

# KENDRION



**KENDRION** SOLUTIONS

## Servo Slim Line

Fail-safe spring-applied brake  
in a flat and space-saving design

PRECISION. SAFETY. MOTION.

# Our brakes - perfect for your safe application

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

## Strong know-how

Our specialists develop pioneering permanent magnet and spring-applied brakes. On the one hand, they use the bundled know-how in the team; on the other hand, they maintain a dialogue with customers in order to always keep trends and requirements in mind. With INTORQ as a new addition to KENDRION, we have once again consistently expanded our range of spring-applied brakes and clutches for you. So we can find the right solution for every requirement.



## 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

Worldwide, more than 50 specialists in our research and development department work in agile teams to create convincing product solutions for tomorrow.

## In-depth market knowledge

We are very familiar with our focus markets - thanks to in-depth experience and research, but also thanks to long-standing customer relationships based on partnership at eye level.

## International power

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

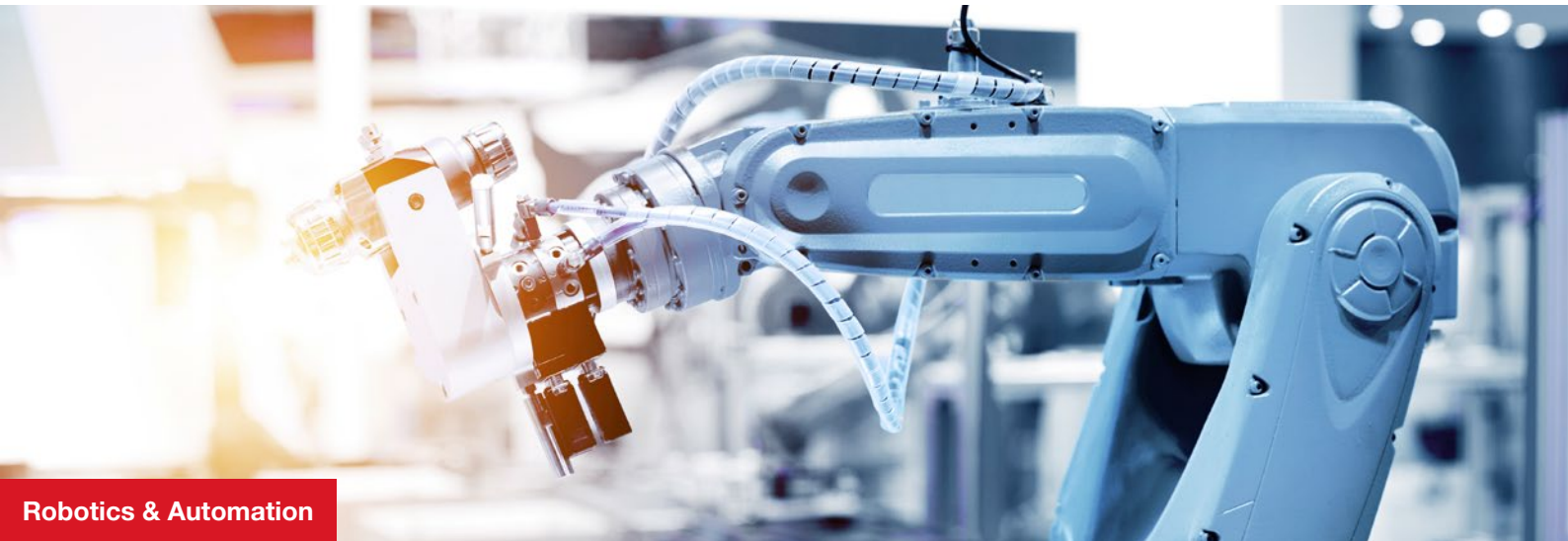
# The Servo Slim Line

## On the point

- Fail-safe spring-applied brake
- Holding brake with emergency stop function
- A total of 7 different sizes available
- Torque range from 0.27 Nm to 11 Nm
- Standard temperature range from  $-10^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$



## Suitable for the use of:



Robotics & Automation



Automated Guided Vehicles (AGVs)



Medical technology





## Maximum safety with minimum space requirements

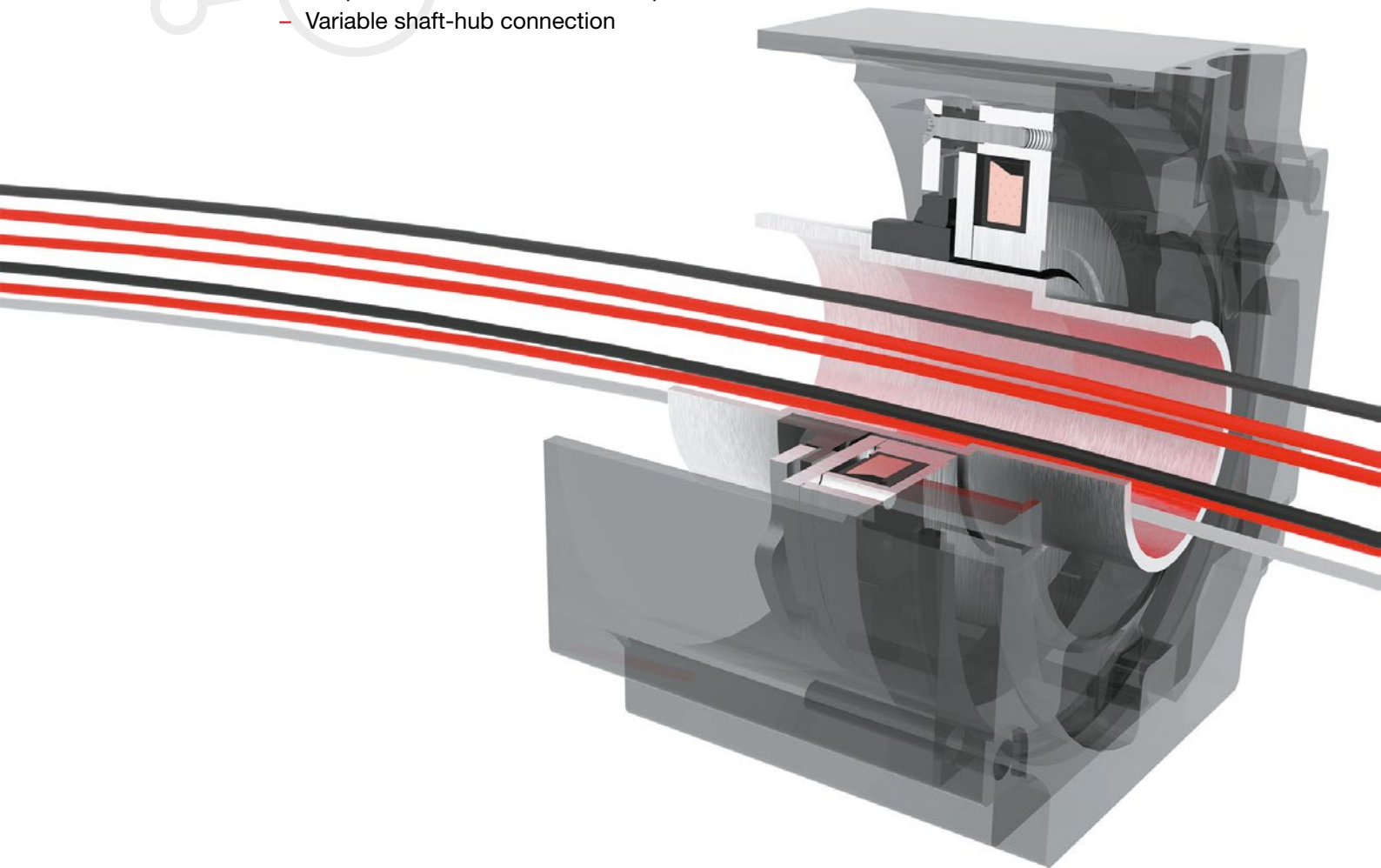
**Safety aspects are crucial issues in robot applications. After all, uncontrolled movements caused by control system or power failure must be avoided to prevent harm or damage to people and property.**

For decades Kendrion has been supplying brakes for industrial robots with loads higher than 20 kg. In order to also serve the rapidly growing market for smaller robots, Kendrion has developed the new flat spring-applied brake referred to as “Servo Slim Line”.

Kendrion’s Servo Slim Line flat spring-applied brake is perfectly tailored to the specific requirements in robotics and is designed for applications with payloads of up to about 20 kg. The slim single-disc brakes are flatter and lighter than the market standard in relation to their power density. Owing to their large inside diameter, they are ideal for hollow-shaft drives. These features make them the perfect choice for lightweight robots equipped with incorporated drives.

## Ideal for restricted space applications

- Designed for integrated installation in robot joints and hollow-shaft motors
- Simple and versatile installation options
- Variable shaft-hub connection



## Technical highlights

- High power density due to patented air gap adjustment
- Guaranteed minimum torque over entire life time
- Slim and space-saving design
- Flexible cable routing
- Fast opening and closing times
- Low weight

# Brake types

The two standard brake types – 500 and 502 – have been specially developed for integration into compact hollow-shaft motors. The space-saving design of the Servo Slim Line brakes makes them ideal for applications requiring optimal use of restricted space. Customers are welcome to discuss their specific requirements with us to receive customized solutions.

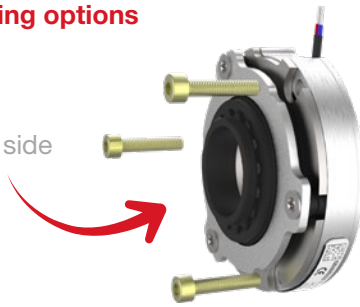
## Brake type 500

### Hub with large outside diameter

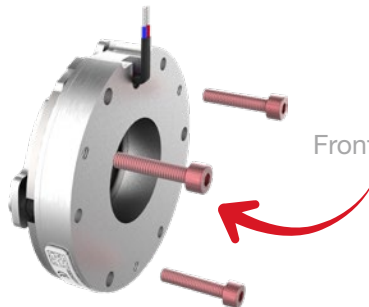
- Brake can be guided over the hub **only** on the flange side
- Mounting of the brake on the motor bearing shield is possible on the flange and front side
- Suitable for larger shaft diameters (hollow shaft)

### Mounting options

Flange side



Front side



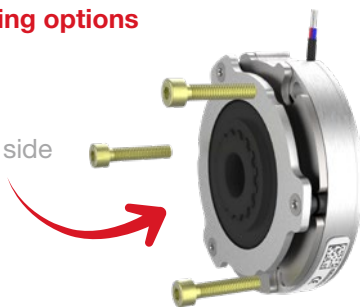
## Brake type 502

### Hub with small outside diameter

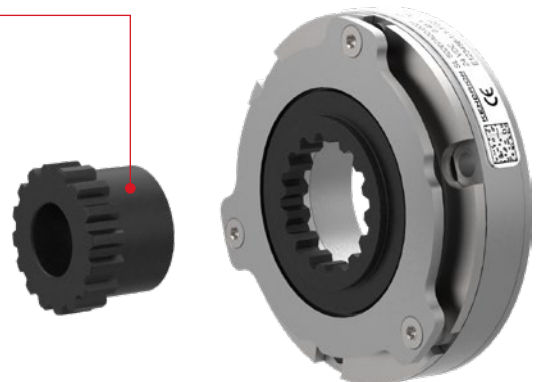
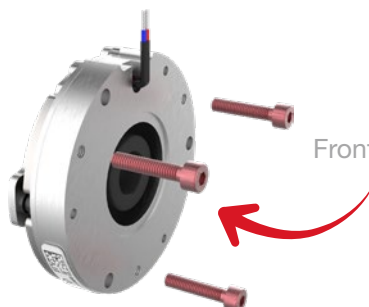
- Brake can be guided over the hub **on both** the flange and the front side
- Mounting of the brake on the motor bearing shield is possible on the flange and front side
- Suitable for small to medium shaft diameters

### Mounting options

Flange side



Front side



# Hub types

The hub is the connecting element between the motor shaft and the brake. The hubs of the Servo Slim Line offer various options in terms of hub length, hub diameter, keyway and noise reduction design. The hub type can be selected based on the specific installation conditions.

## Hub for brake type 500

### Hub with large outside diameter

- Short hub for press-fit connection
- Large outside diameter
  
- Short hub with keyway
- Large outside diameter

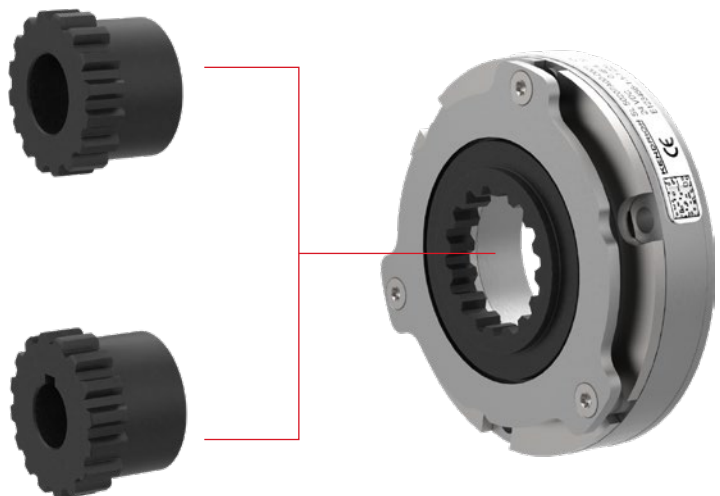


Also available with innovative noise reduction function. Get in touch with us.

## Hub for brake type 502

### Hub with small outside diameter

- Long hub for press-fit connection
- Small outside diameter
- Special version with set screws available on request
  
- Long hub with keyway
- Small outside diameter
- Special version with set screws available on request



Also available with innovative noise reduction function. Get in touch with us.

# Technical details

<b>Product code / Types</b>	SL 500..A00 ; SL 502..A00
<b>Operation mode</b>	Holding brake with emergency stop function
<b>Standard nominal voltage</b>	24 VDC sizes 04 to 12 12 VDC size 03 (other ratings available on request)
<b>Protection class</b>	IP00
<b>Thermal class</b>	F (155°C)
<b>Transmittable torque range</b>	0.27 Nm to 11 Nm
<b>Duty cycle</b>	100% ED
<b>Nominal backlash</b>	1°
<b>Ambient temperature</b>	-10°C to +100°C
<b>Note</b>	The general information on specification sheets and the relevant operating instructions must be observed. Subject to change without notice.

Brake size	Brake type		Min. transmittable torque <sup>1)</sup>	Nominal torque <sup>2)</sup>	Nominal power	Max. rotation speed <sup>3)</sup>	Max. emergency stop rotation speed	Maximum switching energy per ES (Z=1)	Number of emergency stops	Switching times		Max. inertia friction disc incl. hub	Max. weight brake incl. hub
										Closing time <sup>4)</sup>	Opening time		
			M <sub>4min</sub> [Nm]	M <sub>4N</sub> [Nm]	P <sub>N</sub> [W]	n <sub>max</sub> [min <sup>-1</sup> ]	n [min <sup>-1</sup> ]	W <sub>max</sub> [J]	Z <sub>ges</sub>	t <sub>ci</sub> [ms]	t <sub>o</sub> [ms]	J [kgcm <sup>2</sup> ]	m [kg]
03	500	–	0.27 <sup>5)</sup>	0.38 <sup>5)</sup>	5.8	8000	6000	0.5	200 (Standard)	5	25	0.002	0.1
04	500	502	0.3	0.4	7.1	8000	6000	5		10	30	0.005	0.12
05	500	502	0.6	0.7	10.3	8000	5000	20		8	30	0.02	0.15
07	500	502	1.7	2.4	11.4	8000	4000	50		9	45	0.09	0.32
09	500	–	4	5	14	6000	3000	250		15	50	0.5	0.53
10	500	–	5	6.5	20	6000	3000	300		15	60	1.3	0.68
12	500	–	11	15	27.2	5000	2500	800		30	160	2.2	1.7

<sup>1)</sup> Minimum guaranteed static torque over lifetime (factory grinded-in and torque tested brakes)

<sup>2)</sup> Expected average static torque over lifetime at room temperature with grinded-in brake

<sup>3)</sup> Without emergency stop

<sup>4)</sup> Measured with parallel varistor (fast turn-off)

<sup>5)</sup> Overexcitation mode 24/12 V



# Dimensions

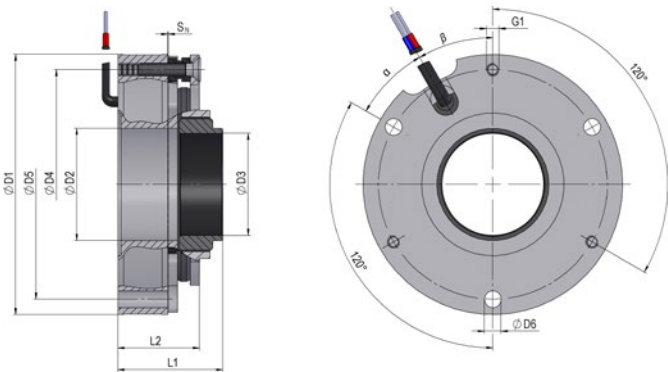
Brake size	Brake type	Ø D <sub>1</sub> [mm]	Ø D <sub>2</sub> [mm]	Ø D <sub>3</sub> [mm]								Ø D <sub>4</sub> [mm]	Ø D <sub>5</sub> [mm]	D <sub>6</sub> [mm]	G <sub>1</sub> [mm]	α [°]	β [°]	L <sub>1</sub> [mm]		L <sub>2</sub> [mm]	S <sub>N</sub> <sup>1)</sup> [mm]
				Type 500				Type 502										Type 500	Type 502		
				Press-fit <sup>2)</sup>		Keyway <sup>3)</sup>		Press-fit <sup>2)</sup>		Keyway <sup>3)</sup>											
				Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.										
03	500 -	32	9	6 <sup>H7</sup>	8 <sup>H7</sup>	6 <sup>H7</sup>	7 <sup>H7</sup>	-	-	-	-	28	28	2 x 2.3	-	120	-	16.3	-	16	0.08 <sup>±0.02</sup>
04	500 502	38	11.5	6 <sup>H7</sup>	10 <sup>H7</sup>	6 <sup>H7</sup>	9 <sup>H7</sup>	6 <sup>H7</sup>	6 <sup>H7</sup>	-	-	32.6	34.5	2 x 2.3	-	60	-	17	16.5	16	0.08 <sup>±0.02</sup>
05	500 502	51	22	8 <sup>H7</sup>	20 <sup>H7</sup>	8 <sup>H7</sup>	13 <sup>H7</sup>	6 <sup>H7</sup>	12 <sup>H7</sup>	6 <sup>H7</sup>	10 <sup>H7</sup>	45	45	3 x 3.3	3 x M2.5	30	30	20.6	17.4	16	0.08 <sup>±0.02</sup>
07	500 502	69	30	9 <sup>H7</sup>	28 <sup>H7</sup>	9 <sup>H7</sup>	20 <sup>H7</sup>	8 <sup>H7</sup>	20 <sup>H7</sup>	8 <sup>H7</sup>	13 <sup>H7</sup>	61.5	61.5	3 x 4.4	3 x M4	30	60	23.8	20	18	0.09 <sup>±0.02</sup>
09	500 -	86	42	20 <sup>H7</sup>	40 <sup>H7</sup>	20 <sup>H7</sup>	36 <sup>H7</sup>	-	-	-	-	78.5	78.5	3 x 4.4	3 x M4	30	60	28	-	20	0.1 <sup>±0.02</sup>
10	500 -	105	58	30 <sup>H7</sup>	55 <sup>H7</sup>	30 <sup>H7</sup>	44 <sup>H7</sup>	-	-	-	-	97	97	3 x 4.4	3 x M4	30	60	28	-	21	0.15 <sup>+0.02 / -0.03</sup>
12	500 -	127	63	30 <sup>H7</sup>	60 <sup>H7</sup>	30 <sup>H7</sup>	50 <sup>H7</sup>	-	-	-	-	116	116	3 x 4.4	3 x M4	45	30	35.5	-	29.3	0.17 <sup>+0.02 / -0.03</sup>

<sup>1)</sup> Nominal air gap

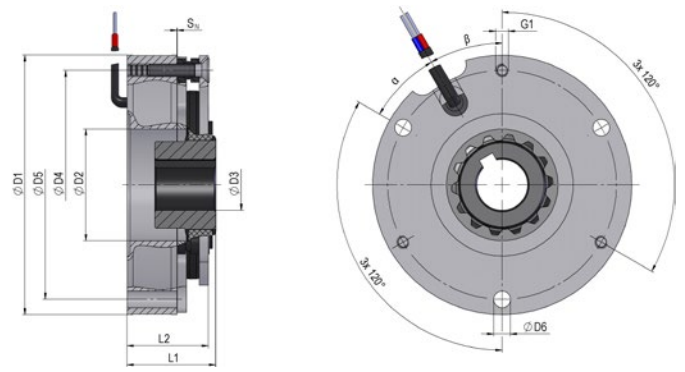
<sup>2)</sup> Press-fit connection on request

<sup>3)</sup> Keyway on request (to DIN 6885-1)

## Brake type 500



## Brake type 502



Not found the  
right brake?  
Talk to us!

# Order code

Our order code helps you specify the desired brake variant.  
The code is composed of the hub type, brake size and  
brake version.



	SL 50	_	_	_	A	_	_
<b>Hub type</b>		0					
		2					
<b>Brake size</b>			03				
			04				
			05				
			07				
			09				
			10				
			12				
<b>Version</b>						00	
						XY	
<b>Example</b>	SL 50	2	05	A	0	0	

Servo Slim Line with small hub, size 05, standard series

# Customized solutions – tailored exactly to your needs

**Automation solutions have become an indispensable part of industry and everyday life. In this context, it is often the brakes that ensure safety: They hold loads and brake reliably in an emergency.**

Just as automation continues to evolve, brakes must also face higher demands – forward-looking products are in demand. At the same time, quality and safety must be unconditionally guaranteed. This is a challenge that Kendrion Industrial Brakes meets with passion and care.



When it comes to developing customer-specific solutions, we have three aces up our sleeves:

- With our **new agile organization**, we respond much faster to customer requests.
- Our **modularly developed products** enable new configurations without complete redevelopment.
- The **global structure of our organization** bundles competencies and ensures valuable knowledge transfer.

This makes us a competent and reliable partner for our customers – starting with industry-savvy consulting, through product development with practical experience, to uncompromising quality assurance.



We will find the  
solution that suits  
you best!



**KENDRION**

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