

excellence for mobility



Nidec
NIDEC GPM Group



We bring the best pump solution with innovative thermal management on the market.

NIDEC GPM was founded in 1939 and started manufacturing pumps in 1949. For over 80 years we have been working on advanced pump technologies and continue to develop these incessantly. Thanks to the innovative results, our products are a valuable contribution to reducing CO₂ and saving fuel – always with incomparably high reliability.

The merger with the NIDEC Group in 2015 has made it possible for us to combine our outstanding know-how in the field of pumps with excellent NIDEC capabilities in the field of electric motors. This opens up new perspectives as we are already leading the way in the market for mechanical, switchable and controllable pump systems. As part of the NIDEC Automotive Motor & Electronic Control Business Unit, we have taken a further step forward and can offer thermal management solutions for all types of drive systems – regardless of the renewable source.

Another area that we would like to highlight concerns our solutions for the future of mobility: based on our competence in engine cooling and lubrication, we are now focussing on the next targets to make NIDEC the largest supplier of high quality components for e-mobility in the world.

To underline the ambition we have set ourselves, we have developed a new slogan: „excellence for mobility“ – and through the consistent use of the most modern techniques for saving fuel and CO₂ we emphasise our untiring ambition. We show like no other: NGPM generates the greatest possible advantage through development. We want to prove this in the future as well.

Mobilise innovation. That is our tradition. For over 80 years!



NGPM stands for more than 80 years of experience in the automotive supplier industry. Since the company was founded in 1939, innovative pump concepts characterise our core competence. Always again the former family business inspires with future-oriented systems for engine cooling and lubrication and, in 2015, having three foreign locations it became part of the Japanese NIDEC Group Corporation.

Today, fuel-saving systems for the engine cooling and lubrication in passenger cars, trucks and large diesel engines stand in our focus stronger than ever. The goal: continuous efficiency

improvement. So, with our proven switchable and controllable pumps, we could already start an important contribution to the reduction of CO₂ emissions. Currently, every tenth employee at NGPM is involved in the field of research and development having unique expertise to set standards in the future as well – especially in the field of electric mobility. The characteristic mixture of well-founded wealth of experience and a clear view for the new has been securing NGPM a new place as an A-supplier in the global automotive industry for many years.

- 
- 1939** Foundation of the company „Karl Schmidt Präzisions-Flugteile“.
- 1949** Start of the production of water pumps and the repair of old water pumps for vehicles.
- 1958** Series supplier of coolant pumps for Horch, Sachsenring Zwickau and Automobilwerk Eisenach.
- 1967** First gold medal at the Leipzig Fair for water pumps for truck diesel engines.
- 1972** Nationalisation of the company and foundation of VEB GPM.
- 1990** Reprivatisation under the managing director Partner Dr. Eugen Schmidt to „Geräte und Pumpenbau GmbH Dr. Eugen Schmidt“.
- 2001** Development of the foreign location in Brazil and expansion of the Merbelsrod site.
- 2008** Opening of our subsidiary GPM Automotive Pumps Suzhou, China, and GPM North America Corporation (Office) in Troy, USA.
- 2013** Winner of the Automotive News PACE Award for the adjustable ECF coolant pump in Detroit
- 2015** GPM becomes part of the NIDEC Group.
- 2015** Start of the development of electrical oil and water pumps.
- 2016** First nomination for series production of electric water pumps by large German OEM.
- 2017** Development of a site in Hungary.
- 2020** Commissioning of 2 new plants in China.



Setting standards with NIDEC and a worldwide competence network.

Since 2015 NGPM has been operating under the umbrella of the NIDEC Corporation. Having 339 subsidiaries in over 43 countries worldwide, the group is considered the largest manufacturer of electric motors in the world.

As the global leading engine manufacturer, the NIDEC Group takes care of everything „what turns and moves“ – from miniature to giant. What makes the group different is that every single company is striving for even higher growth and improves its technical capabilities as well as its competitive advantage. Three decisive value principles have significantly stood for identity and strength of the NIDEC Group for around 50 years:

1. Passion, enthusiasm and persistence.
2. Work hard and smart.
3. Do it now; do it without hesitation; do it until it is ready.

All subsidiaries follow these principles and thus realise the leading slogan „all for dreams“.

We are proud to be part of the group. These ideal conditions within this outstanding competence network make it possible to systematically extend development competence and competitiveness in the electrification sector as well.





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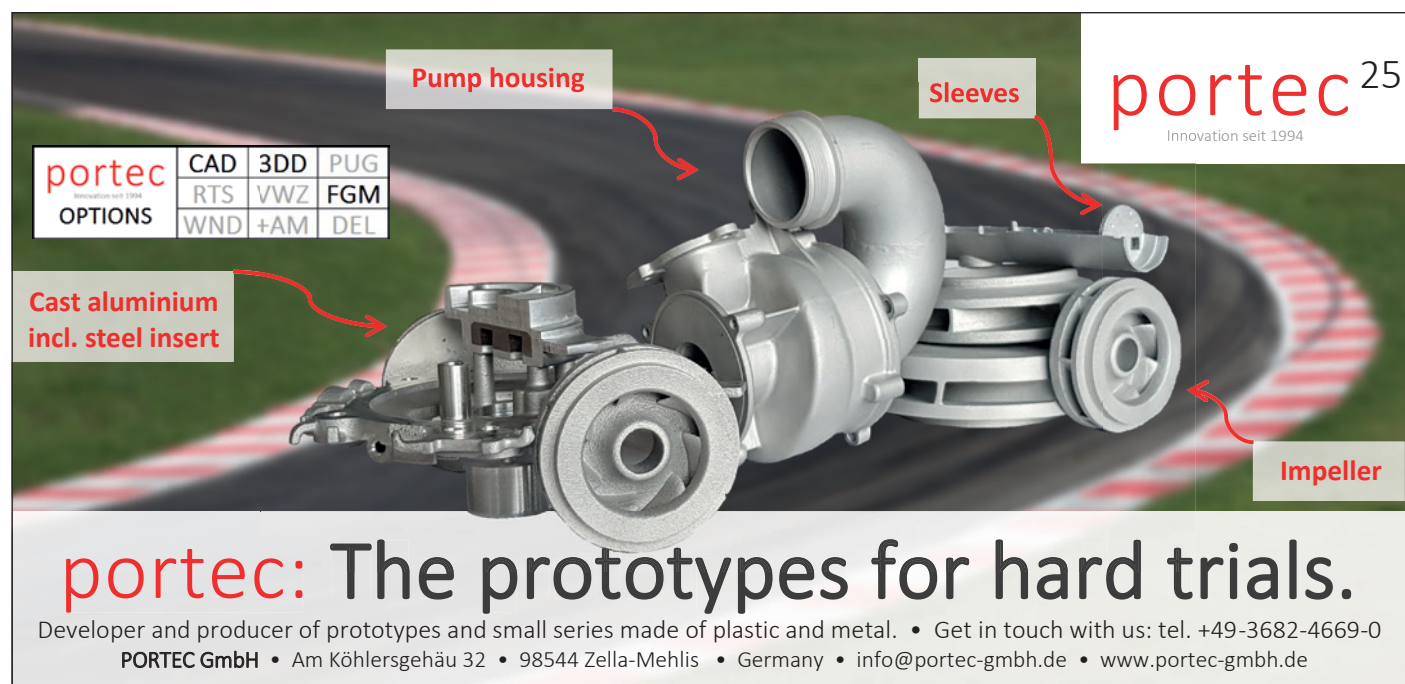
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CAQ mit System

Thinking globally. Acting locally: Business Unit AMEC.

As an expert in the field of engine cooling and lubrication, NGPM is part of the NIDEC Business Unit „Automotive Motor & Electronic Control“ (AMEC).

AMEC's main products include electric motors, control units and pumps, radar units and sensors. They all contribute to the improvement of the three basic performance features for cars: "safety", "environmental protection" and "comfort".

Innovative product development also takes place in the area of „Green Technology“ in order to further reduce energy consumption and increase the added value. In addition to the product range, AMEC develops traction motors for hybrid and electric vehicles. The latest developments also include electric oil and water pumps that make a demonstrable contribution to CO₂ savings.



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We make research and development the foundation for sustainably strong results.

For over 80 years we have proved enthusiasm for new developments again and again.

Pioneering milestones in the field of engine cooling and lubrication prove our technological leadership. An important milestone on this path is the ECF pump, for which a patent application was filed for the first time in 2009, and the development of electric oil and water pumps.

Just how crucial continuous innovation is for us is also shown by the fact that every tenth employee at NGPM is involved in research and development. Excellent progress is being made by placing particular emphasis on high quality trained know-how with a classical background in mechanical engineering. Increasingly, we also include the disciplines of electrics, electronics and software. Continuous further training in all areas of the company guarantees a continuously high professional level.

With this commitment we want to strengthen our core competence especially in the field of automotive electrification. The set goal: not only to make a contribution to mechatronics products of the future, but also to continue to contribute to a verifiable reduction in fuel consumption and CO₂ emissions.

Excellence for mobility. Full expertise in thermal management.

Today more than ever, pump development is the focus of efficiency improvement at NGPM. We have already achieved a milestone in fuel reduction with our revolutionary concepts for switchable and adjustable pumps. Our product range is designed to meet different requirements to provide the appropriate respective system. Our product portfolio comprises the three product categories water pumps, oil pumps and pump modules.

High quality and functional: we have many years of expertise in the development of pumps.

With more than 70 years of experience of water pumps for car and truck applications, we are able to develop high-quality coolant pumps for the automotive industry. Our pumps are characterised by their high functionality.

Especially through computer fluid design and CAD-optimised systems, we are able to achieve very high levels of optimisation of our pumps.

Currently, 120 people are employed in the development department. These are divided into series development, pre-development and testing as well as simulation and calculation. In addition, we convince with our 30 years of experience in the area of the transmission oil pump. To this end, we use synergies from the NIDEC Group for brush-less motors and corresponding controls.

With our well-established, switched and mechanical water pumps we achieve fuel savings of 1–3 %. We use the latest CAD systems with strong networking and data exchange with our customers and suppliers. With the electrically driven pumps we support the development trends of our customers in the direction of electrically driven vehicles both PHEV (plug-in hybrid) as well as BEV.





Ihr Weg zur flexiblen Automatisierung

Die Fabrik der Zukunft ist vor allem eines: flexibel. Automatisierungslösungen von ABB werden allen Anforderungen hinsichtlich Vereinfachung, Kollaboration und Digitalisierung gerecht und ebnen den Weg für eine intelligente und effiziente Produktion. Profitieren Sie von unseren maßgeschneiderten Robotiklösungen und dem branchenweit größten Service-Angebot – aus einer Hand. www.abb.de/robotics



Feutron Klimasimulation GmbH



FEUTRON – ein Markenname, der für Innovation und Zuverlässigkeit steht. Eine lange Tradition, über 50 Jahre Erfahrung und Flexibilität eines mittelständischen Unternehmens aus Greiz in Thüringen, sichern Ihnen maßgeschneiderte und hochwertige Produkte aus den Bereichen Klima-, Kälte- und Umweltsimulationstechnik.

Die Firma wurde 1941 von Karl Weiss als Ingenieurbetrieb gegründet. Die Ingenieure entwickelten die erste Prüfkammer, die dann 1955 in Serienproduktion ging. Die Feutron Klimasimulation gehört zu den etablierten Herstellern auf dem Gebiet der Klima- und Umweltsimulation, und unsere Anlagen bewähren sich täglich im weltweiten Einsatz.



Zur Standard-Produktionsreihe von Feutron gehören Prüfkammern und Prü fzellen, welche als Temperaturprüfanlagen und als Klimaprüfanlagen mit zusätzlicher Feuchterege lung angeboten werden.

Durch die vollständige Entwicklung und Konstruktion unserer Produkte im eigenen Haus und einer großen Palette an Zusatzoptionen wird eine sinnvolle Ergänzung des Standard-sortiments und somit eine optimale Anpassung der Anlagen an kundenspezifische Arbeits-aufgaben erreicht.

Die Feutron Klimasimulationskammern werden als Kompaktsysteme von 10 dm³ bis 2000 dm³ angeboten. Die größeren Nutzräume stehen Ihnen mit unserem Sortiment an Prü fzellen zur Verfügung. Die Klimaprüfanlagen finden ihr breites Anwendungsgebiet sowohl in der Forschung und Entwicklung als auch in der Industrie.

Der eigens von Feutron Klimasimulation entwickelte Touch Controller bietet Ihnen bei der Steuerung unserer Prü fzellen und Prüfkammern höchste Genauigkeit der Klima- und Temperaturparameter.





What drives NIDEC? The global megatrends – and people like you!

Work in a team that pulls together in order to realise common dreams and megatrends.

Dreams, which are about current issues such as electrification, CO₂ reduction, autonomous driving and about the chance to work with the latest technologies to drive forward innovation projects and move a lot. We invite you to join us to grow with us – professionally and personally.

Through our integration into our parent company, you will experience an environment with us that is characterised by an exciting mix of local and Japanese corporate culture. Our intercultural teams are unusually versatile and inspiring.

As an international community of values, we live our passion and face every new challenge with noticeable enthusiasm and lots of bite. We love intellectually challenging activities and are not afraid of hard work. When we do something, we do it immediately and without hesitation until we have completed our work.

Do you think and work the same way? Then let's go!



You'll find more information on our website.

We put electrification into the focus.

The combination of outstanding electric motor expertise and NGPM competence for mechanical pumps is trend-setting. Together with partners from the NIDEC Group we develop new types of electrical water and oil pump concepts for passenger car applications in the voltage range of 12 and 48 volt as well as high voltage for electric vehicles. This enables us to continuously improve the performance of our products and also to reduce energy consumption and CO₂ emissions.

With the symbiosis of NIDEC and NGPM, the way for the development of electric pump systems is paved. This strength will enable us to provide the right system for every type of vehicle. In this way we want to inspire holistically.

The NIDEC Corporation is the world's largest electric motor manufacturer.

A photograph of an industrial casting machine with a robotic arm. Two workers in blue uniforms are standing next to the machine, looking at a control panel. The machine is blue and white, with various pipes and components visible. The background is a factory setting with other machinery.

Bühler Druckguss

Bühler ist Ihr verlässlicher Partner für alle Anforderungen im Bereich Druckguss. Integrierte Zellenlösungen, Technologie-Support sowie Revisionen zählen zu unseren Stärken. Mit einem umfassenden globalen Service-Netzwerk bietet Bühler lokale Kompetenz, wo auch immer Sie sind.

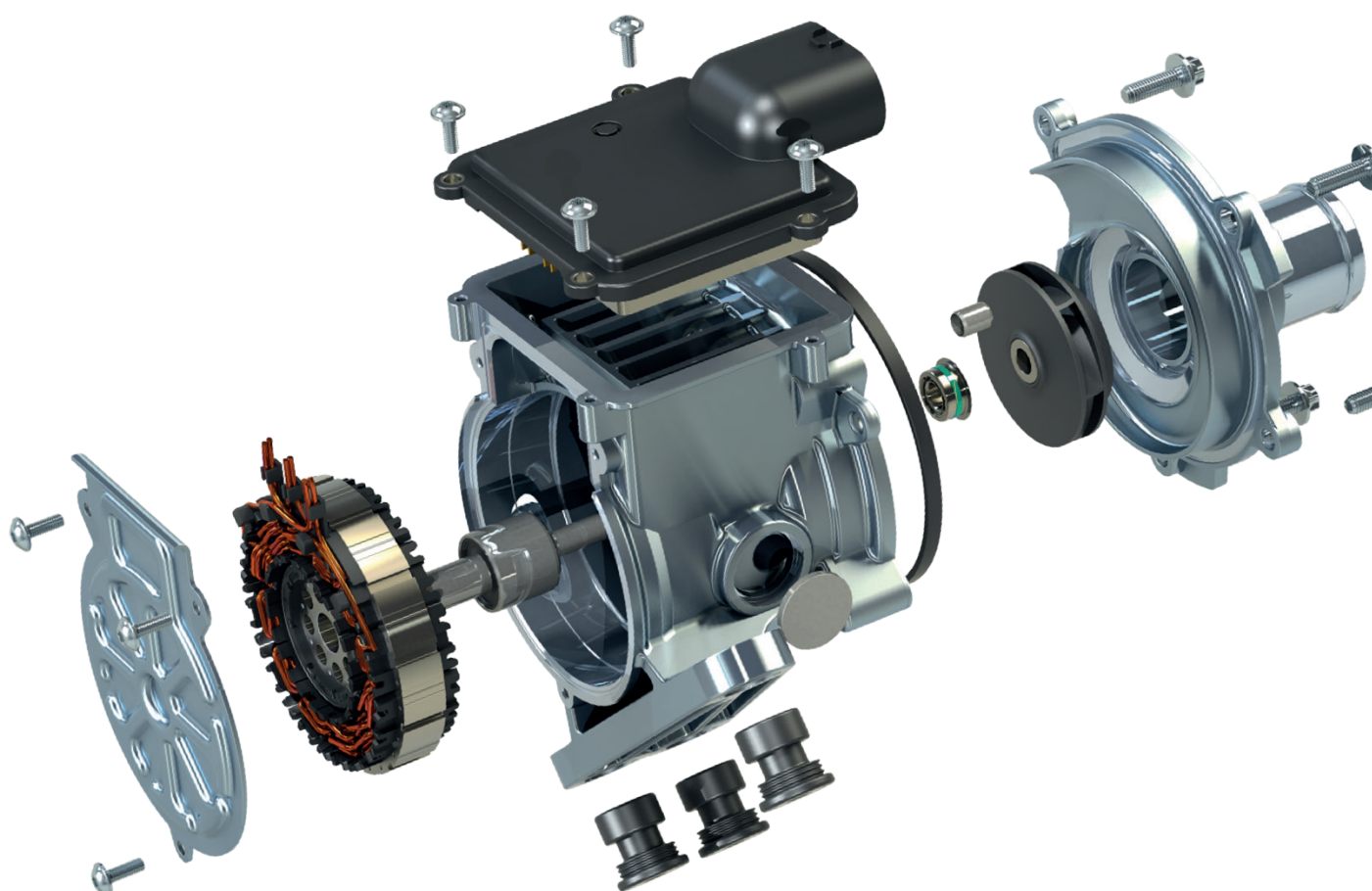
Mehr unter: buhlergroup.com/die-casting

BUHLER

Shaping the future with the electric water pump.

The fact that the high objectives of our research and development work have an effect is demonstrated by our latest creation: the electric water pump. It combines a mechanical water pump from NGPM and an electric motor from NIDEC Motors & Actuators.

Up to now, the automotive industry has mainly used electric glandless water pumps. With the dry-running concept, however, we have developed significant advantages in terms of size, weight and performance. Our new glanded water pump family combines all these advantages. Beyond that, the coolant flow can be regulated fully variable. The family is divided into three types: the small auxiliary water pump, the large auxiliary water pump and the main water pump.



Test bench & prototypes: because we like to take it into our own hands.

Sample construction

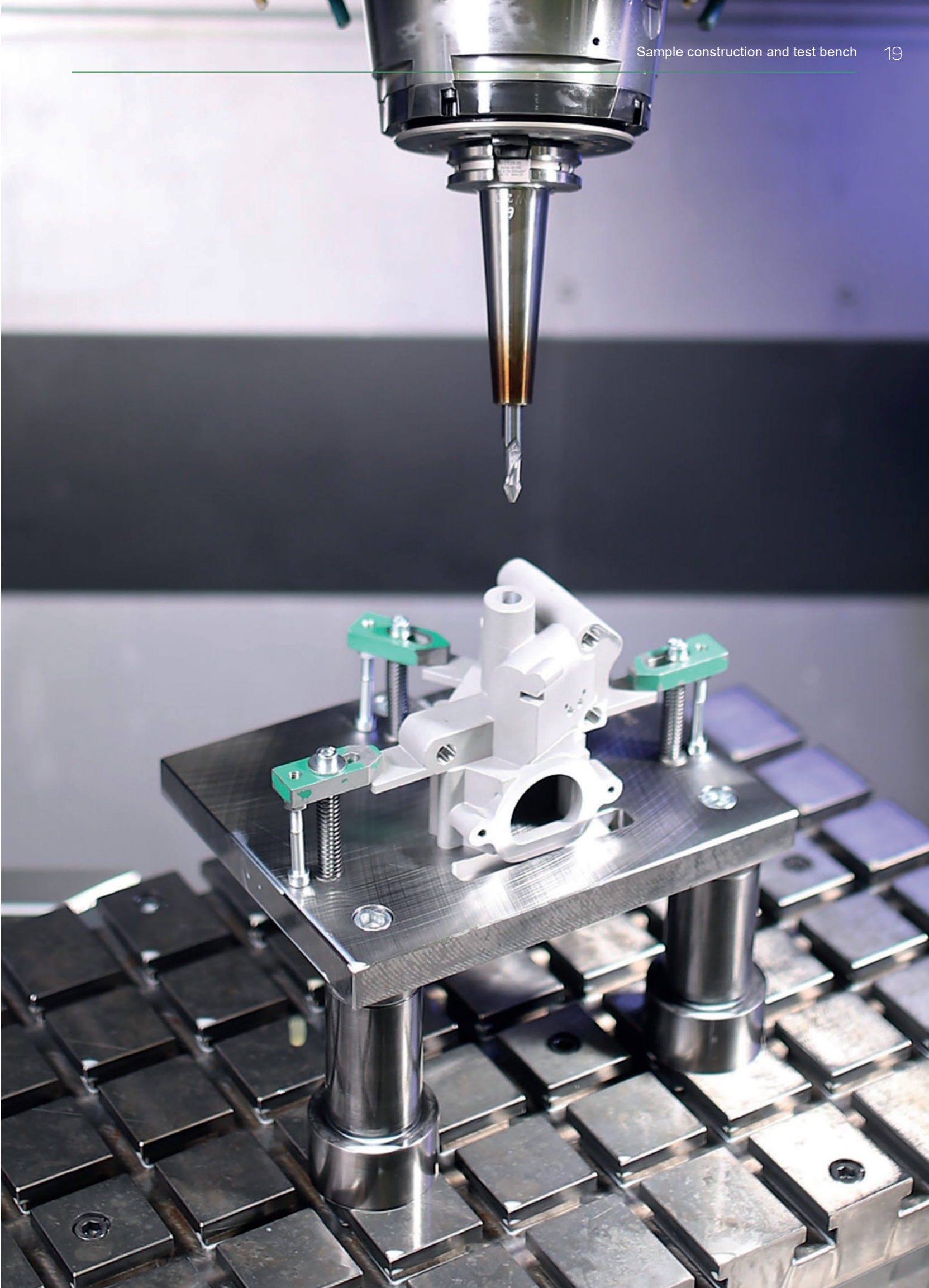
Only those who have it in their own hands determine the quality. We take this insight seriously – and are proud of our own sample construction for prototype production. The internal communication between the development department and prototype construction enables us to carry out necessary optimisation loops in short time.

Test bench

NGPM has an excellently equipped test centre with over 70 test procedures. In these procedures we put our pumps through their paces – among others with the shaker test, fog spray chamber test, endurance test and climate chambers. We offer our customers the better product.

Acoustics laboratory

In our modernly equipped acoustics laboratory we test our pumps to their noise emission. Especially the aspect of making the pumps as quiet as possible finds hearing. The examination includes the airborne sound. This allows sound pressure levels to be determined and set up a frequency spectrum. On the basis of this, it is possible to determine interference frequencies and locate the noise sources. An additional structure-borne sound sensor serves to confirm the records – to finally optimise our results further and further. Our acoustics laboratory was certified according to DIN EN ISO 3746 (accuracy class 1 method for low-reflection rooms and half rooms) and according to DIN EN ISO 3744 (enveloping surface method of accuracy class 2 for an essentially free sound field above a reflecting plane).





Development on the screen. For quality right from the start.

For us, high quality has top priority right from the start. In order to guarantee this, we work with state-of-the-art software that allows a unique technology to be developed, refined and manufactured.

With the latest design software we create the optimum for our customers. We also use special software when it comes to the simulation of complex systems. This means that they can be checked at an early stage and in detail so that any errors are not put into the prototype construction in the first place. Adaptions are fast and uncomplicated. This, in turn, saves time and money. With our latest calculation program, even complete pump structures can be verified with regard to component tolerances. One thing is certain: we leave nothing to chance.



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In addition to classic machining, assembly and testing, we also manufacture process-safe with 2-component silicone coating, laser welding, vacuum impregnation, residual dirt and noise analysis technology as well as with clean room production.

The process landscape is stored in the form of a company-wide network. It is constantly being developed and gives all employees access to current process sequences, procedural instructions and forms.

The NGPM management system combines quality and environmental aspects in equal measure. Error prevention measures are applied in the process of development, planning and series production support with modern methods such as the implementation of FMEAs or Lessons Learned. Always with the defined goal „0-error“. Another component is characterised by the continuous improvement process involving LEAN management methods and the daily development of the shop floor management.

Last but not least, in production and manufacturing, the customer's wishes are of course always decisive as well.

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We work every day to improve the future.

We are aware of the fact that being the „global engine manufacturer no. 1“, the NIDEC Group bears responsibility for the environment.

We treat this responsibility with respect. That is why the sustainable environmental improvement is now more than ever one of our priority objectives – and should contribute significantly to a positive vision of the future.

Through targeted measures in environmental protection, we take care of the following aspects within the company: saving resources and avoiding unnecessary environmental pollution. This becomes visible through activities such as the conscious handling of waste or the use of photovoltaic alternative energy.

The sustainability of this environmental protection is fundamentally reflected in our product range of oil and water pumps. Already for many years the increase in performance with lower consumption has played a leading role in development. In the future, too, we want to achieve further fuel and CO₂ savings in vehicles.

With a holistic environmental management system we make it clear that we not only deepen the concept of environmental protection but anchor it firmly in our actions. More with every day. For a perspective that benefits our planet.

The image shows a close-up of interlocking metal gears, with the mbw logo overlaid. The logo consists of the letters 'mbw' in a stylized, bold, green font, followed by a green checkmark-like symbol. Below the logo, the website address 'www.mbw-group.com' is written in a small, black, sans-serif font. Further down, the text 'mbw Unternehmungsgruppe' appears in a small, black, sans-serif font. Below that, the main slogan 'Ihr Spezialist für Metallveredelung & Metall- und Vorrichtungsbau' is written in a larger, bold, green, sans-serif font. At the bottom, the company's address and contact information are listed in a small, black, sans-serif font: 'Victoria Boulevard K 100 · 77836 Rheinmünster' and 'Tel.: +49 7229 3040-0 · info@mbw-group.com'.

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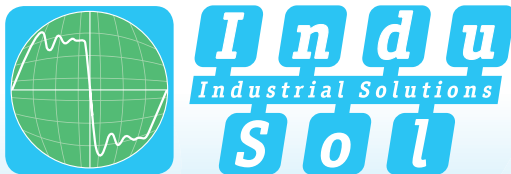


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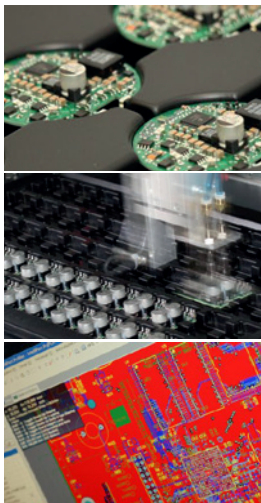
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Die Krüger & Gothe GmbH mit ihren Standorten in Staßfurt (Sachsen-Anhalt – Deutschland) und Kunshan (Jiangsu Province – China) bietet als EMS (Electronic Manufacturing Services) ihren Kunden umfassende Elektronikdienstleistungen an. Das Unternehmen mit rund 50 Mio. € Jahresumsatz und ca. 200 Mitarbeitern ist im oberen Segment der deutschen Elektronikdienstleister angesiedelt. Eine kompetente Entwicklung für Software-Applikationen im Bereich der elektrischen Prüfungen und eine leistungsstarke Produktion von elektronischen Baugruppen bis hin zu kompletten Elektronikprodukten und Endgeräten decken alle gegenwärtigen Technologien der EMS-Branche ab. Die Krüger & Gothe GmbH ist ein starker Partner in den Gebieten von Muster- und Prototypenfertigung sowie für die Hochleistungsfertigung von mittleren und großen Serien. Leistungsstarke bereichsübergreifende Prozesse bilden hierbei die Basis für den Unternehmensanspruch, „höchste Qualität mit hohen Sicherheitsstandards, wettbewerbsfähig und mit einem Mehrwert für die Kunden zu produzieren“. Die vorhandenen Prozesse basieren auf den Vorgaben umfangreicher Zertifizierungen (u. a. IATF 16949, ISO/TS 22163, ISO 14001) und den einschlägigen Richtlinien wie zum Beispiel der IPC-A-610.

Krüger & Gothe GmbH has locations in Staßfurt (Saxony-Anhalt – Germany) and Kunshan (Jiangsu Province – China). As an EMS (Electronic Manufacturing Services) we offer our customers comprehensive electronic services. With an annual sales of around 50 million € and approx. 200 employees the company is positioned in the upper segment of the German electronic service providers. A competent development for software applications in the field of electrical testing and a high-performance production of electronic PCBAs up to complete electronic products and end devices cover all current technologies of the EMS industry. Krüger & Gothe GmbH is a strong partner in the field of sample and prototype production as well as the production of medium and large series. High-performance cross-departmental processes are the basis for the company's mission "to produce high quality with high security standards and to be competitive and with an added value for the customer". The existing processes are based on the specifications of extensive certifications (e.g. IATF 16949, ISO/TS 22163, ISO 14001) and relevant guidelines like IPC-A-610.

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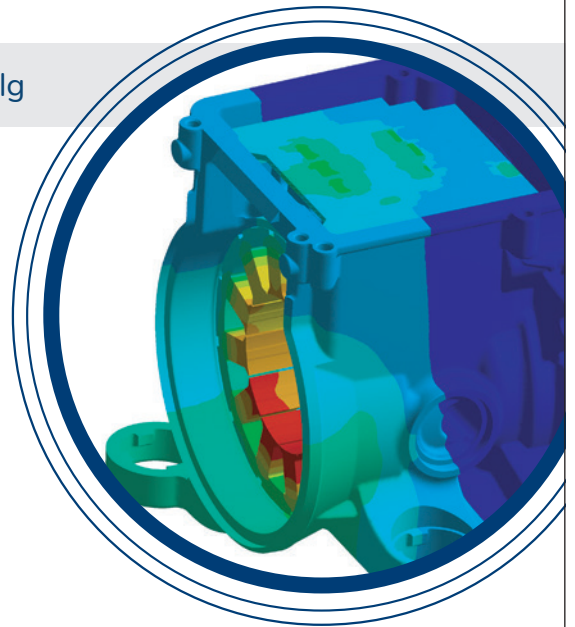
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Mechanical seal for motor cooling



Mechanical seal for reduction gear



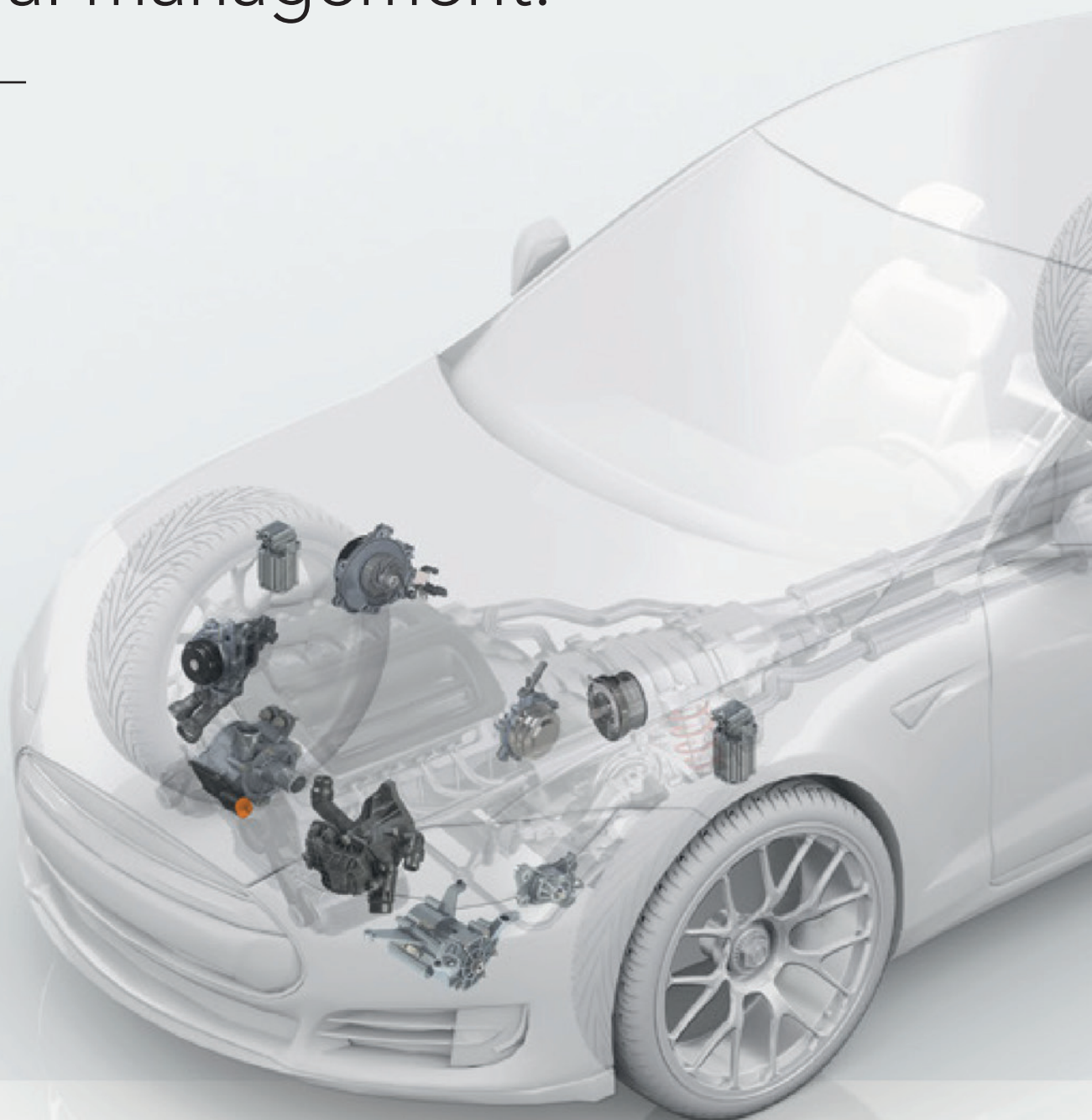
Mechanical seal for clean air compressor

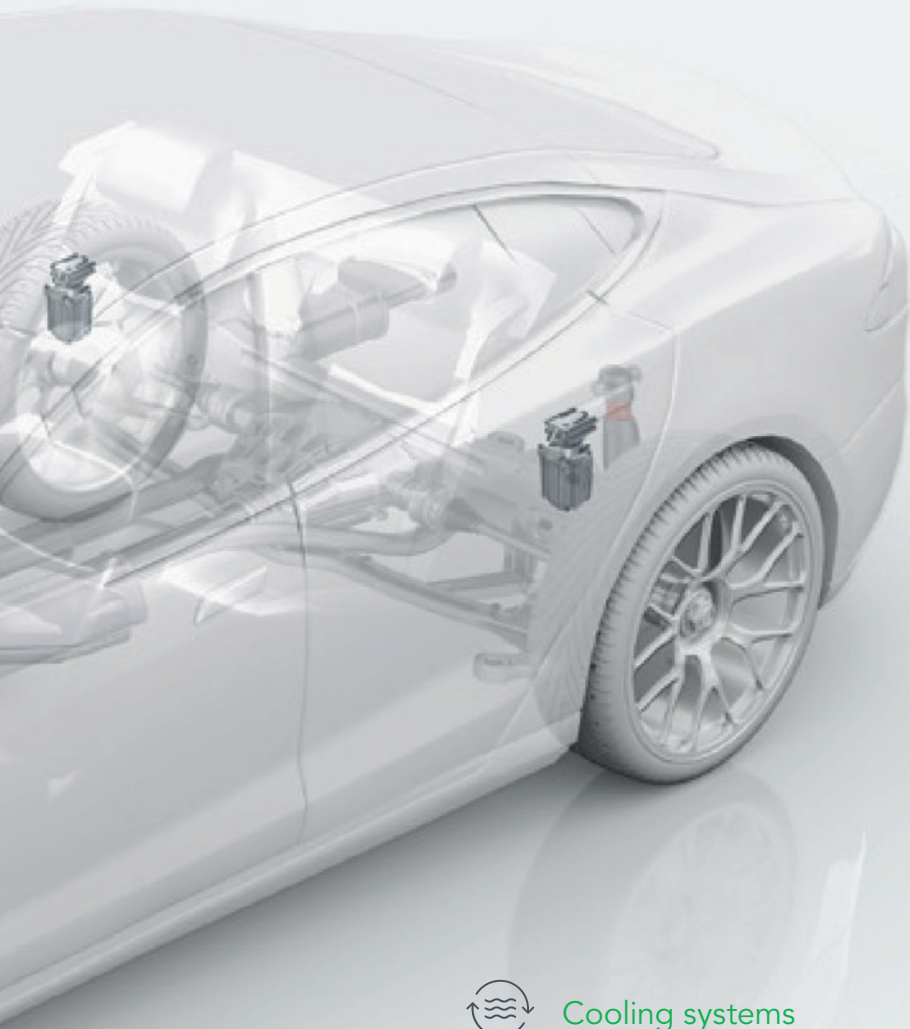


Hydrogen control valve

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Our product range:
full expertise in
thermal management.





Cooling systems

In the field of cooling systems NGPM supplies an innovative range of water pumps, that is fully designed to serve the mobility of today – and to shape the future of mobility.



Oil systems

Having a compact and durable design, our oil systems offer first-class oil supply.



Module systems

Excellent thermal management makes it possible to make car mobility more efficient than ever before. The NGPM pump module is a pioneer in this area and shows exciting CO₂ savings.



Constant water pumps

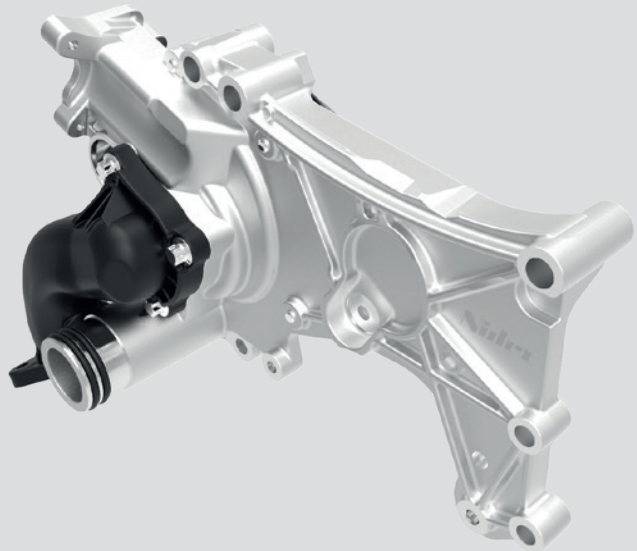
Centrifugal force releases forces.

Proven modular solutions from the portfolio of the market leader for mechanical water pumps.

NGPM has developed the belt-driven constant water pumps to perfection in decades of continuous optimisation.

Advantages

- high efficiency through 3D-wing geometry
- closed plastic impeller with 3D-wing geometry



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Switchable water pump PSF

Switching times with record potential.

The switchable PSF (Pneumatically Switched Flow) coolant pump is based on a conventional centrifugal pump.

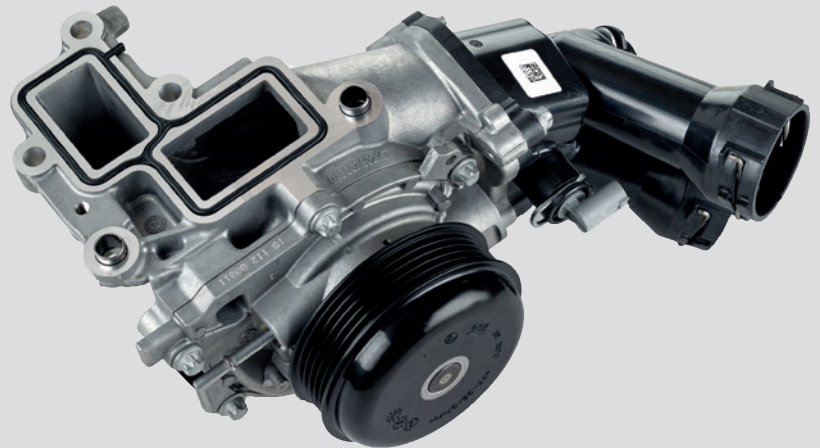
A switch unit, which is connected to the vehicle vacuum system, is integrated in the pump. If the coolant pump is switched, a slide valve moves via the impeller and interrupts the flow. The coolant circulation is stopped, which accelerates the heating of the motor. This principle can lead to significant fuel savings.

Advantages

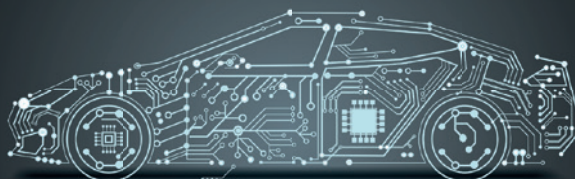
- PSF control unit realises switching times of up to 0.1 seconds
- High efficiency

Product specification

Delivery pressure	2.7 bar
Delivery rate	320 l/min at 8,450 rpm



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Switchable water pump ECF

Hydraulics at its best.

The switchable ECF (Electro-hydraulically Controlled Flow) coolant pump is based on a hydraulic control of the internal switching unit. This works according to the on/off principle.

The coolant flow can be regulated completely independently of the vehicle vacuum. Fuel consumption remains low and emissions are reduced thanks to a particularly rapid engine warm-up.

Advantages

- Vacuum independent
- Rapid motor heating causes reduction of fuel consumption and emissions
- Minimisation of the leakage risk due to the omission of static sealing points
- Small installation space
- Power reserves when shifting gears
- Ensuring the fail-safe function, i.e. full funding guaranteed in the event of control system failure

Product specification

Flow rate	230 l/min at 4800 rpm
Pressure	1.5 bar at 4800 rpm
Temperature range	-40 °C to +140 °C
Speed	0–6230 rpm



 Fully variable mechanical water pump

The pump for infinitely variable volume flow.

In addition to switching the coolant flow on and off, this fully variable ECF (Electro-hydraulic Controlled Flow) water pump can regulate the flow rate in between with a modulated hydraulic pressure which is generated by an electrically initiated and pulsating magnetic valve.

To complete the control loop, NGPM uses a continuous feedback from the position of the control spool by magnet and sensor. This concept supports NGPM's main objective to reduce CO₂ emissions by means of a system perfectly adapted to the needs of the engine tuned coolant flow.

Advantages

- Coolant heat management/flow control if required
- The fast motor heating causes a reduction of fuel consumption and emissions
- Independent of the vacuum
- No enlargement of the installation space compared to the fixed displacement pump
- Power reserves of the axial piston pump for control system
- Fail-safe function: complete delivery also in case of control failure

Product specification

Flow rate	250 l/min at 6240 U/rpm
Pressure	1.5 bar at 6240 U/min
Temperature range	-40 °C to +110 °C
Speed	0–7488 U/min





The best of two worlds (12 V).

The electric water pumps with controlled flow deliver coolant flow rates based on external commands via LIN, CAN or PWM.

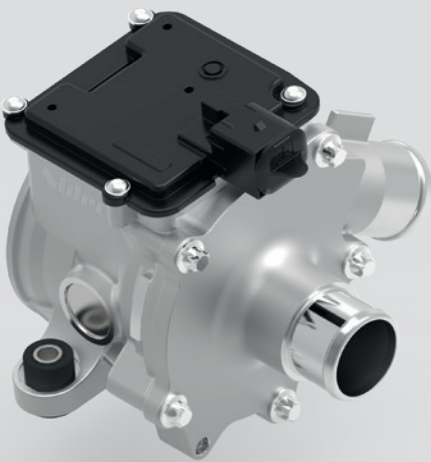
Especially the new P450 is designed for 12 V applications and using best components of mechanical water pumps in combination with electric motors, which convince with a higher power density, it delivers exemplary results.

Advantages

- Best packaging in its class due to unique concept
- Proven components of mechanical water pumps
- Proven electric motor with high power density in use
- Concepts for 12 V and 48 V applications

Product specification 12 V

Version	12 V/450 W	12 V/600 W	48 V/950 W
Status	available	in development	available
Volume flow (l/min)	150	160	189
Pressure (bar)	0.9	1.1	1.5
Voltage (V)	12	12	48
Power (W)	450	600	950



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The best of two worlds (48 V).

The electric water pumps with controlled flow deliver coolant flow rates based on external commands via LIN, CAN or PWM.

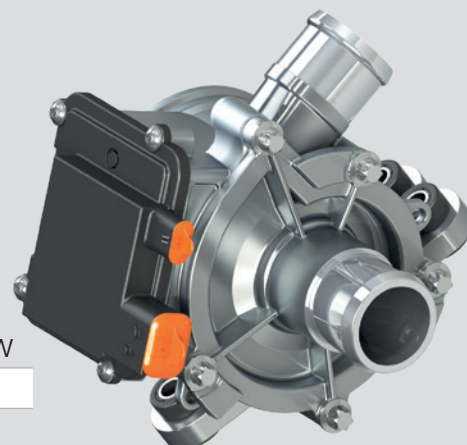
Especially the new P950 is specially designed for 48 V applications and using best components of mechanical water pumps in combination with electric motors, which convince with a higher power density, it delivers exemplary results.

Advantages

- Best packaging in its class due to unique concept
- Proven components of mechanical water pumps
- Proven electric motor with high power density in use
- Concepts for 12 V and 48 V applications

Product specification 48 V

Version	12 V/450 W	12 V/600 W	48 V/950 W	360 V/950 W
Status	available	10/2017	available	2018
Volume flow (l/min)	150	160	189	189
Pressure (bar)	0.9	1.1	1.5	1.5
Voltage (V)	12	12	48	360
Power (W)	450	600	950	950



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NEW P150

All-rounder for all cases (80–300 W).

The dry rotor concept combines the experience in mechanical pumps with the existing motor platform.

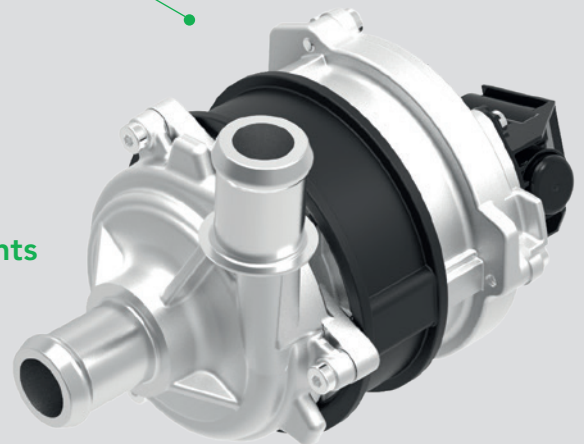
Electric water pumps are used as additional pumps in heating systems and enable energy-efficient temperature management depending on the engine load. They offer a wide range of applications and performance and are used for example in electric vehicles for battery cooling, temperature measurement or control of service units. The provision of a simple interface via LIN, CAN or PWM is guaranteed.

Advantages

- Dry-running concept – insensitive to contaminated coolant
- Proven motor concepts – new generation motors with superior power to weight ratio
- Flow rate independent of motor speed
- Increased placement options due to beltless drive
- Lightweight construction and vibration-optimised design with regard to acoustics

Product specification depending on customer requirements

Power	100 W
Design point	17 l/min, 1 bar at 7000 rpm
Temperature range	-40 °C to +130 °C
Speed	0–7000 rpm



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Transmission auxiliary oil pump

Efficient and durable.

The electrically driven auxiliary oil pump is designed for use in a double-clutch transmission for pressurised oil supply.

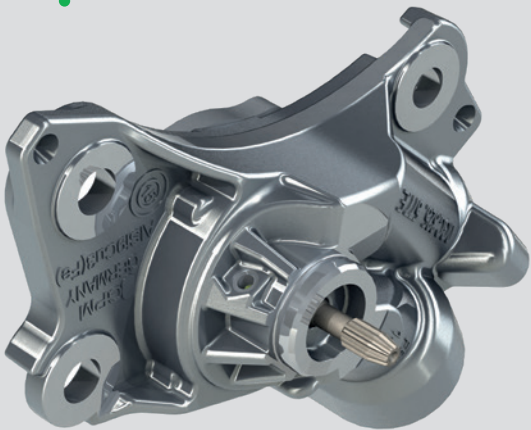
The pump is based on the positive displacement principle and is designed as a gerotor. It is directly driven by an electric motor via an intermediate shaft. The speed is therefore infinitely variable from 0 to approx. 5000 rpm. Depending on the requirements, the auxiliary oil pump is activated in a fraction of a second and supports the mechanically driven main oil pump e.g. with switching operations with up to 20 bar system pressure. A secondary function is the clutch cooling mode, in which low pressures and high volume flows (up to 12 l/min) are required.

Advantages

- Robust
- Temperature compensation
- Lower losses with high temperatures
- Compact installation space
- Durable
- Constant column over all temperatures
- Individual, efficiency-optimised gerotor
- Improved cold start performance
- Reduced internal friction

Product specification

Flow rate	up to 12 l/min
Operating pressure	0.1–20 bar
Temperature range	-40 °C up to +140 °C
Speed	50–5000 rpm



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Main transmission oil pump

Maximum efficiency.

The main transmission oil pump is an external transmission pump without internal pressure control system. It draws the oil (on the suction side) with the help of a special filter and conveys it to a downstream control module via the pressure side.

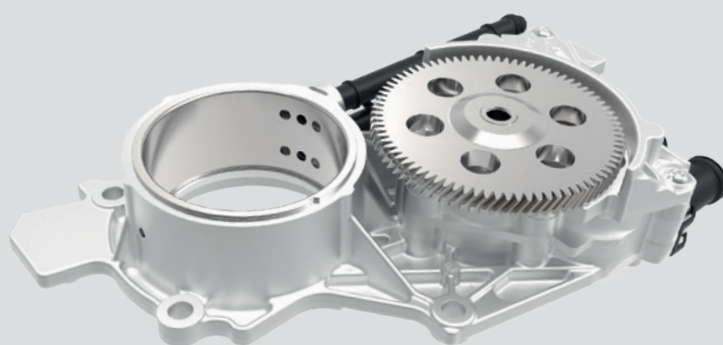
Depending on the oil requirement of the clutch, an additional return flow is generated on the suction side to control the overflow volume of the oil pump. The flanged pump is suitable for thin, friction-optimised gear oils. Due to a special material selection it achieves a high degree of efficiency.

Advantages

- Integration of additional oil supply channels
- High efficiency due to special material selection
- Compact construction

Product specification

Flow rate	5,5 l/min at 550 rpm, 10 bar
Pump pressure	10 bar–20 bar
Temperature range	-40 °C to +150 °C
Speed	550–8400 rpm



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Constant oil pump

Consistent quality.

The main oil pump is built up in a simple construction with a gerotor. It draws engine oil from the engine oil sump and, under operating pressure, it supplies the lubrication points with engine oil.

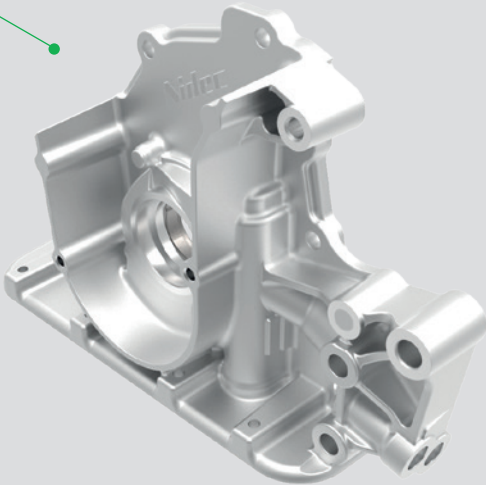
The oil pump is driven via the crankshaft and the pressure regulator is controlled by the plastic piston. With this, the plastic is controlled via the gallery pressure and performs two functions. One of them is the setting of the operating pressure and the other one is an internal security function which is based on the pressure of the engine oil in case of failure of the gallery pressure.

Advantages

- Plastic regulating piston
- Simple construction

Product specification

Flow rate	3 l/min at 850 rpm, 120 °C and 3.5 bar
Working pressure	3.5 bar
Temperature range	-40 °C up to +150 °C
Speed	0–6200 rpm



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Electric auxiliary oil pump

Compact and effective.

The electric auxiliary oil pump enables the switching function of automated transmissions even when the combustion engine is at rest.

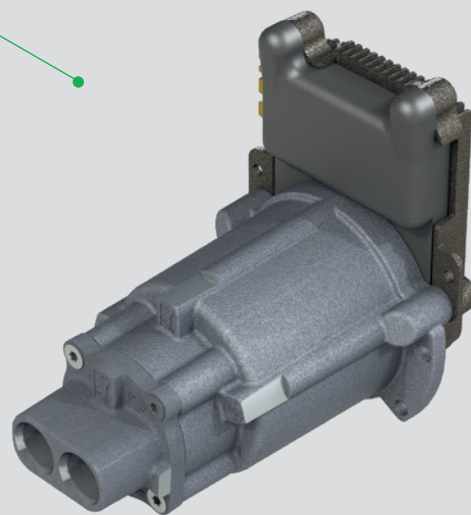
A long service life of the transmission is guaranteed in the cooling/lubricating pump variant.

Advantages

- Compactness of oil pump/electric motor/ ECU system
- Relatively small external dimensions
- High pressure values (depending on pump size) achievable
- Modification of the pump housing for hydraulic insertion and exit and also in the fixation possible
- System available as dry and wet runner

Product specification

Voltage	12 V
Working pressure	up to 25 bar
Power	100–400 W
Motor development	uniform motor platform, variable stacking length for performance classes
Communication	LIN, CAN, PWM
System control	separate (e.g. TCU) / integrated (ECU)



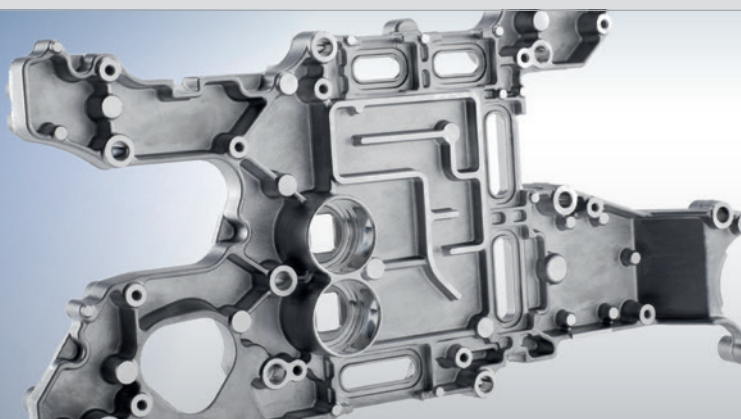
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⊕ Pump module

How integration works.

Pump modules from NGPM offer a wide range of integration options of coolant pump, thermostat, filter, heat exchanger and adjustable lubricating oil pump in a common housing.

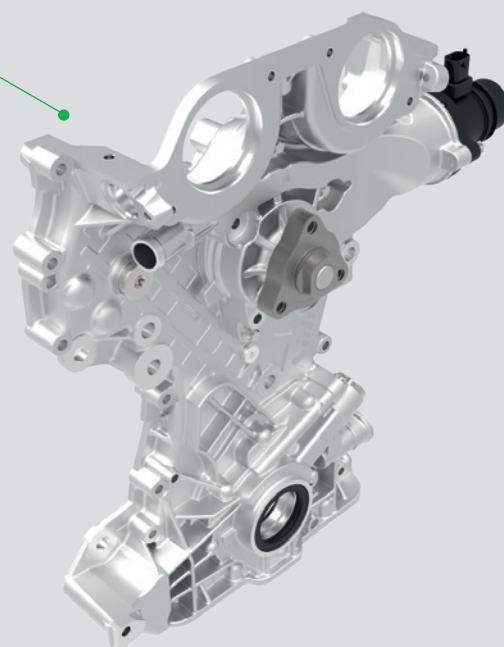
This results in advantages in packaging and in the final assembly on the vehicle.

Advantages

- Fast and safe switching of a panic flow in case of load peaks in cold condition via an electrically adjustable ball valve over the entire temperature range
- Pilot flow via engine block thermostat thanks to an electrically adjustable ball valve
- Friction-reducing sealing discs on the ball valve
- 105 °C thermostat for engine block flow control

Product specification

Flow rate	185 l/min at 4600 rpm
Betriebsdruck	1,35 bar at 4600 rpm
Temperature range	-40 °C to +140 °C
Speed	0–5800 rpm



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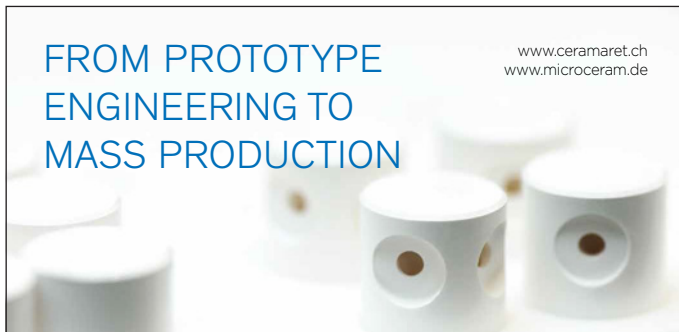
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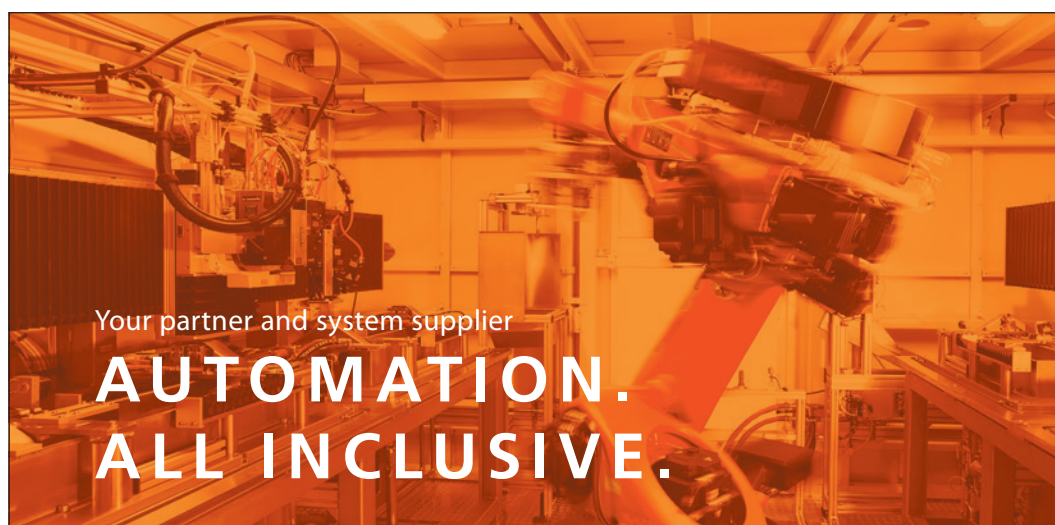


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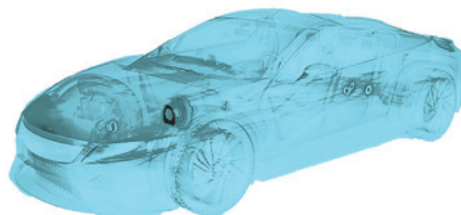
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Erfolgreiche Unternehmen vertrauen auf uns und unsere Leistungen:
Qualitätslösungen in der Materialfluss- und Handhabungstechnik.

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