



Instruction Manual

DinEnd Close Coupled Pumps

DinIn-Line Close Coupled Pumps





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1 Introduction

1.1 PREFACE

This manual covers DIN End suction close coupled motor pumps and DIN In-line close coupled motor pumps. Basically DinEnd and DinIn-Line have the identical components for the correspondent models. The design features are mentioned in general brochures. This manual is intended for technicians and maintenance staff and for those who are in charge of ordering spare parts.

This manual contains important and useful information for the proper operations and maintenance of the pump. It also contains important instructions to prevent potential accidents and damages, and to ensure safe and fault-free operation of the pump.

! Read this manual carefully before commissioning the pump, familiarize yourself with the operations of the pump and strictly obey the instructions!

The data published here comply with the most recent information at the time of going to press. However they may be subject to later modifications.

Smoothflo Pumps reserves the right to change the construction and design of the products at any time without being obliged to change earlier deliveries accordingly.

1.2 SAFETY

This manual contains instructions for working safely with the pump. Operators and maintenance staff must be familiar with these instructions.

Below is a list of the symbols used for those instructions and their meaning:

| | |
|----------|---|
| | Personal danger for the user. Strict and prompt observance of the corresponding instruction is imperative! |
| ! | Risk of damage or poor operation of the pump. Follow the corresponding instruction to avoid this risk. |
| | <i>Useful instruction or tip for the user.</i> |
| | Items which require extra attention are shown in bold print . |

1.3 GUARANTEE

Smoothflo Pumps shall not be bound to any guarantee other than the guarantee accepted by Smoothflo Pumps in particular, Smoothflo Pumps will not assume any liability for explicit and/or implicit guarantees such as but not limited to the marketability and/or suitability of the products supplied.

The guarantee will be cancelled immediately and legally if:

- Service and/or maintenance are not undertaken in strict accordance with the instructions.
- The pump is not installed and operated in accordance with the instructions.
- Necessary repairs are not undertaken by our personnel or are undertaken without our prior written permission.
- Modifications are made to the products supplied without our prior written permission.
- The spare parts used are not original Smoothflo Pumps parts.
- Additives or lubricants used are other than those prescribed.
- The products supplied are not used in accordance with their nature and/or purpose.
- The products supplied have been used amateurishly, carelessly, improperly and/or negligently.
- The products supplied become defective due to external circumstances beyond our control.

1.4 INSPECTION OF DELIVERED ITEMS

Check the consignment immediately on arrival for damage and conformity with the advice note. In case of damage and/or missing parts, have a report drawn up by the carrier at once.

1.5 INSTRUCTIONS FOR TRANSPORT AND STORAGE

1.5.1 DIMENSIONS AND WEIGHT

A pump or a pump unit is generally too heavy to be moved by hand. Therefore, use the correct transport and lifting equipment.

1.5.2 USE OF PALLETS

Usually a pump or pump unit is shipped on a skid. Leave it on the pallet as long as possible to avoid damages and to facilitate possible internal transport.



! When using a forklift always set the forks as far apart as possible and lift the package with both forks to prevent it from toppling over! Avoid jolting the pump when moving it!

1.5.3 HOISTING

When hoisting a pump or complete pump units the straps must be fixed in accordance with figure 1.

⚠ *Never go underneath a hoisted pump!*



Figure 1: Lifting instructions.

1.6 STORAGE

If the pump is not to be used immediately the stub shaft must be turned by hand twice per week.

2 GENERAL

2.1 PUMP DESCRIPTIONS

The DinEND & DinIn-Line are a range of non-self-priming centrifugal close coupled motor pumps. The pump and the standard IEC flanged motor are assembled by means of a motor stool and a stub shaft to one complete unit. The pumps are available in cast iron casing, bronze impeller and stainless steel shaft. The pump casings and impellers comply with DIN24255 (EN733). The other materials can be supplied upon request.

2.2 APPLICATIONS

· In general, the pumps can be used for thin, clean or slightly polluted liquids. But these liquids should not affect the pump materials.

· Further details about the application possibilities of your specific pump are mentioned in the order confirmation.

· Do not use the pump for purposes other than those for which it is delivered without prior consultation with your supplier.

⚠ *Using a pump in a system or under system conditions (liquid, working pressure, temperature, etc.) for which it has not been designed may hazard the user!*

2.3 CONSTRUCTION

2.3.1 DESIGN

The design is characterized by a compact construction. The pump is close coupled to a standard IEC flanged motor by means of a motor stool and stub shaft. The pump cover is clamped between the pump casing and motor stool. The electric motors have B3/B5 mounting for DinEnd Pumps. And B3 flanged motors are for All models of DinIn-Line pumps. More design features refer to general brochures.

2.3.2 MECHANICAL SEAL

The pump is provided with a mechanical seal with mounting dimensions according to DIN24960. Only 3 diameters of seals are used for the whole range: 32mm, 44mm or 53mm.

2.3.3 BEARING CONSTRUCTION


The pump shaft bearing is provided by the motor bearings. The selection of the pump/motor combination is such that the bearings of the applied electric motors can absorb the axial and radial forces without the bearing life being affected. The electric motors must be provided with a **fixed bearing**.

2.4 RE-USE

The pump may only be used for other applications after prior consultation with Smoothflo Pumps or your supplier. Since the lastly pumped medium is

not always known, the following instructions should be observed:

- flush the pump properly.
- make sure the flushing liquid is discharged safely (environment!).

 **Take adequate precautions and use the appropriate personal protection means like rubber gloves and spectacles!**

2.5 SCRAPPING

If it has been decided to scrap a pump, the same flushing procedure as described for RE-USE should be followed.

3 INSTALLATION

3.1 SAFETY

- Read this manual carefully prior to installation and commissioning. Non-observance of these instructions can result in serious damage to the pump and this will not be covered under the terms of our guarantee. Follow the instructions given step by step.
- Ensure that the pump can't be started if work has to be undertaken to the pump during installation and the rotating parts are insufficiently guarded.
- Depending on the design the pumps are suitable for liquids with a temperature of up to 110°. When installing the pump unit to work at 70° and above the user should ensure that appropriate protection measures and warnings are fitted to prevent contact with the hot pump parts.
- If there is danger of static electricity, the entire pump unit must be earthed.
- If the pumped liquid is harmful to men or the environment, take appropriate measures to drain the pump safely. Possible leakage liquid from the shaft seal should also be discharged safely.

3.2 ENVIRONMENT

- The foundation must be hard, level and flat.

- The area in which the pump is installed must be sufficiently ventilated. An ambient temperature or air humidity which is too high, or a dusty environment, can have a detrimental effect on the operation of the electric motor.
- There should be sufficient space around the pump unit for the operation
- Behind the cooling air inlet of the motor there must be a free area of at least 1/2 of the electric motor diameter, to ensure unobstructed air supply.

3.3 INSTALLATION OF A PUMP UNIT

If the unit is delivered as a complete set, the pump and motor are pre-assembled in the works. In that case the impeller has already been properly adjusted axially. In case of permanent arrangement, level the pump on the foundation by means of shims and carefully tighten the nuts of the foundation bolts.

3.4 PIPING

- The piping works to the suction and delivery connections must fit exactly and must not be subject to stress during operation.
- The passage of the suction pipe must be amply dimensioned. The pipe should be as short as possible and run towards the pump in such a way that **NO AIR POCKETS CAN ARISE**. If this is not possible, a venting facility should be provided at the highest point of the pipe. If the inside diameter of the suction pipe is larger than the suction connection of the pump, an **ECCENTRIC REDUCER** should be applied to prevent air pockets and whirls.

See figure 2.

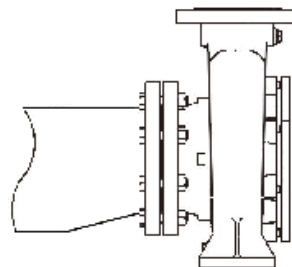


Figure 2: Eccentric reducer to suction flange.



·The maximum allowable system pressure is stated in Table 1. If there is a risk that this pressure might be exceeded, for instance because of an excessive inlet pressure, appropriate measures should be taken by mounting a safety valve in the pipe line.

·**SUDDEN CHANGES IN THE RATE OF FLOW** can lead to high pressure impulses in the pump and the pipe lines (water shock). Therefore, do not use quick-acting closing devices, valves etc.

3.5 ACCESSORIES

- Fit any parts that may have been supplied separately.
- If the liquid does not flow towards the pump, fit a foot valve at the bottom of the suction pipe, If necessary, combine this foot valve with a suction strainer to prevent impurities from being drawn in.
- When mounting, place temporarily (for the first 36 operating hours) a fine gauze between suction flange and suction pipe to prevent internal pump parts from being damaged by foreign matter. If the risk of damage continuously exists, fit a permanent filter.

3.6 CONNECTION OF THE ELECTRIC MOTOR



The electric motor must be connected to the mains by a licensed electrician.

- Refer to the instruction manual belonging to the electric motor.
- If possible, fit a switch as close as possible to the pump.

4 COMMISSIONING

4.1 INSPECTION OF THE PUMP

·Check whether the stub shaft turns freely. Do this by turning the motor fan (taking fan cover off first) a few times by hand.

4.2 INSPECTION OF THE MOTOR

·Check whether the fuses have been mounted.

4.3 PREPARING THE PUMP UNIT FOR COMMISSIONING

Proceeds for the pumps first time put in us and after the pump has been overhauled:

- 1 Fully open the stop valve in the suction pipe. Close the delivery stop valve.
- 2 Fill the pump and the suction pipe with the liquid to be pumped.
- 3 Turn the stub shaft a few times by hand and add more liquid, if necessary.

4.4 CHECKING THE DIRECTION OF ROTATION



Beware of possible non-screened rotating parts, when checking the direction of rotation!

- 1 The direction of rotation of the pump is indicated by an arrow. Check whether the direction of rotation of the motor corresponds with that of the pump.
- 2 Let the motor run for only a short time and check the direction of rotation.
- 3 If the direction of rotation is **not** correct, change the direction of rotation. See the instructions in the user manual belonging to the electric motor.
- 4 Fit the guard.

4.5 START-UP

- 1 Start the pump.
- 2 As soon as the pump is under pressure, slowly open the delivery stop valve until the working pressure is attained.



Make sure that when a pump is running, rotating parts are always properly screened by the guard!

4.6 PUMP IN OPERATION

When the pump is in operation, pay attention to the following:

- The pump should never run dry.
- Never use a stop valve in the suction line to control pump output. The stop valve should always be fully opened during operation.
- Check whether the absolute inlet pressure is sufficient, to prevent vaporization in the pump.



- Check whether the pressure difference between suction and delivery side corresponds with the specifications of the pump's duty point.
- A mechanical seal may never show visible leakage.

5 MAINTENANCE

5.1 DAILY MAINTENANCE

Regularly check the outlet pressure.



***No water should get into the terminal box of the electric motor when the pump room is sprayed clean!
Never spray water on hot pump parts! The sudden cooling down may cause them to burst and hot water may flow out!***

5.2 MECHANICAL SEAL

A mechanical seal generally requires no maintenance. However, **it should never be allowed to run dry**. If there are no problems, do not dismantle the mechanical seal. As the seal faces have run in on one another dismantling usually implicates replacement of the mechanical seal. If a mechanical seal shows any leakage it has to be replaced.

5.3 LUBRICATION OF THE BEARINGS

For maintenance of the motor bearings we refer to the instructions of the motor supplier concerned.

5.4 ENVIRONMENTAL INFLUENCES

- Regularly clean the filter in the suction pipe or the suction strainer at the bottom of the suction pipe, as the inlet pressure may become too low if the filter or the suction strainer is fouled or blocked.
- If there is a risk that the pumped liquid expands during solidification or freezing, the pump has to be drained and, if necessary, flushed after it has been put out of service.
- If the pump is out of service for a long time, it has to be preserved.

5.5 NOISE

If a pump starts making noise, this may point to certain problems with the pump unit. A crackling

noise can indicate cavitation or excessive motor noise can indicate deterioration of the bearings.

5.6 FAULTS



the pump, of which you want to determine the fault, may be hot or under pressure. Take the appropriate precautions first and protect yourself with the proper safety devices (safety goggles, gloves, protective clothing)!

To determine the source of the malfunctioning of the pump, proceed:

- 1 Switch off the power supply to the pump unit. Lock the working switch with a padlock or remove the fuse.
- 2 Close the stop valves.
- 3 Determine the nature of the fault.
- 4 Try to determine the cause of the fault with chapter 6 "Problem Solving" and take the appropriate measures or contact your installer.

6 PROBLEM SOLVING

Faults in a pump installation can have various causes. The faults may not be in the pump. It may also be caused by the pipe system or the operating conditions. Firstly, always check that installation has been executed in accordance with the instructions in this manual and that the operating conditions still correspond with the specifications for which the pump was purchased.

In general, breakdowns in a pump installation are attributable to the following causes:

- Faults with the pump.
- Breakdowns or faults in the pipe system.
- Faults due to incorrect installation or commissioning.
- Faults due to incorrect choice pump.

A number of the most frequently occurring failures as well as their possible causes are shown in the below.



Table 2: Most frequently occurring failures.

| Most common faults | Possible causes, See Table 3. |
|---|---|
| Pump delivers no liquid | 1 2 3 4 8 9 10 11 13 14 17 19 20 21 29 |
| Pump has insufficient volume flow | 1 2 3 4 8 9 10 11 13 14 15 17 19 20 21 28 29 |
| Pump has insufficient head | 2 4 13 14 17 |
| Pump stops after start up | 1 2 3 4 8 9 10 11 |
| Pump has higher power consumption than normal | 12 15 16 17 18 22 23 24 25 26 27 32 38 39 |
| Pump has lower power consumption than normal | 13 14 15 16 17 18 20 21 28 29 |
| Mechanical seal has to be replaced too often | 23 25 26 30 32 33 36 |
| Pump vibrates or is noisy | 1 9 10 11 15 18 19 20 22 23 24 25 26 27 29 37 38 39 40 |
| Bearings wear too much or become hot | 23 24 25 26 27 37 38 39 40 42 |
| Pump running rough, hot or seizes | 23 24 25 26 27 37 38 39 40 42 |

Table 3: Possible causes of pump failures.

| | Possible causes |
|----|---|
| 1 | Pump or suction pipe is not sufficiently filled or de-aerated |
| 2 | Gas or air coming from the liquid |
| 3 | Air lock in the suction pipe |
| 4 | Air leak in the suction pipe |
| 8 | The manometric suction head is too high |
| 9 | Suction pipe or suction strainer is blocked |
| 10 | Insufficient immersion of foot valve or suction pipe during operation of the pump |
| 11 | NPSH available too low |
| 12 | Speed too high |
| 13 | Speed too low |
| 14 | Wrong direction of rotation |
| 15 | Pump does not operate at the right duty point |
| 16 | Liquid density differs from the calculated liquid density |
| 17 | Liquid viscosity differs from the calculated liquid viscosity |
| 18 | Pump operates when the liquid flow is too low |
| 19 | Wrong pump selection |
| 20 | Obstruction in impeller or pump casing |
| 21 | Obstruction in the piping |
| 22 | Wrong installation of the pump unit |
| 24 | Rotating part running out true |
| 25 | Imbalance in rotating parts(for instance: impeller or stub shaft) |
| 26 | Stub shaft is running out true |
| 27 | Bearings faulty or worn out |
| 28 | Wear ring faulty or worn out |
| 29 | Damaged impeller |
| 30 | Seal faces of the mechanical seal are worn out or damaged |
| 32 | Bad mounting of the mechanical seal |
| 33 | Mechanical seal not suitable for the pumped liquid or operation circumstances |
| 36 | Flushing liquid to the mechanical seal is polluted |
| 37 | Axial retaining of impeller or stub shaft is defective |
| 40 | Wrong or polluted lubricant |
| 42 | Too high axial force because of worn dorsal blades or excessive inlet pressure |



7 DISASSEMBLY AND ASSEMBLY

7.1 PRECAUTIONARY MEASURES



Take adequate measures to avoid that the motor is started while you are working on the pump. This is especially important for electric motors with remote control.

- Switch the operating switch near the pump (if available) to “OFF”.

- Turn off the pump switch on the switchboard.

- If necessary remove the fuses.

- Hang a “danger” card near the switchboard cabinet.

7.2 SPECIAL TOOLS

Assembly and disassembly work requires no special tools. However, such tools can make certain jobs easier, for instance replacing the shaft seal. If such is the case it will be indicated in the text.

7.3 LIQUID DRAINING



Make sure no liquid gets into the environment!

Before starting any disassembly the pump should be drained.

- 1 If necessary, close the valves in the suction and delivery pipes and in the flushing or cooling supply lines to the shaft seal.

- 2 Remove the drain plug (00310).

- 3 If harmful liquids are pumped, wear protective gloves, glasses, etc, and thoroughly flush the pump.

- 4 Refit the drain plug.

7.4 DISASSEMBLY

7.4.1 BACK-PULL-OUT FEATURE

The pumps are designed with a Back-Pull-Out system. The entire rotating section can be removed together with the motor. This means that almost the whole pump can be dismantled without disturbing the suction and delivery piping.

7.4.2 DISASSEMBLING THE BACK-PULL-OUT UNIT

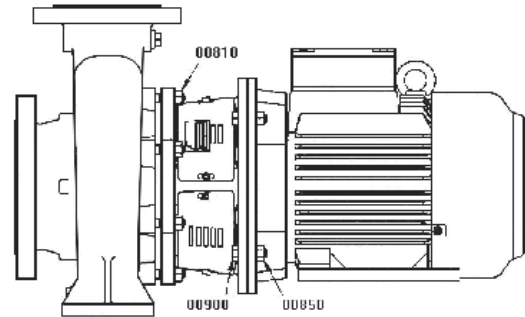


Figure 3: Back-Pull-Out principle.

- 1 Open the terminal box and loosen the wires.

- 2 If the electric motor has been mounted on a separate foundation, loosen the electric motor.

- 3 Remove the nuts (00810).



Never start dismantling by loosening the motor bolts (00850) and nuts (00900). This may result in the damage to the mechanical seal and the impeller!

- 4 Pull the motor together with the entire motor stool out of the pump casing. The Back-Pull-Out unit of large pumps is very heavy. Support it with a beam or hang it in a pulley sling.

7.4.3 ASSEMBLING THE BACK-PULL-OUT UNIT

- 1 Fit a new gasket (00300) into the casing cover.

- 2 Mount the complete motor stool with motor back into the pump casing.

- 3 Fit the nuts (00810) and tighten them clockwise with the proper tightening torque.

7.5 REPLACING THE IMPELLER

The clearance between the impeller and the wear ring is 0.3 mm. In case the clearance has increased to 0.5-0.7mm due to wear, the impeller and wear ring should be replaced.

7.5.1 DISASSEMBLING THE IMPELLER

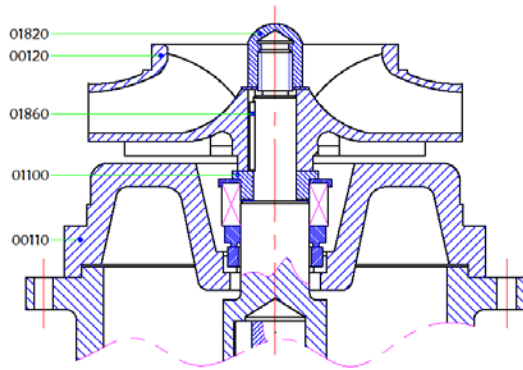


Figure 4: Disassembling the impeller.

The item numbers used are referring to figure 4.

- 1 Remove the Back-Pull-Out unit, see paragraph 7.4.2 “Disassembling the Back-Pull-Out unit”.
- 2 Remove the impeller nut (01820). Sometimes the nut has to be heated to break the Loctite-contact.
- 3 Remove the impeller (00120) with a pulley puller, or wrest the impeller by inserting for instance 2 big screw drivers between the impeller and the pump cover (00110).
- 4 Remove the impeller key (01860).
- 5 Remove the distance sleeve (01100) (Module 35 and 45 pumps) with the rotating part of the mechanical seal (01220) or remove shaft sleeve with seal rotating part (Module 25 pumps).

7.5.2 MOUNTING THE IMPELLER

- 1 Fit the rotating part of the mechanical seal on the shaft sleeve (Module 25 Pumps) or on stub shaft directly (Module 35 and 45).
- 2 Fit the shaft sleeve with the rotating part of mechanical seal on the stub shaft (Module 25) or fit distance spacer on stub shaft (Module 35 and 45).
- 3 Place the impeller key in the key way of the stud shaft.
- 4 Push the impeller onto the stub shaft against the shaft sleeve or distance spacer.
- 5 Degrease the thread on the stub shaft and the thread in the cap nut.
- 6 Put a drop of Loctite 243 on the thread and fit the impeller nut.

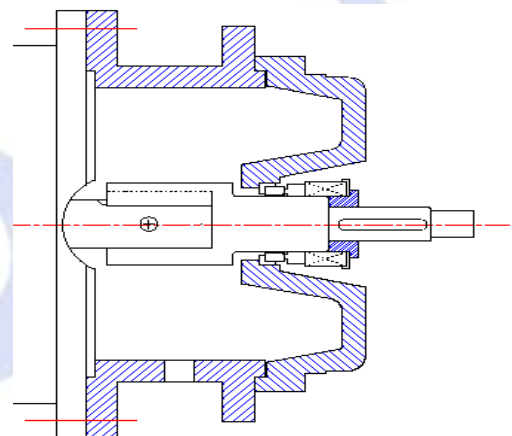
- 7 Mount the Back-Pull-Out unit, see paragraph 7.4.3 “Assembling the Back-Pull-Out unit”.

7.6 MECHANICAL SEAL

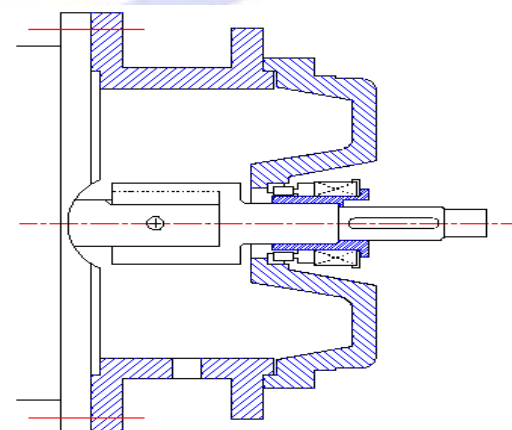
7.6.1 INSTALLATION OF MECHANICAL SEAL

- First read the following instructions regarding the mounting of a mechanical seal. Follow these instructions closely when mounting a mechanical seal.
- A mechanical seal is a fragile precision instrument. Leave the seal in its original packing until you are ready to fit it!
- Clean all receiving parts properly. Make sure your hands and working environment are clean!
- Never touch the sliding surfaces with ones fingers!**
- Take care not to damage the seal during assembly. Never put the rings down on their sliding surfaces!

7.6.2 DISASSEMBLING A MECHANICAL SEAL



Seals for module 35 and 45 Pumps



Seals for module 25 Pumps

Figure 5: Mechanical Seal Arrangements.

The difference for the mechanical seal between module 25 pumps and module 35&45 pumps:



- **Module 25 pumps: the seals are fitted on shaft sleeve.**
- **Module 35 & 45 Pumps: the seals are fitted on stub shaft directly and distance spacers are used against the impellers. Referring to figure 5 is easy to see the difference.**

The item numbers used refer to figure 6 and figure 7.

1 Remove the impeller, see paragraph 7.5.1

“Disassembling the impeller”.

2 Pull the distance sleeve (01100) and the rotating part of the mechanical seal (01220) off the stub shaft (Module 35 and 45 pumps) or pull shaft sleeve with rotating part off the stub shaft (module 25 pumps).

3 Mark the position of the pump cover (00110) in relation to the motor stool (00250). Knock the pump cover loose and remove it.

4 Push the stationary of the mechanical seal (01220) out of the pump cover.

7.6.3 ASSEMBLING A MECHANICAL SEAL

1 Make sure the stub shaft (02200) is not damaged. If it is, replace it.

2 Place the electric motor with the shaft upright.

3 Put the pump cover flat down and press the stationary of the seal straight into it. If necessary, use a plastic pressure piece. **Never hammer it inside!**

4 Mount the pump cover in the right position in the collar of the motor stool. Check whether the pump cover is at right angles to the stub shaft.

5 Fit the rotating part of the mechanical seal on the shaft sleeve (Module 25 pumps) or fit it on stub shaft directly and then fit distance spacer on stub shaft (Module 35 and 45 pumps). **Applying silicon grease on the bellows and shaft or shaft sleeve will help greatly!**

6 Mount the impeller, see paragraph 7.5.2 “Mounting the impeller”.

7.7 REPLACING THE STUB SHAFT AND THE MOTOR

7.7.1 DISASSEMBLING THE STUB SHAFT AND THE MOTOR

The item numbers used refer to figure 6 & figure 7.

1 Dismantle the impeller and the shaft seal. See paragraph 7.5.1 “Disassembling the impeller” and paragraph 7.6.2 “Disassembling a mechanical seal”.

2 Loosen the bolts (00850) and nuts (00900) and remove the motor stool(00250) from the motor.

3 Unlock the screws (02280) and pull the stub shaft (02200) from the motor shaft.

7.7.2 ASSEMBLING THE STUB SHAFT AND THE MOTOR

1 Put the key on the motor shaft.

2 Put the motor in vertical position, shaft end up. Fit the stub shaft (02200) on the motor shaft. Make sure that motor shaft end touches the hollow end of stub shaft and then lock it on motor shaft.

3 fit the guards on motor stool and then fit the motor stool (00250) to the electric motor with bolts (00850) and nuts (00900).

4 Mount the pump cover (00110), the mechanical seal (01200) and the impeller (00120), see paragraph 7.6.3 “Assembling a mechanical seal” and paragraph 7.5.2 “Mounting the impeller”.

5 Put gasket on the back cover.

6 Fit the pump casing (00100) and then lock it on back cover or motor stool.

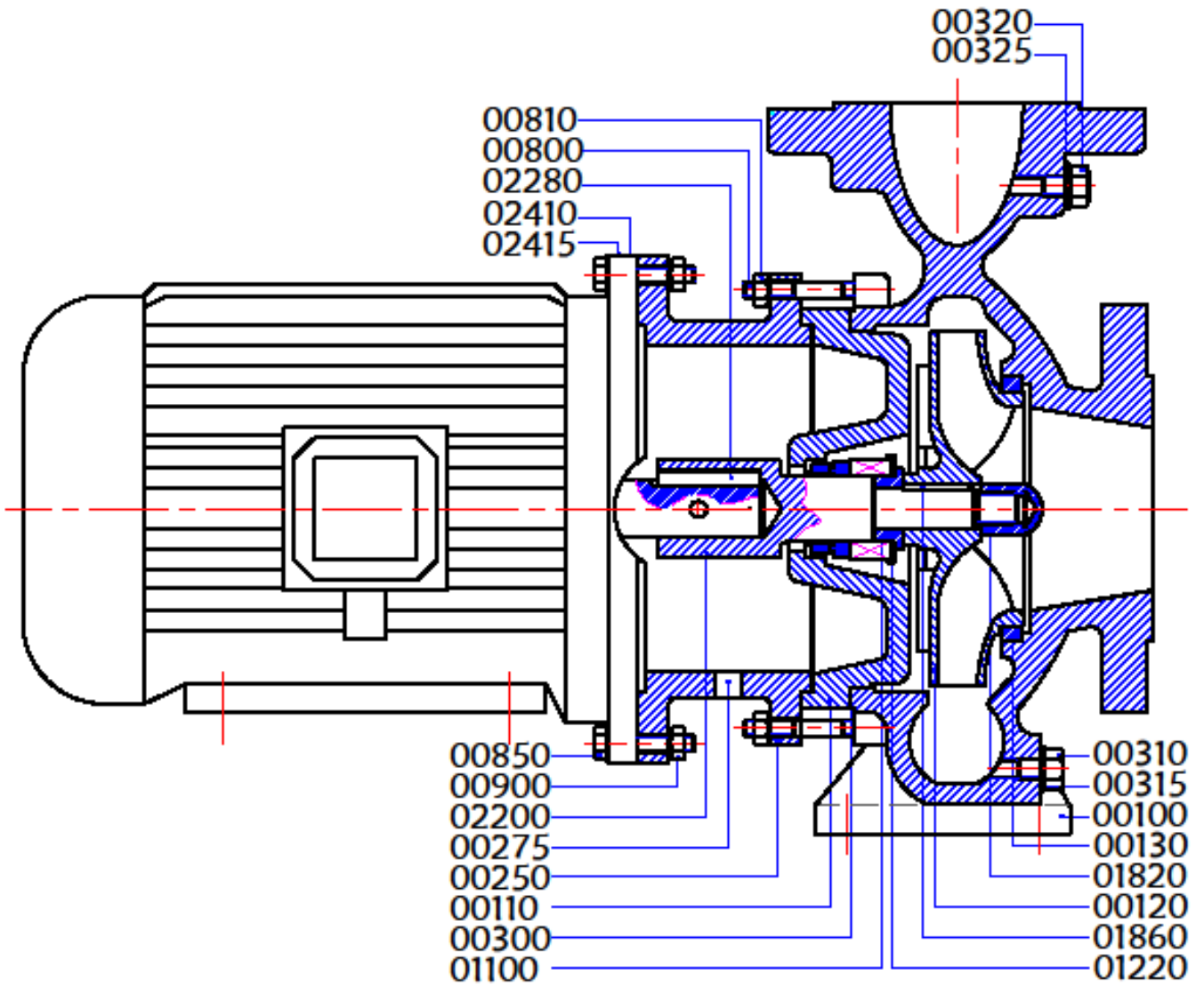
7 Use a bar to spin the impeller from pump suction and make sure that the impeller can be turned for free.

8 If the impeller touched on casing or jammed, find the cause and then fix it.



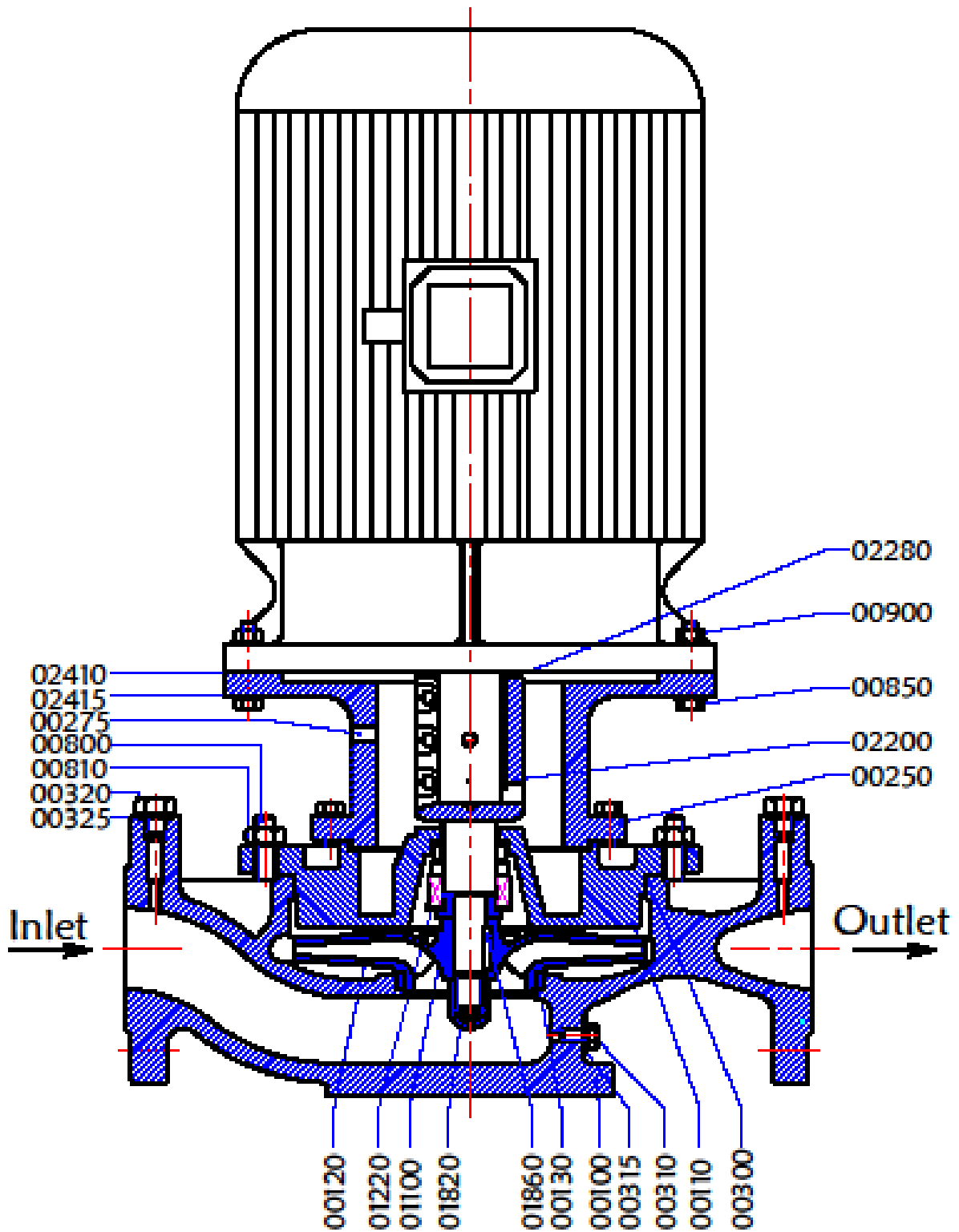
8 Parts

8.1 SECTIONAL DRAWING



DIN Motor Pump Assembly Sectional View For Module 35 and 45

Figure 6: Sectional drawing.



DIN In-Line Pump Assembly Module 35 and 45

Figure 7: Sectional drawing



8.2 PARTS LIST WITH STANDARD CONSTRUCTION MATERIALS

| Item | Quantity | Description | Materials |
|--------|----------|-----------------|-------------------------------|
| 00100 | 1 | Pump Casing | Cast Iron |
| 00110 | 1 | Pump Cover | Cast Iron |
| 00120* | 1 | Impeller | Bronze |
| 00130* | 1 | Wear Ring | Cast Iron |
| 00250 | 1 | Motor Stool | Cast Iron |
| 00270 | 4 | Guard | Stainless Steel |
| 00275 | 8 | Allen Screw | Not Specified |
| 00300* | 1 | Gasket | Not Specified |
| 00310 | 1 | Plug | Steel |
| 00315 | 1 | Gasket | Not Specified |
| 00320 | 1 | Plug | Steel |
| 00325 | 1 | Gasket | Not Specified |
| 00800 | 8/12* | Stud | Steel |
| 00810 | 8/12* | Nut | Steel |
| 00850 | 4/8** | Bolt | Steel |
| 00900 | 4/8** | Nut | Steel |
| 01100 | 1 | Distance Spacer | Stainless Steel |
| 01220* | 1 | Mechanical Seal | Standard: Carbon/Ceramic/Buna |
| 01820* | 1 | Impeller Nut | Brass Cap Nut |
| 01860* | 1 | Impeller Key | Stainless Steel |
| 02200* | 1 | Stub Shaft | Stainless Steel |
| 02210 | 1 | Coupling Key | Steel |
| 02280* | 2 | Lock Plug | Stainless Steel |
| 02400 | 1 | Name Plate | Stainless Steel |
| 02405 | 2 | Rivet | Stainless Steel |
| 02410 | 1 | Arrow Plate | Aluminium |
| 02415 | 2 | Rivet | Stainless Steel |

Marked Item Numbers Are The Parts Are Easy Worn Out Parts And Recommended For Stock

The other materials can be supplied upon request.

*) Quantity depending on pump type

**) Quantity depending on motor type

DIN In-Line Pump Assembly

The following Pump Models have this parts arrangement:

L250-260, L250-320, L250-400

L300-320, L300-400

Major Parts List

- 1, electric motor
- 2, motor shaft key
- 3, coupling
- 4, stub shaft
- 5, adaptor
- 6, pump casing
- 7, casing O-ring
- 8, mechanical seal rotating
- 9, back cover
- 10, mechanical seal stationary
- 11, pump shaft key for coupling
- 12, impeller
- 13, impeller key
- 14, impeller washer
- 15, impeller lock nut
- 16, bearing cover
- 17, bearing
- 18, bearing bracket

