

#### INTORQ



KENDRION

**KENDRION** SOLUTIONS

OKG

#### **Engineering the future** Electromagnetic brakes

for industrial applications

PRECISION. SAFETY. MOTION.

# Our brakes – perfect for your safe application

KENDRION Industrial Brakes – stands for smart innovation and excellent service, which we consistently apply for the benefit of our customers:

#### Strong know-how

Our specialists develop the leading-edge permanent magnet and springapplied brakes. With INTORQ as a new member of KENDRION, we have once again consistently expanded our range of spring-applied brakes and clutches for you. This way, we can find the right solution for any of your requirements.

#### Complete product portfolio

Electromagnetic brakes and clutches as well as perfectly matched accessories: with us you will find an exceptionally large selection of quickly available off-the-shelf products that can be put together in a modular system and the best expertise for customer-specific solutions.

#### Dynamic innovative power

More than 50 specialists working in agile teams in our research and development worldwide are creating convincing product solutions for tomorrow.

#### Excellent market knowledge

We are very familiar with our focus markets - thanks to extensive experience and research, but also thanks to long-term customer relationships built on partnership and eye-to-eye cooperation.

#### International power

Committed and competent employees, production sites in Germany, America, India and China as well as a large number of certified sales partners all over the world make us a strong partner for you!



## Industrial Brakes by Kendrion

Permanent Magnet Brakes



Rectifiers



Electromagnetic Brakes

Electronics

### Permanent Magnet Brakes High power density and dynamics

Due to their high power density, wear- and residual torque-free operation and short switching cycles permanent magnet brakes are in most cases the optimum solution in robotics and machine building.

Above all, permanent magnet brakes convince by their compact dimensions and their relatively low weight. with a diameter of 14 mm, it is smaller than a one-cent coin and is particularly suitable for applications with the highest demands on installation space and weight.

Furthermore, due to their design principle permanent magnet brakes are backlash- and wear-free. Thus, permanent magnet brakes are ideally suited for applications in medical technology and for servomotor applications, e.g. in handling technology and robotics.

#### The smallest permanent magnet brake in the world

... with a diameter of 14 mm, it is smaller than a one-cent coin and is particularly suitable for applications with the highest demands on installation space and weight.



#### Automation & Robotics



Applications





#### Servo Motors



#### Medical Engineering





- Designed for integrated installation in the motor
- A- and B-side mounting position on fixed bearing possible
- Integration in non-motor applications possible





## Space saving design & Efficiency

The internal installation of brakes within a drive system offers a compact, space-saving solution that protects the brake from environmental factors such as dust and moisture. Additionally, the brake integration reduces system complexity, optimizes coordination between the brake and the drive and allows more efficient power transmission.

#### The new flat spring-applied brake

Servo Slim Line from Kendrion is ideal for light weight robotic applications. It is lighter and flatter than the market standard, and its large inner diameter makes it particularly well-suited for hollow shaft drives in lightweight robots.

Automation & Robotics

#### Engineering at its best

Brake design is our passion. Top applications require brakes that meet the highest requirements. With the Servo Slim Line, we offer one of the slimmest brakes in the world.



#### Servo Motors



## Applications



#### Medical Engineering



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	Servo Line		Servo Slim Line
Features	<ul> <li>Fail-safe spring-applied brake with high variability</li> <li>High power density due to patented air gap adjustment</li> <li>Versatile mounting options (face or flange mounting)</li> <li>Fast opening and closing times</li> </ul>	0	<ul> <li>Flat fail-safe spring-applied brake in space-saving design</li> <li>Suitable for hollow shaft motors due to large inner diameter</li> <li>Optimal for dynamic applications due to low weight</li> <li>Flexible cable routing and mounting options</li> </ul>
lechnical data	<ul> <li>Holding brake with emergency stop function</li> <li>10 sizes in standard</li> <li>Torque range: 0.22 Nm - 70 Nm</li> <li>Operating voltage: 24 VDC</li> <li>Temperature range: -15 °C to +120 °C</li> </ul>		<ul> <li>Holding brake with emergency stop function</li> <li>7 sizes in standard</li> <li>Torque range: 0.27 Nm - 8 Nm</li> <li>Operating voltage: 24 VDC</li> <li>Temperature range: -10 °C to +100 °C</li> </ul>

- Designed for integrated installation in the motor
- A- and B-side installation position possible on the locating and non-locating bearing
- Simple and versatile installation options
- Variable shaft-hub connection





### Spring-Applied Brakes External mounting Design flexibility & maintenance efficiency

The external installation of an electromagnetic brake on a drive system offers significant advantages. It simplifies maintenance and repairs without the need to disassemble the drive. External brakes provide higher design flexibility, better cooling and the possibility of manual release. They are easier to retrofit and can be used in a wider range of systems, which overall offers higher flexibility and maintenance efficiency in industrial applications.

#### Versatility and Flexibility

The BFK458 modular system, proven over decades, offers both standard and industry-specific solutions. With freely configurable, well-matched components, brakes can be quickly and efficiently assembled and delivered for almost any application.

#### Geared Motors



Applications

# Industrial Trucks

#### Safety & reliability for your application

Our wealth of experience in brake design and state-of-the art manufacturing technologies enables us to ensure an optimum brake service life for given temperature and torque specifications.



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#### Wind Power



Hoists & Cranes



		INTORQ BFK458		INTORQ BFK470
Features		<ul> <li>Fail-Safe spring applied-brake</li> <li>Adjustable service brake and holding brake</li> <li>Standard modular system with many options</li> <li>Braking torque can be reduced (with the E model)</li> <li>TÜV-Nord safety certificate</li> <li>UL certified</li> </ul>		<ul> <li>Fail-Safe spring applied-brake</li> <li>Protection class according to IP66, also with hand release</li> <li>Inductive proximity sensor for function monitoring</li> <li>Increased maximum torques</li> <li>Maximum longevity due to the development of the mechanical structure</li> <li>UL certified</li> </ul>
Technical data		<ul> <li>Rated torque range: 1.5 Nm – 720 Nm</li> <li>Operating voltage: 24, 103, 180, 205 VDC</li> <li>Protection class: IP00 – IP55</li> <li>Temperature range: -40 °C to +40 °C</li> <li>Thermal class: F (155 °C)</li> </ul>		<ul> <li>Rated torque range: 2 Nm - 370 Nm</li> <li>Operating voltage: 24, 103, 180, 205 VDC</li> <li>Protection class: IP66</li> <li>Temperature range: -40 °C to +50 °C</li> <li>Thermal class: F (155 °C)</li> </ul>
Mounting position	– Design – Mounti	<ul> <li>Designed for external mounting outside the motor</li> <li>Mounting outside the engine under the fan cover</li> </ul>		





# Electronic assemblies for industrial brakes

#### For versatile use

The product range of Kendrion contains a variety of electronic components for the control of industrial brakes.

A variety of the properties of brakes can be considerably improved through the use of control modules. Reaction times are significantly optimised by overexcitation functions and fast shutdown. Lowering of the holding voltage improves the thermal behaviour of the brake and saves energy. There are suitable electronic modules available for different classes. Depending on the mounting conditions, there are a variety of connection concepts. Kendrion as a result provides the optimum complementary control electronics for electromagnetic brakes for all applications.

#### **Slim Collection**

- Very small design and cost-effective
- Versatile options for assembly and connection
- Integrated fast shutdown
- Energy savings up to 75%



		Slim Collection
I cardies	and the second s	<ul> <li>Compact design</li> <li>Simple and variable mounting due to central attachment</li> <li>Enables energy saving or overexcitation through bridge rectification and PWM</li> <li>Cost-effective</li> <li>UL certified for all types</li> </ul>
	() () () () () () () () () () () () () (	<ul> <li>Rated input voltage: Rectifier up to max. 500 VAC PWM module up to 48 VDC</li> <li>Max. output current: Half-wave max. 0.5 A Bridge max. 0.8 A Overexcitation max. 2.0 A / 1.0 A PWM 4.0 A / 2.0 A</li> <li>Dimensions 60x24x19 mm</li> <li>Optionally with integrated quick shutdown</li> </ul>

#### Universal Collection

- Bridge, half-wave and overexcitation rectification can be combined in one housing
- Simple, fast mounting and bonding
- Ideal for installation in the motor terminal box
- UL certified

- Rated input voltage: Rectifier up to max. 500 VAC
- Max. output current: Half-wave max. 0.5 A
   Bridge max. 0.8 A
   Overexcitation max. 2.0 A / 1.0 A
- Optionally with external or integrated quick shutdown
- Optionally with flying leads

	Compact Collection
	<ul> <li>Affordable standard rectifier for major customers</li> <li>Two input voltage variants</li> <li>Two different housing variants allow mounting by screwing or snapping in</li> <li>UL certified for all types</li> </ul>
<pre></pre>	<ul> <li>Rated input voltage: Rectifier up to max. 555 VAC</li> <li>Max. output current: Half-wave max. 1.0 A Bridge max. 1.0 A</li> <li>Dimensions 25x18x40 mm</li> </ul>





Have a look at our website!

Technical data

Features

# Why is Kendrion the **perfect** partner?

The customer is in the focus of our activities. The complete Kendrion team is committed to meet the requirements and wishes of our global customers. We place great value on partnership and open communication.



"We are a **full-line provider** and specialist for **permanent magnet** and **spring-applied brakes** for technologically demanding servomotors."

- Our product series convince by great variability and the highest performance density.
- With our products we offer suitable brake solutions for each application in the technologically demanding industries of the future.



"Our products are used in fast growing markets of the future such as **robotics**, **AGVs**, **wind power** and **medical technology**."

- We consistently focus on market development, are looking for innovative technology trends and new industries for holding applications.
- Based on many years of cooperation with leading companies, we have built up a strong and extensive market know-how.



"Customized to your application, the design of our brakes is the best possible combination of technology and economy."

- A comprehensive standard product line, combined with extensive technological knowhow enables us to develop customized solutions fast and with great flexibility.
- Open and quick communication between customer, sales, and technology supports a focused project management.



"We offer highest safety standards through our **unique validation and quality processes**."

- For ultimate customer satisfaction, we guarantee product-specific data over the entire lifetime of the brake.
- Our certifications and globally coordinated processes guarantee the highest quality standards worldwide.



# Creating long-term **sustainable** value



Responsible business conduct

The Natural Capital pillar focuses on reducing the negative impacts of climate change by increasing energy efficiency and use of renewable energy, reducing CO<sub>2</sub> emissions, and strengthening waste management practices.



Social and human capital

The Social and Human Capital pillar concerns the preservation of the health and safety of our employees by providing a high-quality and safe work environment and maintaining a culture consistent with the norms and values underlying The Kendrion Way and our Code of Conduct. Diversity, fair labor practices and recognition of human rights are other material themes of the Social and Human Capital pillar.



The Responsible Business Conduct pillar focuses on business conduct and integrity, accountability, and transparency. Material themes for the Responsible Business Conduct pillar include sustainable sourcing and ethical behavior.

#### Key components of the ESG program

We completed the development of our third 5-year sustainability / ESG program for the period 2024 – 2028. The development process involved the completion of various extensive analyses, the identification of areas for improvement, and validation of ambitious and realistic sustainability targets. The key components of the 2024 – 2028 sustainability / ESG program are outlined below.

- Achieve a further 70% reduction in CO<sub>2</sub> emissions.
- Establish reporting frameworks for Scope 1, 2 and 3 reporting and disclosure.
- Implement gender diversity targets at Business Group level for indirect staff, aiming for a 25% improvement over time with a minimum threshold of 33%.
- Enhance supplier selection and screening by transitioning from basic risk assessment to integrating ESG metrics into the sourcing process.
- Sustain ESG ratings from EcoVadis (currently silver medal) and CDP (currently B- scoring).





#### **KENDRION**

#### Contact us!

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