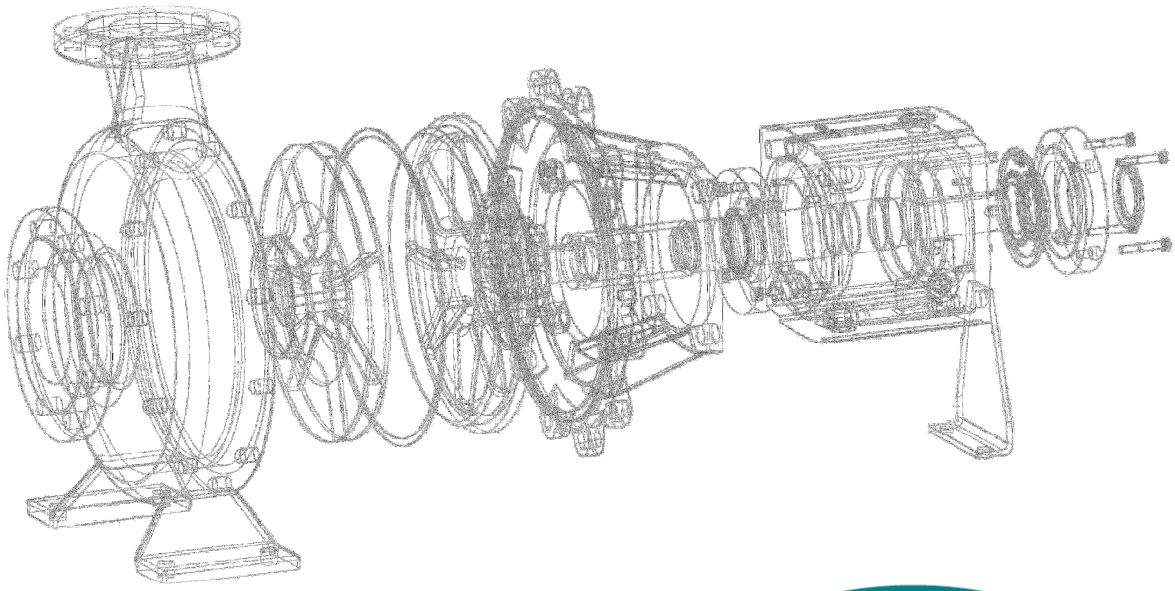
SIVAG
PUMPEN AUSTRIA

Maintenance- and Service Manual



VOLUTE CASING PUMPS DIN 24256 NC

CONTENTS

1 GENERAL INSTRUCTIONS

The instruction manual contains important information about the pump safety, reliably and economically operate. Your consideration will help to reduce risks, reduce repair costs and downtime and increase reliability and service life of the pump. This manual includes instructions and instructions that are necessary for proper handling. Before putting the pump unit, this manual is carefully read and follow the instructions must be followed exactly. The operating instructions must be available at the pump and should be read by every person who is authorized to work on the pump. It is assumed that the transport, assembly, installation, commissioning, maintenance and repairs are performed by qualified personnel and checked by responsible professionals. Directly attached to the pump and instructions, must be completely legible condition. This is the case for the nameplate, which is the range and size, and the pumping number that uniquely identifies the pump. Not take into account the compliance of the instruction manual site-specific provisions, the operator is responsible.

2 SAFETY

2.1 Application

Pump or pump unit only in technically perfect condition. The pump must never run dry, this means no pumped fluid operated. Pressure-side gate valve not open on the permissible range and throttle the suction line is not → cavitation ← possible consequential damage to the pump.

2.2 Instructions for maintenance and assembling

The operator must ensure that work is performed on the pump or pump unit only by qualified personnel.
Work on the pump / unit must be carried out according to electrical safety and the pump stops. The pump must be drained and have to ambient temperature. Be decontaminated when pumping hazardous fluids, the pump before servicing.

2.3 Disposal

Drain the pump and dispose of any liquids or hazardous liquids in accordance with statutory provisions. Pump or pump unit dismantled to separate the materials (metal, plastic, electronic waste, liquids) and dispose of according to regulations.

3 INSTALLATION OF CENTRIFUGAL PUMPS

3.1 Storage

If a pump unit for a long time storage, note the following:

- to avoid damage vibration-free storage to consolidated statement
- locking lid on the suction and pressure side
- Anti-freeze for non-drainable pump cavities
- in cast iron impeller and casing corrosion protection products should be injected into the dense column
- remove the packing gland
  protection of electrical motors from dust and moisture
- pumping site in a clean, dry place and protect with a damp resistant hood

3.2 Transport

Transport of pump unit should be effected as careful as possible because of the risc of damaging the terminal box and fan casing. Lift the pump unit only on the places described in fig. 1. It is never allowed to lift the pump or motor on the shaft.

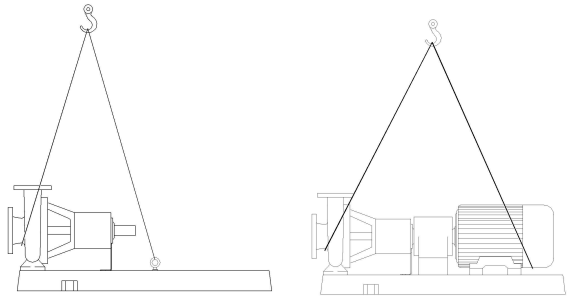


fig. 1

3.3 Installation and foundation

The pump unit should be disposed easy to reach for maintenance and inspection. Consider the location of the pipes and therefore the possibility of assembly. Mind the room for using lifting devices for heavy pumps.

Foundation and mounting of the bed-plate of the pump must be executed carefully. Admissible pipe tensions have to be carried by the foundation therewise the unit is not allowed to be moved at its location. Suitable methods for mounting the bed-plate are:

- concrete slab with anchor screws fig. 2
- casted or welded bed-plate with foundation screws fig. 3
- bed-plate made of sectional steel fig. 4

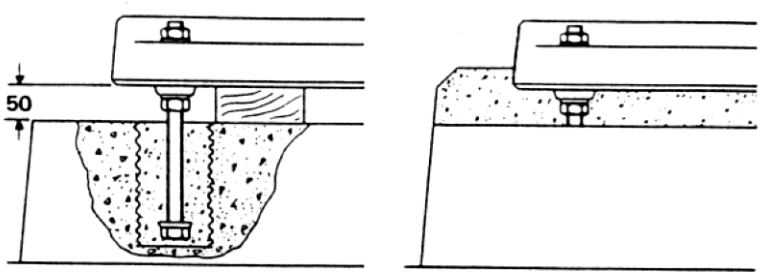


fig. 2

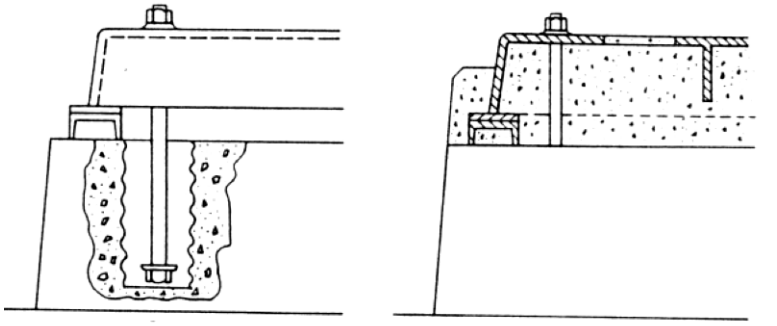


fig. 3

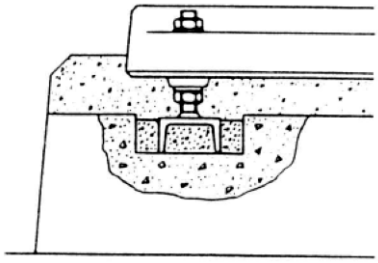


fig. 4

3.4 Pipe placement and accessories

Suction line: The suction line should be as short as possible and must rise to the suction flange of the pump. If pressure is available an suction side the pipes have to be installed falling to the pump flange to avoid air inclusions in the suction pipe. The diameter of suction pipes should be of a diameter that the velocity in the suction line is max. 2 m/s.

If 2 or more pumps have only one suction line, take care that there are used cone shaped suction pipes with correct angles to avoid turbulences. Valves in the suction line are only used for closing the pipes, but totally open when the pump works.

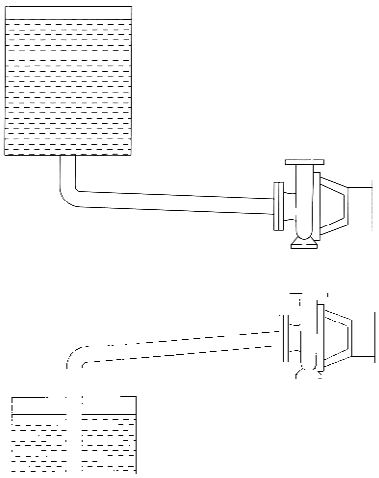


fig. 5

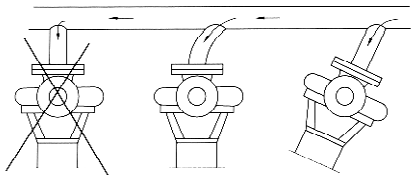


fig. 6

Conical suction lines should be designed with a horizontal top edge. Valves in the suction line should be used only for closing. During the operation the complete section of the suction line must be free to minimize the suction line-losses.

Discharge line: It is recommended to place a valve closed to the discharge flange for exchanging the pump easily without emptying the whole discharge line.

Operates the pump an extended periode against closed valve a by-pass must be installed.

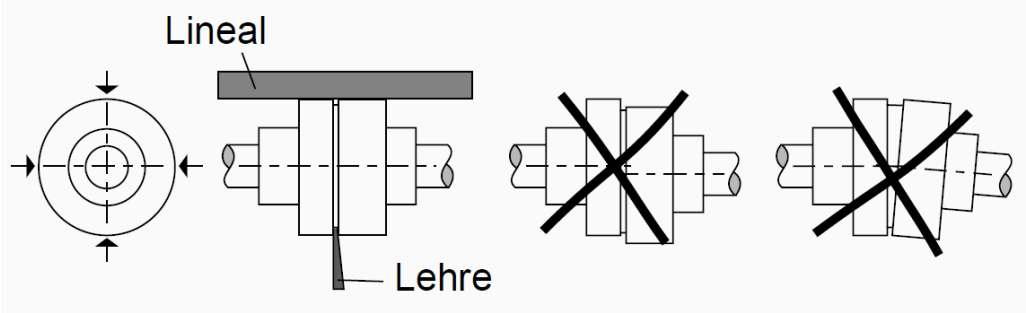
Consider the capacity of electric motor and admissible increase of temperature to avoid cavitation.

3.5 Justification of the pump unit

The pump unit with elastic coupling is preseted on the base plate before the delivery. The justification can be prejudiced by transport movements.
Justification of the coupling has to be controlled on the ground.

After Installation, fixing of founding-screws and fixing the connections the justification of the coupling must be end-controlled. If necessary the pump unit has to be justified again.

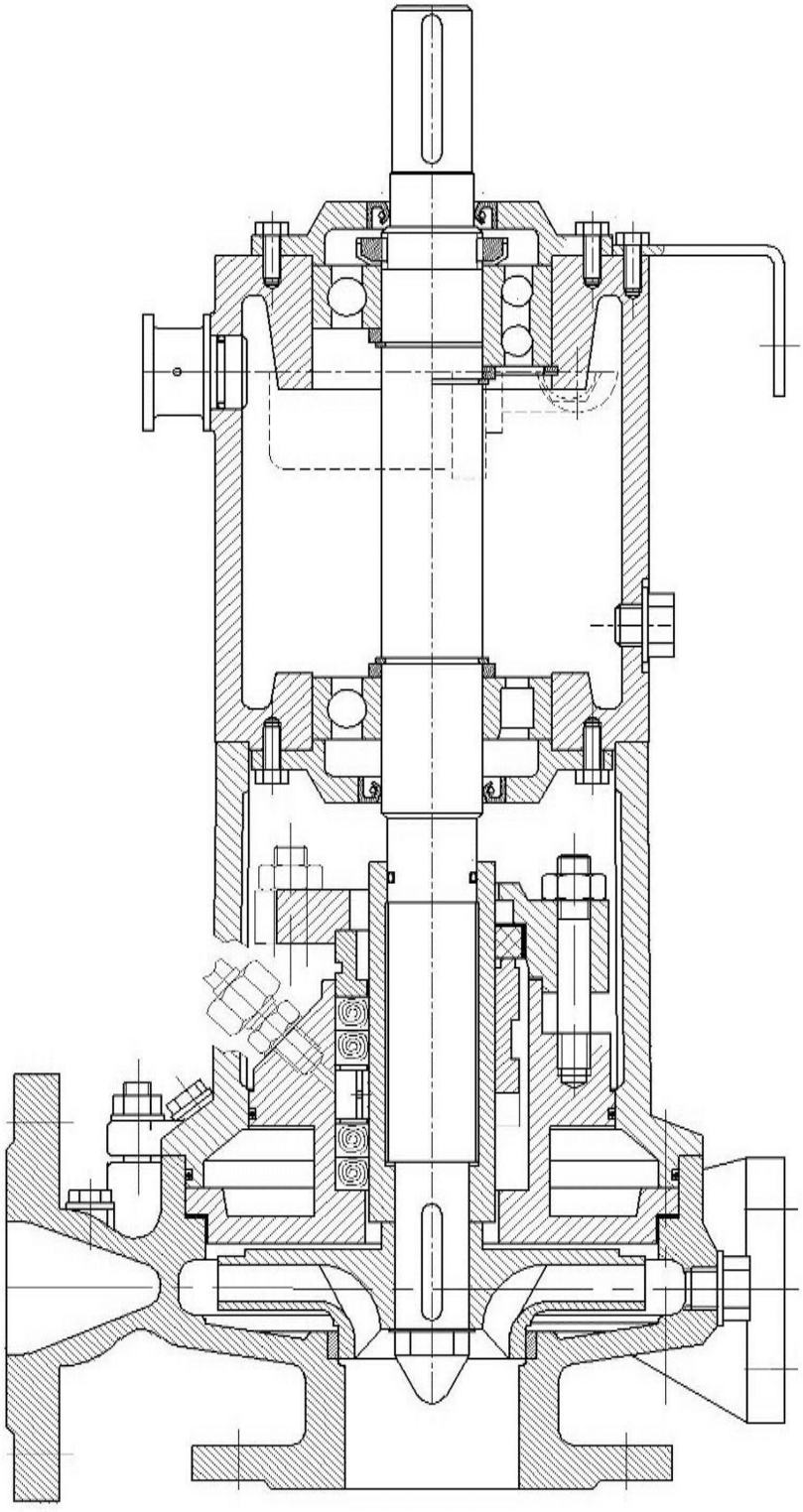
After dismantling the coupling protection the distance between the coupling halves have to be controlled on the surface with surface feeler or gauge. The distance should be the same round about. (2-5mm)
The Measure has to be controlled on 4 Points, which are in the same distance and the check should be performed on 4 points that are located at equal distances on the circumference and diametrically opposed.



For corrections the necessary screws have to be loosened in order to move the pump or motor feet on the base plate. Use, if necessary calibrated panels between feet and plate.
Check that the rotor can be rotated freely by hand.
The alignment should be checked again when the engine reaches its operating temperature.
ATTENTION:
Improper installation and alignment of the units or improper line connection will cause vibration and premature wear of the elastic coupling elements, the bearings, shaft seals and other internal parts.

4 CONSTRUCTION

4.1 Sectional drawing



4.2 Bearing

4.2.1 Description

For the bearing of the pump shaft different types of rolling bearings are used.
As a simple standard bearing groove ball bearings in lifetime-greased or oil-lubricated design are used. (Both sides' identical ball bearings)
For the long-term work stronger bearings with double angular contact ball bearings (coupling side) and as fixed bearing a cylindrical roller bearing (medium side)
This execution is only available with oil-lubricated bearings.
The bearings are shown under the item 10 in the cross section under 4.1 Sectional drawingon page 10.

Grease lubricated bearings
Execution NVD

Bearing bracket size	Bearing type pump side	Bearing type motor side
1	6306 2Z	6306 2Z
2	6308 2Z	6308 2Z
3	6311 2Z	6311 2Z
4	6312 2Z	6312 2Z
5	6313 2Z	6313 2Z

Oil lubricated bearings
Execution NHD, NHG

Lagerträgergröße Bearing bracket size	Ausführung / Execution NHD	Ausführung / Execution NHG	
	pump – and motor side	pump side	motor side
1	6306	NJ 306	3306
2	6308	NJ 308	3308
3	6311	NJ 311	3311
4	6312	NJ 312	3312
5	6313	NJ 313	3313

4.2.2 Oil lubrication

It is necessary to maintain regularly and carefully the lubrication system for long durability of operation. That means to check regularly the oil-level and the temperature. Ambient temperature plus 50 K or 80°C are limits of the admissible bearing temperature. Temperatures up to 110°C are permitted for regular work only by using special oils like Shell Tellus Oil, etc.. Before starting operation fill the bearing bracket with oil. After long periods of storage and transportation clean the unit by filling the bearing bracket with patrol and turn the shaft by hand for removing solids from the bearings.

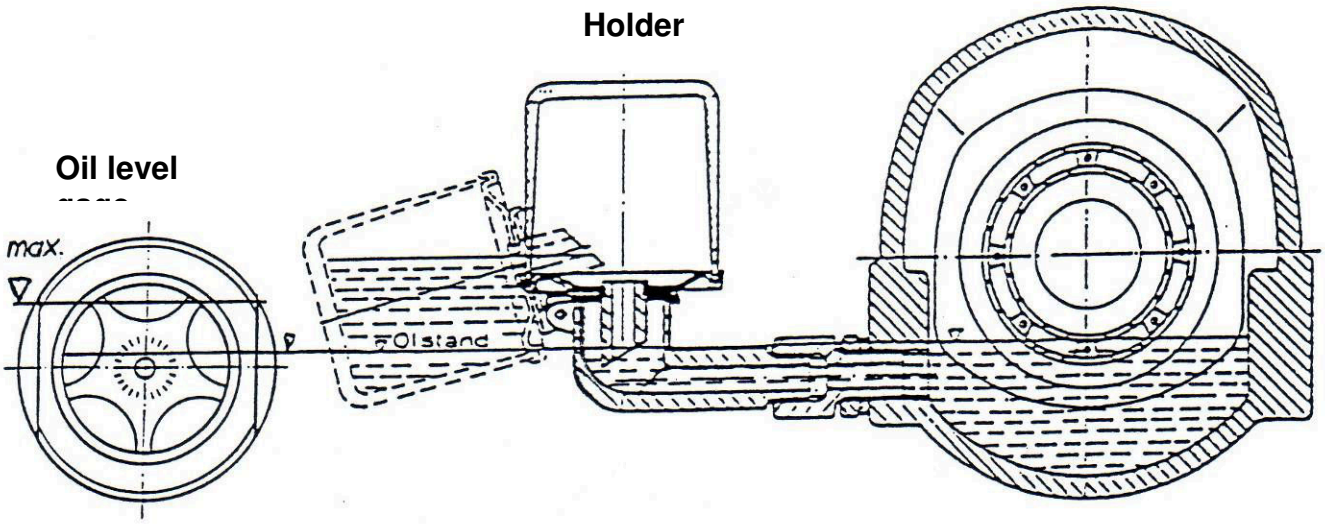
- **Bearing casing with holder**

Remove the plug from the top of the casing of the bearing and fill the oil after you have fold back the holder (shown in the figure above). The oil level must reach the top edge of the oil pipe. Fasten the plug. Fill the holder with oil as much as possible and put it back. During operation take care that the level of oil in the holder is higher than 1/3 of the height of the holder.

- **Bearing casing with oil level gage**

Remove the plug from the top of the bearing casing and fill in the oil (shown in the figure above).The minimum oil level must reach to the middle of the oil level gage, so that the lubrication of the bearings is guaranteed.

Replace the oil after aprox. 200 hours of operation.



- **Ölfüllmengen**

Lagerträgergröße Bearing bracket size	Füllmenge in l Quantity in l	Hauptabmessungen in mm Main dimensions in mm	
		Länge Length	Breite Width
1	0,4	146	120
2	0,5	178	160
3	1,0	182	200
4	2,25	255	240
5	3,25	307	280

4.2.3 Lubricants

For plane bearings and roller bearings			
Hersteller	Type of lubricant		
	Grease lubrication *	Oil lubrication	
	NLGI GRADE 2	Viscosity 46 cSt 40°C (ISO3448 VG 46)	
		Hydraulic oil containing zinc	Hydraulic oil zinc-free
bp	ENERGREASE LS 2 MEHRZWECKFETT L2	ENERGOL HLP-HM 46	ENERGOL HLP-DH 46
OMV	DURAPLEX EP 2 LITHPLEX EP 2	HYD HLP 46 HYD HLP-SH46	HYD HLP AL 46
Esso	BEACON EP 2 BEACON 2 UNIREX N 2	NUTO H 46	
Mobil	MOBILITH A W-2 MOBILUX EP 2 MOBILGREASE MP MOBILITH SHC 220 MOBILGREASE HP	DTE 25	DTE EXCEL 46
Shell	RETINAX A ALVANIA EP GREASE 2 ALVANIA GREASE R 2 ALVANIA GREASE G 2	TELLUS S2 VA 46	TELLUS S 46
Castrol	CASTROL SPHEEROL EPL 2 CASTROL GREASE LMX	HYSPIN AWS 46	HYSPIN ZZ 46
ARAL	ARALUB HLP 2	VITAM GX 46	VITAM GF 46
TOTAL	MULTIS EP 2 MULTIS 2	AZOLLA ZS 46	AZOLLA AF 46

* *When grease lubrication only use grease of same bases.*
All greases indicated in the chart are of lithium soap type.
The indication of the suppliers of the lubricants does not give information of the quality.
On request our engineers of the lubricant service of the competent mineral-oil companies will be at your assistance.

A lubricant safety data sheet is available on request from the manufacturer.

IMPORTANT NOTE!

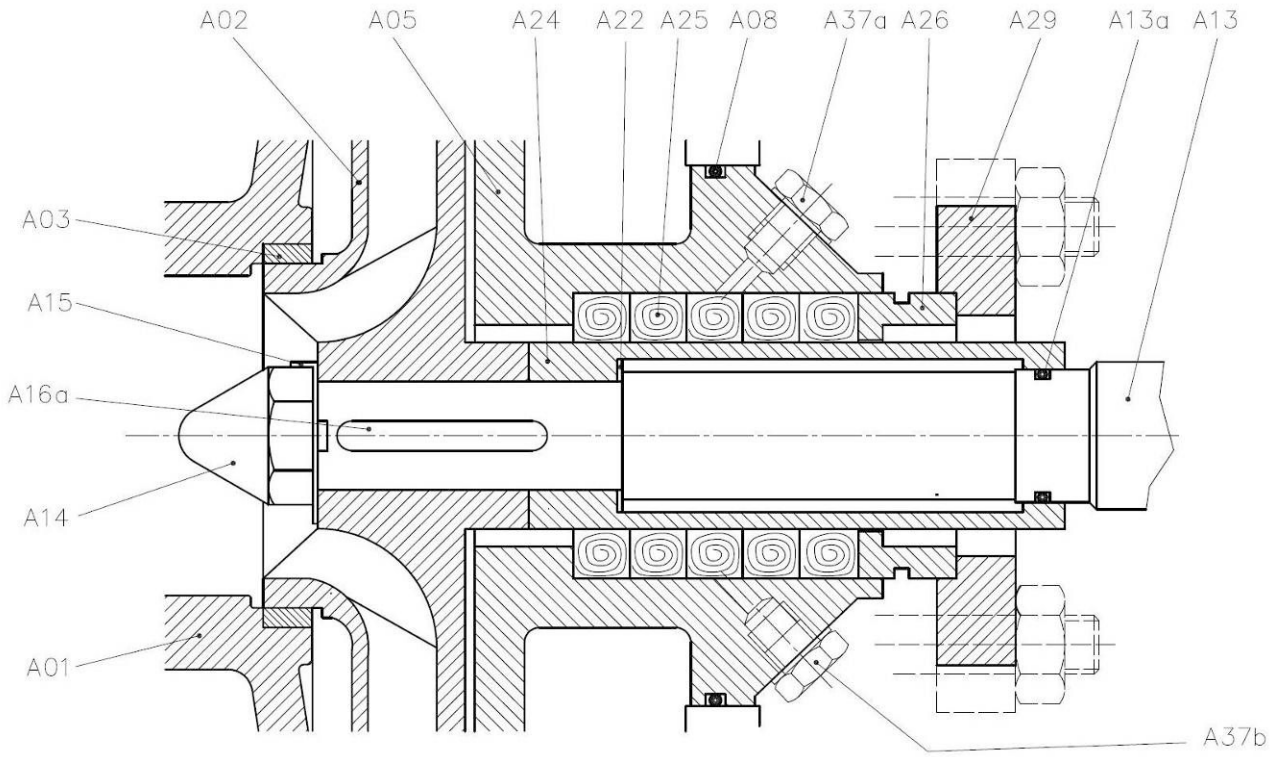
The mixing of zinc-containing hydraulic oil with zinc-free hydraulic oil should be avoided.

4.3 Shaft Seal

4.3.1 Packing

Wellenabdichtung durch Packungsstopfbuchse (Kurzbeschreibung P)	Shaft sealing with packing (Code P)

P1

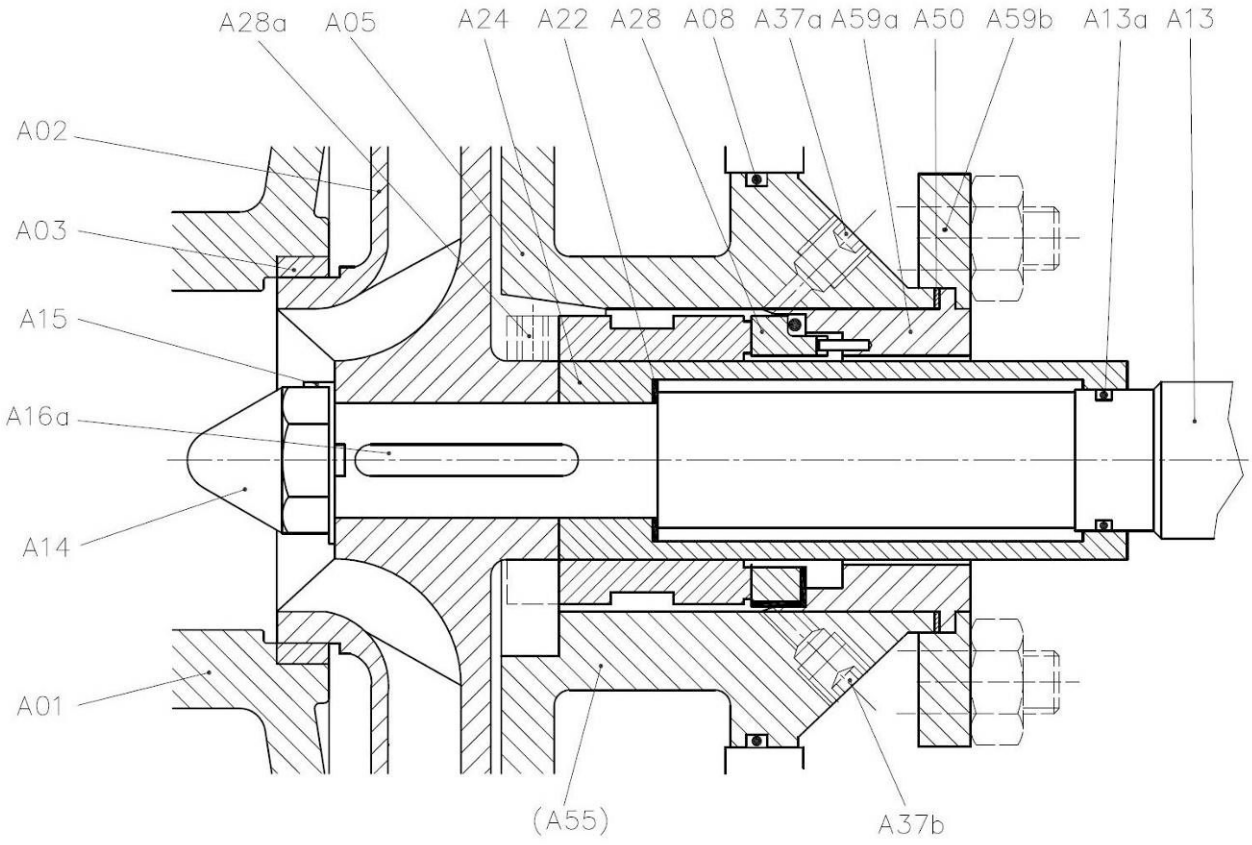


If leakage along the shaft is excessive, gradually tighten the gland nuts.
ATTENTION: Do not overtight the gland nuts.
During the operation, liquid must leak through the packing(drop by drop) for lubrication and cooling. If this loss of liquid is dangerous due to corrosion or fire hazard, a mechanical seal must be fitted.

4.3.2 Single acting mechanical seal

Wellenabdichtung durch einfach wirkende Gleitringdichtung (Kurzbeschreibung S)	Shaft sealing with single mechanical seal (Code S)

S1



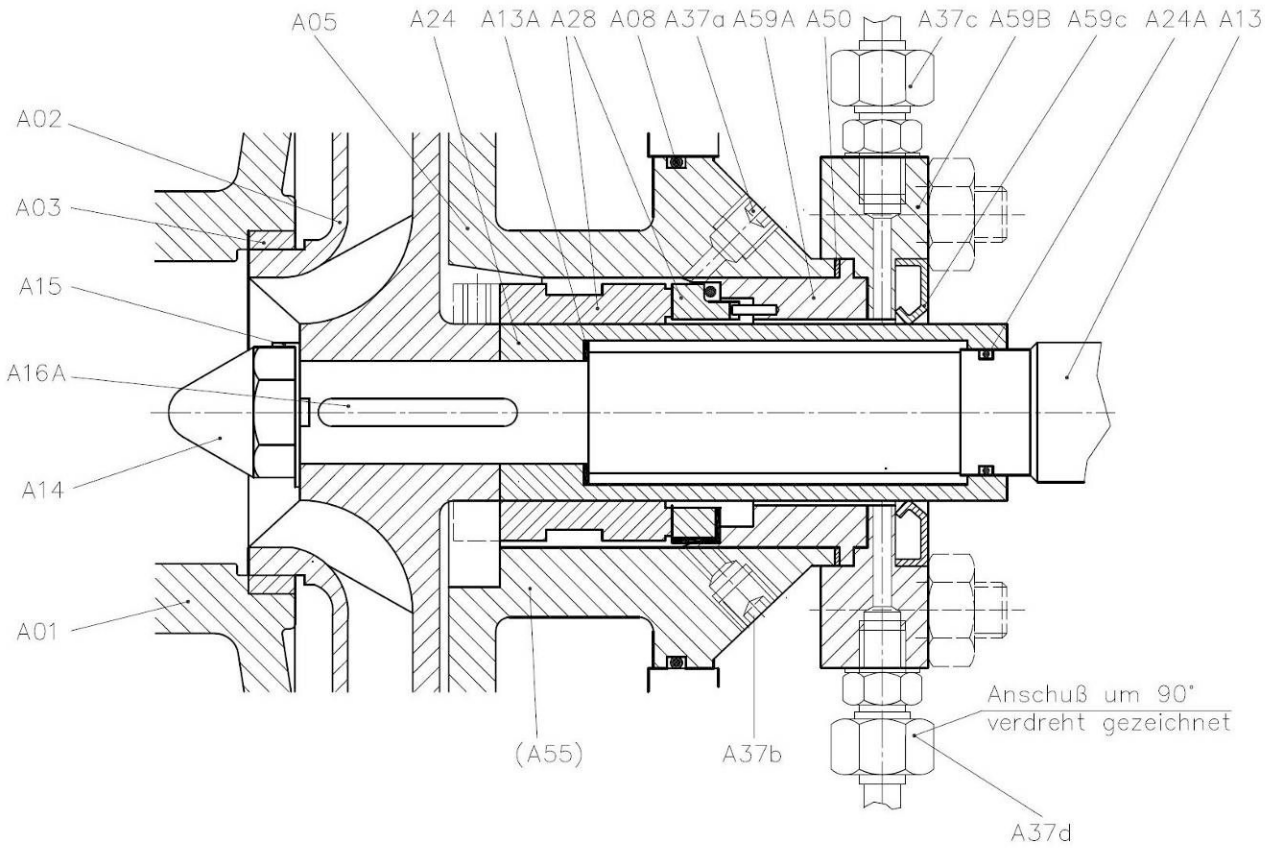
The sliding faces are pressed against each other by means of spring force, thus preventing the opening of the seal at stand-still. The seal faces are statically sealed against the housing and the shaft by secondary seals. With the entry of the pumped medium into the minimal sealing gap a lubricating film is generated and the sealing effect is thus obtained.

4.3.3 Construction single-acting mechanical seal with quench

Abdichtung durch Quench (Kurzbeschreibung Q)	Shaft sealing with quench (Code D)

S1.Q3

Mediumseitig einfache Gleitringdichtung und atmospährenseitig Wellendichtring. 2 Anschlüsse vorbereitet für Zu- und Ableitung einer externen Sperrflüssigkeit.	Medium side single mechanical seal and atmosphere side radial seal ring. 2 connections for foreign flushing liquid.



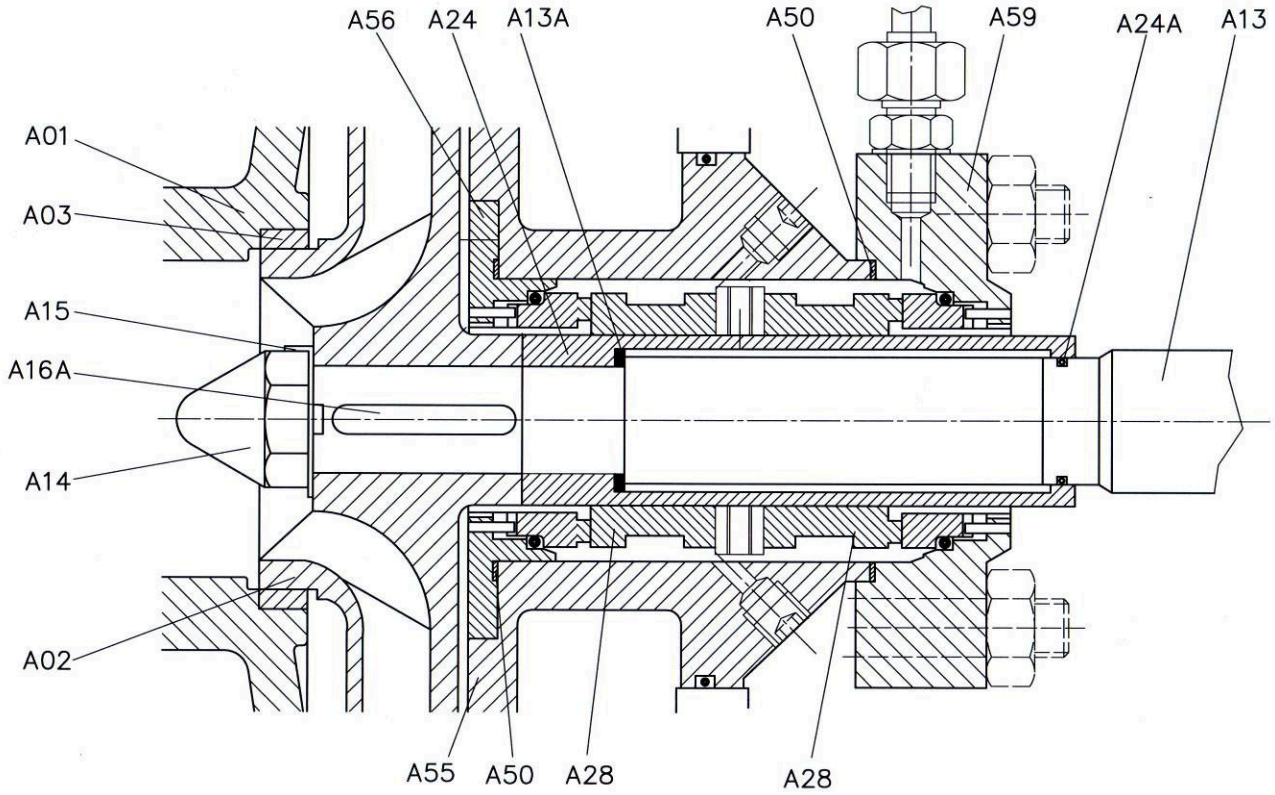
ATTENTION: The plug screw pos. A37d must be unclosed during the filling of the sealing medium box. Until the sealing medium discharge at the plug screw you must let open the outlet. So you prevent the creation of air cushion. Then close the plug screw again.

4.3.4 Shaft sealing with double mechanical seal in assembly "back to back"

Abdichtung durch Doppelgleitringdichtung (Kurzbeschreibung D)	Shaft sealing with double mechanical seal (Code D)

D1

Doppelgleitringdichtung mediumseitig und atmosphärenseitig nicht entlastet, mit Fremdflüssigkeit als Sperrmedium.	Double mechanical seal, medium- and atmosphere side unbalanced, with foreign flushing liquid.



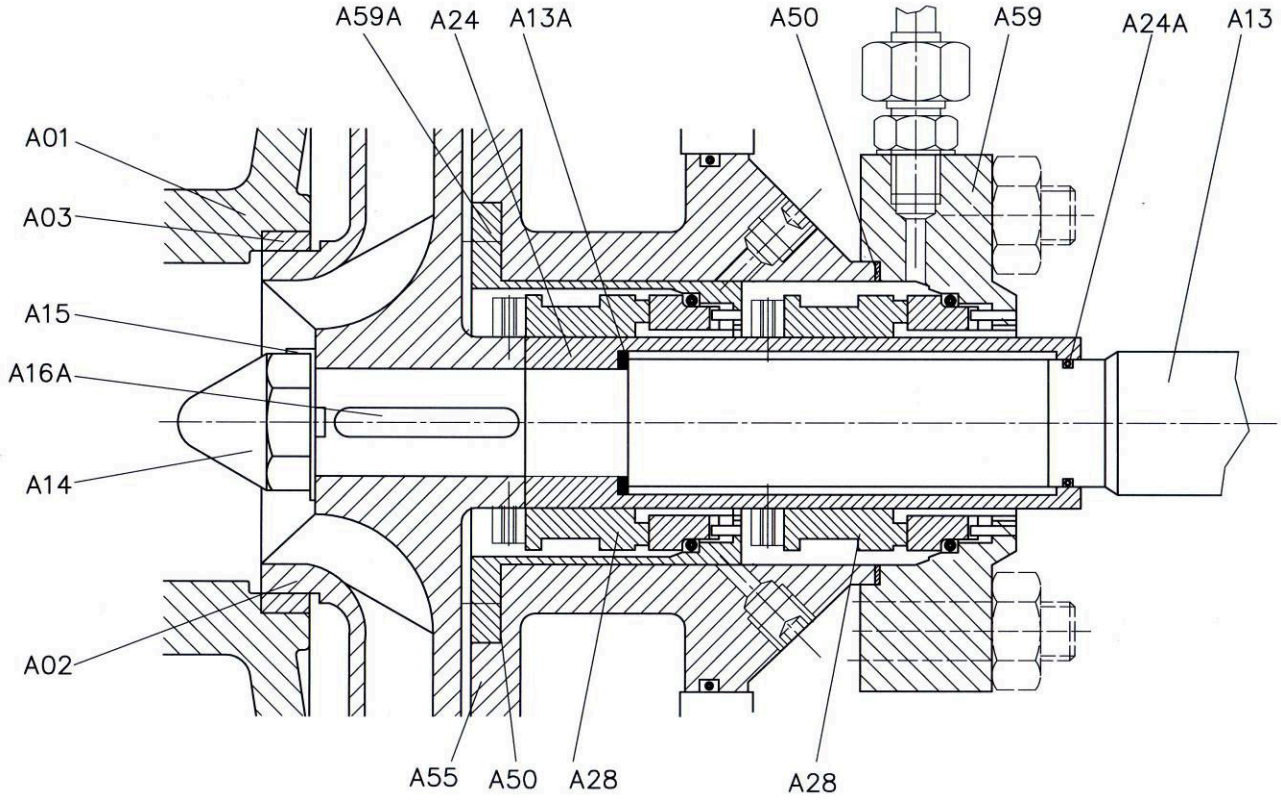
The pressure in the cavity between the two seals has to be ca. 1 bar over the working point of the pump. So it can be guarantee that the sealing faces are flushed only with pure medium.
The differential pressure shouldn't overstep 4 bars, because of increasing abrasion and invalid heating of the mechanical seal.
The sealing medium always has to circulate.

4.3.5 Shaft sealing with double mechanical seal in assembly "tandem"

Abdichtung durch Doppelgleitringdichtung (Kurzbeschreibung D)	Shaft sealing with double mechanical seal (Code D)

D2

Doppelgleitringdichtung mediumseitig und atmosphärenseitig nicht entlastet, mit Fremdflüssigkeit als Sperrmedium.	Double mechanical seal, medium- and atmosphere side unbalanced, with foreign flushing liquid.



The sealing room will be flushed non-pressurized with the sealing medium.
The sealing medium always has to circulate.

5 OPERATION AND MAINTENANCE

5.1 Before starting operation

- grease the bearings (grease lubricated)
- open the valves of cooling-, flushing- and blockingwatersystem
- prime pump and suction line and evacuate air from pump casing
  in case of suction operation set non return valve and prime suction pipe with an extra filling pipe to evacuate air when filling from external source.
  If system is under pressure open discharge valve to evacuate air and fill pump and suction line.
- check if it is possible to rotate shaft by hand, if not check following:
  - something blocks the impeller
  - nuts for gland packing are tightened too hard
  - contact of impeller and casing
- control sense of rotation marked by an arrow on the pump, to avoid damage of the pump that is possible when the pump runs for a longer periode in wrong sense.

5.2 Starting operation

- Close discharge valve
- control the shaft sealing

Gland packing:
soft packing must have a leakage between 10 and 20 drops per minute. Is the leakage less or gets the gland packing worm lower the nuts till the leakage is right.

mechanical seal: they are not allowed to have leakage, except a few minutes after the first start in which the rotating and stationary part of mechanical seal get closed

- open the discharge valve for the target flow. The electric motor can be overheated by capacities higher then recommended on the type plate
- adjust the quantity of cooling- and blocking water

5.3 Check after some hours

- check the leakage of the gland packing
- check temperature and noise of the bearings
  temperature stabilisates after some hours in some cases after one day.
- check the running of the whole unit

5.4 Maintenance during operation

- bearings:
  - grease bearings for life time (maintenance free)
  - oil lubricated: control the oil level on the holder or the oil level gage

Intervals for oil change:

Temperature of the bearing point	First change	Any other changes
till 70°C	after 300 operating hours	after 12500 operating hours
70°C – 80°C	after 300 operating hours	after 10000 operating hours
80°C – 90°C	after 300 operating hours	after 7500 operating hours

Lubrications see on page 9, 4.2.3 Lubricants

Steps for oil changing:

- Put a box under the screw plug (pos. 34)
- Unscrew and remove the screw plug and empty the oil
- After emptying, assemble the screw plug and fill in an acceptable oil

monthly check of oil level in the bearing system

- shaft sealing:

Packing gland:
Control of the appropriate leakage 2 or 3 times a week
Packing glands are losing volume in a while – a singular refit of a packing gland ring is necessary.

Mechanical seal:
Mechanical seals are virtually free of leckage.
In event of leckage replace the mechanical seal.
In use of flushing liquid connections the existence of right pressure and enough liquid circulatory must be warranted.

- Controlling of static sealings for leckage.
- Change outworn elastic parts of coupling
- Oversee the engine smoothness of Pump unit (bearing noice, vibrations, etc)

5.5 After longer shutdown

If the pump stand still for longer time it is favourable to turn the shaft from time to time by hand.

This prevents that moving parts and bearings don't getting stucked.
If the pump unit runs in an unheated room the pump should be completely emptied.
If the medium dries out it is possible that the mechanical gland stucks. When using liquids which produce residues, flush the casing of the mechanical seal with solutions or water for cleaning it from residues.

6 FOULT FINDING

Before looking into technical matters of disfunction in operation check the main datas like capacity of pump, required head and installed motor power in relation to the required power of the pump.

6.1 Pump does not deliver expected capacity

- wrong sense of rotation
- suction of air caused by:
  - liquid level in the reservoir of supply is too low
  - liquid disengages air or gases
  - suction line leakes or inclusion of air
  - air is sucked through the shaft sealing
- wrong design of the suction line (cause cavitation and turbulences)
- suction line too long, exceeding admissible height of suction for hot liquids
- too large distance between casing and impeller
- blocked impeller
- friction of pipes and deposits inside

6.2 Leakage of shaft sealing

gland packing:
- damaged packing rings
- wrong mounted
- less or no pressure on priming ring
- vibrations of the shaft

mechanical seal:
- wrong assembly
- vibrations
- blocked mechanical seal caused by soiling
- crackings in the stationary or rotary ring
- damage of the o-rings
- damaged or worn out mechanical seal
- too low pressure of flushing water at double mechanical seal

6.3 Overheating of the bearings

- unsuitable lubrication substances or moisture in the bearings
- large distance between impeller and casing causes higher axial strengths on the bearings
- abrasion on the bearing housing or not carefully mounted bearings
- attrition on the backimpeller causes higher axial strenghts

6.4 Vibrations

- sand, stones or other solids in the casing
- not correctly fixing of the pump unit
- turbulences in supply
- capacity too low
- cavitation (noise)
- foults in the planing of unit

6.5 Exchanging of the electric motor

Remove the coupling guard and loosen the screws between motor and bed-plate. After replacement of the motor adjust the new drive so that the shaft is in the same axis as the pump shaft. Tighten the motor and mount the coupling guard carefully. Control the sense of rotation of the unit.

7 ASSEMBLING AND DISASSEMBLING

7.1 Disassembling

- loosen casing screws and remove bearing unit (part 6) with casing cover, impeller and shaft (use 2 crowbars for careful removing from the casing)
- remove impeller nut (part 14) with safety loop (part 15) and remove impeller with 2 crowbars placed between casing cover and impeller behind 2 impeller blades.

7.2 Disassembling of shaft seal

7.2.1 Disassembling of single mechanical seal

- loosen mechanical seal cover (part 59)
- remove casing cover (part 5)
- remove impeller key (part 16), shaft sleeve (part 24) with the rotating part of the mechanical seal and o-ring (part 22)
- remove mechanical seal cover with the stationary ring

7.2.2 Disassembling of double mechanical seal in "back to back" arrangement (D1)

- remove medium side mechanical seal cover including stationary ring of the mechanical seal
- remove impeller key and shaft sleeve with both rotating rings of the mechanical seal
- remove atmosphere side mechanical seal cover from casing cover

7.2.3 Disassembling of double mechanical seal in "tandem" arrangement (D2)

- After disassembling of the pump (7.1) remove the first rotating part of the mechanical seal
- Remove the medium sided cover of the mechanical seal inclusive stationary ring.
- Pull out the shaft sleeve with the atmosphere sided rotating part of the mechanical seal
- Remove the second cover of the mechanical seal (atmosphere sided) with the stationary ring.

7.2.4 Disassembling of gland packing

- remove gland packing flange
- remove packing ring and soft packing (part 25) and if installed also priming ring (part 27)

7.3 Disassembling of the bearing system

- drain bearing bracket in case of oil lubrication bearings with drain plug (part 34)
- remove both bearing cover (part 11) which are mounted with screws on bearing bracket (part 9)
- remove shaft nut (part 19) and washer (part 20) from motor side bearing
- remove shaft with bearings with soft strikes on the shaft end from bearing bracket.

8 ASSEMBLING OF PUMP

8.1 Assembling of bearing system

- heat bearings up to a temperature of 100°C and pull them on the shaft
- to avoid cant when pushing the shaft into the bearing bracket put the shaft into vertical position
- thread washer and nut to fix motor side bearing on the shaft
- assemble bearing cover with lip ring and refill bearing bracket with oil (oil lubricated bearings)

8.2 Assembling of shaft seal

8.2.1 Assembling of mechanical seal

- The sealing surfaces must be clean and the seals must be intact
- Install the stationary seal ring of the seal carrier
- seal carrier on pump cover (Part 5) screw and insert it into the lantern. (Note the gauge of the mechanical seal according to manufacturer) mounted Rotating part of the mechanical seal on the shaft sleeve (part 24).
- The shaft sleeve (part 24) onto the shaft with a rotating unit.

8.2.2 Installation of double mechanical in "back to back" arrangement

- The sealing surfaces must be clean and the seals must be intact.
- The stationary seal ring of the seal carrier (Part 59) and use this to screw the pump cover.
- Pump cover into lantern
- Rotating parts of both seals (back to back) onto the shaft sleeve (part 24). Attach spacers after each adjustment dimension of the seals between the rotating parts.
- Shaft sleeve (part 24) onto shaft and seal carrier (Part 56) on pump cover (medium) screw.

8.2.3 Installation of the mechanical seal in "tandem" - assembly

- The sealing surfaces must be clean and the seals must be intact. The steady-ring seal in the first seal carrier(Part 59) and use this fit into the pump cover.
- Rotating part of the first seal mounted to observe the adjustment dimension on the shaft sleeve and slide it onto the shaft.
- seal carrier (Part 59 A) with a stationary ring of the second seal in the pump cover (medium) screw.
- Rotating part of the second seal mounted with respect to the adjustment dimension.

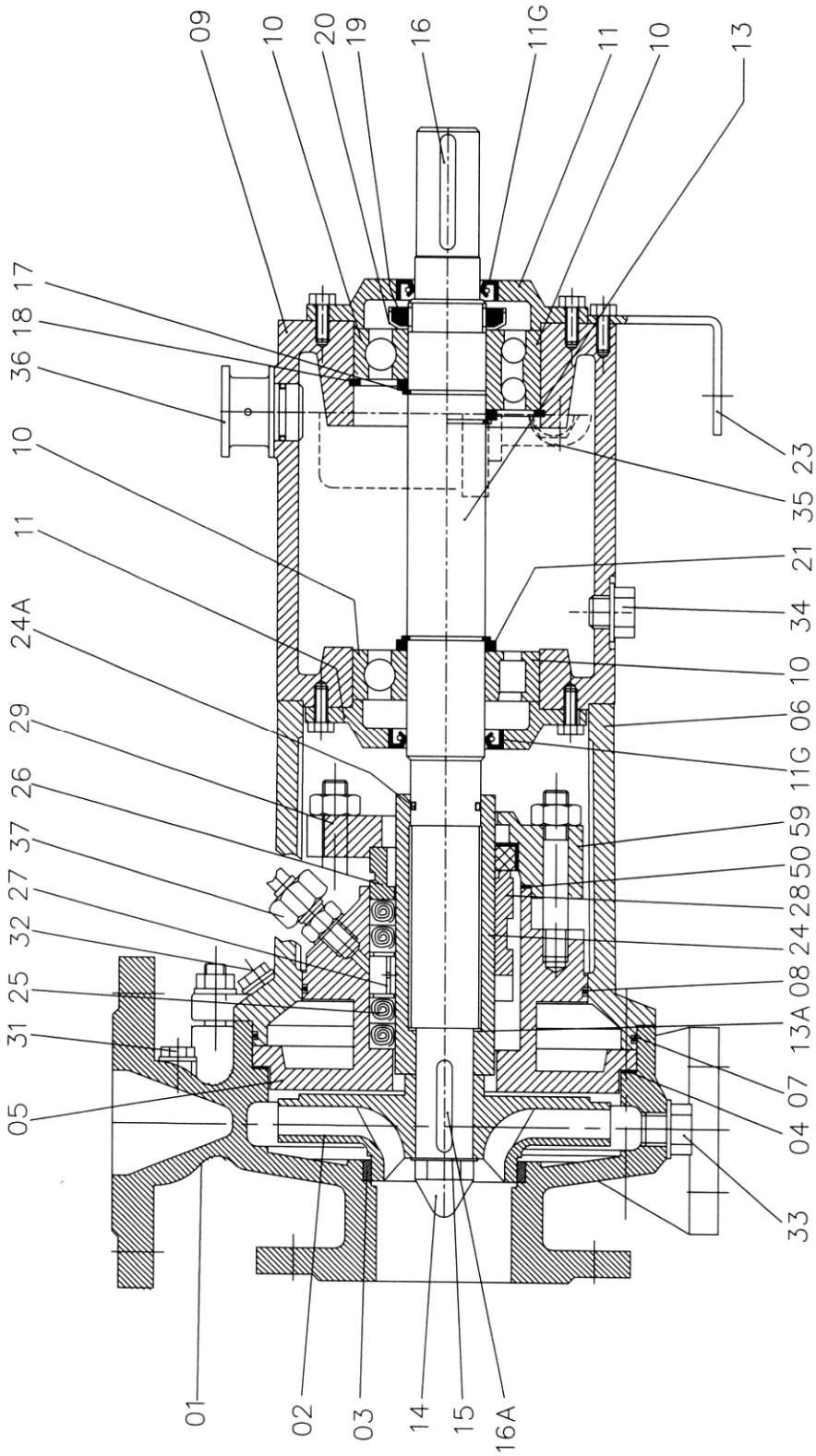
8.2.4 Installation of packing

- After insertion of the pump cover (Part 5) in the lantern (Part 6) and inserting the shaft sleeve, the packaging lines (part 25) with the ends offset press in the pump cover (As shown in 4.3.1)
- Packing pressure ring (part 26) and packing glasses fit

8.3 Pump assembly

- According to reap-bearing support assembly and insertion of the impeller shaft seal seat with a suitable lubricant
- Install and impeller keyed onto the shaft and secure with lock washer (part 15) and impeller nut (part 14).
- The slide unit back inside the housing and tighten the nuts on the coil housing.

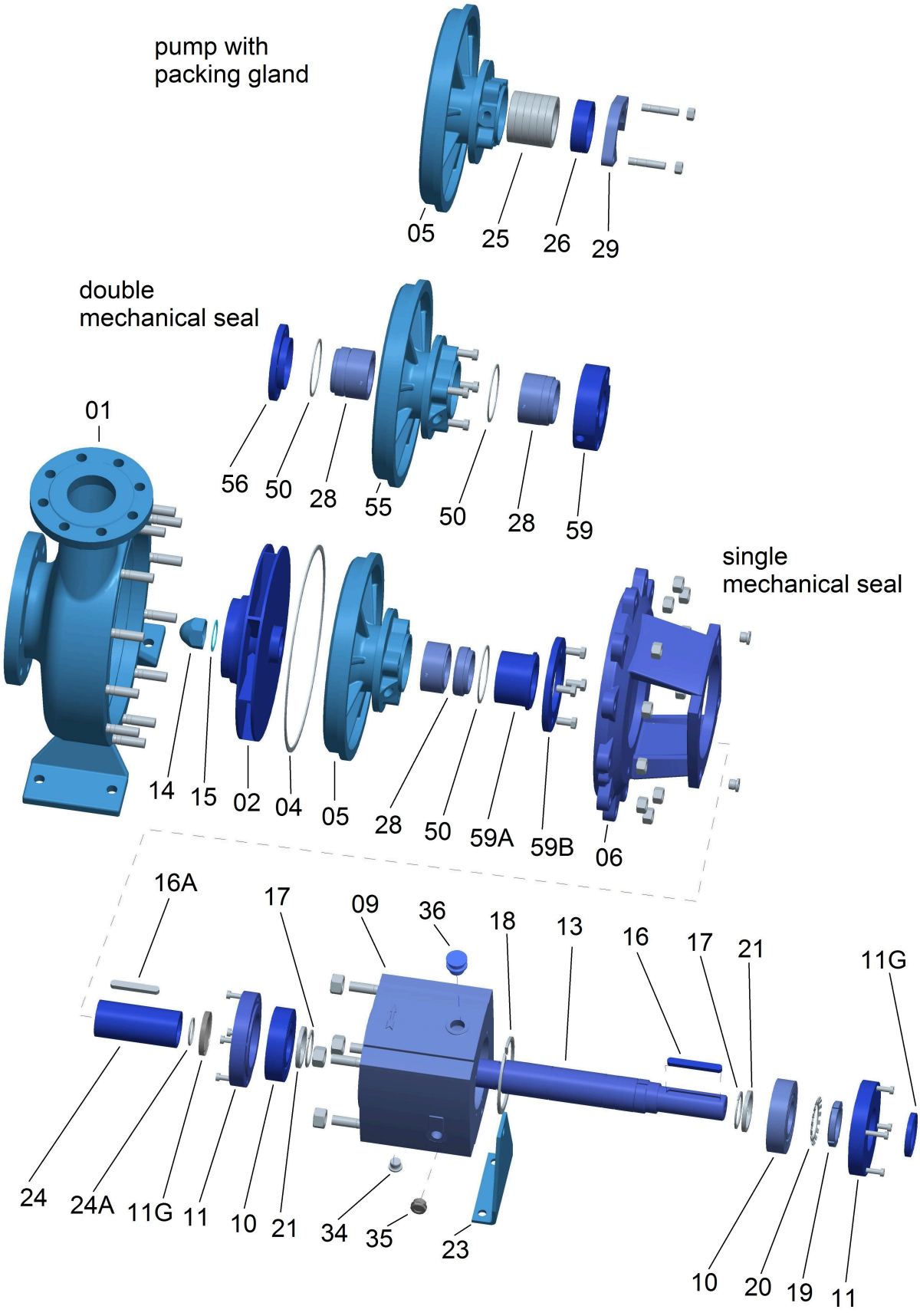
9 SECTIONAL DRAWING



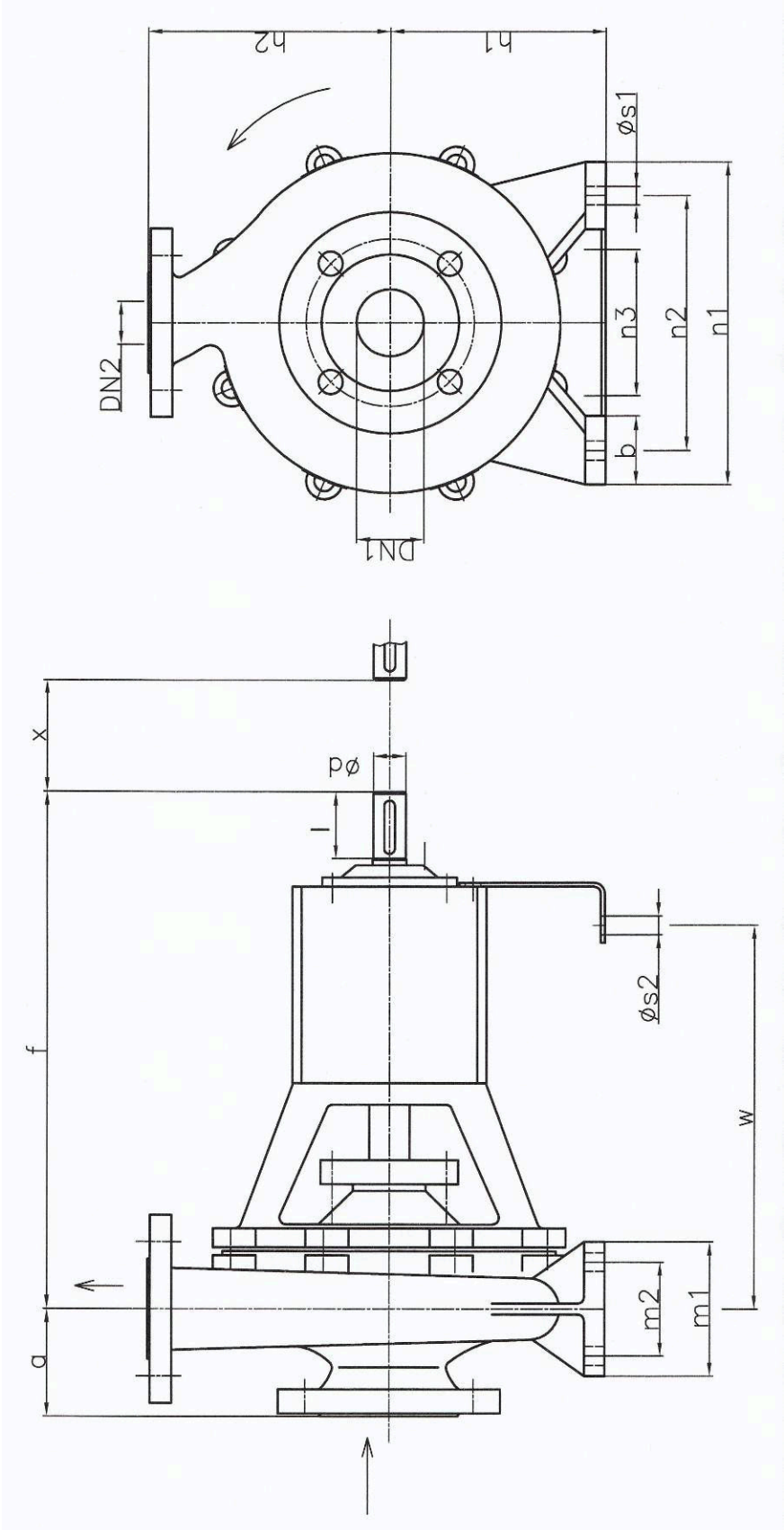
10 PARTS DESIGNATION

Position	Bezeichnung	designation
A01	Pumpengehäuse	*pump casing*
A02	Laufrad	*impeller*
A03	Spaltring	*wear ring*
A04	Gehäusedichtung	*casing gasket*
A05	Pumpendeckel	*casing cover*
A06	Laterne	*lantern*
A07	O-Ring	*o-ring*
A08	O-Ring	*o-ring*
A09	Lagergehäuse	*bearing bracket*
A10	Lager	*bearing*
A11	Lagerdeckel	*bearing cover*
A11G	Wellendichtung	*radial shaft ring*
A13	Welle	*shaft*
A13A	Distanzring	*shaft ring*
A14	Laufradmutter	*impeller nut*
A15	Sicherungsblech	*locking plate*
A16A	Passfeder	*key*
A16	Passfeder	*key*
A17	Sicherungsring	*circlip*
A18	Sicherungsring	*circlip*
A19	Mutter	*bearing nut*
A20	Sicherungsscheibe	*locker for bearing nut*
A21	Setzring	*thrust ring*
A23	Stützfuß	*support foot*
A24	Wellenschutzhülse	*shaft sleeve*
A24A	O-Ring	*o-ring*
A28	Gleitringdichtung	*mechanical seal*
A33	Verschlussschraube	*plug*
A34	Ölablaßschraube	*plug*
A35	Ölstandskontrolle	*oilcontrol*
A36	Lagerbockentlüftung	*oil filling plug*
A50	GLRD-Trägerdichtung	*mech. seal cover gasket*
A59A	Gleitringdichtungsträger	*mechanical seal cover*
A59B	Gleitringdichtungsflansch	*mechanical seal support*

11 EXPLOSION VIEW



12 DIMENSIONAL DRAWING



	DN1	DN2	a	f	h1	h2	b	m1	m2	n1	n2	n3	w	Øs1	Øs2	d	l	x	kg
32-125	50	32	80	385	112	140	50	100	70	190	140	110	285	14	14	24	50	100	28
32-160	50	32	80	385	132	160	50	100	70	240	190	110	285	14	14	24	50	100	36
32-200	50	32	80	385	160	180	50	100	70	240	190	110	285	14	14	24	50	100	43
32-250	50	32	100	500	180	225	65	125	95	320	250	110	370	14	14	32	80	100	61
50-125	65	50	80	385	112	140	50	100	70	210	160	110	285	14	14	24	50	100	34
50-160	65	50	80	385	132	160	50	100	70	240	190	110	285	14	14	24	50	100	37
40-200	65	40	100	385	160	180	50	100	70	265	212	110	285	14	14	24	50	100	46
40-250	65	40	100	500	180	225	65	125	95	320	250	110	370	14	14	32	80	100	77
40-315	65	40	125	500	200	250	65	125	95	345	280	110	370	14	14	32	80	100	100
65-125	80	65	100	385	132	160	50	100	70	240	190	110	285	14	14	24	50	100	37
65-160	80	65	100	385	160	180	50	100	70	265	212	110	285	14	14	24	50	100	40
50-200	80	50	100	385	160	200	50	100	70	265	121	110	285	14	14	24	50	100	50
50-250	80	50	125	500	180	225	65	125	95	320	250	110	370	14	14	32	80	100	80
50-315	80	50	125	500	225	280	65	125	95	345	280	110	370	14	14	32	80	100	102
80-125	100	80	100	385	160	180	65	125	95	280	212	110	285	14	14	24	50	100	42
80-160	100	80	100	500	160	200	65	125	95	280	212	110	370	14	14	32	80	100	65
65-200	100	65	100	500	180	225	65	125	95	320	250	110	370	14	14	32	80	140	70
65-250	100	65	125	500	200	250	80	160	120	360	280	110	370	18	14	32	80	140	85
65-315	100	65	125	530	225	280	80	160	120	400	315	110	370	18	14	42	110	140	134
80-160	125	80	125	500	180	225	65	125	95	320	250	110	370	14	14	32	80	140	70
80-200	125	80	125	500	180	250	65	125	95	345	280	110	370	14	14	32	80	140	75
80-250	125	80	125	500	225	280	80	160	120	400	315	110	370	18	14	32	80	140	108
80-315	125	80	125	530	250	315	80	160	120	400	215	110	370	18	14	42	110	140	140
80-400	125	80	125	530	280	355	80	160	120	435	355	110	370	18	14	42	110	140	183
100-200	125	100	125	500	200	280	80	160	120	360	280	110	370	18	14	32	80	140	87
100-250	125	100	140	530	225	280	80	160	120	400	315	110	370	18	14	42	110	140	143
100-315	125	100	140	530	250	315	100	200	150	400	315	110	370	18	14	42	110	140	168
100-400	125	100	140	530	280	355	80	160	120	500	400	110	370	23	14	42	110	140	207
125-250	150	125	140	530	250	355	100	200	150	400	315	110	370	18	14	42	110	140	130
125-315	150	125	140	530	280	355	100	200	150	500	400	110	370	23	14	42	110	140	157
125-400	150	125	140	530	315	400	100	200	150	500	400	110	370	23	14	42	110	140	202
150-250	200	150	140	530	280	375	100	200	150	500	400	110	370	23	14	42	110	180	160
150-315	200	150	160	670	315	400	100	200	150	550	450	140	500	23	18	48	110	180	218
150-400	200	150	160	670	315	450	100	200	150	550	450	140	500	23	18	48	110	180	260
150-500	200	150	180	670	375	500	100	200	150	550	450	140	500	23	18	48	110	180	334
200-315	250	200	200	670	355	450	100	200	150	550	450	140	500	23	18	48	110	180	267
200-400	250	200	200	670	355	500	100	200	150	550	450	140	500	23	18	48	110	180	297
200-500	250	200	200	770	425	560	100	200	150	660	560	140	585	23	18	80	140	180	404
250-400	300	250	200	770	425	600	130	260	190	800	670	140	585	27	18	80	140	180	377
250-500	300	250	200	770	475	670	130	260	190	800	670	140	585	27	18	80	140	180	450

13 CE-KONFORMITÄTSERKLÄRUNG

(Gem. Richtlinie 2006/42/EC)

Hiermit erklären wir, dass die in dieser Betriebsanleitung beschriebenen

Spiralgehäusepumpen der Serie NC

mit freiem Wellenende und Fabrikationsnummer nach Leistungsschild den EG-Vorschriften 2004/108/EG, 2006/42/EG, 2006/95/EG entsprechen.

CONFORMITY DECLARATION OF MACHINERY

(Directive 2006/42/EC)

We SIVAG Pumpen Ges.m.b.H. declare that our

Volute casing pumps range **NC**,

with pump type and serial number as shown on the name plate, are constructed in accordance with Directives 2004/108/EC, 2006/42/EC, 2006/95/EC and assume full responsibility for conformity with the standards laid down therein.

SIVAG PUMPEN GmbH
Aumühlgasse 12-14
A-2020 Hollabrunn

Werner Gössl (Geschäftsleitung)

NOTES:

NOTES:

NOTES:

SIVAG Pumpen GmbH

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