



Pharmaceutical Pumps

Pumps for the biotech and pharmaceutical industries.



Packo Pumps, your ideal partner in pharmaceutical industry

Purified water (PUW) and water for injection (WFI) are of vital importance in the pharmaceutical industry. But the quality of the water is directly related to the pumps used for water treatment. This brochure provides an overview of our sterile pumps in stainless steel. You will also find a schematic overview indicating where our pumps can be deployed within the pharmaceutical industry.

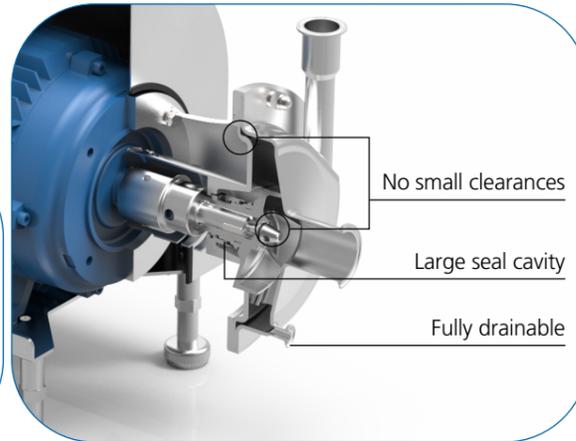
Packo Pumps is currently experiencing strong growth in the pharmaceutical industry. For a large part this is related to the quality of the pumps. The finish meets the most stringent surface quality requirements and is subjected to a thorough internal FAT (Factory Acceptance Test). As a result our pumps are delivered with corresponding certificates and supplier documents.

But most of all it is our knowhow of the specific processes that makes all the difference. This had led to the creation of the Novapad seal, amongst others, which increases the durability and the operational reliability significantly. Applying our knowledge provides you with the highest pump efficiency – resulting in a lower electricity bill - and a lower NPSH.

We optimize your flow



Perfectly cleanable construction. All pharmaceutical pumps, including the CIP return pumps, are EHEDG and 3A certified. Construction is in line with ASME BPE guidelines.



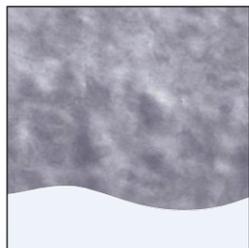
Hydraulic high quality product with the highest pump efficiencies and lowest NPSH values.

High pump efficiency, resulting in lower energy bills.

Easy, modular, maintenance friendly and robust concept.

Electropolished design

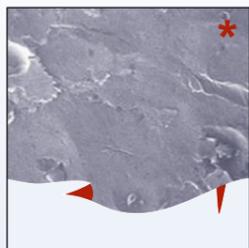
(for wetted & non-wetted parts);



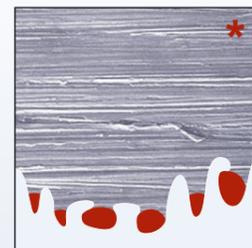
Electropolished

All pumps are electropolished. Compared to other techniques, this has the following advantages:

- easy to clean
- increased corrosion resistance
- better resistance against rouging
- no bacteria traps



Glass bead blasted



Mechanical polishing 240 grit

* Higher risk of bacteria traps with other pump brand.

Designed for pharma

Even if the requirements are driven to extremes, like in the pharmaceutical industry, we offer a solution. With their unparalleled hygienic and robust design, our pumps rank among the most efficient pumps in the sector.

Discover some of Packo pumps characteristics and find out why we are the perfect match for your pharmaceutical process.



Sterile balanced seals, also for higher inlet pressures.

Hydropad for WFI > 80 °C.

Novapad suitable for SIP when pump is operating.



According to applicable standards and legislations, particularly within Europe, but also outside.



Before shipping all pumps are subjected to an internal Factory Acceptance Test (FAT). Performance and hydrostatic pressure tests, as well as a vibration test and control of the main dimensions are part of the standard test procedure. 100% final inspection! The pumps are provided with a certification package and supplier documents.

ISO 9001:2015
ISO 14001:2015



BQA_QMS019_C_1994041



BQA_EMS019_C_2015041



Standardized motor dimensions to IEC. Available in accordance with local motor laws.

Certification and supplier documents

Factory acceptance tests and Certification for the Packo pharmaceutical pump series.

Internal FAT (Factory Acceptance Test) valid for Packo pump series PHP2 and PRP2 for use in pharmaceutical and biotech industries:

As a standard following internal factory tests are executed:

- Pump performance test at the requested voltage and frequency measured at 5 points on the curve including the duty point that has to be certified.
- Roughness value measurement of the wetted surfaces (pump casing, impeller and backplate)
- Hydrostatic pressure test (1 minute @ 5 bar)
- Inspection of the main pump dimensions including squareness of the port connections

As an option the following tests can be executed as well:

- Noise pressure level measurement LpA in duty point that has to be certified
- NPSH-value measurement in duty point that has to be certified

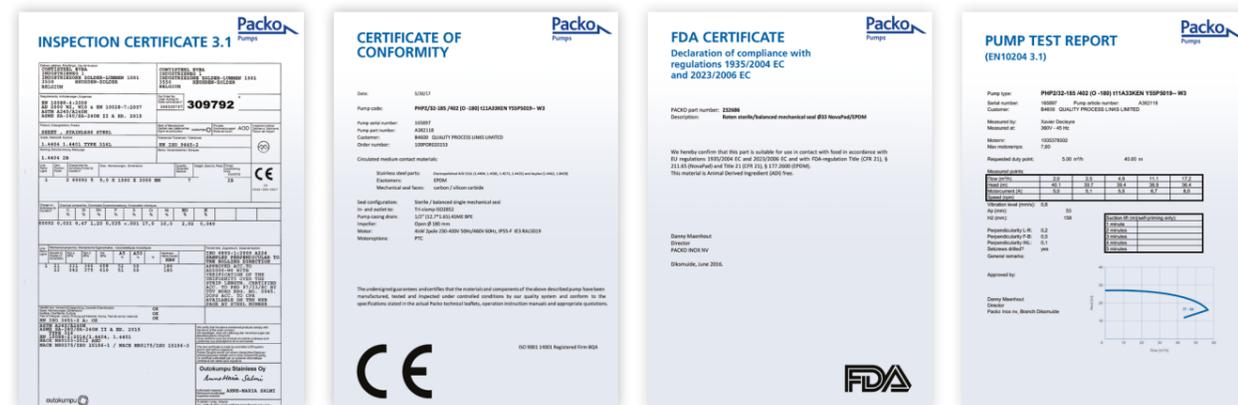
Certification and supplier documents valid for Packo pump series PHP2 and PRP2 for use in pharmaceutical and biotech industries:

Each Packo pump will be supplied with the following documents as a standard:

- Roughness measurement certificate for the wetted surfaces (EN10204 3.1)
- Pump performance test certificate (5 points) (EN10204 3.1)
- Certificate of conformity (EN10204 2.1)
- Material certificate impeller, impeller screw, pressed part and clamp ferrules pump casing and backplate body (EN10204 3.1)
- FDA declaration mechanical seal
- FDA declaration O-rings

As an option the following certificates are available as well:

- USP CI. VI, USP CI. VI 121°C & ADI free certification for some of the installed O-ring materials
- Passivation and electropolishing certificate (EN10204 2.1)
- NPSH measurement certificate at duty point (EN10204 3.1)
- Noise pressure level LpA certificate at duty point (EN10204 3.1)
- Hydrostatic pressure test certificate (EN10204 2.1)



Novapad seal

For applications with poor lubrication



For applications where the sealing faces of the mechanical seal are poorly lubricated, Packo Pumps developed the Novapad seal. Its seal faces consist of specially treated silicon carbide to adjudge self lubricating properties whilst maintaining the same hardness and durability of silicon carbide.

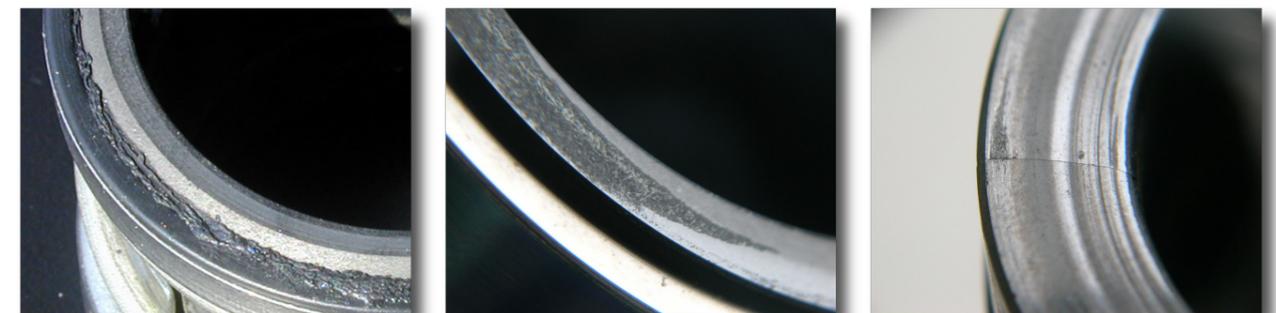
Thanks to these specific properties the Novapad seal is the ideal solution for CIP return applications where the lubrication of the seal faces is poor. The Novapad seal is very appropriate as well for pumps that are continuously operating during the sterilization process. In this specific case the seal will work under vapour conditions.

The seals are FDA and USP certified.

Typical applications:

- CIP return pump / scavenge pump in pharmaceutical and biotech industries.
- Pumps with a single mechanical seal operating close to the liquids boiling point.

Mechanical seal with SiC/SiC seal faces - poor lubrication



Purified water line:

- Circulation to keep PUW sterile, UV & Ozone treatment, etc.
- Sterile design suitable for CIP & SIP
- Low energy consumption
- Electropolished, Ra < 0.8 or 0.4 μm



Pump series:

- PHP2..... p. 8
- FP2+..... p. 12

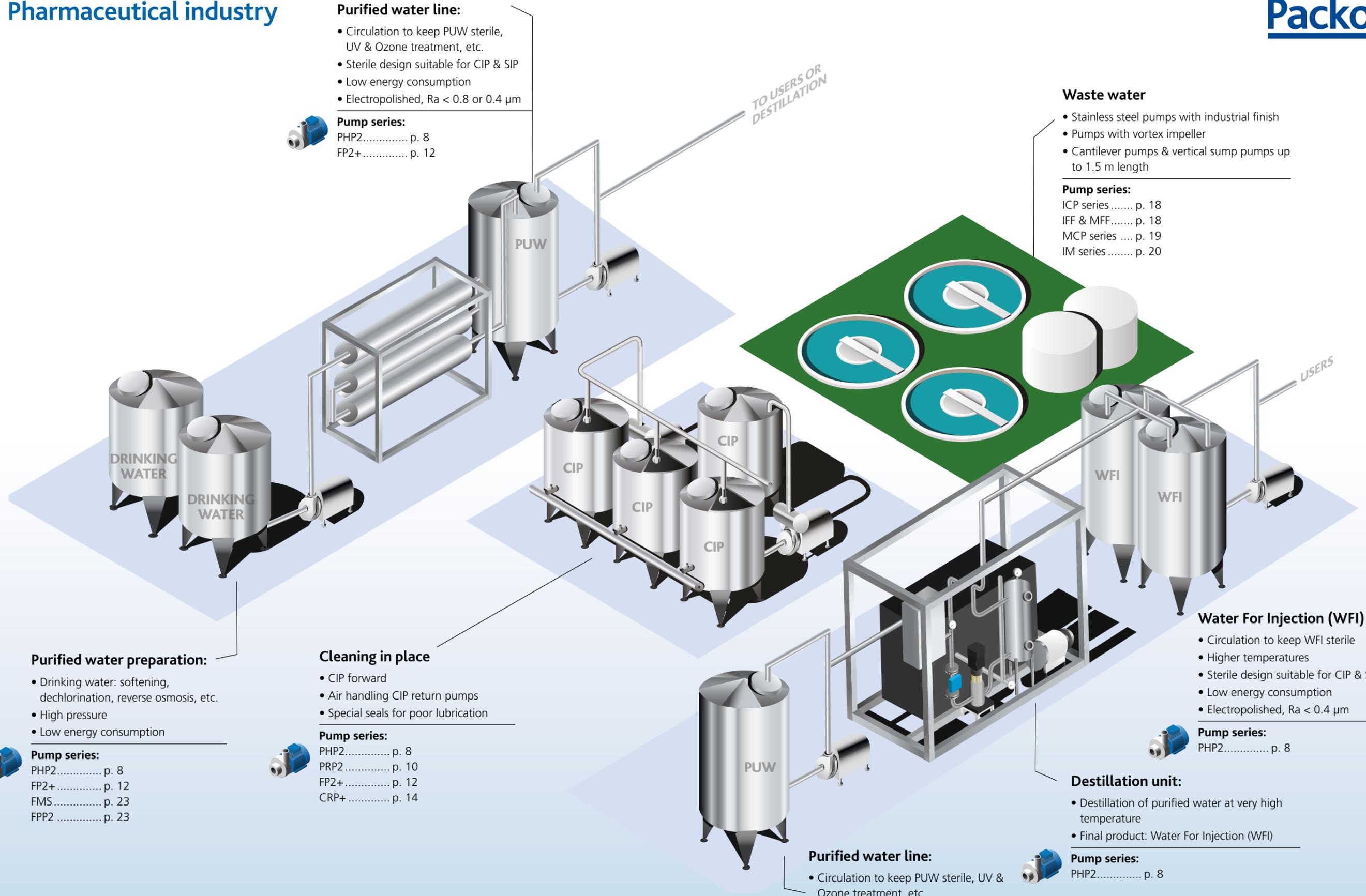
TO USERS OR
DESTILLATION

Waste water

- Stainless steel pumps with industrial finish
- Pumps with vortex impeller
- Cantilever pumps & vertical sump pumps up to 1.5 m length

Pump series:

- ICP series p. 18
- IFF & MFF..... p. 18
- MCP series p. 19
- IM series p. 20



Purified water preparation:

- Drinking water: softening, dechlorination, reverse osmosis, etc.
- High pressure
- Low energy consumption



Pump series:

- PHP2..... p. 8
- FP2+..... p. 12
- FMS..... p. 23
- FPP2..... p. 23

Cleaning in place

- CIP forward
- Air handling CIP return pumps
- Special seals for poor lubrication



Pump series:

- PHP2..... p. 8
- PRP2..... p. 10
- FP2+..... p. 12
- CRP+..... p. 14

Water For Injection (WFI) line:

- Circulation to keep WFI sterile
- Higher temperatures
- Sterile design suitable for CIP & SIP
- Low energy consumption
- Electropolished, Ra < 0.4 μm



Pump series:

- PHP2..... p. 8

Distillation unit:

- Distillation of purified water at very high temperature
- Final product: Water For Injection (WFI)



Pump series:

- PHP2..... p. 8

Purified water line:

- Circulation to keep PUW sterile, UV & Ozone treatment, etc.
- Sterile design suitable for CIP & SIP
- Low energy consumption
- Electropolished, Ra < 0.8 or 0.4 μm



Pump series:

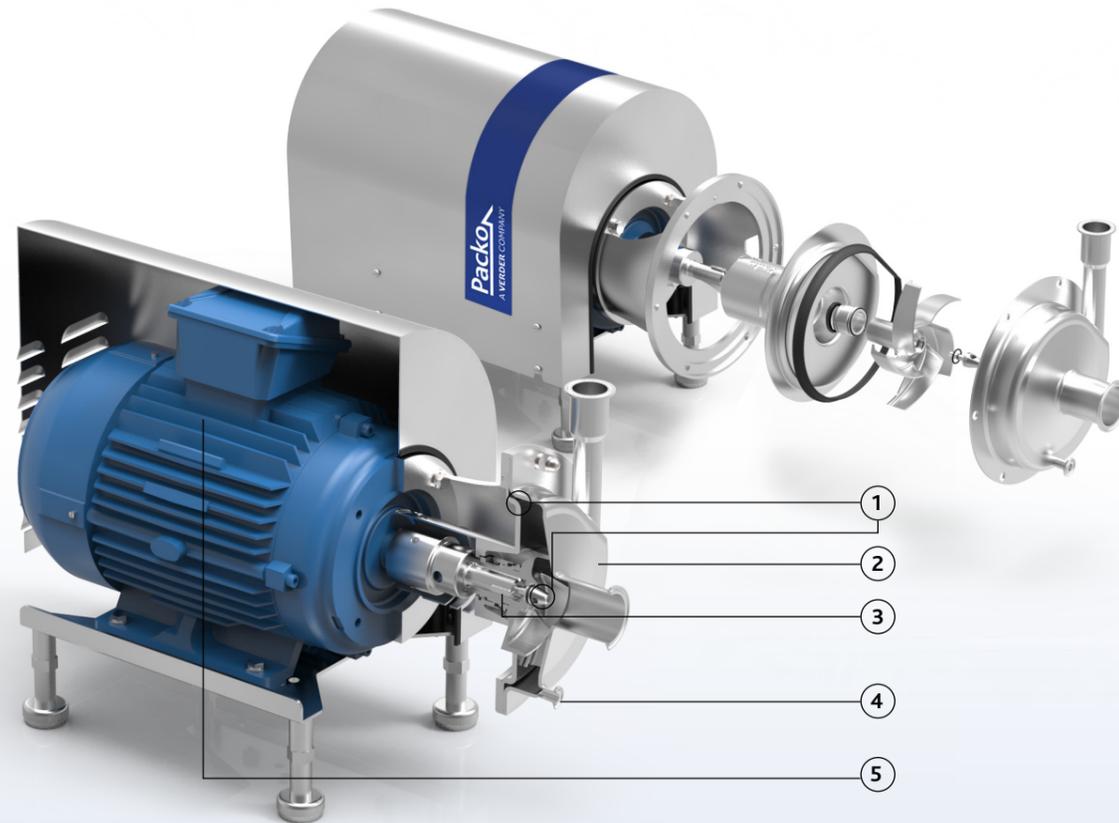
- PHP2..... p. 8
- FP2+..... p. 12

Pump series PHP2



Characteristics

The Packo 3A certified pharmaceutical process pumps of the PHP2 series are used for the most demanding sterile applications in the pharmaceutical, biotech and semi-conductor industry. These perfectly cleanable pumps have stainless steel 316L pump casings constructed in thick cold rolled plate, 100% non porous and extremely smooth. The pumps have fully machined open impellers constructed in 1.4435 material. Thanks to its crevice-free design and electropolishing as a final surface treatment, the PHP2 pump series are perfectly cleanable, resulting in a reliable component into your production process.



PHP2

- 1 Electropolished, easy to clean construction, no bacteria traps and no small clearances in order to clean the area around the O-ring
- 2 Pressed stainless steel pump casing in 2B, extremely smooth
- 3 Large seal cavity to clean mechanical seal properly
- 4 Fully drainable
- 5 Monobloc execution with std. IEC motors
- 6 Standardized mechanical seals to EN 12756
FDA approved sterile O-ring seals
- 7 Sterile mechanical seal with hydropad
static seal face for WFI > 80°C



Your benefits:

- High pump efficiency lower energy consumption
- Low NPSH values: less risk on cavitation
- Electropolished: perfectly cleanable
- Easy & robust construction and easy maintenance: Less downtime
- Standard components
- 2 mechanical seal diameters for entire range
- Fully certified (roughness value, FDA, USP, 3.1 for wetted parts, certificate of conformity, etc.)
- Suitable for SIP
- Parts in contact < 0,4 µm

Application areas

These perfectly cleanable process pumps are the ideal solution for pure water circulation loops, cleaning applications, etc.
Typical liquids are pure water, WFI, CIP, syrups, etc.

Pump series

Performance

	PHP2
max. flow rate	110 m ³ /h
max. differential head	110 m
max. Inlet pressure	13 bar
max. liquid viscosity	1000 cP
max. temperature	140°C
Impeller type	Open
max. free passage	22 mm
max. motor power	45 kW
max. speed	3000 / 3600 rpm
available frequency	50 / 60 Hz

Technical specifications

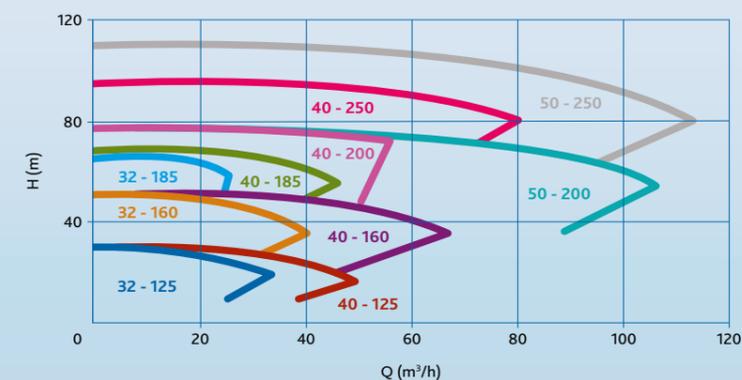
materials wetted parts	stainless steel 316L for casing and backplate, 1.4435 for the impellers, duplex 1.4462 for metallic parts of the seal and impeller screw
available materials o-ring	EPDM, FKM, FEP-FKM, FFKM, Silicone
mechanical seal configuration	single, quench, double
connections	sterile connections
surface finish	pharmaceutical quality, roughness value < 0,4 µm for wetted parts, electropolished, fully certified

certificates & legislation



Performance curves at 2900 rpm

PHP2

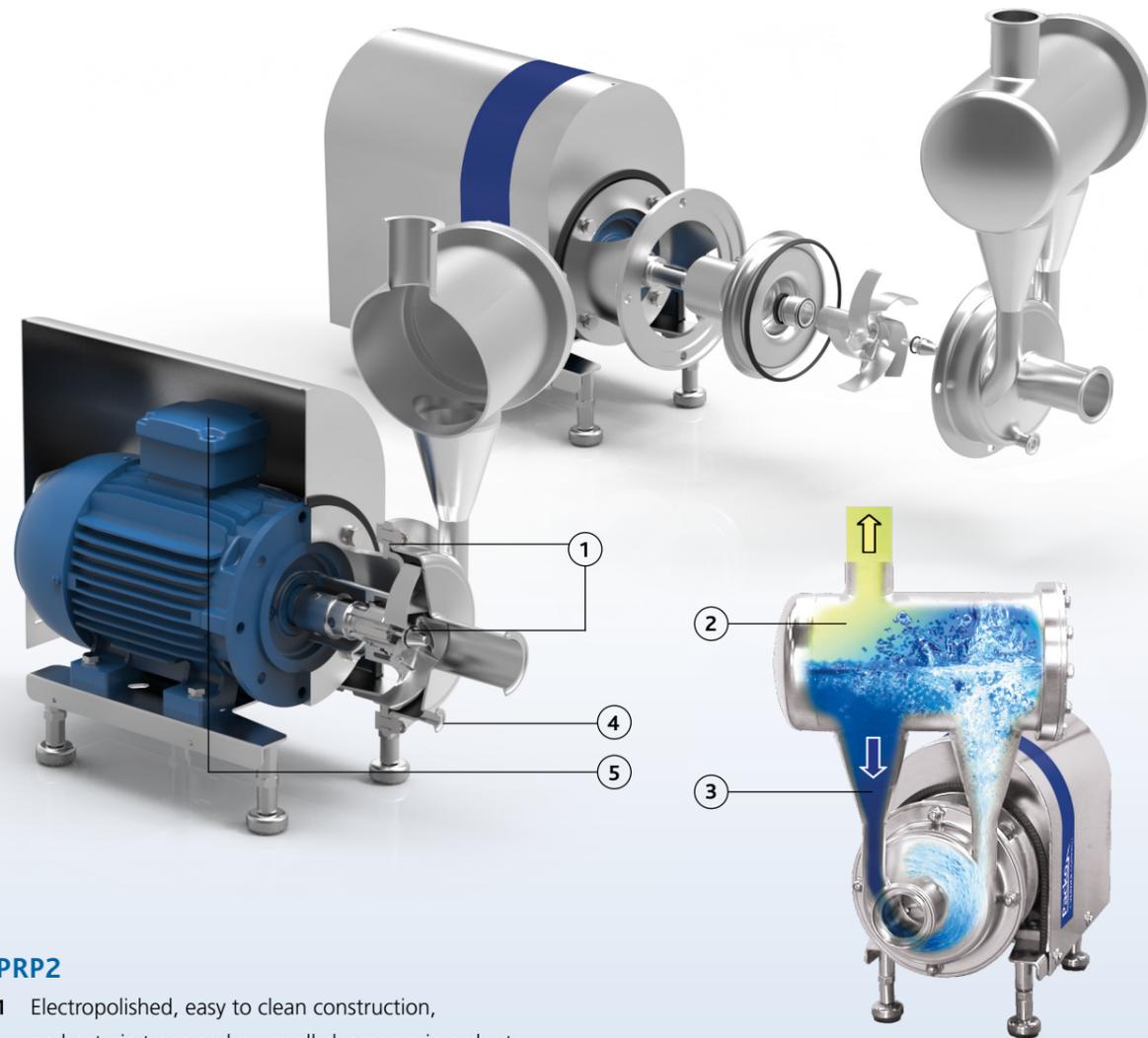


Pump series PRP2



Characteristics

The pumps of the PRP2 series are perfectly cleanable EHEDG and 3A certified air handling pumps and are mainly used to pump a mixture of liquid and air. These perfectly cleanable pumps have stainless steel 316L pump casings constructed in thick cold rolled plate, 100% non porous and extremely smooth. The pumps have fully machined open impellers constructed in 1.4435 material. Thanks to its crevice-free design and electropolishing as a final surface treatment, the PRP2 pump series are perfectly cleanable, resulting in a reliable component into your production process.



PRP2

- 1 Electropolished, easy to clean construction, no bacteria traps and no small clearances in order to clean the area around the O-ring
- 2 Unique air handling design with cleanable air separator
- 3 By-pass to casing taking care about air evacuation
- 4 Fully drainable
- 5 Monobloc execution with std. IEC motors
- 6 Standardized mechanical seals to EN 12756
FDA approved sterile O-ring seals
- 7 Optional: Novapad seal for applications with poor lubrication



Your benefits:

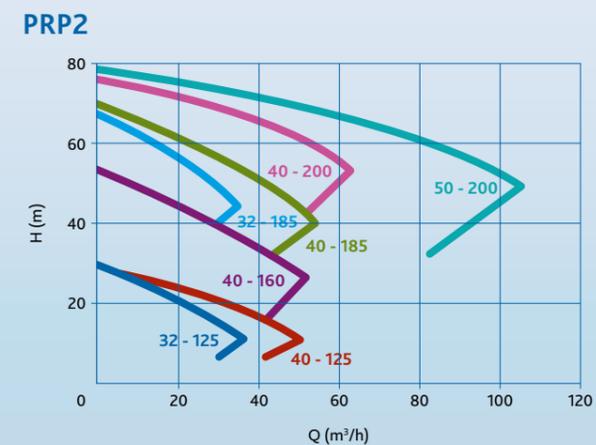
- Higher pump efficiency compared with a classic liquid ring pump
- Low NPSH values: less risk on cavitation
- Electropolished: perfectly cleanable
- Easy & robust construction and easy maintenance: Less downtime
- Limited noise level
- 1 mechanical seal diameter for the entire range
- Fully certified (roughness value, FDA, USP, 3.1 for wetted parts, certificate of conformity, etc.)
- Suitable for SIP
- Parts in contact < 0.4 µm

Application areas

Thanks to its unique air handling design based on a standard centrifugal pump, the PRP2 series are particularly suitable as CIP return pump!

Pump series	PRP2
Performance	
max. flow rate	105 m ³ /h
max. differential head	75 m
max. inlet pressure	13 bar
max. liquid viscosity	10 cP (to guarantee air handling capabilities)
max. temperature	140°C
impeller type	Open
max. free passage	22 mm
max. motor power	22 kW
max. speed	3000 / 3600 rpm
available frequency	50 / 60 Hz
Technical specifications	
materials wetted parts	stainless steel 316L for casing and backplate, 1.4435 for the impellers, duplex 1.4462 for metallic parts of the seal and impeller screw
available materials o-ring	EPDM, FKM, FEP-FKM, FFKM, Silicone
mechanical seal configuration	Single, quench, double
connections	sterile connections
surface finish	pharmaceutical quality, roughness value < 0.4 µm for wetted parts, electropolished, fully certified
certificates & legislation	

Performance curves at 2900 rpm

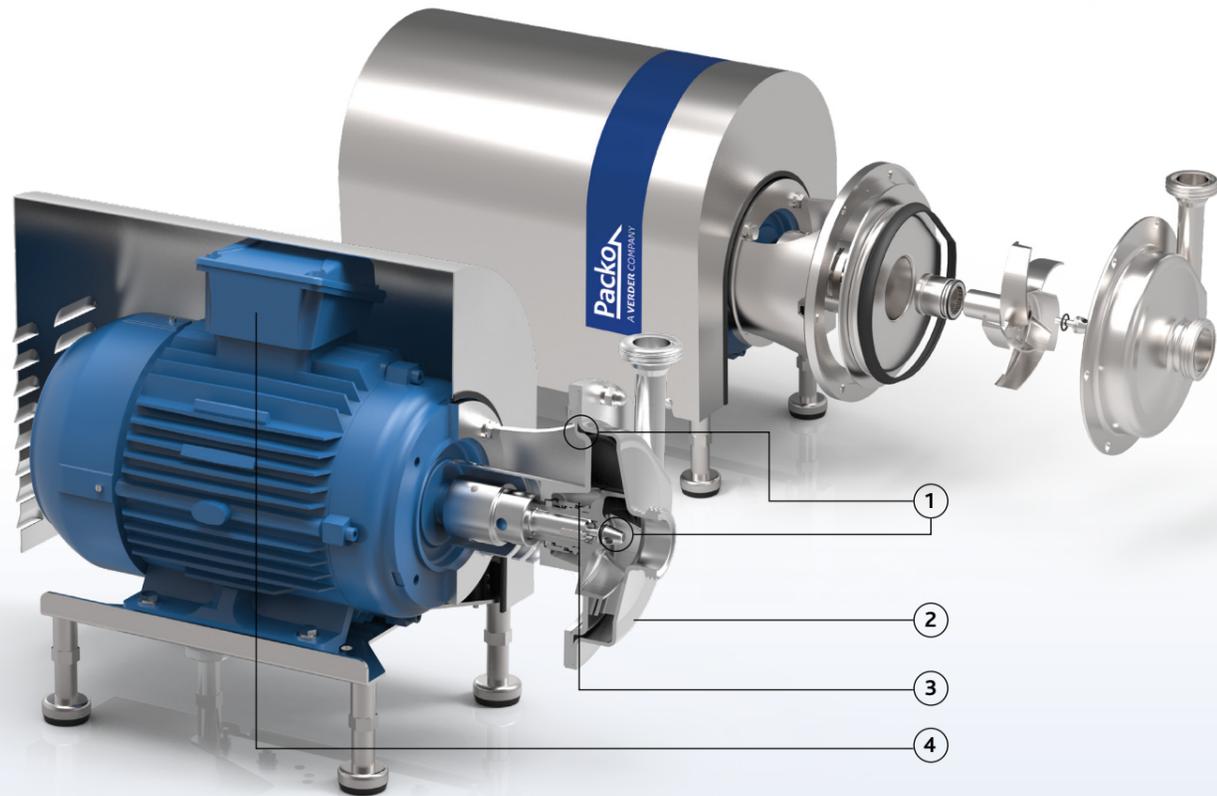


Pump series FP2+



Characteristics

These 3A certified pumps have stainless steel 316L pump casings constructed in thick cold rolled plate, 100% non-porous and extremely smooth. The pumps have open investment cast impellers, constructed in 316L or duplex materials. Thanks to its crevice-free design and electropolishing as a final surface treatment, the FP2+ pump series are perfectly cleanable, resulting in a reliable component for your production process.



FP2+

- 1 Electropolished, easy to clean construction, no bacteria traps and no small clearances in order to clean the area around the O-ring
- 2 Pressed stainless steel in 2B quality plate, extremely smooth
- 3 Large seal cavity to clean mechanical seal properly
- 4 Monobloc execution with std. IEC motors
- 5 Standardized mechanical seals to EN 12756 FDA approved sterile O-ring seals (spring not in contact with the liquid)
- 6 One seal diameter: Ø 33 mm, except for 250 types: Ø 43 mm



Your benefits:

- High pump efficiency resulting in lower energy consumption
- Low NPSH values: less risk on cavitation
- Electropolished: perfectly cleanable
- Easy & robust construction and easy maintenance: less downtime
- Standard components
- Easy to install
- 2 mechanical seal diameters for entire range
- Robust construction

Application areas

The Packo 3A certified process pumps of the FP2+ series are used in almost all food related industries as well as in pharmaceutical and biotech industry.

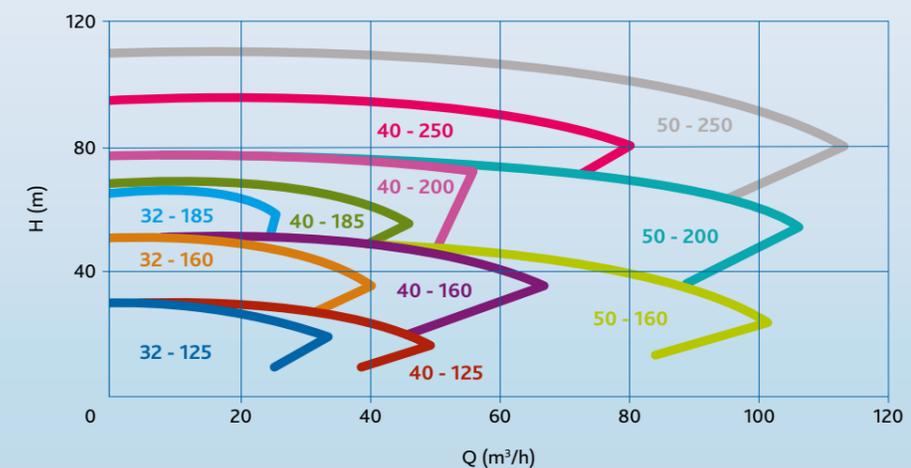
They are the ideal solution for filtration applications, pasteurisation, evaporating systems, yeast propagation and for CIP cleaning systems as well.

In pharmaceutical and biotech industry they are mainly used for handling Purified Water and as CIP forward pump in cleaning systems.

Pump series	FP2+
Performance	
max. flow rate	110 m ³ /h
max. differential head	110 m
max. inlet pressure	13 bar
max. liquid viscosity	1000 cP
max. temperature	140°C
impeller type	open
max. free passage	22 mm
max. motor power	45 kW
max. speed	3000/3600 rpm
available frequency	50/60 Hz
Technical specifications	
materials wetted parts	stainless steel 316L or similar
mechanical seal configuration	single sterile, quench, double
available material o-ring	EPDM, FKM, FEP-FKM, FFKM, Silicone
connections	3A approved hygienic fittings only
surface finish	hygienic quality, internal welds hand polished + electropolished (wetted parts 0.8 µm)
certificates & legislation	

Performance curves at 2900 rpm

FP2+

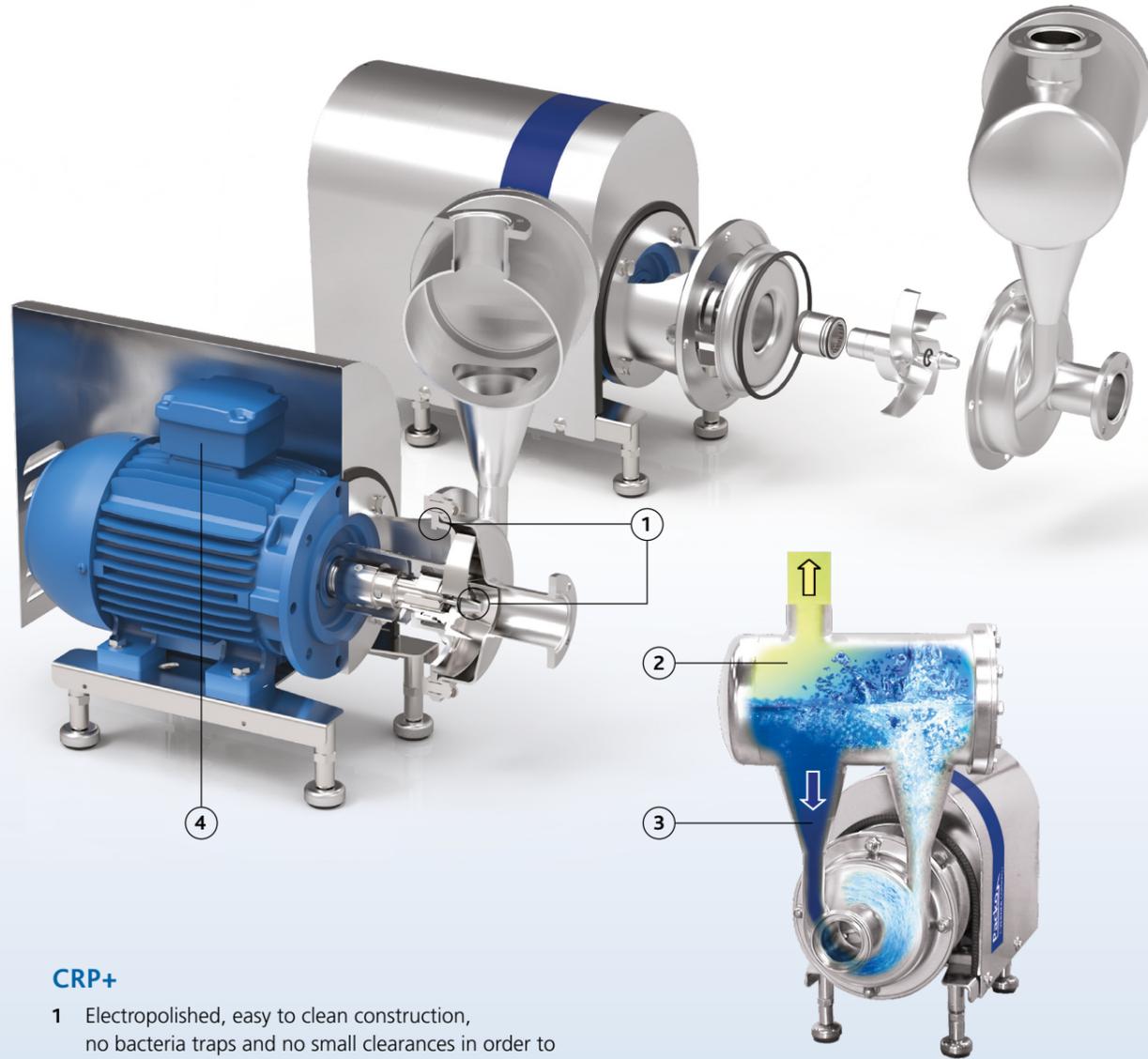


Pump series CRP+



Characteristics

The pumps of the CRP+ series are perfectly cleanable EHEDG and 3A certified air handling pumps and are mainly used to pump a mixture of liquid and air. Constructed in thick cold rolled plate, 100% non-porous and extremely smooth. The pumps have open investment cast impellers, constructed in 316L or duplex materials. Thanks to its crevice-free design and electropolishing as a final surface treatment, the CRP+ pump series are perfectly cleanable, resulting in a reliable component for your production process.



CRP+

- 1 Electropolished, easy to clean construction, no bacteria traps and no small clearances in order to clean the area around the O-ring
- 2 Unique air handling design with cleanable air separator
- 3 By-pass to casing taking care about air evacuation
- 4 Monobloc execution with std. IEC motors
- 5 Standardized mechanical seals to EN 12756 FDA approved sterile O-ring seals
- 6 One mechanical seal diameter: Ø 33 mm
- 7 Optional: Novapad seal for applications with poor lubrication



Your benefits:

- Higher pump efficiency compared with a classic liquid ring pump
- Low NPSH values: less risk on cavitation
- Electropolished: perfectly cleanable
- Easy construction and easy maintenance: less downtime
- Standard components
- Easy to install
- 1 mechanical seal diameter for the entire range
- Robust construction
- Limited noise level

Application areas

Thanks to its unique air handling design based on a standard centrifugal pump, the CRP series are particularly suitable as a CIP return pump, as well as for unloading applications.

They are used in the most demanding hygienic applications in almost all industries such as dairies, breweries, beverage industry, distilleries, etc.

In pharmaceutical and biotech industry they are mainly used for CIP return applications.

Pump series

Performance

max. flow rate	105 m ³ /h
max. differential head	75 m
max. inlet pressure	13 bar
max. liquid viscosity	10 cP
max. temperature	140°C
impeller type	open
max. free passage	22 mm
max. motor power	22 kW
max. speed	3000/3600 rpm
available frequency	50/60 Hz

Technical specifications

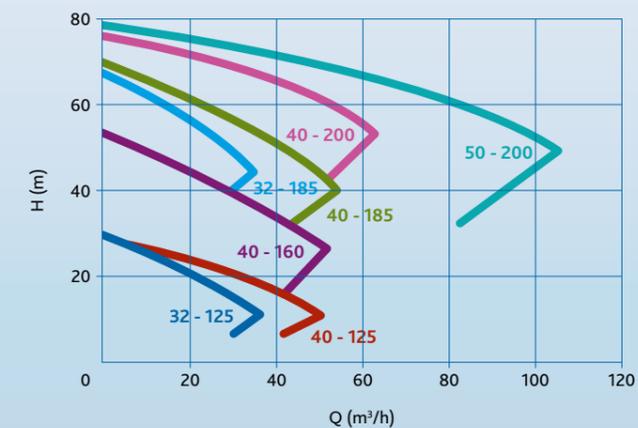
materials wetted parts	stainless steel 316L or similar
mechanical seal configuration	single bellow, sterile, quench, double
available material o-ring	EPDM, FKM, FEP-FKM, FFKM or similar
connections	3A hygienic fittings only
surface finish	hygienic quality, internal welds hand polished + electropolished (wetted parts 0.8 µm)

certificates & legislation



Performance curves at 2900 rpm

CRP+



Our wide range of stainless steel pumps

Standard Packo pump range

General industrial pumps



Pump Series NP60

Low cost industrial stainless steel centrifugal pump. Energy saving thanks to high efficiency. [Easy concept and maintenance.](#)

- Max. flow up to 40 m³/h
- Max. head 27 m
- Motor power up to 2.2 kW



Pump Series ICP2 & ICP3

Robust execution in pressed stainless steel 316L. High efficiency and very low NPSH. Modular concept composed with standard components. [Easy maintenance.](#)

[Available with hygienic fittings, pump series ICP+.](#)

- Max. flow up to 320 m³/h
- Max. head 120 m
- Motor power up to 90 kW



Pump Series MCP2 & MCP3

Robust design in cast stainless steel 316L. Extremely efficient thanks to optimum pump hydraulics. Modular concept composed with standard components. [Easy maintenance.](#)

- Max. flow up to 1800 m³/h
- Max. head 75 m
- Motor power up to 22 kW



Pump Series NMS

Multistage pump in an industrial design. [Ideal for moderate flow rate and high pressures.](#)

- Max. flow up to 50 m³/h
- Max. head 215 m
- Motor power up to 45 kW



Pump Series ICP1

The best 'value for money' industrial stainless steel centrifugal pump. Energy-saving with high efficiency. Modular concept built up with standard components. [Easy maintenance.](#)

- Max. flow up to 55 m³/h
- Max. head 37 m
- Motor power to 5.5 kW



Vortex Pump Series IFF & MFF

Stainless steel vortex pump with recessed impeller. [Ideal as a process pump for pumping liquids with a significant proportion of solids and / or long fibers.](#) [Available with hygienic fittings.](#)

- Max. flow up to 750 m³/h
- Max. head 35 m
- Motor power up to 250 kW



Pump Series IPP2

High pressure pump suitable for system pressures up to 40 bar! Made of solid, machined stainless steel 316L. [Especially for use in reverse osmosis applications.](#) [Available with hygienic fittings.](#)

- Max. flow up to 110 m³/h
- Max. head of 110 m
- Motor power up to 22 kW



Duplex Pump Series MWP2

Robust execution in wear resistant duplex material. [Ideal for pumping erosive / abrasive products.](#)

- Max. flow up to 55 m³/h
- Max. head 60 m
- Motor power up to 11 kW

General industrial pumps



Pump Series VPCP

Product pump in stainless steel AISI 304. Thanks to its specially designed vane and large pump casing this pump is extremely suitable for soft and damage free pumping of e.g. potatoes, vegetables, mussels, shrimp, etc.
Extreme large passage.
 Available up to outlet DN 250.

- Max. flow up to 1000 m³/h
- Max. head 20 m
- Motor power up to 55 kW
- Max. free passage 213 mm



Air handling Pump Series IRP

Industrial air handling pump for CIP return applications as well as for truck and tank unloading, etc. High efficiency and low NPSH in comparison with a classic liquid ring pump.
Limited noise level.
Easy maintenance.
 Available with hygienic fittings, pump series IRP+.

- Max. flow up to 150 m³/h
- Max. head 75 m
- Motor power up to 22 kW



Selfpriming Pump Series MSP2

Robust execution in cast stainless steel 316L. Suitable for CIP return, truck unloading etc.
Ideal for pumping air containing liquids.
 Available with hygienic fittings.

- Max. flow up to 70 m³/h
- Max. head 43 m
- Motor power up to 11 kW



Cantilever Pump Series IM

Available as cantilever pump series IML without mechanical seal or support bushing for insertion length of 0.5 m. With support bushing for series IMXL with insertion length up to 1.5 m.
Particularly suitable for pumping liquids that are difficult to seal, such as paints, varnishes, galvanic coatings, hot frying oil, etc.

- Max. flow up to 1000 m³/h
- Max. head 60 m
- Motor power up to 132 kW

Standard Packo pump range

Hygienic pumps



Pump Series FP60

Low cost hygienic pump executed in pressed stainless steel. Energy saving thanks to high efficiency.
Easy concept and maintenance.

- Max. flow up to 40 m³/h
- Max. head 27 m
- Motor power up to 2.2 kW



Pump Series FP1

The best 'value for money' hygienic stainless steel centrifugal pump. Energy-saving with high efficiency. Modular concept built up with standard components.
Easy maintenance.

- Max. flow up to 55 m³/h
- Max. head 37 m
- Motor power to 5.5 kW



Pump Series FP2 & FP3

EHEDG certified
 Robust executed hygienic pump in stainless steel 316L. Energy saving and very low NPSH. Modular concept composed with standard components.
Easy maintenance.

- Max. flow up to 320 m³/h
- Max. head 220 m
- Motor power up to 90 kW



Pump Series MFP2 & MFP3

Hygienic execution in cast stainless steel 316L. Extreme energy saving thanks to optimum pump hydraulics. Modular concept composed with standard components.
Easy maintenance.

- Max. flow up to 1800 m³/h
- Max. head 75 m
- Motor power up to 250 kW

Hygienic pumps



Pump Series FMS

Hygienic executed multistage pump.
Ideal for working at moderate flow rate and high pressures.

- Max. flow up to 50 m³/h
- Max. head 215 m
- Motor power up to 45 kW



Pump Series FPP2

Hygienic high pressure pump suitable for system pressures up to 40 bar!
Made of solid, machined stainless steel 316L.
Especially for use in reverse osmosis applications.

- Max. flow up to 110 m³/h
- Max. head of 110 m
- Motor power up to 22 kW

Hygienic pumps



Pump Series GFP

Hygienic multi-phase pump. Combination of a standard centrifugal pump and a liquid ring pump both mounted together on 1 motor and 1 shaft.
Ideal for foaming liquids and (viscous) liquids containing gas.

- Max. flow up to 400 m³/h
- Max. head 30 m
- Motor power up to 45 kW

Dispersing technologies



High Shear Pump Series SFP2 and SFP3

Based on the pump series FP2 with open impeller and pump series FP3 with closed impeller.
Specially with ANSYS CFD package designed stator (patented design). Efficiency improvement between 70 and 100% compared to current technologies available.
Very energy saving thanks to its high efficiency.

- Max. flow up to 200 m³/h
- Max. head 55 m
- Motor power up to 45 kW
- Max. shear up to 100.000 s⁻¹



Pump Series CRP

EHEDG certified CIP return pump.
Unique air handling concept. High efficiency and low NPSH in comparison with a classic liquid ring pump.
Limited noise level.
Easy maintenance.

- Max. flow up to 150 m³/h
- Max. head 75 m
- Motor power up to 22 kW



Pump Series MSCP

Self-priming side channel pump with exceptional suction power and air handling capacity.
Used in applications where air must be pumped in against a high back pressure in the discharge line.

- Max. flow up to 40 m³/h
- Max. head 75 m
- Motor power up to 15 kW



We optimize your flow



Watch the Packo Pumps video.

A **VERDER** COMPANY

Packo Inox Ltd • Industriepark Heernisse • Cardijnlaan 10 • 8600 Diksmuide • BELGIUM
Tel. +32-51-51 92 80 • Fax +32-51-51 92 99 • E-mail pumps@packo.com • www.packopumps.com
LinkedIn: www.linkedin.com/company/packopumps