

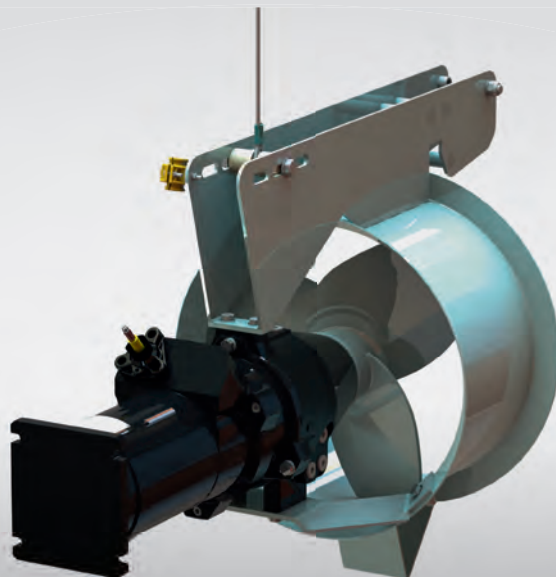
Pioneering for You

wilo

Product information

Recirculation pumps

Our solution for optimized water flows.



Wilo – Pioneering for You.



We are there for you worldwide.

Since 1872, we at Wilo have been turning visionary ideas into intelligent solutions that regularly set new standards in the industry. The goal of our company founder, Caspar Ludwig Opländer, was to use his *Kupfer- und Messingwarenfabrik* to improve and facilitate the supply of water to people. It was not long until the decisive step was made: In 1928, his son Wilhelm designed the world's first circulation accelerator.

We have continued this tradition ever since with pioneering innovations, such as the world's first high-efficiency pump in the heating, air-conditioning and cooling sector, and at the same time we have proven our commitment to using valuable resources such as energy and water responsibly. Today, with its headquarters in Dortmund, the Wilo Group is a complete system supplier of pumps and pumping systems for water management with worldwide presence.

Cooperative support you can rely on.

With over 7,500 employees and 60 production and sales companies all over the world, we personally see to it that the desires and requirements of our customers and users – whether specialist consultants, operators, or general contractors – are optimally met every day. This means making your life and work as easy as possible with the help of our products, solutions and services.

“Pioneering for You” is our commitment to a clear customer focus, strict quality orientation and strong passion for technology. In times of dwindling natural resources, the responsible management of water is an extremely important task, which is why we are committed to providing pioneering developments, sustainable product solutions, and cooperative support to ensure you can rely on our solutions for the daily management of water. That’s what we call Pioneering for You.

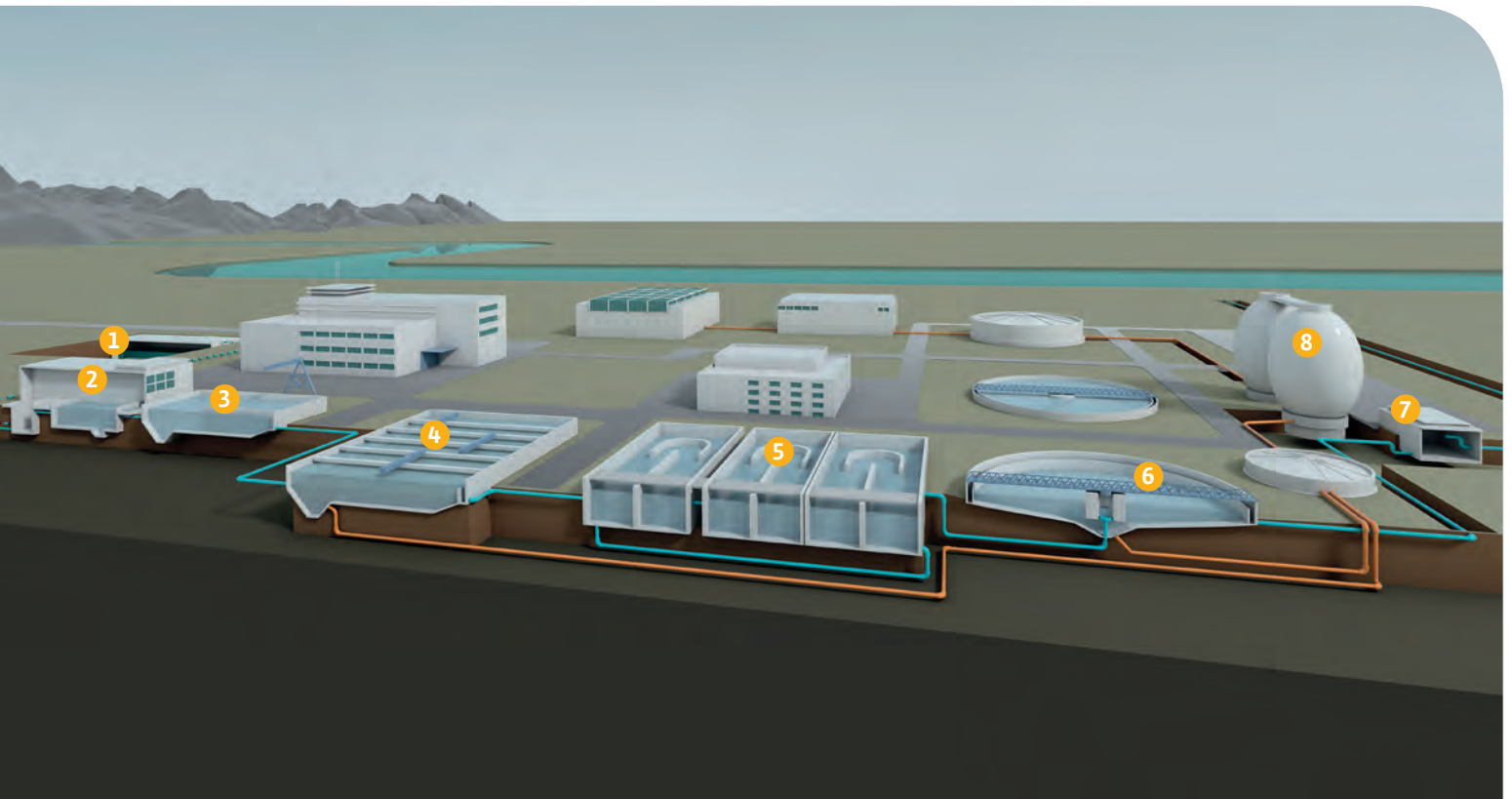


**“Coming up with the best solution in close partnership,
that’s what I call Pioneering for You.”**

Harold Adams, National Sales Manager
WILO USA LLC

Intelligent solutions

For the wastewater treatment circuit.



- 1 Stormwater retention tank
- 2 Intake pumping system
- 3 Mechanical cleaning
- 4 Primary treatment
- 5 Biological treatment/ sludge activation
- 6 Secondary treatment
- 7 Discharge pumping station
- 8 Sludge treatment

You can rely on that.

Our experts provide you with personal support in every phase of the project, from design and configuration, through to commissioning and maintenance. And our systems and product solutions set new standards in terms of technical performance, cost efficiency, security standards, and durability – in all applications relating to wastewater treatment.

Wilo – the right partner to address your challenges.

With regard to world climate change, low energy consumption is a key market topic. The cost pressure on municipal or private suppliers is rising. Challenges are growing. These include an increasing amount of solids in wastewater, a growing number of regulations, and stricter legal requirements. Against this backdrop, Wilo is a partner on whom you can fully depend in all areas.

In this brochure we present selected recirculation pumps for the generation of optimized water flows.

Optimized water flows

Your challenge. Solution from Wilo.



In wastewater treatment systems or in water slides at the amusement parks, the recirculation pumps from Wilo pump water with large flows and low heads to generate the water flow you need.

Wilo recirculation pumps are designed as modular systems, with the submersible motor, housing, gears and propeller forming a compact unit. Due to the modular construction the recirculation pump can be adapted exactly to suit local conditions. Wilo recirculation pumps cover the entire range of delivery heads up to 23 ft (7 m) and pumped volume up to 30,000 US gpm (1,900 l/s). The propellers are flow-optimized and resistant to entwining or clogging. They feature ultra-smooth operation and their self-cleaning effect results in significant savings in energy costs.

The other central factor besides pump power is cost effectiveness. The compact construction of Wilo recirculation pumps produces considerable savings on energy, installation

and maintenance costs. For optimum utilization, we supply accessories tailored specifically to Wilo recirculation pumps.

Advantages of recirculation pumps

- Wide performance ranges.
- Cost-minimizing routing of pipelines.
- The use of recirculation pumps lowers the volume of capital outlays.
- Maximum ease of installation and maintenance due to screwless installation to the wall flange pipe.
- Easy installation and removal.
- Can be retrofitted to existing plants at any time.
- The special blade design provides gentle pumping of water, sewage and activated sludge.
- Submersible, compact installation unit.

When planning and selecting the right pumps for you, we are happy to provide any assistance you may need.

Wastewater treatment applications

Biological cleaning of nitrogenous sewage requires the wastewater to be run cyclically through certain cleaning stages, which means it must be pumped numerous times from one tank into another. This task is handled by Wilo recirculation pumps. They pump the nitrate-loaded sewage against the natural incline of the wastewater treatment system, from nitrification tanks back into denitrification tanks. The volume and load of the pumped fluid is regulated for Wilo recirculation pumps by means of a frequency converter.



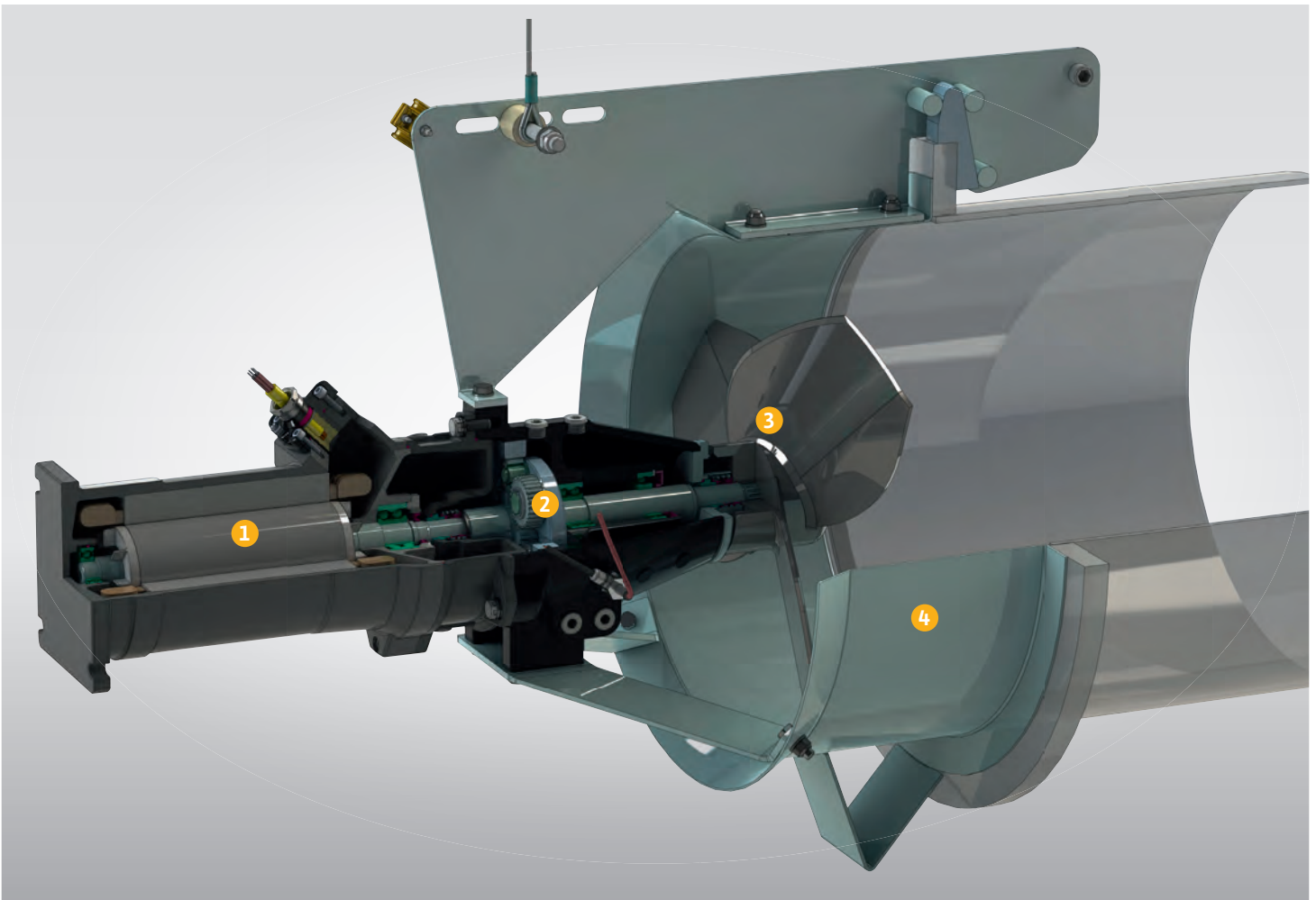
In wastewater treatment systems, recirculation pumps are utilized for cleaning nitrogenous sewage – to pump it from the nitrification tank to the denitrification tank.

Special applications

One of the most popular attractions in amusement and theme parks are the flume rides or „log rides“, with their long slow rise and rapid descent. These installations require a continuous cyclical flow of water to create a „stream“ along which the boats can glide while being pulled upwards or sliding down. Wilo has developed special recirculation pumps for this task, which are designed for pumping large volumes of water to low heads.



In amusement and theme parks, recirculation pumps generate a continuous cyclical flow of water.



Matured technology

The components.

1 Motor

- Submersible motor with protection class IP68 (Submerged under pressure)
- Motor winding with a temperature monitor (standard: bimetal, optional: PTC)
- Explosion protection according to FM or CSA standard (optional)
- Large-sized ball bearings ensure long service life of the motor bearings
- Longitudinally watertight encapsulated cable lead-in with anti-kink function and strain relief
- VFD operation

2 Gear

- Single-stage planetary gear with exchangeable transmissions (only RZP 50-3 to 80-2, RZP 20 to 40 are direct driven without gear)
- The gear bearings are dimensioned so that the resulting mixing forces are absorbed and are not transferred to the motor bearings

3 Propeller

- Available in PUR or stainless steel
- Entwining-free due to backward curve of incoming flow edge
- Corrosion- and wear-resistant mechanical seal made of solid silicon carbide material. A seal bushing ensures long-term corrosion-protected fit of the mechanical seal.

4 Flow housing

- Hydraulically optimized intake characteristics
- Designed for automatic screwless coupling to the discharge pipe



Technical construction

Modular component system.

In Wilo recirculation pumps, the submersible motor, pump housing, gears and propeller form a compact unit. This mode of construction means that the recirculation pumps can be adapted precisely to provide the performance required.

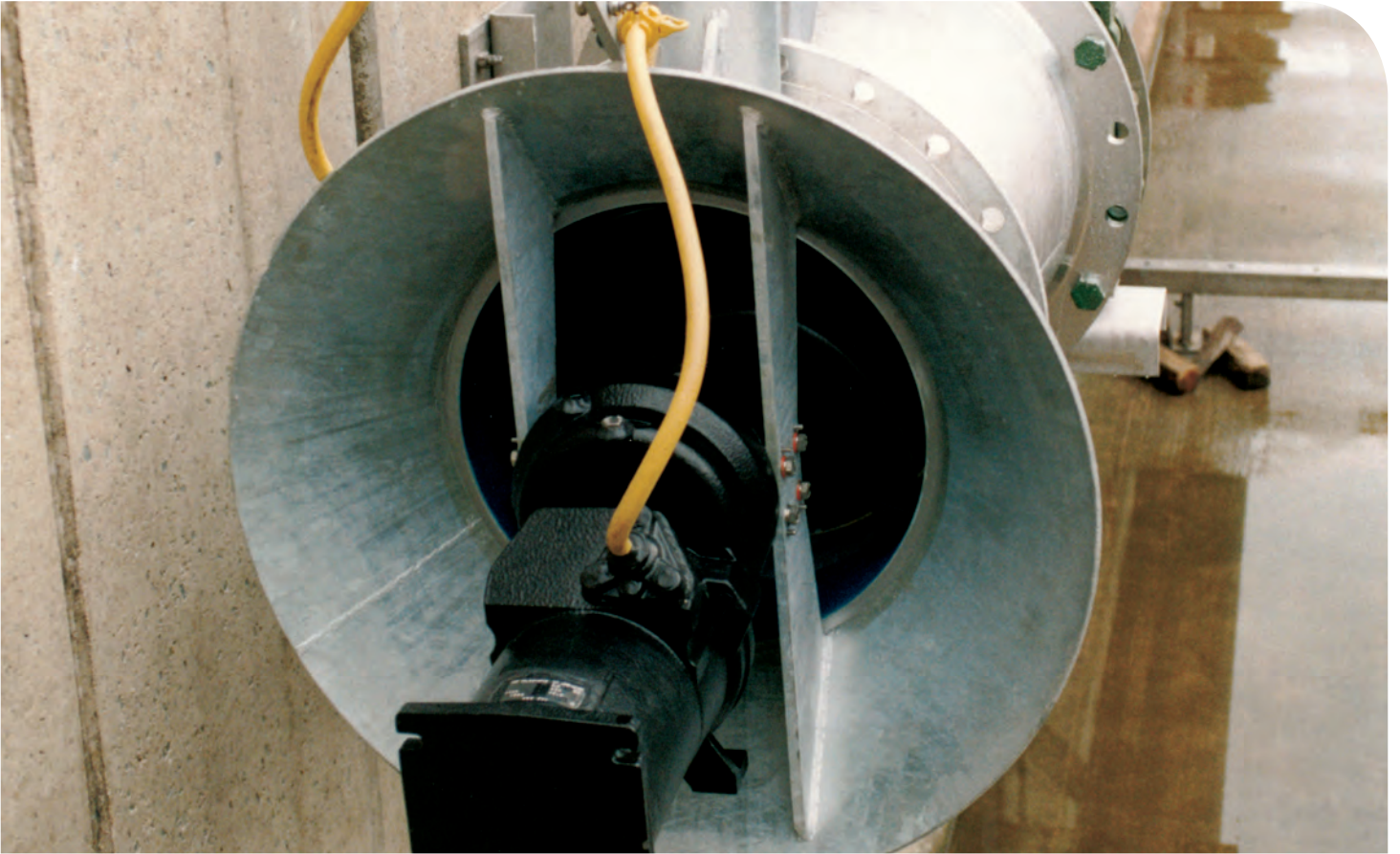
The layout of the individual tanks and the required volume of internal recirculation in a particular wastewater treatment system will

require a certain number of recirculation pumps to be installed. The modular system employed by Wilo makes it possible to combine motors, gears and propellers so as to provide a wide range of recirculation pumps and pumping characteristics.

The use of frequency converters makes it possible to bring the recirculation pumps to the desired duty point.

Installation

Secure by design.



One of the most important criteria for the design of our recirculation pumps was ease and versatility of installation. This means installation is particularly economical, and that maintenance or repairs later on can be carried out quickly and simply.

Standard mounting

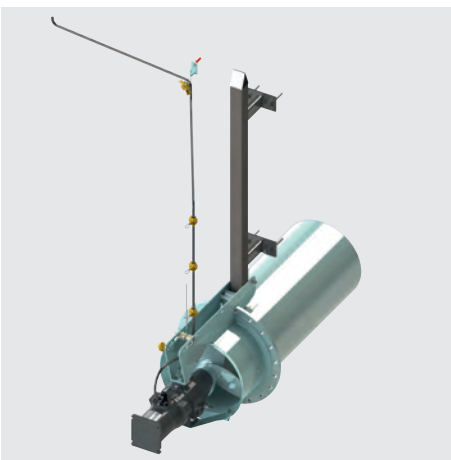
In combination with a Wilo lowering device Wilo recirculation pumps can be coupled – in place without screws and without fixed joints – directly to the discharge pipe. The seal between the pump housing and the discharge pipe is created by the weight of the pump itself. In the standard mounting an installation and maintenance is also possible in case of full tank.

Flange mounting

In the case it's not possible to install a lowering device you can fit the Wilo recirculation pump directly on the discharge pipe. For this installation the flow housing has a standard DIN flange. In the standard mounting an installation and maintenance is only possible with an empty tank.

Inline mounting

The inline option, where the pump is fitted directly in the pipe, should be selected when there is no way to install the unit at the start of the pipe or if the flow is to be reinforced – which is advisable with particularly long pipes, for example. For this installation the recirculation pump will be delivered pre-mounted in complete pipe housing.



Standard installation

→ In combination with a Wilo lowering device a smooth installation in a full tank or basin is possible.



Flange installation

→ The recirculation pump is permanently flange-mounted to the discharge pipe. For maintenance and repair the tank or basin must be emptied.



Inline installation

→ The Wilo recirculation pump is pre-mounted to a housing unit. The entire housing unit can be removed from the pipe for maintenance and repair purposes.

Wilo accessories

Everything for intelligent installation.



Wilo has a broad range of accessories to accompany the recirculation pumps. These include a wide selection of sturdy, technically advanced lowering devices, auxiliary hoisting gear and other installation equipment. Wilo manufactures all accessory parts in house, which is why our expert sales representatives can offer tailored system solutions. Upon request, we can supply planning data, engineering datasheets and accessory specifications in conventional file formats.

Lowering devices

With Wilo lowering devices, our recirculation pumps can be installed directly in front of the discharge pipe. The lowering devices enable secure lowering of the recirculation pumps until they couple onto the discharge pipe.

The recirculation pumps are also prevented from failing by the automatic catch device on the lowering devices. The matured technology and robust materials of the lowering devices guarantee high stability and durability.

Auxiliary hoisting gear

With Wilo's auxiliary hoisting gear, tested by German testing agency LGA, it's an easy matter to install our recirculation pumps securely or to hoist them out of the tank for maintenance. Wilo can provide auxiliary hoisting gear with an outreach of up to 10 ft (3.2 m) and bearing capacity of up to 1100 lbs (500 kg). To ensure simple and safe implementation, some models

can be disassembled into compact separate parts. Furthermore, most types give you a choice of material between galvanized steel, stainless steel AISI 304 (1.4301) and stainless steel AISI 316Ti (1.4571), as well as between a 2-gear aluminum winch and a stainless steel winch.

Other accessories

An extensive range of practical accessories rounds out the Wilo recirculation pump catalog. Among the items on offer:

- An automatic catch device for raising and lowering recirculation pumps, so that the rope does not have to remain in the fluid all the time.
- An additional polyamide rope is provided for the control and supply cables. It relieves strain on the cables supplying the recirculation pump.
- A separate rope holder (winding mechanism) for the use of auxiliary hoisting gear at different installation locations.



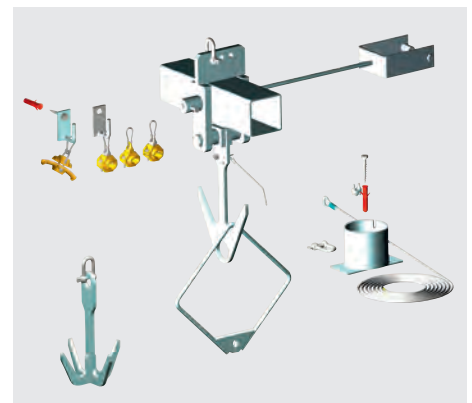
Lowering devices

- They enable secure guidance of the recirculation pumps for a diverse range of application situations and discharge pipe connections.



Auxiliary hoisting gear

- With a working radius of 360°
- Different bearing capacity and outreach



Accessories

- Wilo supplies accessories – such as patented catch devices and catch shackles – for smooth adaptation to any application.

RZP 20, 25-2 and 40

Specialists for small volume flows.



In response to the demand for recirculation pumps for small volume flows, Wilo developed the types RZP 20 to RZP 40. With their compact dimensions, Wilo's small, powerful recirculation pumps can be used anywhere where relatively small volume flows need to be moved.

The propeller with two or three blades has a patented helical hub with a self-cleaning effect. It can be combined with either PU or stainless steel propellers.

Stainless steel is recommended when using in aggressive or corrosive fluids. For corrosive fluids, stainless steel propellers with our high-efficiency Ceram C0 coating are the best choice.

Technical data

- Power connection: 3~460 V, 60 Hz
- Made for continuous duty
- Protection class: Submerged under pressure
- Fluid temperature: 37–104 °F (3–40 °C)
- Direct driven unit
- Max. submersion depth: 65 ft (20 m)

Materials

- Housing components: A 48 Class 35/40 B (EN-GJL-250)
- Propeller: PUR or AISI 316TI (1.4571)
- Propeller hub: AISI 316TI (1.4571)
- Screwed connections: AISI 304 (1.4301) or AISI 316TI (1.4571)
- Flow housing: AISI 316TI (1.4571)

Product overview

Designs	RZP 20	RZP 25-2	RZP 40
Standard version	•	•	•
Flange version	•	•	–
Inline version	–	•	•
Reinforced version	–	–	–

Propeller material

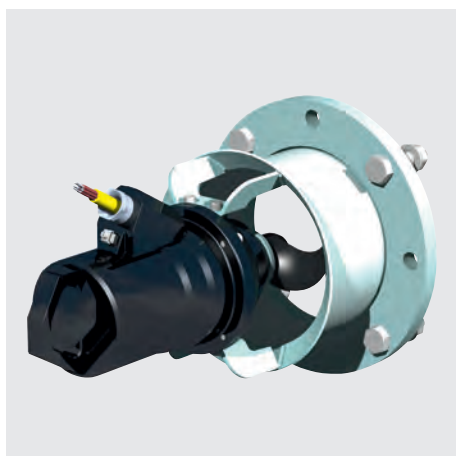
PUR	•	•	•
Stainless steel	•	•	•

Technical data

Max. Volume flow	1,815 US gpm (114.5 l/s)	4,026 US gpm (254 l/s)	6,546 US gpm (413 l/s)
Max. Delivery head	8.9 ft (2.7 m)	25 ft (7.6 m)	6.2 ft (1.9 m)
Ex approval to FM	o	o	o
Ex approval to CSA	o	o	o

Legend:

- = available
- = not available
- o = optional



RZP 20 in flanged version

- Horizontal installation allowing adaptation to a very wide range of installation situations.



RZP 25-2 in standard version

- for coupling in place without screws and without fixed joints



RZP 40 in inline version

- for fitting directly in the pipe

RZP 50, 60 and 80

Big. Light. Effective.



Wilo's powerful recirculation pumps in the 50, 60 and 80 series are intended for large volume flows with low delivery heads, making them an ideal solution for a broad variety of applications in industrial and municipal systems. Depending on the series the recirculation pumps are available with a self-cleaning PU propeller or a stainless steel propeller.

Stainless steel is recommended when using in aggressive or corrosive fluids. For corrosive fluids, stainless steel propellers with our high-efficiency Ceram C0 coating are the best choice.

Technical data

- Power connection: 3~460 V, 60 Hz
- Made for continuous duty
- Protection class: Submerged under pressure
- Fluid temperature: 37–104 °F (3–40 °C)
- Gear driven unit
- Max. submersion depth: 65 ft (20 m)

Materials

- Housing components: A 48 Class 35/40 B (EN-GJL-250)
- Propeller: PUR or AISI 316TI (1.4571)
- Propeller hub: AISI 316TI (1.4571)
- Screwed connections: AISI 304 (1.4301) or AISI 316TI (1.4571)
- Gear shaft: AISI 329 (1.4462)
- Flow housing: AISI 316TI (1.4571)

Product overview

Designs	RZP 50-3	RZP 60-3	RZP 80-2
Standard version	•	•	•
Flange version	–	•	–
Inline version	–	–	–
Reinforced version	–	•	•

Propeller material

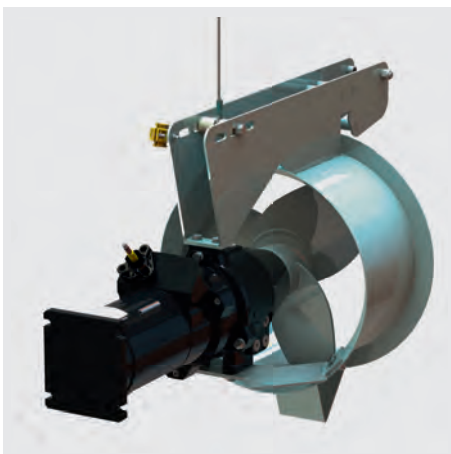
PUR	–	–	•
Stainless steel	•	•	•

Technical data

Max. Volume flow	9,780 US gpm (617 l/s)	1,3917 US gpm (878 l/s)	30,496 US gpm (1924 l/s)
Max. Delivery head	8.5 ft (2.6 m)	5.9 ft (1.8 m)	4.3 ft (1.3 m)
Ex approval to FM	o	o	o
Ex approval to CSA	o	o	o

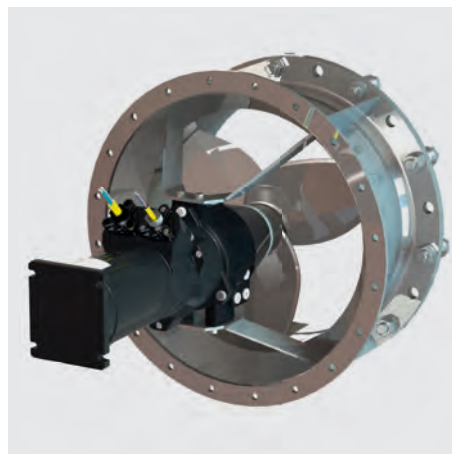
Legend:

- = available
- = not available
- o = optional



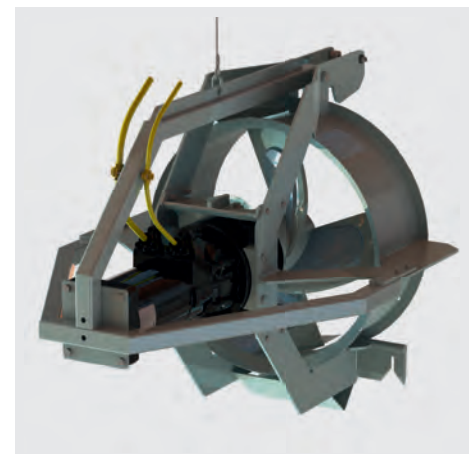
RZP 50-3 in standard version

- for coupling in place without screws and without fixed joints



RZP 60-3 in flanged version

- Horizontal installation allowing adaptation to a very wide range of installation situations.



RZP 80-2 in "reinforced" version

- Reinforcement for unclear inflow conditions with longitudinal cross beams

Ceram C0 coating from Wilo

Effective protection from corrosion.

The unique 2-component coating offers the best possible protection against aggressive media compared with other coatings. Thanks to its increased resistance to corrosion, it effectively prevents wear and chemical corrosion and always ensures optimal functionality and performance. With Wilo Ceram, the service life of recirculation pumps is considerably increased.

Description

Sprayable, solvent-free, 2-component polymer coating material with portions of aluminum oxide: for corrosion protection under great mechanical stress.

Composition

Solvent-free epoxy polymer with solvent-free polyamide hardener and various extenders.

Properties

- Tough and hard, durable coating with high mechanical and chemical resistance, as well as good wear resistance
- Excellent wet adhesion as single or multi-layered coating on steel surfaces
- Replaces tar-containing coatings
- Cost-savings thanks to the long service life, low maintenance and easy reparability.
- Tested by the "Bundesanstalt für Wasserbau" (German Federal Institute for Hydraulic Engineering).
- Solvent-free.
- High gloss finish after hardening

Technical data Ceram C0

Designation	Standard	Value
Density (mixture)	ASTM D 792	87.3 lb/ft ³ (1.4 g/cm ³)
Solid content (volume)		97 %
Solid content (weight)		98 %
Adhesive strength, steel	ISO 4624	2175 psi (15 N/mm ²)
Impact strength	DIN EN ISO 6272	6.64 ft-lb (9 J)
Temperature resistance		
Dry, continually		140 °F (60 °C)
Dry, for short periods		248 °F (120 °C)
Moist/liquid		depends on fluid, on request

Resistance of Ceram C0

Fluid	Concentration	Temperature	Factor
Sewage, alkaline	ph 11	68 °F (20 °C)	1
Sewage, alkaline	ph 11	104 °F (40 °C)	1
Sewage, slightly acidic	ph 6	68 °F (20 °C)	1
Sewage, slightly acidic	ph 6	104 °F (40 °C)	1
Sewage, highly acidic	ph 1	68 °F (20 °C)	2
Sewage, highly acidic	ph 1	104 °F (40 °C)	3
Ammonium hydroxide	5 %	104 °F (40 °C)	3
Decanol (fatty alcohol)		68 °F (20 °C)	1
Decanol (fatty alcohol)		122 °F (50 °C)	1
Ethanol	40 %	68 °F (20 °C)	1
Ethanol	96 %	68 °F (20 °C)	3
Ethylene glycol		68 °F (20 °C)	1
Heating oil/diesel		68 °F (20 °C)	1
Compressor oil		68 °F (20 °C)	1
Methyl ethyl ketone (MEK)		68 °F (20 °C)	3
Caustic soda	5 %	68 °F (20 °C)	1
Caustic soda	5 %	122 °F (50 °C)	2
Sodium chloride solution	10 %	68 °F (20 °C)	1
Hydrochloric acid	5 %	68 °F (20 °C)	2
Hydrochloric acid	10 %	68 °F (20 °C)	2
Hydrochloric acid	20 %	68 °F (20 °C)	3
Sulphuric acid	10 %	68 °F (20 °C)	2
Sulphuric acid	20 %	68 °F (20 °C)	3
Nitric acid	5 %	68 °F (20 °C)	3
Toluene		68 °F (20 °C)	2
Water (cooling/industrial water)		122 °F (50 °C)	1
Xylene		68 °F (20 °C)	1

Factor: 1 = resistant, 2 = resistant for 40 days, 3 = spill resistant (immediate cleaning recommended)

In reference to a total layer thickness at least 400 µm



Ex protection

Use in explosive atmospheres.



Explosive gases can form from the substances in the fluid in sewage systems. According to the particular regional or national regulations on gas concentrations and air circulation, system operators must define so-called ex zones. Safety is of the highest priority, of course, for units used in these explosive atmospheres, and they must be designed with this in mind. Wilo units for such applications are certified according to three different standards, in order to minimize risks: ATEX standard, FM standard, CSA standard.

ATEX standard

ATEX is the abbreviation for the French term “Atmosphères Explosibles”. In the area of explosion protection, there are specifications according to the ATEX directive from the European Union. Here Wilo units may be operated in potentially explosive areas which require electrical devices from Device Group II, Category 2. Use in zone 1 and zone 2 is allowed, but not in zone 0.

FM standard

FM certificates are internal approvals issued by the American insurance company “FM Global”. With its regulations, the company tries to minimize risk. Its subsidiary “FM Approvals” issues certificates following various product tests. “FM Approvals” has its own policy regarding these product-specific tests. Wilo units are approved and certified by FM Approvals. They are approved for operation in potentially explosive

areas that require electrical devices with the protection class “Explosion-proof, Class 1, Division 1”. Operation is also possible in areas with the required protection class “Explosion-proof, Class 1, Division 2”.

CSA standard

CSA approvals are the standard of the CSA Group, an independent Canadian organization. Regulations in North America stipulate that particular products must be tested according to certain standards by a nationally recognized test laboratory. Numerous organizations such as the SCC (Standards Council of Canada), the ANSI (American National Standards Institute) and the OSHA (Occupational Safety and Health Administration) have accredited and accepted the CSA Group as an official testing and certification institute. Wilo units are certified according to the current standards by the recognized testing and approval authority “KEMA” (the European certification office for CSA). Units are approved according to a class system. They are approved for operation in potentially explosive areas that require electrical devices with the protection class “Explosion-proof, Class 1, Division 1.” Operation is also possible in areas with the required protection class “Explosion-proof, Class 1, Division 2”.

Please see the technical documentation or the rating plate for information on which standard has been used to test and approve individual Wilo series.

Wilo Services

Our „all-around“ service package for you.



Customer service always starts with a personal consultation. On this basis, we develop tailor-made individual solutions precisely for your demands. Our service then goes far beyond this. With fast and reliable repair and maintenance concepts, we also assist you in the long term.

Plan with our consulting.

We are here for you and will draw up an exact assessment of what you require. From this, our specialists will work closely with you to find an individual solution.

You can count on our selection of pumps.

With the help of a modern selection program, we can offer you the most economical solution.

Your complete service package

Pre-sales:

- On-site support
- Design support
- Product selection
- Select program
- CFD simulations
- Flow calculation
- Pipeline calculation
- Installation drawings
- Documentation

Sales:

- Certification
- Acceptance testing at the plant
- Commissioning
- Start up

After-sales:

- Local service in 60 countries
- More than 1,200 Wilo technicians worldwide
- Individual maintenance concepts
- Customer-oriented replacement solutions
- Efficiency check
- Training

Baton Rouge South Wastewater Treatment Plant

Baton Rouge, Louisiana



In 2013, 3 pump stations were put into operation in Baton Rouge, the capital of the US state of Louisiana. They pump sewage to the main water treatment plant in the city.

All 17 submersible sewage pumps are dry mounted. Together they pump approx. 317,000 US gpm (20,000 l/s) with an average delivery head of 65 ft (20 m). All submersible motors are equipped with an internal cooling system and thus can also be used in continuous

operation even though they are non-immersed. The pumps are equipped with four-channel impellers and have a complete Ceram C0 coating. In comparison to other coatings, this 2 component coating provides the best possible protection against aggressive media and environmental influences. Thanks to its increased resistance to corrosion, it provides effective protection against wear and chemical corrosion and ensures optimum functionality and performance.

The Wilo Way: Individual solutions and reliable technologies you can trust in.



Water Management by Wilo – that's more than innovative technology and long-term expertise. The Wilo Way rather means making your working life easier by providing you with excellent product quality that is tested for outstanding reliability and long service life. Our qualified experts support you personally in selecting the best solution for your individual need. That is how we live our promise "Pioneering for You".

So how can Wilo support you? www.wilo.com/WaterManagement



Member of
**German Water
Partnership**

wilo

Pioneering for You



6078821/250/Ed.01/0915/WH

WILO USA LLC.
W66 N1253 Forward Way
Cedarburg, WI 53012 USA
USA
Phone (262) 204-6600

WILO Canada Inc.
Bay 7 - 2915
10th Ave. N.E.
Calgary, Alberta, T2A 5L4
Canada
Phone (403) 276-9456
Fax (403) 277-9456