

GENERAL INSTALLATION, OPERATION, MAINTENANCE AND TROUBLESHOOTING MANUAL FOR:

THREE SCREW PUMP CLASS SMT16B / SMT / SMAPI / SM

WARNING



This manual, and the specific INSTRUCTION MANUAL, should be read thoroughly prior to pump installation, operation, maintenance or troubleshooting.

Notes:

- Settima production includes: three screw pumps, helical rotor Continuum ® pumps, flow metering devices, motor-pump unit, custom products
- Please refer to the catalogues to have all the information about Settima production
- Pump drawing available in 2D and 3D format
- Please visit www.settima.it / www.settimafm.com

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READ THIS ENTIRE PAGE BEFORE PROCEEDING

FOR THE SAFETY OF PERSONNEL AND TO PREVENT DAMAGE TO THE EQUIPMENT, THE FOLLOWING NOMENCLATURE HAS BEEN USED IN THIS MANUAL:



DANGER

Failure to observe the precautions noted in this box can result in severe bodily injury or loss of life.



WARNING

Failure to observe the precautions noted in this box can cause injury to personnel by accidental contact with the equipment or liquids. Protection should be provided by the user to prevent accidental contact.

CAUTION

ATTENTION

Failure to observe the precautions noted in this box can cause damage or failure of the equipment

Non-compliance of safety instructions identified by the following symbol could affect safety for persons:



Safety instructions where electrical safety is involved are identified by:



Safety instructions which shall be considered for reasons of safe operation of the pump and/or protection of the pump itself are marked by the sign:

ATTENTION

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GENERAL

The instructions found herein cover the general installation, operation, maintenance and troubleshooting of subject equipment.

NOTE: Individual contracts may have specific provisions that vary from this manual. Should any questions arise which may not be answered by these instructions, refer to the specific pump instruction manual provided with your order. For further detailed information and technical assistance to questions not answered by these manuals, please refer to SETTIMA MECCANICA, Technical/Customer Service Department, at +39 0523 557623 or info@settima.it.

This manual cannot possibly cover every situation connected with the installation, operation, maintenance and troubleshooting of the equipment supplied. Every effort was made to prepare the text of the manual so that engineering and design data was transformed into easily understood wording.

SETTIMA MECCANICA must assume the personnel assigned to operate and maintain the supplied equipment and apply this instruction manual have sufficient technical knowledge and experience to use sound safety and operational practices which may not be otherwise covered by this manual.

In applications where equipment furnished by SETTIMA MECCANICA is to become part of a process or other machinery, these instructions should be thoroughly reviewed to determine proper fit of the equipment into overall plant operational procedures.



WARNING

If installation, operation, and maintenance instructions are not correctly and strictly followed and observed, injury to personnel or serious damage to pump could result. SETTIMA MECCANICA cannot accept responsibility for unsatisfactory performance or damage resulting from failure to comply with instructions.

1 TRANSPORTATION AND STORAGE

Always protect the pump against taking in water and other contaminants. Store the pump in a clean, dry and relatively warm environment. Pumps are delivered with their internals oiled (unless specified otherwise by the customer order) and with protective covers in or over all openings. These covers should remain in place during the mounting and alignment procedures. The covers must be removed just prior to attaching system piping to pump. If pumps are to be stored in other than a clean, warm, or dry environment, or if they are to be stored for more than six months, contact SETTIMA MECCANICA for appropriate storage procedures.

2 DESCRIPTION OF THE PUMP

Additional specific pump instruction manual may be provided with your order.

3 INSTALLATION / ASSEMBLY



WARNING



On critical or dangerous equipment, provide safety and emergency systems to protect personnel and property from injury due to pump malfunction. If pumped liquids are flammable, toxic, corrosive, explosive or otherwise hazardous, provide for safety in the event of leakage or malfunction. **BEFORE** working on equipment, make sure all power to equipment is disconnected and locked-out.

3.1 TOOLS

The procedures described in this manual require common mechanics hand tools, dial indicators for alignment and suitable lifting devices such as slings, straps, spreader bars, etc.

3.2 LIFTING OF PUMP AND PUMP/DRIVER ASSEMBLIES

All pumps and pump/driver assemblies should be lifted with appropriate devices securely attached to the whole unit. Ensure unit's center-of-gravity is located between lifting points. See Figure 1. This will avoid tipping of pump or pump/driver assembly. Spreader bars should be used as necessary to insure load is properly distributed and lifting straps do not damage equipment.

Some pumps and pump/driver assemblies have designated lifting points that are shown on their outline drawings.



DANGER

ATTENTION

Lifting a vertical pump/driver using straps or hooks attached to the pump or pump-to-driver bracket may be dangerous since the center-of-gravity of the assembly may be higher than the points of attachment. Take precautions to prevent slippage of slings and hooks. Always use properly rated lifting devices.

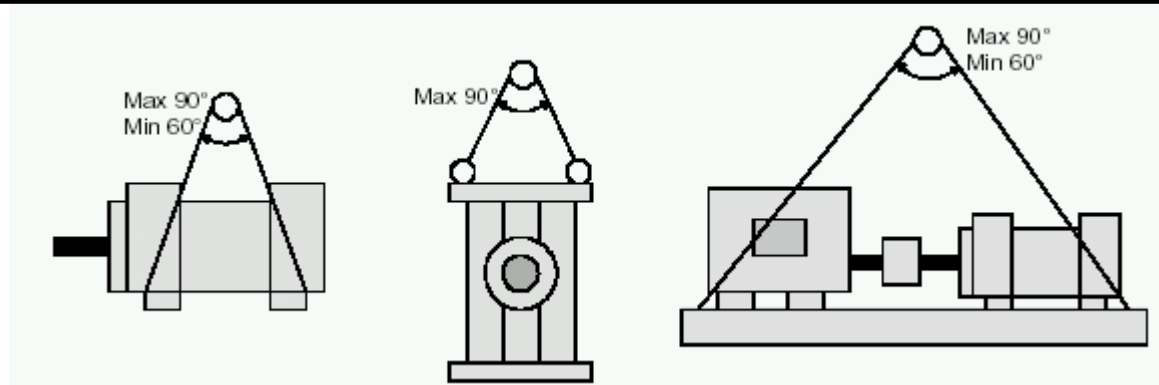


Figure 1 - Lifting Pumps and Pump/Driver Assemblies

3.3 INSTALLATION OF PUMP ASSEMBLY

To insure adequate flow of liquid to pump's inlet port, place pump near liquid source and preferably place pump center line below liquid surface. Use short, straight inlet lines.

A dry, clean, well-lit and well-ventilated site should be selected for installing the pump assembly.

Sufficient open space should be provided around pump rotor and/or gear housing to permit routine visual inspection, on-site service and maintenance, and pump replacement. For installation and servicing of large pump units, ample overhead clearance should be provided to allow for lifting device manoeuvring.

Types of outlet and inlet connections are SAE. The suction connection can be rotated 90°, 180° or 270°. The steps for the rotations are:

- Remove the four screws
- Rotate the suction connection to desired position

- Tight the four screws in. Make sure that the sealing is properly located in its seat. Tighten the screws according to the specification: M 8 = 25 Nm, M 10 = 50 Nm, M 12 = 80 Nm.

Connect the pressure and suction lines and remove the protective stoppers

3.4 FOUNDATIONS AND BASEPLATES

Foundations and base plates must be designed and installed so pump and driver alignment can be maintained at all times. Be sure base plates are level and rest on smooth flat surfaces. Small pumps may be mounted on base plates or directly to existing floors that meet the criteria of foundations. Larger pumps and/or drivers must be mounted to base plates and foundations. It is recommended that pumps and their drivers be mounted on common base plates.

3.5 MOUNTING OF FOOT MOUNTED PUMPS AND DRIVERS

Some pumps are shipped on base plates without drivers. For these units, install and tighten each coupling half on driver and pump shafts. Place driver on base plate and set proper distance between shafts and coupling hubs (See Figure 2). Locate driver so pump and driver shafts are in axial alignment. See Section on Alignment.

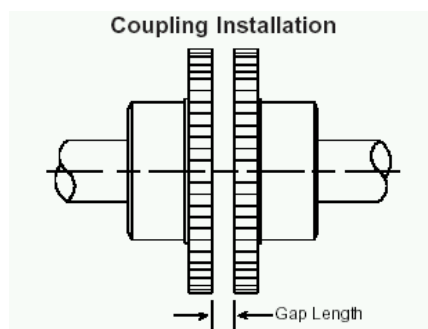


Figure 2 - Coupling Gap Measurement

For pumps driven through a separate gearbox or other device, first align device relative to pump, and then align driver relative to device.

See Section D.6.5 for belt-driven pumps. On horizontal pump/driver assemblies, shaft couplings are often shipped disassembled to prevent coupling damage during shipping and handling.

When not supplied by the manufacturer, coupling, shaft and/or belt guards conforming to ANSI B15.1 should be installed for personnel protection during pump operation.

Final alignment of pump and driver should take place after unit is secured to foundation. If base plate is to be grouted, this should be completed before final alignment.

NOTE: Grouting is recommended to prevent lateral shifting of base plate, not to take up irregularities in the foundation. For installations requiring grouting, a base plate designed specifically for this purpose is needed.

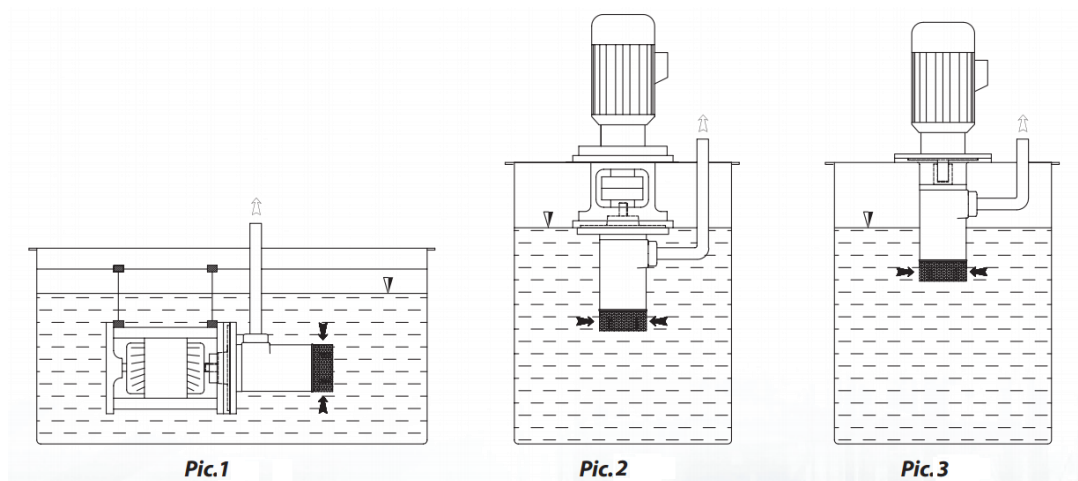


WARNING

Install guards over couplings and shafts to protect personnel from accidental contact with rotating couplings, belts, sheaves, chains, shafts and/or keyways.

3.6 INSTALLATION OF SM SUBMERSIBLE PUMP

SM Pumps Series should be used as submersible pumps: horizontal installation (Pic. 1), vertical installation (Pic. 2) and/or semi-submersible (Pic. 3), all with no shaft sealing and with no maintenance. For different installation please contact Settima.



3.7 ALIGNMENT

3.7.1 General

All pump and driver assemblies must be aligned after site installation and at regular maintenance intervals. This applies to factory-mounted units (new or rebuilt) because factory alignment is often disturbed during shipping and handling. Flexible couplings shall be used to connect pump to its driver (unless otherwise specified by SETTIMA MECCANICA).

The objective of any aligning procedure is to align shafts (not align coupling hubs) by using methods that cancel out any surface irregularities, shaft-end float, and eccentricity.

At operating temperatures above 65°C (175°F), pumps require “hot alignment” after pump and driver reach normal operating temperatures. Also, re-check final alignment after all piping is connected to pump.

3.7.2 Flexible Shaft Couplings

Flexible couplings are intended to provide a mechanically flexible connection for two aligned shaft-ends. Flexible couplings are not intended to compensate for major angular or parallel shaft misalignment. The allowable misalignment varies with the type of coupling. Any improvement in alignment beyond coupling manufacturer’s minimum specification will extend pump, mechanical seal or packing, coupling, and driver service life by reducing bearing loads and wear.



CAUTION

ATTENTION

- Flexible couplings are **NOT** intended to permit significant shaft misalignment. Proper alignment must be established/maintained to obtain proper operation and maximum life.
- Pump alignment requirements are nearly always more strict than coupling alignment requirements. Regardless of coupling manufacturer’s stated limits, pump-to-driver shaft alignment must be per pump’s alignment requirement.
- Be sure all coupling set-screws and bolts are tight and coupling gap is properly set.

3.7.3 Aligning Foot Mounted Pumps - See Figure 3

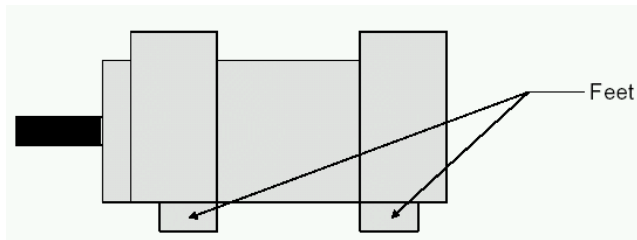


Figure 3 - Foot Mounted Pump

To install foot mounted pumps, perform the following:

- Install pump and driver onto base plate after installing appropriate coupling halves on pump and driver shafts.
- Perform alignment of pump and driver shafts using dial indicators. Acceptable alignment has been attained when FIM (Full Indicator Movement) is less than or equal to 0.1mm (0.005 inch) for face (angularity) and rim (parallelism) readings at or near coupling outer diameter while rotating both shafts together one full turn (360°).



3.7.4 Aligning Flange Mounted Pumps and Drivers - See Figure 5

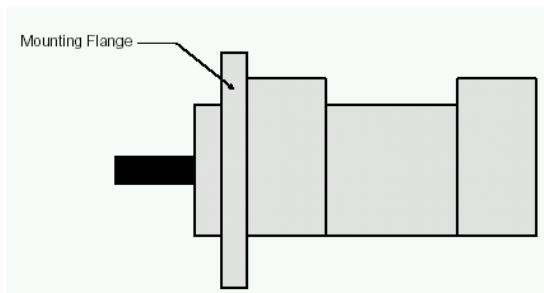


Figure 4 - Flange Mounted Pump

Shaft alignment requirements for flange mounted pumps are the same as for foot mounted pumps. That is, shafts must be aligned within 0.1mm (0.005 inch) FIM (Full Indicator Movement) for face (angularity) and rim (parallelism) at or near coupling outer diameter while rotating both shafts together one full turn (360°).

When a pump and driver are both flange mounted to a bracket, **DO NOT** assume bracket will automatically align shafts to the above requirements. Brackets must be designed to obtain/maintain required alignment as well as to support pump weight plus any (small) residual piping forces without distorting. If at all possible, bracket design should include adequate room to check shaft alignment with dial indicators with both pump and motor mounted onto bracket. See Figure 4. If this is not possible, align bracket to driver shaft (see Figure 6), then attach pump to bracket (assumes pump fits snugly into its mounting bore in the bracket).

After pump-bracket-driver is installed into system and after piping is connected to pump, shaft alignment should be re-checked and adjusted, if necessary. When a right-angle foot bracket is used, mount pump onto bracket and tighten pump-to-bracket mounting bolts. At this point, bracket base, in effect, becomes pump feet. Continue with aligning procedure as if pump were foot mounted. See Section D.6.3.

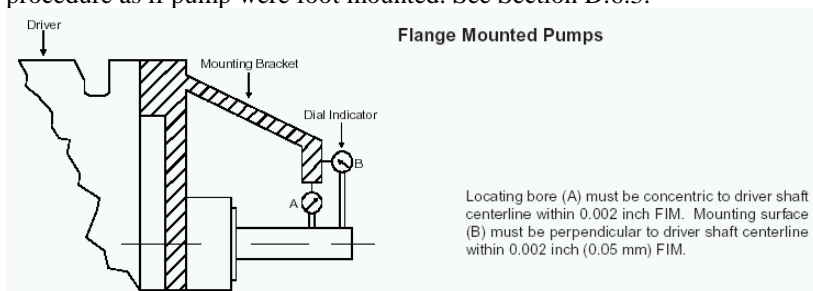


Figure 5 -Alignment of Flange Mounted Pumps

- Be sure all coupling set screws and bolts are tight and coupling gap is properly set.
- Install safety shield(s) or plate(s) over bracket opening(s).

3.7.5 Belts and Sheaves

It is only acceptable to belt drive SETTIMA MECCANICA PUMPS that are specifically designed for this purpose. It is generally not acceptable to belt drive pumps with ratings in excess of 40 bar (600 psi) differential pressure. **Contact SETTIMA MECCANICA if not sure a particular pump can be belt driven.**

Belts and sheaves must be properly selected aligned and tensioned to minimize belt wear, eliminate possibility of belt turnover in sheave grooves, and avoid excessive side load on pump shaft. Adjustable slide rails mounted under driver are recommended for proper belt tensioning.

Check belt tension frequently during first 24 to 48 hours of run-in operation. Follow belt drive manufacturer's recommendations for alignment of sheaves and belt-tension settings.



CAUTION

ATTENTION

Loose, slipping belts will squeal and cause overheating of sheaves leading to reduced belt life. Excessively tightened belts will result in reduced belt and bearing life and possible bearing or shaft failure.

3.7.6 Hollow Shaft

Close all cut-off cocks and remove protection for outlet and inlet. To facilitate venting, place the outlet higher than inlet.

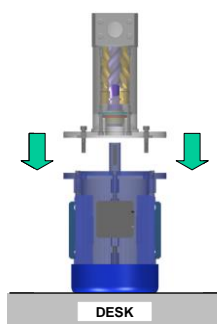


Figure 6b – Hollow Shaft mounting

Proceed as follow:

- Check the motor: verify the perpendicularity of the flange and the motor shaft: 0,05 max allowed.
- The use of motor IP65 is suggested.
- Warranty is voided if motor is outside the tolerances.
- Put the motor in **vertical position**, as per drawing;
- The pump has to **entry free** on the shaft of electric motor;
- **Do not force.** If necessary remove and polish the key of the shaft of electric motor;
- After you have tighten the four screws, control that the pump-motor group **turn free by rotating the motor fan.** If not the shafts may be misaligned.
- In case of replacement, and the motor can not be disassembled, always verify the free smooth rotation of the motor fan. **IF IT IS NOT SO NEVER ACTIVATE THE MOTOR.**



CAUTION

ATTENTION

To reduce possible FRETTING corrosions, please use appropriate greases to lubricate the motor shaft.

NOTES:

- **FRETTING:** To reduce the corrosion due to fretting effect we recommend to greases the motor shaft with dedicated products (samples: lubricants based on MoS₂, Loctite ® 8008, Molykote ® G-n plus, Turmopast ® MA2).
- **FRETTING:** To reduce the corrosion due to fretting effect, we recommend to check the electric motor ground connection and to check that the shaft residual currents are within the norms.
- **LEACKAGE PREVENTION:** In case of wear of shaft seal to avoid leakage, all pump flanges with hallow shaft have a threaded 1/4" GAS thread that can be used for drainage connection to the tank.

3.8 PIPING AND VALVES

3.8.1 General

Piping connected to pump **MUST** be independently supported and not allowed to impose strains on pump casing including allowing for expansion and contraction due to pressure and temperature changes.

To prevent foaming and air entrainment, all return lines in recirculating systems should end well below liquid surface in reservoir. Bypass liquid from relief pressure and flow control valves should be returned to source (tank, reservoir, etc.), **NOT** to pump inlet line.

Shut-off valves should be installed in both the suction and discharge lines so pump can be hydraulically isolated for service or removal. All new piping should be flushed clean before connecting to pump.



CAUTION

ATTENTION

- Pipe strain will distort a pump. This could lead to pump and piping malfunction or failure.
- Return lines piped back to pump can cause excessive temperature rise at pump which could result in catastrophic pump failure.

3.8.2 Relief Valve

Use relief valves to protect pumps from overpressure. They need to be connected to pump discharge lines as close to pumps as possible and with no other valves between pumps and relief valves. Relief valve settings should be set as low as practical.

DO NOT set relief valve higher than maximum pressure rating of pump, including pressure accumulation at 100% bypass. Relief valve return lines should **NOT** be piped into pump inlet lines because they can produce a loop that will overheat pump. See Figure 7.



DANGER

The SETTIMA MECCANICA pump is a positive displacement type. It will deliver (or attempt to deliver) flow regardless of back-pressure on unit. Failure to provide pump overpressure protection can cause pump or driver malfunction and/or rupture of pump and/or piping.

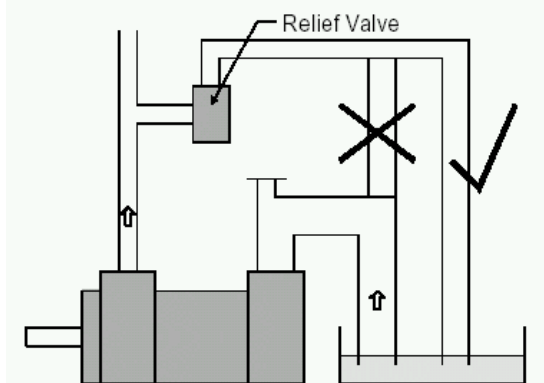



Figure 6– Proper Relief Valve Return Line Arrangement

Some low pressure pump models include built-in safety relief valves. They are intended only for emergency operation, **NOT** for system control. Extended operation of relief valves in these pumps could lead to pump damage or failure.

3.8.3 Suction Line

The suction line should be designed so pump inlet pressure, measured at pump inlet flange, is greater than or equal to the minimum required pump inlet pressure (also referred to as Net Positive Inlet Pressure Required or NPIPR). Suction line length should be as short as possible and equal to or larger than pump's inlet size. All joints in suction line must be tight and sealed. If pump cannot be located below liquid level in reservoir, position suction line or install a foot valve so liquid cannot drain from pump while it is shut down. See Figure 8. When pump is mounted vertically with drive shaft upward, or mounted horizontally with inlet port opening other than facing upward, a foot valve or liquid trap should be installed in suction line to prevent draining. The suction line should

be filled before pump start-up.



DO NOT operate the pump without liquid or under severe cavitation.

CAUTION

ATTENTION

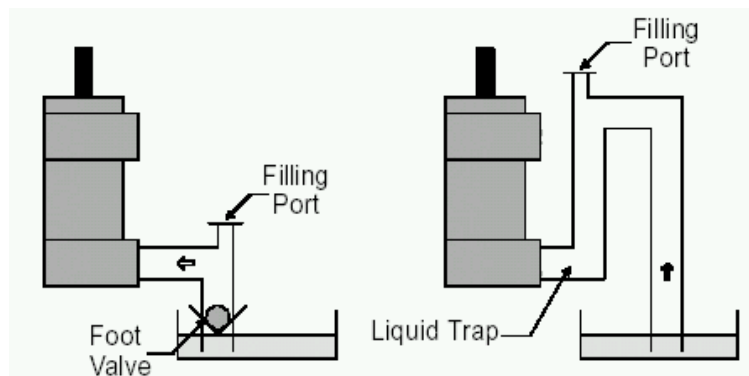


Figure 7– Fluid Trap and Foot Valve Arrangements for Vertical Pumps

3.8.4 D.7.4 Suction Strainer /Filter

Pump life is related to liquid cleanliness. Suction strainers or filters should be installed in all systems to prevent entry of large contaminants into pump. See Figure 9.

The purpose of a suction strainer or filter is for basic protection of internal pumping elements. It should be installed immediately ahead of inlet port. This location should provide for easy cleaning or replacement of strainer element. Appropriate gages or instrumentation should be provided to monitor pump pressure. Pressure drop across a dirty strainer must not allow inlet pressure to fall below NPIPR. General guidelines for strainer sizing are as follows:


When pumping relatively clean viscous liquids (over 1000 cSt), use 10 to 12 mesh screens or those with about 1,5mm (1/16 inch) openings.

When pumping relatively clean light liquids such as distillate fuels, hydraulic oil and light lube oils, use suction strainers of 100 to 200 mesh.

When pumping heavy crude oils, use 5 to 6 mesh strainer screens or those with or about 3mm (1/8 inch) openings.

When pumping relatively clean distillate fuels in high pressure fuel supply systems, use 25 micron “absolute” filters for three screw pumps and 10 micron “absolute” filters for gear pumps.

Make sure size/capacity of strainer or filter is adequate to prevent having to clean or replace elements too frequently.



Before connecting pump to system, all system piping must be thoroughly flushed to remove debris which accumulates during fabrication, storage, and installation. SETTIMA MECCANICA PUMPS should not be used for flushing. One large, hard particle may cause internal damage, possibly requiring a pump overhaul. Pay particular attention to suction line between suction strainer and pump to be sure it is clean.

CAUTION

ATTENTION

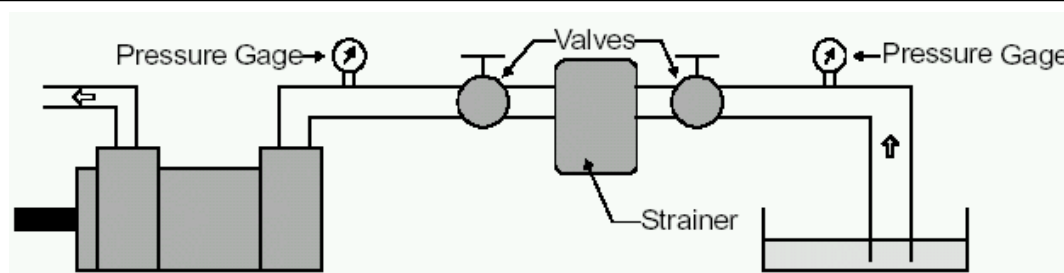


Figure 8- Ideal Strainer Arrangement

3.8.5 D.7.5 System Filtration

In systems that re-circulate the pumped liquid, downstream (pressure and/or return side) filtration should be installed. Downstream filters may also be required to protect components such as servo valves in hydraulic systems or high-pressure fuel nozzles and flow dividers in fuel oil supply systems for gas turbines.

The system's most contamination-sensitive component determines its liquid cleanliness requirement. For optimum SETTIMA MECCANICA pump life when running on fuel oil, light lube oil, hydraulic oil and other relatively low viscosity (thin) liquids, a high efficiency 10 micron "absolute" or finer filter is recommended in accordance with NAS 1638/10 or ISO DIN 4406-19/16. This same filter rating is recommended for pumps running at extreme operating conditions and/or in harsh environments. For pumps running on relatively clean, more viscous (thicker) liquids, filter ratings as high as 25 micron "nominal" may be acceptable as long as operating conditions and the operating environment are moderate.

SETTIMA MECCANICA should be contacted for filtration requirements for pumps running on very low viscosity (water thin) and low lubricity as well as for those with an unusually large quantity of contaminants.

The system builder determines filter size (dirt holding capacity) by the amount and size of contamination expected to be produced by system and other external contamination sources, by allowable pressure drop across filter and by acceptable frequency for cleaning/replacing filter elements.

3.8.6 Outlet Piping

In general, outlet piping should be sized to accommodate the pump's flow rate while minimizing pipe friction losses. It should also be designed to prevent gas and air pockets. Piping downstream of pump should include a vent at highest point in system to allow air to escape during priming.

3.8.7 Shaft packing and seal leakage

The pump should be installed so any leakage from shaft packing or shaft seal does not become a hazard. Packing leakage should be about 8 to 10 drops per minute. A small amount of liquid may also leak from mechanical or lip seals (usually less than or equal to 10 drops per hour).

Provisions should be made to collect leakage from packing or shaft seals.



WARNING

DANGER

If not appropriately collected, packing leakage may make floor slippery or expose personnel to hazardous fluids.

3.9 QUENCHED SHAFT SEALS

Some pumps include quenched mechanical shaft seals. For these pumps, a low pressure stream of steam, nitrogen, or clean water is supplied from an external source to atmospheric side of seal faces.

Quenching is used in selected seal applications to:

- Heat or cool seal area.
- Prevent build up of coke formations by excluding oxygen.
- Flush away undesirable material build-up around dynamic seal components.
- When quenched mechanical seals are part of pump assembly, an appropriate quenching stream must be supplied by user.

NOTE:

Refer to pump or pump/driver outline drawing and/or specific pump's instruction manual for quench connection size and port locations.

3.10 GAGES

Pressure and temperature gages are recommended for monitoring the pump's operating conditions. These gages should be easily readable and placed as close as possible to pump's inlet and outlet flanges. See Figure 10a.

3.11 IDEALIZED INSTALLATION FOR PUMPS LOCATED ABOVE LIQUID LEVEL

Figures 10a and 10b are compilations of Figures 7, 8 and 9 showing good-practice installation schemes for pumps located above the liquid reservoir in systems that re-circulate the pumped liquid.

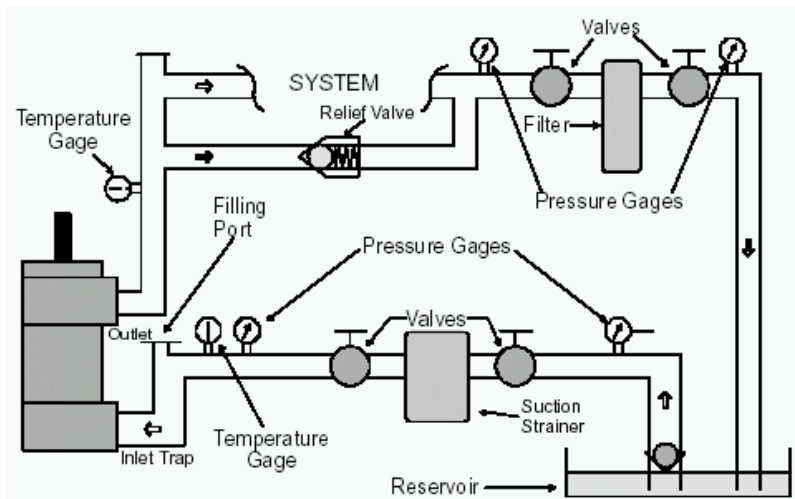


Figure 9 a- Vertical Mounted Pump

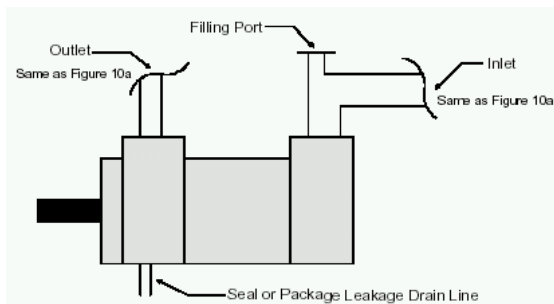


Figure 10 b- Horizontal Mounted Pump

4 STARTUP, OPERATION and SHUTDOWN



CAUTION

ATTENTION

Operation conditions, such as speed, liquid viscosity, temperature, inlet pressure, discharge pressure, filtration, duty cycle, drive type, mounting, etc., are interrelated. Due to these variable conditions, specific application limits may be different from pump's operating and structural limits. This equipment must not be operated without verifying system's operating requirements are within the pump's capabilities.



DANGER

Make sure all power equipment is disconnected and locked-out before proceeding.

4.1 ELECTRICAL CONNECTIONS

Verify electrical requirements for driver match electrical supply with respect to voltage, number of phases and terminal connections. Also, check that driver has been wired to rotate in correct direction.

4.2 ROTATION

Before connecting couplings, check pump rotation to be sure it matches rotation of driver. When coupling is connected and shafts are correctly aligned, pump should turn freely by hand. Rotation direction is indicated by an arrow cast on casing or by an attached plate showing a rotation direction arrow. See Figure 11.



CAUTION

ATTENTION

Operating pump in the reverse direction may cause pump damage. Make sure rotation direction is not confused with inlet or outlet flow direction arrows.

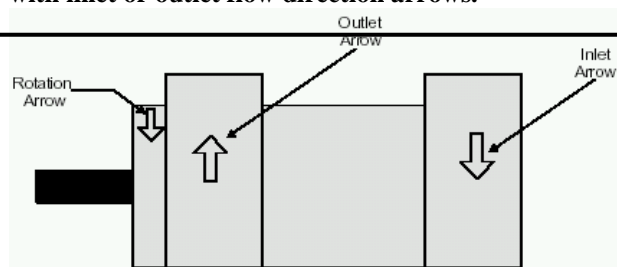


Figure 10– Rotation Arrow

4.3 HYDROSTATIC TESTING THE SYSTEM

Before any system is hydrostatically tested, pump must be removed or isolated.



CAUTION

ATTENTION

To prevent damage to pump, it is necessary to remove or isolate it from the system prior to starting hydrostatic testing.

4.4 PROTECTIVE DEVICES

4.4.1 General

Automatic shutdowns, emergency switches, and similar controls should be part of pumping system. They are generally supplied by system supplier or user.

4.4.2 Covers and Guards

Before start-up, insure all protective-covers and guards are in place.



WARNING

DANGER

To protect personnel from accidental contact with rotating couplings, sheaves, belts, Shafts keys, keyways, etc., install the following covers or guards over:

- Bracket openings on flange mounted pumps.
- Couplings and shafts on foot mounted pumps.
- Sheaves, gears, chains, belts or other type drives.

4.4.3 Valves

Check all valves, especially those that are manually operated, to be sure they are in the proper position. Check that there is no possibility of starting pump with a blocked suction or discharge line.



WARNING

Starting a pump with discharge line blocked and without adequate relief protection will cause catastrophic pump failure and possible injury to personnel.

4.5 INTERMEDIATE DRIVE LUBRICATION

Some SETTIMA MECCANICA pump units include intermediate gearboxes or other devices between pump and driver. When these devices are present, lubrication is required. Add lubricant to specified level per device manufacturer's recommendations before start-up.

4.6 QUENCHED SHAFT SEALS

When quenching fluid is hot water or steam, apply to seal at least 30 minutes prior to pump start-up to insure seal area is thoroughly heated. When steam is used, it should be saturated at about 4 to 7 psi gage. When quench fluid is ambient temperature nitrogen, it can be applied just prior to pump start-up.

4.7 PUMPED LIQUIDS

NEVER operate a pump with water. The pump is designed for liquids having general characteristics of oil. In closed or recirculating systems, check liquid level in tank before and after start-up to be sure it is within operating limits. If initial liquid level is low, or if it drops as system fills during start-up or pumping operations, add sufficient clean liquid to tank to bring liquid to its normal operating level. Only use liquid recommended or approved for use with the equipment. Regular checks should be made on the condition of the liquid. In closed systems, follow supplier's recommendations for maintaining liquid and establishing when liquid is to be changed. Be sure temperature is controlled so liquid cannot fall below its minimum allowable viscosity which occurs at its maximum operating temperature. Also, insure that maximum viscosity at cold start-up does not cause pump inlet pressure to fall below its minimum required value.



CAUTION

ATTENTION

- NEVER operate a pump without liquid in it!
- Operate only on liquids approved for use with pump.



WARNING

If not appropriately collected, packing or seal leakage may make floor slippery and/or expose personnel to hazardous fluids.

4.7.1 High Viscosity

High Viscosity and high rotation speed may cause the pump to cavitate. Consequence of this may with time damage the pumps inner part and deteriorate the efficiency of the pump if not the overall pump behaviour. Special finishing of the internal screws may prevent the cavitations due to high viscosity with a loss of overall efficiency.

When application requires fluid viscosity higher than 68 cSt special option have to be selected when ordering the products. Ask to SETTIMA MECCANICA for support when selecting a product for high viscosity. Use the table at the end of this document to guide your application description.


4.7.2 Air Emulsions

In gear box or turbine lubrication applications air emulsion may not be avoided. Air Emulsion may cause the pump to cavitate. Consequence of this may with time damage the pumps inner part and deteriorate the efficiency of the pump if not the overall pump behaviour. Special finishing of the internal screws may prevent the cavitations due to high viscosity with a loss of overall efficiency.

When application requires air emulsion fluid special option have to be selected when ordering the products. Ask to SETTIMA MECCANICA for support when selecting a product for high viscosity. Use the table at the end of this document to guide your application description.

4.8 PRIMING

Prime pump before initial start-up by pouring some of liquid to be pumped into fill point in system or directly into pump suction port. Rotate pump slowly by hand until rotors or gears (pumping elements) are wet and suction line is as full of liquid as possible. See Figure 12. Also, fill mechanical seal chamber with liquid to insure seal does not start dry.



CAUTION

ATTENTION

Dry-starting a pump is likely to cause damage to pumping elements and shaft seal.

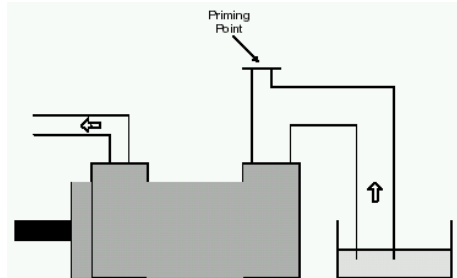



Figure 11 - Priming Point

4.9 START-UP

It is suggested that the driver be started and immediately stopped (jogged) three or four times in order to verify proper pump rotation and to insure pump is filled with liquid. Open bleed port at high point in system and vent trapped air until a solid stream of liquid emerges (where practical).

When pump is running, check for unusual noise or vibration. Investigate any abnormalities.

Check inlet and outlet gages to see if pump is operating within its ratings. Generally, differential pressure across pump should be at least 1,5 bar (25 psi) to insure proper pump operation.



CAUTION

ATTENTION

- **Precautions must be taken when venting air in system using hazardous liquids.**
- **Provide hearing protection whenever high noise levels are expected from system components and/or environment.**
- **If operating temperatures exceed 60°C (140° F), measures should be taken to avoid skin contact.**

4.10 SHAFT PACKING (STUFFING BOX) LEAKAGE

Pumps with packing-type seals must be checked to insure packing gland is not too tight. Excessive gland pressure on packing will cause a scored shaft, overheating and rapid breakdown of packing. Keep gland nuts only finger tight. After new packing has been installed, gland nuts should be tightened evenly but only tight enough to seat packing rings properly. Then, loosen gland nuts and re-tighten finger tight. The final adjustment should allow a leakage of approximately ten drops per minute while pump is operating. This leakage is necessary to lubricate the

packing. Provide a place for safe draining and disposal of this leakage.



WARNING

If not appropriately collected, packing leakage may make floor slippery and/or expose personnel to hazardous fluids.

4.11 THERMAL SHOCK AND OPERATING TEMPERATURE LIMITS

During pump start-up, as well as during pump operation, pump must not see a thermal shock greater than 28°C (50°F) from liquid entering the pump. Rapid temperature changes beyond this limit must be avoided. Unless approved by SETTIMA MECCANICA, liquids entering pump inlet must not be

hotter than 107°C (225°F) nor colder than -18°C (0°F). Most pumps also have temperature limits of 107°C (225°F). The maximum rate of temperature change during pump heating or cooling should be about 0.8°C/minute (1.5°F/minute). A heated or cooled pump should be held at its start-up temperature for at least an hour prior to start-up. This will insure uniform temperature distribution throughout pump assembly.



CAUTION

ATTENTION

Never exceed minimum or maximum allowable pump or liquid temperature. Do not expose equipment to thermal shock. Differences in metallurgy and their respective coefficients of expansion could cause distortion of pump parts resulting in a breakdown condition. Use of insulation and heating jacket or heat tracing to maintain pump at liquid temperature is recommended in high temperature applications.

4.12 SHUTDOWN

If system is to be shut down for a short period, do not drain pump as this would require priming at start-up. If pump is to be stored, apply a rust-inhibiting agent (one compatible with all pump materials) to all internal and external surfaces, especially those that are machined.

5 MAINTENANCE



DANGER

BEFORE starting any maintenance procedure, do the following:

- Shut off all power switches and circuit breakers.
- Remove any electrical service fuses.
- Lock electrical service panel supplying power to driver.
- Shut, wire or chain, and lock all valves in pump inlet/outlet piping.
- If applicable, shut off any steam or other fluid supply lines to pump.

5.1 FILTERS AND STRAINERS

All filter and strainer elements should be periodically checked for cleanliness and cleaned or replaced as necessary. This will protect equipment from damage due to pressure-drop across clogged or dirty elements.

5.2 FOUNDATION

Foundation and hold-down bolts should be checked for tightness at least every six months.

5.3 ALIGNMENT

Alignment of pump and its driver should be checked and corrected, if necessary, at least every six months. If system experiences an unusual amount of vibrations or large variations in operating temperatures, this should be done often. Well-maintained alignment will help insure maximum equipment life.



WARNING

Rotating parts, such as couplings, pulleys, external fans, or unused shaft extensions should be permanently guarded against accidental contact with personnel or clothing. This is particularly important where parts have surface irregularities such as keys or set- screws.

5.4 LUBRICATION

5.4.1 Bearings

Pump environment, operating conditions and intervals between bearing checks all effect bearing life. Bearings have a finite life and should be checked often for increase in temperature and/or rough operation. If either condition is noted, stop equipment and replace bearing. When grease or oil fittings are provided, lubricate bearings as specified in applicable pump instruction manual.



CAUTION

ATTENTION

Continued running with a rough or worn bearing can lead to catastrophic bearing failure which could cause seal and/or pump failure.

5.5 PACKING

A pump should be repacked when all packing gland travel is exhausted or when packing is damaged. Follow packing replacement instructions in applicable pump instruction manual.

5.6 SHAFT SEALS AND LEAKAGE

Visually check equipment frequently for signs of damage/leakage from shaft seals, gaskets or O-rings. Be sure all connections are tight. If seal leakage is more than about 10 drops per hour per seal, shut down equipment and repair or replace necessary parts. Shaft seals have a finite life which is affected by operating conditions and environment. Expect them to wear and eventually fail. When leakage becomes unacceptable, replace seal unit with one compatible with

pump's operating conditions. Dirty liquids will reduce seal life. Hollow Shaft pumps have ¼" GAS connections for drain pipes.

NOTE:

A very small amount of leakage (about 10 drops per hour per seal) is normal, even when the shaft seals are new.

NOTE:

Make sure any seal leakage is disposed of properly.



WARNING

Since leakage or seal failure can be expected to eventually occur, be sure installation can withstand this situation. Take appropriate measures if liquid is hazardous.

5.7 SPARE PARTS

Where pump out-of-service time is of vital concern, and this down time must be minimized, a set of spare parts or repair kits should be retained on-site.

5.8 DISASSEMBLY AND REASSEMBLY

Various procedures for disassembly and reassembly apply to different pumps. Refer to the specific pump instruction manual on how to perform these procedures.

6 FIELD AND FACTORY SERVICE AND PARTS

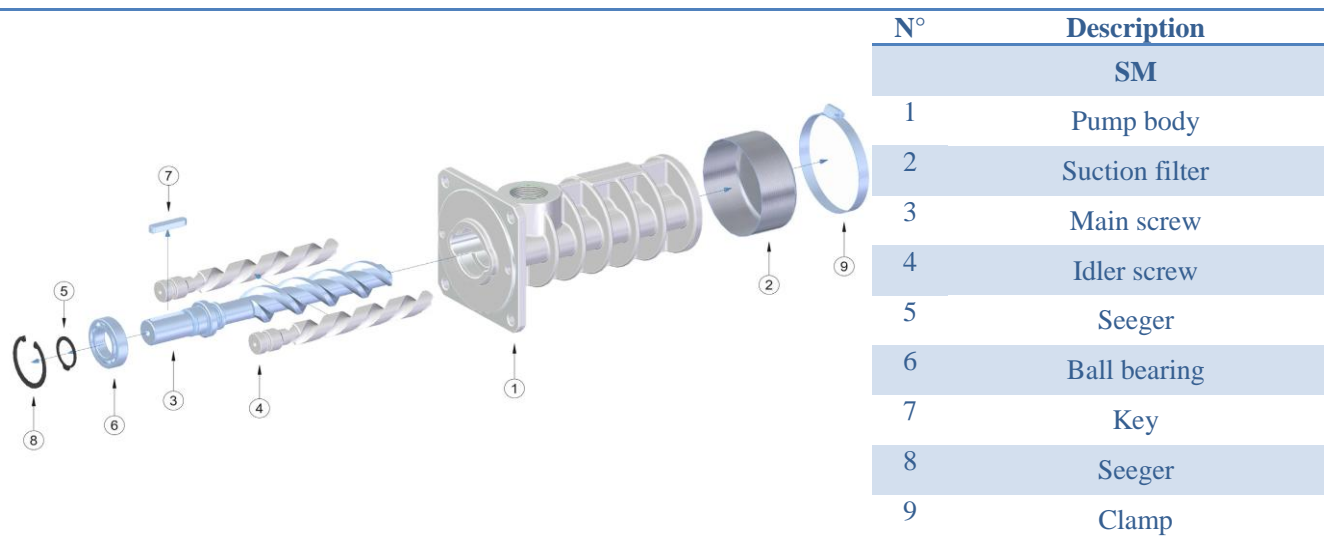
SETTIMA MECCANICA Pump maintains a staff of trained service personnel that can provide pump installation, pump start-up, maintenance/overhaul and troubleshooting supervision as well as installation and maintenance training.

Our factories provide maintenance as well as overhaul and test facilities in the event the user prefers to return pumps for inspection or overhaul. Pumps that have been factory-overhauled are normally tested and warranted “as-new” for a period of one year from date of shipment.

For either field service or factory overhaul assistance, contact your local SETTIMA MECCANICA Sales Office or representative at the Technical/Customer Service Department in Settima (Gossolengo Piacenza) Italy.

Most pumps have repair kits available. Minor Repair Kits are used to repair leaking seals, bad bearings and/or for re-assembly after pump tear-down. They include (as applicable) pump shaft seals, packing, all gaskets/O-rings and bearings. Major Repair Kits are sufficient to rebuild completely worn-out pumps to “as-new” condition. They include all parts found in Minor Repair Kits plus all major internal parts subject to wear. Since kits have all the necessary parts, it is preferred that they be purchased rather than selecting individual parts. When parts are individually selected from the Parts List, some needed components are often overlooked. In addition, mixing worn or used parts with new parts risks rapid wear and shortened service life from the new parts.

| | | N° | Description |
|---|--|-------------------------------|----------------------|
| | | 1 | Screw |
| | | 2 | Flange |
| | | 3 | Seal |
| | | 4 | Seeger |
| | | 5 | Ball bearing |
| | | 6 | Key |
| | | 7 | Main screw |
| | | 8 | Idler screw |
| | | 9 | O-ring |
| | | 10 | Body pump |
| | | 11 | Plane gasket |
| | | 12 | Radial suction cover |
| | | 12 | Axial suction cover |
| | | 12 | Tank top flange |
| | | 12 | Suction filter |
| | | 13 | Clamp |
| A | | SMT16B | |
| B | | SMT16B AX (axial BSPP) | |
| C | | SMT16B AL (vertical) | |
| D | | SMT16B (submersible) | |



SMAPI USER GUIDE & SERVICE MANUAL

This part is explicitly intended for use of Settima screw pumps class SMAPI. The following instruction integrates the instruction given above. Read carefully also the above part and subsequently apply the following parts.

6.1 PUMP CARTRIDGE-CASE ASSEMBLY

Please refer to drawing H1.

1. Clean with the maximum accuracy the inlet of the case with a strong rag in order to remove all particles and impurity.
2. Put and lock the two studs (5)(6) using PTFE film to obtain a perfect sealing.
3. Spread grease in the OR(4) allocation in the case, position the OR and spread grease on it.
4. Spread grease in the OR(3) allocation on the case front flange, position the OR and spread grease on it.
5. Spread grease on the pump cartridge body(2).
6. Lift the pump cartridge(2) with an appropriate tool and insert it in the case. Be careful to the introduction of the pump cartridge in the internal OR in order to avoid the damaging of the OR. The insertion could be hard because of the resistance of the OR on the pump body, if necessary hammer with plastic tool on the front flange of the pump cartridge up to the contact between case front flange and pump front flange.
7. Screw and lock boltings(1) in the four appropriate holes.

6.2 PUMP-BELLHOUSE-MOTOR ASSEMBLY

Please refer to drawing H2.

1. Position the shaft insert (11) in its own cave on the pump shaft, if necessary using a plastic hammer.
2. Put the half joint(10) on the pump shaft, screw the internal screw(5) to lock the joint.
3. Put the polymeric joint insert(9).
4. Position the bell-house (8) on the pump frontal face centring.
5. Put and lock bell-house bolting and washers(1)(7).
6. Position the shaft insert (4) in its own cave on the motor shaft, if necessary using a plastic hammer.
7. Put the half joint(6) on the motor shaft, screw the internal screw(5) to lock the joint.
8. Position the motor on the pump bell-house group with proper bolting and washer (2)(1).



WARNING

Be careful to the orientation of the two half joints during the introduction of the motor into bell-house in order to avoid the damaging of parts of the coupling and a wrong running.

6.3 PUMP COMMISSIONING

1. Inspect with the maximum accuracy the gasket case and remove with a strong rag all particles and impurity.
2. Verify the good condition of the gasket cartridges.
3. Remove the pump drain stud (6) and open the fluid valve to wash the piping from gasket to the pump. Make flowing the fluid to wash up to it seems completely normal and clean, collect it in a bucket and eliminate it.
4. Replace the drain stud.
5. Open completely the return valve to the tank.
6. Verify the motor rotation, it must be CLOCKWISE.
7. Start the motor.
8. Verify when the fluid flow starts up, in the case it wouldn't start in 30 seconds stop the motor and look for the problem in the equipment and pipe line.
9. When the flow starts up let the pump run for about 10 minutes without pressure.

10. Drive the valve to obtain the nominal pressure the first time increasing pressure of about 1 bar every 15 seconds.
11. When the nominal pressure has been obtained let the pump run for 10 minutes to end the commissioning.

6.4 BEST PUMP RUNNING SETTING

In the setting of control software parameters consider that this type of pump must avoid the starting against a direct pressure. So in the working starts it is necessary to respect the following sequence:

1. Start the motor
2. Let the motor arrive to nominal RPM without close the pressure setting valve, the ideal time is 5 seconds, at least 3 seconds.
3. Close the valve to the pre-set percentage. NOTE: the internal bypass has to be used to protect the circuit from pressure peaks and NOT FOR PRESSURE CONTROL.
4. In operations or maintenance process avoid a pipeline pressure condition that let the pump run with the internal bypass open for more than 3 seconds (3''). If, for special reason, it cannot be achieved, please follow the indication of the table below. Otherwise the pump may be damaged because the liquid is circulated within the pump, overheated because of full transfer of motor power into oil heating.

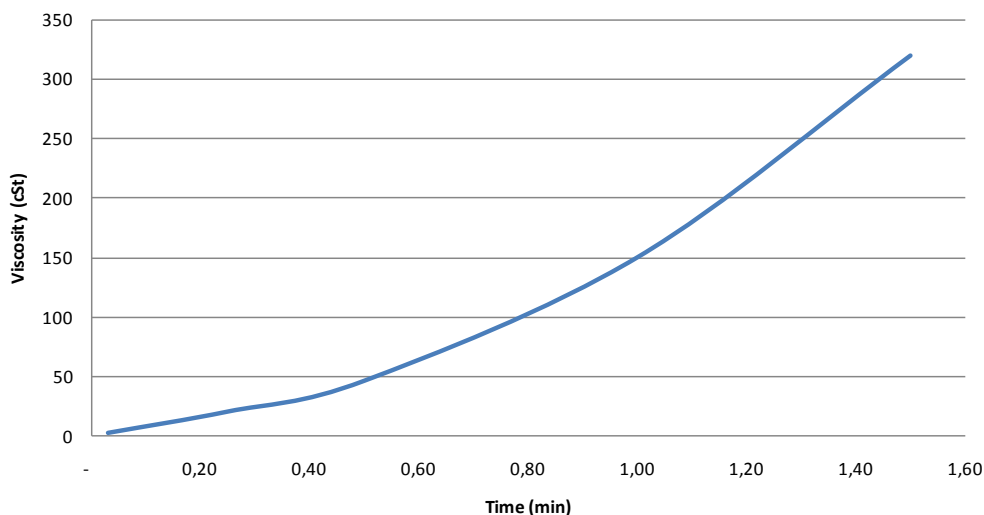


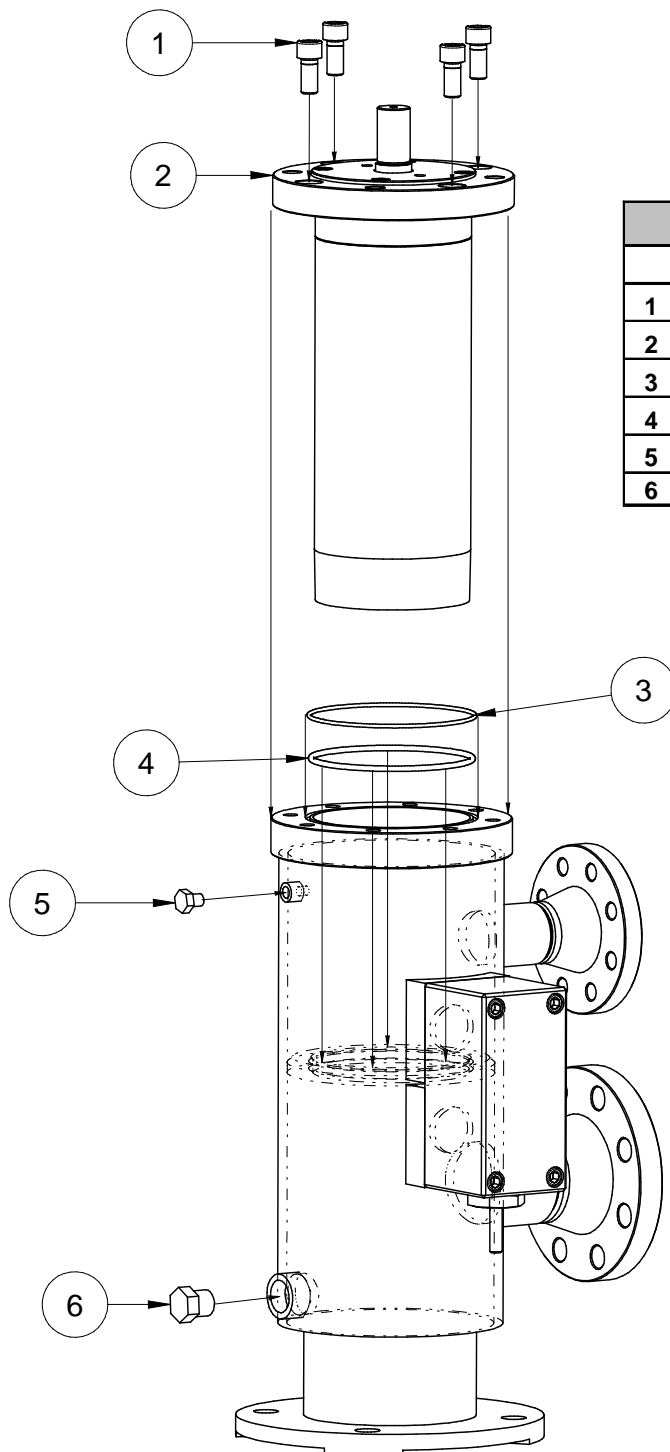
DANGER

A similar sequence preserve the pump for a longer life.

**In general avoid in any automatic / manual start-up procedure
all conditions of start / stop with pipeline in pressure.**

Maximum internal relief valve opening time





| PUMP PART LIST | | |
|----------------|--------------------------------------|---|
| | DESCRIPTION | # |
| 1 | SCREWS PUMPING CARTRIDGE-CASE M16X40 | 4 |
| 2 | PUMPING CARTRIDGE GR60 | 1 |
| 3 | PUMP-CASE FRONT OR 4625 | 1 |
| 4 | PUMP-CASEINTERNAL OR 6600 | 1 |
| 5 | STUD NPT 1/4" VENT | 1 |
| 6 | STUD NPT 1" DRAIN-PURGING | 1 |

Figure H1

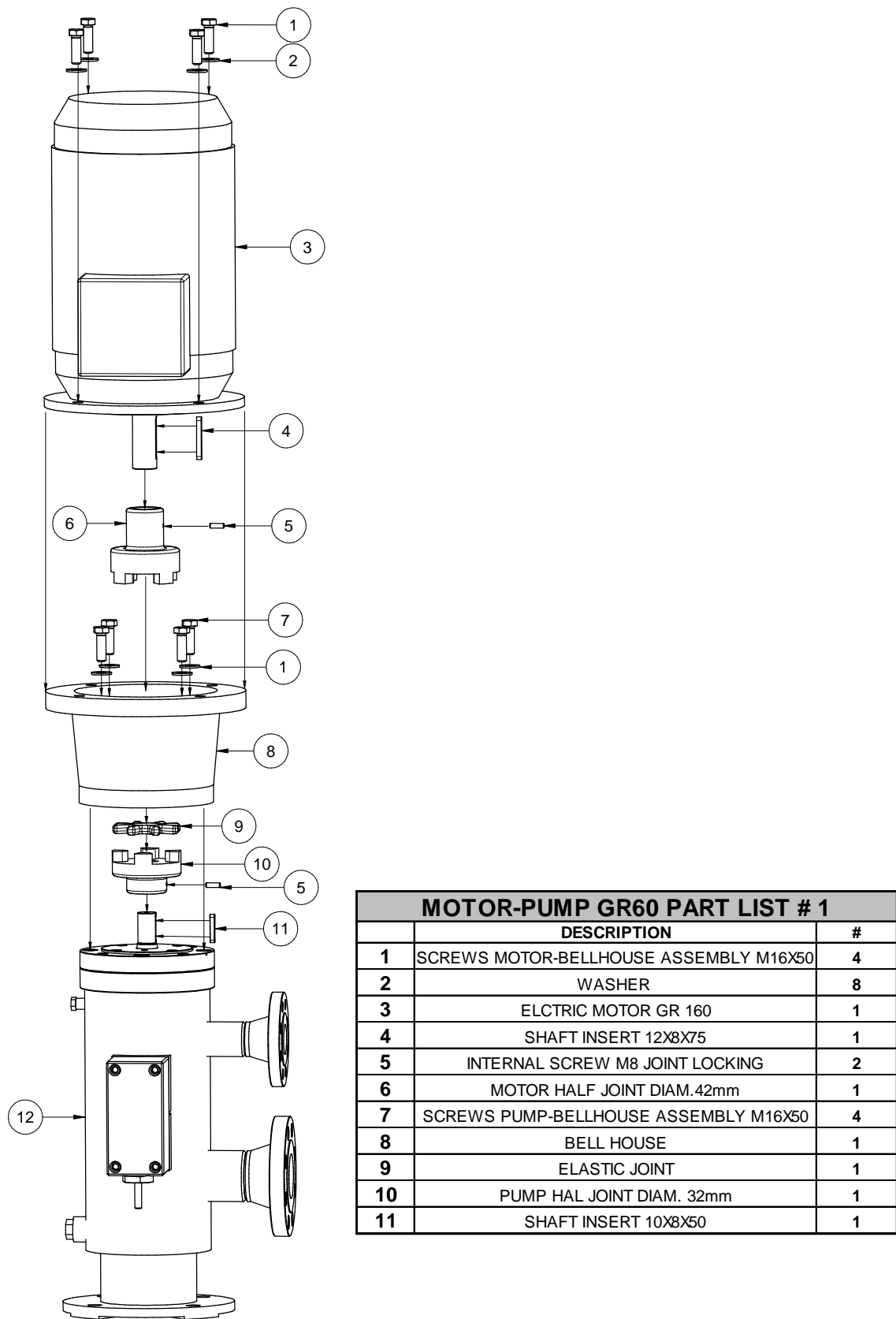


Figure H2

7 MAGNETIC COUPLING DRIVEN PUMP GUIDE



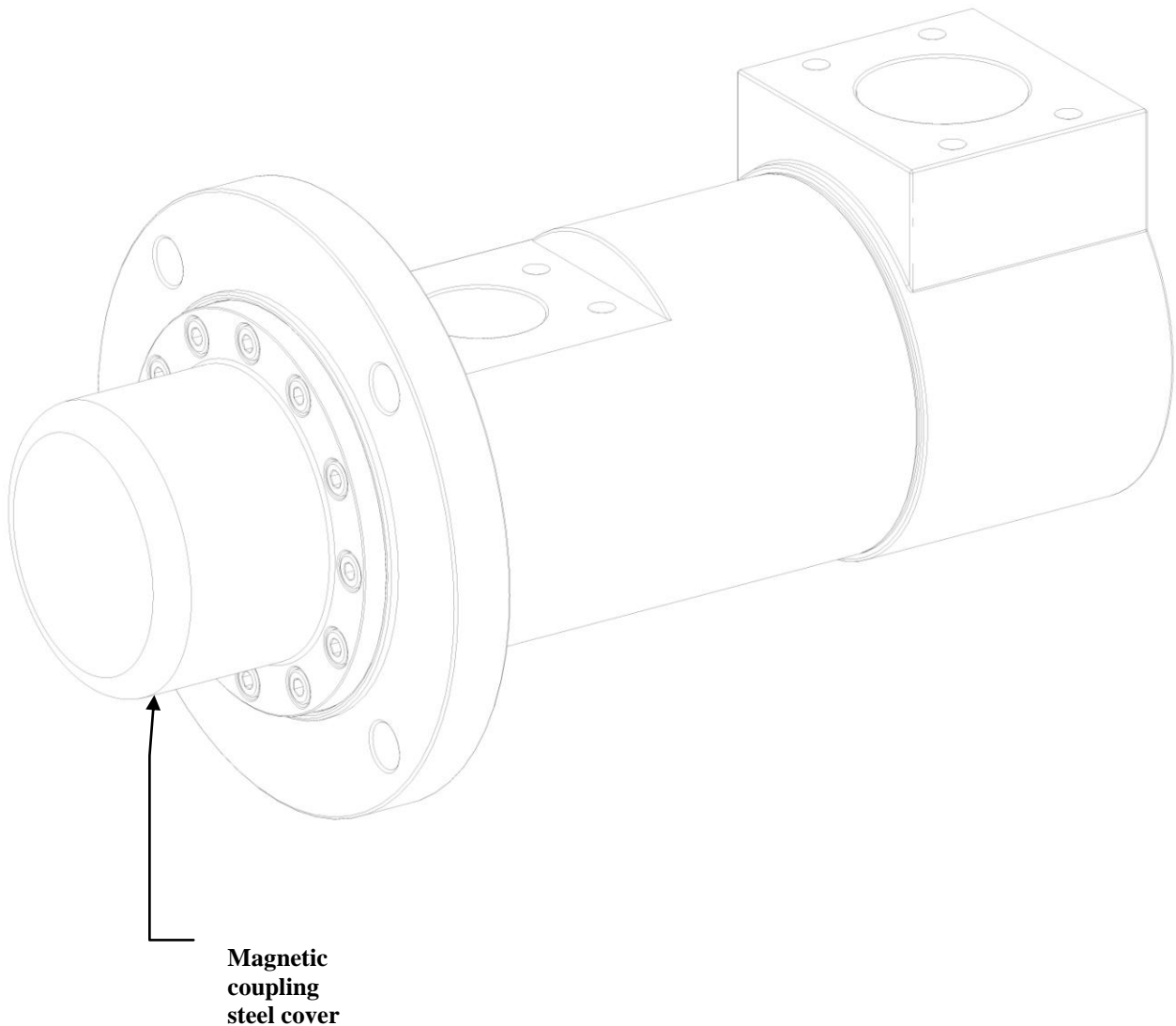
DANGER

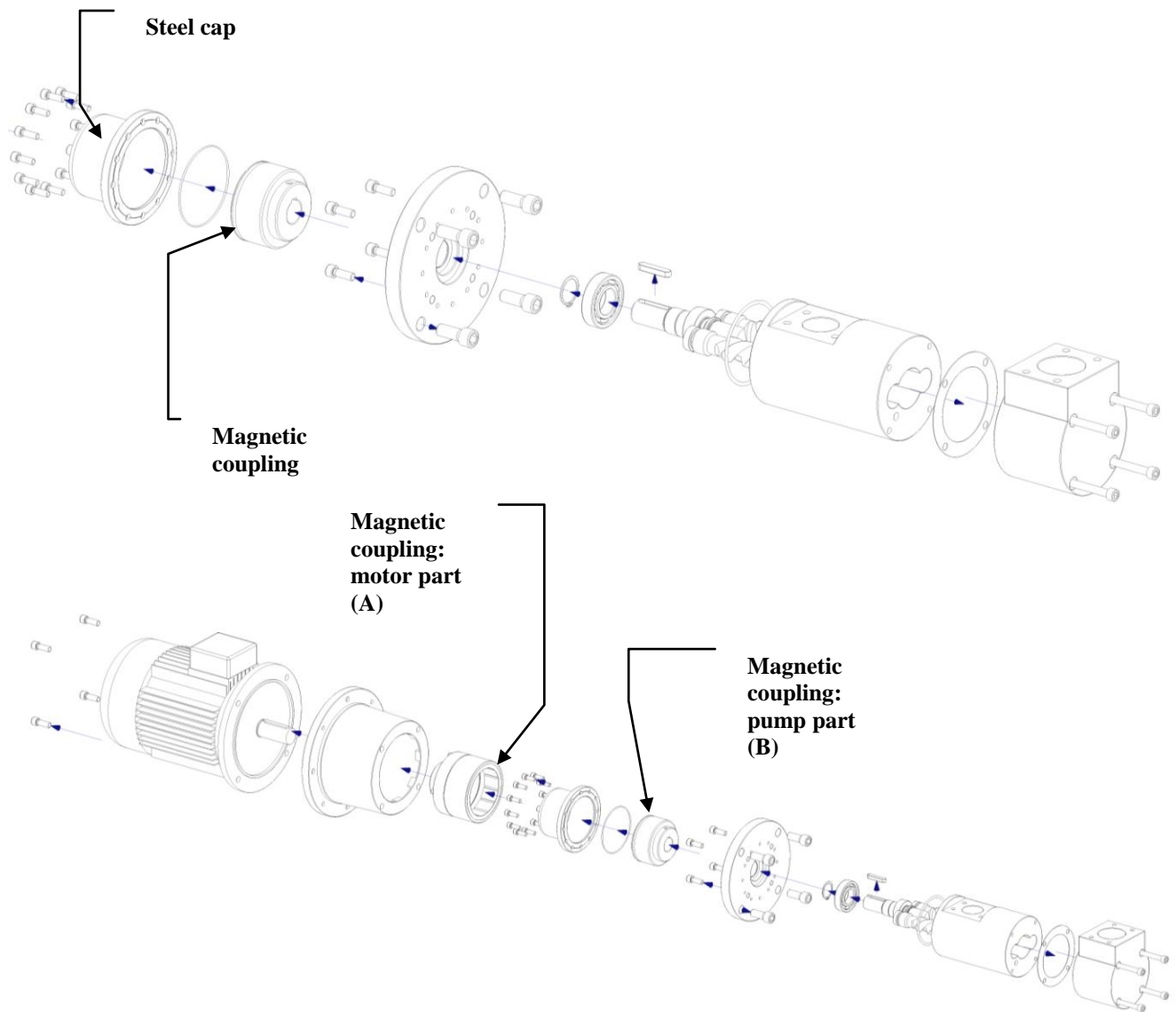


Be careful handling magnetic devices. Heart control systems, medical devices, electronics devices, components and tools may be affected and malfunctioning in case of usage near magnetic components, like magnetic joint used to connect Settima screw pumps and motors. Injuries to personal health may happen.

7.1 HOW A MAGNETIC COUPLING DRIVEN PUMP LOOKS LIKE

The shaft end is covered by a steel cover / cap. The magnetic radiation exit trough the steel cover. Pay attention to personal injuries.





DANGER



Be careful handling magnetic devices. While assembling the motor pump unit, please pay attention to put near each other the part (A) and (B). An high magnetic force attract the components (A) and (B) and personal injuries may happen.

8 TROUBLESHOOTING

| MALFUNCTION | POSSIBLE CAUSE | REMEDY |
|-------------------------------------|---|--|
| Loss of Flow or Low Capacity | System component malfunction | Inspect all system components. Correct any malfunctions. Insure that suction and discharge lines are open and all valves are in proper positions. |
| | Pump not primed or vented | Check reservoir oil level and fill as required. Vent air from pump. |
| | Low pump speed | Insure driver is not overloaded. For belt drives, insure belt not slipping. For variable speed drivers or variable speed intermediate devices, insure proper speed is set. |
| | Incorrect pump rotation | Correct direction of driver rotation. |
| | Obstruction in piping | Inspect all system piping and valves. Remove any obstructions. |
| | Wear of rotors and/or housings | Replace worn rotors, gears, and/or housing(s). |
| | System bypass | Check all system bypass valves, including relief valve. Repair or replace as required. |
| | Insufficient inlet pressure | Remove obstruction. Clean suction strainer or filter element. |
| | | |
| Loss of Suction | Suction line closed, blocked or leaking | Verify suction line valve is locked open. Inspect suction line, especially joints. Remove any obstruction and repair any leaks. Clean strainer or replace filter. |
| | Excessive viscosity | Reduce viscosity by heating pump and/or system liquids. |
| | Dirty suction strainer | Clean or replace strainer or filter element. |
| | Wrong direction of rotation | Correct direction of driver rotation |
| Low Discharge Pressure | Low liquid level in reservoir | Check liquid level in reservoir. Fill as necessary. |
| | Air in system | Insure pump is vented and suction lines are full of liquid. |
| | Worn rotors, gears, and/or housing(s) | Replace worn rotors, gears, and/or housing(s). |
| | Obstruction in piping | Inspect inlet piping and suction valve(s). Remove any obstruction(s). |
| | Dirty suction strainer | Clean/replace suction strainer or filter element |
| | System bypass problem | Check all system bypass valves for leakage, including relief valves. Repair or replace as as required. |

| MALFUNCTION | POSSIBLE CAUSE | REMEDY |
|--|---|--|
| Excessive Or Unusual Noise Or Vibration | Misalignment | Check pump and driver alignment and correct as required. |
| | Restricted suction line | Check suction line and remove any obstructions. |
| | Air in system | Insure pump is vented and suction lines are full of liquid. Check reservoir level. Fill as necessary. Check all lines, flanges, joints and connections for leakage. Repair as necessary. |
| | Dirty suction strainer | Clean suction strainer or filter element |
| | Relief valve chatter or leakage | Check discharge relief valve pressure setting. Re-adjust, repair or replace relief valve |
| | Heavy internal rubbing of pump parts | Verify pump and driver alignment. Inspect pump wearing parts. Replace as required. |
| | Mechanical problem | Check for loose or mis-positioned coupling, bent or broken shafts, or worn bearing. Repair or replace as required. |
| Rapid Pump Wear | Fluid contains abrasive foreign matter | Collect samples of liquid and test for foreign matter. Reduce downstream filter ratings in re-circulating systems (do not exceed NPIPR). If necessary, replace liquid in re-circulating systems. |
| | Fluid contains water | Remove any water from reservoir. Find source and prevent further ingestion |
| | Misalignment | Check pump and driver alignment. Correct as required. |
| | Insufficient liquid | Check liquid level in reservoir and correct as required. Remove any suction line obstructions. Clean/replace strainer or filter element. |
| Excessive Power Usage | Fluid more viscous than specified | Heat fluid to proper viscosity and/or design temperature. |
| | Pump suction and/or discharge lines closed or blocked | Insure suction and discharge lines are open, and remove obstructions if Present |
| | Heavy internal rubbing of pump parts | Verify pump and driver alignment. Inspect pump wearing parts. Replace as required. |
| | Excessive pump speed | Reduce pump speed to design limits. |
| | Mechanical problems | Check for bent shaft, tight shaft parking, or pipe strain. Repair or replace as required. |

9 APPLICATION DESCRIPTION OR PROBLEM REPORT

Project ☐ / Application ☐ / Problem ☐ Description

(mark one of the above)

| | |
|---|--|
| Customer / Project Name | |
| Project / Application description | |
| Application <ul style="list-style-type: none"> Description: <ul style="list-style-type: none"> Power hydraulic <input type="checkbox"/> Mobile hydraulic <input type="checkbox"/> Filtration <input type="checkbox"/> Cooling <input type="checkbox"/> Lubrication <input type="checkbox"/> Elevator hydraulic <input type="checkbox"/> other: please specify <input type="checkbox"/> Tank capacity: <input type="checkbox"/> Cooling: YES/NO <input type="checkbox"/> Installation: <ul style="list-style-type: none"> Above oil level – meters ? <input type="checkbox"/> Below oil level <input type="checkbox"/> | |
| Application general description | |
| Pump type <ul style="list-style-type: none"> Displacement (cc): <input type="checkbox"/> or <ul style="list-style-type: none"> Flow: <ul style="list-style-type: none"> Flow rate <input type="checkbox"/> RPM for above flow rate <input type="checkbox"/> | |
| Motor speed of rotation <ul style="list-style-type: none"> Min. speed: <input type="checkbox"/> Max. speed: <input type="checkbox"/> | |
| Outlet / Operating pressure <ul style="list-style-type: none"> Max: <input type="checkbox"/> Max @ min speed: <input type="checkbox"/> | |
| Inlet / Suction pressure <ul style="list-style-type: none"> Max: <input type="checkbox"/> Max @ min speed: <input type="checkbox"/> | |
| Fluid <ul style="list-style-type: none"> Type / Designation <input type="checkbox"/> Percentage of air (%) <input type="checkbox"/> Percentage of water (%) <input type="checkbox"/> | |
| Fluid properties @ start up | |

| | |
|---|--|
| <ul style="list-style-type: none"> • Viscosity (cSt) • Temperature (°C) | |
| Fluid properties @ operations <ul style="list-style-type: none"> • Viscosity (cSt) • Temperature (°C) | |
| Filtration <ul style="list-style-type: none"> • Pressure port filtration (NAS class): • Suction port filtration (NAS class): | |
| Drive shaft load <ul style="list-style-type: none"> • Axial load : <ul style="list-style-type: none"> ○ Force (estimation): ○ Description of load (direction, type, what job to do, etc..) • Radial load: <ul style="list-style-type: none"> ○ Force (estimation): ○ Description of load (direction, type, what job to do, etc..) | |
| Problem description | |
| Quick problem description <ul style="list-style-type: none"> • leakage <input type="checkbox"/> • no pressure <input type="checkbox"/> • noise <input type="checkbox"/> • body damage <input type="checkbox"/> • front flange damage <input type="checkbox"/> • pump blocking <input type="checkbox"/> • other: please specify <input type="checkbox"/> | |
| Further Details / Notes | |

10 WARRANTY

10.1 Exclusive Warranties

THE WARRANTIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES. SETTIMA MECCANICA MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, AND IT EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, INCLUDING IMPLIED WARRANTIES OF SATISFACTORY QUALITY, NONINFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE. MOREOVER, THE PROVISIONS SET FORTH ABOVE STATE SETTIMA MECCANICA'S ENTIRE RESPONSIBILITY AND THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDY WITH RESPECT TO ANY BREACH OF ANY WARRANTY.

10.2 Limited Warranty and Remedy

SETTIMA MECCANICA warrants that the Product will be free from defects in materials and workmanship for a period of one (1) year from the date of delivery under normal use and conditions. If the Customer believes that it has discovered any such defect during the Warranty Period, during such period the Customer may return the Products, freight prepaid, to the Companies, and if it is determined that the returned Product contains a significant defect in materials or workmanship, then either (a) the defective Product will be repaired or replaced and returned to the Customer, freight prepaid, or, at the Customer's election, (b) the amount paid by the Customer for the defective Product will be refunded. If it is determined that the Product is not defective, it will be returned to the Distributor freight collect. SETTIMA MECCANICA shall have no responsibility or obligation with respect to any deficiency resulting from misuse, or modifications.

10.3 Returns Per RMA (Return Material Authorization) Procedure

All Products returned for repair or replacement, whether or not covered by the foregoing warranties, shall be returned in accordance with SETTIMA MECCANICA's current return materials authorization procedure provided that such procedure does not at any time impair the Customer's rights or the enforcement of the rights.

The Companies will have no liability for any claim of infringement or misappropriation arising as a result of (a) the Customer's use or sale of a Product in combination with any items not supplied by SETTIMA MECCANICA; (b) any modification of a Product by the Customer or third parties.

10.4 LIMITATION OF LIABILITY; INDEMNITY

No Consequential Damages, Etc. THE COMPANIES'S LIABILITY UNDER, OR ARISING OUT OF, THIS DOCUMENT SHALL BE LIMITED TO THE AMOUNTS PAID TO SETTIMA MECCANICA FOR THE PRODUCT HEREUNDER. IN NO EVENT SHALL THE COMPANIES BE LIABLE FOR COSTS OF PROCUREMENT OF SUBSTITUTE PRODUCTS OR SERVICES, NOR WILL IT, THE COMPANIES OR ITS LICENSORS, BE LIABLE FOR LOST PROFITS, OR ANY OTHER SPECIAL, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, ARISING OUT OF OR RELATING TO THIS AGREEMENT OR RESULTING FROM THE SALE OF PRODUCTS OR SERVICES BY THE CUSTOMER OR RESALE OR USE BY ANY END-USER OR ANY TRANSFEREE OF SUCH PRODUCTS OR SERVICES. THIS LIMITATION SHALL APPLY EVEN IF A PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

11 RMA PROCEDURE

11.1 RMA Number

The customer must ask for a RMA number from SETTIMA Sales Support. This number identifies the repair once the item is in the repair shop. The customer might ask for advancement of the repair by referring to the RMA number given to you by email at info@settima.it.

11.2 Italian Clients

1. The customer must label the outside of the shipping package as well as all shipping documents with the RMA number. Address shipment to:
SETTIMA MECCANICA snc. (RIPARAZIONI) 29020 LOC. CONCA DI SETTIMA (GOSSOLENGO)
PIACENZA ITALIA
2. The customer must provide the serial number as well as proof of purchase in order to substantiate a warranty claim. If a proof of purchase can't be provided then the date of the Transportation Document will be used as the purchase date.
3. All shipments received collect will be charged back to the customer.
4. There is a 50€ flat rate repair charge in addition to spare parts used on all out of warranty work. The customer is responsible for ALL out of warranty shipping charges.
5. If a product is in warranty (See related paragraph in this document), the customer is responsible for shipping to SETTIMA. SETTIMA will pay all shipping cost to the customer if warranty is not voided.
6. The customer must provide a detailed problem description with each item to assist the repair staff.

11.3 International Clients

1. The customer must state on the waybill and shipping package "Italian goods being returned for warranty repair".
2. The customer must state on the above documents that the "Origin of goods is ITALY", not the country from which it is being shipped. The customer must mark on the outside of the shipping package as well as all shipping documents, the RMA number that was issued for its return. Address package to: SETTIMA MECCANICA, Repair Department, 29020 LOC. CONCA DI SETTIMA (GOSSOLENGO) PIACENZA ITALIA
3. The customer must provide the serial number as well as proof of purchase in order to substantiate a warranty claim. If a proof of purchase can't be provided then the date of the Transportation Document will be used as the purchase date.
4. If the customer can not supply proof of purchase, Italian Customs may assess additional duties and taxes against the returning goods. The customer is responsible for these charges if they should occur.
5. The proof of purchase should be included in the shipping documents so that Italian customs will have access to it.
6. The customer is responsible for the payment of any freight and brokerage charges that may be applied to the goods entering Canada. All goods must arrive prepaid by the sender.
7. It is recommended that the Customer use a "door to door" service that is offered by various carriers. These firms have their own internal departments to handle customs clearance and brokerage.
8. If an independent brokerage house becomes involved as an agent, additional charges may be assessed on the goods. These charges will be billed back to the customer.
9. All shipments received collect will be charged back to the customer.
10. There is a 50€ flat rate repair charge in addition to spare parts on all out of warranty work. The customer is responsible for all shipping charges for out of warranty work.
11. If a product is in warranty, the customer is responsible for shipping to SETTIMA. SETTIMA will pay all shipping cost to the customer if warranty is not voided.
12. The customer must provide a detailed problem description with each item to assist the repair staff.