UTS EVO

TRANSLATION OF ORIGINAL INSTRUCTIONS
CAREFULLY READ THIS MANUAL BEFORE USING OR REPAIRING THIS PRODUCT

Magnetic drive metal centrifugal pump

Installation, Operating and Maintenance Manual

CLIENT :
POMPE TYPE :
N° SERIE :
ANNEE :

PCB Pompes Industrielles

INDEX

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Check receipt of goods

Upon receipt of the pump, please open the package and inspect the contents to check:

- the model and specifications listed on the data plate
- any accessories ordered
- the presence of accidental damages

For any inconsistencies between the delivered and ordered product please contact P.C.B. or your authorized dealer.

For any future spare parts enquiry, assistance, or information about the pump delivered, it is important that you state the relevant **SERIAL NUMBER** (shown on the data plate fixed on the pump lantern).

This manual provides the users of the pump-motor unit of P.C.B. with the information re-quired for correct installation, operation and maintenance under safety conditions as established by EC standards.

Please read this manual carefully before installation and make it available at any time to anyone using the machine.

The user is liable for damage resulting from not observing the operation conditions agreed at Order confirmation.

The Purchaser has the responsibility to:

- Check that the pump-motor unit and any accessory are suitable for the working environment.
- Provide suitable personal protective equipment to the operators.
- Inform users of the allowed use.

P.C.B. may update or edit this manual at any time and without previous notice to correct typos, inaccurate information or updated products.

These changes must be added to new editions of the manual.

P.C.B. has no obligation to install any modification of design or improvement of the products to previously delivered units.

This manual contains technical information and drawing owned by P.C.B. and cannot be re-produced in full or in part in any case without prior written authorization by P.C.B.

Any use other than the operation described in the manual is considered improper use and therefore P.C.B. will not be held responsible in this case.

P.C.B. is a leader in designing, manufacturing, selling and servicing centrifugal pumps for the treatment of dangerous and corrosive liquids in the chemical and pharmaceutical industries and in other industrial processes.

P.C.B.

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1. Warranty

1.1 Warranty conditions

P.C.B. warrants that its products (pumps and spare parts) are free from flaws and/or defects in manufacturing and assembling for a period of 12 (twelve) months from the date of delivery (indicated on the delivery note).

The purchaser's warranty is limited to the free replacement of parts recognized as defective, excluding the buyer's right to request termination of the contract or price reduction, or other damages.

P.C.B. warrants that the product sold is of good quality, material, and workmanship and agrees to, during the warranty period specified herein, repair or replace at its own expense in the shortest amount of time possible, those parts which due to poor quality of material or defect in workmanship or faulty assembly prove to be defective.

The warranty is understood ex warehouse from where the supply was carried out, including the return of defective parts.

The warranty validity period is:

12 months

from the date of delivery/shipment listed on the delivery note.

1.2 Warranty terms

For the warranty to remain fully valid throughout the period indicated in the warranty conditions it is necessary that:

- construction and/or material flaws are reported in writing within 8 days of receipt of the goods;
- all contractual obligations of the buyer have been fulfilled. Alleged or confirmed product defects do not justify non-fulfilment of contractual obligations;
- all installation operations, connection of the Product to energy networks (electric, water), use and maintenance are carried out in strict compliance with the instructions included in the Instruction Booklet or documentation provided with the product;
- all repairs are performed by personnel authorized by P.C.B. and that all spare parts used must be original spare parts.

The warranty does not cover:

- damages occurring during shipping and handling carried out by the buyer;
- pumping fluids that due to the nature or content are not compatible with the construction materials and/or application limits prescribed in the order;
- incorrect selection caused by incorrect information provided by the buyer;
- incorrect or lack of maintenance;
- tampering, failed or improper execution of the prescribed requirements for putting into service;
- normal wear and tear related to the service conditions.

1.3 Exclusion Clause

- Repairs or replacements pursuant to this warranty shall not renew or extend the original warranty period
- The product shall not be considered defective in materials, design, or workmanship if they need to be adapted, changed, or adjusted to conform to local technical or safety standards in force in any Country other than that for which the product was originally designed and manufactured.
- This warranty will not reimburse for such modifications or attempted modifications, whether properly performed or not, nor any damage resulting from them.
- This warranty will not reimburse for any attempted modifications made to adapt the product for purposes other than those defined in the contractual phase without prior consent in writing by P.C.B.
- P.C.B. shall not be held liable in any way for indirect, incidental, or consequential damages suffered by customers or third parties, including loss of profits, resulting from any infringement of the contents of this document, or suffered by customers or third parties due to the impossibility to use the product.
- The terms of this warranty shall be considered void if the User uses the pump differently than as specified in the order or does not follow the instructions contained in this manual.

1.4 Warranty Implementation

- The parts replaced must be sent to the closest P.C.B. office for review.
- WARRANTY ACCEPTANCE will not be granted unless the defective part is returned or appropriate photographs and a written report are provided.
- All defective parts replaced, as provided for in this document, become the property of P.C.B.
- The buyer shall not be required to deliver a defective part to P.C.B. if:
  - · the part was destroyed as a result of its defect or of any defect covered by this warranty
  - · P.C.B. is reasonably satisfied that the product was defective at the time of sale.
- If both of these conditions are met, P.C.B. shall replace the part as established herein, as if the Buyer had delivered the defective part to P.C.B.
- Pumps containing process fluid or installations outside of the pumping unit shall not be taken into consideration.
- The buyer agrees to provide P.C.B. with the time and availability to perform repairs and/or replacements, as P.C.B. deems necessary.
- Interventions on the plant. If the product supplied cannot be removed from the related plant, P.C.B. shall be responsible only for the explicit repair costs. Any other costs shall be the sole responsibility of the customer, based on A.N.I.M.A. (Italian Association of Mechanical and Engineering Industries) rates, including any civil works and/or defective designs.

Without prejudice to the foregoing, P.C.B. liability to customers or third parties from any claim shall be limited to the total amount paid by the customer for the product that caused the damage.

This warranty shall be governed by the Italian law. The Court of Milan shall have sole jurisdiction over any dispute.

2. Safety

2.1 Introduction

This manual contains all the information needed for the correct installation, use, and maintenance of the pump. It should be read and understood by all the personnel involved in the installation, operation, and maintenance of the pump before it is put into service.

Failure to comply with these safety instructions can be a source of danger for people, the environment and the machine, and voids any right to make claims against P.C.B. The liability of the sup-plier is ensured only if the pump is used in accordance with the contents of this manual. The limit values indicated in this manual or in any other documentation concerning the pump must never be exceeded. Personnel involved in the installation, operation, and maintenance of our pumps must be properly qual-ified to perform the operations described in this manual.

P.C.B. shall not be held liable for the training level of personnel and for the fact that they are not fully aware of the contents of this manual.

2.2 Symbols

Each pump is provided with the following plates:

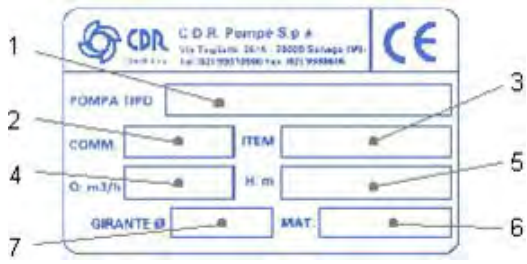


Fig. 1 *PUMP DATA PLATE.*

1_Pump model
2_Serial no. / year of manufacture
3_Item (when necessary)
4_Flow rate
5_Head
6_Material in contact with liquid
7_Impeller diameter

ARROW INDICATING THE PUMP'S DIRECTION OF ROTATION

DO NOT RUN THE PUMP DRY

BAR CODED BINS (waste management according to EU Directive 2012/19/EC_WEEE)

GROUNDING

MAGNETIC FIELD HAZARD (only for magnetic drive pumps)

The following symbols are used in this manual:

WARNING: indicates that the pump and its operation may be at risk.

ELECTRICAL HAZARD: indicates a hazard caused by electronic equipment.

MAGNETIC FIELD HAZARD: indicates the presence of a hazard caused by magnetic fields.

GENERAL HAZARD: indicates the presence of a hazard for persons working on the pump unit.

PROHIBITED: persons with pacemakers must not go near strong magnetic fields (magnetic drive pumps).

2014/34/EU SYMBOL: the explosion-proof equipment used in hazardous atmospheres has to be marked by this symbol.

The pump may be supplied for safe areas or classified areas.

The Atex Declaration of Conformity is applicable to the pump bearing the nameplate with the marking data for classified areas.

2.3 Safety instructions and precautions

2.3.1 Personal Protective Equipment (PPE)

Fig. 2 *Suitable gloves to prevent contact with hazardous substances.*

Fig. 3 *Mask to avoid breathing toxic or harmful substances.*

Fig. 4 *Goggles for eye protection.*

Fig. 5 *Accident prevention shoes to protect feet from any accidental falls.*

Fig. 6 *Protective clothing for the body.*

Prior to carrying out any work on the pump make sure to use adequate protective equipment.

Pumps must be drained and flushed before servicing!

The corrosive and hazardous liquids contained in the pump may pose serious health and environmental hazards.

Avoid pumping, even at different times, liquids that may cause chemical reactions, without first draining and flushing the pump.

After servicing, start the pump again following all the safety instructions described in chapter "Starting and stopping".

Do not run the pump dry.

Start the pump only when it is completely filled and the delivery valve is almost completely closed, limiting this condition to the time that is strictly necessary to start the pump.

In the event dirty liquids are to be pumped, if this was not indicated at the time of or-dering, please contact P.C.B.'s technical service beforehand.

2.3.2 Electricity

Do not perform any operation on the pump when it is running or before disconnecting it from the electrical system.

Any hazard caused by electricity must be avoided (refer to applicable regulations for further details).

Do not perform running tests before filling the pump with liquid. Check that the electrical data shown on the motor plate match the electrical specification of the system to which the pump will be connected.

2.3.3 Magnetic fields

Persons with pacemakers must stay at least 50 cm away from magnetic parts/ components.

The strong magnetic fields present may cause heart rhythm disturbances, affect magnetic media and all metal instruments in general. See recommendations during disassembly/assembly in the corresponding chapters.

2.3.4 Hot surfaces

Hot and cold parts of the pump unit must be protected to prevent accidental contact. Do not subject the pumps to sudden changes in temperature.

Please remember that the maximum surface temperature mainly depends on the operating conditions of the fluid processed by the user (UNI EN 13463-1 art. 6.1.3).

2.3.5 Moving parts

Do not tamper with the guards of rotating parts. Do not touch or go near rotating parts when in motion.

2.4 Expected use

Safety of operation of the supplied product can be ensured only if the instructions of this manual or of the contractual documentation are strictly followed; if further clarifications are needed, please contact P.C.B.

The pump (or pump unit) and any configuration variation must be run according to the limits listed and/ or described in the relevant contractual documentation provided with the pump.

Contact P.C.B. if the pump must be used in ways or for purposes other than those shown in the data sheet and/or contractual documentation.

The pump must **NEVER** operate beyond the values of the data sheet, such as pumped fluid (type, density, viscosity, etc.), temperature, flow rate, speed, head and shaft power.

The pump must be in perfect technical conditions before operation.

The pump must never run dry and/or with a percentage of gas over 2% in volume!

Always check that the pump is filled with liquid during operation.

Applying and observing the technical and operational limits of the pump is necessary to ensure correct and safe pump operation, particularly when installed in environments with possible generation of explosive atmosphere. In this case, applying and respecting the technical and operational limits as well as application limits of the pump decreases the risk of generating ignition sources (see chapter "Safety in an explosive environment").

Always refer to the Directive 99/92/EC containing minimum regulations to improve health and safety of workers who may be exposed to explosive atmosphere hazards.

Always check the limits of **minimum flow rate** as shown in the contractual documentation. This is necessary to prevent damage due to overheating, excessive axial thrust, damage of the bearings, high wear of rotating parts, etc. (see the section "Minimum and maximum flow" of chapter "Technical characteristics").

Always check the limits of **maximum flow rate** as shown in the contractual documentation. This is necessary to prevent damage due to vibrations, cavitation, damage of the bearings, overheating, etc. (see the section "Minimum and maximum flow" of chapter "Technical characteristics").

To adjust flow rate or head never operate by closing the suction valve but always operate on the delivery valve.

Improper use (not consistent with the instructions in this manual or with best practices in the operation of centrifugal pumps), even if for very short periods, may cause serious and extensive damage to the unit (pump or pump unit).

With regards to centrifugal pumps with mechanical seal, always refer to the specific manual of the mechanical seal manufacturer for its correct operation.

In particular, check and compare accurately the operational temperature limits of the mechanical seal with those of the pumped liquid (also see the section "Temperature limits" of chapter "Factors to be taken into account for ATEX environment installations").

2.5 Safety information for the customer/operator

The operator must always use Personal Protective Equipment (PPE) as required by the current safety regulations for work environments, with regards to the time and location of the work.

Please **ALWAYS**:

- strictly observe the instructions of this manual and of the contractual documentation;
- respect current safety prevention regulations;
- respect safety measures and regulations of the system and/or customer;
- never disable safety and protections devices when the pump is operating;
- protect hot and/or cold parts of the machine so that it is not possible to touch them;
- the personnel must always wear suitable Personal Protective Equipment when working on hot, cold and/o moving parts, as well as checking that the devices are active and are operating correctly;
- in the event of treatment of dangerous liquids (e.g. explosive, toxic, harmful, hot liquids), stop, limit and remove any leaks in order to avoid risks to people and the environment. Take care to always follow regulations!
- avoid any electrical hazard. Please refer to applicable national safety regulations and/or regulations issued by local power companies.

Take particular care when the unit is installed in potentially explosive areas. Avoid any incorrect or improper operation!

2.6 Safety information for maintenance, inspection and installation

The instructions of this manual or of the contractual documentation must be strictly followed; if further clarifications are needed, please contact P.C.B.

Always purge the pump when used to pump harmful liquids (see section "Return to supplier" in the chapter "Handling and storage").

Perform maintenance only when the pump is:

- stopped and in safety conditions (see the "Stop sequence" section in the chapter "Starting and stopping")
- cooled to room temperature
- not under pressure

The pump maintenance, inspection and installation personnel must be specialised and qualified, as well as informed of the content of this manual.

Any modification to the pump is allowed only after prior authorisation by P.C.B.

Use only genuine spare parts or spare parts authorised by P.C.B. Any damage due to using non genuine spare parts voids any liability by P.C.B.

Immediately after maintenance all safety and protection devices must be reassembled and activated (see the sections "Pre-start checklist" and "Start sequence" in the chapter "Starting and stopping").

2.7 Safety in an explosive environment

2.7.1 ATEX EC marking example (valid only for pumps compliant with the ATEX regulation)

The pump is compliant with the **ATEX Directive 2014/34/EU**.

The identification mark on the pump refers to the pump only.

The motor has a specific identification mark.

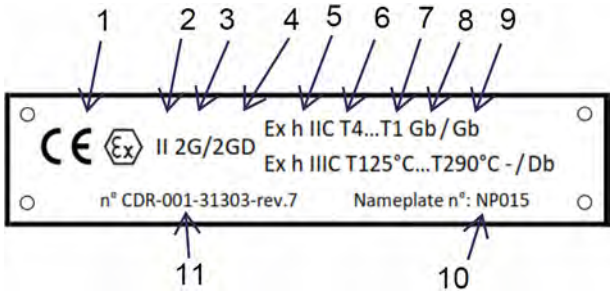


Fig. 7 *ATEX data plate.*

An additional data plate is applied to pumps installed in an explosive environment, with the following information:

1_EC conformity Mark and Ex explosion protection

2_ Group

3_ Category and type of explosive atmosphere of the internal zone ("-" if not applicable)

4_Category and type of explosive atmosphere of the external zone

5_Non-electric appliances

6_Gas Subgroup (1st line) and Powders (2nd line)

7_ Temperature Class

8_Internal zone protection level ("-" if not applicable)

9_External zone protection level

10_Identification Code plate

11_Technical handbook number

The data plate shows the pump marking (see "ATEX declaration" attached to this manual).

2.7.2 Protection in an explosive environment

If the pump is installed in potentially explosive environments, always follow the instructions in this section (in particular, see the chapters **"Intended use", "Safety information for the customer/operator", "Safety information for maintenance, inspection and installation"**).

Only pumps (or pump units) identified and compliant with the ATEX Directive 2014/34/EU can be installed in environments with a risk of explosion.

Always refer and see the specific sections highlighted by the "Ex ATEX" symbols in this manual.

Safety of operation of the supplied product can be ensured only if the instructions of this manual or of the contractual documentation are strictly followed; if further clarifications are needed, please contact P.C.B. (see the "Intended use" chap-ter).

The pump must **NEVER** operate beyond the values of the data sheet, such as pumped fluid (type, density, viscosity, etc.), temperature, flow rate, speed, head and shaft power.

Avoid any incorrect or improper operation!

2.7.3 Classification

If included in the supply, the specific conformity certificate of the motor or coupling must always be available.

The sample of the Atex nameplate illustrated in fig. 7 shows the ff. temperature class:

T4...T1

This means that the pump may be used in environments where the ignition temperature is higher, e.g., at T4 > 135°C or at T1 > 450°C.

The temperature class must be defined by the user according to table 2.7.4.d depending on the temperature and the process liquid.

In any case, the temperature class must always be assessed according to the highest ignition temperature of each individual element comprising the unit: pump, motor, coupling, etc.

Example 1:

Pump T4 > 135 °C

Motor T4 > 135 °C

Coupling T3 > 200 °C

The pump can be installed in environments classified as T3 > 200 °C.

Example 2:

Pump T4 > 135 °C

Motor T4 > 135 °C

Coupling T4 > 135 °C

The pump can be installed in environments classified as T4 > 135 °C.

The maximum temperature of the liquid to be pumped, according to the aforementioned data, is listed in the table under paragraph "d" below.

2.7.4 Factors to take into consideration for installations in ATEX environments.

a. Electrostatic charges

The user is responsible for the electrical connection and grounding of the machine.

The pump is provided with a threaded hole on the adaptor, or fastening screws on the pump feet (see section "Electrical connections" in chapter "Installation").

The surfaces of coupled metallic parts are clean and degreased thus ensuring connection between the pump frame, motor frame, and support frame. The outer parts of the machine are made of conducting materials.

b. Dry running

Dry running will cause:

- an abrupt increase in temperature of the rotating parts
- pump failure
- danger for persons and the environment depending on the liquid being pumped.

c. Temperature limits

During normal pump operation the highest temperature can be found:

- on the surface of the volute casing
- on the surface of the isolation shell
- on the bearing bracket oil ring (if fitted)
- on the bearings

Under critical operating conditions, such as temperature of the liquid > 120°C, dry run, low flow rate and/or room temperature > 40°C the temperature on the surface of the volute casing may exceed 130°C.

During pump operation ensure the external surface is free from dust in order to prevent the pump surface from exceeding the allowed temperature.

The client should ensure that the maximum temperature during pump operation is strictly complied with and if needed, or in case of doubt, must be suitably monitored (see chapter "monitoring devices"). The maximum temperature accepted for the liquid transported at the pump delivery point depends on the temperature class requested each time.

d. Allowed temperature for gas atmosphere (G)

The following table indicates the limit (theoretical) temperature value of the liquid, pursuant to EN/ISO 80079-36.

Temperature class pursuant to EN/ISO 80079-36	Process fluid temperature limit Pump material = AISI 316
T6 (85 °C)	NO ATEX
T5 (100 °C)	NO ATEX
T4 (135 °C)	125 °C
T3 (200 °C)	190 °C
T2 (300 °C)	290 °C
T1 (450 °C)	300 °C

T4: limit valid for pumps operating within 50 Hz

Over 50 Hz (>2900 rpm) non contacting labyrinth seal rings must be installed on the bearing bracket.

Room temperature must be between -20 °C/+40 °C, otherwise please contact P.C.B. **War-ning!** The values above are applicable only in proper operation, lubrication and maintenance conditions.

e. Allowed temperature for dust atmosphere (D)

Tmax is determined as the minimum temperature deriving from the following equations:

- Tmax = pump temperature limit shown on the Atex nameplate fig.7 (according to the temperature limit of the process fluid shown in the table of paragraph 2.7.4.d)

Room temperature must be between –20 °C/+40 °C.

Warning! Keep the outer surface of the pump free from dust by means of antistatic clothes.

2.8 Noise

The noise levels shown in the following chart refer to pump (A) operation in normal working conditions coupled with an electric motor (B) at a speed of 2900 rpm.

The values of the graph, as per ISO 3744 and EN 12639 , are valid for operating range Q/Q_{opt}= 0.8-1.1 without cavitation. Add an allowance of 3 dB to allow for the tolerance of measuring tools.

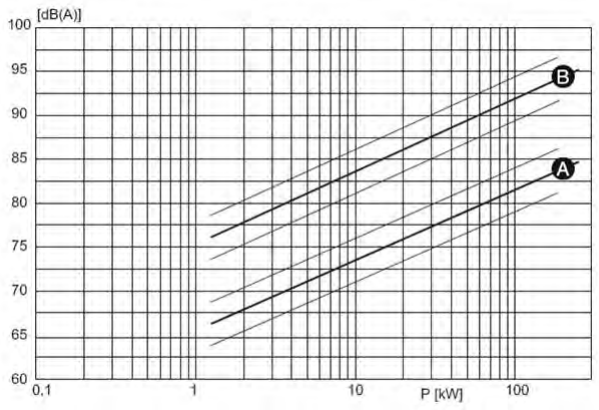


Fig. 8 *Noise chart in logarithmic scale.*

The major sources of noise are not connected with the pump.

We would like to remind you that the most frequent sources include:

- liquid turbulence in the plant
- cavitation (not dependant on the manufacturer)

The user must provide adequate protective equipment if the sources of noise generate a noise level harmful for operators and for the environment (in accordance with current regulations).

2.9 Monitoring devices

The motor-pump unit must be operated only within the limits specified in the data sheet and on the plate.

If the operating system is unable to guarantee compliance with the parameters shown on the data-sheet, continuous monitoring devices must be used on the pump. The user should monitor the temperature of the process fluid in cases where there is the possibility of overcoming the limit values given in table fig. 7. Moreover, the user is responsible for the adoption of monitoring systems / presence of liquid in the suction pipes or in the tank that can make the pump stop in case of the lack of liquid.

The following accessories can be supplied by P.C.B. upon request:

- temperature probes
- pressure sensors
- flow sensors
- vibration sensors
- electrical protection equipment

All electrically actuated accessories must be in conformity with applicable safety requirements and regulations on explosion protection systems.

Take into consideration the following risks when choosing suitable monitoring equipment:

2.9.1 Interruption of the cooling flushing

In the standard version the inner magnet is cooled by the process fluid through flushing holes located on the bushings support. Due to some characteristics of the transported liquid, e.g. the high viscosity, flushing could be interrupted, causing a dangerous increase in temperature.

2.9.2 Loss of synchrony between inner and outer magnet.

Overloading, overheating or non compliance with design data can cause a lack of synchronisation of the inner and outer magnets. The thermal energy generated inside the isolation shell or outer magnet can also cause a dangerous increase in temperature.

2.9.3 Liquid leaks

Liquid leaks (dangerous, toxic, harmful liquids) can also pose a danger to the personnel and the environment. Therefore monitor any leak continuously and equip the pump with containment systems if necessary.

2.9.4 Magnetic fields

Presence of magnetic fields near the magnets.

The minimum safety distance from components containing permanent magnets or from permanent magnets not assembled on the pump must be at least 35 cm, for the following reasons:

- Danger of death for people having a pacemaker!
- Interference with electronic devices!
- Magnets generate strong attraction that interacts with objects, part and components that are sensitive to magnetic forces!

When the pump is completely assembled the intensity of the magnetic field generated by permanent magnets contained in the cores is completely shielded, therefore there is no danger due to the magnetic fields, whether the pump is running or not.

In any case we discourage any people wearing a pacemaker from coming close to the area near the external magnet, marked by the relevant symbol, in particular for pumps equipped with very powerful magnets (where the coupled electric motor is very powerful).

2.10 Operating range

The pump (or pump unit) operating ranges for pressure, temperature, flow rate, speed and power are listed in the Data Sheets and/or in the contractual documentation and must be strictly observed.

These values always refer to liquids similar to water; if fluids with chemical and physical characteristics different from water are pumped, the above limits may vary and this variation must be taken into account. If in doubt, contact P.C.B.

The aforementioned caution is extremely important, in particular for those fluids having a specific heat that could considerably increase the process temperature, which in turn can increase the temperature of the pump surface.

3. Handling and storage

3.1 Packaging

P.C.B. pumps or pumping units are normally packed in either cartons or secured on pallets.

In case of pumps ordered without an electric motor, they are packed with the external magnetic core loose, which is kept in the package, yet separate from the pump, and protected against possible impacts due to handling the package.

The strong magnetic fields present (only for mag drive pumps) may cause heart rhythm disturbances, affect magnetic media and all metal instruments in general.

Persons with pacemakers must not, under no circumstances whatsoever, go near magnetic parts and components. The strong magnetic fields can cause heart rhythm disturbances.

3.2 Handling

To move crates, cages, cartons, or pallets weighing more than 20Kg, use proper equipment suitable for the weight indicated on the shipping document. When lifting freely suspended loads, harness the crate as illustrated below.

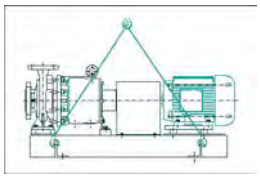


Fig. 9 *Execution on base.*

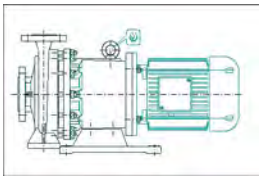


Fig. 10 *Monobloc execution.*

Fig. 11 *Handling.*

To ensure correct handling and lifting of crates, cages, cartons, or pallets, refer to the specific symbols shown on the packaging.

Fig. 12 *Symbols on the packaging.*

3.3 Shipping

The goods we deliver are subject to a verification procedure and approved prior to being released. At any rate, you should follow these instructions. The contents of each package are described in the packing list or delivery note. They must be carefully checked upon receipt. Upon receipt, and with the driver present if possible, check that the material and packaging are not damaged. Any claim must be reported immediately to the shipping company, with the claim signed by the driver. Furthermore, check that the goods delivered match the purchase order (quantity and type of material).

3.4 Receiving

See instructions for inspection at the reception given at the beginning of the manual.

3.5 Storage

In case of storage, the pump must be stored in a covered and dry location, and kept in its original packaging.

The protection caps and lids of the flanges must remain on the pump until it is time for installation. If the pump will be stored for a long period of time, or stored in particularly severe weather and environmental conditions, the use of hygroscopic substances (silica gel) or sealing of the package is recommended.

3.6 Return to supplier

Before returning pumps to P.C.B., you must ensure the following:

- pump not pressurized,
- pump completely empty,
- electrical connections isolated and motor secured against switch-on,
- pump cooled down,
- auxiliary systems shut down, not pressurized and emptied,
- manometer lines, manometer and fixtures dismounted.

Pumps that have been used for handling toxic or corrosive fluids must be flushed and cleaned before being returned to the manufacturer.

Always complete and enclose a truthful and full certificate of decontamination when returning to P.C.B. the pump-motor unit or individual parts (see form at the end of manual).

Always indicate any purging and safety measure observed.

Order a safety certificate from P.C.B. **if necessary.**

Take necessary measures, depending on the required repair work, as listed in the table below when re-turning the pump to the P.C.B.:

Repair carried out	Measure for return
...at the customer's premises	Return the defective component to the manufacturer.
...at the manufacturer's premises	Flush the pump and decontaminate it if it was used to pump hazardous media. Return the complete pump (not disassembled) to the manufacturer.
...at the manufacturer's premises for warranty repairs	Only in the event of hazardous pumped media: flush and decontaminate the pump. Return the complete pump (not disassembled) to the manufacturer.

4. Installation

4.1 General instructions

P.C.B. shall not be held liable for any damage to property or injury to persons caused by incorrect assembly or assembly performed by unauthorized persons and/or any person who has not re-ceived specific training on the above operations.

4.2 Foundations

Do not start the pump until it has been secured to the ground.

The pump-motor unit must be set on and secured to a structure strong enough to support the entire perimeter of the base of the unit. The support surface of the foundation must be flat and level. Concrete foundations on a firm ground are the most satisfactory type. Comply with the requirements of standard DIN 1045 on handling concrete. Provide for foundation bolts as shown in the illustration:

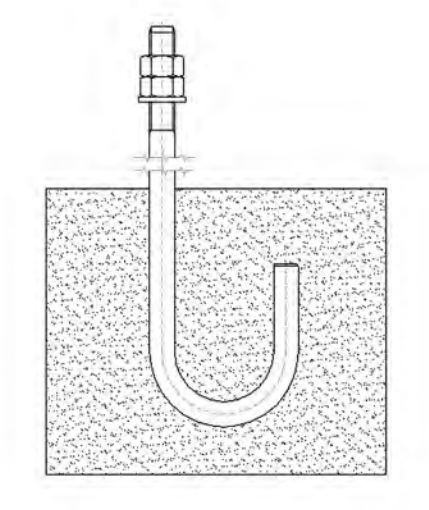


Fig. 13 *Foundations for fixing of pump-motor unit.*

Once the pump-motor unit is in position, level it using metal shims placed between the feet and the surface on which it stands.

The shims must be placed right next to the foundation bolts and they must be sufficiently wide to cover the largest possible surface.

Check that each foot of the pump-motor unit stands steady on each of these.

Under no circumstances should this position be obtained by excessive tightening of the foundation bolt nuts.

For bases that have windows, fill them with mortar that doesn't shrink.

If the unit is installed on a steel structure, make sure that it is supported so that the feet do not warp.

In any case, we recommend that you place appropriate rubber vibration dampers between the pump and civil works.

4.3 Correct installation

The pump should be installed in a location where, if possible, it is easy to perform maintenance tasks.

Therefore enough space must be provided around the pump in order to facilitate:

- maintenance operations
- ventilation for the electric motor

The pumps or pumping units running in potentially explosive areas must be in compliance with standards on explosion protection (see section "Safety in explosive environments" in chapter "Safety").

For pumping flammable fluids provide for, in any event, especially in ATEX environments, proper grounding of the pump as static currents may cause sparks and explosions (see section "Electrical connections").

Whenever there is a danger of explosion, you must comply with the regulations concerning ATEX protection and those of the test certificate, kept where the machine is used.

4.4 Pump installation diagram

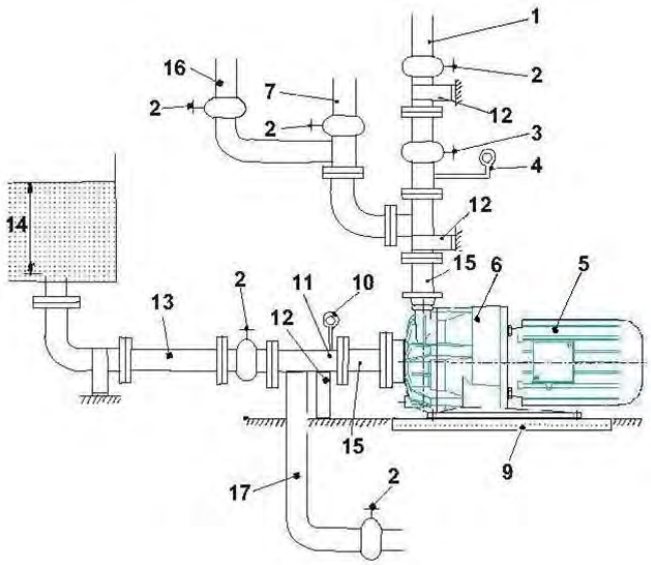


Fig. 14 *Pump installation diagram.*

1_Delivery pipe

2_Valve

3_Check valve

4_Pressure gauge

5_Motor

6_Pump

7_Breather hose

9_Leak collection

10_Compound gauge

11_Pump connection reducer

12_Base (refer to allowable forces and moments tables)

13_Suction pipe (length equal to at least 10 times the suction Ø)

14_Minimum level equal to at least 3÷5 times the diameter of suction

15_Compensation coupling

16_Cleaning piping (delivery side)

17_Cleaning piping (suction side)

The check valve protects the pump from possible water hammering.

The shut-off/regulation valve excludes the pump from the line and also adjusts the flow.

If there is a foot valve do not install a delivery check valve because the closing of the foot valve before the check valve would cause water hammer which harms pump performance.

4.4.1 General information

Before connection, remove the pump suction and delivery port protection caps.

A pump is generally part of a piping system that can include a number of components such as valves, fittings, filters, expansion joints, instruments, etc. The piping layout and the position of these components have an important influence on the operation and service life of a pump.

The pump must never be used as a support for the components connected to it.

The thermal expansion of pipes must be compensated for using appropriate expansion compensators.

The pump-piping connection flanges must be centred and aligned before tightening the related bolts. Do not, under any circumstances, attempt to pull or straighten the pipes by tightening the bolts of the flanges or threaded fittings.

The suction and delivery lines and the installed valves or filters must be supported and anchored next to but not on the pump so that no strain is transmitted to the body of the pump.

The forces and moments transmitted to the pump by the piping system must not exceed the allowable forces and moments (see relevant section in the chapter "Technical Data").

The piping must remain clean and free of debris (welding slag, small chips, etc.).

Remove the temporary filters specially provided after commissioning/testing the plant.

The liquid flow should be as straight as possible.

To the extent possible, elbows, tight bends, or radical reductions in diameters should be avoided as they may cause head loss s in the plant.

If you need to reduce the diameter you should use appropriate eccentric reducers on the suction flange (and concentric reducers on the delivery flange) at size changes, placed at a minimum distance from pump ports equal to ten (10) times the diameter of the pipe.

4.4.2 Suction piping

Suction piping plays a critical role in the correct operation of the pump-motor unit.

Suction piping must be:

- as short and direct as possible (length equal to at least 10 times the suction Ø)
- created according to best practices to prevent the possible formation of air pockets
- free from air inlets (critical points are the seals between the flanges and the seals of the valve stems)
- with the inside diameter equal to that of the suction side of the pump
- with the inside diameter one size greater than that on the suction side of the pump in case of longer pipes

For low conduction liquids (<50pS/m) the user should:

- prepare the plant with piping in conductive material

- furnish CDR with the value of the maximum speed of the liquid to be processed

The plant must have a Npsha (available) > Npshr (required)

The NPSHd value of the system must always be at least 0.5 m above the NPSHr of the pump (value referring to water at 20 °C).

RECOMMENDED:

to eliminate air, set up the pipe as shown in the following diagram

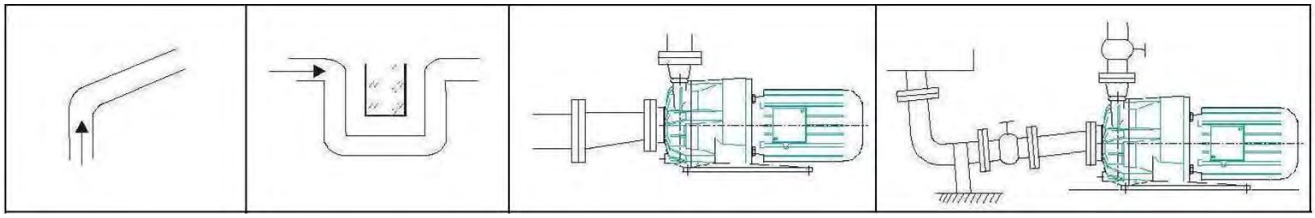


Fig. 15 *Recommended installation of suction piping.*

AVOID:

piping that can entrap or obstruct the evacuation of air as shown in the following diagram

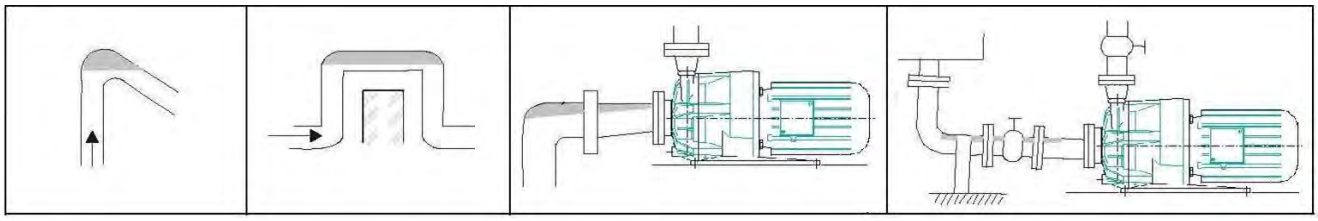


Fig. 16 *Not recommended installation of suction piping.*

Single-stage centrifugal pumps **not self-priming** always require that a suitable foot valve (check-valve) is installed in all cases where pumps are positioned above the level of the liquid.

Do not, under any circumstances, adjust the flow-rate using the valve on the suction pipe.

4.4.3 Delivery piping

The check valve protects the pump from possible water hammering.

The shut-off/regulation valve excludes the pump from the line and also adjusts the flow.

4.5 Instruments

In order to obtain a reasonable control of the performances, of the presence of liquid and of the conditions of the installed pump, at least one of the following instruments should be adopted:

- sensor to detect the presence of liquid on the suction or delivery piping, or else a vacuum gauge on the suction piping
- a pressure gauge on the delivery line

The pressure fittings must be installed on straight segments of pipe at least five diameters from the pump ports.

The pressure gauge on delivery must always be placed between the pump and the shut-off/regulation valve.

Flow rates can be deduced by reading the pressures, converted into meters and then compared with the characteristic curves. These optional instruments can signal different pump malfunctions, including: accidental valve closing, no liquid, overloads, etc. (for details relating to the positioning of the instruments and for further information pls contact P.C.B.).

If the temperature of the pumped liquid represents a critical element, a thermometer should be installed (preferably in suction), and regulated in conformity with the limits given in the temperature class table in chapter 2.7.4.d.

See also "Auxiliary Connections" in chapter 13, which gives the position and dimensions of the thermowell temperature probe present in the pump.

The instruments must be in conformity with applicable safety requirements and regulations on explosion protection systems.

4.6 Pump-motor unit alignment

4.6.1 General information

Correct alignment between the pump and motor is essential both for proper operation and for a satisfactory service life.

Close coupled execution

In the event the pump is supplied without a motor, carefully follow the instructions included in the chapter "Pump assembly" in order to assemble the motor correctly.

End-suction execution

The joints provided are generally a flexible type to compensate for minor misalignments due to assembly, or due to possible thermal expansion. The flexible joint is protected by a special non-sparking coupling guard, to prevent accidental contacts while the pump is running.

You should not rely on the flexibility of the joints to compensate for misalignments exceeding the limits specified below.

General information is reported below concerning the joints and coupling between the pump and motor; for further details please refer to the joint manufacturer's manual.

4.6.2 Checking alignment

1) You must check the alignment before commissioning (i.e. after tightening the nuts of the foundation bolts and the tightening of the port flanges), or after performing maintenance, or when pumps supplied on a base are delivered.
2) Warning: checking, and if necessary, correcting the alignment must always be performed with the motor stopped and in safety.
3) The tools needed to align these joints are a cutting ruler, a wedge type feeler gauge or a series of thickness probes.
4) It is advisable to leave the pump in its position and only move the motor.
   4.1) For motors fixed directly to the base, loosen the bolts of the motor feet.
   4.2) For motors fixed on an adjustable plate, loosen the bolts securing the motor plate to the respective threaded columns.
   4.3) Height adjustments can be made by inserting or removing thin metal sheets under the feet of the motor or by adjusting the threaded screws, while horizontal adjustments can be made with lateral movements. Once the alignment is satisfactory, the motor must be blocked by once again tightening the bolts that secure it to the base.
5) The pump-motor unit must be aligned in all directions

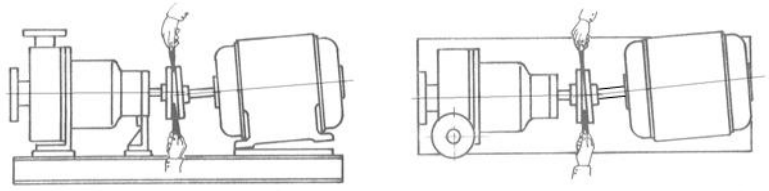


Fig. 17 *Angular: the maximum misalignment allowed is 0.8 mm (for a joint that has a 96 millimetre diameter).*

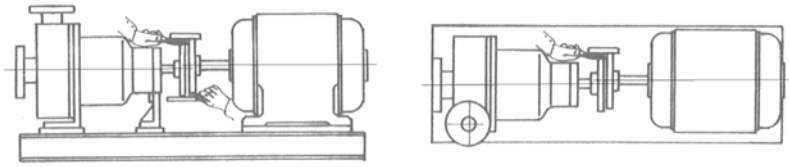


Fig. 18 *Lateral: a slight parallel misalignment, no greater than 0.2 mm, can be tolerated with this type of joint.*

4.7 Electrical connections

WARNING! Electrical installations in hazardous areas (ATEX classified) must comply with the requirements of IEC 60079-14.

4.7.1 Grounding

Make sure that the motor has suitable grounding and that it has been connected properly. The user is responsible for grounding the machine.

Use the threaded hole on the lantern, or the fastening screw on the foot of the pump marked with the following symbol. See section "Correct Installation".

4.7.2 Wire connections

Please keep in mind that:

- you must comply with the regulations of the local electricity distribution company
- do not, under any circumstances, connect the electrical motors directly to the mains, but install a suitable electrical panel equipped with a disconnector and suitable safety devices
- motors must be protected against overloads using adequate safety devices
- before turning the motor on, check that the motor cooling fan rotates freely
- to facilitate maintenance operations on the pump use flexible cables, allowing the lantern/motor unit to "slide" (see figure below)

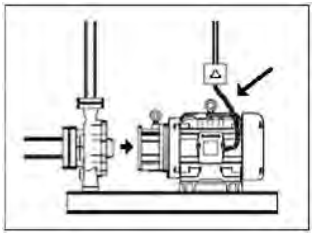


Fig. 19 *Lantern/motor unit "sliding".*

- the type of connection is specified on the motor data plate, which may be Y (star) or Δ (Delta), based on the power supply of the motor (see figure below).

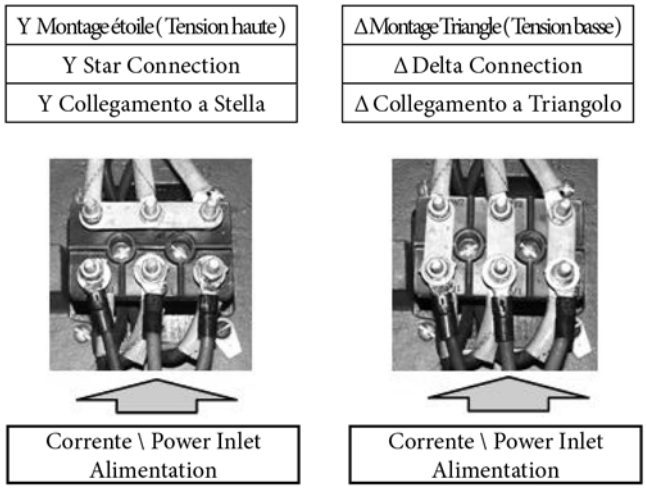


Fig. 20 *Electrical connections of the motor.*

WARNING!

Always have the electrical connections installed by a trained electrician.

Compare the available mains voltage with the data plate on the motor and then select an appropriate connection.

The electric motor to be used should comply with the data specified on the data-sheet and, however, must not exceed 3500rpm.

Do not start the pump! Check the direction of rotation! To check the motor's direction of rotation you must first FILL THE PUMP and follow the safety rules contained in the section "Safety".

5. Starting and stopping

5.1 Pre-start checklist

Before starting the pump, check the following:

- the shut-off valve on suction (if provided) must always be completely open
- the shut-off/regulation valve on the delivery must be set to the minimum flow rate for the pump. If you don't know the minimum flow rate close completely the discharge valve and slowly re-open it to 1/3.
- make sure that the fluid flows regularly to the pump
- the pump and suction piping are completely full of liquid
- for starting on new or modified plants you should use suitable temporary filter socks installed on the suction line

in case of negative suction head, fill the suction pipe and check that the foot valve works properly to prevent back flow of liquid thus emptying the suction pipe with consequent disconnection of the pump

check the direction of rotation:

the motor must turn in the same direction as the arrow shown on the pump. Since all the P.C.B. pumps turn clockwise, make sure that the motor fan turns clockwise too (view facing the motor fan).

check that the motor rotates freely by turning by hand:

· the motor cooling fan for close-coupled pumps

· the flexible joint for pumps with bearing bracket

- If the liquid must be kept at a certain temperature to prevent crystallization or solidification, heat piping in accordance with installation requirements
- make sure that any auxiliary connections are connected and working (see chapter 11 auxiliary connections, where provided):

  · heating jackets

  · inert gas flushing of the lantern: Please note: check that all threaded holes of the lantern are plugged, especially the lower one near the pump stand

  · if the pump is supplied sealed with external flushing, the flushing liquid pressure must be in compliance with the seal manual

check the level of oil:

· for pumps provided with oil lubricated bearing bracket, fill it before starting the pump (see details in section "Maintenance").

5.2 Frequency of starts

ATTENTION to the excessive surface temperature of the motor!
It may cause danger of explosion and damage to the motor!

In case of ATEX motor installation, observe the frequency of starts specified in the manufacturer's manual.

The frequency of starts is usually determined by the maximum temperature increase of the motor. This largely depends on the power reserves of the motor in steady-state operation and on the starting conditions. If the start-ups are evenly spaced over the period indicated, the following limits can be used for orientation for start-up with the delivery-side gate valve slightly open:

Motor (kW)	Maximum number of start-ups (Start-up/ hour)
< 12	15
12 - 100	10
>100	5

Do not re-start the pump/motor unit before the motor has stopped!

5.3 Start-up sequence

1) The delivery regulation/shut-off valve must be set so that the pump runs at minimum flow.
2) Make sure that the air or gas pockets have been thoroughly bleed.

   For mechanical seal pumps, only for the first start up or after long periods of downtime, rotate the pump manually 12 times through the motor fan (close-coupled pumps) or by the coupling (long coupled pumps). This in order to ensure the lubrication of the seal faces, avoiding the bonding and /or seizing up of the seal faces.

3) Start the electric motor.
4) Gradually open the delivery valve until reaching the desired output or at least one fourth of the total opening.
5) If the pressure shown on the delivery pressure gauge does not increase, turn the pump off immediately. Repeat the installation procedure.
6) The pump must not run more than two or three minutes with the delivery closed. Operating in these conditions for a longer period of time could cause serious damage to the pump.

Do not adjust the flow rate using the suction valve; see section "Intended Use" in the chapter "Safety".

Should dramatic changes in the flow rate, head, density, temperature, or viscosity of the liquid occur, stop the pump and contact P.C.B.**'s technical service.**

5.4 Starting after power failure

In case of accidental stopping, make sure that the check valve has prevented backflow and check that the motor cooling fan is stopped.

Then restart the pump following the instructions in previous section "Start-up sequence".

If the pump is installed over the machine in level, it can unprime during the stop. Therefore, before starting, check again that the pump and the suction piping are full of liquid.

To ensure correct operation of the pump avoid:

- dry running, which could cause the rotating parts to seize
- operating with the delivery closed, which will not allow the heat generated by the pump to be dissipated, resulting in a sudden increase in temperature until the pumped liquid boils and the plastic parts deteriorate
- cavitation, which causes damage to the impeller
- water hammer, which can cause the internal ports and isolation shell to break
- abnormal vibrations, which can cause the screws to loosen and affect the durability of bearings
- unstable working points, which cause undue stress on the mechanical parts.

A series of accessories are available in order to ensure that the pump runs smoothly:

- bushings for accidental dry running made of Graphite LF or Run Safe SiC
- temperature probes
- pressure sensors
- flow sensors
- vibration sensors
- electrical protection equipment

P.C.B. is at your service to help you select the most appropriate accessory.

5.5 Stop sequence

A) gradually close the delivery regulation/shut-off valve until reaching the minimum flow rate
B) stop the motor making sure that the motor deceleration is steady
C) close all the other valves: if a suction shut-off valve is present, you should close it completely

The reverse sequence is not recommended, especially with larger pumps or with longer delivery piping, in order to prevent possible problems due to water hammer.

5.6 Measures to take for periods of long inactivity

The pump remains installed:

to prevent sediment from forming inside the pump, periodically start the pump for about five minutes (about once a month).

The pump is removed:

proceed as described in the previous section "Stop Sequence". Protect the ports (using the caps provided on delivery). When handling and storing the pump, follow the instructions in section "Storage".

If electrically charged liquids were used in the pump, fill it with inert gas when draining to prevent the formation of an explosive atmosphere.

To allow electrostatic charges to dissipate, wait at least one hour before removing the pump from the plant.

5.7 Running the pump after a long period of stop

It is always recommended to run the pump at least once a month or once every three months as a minimum, for approximately 5-10 mins.

This avoids the formation of sediments inside the pump, as well as preventing the elastomers from loosing their elasticity and the mechanical seal from hardening (if the pump is equipped with it).

To restart the pump after a period of inactivity, see the entire section "Starting and stopping" and the section "Maintenance".

We recommend following these suggestions:

UP TO ONE YEAR:

- replace all elastomers;
- check the conditions of the bearing lubricant (1)
- check the mechanical seal (see the mechanical seal manual) (2)

BEYOND ONE YEAR (in addition to the above):

- replace the bearings (1)
- check the magnetic field of the inner and outer magnet (3)

(1) applicable only for pumps equipped with bearing bracket

(2) applicable only for pumps with mechanical seal

(3) applicable only for magnetic drive pumps

6. Pump characteristics

6.1 Description and operation of the pump

The **UTS EVO** series pumps are single-stage centrifugal magnetic pull ones, made in the ball bearing bracket version.

The main feature of these pumps is the transmission of motion by magnetic coupling.

The external magnetic core, connected to the primary shaft, which in turn is connected to the motor by a jaw coupling with spacer, transmits the torque to the internal magnetic core and then to the impeller by means of a magnetic field.

The impeller is thus rotated without physical contact between the two cores.

The isolation shell is fitted between the two cores which, together with the casing and because of the gaskets, hermetically seals the liquid pumped from the atmosphere without the aid of a mechanical seal.

6.2 Reference regulations

Compliant with	2006/42/EC	2014/34/EU
In accordance with	ISO 2858 / EN 22858 (formerly DIN 24256)	ISO 5199- DIN EN ISO UNI 15783
Flange	UNI 1092-1 PN16RF	
	or slotted hole ANSI 150RF (optional)	

6.3 Minimum and Maximum Flow

Unless specified otherwise in the characteristic curves or on the data sheets, the following applies:

Qmin = 0.1 x Qbep : SHORT OPERATION

Qmin = 0.3 x Qbep : CONTINUOUS OPERATION

Qmax = 1.1 x Qbep : 2-POLE OPERATION

Qmax = 1.25 x Qbep : 4-POLE OPERATION

Qmin = Minimum flow

Qmax = Maximum flow

Qbep = Flow at the best efficiency point

The data refer to water or other liquids similar to water. However, if the physical properties of the treated liquids are different from those of water, it is necessary to determine whether the additional heat generated can lead to an increase in temperature, such as to impair the operation of the pump. If necessary, the minimum flow rate must be increased.

7. Technical data

7.1 Technical characteristics

CHARACTERISTICS	DESCRIPTION
Type of Pump	Horizontal single stage centrifugal magnetic pull pump - Execution: ball bearing bracket
Performance 2900 rpm	Q max = 320 m3/h -> H max = 95 mcl
Motor drives 2900 rpm	1.1 kW (size 80) -> 90 kW (size 280)
Operating temperature limits ***	-20°C -> +300°C (option up to -40°C)
Viscosity limits	0.5 - 60 cSt max *
Solid limits **	2% max.concentration_Max. dimension 0.3 mm

*In the presence of other viscosities, contact P.C.B.

**In the presence of solids, always follow the indications on the data-sheet or contact P.C.B.

***With temperatures above180°C, check that the pump is supplied with an adjustment spacer / heat sink (see chapter 12.1)

7.2 Operating temperature/pressure limit chart

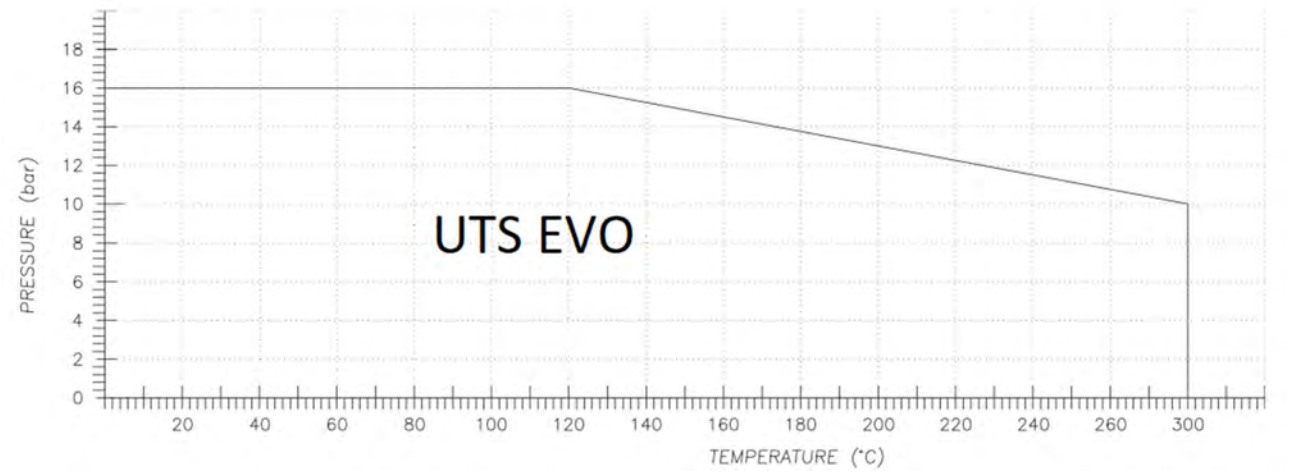


Fig. 21 *UTS EVO chart*

Environmental temperature	0÷40 °C
Environmental humidity	35÷85% RH
Environmental pressure	0.8÷1.1 bar abs

In the event of high thermal excursion between the temperature of the pumped liquid and the room temperature, condensation may form inside the lantern.

To transfer high temperature liquids take into account the motor operating temperature limit.

When transferring low temperature liquids, condensation may form on the magnet and volute casing. In this case, de-humidify the area.

7.3 Materials constituting the pump

DIN code	COMPONENT	MATERIAL
102	Volute Casing	AISI 316 (CF8M) (1.4408)
157	Isolation shell	Hastelloy C + 316L
211	Shaft	AISI 316 (1.4401)
213	Top shaft	Steel C45
230	Impeller	AISI 316 (CF8M) (1.4408)
330	Bearing bracket	GS400
344	Lantern	GS400 (C40*- SS*)
35x	Bushings support	AISI 316L (CF3M) (1.4409) AISI 316 (1.4401)
411.x	Joint Ring	PTFE / Grafoil / Gore®
412.x	O-ring	Silicone / Pfa
504.x	Spacer ring	PTFE / Armored Grafoil
510	Thrust bearing	SiC / RSSiC
529	Bearing sleeve	SiC / RSSiC
545	Bearing bush	SiC / Graphite / PEEK / RSSiC
855	Inner magnet	AISI 316L (1.4404)
856	Outer magnet	GS400 / High temperature version

*Special structure

7.4 Allowed forces and moments

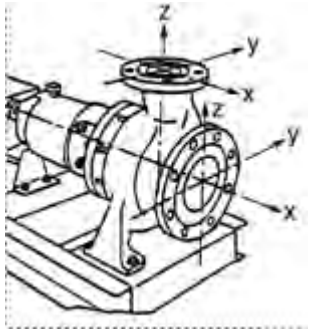


Fig. 22 *Forces and moments. X-axis: suction, Z-axis: delivery.*

FORCES (Fx, Fy, Fz)

Axis z - DN	Fy (N)	Fz (N)	Fx (N)	Σ F (N)
25	490	595	525	910
32	595	735	630	1155
40	700	875	770	1365
50	945	1155	1050	1820
65	1190	1470	1295	2310
80	1435	1750	1575	2765
100	1890	2345	2100	3675

Axis x - DN	Fy (N)	Fz (N)	Fx (N)	Σ F (N)
25	525	490	595	910
32	630	595	735	1155
40	770	700	875	1365
50	1050	945	1155	1820
65	1295	1190	1470	2310
80	1575	1435	1750	2765
100	2100	1890	2345	3675
125	2485	2240	2765	4340

MOMENTS (Mx, My, Mz)

Axis z - DN	My (Nm)	Mz (Nm)	Mx (Nm)	Σ M (Nm)
25	420	490	630	910
32	525	595	770	1120
40	630	735	910	1330
50	700	805	980	1435
65	770	840	1050	1540
80	805	910	1120	1645
100	875	1015	1225	1820

Axis x - DN	My (Nm)	Mz (Nm)	Mx (Nm)	Σ M (Nm)
25	420	490	630	910
32	525	595	770	1120
40	630	735	910	1330
50	700	805	980	1435
65	770	840	1050	1540
80	805	910	1120	1645
100	875	1015	1225	1820
125	1050	1330	1470	2135

7.5 Component details and drawing

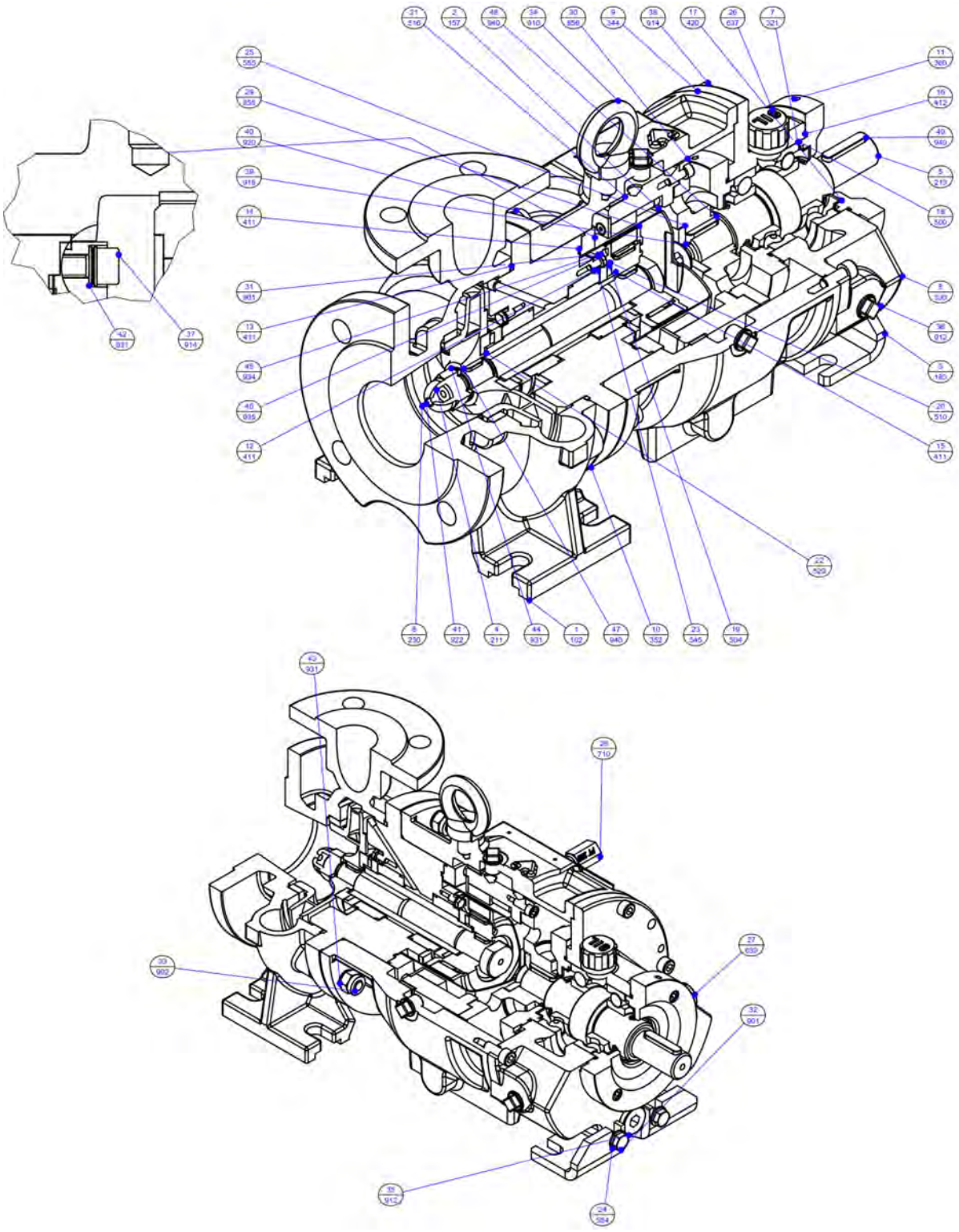


Fig. 23 *General section UTS EVO first frame series 125.*

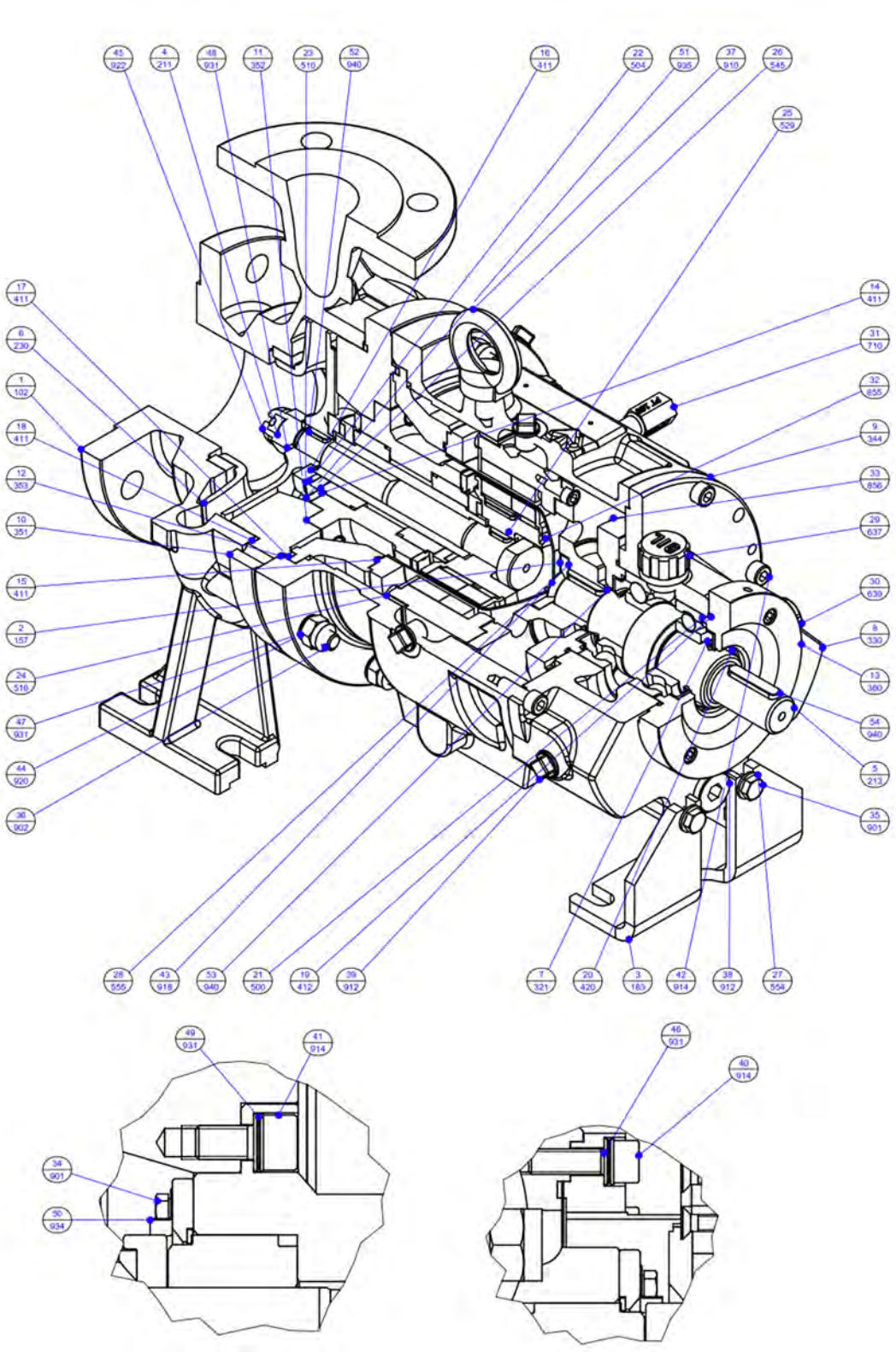


Fig. 24 *General section UTS EVO first frame series 160/200.*

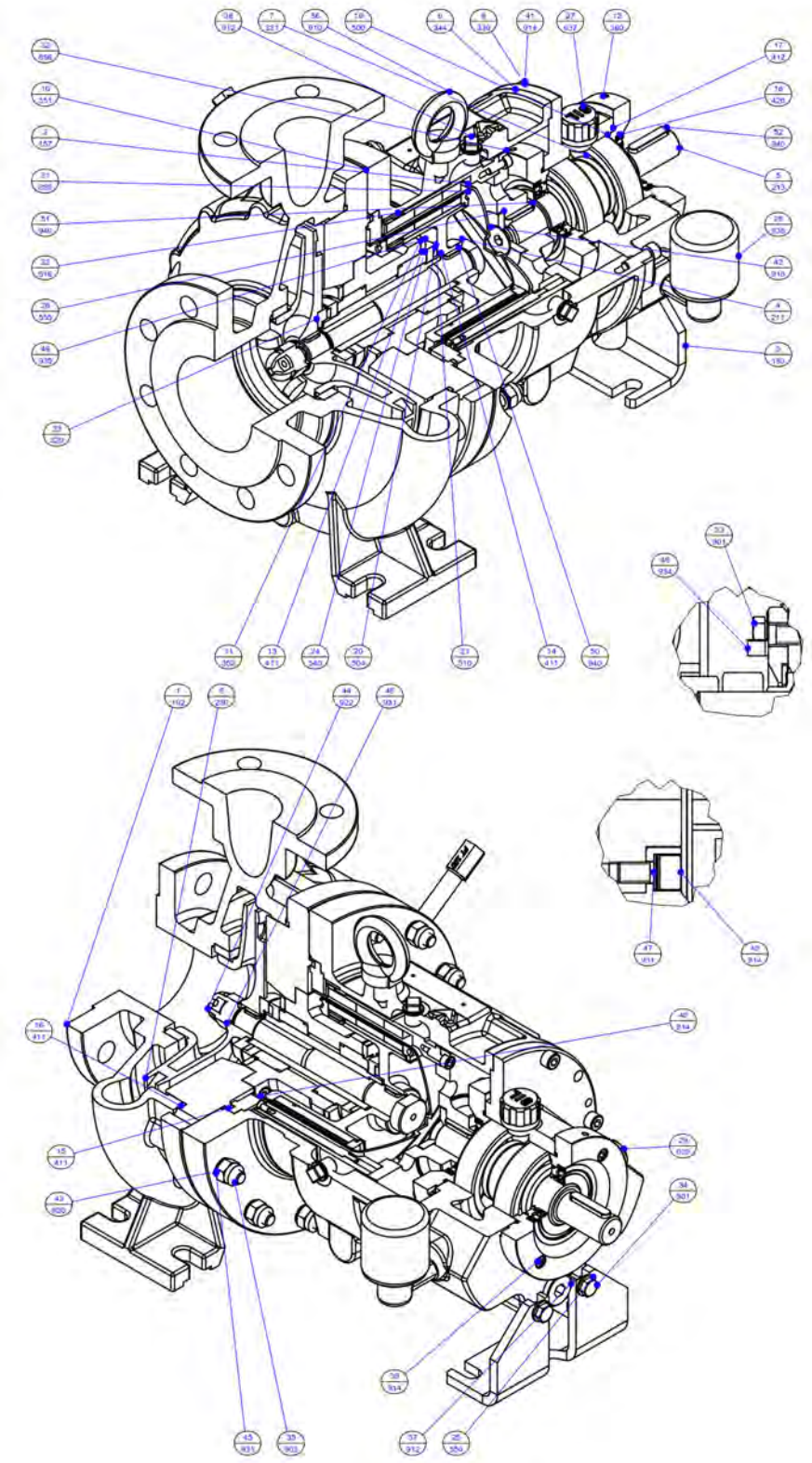


Fig. 25 *UTS EVO section 1st bracket 50-160/200 series (Motor >= 22 kW/2900 rpm).*

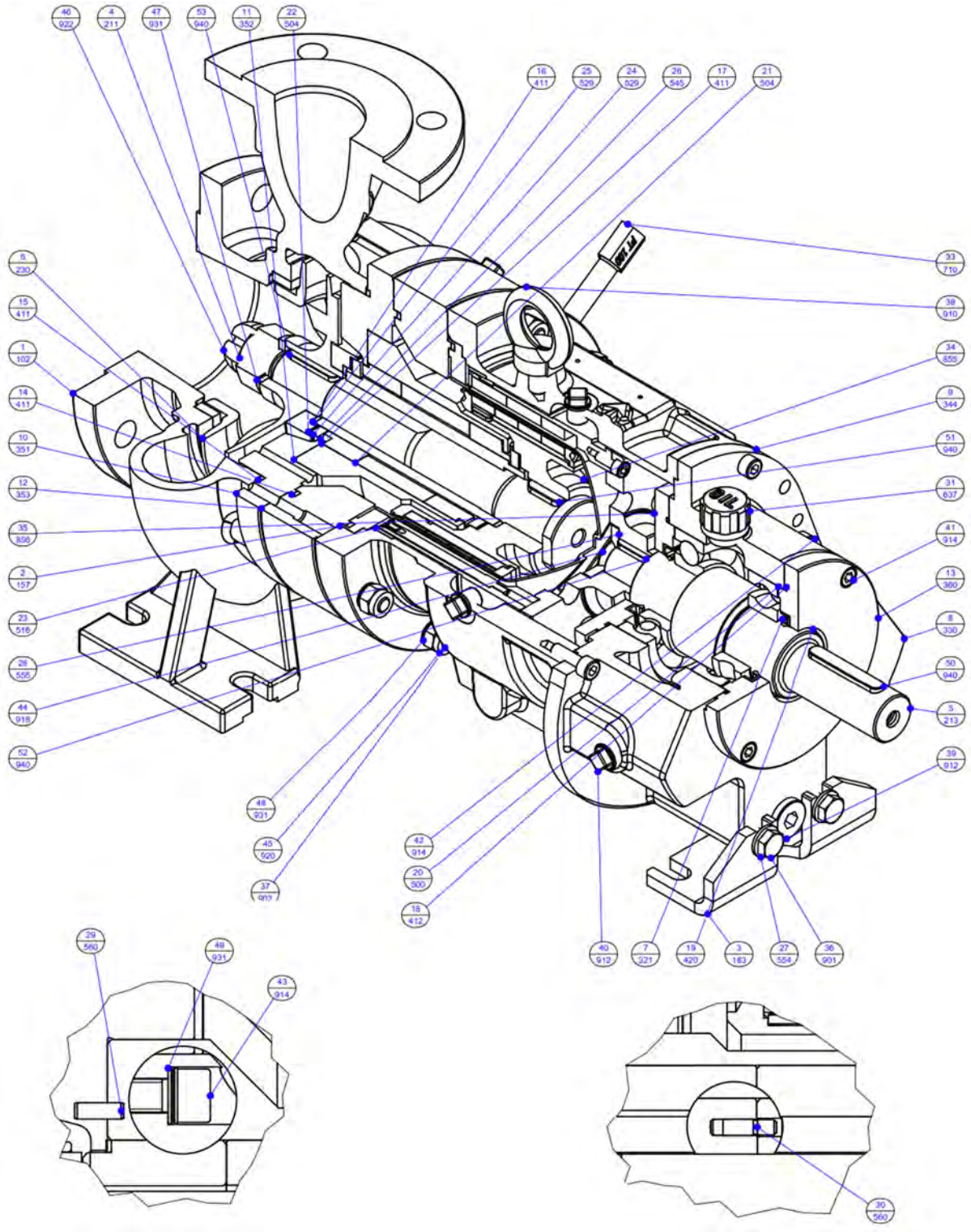


Fig. 26 *General section UTS EVO second frame series 160.*

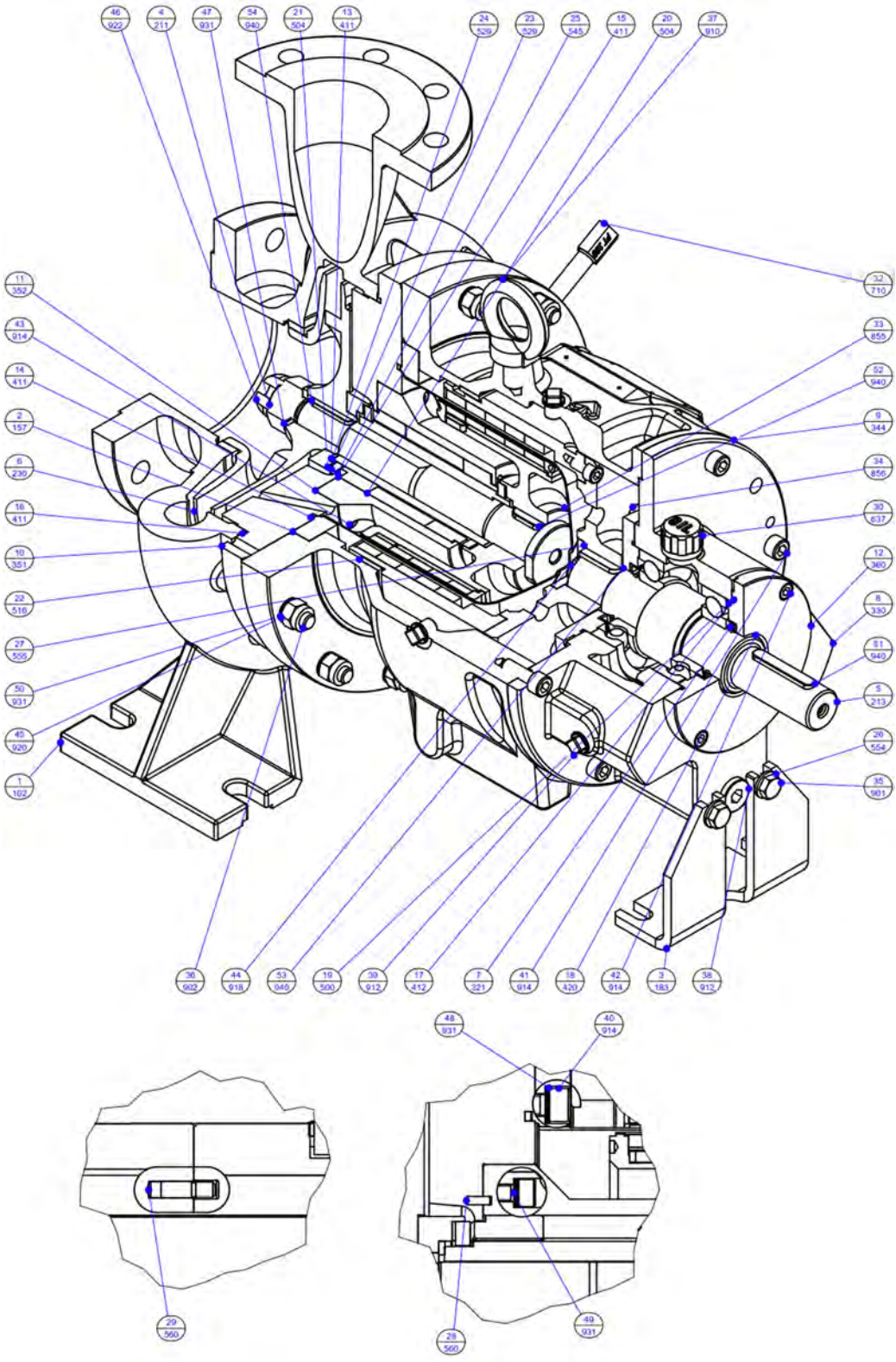


Fig. 27 *General section UTS EVO second frame series 200/250.*

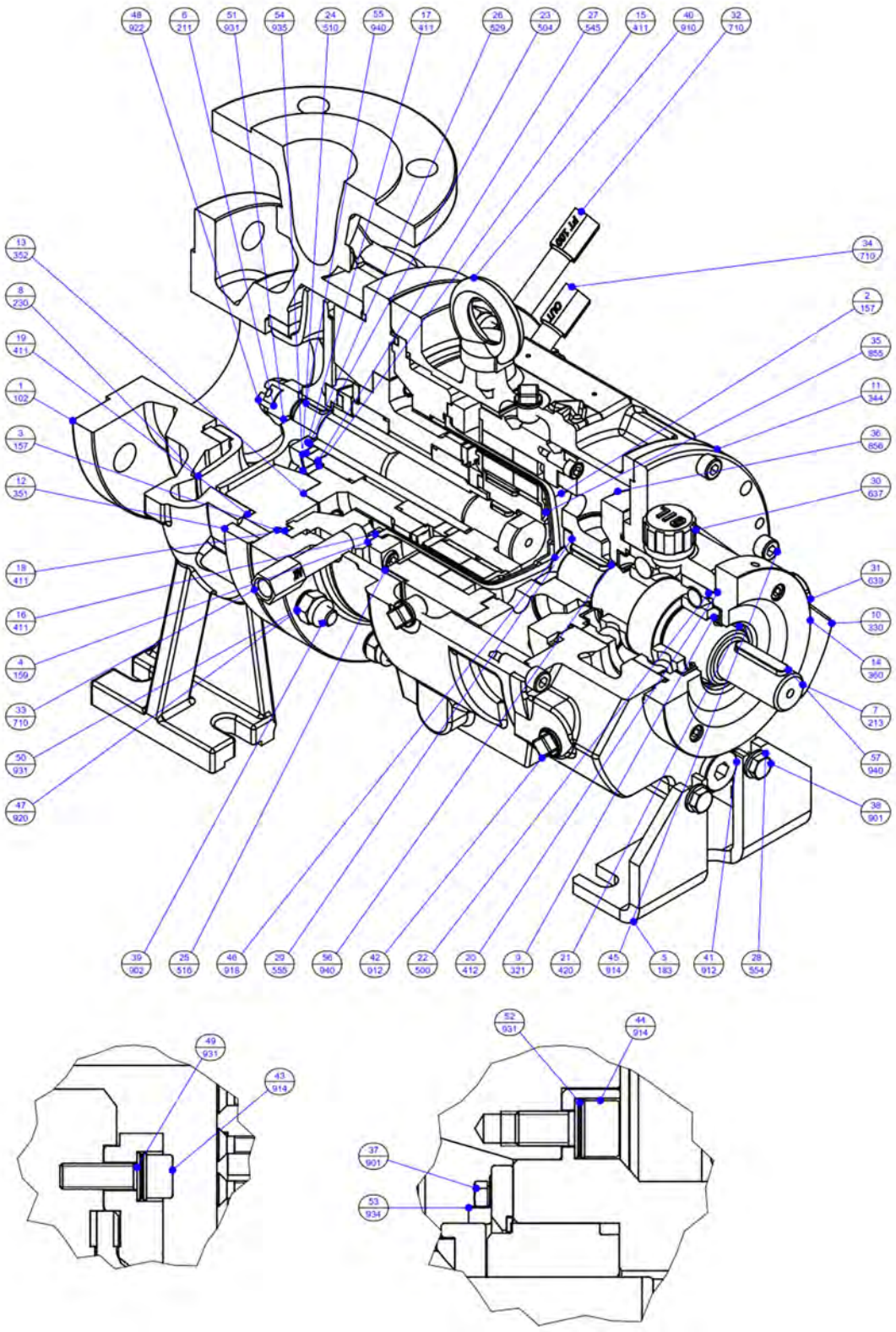


Fig. 28 *UTS EVO section 1st bracket double isolation shell.*

DIN. Code	Description
102	Volute Casing
157	Isolation shell
159	Isolation Shell Flange
183	Support Foot
211	Pump side Shaft (secondary shaft)
213	Motor side Shaft (primary shaft)
230	Impeller
321	Single row radial ball bearing
330	Bearing Bracket
344	Lantern
348	Lantern Spacer
351	Jacketed Bushing Bracket
352	Bushing Bracket: Seat
353	Bushing Bracket: Adjustment Flange
360	Bearing Bracket Cover
411	Ring Gasket
412	O-Ring
420	Oil Seal
426	Not contacting Seal
500	Ring
504	Spacer
510	Thrust Bearing
516	Spark-proof Ring
529	Rotating Bushing
545	Static Bushing
554	Flat Washer
555	Flat Countersunk Washer
560	Pin
637	Oil Filler Cap
638	Constant Level Oiler
639	Oil Level Cap
710	Connection
855	Internal Magnetic Core
856	External Magnetic Core
901	Hex Head Screw
902	Stud Bolt
910	Eye Bolt
912	Drainage Plug
914	Hex Socket Head Screw
918	Countersunk Hex Head Screw
920	Nut
922	Impeller Nut
931	Locking Washer
934	Locking Device
935	Locking Ring
940	Key

8. Disassembly

8.1 General information

During the warranty period no work must be performed by personnel not authorised by P.C.B. All stages described in this chapter must be performed by qualified personnel.

Prior to carrying out any work on the pump ensure the following recommendations are observed:

use proper Personal Protective Equipment.

clean the outer surface of the pump only with antistatic solutions and clothes.

disconnect all electrical contacts so that the machine cannot start inadvertently.

empty and purge the pump to service the parts in contact with the pumped liquid.

Warning! During assembly/disassembly, strong magnetic fields are present near the magnetic parts/components. Bring metal tools at a safe distance so that they are not pulled suddenly. Furthermore, we recommend to keep electrical data or magnetic strip supports and watches at least 15 cm away.

People with pacemakers must remain at least 50 cm away.

Ceramic and silicon carbide parts are very brittle, therefore they must be handled with care.

8.2 UTS EVO pump Frame I and II disassembly.

Fig. 29 *Empty the oil contained in the bearing bracket by unscrewing the drain plug (912).*

Fig. 30 *Position the pump vertically. Loosen the screws (914) and separate the bearing bracket (330) from the pump using appropriate lifting systems. Loosen the screw and separate the foot (183) from the bracket (330).*

Fig. 31 *Loosen the nuts (920) and separate the lantern (344) from the volute casing (102) using appropriate lifting systems.*

Fig. 32 *Remove the assembled bracket from the volute casing (102) and place it on a stable spacer (do not "load" the impeller with the weight of the assembled bracket).*

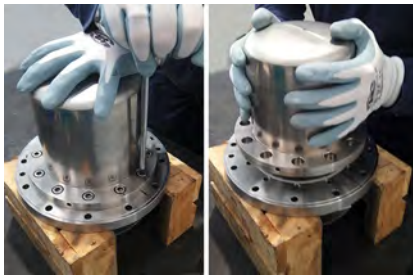


Fig. 33 *Where present, loosen the screws (914) and remove the isolation shell (157).*

Fig. 34 *Tighten the equipment (if available) in a bench vice and place the assembled bracket on top.*

Fig. 35 *Unscrew and remove: the impeller nut (922), the washer (931) and the impeller (230).*

Fig. 36 *Turn the impeller (230) upside down and extract the rotating bushing gasket (411).*

Fig. 37 *Remove the front feather key (940) from the secondary shaft (211).*

Fig. 38 *Remove the compensation ring (504) and the front slewing bearing (510).*

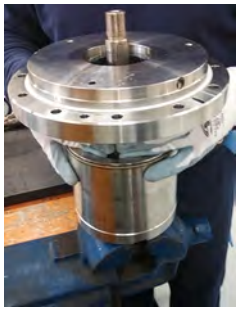


Fig. 39 *Extract the bushing bracket (350).*

Fig. 40 *Extract the following from the impeller shaft (211): the rotating bushing (529), the rear slewing bearing (510) and then the compensation ring (504).*

Fig. 41 *Extract the secondary shaft (211) from the internal magnetic core (855).*

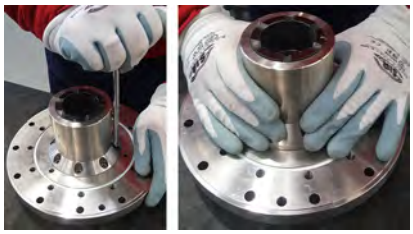


Fig. 42 *For the "2nd bracket" pumps: loosen the screws (914) and the washers (931) to separate the "flange" (351) from the bushing bracket seat (352).*

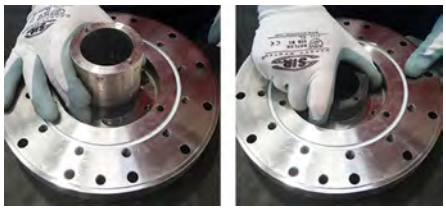


Fig. 43 *For the "2nd bracket" pumps: extract the spacer ring (504) and the front static bushing (545).*

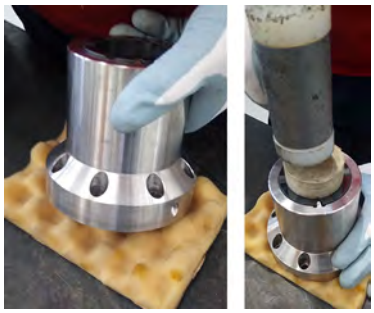


Fig. 44 *For the "2nd bracket" pumps, place the bushing bracket "seat" (352) on a soft surface. With a plastic buffer, extract the rear static bushing (545).*

Fig. 45 *For the "1st bracket" pumps: from the bushing bracket (350) disengage the safety washers indicated by the arrow (931) from the screws (901) and loosen the bushing locking flange (935).*

Fig. 46 *For the "1st bracket" pumps: extract the bushing locking flange (935) from the bushing bracket (350).*

Fig. 47 *For the "1st bracket" pumps: extract the gasket (411) and the front static bushing (545). Turn the bracket (350) upside down and repeat the operations in fig. 45 to extract the rear static bushing (545).*

Fig. 48 *For the "1st bracket" pumps: if the bushing bracket is divided (351 + 352), loosen the screws (914) and the washers (931) to separate the "flange" (351) from the seat (352).*

Fig. 49 *Extract the gasket of the rotating bushing (411) from the internal magnetic core (855).*

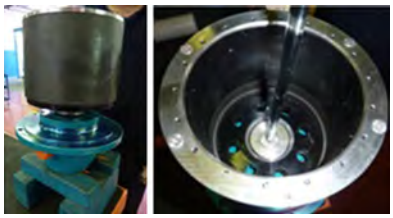


Fig. 50 *Position the bearing bracket vertically (330) with the outer magnetic core (856) facing upwards. Remove the screw (918) and the washer (555).*

Fig. 51 *Extract the outer magnetic core (856) from the primary shaft (213).*

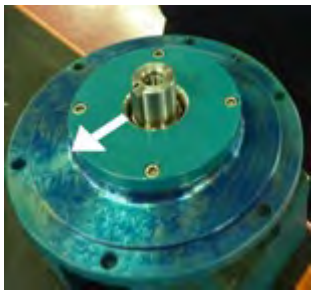


Fig. 52 *Remove the feather key (940) from the primary shaft (213). Repeat the operation on the other side of the shaft.*

Fig. 53 *Unscrew the oil bracket cover screws.*

Fig. 54 *Separate the cover (360) from the bearing bracket (330).*

Fig. 55 *Pull out the O-Ring (412) from the bearing cover seat (360).*

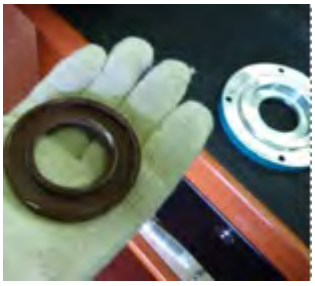


Fig. 56 *Remove the oil seal (420) from the bearing cover (360).*

Fig. 57 *Remove the primary shaft (213) and its bearings under the press.*

Fig. 58 *Using the extractor to separate the bearings (321) from the primary shaft (213).*

Fig. 59 *Remove the compensation ring (500) from the bearing bracket (330). Turn the bearing bracket (330) upside down and repeat the operations in fig. 52 to separate the cover (360).*

9. Maintenance

9.1 Maintenance interval

To ensure reliable and safe operation the pump unit must undergo proper maintenance at regular intervals and must be kept in perfect technical conditions.

The inspection/maintenance intervals may vary according to the working point of the pump referred to the characteristic curve.

Furthermore, some circumstances, such as intermittent operation, characteristics of the pumped fluid and installation in a system, may impact the duration of wear parts.

However, the best practice is to verify annually the state of the pump components.

9.2 Parts to be checked

1) BEARING BRACKET (Code 330)

DETAILS	ACTIONS
Is the bearing bracket over temperature? (see following paragraph "Oil change")	Check the alignment of the elastic coupling between pump and motor and check pump execution
Is there enough oil?	Check the oil level and refill/replace the existing oil

2) OUTER MAGNET (Code 856)

DETAILS	ACTIONS
Are there any abrasions on the magnet housings?	Contact P.C.B. in case of faults.
Is the magnet mounted properly? Are screws loose?	Check the coupling between motor and magnet and tighten the screws.
Is the internal diameter of the magnet turning concentrically to the drive shaft?	Check the magnet-motor coupling. Tighten or replace the fastening screws.
Is the magnet vibrating during operation?	Check balancing and magnet-motor coupling. Tighten or replace the screws.

3) ISOLATION SHELL (Code 157)

DETAILS	ACTIONS
Does the internal diameter of the isolation shell show signs of chemical aggression?	Contact P.C.B. in case of faults.
Is the isolation shell visibly broken?	Stop the pump and replace the isolation shell.
Are there spots/stains on the outer surface of the isolation shell?	Clean the isolation shell thoroughly and check its seal.

4) IMPELLER (Code 230)/INNER MAGNET (Code 855)

DETAILS	ACTIONS
Is the impeller damaged?	Pls contact P.C.B. if some failure is detected
Are the impeller vanes clogged?	Unclog and clean the impeller
Is there any chemical attack on the lined surface?	Pls contact P.C.B.

5) VOLUTE CASING (Code 102)

DETAILS	ACTIONS
Are there any signs of breakage?	If any abnormality is observed, replace the casing.
Does the gasket show signs of swelling/wear?	Replace the gasket.
Are there signs of chemical aggression on the inner surface?	Contact P.C.B.

6) SHAFT (Code 211) / BUSHINGS (Code 529 - 545)

DETAILS	ACTIONS
Are the shaft and/or bushings worn out?	Check for wear according to the following table and replace worn components as necessary.

9.3 Replacing wear parts

The following components may impair the correct operation of the pump if not replaced regularly:

- casing and isolation shell gaskets (411.x)
- gaskets of bearing sleeves and bushing locking flange (411.x) and compensation rings (504.x)
- bearing sleeve (529), bearing bush (545) and thrust bearings (510) (The limit size values are shown in the following table)

To order spare parts please specify the DIN code of the component and the **SERIAL NUMBER OF THE PUMP**.

Description	DIN code	Ref.	First support rated value (mm)	First support limit value (mm)	Second support rated value (mm)	Second support limit value (mm)
Thrust bearings	510	A	10.3	10.1	7	6.8
		F	Ø 38.1	38.7	Ø 55.1	Ø 55.7
Bearing sleeve	529	E	Ø 38	37.95/37.97	Ø 55	Ø 54.93
Bearing bush	545	C	30.5	30.45	35	34.9
		D	Ø 38	38.02/38.07	Ø 55	Ø 55.08

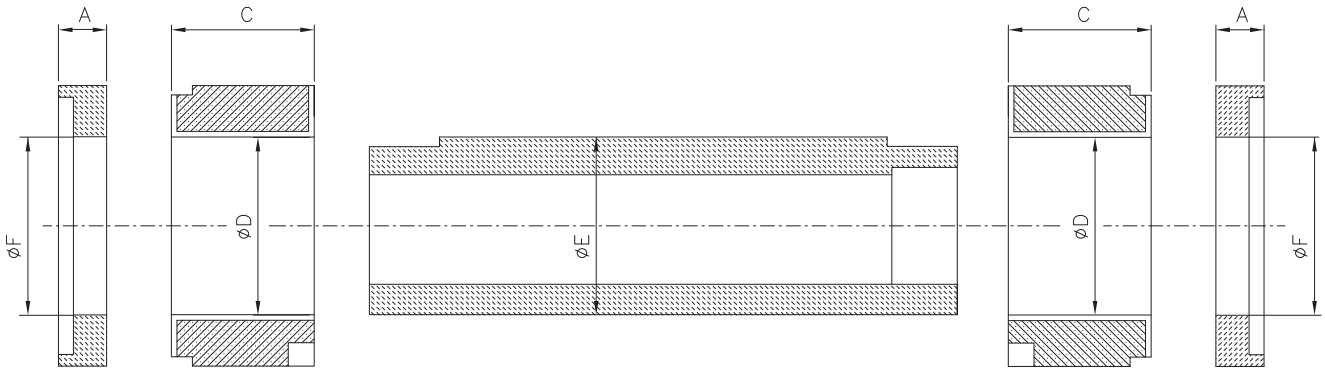


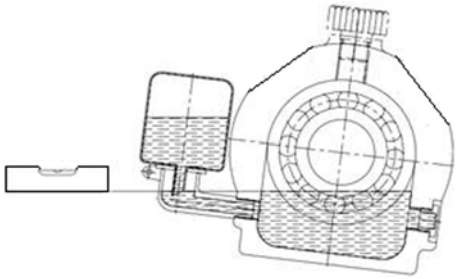
Fig. 60 *Thrust bearings, bearing sleeve and shaft are wear parts.*

9.4 Bearing bracket and bearing life

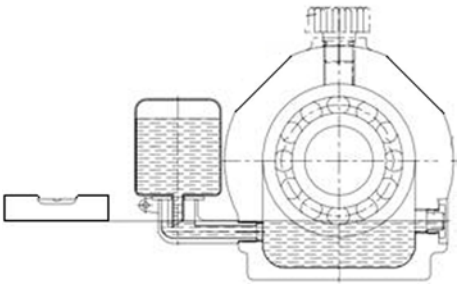
Warning! Excessive increase in temperature may seriously damage the pump and create a risk in an explosive environment.

The bearings are designed to last 17,500h provided that the instructions given here are followed:

- pipe performances (given in the data-sheet and on the nameplate)
- correct alignment of the elastic joint between pump and electric motor
- correct oil level (must be in the center of the specific level warning device)
- oil change intervals (see paragraph 9.5)
- correct installation of the support bearings (see drawing below)



Non correct installation



Correct installation

It is advisable to monitor the bearing temperature, particularly for pumps installed in environment with an explosion hazard.

In some cases vibrations must be measured in order to identify any wear of the bearing brackets in a timely manner.

It is advisable to replace the bearings after 17,500h of operations.

Their operating life drastically reduces if the aforementioned instructions are not followed.

The standard equipment provides for the following oil lubricated roller bearings :

- 2 bearings type 6307 C3 (1st bracket)
- 2 bearings type 6309 C3 (2nd bracket)

9.5 Oil change

Oil change intervals depend on the conditions of pump operation. Observe the following table.

Bearing bracket temperature	First change after the following no. of hours of operation	Subsequent changes after the following no. of hours of operation
up to 70 °C	300	8600
70 °C ÷ 80 °C	300	4300
80 °C ÷ 90 °C	300	2100
90 °C ÷110 °C	300	1000

Use the following type of lubricant: viscosity of 46 Cst, for application limits between -15 °C and 190 °C and with room temperature between -15 °C and 40 °C.

Should the temperature of the process fluid be higher than 190°C the lubricant to be used should have a viscosity equal to 68Cst, as indicated in the table below.

Application limits	-15 °C ÷ 190 °C	> 190 °C
Viscosity	46 cSt	68 cSt

The following table shows the lubricants that match the required characteristics:

Brand	T process liquid < 190 °C	T process liquid > 190 °C
ROLOIL	LR-46	LR 68
AGIP	OTE-46	OTE 68
MODIL	MODIL 46	MODIL 68
ESSO	NURAY 46	NURAY 68
CASTROL	MAGNA 46	MAGNA 68

Oil load table:

Support	Oil top-up (litres)
First support	0.25*
Second support	0.50*

*with constant level oiler option, the oil load increases by 0.12 l.

9.5.1 Filling the oiler (if supplied)

Proceed as follow to fill up the oiler:

1) Tilt the oiler bowl (638)
2) Fill the oiler bowl with oil
3) Release the bowl so that it returns to vertical position
4) If the oil level is too low, top up the bowl

WARNING! Never fill the bearing bracket with oil through the connection in the oiler!

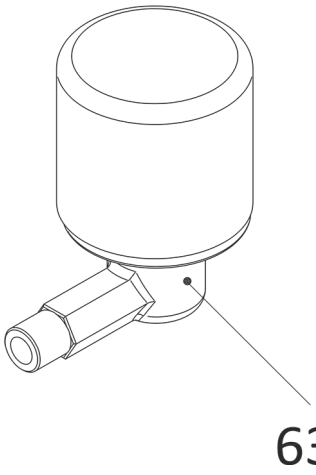


Fig. 61 *Oiler.*

9.6 Stock of recommended spare parts (two years of operations according to DIN 24296)

Quantity of the recommended spare parts stock:

Part no.	Workpiece name	Number of pumps (including backup pumps)						
		2	3	4	5	6 and 7	8 and 9	10 and more
211	Shaft	1	1	1	1	2	2	20%
213	Shaft	1	1	1	1	2	2	20%
157	Isolation shell	1	1	1	1	2	2	20%
230	Impeller	1	1	1	1	2	2	20%
321	Ball Bearing	2	4	4	6	6	8	100%
411	Casing gasket	4	6	8	10	12	16	200%
411	Isolation shell gasket	4	6	8	10	12	16	200%
411	Bushing gasket	4	6	8	10	12	16	200%
412	O-ring	4	6	8	10	12	16	200%
420	Oil Seal	4	6	8	10	12	16	200%
502	Casing wear ring	1	2	2	3	3	4	50%
504	Spacer ring	2	4	4	6	6	8	100%
510	Thrust Bearing	2	4	4	6	6	8	100%
529	Rotating Bushing	1	2	2	3	3	4	50%
545	Static Bushing	2	4	4	6	6	8	100%
855	Internal Magnetic Core	1	1	1	1	1	2	20%
856	External Magnetic Core	1	1	1	1	1	2	20%

10. Assembly

10.1 General information

Before any assembly operation see the recommendations in the "Disassembly" chapter.

10.2 Screw tightening torque

DIN Cod.	Description	Thread	Tightening torque (Nm)
901	Hexagon head bolt	M5	3
		M10	28
914	Socket Head cap screw	M6	6.9
		M8	17
		M10	33
		M12	56
918	Countersunk hex head screws	M12	30
920	Volute casing nuts	M10	28
		M16	90
922	Impeller nut	M16	90
		M24	250

10.3 UTS EVO pump first and second bracket assembly.

Follow the sequence given in the "Disassembly" chapter in reverse order and take into consideration the following:

Fig. 62 *Vertically position the lantern (344), insert the isolation shell (157) making sure that the hole on the isolation shell flange is aligned with the hole of the temperature probe housing on the lantern. Use an Allen key as a position reference leaving it inserted until assembly has been completed.*

Fig. 63 *For the "1st bracket" pumps: insert the hex head screws (901) and their safety washers (931) into the holes of the bushing locking flange (935) and bend the washers over the outer edge of the flange (935).*

Fig. 64 *For the "1st bracket" pumps: position the bushing locking flange (935) so that the anti-rotation tooth is aligned with the slot of the static bushing (545).Tighten the screws (901), bend and lock the washers. Turn the support (350) upside down and repeat the same operations to assemble the other static bushing (545).*

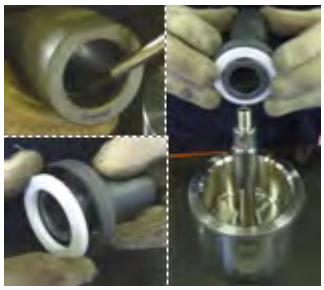


Fig. 65 *Caution! Insert the components on the rotating bushing (529) from the side that has been internally milled as indicated.Insert: the rear thrust bearing (510), the axial clearance compensation ring (504). In the "high temperature" version, insert the reinforced Grafoil ring (504) into the thrust bearing (510) and then the metal shim (504).Insert everything on the secondary shaft (211).*

Fig. 66 *Position the lubrication hole on the bushing bracket (350) as indicated.*

Fig. 67 *Note. The lubrication hole is in line with the volute casing volute outlet (102).*

Fig. 68 *Heat the bearings (321) using a specific heater and insert them on the primary shaft (213).*

10.4 Assembly check

After assembly, check the following:

- the impeller rotates freely, when operating on the motor fan or the impeller vanes from the intake or delivery opening;
- the pump is sealed by means of air or water pressure at 6 bar;
- the screws of the casing are tightened according to the table in the "Screw tightening torque" paragraph;
- the bearing bracket does not leak oil from the plug or from the gaskets/sealing rings.

Do not start the pump!

To check the motor's direction of rotation you must first FILL THE PUMP and follow the instructions in "Starting and stopping".

11. Malfunctions and solutions

Prior to performing any operation on the pump disconnect the power.

Do not, in any case, operate on pumps or components that have not been fully purged.

In compliance with regulation 81/08, our technical assistance service cannot operate on pumps or components which have not been fully purged. Therefore we will be forced to return to sender all pumps we receive that have not been purged.

11.1 Malfunction table: possible causes and solutions

A	The pump delivers an insufficient flow rate
B	Motor overloading/overheating
C	Excessive increase of the bearing temperature (where present)
D	Leaks from the pump, the mechanical seal (when present) or connections
E	Vibrations during pump operation
F	Excessive increase of the temperature inside the pump

A	B	C	D	E	F	Possible cause	Solution
X						The pump is not primed correctly	Prime the pump and bleed any air in the pipes/volute casing.
X						High head loss.	Set the operation point in accordance with the pump characteristic curves. Check that the pumped liquid is free from impurities. Check the diameter of the impeller; it may be too small
X				X	X	Air in the pump or pumped liquid. The pump or piping are not fully bled/filled	Check the piping seal and the gaskets of the volute casing; replace them if necessary. Bleed and/or fill up
X						Intake manifold or impeller clogged and/or blocked	Remove any sediment from the pump or piping
X			X	X		Available NPSH too low (cavitation)	Check/increase the suction head. Open the suction cut-off valve. Check suction head loss. Check and clean any filter installed on suction
X						Wrong direction of rotation	Invert the two power supply phases of the motor (in case of three-phase power supply)
X						Speed is too low, wrong electrical connections (a phase is missing)	Check the electrical connections and correct them if necessary. Check and increase voltage/frequency within the allowed range if necessary
	X					Power voltage too low	Check electrical installation

A	B	C	D	E	F	Possible cause	Solution
X		X	X	X	X	Rotating parts worn (bearings/ seal faces/wear rings)	Replace worn parts with new parts
	X			X		Backflush pressure of the pump lower than the value in the data sheet. No head on delivery	Adjust the working point again. In case of permanent overload, decrease the impeller diameter.
X	X			X		Density and viscosity of the pumped liquid too high compared with the values in the data sheet	Contact P.C.B.
X			X			Worn gaskets in the volute casing or flanges	Replace the gaskets of the volute casing or connections.
	X	X	X	X		Pipes cause mechanical stress on the pump, or vibrations in the pipes	Check the pump is installed correctly, so as not to be mechanically strained, and check the alignment. Support the pipes properly
	X	X	X	X		Misalignment of the pump/motor unit	Check the coupling and realign if necessary. Check the conditions of the seal for pumps with mechanical seal. Replace the coupling blocks if worn
		X		X		Poor lubrication (low oil level) or excessive lubrication (excessive oil in the bearing bracket) or wrong type of lubricant	Add, decrease or replace the lubricant
	X				X	Wrong tolerance of the bearing bracket housing/bearings	Contact P.C.B.
				X		The impeller is not properly balanced	Balance and/or clean the impeller
	X			X		Worn bearings	Replace bearings
			X			Loose connecting bolts and screws	Check the bolts and screws are tightened periodically
					X	Liquid temperature not compliant with data sheet or contractual documentation	Check the temperature of the pump/pumped liquid. Contact P.C.B.
			X			Use of unsuitable materials	Change the combination of materials. Contact P.C.B.
					X	No coolant or dirty flushing liquid	Increase flushing. Clean/purify the flushing liquid
			X			Disassemble the pump and find the source of leaks	Repair where necessary. Contact P.C.B.
X				X	X	Air in the pumped liquid due to a low level of liquid at suction	Increase the level of liquid at suction and keep it as constant as possible
X				X	X	Pump running without liquid (dry run)	Stop the pump and check the internal components are not damaged
X	X			X		Foreign bodies in the pump	Check and clean the pump

11.2 Disposal

Parts of the pump may be contaminated by liquid that is harmful for people or the environment.

1) Wear protective clothing when operating on the pump.
2) Before disposing of the pump:

   - Collect any leaked fluids and dispose of them in compliance with current regulations.

   -Purge any residual fluids

3) Separate the materials of the pump (plastic, metal, etc.), disposing of them in compliance with current regulations.

The Directive 2012/19/EU regarding disposal of waste coming from electrical and electronic devices on UE territory (RAEE) is applicable to this product. This device cannot be disposed of like normal domestic waste, due to the different materials it is made of. It will be your care to inquire the public authority about the ecological platform which can receive and dispose this product to be recycled.

Please mind that together with a new purchase, the manufacturer have to collect for free your old product that must be disposed.

This product is not potentially dangerous for human health and environment, it does not contain any dangerous materials as per Directive 2011/65/UE (RoHS) but, if abandoned on the environment it can impact negatively on the ecosystem. Please, carefully read the instructions before using the device for the first time. Do not use this product for a different purpose than the one it has been manufactured for, an improper use can lead to electrical shock.

The symbol on the left, which is also placed on the device label, specifies that this product is subordinated to the legislation in matter of electronic and electric waste. The abandon of this type of products on the environment is punished by law.

12. Weight and size

Weight of pumps excluding the motor:

PUMP TYPE	WEIGHT (kg)
UTS EVO (40-25/50-32/65-40)-125	55
UTS EVO 80-50-125	60
UTS EVO (40-25/50-32/65-40)-160	65
UTS EVO 80-50-160	68
UTS EVO 40-25-200	82
UTS EVO (50-32/65-40/80-50)-200	85
UTS EVO 100-65-125	70
UTS EVO (100-65/125-80)-160	105
UTS EVO (100-65/125-80)-200	132
UTS EVO 125-100-200	150
UTS EVO (65-40/80-50/100-65)-250	140
UTS EVO 125-80-250	145

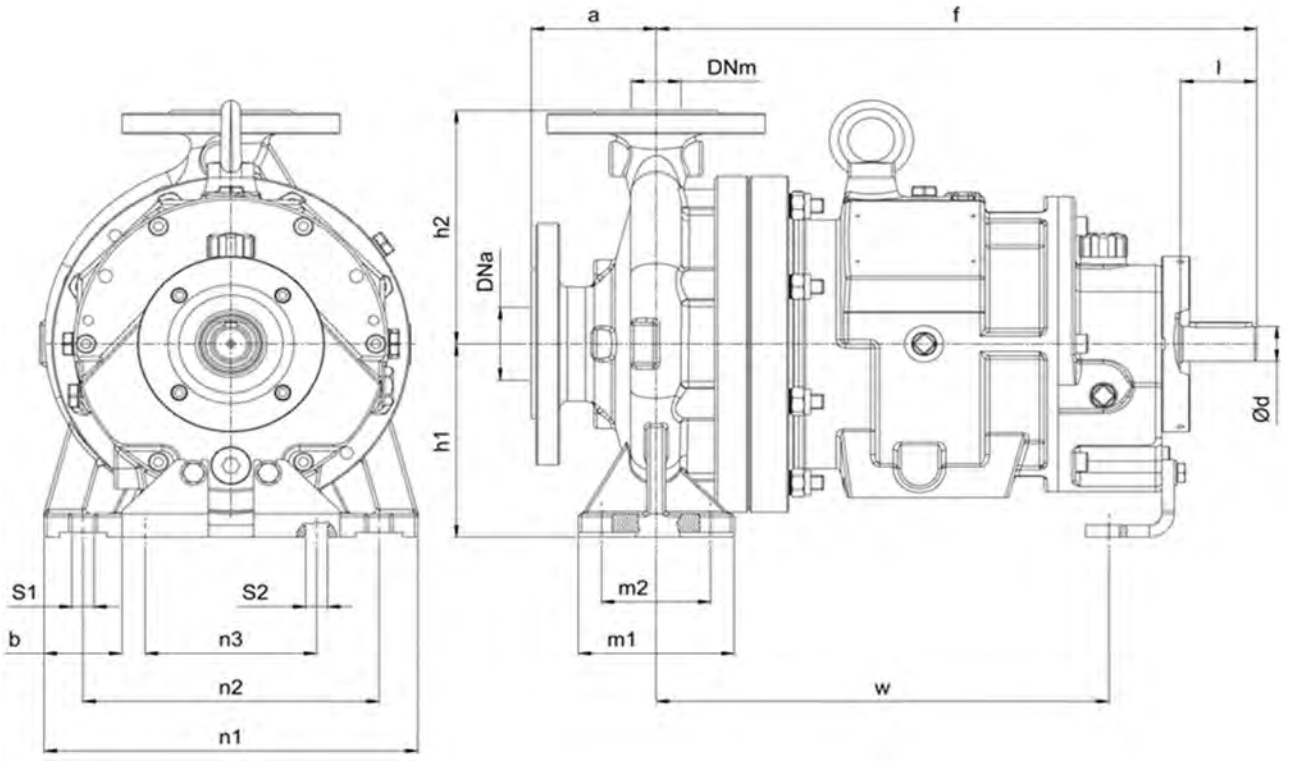


Fig. 69 *Dimensional drawing of bare shaft pumps.*

Bracket	Pump Model	DNa		DNm		a	b	Ød	f	h1	h2	l	m1	m2	n1	n2	n3	S1	S2	w
						mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	UTS EVO 40-25-125	40	UNI EN 1092-1 PN 16RF slotted to ANSI 150	25	UNI EN 1092-1 PN 16RF slotted to ANSI 150	80	50	24	385	112	140	50	100	70	190	140	110	14	14	285
	UTS EVO 40-25-160	40		25		80	50	24	385	132	160	50	100	70	240	190	110	14	14	285
	UTS EVO 40-25-200	40		25		80	50	24	385	160	180	50	100	70	240	190	110	14	14	285
	UTS EVO 50-32-125	50		32		80	50	24	385	112	140	50	100	70	190	140	110	14	14	285
	UTS EVO 50-32-160	50		32		80	50	24	385	132	160	50	100	70	240	190	110	14	14	285
	UTS EVO 50-32-200	50		32		80	50	24	385	160	180	50	100	70	240	190	110	14	14	285
	UTS EVO 65-40-125	65		40		80	50	24	385	112	140	50	100	70	210	160	110	14	14	285
	UTS EVO 65-40-160	65		40		80	50	24	385	132	160	50	100	70	240	190	110	14	14	285
	UTS EVO 65-40-200	65		40		100	50	24	385	160	180	50	100	70	265	212	110	14	14	285
	UTS EVO 80-50-125	80		50		100	50	24	385	132	160	50	100	70	240	190	110	14	14	285
	UTS EVO 80-50-160	80		50		100	50	24	385	160	180	50	100	70	265	212	110	14	14	285
	UTS EVO 80-50-200	80		50		100	50	24	385	160	200	50	100	70	265	212	110	14	14	285
	UTS EVO 100-65-125	100		65		100	65	24	385	160	180	50	125	95	280	212	110	14	14	285
2	UTS EVO 65-40-250	65		40		100	65	32	500	180	225	80	125	95	320	250	110	14	14	370
	UTS EVO 80-50-250	80		50		125	65	32	500	180	225	80	125	95	320	250	110	14	14	370
	UTS EVO 100-65-160	100		65		100	65	32	500	160	200	80	125	95	280	212	110	14	14	370
	UTS EVO 100-65-200	100		65		100	65	32	500	180	225	80	125	95	320	250	110	14	14	370
	UTS EVO 100-65-250	100		65		125	80	32	500	200	250	80	160	120	360	280	110	18	14	370
	UTS EVO 125-80-160	125		80		125	65	32	500	180	225	80	125	95	320	250	110	14	14	370
	UTS EVO 125-80-200	125		80		125	65	32	500	180	250	80	125	95	345	280	110	14	14	370
	UTS EVO 125-80-250	125		80		125	80	32	500	225	280	80	160	120	400	315	110	18	14	370
	UTS EVO 125-100-200	125		100		125	80	32	500	200	280	80	160	120	360	280	110	18	14	370

Fig. 70 *Dimensional table of bare shaft pumps.*

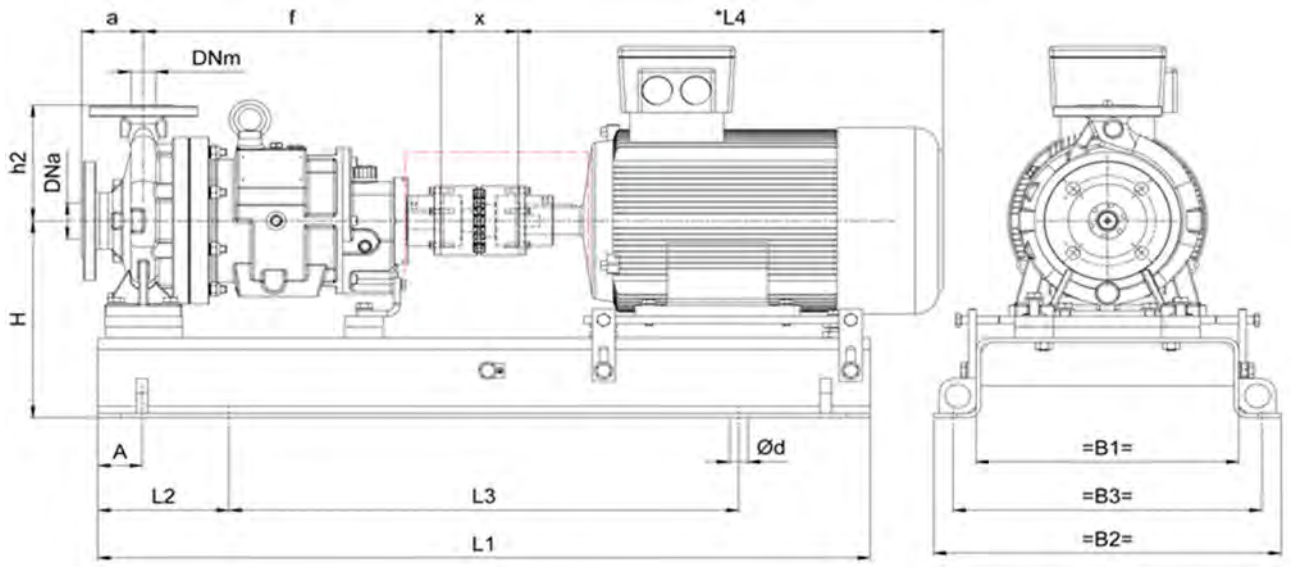


Fig. 71 *Dimensional drawing of pumps on base.*

Pump Model	DNa		DNm		a	A	f	h2	x	H										
										mot. 80	mot. 90	mot. 100	mot. 112	mot. 132	mot. 160	mot. 180	mot. 200	mot. 225	mot. 250	mot. 280
	mm		mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
UTS 40-25-125	40		25		80	60	385	140	100	257	257	257	257	272	272					
UTS 40-25-160	40		25		80	60	385	160	100	257	257	257	257	272	272					
UTS 40-25-200	40		25		80	60	385	180	100	285	285	285	285	300	300					
UTS 50-32-125	50		32		80	60	385	140	100	257	257	257	257	272	272					
UTS 50-32-160	50		32		80	60	385	160	100	257	257	257	257	272	272					
UTS 50-32-200	50		32		80	60	385	180	100	285	285	285	285	300	300					
UTS 65-40-125	65		40		80	60	385	140	100	257	257	257	257	272	272					
UTS 65-40-160	65		40		80	60	385	160	100	257	257	257	257	272	272					
UTS 65-40-200	65		40		100	60	385	180	100	285	285	285	285	300	300					
UTS 80-50-125	80	UNI EN 1092-1	50	UNI EN 1092-1	100	60	385	160	100	257	257	257	257	272	272					
UTS 80-50-160	80	PN 16RF	50	PN 16RF	100	60	385	180	100	285	285	285	285	300	300	300				
UTS 80-50-200	80	slotted to ANSI	50	slotted to ANSI	100	60	385	200	100	285	285	285	285	300	300	300				
UTS 100-65-125	100	150	65	150	100	60	385	180	100	285	285	285	285	300	300	300				
UTS 65-40-250	65		40		100	75	500	225	140	305	305	305	305	298	318	318	358	383	403	403
UTS 80-50-250	80		50		125	75	500	225	140	305	305	305	305	298	318	318	358	383	403	403
UTS 100-65-160	100		65		100	75	500	200	140	285	300	300	300	278	298	318	358		403	403
UTS 100-65-200	100		65		100	75	500	225	140	305	305	298	298	298	318	318	358	383	403	403
UTS 100-65-250	100		65		125	90	500	250	140	318	318	318	318	318	338	338	358	383	403	403
UTS 125-80-160	125		80		125	75	500	225	140	305	305	298	298	298	318	318	358		403	403
UTS 125-80-200	125		80		125	75	500	250	140	298	298	298	298	298	318	318	358	383	403	403
UTS 125-80-250	125		80		125	90	500	280	140	363	363	363	363	363	363	363	383	383	403	403
UTS 125-100-200	125		100		125	90	500	280	140	318	318	318	318	318	338	338	358	383	403	403

Fig. 72 *Dimensional table of pumps on base.*

The size of flanges (DNa, DNm) follows the UNI 2223-2229 PN16 standard; hole ANSI 150 upon request.

The size of motor L4 changes according to the brand of installed motor.

The dimensions not listed in the table comply with UNI EN ISO 3661.

12.1 Sectional Drawing and Part List of Additional Configuration UTS EVO pump

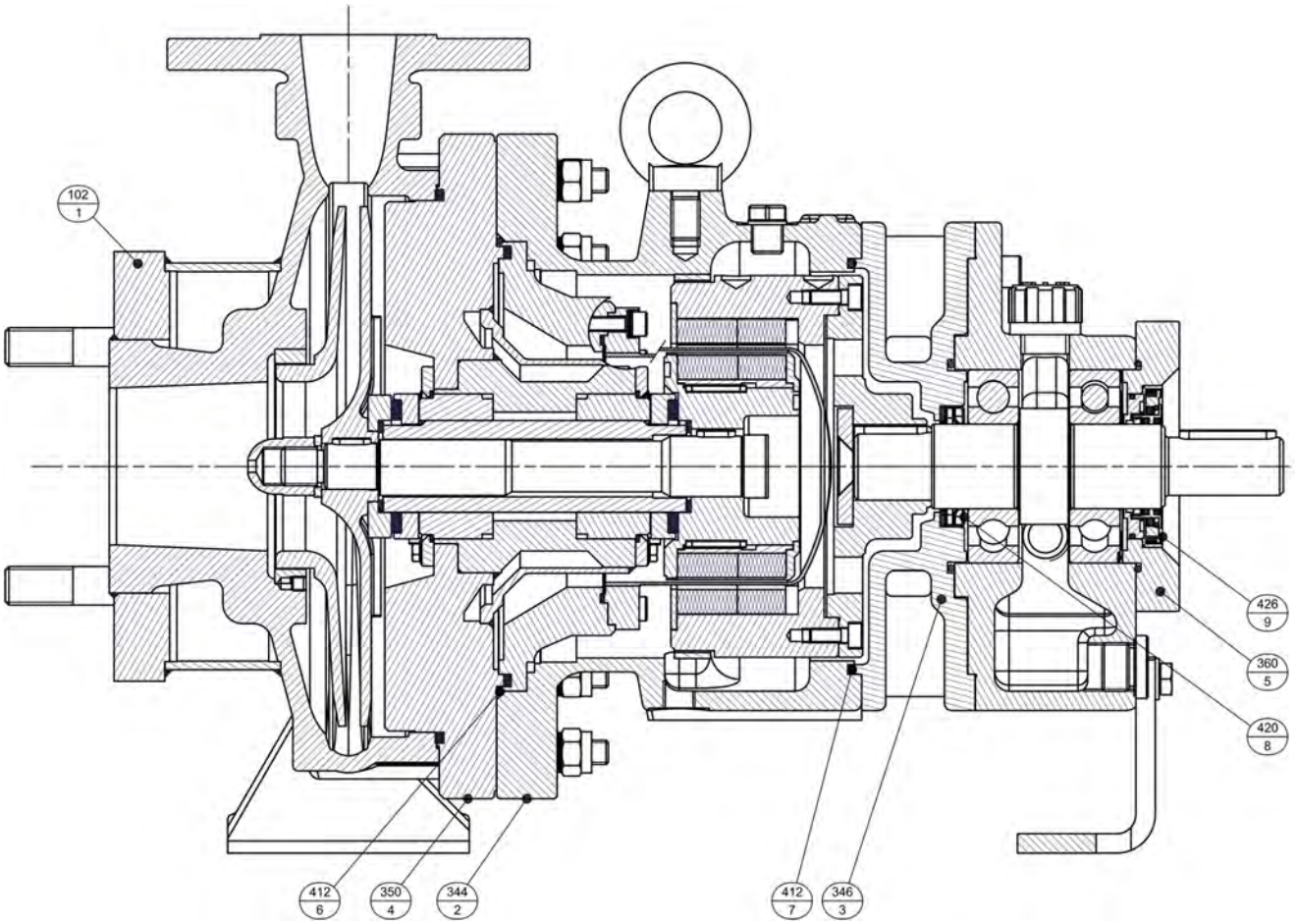


Fig. 73 *Section of UTS EVO with options.*

DIN Code	Description
102	Heated volute casing
344	Double containment lantern
346	Heat sink adjustment spacer
350	Heated bushing bracket
360	Not contacting seal cover
412	O-Ring
420	Oil seal with opposing lips
426	Not contacting seal

13. Auxiliary connections

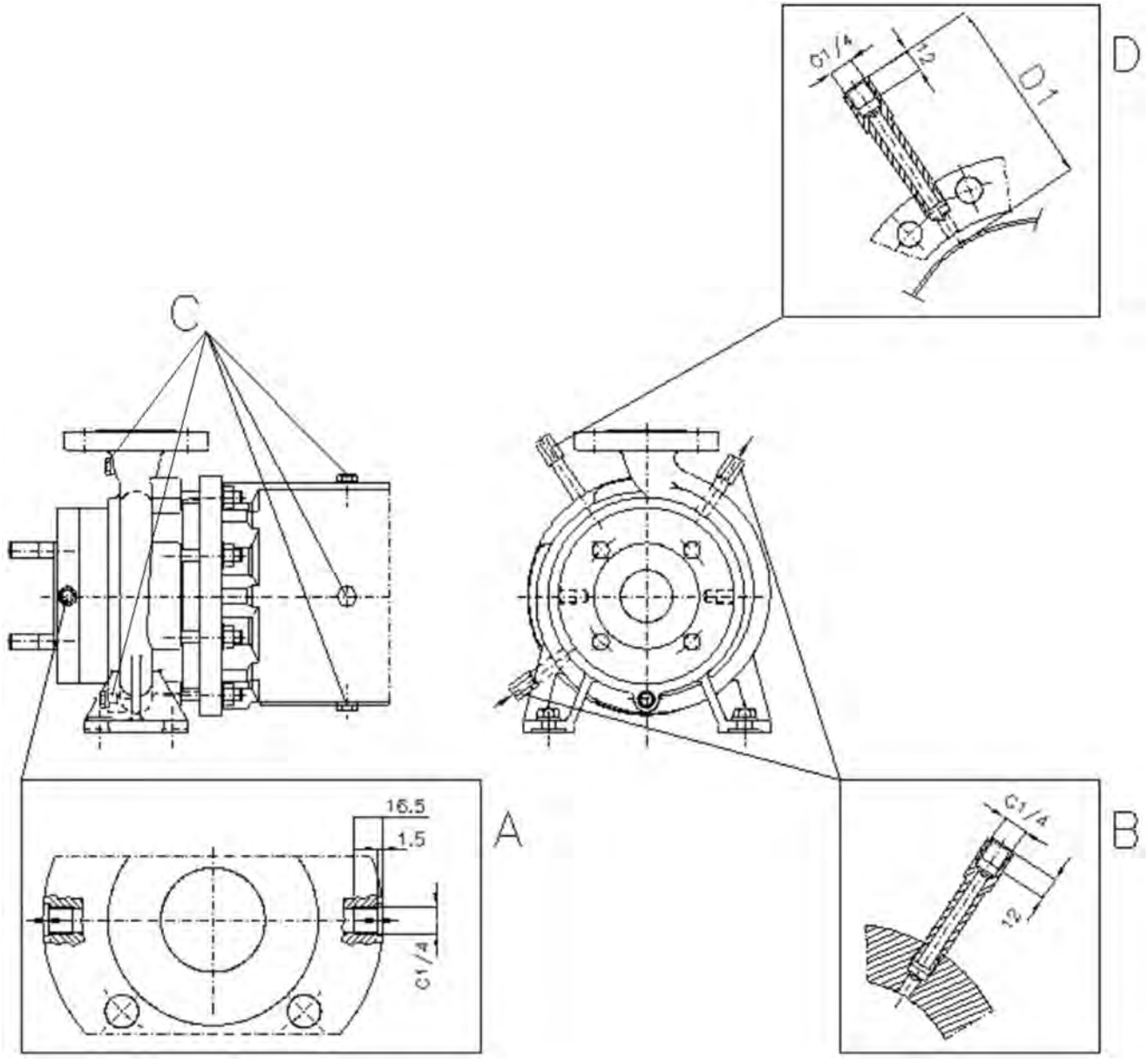


Fig. 74 *Gas threaded connections and remaining measurement in mm.*

Ref.	Connection for:	Identification	Connection	Type of fluid	T max (°C)	P max (bar)
A	Volute casing heating		1/4" Gas hole	Superheated water / saturated steam	183	10
B	Bracket heating	In ÷ Out		Superheated water / saturated steam	183	10
C	Lantern flushing			Inert gas	room	1
	Volute casing drainage					

Ref.	Connection	Dimension	D1 (mm) Isolation shell material: Hastelloy C	D1 (mm) Isolation shell material: Zirconium oxide	Frame	Magnet Length
D	Temperature probe connection socket (PT100)	Threaded hole G1/4" (temperature probe Ø=6mm)	**117**	**120**	I° frame series 125	25÷45
			125	**117**	I° frame series 160	25÷45
			117	**115**	I° frame series 160	60÷80
			125	**139**	I° frame series 200	25÷45
			139	**137**	I° frame series 200	60÷80
			117	**105**	II° frame series 160	40÷100
			120	**118**	II° frame series 200	40÷100
			149	**145**	II° frame series 250	40÷100

14. Annexes: CE / ATEX Declarations / Contamination Safety

The pages below list the following annexes:

- Machine's EC Declaration of Conformity
- ATEX EU Declaration of Conformity
- Safety information / Declaration of contamination

The pump may be furnished for safe areas or for classified areas.

The Atex Declaration of Conformity is applicable to the pump bearing the nameplate with the marking data for classified areas.

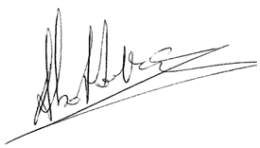
Dichiarazione di Conformità *secondo EN ISO/IEC 17050*
Declaration of Conformity *according to EN ISO/IEC 17050*

Prodotto *Product*	Pompe in metallo a trascinamento magnetico come unità *Magnetic Drive Metallic Pumps as unit*	
Serie *Serie*	UTS EVO	
Direttiva UE *EU-Directive*	2006/42/CE – Direttiva Macchine *2006/42/EC – Machinery Directive*	
Modulo *Modul*	Allegato II _ modulo A *Attached II - Modul A*	
Norme armonizzate applicate *Applied harmonised Standards*	EN ISO 12100 EN 60204-1	EN 809
Marcatura *Marking*	2006/42/CE	*2006/42/EG* CE

C.D.R. Pompe s.r.l. dichiara sotto la propria esclusiva responsabilità che la serie di pompe in oggetto sono conformi alla Direttiva e alle Norme sopra indicate.

C.D.R. Pompe s.r.l. declares under its sole responsibility that the series of pumps in question comply with the Directive and the Standards indicated above.

Bollate, 20.03.2020



_____

M. Abordi
Amministratore Delegato
Chief Executive Officer

Compilato / Compiled: A. Cerizza il / on: 20.03.2020
Approvato / Approved: M. Abordi il / on: 20.03.2020

Dichiarazione di Conformità UE
EU Declaration of Conformity

Prodotto *Product*	Pompe in metallo a trascinamento magnetico Asse nudo, monoblocco o come unità 1) *Magnetic Drive Metallic Pumps* *Bare shaft, block version or as unit* 1)
Serie *Serie*	UTS EVO
Numero di serie *Serial number*	dal 68848 *from*
Direttiva UE *EU-Directive*	2014/34/UE – Direttiva per atmosfere potenzialmente esplosive *2014/34/EU – ATEX Equipment explosive atmosphere*
Modulo *Modul*	Allegato VIII modulo A articolo 13 1bii *Allegato VIII modulo A articolo 13 1bii*
Norme armonizzate applicate *Applied harmonised Standards*	EN ISO 80079-36 EN ISO 80079-37
Marcatura *Marking*	2014/34/UE *2014/34/EU*

II 2G/2GD Ex h IIC T4...T1 Gb / Gb
Ex h IIIC T125°C...T290°C - / Db

Il fascicolo tecnico è stato depositato presso il sottostante ente notificato secondo la Direttiva 2014/34/UE:
The technical documentation is filed by below mentioned notified body according to Directive 2014/34/EU:
BUREAU VERITAS ITALIA S.p.A. Viale Monza 261, 20126 Milano (Italia)

Serie ***Series***	***n° Registrato Registered number***	**n° Fascicolo Tecnico** ***Technical File number***
UTS EVO	BVI/ATEX/ITA/20/050	CDR-001-31303-rev.7

C.D.R. Pompe s.r.l. dichiara sotto la propria esclusiva responsabilità che la serie di pompe in oggetto sono conformi alla Direttiva e alle Norme sopra indicate.

C.D.R. Pompe s.r.l. declares under its sole responsibility that the series of pumps in question comply with the Directive and the Standards indicated above.

1) Non applicabile all'assieme in ottemperanza alla 2014/34/UE (Linee Guida ATEX, 2da Edizione, Dic.2017, art.2, parag.44, comma 2a)
1) Not applicable to the assembly in according to 2014/34/EU *(ATEX Guideline,2nd Edition, Dic.2017, art.2, Paragraph 44, subparagraph 2a)*

Bollate, 20.03.2020

M. Abordi
Amministratore Delegato
Chief Executive Officer

Compilato/*Compiled:* A.Cerizza il/on: 20.03.2020
Approvato/*Approved:* M.Abordi il/on: 20.03.2020

Safety information / Contamination declaration on CDR pumps and components

Dear Customer,

all industrial and commercial companies have a duty to protect their workers and the environment from harmful influences arising from the use and handling of hazardous materials in compliance with applicable legal regulations.

For the reasons detailed above, an inspection/repair of C.D.R. Pompe S.r.l. products or parts occurs only if they have been thoroughly cleaned up.

Before arranging for shipment of pumps or components, the operator must fill in the declaration on the next page and enclose it with the shipping documents.

Always observe the following requirements:

- ◊ **Drain process fluids**
- ◊ **Wash parts in contact with process fluid**
- ◊ **Hermetically seal all openings**
- ◊ **Package properly**
- ◊ **Send in a container / packaging suitable for transport**
- ◊ **Affix a copy of the contamination declaration on the outside of packaging**

Devices which have come into contact with radioactive substances are not accepted for any reason.

If, despite a thorough emptying and cleaning of equipment, additional security measures are necessary, these must be communicated to us.

Annex: The "Contamination declaration" is an integral part of the repair order.

This shall not however prejudice our right to refuse to accept the order for other reasons.

Sincerely,
C.D.R. Pompe S.r.l.

Bollate 02.05.2019

CDR POMPE S.r.l.
Via R. Sanzio, 57
I-20021 Bollate, MI
Tel.: +39 02 990 1941
Fax: +39 02 998 0606
www.cdrpompe.com
info@cdrpompe.com

CONTAMINATION DECLARATION OF C.D.R. PUMPS AND COMPONENTS

The repair and/or maintenance of pumps and components will be performed by C.D.R. Pompe S.r.l. after the Customer has sent this declaration, fully completed and signed by authorised personnel.
If that statement does not accompany the equipment to be repaired, the shipment will be rejected and sent back to the sender.
In addition, provide for a declaration for each individual pump or part contained.

Customer: _____

Street: _____

Postcode, town: _____

Contact person: _____

Telephone: _____

Fax: _____

Final user:

_____

_____

Reason for sending, mark X in the related boxes:

Repair: ☐ under guarantee ☐ subject to fee

Replacement: ☐ under guarantee ☐ subject to fee

Return: ☐ rental ☐ on loan ☐ for credit

A _ Data regarding C.D.R. product:

Type: _____

Serial number: _____

Description of defect:

_____

_____

_____

_____

B _ C.D.R. product conditions:

Has part been used? ☐ **No** → pass to point **D**

☐ **Yes** → empty all liquids, hermetically seal all openings and thoroughly clean!

What cleaning method and what detergent was used? _____

C _ Data on transported fluids

What fluids has the aggregate been in contact with? →

Are they a health hazard? ☐ **No** ☐ **Yes**

Trade name:	Chemical name:

Do they give off dangerous products after thermal decomposition? ☐ **No** ☐ **Yes**

If yes, which? _____

Note: Aggregates contaminated with microbiological or potentially explosive materials are accepted by us only upon presentation of proof that have been subjected to cleaning in accordance with current regulations. Under no circumstances shall we accept aggregates contaminated by radioactive materials.

D _ Legally valid declaration: We ensure that the facts of this statement are true and complete and that I, as the undersigned, have the skills to judge as much. We are aware of our responsibility to CDR Pompe S.r.l. in case of damage incurred due to incomplete or erroneous information. We commit to exempting CDR Pompe S.r.l. from any claim for damages by third parties that have occurred due to incomplete or erroneous information. We are aware that, independently from this statement, we are directly accountable to third parties, particularly with respect to CDR Pompe S.r..l. personnel responsible for handling or repairing the product.

Name of authorised person
(please print): _____

Date _____ Signature: _____

Company stamp

PCB

6 chemin des 2 Mas - PIST 4
F 30100 ALES-en-CEVENNES

tél : 33 (0)4 66 30 19 16

www.pcb.fr
contact@pcb.fr

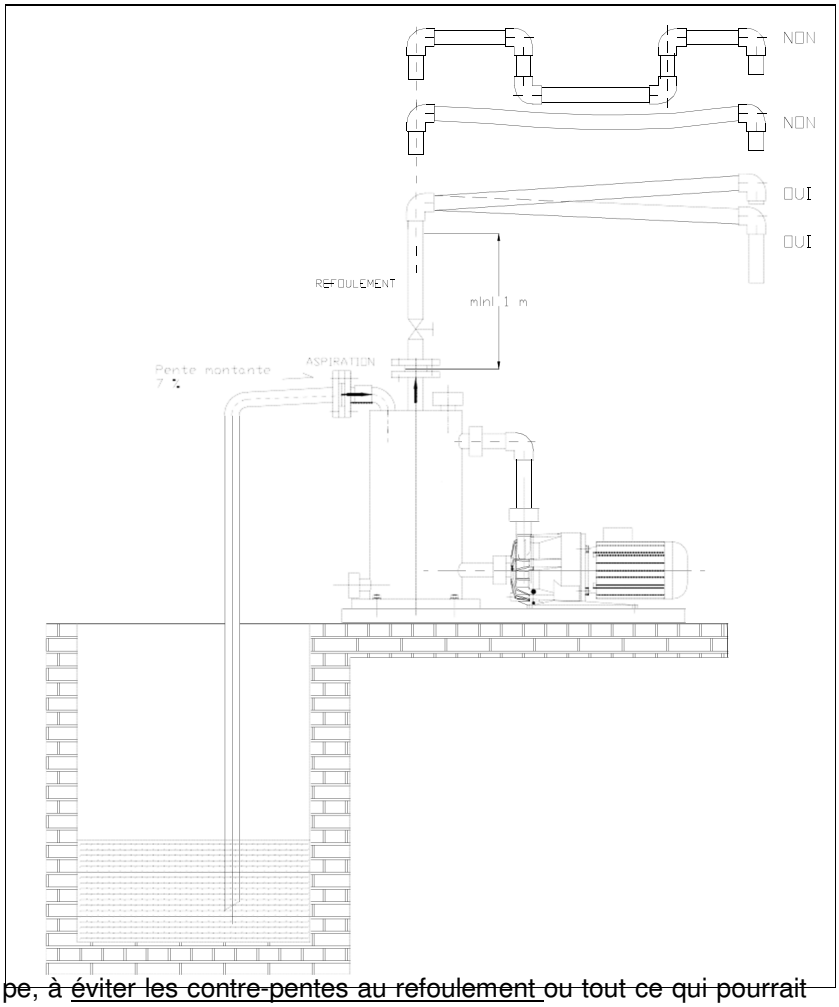
P.C.B. Pompes Chimiques Brahic
6 chemin des deux Mas PIST 4 - 30100 ALES

Pompes Auto-amorçantes

PRIM : Pompes Centrifuges Plastique

ETS-A / UTS-A / HD-A / RD-A : Pompes Centrifuges Inox

Précautions spécifiques d'installation



Aspiration :

La pompe doit être implantée le plus bas possible et le plus près possible de la surface du liquide à aspirer . En effet il faut limiter la hauteur d'aspiration ainsi que le volume d'air à extraire de la conduite d'aspiration .

Pour le diamètre à installer, nous vous conseillons le même diamètre que l'orifice d'aspiration de la pompe (diamètre 32 mm ou 50 mm ou 80 mm intérieur).

Cette valeur représente un bon compromis entre des pertes de charges raisonnables et un temps d'amorçage réduit .

La pompe est équipée d'origine d'un système casse-siphon . Il est possible d'installer un clapet de pied à l'aspiration de la pompe . Dans ce cas il faut choisir un clapet sans ressort et dont la perte de charge soit la plus faible possible.

La tuyauterie d'aspiration doit être toujours montante vers la pompe avec une pente supérieure à 7%.

Refoulement :

La conduite de refoulement sera choisie en fonction de sa longueur pour que les pertes de charge et la vitesse de circulation soient dans des valeurs raisonnables (vitesse inférieure à 3 m/s).

Cependant il faut veiller, avec ce type de pompe, à éviter les contre-pentes au refoulement ou tout ce qui pourrait créer un bouchon de liquide à l'arrêt. En effet ce bouchon empêcherait l'évacuation de l'air lors des démarrages futurs et bloquerait l'auto-amorçage. Il faut donc réserver un circuit montant libre pour laisser échapper les bulles d'air vers l'atmosphère par la conduite de refoulement .

Dans le cas où c'est impossible géométriquement sur l'installation, il est bon de prévoir à la sortie de la pompe une petite conduite de retour sur le ciel de la cuve, équipée d'un orifice calibré de 4 ou 5 mm par lequel l'air pourra s'échapper : l'orifice calibré devra être installé sur une conduite verticale.

De même il faut prévoir immédiatement au refoulement de la pompe, une partie montante sur 1 à 1.5 m de haut pour permettre au liquide contenu au démarrage dans le module d'amorçage de retomber dans la pompe pendant la période d'auto-amorçage .

Démarrage :

Important : La pression d'épreuve ne doit pas dépasser 1 bar

Avant le démarrage il faut remplir la pompe avec de l'eau si elle peut se mélanger au procédé, ou directement avec le produit pompé. Ceci permet l'auto-amorçage et protège la pompe contre la marche à sec qu'elle ne supporte pas (sauf paliers spéciaux sur STN ou ETN).

La pression d'épreuve du circuit comprenant la pompe ne doit pas dépasser 1 bar

Il faut aussi s'assurer du sens de rotation correct du moteur (flèche sur lanterne, sens horaire vue coté ventilateur).

Les vannes du circuit de refoulement doivent être ouvertes au moins partiellement pour la libre circulation de l'air.

L'amorçage de ces pompes est quasi instantané jusqu'à une profondeur de 3 à 4 mètres si la longueur droite de tuyau d'aspiration est réduite. Pour des profondeurs ou des longueurs supérieures le temps d'amorçage peut atteindre quelques minutes, généralement pas plus de 5 min

La pompe ne risque rien en dessous de 10 minutes tant qu'elle est bien remplie d'eau ou de liquide.

Un clapet anti-retour de pied d'aspiration rendra les amorçages futurs immédiats tant qu'il sera étanche.