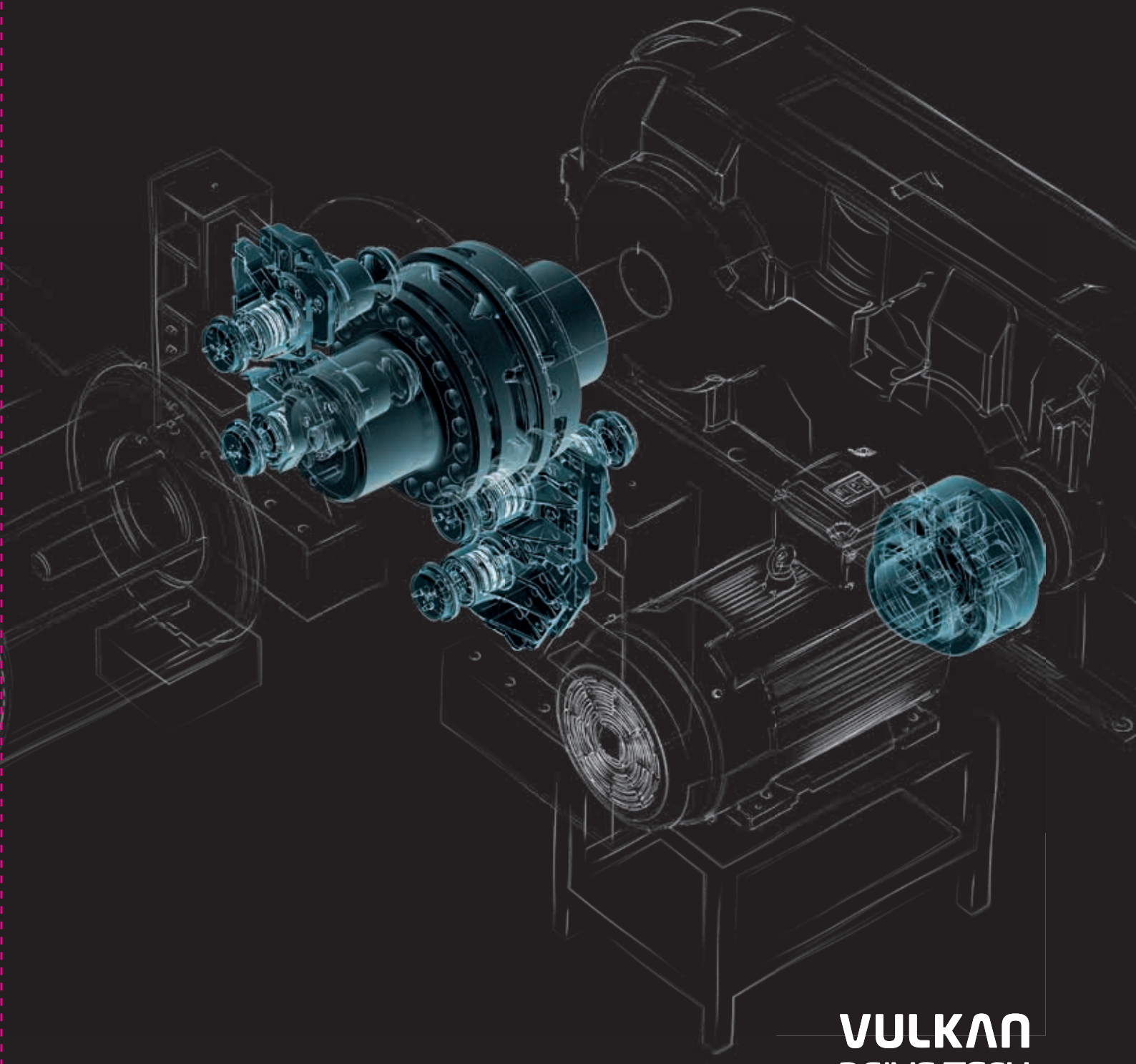
DRIVE SOLUTIONS FOR BELT CONVEYORS, STACKERS AND RECLAIMERS



TORQUE FOR HEAVY DUTIES

VULKAN DRIVE TECH

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REQUIREMENTS

Iron ores, coal, precious minerals and similar materials need to be transported from mines to different points of use – such as processing plants or stocking piling – for sea transportation to other end users. Conveyor belts, stackers and reclaimers are the main machinery used for this purpose. The expected performances of these applications are extremely high and require **powerful and reliable drives** with power ratings up to 10,000 kW and transportation capacity up to 15,000 tons per hour.

Couplings are generally installed onto either high speed and low speed shafts of the drive train in order to **compensate misalignments** between the motor and the gearbox. Alternatively, they can be installed between the gearbox and the pulley when the drive train is on a separate base frame from the pulley drum (typical configuration of high powered conveyors). The coupling compensates misalignments due to **thermal expansions** phenomena, as well as reduces **shock loads** transmissions. Inclined conveyors do also require **safety equipment**, in the unlike event of emergency conditions such as **failure of the drive train**, **rolling back of the belt** or **overspeeding** of regenerative conveyor belts. For these purposes either **backstops and brakes systems** have to be properly selected. Motor stalling torque, run back torque, conveyor stopping time, conveyor speed, are just few mandatory variables to be considered into couplings, backstops and brakes system design.

SOLUTIONS

To face all of these requirements, **VULKAN Drive Tech** has developed an extensive product portfolio that is specific for belt conveyors applications, including torsional flexible couplings, torsional rigid couplings, service and emergency brakes and backstops focusing on the following **three major key aspects:**

Efficiency

To minimise service and machinery lay down costs, VULKAN Drive Tech has developed couplings with special elastic elements that are made of chemical contamination resistant materials. These increase the lifetime of the products considerably. Brakes are equipped with special sealings that guarantee no contamination of potentially dangerous dust to internal brakes components. Backstops are equipped with additional oil reservoir tanks, which increase the operating time between services.

Tailor-made solutions

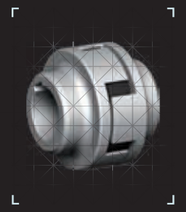
Due to the unique nature of each belt conveyor, it is simply impossible to take another approach to the application of its products, if not the one of customised solutions. Our engineers are at the disposal of our customers to ensure that the best tailor-made solution is developed. A proposal that can satisfy either technical and economic requirements that each project specifically demands: a customised solution with standard design products.

Design

Couplings, brakes and backstops have an extremely high interaction rate within the design of a conveyor belt drive train. VULKAN Drive Tech provides specific designs to closely match the integrated installation of couplings and brakes (or backstops), with a view to optimising product performances. State of the art engineering, 3D CAD tools, in-house testing are the foundation of VULKAN know-how.

SOLUTIONS

Product portfolio



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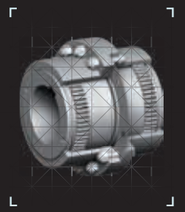

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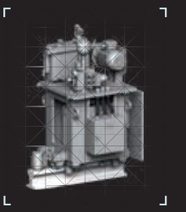

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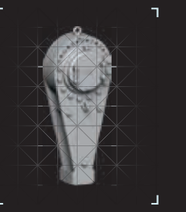

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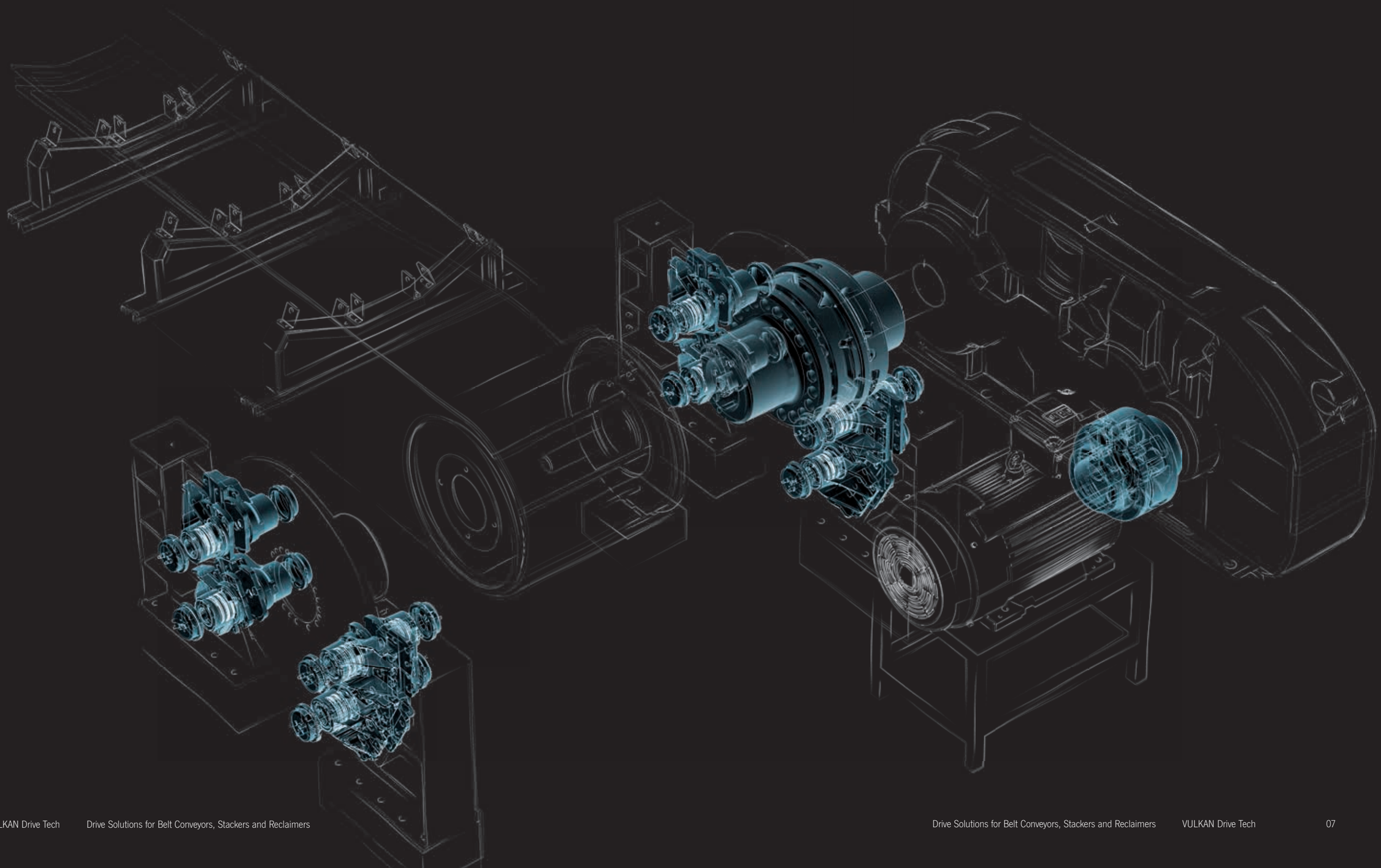


FLEXOMAX

Nominal Torque Range: 0.003 – 644.00 kNm

FLEXOMAX GSN

FLEXOMAX is a family of torsional flexible couplings which are used for high speed shaft installation. It is characterized by claw design and shaft to shaft design, with radial removability, without moving the connected machinery.

FEATURES

The three different designs available are FLEXOMAX G, FLEXOMAX GSN and FLEXOMAX GBN; each of which is developed to fulfill specific requirements in terms of nominal torque transmission, shock loads absorption, axial, radial and angular misalignments capacity. The elastic element of the three designs differs as regards material and geometry and this means that it complies with even the most demanding application requirements. FLEXOMAX is available in more than 30 different versions and 50 different sizes. This ensures it will fit the requirements of almost any application.

The FLEXOMAX coupling is suitable for reverse rotation and is typical of electric motor drives. The claws and elastic element design mean that FLEXOMAX is a maintenance-free product as it does not require any special type of servicing or maintenance. The wearing of the elastic element is minimised by the material used, which is NBR for FLEXOMAX G and polyurethane for FLEXOMAX GSN and GBN. FLEXOMAX is suitable for compensating axial, radial and angular misalignments due to thermal growth and dynamic misalignments of the machinery.

The modular design of the couplings allow the creation of specific versions to fit almost any kind of machinery, such as, for example, FLEXOMAX GH, with intermediate spool to enable the removal of the pump's impeller without the need to move the machinery. Other examples are the FLEXOMAX GGTB, GSND-TB and GBND-TB, which are provided with an integrated brake disc in order to properly accommodate the installation of a service or parking brake as well. The radial removal of the elastic element is a common feature of all FLEXOMAX G, GSN and GBN designs, so as to enable the most straightforward replacement of the element with minimum costs.

FLEXOMAX G: Nominal Torque Range: 0.02 to 48.60 kNm and shaft accommodation up to ø 250 mm
FLEXOMAX GSN: Nominal Torque Range: 0.003 to 20.00 kNm and shaft accommodation up to ø 250 mm
FLEXOMAX GBN: Nominal Torque Range: 3.6 to 64.44 kNm and shaft accommodation up to ø 600 mm

PRODUCT KEY FACTS

Efficiency

- Allows to compensate axial, radial and angular misalignments.
- Limited maintenance required.
- Protect the drivetrain from shockloads.

Tailor-made solutions

- Modular design with high customisation degree possibilities.
- Radial removability of the coupling without moving the connected machinery.
- Possibility to integrate braking discs or pulleys within the coupling.

Design

- Available in different designs G-GSN-GBN to satisfy the most restricted applications' requirements.
- Reverse functionality.
- Compact design.

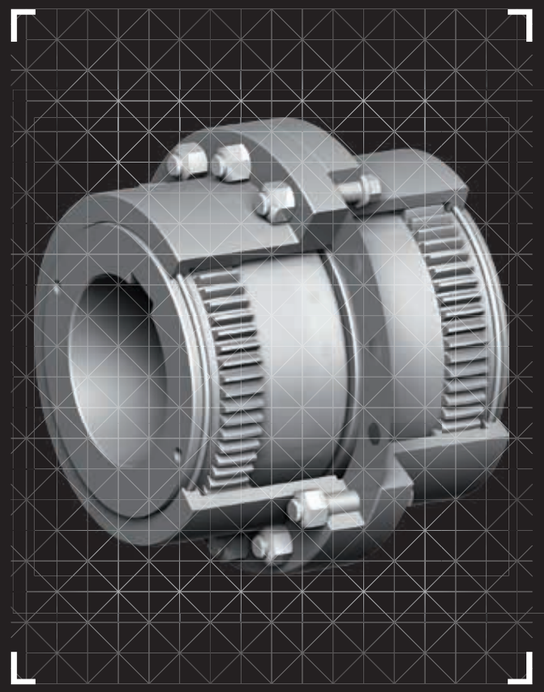
More products of this series:

FLEXOMAX G

FLEXOMAX GBN

DENFLEX

Nominal Torque Range: 1.00 – 560.00 kNm



DENFLEX

DENFLEX is a tooth gear coupling that is torsionally rigid and used for synchronous torque transmission. The tooth gear profile allows the transmission of high torque values within minimum sizing of the coupling and compensates axial, radial and angular misalignments with low reaction forces generation.

FEATURES

It is particularly suitable for low speed shaft applications where high torque within limited size and weight is mandatory. The modular design of its components allows a huge variety of design compositions, which in turn fit even the most demanding applications.

The tooth profile is the core of this coupling and DENFLEX features a specific design that guarantees the minimum surface contact area between teeth. This ensures that friction and the consequent wearing of the parts is reduced, hence increasing the lifetime of the product. The spline design of the tooth sleeves allows DENFLEX to compensate high axial misalignments; in addition, the round tooth profile compensates either radial or angular misalignments as well. A complete system of sealings and gaskets prevent the gears area from becoming contaminated by dust or aggressive elements that could reduce the internal lubricant lifetime or even damage the gears.

DENFLEX, with standard lubrication, can be used for an operation environment temperature ranging from -10°C up to 90°C. Meanwhile, special lubrication is available on demand for more extreme environmental conditions. The reduced number and modular design of the components make DENFLEX a highly customisable product. Indeed, it is available in more than 30 different versions and 17 sizes that are suitable for shaft accommodation up to ø 450 mm.

A special version is also available on demand that features hardened teeth and is able to transmit an additional 30-40% (depending on size) of torque, within the same dimensions of the standard coupling.

PRODUCT KEY FACTS

Efficiency

- High torque transmission within limited dimensions.
- Long lasting working condition between service operations.
- High axial misalignment capacity.

Tailor-made solutions

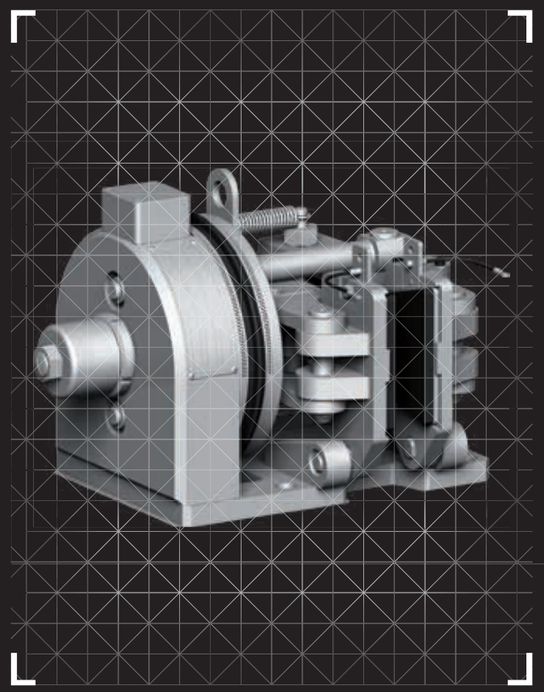
- More than 30 different configurations available.
- Possibility to integrate braking discs or pulleys within the coupling.
- High torque transmission version (+30%) available on demand.

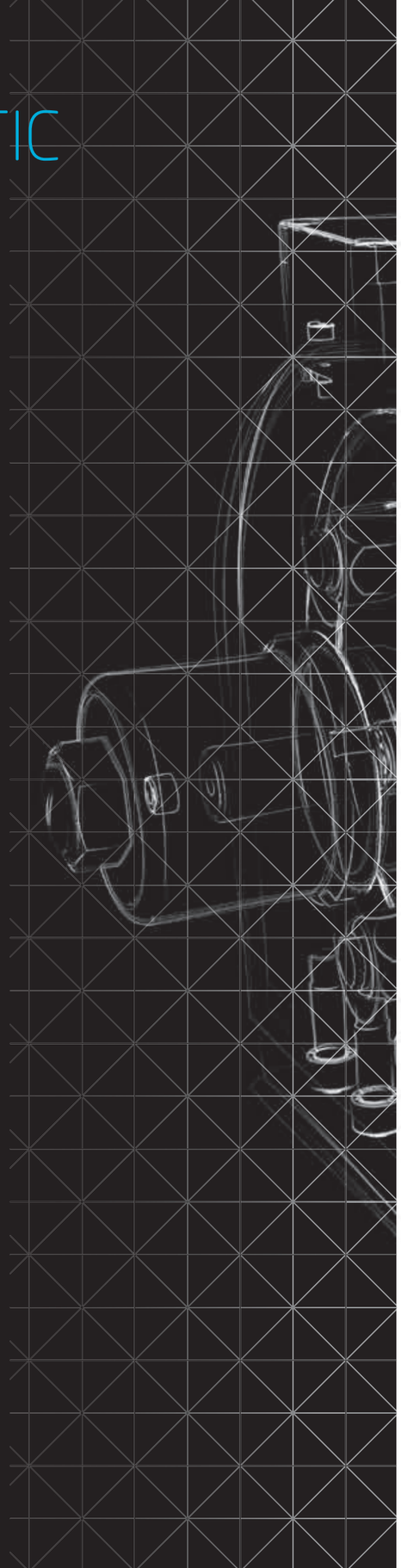
Design

- High axial misalignment capacity with minimised reaction forces to the connected machinery.
- Synchronous torque transmission.
- Sealed against aggressive contaminants.
- Modular design.

ELECTROMAGNETIC BRAKES

Nominal Torque Range: 0.01 – 25.00 kNm





ELECTROMAGNETIC DISC BRAKE

Large fans machinery might require service and parking brakes due to the high inertias of the machinery components. VULKAN Drive Tech has a wide range of failsafe ELECTROMAGNETIC BRAKES used for this scope, which are specifically designed to comply with service, parking or emergency working profiles.

FEATURES

Each brake model can be equipped with a variety of accessories to comply with the most demanding applications that require reliable product performances within the most extreme operating conditions. The VULKAN Drive Tech power supply portfolio completes the brakes product range that we are able to offer.

VULKAN Drive Tech ELECTROMAGNETIC BRAKES are failsafe brakes that are available in either disc or drum configuration (AISE 11 Standard). They have been designed to ensure a minimum operating reaction time of 0.2 seconds and to support repetitive braking operations up to 700 cycles per hour. Laboratory tests have shown that VULKAN Drive Tech brakes are maintenance-free for up to 4,000,000 cycles.

VULKAN Drive Tech offers the following main customisation possibilities: automatic lining wear compensation system, brakes position sensors, pads worn out sensors, automatic or manual brake release mechanism, organic and sintered pads that are asbestos-free. Furthermore, the complete range of solid and self-ventilated discs with integrated flexible couplings are also available and these complete the scope of supply.

Each brake is equipped with a power supply unit to operate it; as regards the calipers, the power supply units can also be equipped with different electric/electronic circuits to better suit the specific requirements of the applications.

PRODUCT KEY FACTS

Efficiency

- Failsafe brake.
- 0,2 seconds reaction time.
- Maintenance-free up to 4,000,000 cycles.

Tailor-made solutions

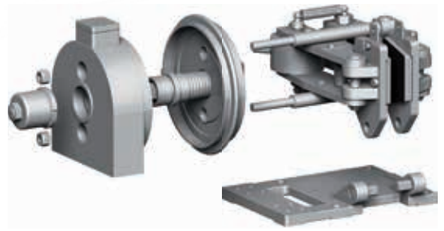
- Left and right installation versions.
- Brake and pads status monitoring available.
- Braking torque tuning capacity.

Design

- Available in either disc or drum configuration.
- Shunt or series coil available.
- Automatic lining wear compensation system.

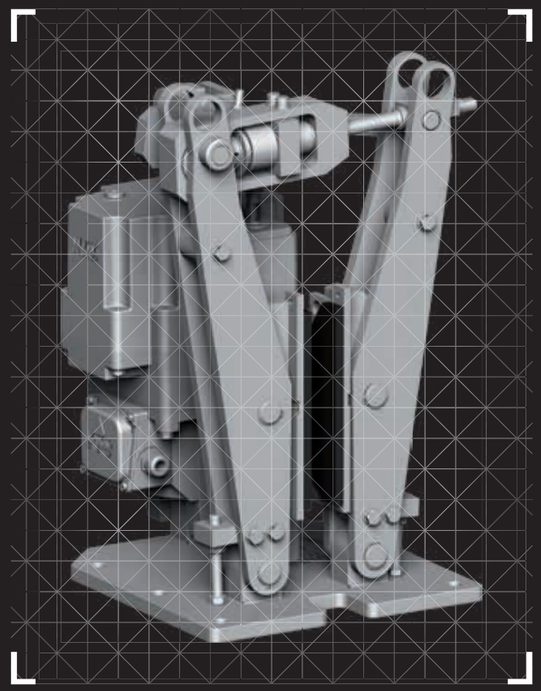
More products of this series:

ELECTROMAGNETIC DRUM BRAKE



ELECTROHYDRAULIC BRAKES

Nominal Torque Range: 0.20 – 17.80 kNm



ELECTROHYDRAULIC DISC BRAKE

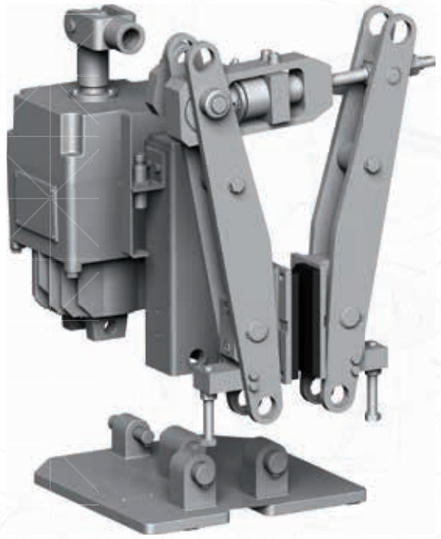
When service brakes do not require a high degree of manoeuvring, a useful alternative to ELECTROMAGNETIC BRAKES could be ELECTROHYDRAULIC BRAKES. Available in either a disc or drum configuration, VULKAN Drive Tech ELECTROHYDRAULIC BRAKES are of a failsafe type and do not require the combined installation of a power supply to operate the caliper, which means an economic advantage at installation.

FEATURES

A wide range of accessories is also available for this product family, which includes automatic lining wear compensation system, pads worn out control and sintered pads. Our applications engineering desk will provide the right configuration according to the specific requirements of the customer.

VULKAN Drive Tech ELECTROHYDRAULIC BRAKES are spring applied and released by means of an electrohydraulic thruster that can be fed by 220-380 or 440 VAC and that has been designed according to the DIN 15430 standard. The nominal braking torque value can be manually adjusted in order to properly fit each application and the electrohydraulic thruster can be equipped with delay valves for smooth braking operation.

The ELECTROHYDRAULIC BRAKES family is available in three different caliper sizes, seven different thruster models and 13 disc configurations. This ensures that the braking features of each caliper can be properly set. Furthermore, it is possible to manually adjust the nominal braking torque value of each brake to fine tune the performance of the brakes on-site. Automatic lining wear compensation system, brakes position sensors, pads worn out sensors, automatic or manual brake release mechanism, and asbestos-free organic and sintered pads, are the main customisation possibilities that VULKAN Drive Tech offers.



PRODUCT KEY FACTS

Efficiency

- Failsafe Brake.
- Easy and fast installation on site.
- Compliance to DIN 15430 Standard.

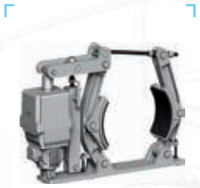
Tailor-made solutions

- Left and right installation versions.
- Brake and pads status monitoring available.
- Braking torque tuning capacity.

Design

- Available in either disc or drum configuration.
- Modular design to fit different thruster into the same caliper.
- Automatic lining wear compensation system.

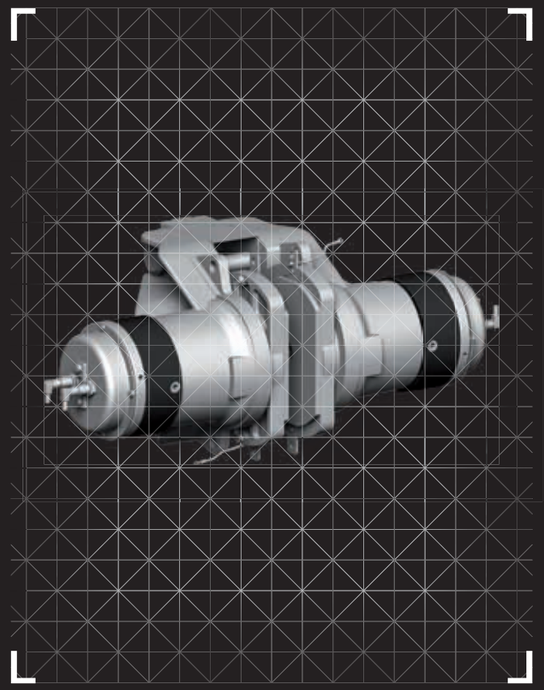
More products of this series:

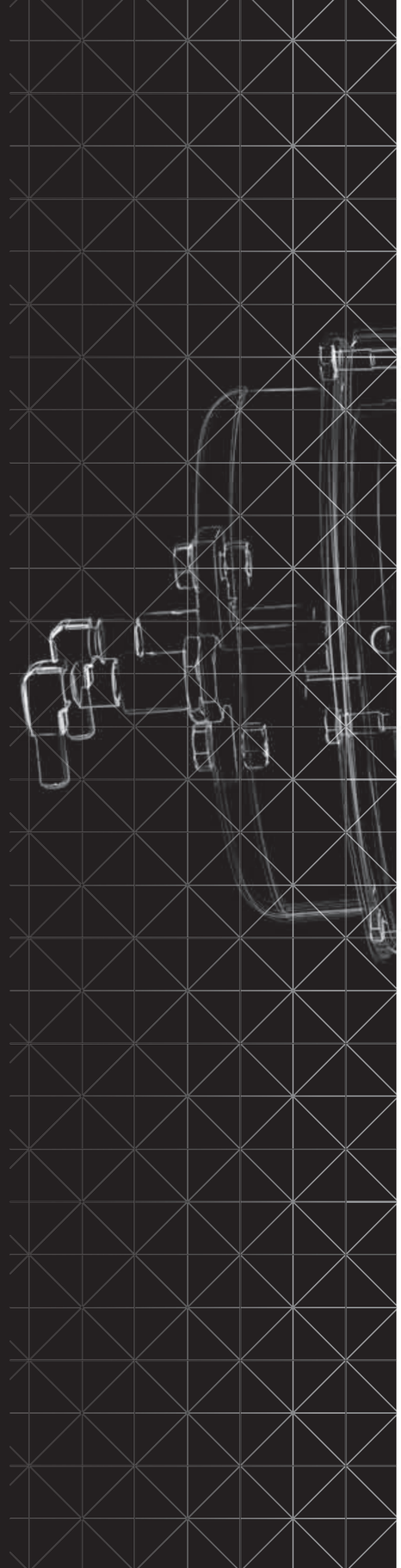


ELECTROHYDRAULIC DRUM BRAKE

HYDRAULIC BRAKES

Nominal Torque Range: 0.11 – 171.00 kNm





HYDRAULIC DISC BRAKE

Regenerative conveyors need braking systems that are capable of preventing overspeeding of the belt during normal operations and emergency stopping in critical conditions. As proportional braking and high dynamic torque due to machinery inertias are the main features to be considered, HYDRAULIC BRAKES are the prime products for this application.

FEATURES

BRAKES > HYDRAULIC DISC BRAKE

The VULKAN Drive Tech HYDRAULIC BRAKES portfolio includes a wide range of calipers with all of the relevant accessories, such as a hydraulic power pack, electronic control unit and special electronic braking monitoring system that is able to continuously control the speed of the conveyor and apply proportional braking torque. This prevents overspeeding and guarantees the belt will stop within the desired time without overstressing of the belt itself, regardless of the load percentage of the conveyor.

VULKAN Drive Tech HYDRAULIC BRAKES are available in either positive (hydraulic applied and spring released) or negative (spring applied and hydraulic released) configuration and in single spring design for disc floating conditions, or double spring design for fixed disc conditions. The SH line is the prime product used for emergency operations into the belt conveyor. Available in nine different sizes, this double spring caliper can be easily installed on any disc diameter and thickness thanks to its adjustable design. A manual lining wear compensation system, brakes position sensors, pads worn out sensors, manual brake release mechanism, and organic and asbestos-free sintered pads are the main customisation possibilities offered by VULKAN Drive Tech.

VULKAN Drive Tech also provides a wide range of hydraulic power packs with different hydraulic performances such as the simple “On/Off” CH1 circuit or the most complex and sophisticated CH6 “Digital Proportional Braking system” which has the possibility of several custom accessories.

PRODUCT KEY FACTS

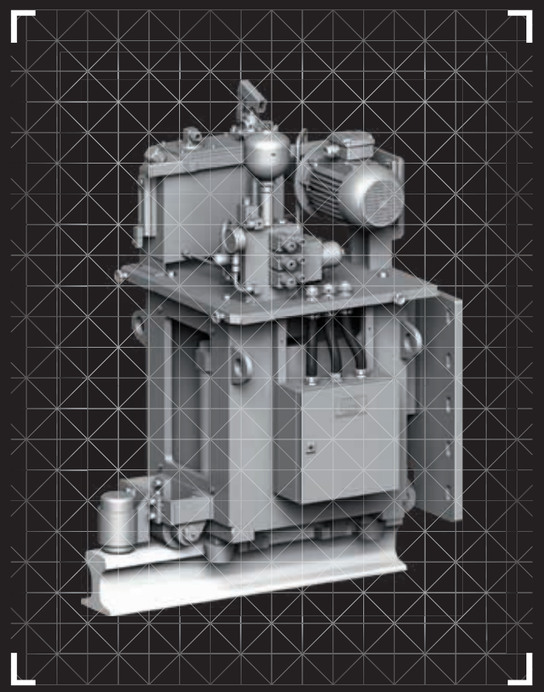
Efficiency
- Failsafe brake.
- Proportional braking capacity.
- High braking force capacity.

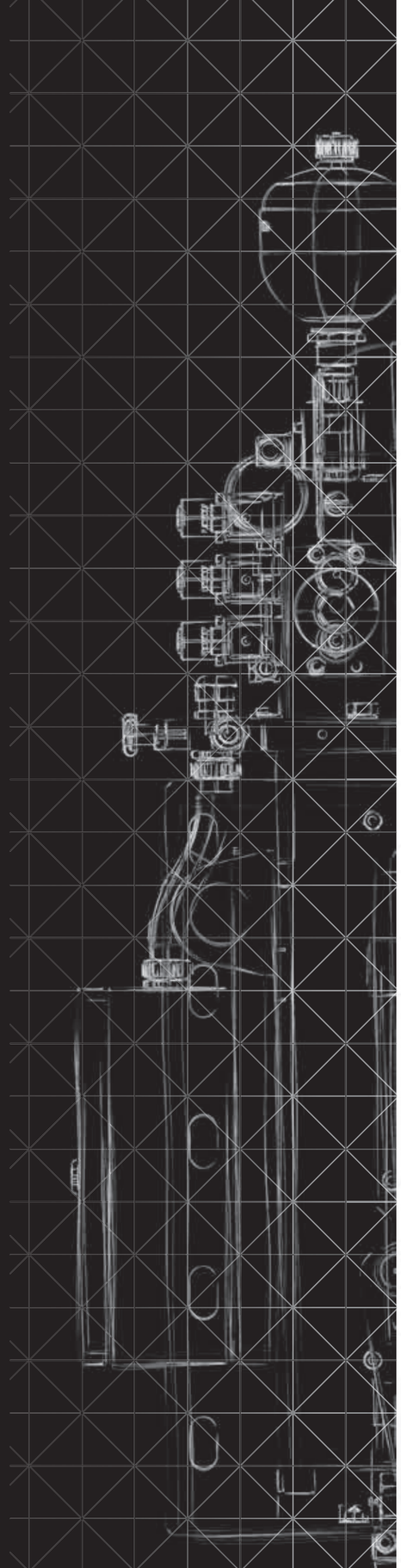
Tailor-made solutions
- Brake and pads monitoring status available.
- Possibility to install on any disc diameter and thickness.
- Digital proportional braking system control unit.

Design
- Mono and dual spring design.
- 6 different hydraulic power pack units.
- Lining wear compensation system.

RAIL CLAMPS

Nominal Torque Range: 50.00 – 400.00 kNm





RAIL CLAMPS

Also known as the “Storm Brake”, this product is largely used on port cranes, stackers, reclaimers and gantry cranes, where extreme winds might affect stability. They provide stability during abnormal operating conditions by literally clamping the crane to its foundations: rails.

FEATURES

VULKAN Drive Tech Rail Clamps are composed of a spring applied or counterweight applied brake, which is then hydraulically released. Designed to meet the most critical applications and weather conditions, the rail clamps are provided with treated alloy steel jaws enabling better clamping effort performance.

The hydraulic power pack is designed in such a way as to guarantee the clamp remains open without requiring the frequent starting of the motor. This prolongs the lifetime of the hydraulic valves and components in general. To stop the clamps from accidentally closing, they are equipped with “open/close” status sensors, and there is also a flow control valve used, the purpose of which is to enable time controlled closing during clamping. Available in seven different sizes, VULKAN Drive Tech Rail Clamps are supplied to match a specific rail profile and can be designed for either front fastening or top fastening installation.

VULKAN Drive Tech Engineering is available for the design and selection of rail clamps, which are based on the wind requirements of single projects and machinery layout.

PRODUCT KEY FACTS

Efficiency

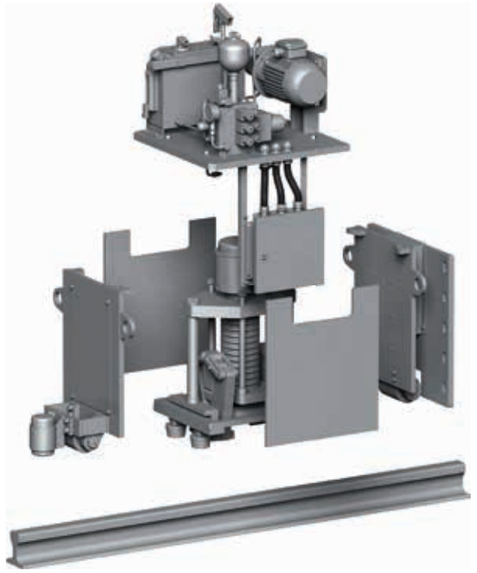
- Clamping force up to 400 kN.
- Long lasting static open condition without engaging of the motor pump.
- Redundant pressure switches to prevent failure risk.

Tailor-made solutions

- Suitable for any rail profile.
- Front or top fastening version.
- With or without hydraulic power pack.

Design

- Secure rail side clamping jaws system.
- Clamp status monitoring system to prevent accidental closing.
- Articulated structure to avoid unnecessary friction with rails.



BACKSTOPS

Nominal Torque Range: 0.001 – 578.00 kNm

LOW SPEED BACKSTOP

VULKAN Drive Tech provides backstops for either high speed shaft or low speed shaft installations. The bearings can be sprag lift off or roller type, with or without radial bearing support and torque arm. Backstops are also available for pulley shaft end installation or shaft through installation and most sub-components are symmetrical in order to simplify their assembly in relation to the free rotation side, blocking direction and torque arm positioning.

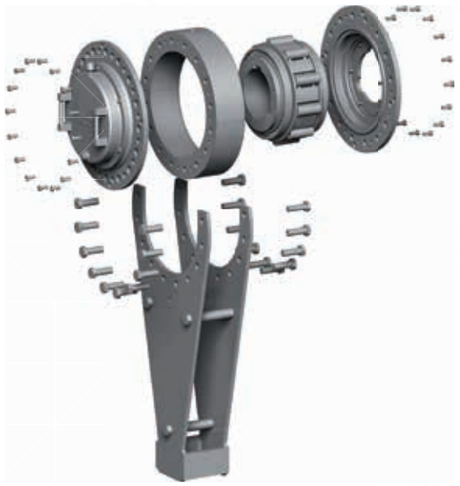
FEATURES

The labyrinth sealing system guarantees optimal working conditions for the bearings and rollers, which have been designed for a standard lifetime of 10,000,000 stopping cycles. Furthermore, extra oil reservoir tanks for either pulley shaft end design (T) or shaft through installation design (P) are available to increase the operating working hours between maintenance service intervals.

Finish bores according to customer specification with relative number and type of keyways, together with different torque arm designs and lengths complete the backstop custom design possibilities. This ensures compliance with the requirements of each individual project.

Every VULKAN Drive Tech backstop is supplied with internal test certification that shows the operating conditions test it has been subjected to and which corresponds to the field working conditions to which it must comply.

The sprag lift off design with radial support bearing, such as BA & BC, are generally installed on high speed shafts. Meanwhile, Design 261, with cylindrical rollers and radial bearings, is typically installed on low speed shafts.



PRODUCT KEY FACTS

Efficiency

- Operating lifetime of the bearing for 10,000,000 cycles.
- Steel hardened components and labyrinth sealing system for long lasting of internal components.

Tailor-made solutions

- Different torque arms typology available.
- Extra oil reservoir tank.
- Reaction force balancing device on demand.

Design

- Cylindrical rollers or sprag lift off type available.
- Through shaft or free end shaft installation design.
- Blocking direction orientation possibility.

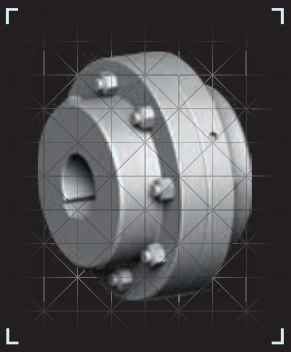
More products of this series:

HIGH SPEED BACKSTOP

NOTES

PRODUCT RANGE

For Belt Conveyors, Stackers and Reclaimers



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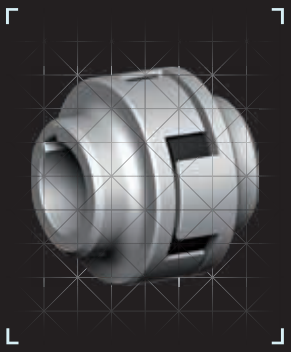

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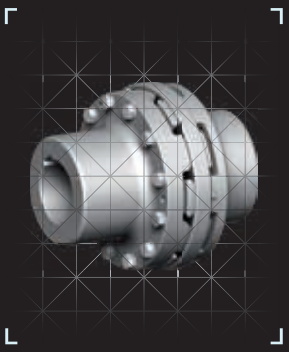

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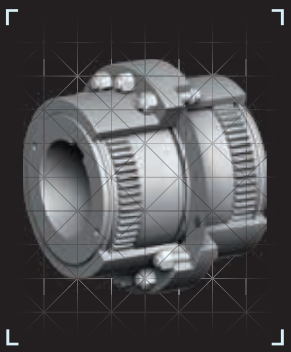

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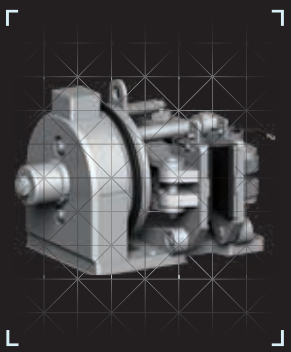

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19 **ELECTROMAGNETIC DRUM BRAKE**
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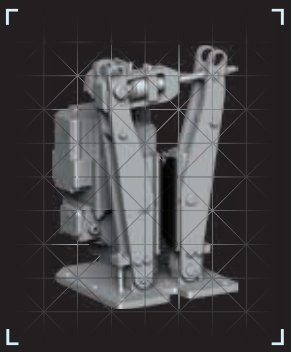

21 **ELECTROHYDRAULIC DISC BRAKE**
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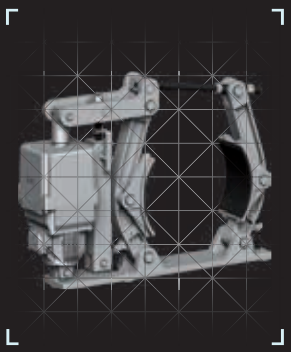

22 **ELECTROHYDRAULIC DRUM BRAKE**
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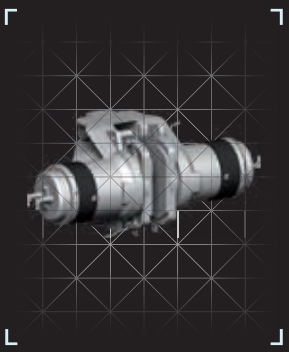

23 **HYDRAULIC DISC BRAKES**
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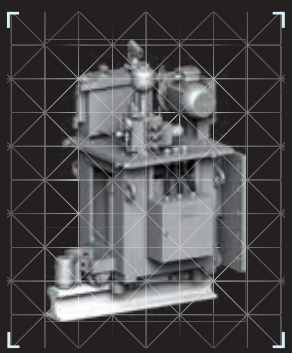

24 **RAIL CLAMPS**
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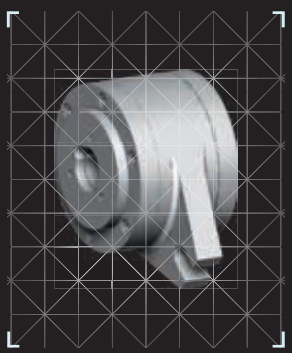

25 **HIGH SPEED BACKSTOP**
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26 **LOW SPEED BACKSTOP**
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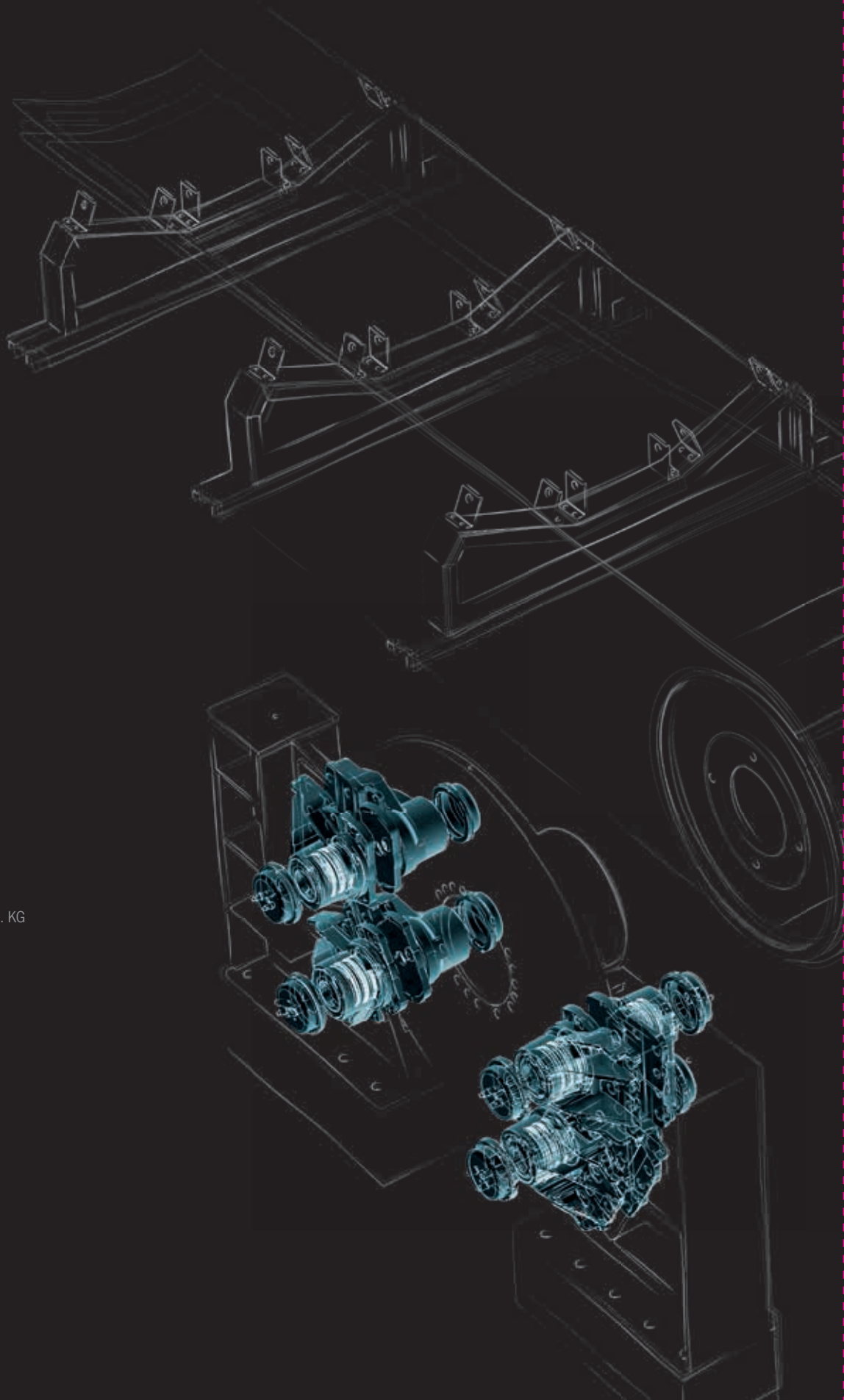

PUBLISHER:
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STATUS: 09/2013