

# INSTRUCTIONS FOR INSTALLATION AND USE

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NON SELF-PRIMING SINGLE-STAGE

STAINLESS STEEL CENTRIFUGAL PUMP KYNX

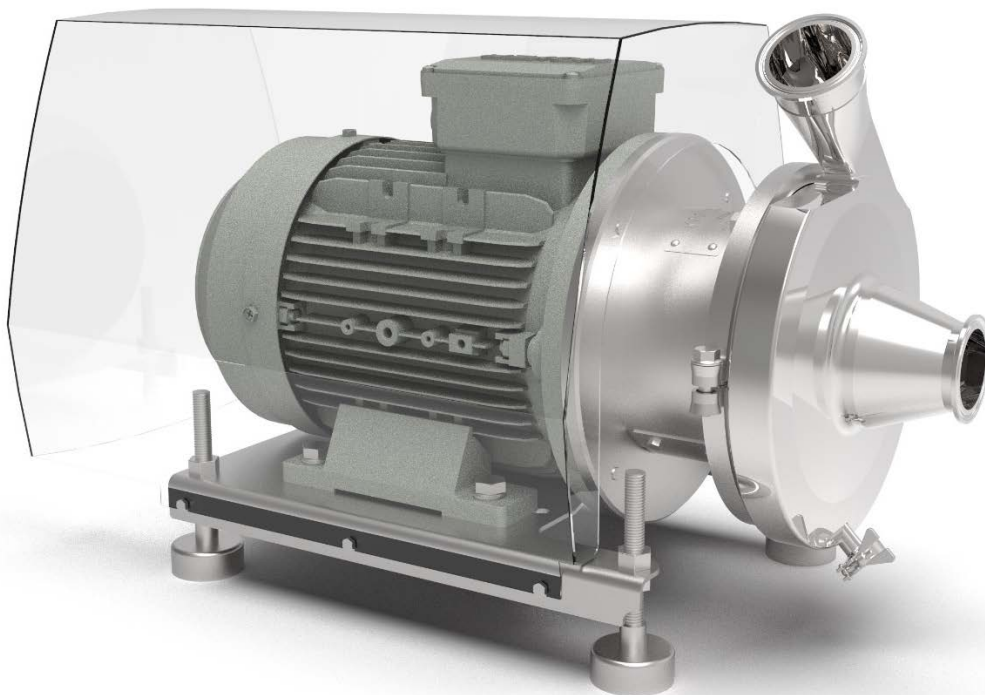


FIGURE.KYNX 180/15 AI

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# CONTENT

1. Hazard symbols .....	3
2. Technical Specifications .....	4
2.1. Description .....	4
2.2. Options .....	4
3. Important Information .....	5
3.1. Intended use.....	5
3.2. Safety regulations.....	5
3.3. Preparation.....	6
3.4. Method of application.....	6
3.5. Nomogram.....	7
3.6. Conveyed material and static seals .....	8
4. Transport and storage .....	10
5. Installation.....	11
5.1. Principles for the installation of the pump.....	11
5.2. Avoidance of seal damage due to dry running.....	12
6. Operation .....	13
6.1. Malfunctions.....	13
6.2. Cleaning .....	15
6.3. Frequency converter operation .....	15
7. Maintenance .....	16
7.1. General information motor .....	16
7.2. Impeller nut .....	16
7.3. Seals.....	17
7.4. Change the sterile mechanical seal .....	18
7.5. Changing the pump shaft .....	19
8. Spare Parts .....	21

## Appendix

**Declaration of Conformity**

**Test Protocol/Data Sheet**

**Characteristic Curve**

**Technical Drawing**

**Assembly and Operating Instructions Motor incl. Declaration of Conformity**

**3.1 Acceptance Test Certificate**

**Welding Documentation (Welders Log, WPS, PQR)**

# 1. HAZARD SYMBOLS



Please note that we do not accept liability for damage and malfunctions resulting from the non-compliance with the symbols below.

The following safety instructions must be observed!  
The following **hazard symbols** are used:



This symbol represents **an immediate risk** to life or health! Failure to comply with this instruction may result in serious health issues, including life-threatening injuries that may be fatal.



This symbol represents **a potential risk** to life or health. Failure to comply with this instruction may result in serious health issues, including life-threatening injuries



This symbol represents **a potentially hazardous situation**. Failure to comply with this instruction may result in minor injuries or property damage.



This symbol is used in the context of information that must be observed when there is a risk of explosion.



This symbol represents important instructions on **how to operate the machine / system properly**. Failure to comply with this instruction may result in faulty behaviour of the machine / system or surrounding equipment.

These symbols **always precede** the text to which they refer to inform the operators of potential hazards before they start any activity on the machine / system.

## 2. TECHNICAL SPECIFICATIONS

### 2.1. Description

The centrifugal pumps of the KYNX series are suitable for use in

- Food and Beverage Industry
- Pharmaceutical and Cosmetics industry
- Chemical industry

and available in different executions

<b>BA</b>	Basic - food and beverage
<b>SM</b>	Smart - food, beverage and easy pharma application
<b>PR</b>	Premium - sterile applications

### Type code

For example - **KyNX 230/15-PR-AL-055/2**

**KyNX** – Kyffhäuser Next Generation

**230** – maximal Impeller Diameter

**15** – Impeller height

**PR** - Premium

**A** – Design - on height adjustable stainless steel machine feet, with stainless steel motor cover

**L** – with Drainage

**055** – 5,5 kW

**2** – 2 pol.

All metal parts in contact with the product are made of Cr-Ni-Mo steel.

Various elastomers selected to suit the individual applications are available for the static seals.

The shaft sealing on the product side by means of a mechanical seal, of which various types are available.

### 2.2. Options

- Motor cover
- Pump trolley
- Drain connection
- Heating jacket
- ASEPTEC-design

The pumps of the series KyNX are not self-priming.

Further technical information can be found in the annexes from page 22 ff.

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## 3. IMPORTANT INFORMATION

### 3.1. Intended use

Care shall be taken to ensure that the machine is only used for its intended purpose. "Intended use" is that for which the product is suitable according to the manufacturer's information in the contract. The intended use also includes compliance with the intended operating and maintenance conditions.

### 3.2. Safety regulations

The following directives were observed during construction and factory acceptance:

- **EG-Maschinenrichtlinie 2006/42/EG**
- **Niederspannungsrichtlinie 2014/35/EU**
- **EMV-Richtlinie 2014/30/EU**

For commissioning, service, and maintenance

- **DIN EN ISO 12100:2010**
- **EN 60204-1**
- **EN ISO 14121-1**

and the assembly and operating instructions must be observed.

- Read safety instructions carefully before starting up the machine.
- Always observe safety instructions to avoid danger to life and limb, health, and property.
- The machine may only be installed and operated by trained specialists.
- Temporary staff and trainees may only work on the machine under the supervision of qualified personnel.

The operations manager is obliged to use operating instructions to instruct their staff to comply with all regulations and instructions.

#### **Technical specifications**

The values specified in the technical specifications must not be exceeded.

#### **Occupational health and safety**

Occupational safety is guaranteed.

### 3.3. Preparation

Welding work shall be carried out by certified welders (DIN EN 287-1) on the basis of construction documents that have been approved for welding (quality class C acc. to DIN EN ISO 5817: 2014-06).



When opening the pump during installation, operation, or maintenance, make sure that hazardous materials cannot escape from the pump. Regulations for handling these conveyed goods must be observed.



When touching the pump during installation, operation, or maintenance, make sure that the temperature of pump components isn't too high. If necessary, take measures to cool pump components.



Legal regulations for disposal must be observed for:

- Conveyed products, including product residues from maintenance work
- Sealing media when using double shaft seal
- Pump components when decommissioning

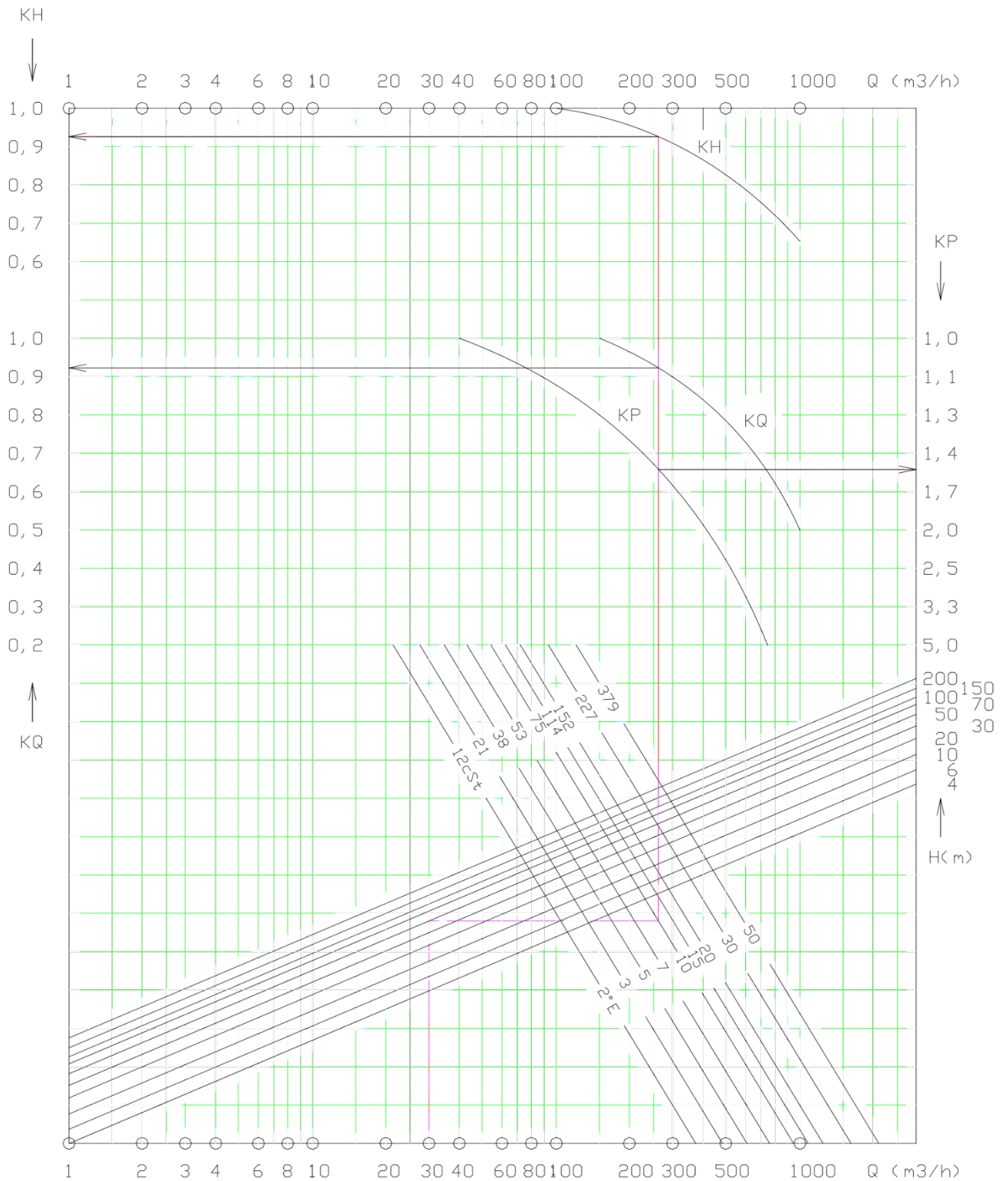
### 3.4. Method of application

The hydraulic values, which are documented in diagrams and performance tables, apply to water at 20 °C.

Products with other viscosities require a special pump design. An approximate correction of the hydraulic values can be found in the nomogram below.

Hydraulic values must also be corrected for products with a different density. Flow rate and geodetic head remain unchanged. Manometric head (pressure) and power requirements change in proportion to density.

### 3.5. Nomogram



Example:	Water values	Correction factors	Values for product with 75 cSt
----------	--------------	--------------------	--------------------------------

30 m<sup>3</sup>/h  
50 m  
9,0 kW

KQ=0,92  
KH=0,93  
KP=1,5

27,6 m<sup>3</sup>/h  
46,5 m  
13,5 kW

The version of the shaft seal depends on the type and temperature of the product, as well as the technological requirements. Elastomer parts shall also be determined according to the type and temperature of the product. The following table contains a selection of possible conveyed goods with information on the resistance of elastomers.

### 3.6. Conveyed material and static seals

Conveyed material and static seal x = resistant / (x) = weak attack / - = unstable					PTFE sheathed or FFKM (Kalrez®) max. 280°C
	°C	NBR (not sterilizable with steam) max. 100°C	EPDM max. 140°C	FKM (Viton®) max. 200°C	
Aerosol HFA227 (liquid, 3 bar)					x (EPDM)
Alcohol	80	-	x	-	
Formic acid 10%			(x)		x (EPDM)
Beer		x	x	x	
Blood		x	x	x	
CIP Solution		x	x	x	
Steam	130	-	x	(x)	
demineralized water		x	x	x	
Eggnog		-	x	x	
Yolk		x	x	x	
Ice cream		x	x	x	
Vinegar 5%		(x)	(x)	(x)	
Acetic acid 10%	50	-	-	-	x (EPDM)
Acetic acid 25-85%	100	-	-	-	x (EPDM)
Fruit juice	100	(x)	x	x	
Fruchtsaftkonzentrat		-	x	x	
Gelatine	40	x	x	x	
Glycol, aqueous	100	x	x	-	
Glycerine	100	x	x	x	
Urea, aqueous	60	x	x	x	
Hot water	135		x	x	
Yeast		x	x	x	
Injektionswasser			x		
Isopropanol	60	(x)	x	x	
Yoghurt		x	x	x	



Conveyed material and static seal x = resistant / (x) = weak attack / - = unstable					PTFE sheathed or FFKM (Kalrez®) max. 280°C
	°C	NBR (not sterilizable with steam) max. 100°C	EPDM max. 140°C	FKM (Viton®) max. 200°C	
Condensed milk 4% / 7% / 10%	90	x	x / (x) / -	x	
Puddle		-	-	-	x (FKM)
Liqueur	20	x	x	x	
Lemonade		x	x	x	
Limonadensirup		x	x	x	
Solvent		-	-	-	x (FKM)
Mash		x	x	x	
Molasses		x	x	x	
Milk	100	x	x	x	
Whey		x	x	x	
NaCl Solution		x	x	x	
Natriumphosphat 10%	20	x	x	x	
Soda lye	20	(x)	x	-	
Caustic soda 2-2.5%	85	x	x	x	
Oil (vegetable/animal)		(x)	-	x	
Pectin	20	x	x	x	
Peppermint oil				x	
Proteinlösung 10%		x	x	x	
Quarkbruch		x	x	x	
Rahm	100	x	-	x	
Salt water	20	x	x	x	
Seifenlösung	20	x	x	x	
Sulfuric acid 10%	20	(x)	x	x	
Tabakemulsion	60			x	
Water		x	x	x	
Wine		x	x	x	
Spice		x	x	x	
Zitrussoft	60	x	x	x	
Sugar solution	60	x	x	x	

## 4. TRANSPORT AND STORAGE

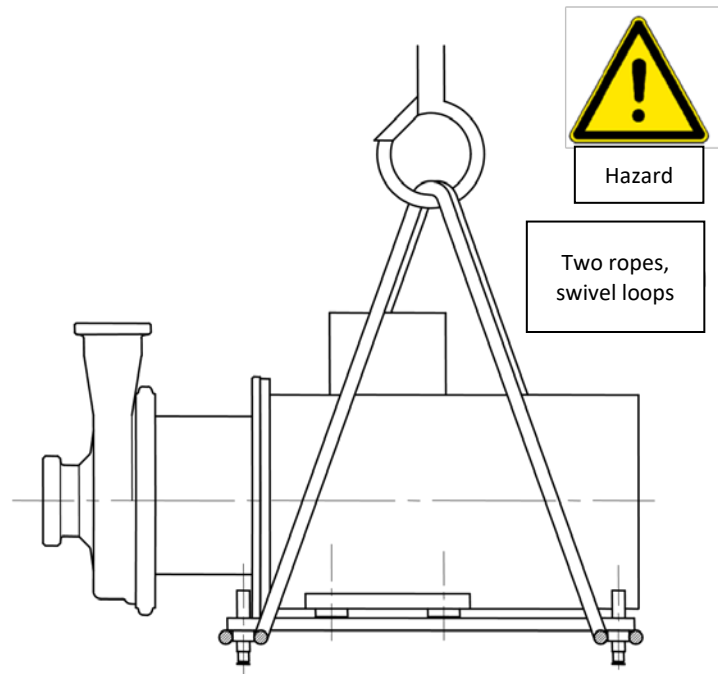
The delivery must be checked immediately for transport damage, and any defect must be reported without delay.

The pump packed in a crate, must be transported as close as possible to the future location, before the crate is removed.

Pumps that weigh below 60kg can be transported manually by two people. Pumps that weigh over 60kg should be lifted from the base of the crate using a crane. Use hemp ropes with  $\varnothing$  16mm and loops (Fig.) for this purpose.

**!Attention!**

Use hemp ropes with  $\varnothing$  20mm for motor outputs of 11-22 kW. Observe general regulations for transport, storage, and lifting gear.



Because grease fillings in the bearings of electric motors harden, pumps should not be stored for longer than three years. Special protection is not required.

Spare parts should be stored in a dry, dust-free, moderately ventilated room at +20 °C to –10 °C. Failure to comply with these temperature limits may reduce the service life of rubber parts.

## 5. INSTALLATION

### 5.1. Principles for the installation of the pump

The pump must only be taken out of its box in the immediate installation site.

**When connecting it to the pipe system, make sure that the pipes are exactly fitted and do not strain the pump.**

Before connecting the motor, values of motor rating plate must be checked with regard to the capacity for use in the existing mains power system.

After the motor has been connected, check the direction of rotation by short test run (1-2sec). When seen through the ventilation flap, the ventilator must turn in a **clockwise**. A wrong direction of rotation leads to malfunction of the pump and must be avoided.



This work must only be carried out by persons authorized to do so.



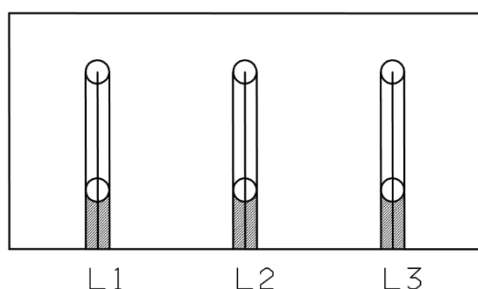
Make sure that the motor is ventilated. A distance of 50 mm from the wall must be maintained on the ventilation side (for pumps without motor cover)



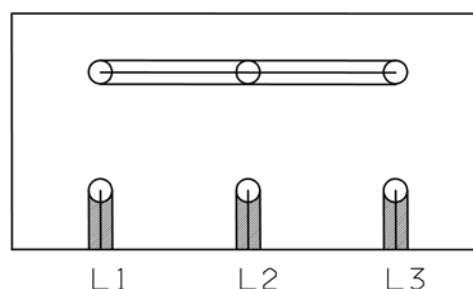
Before opening the pump, the motor must be disconnected from the mains power supply.

For frequency converter operation, see the operation of frequency converter mode (chapter 6.3)

**Δ circuit**



**Y-circuit**



**In any case, the motor must be connected in accordance with the separate information on the motor nameplate! Local regulations for this must be observed.**

The use of electronic slow starters offers further advantages and therefore it is to be recommended instead of the star-delta connection.

Soft start means:

- Avoidance of extreme loads on pipe joints and other plant components and elements of the pump while switching on
- Prolongation of the service life of the pump and of all its plant components
- Prolongation of life of the shaft seal of the pump
- Reduction in noise pollution while switching on the pump

The nominal current specified on the motor nameplate must not be exceeded.

The operating point of the pump must be checked by measuring the volume flow and the electrical current.

Overflow may cause overload! Avoid overload by installation of an aperture or control valve in the pressure line.

Compare the characteristic curve of the pump to learn overflow area.

## 5.2. Avoidance of seal damage due to dry running

Mechanical seals wear out extremely quickly when running dry due to lack of heat dissipation.

Therefore, we recommend the following measures:

1. Installing a dry running sensor in the suction line or the bottom of the tank, if there is a risk of dry running, to switch off the pump
2. Installing a dry running sensor in the seal water area in automated systems.
3. No operation is allowed whatsoever if there is no liquid in the pump and the seal water area.
4. If there is no pipeline network available for a functional test, for example, for checking the direction of rotation, tests can be performed as follows.
  - Close the suction nozzle using a blank
  - Fill water up to the top of the pressure nozzle
  - Close the pressure nozzle tightly using a matching blank
  - Operate for a maximum of 5 seconds
5. Informing operating personnel of the issues of dry running and damage to the seals

We would like to point out that there is no guarantee for mechanical seals.

Premature seal failures are due to operational errors such as dry running, insofar as the seal is considered suitable for the specific application in terms of its design and material combination.

All pumps are checked on the test rig for shaft sealing.

Defective seals in delivered pumps are therefore ruled out.

## 6. OPERATION

### 6.1. Malfunctions

#### Reduction of conveying values

Cause	Measure
Suction line leaking	Seal suction line
Mechanical seal defective	Replace seal
Housing seal worn	Replace seal
Sealing rings in suction and pressure nozzle worn out	Replace sealing rings
Pumped liquid heavily permeated by gas	Prevent gas uptake by the liquid or degas the liquid

#### Pump do's not pumping

Cause	Measure
Shut-off in suction and pressure pipes closed	Open shut-off devices
Suction line blocked	Clean suction line

#### Mechanical seal *leaking*

Cause	Measure
Sealing elements consumed, broken or poorly installed	Renewing the mechanical seal

#### Overload of the engine

Cause	Measure
(correctly set circuit breaker switches off)	
The pump's back pressure is significantly lower than stated in the order data	Installation of throttle visors, Impeller correction, Speed adjustment

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**Noisy operation**

Cause	Measure
Bearings faulty	Replacing bearings and sealing elements
Cavitation	Reduction of temperature in the inlet, Increase in the inlet height, Magnification (nominal width) of the suction line
Clutch toothed ring worn (version with bearing carrier)	Renewing the tooth wreath
Shaft alignment insufficient (execution with bearing carrier)	Make wave alignment

## 6.2. Cleaning

The pumps must be cleaned in the through-flow, depending on product technology requirements (CIP - Cleaning in Place).

Washing solution: Nitric acid up to 2%

Sodium hydroxide solution, up to 5%, 60-80 °C (max. 95 °C)

Special versions can be SIP-cleaned for special requirements (SIP - Steam in Place).

Steam temperature: up to 140 °C

Pump switched off during SIP!

Other sterilisation processes must be agreed with the manufacturer for the relevant special versions.

## 6.3. Frequency converter operation

The pumps are suitable for frequency converter operation.



Caution

Observe operating instructions for the frequency converter!

When operating at frequencies above 50 Hz, there is a risk of exceeding the rated current specified on the motor nameplate. It is essential to avoid this.

Suitable measures are:

- Limiting the output of the frequency converter
- Where appropriate, using the self-adjusting parameter of the frequency converter with regard to the drive motor (not available for all frequency converters)
- Using motors with PTC thermistors



Caution

It must be ensured that the frequency does not exceed 60Hz

Motors with a rated speed of approx. 2.900 r.p.m. @ 50 Hz or 3.500 r.p.m. @ 60 Hz may be operated at a **maximum of 60 Hz** and

Motors with a rated speed of approx. 1.450 r.p.m. @ 50 Hz or 1.750 r.p.m. @ 60 Hz may be operated at a **maximum of 60 Hz**.

Motors must be equipped with PTC thermistor detectors when operated with.

In any case, a motor equipped with cold conductor sensors must be used when operating explosion-proof motors with frequency converters. The cold conductors shall be evaluated by the frequency converter.

EExe-Motors must have a certificate of conformity for operation with a frequency converter. This certificate must indicate the motor type and the frequency converter type.

This certificate is not required for EExd -Motors. Therefore, the use of EExd-Motors for frequency converter operation is oriented.

## 7. MAINTENANCE

### 7.1. General information motor

The bearings are equipped with lifetime lubrication. Re-lubrication is not required. We recommend replacing bearings preventively after 20,000 operating hours. Defective bearings must be replaced immediately.

It is also prescribed how often the pumps may be started per hour, see tab. 1.1.

P [kW]	Starts per hour
4	15
7,5	15
11	12
30	12
≥ 30	≤ 10

[Tab.1.1.]



The motor must be disconnected from the mains for all maintenance tasks described here!

### 7.2. Impeller nut



For mounting the Impeller nut (922), low-strength liquid screw locking agent must be used. (930) for example (Loctite).



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### 7.3. Seals

The service life depends on the type, temperature, and pressure of the conveyed material.

We recommend changing the seals preventively yearly where appropriate.

When mounting the Seals, it is very helpful if you spray the O-rings with some cleaning alcohol.

**Never apply oil or grease to O-rings made of EPDM.** They are not resistant to oil or grease.

#### **Shaft seal / mechanical seal**

The service life of the shaft seal / mechanical seal depends on the following:

- Type of conveyed material
- Temperature of conveyed material
- Pressure of conveyed material
- Design of the shaft seal / mechanical seal

Dry running will destroy the mechanical seal very quickly.

For this reason, it is not possible to say when a change may be necessary.

In the case of pumps that are integrated into systems that cannot fail, we recommend changing the shaft seal / mechanical seal preventively during the regular maintenance work on the system.

When changing mechanical seals, observe the following:

- SiC and carbon rings are brittle

They must be installed without using excessive force.

It is helpful to wet elastomers with water or a soap solution.

Do not use oil, as oil-coated sliding surfaces may reduce service life.

- Do not touch sliding surfaces with fingers.

They must be kept perfectly clean.

## 7.4. Change the sterile mechanical seal



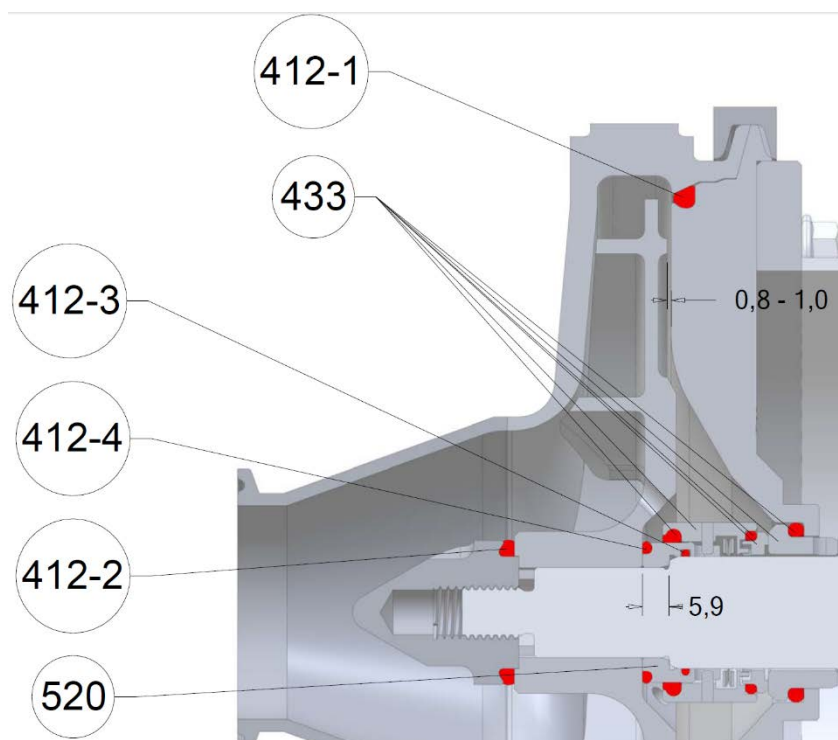
<http://kynx-glr-d-steril.aseptec.de>

### Dismounting:

1. Remove the clamping ring (515) and the volute casing (102)
2. Loose the impeller nut (922) ( light hammer scale on a spanner) and remove the impeller (230)
3. Pull the rotating parts of the mechanical seal (433) with the sleeve (520) and O-ring from the shaft (210)
4. If necessary, loose the screw and remove the casing cover (161)
5. Depress the fixed part of the mechanical seal (433) with O-ring out of the casing cover (161)

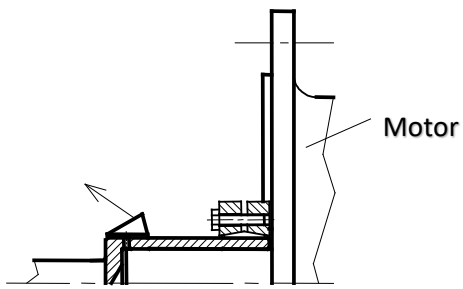
### Mounting: (it is very helpful if you spray the O-rings with some cleaning alcohol)

6. Mounting of the casing cover (161) to the lantern (344), tight the screws
7. Press the new fixed part (433) of the mechanical seal with new O-ring in the casing cover (161)
8. Put the rotating parts (433) of m echanical seal with the sleeve (520)and O-ring on the shaft
9. Push the impeller (230) on the shaft (210) and stress it with the impeller nut (922)
10. Mounting of the impeller nut (922) ( light hammer scale on a spanner)
11. Check the gap between impeller back wings and casing cover (fig., they must be 0,8 – 1,0 mm )
12. Mounting of the volute casing (102) and the clamping ring(515)
13. Check if the impeller rotate free in the pump without touching any casing parts by turning the impeller from hand

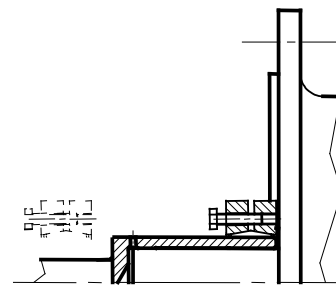


## 7.5. Changing the pump shaft

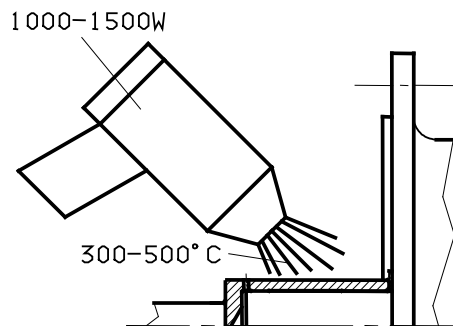
### Disassembly



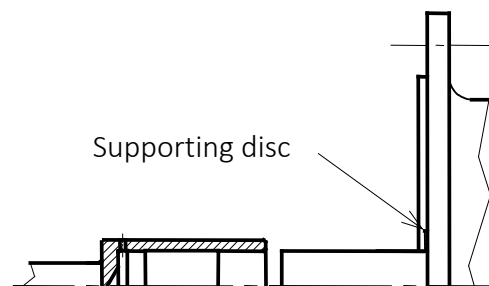
1.Remove adhesive strips



2.Remove shrink disc



3.heat shaft



4.pull of the shaft

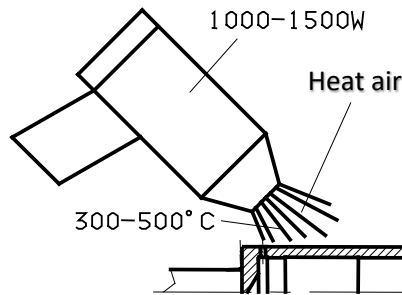
Assembly



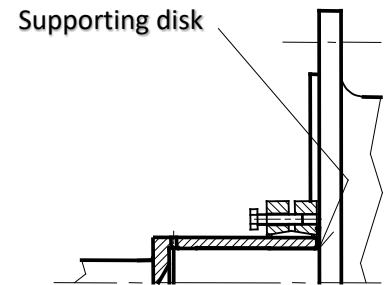
**Shrink disc never clamp without plug-in shaft on the motor shaft!**  
**Allow the shaft to cool before tightening with the torque wrench!**



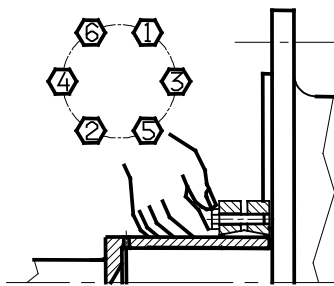
1. Cleaning the motor shaft



2. Heat shaft

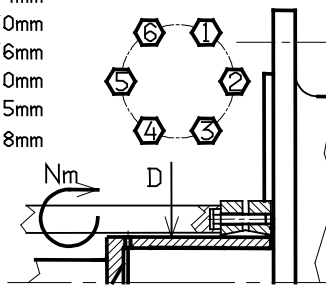


3. Insert the shaft and shrink disc

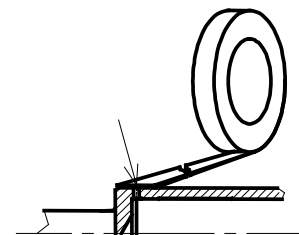


4. Mount the shrinking disk

- 5 Nm / D=24mm
- 5 Nm / D=30mm
- 12 Nm / D=36mm
- 12 Nm / D=50mm
- 12 Nm / D=55mm
- 12 Nm / D=68mm



5. Mount the shrinking disk firmly with torque wrench

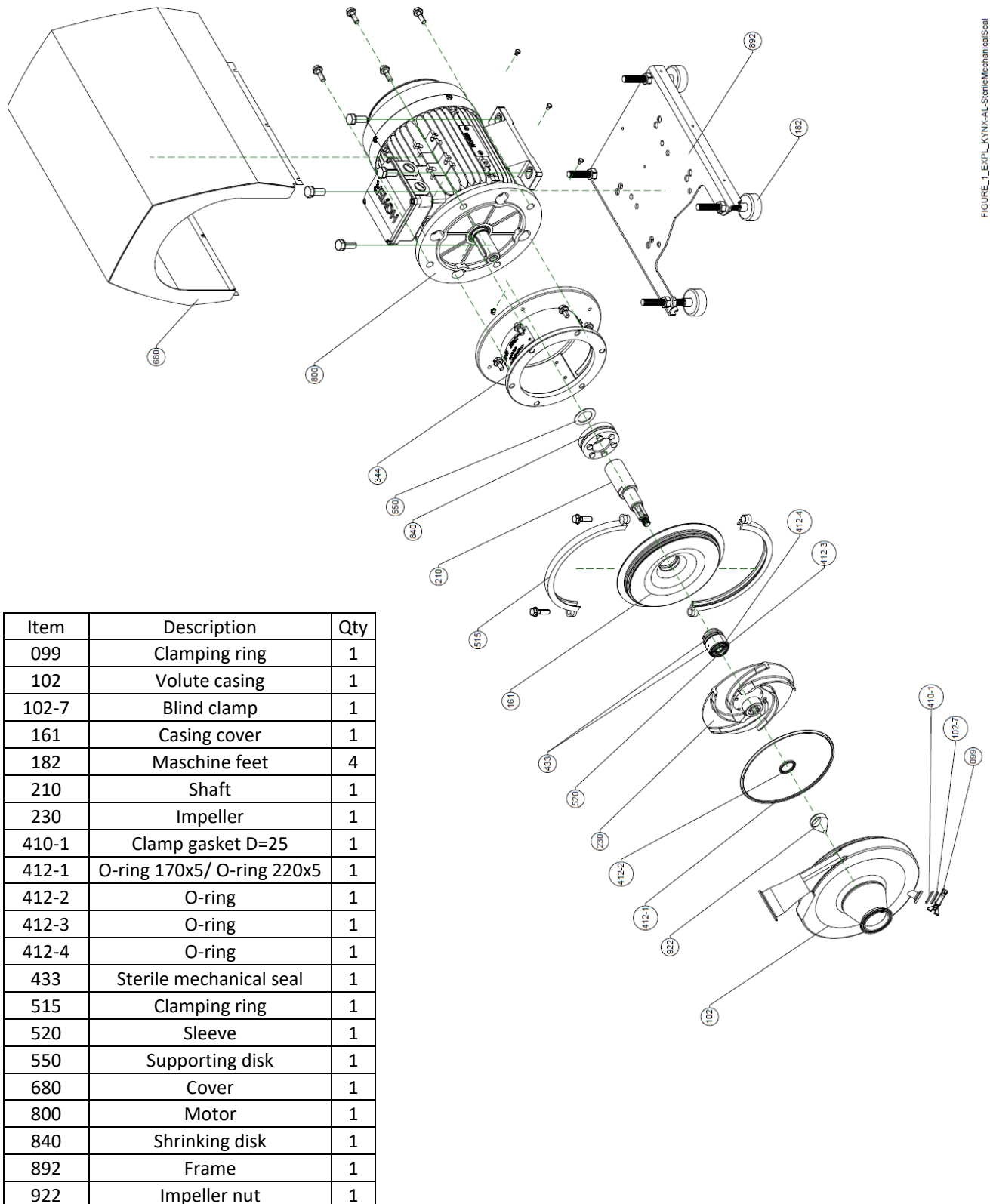


6. Close ventilation hand-tight hole

## 8. SPARE PARTS KYNX

To order spare parts, search for the relevant spare part / wear part in the figure and its associated item number.

Let us know the item no. from the list below, as well as all data from the pump nameplate (the pump's reg. no. is important).



FIGURE\_1\_EXPL\_KYNX-AL-SterileMechanicalSeal

**Wear parts KYNX up to and including engine size 180 consisting of**

Item	Description	Quantity
433	Mechanical seal	1
412-1	O-ring 170x5/ O-ring 220x5	1
412-2	O-ring 25,00x3,53	1
412-3	O-ring 25,12x1,78	1
412-4	O-ring 25,07x2,62	1
410-1	Clamp gasket D=25	1

**Wear parts KYNX engine size 200 consisting of**

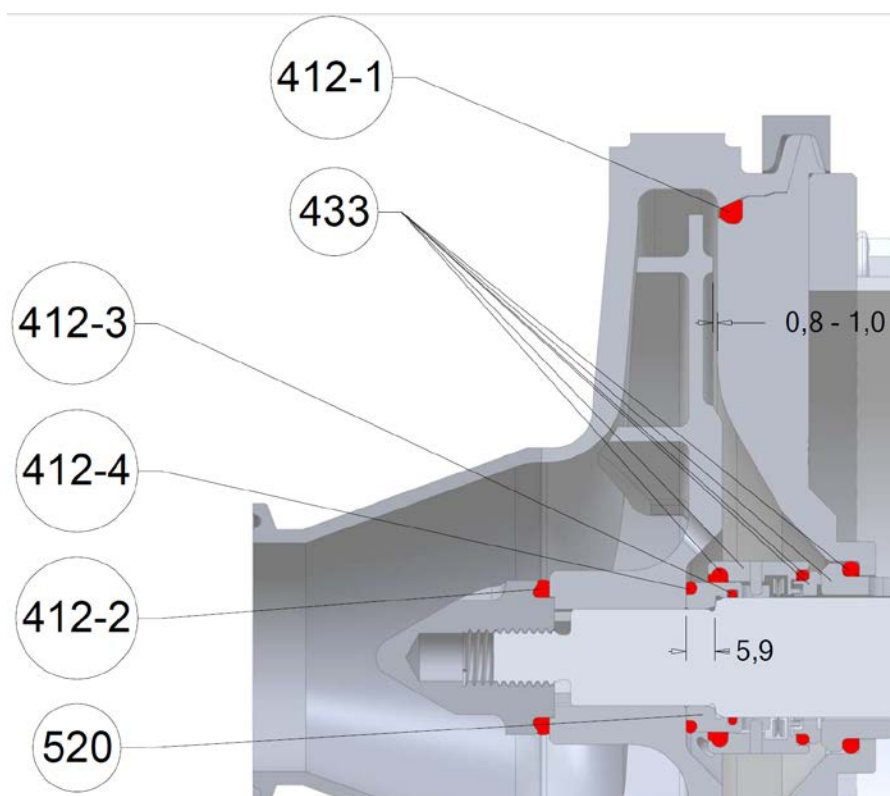
Item	Description	Quantity
433	Mechanical seal	1
412-1	O-ring 170x5/ O-ring 220x5	1
412-2	O-ring 29,74x3,53	1
412-3	O-ring 35x1,8	1
412-4	O-ring 35x3	1
410-1	Clamp gasket D=25	1

**Note: Item 412-1**

KYNX 180, the O-ring dimension is 170x5

KYNX 230, the O-ring dimension is 220x5

**Note: The sleeve (520), here as an example with the measure 5,9 is not part of the wearing parts and this must be ordered separately.**



# INSTRUCTIONS FOR INSTALLATION AND USE

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SELFPRIMING

STAINLESS STEEL CENTRIFUGAL PUMP KYNX HYBRID

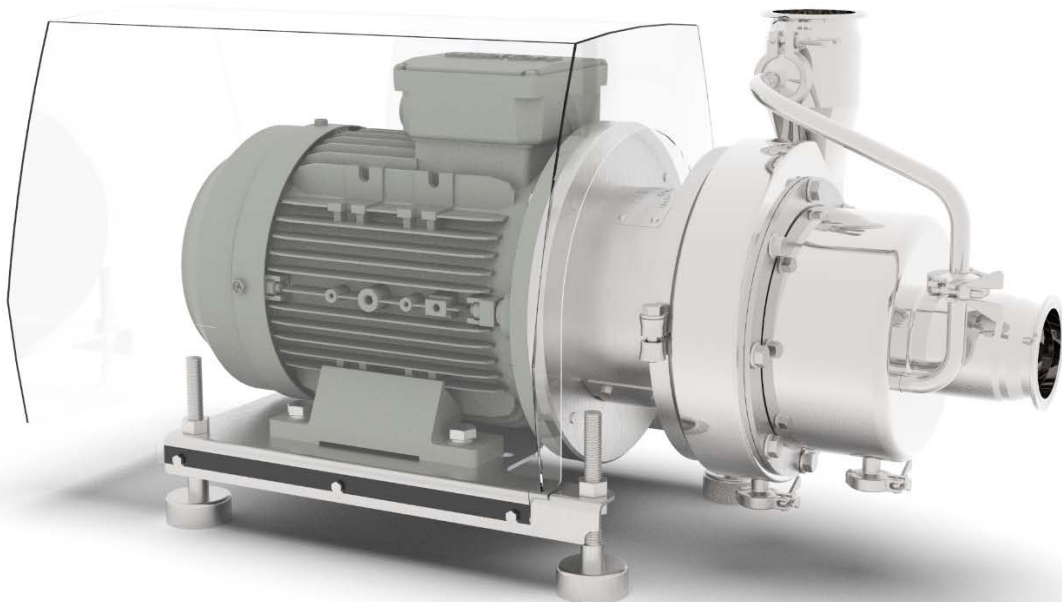


FIGURE.KYNX HYBRID 180/25 AL

**Kyffhäuser Pumpen Artern GmbH**

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☎ +49 3466 7400-22

Website: [www.kpa-pumps.de](http://www.kpa-pumps.de)

E-mail: [info@kyffpa.de](mailto:info@kyffpa.de)



# CONTENT

1. Hazard symbols .....	3
2. Technical Specifications.....	4
2.1. Description .....	4
2.2. Options .....	4
3. Important Information .....	5
3.1. Intended use.....	5
3.2. Safety regulations.....	5
3.3. Preparation.....	6
3.4. Method of application.....	6
3.5. Nomogram.....	7
3.6. Conveyed material and static seals .....	8
4. Transport and storage .....	10
5. Installation.....	11
5.1. Principles for the installation of the pump.....	11
5.2. Avoidance of seal damage due to dry running.....	13
6. Operation .....	14
6.1. Malfunctions.....	14
6.2. Cleaning .....	16
6.3. Frequency converter operation .....	16
7. Maintenance .....	17
7.1. General information motor .....	17
7.2. Impeller nut .....	17
7.3. Seals.....	18
7.4. Change the sterile mechanical seal .....	19
7.5. Changing the pump shaft .....	30
8. Spare Parts.....	32

## Appendix

**Declaration of Conformity**

**Test Protocol/Data Sheet**

**Characteristic Curve**

**Technical Drawing**

**Assembly and Operating Instructions Motor incl. Declaration of Conformity**

**3.1 Acceptance Test Certificate**

**Welding Documentation (Welders Log, WPS, PQR)**



# 1. HAZARD SYMBOLS



Please note that we do not accept liability for damage and malfunctions resulting from the non-compliance with the symbols below.

The following safety instructions must be observed!  
The following **hazard symbols** are used:



This symbol represents **an immediate risk** to life or health! Failure to comply with this instruction may result in serious health issues, including life-threatening injuries that may be fatal.



This symbol represents **a potential risk** to life or health. Failure to comply with this instruction may result in serious health issues, including life-threatening injuries



This symbol represents **a potentially hazardous situation**. Failure to comply with this instruction may result in minor injuries or property damage.



This symbol is used in the context of information that must be observed when there is a risk of explosion.



This symbol represents important instructions on **how to operate the machine / system properly**. Failure to comply with this instruction may result in faulty behaviour of the machine / system or surrounding equipment.

These symbols **always precede** the text to which they refer to inform the operators of potential hazards before they start any activity on the machine / system.

## 2. TECHNICAL SPECIFICATIONS

### 2.1. Description

The centrifugal pumps of the KYNX HYBRID series are suitable for use in

- Food and Beverage Industry
- Pharmaceutical and Cosmetics industry
- Chemical industry

and available in different executions

<b>BA</b>	Basic - food and beverage
<b>SM</b>	Smart - food, beverage and easy pharma application
<b>PR</b>	Premium - sterile applications

#### Type code

For example - **KyNX 180/H25AL-055/2**

<b>KyNX</b>	Kyffhäuser Next Generation
<b>180</b>	maximal Impeller Diameter
<b>H</b>	Hybrid
<b>25</b>	Impeller height
<b>A</b>	Design - on height adjustable stainless steel machine feet, with stainless steel motor cover
<b>L</b>	with Drainage
<b>055</b>	5,5 kW
<b>2</b>	2 pol.

All metal parts in contact with the product are made of Cr-Ni-Mo steel.

Various elastomers selected to suit the individual applications are available for the static seals.

The shaft sealing on the product side by means of a mechanical seal, of which various types are available.

### 2.2. Options

- Motor cover
- Pump trolley
- Drain connection
- Heating jacket
- ASEPTEC-design

Under ideal conditions, the pumps of the KyNX-HYBRID series are self-priming up to 3.5m.

Further technical information can be found in the annexes from page 33 ff.

---

## 3. IMPORTANT INFORMATION

### 3.1. Intended use

Care shall be taken to ensure that the machine is only used for its intended purpose. "Intended use" is that for which the product is suitable according to the manufacturer's information in the contract. The intended use also includes compliance with the intended operating and maintenance conditions.

### 3.2. Safety regulations

The following directives were observed during construction and factory acceptance:

- **EG-Maschinenrichtlinie 2006/42/EG**
- **Niederspannungsrichtlinie 2014/35/EU**
- **EMV-Richtlinie 2014/30/EU**

For commissioning, service, and maintenance

- **DIN EN ISO 12100:2010**
- **EN 60204-1**
- **EN ISO 14121-1**

and the assembly and operating instructions must be observed.

- Read safety instructions carefully before starting up the machine.
- Always observe safety instructions to avoid danger to life and limb, health, and property.
- The machine may only be installed and operated by trained specialists.
- Temporary staff and trainees may only work on the machine under the supervision of qualified personnel.

The operations manager is obliged to use operating instructions to instruct their staff to comply with all regulations and instructions.

#### **Technical specifications**

The values specified in the technical specifications must not be exceeded.

#### **Occupational health and safety**

Occupational safety is guaranteed.

### 3.3. Preparation

Welding work shall be carried out by certified welders (DIN EN 287-1) on the basis of construction documents that have been approved for welding (quality class C acc. to DIN EN ISO 5817: 2014-06).



When opening the pump during installation, operation, or maintenance, make sure that hazardous materials cannot escape from the pump. Regulations for handling these conveyed goods must be observed.



When touching the pump during installation, operation, or maintenance, make sure that the temperature of pump components isn't too high. If necessary, take measures to cool pump components.



Legal regulations for disposal must be observed for:

- Conveyed products, including product residues from maintenance work
- Sealing media when using double shaft seal
- Pump components when decommissioning

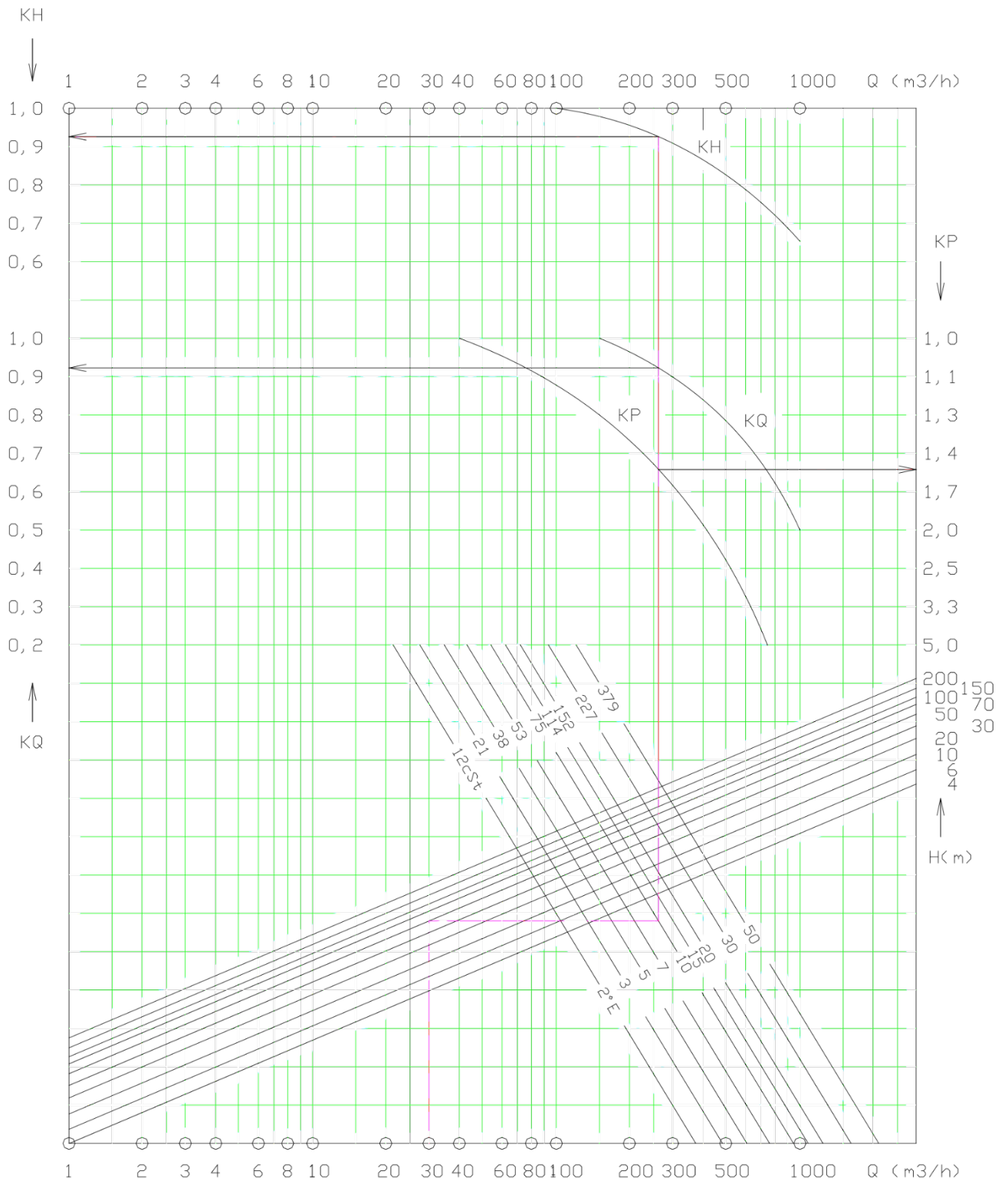
### 3.4. Method of application

The hydraulic values, which are documented in diagrams and performance tables, apply to water at 20 °C.

Products with other viscosities require a special pump design. An approximate correction of the hydraulic values can be found in the nomogram below.

Hydraulic values must also be corrected for products with a different density. Flow rate and geodetic head remain unchanged. Manometric head (pressure) and power requirements change in proportion to density.

### 3.5. Nomogram



Example:	Water values	Correction factors	Values for product with 75 cSt
----------	--------------	--------------------	--------------------------------

30 m<sup>3</sup>/h  
50 m  
9,0 kW

$KQ=0,92$   
 $KH=0,93$   
 $KP=1,5$

27,6 m<sup>3</sup>/h  
46,5 m  
13,5 kW

The version of the shaft seal depends on the type and temperature of the product, as well as the technological requirements. Elastomer parts shall also be determined according to the type and temperature of the product. The following table contains a selection of possible conveyed goods with information on the resistance of elastomers.

### 3.6. Conveyed material and static seals

Conveyed material and static seal x = resistant / (x) = weak attack / - = unstable					PTFE sheathed or FFKM (Kalrez®) max. 280°C
	°C	NBR (not sterilizable with steam) max. 100°C	EPDM max. 140°C	FKM (Viton®) max. 200°C	
Aerosol HFA227 (liquid, 3 bar)					x (EPDM)
Alcohol	80	-	x	-	
Formic acid 10%			(x)		x (EPDM)
Beer		x	x	x	
Blood		x	x	x	
CIP Solution		x	x	x	
Steam	130	-	x	(x)	
demineralized water		x	x	x	
Eggnog		-	x	x	
Yolk		x	x	x	
Ice cream		x	x	x	
Vinegar 5%		(x)	(x)	(x)	
Acetic acid 10%	50	-	-	-	x (EPDM)
Acetic acid 25-85%	100	-	-	-	x (EPDM)
Fruit juice	100	(x)	x	x	
Fruchtsaftkonzentrat		-	x	x	
Gelatine	40	x	x	x	
Glycol, aqueous	100	x	x	-	
Glycerine	100	x	x	x	
Urea, aqueous	60	x	x	x	
Hot water	135		x	x	
Yeast		x	x	x	
Injektionswasser			x		
Isopropanol	60	(x)	x	x	
Yoghurt		x	x	x	

Conveyed material and static seal x = resistant / (x) = weak attack / - = unstable					PTFE sheathed or FFKM (Kalrez®) max. 280°C
	°C	NBR (not sterilizable with steam) max. 100°C	EPDM max. 140°C	FKM (Viton®) max. 200°C	
Condensed milk 4% / 7% / 10%	90	x	x / (x) / -	x	
Puddle		-	-	-	x (FKM)
Liqueur	20	x	x	x	
Lemonade		x	x	x	
Limonadensirup		x	x	x	
Solvent		-	-	-	x (FKM)
Mash		x	x	x	
Molasses		x	x	x	
Milk	100	x	x	x	
Whey		x	x	x	
NaCl Solution		x	x	x	
Natriumphosphat 10%	20	x	x	x	
Soda lye	20	(x)	x	-	
Caustic soda 2-2.5%	85	x	x	x	
Oil (vegetable/animal)		(x)	-	x	
Pectin	20	x	x	x	
Peppermint oil				x	
Proteinlösung 10%		x	x	x	
Quarkbruch		x	x	x	
Rahm	100	x	-	x	
Salt water	20	x	x	x	
Seifenlösung	20	x	x	x	
Sulfuric acid 10%	20	(x)	x	x	
Tabakemulsion	60			x	
Water		x	x	x	
Wine		x	x	x	
Spice		x	x	x	
Zitrusaft	60	x	x	x	
Sugar solution	60	x	x	x	

## 4. TRANSPORT AND STORAGE

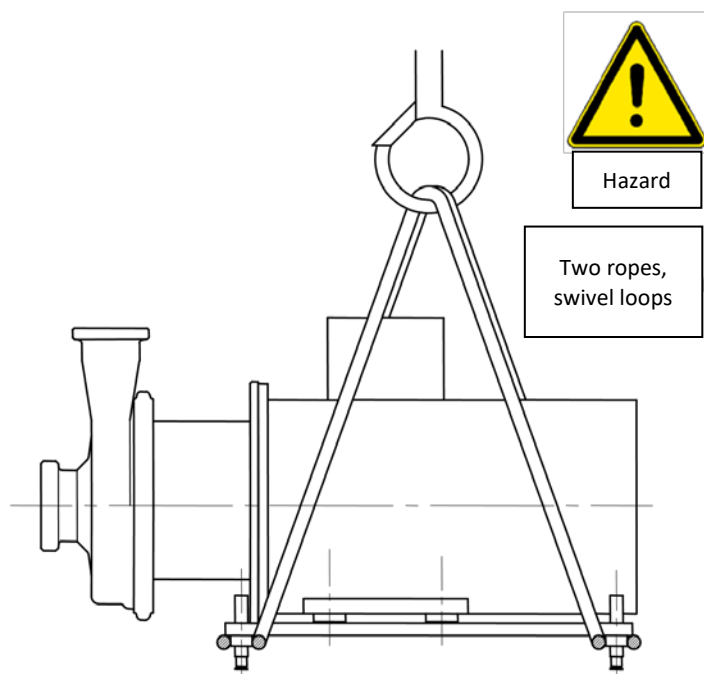
The delivery must be checked immediately for transport damage, and any defect must be reported without delay.

The pump packed in a crate, must be transported as close as possible to the future location, before the crate is removed.

Pumps that weigh below 60kg can be transported manually by two people. Pumps that weigh over 60kg should be lifted from the base of the crate using a crane. Use hemp ropes with  $\varnothing$  16mm and loops (Fig.) for this purpose.

### **!Attention!**

Use hemp ropes with  $\varnothing$  20mm for motor outputs of 11-22 kW. Observe general regulations for transport, storage, and lifting gear.



Because grease fillings in the bearings of electric motors harden, pumps should not be stored for longer than three years. Special protection is not required.

Spare parts should be stored in a dry, dust-free, moderately ventilated room at +20 °C to -10 °C. Failure to comply with these temperature limits may reduce the service life of rubber parts.

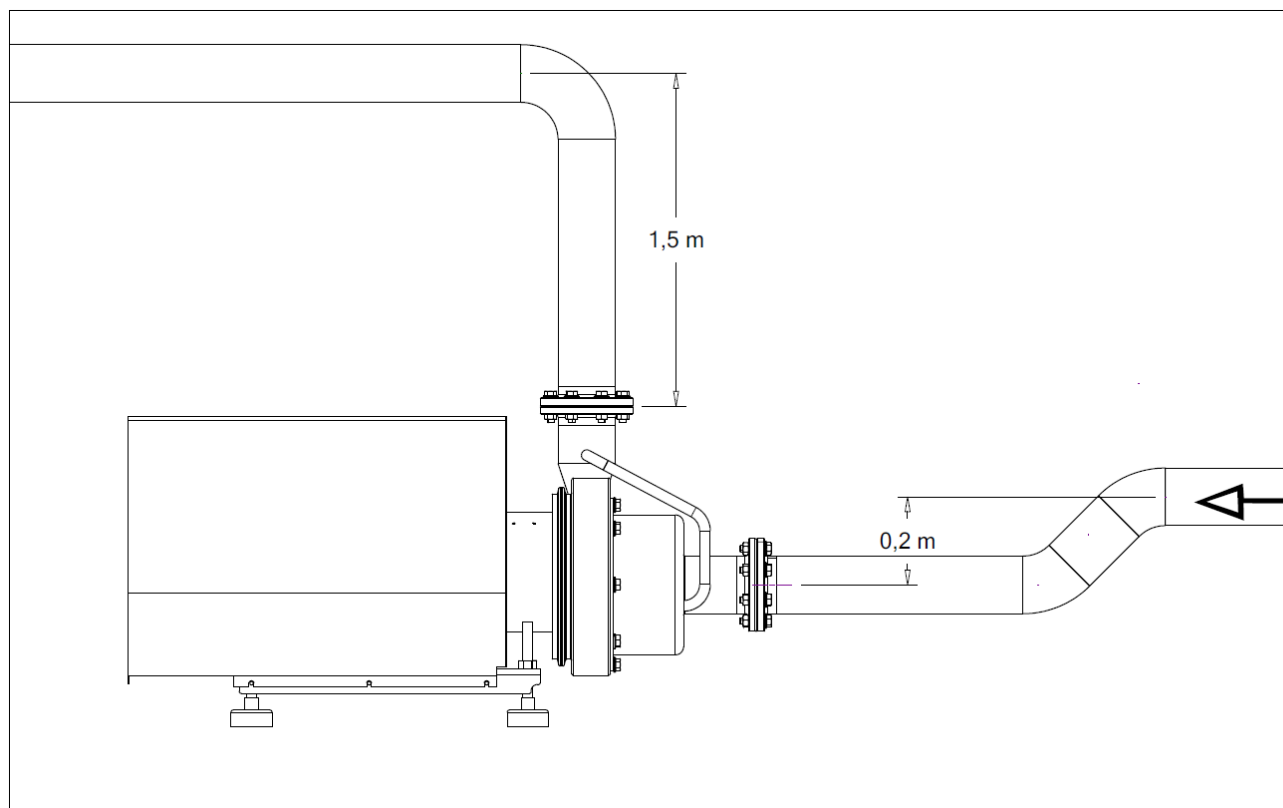


## 5. INSTALLATION

### 5.1. Principles for the installation of the pump

The pump must only be taken out of its box in the immediate installation site.

The following figure shows how to connect the suction and pressure side of the KYNX HYBRID pump.



FIGURE\_3\_connect\_SS\_PS\_KYNX-HYBRID

**When connecting it to the pipe system, make sure that the pipes are exactly fitted and do not strain the pump.**

Before connecting the motor, values of motor rating plate must be checked with regard to the capacity for use in the existing mains power system.

After the motor has been connected, check the direction of rotation by short test run (1-2sec). When seen through the ventilation flap, the ventilator must turn in a **clockwise**. A wrong direction of rotation leads to malfunction of the pump and must be avoided.



This work must only be carried out by persons authorized to do so.



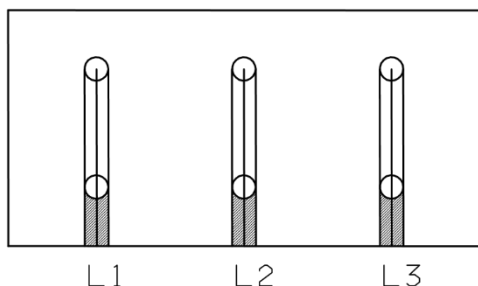
Make sure that the motor is ventilated. A distance of 50 mm from the wall must be maintained on the ventilation side (for pumps without motor cover)



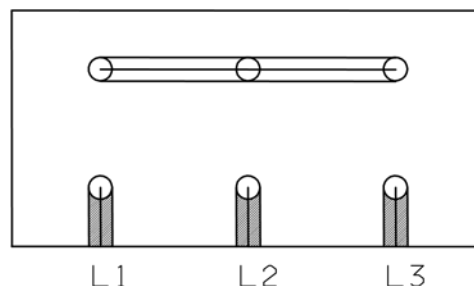
Before opening the pump, the motor must be disconnected from the mains power supply.

For frequency converter operation, see the operation of frequency converter mode (chapter 6.3)

**Δ circuit**



**Y-circuit**



**In any case, the motor must be connected in accordance with the separate information on the motor nameplate! Local regulations for this must be observed.**

The use of electronic slow starters offers further advantages and therefore it is to be recommended instead of the star-delta connection.

Soft start means:

- Avoidance of extreme loads on pipe joints and other plant components and elements of the pump while switching on
- Prolongation of the service life of the pump and of all its plant components
- Prolongation of life of the shaft seal of the pump
- Reduction in noise pollution while switching on the pump

The nominal current specified on the motor nameplate must not be exceeded.

The operating point of the pump must be checked by measuring the volume flow and the electrical current.

Overflow may cause overload! Avoid overload by installation of aperture or control valve in the pressure line.

Compare the characteristic curve of the pump to learn overflow area.

---

## 5.2. Avoidance of seal damage due to dry running

Mechanical seals wear out extremely quickly when running dry due to lack of heat dissipation.

Therefore, we recommend the following measures:

1. Installing a dry running sensor in the suction line or the bottom of the tank, if there is a risk of dry running, to switch off the pump
2. Installing a dry running sensor in the seal water area in automated systems.
3. No operation is allowed whatsoever if there is no liquid in the pump and the seal water area.
4. If there is no pipeline network available for a functional test, for example, for checking the direction of rotation, tests can be performed as follows.
  - Close the suction nozzle using a blank
  - Fill water up to the top of the pressure nozzle
  - Close the pressure nozzle tightly using a matching blank
  - Operate for a maximum of 5 seconds
5. Informing operating personnel of the issues of dry running and damage to the seals

We would like to point out that there is no guarantee for mechanical seals.

Premature seal failures are due to operational errors such as dry running, insofar as the seal is considered suitable for the specific application in terms of its design and material combination.

All pumps are checked on the test rig for shaft sealing.

Defective seals in delivered pumps are therefore ruled out.

## 6. OPERATION

### 6.1. Malfunctions

#### Reduction of conveying values

Cause	Measure
Suction line leaking	Seal suction line
Mechanical seal defective	Replace seal
Housing seal worn	Replace seal
Sealing rings in suction and pressure nozzle worn out	Replace sealing rings
Pumped liquid heavily permeated by gas	Prevent gas uptake by the liquid or degas the liquid

#### Pump do's not pumping

Cause	Measure
Shut-off in suction and pressure pipes closed	Open shut-off devices
Suction line blocked	Clean suction line

#### Mechanical seal *leaking*

Cause	Measure
Sealing elements consumed, broken or poorly installed	Renewing the mechanical seal

#### Overload of the engine

(correctly set circuit breaker switches off)	<b>Measure</b>
<b>Cause</b>	
The pump's back pressure is significantly lower than stated in the order data	Installation of throttle visors, Impeller correction, Speed adjustment

## Noisy operation

Cause	Measure
Bearings faulty	Replacing bearings and sealing elements
Cavitation	Reduction of temperature in the inlet, Increase in the inlet height, Magnification (nominal width) of the suction line
Clutch toothed ring worn (version with bearing carrier)	Renewing the tooth wreath
Shaft alignment insufficient (execution with bearing carrier)	Make wave alignment

## 6.2. Cleaning

The pumps must be cleaned in the through-flow, depending on product technology requirements (CIP - Cleaning in Place).

Washing solution: Nitric acid up to 2%

Sodium hydroxide solution, up to 5%, 60-80 °C (max. 95 °C)

Special versions can be SIP-cleaned for special requirements (SIP - Steam in Place).

Steam temperature: up to 140 °C

Pump switched off during SIP!

Other sterilisation processes must be agreed with the manufacturer for the relevant special versions.

## 6.3. Frequency converter operation

The pumps are suitable for frequency converter operation.



Caution

Observe operating instructions for the frequency converter!

When operating at frequencies above 50 Hz, there is a risk of exceeding the rated current specified on the motor nameplate. It is essential to avoid this.

Suitable measures are:

- Limiting the output of the frequency converter
- Where appropriate, using the self-adjusting parameter of the frequency converter with regard to the drive motor (not available for all frequency converters)
- Using motors with PTC thermistors



Caution

It must be ensured that the frequency does not exceed 60Hz

Motors with a rated speed of approx. 2.900 r.p.m. @ 50 Hz or 3.500 r.p.m. @ 60 Hz may be operated at a **maximum of 60 Hz** and

Motors with a rated speed of approx. 1.450 r.p.m. @ 50 Hz or 1.750 r.p.m. @ 60 Hz may be operated at a **maximum of 60 Hz**.

Motors must be equipped with PTC thermistor detectors when operated with.

In any case, a motor equipped with cold conductor sensors must be used when operating explosion-proof motors with frequency converters. The cold conductors shall be evaluated by the frequency converter.

EExe-Motors must have a certificate of conformity for operation with a frequency converter. This certificate must indicate the motor type and the frequency converter type.

This certificate is not required for EExd -Motors. Therefore, the use of EExd-Motors for frequency converter operation is oriented.

## 7. MAINTENANCE

### 7.1. General information motor

The bearings are equipped with lifetime lubrication. Re-lubrication is not required. We recommend replacing bearings preventively after 20,000 operating hours. Defective bearings must be replaced immediately.

It is also prescribed how often the pumps may be started per hour, see tab. 1.1.

P [kW]	Starts per hour
4	15
7,5	15
11	12
30	12
≥ 30	≤ 10

[Tab.1.1.]



The motor must be disconnected from the mains for all maintenance tasks described here!

### 7.2. Inducer



For mounting the Inducer (236), low-strength liquid screw locking agent must be used. (930) for example (Loctite).

---

### 7.3. Seals

The service life depends on the type, temperature, and pressure of the conveyed material.

We recommend changing the seals preventively yearly where appropriate.

When mounting the Seals, it is very helpful if you spray the O-rings with some cleaning alcohol.

**Never apply oil or grease to O-rings made of EPDM.** They are not resistant to oil or grease.

#### **Shaft seal / mechanical seal**

The service life of the shaft seal / mechanical seal depends on the following:

- Type of conveyed material
- Temperature of conveyed material
- Pressure of conveyed material
- Design of the shaft seal / mechanical seal

Dry running will destroy the mechanical seal very quickly.

For this reason, it is not possible to say when a change may be necessary.

In the case of pumps that are integrated into systems that cannot fail, we recommend changing the shaft seal / mechanical seal preventively during the regular maintenance work on the system.

When changing mechanical seals, observe the following:

- SiC and carbon rings are brittle

They must be installed without using excessive force.

It is helpful to wet elastomers with water or a soap solution.

Do not use oil, as oil-coated sliding surfaces may reduce service life.

- Do not touch sliding surfaces with fingers.

They must be kept perfectly clean.



#### 7.4. Change the sterile mechanical seal

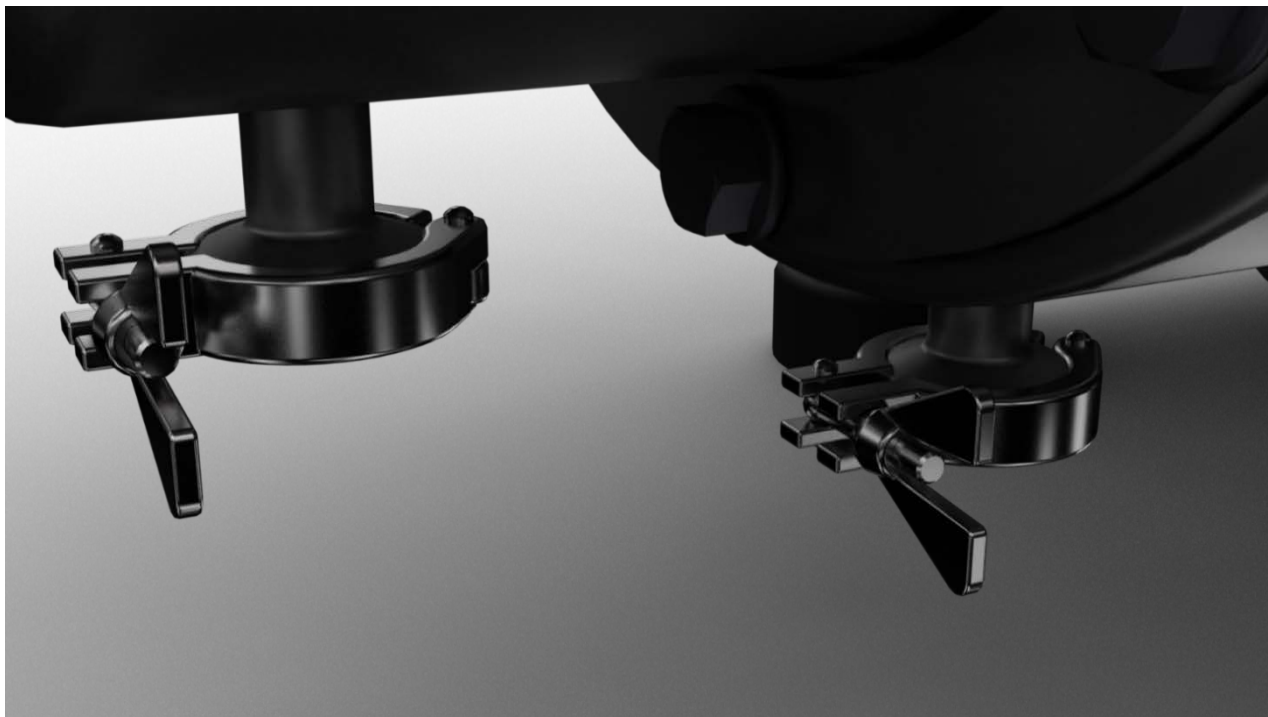


<http://kynxhybrid-glrd-steril.aseptec.de>

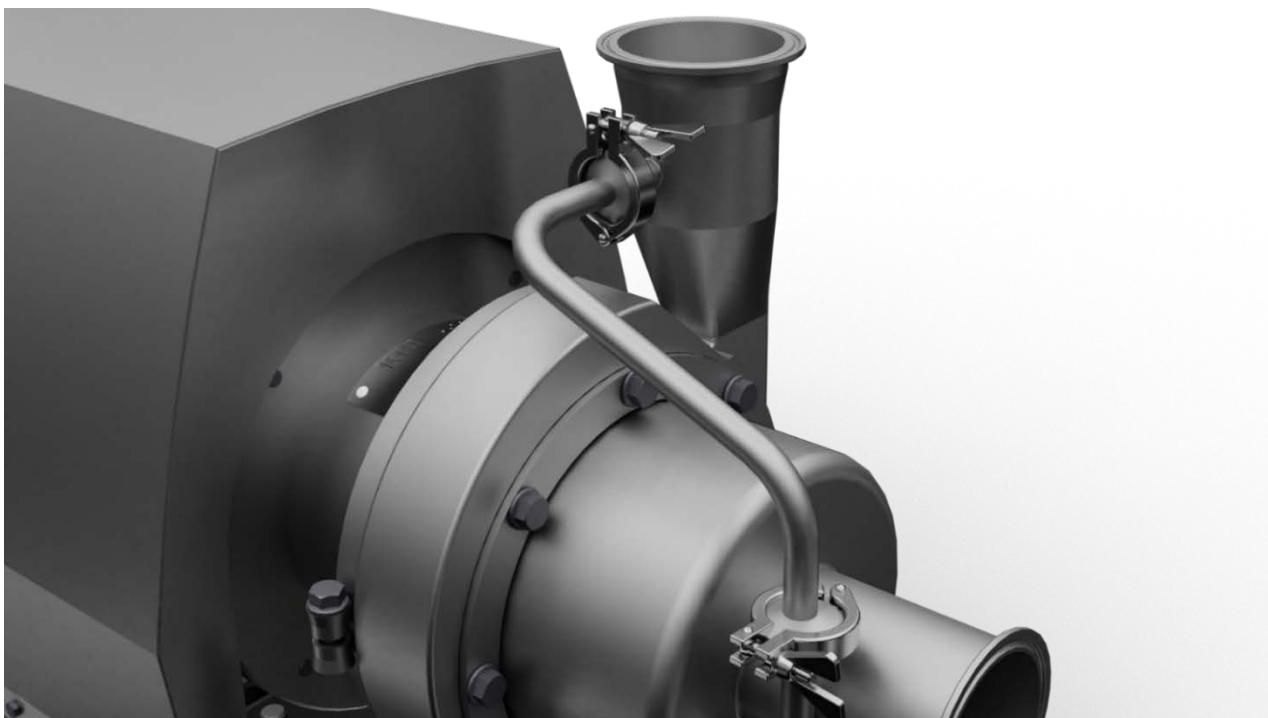
The following text sections with the corresponding illustrations below show you how the professional mechanical seal change should be carried out.



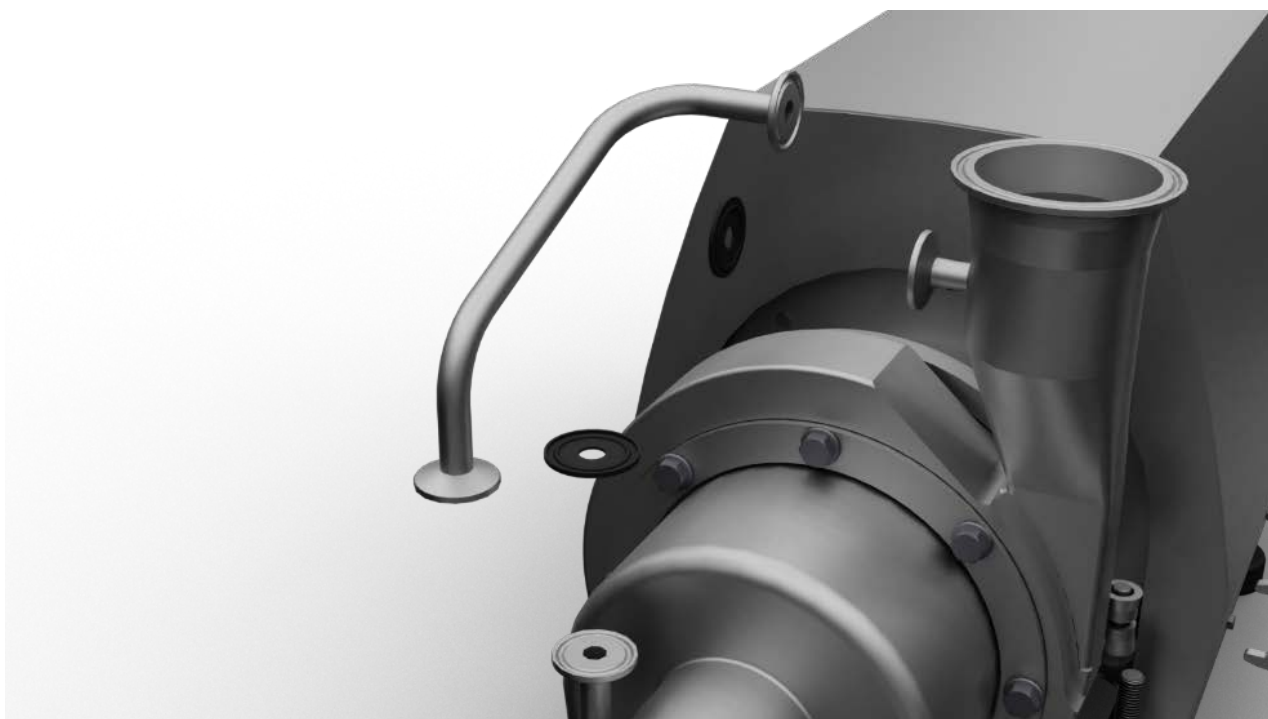
1. Loosen the clamps (item 099-1) and remove the blind casing with seals (item 102-7, 106-6, 410-1)



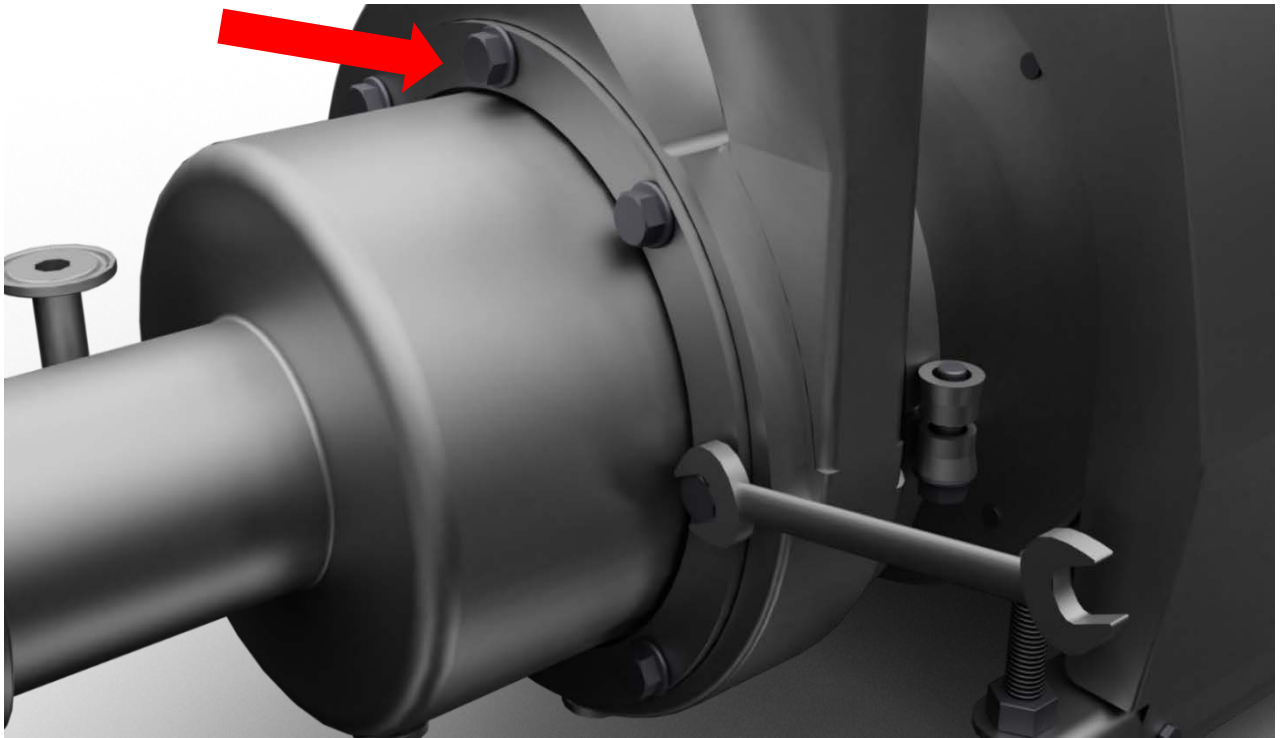
2. Then remove the clamping ring (item 099-2)



3. Next, remove the bent pipe with clamps (item 702) and seals (item 410-2)



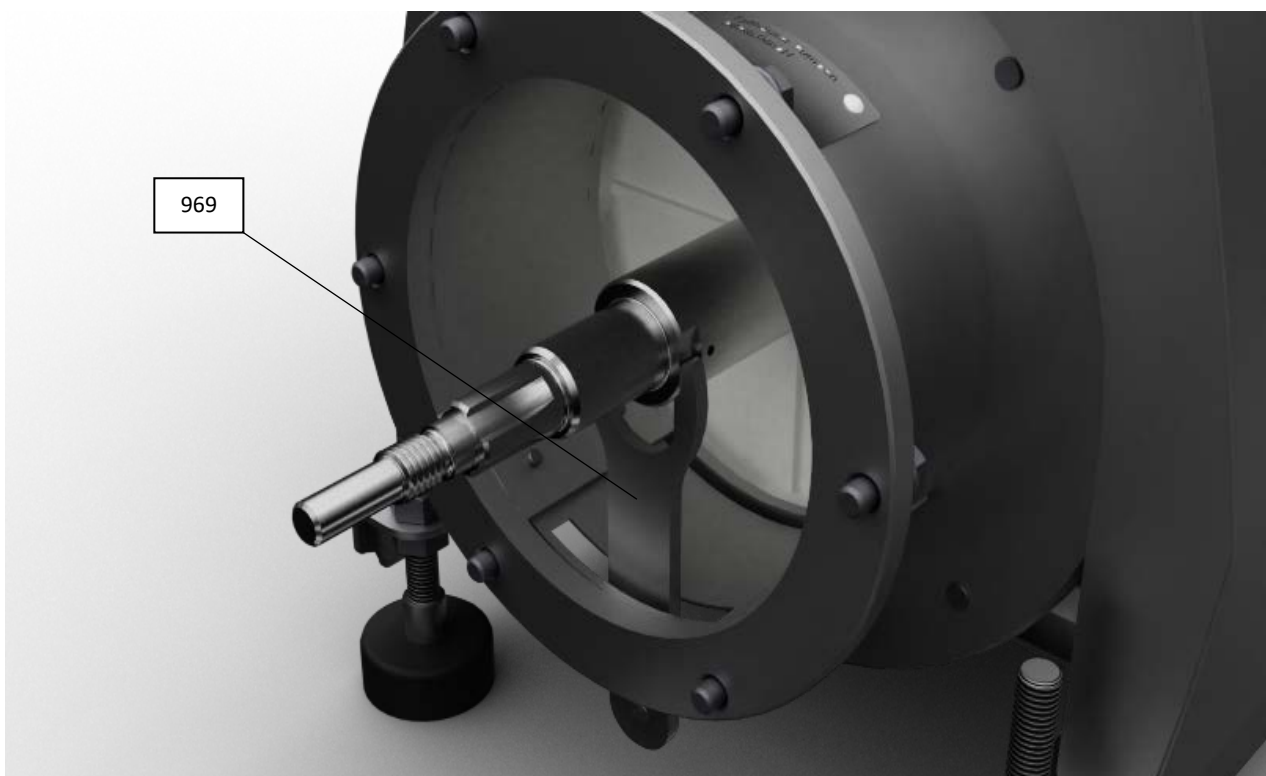
4. Loosen all screws(270) and disassemble them. Finally, remove the screw at 12 o'clock, holding the suction casing (106) in place.



5. Dismantle the suction casing (106) including flange (723)



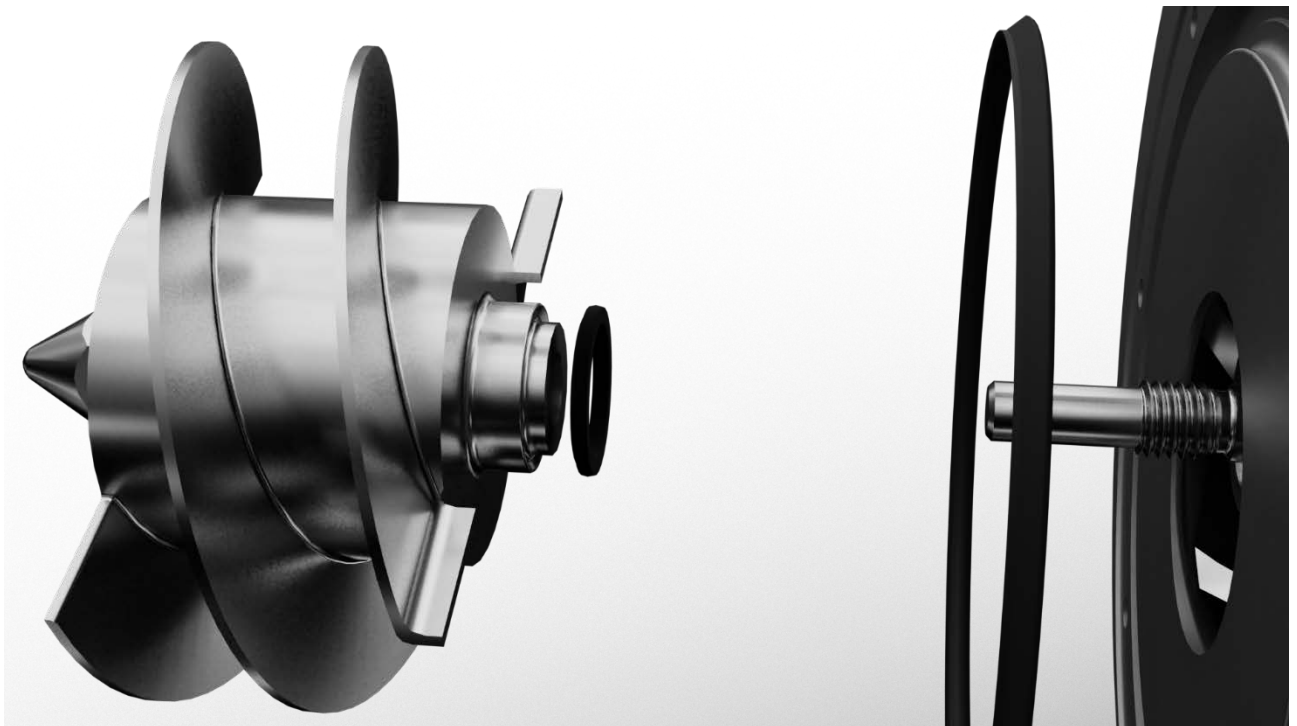
6. Grab the guide on the shaft (210) with the special key (969), vertically from bottom to top into the lantern (344), in order to be able to hold it in place. Fix the shaft (210) by holding the keys



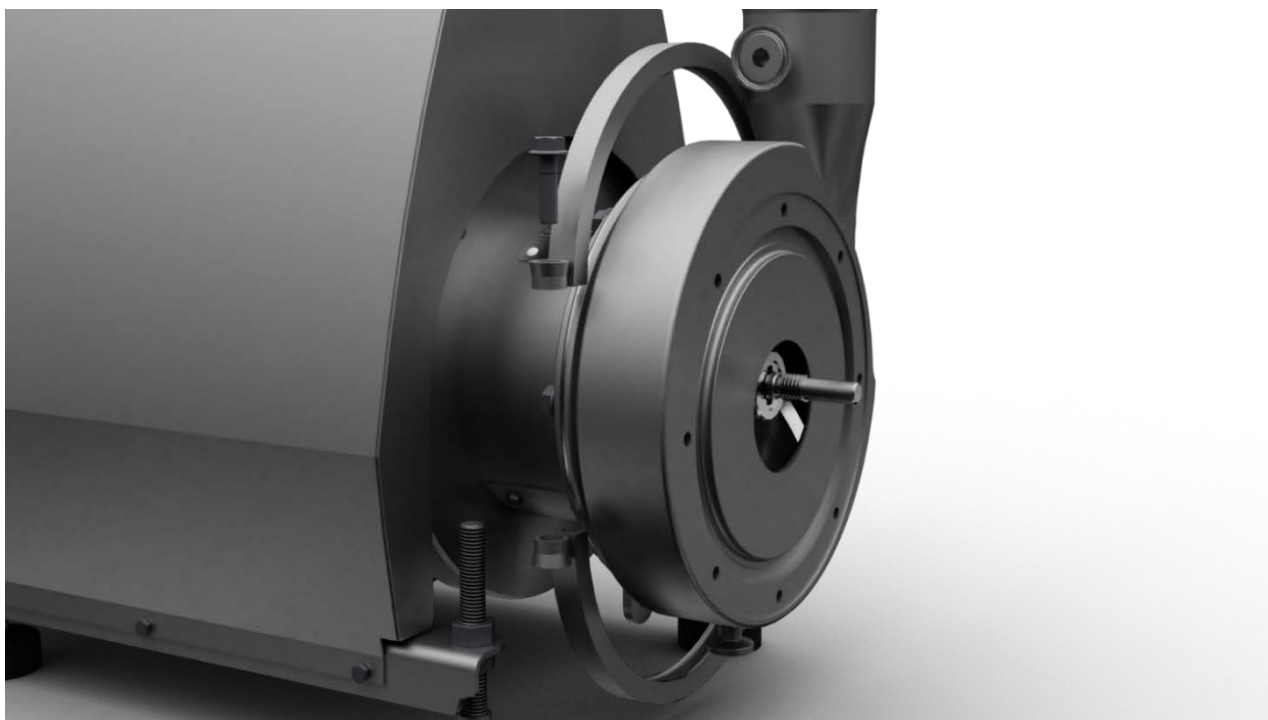
7. Then loosen the inducer (236) with a wrench (SW22) and dismantle the inducer.



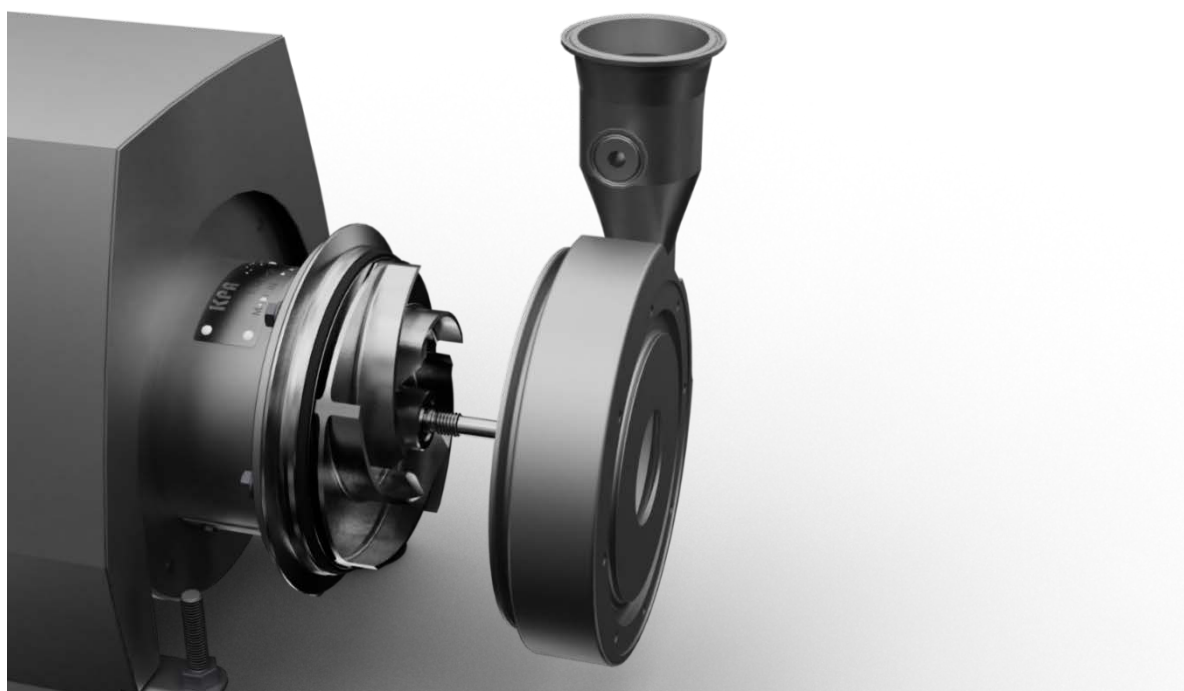
8. Next, remove the O-rings (412-2, 412-5)



9. Disassemble the screws (272) with a wrench (SW13) and remove the clamping ring (515). Hold the volute casing (102) in place.



10. Disassemble the volute casing (102)



11. Pull the impeller (230) off the shaft (210).





12. Remove the O-ring (412-1)



13. Dismantle the rotating part of the mechanical seal (433)



14. Pull the sleeve (520) with the O-rings (412-3, 412-4) from the rotating part of the mechanical seal (433). Remove the O-rings (412-3, 412-4) from the sleeve.



15. Dismantle the fix part of the mechanical( 433) with the O-ring.



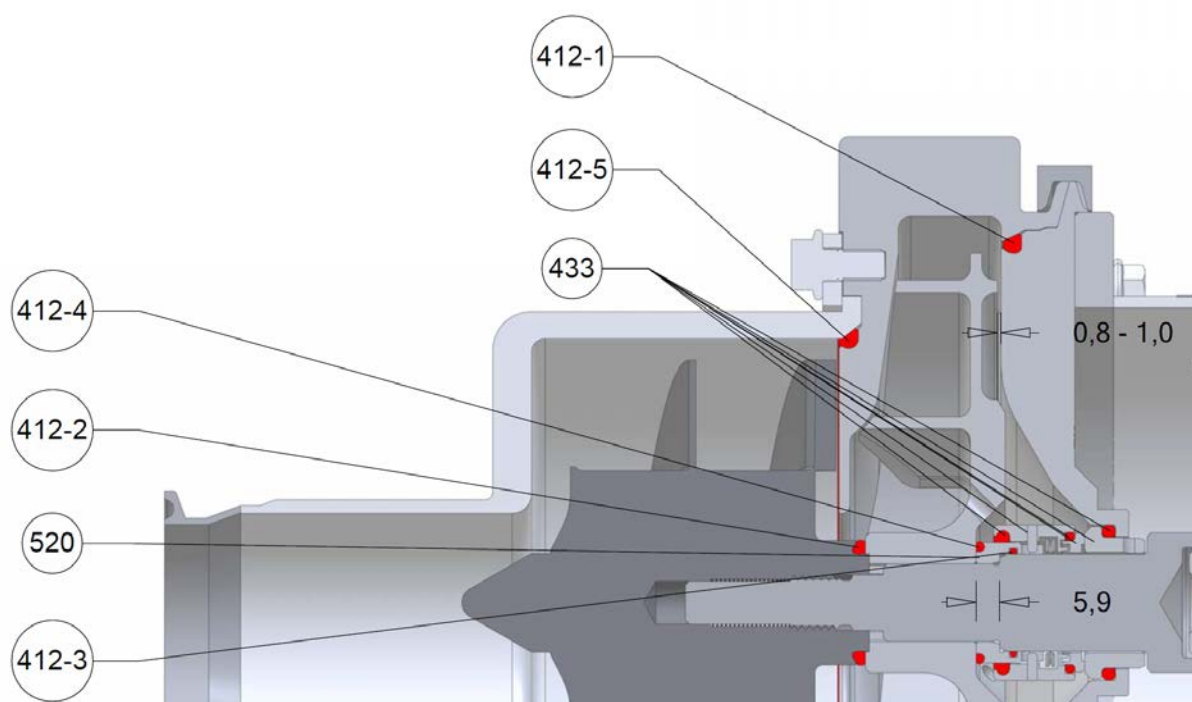
Now replace the wearing parts with the new wearing part set.

**Note: The sleeve (520), here as an example with the measure 5,9 is not part of the wearing parts and this must be ordered separately.**

After that, you can reassembling the pump in reverse order. It is important that all O-rings fit correctly in their groove. It is very good if the O-rings are sprayed with cleaning alcohol when assuring the pump.

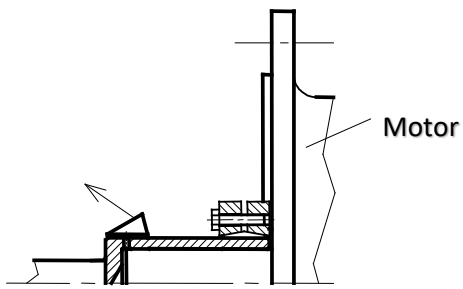
### Section KYNX HYBRID sterile mechanical seal

Gap between impeller and casing cover between 0.8-1.0 mm

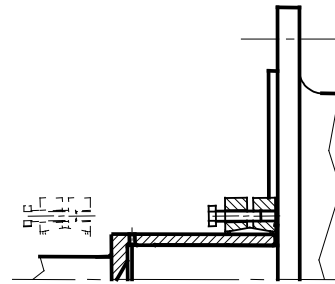


## 7.5. Changing the pump shaft

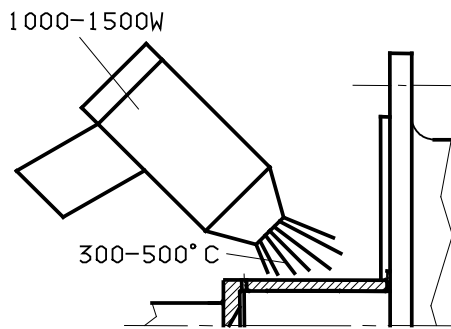
### Disassembly



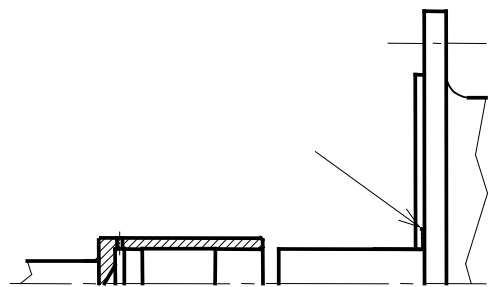
1.Remove adhesive strips



2.Remove shrink disc



3.heat shaft



4.pull of the shaft

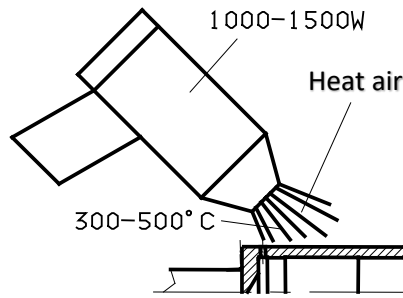
Assembly



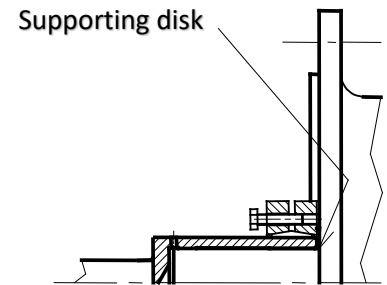
**Shrink disc never clamp without plug-in shaft on the motor shaft!**  
**Allow the shaft to cool before tightening with the torque wrench!**



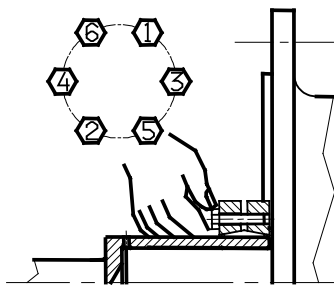
1. Cleaning the motor shaft



2. Heat shaft

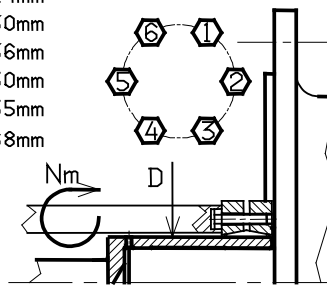


3. Insert the shaft and shrink disc

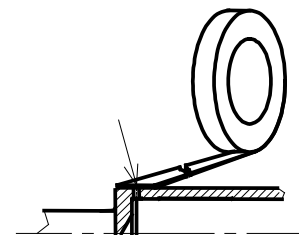


4. Mount the shrinking disc

- 5 Nm/ D=24mm
- 5 Nm/ D=30mm
- 12 Nm/ D=36mm
- 12 Nm/ D=50mm
- 12 Nm/ D=55mm
- 12 Nm/ D=68mm



5. Mount the shrinking disc firmly with torquewrench

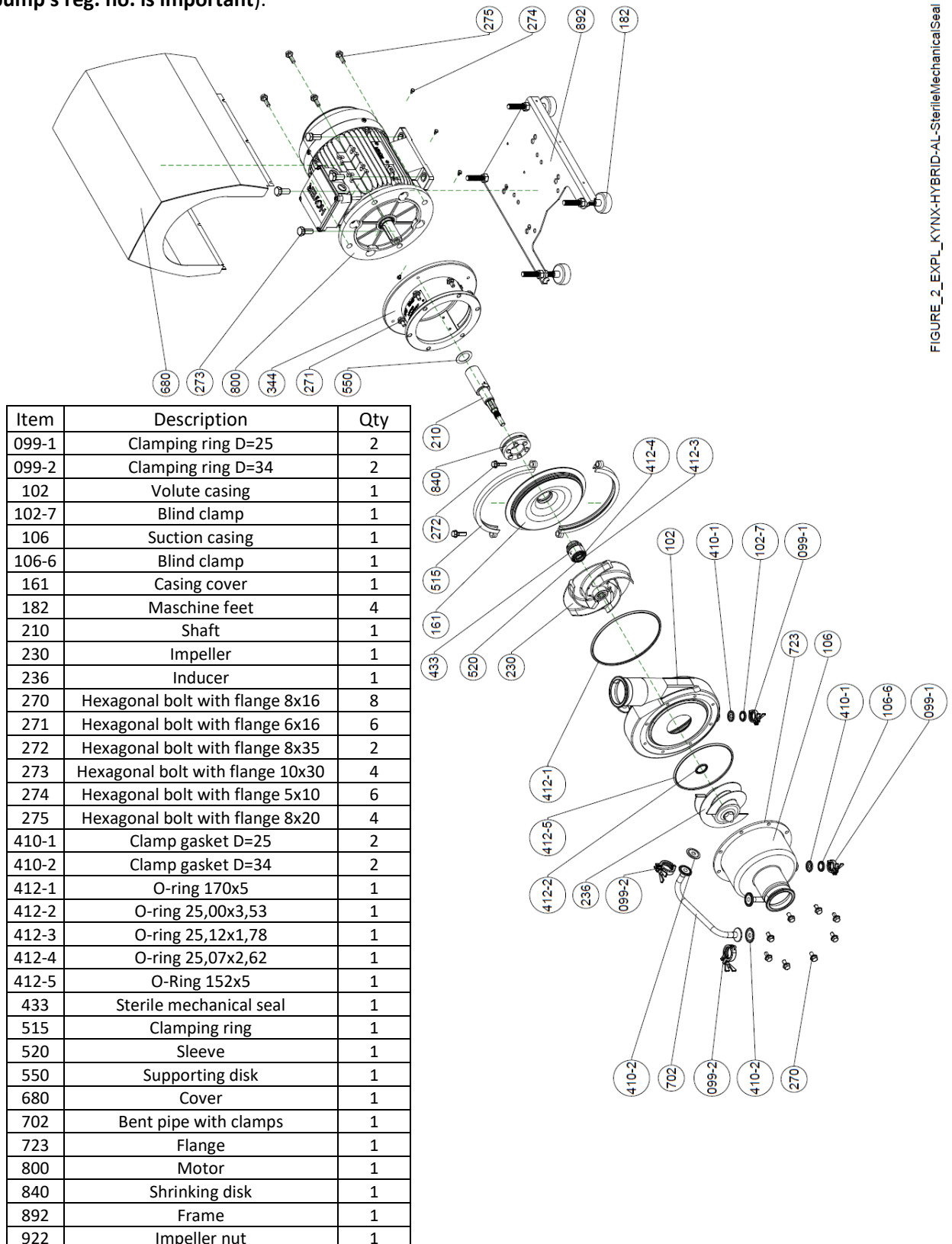


6. Close ventilation hand-tight hole

## 8. SPARE PARTS

To order spare parts, search for the relevant spare part / wear part in the figure and its associated item number.

Let us know the item no. from the list below, as well as all data from the pump nameplate (the pump's reg. no. is important).



FIGURE\_2\_EXPL\_KYNX-HYBRID-AL-SterileMechanicalSeal

Wearing parts KYNX HYBRID composed of

Item	Description	Quantity
433	Mechanical seal	1
412-1	O-ring 170x5	1
412-2	O-ring 25,00x3,53	1
412-3	O-ring 25,12x1,78	1
412-4	O-ring 25,07x2,62	1
412-5	O-ring 152x5	1
410-1	Clamp gasket D=25	2
410-2	Clamp gasket D=34	2

**Note: The sleeve (520), here as an example with the measure 5,9 is not part of the wearing parts and this must be ordered separately.**

