

Made for Motion



## **KTR for Pumps and Compressors**

Drive technology  
Cooling systems

[www.ktr.com](http://www.ktr.com)

# KTR – all the best for your pump.

No matter how big or small a pump is, no matter where it is used, and no matter whether it transports fluid or gaseous media, one thing is the same with all pumps: they are one of the biggest cost drivers in the industry.

If you want to have a significant influence on this, KTR is the ideal partner. We have developed couplings specifically for pump drives, allowing you to reduce operating costs due to an extended life of the pump. Our Power Transmission Center, a modern R & D centre comprising a multifunctional assembly hall, plays a major role in this development. In this centre alone, engineers have more than 25 hydraulic and electric test benches at their disposal on which extensive durability and load tests are carried out. With the result that you can be absolutely certain: a KTR coupling does what it promises.





## Wherever movement is needed, we push on.

Always a good connection: KTR has been in the business of effective power transmission for over 50 years. Today, we are a leading manufacturer of high-quality power transmission technology, braking systems, cooling systems and hydraulic components. And a trustworthy partner for anyone wanting reliable and durable propulsion for their pumps and compressors.

KTR started in 1959 with one simple question: can the established curved tooth coupling be developed further? The answer was obvious, the result revolutionary – the BoWex<sup>®</sup>, the maintenance-free coupling which combined nylon and steel for the first time. Shortly afterwards, our engineers developed the ROTEX<sup>®</sup>, a jaw coupling which became the generic term and later even found its way into the DIN standard. From that point on, the path was mapped out. Today, KTR offers a virtually unlimited product range of well over 20,000 different couplings and other drive elements.

If you can't find what you are looking for, however, we see that as a personal challenge. Because we don't just want to be suppliers to our customers but problem solvers, too. This includes finding the best, most cost-effective solutions for custom applications. Or to express it in numbers: KTR develops more than 20,000 new products and product variants every year on behalf of its clients. And believe us: that includes the coupling that drives your pump at maximum performance.

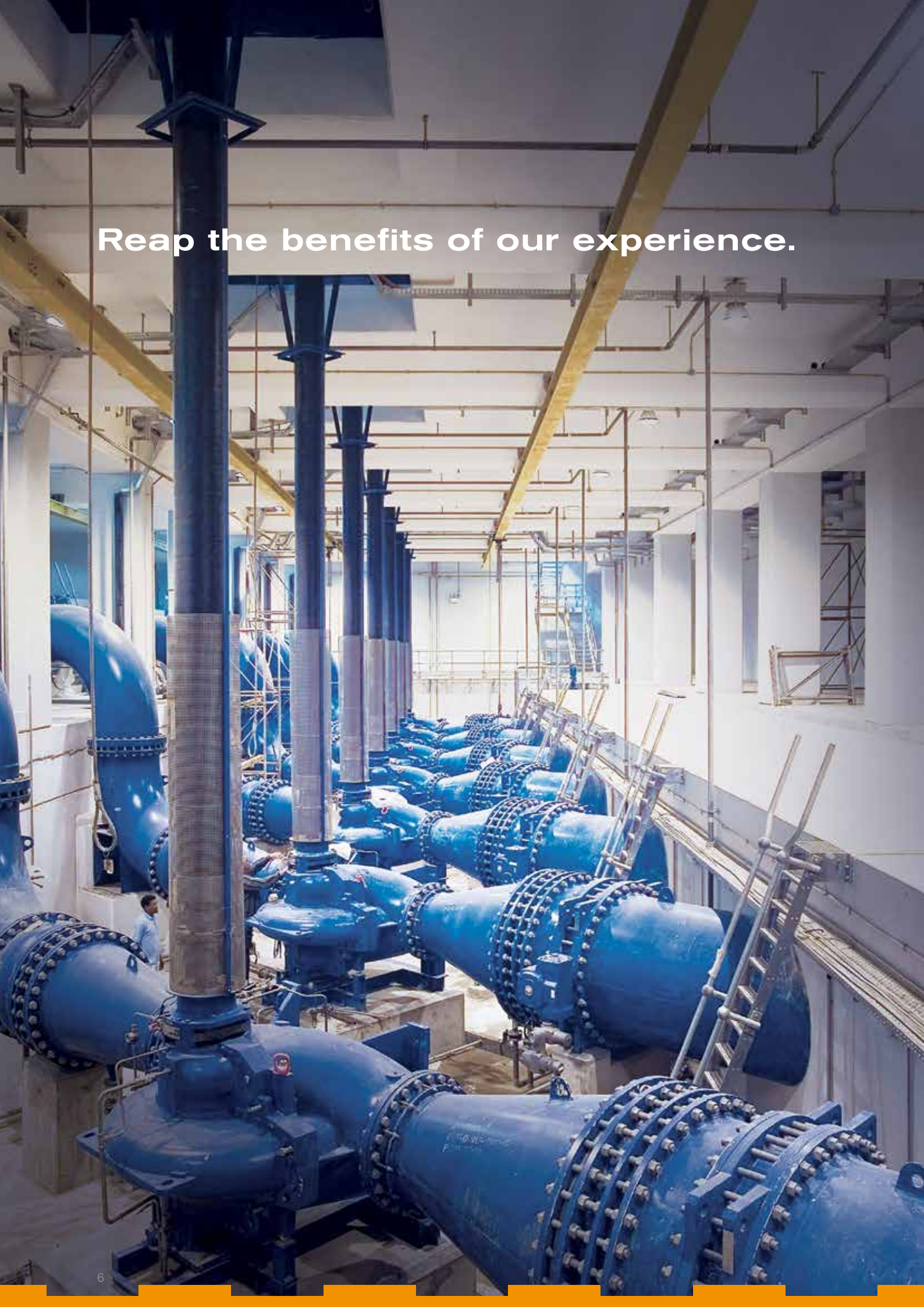
If you want professional advice even in the planning phase: no problem. Our trained sales staff and application engineers will support you right from the start. In addition, a wealth of information about our products, a CAD library, assembly instructions and much more are freely available at [www.KTR.com](http://www.KTR.com). All it takes is one click.

If you need standard products for your pumps or compressors, taking a look at our website will help you, too. Simply use the calculation program to determine which size of coupling is right for your application, and place your order for the desired date. The fact that this all runs smoothly is thanks to our SAP data hub which allows direct communication with other systems, thus ensuring short response times, including for orders. The rest is then taken care of by the KTR logistics centre which controls the entire flow of goods using radio-controlled barcode scanning. And even once the items are on their way, you are still in control of everything: with the track-and-trace system, you can check the status (or rather, the delivery) of your items at any time.





Reap the benefits of our experience.



## From specialists and experts

Competent, customised advice, right from the outset. We have introduced Industry Market Managers e.g. to assist our clients in the pump industry who purchase all their couplings from one source. In practice, this means a specialist is assigned to you as your direct contact person. And for additional support, a whole host of KTR experts work on your specific development project. And this commitment can be seen all over the world. KTR's international presence in all important industrial markets ensures that users around the globe receive support fast whenever it is needed.

## From standard to tailor-made

You have the pump, we have the coupling. Either as a standard product, available ex stock, or as a custom-developed design. The compact, maintenance-free KTR couplings do an outstanding job in any type of pump. Possible applications range from small water pumps to enormous irrigation systems, from the tiniest aspirators to the most powerful turbines. But KTR couplings also provide long-lasting connections in nuclear power plants, in LCD manufacture and in isocyanate foaming processes.



# Have confidence in our quality control.

## Of quality and safety

We are convinced of the quality of our products. Now we know, of course, that this view of things is not always entirely objective. That is why we also have this impression verified by independent third parties: our quality management was already certified according to ISO 9001 in 1993. In addition to the quality, safety and environmental compatibility of our couplings, this certification incidentally also put all the necessary preparatory work under the microscope: from correct design of the products to reliable processing of orders.

KTR also holds the type examination tests of all major classification societies; in addition, our couplings meet the special requirements of the pump industry, in particular API 610, 671 and 685.

You see, you know you're safe with KTR products. Even when they are being used in potentially explosive atmospheres. In line with European Directive 94/9/EC – better known as ATEX 95 – KTR has arranged for key models in its overall range to undergo certification by an independent institute to assess their suitability for use in potentially explosive atmospheres.







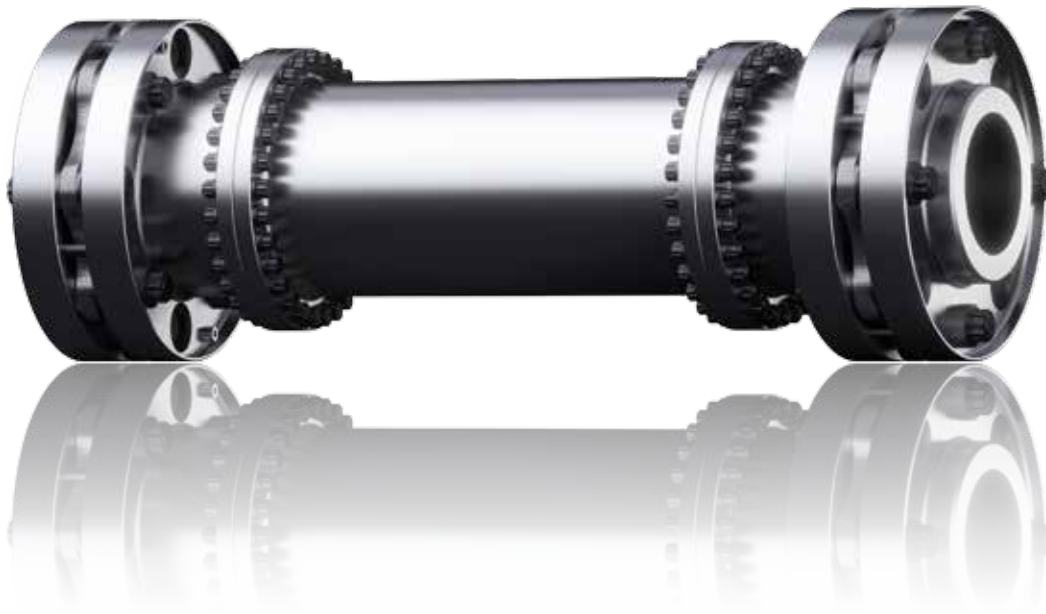
## Turbo compressors – when everything turns on maximum performance.

Gas and steam turbines, turbo compressors and generators all have one particular thing in common: they achieve extremely high speeds. Because large forces must be mastered at the same time, couplings are subjected to loads from two sides. The KTR solution: high-strength steels which enable the couplings to be designed so that they are as light and compact as possible. Because the larger the diameter, the higher the circumferential speed. And that results in loads that KTR would rather avoid in the first place.

KTR also avoids vibrations caused by an imbalance – after all, the drives are often used in highly sensitive areas. To prevent these vibrations from building up, KTR carries out precision work right from the outset: we place particular importance on good, precise production and balancing.

One coupling that combines all these benefits is the RIGIFLEX®-HP high-performance coupling. It even bears its performance credentials in its name and has been developed specifically for use in high-speed drivetrains. In other words, at 1,000 cubic metres of air per second, 10,000 revolutions per minute and 500 bars of pressure, this torsionally rigid and low-maintenance all-steel coupling is not stretched to its limits; rather, it is in its element. It combines optimum rigidity with maximum flexibility and is therefore the first choice for nuclear plant and energy technology, in petrochemistry and marine technology, in mining and tunnel construction.





### **Full power – even under pressure**

High-performance compressors often contain high-density air – in extreme cases up to 500 bar. As a result, extreme loads and high torques can occur, particularly when the system starts up. These must be expertly absorbed in order to protect the entire system from damage – a task that the RIGIFLEX®-HP masters perfectly. As stable as possible and as flexible as necessary – in reciprocating, screw or pendulum compressors, industrial gas or process air compressors, plunger or turbo compressors, it is responsible for two things at the same time: it produces and withstands pressure.

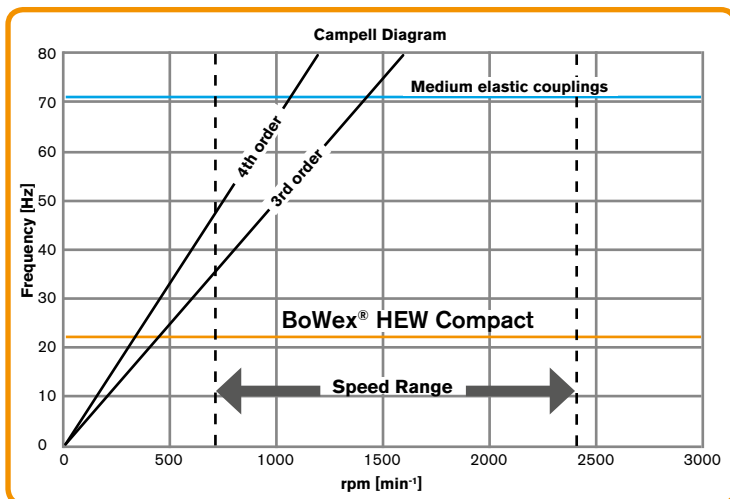
# Stationary compressors: power when it's needed.

Either 'off' or on 'full power' – these days, traditional industrial power transmission technology often still works at these two extremes. One thing is increasingly coming to attention, however: consistent revolution at maximum speed results in extreme life-cycle costs. With the result that, in industrial applications, fixed-speed drives are increasingly being replaced with variable-speed drives. The advantages of VSDs (variable-speed drives) are obvious: an industrial compressor that generates only as much compressed air as is really needed often operates at a correspondingly lower speed. And this not only reduces energy consumption but life-cycle costs, too.

Although it sounds so simple, this requires a rethink and a new approach from the point of view of coupling technology. Because the shaft couplings that are used here go through

a much wider range of speeds and can begin to resonate. When choosing the right coupling, it is therefore essential to ensure that the natural frequency of the coupling is outside the range of speeds at which the drive operates.

Obviously a job for the BoWex® HEW Compact. The elastomer coupling, which is vulcanised from natural rubber, reliably damps the torsional vibrations arising in the drivetrain and in the process reduces the forces that accumulate. Moreover, it also compensates for the usual axial and radial shaft displacements and thus contributes significantly towards ensuring that the adjacent components in the drivetrain are not subjected to torque peaks. And because good things always come in threes: thanks to the ability to connect them axially, installing the BoWex® HEW Compact is an easy feat.



Real model calculation for a screw compressor system – the Campbell diagram presents the simulation results of the resonance points



## Vacuum pump: setting to work with a breath of fresh air.



Quite why the vacuum pump is called a pump, even though it is technically a compressor that runs backwards, we can't tell you. What we can tell you with certainty, however, is that when you come to us you will find the perfect drives for this compressor, too.

Whether it's in the packaging industry or in pneumatic conveyance, for preserving goods or for extracting gases and liquids: vacuum pumps are frequently produced in high quantities. To optimise manufacturing costs they have an extremely compact design, which can result in intense heat development. The solution: KTR provides a breath of fresh air. Couplings with moulded-on fans enable the necessary air circulation by virtue of the fans removing the warm air directly from the housing by means of a heat exchanger.





## Portable compressors: momentum without vibration.

No power? No problem! Wherever the infrastructure does not allow for an electricity supply, portable compressors provide the necessary pressure. In civil engineering or in road construction, in quarries or in blasting work, powerful diesel engines reliably power pneumatic tools, pumps and sandblasting equipment.

In this situation, a portable compressor places very high demands on the mounted components. On the one hand, because of the vibrations generated by the internal combustion engine. And on the other hand, because today's compressor screws have a large inertia and often require an additional gear stage to achieve higher rotational speeds. And that places the coupling under high load, particularly when starting up. In order to absorb these and other shock loads, KTR provides highly elastic couplings which damp the oscillations and can absorb vibrations. This therefore minimises the loads in the drivetrain and significantly extends the service life of adjacent components.

However, KTR calculates before it gets that far. And really well, too. A vast range of different factors are taken into consideration in the so-called Torsion Vibration Analysis (TVA): the resonance range of the coupling, its performance at extremes of temperature, the transmission of vibrations from the internal combustion engine, the moments of inertia of the engine and compressor screw, and much more. The appropriate coupling and the way of adapting it to the construction are then selected on the basis of this sophisticated, computer-based analysis of torsional vibration.

The coupling, which has been designed specifically for elastic torque transmission in drives at risk of torsional vibration, is the BoWex-ELASTIC®. It is highly torsionally elastic and combines the advantages of the proven BoWex® system in a compact design with the option of an axial plug assembly within the curved toothing. Torsional vibrations and shock loads are damped and reduced. The coupling also enables misalignments to be compensated – radially, angularly, axially – whilst maintaining extremely low restoring forces.



# The full programme for the best possible drive.

Are you looking for the right drive for a pump? Or for a compressor? You are sure to find it at KTR. KTR offers a comprehensive product range of elastic and torsionally rigid couplings to keep your products reliably in motion.

## For pumps:

- The torsionally elastic jaw coupling ROTEX®.
- The ROTEX® ZS-DKM-H whose double-cardan design has been specially developed for pump drives.
- The compact, torsionally elastic jaw coupling POLY-NORM®.
- The non failsafe POLY coupling.
- The backlash-free, torsionally rigid steel lamina couplings RADEX®-N and RIGIFLEX®-N. These comply with API 610 or 671 and, thanks to their all-steel design, permit temperatures of between -30 and +280 degrees.
- The permanent-magnet coupling MINEX® which is used for contactless torque transmission in pumps for aggressive and toxic media.
- The DATAFLEX® which has proven itself both in development and quality assurance as precision measuring equipment.

## For portable compressors:

- The highly elastic flange coupling BoWex-ELASTIC®.
- As MMC coolers, e.g. as oil coolers and charge-air coolers in a housing.
- The DATAFLEX® torque measurement shaft for reliably determining resonance points in testing.

## For stationary compressors:

- The ROTEX® for screw compressors with a constant speed.
- The BoWex® HEW Compact for driving screw compressors with a variable speed.
- The RADEX®-N and RIGIFLEX®-N for multistage compressors.

## For LNG and turbo compressors:

- The RIGIFLEX®-HP high-performance coupling with adjusted centre of gravity and optimised torsional rigidity.

## For vacuum pumps:

- The ROTEX® and ROTEX® FNN couplings with or without integrated fan impeller.
- The POLY-NORM® jaw coupling with NBR elastomer.
- The BoWex® HEW Compact as a highly elastic coupling.



## The specialist solutions for individual applications

Single-cardan couplings have a wide range of applications. But they also have their limits. If compensation of a large shaft offset is necessary in order to convey heated media, this can only be done by double-cardan couplings, e.g. by the ROTEX® ZS-DKM-H. This spacer coupling can also be installed and uninstalled in no time: the shell hubs are reliably held by just four screws.

Unique, yet versatile: thanks to the wide choice of gear elastomers, the ROTEX® jaw coupling can easily be adapted to a vast range of different requirements. The new materials are extremely durable and are characterised by very high temperature resistance and excellent wear resistance.

We can also provide special design for our steel lamina couplings RADEX®-N and RIGIFLEX®-N by utilising new technologies. Thanks to high-strength GRP or CRP spacers, larger shaft distances can be bridged. And without any weight problems either – ideal for large pumps in irrigation systems.

If the torques reach very high levels, the torsionally elastic and fail-safe pin and bush coupling REVOLEX® KX-D is the ideal connection. It can be used at up to 1,220 kNm, connected axially and is extremely compact. It compensates axial, radial and angular shaft offsets alike and its elastomer rings are resistant to gasoline and oils.

Two become one: a unique design feature of the BoWex® GT is its split sleeve composed of two half-shells, which completely simplifies disassembly for maintenance purposes. At the same time, thanks to the double-cardan principle, the BoWex® GT has a considerably greater capacity for radial misalignment than conventional products.
















### The ROTEX® SP



The ROTEX® is always characterised by small dimensions, low weight and low inertia whilst at the same time having high torque transmission. The precise, all-over machining has a positive effect on the running characteristics and significantly increases the service life of the coupling. As the newly developed ROTEX® SP, it is also zero maintenance in potentially explosive atmospheres and is fail-safe but non-sparking.

# PRODUCT OVERVIEW FOR PUMPS AND COMPRESSORS

					
Couplings		ROTEX®	ROTEX® SP	RADEX®-N	RIGIFLEX®-N
Pumps	Centrifugal pumps	▪	▪	▪	▪
	Centrifugal pumps for diesel engines				
	Mag Drive pumps				
Compressors	LNG and turbo compressors			▪	▪
	Stationary screw-compressors	▪	▪	▪	
	Portable screw-compressors				
Vacuum pumps	Rotary valve vacuum pumps	▪	▪		
	Roots vacuum pumps	▪	▪		
Certificates and standards	ATEX and API			 API 610	 API 610 / 617

							
RIGIFLEX®-HP	POLY-NORM®	REVOLEX® KX-D	BoWex® HEW Compact	BoWex-ELASTIC®	BoWex® GT	MINEX®-S	MMC Cooler
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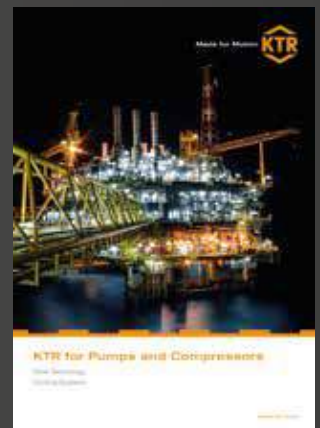
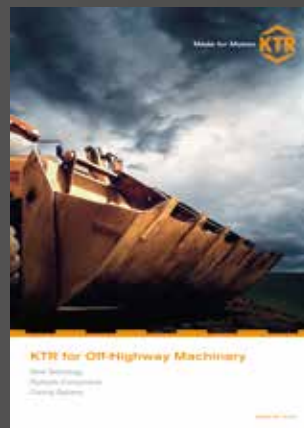
# Overview of literature

The KTR product portfolio is as varied as its areas of use, whether you require the perfect power transmission system, effective brakes, space-saving cooling systems or precision hydraulics on land, water or high in the air. These catalogues and brochures offer an overview. Available at [www.ktr.com](http://www.ktr.com)

## Product catalogues



## Individual sector brochures





**Headquarter:**

**KTR Kupplungstechnik GmbH**  
 Postfach 1763  
 D-48407 Rheine  
 Phone: +49(0)5971 798-0  
 Fax: +49(0)5971 798-698  
 and 798-450  
 E-Mail: mail@ktr.com  
 Internet: www.ktr.com

**KTR Brake Systems GmbH**  
**Competence Center for Brake Systems**  
 Zur Brinke 14  
 D-33758 Schloß Holte-Stukenbrock  
 Phone: +49(0)5207 99161-0  
 Mobile: +49(0)175 2650033  
 Fax: +49(0)5207 99161-11

**KTR worldwide:**

**Algeria**  
 KTR Alger  
 Algeria Business Center -  
 Pins Maritimes  
 DZ-16130 Alger Mohammedia  
 Phone: +213 661 92 24 00  
 E-mail: ktr-dz@ktr.com

**Belgium/Luxemburg**  
 KTR Benelux B. V. (Bureau Belgien)  
 Blancfloerlaan 167/22  
 B-2050 Antwerpen  
 Phone: +32 3 2110567  
 Fax: +32 3 2110568  
 E-mail: ktr-be@ktr.com

**Brazil**  
 KTR do Brasil Ltda.  
 Rua Jandaia do Sul 471 -  
 Bairro Emiliano Perneta  
 Pinhais - PR - Cep: 83324-040  
 Phone: +55 41 36 69 57 13  
 Fax: +55 41 36 69 57 13  
 E-mail: ktr-br@ktr.com

**China**  
 KTR Power Transmission Technology  
 (Shanghai) Co. Ltd.  
 Building 1005, ZOBON Business Park  
 999 Wangqiao Road  
 Pudong  
 Shanghai 201201  
 Phone: +86 21 58 38 18 00  
 Fax: +86 21 58 38 19 00  
 E-mail: ktr-cn@ktr.com

**Czech Republic**  
 KTR CR, spol. s. r. o.  
 Olomoucká 226  
 CZ-569 43 Jevicko  
 Phone: +420 461 325 162  
 Fax: +420 461 325 162  
 E-mail: ktr-cz@ktr.com

**Finland**  
 KTR Finland OY  
 Tiistinniintyentie 4  
 SF-02230 Espoo  
 PL 23  
 SF-02231 Espoo  
 Phone: +358 2 07 41 46 10  
 Fax: +358 2 07 41 46 19  
 E-mail: ktr-fi@ktr.com

**France**  
 KTR France S.A.R.L.  
 46-48 Chemin de la Bruyère  
 F-69570 Dardilly  
 Phone: +33 478 64 54 66  
 Fax: +33 478 64 54 31  
 E-mail: ktr-fr@ktr.com

**Great Britain**  
 KTR Couplings Ltd.  
 Robert House  
 Unit 7, Acorn Business Park  
 Woodseats Close  
 Sheffield  
 England, S8 0TB  
 Phone: +44 11 42 58 77 57  
 Fax: +44 11 42 58 77 40  
 E-mail: ktr-uk@ktr.com

**India**  
 KTR Couplings (India) Pvt. Ltd.,  
 T-36 / 37 / 38, MIDC Bhosari  
 Pune 411026  
 Phone: +91 20 27 12 73 22  
 Fax: +91 20 27 12 73 23  
 E-mail: ktr-in@ktr.com

**Italy**  
 KTR Kupplungstechnik GmbH  
 Sede Secondaria Italia  
 Via Giovanni Brodolini, 8  
 I - 40133 Bologna (BO)  
 Phone: +39 051 613 32 32  
 Fax: +39 02 700 37 570  
 E-mail: ktr-it@ktr.com

**Japan**  
 KTR Japan Co., Ltd.  
 3-1-23 Daikaidori  
 Hyogo-ku, Kobe-shi  
 652-0803 Japan  
 Phone: +81 7 85 74 03 13  
 Fax: +81 7 85 74 03 10  
 E-mail: ktr-jp@ktr.com

KTR Japan - Tokyo Office  
 1-11-6, Higashi-Ueno, Taito-Ku,  
 Tokyo 110-0015 Japan  
 (Takeno-building, 5F)  
 Japan  
 Phone: +81 3 58 18 32 07  
 Fax: +81 3 58 18 32 08

**Korea**  
 KTR Korea Ltd.  
 # 101, 978-10, Topyung-Dong  
 Guri-City, Gyeonggi-Do  
 471-060 Korea  
 Phone: +82 3 15 69 45 10  
 Fax: +82 3 15 69 45 25  
 E-mail: ktr-kr@ktr.com

**Netherlands**  
 KTR Benelux B. V.  
 Postbus 87  
 NL-7550 AB Hengelo (O)  
 Adam Smithstraat 37  
 NL-7559 SW Hengelo (O)  
 Tel.: +31 74 2553680  
 Fax: +31 74 2553689  
 E-mail: ktr-nl@ktr.com

**Norway**  
 KTR Kupplungstechnik Norge AS  
 Fjellbovegen 13  
 N-2016 Frogner  
 Phone: +47 64 83 54 90  
 Fax: +47 64 83 54 95  
 E-mail: ktr-no@ktr.com

**Poland**  
 KTR Polska SP. Z. O. O.  
 ul. Czerwone Maki 65  
 PL-30-392 Kraków  
 Phone: +48 12 267 28 83  
 Fax: +48 12 267 07 66  
 E-mail: ktr-pl@ktr.com

**Russia**  
 KTR Privodnaya tehnika, LLC  
 6 Verhniy Pereulok 12  
 Litera A, Office 229  
 194292 St. Petersburg  
 Phone: +7 812 383 51 20  
 Fax: +7 812 383 51 25  
 E-mail: ktr-ru@ktr.com  
 Internet: www.ktr.ru

**South Africa**  
 KTR Couplings South Africa (Pty) Ltd.  
 28 Spartan Road, Kempton Park,  
 GautengSpartan Ext. 21  
 Phone: +27 11 281 3801  
 Fax: +27 11 281 3812  
 E-mail: ktr-za@ktr.com

**Spain**  
 KTR Kupplungstechnik GmbH  
 Estartetxe, nº 5-Oficina 218  
 E-48940 Leioa (Vizcaya)  
 Phone: +34 9 44 80 39 09  
 Fax: +34 9 44 31 68 07  
 E-mail: ktr-es@ktr.com

**Sweden**  
 KTR Sverige AB  
 Box 742  
 S-191 27 Sollentuna  
 Phone: +46 86 25 02 90  
 Fax: +46 86 25 02 99  
 E-mail: info.se@ktr.com

**Switzerland**  
 KTR Kupplungstechnik AG  
 Bahnstr. 60  
 CH-8105 Regensdorf  
 Phone: +41 4 33 11 15 55  
 Fax: +41 4 33 11 15 56  
 E-mail: ktr-ch@ktr.com

**Taiwan**  
 KTR Taiwan Ltd.  
 1 F, No.: 17, Industry 38 Road  
 Taichung Industry Zone  
 Taichung, R. O. C.  
 Phone: +886 4 23 59 32 78  
 Fax: +886 4 23 59 75 78  
 E-mail: ktr-tw@ktr.com

**Turkey**  
 KTR Turkey  
 Güç Aktarma Sistemleri San. ve Tic. Ltd.  
 Sti.  
 Kayışdagı Cad. No: 117/2  
 34758 Atasehir -Istanbul  
 Phone: +90 216 574 37 80  
 Fax: +90 216 574 34 45  
 E-mail: ktr-tr@ktr.com

**USA**  
 KTR Corporation  
 122 Anchor Road  
 Michigan City, Indiana 46360  
 Phone: +1 2 19 8 72 91 00  
 Fax: +1 2 19 8 72 91 50  
 E-mail: ktr-us@ktr.com

**Headquarter**

**KTR Kupplungstechnik GmbH**

P.O. Box 1763

D-48407 Rheine

Phone: +49(0)5971 798-0

Fax: +49(0)5971 798-698 u. 798-450

E-mail: [mail@ktr.com](mailto:mail@ktr.com)

Internet: [www.ktr.com](http://www.ktr.com)

