

Flexible Impeller Pumps
one design - four types



UNISTAR - COMBISTAR - NIROSTAR - ACOSTAR



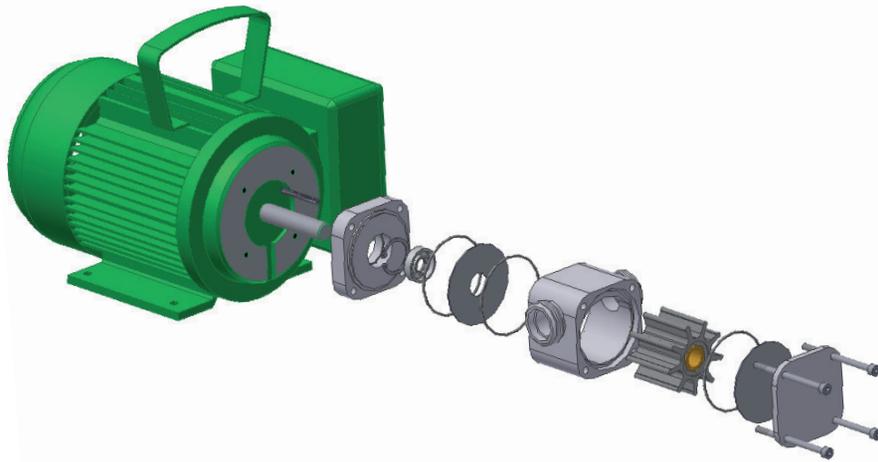
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ZUWA-Zumpe GmbH

The family run enterprise ZUWA-Zumpe GmbH has been manufacturing high quality pumps and innovative pump systems for 70 years. The ample experience in designing and producing high end products enables us to offer a wide range of different devices.

The entire product range consisting of pumps, fuelling stations, plant protection systems as well as charging and flushing stations is in high demand all over the world. ZUWA is working in accordance with the ISO 9001:2008 quality management system, regularly controlled by TÜV SÜD. Process safety and constant quality is guaranteed.

The close contact with our customers provides us with proposals and impulses to improve and further develop our products. In house production and shop floor enable us to meet customer specific requirements, manufacture custom made products and complete repair jobs. Competent contact persons and lean management make for quick and reliable service.



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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.

1. Suction:

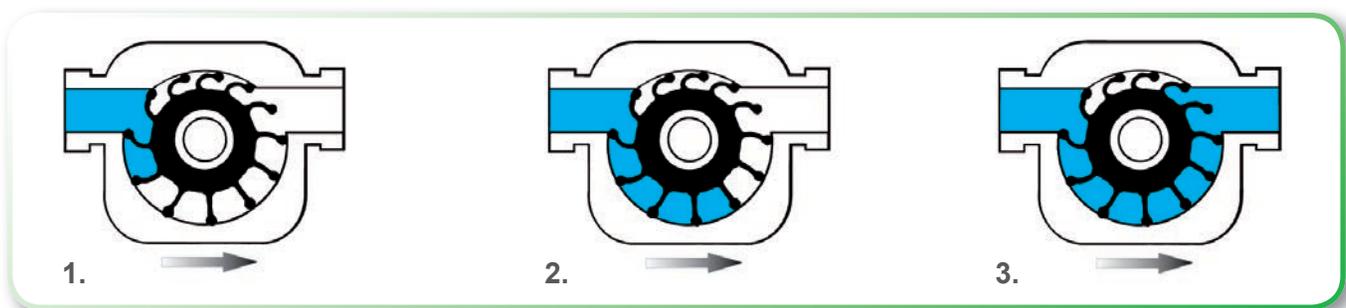
The impeller rotation and the straightening of the vanes upon leaving the cam creates a vacuum on the suction side drawing the fluid into the pump chamber.

2. Transfer:

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

3. Press:

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 suction depth is max. 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 continuous 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

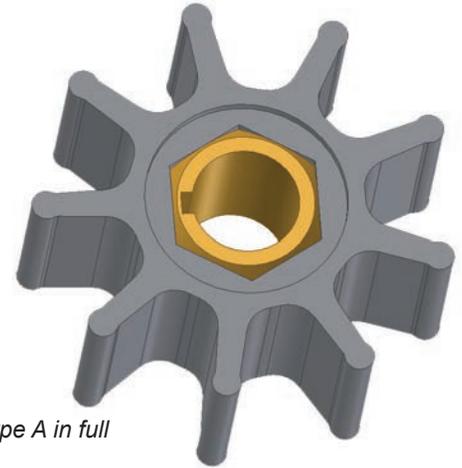
Impeller pumps will readily pump fluids with a wide range of viscosity, even highly viscous liquids such as oil or honey (up to 20 000 mPAS) as well as liquids containing solids. The approved media temperature is max. 90°C. A short dry-run of up to one minute can be tolerated.

Pump types

UNI-, COMBI-, NIRO- and ACOSTAR

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

Pump types

UNISTAR

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

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.

ACOSTAR

The synthetic pump is for a wide variety of applications in the chemical sector. Perfect for fluids with various viscosities plus aggressive acids, bases and solvents.

For all applications the right Impeller material



NBR /Acrylonitrile-Butadiene-rubber (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 /Ethylene-Propylene-Diene-rubber (Keltan®, Buna EP®):

for high temperatures, for acids and bases. high elasticity and very good mechanical stability



CR /Chloroprene-rubber (Neoprene®, Bayprene®):

preferably used for applications in the food industry. flame retardant, tearproof, durable



FKM or FPM /Fluor-rubber (Viton®, Fluorel®):

for oil, diesel, fuel oil, palm oil, soy bean oil and oil emulsive wood preservatives very good chemical resistance, less mechanical resistance



Plastic

for water, mineral and vegetable oils, diesel fuel, heat transfer fluid and several chemicals. Extremely tear resistant and good mechanical resistance (not suitable for abrasive fluids) maximum fluid temperature 60°C



Thermoplastic impeller

UNISTAR	2000-A, B and C	2001-A, B and C	COMBISTAR	2000-A and B	2001-A and B
Pump housing	Aluminium		Pump housing	AISI 316 L	
Pump cover*	AlMgSi1		Pump cover*	AlMgSi1	
Pump shaft	AISI 430 F	AISI 316 L	Pump shaft	AISI 430 F	AISI 316 L
Rotary shaft seal	✓	✓	Rotary shaft seal	✓	✓
Impeller wheel: NBR, EPDM, FKM, CR, Plastic	optional	optional	Impeller wheel: NBR, EPDM, FKM, CR, Plastic	optional	optional

NIROSTAR	2000-A and B	2000-C, D, E and F 2001-D, E and F	2001-A and B
Pump housing	AISI 316 L	C = AISI 316, D-F = AISI 304	AISI 316 L
Pump cover*	AISI 316 L	C = AISI 316, D-F = AISI 304	AISI 316 L
Pump shaft (directly flanged)	AISI 430 F	AISI 304	AISI 316 L
Pump shaft (with pump carrier)	AISI 316 L	✗	✗
Rotary shaft seal	✓	✗	✓
Floating shaft seal	✗	✓	✗
Impeller wheel: NBR - Perbunan®	✓	✓	✓
EPDM - Keltan®	optional	optional	optional
FKM - Viton®	optional	✗	optional
CR - Neoprene®	optional	optional	optional
Plastic	optional	✗	optional

ACOSTAR	2000-A
Pump housing	PTFE
Pump cover*	PTFE
Pump shaft	NIRO 1.4104 with ceramic (AK99,5) shaft bush
Rotary shaft seal	VITON®
rod seal	VITON®
Impeller wheel:	VITON®

* For UNISTAR and COMBISTAR: to protect the aluminium pump covers the pump chamber is sealed with stainless steel discs (AISI 316). The PTFE lids are covered by Ceramic discs on the side in touch with the fluid.

✓ = standard, ✗ = not available

Versions and Drive Systems

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



directly flanged

Pump carrier

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



with pump carrier

Gear motor

- ▶ single or two stage
- ▶ variably adjustable



with gear motor

Hydraulic motor

Hydraulic motor for connection to hydraulic systems of commercial vehicles.



with Hydraulic motor

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 on request available.



with rotary switch

Pneumatic motor

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).



with pneumatic motor

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.

Drive Options:

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



UNISTAR
2001-A

with V-belt pulley

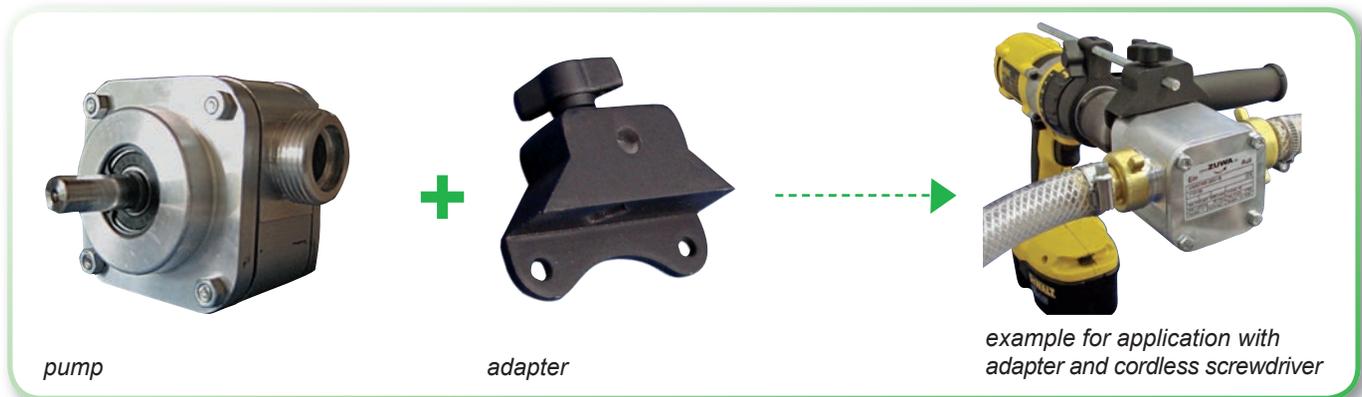
Transmission for V-belt drive

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 available for back fitting.



example for application with regraded
support (optional accessory)

2000-A | 2000-B | 2000-C

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

Applications

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

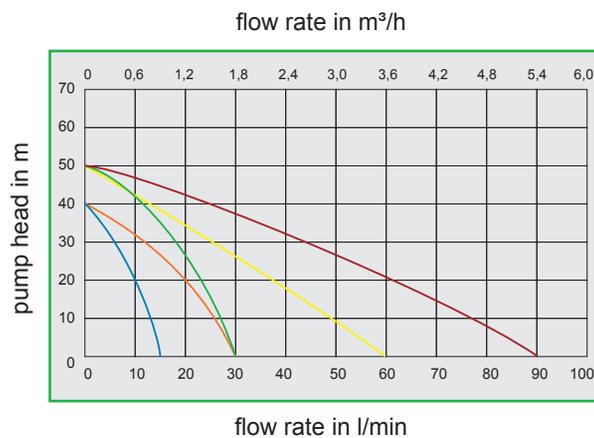
Fluids

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



UNISTAR 2000-A/B

Characteristic curves:



UNISTAR 2000-C
bidirectional motor as standard

Technical details

UNISTAR	2000-A								2000-B								2000-C	
Flow rate max. (l/min)	15	30	15	30	15	30	15	30	30	60	30	60	30	60	30	60	90	
Pressure max. (bar)*	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	5	
connections	3/4"								1"								1 1/4"	
Volt	230		400		12		24		230		400		12		24		230	400
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	2,1	1,9	39	42	12	18	4,4	4	2,8	2,4	50	49	23	8,8	2,7		
motor power	0,37 kW				0,25 kW				0,55 kW				0,37 kW				1,1 kW	
temperature max.	90°C								90°C								90°C	
weight	9 kg								9,2 kg								13 kg	

* with Perbunan-Impeller

UNISTAR without drive unit

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 aquariums
- ▶ dispose off cooling lubricants
- ▶ bilge pump
- ▶ booster pump

Fluids

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



UNISTAR 2001-A/-B



UNISTAR 2001-A, for example with cordless screwdriver



UNISTAR 2001-C with transmission

Technical details

UNISTAR	2001-A	2001-B	2001-C
Flow rate max. (l/min)	30	60	90
Pressure max. (bar)*	4	4	4
connections	3/4"	1"	1 1/4"
minimum drive power	500 W	700 W	1.400 W
rpm	max. 2.800	max. 2.800	max. 2.800
temperature max.	90°C	90°C	90°C
weight	0,6 kg	0,8 kg	2,4 kg

* with Perbunan-Impeller

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

COMBISTAR

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

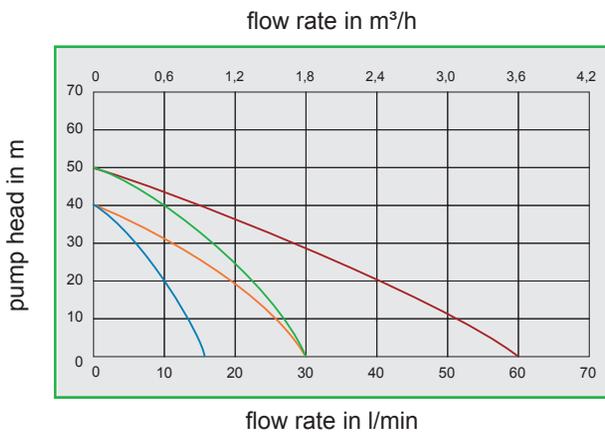
Fluids

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



COMBISTAR 2000-A/B

Characteristic curves:



- Type A with 1400 rpm
- Type A with 2800 rpm
- Type B with 1400 rpm
- Type B with 2800 rpm



COMBISTAR 2001-A/B

Technical details

COMBISTAR	2000-A								2000-B								2001-A	2001-B		
Flow rate max. (l/min)	15	30	15	30	15	30	15	30	30	60	30	60	30	60	30	60	30	60		
Pressure max. (bar)*	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4			
connections	3/4"								1"								3/4"	1"		
Volt	230		400		12		24		230		400		12		24		COMBISTAR without drive unit			
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		2,1		1,9		3,9		4,4		4		2,8		2,4				23	
motor power	0,37 kW				0,25 kW				0,55 kW				0,37 kW							
temperature max.	90°C								90°C								90°C			
weight	9,4 kg								10 kg								1 kg	1,6 kg		

* with Perbunan-Impeller

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

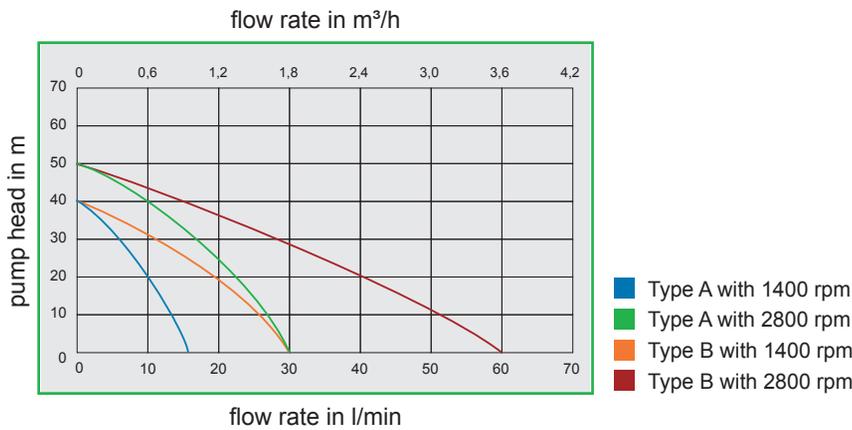
Fluids

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



NIROSTAR 2000-A/B

Characteristic curves:



NIROSTAR 2001-A/B

¹⁾ For more information about the Star Handles - Page 16

Technical details

NIROSTAR	2000-A								2000-B								2001-A	2001-B
Flow rate max. (l/min)	15	30	15	30	15	30	15	30	30	60	30	60	30	60	30	60	30	60
Pressure max. (bar)*	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	
connections	3/4"								1"								3/4"	1"
Volt	230		400		12		24		230		400		12		24		NIROSTAR without drive unit	
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	2,1	1,9	39	42	12	18	4,4	4	2,8	2,4	50	49	23				
motor power	0,37 kW				0,25 kW				0,55 kW				0,37 kW					
temperature max.	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 C - F

Applications

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

Fluids

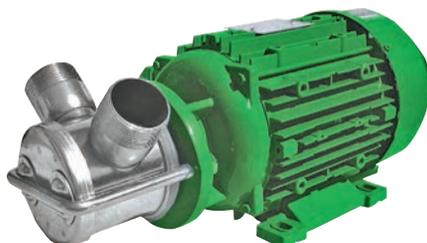
- ▶ heating oil, diesel fuel
- ▶ food, drinks
- ▶ mash
- ▶ chemicals
- ▶ acids
- ▶ bases
- ▶ liquid fertilizers
- ▶ dyes, glues
- ▶ vegetable oils
- ▶ surface treatment
- ▶ cooling lubricants
- ▶ fire fighting foam agents
- ▶ concrete admixtures

Connections

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



NIROSTAR 2000-C



NIROSTAR 2000-D



NIROSTAR 2001-D

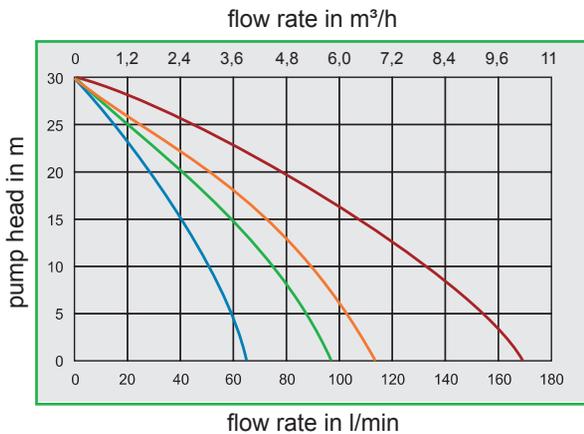
Technical details

NIROSTAR	2000-C*					2000-D*			2001-D
Flow rate max. (l/min)	64	96	64	96	64	115	115	166	115
Pressure max. (bar)	3					3			3
connections	1¼"					1½"			1½"
Volt	230		400		24	230	400		NIROSTAR without drive unit
rpm	900	1.400	900	1.400	900	900	1.400		
Ampere	5	7,1	1,7	2,1	30	13	4,1	3,8	
motor power	0,56 kW	0,75 kW	0,56 kW	0,75 kW	0,56 kW	1,5 kW			
temperature max.	90°C					90°C			90°C
weight	15 kg					20 kg			5,4 kg

* bidirectional motor

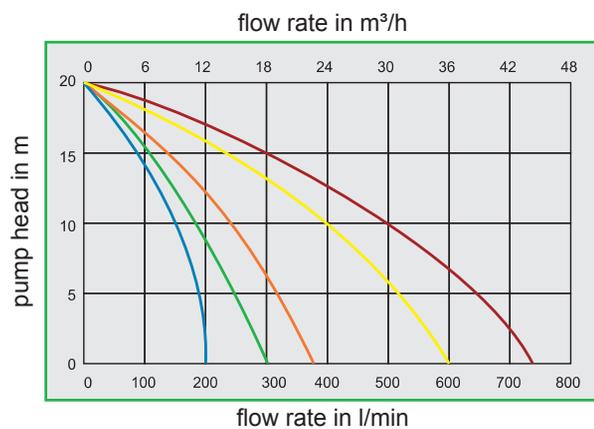
Characteristic curves:

NIROSTAR C and D



- Type C with 900 rpm
- Type C with 1400 rpm
- Type D with 900 rpm
- Type D with 1400 rpm

NIROSTAR E and F



- Type E with 470 rpm
- Type E with 700 rpm
- Type E with 900 rpm
- Type F with 470 rpm
- Type F with 600 rpm



NIROSTAR 2000-E



NIROSTAR 2001-F



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

Technical details

NIROSTAR	2000-E*			2000-F*		2001-E	2001-F
Flow rate max. (l/min)	200	300	375	600	730	375	730
Pressure max. (bar)	2			2		2	
connections	2"			3"		2"	3"
Volt	400			400		NIROSTAR without drive unit	
rpm	470	700	900	470	600		
Ampere	6,9	6	5,5	9,5	8,2		
motor power	1,25 kW	1,5 kW	1,87 kW	3,3 kW	3,5 kW		
temperature max.	90°C			90°C		90°C	
weight	38 kg	31 kg	31 kg	69 kg		9,7 kg	15,7 kg

* bidirectional motor

2000-A

Synthetic impeller pump - for a wide variety of applications in the chemical sector. Perfect for fluids with various viscosities plus aggressive acids, bases and solvents.

Suitable only for fluids compatible with PTFE (TEFLON®) and FPM/FKM (VITON®)!

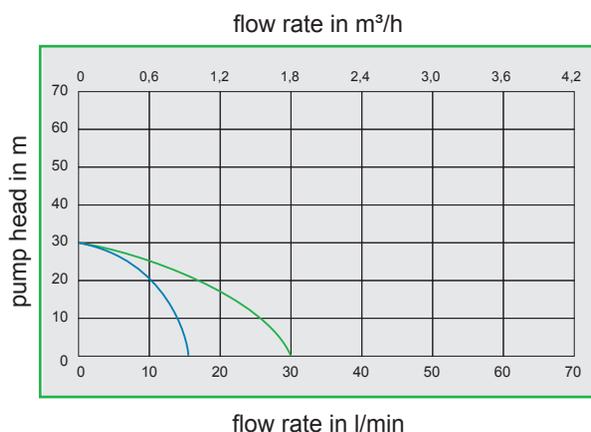
Applications

- ▶ conveying
- ▶ filtering
- ▶ dosing
- ▶ decanting
- ▶ draining

Fluids

- ▶ acids
- ▶ bases
- ▶ solvents
- ▶ fluids with viscosities

Characteristic curves:



ACOSTAR 2000-A

- Type A with 1400 rpm
- Type A with 2800 rpm

Technical details

ACOSTAR	2000-A			
Flow rate max. (l/min)	15		30	
Pressure max. (bar)	3			
connections	¾" male thread or hose fitting ½"			
Volt	230	400	230	400
rpm	1400		2800	
Ampere	3,2	2	3,2	1,9
motor power	0,37 kW			
temperature max. (with dry run protection)	max.60°C			
weight	9,4 kg			

bidirectional motor available on request

Frequency Converter

integrated or external frequency Converter

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

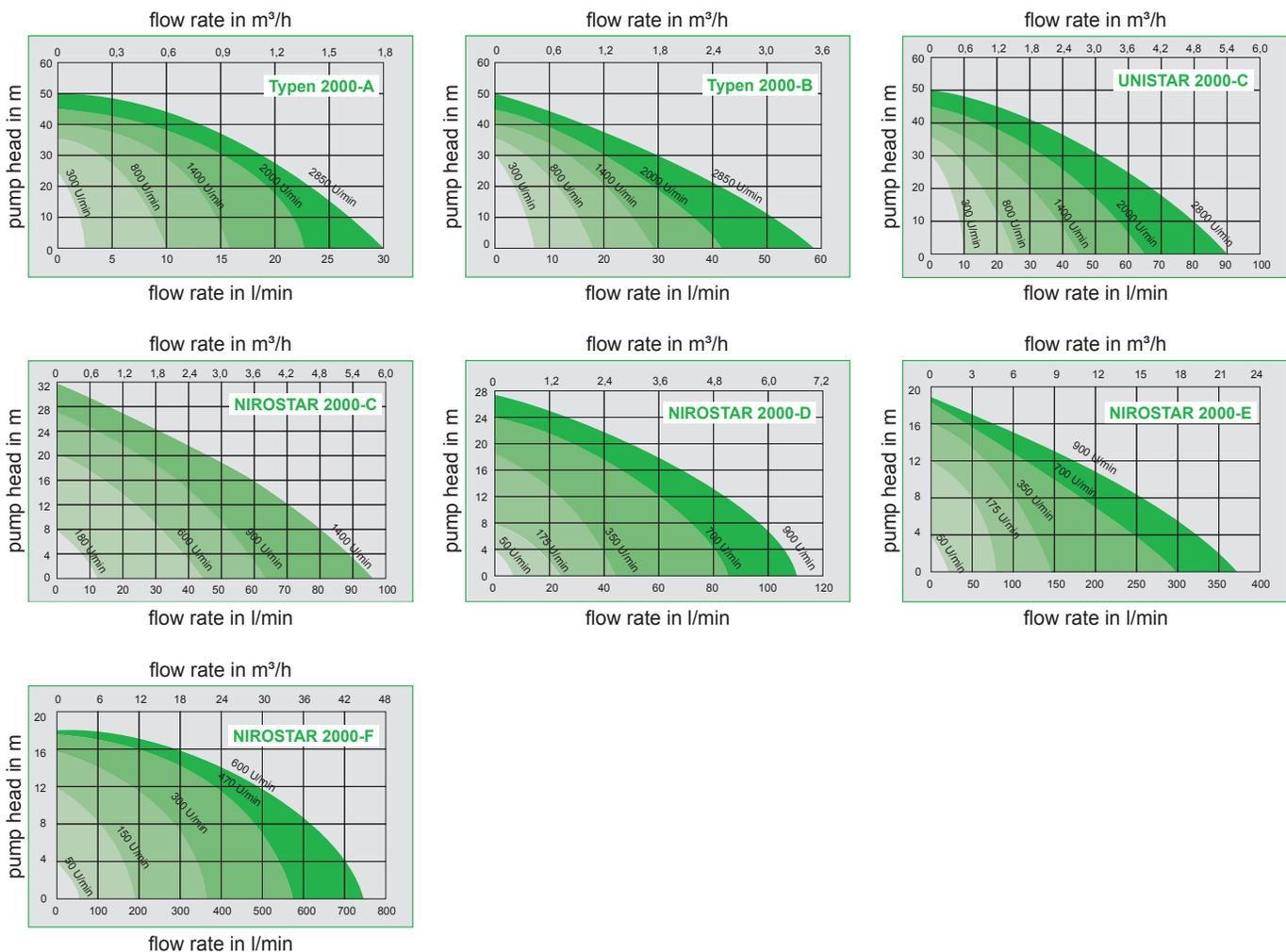
Integrated frequency converter:



External frequency converter:



Characteristic curves for Pumps with frequency converter:



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

Star handles



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. (for NIROSTAR A and B)

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

Flow control



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
- ▶ operating pressure max.: 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).

Remote control

For frequency converter

Remote control with 15 meter cable to control speed and sense of rotation.

Remote control for pump

10 metre extension cable with ON/OFF switch.

Remote control

Handy little transmitter with receiver.



remote control



remote control for pump



NIROSTAR 2000-C with frequency converter and remote control

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.: 12–60 l/min
- ▶ Operating pressure max.: 5 bar
- ▶ two sizes available

Features:

- ▶ dry self-priming impeller pump
- ▶ 3 pole connector plug
- ▶ ON/OFF switch with thermal motor protection
- ▶ 2" barrel connection (on option)

(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).

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



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

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

(battery not included)



HVAC Filling and Flushing Stations



FLUSH PRO



Solarcheck Mobilcenter



DESCAL



UNISTAR 2000



Stationary ServiceCenter

Additional information regarding 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

Impeller Pumps



www.ZUWA.de



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