

# Instruction and Maintenance Manual

## Self-priming Centrifugal Pumps Type S

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Spare Part List

Annex

Pump No.



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## A. Declaration of Conformity

We hereby declare that the self-priming centrifugal pumps type **S** comply with the following relevant requirements:

⇒ EC Machinery Directive 2006/42/EC, Appendix II A.

Pumps **without a drive unit** are intended to be connected to other machines. It is forbidden to start-up the machine in which the pump is installed if the machine has not been declared conform to the above named EC Directives.

By pumps **with a drive unit** that are modified and/or are not used for the purpose intended, will render null and void the validity of this declaration of conformity.

The following standards have been found helpful and have been used in their entirety or in part:

⇒ EN 809:2009

⇒ EN ISO 12100:2010

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## B. Introduction

### 1. Introduction

- 1.1 The instruction manual contains important information on how to operate the pump safely, properly and most efficiently. Observing these instructions helps to avoid danger, to reduce repair costs, downtimes and to increase the reliability and life of pump.
- 1.2 The operating instructions must always be available wherever the pump is in use.
- 1.3 The operating instructions must be read and applied by any person in charge of carrying out work on the pump.
- 1.4 Observe the mandatory rules and regulations for accident prevention and environmental protection in the country and place of use of the pump. The generally recognized technical rules for safe and proper working must also be observed.
- 1.5 It is presumed that fundamental project work as well as all work with regard to transport, assembly, installation, start-up, maintenance and repair is performed by qualified personnel or supervised by skilled labor taking overall responsibility.

### 2. Safety

- 2.1 A pump that is installed incorrectly, operated wrongly, or maintained poorly can present a hazard. If the following considerations are overlooked, the safety of personnel or satisfactory operation of the pump may be endangered.
- 2.2 Attention must be given to the safe handling of all items. Where pumps, pump units or components weigh in excess of 20 kg (44 lb.), it is recommended that suitable lifting equipment should be used in the correct manner to ensure that personal injury or damage to pump components does not occur.

<b>WARNING</b> Note that lifting eyes fitted to individual pieces such as pump and motor are designed to lift only this part and not the complete assembly.
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- 2.3 Before starting to dismantle a pump all relevant and appropriate safety precautions must be taken, particularly if the pumps have been handling hazardous or toxic products. Seek advice from your safety officer or the manufacturer if you have any doubts.
- 2.4 Always wear adequate protective clothing and eye protection when dismantling pumps that have been used to pump toxic or hazardous products. Breathing apparatus may be necessary.
- 2.5 Always isolate the pump electrically before dismantling. Ensure that the electrical switch gear cannot be operated whilst any work is being carried out on the pump.
- 2.6 Always drain the pump casing of product before removing the pump from its associated pipe-work.
- 2.7 Flush out the pump casing and shroud with a compatible flush and drain away to a safe area.
- 2.8 Check with your process people to see if any special decontamination procedures have to be followed before working on a pump.
- 2.9 All pumps returned for factory servicing must be decontaminated and labeled to inform what precautions should be taken before dismantling.

### 3. Shipment inspection

- 3.1 Pumps and units are shipped suitably protected to prevent damage in transit from normal handling. When received, the shipment should be inspected immediately. Damages to the packaging or crating that may reveal content damages when unpacked should be reported to the carrier and possibly photographed.
- 3.2 A photograph is helpful in any claims to be made against the carrier. Inform manufacturer or the local authorized distributor, too.



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- 3.3 Shipment shortages, checked against the transport documents, should be reported to the carrier.
- 3.4 Check the nameplate data against the shipping papers and against your purchase order to ensure that the proper pump is provided.

#### 4. Storage

- 4.1 After receipt and inspection, a pump not immediately installed should be repackaged and placed in suitable storage.
- 4.2 Protective coatings on unpainted surfaces should be inspected and left intact. Unpainted surfaces, not factory treated with a rust inhibiting coating, should have a protective coating applied.
- 4.3 Plastic or gasket type port covers should be left in place.
- 4.4 Pumps should be stored in a clean, dry location. When moist, dusty atmosphere must be used for storage, further protect the pump with a moisture repellent cover.
- 4.5 If the pump has been used please empty the pump casing by opening the clean-out cover or plug and fill with some corrosion inhibiting oil.

<p><b>WARNING</b> Never forget water inside pump casing during cold weather! Water may freeze and break the pump casing!</p>
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## C. Operation

### 1. Installation

- 1.1 Set up the pump on a flat surface as near as possible to the liquid to be pumped. Make sure that the surrounding is adequately ventilated.
- 1.2 Suction hose or pipe should be as short as possible and should have the same diameter as the pump port. It is recommended minimize the use of curves, corners or necks. This will reduce the priming time and ensure full capacity.
- 1.3 Check that any connections (threads, welds, gaskets, quick-couplings, valves, etc.) are completely airtight: if necessary, coat them with grease.
- 1.4 If present mount and fill the oil reservoir with oil or mount the automatic grease lubricator (see section D "Automatic Grease Lubricator", on page 8).
- 1.5 It is a good advice to use a suction strainer without valve (available on request).
- 1.6 Connect the electric motor with authorized personal only (see section E "Electric Motor", on page 9).

### 2. First Start-up

- 2.1 Use the pump only in the authorized performances levels indicated in performance curve, technical datasheet and instructions! The liquid should never be pumped on the limit of vaporization, crystallization, polymerization or solidification.
- 2.2 The material of the pump must be compatible with the pumped liquid. The pump manufacturer has no responsibility on this.
- 2.3 To self-prime the first time: Open the priming cover on the top of the pump. Fill the pump chamber completely with the liquid to be pumped. Close the cover.
- 2.4 Check that direction of rotation is the same as shown by the arrow on the back of the pump (clockwise when looking from the shaft or motor end).
- 2.5 Open all valves. Otherwise the mechanical seal can be damaged.
- 2.6 Start the pump and check after some minutes if the pump is working as planned.

**WARNING** Any deviation from normal operating conditions (increased power consumption, temperature, vibrations, noise etc.) or warning signals by monitoring equipment suggest malfunction. Inform the responsible maintenance personnel at once to prevent the trouble from getting worse and causing, directly or indirectly, serious physical injury or material damage.  
**In case of doubt disconnect the machine immediately!**

### 3. Running

- 3.1 Start and stop the pump if necessary. The pump is designed for 6 starts per hour. More frequent start cycles must be approved by the pump producer.
- 3.2 If the suction line is empty, the pump will first suck in the air and then the liquid.
- 3.3 In case of pump stop, the integrated non-return valve (if present) prevents the flow back of the liquid.

### 4. Operating troubles

- 4.1 PUMP DOES NOT PRIME
  - (a) Air leaks into the suction line (through couplings, threads, flanges, gaskets, hose clips, cuts, etc.). It is difficult to find the trouble place. You can take off the suction pipe from the suction port, start the pump and check if the pump sucks by placing the hand on the suction port.
  - (b) Level of liquid inside pump casing is too low or empty.

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- (c) Wrong direction of rotation or too low speed.
  - (d) Overpressure in the delivery line. Air does not escape. Exhaust air through priming cover or install an automatic air-release valve.
  - (e) Liquid inside pump chamber overheated. Allow liquid to cool down or refill it with cold liquid.
  - (f) Air leaks through the mechanical seal because of damage or lack of lubrication. Replace the mechanical seal.
  - (g) Leading edge of the volute is worn out by the abrasive action of the liquid.
  - (h) Clogged, broken or worn impeller.
- 4.2 LOW CAPACITY
- (a) Strainer or filter clogged. Clean out.
  - (b) Suction or delivery lines clogged or rubber hose collapsed. Locate and remove obstruction.
  - (c) High friction losses in the line. Get rid of unnecessary curves, valves and constrictions.
  - (d) Static suction lift too high. Place the pump as close as possible to the surface of liquid to be pumped.
  - (e) Low rotation speed. Increase RPM.
  - (f) Impeller clogged. Free impeller through the inspection cover or open the pump casing.
  - (g) Impeller and/or wear plate(s) worn out. Replace.
- 4.3 PUMP IS MAKING NOISE
- (a) Discharge side or suction side closed or clogged. Install a manometer and a vacuum meter to inspect the piping.
  - (b) Impeller clogged. Free impeller through the inspection cover or open the pump casing.
  - (c) Cavitation. The pump is working outside the allowable curve. Check how the sound changes by slowly closing and opening the valve in the discharge side.
  - (d) Ball bearing worn out; replace.
- 4.4 PUMP IS LEAKING
- (a) Loosen screws. Check.
  - (b) Loads on the pump and piping too high. Check.
  - (c) Overpressure. Mechanical seal damaged.
  - (d) Dry-running or closed lines. Mechanical seal overheated and broken. Replace.
  - (e) Rubber components not compatible with the pumped liquid. Please contact your pump partner for alternative materials.
- 4.5 For any other operation troubles, please contact your pump partner by mentioning:
- ⇒ Pump type
  - ⇒ Serial no.
  - ⇒ Problem
  - ⇒ Running time
  - ⇒ And possibly attach photographs of pump and piping.

## 5. Maintenance

- 5.1 After start-up the pump will need to be checked at the following intervals to make sure it is pumping properly and with regard to pump noise: 10 min. / 1 hour / 10 hours / 1 day / 1 week / 1 month. Inspection may take place thereafter at monthly intervals provided the conditions of use do not change.



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**WARNING** When pump is not used, never forget water inside the pump casing during cold weather! Water may freeze and break the pump casing!

- 5.2 Each 3 months, if necessary, lubricate the mechanical seal (see section 5 "Lubrication of the mechanical seal" on page 7).
- 5.3 Each 6 months open the inspection cover or the casing and check inside. Remove possible foreign parts blocked inside the casing. Clean the pump and the motor. If necessary, check more frequently.
- 5.4 Each 12 months, if necessary, change the automatic grease lubricator (see section D "Automatic Grease Lubricator", on page 8).
- 5.5 Each 5-10 years make a general pump recondition.

## 6. Lubrication of the mechanical seal

- 6.1 Pumps with carbon seal (i.e. .30. / .302. / .35. / .10. / .16. / .55.) have no lubrication and do not need any maintenance.
- 6.2 The models with mechanical seal with diamond coating (.36., .362.) have no lubrication and therefore need no maintenance.
- 6.3 For models with automatic grease lubricator please follow the instructions in section D "Automatic Grease Lubricator", on page 8.
- 6.4 Models with grease nipple do not need any maintenance for the first 200 working hours. After this period lubricate each 3 months with only one hub of grease. Use standard grease with viscosity grade between 1 and 3. With alkaline products (ex. lime-milk) use the special grease of Victor Pumps (please contact your Pump partner).

**WARNING** Do not over-grease, otherwise the narrow ball bearing can be damaged!

## 7. Warranty

- 7.1 The manufacturer warrants the pump against defects or faulty workmanship for a period of 12 months from the date of delivery. Longer warranty periods are available on request.
- 7.2 Repair of the pump or replacement of parts or of the pump itself can only be carried out after careful examination of the pump in our workshop where the pump should be sent by carriage paid. Any exceptions must be confirmed in writing.
- 7.3 This warranty does not cover parts damaged by improper operation, handling and assembly, as well as parts subjected to deterioration and normal wear (especially impellers, wear plates and mechanical seals).
- 7.4 This warranty is no longer valid if the pump is disassembled or modified without the authorization of the manufacturer.

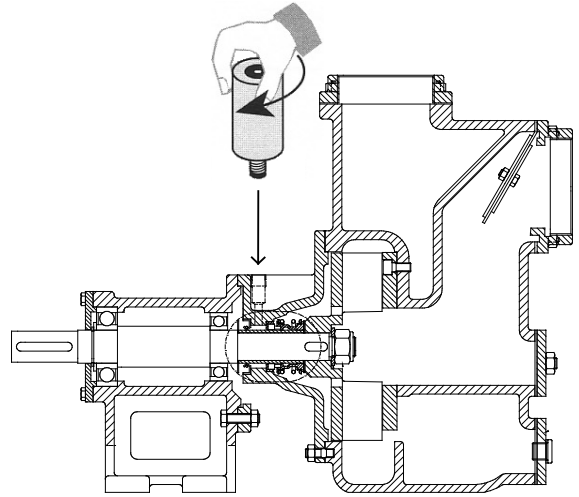
**WARNING** Never forget water inside pump casing during cold weather! Water may freeze and break the pump casing!

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## D. Automatic Grease Lubricator

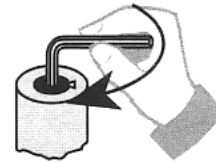
### 1. Description

- 1.1 The automatic lubricator (+PS) is a long-term grease dispenser activated by a hydrogen gas producing dry cell. The lubricator contains 125 ml of grease dispensed during a period of 12 months. The operating temperature is min -20°C and max +55°C (-4/+131°F). The weight of the full lubricator is approx. 190g (6.7oz) and empty approx. 75g (2.7oz). The grease is special water-repellent, suitable for alkaline products.
- 1.2 Storage time of the cartridge should not be longer than 3 years.



### 2. Installation and activation

- 2.1 Open the lubricator outlet by removing the plug.
- 2.2 Screw the lubricator in the hole with ¼" thread on the head of the pump. If the hole is already closed by a tap or grease nipple take this part away. If necessary, use the extension to mount the lubricator.
- 2.3 Set the gas generator to **position 12 (12 months)** using a size 3 mm Allen key.
- 2.4 With a waterproof pen register the starting date on the label. The life time of the lubricator is 12 Months. Replace afterwards the empty lubricator with the same type.



### 3. Notes

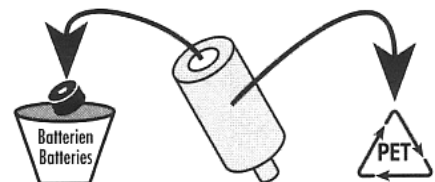
- 3.1 After activating it can take some days, until grease is dispensed for the first time.
- 3.2 The lubricator can be readjusted or switched off (position 0) during operation. If you unscrew the lubricator the created pressure in the quench chamber will be lost and the life time of the lubricator will be less.
- 3.3 In order for the lubricator to function reliably it is important to have the quench chamber already filled with grease. If you change the mechanical seal it is important to refill the quench chamber and the line before installing the lubricator.

### 4. RECYCLING

- 4.1 Unscrew gas generator from the lubricator and dispose the complete part in the battery recycling.

**WARNING** Do not unscrew the gas generator from the lubricator near a naked flame.

- 4.2 Dispose of empty housing of the lubricator in the PET-recycling. If the lubricator still contains grease, please dispose it in accordance with the local regulations.





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## E. Electric Motor

### 1. Introduction

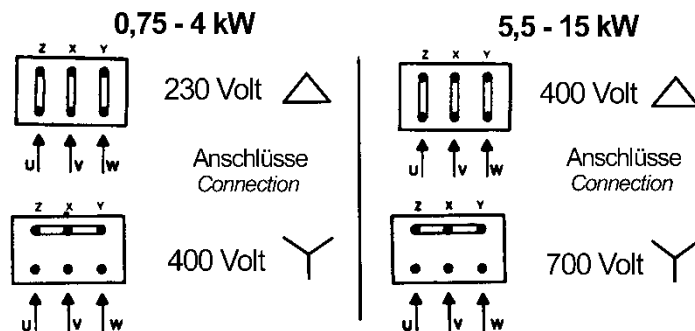
- 1.1 This section is valid only for close coupled pumps. For all other type of pumps, please see the separate motor instruction manual.
- 1.2 The close coupled motor is equipped with stronger ball bearings and an extended shaft that is also the pump-shaft. The motor can be bought only through the pump manufacturer.

### 2. Electric connection

- 2.1 Check the voltage and frequency with the technical information on the motor label.
- 2.2 Make a secure connection to earth.
- 2.3 Close unnecessary cable entries to close the box dust and waterproof.
- 2.4 Mount a safe overload switch. Set the motor overload switch to the nominal current +10%.

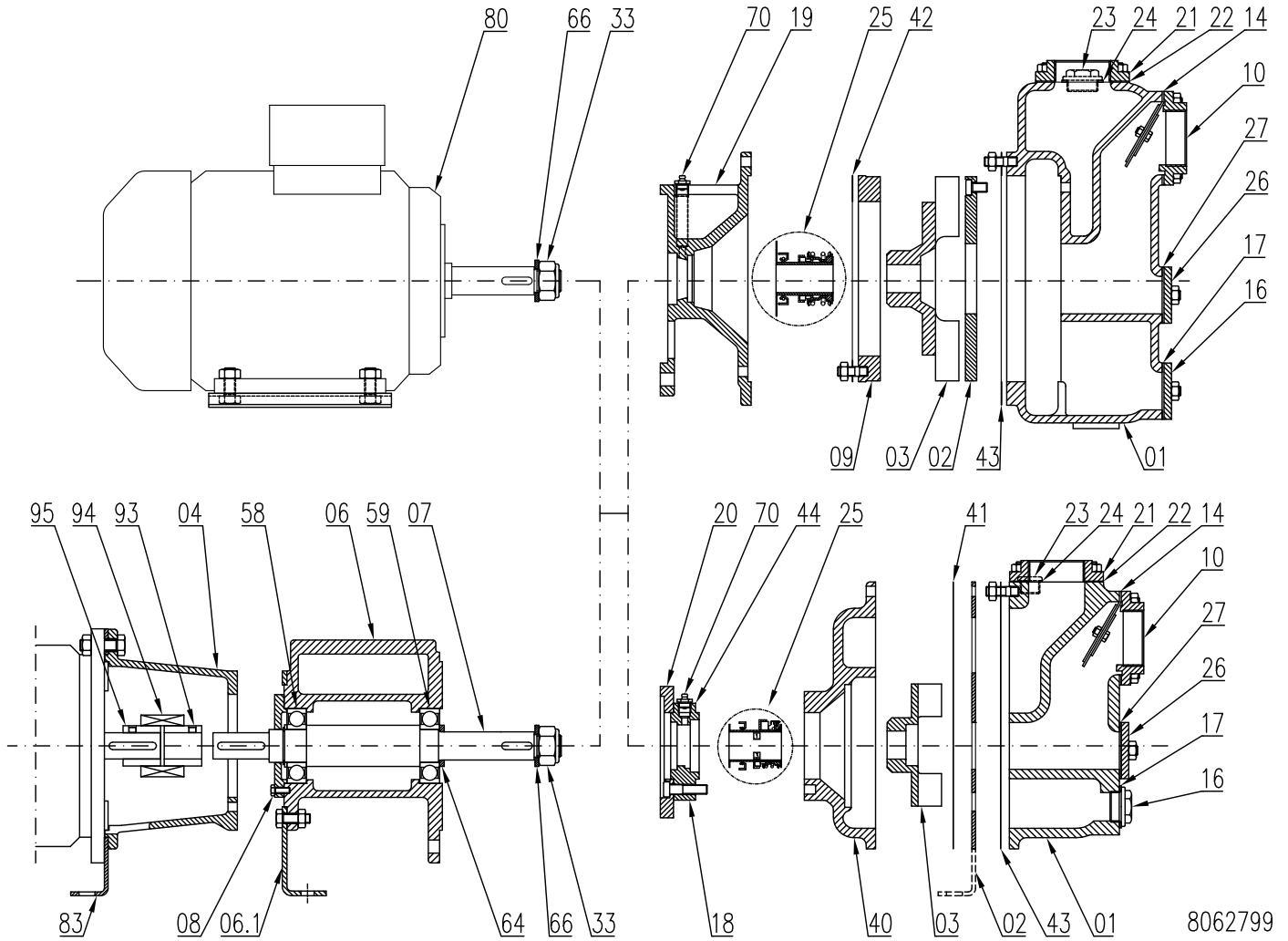
**WARNING** The pump can be blocked by solids. To prevent damages always connect the motor through an overload switch.

- 2.5 Connect the motor following the wiring diagram. If necessary, change the motor rotation by inverting 2 Phases.



### 3. Maintenance

- 3.1 Clean the motor from dust (risk of overheating).
- 3.2 Clean the motor fan.



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Ref.	Part Name
01	Casing
02	Wear Plate
03	Impeller
04	Bracket
06	Bearing Housing
06.1	Foot, Bearing Housing
07	Shaft
08	Bearing Cover
09	Wear Plate rear (with 42)
10	Suction Valve
14	Check Valve
16	Drain Cover or Plug
17	Gasket (Drain)
18	Seal Box
19	Head
20	Seal box flange
21	Discharge Flange
22	Gasket Discharge Flange
23	Priming Cover or Plug
24	Gasket (Priming)

Rif.	Part Name
25	Mechanical Seal
26	Clean Out Cover
27	Gasket (Clean Out)
33	Nut Impeller
40	Volute
41	Gasket, Volute
42	Gasket, Wear Plate Rear
43	Gasket, Casing
44	Gasket, Seal Box
58	Ball Bearing, outer
59	Ball Bearing, inner
64	Sleeve, inner
66	Impeller Washer
70	Grease Lubricator
80	Electric Motor (with 33,66)
83	Foot, Bracket
93	Coupling Half
94	Rubber Part
95	Coupling Half
	Gasket set (with 14,17,22,27,41,42,43,44)

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