

PUMPS AND FILTERS FOR YOUR SUCCESS

OR WHY OUR PUMPS ARE REAL WINNERS

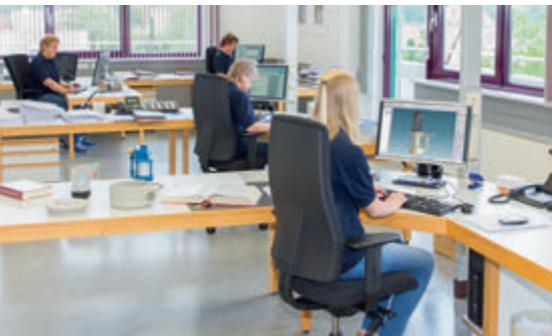


INNOVATIVE PUMP
AND FILTER TECHNOLOGY

OUR EXPERIENCE IS YOUR SUCCESS

For over 30 years, we have been in the business of helping make processes involving liquid media run reliably and efficiently.

It all began in the family garage. This is all Wolfgang Renner could afford when he laid the foundation for a company in 1981 which today is recognized as a worldwide leader in the field of magnetically coupled centrifugal pumps. Since then the company has experienced remarkable growth, while remaining steadfast to its mission of focusing on technical expertise a passionate emphasis on quality and early adoption of innovative technologies.



By employing the latest designing methods, even unusual ideas can be implemented quickly



We assure you an outstanding ratio of value to performance through rational series production of components.

We create originals

We consider your goals to be our goals. Taking your entire system into account, we engineer solutions that perfectly fit your requirements by employing a flexible and fully configurable component based program. If this does not allow us to exceed your expectations, our designers always enjoy the challenge of pursuing new avenues to get the job done. In any case, you can always rely on one thing: the unique quality you will get with an original from Renner.



High-tech production as the machinery constantly keeps pace with state-of-the-art technology.

Our vertical integration provides you and RENNER peace of mind.

Many of our competitors find outsourcing to be a good idea, we don't. Since our foundation our goal was to guarantee the desired quality anytime and anywhere. We believe that this can only be achieved if the production of all critical components remains in our own hands. Moreover, new ideas have evolved that have allowed RENNER to expand its technological advantage. And last but not least, our clients benefit from our unique maintenance and customer service capabilities, something which is only possible if a manufacturer has a detailed command of every aspect of the product.



Sophisticated manufacturing infrastructure for efficient tool management.



In the company's own technical center continual efforts are made to find better solutions.

Research as an investment for the future

We never stop striving to improve our products - in collaboration with our customers, with universities and the engineers in our pilot plant. In this process, the practical benefit for our customers remains our singular focus.

Our products are of unsurpassed quality.

Our products are of superb unsurpassed quality. complete manufacturing processes certified. Driven by our own high expectations we surpassed these stringent requirements in many areas, not to mention the 100% quality controls our products are subjected to before they leave the factory.

Renner: A real winner

We will give you our word on the quality of our products. Wherever you see our quality logo, you can be sure of two things: first, the certainty of having a genuine Renner product, and secondly, the confidence that you will be able to optimally support and protect your processes with our product.



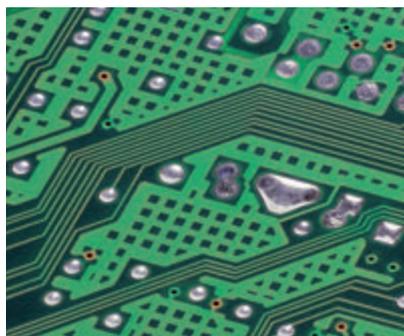
Latest plastics processing on computer-controlled machining centers.

WE KNOW YOUR INDUSTRY SECTOR AND UNDERSTAND YOUR PROCESSES

For wet processes, pumps play a crucial role in any system. The entire process either stands or falls with their functionality and reliability. No one knows that better than we do, because this is our domain.

Pumps and filters from Renner are a reliable partner when it comes to finding solutions for an optimized method of conveying liquids in the name category of "A", like alkalis, to "Z", like zinc sulphate. We support almost all processes in which liquids up to a viscosity of 160 mPas and a density up to 2.0 kg/dm³³ need to be transferred, sprayed or circulated.

As a professional in the technology of pumps and filters in chemical process engineering, we are a **flexible partner for plant construction**. In addition to rapid production of tailor-made solutions, we offer a broad portfolio of standard products from stock.



For the tiniest structures, wet processes must be controlled in a reliable way.

PCB industry

Our corrosion-resistant pumps and filters have a proven record of delivering and discharging solutions for numerous companies around the globe.

Regardless of whether developing, etching, stripping or purging - Renner pumps always ensure the necessary pressure in spray processes and sufficient volume of flow during flooding or circulating processes. Undesirable dirt particles are captured by Renner filters to protect the PCB. For filter replacement without extended interruption in production, we have developed special locking mechanisms to help significantly increase your plant's productivity.

Semi-conductor industry

In clean-room environments, high demands are placed on pumping systems. Hermetically sealed pumps from Renner provide the best conditions for these applications; for example, wafer manufacturing or in the treatment of silicon by means of spraying or dip etching.



Wafer production in a clean-room environment.

Electro-plating and surface finishing

Our pumps and filters enable processes for surface finishing. They are used in rack as well as in drum processing. Depending on purpose, they are manufactured in a variety of materials. Transfer of aggressive or toxic liquids is never a problem.



Surface finishing and corrosion and wear protection by coating with chromium, gold, silver, platinum or rhodium.

Renewable energies, solar cell production and energy storage systems

Energy storage systems are an important element in the transition to power supply of renewable energy. Our pumps play a valuable role in the production of solar cells in wet processes as well as in the circulation of electrolytes in energy storage systems.



Water treatment and environmental engineering

A wide range of different filtering techniques enable the transfer of highly contaminated water polluted with suspended solids. Examples include specially designed pumps for gas and exhaust air scrubbers. Our products and solutions are used worldwide in wastewater treatment, landfill drainage, water supply and in distance heating.

Chemical industry and lab technology

Many processes require reliable transfer of aggressive media (acids, bases, solvents). Our pumps are corrosion resistant and chemical-resistant due to the use of different materials. They are therefore suitable for tanker flushes as well as for filling and supplying of chemicals from storage tanks.



Safe handling of chemicals is essential for large-scale processes in the chemical industry.



Less use of pesticides through controlled application.

Agriculture

Reliable pump performance under severe operating conditions – this is what Renner pumps are for. Our maintenance free pumps ensure a smooth transfer of pesticides and fertilizers as well as for livestock irrigation systems.

Food processing industry

Breweries and dairies rely on Renner solutions for cleaning their extensive piping systems. Our pumps are serving in a host of other process applications such as in large bakeries for applying lye to pretzels.

Pharmaceutical industry

In the strictly controlled pharmaceutical industry, purity of all products must be guaranteed. Our hermetically sealed pumps do their part to ensure that there is no entry of air during transfer.

Refrigeration, heat exchangers, thermal power stations

Whether coolants or water with additives – our pumps are well suited for all requirements in cold and heat applications.

Nuclear technology

Nuclear technical processes depend on 100% safe cooling circuits. Our maintenance free pumps guarantee the required reliability in this critical area.



Reactor safety depends decisively on the cooling process.

Mobile applications

Renner solutions for mobile applications are tried and tested every day, for example, on ships for waste water treatment or in cooling systems. In the aerospace industry we supply, among other things, accessories for engine cleaning systems.

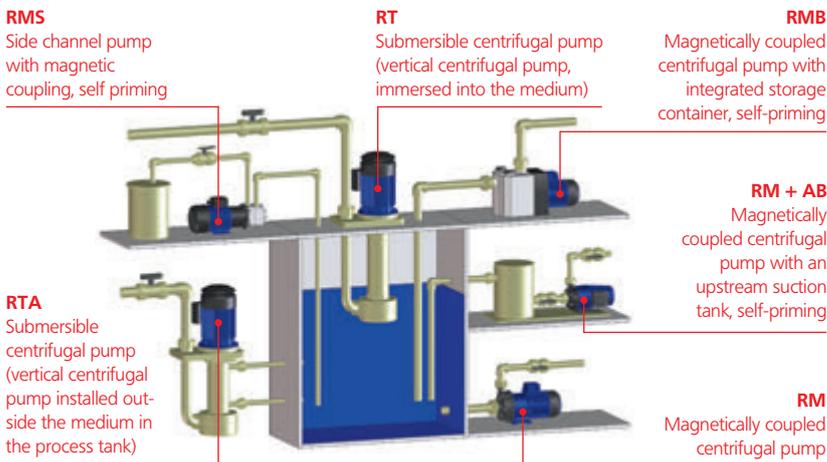
OUR PRODUCT RANGE AT A GLANCE

We develop and manufacture pumps, filters and electronic systems for maximum efficiency in liquid processes. Regardless of whether high-purity water, organic acids or water with additives - anywhere where a variety of chemicals need to be moved, sprayed or circulated, we support our customers with our wide range of experience. In short, we make liquid processes safer and more efficient - in every industry and in every application.

Our pumps offer a large power range from 60 W to 22 kW and beyond. For us, even more important than mere power is the efficient use of energy. We don't only consider drive technology with its required degrees of efficacy (IE2 and IE3), but the pump as a complete system.



THE RIGHT PUMP FOR YOUR APPLICATION



MAGNETIC CENTRIFUGAL PUMPS

Our magnetically coupled centrifugal pumps are hermetically sealed and absolutely leak-free due to their non-contact torque transmission. Pumps made of plastic or stainless steel are placed outside of the medium or container and integrated into the Plant's piping system.

For higher pressures in a metal-free environment, we offer one-to three-stage magnetic drive centrifugal pumps.

NEW: Our fully submersible pump can be installed in the media, thanks to our motor and pump housing which is completely encased in plastic.





**SUBMERSIBLE
 CENTRIFUGAL
 PUMPS**

RENNER submersible centrifugal pumps are designed for vertical deployment in non-pressurized tanks, open basins or pits. They offer the same range of services as magnetic drive centrifugal pumps, and enable additional possibilities due to the vertically submerged installation in the container or tank. These pumps are mainly used in the wet process technology in industrial applications. Customer-specific adjustments are possible with little to no effort thanks to our modular system. For critical applications, we offer a wide variety of patented waterproofing systems.



**FILTER UNITS
 AND
 EQUIPMENT**

RENNER filter units are designed and constructed for deployment in chemical baths and processes. They have proven to be ideal in the circulation and cleansing of clean, slightly dirty or abrasive media, aqueous solutions, suspensions or liquid mixtures. Our range of modular filters offers a wide choice of fully combinable filter units and complete filter systems for the removal of impurities through deep and surface filtration.

The RENNER universal filter housings are engineered to also accommodate:

- Wound cartridges
- Activated carbon
- Filter bags
- Filter plates



**ELECTRONIC
 PROCESS
 PROTECTION**

The most frequent cause of pump failure is frequently not due to technical defects, but critical operating conditions such as running dry, overheating or cavitation. Unfortunately, in many applications this simply can't be avoided. In these cases a reliable, automated monitoring of the process is key.

The electronic process protection system safeguards pumps and equipment against overload, clogged filters, dry run and dead head conditions. In critical situations, it switches the pump off prior to damage occurring at the same time, the system verifies the target flow rate preventing lengthy and costly failures.

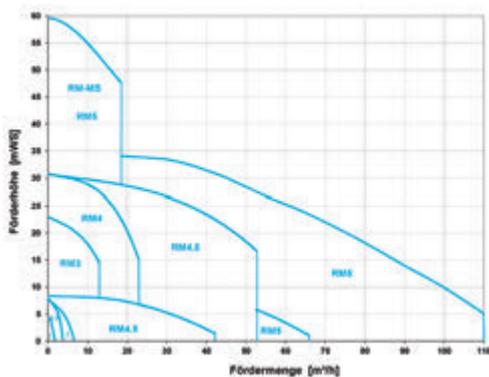


MAGNETICALLY COUPLED CENTRIFUGAL PUMPS RM

OPERATION

In sealless, magnetically coupled centrifugal pumps, the pump drive torque is transmitted without contact by means of a permanent magnetic coupling to the pump impeller. The motor and the pump are hermetically separated by a rear casing. Sealing a continuous rotating shaft is therefore unnecessary. The risk of fluid leakage and air entry into the pumping medium is eliminated.

For leak free and air tight pumping of hazardous or pure liquids, these pumps are the right choice.



Performance range RM



OUR PRODUCTS

RM



- Extremely compact design at high efficacy, resulting in a significant reduction of space required in the plant
- Fan covers and terminal box are made of plastic (up to 2.2 kW)
- **NEW:** Motors also available in completely plastic encased designs
- Acid-resistant 2-component paint standard
- All RAL color shades available
- **Run-dry safe version RM-TS**, from 125 W to 4.0 kW (Patent Pending)

RM-MF



- **Optional Variable Frequency Drive** mounted on motor available for all sizes up to 12.5 kW

RM-MS



- **Multi-level design Metal-free** – unique in the market!

100% RUN DRY SAFE!

The storage system specially developed by Renner (patent pending) guarantees unlimited run dry capability. These pumps are the ideal solution for applications with unavoidable emptying runs of processing tanks, such as tank truck movements.

Almost all RM types of pumps in the performance range of 125 W to 4 kW are also available in run dry safe „TS“ versions. Alternatively, they can be converted by exchanging the impeller-magnet unit at any time.

WORLDWIDE UNPARALLELED!

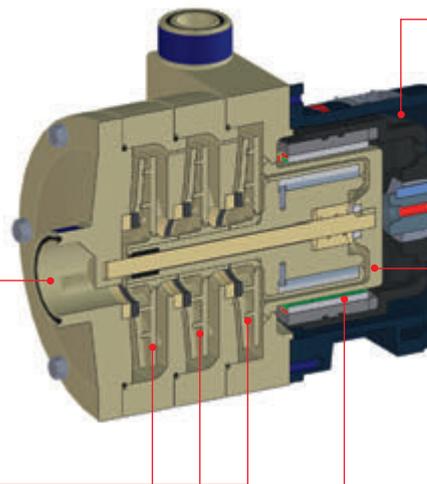
The RM-MS multi-level pump in full plastic design!

COMPELLING PRODUCT BENEFITS OUR IDEAS, YOUR BENEFIT

Well-thought-out and comprehensive modular system for high product availability

Extremely high degrees of efficacy
due to flow-optimized pump housing/impeller geometries help our customers save energy and cost

Horizontal block design
1-stage, 2-stage or 3-stage in a fully plastic design



Energy-efficient, compact design
due to optimally tuned „pump – drive motor – magnetic coupling“

Hermetically sealed hydraulics
that run extremely smooth

Powerful magnetic coupling
suitable for use in high-density applications



Materials

- PP gray, black or natural (available with or without fiber glass)
- PVDF black and natural (no fiber glass)
- ECTFE natural
- PPS (Ryton®)
- Stainless steel
- Ceramics (SiC or Al₂O₃ [high purity 99.7%])



Seals

- EPDM
- FKM
- FFKM
- Kalrez
- FEP-encased



Hydraulic efficiency

- Q_{max} = up to 150 m³/h (2500 l/min.)
- H_{max} = up to 70 mWS



Drives

- 5 W to 22 kW
- All voltages / frequencies
- Asynchronous single or three phase
- Synchronous PM
- DC motors 12V – 48V
- Protection classes: IP55, IP56, IP66, IP67, IP68
- Tropical insulation
- Anti-condensation heater
- VIK version
- UL, CSA-c/US version
- Motor cooling IC 411 (integrated fan), IC 410 (surface cooling)



Connectors

- Witworth pipe thread (sealing surface with O ring groove or for gasket)
- Flange DIN2501, ANSI-Class 150
- NPT adapter



Temperature Limits

- PP 0 to +80 °C
- PVDF -20 to +100 °C
- ECTFE -20 to +100 °C
- PPS (Ryton®) -20 to +100 °C
- Stainless steel -20 to +100 °C
- Ceramics -20 to +100 °C
- PTFE Graphite -20 to +100 °C



Media

- Acids, alkalis and mixtures
- Density up to max. 2.0 kg/dm³
- Viscosity up to max. approx. 160 mPas (cP)



Other features

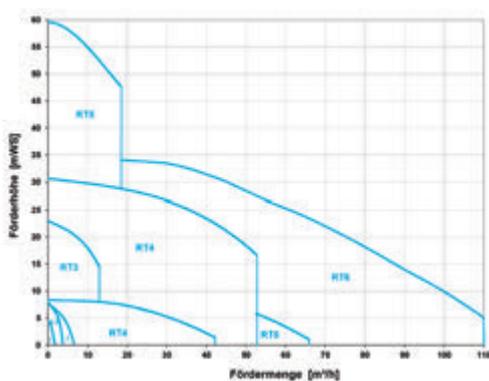
- Corrosion-free plastic pumps
- Energy efficient thanks to high overall efficacy of the system (pump / motor)
- Reliable power transmission due to powerful magnetic couplings

VERTICAL SUBMERSIBLE CENTRIFUGAL PUMPS RT

OPERATION

For submersible centrifugal pumps, the pump drive torque for an extended motor shaft is transmitted directly to the pump impeller. Motor and pump form a compact unit in which the pump tube is completely immersed in the medium. The complete pump is attached to the tank lid by means of an integrated mounting flange. This space-saving direct mounting method eliminates lateral drilling for a container wall and entirely rules out leakage. The entire suction piping is no longer required.

We manufacture immersion depths of 200 mm to 500 mm standard with free-floating motor shaft and without intermediate bearings. Immersion depths of up to 2,500 mm can be achieved with medium-lubricated intermediate bearings.



Efficiency range RT



OUR PRODUCTS

RT



- robust construction
- run-dry safe
- corrosion-free
- customized installation flange dimensions
- variable pressure connection ports
- the right immersion length for every application
- extremely compact design with high efficiency
- fan covers and terminal box constructed of plastic
- acid-resistant 2-component paint
- All RAL color shades available

RT MIT FU



- **integrated variable speed drive** for optimal fluid control at the desired operating point

RT-A



- vertical submersible centrifugal pump for dry installation outside the container
- connection and piping achieved through the deployed container wall
- for example, space constraints in the container

RT-M



- vertical submersible centrifugal pump with magnetic coupling
- transfer of gassing out, or heavily crystallizing media on contact with air
- for oxygen incompatible processes

RT-Z



- vertical submersible centrifugal pump with intermediate bearing for immersion depth up to 2500 mm
- for very deep container or for highly fluctuating liquid level

RT-MS



- **multi-stage** submersible centrifugal pump
- processes with high pressures at low flow rates
- for containers lacking space

ALL CUSTOM-MADE

Our product range offers the right pump for every medium, container depth and customer-specific system-design. If you need individual solutions, we welcome the opportunity to assist you. We customize the dimensions of the mounting flange, as well as to the connection of the pressure port or the depth of immersion.

All Renner submersible centrifugal pumps were optimized for maximum energy efficiency. Variable speed drives offer an additional savings potential.

NEW: Motors with plastic encasement

On request, the motors can be completely encased in plastic. Without exposed metal, these pumps are capable of surviving extremely aggressive environments.

COMPELLING PRODUCT BENEFITS OUR IDEAS, YOUR BENEFIT

Well thought-out and comprehensive modular system for high product availability

Sound pressure level
Low operating vibration
Sound pressure level <70 dB (A) according to DIN EN 12639 (noise measurement of liquid pumps)

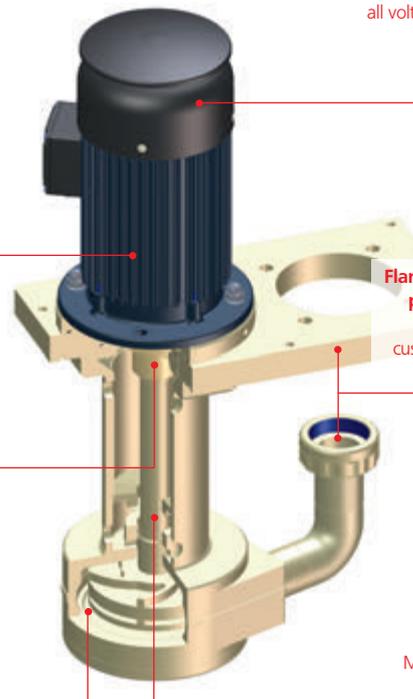
Sealing
Use of different seals depending on the application, patented RENNER sealing system, especially for heavily crystallizing media

Extremely high efficacy levels
levels due to flow-optimized geometries of pump housing / impeller help our customers save energy and cost

Electric drive
IE2, IE3 or IE4, available in all voltages and frequencies, versions with built-in frequency converter standard

Flange dimensions and pressure connection
Design according to customer specification at no extra cost

Corrosion-free
Plastic pump with no metal parts in contact with the medium; Motor shaft completely encased in plastic



Materials

- PP gray, PP natural (available with or without fiber glass)
- PVDF natural (without fiber glass)
- PPS (Ryton®)
- PFA, ECTFE
- PVC, CPVC
- Stainless steel (1.4305; 1.4571)
- Titanium

Seals

- EPDM
- Kalrez
- FKM
- FEP-encased
- FFKM

Hydraulic power

- Q_{max} = up to 150 m³/h (2500 l/min.)
- H_{max} = up to 70 mWS

Drives

- 60 W to 22.0 kW
- All voltages / frequencies
- Asynchronous single or three phase
- Synchronous PM
- DC motors 12 V to 48 V
- Protection classes: IP55, IP56, IP66, IP67, IP68
- All motors from 0.37 kW with additional phase insulation suitable for frequency converter operation (for 60 W to 250 W available on request)
- Tropical insulation
- Anti-condensation heater
- VIK version
- UL, CSA-c/US version
- Motor cooling IC 411 (integrated fan),
- IC 410 (surface cooling)

Connectors

- Witworth pipe thread (sealing surface with O ring groove or for gasket)
- Flange DIN2501, ANSI-Class 150
- NPT adapter

Temperature Limits

- PP 0 to +80 °C
- PVDF -20 to +100 °C
- PFA/ECTFE -20 to +100 °C
- PPS (Ryton®) -20 to +100 °C
- Stainless steel -20 to +100 °C
- Titanium -20 to +100 °C

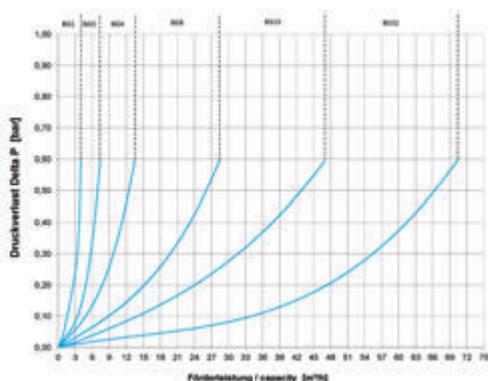
Media

- Acids, alkalis and mixtures
- Density up to max. 2.0 kg/dm³
- Viscosity up to max. approx. 160 mPas (cP)

FILTER UNITS AND FILTER SYSTEMS

OPERATION

The Renner Universal filter housings are used to remove organic and inorganic impurities through deep and surface filtration of aggressive and neutral liquids and gases. All housings are integrated into the Renner modular system and can be combined with the complete range of pumps to individualize filter devices or complex systems to customer specifications. Thanks to our efficient organizational structure, we can develop and manufacture the relevant solutions very quickly. A high priority always goes to the cost-effectiveness of our processes.



Pressure loss diagram for determining the appropriate filter chamber



OUR PRODUCTS

FI



UNIVERSAL FILTER HOUSING

- Safe removal of impurities through **deep and surface filtration**
- Robust construction
- Corrosion-free
- Large variety
- Can be combined with the entire range of pumps
- Different filter element options
- Extensive range of services
- Low pressure drop

SF



QUICK CHANGE FILTER HOUSING

- Quick and easy handling due to compact design
- Simple operation with hand lever quick release
- Extremely short downtime for filter change
- Fitted with two cover monitoring switches
- Direct mounting on mounting flange of the submersible centrifugal pump RT possible



FILTER UNITS

- Combination of RM and RT pumps including filter housing
- Customized and complete solutions
- Compact, ready-assembled units
- Can be combined with the entire range of pumps

FILTER SYSTEMS

- Activated carbon treatment
- Pre-coated filtration
- Total solution customized and ready to install



BAND FILTERS

- for aggressive media and with a large proportion of dirt
- corrosion-free
- compact, portable device
- Variable speed drive for regulating belt speed

LOW PRESSURE DROP

The fluid mechanics of all Renner filter devices is optimized for the highest possible energy efficacy. The pressure loss of the filter housing is minimized while maximizing pump and motor efficacy.

MAXIMUM FLEXIBILITY

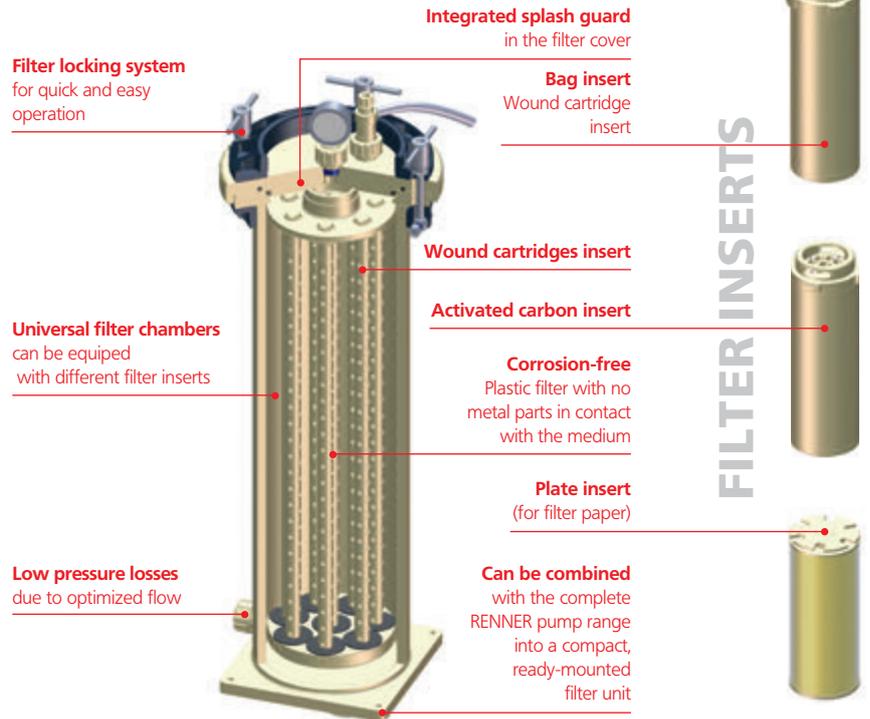
All universal filter housings can accommodate either candles, plates, bags or activated carbon inserts.

BROAD RANGE OF SERVICES

The universal filter housing covers a wide power range 1000 to 70000 l/h for the filtration of all electroplating electrolytes, including nickel, zinc, electroless nickel and electroless copper. For applications where safety devices have previously been installed on the system, all filter housings are equipped with lid switch monitoring.

COMPELLING PRODUCT BENEFIT OUR IDEAS, YOUR BENEFIT

Well-thought-out and comprehensive modular system for high product availability



Materials

- PP gray or natural (available with or without fiber glass)
- PVDF natural (without fiber glass)
- ECTFE
- Plexiglas
- Jena-Glas®
- Stainless steel (1.4305, 1.4571)
- Titanium

Seals

- EPDM
- Kalrez
- FKM
- FEP-encased
- FFKM

Filter efficiency

- Q_{max} = up to 70.000 l/h

Filter surfaces

- 0,02 m² to 5,0 m²

Volume

- 1 dm³ to 185 dm³

Length

- 4 " • 10 " • 20 "
- 30 " • 40 "

Filter elements

- Wound cartridges
- Cloth cartridges
- Membrane cartridges
- Paper discs
- Filter bag
- Filter sieve
- Activated carbon (granular)
- Activated carbon (filter cartridge)

Connectors

- Witworth pipe thread (sealing surface with O ring groove or for gasket)
- Flange DIN2501, ANSI-Class 150
- NPT adapter

Temperature Limits

- PP 0 to +80 °C
- PVDF -20 to +100 °C
- ECTFE -20 to +100 °C
- Stainless steel -20 to +100 °C
- Titanium -20 to +100 °C

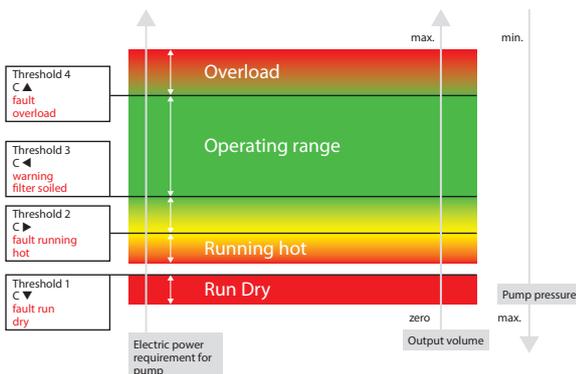
Media

- Acids, alkalis and mixtures
- Density up to max. 2.0 kg/dm³
- Viscosity up to max. approx. 160 mPas (cP)

ELECTRONIC PROCESS PROTECTION

OPERATION

The Process Protection RPR Control 100 monitors the operational state of centrifugal pumps by constant, rapid and successive measurements. Adverse operating conditions such as running dry, overheating, overloading can be reliably detected triggering pump shut down to avoid any damage. In case of filter clogging, a warning is issued. At the same time adherence to the desired flow rate is monitored. Your system is ready for use again immediately after the root cause has been eliminated. A timing meter together with other inputs for a PTC thermistor and other sensors refine the monitoring process even further. In a similar design, faults and warnings can also be visualized so as to alert maintenance personnel.



4 freely programmable switching thresholds



OUR PRODUCTS

100-1



RPR-CONTROL 100-1

- for switching cabinet installation (DIN rail mounting)
- without programming unit

100-2



RPR-CONTROL 100-2

- for switching cabinet installation (DIN rail mounting)
- with integrated programming unit

100-3



RPR-CONTROL 100-3

- Field Unit with power unit up to 4.0 kW (7.5 kW optional)
- Installation in IP 65 housing directly in the system (e.g. the filter unit)
- complete with pilot lights and pushbuttons
- without programming unit



SEPARATE PROGRAMMING UNIT

- as a handheld device with cable and plug
- for programming the switching values
- for RPR-Control 100-1 and 100-3

INSTALLATION

The RPR-Control 100 is easily integrated for installation with the pump's power supply. Since no intervention is necessary in the pipes, retrofitting existing plants is not a problem.

The RPR control 100 is intended for the monitoring of centrifugal pumps with drive power from 0.75 to 20 kW.

For other pump types or with different drive capacities, we welcome the opportunity to make further recommendations.



Installation example:
RPR-Control to monitor the filter condition inside a filter unit

COMPELLING PRODUCT BENEFIT OUR IDEAS, YOUR BENEFIT

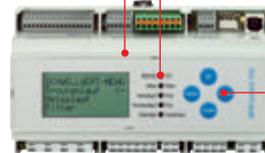
RPR-Control 100-1
DIN rail housing
without LCD



Programming unit (handheld device)
incl. LCD, LED display and
pushbuttons



RPR-Control 100-2
DIN rail housing incl. LCD, for
switching cabinet installation



LEDs
for displaying the
operating condition

Pushbutton
for operating
the controls

RPR-Control 100-3
Switch box with display
board incl. LED, design
for field assembly



Filter soiling
display
of switching
threshold

Overload
Display
of switching
threshold

Run Dry
Display of switch-
ing threshold

Running Hot
Display of switching
threshold

Connector
for programming unit
(handheld unit)



Drive efficiency

- 750 W to 20 kW



Mains voltage

- 100 to 250 VAC
- +5 % /-10 %



Network type

- 1-ph. or 3-ph.



Frequency

- 47 to 63 Hz



Power consumption

- 12 W to max. 15 W



Operating temperature

- 0 to 60 °C



Storage temperature

- -10 to +70 °C



Protection class

- IP20 (RPR-Control 100-1 and -2)
- IP55 (RPR-Control 100-3)



Assembly

- On 35 mm DIN rail 46277 (RPR-Control 100-1 and -2)
- On-site in the system, e.g. filter unit (RPR-Control 100-3)



Other features

- Safe and effective monitoring of pumps up to 20 kW
- Cost-savings by avoiding expensive pump repairs
- Increases the up-time of your installations
- Easy to retrofit to existing installations
- No installations required in pipelines
- Visual presentation of critical operating conditions
- Integrated operating hour meter to display maintenance requirement when due

PRODUCT RANGE

RENNER is the competent partner when it comes to making industrial processes with liquid media more reliable and cost-effective.

- **MAGNETICALLY COUPLED CENTRIFUGAL PUMPS**
- **SUBMERSIBLE CENTRIFUGAL PUMPS**
- **UNIVERSAL FILTERS**
- **QUICK CHANGE FILTERS**
- **FILTER UNITS**
- **FILTER SYSTEMS**
- **ELECTRONIC PROCESS PROTECTION**
- **ACCESSORIES**



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