Operating Manual

Euro-HYGIA® I Adapta®
Euro-HYGIA® I Adapta®- SUPER
Euro-HYGIA® I Adapta®- V

BA.022..Adapta.001.V1.GB

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1.0 Introduction

1.1 Target Group

This operating manual is intended for:

- the operators of the pump and
- maintenance and repair personnel.

It is assumed that all such personnel will have the basic technical background required for the start-up, maintenance, and repair of pump systems.

Sections which are intended only for specially authorised personnel are indicated by a preceding notation to this effect.

1.2 Symbols and Formatting

The following symbols and formats are intended to make it easier to read this document:

- Items in a series, lists of points

Key Words

Key words (flush left) and the titles of figures and tables are printed in *italics*.

Instructions

Instructions which must be carried out in a specific sequence are numbered in the corresponding order.

Part Numbers

Part numbers in instructions which refer to figures and tables are printed in **bold**.

Safety Instructions

The system used to identify safety instructions is described in Section 2.1.2.1, Identification of Safety Instructions in the Operating Manual.

1.3 References to the Document

Copyright

Technical Changes

Design variants, technical data, and spare part numbers are subject to technical change.
The right to make changes for the sake of further technical development is reserved.

1.4 ATEX – Notices to Explosion Protection

The ATEX-Notices listed in this operation manual are valid for ATEX-Pumps only.
Pumps without ATEX-Confirmation and ATEX-declaration on the rating plate must be not used in hazardous areas!

1.5 Rating Plate

Layout of the rating plate:

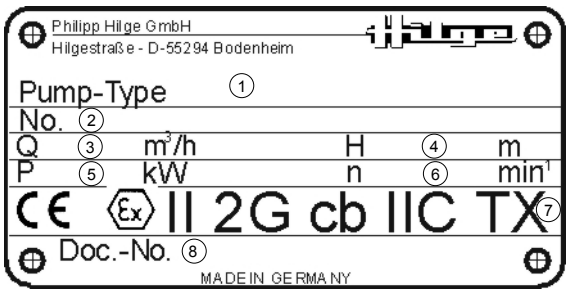


Figure 1: Example rating plate

1 – Pump-type
2 – Pump number (type/year of manufacture/reg. number)
3 – Capacity Q
4 – Head H
5 – Motor power P
6 – engine speed n^{-1}
7 – Example for ATEX – Declaration (For ATEX-pumps only.)
8 – Number of operating manual

Note:
The rating plate can deviate from this one shown.

2.0 Safety

2.1 Instructions for the Operator

2.1.1 General

All our pumps are professionally packaged before they leave our warehouse to avoid damage during transport.

If, after carefully unpacking and inspecting the shipment, you nevertheless find damage, you must promptly inform the shipping agent (railway, post office, trucker, shipping line, etc.).
You are to file your claim with this shipping agent. The shipping risk passes to the customer as soon as the shipment leaves our warehouse.

Storage

If the pump is not put into service immediately, it is important that it be stored properly to ensure that it will function correctly later. This is just as important as proper installation and maintenance.

The pump must be protected from cold, moisture, and dust as well as from mechanical influences.

Specially trained personnel are required to install and maintain the pump properly.

2.1.2 Safety Instructions in the Operating Manual

The operating manual contains all the basic information required for the set-up, operation, and maintenance of the pump. The installer as well as the technical personnel or operator responsible for the pump must therefore read this manual before installing and starting the pump. The operating manual must always be available at the site where the machine/system is being used. Not only the general safety instructions presented in this section but also the specific safety instructions in later sections must be followed.

2.1.2.1 Identification of Instructions in the Operating Manual

The safety instructions presented in this operating manual are identified as follows:

Failure to follow these safety instructions can endanger personnel.

Safety instructions which involve warnings against electrical voltage.

Safety instructions for explosion protection.

ATTENTION

Failure to follow these safety instructions can endanger the machine and its operation.

Improper attachment point for transport and hoisting equipment.

Instructions attached directly to the machine, such as

- Rotational direction arrow

must be noted and kept in completely legible condition. Damaged or illegible instructions must be replaced.

2.1.2.2 Qualifications and Training of Personnel

The employees who operate, maintain, inspect, and install the pump must have the appropriate qualifications for this work. The operator must regulate in detail the tasks for which the employees are responsible, the tasks of which they are in charge, and the manner in which they are supervised.. If the employees do not have the necessary knowledge, they must be instructed and trained as appropriate. This can be done, if necessary, by the manufacturer/supplier under contract to the operator. The operator must also guarantee that the employees fully understand the content of the operating manual.

2.1.2.3 Hazards Upon Failure to Follow the Safety Instructions

Failure to follow the safety instructions can endanger not only the employees but also the environment and the machine itself.
Failure to follow the safety instructions can lead to the loss of the right to file claims for damages.

Failure to follow instructions can, for example, lead in particular to the following hazards:

- Breakdown of important functions of the machine/system.
- Failure of recommended methods of maintenance and repair.
- Endangerment of personnel by electrical, mechanical, and chemical hazards.
- Endangerment of the environment by leakage of hazardous materials.
- Endangerment of personnel by ignition of an explosive atmosphere.

2.1.2.4 Safety-Conscious Work

The safety instructions given in this operating manual, the existing national regulations for accident prevention, and any applicable internal working, operating, and safety instructions of the operator must be followed.

2.1.2.5 Safety Instructions for the Operator / User

If hot or cold mechanical components are a source of danger, structural measures must be taken to prevent contact with them.

Protection against contact with moving parts (e.g., couplings) may not be removed while the machine is operating. Defective safety equipment must be replaced immediately.

Leakage (e.g., at the shaft seal) of hazardous pumping media (e.g. toxic, hot) must be conducted away in such a way that there is no danger to personnel or to the environment. Legal regulations must be followed.

If the mechanical seal or another seal fails, the pump must be switched off. The shaft seal must be replaced before the next start-up.
A defect seal could cause a temperature rise and an ignition source.

Hazards posed by electricity must be excluded. (For details, see, for example, the specifications of the VDE and the local power utility.)

In the case of portable pumps, route the electric power cable in such a way that no one can trip over it.

The electric cables and plugs which are used may not be defective in any way.

2.1.2.6 Unauthorized Modifications and Production of Spare Parts

No modifications or changes to the machine may be made without written approval of the manufacturer. In the interest of safety, only original spare parts and accessories authorized by the manufacturer may be used. The use of other parts can relieve the manufacturer of liability for damage which may thus be caused.

2.1.2.7 Improper Operation

The operational reliability of the delivered machine can be guaranteed only when it is used properly as indicated in the following sections:
3.0 Product Description to
3.3 Wet End Parts as well as the sections
2.2 Set-up / Installation to
2.3 Electrical Connections of this Operating Manual.
The limit values given in Section *4.0 Technical Data,* may not be exceeded under any circumstances.

2.1.2.8 Cleaning

CIP and SIP methods must be in accordance with the most current guidelines of the EU.
When special cleaning agents and methods are used, the supplier must confirm that they are safe for the materials involved.

ATTENTION Before a sterilisation will carry out the system has to be evacuated completely.

2.1.2.9 Transport

Transport work may be performed only by specially qualified personnel under consideration of the relevant safety instructions.

Attachment of Chains / Belts

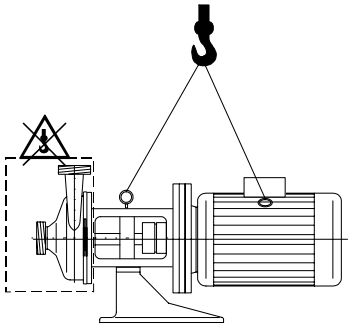


Figure 2. Transport

Use suitable load-lifting equipment with sufficient load-carrying capacity to transport the pump.

Make sure that no one is present underneath a suspended load.

Use the eyebolt on the Adapta® bearing housing to transport the pump. Support the motor as follows:

- If eyebolts are attached to the motor (*Figure 2*), attach the chain to these.
- If there are no eyebolts in a suitable position on the motor, place a belt around the motor
- Make sure that the pump remains horizontal as it is being lifted.

ATTENTION

Under no circumstances should a cable be attached to the pump housing or to the suction /pressure port. This could deform the pump and thus damage it.

ATTENTION

In the case of the SUPER model, the stainless steel shroud must be removed before the pump is transported.

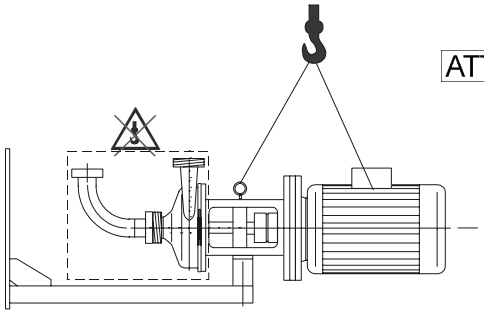


Figure 3: Transport Euro-HYGIA® I Adapta®-V

2.2 Set-up / Installation

2.2.1 Set-up and Alignment of the Pump Assembly

The foundation on which the pump is set up must be clean and flat and must have sufficient load capacity.

The mounting points provided must be bolted to the foundation according to the standard rules of mechanical engineering to ensure the satisfactory set-up of the pump.

Mount the pump – especially when it is to be set up vertically – with the use of suitable heavy-duty anchors. Because the centre of gravity is higher in this case, the pump tends to tip.

In case of a vertical installation under no circumstances the motor must not be positioned underneath the pump.
If there is a leakage the motor could become damaged and this could cause an ignition source.

Take note of the special requirements for mounting the pump on a wall:

- Proper alignment between the support of the pump (foot of the motor) and the mounting location on the machine wall at the building site.
- Proper dimensions for wall thickness, holes, and spacing between holes at the building site. Consult the manufacturer for further information.

Use an engineer's spirit level across the machined flats of the connector sleeves to align the assembly. After aligning the assembly, tighten the mounting bolts uniformly in a crosswise manner.

2.2.2 Installation in the Pipeline

Do not use the pump or its connecting sleeves to support the pipeline. (EN809 5.2.1.2.3 and EN ISO 14847)

ATTENTION All our pumps leave the factory in perfect condition. In addition to the general rules of machine-building and plant construction, also follow the instructions provided by the manufacturer of the connecting elements used (e.g., flanges) when installing the pump in the pipeline or plant.
These specifications will contain data on:

- torques,
- maximum allowable angular offset, and
- tools / auxiliary materials to be used.

ATTENTION It is absolutely necessary to avoid twisting the pump. After connecting the pipes, check the alignment of the coupling (CN only).

If the permissible pipeline forces were exceeded it could course an outflow of liquid or a friction between impeller and pump casing or suction cover. This friction could cause a temperature rise witch could become an ignition source.

ATTENTION The suction and delivery ports are sealed with sheets of plastic, the flushing and drain lines with plastic caps. These must be removed **before the pump is installed in the system.**

ATTENTION The suction line must be absolutely leakproof and routed in such a way that no air pockets can form.

ATTENTION Avoid tight elbows and valves immediately upstream of the pump. They interfere with the incoming flow to the pump and thus with the NPSH of the system..

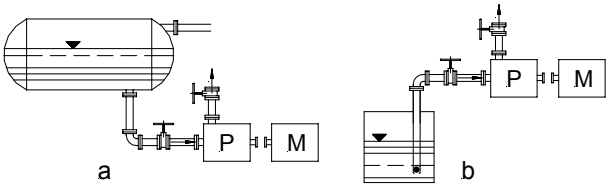


Figure 4: Installation in pipelines.
a – gravity feed mode, b – suction mode

- The head of the system may not be greater than the head guaranteed by the pump.
- The nominal pipeline diameters of the system should be equal to or greater than the DNS or DND connectors of the pump.
- A foot valve should be used in suction mode (Figure 4).
  To prevent air pockets from forming, the suction line must be routed so that it ascends; a gravity feed line must be laid with a slight downward gradient to the pump.
  If local conditions do not allow the suction line to ascend continuously, install a venting device at the highest point of the line.

- A shut off valve should be installed near the pump. This valve must be completely open during operation and may never be used as a control valve.
- A shut off valve is to be installed in the pressure line, near the pump, to control the delivery rate.

2.3 Electrical Connections

The electrical connections must be made by a licensed electrician. VDE specifications and any local regulations must be followed, especially those pertaining to safety measures.
Check the voltage stated on the rating plate of the motor against the operating voltage.

Install an electrical circuit breaker.

Checking the direction of rotation.

Connect the motor and **briefly**
(for about 2 seconds) check the direction of rotation. Note the directional arrow (red) on the pump.

Never operate the pump while dry!
Dry running causes destruction of the mechanical seal. A dry running mechanical seal causes a temperature rise and could become an ignition source.

The electrical connection of portable pumps has to be made so that it is impossible to interrupt the current when the pump is switched on.

The motor should not be switched on more then 15 times an hour. If switched on too often the surface temperature of the motor will rise.
This higher surface temperature could become an ignition source.

Y-connected 3-phase system for high voltage (Figure 5). Connect the pump as specified in the order documents.

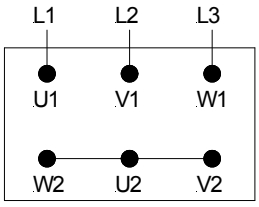


Figure 5: Y-connected 3-phase system

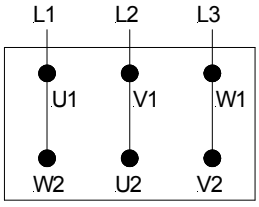


Figure 6: Δ-connection, frequency inverter.

Δ- connection for low voltage (Figure 6). Connect the pump as specified in the order documents.

When installing and operating the frequency inverter, take note of the SIEMENS operating manual for the COMBIMASTER and the supplement „Hilge Centrifugal Pump with Integrated Frequency Inverter“, specific to you pump.

Before changing the parameter settings, read the user manual!
You can obtain a copy of the User Manual at **www.hilge.com**.

2.4 Start-up / Shut down

Please note the following before starting the pump the first time:

This pump is intended for use only under the indicated operating conditions (pressure, temperature, pumping medium).

An especially careful inspection is advised before start-up when toxic substances are to be delivered.

Filling the pump

Vent the pump before startup.
The pump is to be vented and filled when the system itself is vented and filled.

Before the first start-up or after a longer standstill period it is recommended that the pump shaft be turned slowly by hand to ensure that the pump rotates failure free.
If the impeller rubs against the pump casing (for example due to transport damage) it causes a temperature rise an ignition source.

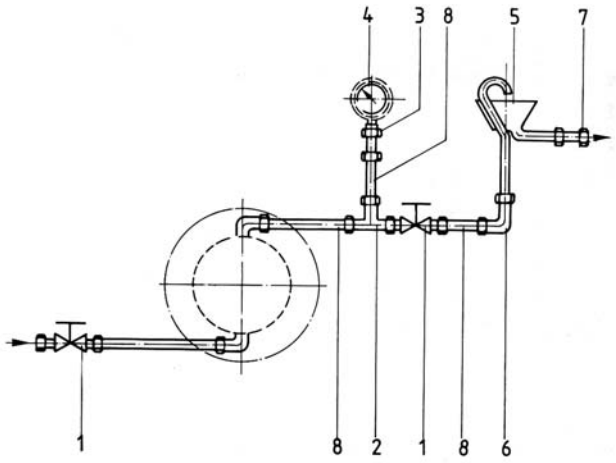
Never run the pump dry.

Running dry will destroy the seal. In the model with a back to back double mechanical seal(Figure 7) or tandem type *(*Figure 8) or in the case of a packed gland, you must make sure that the sealing or flushing fluid can circulate freely. See the supplemental mechanical seal instruction sheet..

Barrier liquid

In the case of a back to back double mechanical seal, connect the sealing fluid to the connectors provided at the proper sealing pressure (1.5-2 bars above the maximum internal pressure of the pump) before start-up. Internal pressure = system pressure + pump pressure.

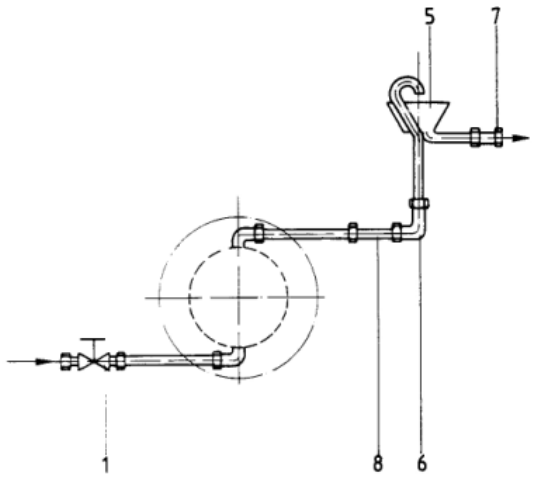
Always keep the fill level in the liquid pot between the upper and lower marks.



Regulate the rate of flow in such a way that the temperature of the sealing fluid does not exceed 60°C on exit but on no account should it be above the boiling point. The temperature difference ΔT must not exceed15 K.

1 – EO two-way valve
2 – EO T – threaded joint
3 – EO – threaded manometer joint
4 – manometer
5 – sealing water discharge
6 – EO threaded angle joint
7 – EO threaded straight joint
8 – pipe

Figure 7: Schematic of the sealing water system – pressurized.



In the case of a tandem double mechanical seal, connect the flushing or sealing fluid to the connectors provided for unpressurized operation before start-up.

1 – EO two-way valve
5 – flushing water discharge
6 – EO threaded angle joint
7 – EO threaded straight joint
8 – pipe

In the case of abrasive media (those which deposit particles), „lost“ flushing is preferred, i.e., where the flushing liquid is discharged directly.

Figure 8: Schematic of the flushing water system - unpressurized

Mechanical seal leakage drain for vertical installation

Pumps which are set up vertically are equipped with an mechanical seal leakage drain. If the pumping medium starts to escape through this drain, check the mechanical seal to make sure that it is working properly and replace if necessary *(See Sections 6.0 Disassembly and 7.0 Assembly).* The drain has a G1/4“ thread. Attach a pipeline here to direct the discharge of the leaked liquid.

ATTENTION If the delivery head does not rise after the pump has been turned on, shut off the pump and carefully vent it again. The specified operating point must be reduced by means of a control valve on the pressure side to prevent the motor from being overloaded. (Compare the measured reference current with the amperage value on the motor rating plate.)

ATTENTION Never operate the pump continuously against a closed shut-off element.

Ex Never operate the pump continuously against a closed shut-off element.
Operation with a closed shut-off device must on no account continue for longer than 30 seconds.

Ex Continuous operation with a closed shut-off device is illegal. Operation below the minimum flow rate of Q_{min}=10-15% Q_{opt} leads to an increase in pump temperature.

Ex After start-up, check the mechanical seal for flawless functioning (leak test). If pumped or flushing liquid leaks out, switch off pump and renew mechanical seal (or have it renewed).
A leakage of pumping or flushing liquids could cause damages which become an ignition source because of a temperature rise.

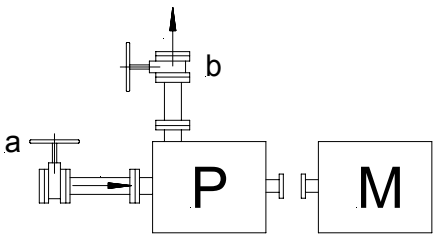


Figure 9: Valve assembly.
a – suction valve all the way open
b – control valve

After the pump has been removed (for repairs), it should be tested to check for leaks between the pump housing and the housing cover (O-ring or flat seal), at the rotating mechanical seal, and at the suction and pressure ports.

Ex For pumps which are used in explosive atmospheres the connections for flushing or barrier liquid must

always carry out with pipes . Do not use a hose connection.

For category 2 pumps (useable in zone 1)

- monitor flushing or barrier liquid with regard to fill level, temperature and if necessary pressure.
- avoid dry running of the pump by means of a monitoring device.

The used equipment for monitoring must be in accordance to the valid directives for explosion protection.

Please note the following before shutting down the pump

When pumping sticky or highly viscous liquids the pump must be thoroughly cleaned before shut down. If this is not observed serious damage can be occurred.

2.5 Repair Contract

The duty to follow the legal regulations on work safety such as

- The Workplace Act (ArbStättV),
- The Hazardous Materials Act (GefStoffV),
- the accident prevention regulations (BGV A1)

and the regulations on environmental protection such as

- The Recycling and Waste Law (KrW/AbfG) and
- The Water Economy Law (WHG)

means that all commercial enterprises must protect their employees, the public at large, and the environment from the harmful effects of hazardous materials.

Certificate of Non-Objection

The certificate of non-objection attached to the shipment is a component of the inspection/repair contract. This does not affect our right to refuse acceptance of this contract for other reasons.

The certificate of non-objection can be found on page .

HILGE products and their parts will therefore be inspected/repaired only if the certificate of non-objection is present and has been correctly and completely filled out by authorized and qualified technical personnel.

Pumps which have been operated in media exposed to radiation will not be accepted.

If any additional safety measures are required even after the careful draining and cleaning of the pump, the necessary information must be provided.

3.0 Product Description

Hygienic design

The Euro-HYGIA® is a single-stage centrifugal pump of end-suction type with a modular design.
All parts which come in contact with the medium are in accordance with „**hygienic design“** guidelines.
Material No. 1.4404 or No. 1.4435 with Fe ≤ 1% and the associated design standard **3A** (Table1) are used as specified on the order documents and certified on request from beginning to end.

Code	Standard	Material	Surface Finish
3A0.01	Industrial	Cr-Ni-Mo-Stahl	
3A1.02	Hygienic	Cr-Ni-Mo-Stahl	Ra ≤ 3.2 μm
3A2.03	Sterile	1.4404 / 1.4435 (316L)	Ra ≤ 0.8 μm
3A1.04	Pharmaceutical	1.4435 Fe ≤ 3%	Ra ≤ 3.2 μm
3A2.05	Sterile	1.4435 Fe ≤ 1%	Ra ≤ 0.8 μm
3A3.06	Sterile	1.4435 Fe ≤ 1%	Ra ≤ 0.4 μm
3A3.07	Sterile	1.4404 / 1.4435 (316L)	Ra ≤ 0.4 μm
3A2.33	Sterile	1.4404 / 1.4435 Fe ≤ 3% (316L)	Ra ≤ 0.8 μm
3A3.37	Sterile	1.4404 / 1.4435 Fe ≤ 3% (316L)	Ra ≤ 0.4 μm

Table 1: Design standards

Areas of application

Pumps of the standard design are used for industrial applications, in textile technology, in surface treatment technology and hydroengineering, and in all systems and processes involved in the food product, dairy, and beverage industries. Because of the consistent hygienic design and the use of materials which are free of both pores and inclusions, the pump is highly suitable for use in the pharmaceutical industry, in medical technology, and for processes in bioengineering. Special areas of application can be found in the delivery of ultrapure water and water for injection and in systems for the production of FDA-approved parenteral and infusion solutions.

3.1 Proper Use

Name plate

The exact model no., size, and serial no. of the pump as well as the most important operating data are indicated on the name plate. The pump serial no. is also stamped on the surface of the bearing housing or the lantern.

Liquid pumping

Only pure or slightly contaminated liquids with a maximum particle size of 0.4 mm a may be pumped. These liquids may not chemically or mechanically attack the pump materials or lower their strength. If liquids with a viscosity greater than that of water are to be pumped, make sure that the motor will not be overloaded.
The pump may not be operated beyond the maximum allowable values. Even brief periods of pressure overload (e.g., as a result of a pressure surge) should be avoided.

Minimum flow rate

Do not operate the pump below minimum flow rate of Q_{min} = 10-15% Q_{opt}.

Connections and pipelines

The nominal diameters of the system pipelines should be equal to or greater than the nominal diameters of the pump, i.e., DNE (suction side) and DNA (pressure side), and the connecting elements to the pump must conform exactly to the design standard/specification of the mating connector piece installed on the pump. The suction line must be absolutely leak-tight and laid in such a way that no air pockets can form. Avoid tight elbows and do not install valves immediately upstream of the pump. The suction head of the system may not be greater than the suction head guaranteed by the pump.

Motor activation

Do not exceed more than 15 activation of the motor per hour.

All information and descriptions in this Operating Manual concerning the use and operation of the pumps are based exclusively on the standard designs.

Special designs

These rules do not apply to special designs, to customer-specific modifications, or to random external influences which may occur during use and operation.

3.2 Design and Function of the Pump

The Euro-HYGIA® pump line is modular in concept, and the components of each pump can be divided into the **wet end parts**, which come in contact with the medium, and the **design parts**.

Wet end area

All of the wet end parts are designed to be uniquely identifiable, so that, with the help of this Operating Manual, it is possible to determine the location of each component in the assembled unit.

(See Figure 10)

The structure and positioning of the mechanical seal components depend on the requested design, which means that, in conjunction with the order data, it is possible to determine the location of each component. Here again, design measures are taken to make it impossible to assemble the parts incorrectly.

3.3 Wet End Parts

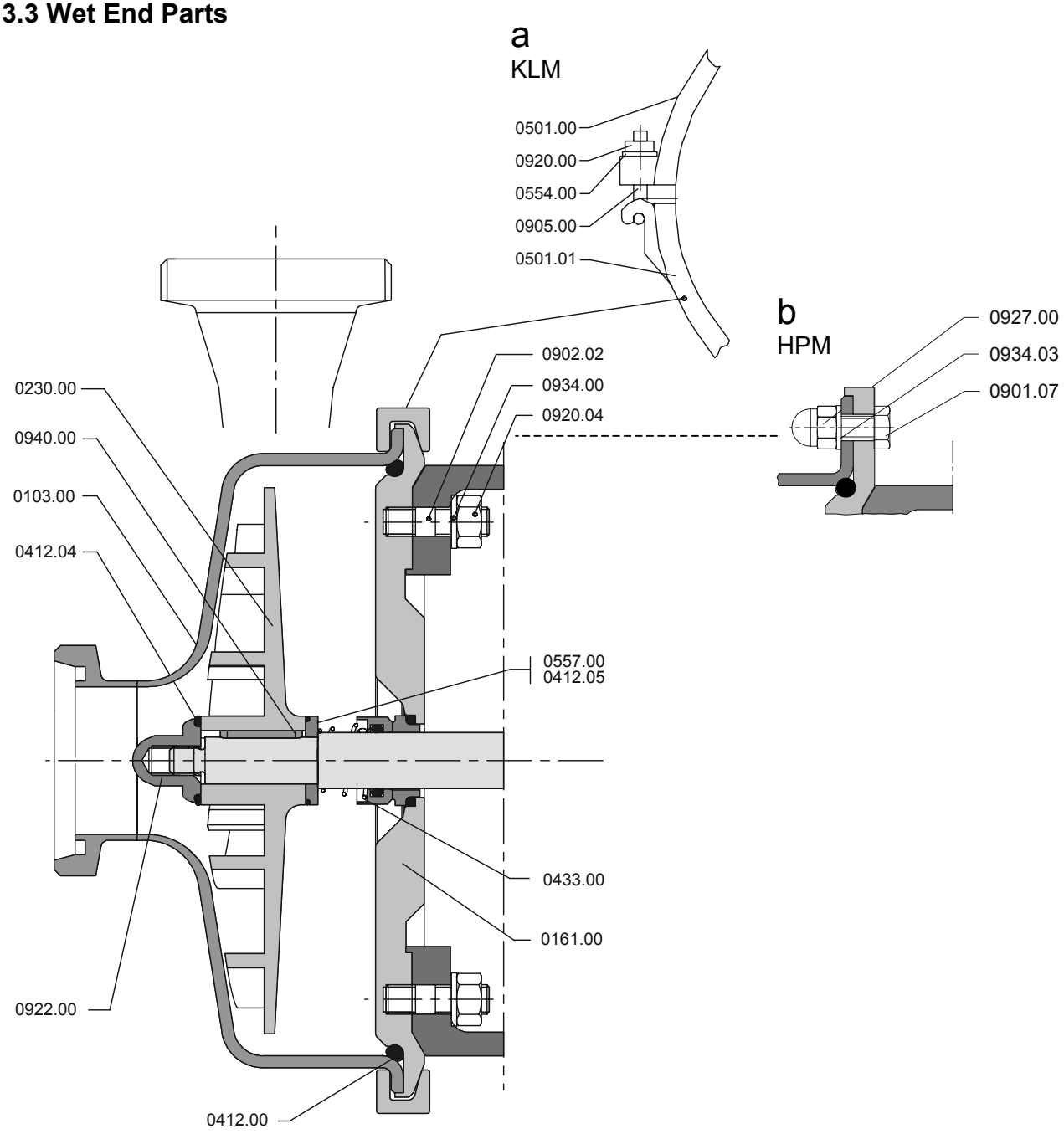
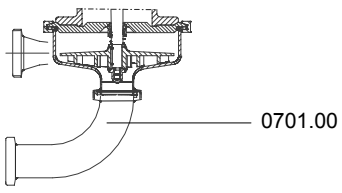


Figure 10: Wet End Parts (Variant KLM and HPM)

The list of the wet end parts depens on the design and on the mechanical seal used (a single rotating mechanical seal or a double mechanical seal).



Parts depending on the Design

Name	Part No.
Pump shaft	0211.00

Table 2: Wet end parts depending on the design

Parts depending on the Mechanical Seal
Single Mechanical Seal 001 Seat
(See also Figure 10)

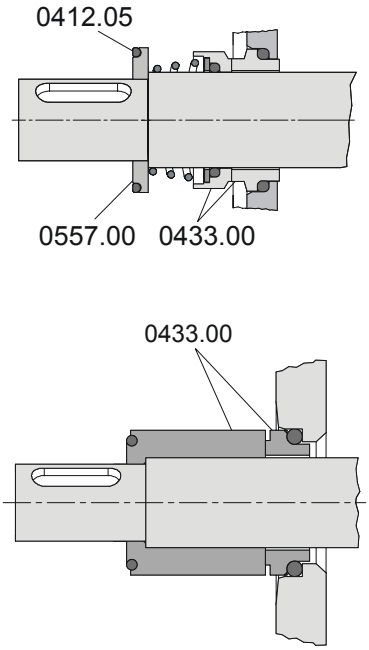


Figure 11: Single mechanical seal

Name	Part No.
O-Ring	0412.05
Mechanical seal, product side	0433.00
Seal spacer	0557.00

Table 3: Wet end parts depending on the mechanical seal: single. 001seat.

Single Mechanical Seal with seal cover
001-Sitz
002-Sitz
003-Sitz
L1K-Sitz

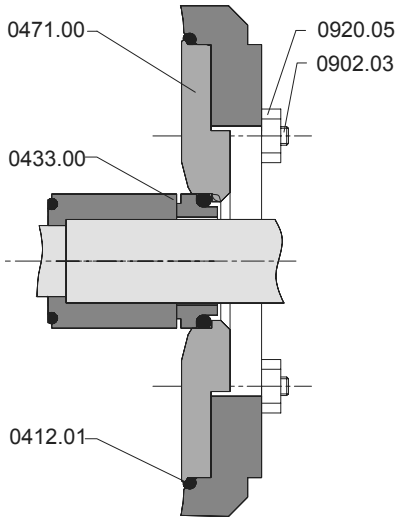


Figure 12:Single mechanical seal with seal cover
(See also Figure 10)

Name	Part No
O-Ring	0412.01
O-Ring	0412.05
Mechanical seal, product side	0433.00
Seal cover	0471.00
Seal spacer (not for 003-sat or HILGE - 3A sterile seal)	0557.00
Hexagon nut	0920.05

Table 4: Wet end parts depending on the mechanical seal, single – seats: 001, 002, 003, L1K

Single Mechanical Seal Seat B3
Carbon / Stainless Steel

Seat B3
SIC / SIC

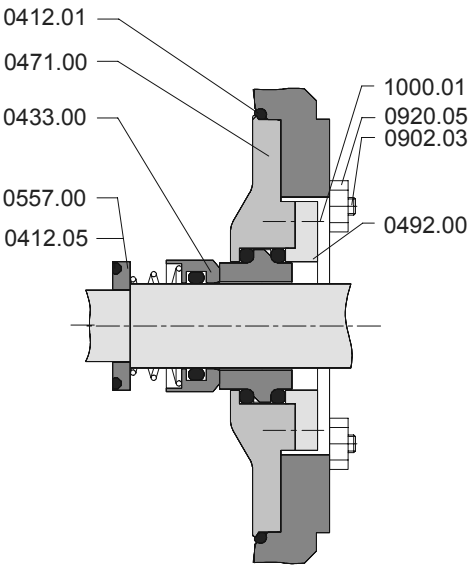


Figure 13: Single mechanical seal, Seat B3.

Name	Part No.
O-Ring	0412.01
O-Ring	0412.05
Mechanical seal, product side	0433.00
Seal cover	0471.00
Locking plate	0492.00
Seal spacer	0557.00
Hexagon nut	0920.05
Counter sunk screw	1000.01

Table 5: Wet end parts, depending on the mechanical seal: single. Seat B3.

Parts depending on the Mechanical Seal
Tandem mechanical seal 001 Seat
002 Seat
003 Seat
L1K Seat

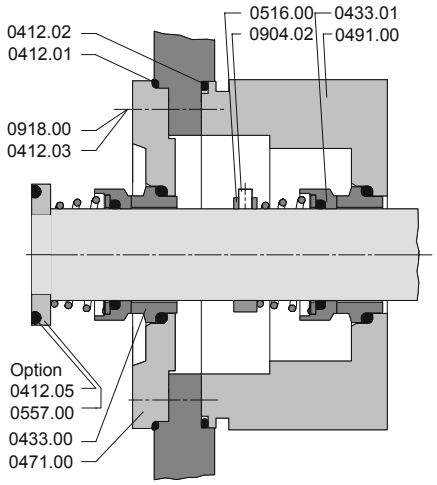


Figure 14: Double mechanical seal, tandem
(see also *Figure 15*).

Name	Part No.
O-Ring	0412.01
O-Ring	0412.02
O-Ring	0412.03
O-Ring	0412.05
Mechanical seal, product side	0433.00
Mechanical seal, atmosphere side	0433.01
Seal cover	0471.00
Seal cartridge	0491.00
Locating ring (not for L1K)	0516.00
Seal spacer (not for the 003 seat or a HILGE - 3A sterile seal)	0557.00
Grub screw	0904.02
Sterile hex head holt	0918.00
Counter sunk screw	1000.03

Table 6: Wet end parts depending on the mechanical seal: tandem. Seats: 001, 002, 003, L1K

Parts depending on the mechanical Seal
mechanical seal, Tandem Seat B3
Carbon / Stainless Steel
SIC / SIC

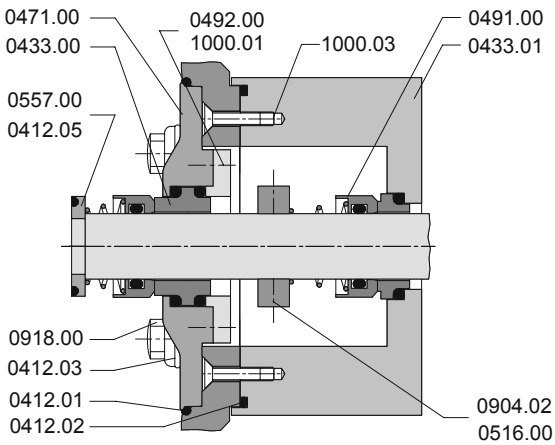
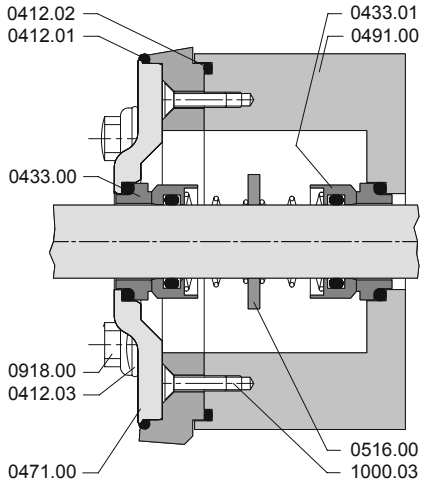


Figure 15: Double mechanical seal, tandem. Seat B3.

Name	Part No.
O-Ring	0412.01
O-Ring	0412.02
O-Ring	0412.03
O-Ring	0412.05
Mechanical Seal, product side	0433.00
Mechanical Seal, atmosphere side	0433.01
Seal cover	0471.00
Seal cartridge	0491.00
Locking plate	0492.00
Locating ring	0516.00
Seal spacer	0557.00
Grub screw	0904.02
Sterile hex head bolt	0918.00
Counter sunk screw	1000.01
Counter sunk screw	1000.03

Table 7: Wet end parts depending on the mechanical seal: tandem. Seat B3.

Parts depending on the Mechanical Seal
Mechanical seal, back to back 001 Seat
002 Seat
L1K Seat

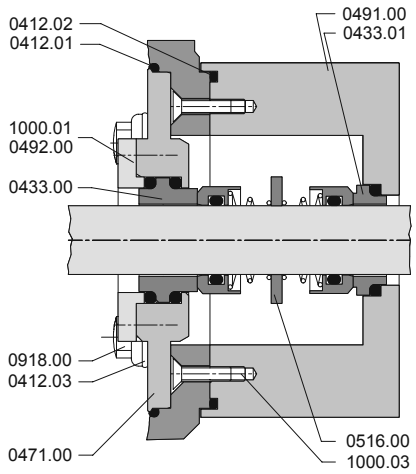


Name	Part No.
O-Ring	0412.01
O-Ring	0412.02
O-Ring	0412.03
O-Ring	0412.05
Mechanical Seal, product side	0433.00
Mechanical Seal, atmosphere side	0433.01
Seal cover	0471.00
Seal cartridge	0491.00
Locating ring (not for L1K)	0516.00
Seal spacer	0557.00
Sterile hex head bolt	0918.00
Counter sunk screw	1000.03

Table 8: Wet end parts depending on the mechanical seal: back to back. Seats: 001, 002, L1K

Figure 16: Double mechanical seal, back to back (see also Figure 10)

RMS, back to back Seat B2



Name	Part No.
O-Ring	0412.01
O-Ring	0412.02
O-Ring	0412.03
O-Ring	0412.05
Mechanical seal, product side	0433.00
Mechanical seal, atmosphere side	0433.01
Seal cover	0471.00
Seal cartridge	0491.00
Locking plate	0492.00
Locating ring	0516.00
Seal spacer	0557.00
Sterile hex head bolt	0918.00
Counter sunk screw	1000.01
Counter sunk screw	1000.03

Table 9: Wet end parts depending on the mechanical seal: back to back. Seat B2.

Figure 17: Double mechanical seal, back to back, seat B2. (See also Figure 10)

3.4 Design Variations

The Euro-HYGIA Adapta® can be delivered in any of the following design variations:

3.4.1 Euro-HYGIA® Adapta®

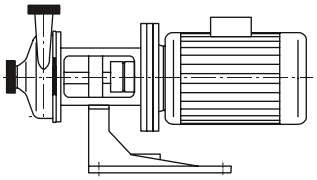


Figure 18: Euro-HYGIA Adapta® on cast iron foot

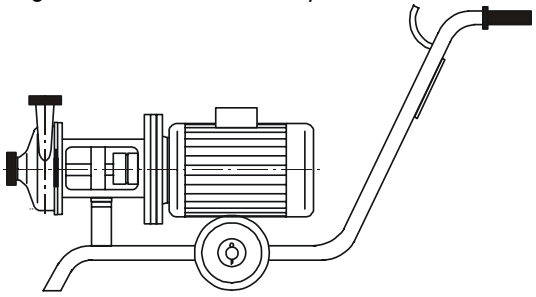


Figure 19: Euro-HYGIA® Adapta® on trolley

Stationary on pump foot for fixed installation.
Using a standard elastic coupling, standard IEC or NEMA motors can be connected directly or by means of an adapter flange to the standard two-bearing pump shaft.
The pump can be left in the system when the motor is removed and reinstalled.

Options:

- On cast iron or stainless steel foot
- On ball feet support
- On VA trolley with standard or conductive wheels
- In-wall installation
- Without motor
- Each variant available with integrated frequency inverter (tronic)

3.4.2 Euro-HYGIA® Adapta®- SUPER

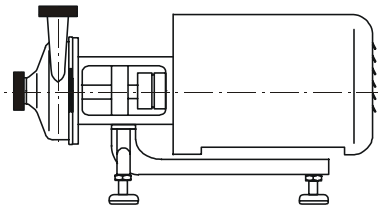


Figure 20: Euro-HYGIA® Adapta®-SUPER on ball feed support

Stationary on stainless steel dome feet.
Using a standard elastic coupling, standard IEC or NEMA motors can be connected directly or by means of an adapter flange to the standard-size pump shaft.
The pump can remain in the system when the motor is removed for repair or replacement.
Motor enclosed in stainless steel.
Options:

- On cast iron or stainless steel foot
- On ball feed support
- On VA trolley with normal or conductive wheels
- Without motor
- Each variants available with integrated frequency inverter (tronic).

3.4.3 Euro-HYGIA® Adapta®-V

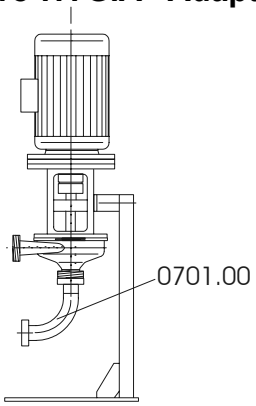


Figure 21: Euro-HYGIA® Adapta® - V

Pump for vertical installation,
stationary on stainless steel stand, space-saving solution
(can be drained completely through suction port).
Options:

- On vertical VA stand with or without elbow (0701.00)
- Without vertical stand, with or without elbow (0701.00)
- Without motor
- Each variants available with integrated frequency inverter (tronic)

4.0 Technical Data

The exact model designation, size, and serial no. of the pump as well as the most important operating data can be found on the rating plate.

Pump designation

The designation of the pump consists of the following elements:

Euro-HYGIA® Size / Number of Stages Model DN_E/DN_A / KW / Number of Poles

Example:
Euro-HYGIA® I Adapta® 40/32 / 3 / 2
or

Pump Serial No.

Each pump can be identified by its unique serial number.

Example:
Pump No.: 022/ 01 / 26100

The performance data of the pump, namely, its head and delivery rate, are determined in accordance with DIN 1944, Part III, Manufacturing Tolerances, and are documented on the acceptance records.

ATTENTION The pumping medium must correspond to the data specified on the order.

ATTENTION The motor may be operated only an electric power system corresponding to the order data.

4.1 Maximum Working Temperatures

Design	Temp. [°C]
Standard Design	95
Special Design	190

Table 10: Maximum duty temperatures

4.2 Maximum Operating Pressures

Design	Pressure [bar].
Flanges according to DIN 2642 or similar	10
Flanges according to DIN 11864-2 or similar	16
Connecting thread according to DIN 11851, 11864-1, or similar	16

Table 11: Maximum operating pressures

Special designs on request.

5.0 Maintenance

5.1 Safety Instructions for Maintenance, Inspection, and Installation Work

The operator must ensure that all maintenance, inspection and installation work is carried out by authorized and qualified technical personnel, who have acquired the requisite knowledge through study of the operating instructions.

When correcting problems with the pump,

- always turn off the voltage,
- release all the pressure, and
- allow to cool.

Avoid maintenance, inspection and installation work in explosive atmospheres.
If this is impossible note the valid directives about explosive protection and use proper non sparking tools .

Take appropriate measures to ensure that the machine cannot be turned on again unintentionally.

Pumps or systems which convey hazardous media must be decontaminated.

As soon as the work is completed, all safety devices and protection measures must be reinstalled or reactivated.
Before starting the unit up again, check the points listed in Section 2.4, Start-up, on page 14.

ATTENTION When there is danger of frost, the pump must be drained completely.

The electrostatic grounding is made by

- the motor
- the mounting (not machine foot)
- the pipe (connection of the pump)

Also the by the elastomer separated coupling is grounded by the bearing housing / motor flange.

5.2 Maintenance of the Pump

The pump is a low-maintenance pump. In addition to cleaning, the only point to be kept in mind is the wear of the rotating mechanical seal. The Adapta® bearings are lubricated for life at the factory to provide approximately 15000 hours of operation. During this time, no additional lubrication is required under normal environmental conditions.

5.2.1 Maintenance of the Motor

For maintenance of the motor see operating manual of engine producer.

5.3 Maintenance of the Adapta® - Bearings

See Figure 41,

The bearing consists of two angular contact ball bearings. They are arranged in pairs and are installed in an O-type configuration as a fixed bearing to absorb axial and radial forces from all directions.

30-50% of the space between the rolling elements is filled with grease at the factory.

This grease is enclosed by the V-rings **0507.02** and **0507.05** and thus serves as permanent lubrication under normal environmental conditions.

Replacement of the V-rings

The contact surfaces of the V-rings **0507.02** / **0507.05** must grease after approx. 1500 operating hours.
If the V-rings are damaged renew rings.

Replacement of the bearings

After about 15000 hours of operation, the bearings should be replaced to ensure satisfactory operation of the pump.

Premature replacement of the bearings

ATTENTION In cases where the pump is exposed for long periods to external conditions which accelerate wear such as exposure to dust, spray water, aggressive ambient air, and high temperatures, we recommend that the bearings be replaced after approximately 5000 hours of operation.

5.4 Roller Bearing Grease

We recommend that the roller bearing greases listed below (Table 13, Roller bearing greases) or verified equivalents be used to lubricate the roller bearings.
(Grease witch is used by the manufacturer in bold type)

Producer	**Bearing Temperature t ≤ 120°C**	**Bearing Temperature t ≤ 60°C Danger of Water Intrusion**
ARAL	HL 3	FM 3
BP	BP ENERGREASE LS 3	BP ENERGREASE PR 3 BP ENERGREASE LS 3
CALTEX	CALTEX MULTIFAK 2	CALTEX CUP GREASE 3 CALTEX MULTIFAK 2
ESSO	BEACON 3	ESTAN 2 R BEACON 3
GULF	GULFCROWN GREASE No. 2 GULFCROWN GREASE No. 3	GULFCROWN GREASE No. 2 GULFCROWN GREASE No. 3
MOBIL - OIL	MOBILUX GREASE No. 3	GARGOYLE GREASE B No.3 MOBILUX GREASE No. 3
SHELL	SHELL ALVANIA FETT 3	SHELL UNEDO FETT 3 SHELL ALVANIA FETT 3
VALVOLINE	VALVOLINE LB 2	VALVOLINE LB 2
OKS	**OKS 4200 (≤ 200°C)**	
SKF	**LGMT 3/1**	**LGMT 3/1**

Table 12: Roller bearing greases

5.5 Troubleshooting

Problem	Cause
Pump does not deliver or delivers at a reduced rate.	1. Incorrect electrical hook-up (2 phases). 2. Wrong rotational direction. 3. Air in the suction line or in the pump. 4. Backpressure too high. 5. Suction head too high, NPSH feed too low.** 6. Lines clogged or foreign material in the impeller. 7. Air inclusions as a result of a defective seal.
Motor safety switch turns motor off. Motor is overloaded.	8. Pump jammed because of clogging. 9. Pump jammed by contact because pump body was twisted by the pipelines. (Check for damage.) 10. Pump continues to run beyond the rated operating point. 11. The density or viscosity of the pumping medium is higher than the value stated in the order.** 12. Motor safety switch not properly adjusted. 13. Motor running on 2 phases.
Pump produces too much noise. Pump runs roughly and vibrates.	14. Suction head too high, NPSH feed too low.** 15. Air in suction line of the pump. 16. Backpressure lower than stated. 17. Impeller out of balance. 18. Internal parts worn. 19. Pump is twisted (causing contact noises). (Check for damage.) 20. Bearings are defective. 21. Bearings have too little, too much, or the wrong kind of lubricant. 22. Motor cooling fan defective. 23. (Gear ring of the coupling (power transmission) defective.) 24. Foreign material in the pump.
Leakage - **at the pump body** - **at the connections** - **at the mechanical seal** (escape of pumping medium through the leakage drain in the case of vertically installed pumps) - **at the stuffing box or gland seal**	25. Pump is twisted (causing leaks at the pump body or at the connections). 26. Housing seals and seals at the connections are defective. 27. Rotating mechanical seal dirty or stuck. 28. Rotating mechanical seal worn. 29. Stuffing box packing worn out. 30. Surface of shaft or shaft safety sleeve worn down. 31. Elastomer unsuitable for the pumping medium.
Unallowable temperature increase at the pump, bearing housing, or motor.	32. Air in the suction line or pump. Suction head too high, NPSH feed to low.** 33. Bearings have too little, too much, or the wrong kind of lubricant. 34. Pump and bearing housing are twisted. 35. Axial thrust too high.** 36. Motor safety switch is defective or not properly adjusted. 37. Pressure valve closed.
 *Before opening the pump, disconnect the cables from the terminals and release all pressure. ** Consult the manufacturer.	

Table 13: Possible problems

Solution*
1. Check the electrical connections and correct them if necessary. 2. Reverse the phases of the power supply (reverse the polarity). 3. Vent the suction line or the pump and refill. 4. Reset the operating point according to the data sheet. Check system for contamination. 5. Raise the liquid level on the suction side. Open the shut-off valve in the suction line all the way. Produce the conditions described in *Section* 2.2.2 Installation in the Pipeline. 6. Open the pump and fix the problem. 7. Check the pipeline seals, the pump housing seals, and the shaft seals. Replace if necessary.
8. Open the pump and fix the problem. 9. Install the pump so that there is no stress on it. Support the pipelines at fixed points. 10. Set the operating point according to the data sheet. 11. If it is acceptable for the performance to be lower than that stated, decrease the delivery rate on the pressure side. Otherwise, use a more powerful motor. 12. Check the setting. Replace the safety switch if necessary. 13. Check the electrical connections. Replace defective fuses.
14. Raise the liquid level on the suction side. Open the shut-off valve in the suction line all the way. Produce the conditions described in *Section* 2.2.2 Installation in the Pipeline. 15. Vent the suction line or pump and refill. 16. Set the operating point according to the data sheet. 17. Clean, inspect, and rebalance the impeller. 18. Replace parts. 19. Install the pump so that there is no stress on it. Support the pipelines at fixed points. 20. Replace the bearings. 21. Add more lubricant, decrease the amount, or replace the lubricant. 22. Replace the motor cooling fan. 23. (Replace the gear ring of the coupling. Realign the coupling (see Section 5)). 24. Open the pump and clean it (install a screen in front of self-priming pumps, if necessary).
25. Install the pump so that there is no stress on it. Support the pipelines at fixed points. 26. Replace the housing seals or the seals of the connections. 27. Inspect and clean the rotating mechanical seal. 28. Replace the rotating mechanical seal. 29. Tighten the stuffing box packing, add more packing, or replace the packing. 30. Replace the shaft or the shaft safety sleeve. Repack the stuffing box. 31. Use an elastomer suitable for the pumping medium and the temperature.
32. Vent the suction line or the pump and refill. Raise the liquid level on the suction side. Open the shut-off valve in the suction line all the way. Produce the conditions described in *Section* 2.2.2 Installation in the Pipeline. 33. Add more lubricant, decrease the amount, or replace it. 34. Install the pump so that there is no stress on it. Support the pipelines at fixed points. Check the alignment of the coupling. 35. Inspect the relief holes in the impeller and the split rings at the inlet. 36. Check the adjustment. Replace the motor safety switch if necessary. 37. Open the pressure valve.

Table 14: Solutions to the problems.

6.0 Disassembly

**Note Section 5.1 Safety Instructions for Maintenance,
Inspection, and Installation Work, p. 27.**

ATTENTION

In accordance with the design standard(**3A0**.01 to **3A3**.37), all tools, possible support surfaces, and other auxiliary materials must ensure that all parts of the pump can be disassembled without damage (e.g., scratches). A special socket wrench with plastic insert for impeller nut **0922.00** can be ordered from Hilge.

6.1 Disassembly of the Wet End Parts

Removal of the impellers

ATTENTION

To unscrew impeller nut **0922.00,** use either a screw driver or the impeller nut installing device (Hilge Art. No. V.101.0922.0001.12), because the **torque applied for removal must be absolutely concentric.** Otherwise there is the danger that the pump shaft will be bent.

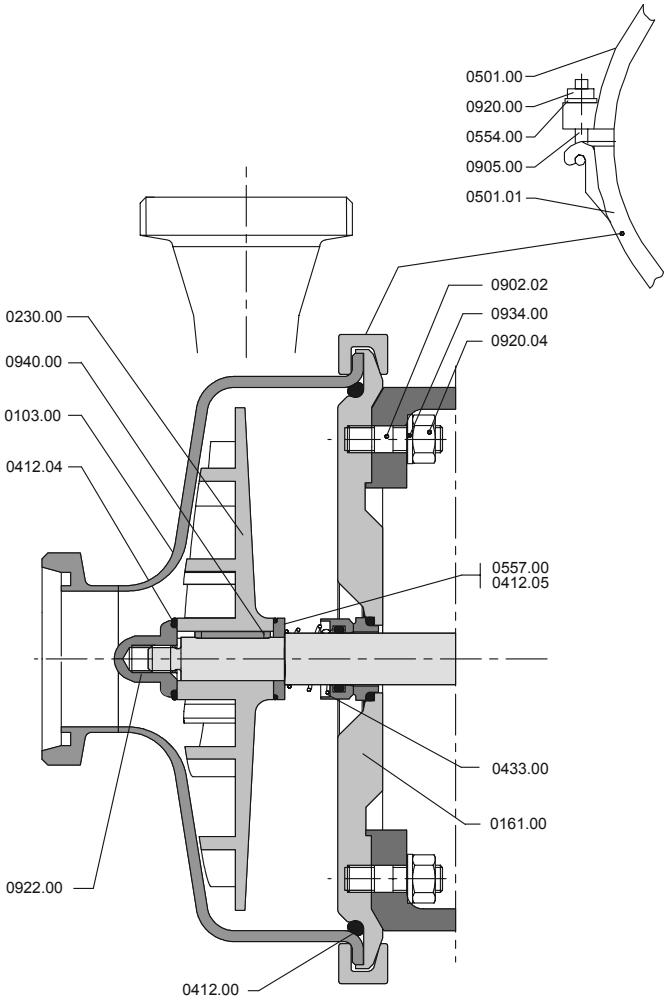


Figure 22: Assembly of the wet end parts

1. After the pump has been removed from the pipeline, unscrew nut **0920.00** and remove them together with the washer **0554.00** and the tie bold **0905.00**
2. Remove upper and lower clamp ring **0501.00, 0501.01** and remove the annular casing **0103.00** with O-Ring **0412.00** (see instruction below).
3. Unscrew the impeller nut **0922.00** (see instructions above).
4. Remove the Impeller **0230.00** together with the O-Ring **0412.04**.
5. Remove key **0940.00**.
6. Pull the seal spacer **0557.00** together with the O-Ring **0412.05** off the shaft.

The backplate **0161.00** is fixed with the Studs **0902.00**, the spring washers **0934.00** and the hexagon nuts at the particular design parts.

The clamp ring **0501.00 / 0501.01** is fixed in this way that the chamfered face touches the chamfer of the backplate **0161.00**.

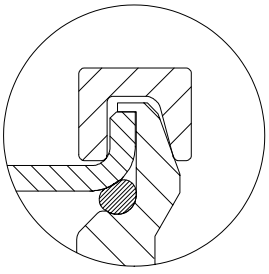


Figure 23: Detail Klemmring

The remainig sealing units, especially those behind the installed mechaical seal, should be removed according to the instructions on the order.
See also
6.2 Disassembly of the Pump with Single-Acting Spiral-Spring
to
6.5 Disassembly of the Pump with Double Mechanical Seal, Tandem

6.2 Disassembly of the Pump with Single-Acting Spiral-Spring Mechanical Seal

(See also Figure 10

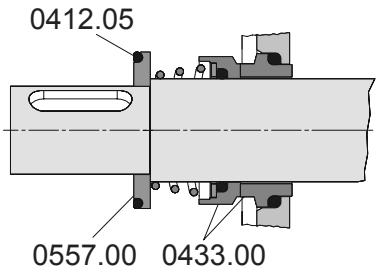


Figure 24: Spiral-spring mechanical seal

1. Pull the seal spacer **0557.00** together with the O-ring **0412.05** off the shaft.
2. Remove the spiral spring mechanical seal **0433.00** unit while turning it slightly in the direction opposite the turns of the spring.
3. Pull the discharge casing **0107.00** resp. backplate **0161.00** (**Figure 22**) together with the stationary ring of the mechanical seal out of the fitted seat.
4. Now push the stationary ring out of the seat from the discharge casing.
5. In some mechanical seal variants, the stationary ring is prevented from rotating in the discharge casing **0107.00** resp. backplate **0161.00** by a pin. In this case, do not change the position of the pin.

6.3 Disassembly of the Pump with Single-Acting Sterile Mechanical Seal

(See also Figure 10)

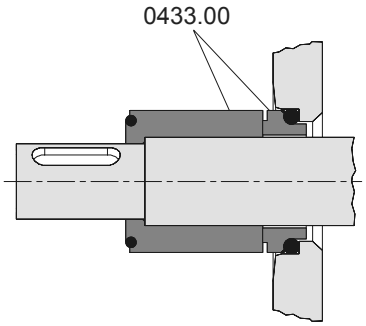


Figure 25: Sterile mechanical seal

1. By design, mechanical seal **0433.00** is seated directly against a shoulder on the shaft.
2. To remove the rotating mechanical seal unit, carefully pull it off the shaft under continuous pressure.
3. Pull the discharge casing **0107.00** resp. backplate **0161.00** (**Figure 22**) together with the stationary ring of the mechanical seal out of the fitted seat.
4. Now push the stationary ring out of the seat from the rear.
5. In some mechanical seal variants, the stationary ring is prevented from turning in the discharge casing **0107.00** resp. backplate **0161.00** by a pin. In this case, do not change the position of the pin.

6.4 Disassembly of the Pump with Double mechanical seal, back to back

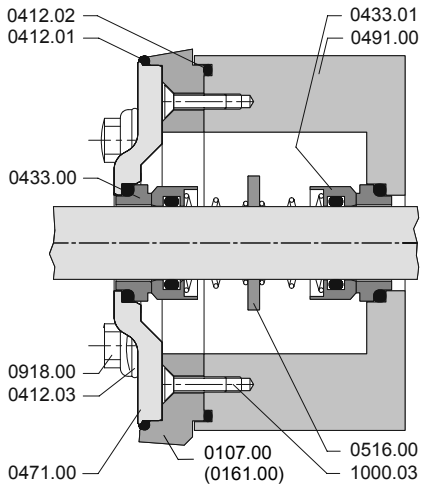


Figure 26: Double mechanical seal, back to back, 001seat

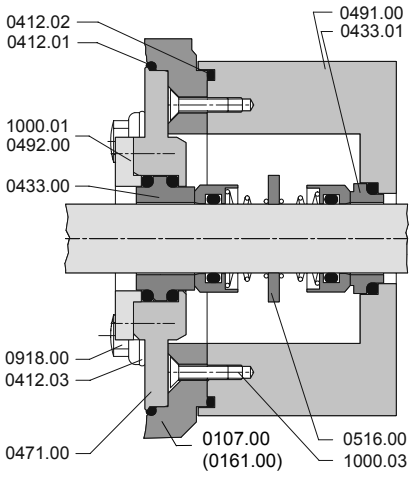


Figure 27: Double mechanical seal, back to back, seat B2.

1. The mechanical seal **0433.00** on the product side is paired with the mechanical seal **0433.01** on the atmosphere side and installed behind a seal cover **0471.00** in a seal cartridge **0491.00**.
2. Unscrew the four hexagon head sterile screw **0918.00** and remove them together with the O-rings **0412.03**.
3. Jointly remove the seal cover **0471.00**, the O-ring **0412.01** and the stationary ring.

Figure 27:
In the case of back-to-back mechanical seal designs in seat B2, the forward stationary ring of the mechanical seal **0433.00** is also attached by a stationary ring seal cover **0492.00** and counter sunk screw **1000.01**.

4. Pull the rotating units of mechanical seal **0433.00** and mechanical seal **0433.01** together with the locating ring **0516.00** from the shaft while turning slightly in the direction opposite the turns of the spring.

5. Pull the discharge casing **0107.00** (resp. backplate **0161.00**) and the still-assembled seal cartridge **0491.00** out of the fitted seat together with the stationary ring of mechanical seal **0433.01**.
6. Push the stationary ring out of the seat from the rear.
7. Separate the seal cartridge **0491.00** with its O-ring **0412.02** by unscrewing the two counter sunk screws **1000.03**.

6.5 Disassembly of the Pump with Double Mechanical Seal, Tandem

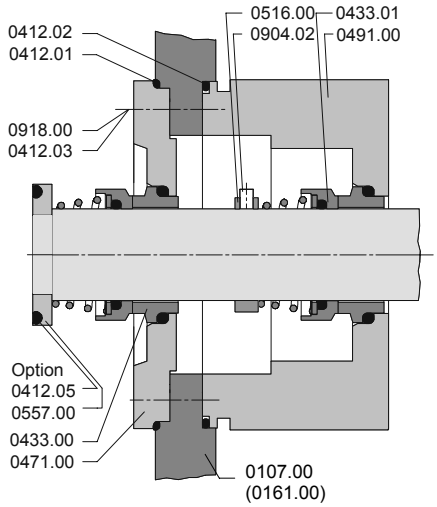


Figure 28: Double mechanical seal, tandem, seat B3

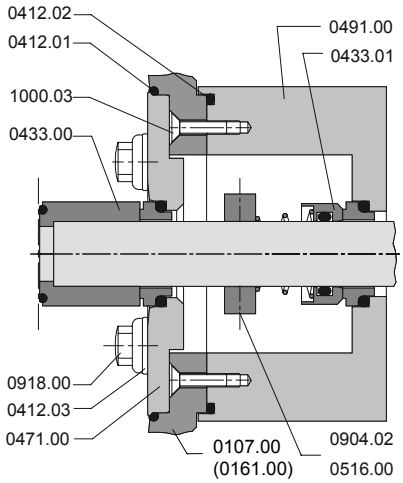


Figure 29: Double mechanical seal, tandem, with sterile mechanical seal.

The product-side mechanical seal **0433.00** installed in the discharge casing **0107.00** resp. back plate **0161.00** and its stationary ring supported in the seal cover **0471.00** are installed in tandem with mechanical seal **0433.01** on the atmosphere side in a seal cartridge **0491.00**.
There are two variants of the product-side mechanical seal **0433.00**:

Seat B3 *(Figure 28*):
Pull the seal spacer **0557.00** together with the O-ring **0412.05** off the shaft. The rotating spiral spring-mechanical seal **0433.00** unit can now be removed while turning slightly in the direction opposite the turns of the spring.

Tandem seat *(Figure 29)*
By design, the mechanical seal **0433.00** is seated directly against a shoulder on the shaft. For disassembly, the rotating mechanical seal unit can be pulled carefully off the shaft under continuous pressure.

In both variants, the stationary rings are seated in a seal cover **0471.00**.

1. To remove this cover **0471.00**, unscrew the four hex head sterile bolts **0918.00** and remove along with the O-rings **0412.03**.
2. Jointly remove the seal cover **0471.00**, the O-ring **0412.01** and the stationary ring.

Seat B3 (Figure 28):
For mechanical seal tandem designs in seat B3, the forward stationary ring of the mechanical seal **0433.00** is also attached by means of a locking plate **0492.00** and counter sunk screw **1000.01**.

<u>*You must measure the mechanical seal locating distance.*</u>

3. Use a suitable measuring device to determine the position of the locating ring **0516.00**. This will allow you to reinstall the mechanical seal in its proper location.
4. Unscrew the grub screw **0904.02** in the locating ring **0516.00** and off the shaft together with the rotating mechanical seal **0433.01** unit while turning slightly.
5. Pull the discharge casing **0107.00** (resp. backplate **0161.00**) and the still-assembled seal cartridge **0491.00** together with the stationary ring of the mechanical seal **0433.01** out of the fitted seat.
6. Now press the stationary ring out of the seat from the rear.
7. Separate the seal cartridge **0491.00** and the O-ring **0412.02** by unscrewing the two counter sunk screws **1000.03**.

6.6 Disassembly of the Adapta® - Bearing Housing

(See also Figure 41)

1. In the case of the SUPER design, first remove the shroud **0680.00** by unscrewing the hexagon nuts **0920.23** and removing the washers **0554.08**.
   In the case of the SUPER tronic design, also remove the screws **1000.04** and the washers **0554.09** *(see Figure 41 / Figure 42*
2. First remove the guard **0686.00** by unscrewing the screws **1000.02**.
3. Separate the bearing housing **0330.00** from the motor **0801.00** or lantern **0346.00** at the separation plane by removing the hexagon nut **0920.09** and the spring washer **0934.06**.
4. Remove the deflector **0507.00**, the V-ring **0507.02** on the pump side, the coupling half **0840.00** (after unscrewing the grub screw **0904.00**), the key **0940.01**, and the V-ring **0507.05** on the motor side.
5. Remove the four hexagon bolts **0901.04** on the motor side and the spring washers **0934.05.** Then pull the bearing cover **0360.01** out of the seat.
6. From the pump side, drive the shaft **0211.00** through the bearing housing **0330.00**.
7. After unscrewing the grooved nut **0926.00,** use a puller to pull the O-mounted angular contact ball bearings **0326.00** off the shaft **0211.00**.

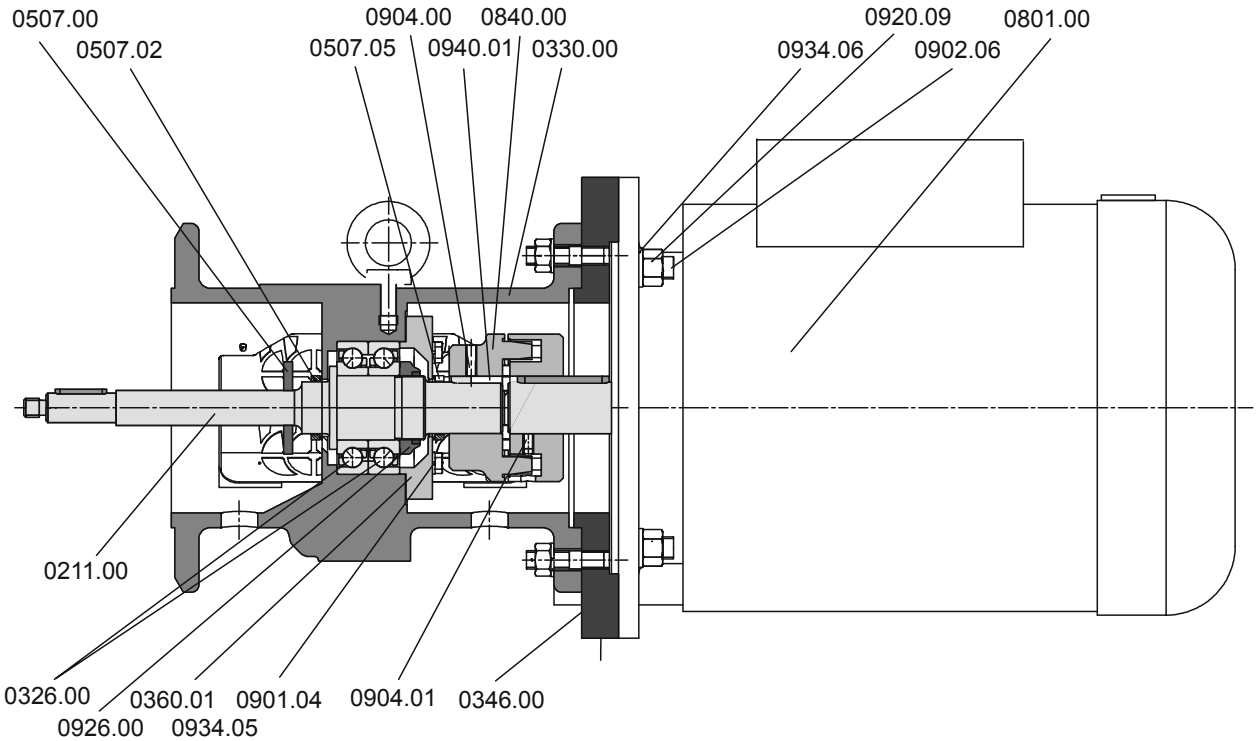


Figure 30: Disassembly of the Adapta®

7.0 Assembly

Please note Section
5.1 Safety Instructions for Maintenance, Inspection, and Installation Work, p .27.

The order in which the pump is assembled is the reverse of that used to disassemble it. Always assemble the design parts first.

Replace defect parts with original spare parts with the HILGE label basically!

ATTENTION In accordance with the design standard(**3A0**.01 to **3A3**.37), all tools, possible support surfaces, and other auxiliary materials must ensure that all parts of the pump can be assembled without damage (e.g., scratches). A special socket wrench with plastic insert for impeller nut **0922.00** can be ordered from Hilge.

ATTENTION Replace the self locking slotted round nut 0926.00 because the saving is not existing after disassembling.

Impeller assembly

ATTENTION To tighten impeller nut **0922.00,** use either

- a screw device or
- the impeller nut installing device (Hilge Art. No. V.101.0922.0001.12),

because the **torque applied to tighten must be absolutely concentric.**
Otherwise there is the danger that the pump shaft will be bent.

ATTENTION As the impeller nut is being fitted, it must be possible to feel the self-locking action. It must be possible to tighten the nut without any problems.
Tighten manually for the first two turns, so that the helicon insert sits correctly on the shaft.

For a better disassembling grease the impeller seat with an FDA-concurring lubricant.

Before assembly, check the condition of the elastomers (0-rings) and renew them if necessary. Defective seals cause the liquid to leak out.

ATTENTION Never use grease which contains mineral oil when assembling the wet end parts.

ATTENTION Before assembly, use clean water to wet the sealing elements made of elastomeric material and use alcohol to clean thoroughly all seating surfaces for the seals. Replace any defective parts.
In the case of rotary mechanical seals, always replace the complete assembly.
It is recommended that assembly sleeves be used for installing spring mechanical seals.

Assembly tool kit

A tool kit with tools for removing and installing the rotating mechanical seals safely and reliably can be ordered under Art. No. M.099.0000.0017.00.

The O-ring seal **0412.04** of the impeller nut **0922.00** must be wetted with water during assembly so that it is not squeezed out of the groove when the nut is tightened.

ATTENTION To guarantee a good seal, use only O-ring seals with the original dimensions.

7.1 Tightening Torques

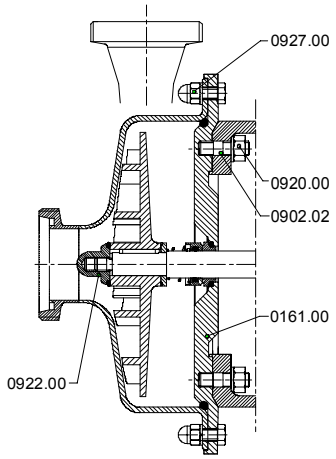


Figure 31: Tightening torques

To ensure the reliable operation of the pump, the following screws must be tightened with the torques indicated:

Designation	Torque [Nm]
0922.00 Impeller Nut	20
0927.00 Domed Nut	17
0920.00 Hexagon Nut	20

Table 15. Tightening torques.

ATTENTION The studs **0902.02** must be stick into the holes.
For this purpose the studs must be provided with an appropriate adhesive and must hand-screwed in the backplate **0161.00**.

7.2 Greasing the Screws

ATTENTION So that the screwed joints will hold properly over the long term, they must be greased during assembly.

ATTENTION If the screws are not greased during assembly, the parts will be destroyed.

The design standard (e.g., Sterile Standard 3A3) must be followed when parts which are in contact with the medium are lubricated. Under certain conditions, all parts in contact with the medium must be greased with an FDA-approved lubricant.

7.3 Assembling the Adapta® bearing housing

In the opposite sequence to section 6.6 Disassembly of the Adapta® - Bearing Housing, S. 35.

When replacing the bearings, always renew grooved nut **0926.00**.

Grease the V-rings **0507.02** and **0507.05** during assembly and ensure that they are seated correctly Push the V-rings up, so that only the seal lip is on the bearing housing **0330.00** or on the bearing cover **0360.01**.

Tightening torques on the bearing housing

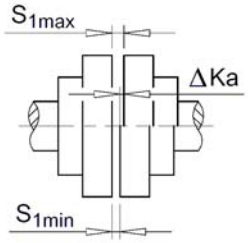


Figure 32: coupling offset

In order to ensure that the pump operates safely, the following must be tightened to the specified torques:

Term	Torque [Nm]
0926.00 grooved nut	200
0904.00 grub screw	4

Table 16: Torques for design parts

The permitted axial offset ΔKa of the coupling parts to each other is within the permitted deviation for the gauge S_1 . **S_1 = 2...4 mm**

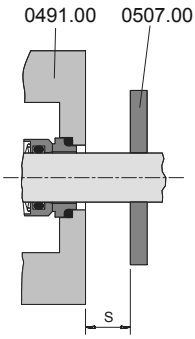


Figure 33: Position of deflector

Mount the deflector **0507.00** in this way that the minimum distance **s** to the abutted parts eliminates a contact.
If the deflector abrades it could cause an ignition source because of a temperature rise.

Stick the grub screws **0904.00** and **0904.01** in place with a solvent-resistant glue, to secure the coupling halves.

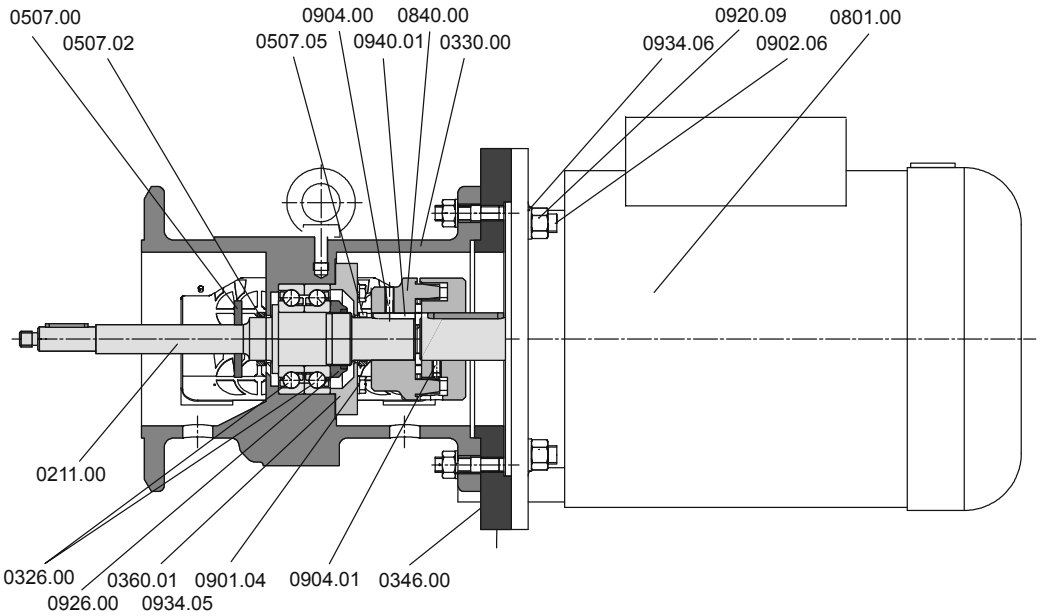


Figure 34: Assembly Adapta®-bearing housing

7.4 Assembly of the Pump with Single-Acting Spiral-Spring Mechanical Seal

(See also Figure 10)

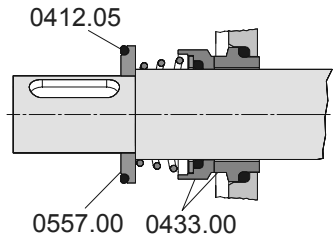


Figure 35: Spiral-spring mechanical seal

1. Push the stationary ring of the mechanical seal **0433.00** with its O-ring into the stationary ring receptacle in the discharge casing **0107.00** resp. backplate **0161.00**. Use a plastic assembly aid for this purpose. In designs with anti-rotation lock, the pin and the groove must line up.
2. Push the assembly aid (brass bushing) onto the shoulder of the shaft.
3. Push the rotating parts of the mechanical seal in the assembled state onto the shaft up as far as the stop (use the plastic assembly aid).
4. Lay O-ring **0412.05** in the seal spacer **0557.00** and push it over the shaft. Make sure that the spring end of the mechanical seal does not seat itself between the shoulder on the shaft and the seal spacer when the impellers are installed. After the impellers have been installed, relax the spring against the seal spacer **0557.00**.

7.5 Assembly of the Pump with a Single-Acting Sterile Mechanical Seal

(See also Figure 10)

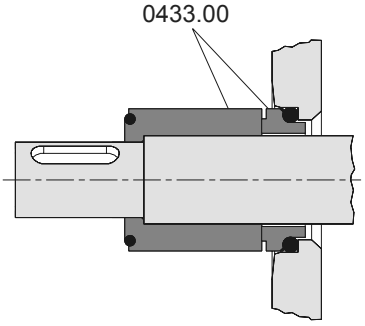
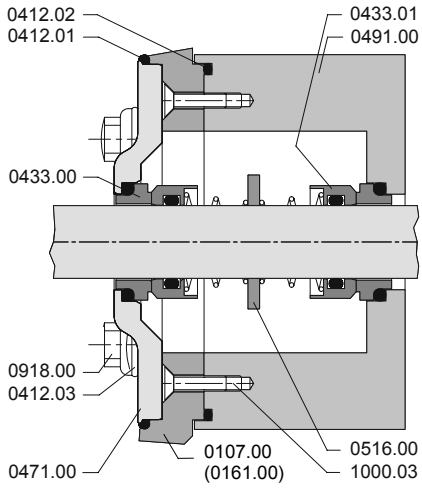


Figure 36: Sterile mechanical seal

1. Push the stationary ring of the mechanical seal **0433.00** along with the O-ring into the stationary ring receptacle in the discharge casing **0107.00** resp. backplate **0161.00**. Use a plastic assembly aid for this purpose. In designs with anti-rotation lock, the groove in the stationary ring and the anti-rotation device must line up.
2. With a slight turning motion, push the rotating parts of the mechanical seal in the assembled state onto the shaft up as far as the stop.

7.6 Assembly of the Pump with Double Mechanical Seal, back to back



1. Install the seal cartridge **0491.00** together with the O-ring **0412.02** and the counter sunk screws **1000.03** on the discharge casing **0107.00** resp. backplate **0161.00**.
2. Using a plastic assembly aid, push the stationary ring of the atmosphere-side mechanical seal **0433.01** together with the O-ring into the stationary ring receptacle of the seal cartridge **0491.00**.
3. Push the assembly aid (brass bushing) onto the shoulder of the shaft.
4. Push the rotating parts of the mechanical seal **0433.01** in the assembled state onto the shaft (using a plastic assembly aid).
5. Push on the locating ring **0516.00**.
6. Again using the plastic assembly aid, mount the product-side mechanical seal **0433.00** with a slight turning motion.

Figure 37: Double mechanical seal, back to back, 001 seat

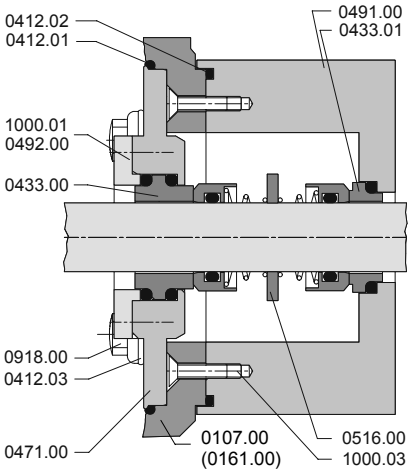


Figure 38: Double mechanical seal, back to back, seat B2.

7. Jointly attach the seal cover **0471.00**, the O-ring **0412.01**, and the stationary ring of the product-side mechanical seal **0433.00** to the discharge casing **0107.00** with the hex head sterile screws **0918.00** and the O-rings **0412.03**.

   Figure 38:
   In the case of back-to-back mechanical seal designs in seat B2, the forward stationary ring of the mechanical seal **0433.00** is also attached by a locking plate **0492.00** and counter sunk screws **1000.01**.

7.7 Assembly of the Pump with Double Mechanical Seal, Tandem

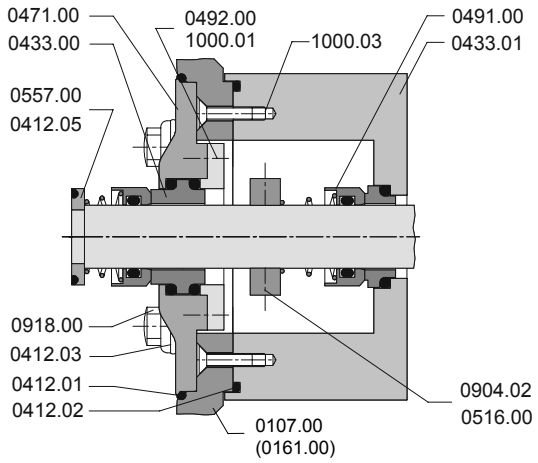


Figure 39: Double mechanical seal, tandem, seat B3

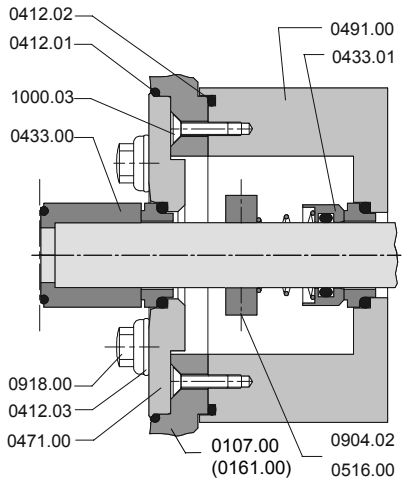


Figure 40: Double mechanical seal, tandem, with sterile mechanical seal.

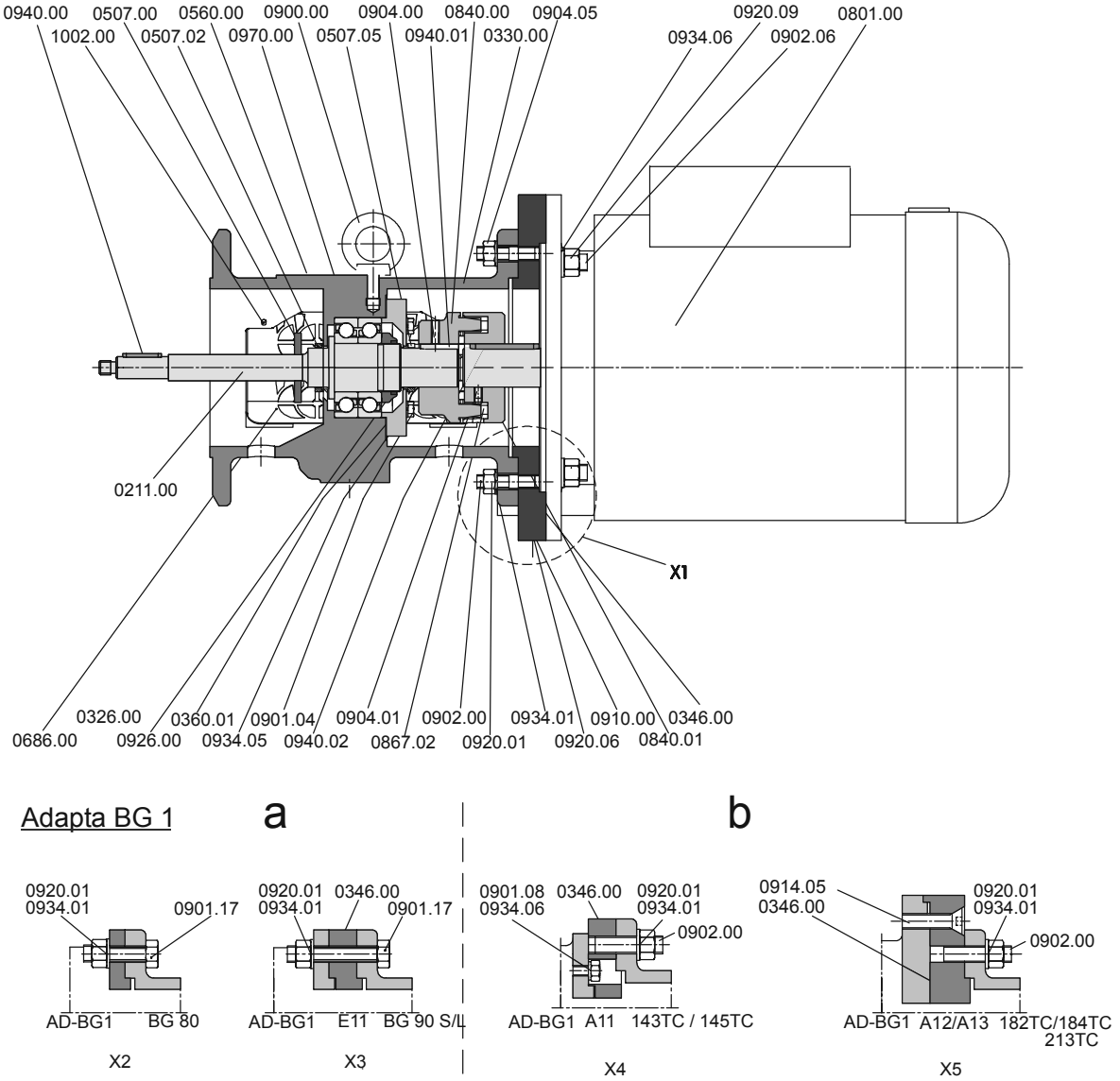
1. Mount the seal cartridge **0491.00** together with the O-ring **0412.02** and the counter sunk screws **1000.03** on the discharge casing **0107.00** (resp. backplate **0161.00**).
2. Push the stationary ring of the atmosphere-side mechanical seal **0433.01** with its O-ring into the stationary ring receptacle in the seal cartridge **0491.00** (using a plastic assembly aid).
3. Push the assembly aid (brass bushing) onto the shoulder of the shaft.
4. Push the rotating parts of the mechanical seal **0433.01** in the assembled state onto the shaft (using the plastic assembly aid).
5. Place the locating ring **0516.00** in position and attach in the predetermined location with the grub screw **0904.02**. Use a medium-tight screw-locking device.
6. Jointly attach the seal cover **0471.00** and the O-ring **0412.01** to the discharge casing **0107.00** (resp. backplate **0161.00**) with the hex head sterile screws **0918.00** and the O-ring **0412.03**.

Seat B3 (Figure 39):
in the case of mechanical seal tandem designs in seat B3, the forward backing ring of the mechanical seal **0433.00** is also attached to the sealing cover by a locking plate **0492.00** and counter sunk screws **1000.01**.

7. Push the stationary ring of the product-side mechanical seal **0433.00** into its seat in the seal cover **0471.00** (using the plastic assembly aid).
8. Push the assembly aid (brass bushing) onto the shoulder of the shaft (not for sterile mechanical seals).
9. Push the rotating parts of the product-side mechanical seal **0433.00** in the assembled state onto the shaft (using the plastic assembly aid).
10. Lay the O-ring **0412.05** in the seal spacer **0557.00** and push it over the shaft. Make sure that the spring end of the mechanical seal does not seat itself between the shoulder of the shaft and the sealing disc when the impellers are installed.
11. After the impellers have been installed, relax the spring of the mechanical seal against the seal spacer **0557.00**.

8.0 Spare Parts

8.1 Euro-HYGIA® Adapta® (SUPER)



a – IEC motors
b – NEMA motors

Figure 41: Design parts of the Euro-HYGIA® Adapta®

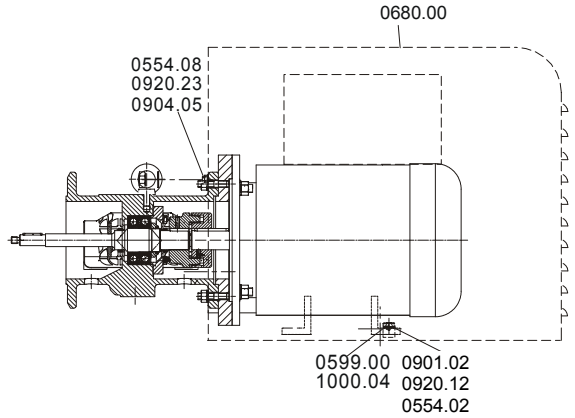


Figure 42: Tronic motor shroud.

Design Parts of the Euro-HYGIA® Adapta® (SUPER)				
Quantity	**Part No.**	**Designation**	**Size/Standard**	**Article No.**
1	0211.00	Pump Shaft		E.022.0211.0001.05
2	0326.00	Angular Contact Ball Bearing		N.097.0326.0002.00
1	0330.00	Bearing Housing		E.099.0330.0001.08
1	0346.00	Intermediate Lantern		E.022.0346.xxxx.10
1	0360.01	Bearing Cover		E.022.0360.0001.08
1	0507.00	Flinger		E.099.0507.0002.06
1	0507.02	V-Ring		N.097.0507.0009.06
1	0507.05	V-Ring		N.097.0507.0009.06
2	0554.02	Washer		N.004.0554.0001.03
4	0554.08	Washer		N.004.0554.0003.01
4	0560.00	Half Round Rivet		N.004.0560.0003.01
1	0599.00	Bracket		E.023.0599.xxxx.01
1	0680.00	Motor Shroud		B.099.0680.xxxx.01
2	0686.00	Guard		E.099.0686.0001.01
1	0801.00	Flanged Motor		E.xxx.xxxx.xxxx.xx
1	0840.00	Coupling Half		x.xxx.0840.xxxx.09
1	0840.01	Coupling Half		x.xxx.0840.xxxx.09
6	0867.02	Coupling Bush		N.097.0867.xxxx.xx
1	0900.00	Ring Screw		N.004.0900.0001.09
2	0901.02	Hex. Head Bold		N.004.0901.xxxx.01
4	0901.04	Hex. Head Bold		N.004.0901.0004.03
4	0901.08	Hex. Head Bold	NEMA 143/145TC	N.004.0901.0089.03
4	0901.17	Hex. Head Bold	IEC 80	N.004.0901.xxxx.03
4	0902.00	Stud		N.004.0902.0004.03
2	0902.04	Stud		N.004.0902.xxxx.01
4	0902.06	Stud		N.004.0902.0005.03
1	0904.00	Grub Screw		N.004.0904.0002.02
1	0904.01	Grub Screw		N.004.0904.0002.03
2	0904.05	Grub Screw		N.004.0904.0043.01
1	0910.00	Bolt		N.004.0910.xxxx.01
4	0914.05	Socket Head Cap Screw		N.004.0914.xxxx.03
4	0920.01	Hex. Head Nut		N.004.0920.0001.03
2	0920.02	Hex. Head Nut		N.004.0920.0001.01
2	0920.06	Hex. Head Nut		N.004.0920.xxxx.01
4	0920.09	Hex. Head Nut		N.004.0920.xxxx.03

2	0920.12	Hex. Head Nut		N.004.0920.xxxx.03
4	0920.23	Hex. Head Nut		N.004.0920.0010.01
1	0926.00	Shaft Nut		N.097.0926.0002.03
4	0934.01	Spring Washer		N.004.0934.0001.04
4	0934.05	Spring Washer		N.004.0934.0003.04
4	0934.06	Spring Washer		N.004.0934.xxxx.04
1	0940.00	Key I		N.004.0940.xxxx.02
1	0940.01	Key		N.004..0940.xxxx.02
1	0940.02	Key		N.004.0940.xxxx.02
1	0970.00	Rating Plate		Z.099.0970.xxxx.01
1	0970.01	Plate		E.099.0970.0002.19
2	1000.04	Cross Head Screw		N.004.1000.0005.01
4	1002.00	Recessed Head Screw		N.004.1002.0001.01
Article variations acc. to order are marked x.xxx.xxxx.xxxx.xx				

8.2 Summary of Spare Parts for the Mounting Variations

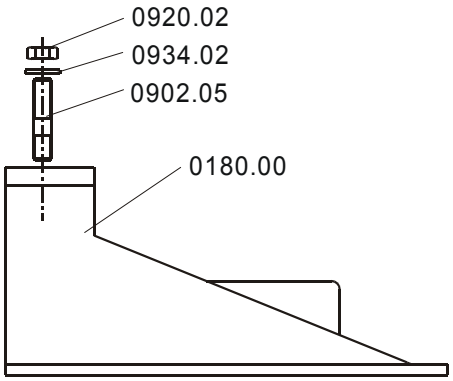


Figure 43: Cast iron foot

GG – Foot				
Quantity	**Part No.**	**Designation**	**Size/Standard**	**Article No.**
1	0180.00	Foot	GG	E.023.0180.0001.08
2	0902.05	Stud		N.004.0902.0001.01
2	0920.02	Hexagon Nut		N.004.0920.0001.01
2	0934.02	Spring Washer		N.004.0934.0001.01
Article variations acc. to order are marked x.xxx.xxxx.xxxx.xx				

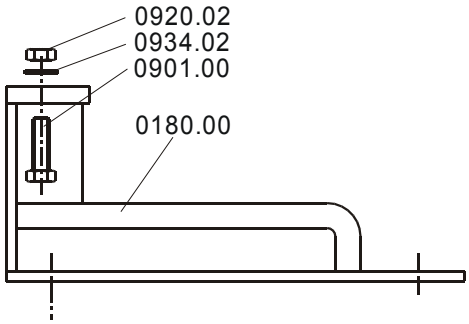


Figure 44: VA foot

VA - Foot				
Quantity	**Part No.**	**Designation**	**Size/Standard**	**Article No.**
1	0180.00	Foot	VA	B.023.0180.0002.01
2	0901.00	Hexagon Head Screw		N.004.0901.0006.01
2	0920.02	Hexagon nut		N.004.0920.0001.01
2	0934.02	Spring Washer		N.004.0934.0001.01
Article variations acc. to order are marked x.xxx.xxxx.xxxx.xx				

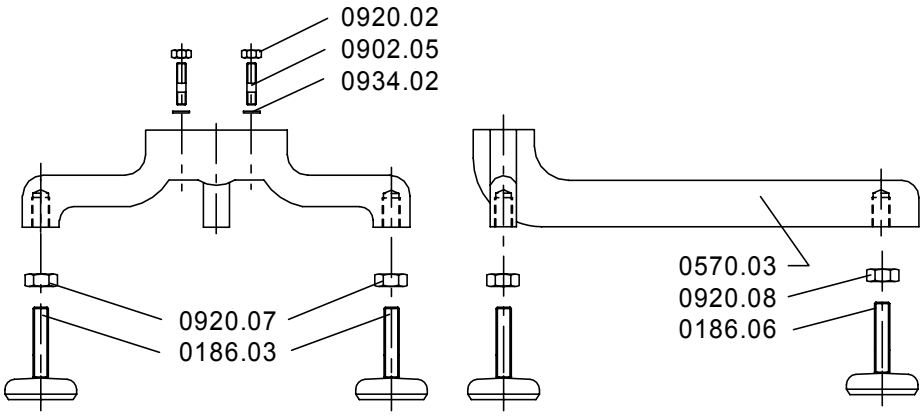


Figure 45: Stand BG 1

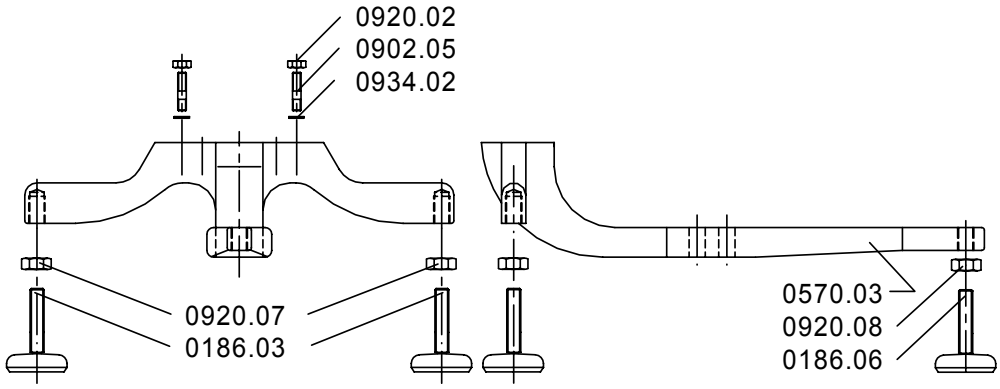


Figure 46: Stand BG 2.

Ball Foot				
Quantity	**Part No.**	**Designation**	**Size/Standard**	**Article No.**
2	0186.03	Machine foot		N.097.0186.0001.01
1	0186.06	Machine foot		N.097.0186.0001.01
1	0570.03	Bracked		E.099.0570.xxxx.13
2	0902.05	Stud		N.004.0902.0001.01
2	0920.02	Hexagon Head Screw		N.004.0920.0001.01
2	0920.07	Hexagon Head Screw		N.004.0920.0008.01
1	0920.08	Hexagon Head Screw		N.004.0920.0008.01
2	0934.02	Spring Washer		N.004.0934.0001.01
Article variations acc. to order are marked x.xxx.xxxx.xxxx.xx				

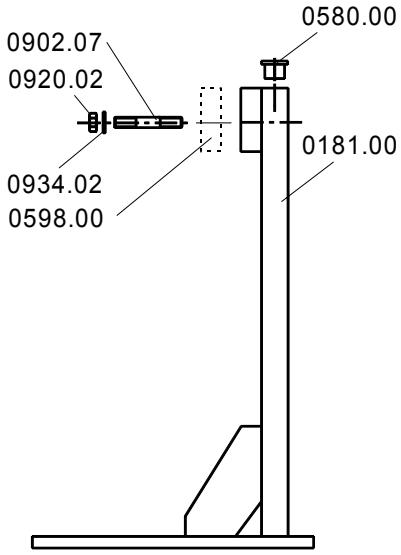


Figure 47: Vertical stand

Vertical Stand				
Quantity	**Part No.**	**Designation**	**Size/Standard**	**Article No.**
1	0181.00	Pump Stand		B.101.0181.0002.01
1	0580.00	Cap		N.097.0580.0001.08
1	0598.00	Plate		E.022-0598.0001.01
2	0902.07	Stud		N.004.0902.0001.01
2	0920.02	Hexagon Nut		N.004.0920.0001.01
2	0934.02	Spring Washer		N.004.0934.0001.01
Article variations acc. to order are marked x.xxx.xxxx.xxxx.xx				

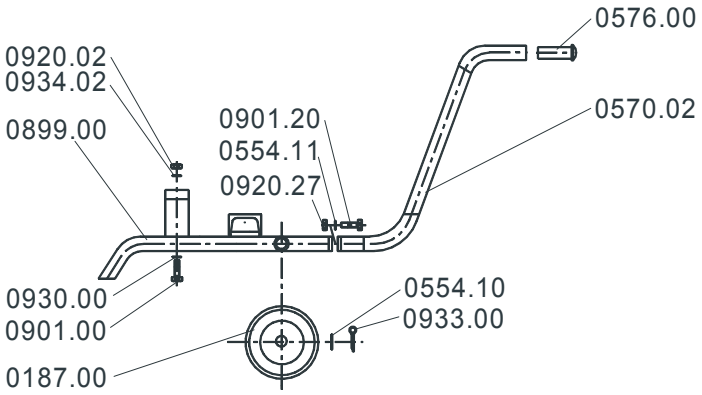


Figure 48: Trolley.

Trolley				
Quantity	**Part No.**	**Designation**	**Size/Standard**	**Article No.**
2	0187.00	Wheel, normal		N.097.0187.0001.14
2	0187.00	Wheel, conductive		N.097.0187.0002.15
4	0554.10	Washer		N.004.0554.0008.01
2	0554.11	Washer		N.004.0554.0004.01
1	0570.02	Bracket		B.099.0570.xxxx.01
1	0576.00	Handle		N.097.0576.0001.13
1	0899.00	Trolley		B.099.0899.xxxx.01
2	0901.00	Hexagon Head Screw		N.004.0901.xxxx.01
2	0901.20	Hexagon Head Screw		N.004.0901.0085.01
2	0920.02	Hexagon Nut		N.004.0920.0001.01
2	0920.27	Hexagon nut		N.004.0920.0014.01
2	0930.00	Toothed Lock Washer		N.004.0930.0001.04
4	0933.00	Split Pin		N.004.0933.0001.01
2	0934.02	Spring Washer		N.004.0934.0001.01
Article variations acc. to order are marked x.xxx.xxxx.xxxx.xx				

(See also Figure 10)

Wet End Parts Euro-HYGIA® I				
Quantity	**Part No.**	**Designation**	**Size/Standard**	**Article No.**
1	0103.00	Annular Casing		B.022.0103.xxxx.xx
1	0161.00	Back Plate		E.022.0161.xxxx.xx
1	0230.00	Impeller		x.022.0230.xxxx.xx
1	0412.00	O-Ring		N.097.0412.0004.xx
1	0412.01	O-Ring		N.097.0412.0008.xx
1	0412.02	O-Ring		N.097.0412.0008.xx
4	0412.03	O-Ring		N.097.0412.0006.xx
1	0412.04	O-Ring		N.097.0412.0010.xx
1	0412.05	O-Ring		N.097.0412.0010.xx
1	0433.00	Mechanical Seal		N.035.0433.xxxx.xx
1	0433.01	Mechanical Seal		N.035.0433.xxxx.xx
1	0471.00	Seal Cover		E.022.0471.xxxx.xx
1	0491.00	Seal Cartridge		E.022.0491.xxxx.xx
1	0492.00	Locking Plate		E.022.0492.xxxx.xx
1	0501.00	Clamp Ring		E.022.0501.0001.06
1	0501.01	Clamp Ring		E.022.0501.0002.06
1	0516.00	Locating Ring		E.xxx.0516.xxxx.xx
1	0554.00	Washer		N.004.0554.0001.01
1	0557.00	Seal Spacer		E.022.0557.xxxx.xx
1	0701.00	Elbow		B.xxx.0701.xxxx.xx
12	0901.07	Hexagon Head Screw		N.004.0901.0084.01
4	0902.02	Stud		N.004.0902.0001.01
1	0905.00	Tie Bolt		M.099.0905.0001.01
1	0914.01	Socket Head Cap Screw		N.004.0914.0039.01
4	0918.00	Hexagon Head Sterile Screw		E.099.0918.0002.xx
1	0920.00	Hexagon Nut		N.004.0920.0001.01
4	0920.04	Hexagon Nut		N.004.0920.0001.01
4	0920.05	Hexagon Nut		N.004.0920.0015.01
1	0922.00	Impeller Nut		M.022.0922.0003.xx
12	0927.00	Domed Nut		N.004.0927.0013.01
4	0934.00	Spring Washer		N.004.0934.0001.01
12	0934.03	Spring Washer		N.004.0934.0007.01
3	1000.01	Counter Sunk Screw		N.004.1000.0011.01
2	1000.03	Counter Sunk Screw		N.004.1000.0012.01
Article variations acc. to order are marked x.xxx.xxxx.xxxx.xx				

Hilge Mechanical Seal Code

The rotating mechanical seals vary with the model and are designated by special HILGE mechanical seal codes.
The special mechanical seal supplement attached to the order will inform you of the designation of the mechanical seal used in your pump.

HILGE-3A2-001-19-aeEO1

Example of an mechanical seal code.

Certificate of Non-Objection

The following pump and its accessories, together with this certificate of non-objection, are herewith contracted out by the undersigned for inspection/repair:

Model: .....

No. .....

Delivery Date .....

Reason for Inspection/Repair Contract:

.....

The pump

☐ was not used in media hazardous to health.

☐ was used for the following: .....
and came into contact with media which must be identified or which contain pollutants.

Please state the last medium to be pumped, if known.

.....

The pump was carefully drained and also cleaned inside and out before it was shipped/made available.

☐ No special safety measures are required in the course of further handling.

☐ The following safety measures pertaining to flushing media, residual liquids, and disposal are required:

.....

.....

.....

We confirm that the information given above is correct and complete and that shipment is in compliance with legal regulations.

Company (Address) Telephone .....

..... Fax .....

..... Email .....

.....

Name (please print) Title

....

Date Company Stamp / Signature

.....

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