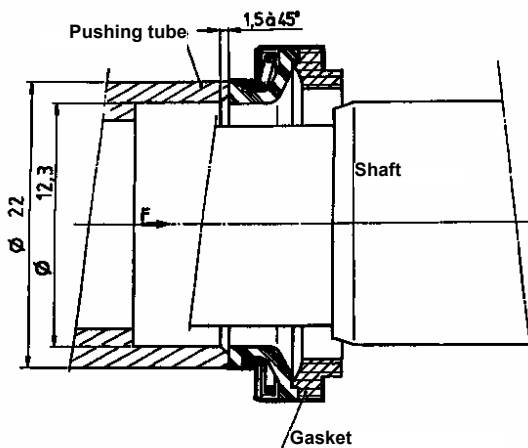
Refitting a new seal:

- The spacer ring housing must be clean.
- Fit a new spacer ring, lubricating the rubber ring and its housing with a 10% solution of Teepol in clean water.
- Insert the spacer ring (72) into its housing in the body (21) by exerting pressure with a plastic tubular mandrel, as shown in the diagram below.



Be careful not to scratch the friction face and make sure that the spacer ring is resting perfectly in the back of the body.

- Make sure that the friction face is dry and clean, together with the part of the shaft accommodating sliding of the slip ring (71).
- Re-fit a slip ring (71), after first lubricating it with the same solution as the spacer ring, using a suitable tool in accordance with the diagram below.



- During these various operations, make sure not to damage the friction faces of the mechanical seal.

11.3 - Reassembling the hydraulic unit

- Before reassembly, it is necessary to check the cleanliness and wear of the parts.
- Reassemble in the reverse order to dismantling.

Note: After the unit has been dismantled, fitting of a new mechanical seal is recommended.

12 - SPARE PARTS

When ordering spare parts, give the following information:

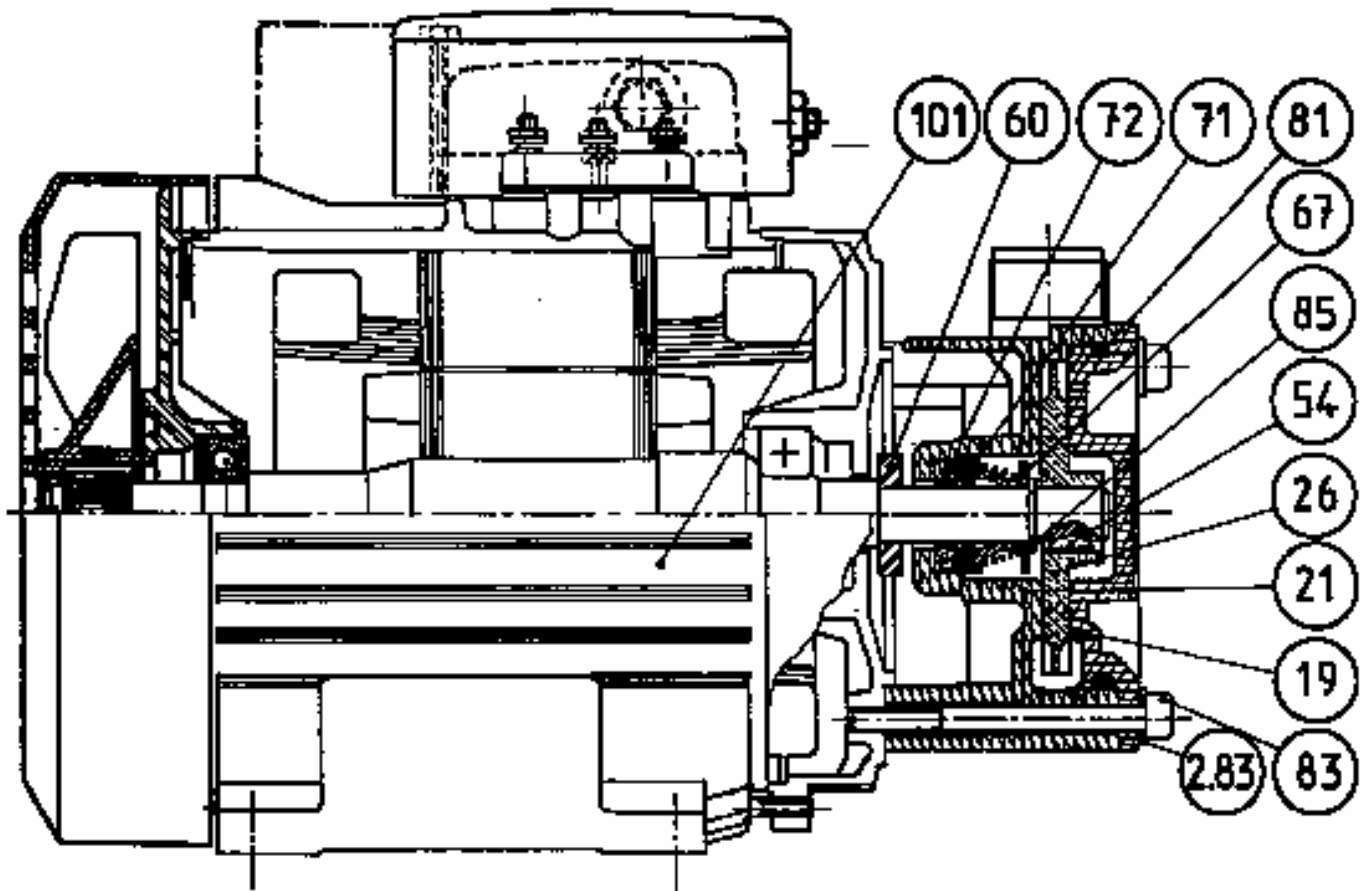
- The electropump type.
- The serial number of the electropump.
- The description of the spare part with its reference, appearing in the drawing and parts list mentioned in this document.

PSP 21 - PSP 22 - PSP 23

Electropumps

SPARE PARTS

Fault	Causes	Remedies
Motor does not start	<ul style="list-style-type: none"> - Faulty or incorrectly rated circuit breaker. - The mains supply voltage is correct but the voltage at the motor terminals is too low. - The motor is connected incorrectly. 	<ul style="list-style-type: none"> - Check. - Renew the unit's power supply line, increasing the wire cross-section by a sufficient amount. - Comply with the connection diagram (motor connections).
The pump does not start	<ul style="list-style-type: none"> - Insufficient filling of the pump body and suction pipework. - The inlet filter is not sufficiently immersed. - Direction of rotation reversed (3-phase motor). - Manometric suction head too great. - The suction pipework is not leakproof or has a reverse slope that forms an air pocket. - The valve is stuck. 	<ul style="list-style-type: none"> - Refill. - Check its immersion depth. - Reverse 2 conductors at the motor terminal block. - Reduce the head (reduce the head losses). - Check the suction pipework. - Check the valve.
Inadequate characteristics	<ul style="list-style-type: none"> - Direction of rotation reversed (3-phase motor). - The total manometric head is greater than that provided for. - Manometric suction head too great. - The pump, suction pipework or inlet filter are partially obstructed. - Suction reverse slope forming an air pocket. - Entry of air during suction. 	<ul style="list-style-type: none"> - Reverse 2 conductors at the motor terminal block. - Provide an electropump with higher characteristics or reduce the head losses. - Reduce the static suction head. - Reduce the head losses in the suction pipework. - Clean them and remedy the cause. - Give the suction pipework an upward slope of 2 cm per metre minimum. - Check that the suction pipework is leakproof. - Check the immersion depth of the inlet filter valve.
The circuit breaker trips	<ul style="list-style-type: none"> - Permanent excess pressure due to too high a viscosity or density of the pumped liquid. - Voltage drop too great. - 2-phase operation (3-phase motor). 	<ul style="list-style-type: none"> - Please consult Leroy-Somer. - Increase the voltage or the conductor cross-section. - Inspect the power supply cables and connection terminals.
Leak at the mechanical seal	<ul style="list-style-type: none"> - Faulty mechanical seal. 	<ul style="list-style-type: none"> - Check and replace all the mechanical seal elements (never operate dry).
Vibration of the unit	<ul style="list-style-type: none"> - Conformity of the various points given above. - Abnormal stresses on the flanges. - Faulty motor bearings. 	<ul style="list-style-type: none"> - Check them. - Check the fixing of the pump to its support and the connection of the pipework to the intake and outlet ports, then eliminate the stresses (positioning of the pipework or fitting of flexible collars). - Check and change the bearings (same dimensions and type).

PSP 21 - PSP 22 - PSP 23**Electropumps****SPARE PARTS**

Reference	Number	Description	Material
19	1	Pump cover	Ultem
21	1	Pump body	Ultem
26	1	Turbine	PES
54	1	Key	Stainless steel
60	1	Deflector	Nitrile
67	1	Coupling thrust washer	Stainless steel
71	1	Slip ring	Graphite + Nitrile
72	1	Spacer ring	Ceramic + Nitrile
81	1	'O' ring	Nitrile
83	4	Assembly screw	Steel
2-83	4	Washers	Steel
85	1	Circlip	Beryllium copper
101	1	Motor (Z30C13 shaft)	



LEROY-SOMER 16015 ANGOULÊME CEDEX - FRANCE

RCS ANGOULÊME N° B 671 820 223

Limited company with capital of €62,779,000

www.leroy-somer.com