KENDRION


# Slim PM Line

## Permanent Magnet Brake for Low- and Mid-Torque Servo Motors

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 spring-applied 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 and India as well as a large number of certified sales partners all over the world make us a strong partner for you!

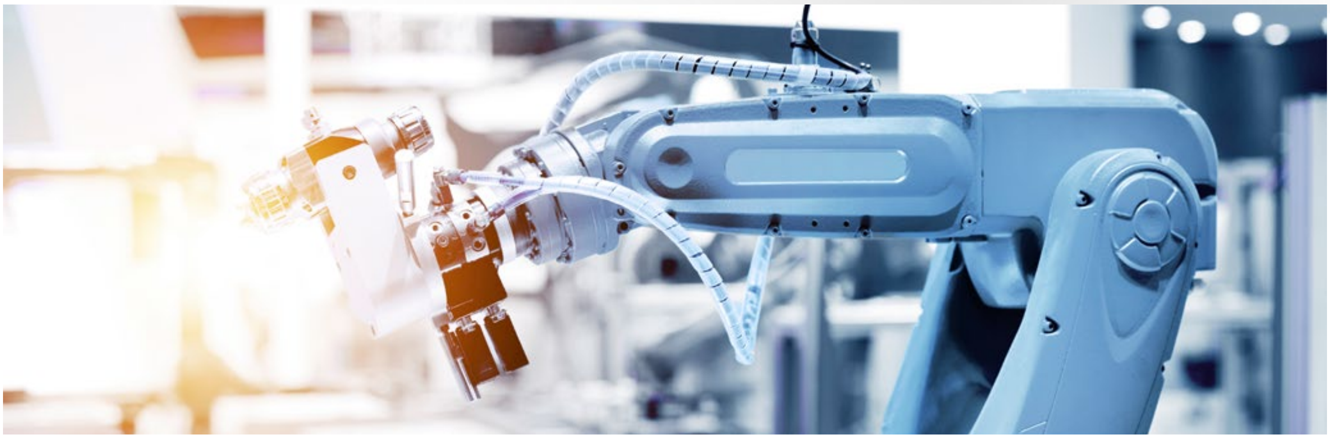
# The Slim PM Line

## On the point

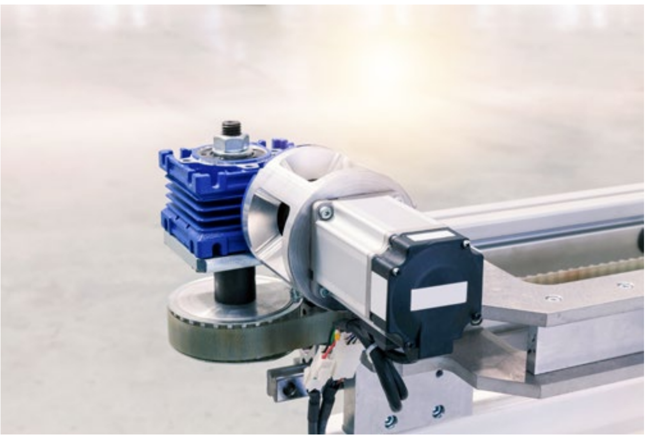
- Fail-safe permanent magnet brake
- Holding brake with emergency stop function
- A total of 6 brake sizes available
- Torque range from 2.7 Nm to 17 Nm
- Standard temperature range from -40 °C to +120 °C

Applications

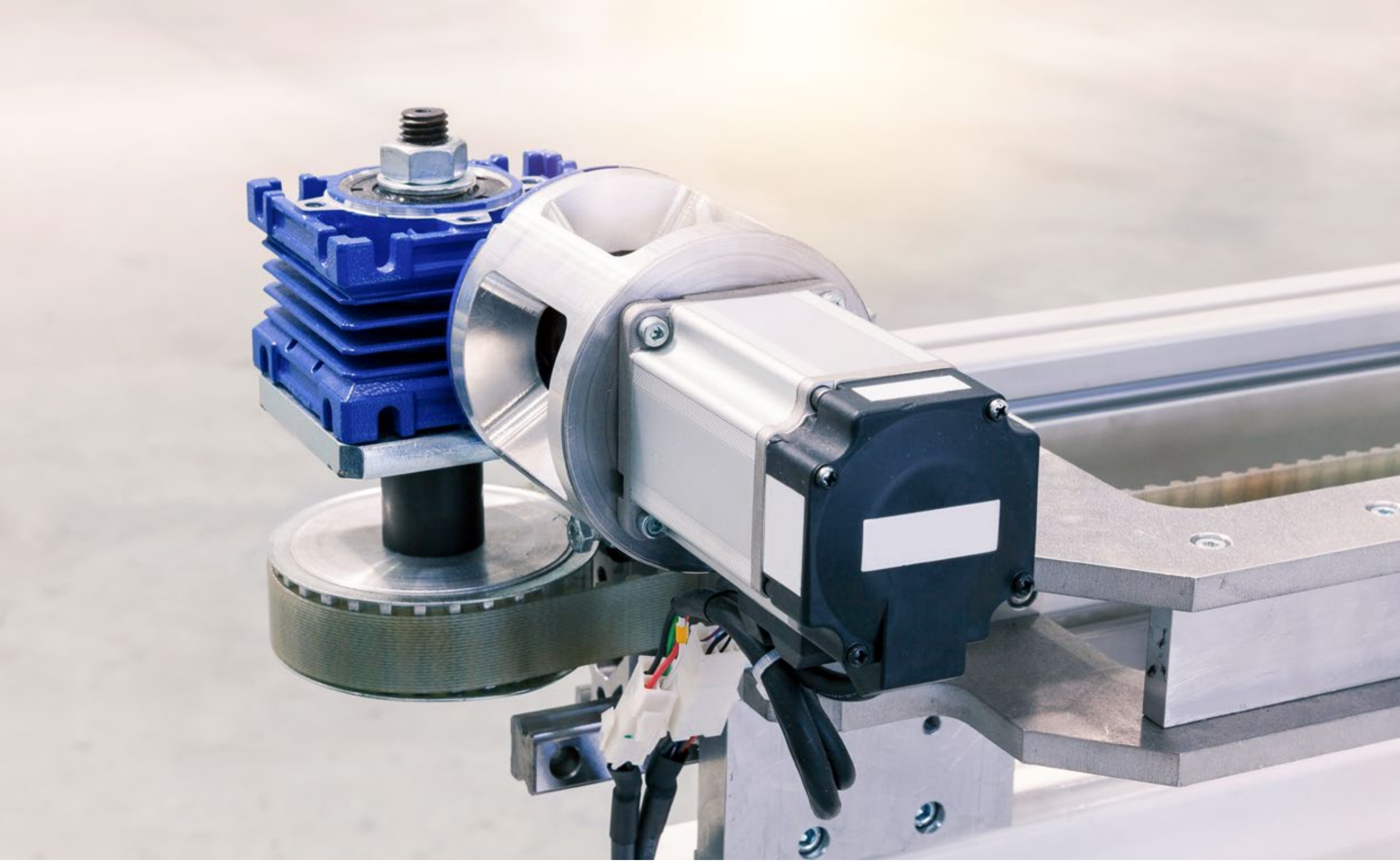
### Automation & Robotics



### Servo Drive Technology



### Medical Technology



# New ways of flexibility

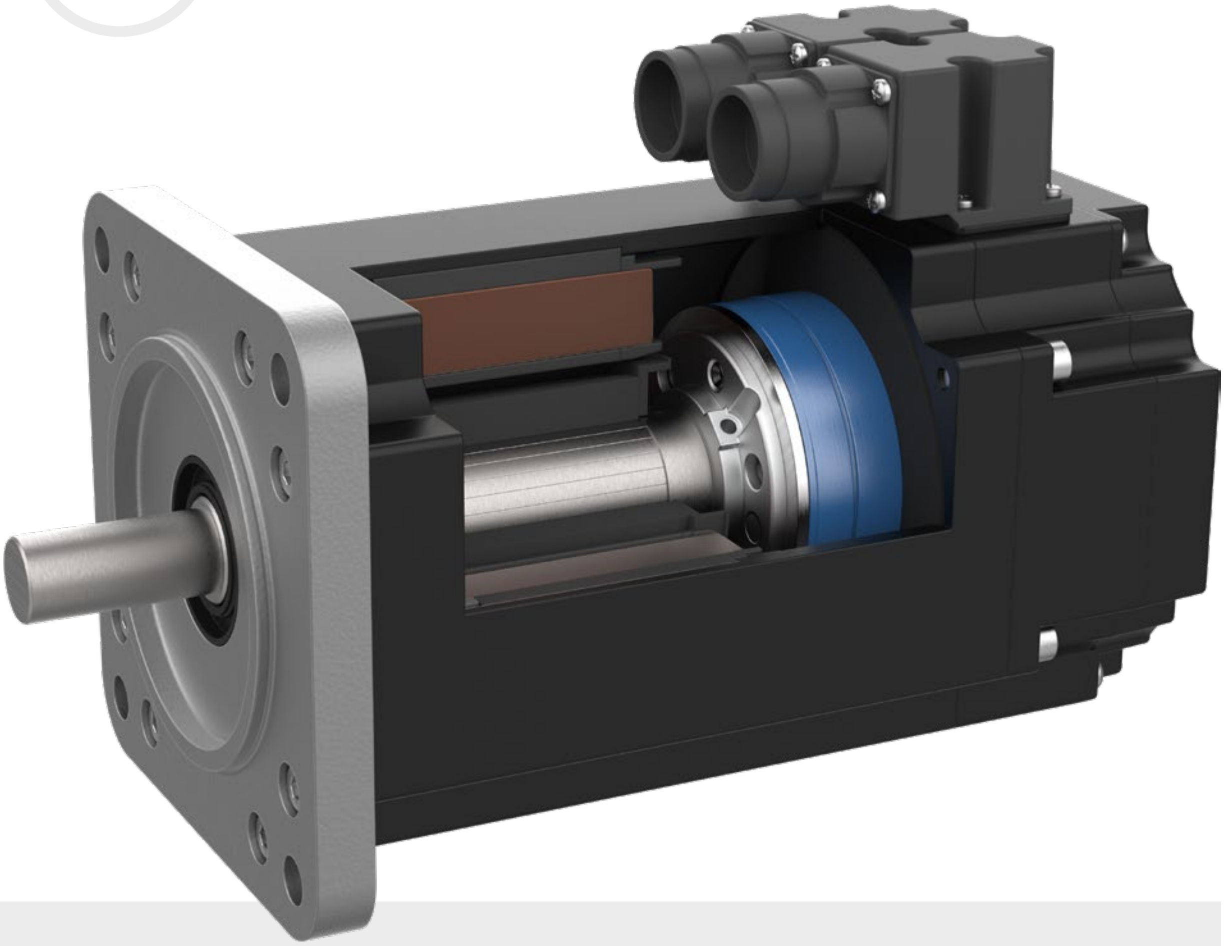
## Maximum freedom for your servo applications

**The Slim PM Line is a permanent magnet brake developed specifically for servo motors in the low and mid-torque range.**

It is the perfect addition to the High Torque Line and therefore covers the majority of the global servo motor market. Both brakes share an identical interface, giving design engineers maximum flexibility – without any additional modifications to the motor design. The Slim PM Line offers servo motor manufacturers a compact, high-performance, and cost-optimized solution – without compromising on quality, integration, or performance.

# Optimized for integration into low- and mid-torque servo motors

- Designed for integrated installation in the motor
- A- and B-side mounting position on the fixed bearing possible
- Integration in non-motor applications  possible e.g. hand-guided tripods



## Product highlights

- Compact, powerful design through innovative magnetic circuit
- Common motor interface with the proven High Torque Line
- Single-pole friction system for stable, reliable torque
- Torque transmission without backlash
- Residual torque-free release, independent of mounting position
- Wear-free under dynamic changes of direction
- Brakes factory-sided grinded and torque tested
- Optional protection against bearing lubricants
- Optional wire protection for safeguarding stator lead wires
- Optional ball bearing seat for precise brake centering and efficient assembly

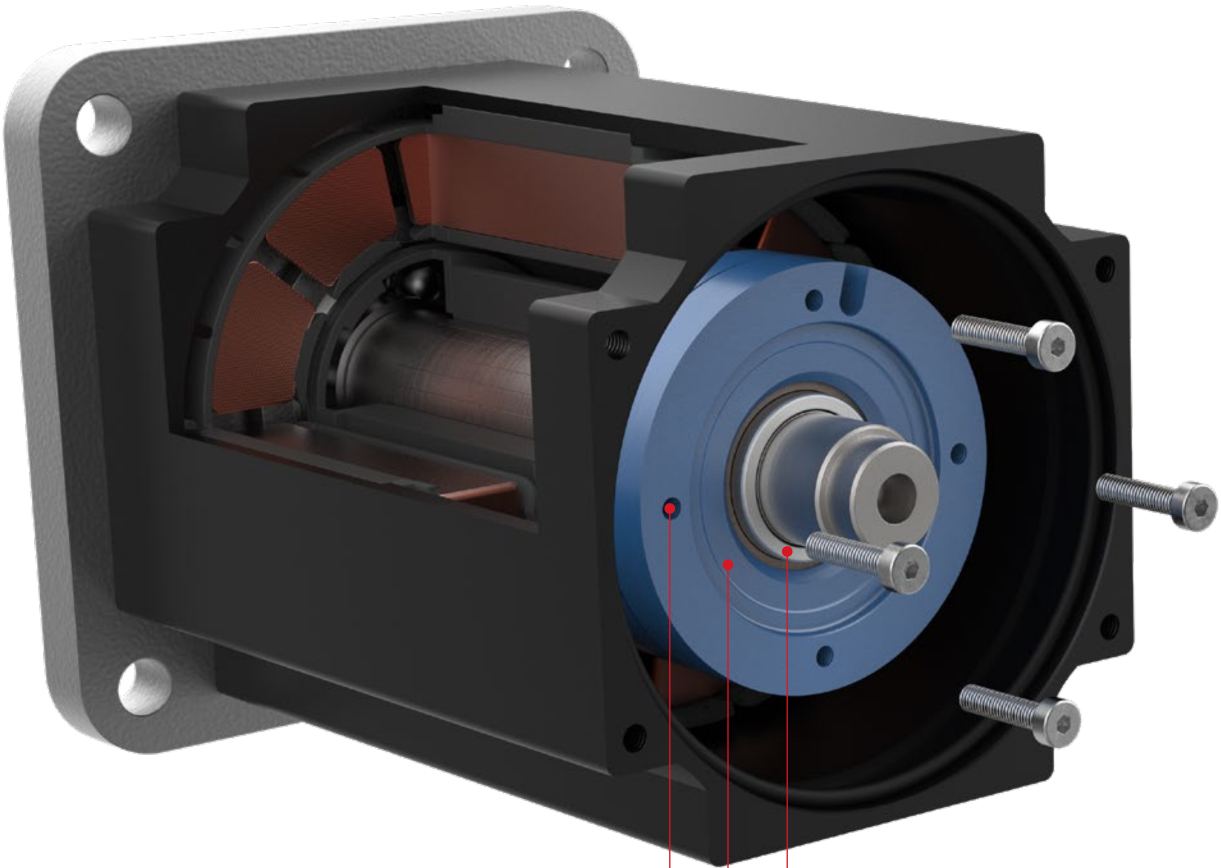
# One motor interface, many possibilities

## Servo motor

Servo motors are typically offered in several stack lengths. The different motor lengths are achieved by stacking. Each stack corresponds to one rotor/ stator length of the motor and increases the torque.

## Brake

The permanent magnet brake is integrated on the fixed bearing side of the servo motor. The torque of the brake is selected to match the motor's standstill torque.



**Fastening pitch circle**

An identical mounting circle to the High Torque Line facilitates the integration process in the servomotor.

**Ball bearing seat**

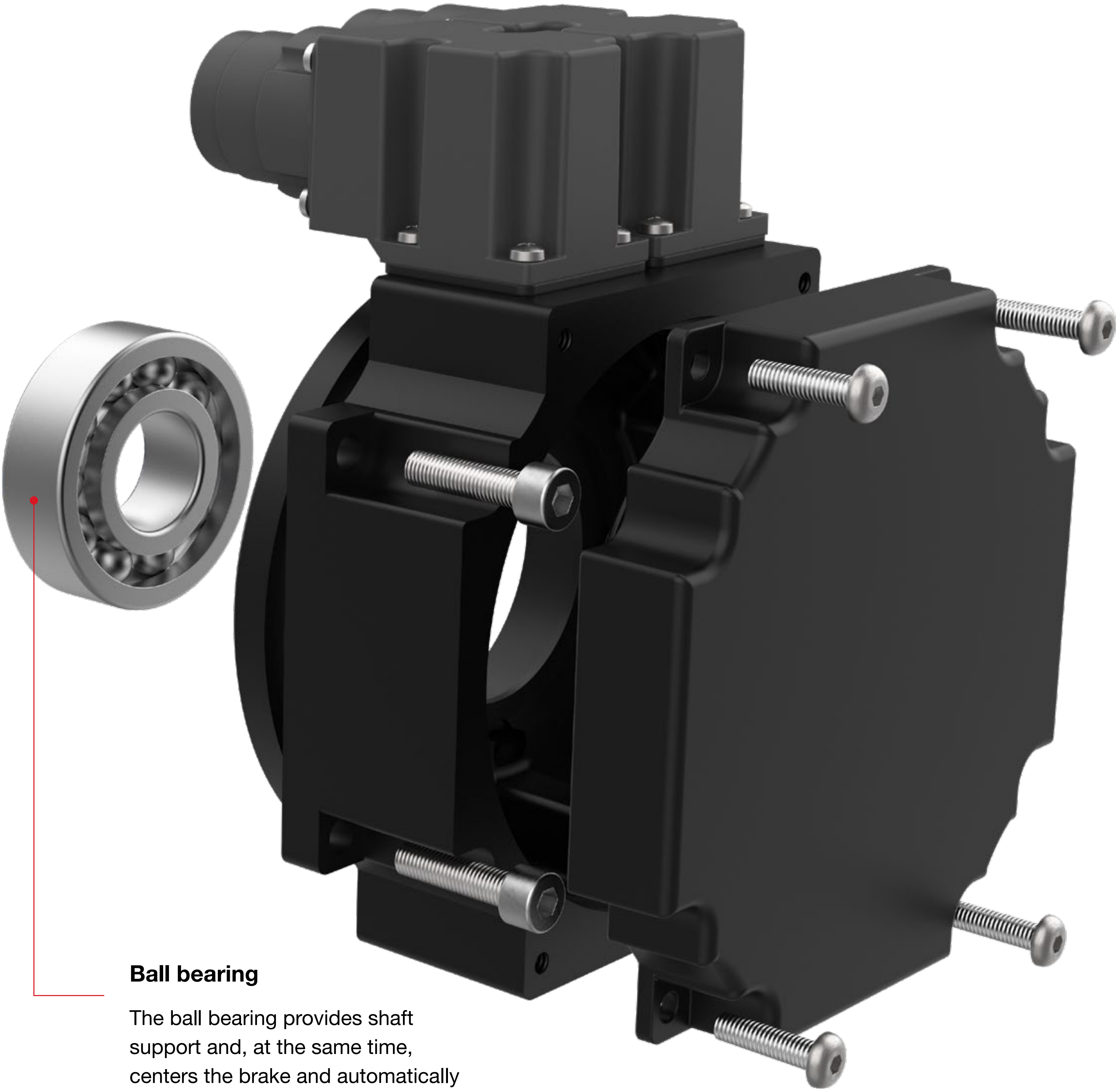
The optional, customer-specific ball bearing seat is identical to the High Torque Line.

**Motor shaft passage**

The design of the through hole in the armature system is identical to that of the High Torque Line.

# The perfect duo – strong together in the servo motor

The **Slim PM** and **High Torque permanent magnet brakes** share an identical motor interface. This simplifies integration of both brakes for the user and promotes an economical motor configuration.

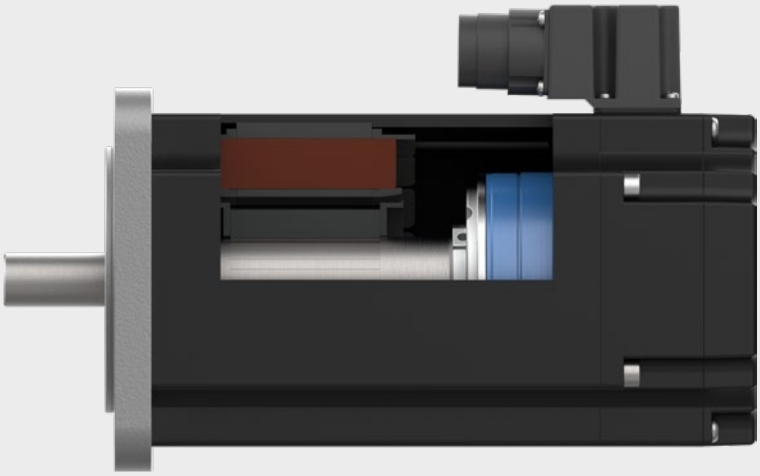


**Ball bearing**

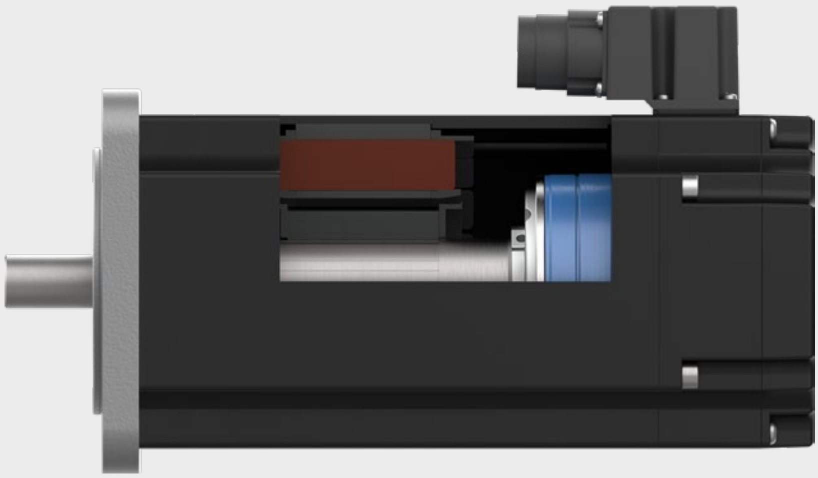
The ball bearing provides shaft support and, at the same time, centers the brake and automatically adjusts the air gap when the Armature 800 system is selected.

# Smart motor configuration

## Slim PM Line

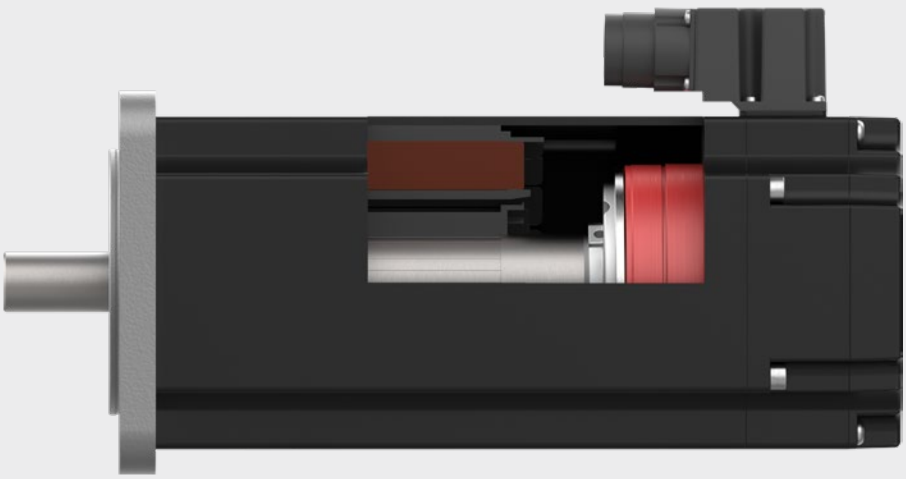


**Low Torque Motor**



**Mid Torque Motor**

## High Torque Line



**High Torque Motor**

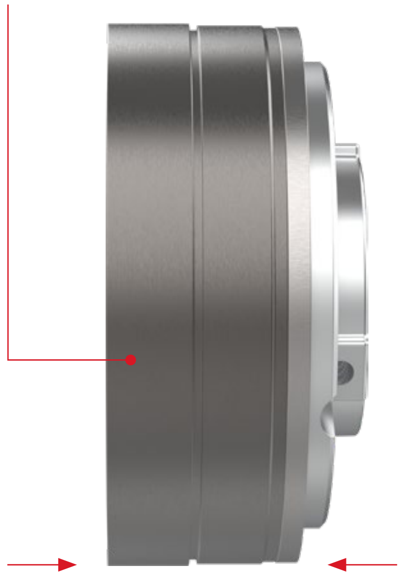
# Torque tailored to the motor

The torque of the **Slim PM Line permanent magnet brake** is perfectly matched to the requirements of low- and mid-torque motors.

High-torque motors with the highest torque demands continue to be equipped with the most powerful **permanent magnet brake, the High Torque Line**. This avoids unnecessary over-sizing and supports an economical brake selection across the entire servo motor series.


### Trend toward shorter motors

Low- and mid-torque motors in a shorter design are ideally equipped with the compact Slim PM permanent magnet brake. This allows servo motors to be built even shorter than the current market standard.



Reduced overall motor length by up to 25%
Up to 30% lower weight

### Sophisticated design

The brake shares an almost identical armature system with the High Torque Line. This smart use of common parts reduces both the cost of the brake and the mechanical and control-design effort in the servo motor.

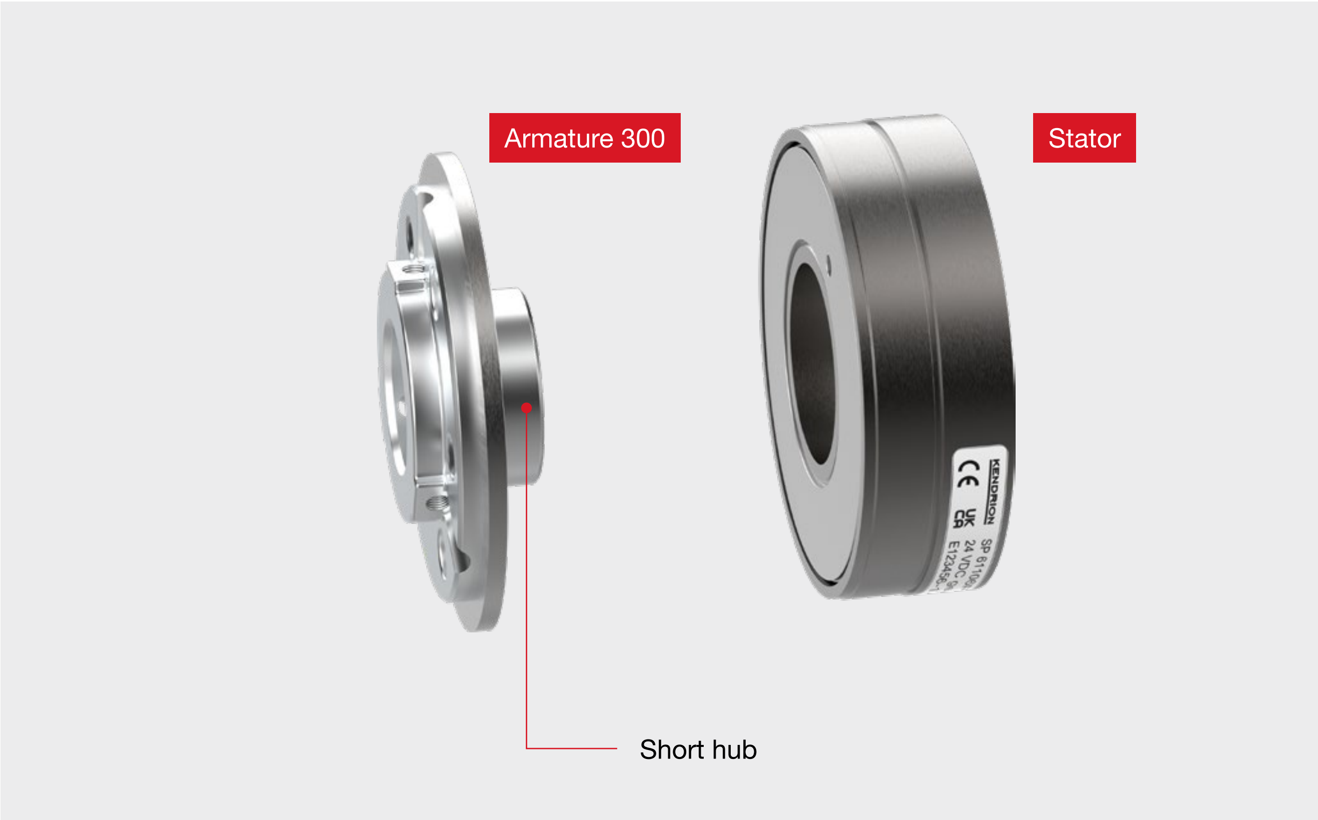
# Innovative and cost-optimized

The innovatively designed excitation system with low material usage gives the brake a high power density and enables cost savings in the assembly process.

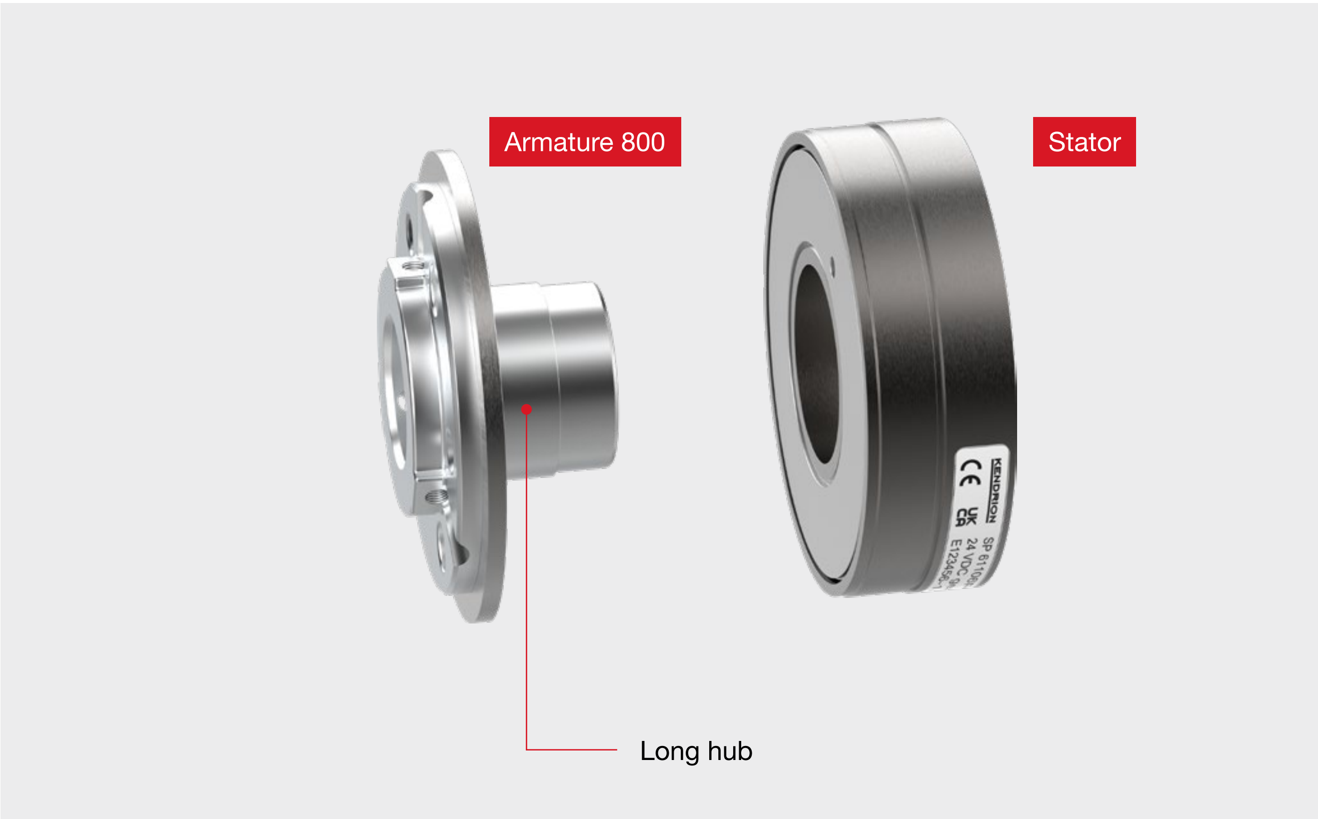
# Brake versions

The Slim PM Line has been specifically developed for integration into servo motors and offers two standard brake versions: P00 and K00. We will gladly discuss your individual requirements with you and develop a tailored solution.

## Brake type K00




## Brake type P00



# Armature systems

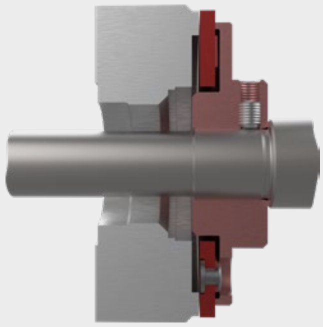
We have compiled a selection of our various armature systems for you. In addition to the standard armatures, further types are available on request. The armature systems depend on the brake type and frame size.

Standard armatures

**Armature 300**

**Manual air gap adjustment**

- Short hub
- Fixing threads **outside** the brake
- Air gap adjustment using feeler gauge

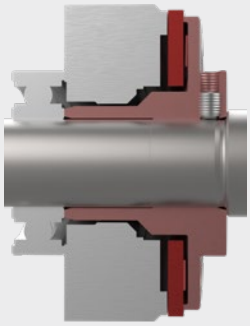


**Armature 800**

**Automatic air gap adjustment**

- Long hub with ball bearing shoulder
- Fixing threads **inside** or **outside** the brake
- Automatic air gap adjustment by ball bearing

Type 800-A

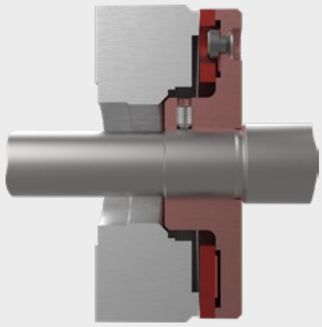


Additional versions on request

**Armature 400**

**Manual air gap adjustment**

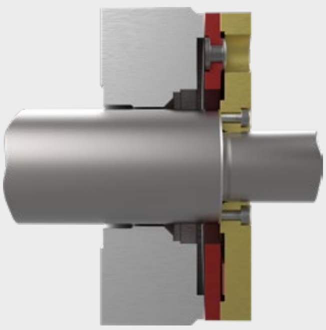
- Short hub
- Fixing threads **inside** the brake
- Air gap adjustment by component position



**Armature 200**

**Without hub**

- Hub supplied by the customer
- Armature–hub interface according to customer specification
- Air gap adjustment on the customer side



# Technical data

| | |
|---|---|
| **Design types** | SP 611..K00 ; SP 611..P00 |
| **Mode of operation** | Holding brake with emergency stop function |
| **Standard rated voltage** | 24 VDC (other variants on request) |
| **Degree of protection** | IP00 |
| **Thermal class** | F (155°C) |
| **Torque range** | 2.7 to 17 Nm |
| **Duty cycle** | 100% ED |
| **Nominal torsional backlash** | 0° |
| **Ambient temperature** | -40 to +120 °C (standard) |
| **Note** | Please observe the general information in the data sheets and the corresponding operating instructions. Design changes reserved. |

| **Brake size** | Brake types | | Min. trans-mittable torque [1] | Static nominal torque [2] | Nominal power | Max. rotation speed [3] | Max. emergency stop rotation speed | Max. switching energy per emergency stop (Z=1) | Number of emergency stops | Switching times | | Max. inertia Armature type 800 | Max. weight brake incl. Armature type 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Coupling time [4] | Opening time | | |
| | | | **$M_4$ [Nm]** | **$M_{4N}$ [Nm]** | **$P_N$ [W]** | **$n_{max}$ [min⁻¹]** | **n [min⁻¹]** | **$W_{max}$ [J]** | **$Z_{ges}$** | **$t_{c1}$ [ms]** | **$t_o$ [ms]** | **J [kgcm²]** | **m [kg]** |
| **05** | K00 | P00 | 2.7 | 3.8 | 12 | 10000 | 3000 | 150 | | 25 | 60 | 0.39 | 0.3 |
| **06** | K00 | P00 | 5 | 7 | 12 | 10000 | 3000 | 300 | | 25 | 70 | 0.55 | 0.4 |
| **07** | K00 | P00 | 6.5 | 9 | 14 | 10000 | 3000 | 600 | 500 | 30 | 100 | 0.83 | 0.5 |
| **08** | K00 | P00 | 8 | 11 | 17 | 10000 | 3000 | 900 | | 45 | 130 | 1.35 | 0.7 |
| **09** | K00 | P00 | 11 | 15 | 19 | 10000 | 3000 | 1100 | | 70 | 150 | 2.73 | 0.85 |
| **10** | K00 | P00 | 17 | 24 | 22 | 10000 | 3000 | 1200 | | 90 | 200 | 4.1 | 1.3 |

[1] Minimum guaranteed static torque over lifetime in the specified ambient temperature range with ground-in brake
[2] Identification of the transmittable (static) torque level
[3] Without emergency stop
[4] Measured with parallel varistor (quick shutdown)

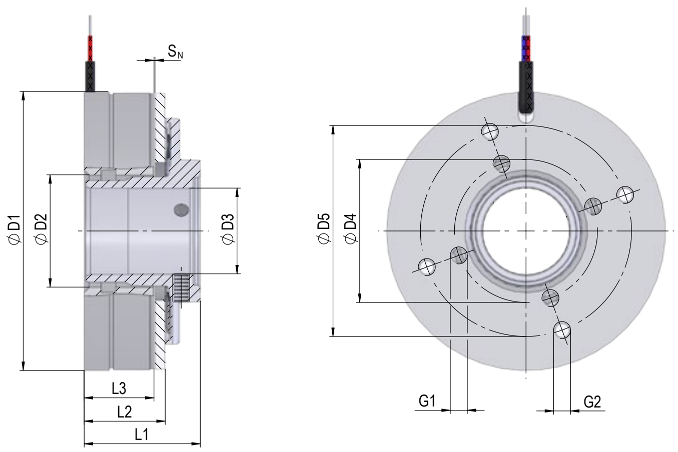
Have a look at our website!

# Dimensions

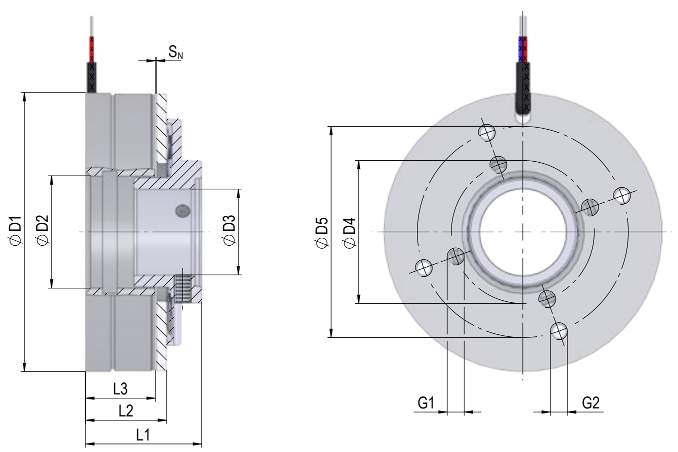
| Brake size | Armature types | | Ø $D_1$ [mm] | Ø $D_2$ [mm] | Ø $D_3$ [2] [mm] | | Ø $D_4$ [mm] | Ø $D_5$ [mm] | $G_1$ [mm] | $G_2$ [mm] | $L_1$ [mm] | | $L_2$ [mm] | $L_3$ [mm] | $S_N$ [1] [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | K00 | P00 | | | Min. | Max. | | | | | P00 | K00 | | | |
| **05** | 300 | 800-A | 56 | 23 | 12 | 17.2 | 35 | 42 | 4 x M4 | 4 x M4 | 30.15 | 30.15 | 22.5 | 20 | 0.2 |
| **06** | 300 | 800-A | 65 | 27.5 | 18 | 20.2 | 42 | 54 | 4 x M4 | 4 x M4 | 30.15 | 30.15 | 22.5 | 20 | 0.2 |
| **07** | 300 | 800-A | 72 | 27 | 12 | 22 | 42 | 54 | 4 x M4 | 4 x M4 | 33.2 | 33.2 | 21.4 | 17.7 | 0.2 |
| **08** | 300 | 800-A | 82 | 33 | 24.2 | 25.2 | 42 | 62 | 4 x M4 | 4 x M5 | 34.1 | 34.1 | 23.5 | 20.5 | 0.3 |
| **09** | 300 | 800-A | 92 | 32 | 18 | 26.2 | 62 | 72 | 4 x M5 | 4 x M5 | 42.1 | 42.1 | 27.6 | 23.6 | 0.27 |
| **10** | 300 | 800-A | 102 | 44 | 33 | 36 | 72 | 83 | 4 x M6 | 4 x M6 | 41.3 | 41.3 | 30.5 | 26.5 | 0.3 |

[1] Min. nominal air gap
[2] Keyway on request (acc. DIN 6885-1)

**Brake P00 | Armature 800**




**Brake K00 | Armature 300**




Can't find the right brake? Contact us!

# Order code

Our order code helps you configure your brake variant.
It consist of brake size, brake type and version.

SP 611 _ _ _ _ _

**Frame size**

05
06
07
08
09
10

**Brake version**

| | |
|---|---|
| K | Armature 300 |
| P | Armature 800 |

**Version**

| | |
|---|---|
| 00 | Standard series |
| XY | Customer-specific types on request |

**Example**

SP 611 0 9 P 0 0

Slim PM Line, size 09, armature 800, standard series

We will find the solution that best suits your needs!

# 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.

# Contact us!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