ZUWA

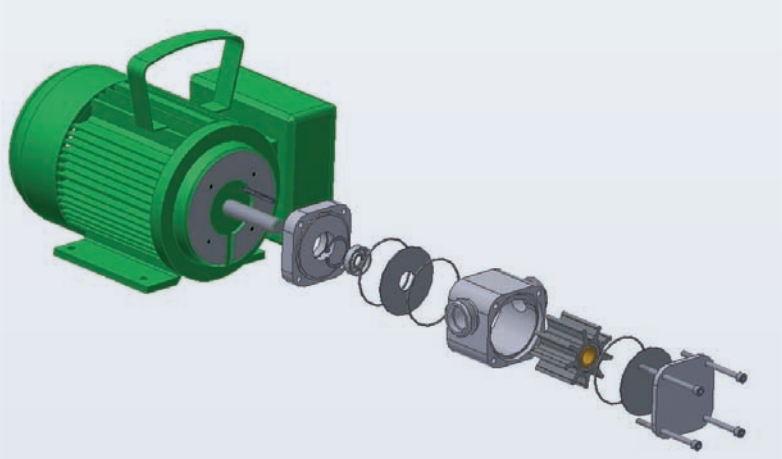
Flexible Impeller Pumps

UNISTAR • COMBISTAR • NIROSTAR

one Design — three types

TÜV SÜD ISO 9001

Content



About ZUWA

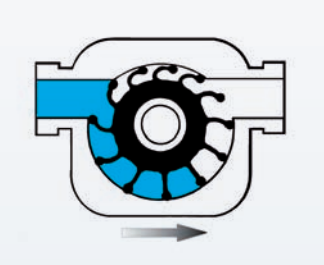
ZUWA-Zumpe GmbH is a family owned and run company with more than 65 years of experience in pump manufacturing and development. We are in constant communication with our customers both locally and abroad and provide them with information regarding all questions concerning pumps.

Taking our customers requirements into consideration and continually improving our products enables us to provide and guarantee first class service and top quality for all our products.
With our in-house production we are able to meet the specific requirements of our customers, enabling us to design and purpose build pumps and pump applications. Our experienced staff provides an efficient and reliable service to our customers.

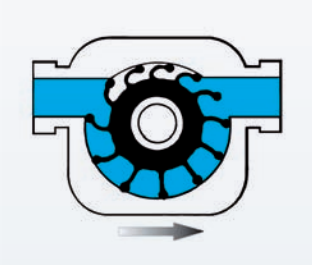
Principles of operation

Flexible impeller pumps are displacement pumps. The rotor with flexible vanes is mounted concentrically in a circular housing which has a flattened area at one side. This provides the eccentric path for the impeller, thereby squeezing the flexible blades on this side.

The impeller rotation and the straightening of the vanes upon leaving the cam creates a vacuum on the suction side drawing the fluid into the pump chamber.



The rotating impeller transfers the liquid from the inlet to the outlet port of the pump.



On the pressure side the impeller vanes are compressed and the fluid is discharged constantly from the pump.

The advantages of an Impeller Pump

Dry self-priming

What makes impeller pumps outstanding – they do not need to be filled prior to operation. Impeller pumps are dry self priming from a depth of three meters. Pre-filling is required for a suction depth of three metres and more. The maximum suction depth is 7 metres.

High capacity

Depending on type and model our pumps are capable of transferring from between 3 litres up to 730 litres per minute. Tanks will be drained down to the last drop.

Versatile

Useful for many different fluids and applications. Materials of impellers, seals and pump housings can be selected according to the individual needs and applications required. ZUWA Impeller Pumps are available with AC and DC motors with various revolutions per minute.

Gentle

Fluids are transferred absolutely free of pulsation. Smaller amounts of air or other gaseous fluids can be handled on the suction side.

Reliable

All pumps are tested for contiuous operation in our workshop. Top quality materials guarantee for a long durability.

Easy maintaining

For cleaning and maintenance work the pumps are quickly and easily disassembled. Replacement parts can be ordered individually.
Low operation costs!

Sturdy

Impeller pumps will readily pump fluids with a wide range of viscosity, even highly viscous liquids such as oil or honey (up to 20 000 mPAS) as well as liquids containing solids. The approved media temperature is 90°C maximum.
A short dry-run of up to one minute can be tolerated.

Pump Types

Where Impeller Pumps are being used

- electroplating
- biotechnology
- heating and sanitary
- workshop, machine shop
- agriculture and horticulture
- food and beverage industry
- boating, marine engineering
- water and sewerage treatment
- manufacturing, industrial plants and construction
- chemical, pharmaceutical and cosmetics industry

impeller wheel type A in full scale: Ø 56 mm

Three pump types

UNISTAR

A multi-purpose pump designed for transferring clean or contaminated liquids. Not suitable for handling abrasive or corrosive fluids.

COMBISTAR

This pump is particularly suitable for all fluids containing abrasives. It is an economic alternative to the NIROSTAR series for transferring abrasive or slightly corrosive fluids.

NIROSTAR

A high quality stainless steel pump with numerous applications in industrial plants and production facilities, the appropriate choice for transferring corrosive fluids.

Impeller materials

NBR /Acrylnitril-Butadien-Kautschuk (Perbunan®, Buna-N®)

for 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 /Ethylen-Propylen-Dien-Kautschuk (Keltan®, Buna EP®)

for high temperatures, for acids and bases.

high elasticity and very good mechanical stability

CR /Chloropren-Kautschuk (Neoprene®, Bayprene®)

preferably used for applications in the food industry.

flame retardant, tearproof, durable

FKM oder FPM /Fluor-Kautschuk (Viton®, Fluorel®)

for oil, diesel, fuel oil, palm oil, soy bean oil and oil emulsive wood preservatives

very good chemical resistance, less mechanical resistance

Plastics *New!*

for water, mineral and vegetable oils, diesel fuel, heat transfer fluid and several chemicals

extremely tear resistant and good mechanical resistance
maximum fluid temperature 60°C

plastics impeller

	pump housing	pump cover*	pump shaft	rotary shaft seal	floating ring seal	impeller wheel				
						NBR	EPDM	FKM	CR	plas-tics
UNISTAR 2000-A	AlMgSi1	AlMgSi1	AISI 430 F	✓	✗	✓	✶	✶	✶	✶
UNISTAR 2000-B				✓	✗	✓	✶	✶	✶	✶
UNISTAR 2000-C				✓	✗	✓	✶	✶	✶	✶
UNISTAR 2001-A			AISI 316 L	✓	✗	✓	✶	✶	✶	✶
UNISTAR 2001-B				✓	✗	✓	✶	✶	✶	✶
UNISTAR 2001-C				✓	✗	✓	✶	✶	✶	✶
COMBISTAR 2000-A	AISI 316 L		AISI 430 F	✓	✗	✓	✶	✶	✶	✶
COMBISTAR 2000-B				✓	✗	✓	✶	✶	✶	✶
COMBISTAR 2001-A			AISI 316 L	✓	✗	✓	✶	✶	✶	✶
COMBISTAR 2001-B				✓	✗	✓	✶	✶	✶	✶
NIROSTAR 2000-A directly flanged		AISI 316 L	AISI 430 F	✓	✗	✓	✶	✶	✶	✶
NIROSTAR 2000-A with pump carrier			AISI 316 L	✓	✗	✓	✶	✶	✶	✶
NIROSTAR 2000-B directly flanged			AISI 430 F	✓	✗	✓	✶	✶	✶	✶
NIROSTAR 2000-B with pump carrier			AISI 316 L	✓	✗	✓	✶	✶	✶	✶
NIROSTAR 2001-A			AISI 316 L	✓	✗	✓	✶	✶	✶	✶
NIROSTAR 2001-B				✓	✗	✓	✶	✶	✶	✶
NIROSTAR 2000-C	AISI 316	AISI 316	AISI 304	✗	✓	✓	✶	✗	✶	✗
NIROSTAR 2000-D	AISI 304	AISI 304		✗	✓	✓	✶	✗	✶	✗
NIROSTAR 2000-E				✗	✓	✓	✶	✗	✶	✗
NIROSTAR 2000-F				✗	✓	✓	✶	✗	✶	✗
NIROSTAR 2001-D				✗	✓	✓	✶	✗	✶	✗
NIROSTAR 2001-E				✗	✓	✓	✶	✗	✶	✗
NIROSTAR 2001-F				✗	✓	✓	✶	✗	✶	✗

* For UNISTAR and COMBISTAR: to protect the aluminium pump covers the pump chamber is sealed with stainless steel discs (AISI 316).

✔ = standard, ✗ = not available, ✶ = on request

Versions and Drive Systems

directly flanged

with pump carrier

with change-over switch

with pneumatic motor

with gear motor

Electrically driven pumps

Electric motors

ZUWA Impeller Pumps are available with electric motors of various specifications. The pump casing can either be directly flanged to the motor or is connected via a special adapter housing. Drives are available as follows:

- 230 Volt AC
- 400 Volt AC
- 12 or 24 Volt DC

Pump carrier

Carrier to connect pumps with standardized motors with installation size M71 B3/B14.

Bidirectional motor

It is possible to pump in both directions by reversing rotation: tanks can be drained and filled easily without changing hoses.

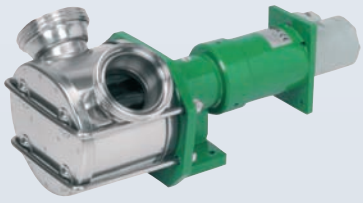
The pumps of series A and B can be mounted to a bidirectional motor on option. For the pumps of series C to F a bidirectional motor is standard equipment.

Pneumatic motor *New!*

Handy and extremely light pump of series 2001-A with a powerful pneumatic drive, especially made for garages where compressed air is available.
The pump is fixed in a similar way as with the drill adapter and depth stop (see next page).

Hydraulic motor

Hydraulic motor for connection to hydraulic systems of commercial vehicles.



with hydraulic motor

Gear motor

- single or two stage
- variably adjustable

Versions and Drive Systems

Pumps without drive units

All ZUWA impeller pumps are also available without electric motors, enabling the pump to be connected to any type of alternative drive unit.

UNISTAR 2001-A with V-belt pulley

Drive Options

- power drill
- V-belt drive
- gear motor
- hydraulic motor
- pneumatic drive

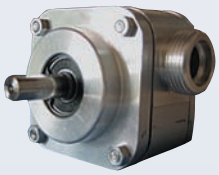
Transmission for V-belt drive *New!*

Transmission with 24 mm stainless steel shaft (AISI CA 6 NM) for pulley carrier.

The motor shaft is mounted with a double angular ball bearing and is fixed by the bearing housing. Thereby the axial forces barely affect the pump shaft and abrasion is minimized.

pump with transmission

Drill driven Impeller Pumps



pump

adapter

example for application with adapter and cordless screwdriver

The pump series 2001-A and 2001-B are ideally driven with a drill. The shaft can easily be fixed to the chuck of each regular electric or cordless drill and screwdriver. The pump is available in two versions:

1. with drill adapter

The adapter fixes the pump with the depth stop.

2. with regraded support and mounting feet

The pump is mounted to a regraded support along with the drill (the support is not part of the standard equipment).

Adapter and regraded support separately availble for back fitting.

example for application with regraded support (optional accessory)

UNISTAR

2000-A | 2000-B | 2000-C

UNISTAR 2000-A/-B

A multi-purpose pump designed for transferring clean or contaminated fluids without abrasive particles (suitable for all non corrosive and non abrasive fluids).

Fluids

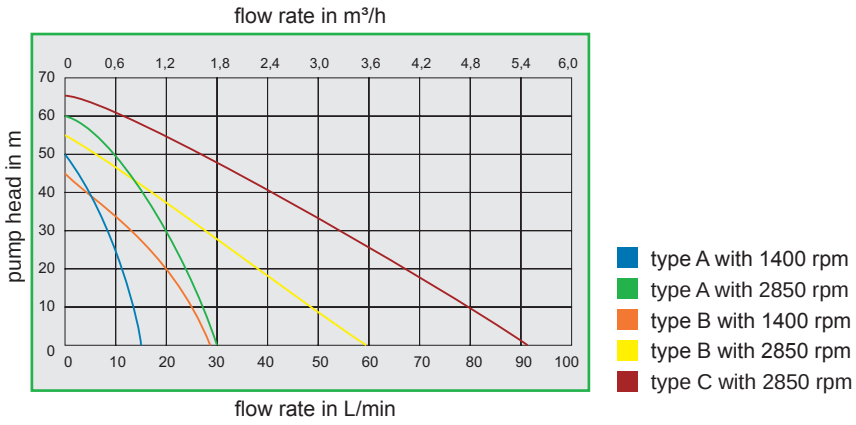
- water, salt water
- waste water
- diesel fuel, biodiesel
- vegetable oils
- heating and motor oil
- detergents
- antifreeze
- heat transfer fluid
- cooling lubricants

Applications

- filling solar collectors
- irrigation
- rain water harvesting
- domestic water supply
- drain flooded basements
- decanting barrels
- draining waste oil
- sewerage disposal
- fuelling vehicles
- car wash
- draining ponds/pools
- cleaning tanks
- draining tanks
- dispose off cooling lubricants
- draining water beds

UNISTAR 2000-C

bidirectional motor as standard



Technical data	UNISTAR 2000-A								UNISTAR 2000-B								UNISTAR 2000-C		
flow rate max.	30 L/min								60 L/min								90 L/min		
max. pressure	5 bar *								5 bar *								5 bar *		
connections	¾“								1“								1¼“		
Volt	230		400		12		24		230		400		12		24		230 V	400 V	
rpm	1 400	2 800	1 400	2 800	1 500	3 000	1 500	3 000	1 400	2 800	1 400	2 800	1 500	3 000	1 500	3 000	2 800		
Ampere	3.2	3.2	2.1	1.9	39	42	12	18	4.4	4	2.8	2.4	50	49	23	23	8.8	2.7	
motor power (kW)	0.37				0.25				0.55				0.37				1.1		
max. temperature	90°C								90°C								90°C		
weight	9 kg								9.2 kg								13 kg		

* with Perbunan impeller

Fluids

- water, salt water
- waste water
- diesel fuel, biodiesel
- vegetable oils
- heating and motor oil
- detergents
- antifreeze
- heat transfer fluid
- cooling lubricants

Applications

- refill solar collectors
- irrigation
- rain water harvesting
- domestic water supply
- drain flooded basements
- decanting barrels
- draining waste oil
- sewerage disposal
- fuelling vehicles
- car wash
- draining water beds
- draining aquariums
- dispose off cooling lubricants
- bilge pump
- booster pump

UNISTAR 2001-A/-B

UNISTAR 2001-A with cordless screwdriver

UNISTAR 2001-C with transmission

Technical data	UNISTAR 2001-A	UNISTAR 2001-B	UNISTAR 2001-C *New!*
flow rate max.	30 L/min	60 L/min	90 L/min
max. pressure	4 bar	4 bar	4 bar
connections	¾“	1“	1¼“
minimum drive power	500 W	700 W	1 400 W
rpm	max. 2 900	max. 2 900	max. 2 900
motor power	--	--	--
Ampere	--	--	--
max. temperature	90°C	90°C	90°C
weight	0.6 kg	0.8 kg	2.4 kg without V-belt pulley

COMBISTAR

2000-A | 2000-B | 2001-A | 2001-B

COMBISTAR 2000-A/B

This pump is particularly suitable for all fluids containing abrasives. All components getting in contact with the medium are made of stainless steel. It is an economic alternative to the NIROSTAR series for transferring abrasive or slightly corrosive liquids.

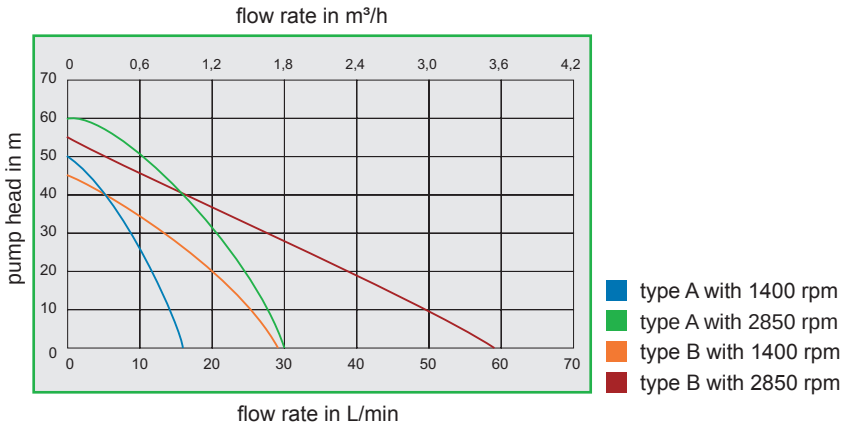
Applications

- cleaning machines
- oil disposal
- whitewashing stables
- draining tanks
- cleaning tanks
- galvanizing tanks
- draining waste oil
- dispose off cooling lubricants

Fluids

- descaler
- grinding emulsions
- coolant
- lime water
- diluted soluble oil
- galvanising sludge
- waste oil
- cooling lubricants

COMBISTAR 2001-A/B



Technical data	COMBISTAR 2000-A								COMBISTAR 2000-B								COMBISTAR 2001-A	COMBISTAR 2001-B
flow rate max.	30 L/min								60 L/min								30 L/min	60 L/min
max. pressure	5 bar *								5 bar *								4 bar	4 bar
connections	¾“								1“								¾“	1“
Volt	230		400		12		24		230		400		12		24		--	--
rpm	1 400	2 800	1 400	2 800	1 500	3 000	1 500	3 000	1 400	2 800	1 400	2 800	1 500	3 000	1 500	3 000	--	--
Ampere	3.2	3.2	2.1	1.9	39	42	12	18	4.4	4.0	2.8	2.4	50	49	23	23	--	--
motor power (kW)	0.37				0.25				0.55				0.37				--	--
max. temperature	90°C								90°C								90°C	90°C
weight	9.4 kg								10 kg								1 kg	1.6 kg

* with Perbunan impeller

NIROSTAR 2000-A/B

NIROSTAR 2001-A/B

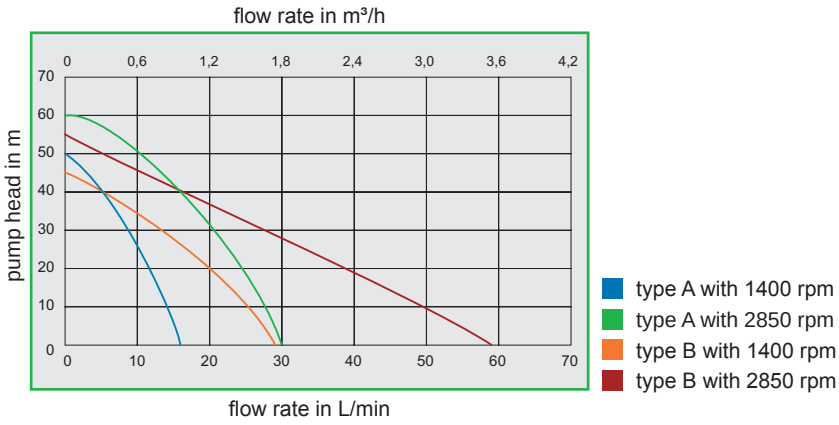
A high quality stainless steel pump with numerous applications in industrial plants and production facilities, the appropriate choice for transferring corrosive fluids. Frequently used in food and beverage industry.

Applications

- delivering
- filtering
- dosing
- decanting
- draining

Fluids

- Food, drinks
- mash
- chemicals, acids, bases
- liquid fertilizers
- dyes, glues
- vegetable oils
- cooling lubricants
- fire fighting foam agents



Star Handles

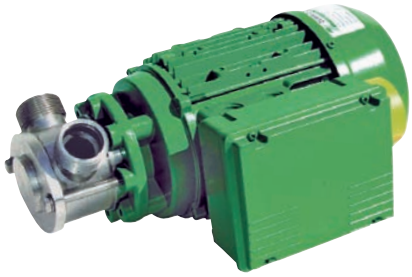
The quick release star handles, available for all NIROSTAR pumps shown on this page, allow for easy opening of the pump by hand without using tools. For this operation it is not necessary to remove the pump from its installed position. This provides an easy access for cleaning, inspection and maintenance.

Technical data	NIROSTAR 2000-A								NIROSTAR 2000-B								NIROSTAR 2001-A	NIROSTAR 2001-B
flow rate max.	30 L/min								60 L/min								30 L/min	60 L/min
max. pressure	5 bar *								5 bar *								4 bar	4 bar
connections	¾“								1“								¾“	1“
Volt	230		400		12		24		230		400		12		24		--	--
rpm	1 400	2 800	1 400	2 800	1 500	3 000	1 500	3 000	1 400	2 800	1 400	2 800	1 500	3 000	1 500	3 000	--	--
Ampere	3.2	3.2	2.1	1.9	39	42	12	18	4.4	4.0	2.8	2.4	50	49	23	23	--	--
motor power (kW)	0.37				0.25				0.55				0.37				--	--
max. temperature	90°C								90°C								90°C	90°C
weight	9.8 kg								10.4 kg								1.5 kg	2 kg

* with Perbunan impeller

NIROSTAR

2000-C | 2000-D | 2001-D



NIROSTAR 2000-C

NIROSTAR 2000-D

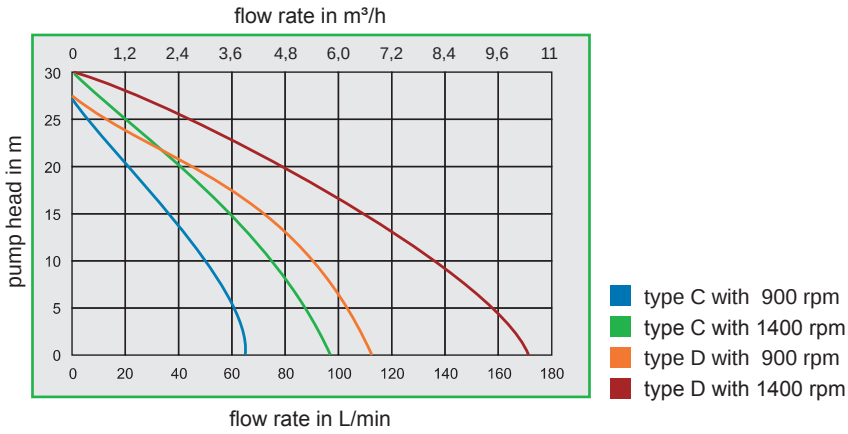
NIROSTAR 2001-D

Applications

- clean tanks
- cleaning ponds
- delivering
- filtering
- dosing
- decanting
- draining

Fluids

- heating oil, diesel fuel
- food, drinks
- mash
- chemicals
- acids
- bases
- liquid fertilizers
- dyes
- glues
- vegetable oils
- surface treatment
- cooling lubricants
- fire fighting foam agents
- concrete admixtures



Connections

On request available with following pipe fittings: BSP male thread, hygienic connection acc. to DIN 11851, Garolla fitting, SMS fitting, BSM (RJT) fitting and further optional connections.

Technical data	NIROSTAR 2000-C*						NIROSTAR 2000-D*			NIROSTAR 2001-D
flow rate max.	96 L/min						166 L/min			115 L/min
max. pressure	3 bar						3 bar			3 bar
connections	1¼“						1½“			1½“
Volt	230 V		400 V			24 V	230 V	400 V		--
rpm	900	1,400	700	900	1,400	900	900	900	1,400	--
Ampere	5	7.1	n. A.	1.7	2.1	30	13	4.1	3.8	--
motor power kW	0.56	0.75	n. A.	0.55	0.75	0.56	1.5			--
max. temperature	90°C						90°C			90°C
weight	15 kg						20 kg			4.5 kg

* bidirectional motor

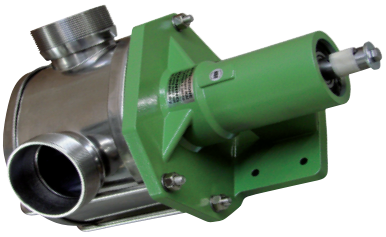
Fluids

- heating oil, diesel fuel
- food, drinks
- mash
- chemicals
- acids
- bases
- liquid fertilizers
- dyes
- glues
- vegetable oils
- surface treatment
- cooling lubricants
- fire fighting foam agents
- concrete admixtures

Applications

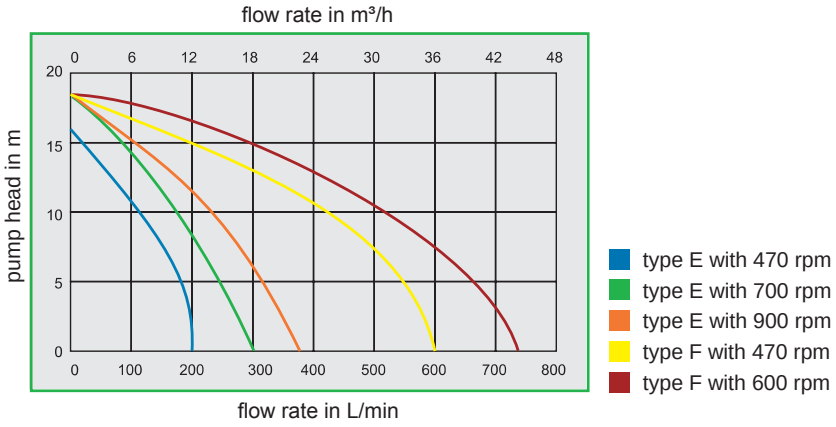
- clean tanks
- cleaning ponds
- delivering
- filtering
- dosing
- decanting
- draining

NIROSTAR 2000-E



NIROSTAR 2001-F

*NIROSTAR 2000-F
with frequency converter and
dry run protection on trolley*



Connections

On request available with following pipe fittings: BSP male thread, hygienic connection acc. to DIN 11851, Garolla fitting, SMS fitting, BSM (RJT) fitting and further optional connections.

Technical data	NIROSTAR 2000-E*			NIROSTAR 2000-F*		NIROSTAR 2001-E	NIROSTAR 2001-F
flow rate max.	375 L/min			730 L/min		375 L/min	730 L/min
max. pressure	2 bar			2 bar		2 bar	2 bar
connections	2“			3“		2“	3“
Volt	400 V			400 V		--	--
rpm	470	700	900	470	600	--	--
Ampere	6	6	5.5	9.5	8.2	--	--
motor power kW	1.12	1.5	1.87	3.3	3.5	--	--
max. temperature	90°C			90°C		90°C	90°C
weight	30 kg			69 kg		8.5 kg	14.5 kg

* bidirectional motor

Frequency Converter

integrated frequency converter

external frequency converter

Frequency converter

Integrated or external to be assembled in a switching cabinet

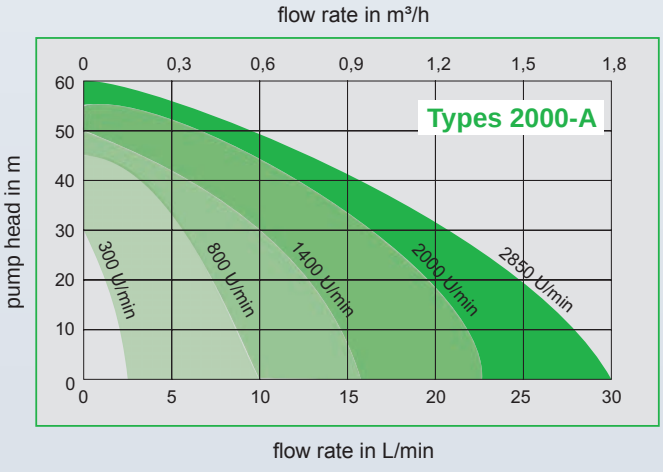
Variable flow rate

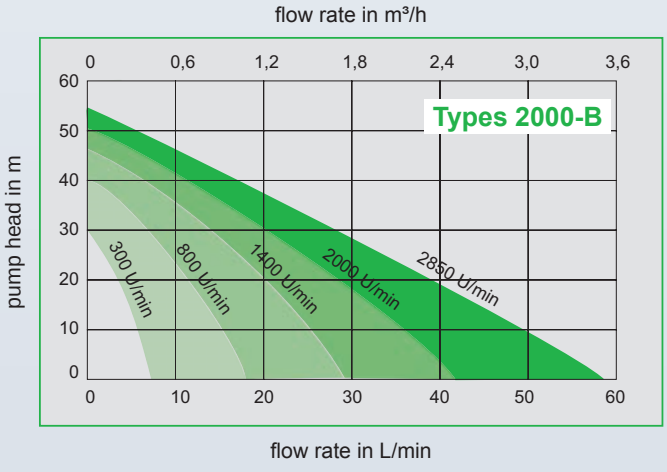
Flexible flow rate controlled by a frequency converter – the exact flow rate can be adjusted when pump is used for filling or dosing.The rotation of the impeller can be reversed if required.

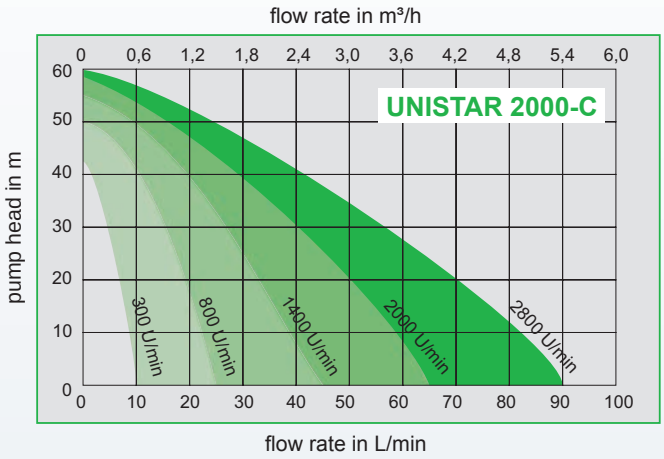
Features

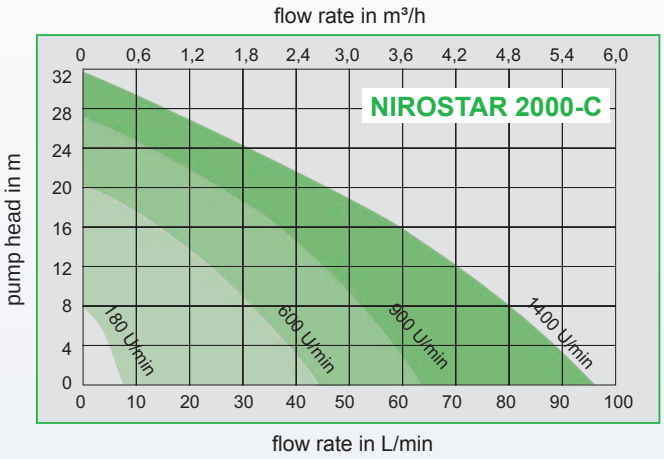
- reversion of rotation
- overload protection
- precise drive
- compact design

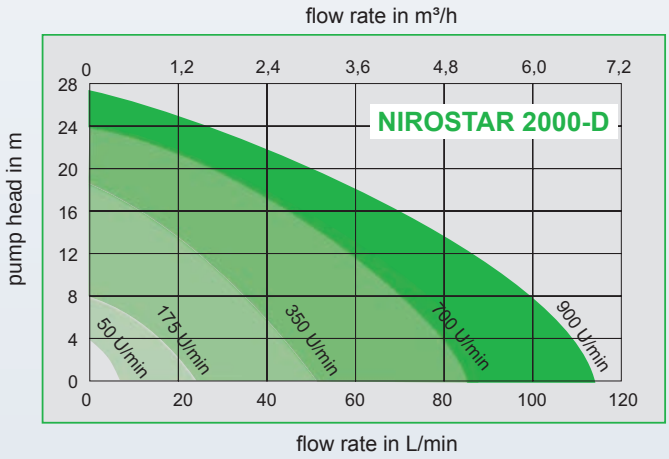
Performance curves for pumps with frequency converter

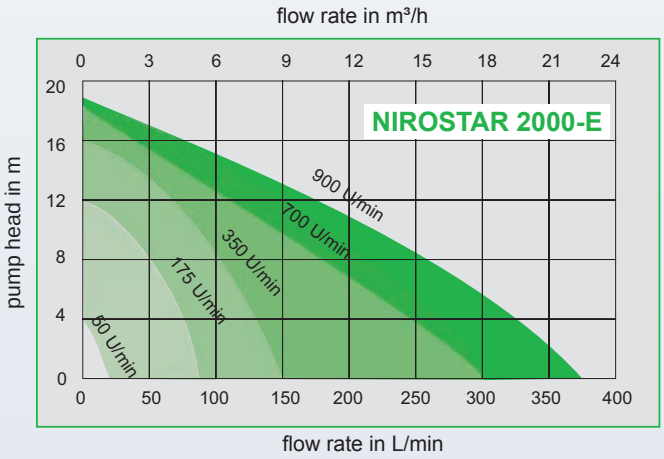


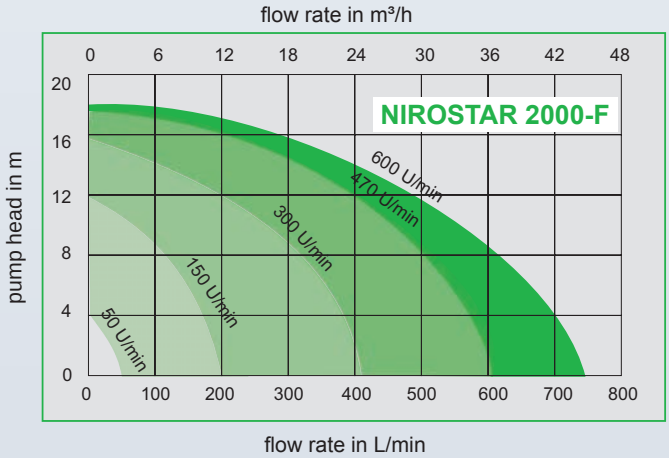



flow rate in m³/h
0 0,6 1,2 1,8 2,4 3,0 3,6 4,2 4,8 5,4 6,0
UNISTAR 2000-C
pump head in m
60 50 40 30 20 10 0
300 U/min
800 U/min
1400 U/min
2000 U/min
2800 U/min
0 10 20 30 40 50 60 70 80 90 100
flow rate in L/min


flow rate in m³/h
0 0,6 1,2 1,8 2,4 3,0 3,6 4,2 4,8 5,4 6,0
NIROSTAR 2000-C
pump head in m
32 28 24 20 16 12 8 4 0
180 U/min
600 U/min
980 U/min
1400 U/min
0 10 20 30 40 50 60 70 80 90 100
flow rate in L/min


flow rate in m³/h
0 1,2 2,4 3,6 4,8 6,0 7,2
NIROSTAR 2000-D
pump head in m
28 24 20 16 12 8 4 0
50 U/min
175 U/min
350 U/min
700 U/min
900 U/min
0 20 40 60 80 100 120
flow rate in L/min


flow rate in m³/h
0 3 6 9 12 15 18 21 24
NIROSTAR 2000-E
pump head in m
20 16 12 8 4 0
50 U/min
175 U/min
350 U/min
700 U/min
900 U/min
0 50 100 150 200 250 300 350 400
flow rate in L/min


flow rate in m³/h
0 6 12 18 24 30 36 42 48
NIROSTAR 2000-F
pump head in m
20 16 12 8 4 0
50 U/min
150 U/min
300 U/min
470 U/min
600 U/min
0 100 200 300 400 500 600 700 800
flow rate in L/min

Accessories

Dry run protection

Impeller pumps can be equipped with a dry run protection. A sensor switch interrupts the power supply before overheating.
Easy retrofitting of existing pumps.

Pressure switch

The pressure switch shuts off the pump when reaching a preset pressure level. As soon as the pressure drops again by 30% the pump automatically starts anew. Device just works with 400 V motor.

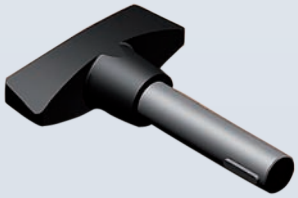
Switching pressure: adjustable from 1-10 bar
Material: stainless steel or brass

Flow control

With the flow control the flow rate of the pump can be controlled and adjusted to a specific quantity. The flow meter is integrated in the housing.
Flow rate: 8 - 30 L/min or 10 - 40 L/min
Connection: 2 x 1“ male thread
Max. operating pressure: 10 bar
Material: brass (approved for drinking water)

Carrying handle

Carrying handle with rubber pads - convenient transport for all impeller pumps of the series 2000 (except for NIROSTAR 2000-E and NIROSTAR 2000-F).



Tool for changing the impeller

A useful tool to install the impeller easily into the casing. Suitable for all ZUWA impellers type A and B

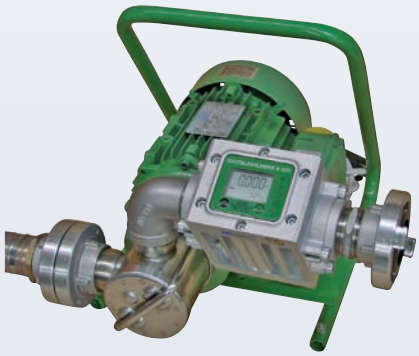
NIROSTAR 2000-C with frequency converter and remote control

Remote control

For frequency converter
Remote control with 15 m cable to control speed and sense of rotation.

Remote control for pump
10 metres extension cable with ON/OFF switch

remote control for pump



Flow Meters

Electronic and mechanical meters for various fluids and applications.
All electronic meters also available in pulser version.

Transport cart

Trolley with removable push rod and handy cable reel.

Special Applications

Barrel pump for battery drive

Extremely lightweight and efficient pump for mobile applications with battery drive 12 or 24 Volt. For continuous duty approved.

Flow rate max.: 15 L/min with 12 V — 30 L/min with 24 V
Operating pressure: max. 3 bar
Weight: only 3.1 kg

Features:

- dry self-priming impeller pump
- 3 pole connector plug
- ON/OFF switch with thermal motor protection
- 2” barrel connection

(barrel and battery not included with the delivery)

Flat suction kits

Effective aid to flooded basements. Also available with oil resistant hose for oil contaminated fluids.

For larger areas two or more mats can be connected to the pump in parallel.

Application:

- drain flooded basements
- suck off flat roofs
- clean sludgy ponds

Features:

UNISTAR 2000-B, spiral hose, flat suction mat and euro container with cover.

On option: pump control, dry run protection and pumps with higher capacity or superior materials (COMBISTAR and NIROSTAR also for fluids with abrasive particles).

Watering cart

Low noise watering and fertilizing of large areas with 12/24 Volt battery drive.

Features:

UNISTAR 2000-A with ZUMATIC pump control switching the pump on and off automatically.
Tank content: 120 litres
(battery not included)

Pump UNISTAR with pump control and 12 or 24 Volt drive separately available.

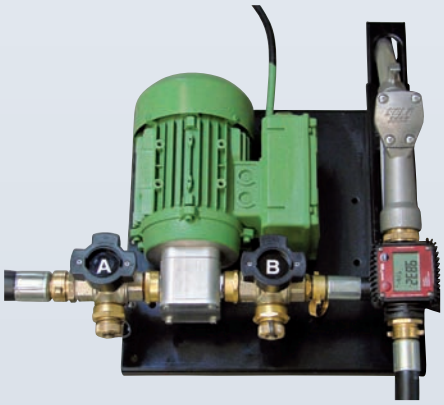
HVAC Filling and Flushing Stations

FLUSH PRO

Solarcheck Mobilcenter

DESCAL

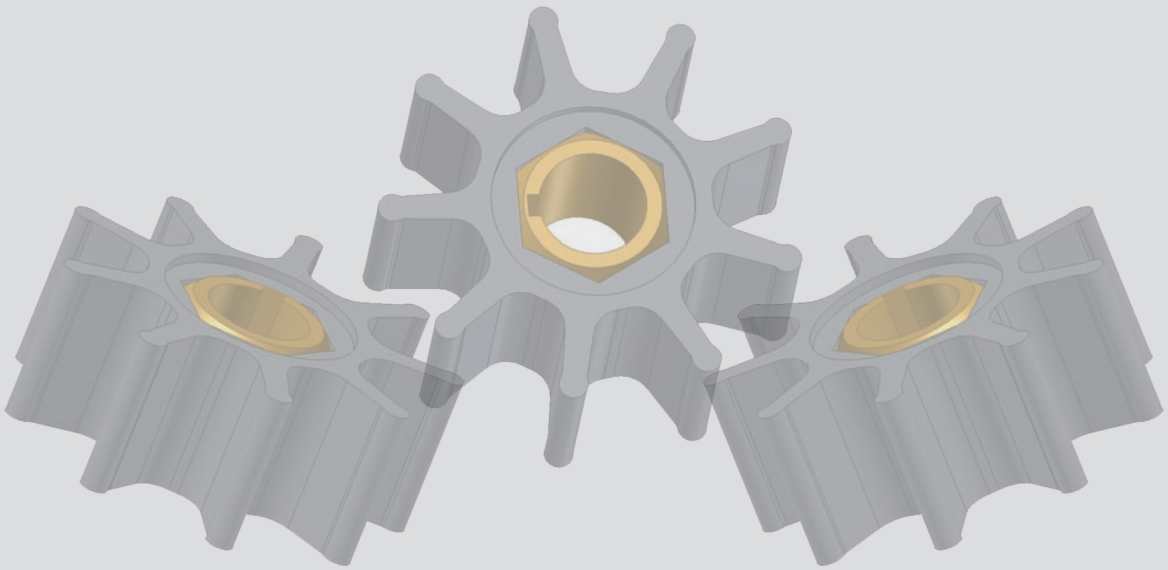
UNISTAR 2000



Stationary ServiceCenter

Additional information on these products is available in our detailed brochure for HVAC professionals (sent to you on request) or can be downloaded from www.zuwa.de

Mobile ServiceCenter



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