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SERVING
California
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Leaders In Slurry & Bulk Material Handling, Process Instrument & Controls



Pumping Solutions

Peristaltic Pumps

Progressive Cavity Pumps

Smart Features

Spares & Services

Complementary Products



Pump solutions

We exist to make your life easier

We deliver advanced pumping solutions for the most demanding process conditions. Our story has started over 40 years ago making us industry experts on flow control. Our unique pump design saves energy and water increasing your process availability and reducing total cost of ownership.

1977:

Company Larox is established

1993:

Company Larox Flowsys Oy is established

2002:

Product portfolio expanded to pumps:
Peristaltic Pumps

2008:

Acquisition of pump services business

2008:

Launch: Metering pumps part of portfolio

LAROX



2011:

Launch: PC pumps part of portfolio



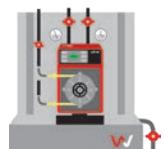
2015:

Launch: Pulsation dampeners



2016:

Launch: Smart Solutions™



2017:

Launch: Packaged Pumping Systems™



OVER

150 000 products delivered Globally

2011 - Name changed

LAROX
FLOWSYS

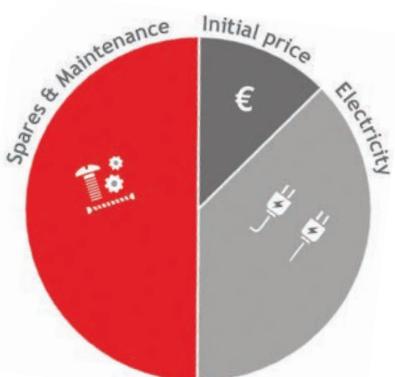
FLOWROX

4 DECADES: KNOW-HOW & INDUSTRY EXPERTISE

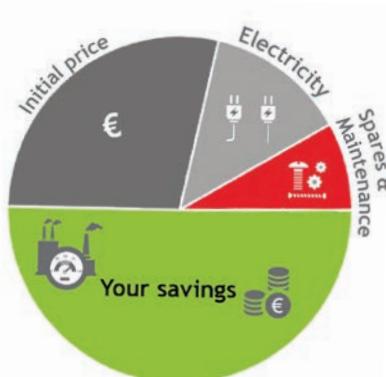
- Mining & metallurgy
- Cement & construction
- Energy & environment
- Water & wastewater
- Chemical process industry
- Oil & offshore
- Pulp & paper
- Food & pharma

We provide the optimal solution:

Centrifugal Pump



Flowrox Solution



Flowrox LPP-T pump compared to a centrifugal slurry pump, when 65 tons of solids per hour are pumped continuously.

YOUR BENEFITS

Low Total Cost of Ownership

Improved process performance

Low operating costs

Long service intervals

Minimized downtime

Heavy duty design

Flowrox Pump Product Portfolio

► Peristaltic Hose Pumps

LPP-T for Transferring

- Volume: 0,5-100 m³/h
- Pressure up to 10 bar
- Solids up to 80%
- Temperature up to 95 °C
- Particle size 25 % from DN size
- Suction lift capability 0-8m



LPP-D for Dosing

- Volume: 0,1 -2 m³/h
- Pressure up 16 bar
- Solids up to 80%
- Temperature up to 95 °C
- Particle size 25 % from DN size
- Suction lift capability 0-8m



LPP-M for Metering

- Volume: 0-0,6 m³/h
- Pressure up 8,6 bar
- Temperature up to 45 °C
- Not for slurries
- Suction lift capability 0-2m



► Progressive Cavity Pumps

E-Series

- Volume: 0-228 m³/h
- Pressure up 10 bar
- Temperature up to 70 °C
- For homogenous medias
- For flooded suction duties
- E.g. paste pumping



EL-Series

- Volume: 0-188 m³/h
- Pressure up 6 bar
- Temperature up to 70 °C
- For homogenous medias
- For flooded suction duties
- E.g. Municipal waste pumping



D-Series

- Volume: 0-0,75 m³/h
- Pressure up 12 bar
- Temperature up to 70 °C
- For chemical dosing
- For flooded suction duties
- For dosing chemicals and flocculants



► Smart Solutions™



Smart LPP Pumps for Optimal Slurry Transfer

- Process data collection through various sensors
- Can also be retrofitted to any pump type or brand
- Enables advanced reporting and data analytics, making your process more reliable and transparent
- Increased productivity through optimization & online predictability

► Pump Services



Comprehensive Pump Installation, Maintenance and Spare Parts Services

- Site survey services
- Spare parts and component services
- Replacement products and components for original & compatible products
- Installation, commissioning, maintenance and repair services
- Product update and retrofit service
- Analysis services / commissioning / training

Pumping Rock Solids

Customer: LKAB, Sweden

Products: Hose Pumps LPP-T100

Application: Thickener underflow

Benefits: Reliability. Hose pump capability up to 80% solids. Can handle coarse particles. Operational safety.

New project for tailings treatment brings Flowrox to site

Flowrox hose pumps were chosen for the project based on a previous experience. “We first learned about Flowrox hose pumps at a paste conference in South Africa and, we were interested in this pumping technology,” says **Thord Wennberg**, Technical Process Development, LKAB.

For the new plant LKAB chose LPP-T100 transfer hose pumps that are able to pump up to 80% solids. “The fact that the hose pumps are suitable for paste and high-density slurries is important to us. However, currently we are only pumping 66% - 70% solids.

The pumps’ capability to actually perform and pump solids effectively is very crucial for us in the water treatment facilities. The slurry is dense enough to enable us to save water and keep up the solids flow,” states **Åsa Partapuoli**, Senior Process Engineer, LKAB.

Reliability is what we look for in a pump

“We have now been working with the three Flowrox pumps in the thickener plant for one year now and they have been operating well. The most important thing for us in pump performance is reliability and

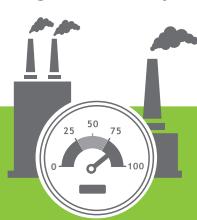
functionality. The other benefits come after, if the pump is not reliable there is nothing else to benefit from either,” states **Ronny Martinson**, Maintenance and Operation, LKAB.

“The initial life-cycle cost (LCC) calculation for the hose was estimated at three months. If we increase the pressure and the density, then of course the hose wear increases, which then affects the LCC, explains **Björn Gardelin**, Minrox, the Flowrox Representative in Sweden.

“We have experienced that the hose pumps handle solids in the slurry better than other pumps and that’s very good, as we occasionally have to deal with large particles,” Martinson tells. “The Flowrox hose pumps have an advanced rolling design. The pump can run dry and operate continuously 24/7 without any heating problems. The design has low friction, maximizes hose life and lowers energy consumption,” Gardelin reveals.

“We are now on a 3-month hose change cycle according to the LCC calculation. And we are looking into expanding the lifetime to 6 months,” Martinson adds.

LKAB’s ambition is to increase their production by five (5) percent a year, until 2021. This means increasing capacity and efficiency additionally in the treatment of waste and tailings. LKAB has placed an order for the 5th pump in the project. “Yes, we have been satisfied and will recommend the Flowrox pumps for other paste pumping applications as well,” states **Björn Henriksson**, Project Manager at LKAB.



OUR CUSTOMER: LKAB

LKAB Svappavaara is one of the oldest pelletizing plants in Sweden and LKAB being the second largest producer of iron pellets in the world. With annual production of iron ore products amounting to 26.9 million tons in 2016, the annual tonnage of tailings disposal is also considerable. For decades LKAB used a dam as disposal method for tailings, but in 2012 the company decided to deposit the tailings in Svappavaara at a high solids content and introduced a project to build a tailings thickening facility.



Flowrox Pump References



Customer: Terrafame, Finland
Products: Flowrox LPP-T65 Hose Pumps
Application: Washing liquid circulation pumps
Benefits:

- Large capacity
- Moving process water with high solids content
- Savings in energy



Customer: Deer Island Waste Water Treatment Plant, USA
Products: Flowrox PC Pump, EL Series
Application: Waste water slurry pumping
Benefits:

- Increased pumping efficiency
- Savings in maintenance costs



Customer: Surfactor, Finland
Products: Flowrox LPP-D pumps
Application: Glue feed, color dosing
Benefits:

- Accurate dosing
- Long maintenance intervals
- Low maintenance cost



Peristaltic Pumps

Flowrox heavy duty hose pumps are designed for the toughest industrial applications. They are ideal for demanding processes involving abrasive, corrosive, viscous or crystallizing media with high solids content.

Advanced Rolling Design

The operating principle of the Flowrox hose pumps is based on the peristaltic effect. As the cylindrical rotor rotates along the hose, the process medium gets pushed forward through the hose. At the same time, the hose behind the compression point reverts to its original circular shape creating a suction effect at the pump inlet port. As a result, the hose bore is re-filled with the medium. No backward flow or slip can occur as the hose is squeezed tight by the roller.

Due to their technical features, Flowrox hose pumps provide exact flow per revolution. They also incorporate an advanced rolling design, which eliminates friction, maximizes hose life and lowers energy consumption. Energy efficiency, long hose life and low maintenance generates substantial savings during the life cycle of peristaltic pumps. Lifetime of Flowrox pumps' hoses is 3-5 times longer than conventional hose pumps.



Technical Features

- Only the hose is in contact with the medium
- Positive displacement with no backflow
- Single roller design that enables minimized friction
- Low lubrication need, only 20% that of conventional peristaltic pumps
- No overheating at high continuous flow rate
- Dry run capability
- Selfpriming up to full vacuum

Trailblazing Pump Technology: This Is How We Roll!

Flowrox LPP-T pumps are equipped with a patented hose flange and reliable in-line pipe connections, as well as a hose leak detection unit. Patented adjustment mechanism senses hose wear when compression is readjusted. This helps to maximize hose lifetime and minimize the risk of over-compression. There is no need for shimming.

The LPP-T100 is one of the world's largest hose pumps, with a maximum continuous flow of 100m³/h.



Scan the code to watch pump animation.

Pump Model Selection Guide

Type	Size (DN)	Motorization	Pressure class	Flange drilling	Body Material	Inverter	Auxiliaries
LPP-T = transfer	15-100	GM = Gear motor	7,5 = 7,5 bar	1 = - 2 = DIN PN10 6 = ANSI 150 8 = BS TABLE D 9A = AS TABLE D R1/2" = Male thread R3/4" = Male thread R1" = Male thread	0 = GRS/Fe 3 = Aluminium	N = None II = Wire connected IP55	D = Hose leak detector R = Revolution detector F = Forced cooling fan T = Pressure transmitter with display X = Special
LPP-D = dosing		GU = Gear unit	10 = 10 bar				
SLPP-T = smart transfer		BS = Bare shaft	16 = 16 bar				
SLPP-D = smart dosing							

Example: LPP-T65GM10-2-0-N-D

Type	Frame size	Model	Maximum motor RPM	Power cord plug type	Auxiliaries
LPP-M2 = metering	2 = Tubes between 1,9 - 9,5 mm	S = Smart model	2 = 125 RPM	6 = 250 V AC, NEMA 7/VII (Europe)	FVS = Flow verification sensor X = Other Auxiliaries
LPP-M3 = metering	3 = Tubes between 6,4 - 19,1 mm				

Example: LPP-M3-S-2 6



All stages of the LPP-T and LPP-D and their hose design and manufacturing are covered by ISO 9001:2015. They are also ATEX approved.

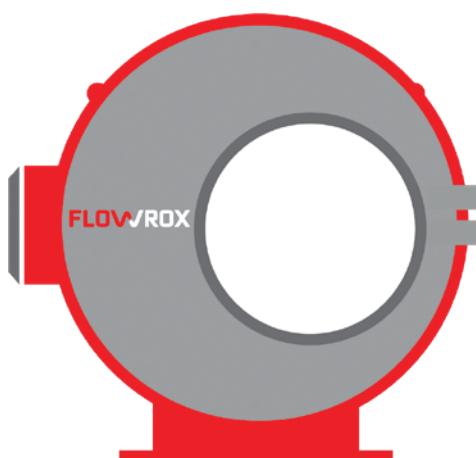
Our Pump Offering

For Transferring, Dosing and Metering

The innovative Flowrox peristaltic pumps set the industry standard for peristaltic pump technology. Designed for heavy industrial duties, they are ideal for pumping diverse slurries and dosing a wide range of abrasive, corrosive, viscous or crystallizing media.

LPP-T pumps provide substantial savings through improved process performance and efficiency, long service intervals and low maintenance costs. They are manufactured using durable elastomers and advanced materials, making them perfect for pumping a wide range of media.

From Features to Benefits



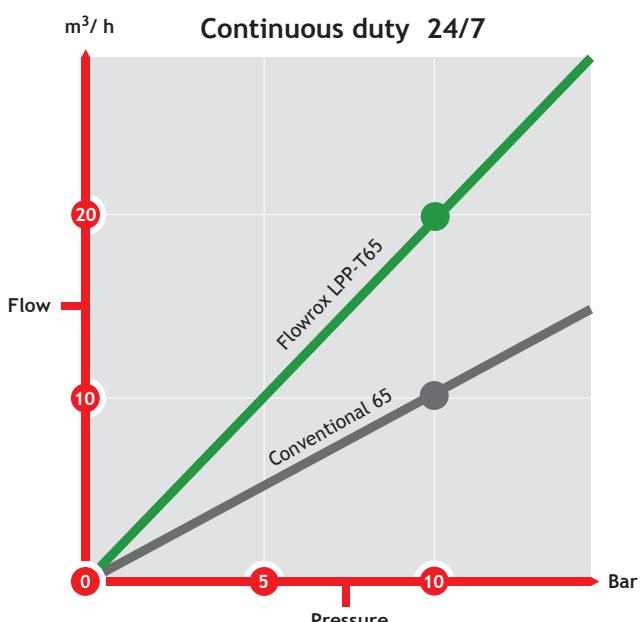
- 3-5 times longer hose lifetime → Less maintenance 
- Less friction → 75% less glycerine 
- Rolling pump design → Save energy up to 40% 
- Pump up to 80% solids → Save water 

Comparison of Flowrox technology

Flowrox rolling technology is capable of operating in continuous duty with its maximum pressure and maximum flow in the same point, where the conventional pump has limitations in continuous duty for pressure or flow.

The pump performs even with 95 °C degrees media temperature.

Image:
Flowrox hose pump technology vs. conventional technology.



Technical Data of Flowrox LPP Pumps

Technical data	LPP-T32	LPP-T40	LPP-T50	LPP-T65	LPP-T80	LPP-T100
Weight	~300 kg	~360 kg	~650 kg	~960 kg	~2450 kg	~4300 kg
Flow/revolution	0,65 l	1,25 l	2,75 l	5,4 l	11,6 l	31,6 l
Maximum flow	3,9 m ³ /h	8 m ³ /h	11,5 m ³ /h	20 m ³ /h	40 m ³ /h	100 m ³ /h
Maximum pressure	10 bar	10 bar	10 bar	10 bar	7,5 bar	10 bar
Lubricant volume	0,8 l	1 l	2,5 l	4 l	8 l	25 l
Hose bore and flange connection	32 mm	40 mm	50 mm	65 mm	80 mm	100 mm
Motor power	0,75-4 kW	1,1-5,5 kW	1,5-9,2 kW	3-11,0 kW	9,2-22,0 kW	37-75 kW

Technical data	LPP-D15	LPP-D20	LPP-D25	Technical data	LPP-M
Weight	47 kg	47 kg	60 kg	Weight/ Shipping weight	LPP-M2: 13,9/15 kg LPP-M3: 24,8/26,3 kg
Flow/revolution	0,1 l	0,18 l	0,3 l	Maximum flow	LPP-M2: 126 l/h LPP-M3: 600 l/h
Maximum flow	0,6 m ³ /h	1,2 m ³ /h	2,0 m ³ /h	Maximum working pressure	8,6 bar
Maximum pressure	7,5/16 bar	7,5/16 bar	7,5/16 bar	Maximum fluid temperature	45°C
Lubricant volume	0,4/1 l	0,4/1 l	0,4/1 l	Enclosure	Nema4x/IP66
Hose bore and flange connection	15 mm	20 mm	25 mm	Plug type (operating voltage requirement 96VAC to 264VAC)	250V, AC, CEE 7/VII (Europe) 115V, NEMA 5/15 (US) 230V, NEMA 6/15 (US) 230V, BS 1363 (UK) 240V, AS 3112 (Australia, NZ)
Motor power	0,55-1,1 kW	0,55-1,1 kW	0,75-1,5 kW		



The Flowrox pumps are suitable for large-scale project deliveries with a selection of Flowrox valves.

Progressive Cavity Pumps

Flowrox progressive cavity (PC) pumps are ideal for demanding industrial slurry and paste pumping applications, especially with highly viscous or shear sensitive liquids and sludges.

Advanced spiral technology

In PC pumps, the pumped medium continuously shifts spaces (progressing cavities) between the rotor and the stator, enabling nearly pulsation-free pumping. With Flowrox technology it is possible to deliver up to 10 bar of pressure per single stage. This is possible with our evenwall stator technology that forms the heart of the entire pump.

Other benefits:

- Over 30% higher pumping capacity compared to a conventional PC pump with same rpm
- Save energy up to 15% compared to a conventional model
- Minimized maintenance time enables the highest run time possible

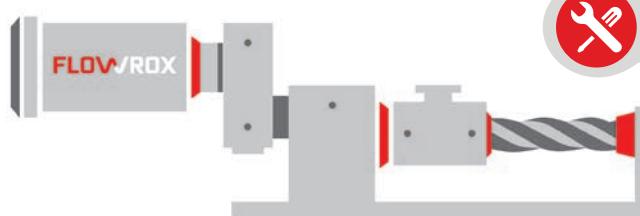


Technical features

- Combination of an elliptic rotor and a stator with even wall thickness
- More pressure with less strain
- Increased flow per revolution
- Long rotor/stator lifetime
- Less backflow

Through advanced technology and precise design, Flowrox PC Pumps offer you significant savings by reducing pumping costs.

From features to benefits



Advanced product structure



Longer maintenance interval



Evenwall® stator



Higher pressure with same RPM



2/3 rotor geometry



30% higher flow with same speed



Technical data

Technical data	E2/10	E4/10	E10/10	E20/10	E35/10	E70/10	E150/10	E250/10
Weight kg	110	135	180	270	350	630	1360	2300
Maximum flow m ³ /h	1,7	3,4	6,8	14,1	35,6	69,6	141,1	227,6
Max. pressure bar	10	10	10	10	10	10	10	10
Flange connection DN	50	65	80	100	125	150	200	250
Motor power kW	1,5	3	3	7,5	11	30	75	90

Technical data	EL50/6	EL100/6	EL200/6	EL330/6
Weight kg	140	540	1120	1900
Maximum flow m ³ /h	38,2	71,1	133,9	187,9
Max. pressure bar	6	6	6	6
Flange connection DN	50	150	200	250
Motor power kW	11	15	30	55

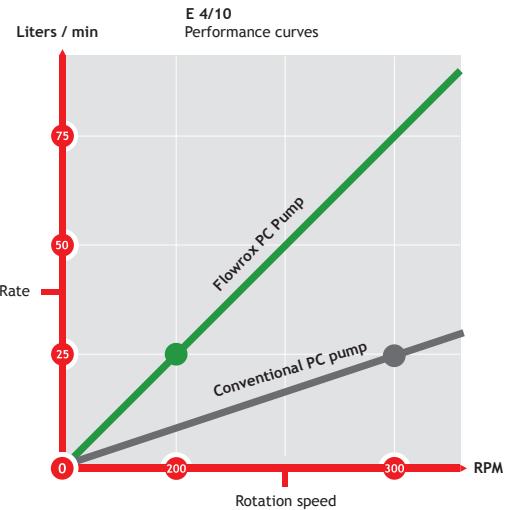
Technical data	D004/12	D010/12	D025/12	D075/12
Weight kg	14	14	15	17
Maximum flow m ³ /h	0,04	0,10	0,25	0,75
Max. pressure bar	12	12	12	12
Flange connection DN	R1"	R1"	R1"	R1"
Motor power kW	0,37	0,37	0,55	1,1

Comparison of Flowrox technology

When the Flowrox PC pump performance is compared with conventional PC pumps, Flowrox 2/3 geometry pumping elements need less RPM than conventional 1/2 geometry pumping elements to achieve the same flow rate.

Image:

Flowrox spiral technology vs. conventional technology.
Less RPM needed to achieve the same flowrate.



Smart Features

Enhance your performance with our Smart Solutions™. Flowrox Smart Features can be included into any old or new delivery. The Smart pumps are next generation solutions delivering data and information in order to provide reliable and cost-efficient production. Real time information from site results in optimized production with maximized output and minimized unplanned shutdowns.

Smart Solutions™

The SLPP Series provides online information about the pumping process, pumping performance and condition of the pump.

The Smart Pump is equipped with instrumentation and intelligent motor diagnostics for continuous monitoring of the pumping performance.

The Flowrox Smart Pump combined with the Malibu™ IIoT (Industrial Internet of Things) user interface enables advanced reporting and data analytics, making your process more reliable and transparent. Malibu is accessible on any device with an Internet browser.



Technical Features

- Real time data available in Malibu
- Pre-fail indications from the sensors
- Vibration & temperature measurements
- Pressure measurement at the pump inlet/outlet
- Medium temperature measurement
- Connectivity with 4G/3G, WIFI or LAN

From Features to Benefits

- Online pump performance monitoring
 - Detect issues before they become a problem, enables production optimization
- Automatic pre-fail indications
 - Savings in maintenance & unexpected shutdown costs
- Advanced analytics and reporting tools
 - Compare and analyse data.
 - Access to detailed pumping data to assess long-term pump performance
- Easy accessibility via the Internet
 - Access wherever you are



Malibu IIoT user interface is simple and easy to use.



Flowrox Smart LPP-T pumps:

The SLPP series pumps provide online information about the pumping process, pumping performance and condition of the pump.

The Flowrox Smart Pump combined with Malibu™ enables advanced reporting and data analytics, making your process more reliable and transparent.

Complementary Products

We provide complementary equipment that is designed to support the optimal flow. Enhance your process with the Flowrox Expulse™ pulsation dampener.

Expulse™

It is common for positive displacement pumps to produce pulsation. The Flowrox Expulse is a flexible inline pulsation dampener, which quiets noise while settling pressure peaks and uneven flows. The design is based on a double hose structure with resilient inner hose, reinforced outer hose and compressed air between the hoses.

- Absorbs up to 90% of the pulsation
- Up to 10% energy savings
- Reduces hammering of the pipeline and makes pump bearings and gearboxes last longer
- All in one; flexible pipeline connection and dampener
- Flowrox Expulse can be installed on any pulsating pump from any brand
- There are no breaking diaphragms or bladders
- Flowrox Expulse is self-cleaning
 - does not collect sediment or particles.



Technical data

Size	DN32-DN100/1 1/4"-4"
Hose Material	NR Standard
Wetted parts	AISI316 & NR
Maximum pressure	10 bar
Maximum temperature	+ 75 °C
Filling media between dampener hoses	Oil free compressed air
Standard features	Threaded ends
Auxillaries	Flanges

From features to benefits

- Reduces noise
 - Quiets the annoying noise of the pulsating pump in the pipelines
- Saves energy
 - Absorbs up to 90% of pulsations and saves up to 10% of energy by temporarily storing it in the flexible inner hose and filler gas
- Easy, independent and reliable
 - Easy to install for any pulsating pump
- Protects pump bearings and gearbox
 - Reduces pipeline pulsations
- Simple and flexible
 - Easy and fast to maintain



Flowrox LPP-T pump with 80 mm Expulse stabilizing the flow in a filter feed application.

Spares & Services

With decades of experience in developing innovative flow control solutions and elastomer technology, Flowrox offers a wide selection of superior elastomers for diverse media and process conditions. The correct mechanical hose design and material selection are essential for optimizing hose lifetime.

Optimal Pump Hoses and Tubes for Each Media

Our high-grade hose materials include chemical resistant ethylene propylene (EPDM), oil and fat resistant nitrile rubber (NBR), which is available also for food grade mediums (NBRF), and extremely abrasive natural rubber (NR), which is ideal for heavy wearing applications.

To guarantee the best possible mechanical characteristics, the hose cover is always made of natural rubber.

LPP-M tube material options are Norprene®, Norprene Chemical®, Flexaprene® and Tygothane®.

Auxiliaries

Revolution sensor & pressure transmitter



The revolution sensor calculates the cycles of the pump. Pressure transmitter can be used to detect overpressure of the pipeline.

The hose leak detector



The hose leak detector indicates hose leakage into pump housing. It automatically stops the rotation of the pump when connected to the control system.

Services

We offer prompt support, spare parts and services in order to maximize your pump performance.

We manufacture and deliver original spare parts and components for all Flowrox products (hose pumps, PC pumps, valves) as well as original and compatible replacement components for other brands' products.

We have the capability to deliver and manufacture stators, rotors, drive shafts, coupling rods, joint assemblies, bearings sets and sealings for most commonly known PC pumps, such as Allweiler, Seepex, Netzschi, Mono, PCM and Bornemann with 20 years experience.



- On-time trouble-free delivery of spares and services
- Cost savings through optimized service cycles and reduced downtime of equipment
- Longer life cycles for equipment