



**HERBORNER
PUMPENTECHNIK**

UNIVERS-P

PROCESS PUMP



The single-stage centrifugal pump for sewage:
compact, powerful and effective at the same time.



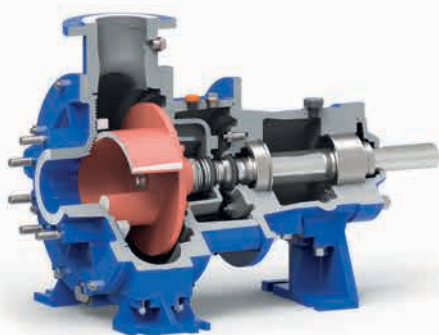
UNIVERS-P

The new generation of centrifugal pumps for sewage

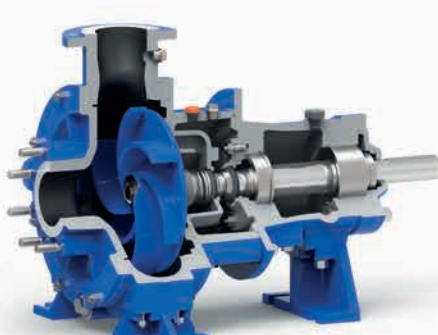
The **UNIVERS-P** is designed for use in raw sewage transport. High loads don't cause the sewage pump any problems.

The process pumps of the **UNIVERS-P** series were constructed especially for hard use in pumping stations and sewage treatment plants with direct operation via coupling or V-belt drive. Reliability and long operating periods together with the highest possible efficiency are priorities during development - these factors all combine to achieve very low life cycle costs. The higher flywheel mass inertia made possible in the design minimises the impact of water hammer in the pipeline system.

The **UNIVERS-P** is ideally used in process-technology plants and municipal businesses. It is especially suited for delivery of uncleaned sewage, dirty water, faeces, sewage sludge, moor mud, pool water, and paper, cellulose, and wood suspensions. With the highest degree of operational safety even in areas where there is an explosion hazard, close coupled sewage pumps contribute to the fault-free functioning of sewage transport systems, pump stations, sewage treatment plants, public facilities, factories, vegetable washing facilities, slaughterhouses, indoor, outdoor, and adventure swimming baths, water parks, paper and sugar factories, breweries, preservative industries, department stores, schools, and residential buildings.



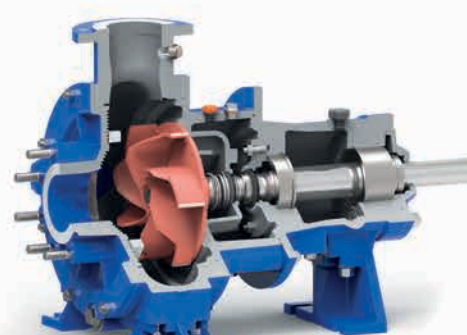
UNIVERS-P



UNIVERS-P-SG / UNIGUM

with rubber-lined pump hydraulics

Page 8



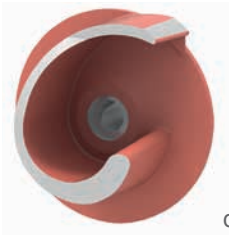
UNIVERS-P-PO

with cutting wheel

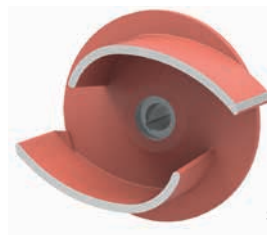
Page 9

Impellers

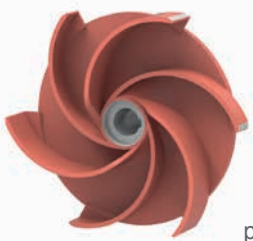
The optimum choice of impeller for the respective pumped medium is guaranteed by the diverse selection of impellers. These ensure the highest degree of operational safety with their efficiency-optimised hydraulics. In the case of the V-belt drive, all hydraulics can be adapted by changing the transmission ratio. All multi vane impellers can reach every duty point within the pump's set of performance curves by correcting the diameter.



Open single vane impeller (Q) with automatic non-clogging system for safe and reliable transport of pumped media containing very rough solids.



Open twin vane impeller (Q) with automatic non-clogging system for gentle transport, even of pumped media containing solids. High running smoothness due to symmetrical form.



Vortex impeller (W) for pumped media with very rough solids and gas pockets and trapped air.



Closed twin vane impeller (K) for dirty pumped media contaminated with solids.



Closed single vane impeller (K) for safe and reliable transport of pumped media containing very rough solids at the highest level of efficiency.

Optimised for servicing and maintenance

All of the components were developed for optimum servicing and maintenance and put together intelligently. When in use this means the highest level of system safety and thus the lowest life-cycle costs (LCC).

General data

- Pump colour RAL 5010 (standard)
- Media temperature range from - 5 to + 60 °C (- 5 to + 40 °C explosion protection version)
- Ambient temperature range from -5 to +40°C
- Performance verification in conformity with DIN EN ISO 9906, Class 2.

Max. density of the pumped medium 1050 kg/m³

Max. viscosity of the pumped medium 1.75 mm²/s

UNIVERS-P

Many innovative features:



1 Non-clogging system

The non-clogging-system for open single and twin vane impeller ensures the greatest possible operational safety. It is guaranteed by a combination of a hard, unprocessed surface of the wear plate and a specially processed cutting edge on the impeller.

2 Impellers

Varied impeller designs permit an adaptation to the pumped medium and duty point.

3 Shaft sealing

Double-acting mechanical seal with state-of-the-art highly wear-proof materials. The required cooling of the sliding surfaces is generated in a targeted manner through the medium via a by-pass channel. The intermediate casing is filled with lubricating oil to lubricate and cool the mechanical seals. This oil even enables a short-term dry run.

4 By-pass channel

For optimal flushing of mechanical seal by means of the pumped medium. In this way, an efficiency increase is achieved in comparison to a ring chamber rinsing process and the life cycle costs are influenced positively.

5 Operational safety

Depending on the size of the pump, the highest possible operational safety is achieved by crushing long-fibre materials at the cutting ring of the rear impeller.

6 Oil chamber

Optimised oil chamber for lubrication and cooling of the mechanical seals. Protection against short-term dry running during suction operation and in case of gaseous media. The intermediate casing can be optionally monitored for leaks using a sealing electrode.

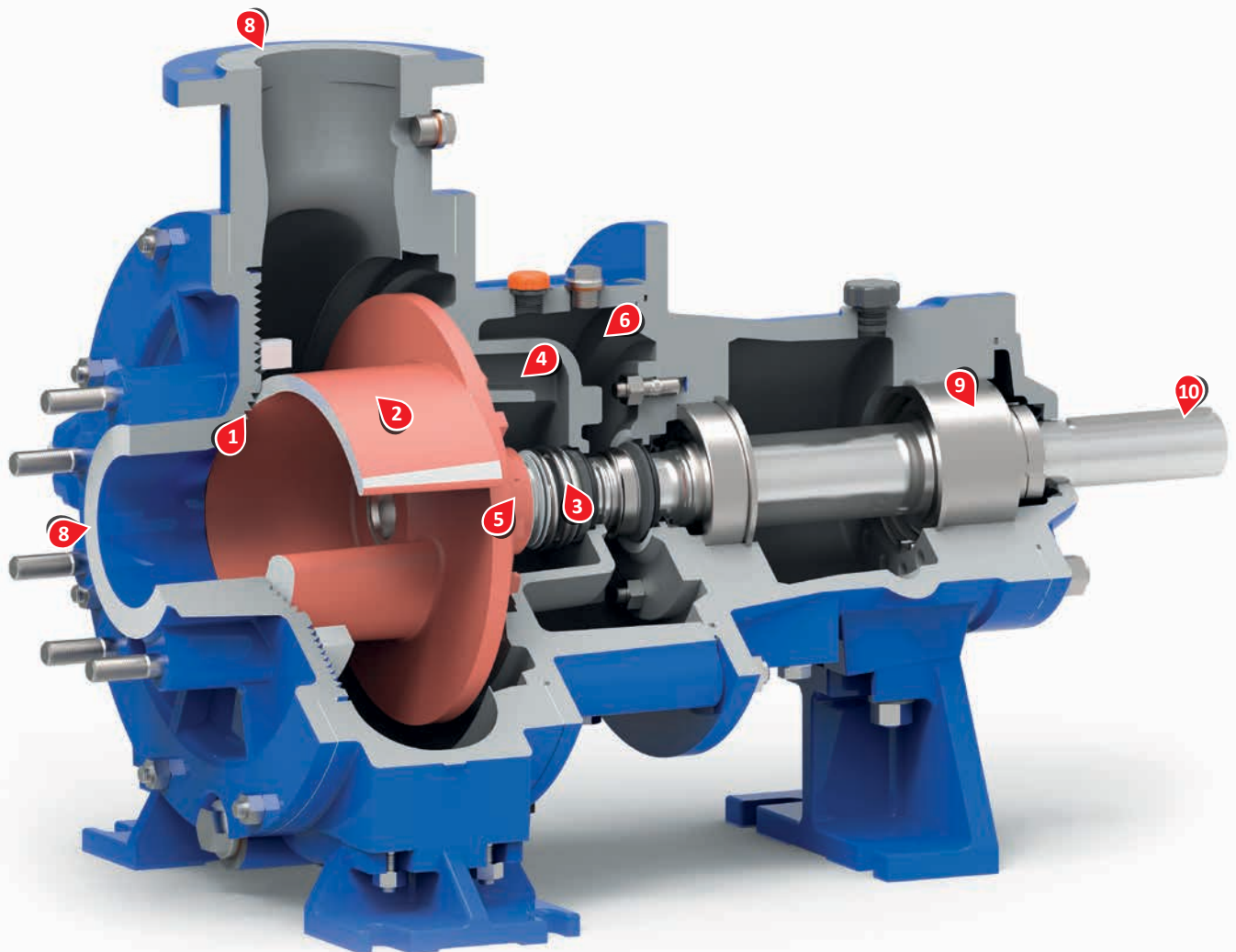
7 Vent plug

The pressure equalisation of the oil chamber is made possible by the vent plug.

8 Construction

Thanks to uniform dimensions across the entire **UNIVERS** construction series, different impeller versions can be used in changed working conditions. This means the operator can enjoy enormous flexibility.

The pump casings can optionally be fitted with cleaning openings.



9 Bearing

The high loads of the sewage pumps are taken up by generously dimensioned anti-friction bearings and shafts. The lifetime of the bearings of the bearing bracket is clearly increased due to the oil bath lubrication in comparison with greased bearings.

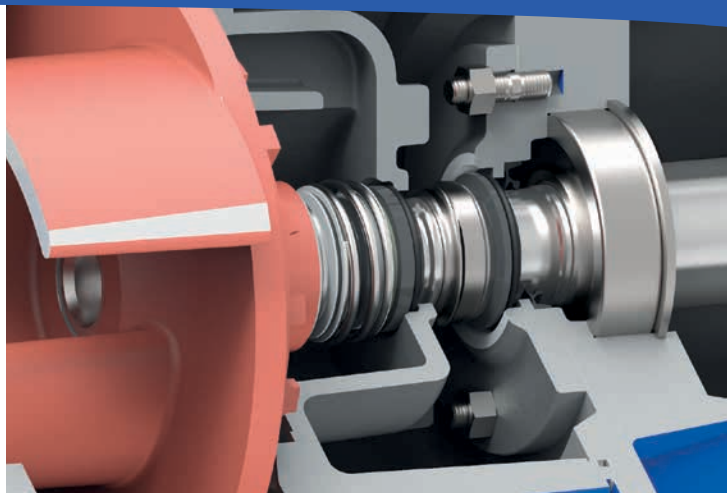
10 Installation

Thanks to different installation options, pumps from the **UNIVERS-P** construction series can be optimally adjusted to the installation situation.

UNIVERS-P

The process pump **UNIVERS-P** guarantees operational safety and productivity during continuous operation.

The single-stage centrifugal pumps of the **UNIVERS-P** construction series provide optimum adaptation to system conditions and spatial circumstances. This is made possible by the various combinations achievable due to the modular construction. The pump casing forms the basis. It accommodates the various impeller forms and drives. The drive unit is an integral part of the pump.



Motor

Premium efficiency class three-phase motor (IE3)

Design	IM B3
Motor connection	Standard
Protection type	IP 55
Speed	960 (1160) rpm 1450 (1750) rpm 2900 (3600) rpm
Frequency	50 (60) Hz
Connection ≤ 2.2 kW	230 Δ / 400 Δ (460 Δ) V
Connection ≥ 3.0 kW	400 Δ / 690 Δ (460 Δ) V

Frequency regulation of pumps is possible and depends upon the working conditions: from 30 to 50 Hz and from 30 to 60 Hz

Power reserve

Recommended power reserve of the drive motor

Pump power input	Power reserve
≤ 7.5 kW	~ 25 %
11 - 22 kW	~ 50 %
30 - 55 kW	~ 15 %
≥ 75 kW	~ 10 %

Shaft sealing

The shaft sealing on the pump side is effected in all models via a maintenance-free mechanical seal, which is independent of the direction of rotation and made from wear-resistant silicon carbide (SiC). Long-fibre materials are crushed by the rear cutting ring of the impeller beforehand.

A mechanical seal made of carbon/chromium molybdenum cast seals the drive side.

Noise

Noise emission is determined by complex influencing factors such as size, materials, operating and installation conditions. As early as the development stage, hydraulic measures and solid construction are used to reduce noise emission. The maximum sound pressure level is generally determined by air, magnetic and bearing noise from the drive motors. Noise levels are below the permissible limit curves specified for electrical motors as defined by DIN EN 60034-9. Lowest noise emission during operation close to Q optimal (greatest efficiency).

Installation

The pumps are to be used in various installations.

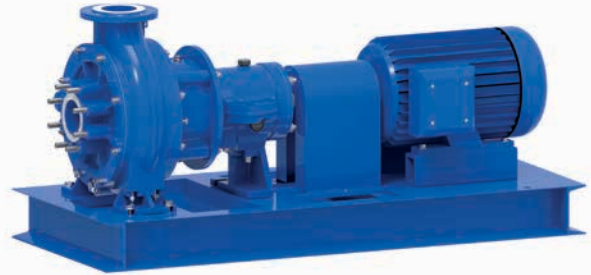
Installation O

Without drive and base plate



Installation D

Direct drive via coupling
with coupling guard



Installation K3

V-belt drive (rear motor)
with belt guard



Installation K1

V-belt drive (small motor size) with belt
guard

Installation K2

V-belt drive (large motor size) with belt
guard



Installation KV

V-belt drive (with auxiliary gearbox)
with belt guard



In addition to the process pump **UNIVERS-P**, we also offer pumps for specific use with difficult pumped media which are attuned to the desired requirements.

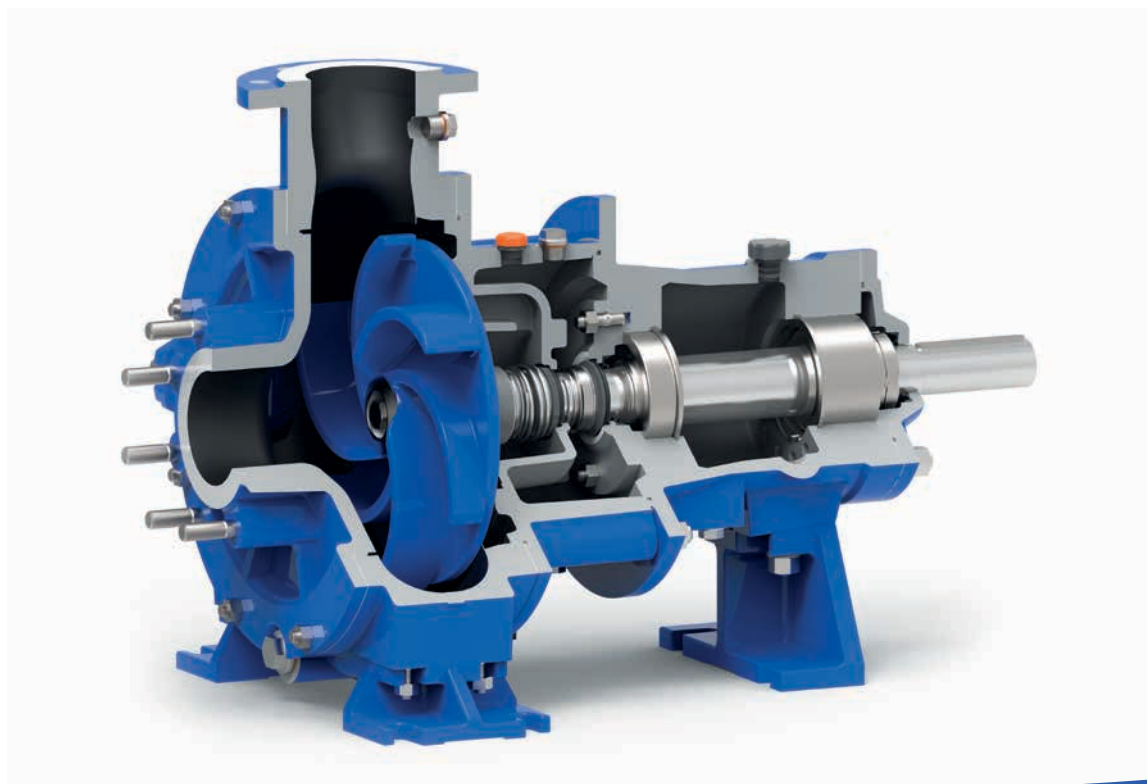
The pump sizes and pump properties as well as the special impellers guarantee smooth operation during daily use at full capacity.



UNIVERS-P-SG / UNIGUM

The “soft” pump for hard materials. Pumps of type **UNIVERS-P-SG** can easily deal with sand and many different abrasive materials in your pumped medium. The soft interior lining with a special rubber lining for the parts at risk of wear prevents abrasive wear and ensures a long lifetime. Here, the pump represents the ideal example for reducing the life-cycle costs (LCC) by means of intelligent pump selection.

Process pumps of the **UNIVERS-P-SG** construction series are particularly suited for the transport of pumped media with unpredictable and extreme contamination with abrasive materials. No other pump demonstrates our capacity for innovation quite like this one.

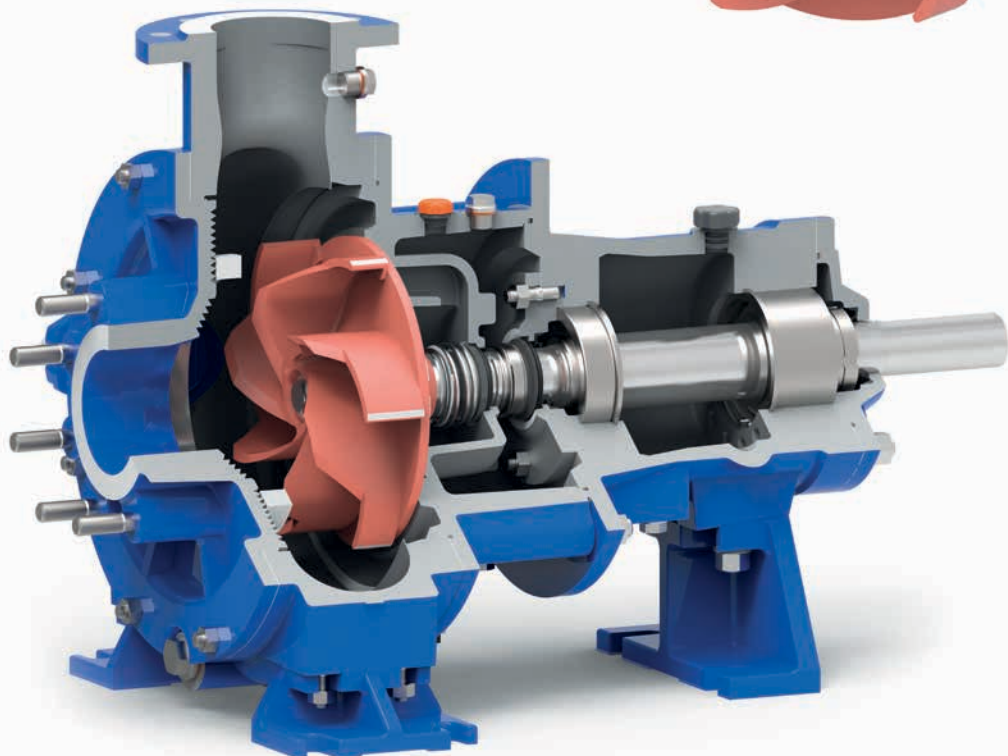
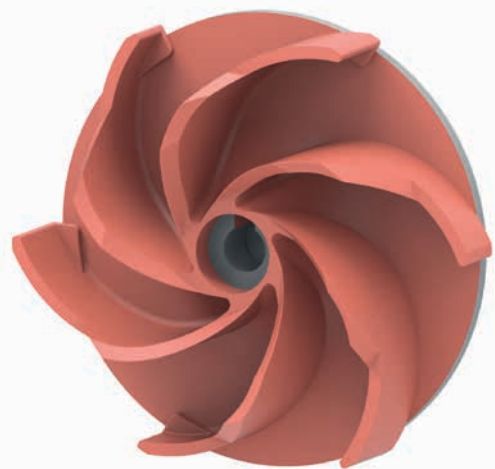


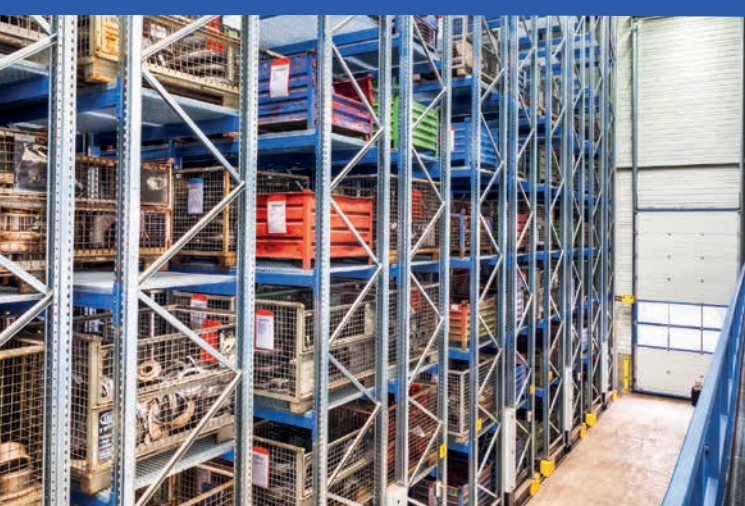


UNIVERS-P-PO

The **UNIVERS-P-PO** is another special-purpose solution from Herborner Pumpen. The specially designed impeller ensures the clog-free transport of fish waste, vegetables and similar constituents by reducing these to sizes which can be pumped.

Process pumps of the **UNIVERS-P-PO** construction series are particularly suited to the safe transport of liquids containing materials (fishing industry, vegetable production, etc.) and with the requirement to crush these materials. These pumps also contribute to uninterrupted operation with the highest possible degree of operational safety.





Original part accessories

Accessory parts for ideal use:



Suction-side adapter with cleaning opening in cylindrical or eccentric design (to prevent air pockets upstream of the pump):

DN 80/80

DN 100/(100/150/200)

DN 150/(150/200/250)

DN 200/(200/250/300)

DN 300/300

DN 350/350



Sealing electrode
(intermediate casing)

frequency converter

A diverse range of frequency converters is available to drive the **UNIVERS-P**.



Type PED

This powerful and robust frequency converter has optimum EMC properties with low leakage currents. It can be installed directly or wall mounted. The individual parameters are set directly at the device using the operating device or computer software.



Switching cabinet or wall-mounted converters

The frequency converter can be installed in control boxes as well as wall-mounted.



Life cycle costs

Calculation of costs over the course of service life.

In order to calculate the economic value of a product or of a system, an overall assessment must be made which includes all costs over the entire life cycle of the system. These are called the life-cycle costs (LCC). For pumps used in sewage plants in particular, it is important to perform an LCC calculation as the selection of the right pump is essential for the safe operation of the unit.

But looking at the acquisition costs alone would be to take too narrow a view, as would looking at the energy efficiency of the pump hydraulics alone.

$$LCC = C_{ic} + C_{in} + C_e + C_o + C_m + C_s + C_{env} + C_d$$

- C_{ic} Acquisition costs
- C_{in} Installation/commissioning costs
- C_e Energy costs
- C_o Operating costs
- C_m Servicing costs
- C_s Failure costs
- C_{env} Environmental protection costs
- C_d Shutdown and disposal costs

The LCC calculation is carried out using a simple formula.

Here you will find a computer program, available in German and English, for simple calculation of the LCC for your pumps:

Comparison of two pumps as an example:

Life-Cycle-Costs Calculator for Pumps

Life-Cycle-Costs (LCC) calculation for your pumpsystems

Summing-up	Pump A	Pump B
Acquisition costs (C_{ic})	2,500.00 €	3,000.00 €
Setup and commissioning costs (C_{in})	1,000.00 €	1,000.00 €
Sub-total of the initial non-recurring costs:	3,500.00 €	4,000.00 €
Energy costs (C_e)	1,500.00 €	800.00 €
Operating costs (C_o)	1,800.00 €	1,800.00 €
Servicing costs (C_m)	2,700.00 €	2,700.00 €
Failure costs (C_s)	2,300.00 €	2,300.00 €
Environm. protection costs (C_{env})	80.00 €	80.00 €
Sup-total of annual costs:	8,380.00 €	7,680.00 €
Costs accum. for 10 years:	74,881.74 €	68,626.70 €
Shutdown and disposal costs (C_d)	550.00 €	550.00 €
Required reserve for system shutdown:	446.79 €	446.79 €
LCC = Life-Cycle-Costs for 10 years operation:	78,828.53 €	73,073.49 €

I calculate with:

costs mechanic: 75€/h

costs operator: 30€/h

electric rate: 8Cent/kWh

10 years of operation

3.5% rate of interest

1.4% inflation

Savings pump B

5,755.04 €

compared to pump A

$$LCC = C_{ic} + C_{in} + C_e + C_o + C_m + C_s + C_{env} + C_d$$



German



English



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PUMPENTECHNIK**

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Special solutions

The customisation of special pumps is one of our performance features.

Our decades of experience in development and our on-site foundry form the basis of our ability to adapt to the requirements of individual projects. The technology needed for perpetual innovation provides our customers with the clear advantage of optimised solutions especially tailored to each unique project.

Special models

- Different voltages and/or frequencies
- Different insulation class
- Higher ambient temperature
- Higher protection type
- Enhanced tropical and moisture protection
- Special materials (high-alloyed cast steel, bronze) for parts in contact with the product
- Special paint finish
- Cleaning opening in the casing
- Version with permanent magnet motor (PM)
- Special mechanical seal on pump side
- Spacer coupling
- Connection elements in stainless steel
- Special oil filling
- Drive with flywheel mass increase
- Customer-specific solutions

Consultation and service

We are here for you - competent and personal.

The last decades have seen our company establish itself worldwide. The client base stretches across the entire globe. Your contact persons in our company are highly qualified employees who use their professional knowledge and technical skills to find tailor-made solutions for your requirements. We also have globally active sales and service teams.

Consultation and sales
sales@herborner-pumpen.de

Service and maintenance
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Further information on
the **UNIVERS-P** can be found at
www.herborner-pumpen.de



UNIVERS-P