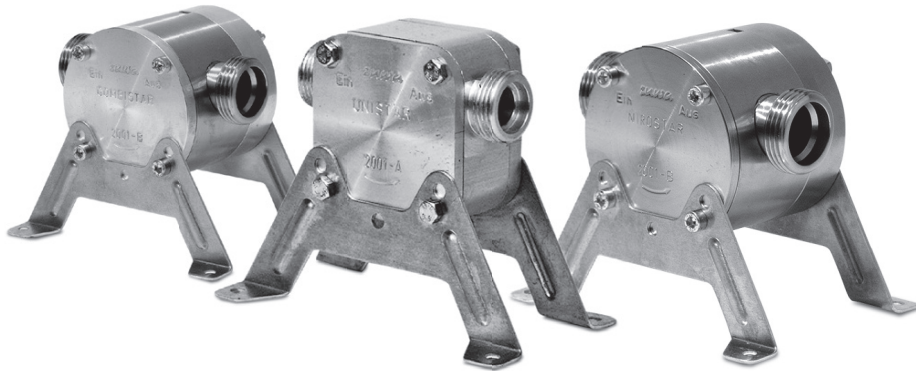


Operating Instructions

Flexible Impeller Pumps



UNISTAR | COMBISTAR | NIROSTAR | ACOSTAR



Impeller Pumps

Operating Instructions (Translation)

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1. Introduction

These operating instructions apply for the following pump types:

with motor

UNISTAR 2000-A
UNISTAR 2000-B
UNISTAR 2000-C
COMBISTAR 2000-A
COMBISTAR 2000-B
NIROSTAR 2000-A
NIROSTAR 2000-B
NIROSTAR 2000-C plus
ACOSTAR 2000-A

without motor

UNISTAR 2001-A
UNISTAR 2001-B
UNISTAR 2001-C
COMBISTAR 2001-A
COMBISTAR 2001-B
NIROSTAR 2001-A
NIROSTAR 2001-B

The manual is intended for all users of the impeller pumps which are listed here.

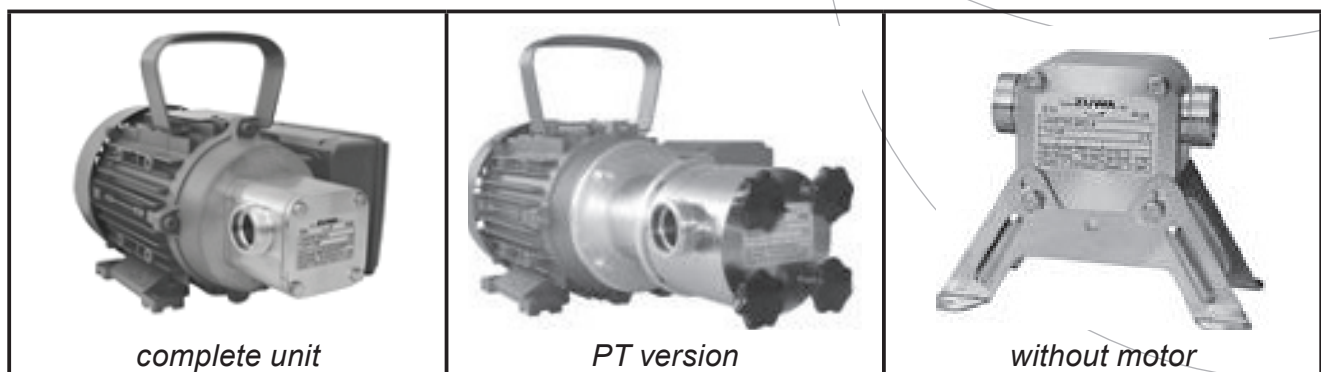
1.1 Further applicable documents

- ▶ Parts lists with exploded drawings

1.2 Machine Specifications

All of the pumps are available in the following designs:

- ▶ Series 2000 – complete unit: Pump with electric motor, directly flanged
- ▶ Series 2000 PT – PT version: Pump with electric motor, coupling and coupling protection
- ▶ Series 2001: Pump without motor and with bare shaft



3. Safety

3.1 Intended use

The pumps are designed for dry-well installation. Make sure that the motor remains dry (protection class IP 55).

Pump types

UNISTAR	Multi-purpose pump with aluminium casing designed for transporting clean or contaminated fluids not containing abrasive substances. Not suitable for handling foods and abrasive or corrosive fluids.
COMBISTAR	Pump made from stainless steel (all parts which come into contact with the liquid) and aluminium (cover), also suitable for abrasive or slightly corrosive liquids. Not suitable for foods.
NIROSTAR	Stainless steel pump that is particularly suitable for corrosive and abrasive liquids, as well as for food and drinks.
ACOSTAR	Synthetic pump perfect for fluids with various viscosities, acids, bases and solvents.

3.2 Important safety instructions







The manufacturer shall not be held liable for damage resulting from nonobservance of the operating instructions.

- ▶ Store these instructions in such a way that they are accessible at all times for pump operating personnel. Urge employees to read and follow these instructions. Do not remove adhesive labels showing technical information.
- ▶ Observe plant-related specifications and provisions.
- ▶ Have work carried out by specialist personnel or personnel briefed according to the VDE-standard.
- ▶ Only carry out work on the pump when the pump is not in operation and the drive has been disconnected from the main power supply.
- ▶ In case of dangerous (e.g. hot, poisonous, explosive) pumped media, use protective equipment.
- ▶ Do not pump any liquids that are corrosive to the pump material.

- ▶ Do not pump any liquids containing particles of diameter greater than 2 mm.
- ▶ Do not use pumps under water.
- ▶ Do not allow pumps to run without liquid for longer than one minute.
- ▶ Only use genuine replacement parts, otherwise the warranty shall cease to be valid.
- ▶ Impeller and seals are wear parts and wear out over time

3.3 Legend

	Danger of death and severe injury
	Danger of death and severe injury due to electric shock
	Danger of light bodily injuries and material damage
	Information, note

4. Technical data

sound pressure level	maximum viscosity of fluid	max. suction height	max. temperature	motor protection class	max. speed	connections In/Out external thread (inches and nominal width in mm)	max. pressure in bar (with Perbunan impeller)	max. flow rate in L/min	
74 dB(A)	20.000 mPas	7 metres (dry 3 metres)	90°C (with plastic impeller 60°C)	IP 55	12 or 24-Volt motors: 3000 rpm 230- or 400-Volt motors: 2800 rpm	3/4" 19	5	30	UNISTAR 2000-A
						3/4" 19	4	30	UNISTAR 2001-A
						1" 25	5	60	UNISTAR 2000-B
						1" 25	4	60	UNISTAR 2001-B
						1 1/4" 32	5	90	UNISTAR 2000-C
						1 1/4" 32	4	90	UNISTAR 2001-C
						3/4" 19	5	30	COMBISTAR 2000-A
						3/4" 19	4	30	COMBISTAR 2001-A
						1" 25	5	60	COMBISTAR 2000-B
						1" 25	4	60	COMBISTAR 2001-B
						3/4" 19	5	30	NIROSTAR 2000-A
						3/4" 19	4	30	NIROSTAR 2001-A
						1" 25	5	60	NIROSTAR 2000-B
						1" 25	4	60	NIROSTAR 2001-B
						1 1/4" 32	3	120	NIROSTAR 2000-C plus
			3/4" 19		3	30	ACOSTAR 2000-A		
		60°C			230-400V				

4.1 Type plate

Type plate, example:

UNISTAR 2000-A			
110120M			CE
230V	3,4 A	0,37 kW	Protection cl.:IP 55
max. rpm	2730U/min	Drive:	64
max. flow rate: 30 l/min		max pressure: 4 bar	
Impeller: 17	Seal: 11	Constr.: 04 / 2015	

Impeller (1st. digit) 1 → NBR 2 → EPDM 3 → FKM 4 → CR 5 → NR 6 → Alu 7 → brass 8 → stainless 9 → plastic	Seal type (1st. digit) 1 → shaft seal 2 → mechanical seal
Bush (2nd digit) 1 → Polyamide 2 → 3 → 4 → 5 → 6 → Alu 7 → brass 8 → ss 9 → ss-spec.	Seal material (2nd digit) shaft seal: 1 → NBR 2 → EPDM 3 → FKM 4 → CR 5 → VQM 6 → Eco-PE 7 → AWC mechanical seal: 1 → ss-graphite-NBR 2 → tungsten-carbi- de-NBR 3 → tungsten-carbi- de-Viton 4 → Carbon-Cera- mik-EPDM 5 → Carbon-Cera- mik-FKM 6 → SIC-SIC-EPDM 7 → SIC-SIC-FKM 8 → SIS-SIC-NBR

Antrieb:

- 00 → no motor, open shaft
- 01 → double bearing for belt drive
- 02 → hydraulic drive
- 03 → air motor
- 13 → gear motor DC12V
- 14 → DC 12 V-S1
- 15 → DC 12 V-KEB
- 24 → DC 24 V-S1
- 25 → DC 24 V-KEB
- 26 → DC 24V-IP67
- 34 → DC 48 V
- 51 → el. Motor 230V special shaft ACOSTAR
- 52 → el. Motor 400V special shaft ACOSTAR
- 53 →
- 55 →
- 60 → el. Motor 110V/50Hz special shaft
- 61 → el. Motor 110 V/50Hz L/R special shaft
- 62 → el. Motor 110 V/60Hz special shaft
- 63 → el. Motor 230 V special shaft
- 64 → el. Motor 230 V standard shaft
- 65 → el. Motor 230V L/R special shaft
- 66 → el. Motor 230V L/R standard shaft
- 67 → el. Motor 230V/60Hz special shaft
- 68 → el. Motor 220V/60Hz special shaft
- 69 → el. Motor 230V/50Hz special shaft ATEX
- 70 → el. Motor 240V/60Hz special shaft
- 71 →
- 72 → el. Motor 400V/50Hz special shaft ATEX
- 73 → el. Motor 400 V special shaft
- 74 → el. Motor 400 V standard shaft
- 75 → el. Motor 400 V L/R special shaft
- 76 → el. Motor 400V/60Hz special shaft
- 77 → el. Motor 480V/60Hz special shaft
- 78 → el. Motor 360V/60Hz special shaft
- 80 → Liveranimotor 230 V
- 82 → Liveranimotor 400 V
- 86 → gear motor.400 V
- 98 → combustion motor 2stroke
- 99 → combustion motor 4stroke

- PT → Pump head with pump carrier
- PF → Pump head directly flanged

note: ss = stainless steel

4.2 Impeller materials

Impeller pumps are equipped with NBR impellers as standard.




Material designation	Suitable for:	Properties
NBR Acrylonitrile butadiene rubber (Perbunan®, Buna-N®)	water, antifreeze, heat transfer fluid, vegetable oil and grease	high impact elasticity and good mechanical strength good for applications involving high pressures up to max. 5 bar
EPDM Ethylene propylene diene rubber (Keltan®, Buna EP®)	high temperatures, acids and alkalis	high elasticity and very good mechanical stability
FKM or FPM Fluorocarbon rubber (Viton®, Fluorel®)	oil, diesel, fuel oil, palm oil, soy bean oil and oleaginous wood preservatives	very good chemical resistance, low mechanical strength
CR Chloroprene rubber (Neoprene®, Bayprene®)	food, drinks	flame resistant, tearproof, durable
plastic (not for NIROSTAR 2000- C plus)	water, mineral and vegetable oils, diesel, heat transfer fluid, antifreeze	extremely tear resistant and good mechanical stability max. fluid temperature 60°C

5. Transportation and unpacking


- ▶ After unpacking, immediately check the pump for completeness and damage.
- ▶ Immediately report any transit damage to the supplying company.
- ▶ Dispose of packaging material according to the respective local regulations.

6. Mounting

 Danger	<p>Danger of death due to electric shock</p> <ul style="list-style-type: none"> • Work on the electrics may only be carried out by specialists.
--	---

 Danger	Danger of injury from rotating components <ul style="list-style-type: none"> • Cover drive and pump shaft.
 Caution	Material damage due to overheating of engine <ul style="list-style-type: none"> • Ensure sufficient space and air supply for the motor.
	The pump can be fitted vertically or horizontally. In case of vertical fitting, it is advantageous to direct the pump head downwards, so that in case of leaking the motor is protected against escaping liquid.

6.1 Connection of hoses or pipes


	Hoses or lines must be suitable for the respective pumped medium. Avoid long suction lines.
--	---

Observe correct direction of rotation of pump, indicated by an arrow on the type plate and the lettering In – Out.

Affix hoses as follows:

- Screw suction line onto the side marked “In”.
- Screw pressure line onto the side marked “Out”.
- Verify that the connections are leaktight.



	In the case that the suction height is more than 3 metres, fit foot valve in the suction line in order to prevent drainage of the pump and suction line.
---	--

6.2 Electrical connection

6.2.1 Series 2000-A, 2000-B, und 2000-C

 Danger	Danger of death due to electric shock <ul style="list-style-type: none"> • Fit the pump's electric circuit with a ground fault circuit interrupter. • Fit a motor overload switch.
--	--

230 Volt motors:

Thermal protection is fitted. Fitting of a motor overload switch is advisable.

400 Volt motors:


No thermal protection is fitted. Fitting of a motor overload switch is required (available as accessory)

Direct current motors::

Protection against overcurrent by means of safety fuses:

- 12 Volt motors: 0,25 kW - 50 A; 0,37 kW – 80 A
- 24 Volt motors: 0,25 kW - 30 A; 0,37 kW – 50 A


The connecting cable must be adapted to the current intensities (see type plate)!

 Caution	Motor damage can arise due to unsuitable extension cable <ul style="list-style-type: none">• For extension cables of length up to 20 metres: Use cables with at least the same cross section as the pump cable.• For extension cables with a length of more than 20 metres: Use cables with a larger cross section than the pump cable.
---	---

6.2.2 Series 2001-A, 2001-B und 2001-C

The pumps can, for example, be driven with the following drive systems:

- ▶ power drill
- ▶ gear motor
- ▶ hydraulic motor
- ▶ pneumatic motor

	When using external drive systems, observe the manufacturer's instructions.
---	---

Ensure correct speed and output of the drive system:

Max. speed 3000 rpm

Minimum output of the drive system:

- 370 Watt for types of series 2001 A
- 550 Watt for types of series 2001 B
- 1100 Watt for types of series 2001 C

Impeller pumps require an increased starting torque.



For pumps with three-phase motor, observe the direction of rotation of the motor. The direction of rotation is indicated by an arrow on the type plate.



6.3 Operation with hand drill or cordless screwdriver

The pump needs to be fixed when it is used with a hand drill or any other electric drill to avoid that it rotates with the drill.

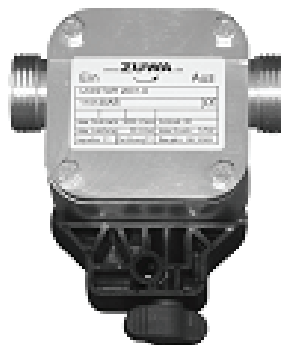
Fixation can be done in two ways:

A) with drill adapter

The adapter either comes with the pump or can be ordered separately from the manufacturer. The adapter is suitable for any standard drills and screwdrivers.

Article No. adapter: 11012300

- ▶ Fix adapter on pump (see below).
- ▶ Insert pump shaft into chuck and tighten.
- ▶ Insert depth stop into upper aperture and tighten fixing screw.



B) with mounting feet and regraded support

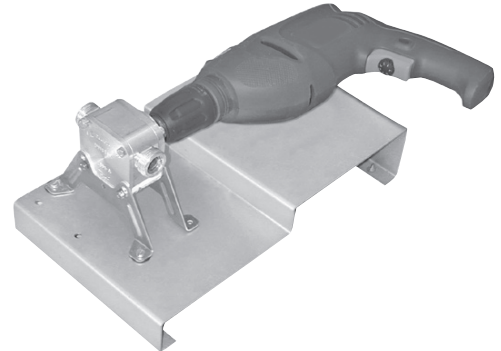
Mounting feet and support can be ordered directly from the manufacturer.

Article No. mounting feet: 11012710

Article No. regraded support: 11012310

The support needs to be suitable for the drill. The grading has to be high enough to provide for a precisely horizontal alignment of drill and pump.


- ▶ Fix mounting feet on top of the support.
- ▶ Insert pump shaft into chuck. Pump and drill must be precisely aligned. Tighten chuck





 Caution	<p>Material damage due to pressure on the shaft</p> <ul style="list-style-type: none"> • Do not fix the drill to the support, allow it to lie loosely to allow it some play.
---	--




6.4 Using other drive systems

If an external drive is being used, a claw coupling with adapter for the connection of the pump with the motor (optional accessories, see parts list from item 200) is necessary.

 Caution	<p>Material damage due to incorrect alignment of the pump</p> <ul style="list-style-type: none"> • If the claw coupling is being used, ensure precise alignment of the pump and motor to prevent the shaft from breaking. The claw coupling can only compensate a tolerance of 0.1 mm.
---	--


7. Commissioning and operation

 Danger	<p>Danger of death due to explosion</p> <ul style="list-style-type: none"> • Do not pump any liquids with a flash point of less than 55 °C. • Do not pump petrol/gasoline.
 Danger	<p>Danger of death and injury due to rotating parts</p> <ul style="list-style-type: none"> • Do not touch pump while it is in operation.


 Danger	<p>Danger of injury due to items of clothing and hair being caught in the running drive</p> <ul style="list-style-type: none"> • Do not wear loose items of clothing such as ties, scarves and shawls. • Tie back long hair and protect using a head covering or hood.
 Warning	<p>Danger of injury and poisoning due to dangerous pumped media</p> <ul style="list-style-type: none"> • Safely collect escaping pumped media and dispose of in an environmentally-friendly manner.
 Caution	<p>Material damage due to high temperatures of the pumped medium</p> <ul style="list-style-type: none"> • Do not pump liquids with a temperature of more than 90 °C in order to avoid damage to the impeller material.



impeller pumps are dry self-priming. For water-like fluids it is not necessary to fill the pumps prior to commissioning except when the suction depth is more than 3 metres. For fluids with higher viscosities it is always recommend to first prime the pump to ensure satisfactory device life.

 Caution	<p>Material damage due to dry running</p> <ul style="list-style-type: none"> • In case of a suction depth of more than 3 metres, fill prior to commissioning. • Never allow the pump to run dry for more than one minute.
---	--

- ▶ Open pressure line.
- ▶ To start the pump, switch on drive..
- ▶ Service interruption: wait 3 - 4 seconds before restarting.

 Caution	<p>Material damage due to overpressure in the pump</p> <ul style="list-style-type: none"> • Do not block pressure side for more than a minute while the drive is running.
---	---

All impeller pumps are suitable for continuous operation.



After extended periods of pump down time prior to starting check that the impeller wheel turns freely and that the pump starts. See also chapter 11: "Troubleshooting".

*rotary switch*

UNISTAR 2000-C

This pump is equipped with a rotary switch to change operating direction. Prior to changing the rotating direction turn off pump and wait for 3 - 4 seconds. Then turn switch into the new direction.

8. Storage

- ▶ Empty pump completely
- ▶ Clean pump in order to avoid adhesions and damage to the impeller
- ▶ Store pump under frost-protected conditions

9. Maintenance

**Danger**

Danger of death due to electric shock

- Prior to work on the pump, always disconnect the drive from the power supply.

9.1 Routine inspection

- ▶ Regularly check the line connections for leak-tightness.
- ▶ The pump is supposed to be turned on in regular intervals for 2-3 seconds to keep the impeller from getting glued to the pump body.

9.2 Cleaning

**Caution**

Material damage due to aggressive cleaning agents

- Do not use cleaning agents that affect the materials of pump or impeller wheel.

9.3 Disassembling the pump

*lateral connection flange*






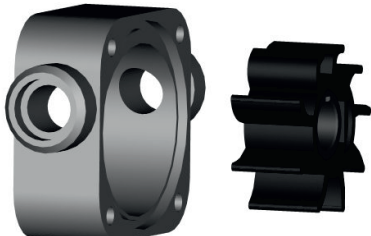
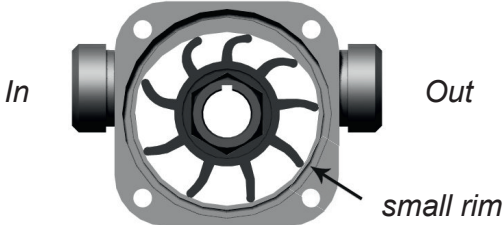
The pumps of the NIROSTAR series are not fitted with lateral discs.

In addition to the disassembling as described on the following pages the lateral connection flanges can be dismantled from pumps of the 2000-C and 2001-C series.



Danger of death due to electrical shock. Prior to work on the pump always disconnect the drive from power supply.

9.3.1 Series 2000-A, 2000-B and 2000-C directly flanged

 <p>1. Disconnect hose connections.</p>	 <p>2. Release screws, remove cover.</p>
 <p>3. Remove wear plate (without hole) and O-ring.</p>	 <p>4. Remove housing with impeller.</p>
 <p>5. Remove O-ring, rear wear plate (with hole) and rear cover. Detach locking ring and press out shaft seal.</p>	 <p>6. Press impeller out of housing.</p>
 <p>7. Housing with small rim on top, turn impeller counter-clockwise into housing. Push impeller as far up as possible.</p>	

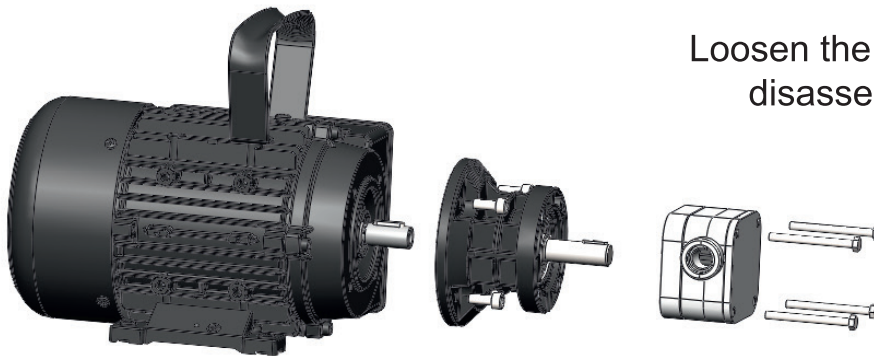


Danger of death due to electrical shock. Prior to work on the pump always disconnect the drive from power supply.

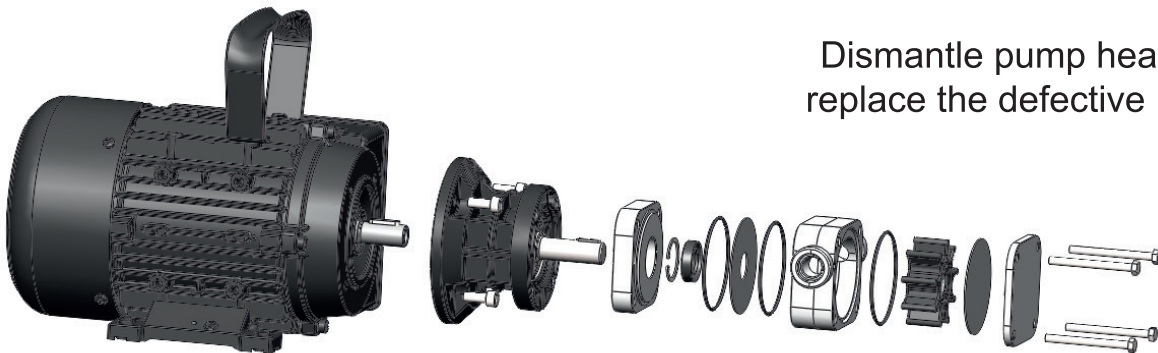
9.3.2 Series 2000-A, 2000-B and 2000-C with pump carrier



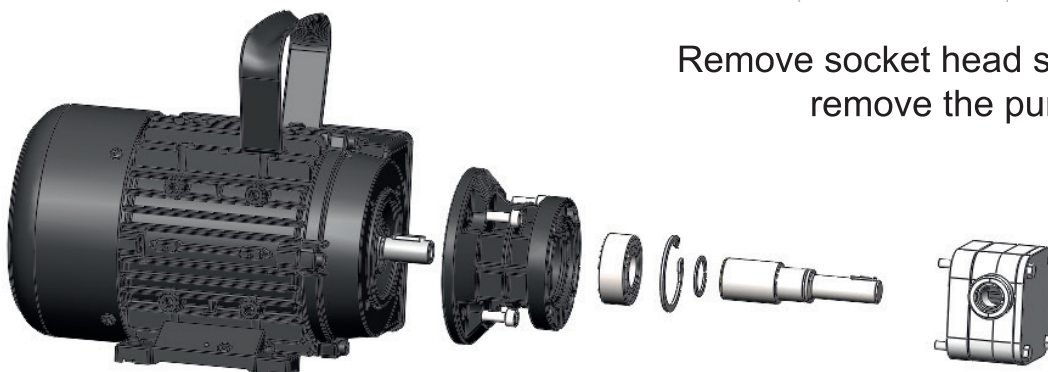
Flexible impeller pump UNISTAR 2000-A/PT



Loosen the hexagon screws and disassemble the pump head.



Dismantle pump head to replace the defective part

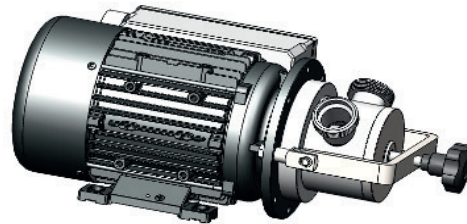


Remove socket head screws and remove the pump carrier.

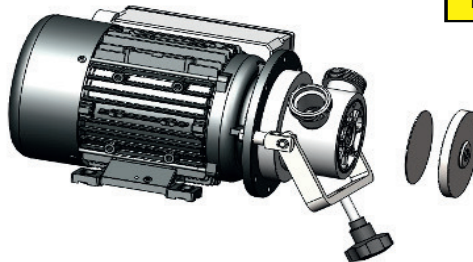
9.3.3 Series NIROSTAR 2000-C plus



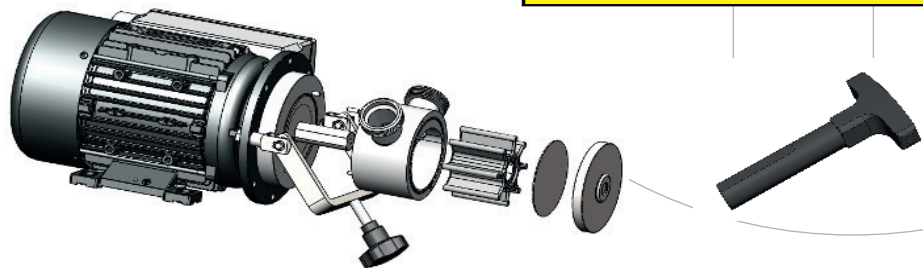
Danger of death due to electrical shock. Prior to work on the pump always disconnect the drive from power supply.



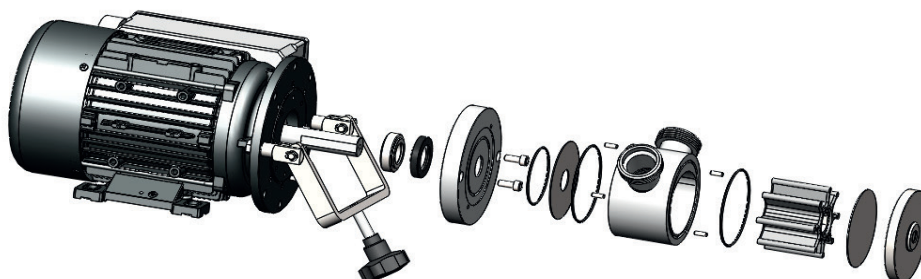
Flexible impeller pump NIROSTAR 2000-C plus

Step 1
replacement of flexible impeller


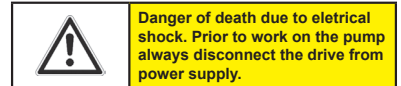
Release safety screw, lower bracket, remove front cover and front wear plate.

Step 2
replacement of flexible impeller


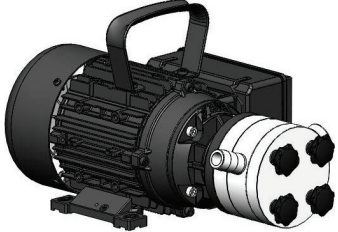
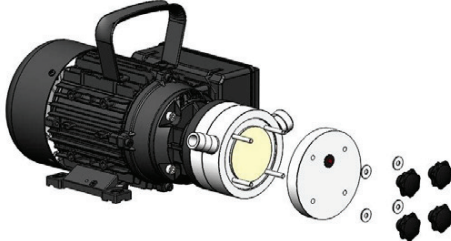
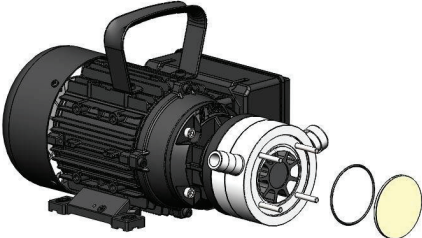
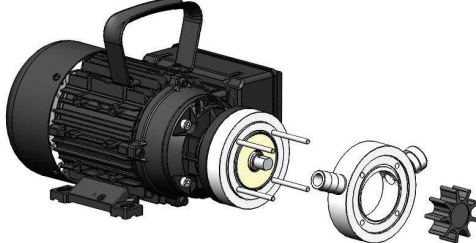
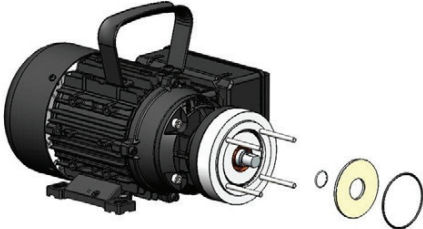
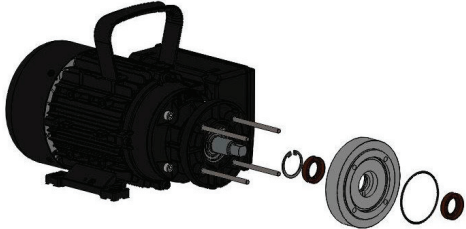
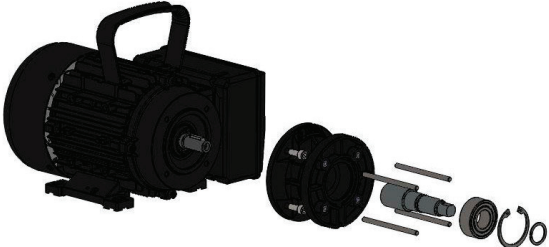
Remove the housing with the impeller, then press out the impeller or use the special tool for changing the impeller.

Step 3


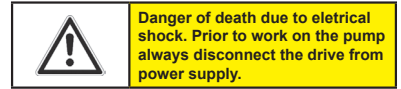
Remove the rear wear plate and the screws of the cylinder head, remove the cylinder head itself and withdraw the mechanical seal



9.3.4 Series type PTFE pump ACOSTAR 2000-A

 <p>1. Disconnect the cable connections.</p>	 <p>2. Loosen star knobs and remove cover.</p>
 <p>3. Remove wear plate without hole and O-ring.</p>	 <p>4. Remove the housing with the impeller, push the impeller out of the housing.</p>
 <p>5. Remove O-ring, wear plate with hole, and PTFE ring.</p>	 <p>6. . Remove the retaining ring, push out rod seal and shaft seal.</p>
 <p>7. Remove socket head screws, pull off the pump carrier, remove retaining ring, press out shaft with bearings.</p>	<p>Reassemble the pump in reverse order.</p>

9.3.5 Series 2001-A, 2001-B and 2001-C



with mounting feet

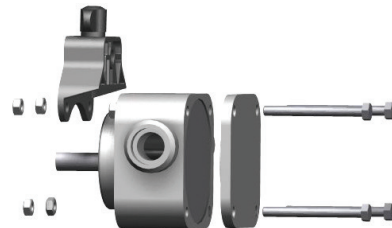


with drill adapter

1. Disconnect line connections.

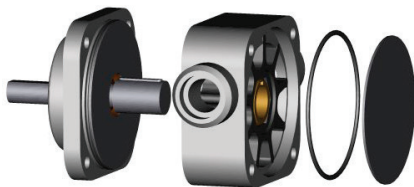


with mounting feet



with drill adapter

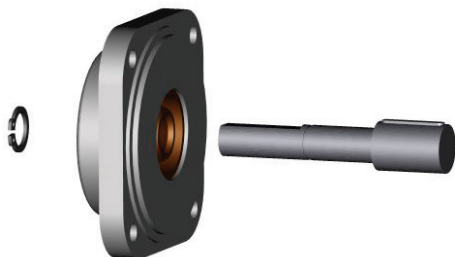
2. Remove bolts, mounting feet or adapter and cover.



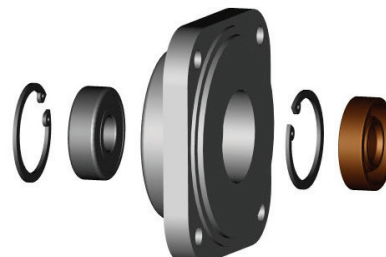
3. Remove wear plate (without hole) and housing with impeller.



4. Remove O-rings and rear wear plate (with whole).



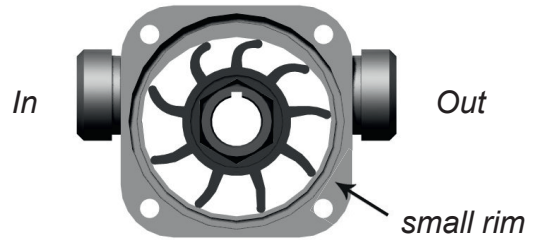
5. Detach locking ring and press out shaft.



6. Release locking rings and press out bearing respectively shaft seal.



7. Press impeller out of housing.



8. Housing with small rim on top, turn impeller counter-clockwise into housing. Push impeller as far up as possible.

9.4 Replacing components

Impeller

1. Push impeller out of the casing
2. Insert a new impeller. Observe direction of impeller vanes (see adjacent illustration): impeller wings must be bent against the rotating direction.

To change the impeller more easily there is a tool. See chapter 10.4 tool for changing the impeller.

Wear plates

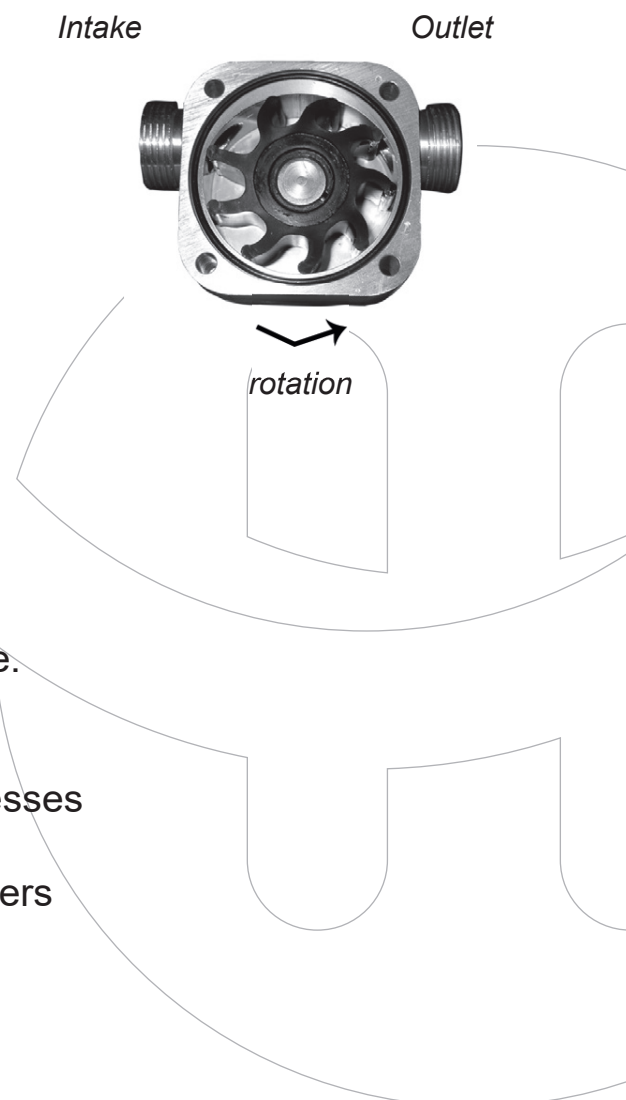
- ▶ Turn around or replace

Bush bearing

- ▶ Remove old bearing and press in the new one.

Seals

- ▶ Replace O-rings and push firmly into the recesses
- ▶ Replacing shaft seal:
 1. Remove retaining ring with suitable pliers
 2. Push out bearing and shaft seal
 3. Push in new shaft seal and bearing
 4. Insert retaining rings



9.5 Assembling the pump

Reassemble pump following the steps of assembling in reverse order – see previous chapter.



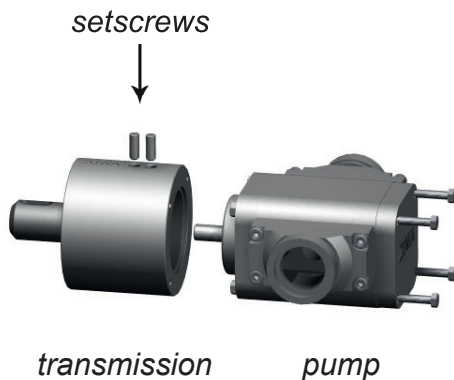
The wear plates and O-rings must lie precisely in the recesses to ensure that the O-rings are not pinched.

After completing pump assembly connect suction and pressure hose according to the indication In/Out on the type plate.

9.6 Mounting and dismounting of transmission for V-belt drive



The transmission with 24 mm stainless steel shaft for disc adaption can be used with pump types 2001-A, 2001-B and 2001-C. Pump with transmission is normally delivered as a completely assembled unit.

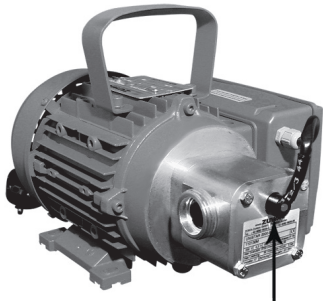


Separating pump from transmission:

First loosen 2 set screws, then the 4 screws on the pump. Pull off pump from transmission. For reassembly first tighten the 4 screws on the pump, then the 2 setscrews.

10. Accessories

10.1 Dry run protection



reset button

Dry run protection prevents overheating of the impeller. When the pump is running dry and heats up the thermo sensitive switch turns off the motor. After cooling off the pump is ready to use again.

► To restart the cooled pump press the red reset button.

Observe the maximum temperature of the fluid when a dry run protection is used:

- 60°C ±3K for UNISTAR, COMBISTAR and NIROSTAR-C plus
- 45°C ±3K for NIROSTAR A and B

10.2 Flow meter

adjusting screw



With the flow control the flow rate of the pump can be controlled and adjusted to a specific quantity.

Flow rate measurement is based on the principle of a floater connected to a spring. The flow meter is integrated in the housing. The flow rate can be adjusted with an adjusting screw:

► Turn the adjusting screw using the scale from 1 - 6

► Fine adjustment: turn the setting screw when pump is operating until the required flow rate is shown in the vision panel.

flow rate:	2 – 8 l/min (for A-types)	8 -30 l/min (for A-types)	10 – 40 l/min (for B-types)
connecting thread:	2 x ¾" a	2 x 1" a	2 x 1" a
max. fluid temperature:	100°C		
max. working pressure:	10 bar		
material:	brass (approved for drinking water)		

10.3 Mechanical pressure switch

The pressure switch stops the pump once the preset pressure of 3 bar is reached (top switching point). When pressure reaches the lower switching point the pump will start automatically.

Switch hysteresis is set to 30% as standard.

The top switching point can be adjusted with the adjusting screw located beneath the connector plug.

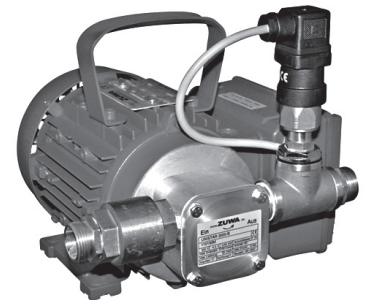
Remove connector plug and turn adjusting screw with a small screw driver:

- turn right for higher pressure
- turn left for lower pressure

Switch hysteresis can not be adjusted.

Works only with 400 V motor!

connector plug



adjusting screw



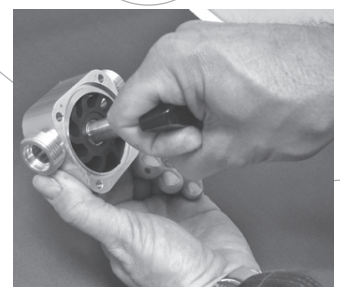
pressure switch and connector

Technical data

switch pressure:	adjustable from 1 - 10 bar
switch current:	4 A
connecting thread:	¼"
protection class:	IP 65 with plug
switch box:	stainless steel
membrane:	FKM as standard

10.4 Tool for changing the impeller

A useful tool to install the impeller easily into the casing, fitting for all impellers.



11. Troubleshooting

Fault	Possible cause	Remedy
Pump does not take in liquid	intake line is not leaktight	seal connection or line
	impeller worn or damaged	replace impeller
	suction line or foot valve is blocked	clean suction line or foot valve
	pressure line closed or blocked	open fittings on the pressure side or clean pressure line
Pump does not build up pressure	impeller or wear plate worn or damaged	replace impeller or wear plates
Liquid escapes from the pump	shaft seal or o-ring missing or defective	check whether part is in place and insert or replace defective component
Pump does not start	impeller stuck	Flush the pump with the medium to loosen impeller
	impeller clogged up or swollen	use an impeller appropriate to the medium
	Sensor activated when using an dry run protection	Press red button on sensor to reset
	motor defective	have motor checked by specialist personnel and have repaired if necessary

12. Environmentally compatible disposal

Most components of the device can be recycled. All metals (steel, aluminum, brass) can be disposed off at any scrap metal dealer.

Follow the locally applicable regulations.

Plastic parts can be contaminated by toxic pumped media, to the extent that cleaning is no longer an adequate solution.



Warning

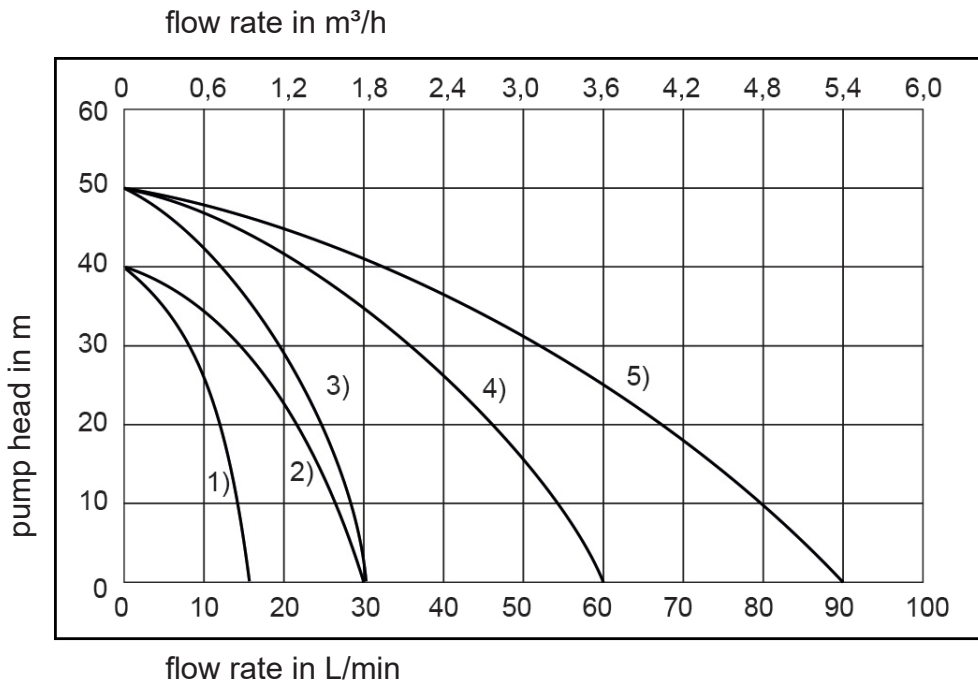
Danger of injury and poisoning due to dangerous pumped media

- Collect escaping pumped media and dispose of according to the locally applicable regulations.
- Neutralise residues of pumped media in the pump chamber.

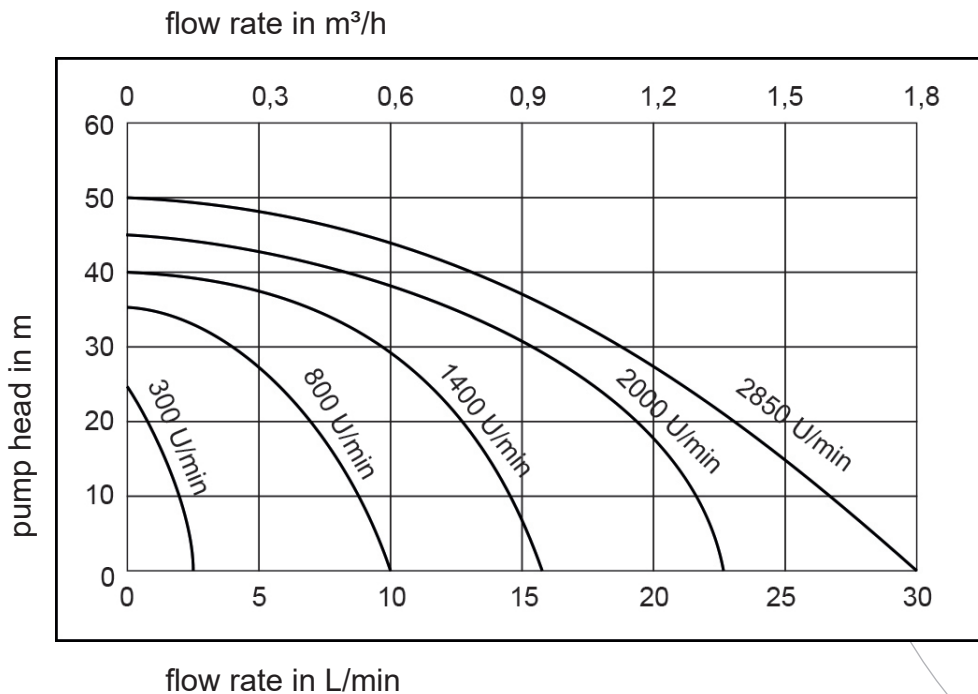




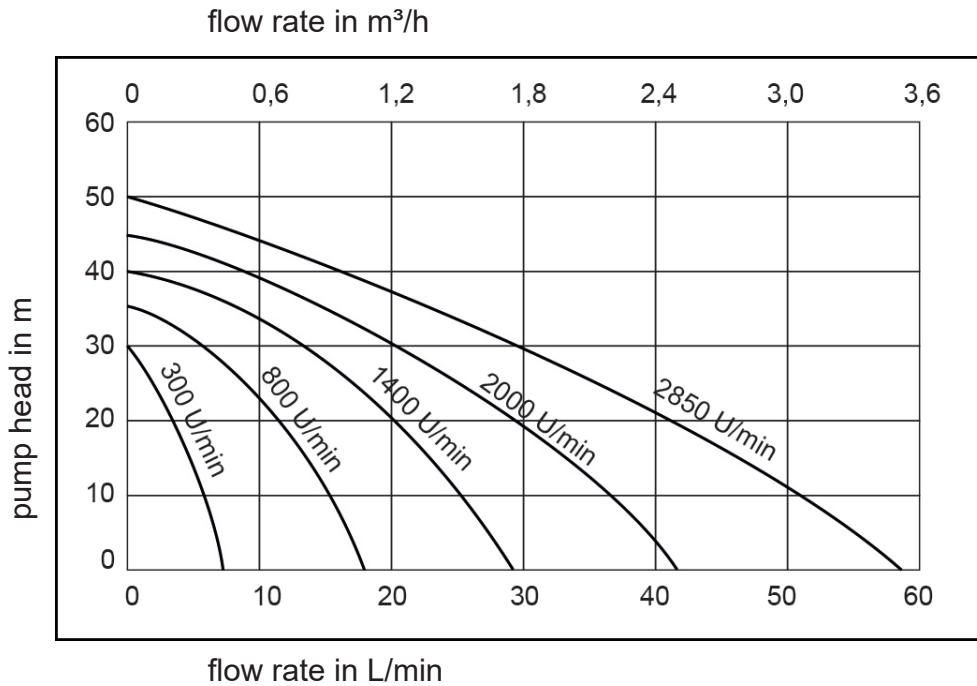
13. Performance curves



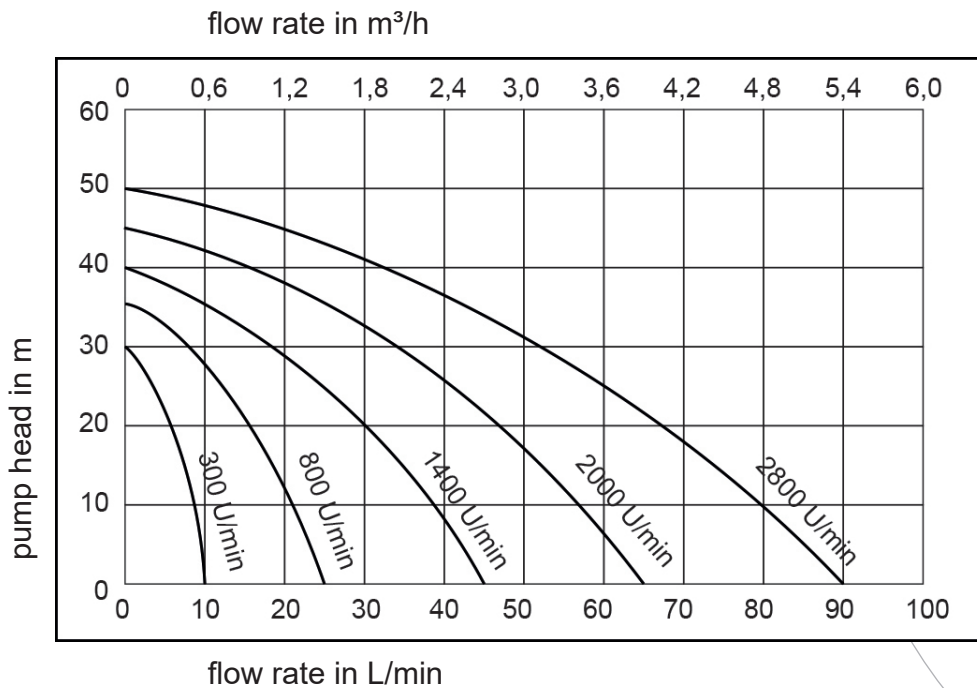
- 1) type A with 1.400 U/min
- 2) type B with 1.400 U/min
- 3) type A with 2.850 U/min
- 4) type B with 2.850 U/min
- 5) type C with 2.800 U/min



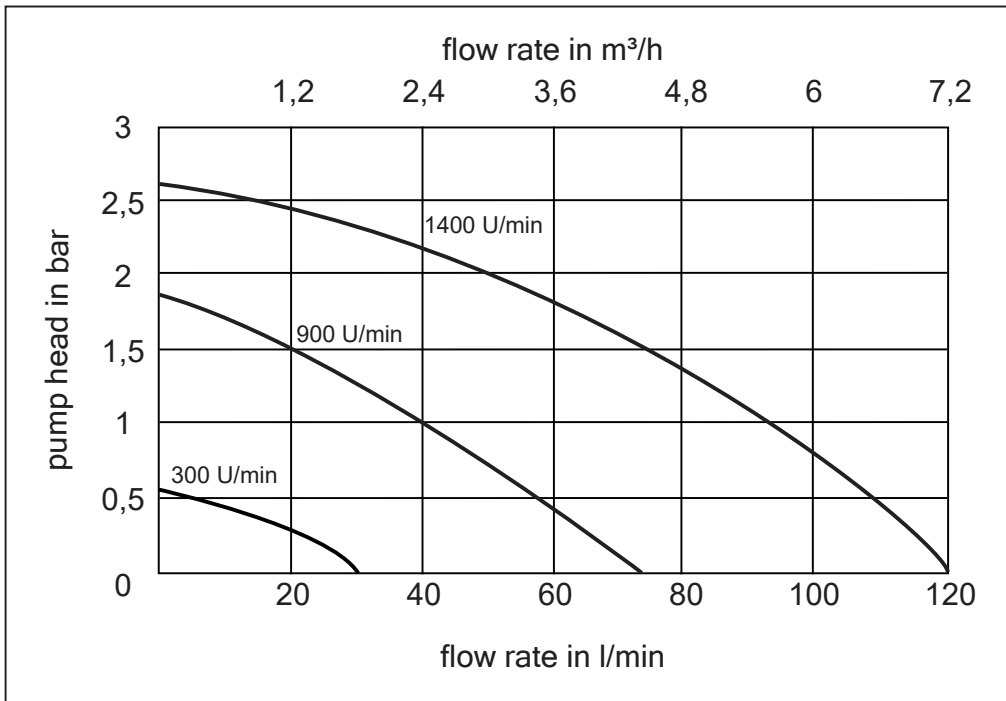
UNISTAR 2000-A with frequency converter



UNISTAR 2000-B with frequency converter



UNISTAR 2000-C with frequency converter



NIROSTAR 2000-C
plus



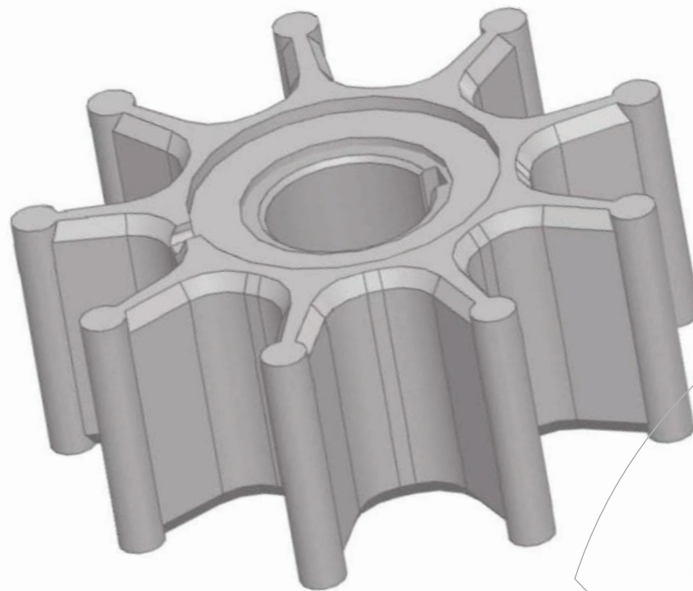


HUCHEM

Flexible Impeller Pumps

Operating Instructions

according to Regulation (EC) No. 1907/2006



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