

# Instruction and Maintenance Manual

Self-priming centrifugal pumps  
Type S

**ATEX version**

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Pump serial no.

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**A. Declaration of conformity – Atex Certificate**

With this Declaration of Conformity, we declare that the **S** type centrifugal self-priming pumps comply with the following directives:

- ⇒ EC Machinery Directive 2006/42/EC, Annex II A.
- ⇒ EU directive on explosion prevention 2014/34/EU relating to equipment:
  - with code + 2A for equipment of category  II 2G Ex h IIB T4...T1 Gb
  - with code +2AC for equipment of category  II 2G Ex h IIC T4...T1 Gb
  - with code +3A for equipment of category  II 3G Ex h IIB T4...T1 Gc
  - with code +3AC for equipment of category  II 3G Ex h IIC T4...T1 Gc

Pumps **without their own drive** must be connected to other devices. It is forbidden to start up the device in which the pump is installed if the device itself has not been declared compliant with the aforementioned Directives.

For pumps **without their own drive** that have been modified and/or are not used for the use for which they were produced, this Declaration of conformity is to be considered null and void.

The following are harmonized standards that have been applied in whole or in part

- ⇒ EN 809:2009
- ⇒ EN ISO 12100:2010
- ⇒ EN ISO 80079-36:2016
- ⇒ EN ISO 80079-37:2016

The technical documentation was filed with the TÜV SUD CERT No. TUV IT 19 ATEX 076 AR.

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## B. Introduction

### 1. Introduction

- 1.1 The instruction manual contains important information on how to operate the pump in a safe, adequate and effective manner. Compliance with these instructions will help you avoid dangerous situations, reduce any repair costs and downtime, and improve the reliability and durability of the pump.
- 1.2 This manual refers only to the pump. For the motor and the coupling please refer to the separate instructions.
- 1.3 The operating instructions must always be available in the place where the pump is in operation.
- 1.4 The operating instructions must be read and applied by all personnel assigned to work with the pump.
- 1.5 The rules and regulations indicated in this manual must be scrupulously complied with, to prevent accidents and protect the environment in which the pump is used. In addition, the local technical and safety regulations necessary for the correct and safe use of the pump must be complied with.
- 1.6 The fundamental operations for the use of the pump, as well as for its transport, assembly, installation, commissioning, maintenance and repair, must be carried out by qualified and responsible personnel.

### 2. Safety

- 2.1 A pump can be dangerous if it is not installed correctly, if it is not properly maintained or if it is not working properly. Failure to comply with the following warnings could compromise the safety of the staff or the correct operation of the pump.
- 2.2 Each part of the pump must be used in full compliance with safety regulations. In the event that the weight of the pumps or their accessories exceeds 20 kg, the use of special lifting devices is recommended in order to avoid any damage to personnel.

<b>CAUTION</b>	Lifting hooks suitable for lifting single elements such as pumps and motors must not be used to lift the complete unit.
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- 2.3 Before starting disassembling the pump it is advisable to take all the necessary safety precautions, especially if dangerous or toxic products have been used in the pumps. If in doubt, contact your Safety Manager or the pump manufacturer.
- 2.4 While disassembling the pumps that have used dangerous or toxic products, always wear adequate clothing, safety glasses and protective masks.
- 2.5 Before disassembling, disconnect the pump electrically. Make sure that nobody can act on the main switch during the work.
- 2.6 Before disconnecting the pump from the pipes, always empty the product from the pump casing, using the appropriate drain plug or port.
- 2.7 Rinse the pump casing with a compatible liquid and allow it to dry in a safe area.
- 2.8 Before proceeding with any maintenance, consult the system manager to verify the need for special decontamination procedures.
- 2.9 All pumps returned to the manufacturer must be decontaminated and marked with a special label that will state the precautions to be taken during disassembly.

### 3. Checking the delivery

- 3.1 Pumps and their parts are shipped duly protected to prevent damage during normal transport operations. Nevertheless, the goods must be inspected immediately after arrival. Any damage found on the packaging, which could have also damaged the material contained, must be communicated to the carrier and, if possible, take photographs, too.

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- 3.2 The photographic support will be useful in case of complaints to the haulier. Inform also the company that sold you the pump.
- 3.3 Immediately notify the haulier in case of any material missing from what is indicated in the transport document.
- 3.4 Check that the data mentioned on the goods label correspond to those in the transport document and in the purchase order, to ensure that the pump received is actually the one ordered.

#### 4. Storage

- 4.1 Should the pump not be installed immediately after it has been received and checked, it should be re-packaged and placed in a suitable storage location.
- 4.2 Check and leave the protective coatings on unpainted surfaces intact. The application of a protective coating on unpainted surfaces untreated by the manufacturer is recommended.
- 4.3 Leave the plastic or port covers intact or replace some.
- 4.4 The pumps should be placed in a dry and clean place. If moisture or dust is present in the storage area, the pump must be protected with a waterproof coating.
- 4.5 If the pump has been used, open the cover or the drain plug, empty the pump casing and fill it with an anti-corrosion oil.

<b>CAUTION</b>	Lifting hooks suitable for lifting single elements such as pumps and motors must not be used to lift the complete unit.
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#### 5. Description of the pump

- 5.1 The S series pumps are centrifugal and self-priming. The impeller with open blades allows a wide passage of solids. With this type of pump, it is possible to handle corrosive and viscous liquids containing suspended solids, abrasive powders, even in the presence of air bubbles. They are installed above or near the liquid to be pumped. In fact, one of the advantages of this type of pump is that it must not be immersed in the liquid. The maximum self-priming height is 8 m; depending on the physical characteristics of the liquid and the location of the pump, the height value can change.
- 5.2 Further information can be found in the attached brochure.

#### 6. Warranty

- 6.1 The manufacturer guarantees the pumps for defects in material or workmanship, for a period of 12 months from the date of delivery. On request, the manufacturer can guarantee longer warranty periods.
- 6.2 Repair of the pump or replacement of components or of the pump itself can take place only after a careful examination of the material at the pump manufacturer workshop. The material must reach the pump manufacturer without any transport charge. Any exemption must be confirmed in writing.
- 6.3 The warranty does not cover parts damaged by incorrect use and assembly of the pump by the user, as well as parts subject to deterioration or normal wear and tear (especially impellers, wear plates and mechanical seals).
- 6.4 The warranty is no longer valid if the pump is disassembled or modified without the manufacturer's authorization.

<b>CAUTION</b>	Do not leave water in the pump casing during the cold season! Water could freeze and break the pump casing!
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## C. ATEX - Information

### 1. Marking

1.1 **S** self-priming centrifugal pumps are marked as follows:

with code + 2A for equipment of category  II 2G Ex h IIB T4...T1 Gb

with code +2AC for equipment of category  II 2G Ex h IIC T4...T1 Gb

with code +3A for equipment of category  II 3G Ex h IIB T4...T1 Gc

with code +3AC for equipment of category  II 3G Ex h IIC T4...T1 Gc



1.2 **Group:**

⇒ II: non-mining use

1.3 **Category:**

⇒ 2G = high gas safety

⇒ 3G = normal gas safety

1.4 **Protection:**

⇒ Ex h = construction protection

1.5 **Class of gas explosion:**

⇒ IIB = IIA and IIB permitted gases

⇒ IIC = IIA, IIB and IIC permitted gases

For details on the conditions of use, see paragraph C.2.4, page 6.

1.6 **Temperature class:**

⇒ T4 ... T1 = All temperature classes are allowed from T4 (up to 135°C), T3 (up to 200°C), T2 (up to 300°C) and T1 (up to 450°C)

For details on the conditions of use, see paragraph C.2.10, page 6.

1.7 **EPL "Equipment Protection Level" classification according to EN ISO 80079-36:**

⇒ Gb = Monitoring of potential ignition sources during normal operation and expected failures (Zone 1)

⇒ Gc = Monitoring of potential ignition sources during normal operation. (Zone 2)

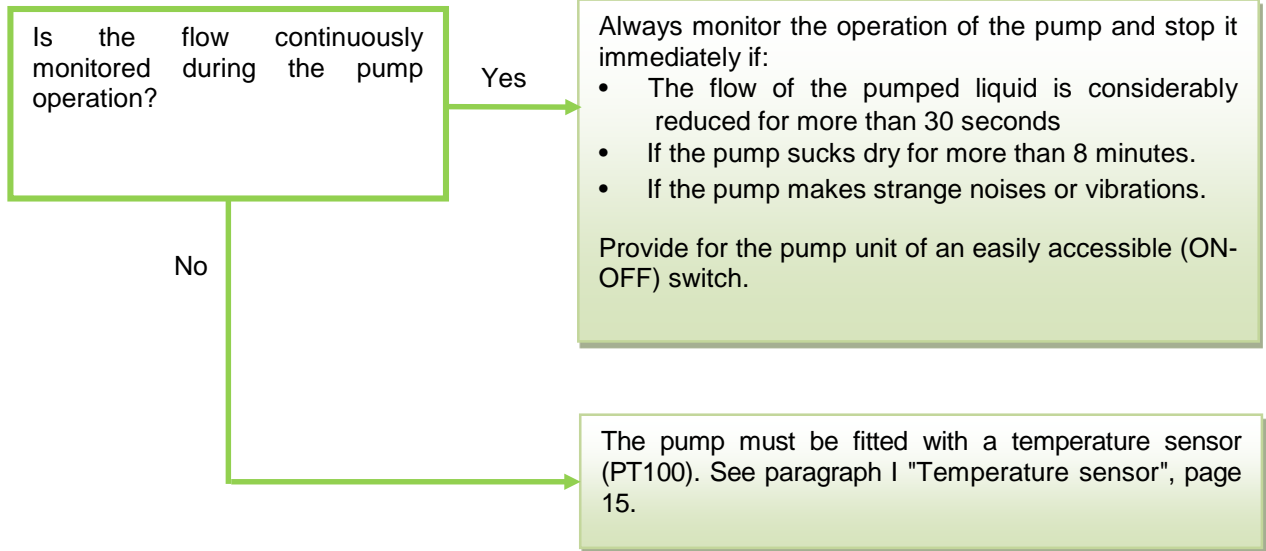
## 2. ATEX requirements

- 2.1 The pump has a mechanical seal that might leak. If the pumped fluid is flammable, the area next to the pump must be declared as Zone 1 (category 2). (Not for pumps with magnetic coupling)
- 2.2 In pumps in use in Zone 1 (+2A and +2AC), with mechanical seals of type .31., .331., .38., .57. and .14 the automatic grease lubricator (+P, +PK, +PS, +PSP) of the mechanical seal must be present, installed and activated. The cartridge must be replaced annually.
- 2.3 In type 6. mechanical seals, standard grease lubrication must be present or a type API 51, 52 or 53 quench system must be installed. This must be checked at least monthly.
- 2.4 If the pump is used with IIC vapour explosion class, there is a danger of electrostatic charging if the coating thickness of the equipment is greater than 0.2 mm, or greater than 2 mm if used in class IIB.
- 2.5 The pump may get blocked due to the presence of solid bodies. It is therefore necessary to use a motor protection switch (PTC if with inverter).
- 2.6 Use the pump only within the parameters indicated in the performance curves, in the technical data sheet and in the instructions. The product must never be pumped to the limits of vaporization, crystallization, polymerization and solidification. If the pump is to be used for purposes other than that requested at the time of ordering (and for which the pump has been produced), please check its compatibility and ask the pump manufacturer for authorization for new use.
- 2.7 The pump must be connected to earth. As an option, grounding is available on the base plate already connected to the motor and the pump. Therefore, grounding on the base plate is sufficient as the sole grounding.
- 2.8 If the pump has a bare shaft select a coupling, coupling cover and the ATEX standard motor adapted to the performance of the pump, install them according to the instructions of the various manufacturers.
- 2.9 The pump material must be compatible with the pumped liquid. The pump manufacturer is not responsible for the inappropriate use of the pumped liquid.
- 2.10 The operating temperature of the pump must not exceed the following values:

Type of mechanical seal	Temperature class			
	T4	T3	T2	T1
.17., .31., .331., .38., .14., .57., .6..	90°C			
.10., .30., .35., .55	75°C	90°C		
.36., .362.:	75°C	110°C		
Magnetic drive	100°C	130°C		

In the event that the liquid to be pumped can reach this temperature, it is not permitted to operate the pump. If necessary, use a temperature sensor.

- 2.11 The use of the pump with closed suction and/or discharge pipes/hoses is prohibited. The owner of the pump must take all necessary precautions to prevent this from happening.
- 2.12 There is no zone inside the pump because there is always product in the pump casing to allow self-priming.
- 2.13 For pumps that are used in Zone 1 (+2A and +2AC) following instruction is mandatory. For pumps that are used in Zone 2, it is not mandatory but we recommend it as well. To avoid running dry or with blocked pipes/hoses, proceed as follows:



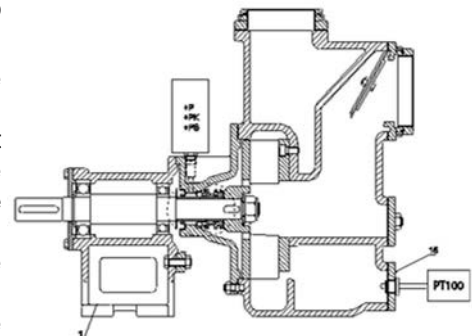
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## D. Installation

### 1. Installation

- 1.1 Check and follow all the points of paragraph C.2 "ATEX requirements" on page 6.
- 1.2 The pumps can be supplied in various ways:
  - ⇒ Bare shaft pump: Select a coupling, coupling cover and ATEX standard motor adapted to the performance of the pump, install them according to the instructions of the various manufacturers.
  - ⇒ Pump prepared for a certain motor: Read in the attached technical sheet which motor is going to be used. Install it according to the instructions of the coupling and of the motor itself.
  - ⇒ Bi-Block pump (code .BB.) without motor: Read in the attached technical sheet which motor is going to be used. Install it according to paragraph H "Coupling for Bi-Block Pumps", page 14 and the motor instructions.
  - ⇒ Pump with motor: The pump is ready to be installed in a plant.
- 1.3 Please take into consideration the existing ATEX regulations and local regulations for installing the pump in a system. The following ATEX certificates are required for a pump with motor:
  - ⇒ Pump
  - ⇒ Coupling (in Bi-Block pumps it is already included in the pump certificate).
  - ⇒ Motor
  - ⇒ Temperature sensor (if any)

The sum of these certificates must meet the needs of the system
- 1.4 If the pump is already installed in a system, follow these installation instructions. Then continue with the following chapter, D.2 "First start-up", page 9.
- 1.5 Place the pump on a level surface, as close as possible to the surface of the liquid to be pumped. Make sure the area is properly ventilated.
- 1.6 The suction pipe must be as short as possible and have the same diameter as the pump outlet. Avoid unnecessary bends, elbows or bottlenecks. This will reduce priming time and guarantee maximum flow rate.
- 1.7 Check that all the connections (threads, welds, quick-fit couplings, flanges, valves, etc.) are completely sealed. If necessary, seal with grease.
- 1.8 If present, install and fill the oil tank or fit the automatic grease lubricator (see paragraph G "Automatic lubricator", page 13)
- 1.9 It is advisable to use a large bottom filter without a valve (available on request).
- 1.10 If present, connect the temperature sensor, an operation that must be performed only by authorized personnel (see paragraph I "Temperature sensor", page 15)
- 1.11 Connect the electric motor, an operation that must be carried out only by authorized personnel (see the supplier's relative instructions).
- 1.12 Directly connected motors must be protected by a motor protection switch set at a value 10% higher than the value indicated on the nameplate.
- 1.13 Motors regulated with an inverter must have thermocouples. These must be installed in the inverter and calibrated specifically so as not to overheat the motors.
- 1.14 The pump must be connected to earth. To do this, use one of the four screws that fix the pump to the base. To ensure the connection, scrape off any paint present (Pos.1). Alternatively, some pumps also have a ground terminal. In the case of a Bi-Block pump, the terminal on the motor can be used for earthing purposes. As an option, grounding is available on the base already connected to the motor and the pump. Therefore, grounding on the base is sufficient as the sole grounding.





## 2. First start-up

- 2.1 Use the pump only within the levels prescribed by the performance curve, technical data and instructions! The liquid should never be pumped to the limits of vaporization, crystallization, polymerization or solidification.
- 2.2 The pump material must be compatible with the pumped liquid. The pump manufacturer is not responsible for damage caused by incompatible materials.
- 2.3 For the first start-up the pump casing must be filled with a liquid that will be pumped. Without this liquid the pump cannot self-prime. This also prevents dry run and potential damage to the pump. Open the plug located in the upper part of the pump casing. Fill the pump completely with the liquid to be pumped. Close the plug.
- 2.4 After the first start-up, there will always be enough liquid to safely restart the pump.
- 2.5 Check that the direction of rotation is the same as indicated by the arrow on the back of the pump (clockwise if viewed from the shaft or motor side).
- 2.6 Open all valves to avoid damaging the mechanical seal.
- 2.7 If the suction line is empty, the pump first sucks in air and then the liquid.
- 2.8 Start the pump and after a few minutes check that the pump is working as expected.

<b>CAUTION</b>	Any change in normal working conditions (increase in power consumption, temperature, vibration, noise, etc.) or any alarm signal in the system monitoring system point at a malfunction. Immediately inform the maintenance manager in order to prevent the problem from getting worse, directly or indirectly causing serious bodily or material harm. If in doubt, stop the system immediately!
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- 2.9 If present, check the correct operation of the temperature sensor.
- 2.10 Check the operation and noise level of the pump starting from commissioning at the following time intervals: 10 min. / 1 hour / 1 day / 1 week / 1 month. The check can then be carried out at monthly intervals, unless the conditions of use change.

## 3. Start-up

- 3.1 Start and stop the pump as required. The pump is designed for 6 starts an hour. More frequent starting cycles must be approved by the pump manufacturer.
- 3.2 If the suction line is empty, the pump first self-primed air and then the liquid.
- 3.3 If the pump stops, the built-in non-return valve (if present) prevents the backflow of the liquid.
- 3.4 Check the operation and noise level of the pump starting from commissioning at the following time intervals: 10 min. / 1 hour / 1 day / 1 week / 1 month. The check can then be carried out at monthly intervals, unless the conditions of use change.

<b>CAUTION</b>	Do not leave water in the pump casing during the cold season! Water could freeze and break the pump casing!
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## 4. Operating problems

- 4.1 THE PUMP DOES NOT START.
  - (a) Air infiltration along the suction pipe (through quick-fit connections, flange gaskets, threaded fittings, hose clamps, hoses, etc.). It is not easy to identify this problem. Try to remove the suction hose from the suction port, start the pump and check if the pump sucks by resting one hand on the suction port.
  - (b) Liquid level inside the pump casing too low, or pump casing empty.
  - (c) Wrong direction of rotation. Speed too low.
  - (d) Overpressure in the delivery line. The air is not vented freely. Vent the air through the filling port or install an automatic air-relief valve.
  - (e) Overheated liquid in the priming chamber of the pump. Wait for the liquid to cool down or replace it with cold liquid.
  - (f) Air penetrates through the seal due to lack of lubrication or damage to the seal. Replace the mechanical seal.
  - (g) Casing worn out by abrasive liquids.

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- (h) Blocked, broken, worn impeller.
- 4.2 THE PUMP DELIVERS TOO LITTLE.
- (a) Clogged suction filter. Clean it.
- (b) Suction or delivery hose/pipe blocked. Locate the obstruction and remove the parts that cause it.
- (c) High pressure drops. Eliminate unnecessary curves, bottlenecks, valves.
- (d) Geodetic suction difference too high. Move the pump as close as possible to the surface of the liquid to be pumped.
- (e) Rotation speed too low. Increase the motor revs (RPM).
- (f) Clogged impeller. Clean the impeller through the inspection door or open the pump casing.
- (g) Worn impeller and/or plates. Replace.
- 4.3 THE PUMP IS NOISY.
- (a) Discharge or suction hose/pipe closed or blocked. Install a pressure gauge in the delivery and a vacuum gauge in the suction side for verification.
- (b) Clogged impeller. Clean the impeller through the inspection door or open the pump casing.
- (c) Cavitation. The pump is used beyond the allowable curve. Check how the sound changes by closing and slowly opening the delivery valve.
- (d) Worn bearings. Replace.
- 4.4 THE PUMP IS LEAKING.
- (a) Loose screws. Check.
- (b) Loads too high for the pump and the hoses/pipes. Check.
- (c) Overpressure. Damaged seal or gaskets.
- (d) Dry pumping or closed pipes. Overheated and broken mechanical seal. Replace.
- (e) Elastomers not compatible with the pumped liquid. Contact the pump supplier for suggestions on alternative materials.
- 4.5 **For any other type of problem** contact the pump supplier stating:
- ⇒ Pump type
  - ⇒ Pump serial number
  - ⇒ Problem experienced
  - ⇒ Time of use
  - ⇒ Attach any photographs

## E. Maintenance

### 1. Inspection plan

- 1.1 Check the operation and the noise level of the pump starting from commissioning at the following time intervals: 10 min. / 1 hour / 1 day / 1 week / 1 month. The check can then be carried out at monthly intervals, unless the conditions of use change. In the ATEX versions, the ball bearings must also be checked.

<b>CAUTION</b>	If the pump is not used, do not leave water in the pump casing during the cold season! Water could freeze and break the pump casing!
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- 1.2 Monthly: The bearings must be checked for noise and wear and replaced immediately if necessary, since they are a source of risk of explosion due to excessive temperature. Bearing life is closely related to the mechanical seal. In case of mechanical seal replacement, replace the bearings as well.
- 1.3 Monthly: With double mechanical seals type .6.. the quench must be checked monthly.
- 1.4 Every 3 months, if necessary, lubricate the mechanical seal (see paragraph E.2 "Lubrication of the mechanical seal", page 11).
- 1.5 Open the inspection cover or casing every 6 months and check inside. Remove any foreign parts in the casing. Clean the pump and the motor. If necessary, check more frequently.
- 1.6 Clean the pump and motor externally every 6 months. If necessary, do it more often.
- 1.7 Every 12 months, if necessary, change the automatic lubricator (see paragraph G "Automatic lubricator", page 13).
- 1.8 Every 5-10 years carry out a general overhaul of the pump.

### 2. Lubrication of the mechanical seal

- 2.1 Pumps with graphite seal face (e.g. .30. / .302. / .35. / .10. / .16. / .55.) do not need any maintenance as they have no lubrication.
- 2.2 Pumps with a diamond mechanical seal (.36., .362.) need no maintenance as they require no lubrication.
- 2.3 For pumps with an automatic lubricator, see the instructions in paragraph G "Automatic lubricator", page 13.
- 2.4 Pumps with lubricators do not require maintenance for the first 200 hours of work. After this period, lubricate every 3 months only with a small amount of grease. Use normal grease with a viscosity between 1 and 3. In the case of alkaline liquids (e.g. lime milk) use the specific grease (contact the pump supplier).

<b>CAUTION</b>	Do not grease too much, it could damage the bearing adjacent to the seal!
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## F. Repairs

### 1. Introduction

- 1.1 Comply with the recognized technical standards for safe and professional work, in addition to the instructions for use and the mandatory accident prevention regulations applicable at the place of use.
- 1.2 Repair work as well as transport, installation and commissioning must be carried out by qualified personnel or checked by responsible specialists.
- 1.3 Make a note of the reason for the machine stoppage before attempting to repair the pump. This is useful information when you want to send the pump out for repair.
- 1.4 Check if the reason for the shutdown can be generated by the system or solved with simple on-site maintenance, especially in the event of flow and pressure problems (see D.4, "Operating problems", page 9).

### 2. Disassembling the pump from the system

- 2.1 Before proceeding, consult the system manager to verify the need for special decontamination procedures.
- 2.2 A certain quantity of product always remains in the pump casing. Evaluate the risk during the disassembly phase.
- 2.3 Comply with the notes in the safety information leaflet of the pumped product.
- 2.4 Before disassembling, disconnect the pump electrically. Make sure that nobody can act on the main switch during the work.
- 2.5 Before disconnecting the pump from the pipes, always empty the product from the pump casing, using the appropriate drain plug or port.

### 3. Repair preparation

- 3.1 If you wish to repair the pump yourself, special knowledge is required. If necessary, contact the manufacturer who offers dedicated courses, instructions and advice.

<b>CAUTION</b>	If the pump has pumped toxic or hazardous substances, always wear protective clothing and appropriate protective glasses during disassembly. Respiratory aids may be required.
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- 3.2 If you wish to send the pump to the dealer or manufacturer for repair, keep the following in mind:
  - (a) Empty and wash the pump to remove any residual fluid.
  - (b) Write a report indicating the reason for the repair and the checks carried out before dismantling the pump from the system.
  - (c) Pack the pump securely on a pallet together with a safety card (if necessary).
  - (d) All pumps returned to the manufacturer must be decontaminated and marked with a special label that will state the precautions to be taken during disassembly.

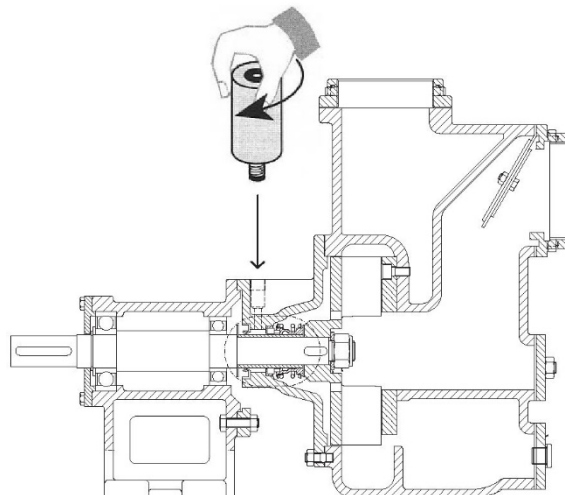
### 4. After the repair

- 4.1 Follow the instructions in chapter D "Installation", page 8, to restart the pump.

## G. Automatic lubricator

### 1. Description

- 1.1 The automatic lubricator (+PS) is a long-term grease dispenser, activated by a gas cartridge. The lubricator contains 125 ml of grease, supplied in a maximum period of 12 months. The operating temperature limits range from a minimum -20°C (-4°F) to a maximum of +55°C (+131°F). The weight of the charged cartridge is about 190g (6.7oz), while the empty cartridge is about 75g (2.7oz). The special grease is water repellent, suitable for alkaline liquids.
- 1.2 Cartridge storage life should not exceed 3 years.



### 2. Installation and activation

- 2.1 Open the lubricator by removing the cap.
- 2.2 Screw the lubricator into the ¼" hole on the top of the pump. If there is already a plug or lubricator in the hole, remove that part. If necessary, use the supplied extension.
- 2.3 Set the cartridge to **position 12 (12 months)** using a 3 mm hexagonal wrench.
- 2.4 With a permanent marker, write the lubrication start date in the appropriate label. The duration of the lubricator delivery is 12 months. Replace the empty cartridge with one of the same type.



### 3. Notes

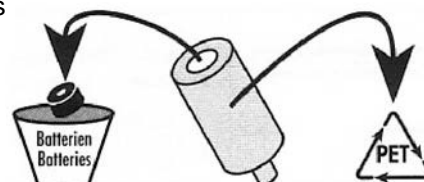
- 3.1 It may take a few days from the activation of the cartridge before the grease is dispensed.
- 3.2 The lubricator can be adjusted or deactivated (position 0) during operation. If the lubricator comes loose, the pressure created inside the quench chamber would be lost, thus reducing dispensing time.
- 3.3 For a correct operation of the lubricator it is important that the quench chamber is always filled with grease. If the mechanical seal is replaced, it is important to refill both the quench chamber and the lubrication line before installing the lubricator.

### 4. Disposal

- 4.1 Unscrew the gas cartridge from the lubricator and place it in the appropriate battery box.

**CAUTION** Do not unscrew the gas charge from the lubricator in the presence of an open flame.

- 4.2 Convey the empty lubricator in the special containers for PET recycling. In the event that the cartridge still contains traces of grease, proceed with its disposal following the local regulations.



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## H. Coupling for Bi-Block Pumps



### 1. Description

- 1.1 Bi-Block type pumps (Abbreviation .BB.) have a built-in coupling.
- 1.2 For all other couplings check the separate instructions.
- 1.3 The coupling consists of two hubs and a polyamide sleeve.

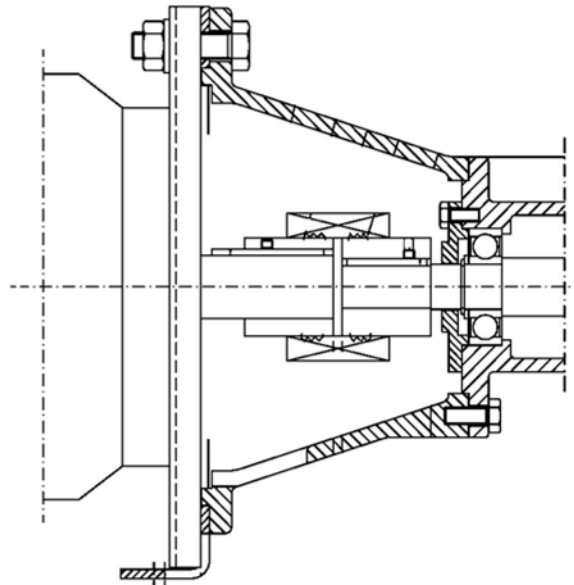
### 2. Assembly

- 2.1 The pump-side hub is already fitted and secured.
- 2.2 Insert the sleeve around the pump-side hub.
- 2.3 Insert the hub into the crankshaft as shown until the hub aligns with the shaft end. The toothed part should be placed on the shaft-end side.
- 2.4 Fix the hub on the crankshaft with the dowel with the following values:



Size	Thread	Tightening torque (Nm)
14 / 19 / 24	M5	2
28 / 32 / 38 / 42 / 48	M8	10
65 / 80 / 100 / 125	M10	17

- 2.5 Insert and fix the motor with the flange on the pump as shown below.



### 3. Maintenance and replacement

- 3.1 The coupling does not require maintenance. If the pump gets stuck or is overloaded, the sleeve will wear out. In this case it must be replaced with an identical one and the cause of the error must be identified. The hubs are not consumables.

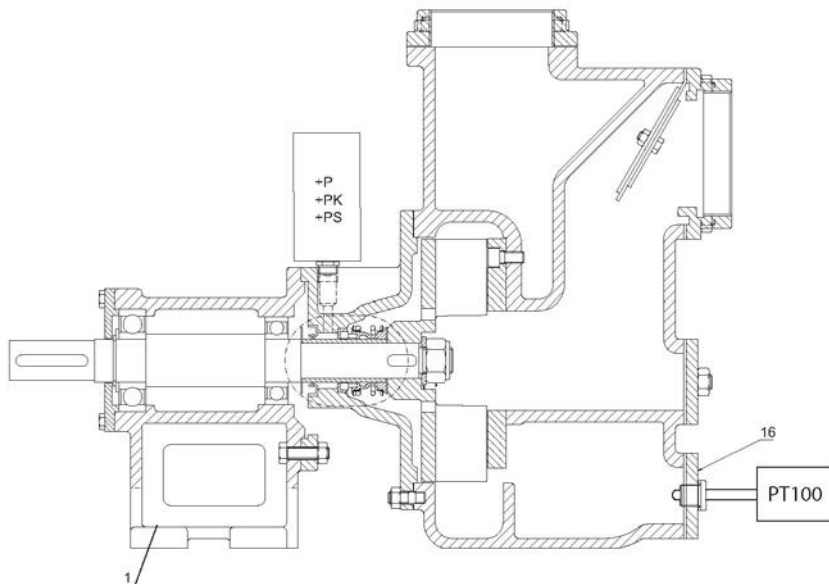
## I. Temperature sensor

### 1. Instructions

- 1.1 In the pumps fitted for the application of the temperature sensor (excluding the magnetic drive versions) there is a ¼" threaded hole in the pump emptying cap to apply a PT100 temperature sensor.
- 1.2 The sensor monitors the temperature increases of the pumped fluid. This means that a problem in the delivery pipe or abnormal wear can be controlled by increasing the temperature. When the temperature limit is exceeded, the sensor disconnects the supply of energy to the pump which then stops working.
- 1.3 The shut-off device and the relative electrical connections are not included in the supply of the pump, and must be carried out by a qualified technician, according to the EN ISO 80079-37, b1-type system standard.

### 2. Installation of the sensor in the pump (excluding the magnetic drive version)

- 2.1 The ¼" threaded hole for the temperature sensor (PT100) is in the drain plug (Pos.16) (not valid for magnetic drive pumps).

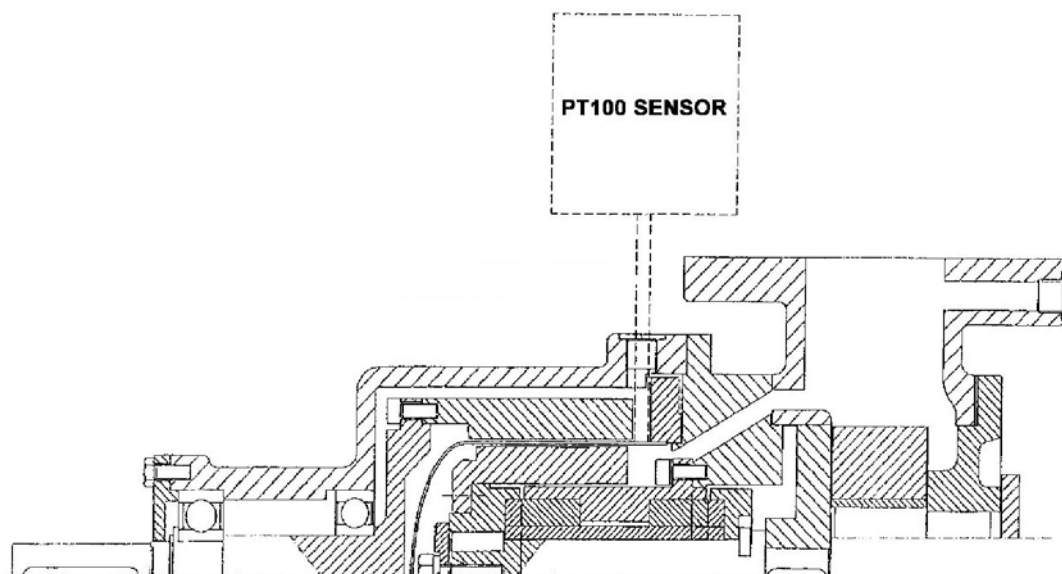


- 2.2 Unscrew the ¼" cap and screw the temperature sensor (PT100) in.

### 3. Sensor installation in magnetic drive pumps

- 3.1 The temperature sensor for magnetic pumps consists of 3 parts: the sensor with the head and the transmitter, the compression fitting and a gasket, if provided.
- 3.2 The holes for the temperature sensor are located on the side of the pedestal. Use the most convenient hole for sensor installation.

- Originale -



- 3.3 Screw the sensor connection with the gasket (if provided) into the selected hole up to half the total length of the thread.
- 3.4 Insert the PT100 temperature sensor into the compression fitting until the head touches the shell.
- 3.5 Tighten the small threaded fitting to secure the sensor to the compression fitting.
- 3.6 Secure the compression fitting to the sensor. In this way the spring inside the compression fitting will increase the contact between the head and the shell.

#### 4. Transmitter connections

- 4.1 The pump manufacturer supplies the sensor (PT100) with a built-in transmitter. The transmitter is set according to the following parameters:

Temperature range	Output signal	Current
0-150°C	4 - 20 mA, linear	8 - 30 VDC

- 4.2 Connect the transmitter to a reading unit (not included in the supply) with an ATEX 2-wire cable (blue cable).
- 4.3 The sensor assembly must be set to automatically switch the pump off within 5 seconds of exceeding the limit temperature.
- 4.4 The temperature limit value must be set 10°C above the pumping temperature but 5°C below the boiling point of the pumped liquid and must not exceed the following values:

Type of mechanical seal	Temperature class			
	T4	T3	T2	T1
.17., .31., .331., .38., .14., .57., .6..	92°C			
.10., .30., .35., .55	78°C	92°C		
.36., .362.:	78°C	112°C		
Magnetic drive	110°C	140°C		

- 4.5 In the technical data sheet, different values can be specifically permitted if necessary.



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