

STÖBER compact

System technology
for drives and
automation



STÖBER

STOBER compact

System technology for drives and automation

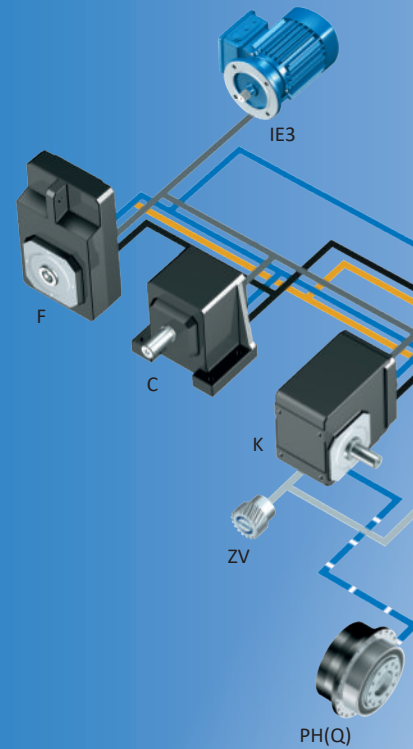
One partner. All the possibilities.

STOBER has developed and produced excellent drive technology since 1934 and is active internationally with around 800 employees at 14 locations. STOBER impresses machine manufacturers in wide-ranging industries and markets around the world with tailor-made, highly efficient drive systems for demanding movements.



"Our vision is to be the preferred partner for perfect movement."

- Andreas Thiel, CEO of STÖBER Antriebstechnik.



STOBER compact – what you can expect!

Take a look at the entire STOBER product range and learn what's essential to the STOBER drive system for perfect motion. The latest STOBER electronics, precise high-performance gear units, highly dynamic motors and super compact geared motors – connected via ready-to-use STOBER cable technology. Everything from a single source! It could not be more convenient.

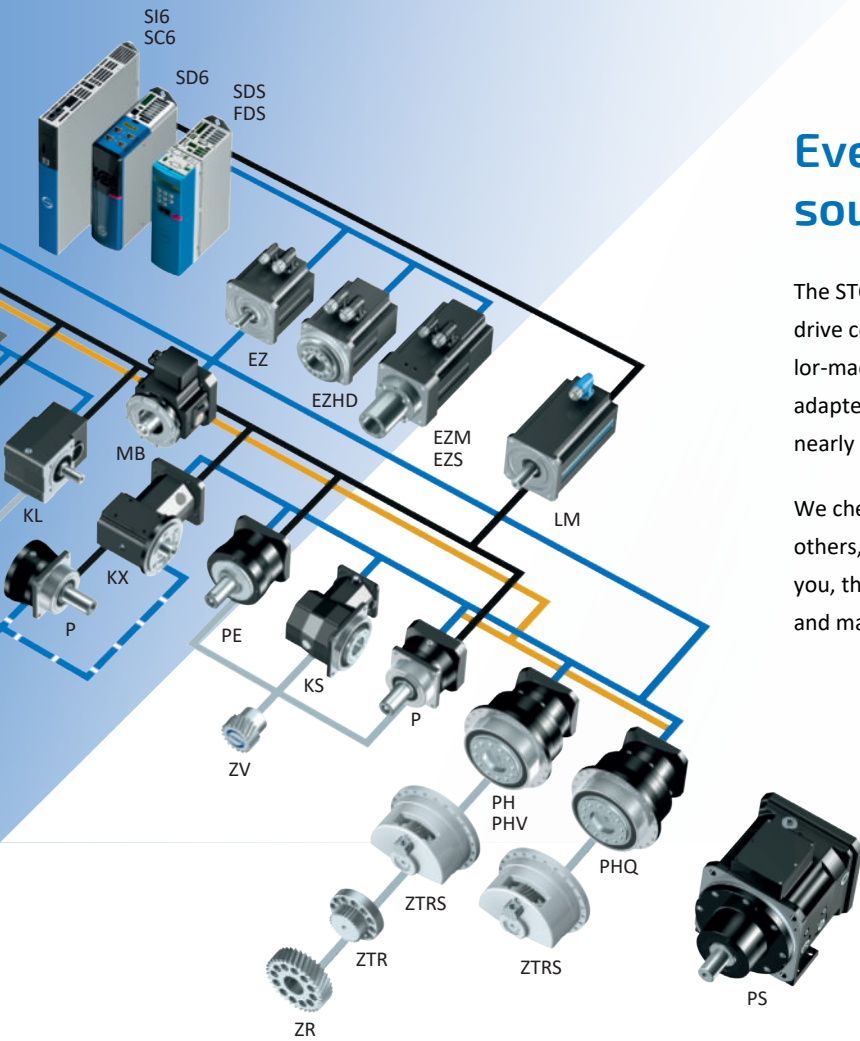
At home in the world of demanding motion

Gear units

Geared motors

Motors

Cables and drive controllers



Everything from a single source.

The STÖBER drive system consisting of gear units, motors, cables and drive controllers has a modular design and is freely scalable—for tailor-made, compact and powerful machine concepts. It can be adapted to your individual requirements and combined as needed in nearly all industries and applications areas.

We check every single component and how it works together with others, taking on the responsibility for the complete drive train. For you, this means that one contact partner, certified operating safety and maximum availability are guaranteed.

Need special solutions?

Numerous one-of-a-kind product highlights and project-related adjustments make it possible. With a holistic approach to your specific task, we work together on individualized solutions that are optimally coordinated to your requirements. Dedicated and solution-oriented in the support of your visions and projects.

STÖBER moves integrally and precisely.



"We put ideas in motion with passion and a great deal of dedication. In the process, we rely on our decades of experience and an exceptionally broad range of products. Our customers benefit from precise, practical system solutions with uncompromising quality and expert individual consultation."

- Patrick Stöber, CEO of STÖBER Antriebstechnik.



STOBER moves as a team and with personality.

As a family-owned company, close relationships are extremely important to us. We build relationships with our employees, customers, and partners based on trust. We put people first.

We advocate for our employees' well-being, see things from our customers' perspectives, and demonstrate personal commitment to our mutual success.



"We have installed gear units, motors and drive controllers from STOBER in nearly all our systems. STOBER supports us in new projects from the first stroke of a pencil in the design phase until commissioning. Our years of cooperation are shaped by openness and honesty and emanate a rather special spirit. The technical consulting, the support—that is real, experienced partnership"

- Jürgen Leicht, Managing Partner of Leicht Stanzautomation.



Working together. Worldwide. Successfully.

With an eye to the future, STOBER is facing the challenges of digitalization and investing in integrated solutions and a strong global production, sales and service presence. STOBER China was founded at the end of 2019. As a result, we are present in more than 40 countries around in the world with eleven subsidiaries and 80 service partners.



**STOBER drives
Systems technology
Taicang, China.**



Table of contents

1	Selection tool	9
2	Servo gear units.....	33
3	Rack and pinion drives	65
4	Two-speed gearboxes	89
5	EZ synchronous servo geared motors.....	93
6	LM Lean geared motors	125
7	Asynchronous geared motors	141
8	Motors.....	149
9	Electronics	163
10	Close to customers around the world	176
11	Appendix.....	178

1 Selection tool

1.1 Servo gear units



Product chapter	P	PE	C	F	PH	PHQ	PHV
Chapter number	▶ 2.1	▶ 2.5	▶ 2.6	▶ 2.7	▶ 2.2	▶ 2.3	▶ 2.4

Technical data

i	3 – 100	3 – 100	2 – 276	4.3 – 552	4 – 100	5.5 – 600	61 – 121
M_{2acc}	21 – 3450 Nm	17 – 250 Nm	47 – 8000 Nm	100 – 1100 Nm	60 – 7500 Nm	200 – 43000 Nm	4250 – 7500 Nm
$\Delta\phi_2$	1 – 8 arcmin	8 – 13 arcmin	10 – 20 arcmin	5 – 11 arcmin	1 – 4 arcmin	1 – 3 arcmin	3 arcmin
η_{get}	95 – 97 %	95 – 97 %	96 – 97 %	96 – 97 %	93 – 96 %	90 – 96 %	90 %

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★★★☆	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★★	★★★★☆
Backlash	★★★★★	★★★★☆	★★★☆☆	★★★★☆	★★★★★	★★★★★	★★★★☆
Price category	€€	€	€	€	€€€	€€€€	€€€
Shaft load	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★★	★★★★★	★★★★★
Smooth operation	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Torsional stiffness	★★★★☆	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★★	★★★★☆
Mass moment of inertia	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆

Key
 ★★☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Shaft design	P	PE	C	F	PH	PHQ	PHV
Solid shaft with feather key	✓	✓	✓	✓			
Solid shaft without feather key	✓		C0 – C5: ✓ Starting at C6: Request	✓			
Hollow shaft with keyway				✓			
Hollow shaft with shrink ring				✓			
Flange shaft					✓	✓	✓
Bearing design	P	PE	C	F	PH	PHQ	PHV
Standard	✓	✓	✓	✓	✓	✓	✓
Axially reinforced	✓						
Radially reinforced	✓						
Reinforced					✓ (PH3 – PH5)	✓ (PHQ4 – PHQ5)	
Maintenance-free	P	PE	C	F	PH	PHQ	PHV
	✓	✓	C0 – C5: ✓	✓	✓	✓	✓

1 Selection tool

1.1 Servo gear units



Product chapter

KS

PKX

PK

Chapter number

[\[> 2.8\]](#)

[\[> 2.9\]](#)

[\[> 2.10\]](#)

Technical data

i	6 – 200	3 – 300	12 – 561
M_{2acc}	90 – 400 Nm	21 – 3300 Nm	200 – 3105 Nm
$\Delta\phi_2$	4 – 6 arcmin	2 – 8.5 arcmin	1.5 – 5 arcmin
η_{get}	93 – 95 %	94 – 96 %	94 %

An explanation of the formula symbols can be found in the chapter [\[> 11.1\]](#).

Features

Features

Power density	★★★☆☆	★★★★☆	★★★☆☆
Backlash	★★★☆☆	★★★★★	★★★★★
Price category	€€€	€€€	€€€
Shaft load	★★★★★	★★★★☆	★★★★★
Smooth operation	★★★★☆	★★★☆☆	★★★☆☆
Torsional stiffness	★★★☆☆	★★★☆☆	★★★☆☆
Mass moment of inertia	★★★★☆	★★★☆☆	★★★★☆
Key	★★★☆☆ good ★★★★★ excellent € Economy €€€€€ Premium		

Shaft design			
Solid shaft with feather key	✓	✓	✓
Solid shaft without feather key	✓	✓	✓
Hollow shaft with shrink ring	✓		
Flange hollow shaft	✓		
Bearing design			
Standard	✓	✓	✓
Axially reinforced		✓	✓
Radially reinforced		✓	✓
Maintenance-free	✓	✓	✓

1 Selection tool

1.1 Servo gear units



Product chapter

KS

PHKX

PHK

PHQK

Chapter number

[> 2.8]

[> 2.11]

[> 2.12]

[> 2.13]

Technical data

	KS	PHKX	PHK	PHQK
i	6 – 200	4 – 300	16 – 561	22 – 2242
M_{2acc}	90 – 400 Nm	60 – 2300 Nm	277 – 7500 Nm	316 – 43000 Nm
$\Delta\phi_2$	4 – 6 arcmin	1 – 6 arcmin	1.5 – 4.5 arcmin	1.5 – 4 arcmin
η_{get}	93 – 95 %	92 – 95 %	92 – 93 %	90 – 93 %

An explanation of the formula symbols can be found in the chapter [\[> 11.1\]](#).

Features

Features

Power density	★★★☆☆	★★★★★	★★★★☆	★★★★★
Backlash	★★★☆☆	★★★★★	★★★★★	★★★★★
Price category	€€€	€€€€	€€€€	€€€€€
Shaft load	★★★★★	★★★★★	★★★★★	★★★★★
Smooth operation	★★★★☆	★★☆☆☆	★★★★☆	★★★☆☆
Torsional stiffness	★★★☆☆	★★★★☆	★★★★☆	★★★★★
Mass moment of inertia	★★★★☆	★★☆☆☆	★★★★☆	★★★★☆
Key	★★☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium			

Shaft design	KS	PHKX	PHK	PHQK
Solid shaft with feather key	✓			
Solid shaft without feather key	✓			
Hollow shaft with shrink ring	✓			
Flange hollow shaft	✓			
Flange shaft		✓	✓	✓
Bearing design	KS	PHKX	PHK	PHQK
Standard	✓	✓	✓	✓
Reinforced		✓ (PH3 – PH5)	✓ (PH5)	✓ (PHQ5)
Maintenance-free	KS	PHKX	PHK	PHQK
	✓	✓	✓	✓

1 Selection tool

1.1 Servo gear units



KL



K

Product chapter

Chapter number

[> 2.14]

[> 2.15]

Technical data

i	4 – 32	4 – 381
M_{2acc}	22 – 65 Nm	60 – 13200 Nm
$\Delta\phi_2$	16 – 25 arcmin	1.5 – 12 arcmin
η_{get}	97 %	94 – 97 %

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Features

Power density	★★★★☆	★★★★☆
Backlash	★★★★☆	★★★★☆
Price category	€	€€
Shaft load	★★★★☆	★★★★☆
Smooth operation	★★★★☆	★★★★☆
Torsional stiffness	★★★★☆	★★★★☆
Mass moment of inertia	★★★★☆	★★★★☆
Key	★★★★☆ good ★★★★★ excellent € Economy €€€€€ Premium	

Shaft design		
Solid shaft with feather key	✓	✓
Solid shaft without feather key	✓	K1 – K4: ✓ Starting at K5: Request
Solid shaft on both sides	✓	✓
Hollow shaft with keyway	✓	✓
Hollow shaft with shrink ring	✓	✓

Accessories		
Flange	✓	✓
Foot plates	✓	✓
Torque arm bracket		✓

Bearing design		
Standard	✓	✓

Maintenance-free	✓	K1 – K4: ✓
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1 Selection tool

1.2 Rack and pinion drives



Product chapter	ZTRSPH	ZTRSPHQ	ZTRSPHV	ZTRPH	ZTRPHV	ZRPH
Chapter number	[> 3.1]	[> 3.2]	[> 3.3]	[> 3.4]	[> 3.5]	[> 3.6]

Technical data

m_n	2 – 10 mm	8 – 10 mm	5 – 10 mm	2 – 8 mm	5 – 8 mm	2 – 4 mm
z	15 – 32	15 – 19	15 – 20	12 – 32	12 – 19	26 – 40
F_{f2acc}	16 – 94 kN	124 – 126 kN	61 – 94 kN	6.5 – 67 kN	56 – 67 kN	2.2 – 16 kN
$v_{f2maxZB}$	0.18 – 4.7 m/s	0.06 – 1.1 m/s	0.2 – 0.62 m/s	0.09 – 4.7 m/s	0.19 – 0.39 m/s	0.23 – 6.7 m/s
Δs	7 – 70 μ m	69 – 70 μ m	44 – 70 μ m	4 – 44 μ m	42 – 44 μ m	10 – 56 μ m

An explanation of the formula symbols can be found in the chapter [\[> 11.1 \]](#).

Features

Power density	★★★★★	★★★★★	★★★★★	★★★★☆	★★★★☆	★★★☆☆
Linear backlash	★★★★★	★★★★☆	★★★★☆	★★★★★	★★★★☆	★★★★★
Price category	€€€€€	€€€€€	€€€€€	€€€€	€€€€	€€€
Smooth operation	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Linear rigidity	★★★★★	★★★★★	★★★★★	★★★★☆	★★★★☆	★★★☆☆
Mass moment of inertia	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Key	★☆☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium					

Pinion gearing						
Helical gearing	✓	✓	✓	✓	✓	✓
Gearing quality	5	5	5	5	5	5
Accessories						
Felt gear	✓	✓	✓			

ATLANTA gear racks

All gear racks suitable for our products are available from our cooperation partner, Atlanta.

<http://atlantagmbh.de/>

1 Selection tool

1.2 Rack and pinion drives



Product chapter

ZVP

ZVPE

Chapter number

[▶ 3.7](#)

[▶ 3.8](#)

Technical data

m_n	2 – 4 mm	2 – 3 mm
z	16 – 25	16 – 25
F_{f2acc}	1.7 – 15 kN	1.7 – 6.1 kN
$v_{f2maxZB}$	0.14 – 5.3 m/s	0.14 – 4.5 m/s
Δs	8 – 44 μ m	40 – 83 μ m

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★★★☆	★★★★☆
Linear backlash	★★★★★	★★★★☆
Price category	€€	€
Smooth operation	★★★★☆	★★★★☆
Linear rigidity	★★★★☆	★★★★☆
Mass moment of inertia	★★★★☆	★★★★☆
Key	★★★★☆ good ★★★★★ excellent € Economy €€€€€ Premium	
Pinion gearing		
Helical gearing	✓	✓
Gearing quality	6	6
Bearing design		
Standard	✓	✓
Axially reinforced	✓	

ATLANTA gear racks

All gear racks suitable for our products are available from our cooperation partner, Atlanta.

<http://atlantagmbh.de/>

1 Selection tool

1.2 Rack and pinion drives



Product chapter

ZVKS

ZVKL

ZVK

Chapter number

[▶ 3.9](#)

[▶ 3.10](#)

[▶ 3.11](#)

Technical data

m_n	2 – 4 mm	2 mm	2 – 4 mm
z	18 – 25	16 – 20	18 – 25
F_{f2acc}	3.2 – 11 kN	1.3 – 2.7 kN	2.7 – 15 kN
$v_{f2maxZB}$	0.07 – 3 m/s	0.33 – 2.8 m/s	0.06 – 3.8 m/s
Δs	37 – 44 μm	99 – 123 μm	12 – 111 μm

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★★☆☆	★★☆☆☆	★☆☆☆☆
Linear backlash	★★★☆☆	★☆☆☆☆	★★★☆☆
Price category	€€€	€	€
Smooth operation	★★★★☆	★★☆☆☆	★★★☆☆
Linear rigidity	★★★☆☆	★☆☆☆☆	★☆☆☆☆
Mass moment of inertia	★★★★☆	★★★★☆	★★★★☆
Key	★☆☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium		
Pinion gearing			
Helical gearing	✓	✓	✓
Gearing quality	6	6	6

ATLANTA gear racks

All gear racks suitable for our products are available from our cooperation partner, Atlanta.

<http://atlantagmbh.de/>

1 Selection tool

1.3 Two-speed gearboxes



PS

Product chapter

Chapter number

[▶ 4.1](#)

Technical data

i	1 – 5.5
n_{1max}	2500 – 10000 rpm
$P_{N,GB}$	39 – 47 kW
M_{2max}	400 – 2200 Nm

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★★★☆
Backlash	★★☆☆☆
Price category	€€€
Shaft load	★★★★★
Smooth operation	★★★★★
Torsional stiffness	★★☆☆☆
Mass moment of inertia	★★★★☆
Key	★★☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium

Housing design	
Short bearing distance	✓
Medium bearing distance	✓
Long bearing distance	✓

Shaft design	
Flange shaft	✓
Solid shaft without feather key	✓
Solid shaft with two feather keys	✓

Bearing design	
Deep-groove ball bearing	✓
Angular contact ball bearing	✓
Cylindrical roller bearing	✓

Lubrication	
Splash lubrication	✓
Circulating lubrication	✓

1 Selection tool

1.4 EZ synchronous servo geared motors



Product chapter

P

PE

C

F

Chapter number

[5.1]

[5.5]

[5.6]

[5.7]

Technical data

i	3 – 100	3 – 50	2 – 270	4.3 – 274
M_{2acc}	11 – 3450 Nm	11 – 250 Nm	9.7 – 6500 Nm	21 – 1100 Nm
$\Delta\phi_2$	1 – 8 arcmin	8 – 10 arcmin	10 – 20 arcmin	5 – 11 arcmin
η_{get}	95 – 97 %	95 – 97 %	96 – 97 %	96 – 97 %

An explanation of the formula symbols can be found in the chapter [\[11.1\]](#).

Features

Power density	★★★★☆	★★★☆☆	★★☆☆☆	★★☆☆☆
Backlash	★★★★★	★★★☆☆	★★☆☆☆	★★★☆☆
Price category	€€	€	€	€
Shaft load	★★★★☆	★★☆☆☆	★★☆☆☆	★★★☆☆
Smooth operation	★★★★☆	★★★☆☆	★★☆☆☆	★★★☆☆
Torsional stiffness	★★★☆☆	★★★☆☆	★★☆☆☆	★★☆☆☆
Mass moment of inertia	★★★★★	★★★★★	★★★★★	★★★★★
Key	★★☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium			

Shaft design				
Solid shaft with feather key	✓	✓	✓	✓
Solid shaft without feather key	✓		C0 – C5: ✓ Starting at C6: Request	✓
Hollow shaft with keyway				✓
Hollow shaft with shrink ring				✓
Bearing design				
Standard	✓	✓	✓	✓
Axially reinforced	✓			
Radially reinforced	✓			
Maintenance-free	✓	✓	C0 – C5: ✓	✓

1 Selection tool

1.4 EZ synchronous servo geared motors



Product chapter

PH

PHQ

PHV

Chapter number

[▶ 5.2](#)

[\[5.3\]](#)

[▶ 5.4](#)

Technical data

i	4 – 100	5.5 – 600	61 – 121
M_{2acc}	24 – 7500 Nm	45 – 22000 Nm	1638 – 7500 Nm
$\Delta\phi_2$	1 – 4 arcmin	1 – 3 arcmin	3 arcmin
η_{get}	93 – 96 %	90 – 96 %	90 %

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★★★☆	★★★★★	★★★★☆
Backlash	★★★★★	★★★★★	★★★★☆
Price category	€€€	€€€€	€€€
Shaft load	★★★★★	★★★★★	★★★★★
Smooth operation	★★★★☆	★★★★☆	★★★★☆
Torsional stiffness	★★★★☆	★★★★★	★★★★☆
Mass moment of inertia	★★★★★	★★★★★	★★★★★
Key	★☆☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium		
Shaft design			
Flange shaft	✓	✓	✓
Bearing design			
Standard	✓	✓	✓
Reinforced	✓ (PH3 – PH5)	✓ (PHQ4 – PHQ5)	
Maintenance-free	✓	✓	✓

1 Selection tool

1.4 EZ synchronous servo geared motors



Product chapter

KS

PKX

PK

Chapter number

[5.8]

[5.9]

[5.10]

Technical data

i	6 – 100	3 – 300	12 – 555
M_{2acc}	27 – 400 Nm	11 – 3300 Nm	68 – 3105 Nm
$\Delta\phi_2$	4 – 6 arcmin	2 – 8.5 arcmin	1.5 – 5 arcmin
η_{get}	93 – 95 %	94 – 96 %	94 %

An explanation of the formula symbols can be found in the chapter [\[11.1\]](#).

Features

Power density	★★★☆☆	★★★★☆	★★★☆☆
Backlash	★★★☆☆	★★★★★	★★★★★
Price category	€€€	€€€	€€€
Shaft load	★★★★★	★★★★☆	★★★★☆
Smooth operation	★★★★☆	★★★☆☆	★★★☆☆
Torsional stiffness	★★★☆☆	★★★☆☆	★★★☆☆
Mass moment of inertia	★★★★★	★★★☆☆	★★★★★
Key	★★★☆☆ good ★★★★★ excellent € Economy €€€€€ Premium		

Shaft design			
Solid shaft with feather key	✓	✓	✓
Solid shaft without feather key	✓	✓	✓
Hollow shaft with shrink ring	✓		
Flange hollow shaft	✓		
Bearing design			
Standard	✓	✓	✓
Axially reinforced		✓	✓
Radially reinforced		✓	✓
Maintenance-free	✓	✓	✓

1 Selection tool

1.4 EZ synchronous servo geared motors



Product chapter

KS

PHKX

PHK

PHQK

Chapter number

[▶ 5.8]

[5.11]

[▶ 5.12]

[5.13]

Technical data

	KS	PHKX	PHK	PHQK
i	6 – 100	4 – 300	16 – 555	22 – 2242
M_{2acc}	27 – 400 Nm	26 – 2100 Nm	89 – 7500 Nm	123 – 43000 Nm
$\Delta\phi_2$	4 – 6 arcmin	1 – 6 arcmin	1.5 – 4.5 arcmin	1.5 – 4 arcmin
η_{get}	93 – 95 %	92 – 95 %	92 – 93 %	90 – 93 %

An explanation of the formula symbols can be found in the chapter [▶ 11.1].

Features

Power density	★★★☆☆	★★★★★	★★★★☆	★★★★★
Backlash	★★★☆☆	★★★★★	★★★★★	★★★★★
Price category	€€€	€€€€	€€€€	€€€€€
Shaft load	★★★★★	★★★★★	★★★★★	★★★★★
Smooth operation	★★★★☆	★★☆☆☆	★★★★☆	★★★☆☆
Torsional stiffness	★★★☆☆	★★★★☆	★★★★☆	★★★★★
Mass moment of inertia	★★★★★	★★★☆☆	★★★★★	★★★★★
Key	★★☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium			

Shaft design	KS	PHKX	PHK	PHQK
Solid shaft with feather key	✓			
Solid shaft without feather key	✓			
Hollow shaft with shrink ring	✓			
Flange hollow shaft	✓			
Flange shaft		✓	✓	✓
Bearing design	KS	PHKX	PHK	PHQK
Standard	✓	✓	✓	✓
Reinforced		✓ (PH3 – PH5)	✓ (PH5)	✓ (PHQ5)
Maintenance-free	KS	PHKX	PHK	PHQK
	✓	✓	✓	✓

1 Selection tool

1.4 EZ synchronous servo geared motors



Product chapter

KL

K

Chapter number

[5.14]

[5.15]

Technical data

i	4 – 32	4 – 381
M_{2acc}	11 – 65 Nm	23 – 13200 Nm
$\Delta\phi_2$	16 – 25 arcmin	1.5 – 12 arcmin
η_{get}	97 %	94 – 97 %

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★☆☆☆	★★☆☆☆
Backlash	★★☆☆☆	★★☆☆☆
Price category	€	€€
Shaft load	★★☆☆☆	★★☆☆☆
Smooth operation	★★☆☆☆	★★☆☆☆
Torsional stiffness	★★☆☆☆	★★☆☆☆
Mass moment of inertia	★★★★★	★★★★★
Key	★★☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium	
Shaft design		
Solid shaft with feather key	✓	✓
Solid shaft without feather key	✓	K1 – K4: ✓ Starting at K5: Request
Solid shaft on both sides	✓	✓
Hollow shaft with keyway	✓	✓
Hollow shaft with shrink ring	✓	✓
Accessories		
Flange	✓	✓
Foot plates	✓	✓
Torque arm bracket		✓
Bearing design		
Standard	✓	✓
Maintenance-free	✓	K1 – K4: ✓

1 Selection tool

1.5 LM Lean geared motors



Product chapter

P

PE

C

F

Chapter number

[▶ 6.1](#)

[\[6.2\]](#)

[▶ 6.3](#)

[\[6.4\]](#)

Technical data

	P	PE	C	F
i	3 – 70	3 – 35	2 – 178	4.3 – 274
M_{2acc}	13 – 1840 Nm	13 – 250 Nm	8.7 – 4140 Nm	19 – 1100 Nm
$\Delta\phi_2$	1 – 5 arcmin	8 – 10 arcmin	10 – 20 arcmin	5 – 11 arcmin
η_{get}	95 – 97 %	95 – 97 %	96 – 97 %	96 – 97 %

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★★★☆	★★★☆☆	★★☆☆☆	★☆☆☆☆
Backlash	★★★★☆	★★★☆☆	★★☆☆☆	★★★☆☆
Price category	€€	€	€	€
Shaft load	★★★★☆	★★☆☆☆	★★☆☆☆	★★★☆☆
Smooth operation	★★★★☆	★★★☆☆	★★★☆☆	★★★☆☆
Torsional stiffness	★★★☆☆	★★★☆☆	★★☆☆☆	★★☆☆☆
Mass moment of inertia	★★★★★	★★★★★	★★★★★	★★★★★
Key	★★☆☆☆☆ good ★★★★★★ excellent € Economy €€€€€ Premium			

Shaft design	P	PE	C	F
Solid shaft with feather key	✓	✓	✓	✓
Solid shaft without feather key	✓		C0 – C5: ✓ Starting at C6: Request	✓
Hollow shaft with keyway				✓
Hollow shaft with shrink ring				✓
Bearing design	P	PE	C	F
Standard	✓	✓	✓	✓
Axially reinforced	✓			
Radially reinforced	✓			
Maintenance-free	P	PE	C	F
	✓	✓	C0 – C5: ✓	✓

1 Selection tool

1.5 LM Lean geared motors



Product chapter

PKX

KL

K

Chapter number

[▶ 6.5](#)

[\[6.6\]](#)

[▶ 6.7](#)

Technical data

	PKX	KL	K
i	3 – 210	4 – 16	4 – 294
M_{2acc}	13 – 3300 Nm	35 – 60 Nm	17 – 6820 Nm
$\Delta\phi_2$	2 – 8.5 arcmin	16 – 20 arcmin	1.5 – 12 arcmin
η_{get}	94 – 96 %	97 %	94 – 97 %

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★★★☆	★★☆☆☆	★★☆☆☆
Backlash	★★★★☆	★★☆☆☆	★★★★☆
Price category	€€€	€	€€
Shaft load	★★★★☆	★★☆☆☆	★★★★☆
Smooth operation	★★☆☆☆	★★☆☆☆	★★★★☆
Torsional stiffness	★★☆☆☆	★★☆☆☆	★★☆☆☆
Mass moment of inertia	★★☆☆☆	★★★★★	★★★★★
Key	★★☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium		

Shaft design	PKX	KL	K
Solid shaft with feather key	✓	✓	✓
Solid shaft without feather key	✓	✓	K1 – K4: ✓ Starting at K5: Request
Solid shaft on both sides		✓	✓
Hollow shaft with keyway		✓	✓
Hollow shaft with shrink ring		✓	✓
Accessories			
Flange		✓	✓
Foot plates		✓	✓
Torque arm bracket			✓
Bearing design			
Standard	✓	✓	✓
Axially reinforced	✓		
Radially reinforced	✓		
Maintenance-free	✓	✓	K1 – K4: ✓

1 Selection tool

1.6 Asynchronous geared motors



Product chapter

C

F

Chapter number

[▶ 7.1](#)

[\[7.2\]](#)

Technical data

P_N	0.12 – 45 kW	0.12 – 7.5 kW
i	2 – 274	4.3 – 547
M_{2N}	2.3 – 8677 Nm	5.1 – 1338 Nm
η_{get}	96 – 97 %	96 – 97 %

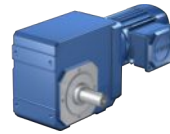
An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★☆☆☆☆	★☆☆☆☆
Price category	€	€
Shaft load	★★☆☆☆	★★☆☆☆
Smooth operation	★★★★☆	★★★★☆
Torsional stiffness	★★☆☆☆	★★☆☆☆
Mass moment of inertia	★★★★★	★★★★★
Key	★☆☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium	
Shaft design		
Solid shaft with feather key	✓	✓
Solid shaft without feather key	C0 – C5: ✓ Starting at C6: Request	
Hollow shaft with keyway		✓
Hollow shaft with shrink ring		✓
Bearing design		
Standard	✓	✓
Maintenance-free	C0 – C5: ✓	✓

1 Selection tool

1.6 Asynchronous geared motors



Product chapter

K

Chapter number

[▶ 7.3](#)

Technical data

P_N	0.12 – 45 kW
i	4 – 381
M_{2N}	6.5 – 14123 Nm
η_{get}	94 – 97 %

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Power density	★★☆☆☆
Price category	€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★☆☆☆
Mass moment of inertia	★★★★★
Key	★★☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium
Shaft design	
Solid shaft with feather key	✓
Solid shaft without feather key	K1 – K4: ✓ Starting at K5: Request
Solid shaft on both sides	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓
Bearing design	
Standard	✓
Maintenance-free	K1 – K4: ✓

1 Selection tool

1.7 Synchronous servo motors



Product chapter

EZ

EZHD

Chapter number

[▶ 8.1](#)

[\[8.2\]](#)

Technical data

M_N	0.89 – 77.2 Nm	1.9 – 24.6 Nm
M_0	0.95 – 94 Nm	2.6 – 31.1 Nm

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Efficiency	★★★★★	★★★★★
Price category	€€€€	€€€€€
Key	★☆☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium	

Shaft design

Solid shaft without feather key	✓	
Flange hollow shaft		✓

Encoder

EnDat 2.2	✓	✓
EnDat 2.1	✓	✓
EnDat 3 One Cable Solution (OCS)	✓	
Resolver	✓	

Cooling

Convection cooling	✓	✓
Forced ventilation	✓	

Brake

Permanent magnet holding brake	✓	✓
--------------------------------	---	---

Marks and test symbols

CE	✓	✓
cURus	✓	✓

1 Selection tool

1.7 Synchronous servo motors



Product chapter

EZM

EZS

Chapter number

[▶ 8.3](#)

[▶ 8.4](#)

Technical data

F_{ax}	751 – 21375 N	760 – 31271 N
----------	---------------	---------------

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Efficiency	★★★★★	★★★★★
Price category	€€€€€	€€€€€
Key	★☆☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium	
Shaft design		
Direct drive of the threaded nut	✓	
Direct drive of the threaded spindle		✓
Encoder		
EnDat 2.2	✓	✓
EnDat 2.1	✓	✓
EnDat 3 One Cable Solution (OCS)		✓
Resolver		✓
Cooling		
Convection cooling	✓	✓
Forced ventilation		✓
Brake		
Permanent magnet holding brake	✓	✓
Marks and test symbols		
CE	✓	✓
cURus	✓	✓

1 Selection tool

1.8 Lean motors



Product chapter

LM

Chapter number

[▶ 8.5](#)

Technical data

M_N	2.25 – 25.7 Nm
M_0	2.43 – 29.8 Nm

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#)].

Features

Efficiency	★★★★★
Price category	€€€
Key	★☆☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium
Shaft design	
Solid shaft with feather key	✓
Cooling	
Convection cooling	✓
Brake	
Spring-loaded holding brake	✓
Marks and test symbols	
CE	✓
cURus	✓

1 Selection tool

1.9 Asynchronous motors



Product chapter

Asynchronous motors

Chapter number

[▶ 8.6](#)

Technical data

n_2	1400 – 1480 rpm
P_N	0.12 – 45 kW
M_N	0.82 – 291 Nm
I_N	0.35 – 83 A

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#)].

Features

Efficiency	★★★★☆
Price category	€€
Key	★☆☆☆☆ good ★★★★★ excellent € Economy €€€€€ Premium
Shaft design	
IEC design	✓
Encoder	
Incremental encoders	✓
SSI multi-turn absolute encoders ¹	✓
Electrical connection	
Terminal box	✓
QuickFit connector box	✓
Cooling	
Self-ventilation	✓
Forced ventilation	✓
Brake	
Spring-loaded brake	✓
Marks and test symbols	
CE	✓
cURus	✓
EISA CC number including cURus	From 4 kW: ✓

¹ only in combination with forced ventilation

1 Selection tool

1.10 Drive controller



SC6



SI6



SD6

Product chapter

Chapter number

[▶ 9.1](#)

[▶ 9.2](#)

[▶ 9.3](#)

Technical data

$I_{2N,PU}$	4.5 – 19 A	5 – 50 A	2.3 – 85 A
$I_{2N,PU}$	4 – 15 A	4.5 – 40 A	1.7 – 60 A
I_{2maxPU}	9.5 – 39.9 A	10.5 – 105 A	4.2 – 153 A
I_{2maxPU}	10 – 37.5 A	11.3 – 100 A	4.3 – 150 A

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Optimal application area

Number of axes	1 – 4	> 4	1 – 8
Application	Drive based	Controller based	Drive based synchronous operation

Motor types

Lean motors	✓	✓	
Asynchronous motors	✓	✓	✓
Synchronous servo motors	✓	✓	✓
Linear motors			✓
Torque motors	✓	✓	✓

Communication

Isochronic system bus (IGB motion bus)			✓
CANopen			(✓)
EtherCAT	✓	✓	(✓)
PROFINET	✓	✓	(✓)
PROFIBUS DP			

(✓): Communication module required

Safety functions

STO, SS1: SIL 3, PL e (cat. 3)			
STO, SS1: SIL 3, PL e (cat. 4)	(✓)	(✓)	(✓)
SS2, SLS, SBC, SBT, SDI, SLI: SIL 3, PL e (cat. 4)			(✓)

(✓): Safety module required

Features

Multi-axis drive system		✓	
Stand-alone	✓		✓
One Cable Solution	✓	✓	
Double-axis controller available	✓	✓	

1 Selection tool

1.10 Drive controller



FDS 5000



SDS 5000

Product chapter

Chapter number

[▶ 9.5](#)

[▶ 9.4](#)

Technical data

$I_{2N,PU}$	1.3 – 16 A	2.3 – 85 A
$I_{2N,PU}$	1 – 10 A	1.7 – 60 A
I_{2maxPU}	2.4 – 28.8 A	4.2 – 153 A
I_{2maxPU}	2.5 – 25 A	4.3 – 150 A

An explanation of the formula symbols can be found in the chapter [▶ 11.1](#).

Features

Optimal application area

Number of axes	1 – 4	1 – 8
Application	Drive based	Drive based synchronous operation

Motor types

Lean motors		
Asynchronous motors	✓	✓
Synchronous servo motors		✓
Linear motors		
Torque motors		

Communication

Isochronic system bus (IGB motion bus)		✓
CANopen	(✓)	(✓)
EtherCAT	(✓)	(✓)
PROFINET	(✓)	(✓)
PROFIBUS DP	(✓)	(✓)

(✓): Communication module required

Safety functions

STO, SS1: SIL 3, PL e (cat. 3)	(✓)	(✓)
STO, SS1: SIL 3, PL e (cat. 4)		
SS2, SLS, SBC, SBT, SDI, SLI: SIL 3, PL e (cat. 4)		

(✓): Safety module required

Features

Multi-axis drive system		
Stand-alone	✓	✓
One Cable Solution		
Double-axis controller available		

1 Selection tool

1.11 Connection method



Cables

Product chapter

Chapter number

[▶ 9.6](#)

Power cables

Design	Motor plug connector size			
	con.15	con.23	con.40	con.58
Quick lock	✓			
speedtec quick lock		✓	✓	
Screw technology		On request	On request	✓

Encoder cables

Design	Motor plug connector size		
	con.15	con.17	con.23
Quick lock	✓		
speedtec quick lock		✓	✓

Encoder	Motor plug connector size			
	con.15	con.17	con.23 synchronous	con.23 asynchronous
EnDat 2.1/2.2 digital	✓	✓	On request	
Incremental (HTL)				✓
SSI				✓
Resolver	✓	✓	On request	
EnDat 2.1 sin/cos	✓	✓	On request	

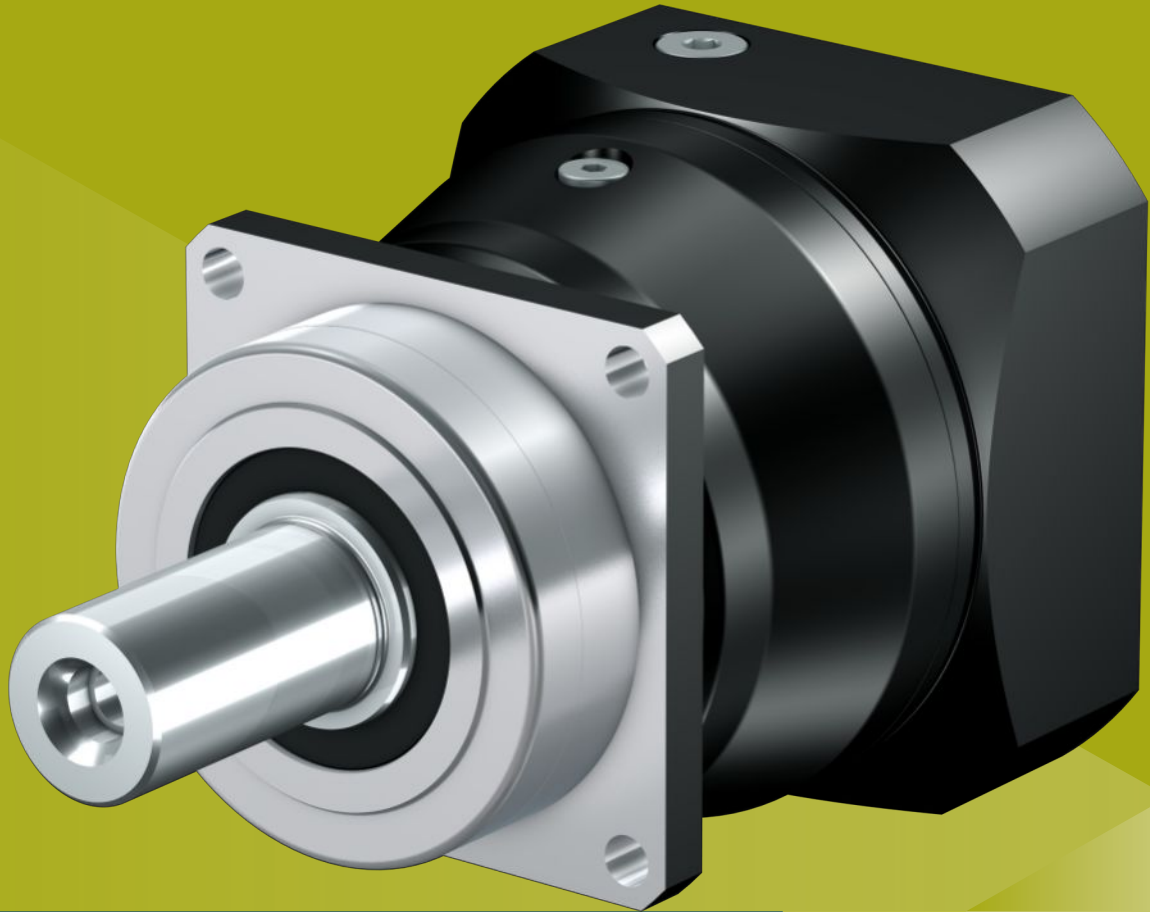
One Cable Solution EnDat 3

Design	Motor plug connector size
	con.23
speedtec quick lock	✓

2 Servo gear units

Table of contents

2.1	P planetary gear units.....	34
2.2	PH planetary gear units.....	36
2.3	PHQ planetary gear units.....	38
2.4	PHV planetary gear units.....	40
2.5	PE planetary gear units.....	42
2.6	C helical gear units.....	44
2.7	F offset helical gear units.....	46
2.8	KS right-angle servo gear units.....	48
2.9	PKX planetary gear units.....	50
2.10	PK planetary gear units.....	52
2.11	PHKX planetary gear units.....	54
2.12	PHK planetary gear units.....	56
2.13	PHQK planetary gear units.....	58
2.14	KL helical bevel gear units.....	60
2.15	K helical bevel gear units.....	62



2.1 Planetary gear units

P

Helical-gear precision planetary gear units

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★☆☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
P231	4 – 10	21 – 25	8000	6	1.6 – 1.9
P232	16 – 100	21 – 25	8000	8	1.6 – 1.8
P331	3 – 10	50 – 80	7000 – 8000	2 – 4	4.3 – 5.4
P332	12 – 100	50 – 75	8000	3 – 5	4.3 – 5.2
P431	3 – 10	100 – 145	6000 – 8000	2 – 4	9.1 – 13
P432	12 – 100	100 – 139	7000 – 8000	3 – 5	9 – 12
P531	3 – 10	200 – 385	5000 – 7000	1 – 3	24 – 34
P532	12 – 100	200 – 364	6000 – 8000	2 – 4	25 – 33
P731	3 – 10	500 – 840	4000 – 6000	1 – 3	54 – 67
P732	12 – 100	500 – 805	5000 – 7000	2 – 4	54 – 65
P831	3 – 10	1200 – 2000	3000 – 4500	1 – 3	147 – 181
P832	12 – 100	1200 – 2000	4500 – 6000	2 – 4	148 – 177
P931	4 – 10	2300 – 3450	3000 – 4000	3	323 – 407
P932	16 – 100	2200 – 3450	3500 – 4500	4	321 – 406

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	✓

Bearing design

Standard	✓
Axially reinforced	✓
Radially reinforced	✓

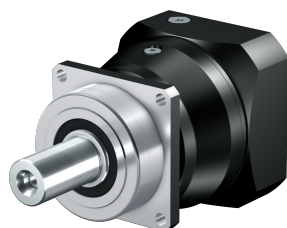
Motor adapter design

Motor adapter with EasyAdapt coupling (ME/MEL)	✓
Motor adapter with FlexiAdapt coupling (MF/MFL)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME and MF motor adapters in ATEX design (Directive 2014/34/EU).

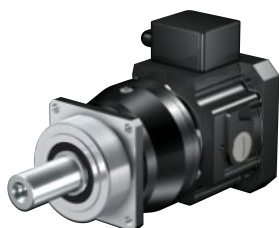
Input options

Motor adapter for attaching synchronous servo motors



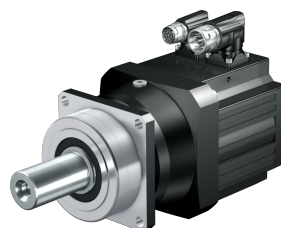
<http://www.stoeber.de/en/PME>

MB motor adapter with brake for attaching synchronous servo motors



<http://www.stoeber.de/en/PMB>

EZ synchronous servo motor



<http://www.stoeber.de/en/PEZ>

LM Lean motor



<http://www.stoeber.de/en/PLM>



2.2 Planetary gear units

PH

High-performance precision planetary gear units

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PH3 – PH5)	✓ (optional)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
PH331	5 – 10	60 – 85	8000	2 – 4	9 – 15
PH332	20 – 100	60 – 85	8000	2 – 4	8.9 – 14
PH431	4 – 10	115 – 189	5000 – 7000	1 – 3	21 – 36
PH432	16 – 100	110 – 174	8000	1 – 3	20 – 32
PH531	4 – 10	288 – 400	5000 – 6500	1 – 3	52 – 91
PH532	16 – 100	288 – 400	7000 – 8000	1 – 3	52 – 85
PH731	4 – 10	575 – 924	4000 – 5000	1 – 3	121 – 219
PH732	16 – 100	550 – 908	6000 – 7000	1 – 3	121 – 200
PH831	4 – 10	1392 – 2300	3500 – 4000	1 – 3	329 – 561
PH832	16 – 100	1380 – 2300	4500 – 6000	1 – 3	333 – 521
PH932	12 – 60	4500 – 5000	3000 – 4500	3	1046 – 1201
PH1032	18 – 60	6912 – 7500	3000 – 4500	3	1591 – 1743

Shaft design	
Flange shaft	✓
Bearing design	
Standard	✓
Reinforced (PH3 – PH5)	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME/MEL)	✓
Motor adapter with FlexiAdapt coupling (MF/MFL)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME and MF motor adapters in ATEX design (Directive 2014/34/EU).

Input options

Motor adapter for attaching synchronous servo motors



<http://www.stoeber.de/en/PHME>

MB motor adapter with brake for attaching synchronous servo motors



<http://www.stoeber.de/en/PHMB>

EZ synchronous servo motor



<http://www.stoeber.de/en/PHEZ>



2.3 Planetary gear units

PHQ

Quattro-Power for maximum power density

Features

Power density	★★★★★
Backlash	★★★★★
Price category	€€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★★
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Any mounting position (single/two stage)	✓
High power density	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PHQ4 – PHQ5)	✓ (optional)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PHQ431	5.5	200 – 220	6000	1 – 3	40 – 42
PHQ432	22 – 55	200 – 247	8000	1 – 3	38 – 40
PHQ531	5.5	550	5000	1 – 3	92 – 102
PHQ532	22 – 55	480 – 562	7000 – 8000	1 – 3	95 – 102
PHQ731	5.5	1050	4900 – 5000	1 – 3	197 – 222
PHQ732	22 – 55	900 – 1050	6000 – 7000	1 – 3	212 – 224
PHQ733	88 – 550	1050	6000 – 7000	1 – 3	214 – 224
PHQ831	5.5	2800 – 3300	4000	1 – 3	533 – 652
PHQ832	22 – 55	2700 – 3300	4500 – 6000	1 – 3	667 – 713
PHQ833	88 – 550	2700 – 3300	5000 – 6500	1 – 3	672 – 711
PHQ932	18 – 60	6000	3000 – 4500	3	1144 – 1220
PHQ933	72 – 600	6000	4500 – 6000	3	1144 – 1205
PHQ1032	24 – 60	10000	3000 – 4000	3	1970 – 2062
PHQ1033	96 – 600	10000	3500 – 4500	3	1969 – 2067
PHQ1132	24 – 60	22000	2800 – 3800	3	3460 – 3538
PHQ1133	96 – 300	22000	3500 – 4500	3	3489 – 3528
PHQ1232	24 – 42	43000	3000 – 3500	3	6236 – 6248
PHQ1233	96 – 420	43000	3000 – 4000	3	6136 – 6271

Shaft design	
Flange shaft	✓
Bearing design	
Standard	✓
Reinforced (PHQ4 – PHQ5)	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME/MEL)	✓
Motor adapter with FlexiAdapt coupling (MF/MFL)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME and MF motor adapters in ATEX design (Directive 2014/34/EU).

Input options

Motor adapter for attaching synchronous servo motors



<http://www.stoeber.de/en/PHQME>

MB motor adapter with brake for attaching synchronous servo motors



<http://www.stoeber.de/en/PHQMB>

EZ synchronous servo motor



<http://www.stoeber.de/en/PHQEZ>



2.4 Planetary gear units

PHV

High-performance precision planetary gear units

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PHV933	61 – 121	4250	4500	3	804 – 848
PHV1033	61 – 91	7500	4500	3	1339 – 1368

Shaft design

Flange shaft

✓

Motor adapter design

Motor adapter with EasyAdapt coupling (ME/MEL)

✓

On request, you can receive the gear units with ME motor adapters in ATEX design (Directive 2014/34/EU).

Input options

Motor adapter for attaching synchronous
servo motors



<http://www.stoeber.de/en/PHVME>

EZ synchronous servo motor



<http://www.stoeber.de/en/PHVEZ>



2.5 Planetary gear units

PE

Cost-efficient, helical-geared planetary gear units

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Non-contact sealing at the input	✓
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
PE221	4 – 10	17 – 20	8000	10	1.2 – 1.4
PE222	16 – 100	17 – 20	8000	13	1.2 – 1.4
PE321	3 – 10	40 – 53	6000 – 7000	8	3.4 – 4.4
PE322	16 – 100	44 – 50	8000	10	3.6 – 4.2
PE421	3 – 10	90 – 109	5500 – 6000	8	10 – 14
PE422	16 – 100	90 – 104	7000	10	10 – 13
PE521	3 – 10	180 – 250	4500 – 5000	8	27 – 35
PE522	16 – 100	220 – 250	6000	10	27 – 33

Shaft design

Solid shaft with feather key

✓

Solid shaft without feather key

Motor adapter design

Motor adapter with EasyAdapt coupling (ME/MEL)

✓

On request, you can receive the gear units with ME motor adapters in ATEX design (Directive 2014/34/EU).

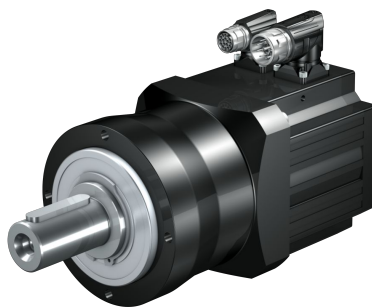
Input options

ME motor adapter for attaching synchronous
servo motors



<http://www.stoeber.de/en/PEME>

EZ synchronous servo motor

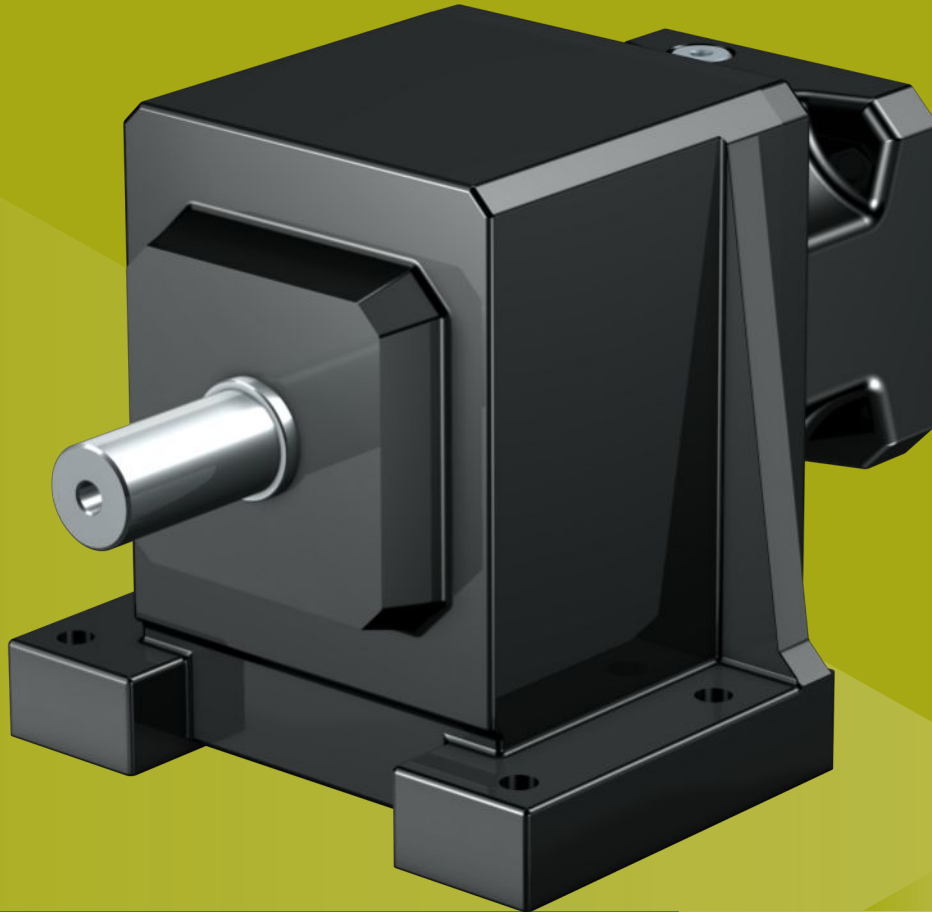


<http://www.stoeber.de/en/PEEZ>

LM Lean motor



<http://www.stoeber.de/en/PELM>



2.6 Helical gear units

C

Compact helical gear units

Features

Power density	★☆☆☆☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free (C0 – C5)	✓
FKM seal ring at the input	✓
Reinforced output bearing	✓ (on request)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
C002	2 – 70	47 – 72	6000 – 7000	16 – 20	1.2 – 1.6
C102	2 – 70	47 – 138	5000 – 6500	15 – 18	2.8 – 3.9
C103	82 – 276	138	6500	15	3.9
C202	2 – 70	91 – 230	4500 – 6500	14 – 17	5.6 – 8.3
C203	80 – 275	230	6000 – 6500	14	8.3
C302	2 – 70	181 – 400	4000 – 6000	13 – 16	6.9 – 8.7
C303	80 – 274	350 – 400	6000	13	8.7
C402	2 – 70	227 – 600	3500 – 5500	12 – 15	16 – 22
C403	81 – 270	550 – 600	5500	12	22
C502	2 – 70	269 – 920	3200 – 5000	12 – 14	20 – 23
C503	81 – 271	850 – 920	5000	12	23
C612	4.2 – 69	1012 – 1650	3000 – 4500	10	70 – 74
C613	49 – 266	913 – 1650	4500	10	74
C712	4.3 – 70	1240 – 2760	2800 – 4500	10	112 – 122
C713	51 – 223	2257 – 2760	4500	10	122
C812	6.7 – 69	1942 – 4800	3500 – 4300	10	139 – 204
C813	49 – 270	2486 – 4800	4300	10	203 – 204
C912	20 – 70	5520 – 7211	4000	10	260 – 392
C913	65 – 215	5630 – 8000	4000	10	392 – 393

Shaft design	
Solid shaft with feather key	✓
Solid shaft without feather key	C0 – C5: ✓ Starting at C6: Request
Housing design	
Pitch circle diameter	✓
Round flange	✓
Square flange	C0 – C4: ✓
Foot	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME)	✓
Motor adapter with curved tooth coupling (MR)	✓
Motor adapter with plug-in coupling (MQ)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME, MQ and MR motor adapters in ATEX design (Directive 2014/34/EU).

Input options

ME motor adapter for attaching synchronous servo motors



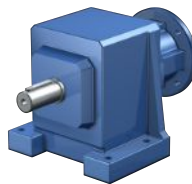
<http://www.stoeber.de/en/CME>

MB motor adapter with brake for attaching synchronous servo motors



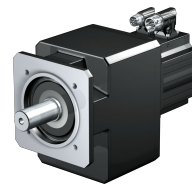
<http://www.stoeber.de/en/CMB>

MR motor adapter for attaching asynchronous motors



<http://www.stoeber.de/en/CMR>

EZ synchronous servo motor



<http://www.stoeber.de/en/CEZ>

LM Lean motor



<http://www.stoeber.de/en/CLM>



2.7 Offset helical gear units

F

Offset helical gear units with large axial distances

Features

Power density	★☆☆☆☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
FKM seal ring at the input	✓
Large axial distances, suitable for confined situations	✓
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
F102	4.3 – 140	100 – 120	6000 – 7000	6 – 11	6.2 – 7.7
F202	4.7 – 141	109 – 270	5000 – 6500	6 – 11	14 – 18
F203	184 – 552	270	6500	7 – 11	18
F302	4.6 – 141	209 – 450	4500 – 6500	6 – 11	20 – 22
F303	182 – 551	450	6000 – 6500	7 – 11	22
F402	4.7 – 140	419 – 700	4000 – 6000	5 – 10	38 – 39
F403	182 – 547	700	6000	6 – 10	39
F602	4.5 – 140	524 – 1100	3500 – 5500	5 – 10	69 – 77
F603	181 – 540	1100	5500	6 – 10	77

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓

Housing design

Pitch circle diameter	✓
Round flange	✓
Square flange	✓
Pitch circle diameter + side fastening	✓

Motor adapter design

Motor adapter with EasyAdapt coupling (ME)	✓
Motor adapter with curved tooth coupling (MR)	✓
Motor adapter with plug-in coupling (MQ)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME, MQ and MR motor adapters in ATEX design (Directive 2014/34/EU).

Input options

ME motor adapter for attaching synchronous servo motors



<http://www.stoeber.de/en/FME>

MB motor adapter with brake for attaching synchronous servo motors



<http://www.stoeber.de/en/FMB>

MR motor adapter for attaching asynchronous motors



<http://www.stoeber.de/en/FMR>

EZ synchronous servo motor

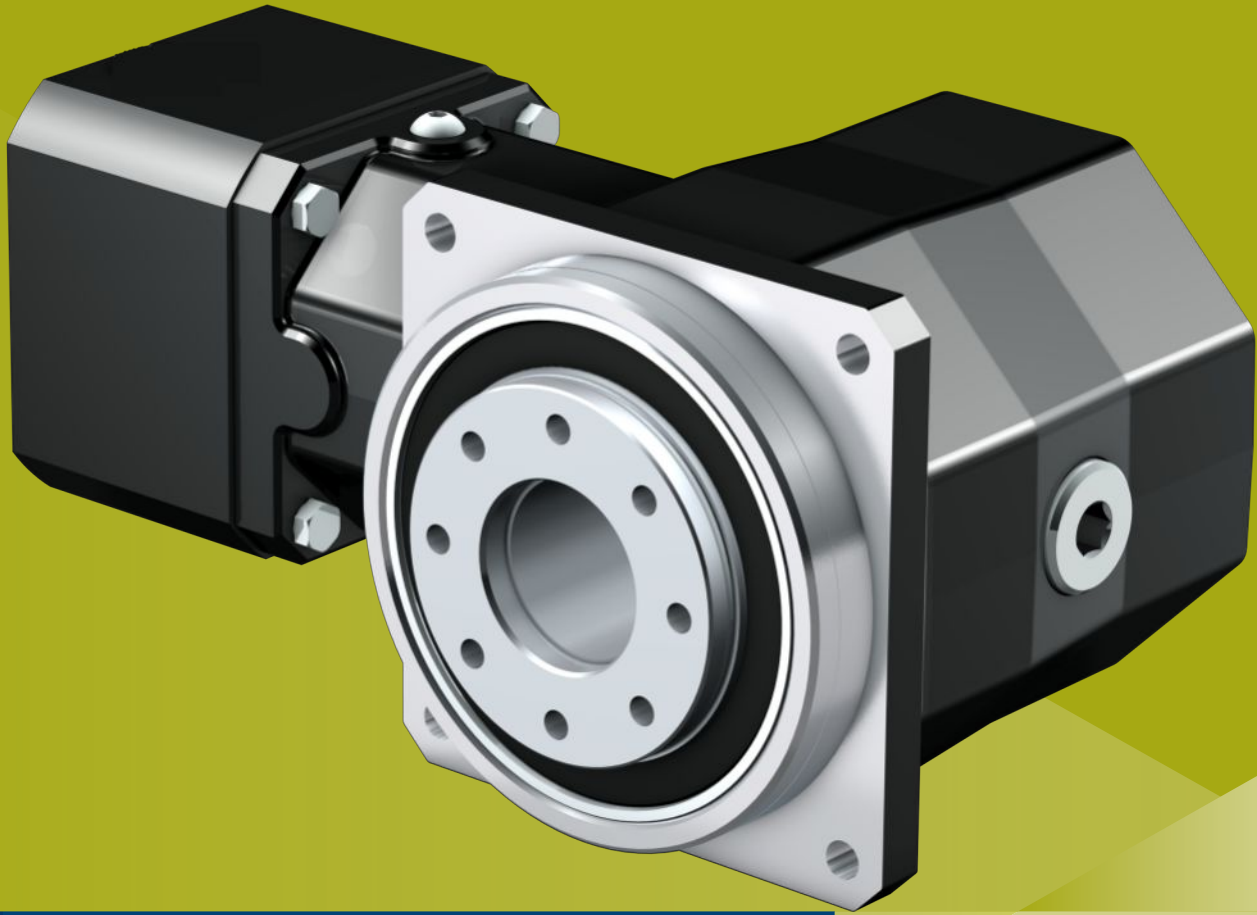


<http://www.stoeber.de/en/FEZ>

LM Lean motor



<http://www.stoeber.de/en/FLM>



2.8

Right-angle servo gear units

KS

Precision right-angle servo gear units

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
FKM seal ring at the input	✓
Stiff output bearings due to pretension	✓
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
KS402	6 – 20	90	6000	6	8.1 – 8.5
KS403	24 – 200	90	6000	6	8.5
KS502	6 – 20	200	5500 – 6000	5	16 – 17
KS503	24 – 200	200	6000	5	17
KS702	6 – 20	400	4500 – 6000	4	40 – 42
KS703	24 – 200	400	6000	4	42

Shaft design

Flange hollow shaft	✓
Hollow shaft with shrink ring	✓
Solid shaft without feather key	✓
Solid shaft with feather key	✓

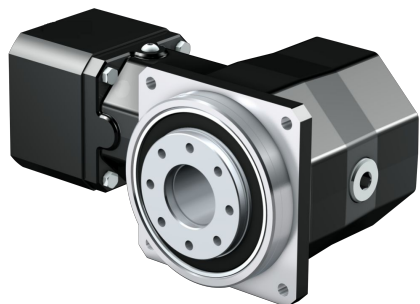
Motor adapter design

Motor adapter with EasyAdapt coupling (ME/MEL)	✓
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On request, you can receive the gear units with ME motor adapters in ATEX design (Directive 2014/34/EU).

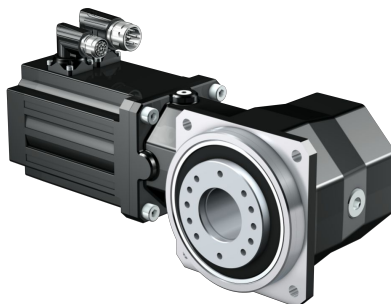
Input options

ME motor adapter for attaching synchronous servo motors



<http://www.stoeber.de/en/KSME>

EZ synchronous servo motor



<http://www.stoeber.de/en/KSEZ>



2.9 Planetary gear units

PKX

Helical-gear precision right-angle planetary gear units

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€
Shaft load	★★★★☆
Smooth operation	★★★☆☆
Torsional stiffness	★★★☆☆
Mass moment of inertia	★★★☆☆
Helical gearing	✓
Maintenance-free	✓
Small installation space	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{zacc} [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
P231KX	4 – 30	21 – 25	4500 – 6000	7 – 8.5	1.5 – 1.7
P232KX	35 – 300	21 – 25	4500 – 6000	8 – 8.5	1.6 – 1.8
P331KX	3 – 30	38 – 75	4500 – 6000	3 – 7.5	2.4 – 4.2
P332KX	32 – 300	60 – 75	4500 – 6000	3 – 5.5	4.3 – 5.2
P431KX	3 – 30	73 – 143	4000 – 5500	3 – 7.5	5.3 – 9.2
P432KX	32 – 300	110 – 139	4500 – 6000	3 – 5.5	9 – 12
P531KX	3 – 30	183 – 380	3500 – 5000	2 – 6.5	13 – 25
P532KX	32 – 300	288 – 364	4000 – 5500	2 – 4.5	25 – 32
P731KX	3 – 30	364 – 840	3000 – 4000	2 – 6.5	38 – 54
P732KX	32 – 300	550 – 805	3500 – 5000	2 – 4.5	54 – 62
P831KX	3 – 30	364 – 1213	3000 – 4000	2 – 6.5	59 – 130
P832KX	32 – 300	1320 – 2000	3000 – 4000	2 – 4.5	148 – 173
P932KX	16 – 300	1900 – 3300	3000 – 4000	4 – 4.5	320 – 393

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	✓

Bearing design

Standard	✓
Axially reinforced	✓
Radially reinforced	✓

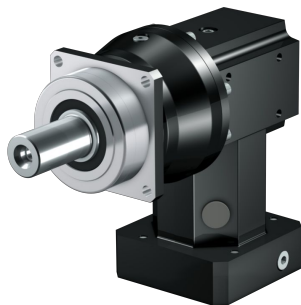
Motor adapter design

Motor adapter with FlexiAdapt coupling (MF)	✓
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On request, you can receive the gear units with MF motor adapters in ATEX design (Directive 2014/34/EU).

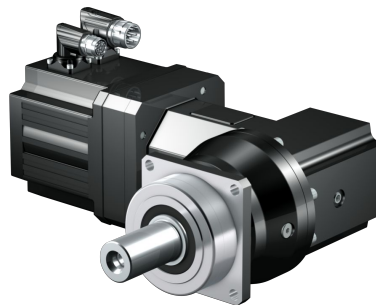
Input options

MF motor adapter for attaching synchronous servo motors



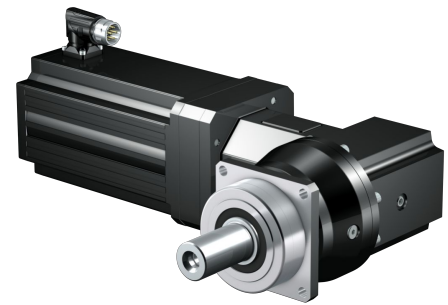
<http://www.stoeber.de/en/PKXMF>

EZ synchronous servo motor

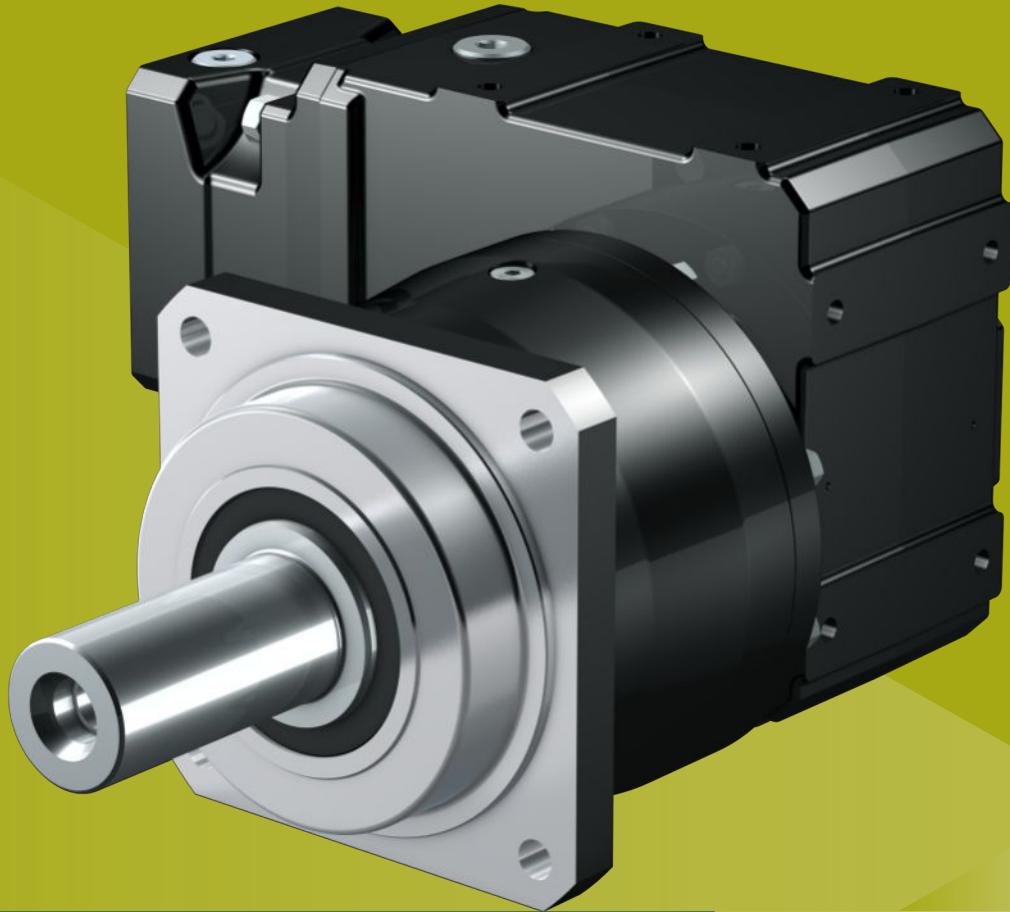


<http://www.stoeber.de/en/PKXEZ>

LM Lean motor



<http://www.stoeber.de/en/PKXLM>



2.10 Planetary gear units

PK

Helical-gear precision right-angle planetary gear units

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

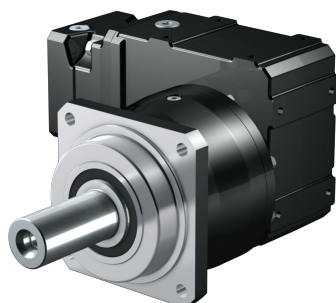
Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
P5K	12 – 280	200 – 385	5000 – 7000	2 – 5	22 – 29
P7K	12 – 561	407 – 840	4500 – 7000	1.5 – 4.5	39 – 53
P8K	12 – 555	676 – 1867	4000 – 6500	1.5 – 4.5	81 – 132
P9K	28 – 485	2191 – 3105	3800 – 5500	3.5	303 – 305

Shaft design	
Solid shaft with feather key	✓
Solid shaft without feather key	✓
Bearing design	
Standard	✓
Axially reinforced	✓
Radially reinforced	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME)	✓
Motor adapter with plug-in coupling (MQ)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME motor adapters in ATEX design (Directive 2014/34/EU).

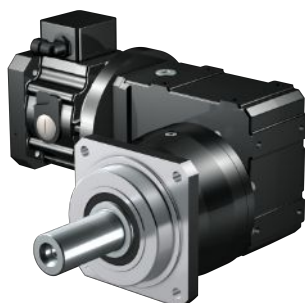
Input options

ME motor adapter for attaching synchronous servo motors



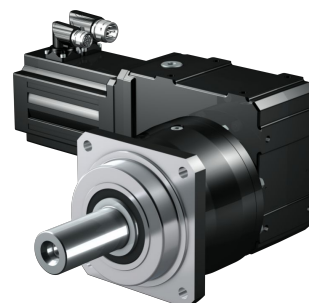
<http://www.stoeber.de/en/PKME>

MB motor adapter with brake for attaching synchronous servo motors



<http://www.stoeber.de/en/PKMB>

EZ synchronous servo motor



<http://www.stoeber.de/en/PKEZ>



2.11 Planetary gear units

PHKX

High-performance precision right-angle planetary gear units

Features

Power density	★★★★★
Backlash	★★★★★
Price category	€€€€
Shaft load	★★★★★
Smooth operation	★★★☆☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★☆☆
Helical gearing	✓
Maintenance-free	✓
Small installation space	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PH3 – PH5)	✓ (optional)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★★★☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PH331KX	5 – 30	60 – 77	4500 – 6000	3 – 6	6.9 – 8.4
PH332KX	35 – 300	60 – 85	4500 – 6000	2 – 4.5	8.8 – 13
PH431KX	4 – 30	96 – 168	4000 – 5500	2 – 5.5	11 – 19
PH432KX	32 – 300	110 – 174	4500 – 6000	1 – 3.5	20 – 30
PH531KX	4 – 30	242 – 387	3500 – 5000	2 – 5.5	28 – 46
PH532KX	32 – 300	288 – 400	4000 – 5500	1 – 3.5	52 – 78
PH731KX	4 – 30	480 – 840	3000 – 4000	2 – 5.5	94 – 122
PH732KX	32 – 300	550 – 908	3500 – 5000	1 – 3.5	121 – 176
PH831KX	4 – 30	480 – 1200	3000 – 4000	2 – 5.5	122 – 253
PH832KX	32 – 300	1380 – 2300	3500 – 4000	1 – 3.5	332 – 489

Shaft design	
Flange shaft	✓
Bearing design	
Standard	✓
Reinforced (PH3 – PH5)	✓
Motor adapter design	
Motor adapter with FlexiAdapt coupling (MF)	✓

On request, you can receive the gear units with MF motor adapters in ATEX design (Directive 2014/34/EU).

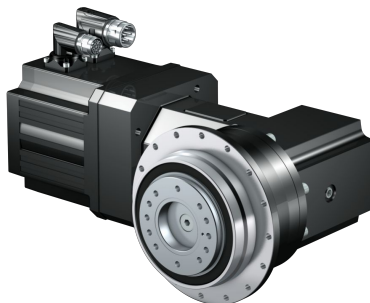
Input options

MF motor adapter for attaching synchronous servo motors



<http://www.stoeber.de/en/PHKXMF>

EZ synchronous servo motor



<http://www.stoeber.de/en/PHKXEZ>



2.12 Planetary gear units

PHK

High-performance precision right-angle planetary gear units

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€€
Shaft load	★★★★★
Smooth operation	★★★☆☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PH3 – PH5)	✓ (optional)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{zacc} [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PH5K	16 – 280	355 – 400	5000 – 7000	2 – 4.5	50 – 62
PH7K	16 – 561	403 – 924	4500 – 7000	1.5 – 4.5	99 – 117
PH8K	16 – 555	681 – 1848	4000 – 6500	1.5 – 4	180 – 260
PH9K	33 – 466	3840 – 4500	3200 – 5000	4 – 4.5	520 – 730
PH10K	49 – 457	6273 – 7500	3000 – 4500	4	1201 – 1210

Shaft design	
Flange shaft	✓
Bearing design	
Standard	✓
Reinforced (PH3 – PH5)	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME)	✓
Motor adapter with plug-in coupling (MQ)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME motor adapters in ATEX design (Directive 2014/34/EU).

Input options

ME motor adapter for attaching synchronous servo motors



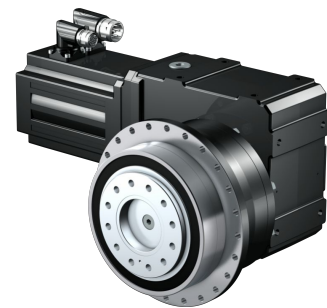
<http://www.stoeber.de/en/PHKME>

MB motor adapter with brake for attaching synchronous servo motors



<http://www.stoeber.de/en/PHKMB>

EZ synchronous servo motor



<http://www.stoeber.de/en/PHKEZ>



2.13 Planetary gear units

PHQK

Quattro-Power precision right-angle planetary gear units

Features

Power density	★★★★★
Backlash	★★★★★
Price category	€€€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★★
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
High power density	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PHQ4 – PHQ5)	✓ (optional)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
PHQ5K	22 – 385	316 – 550	5000 – 7000	2 – 4	69 – 70
PHQ7K	22 – 382	535 – 1050	4500 – 6500	2 – 4	131 – 136
PHQ8K	22 – 381	1704 – 3168	3800 – 5500	1.5 – 3.5	394 – 400
PHQ9K	44 – 580	4765 – 5760	3200 – 5000	4	766 – 771
PHQ10K	45 – 591	10000	2700 – 4200	4	1545 – 1560
PHQ11K	45 – 583	12299 – 22000	2600 – 4000	4	2578 – 2623
PHQ12K	75 – 2242	16744 – 43000	2800 – 3800	4	4614 – 4665

Shaft design	
Flange shaft	✓
Bearing design	
Standard	✓
Reinforced (PHQ4 – PHQ5)	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME)	✓
Motor adapter with plug-in coupling (MQ)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME motor adapters in ATEX design (Directive 2014/34/EU).

Input options

ME motor adapter for attaching synchronous servo motors



<http://www.stoeber.de/en/PHQKME>

MB motor adapter with brake for attaching synchronous servo motors

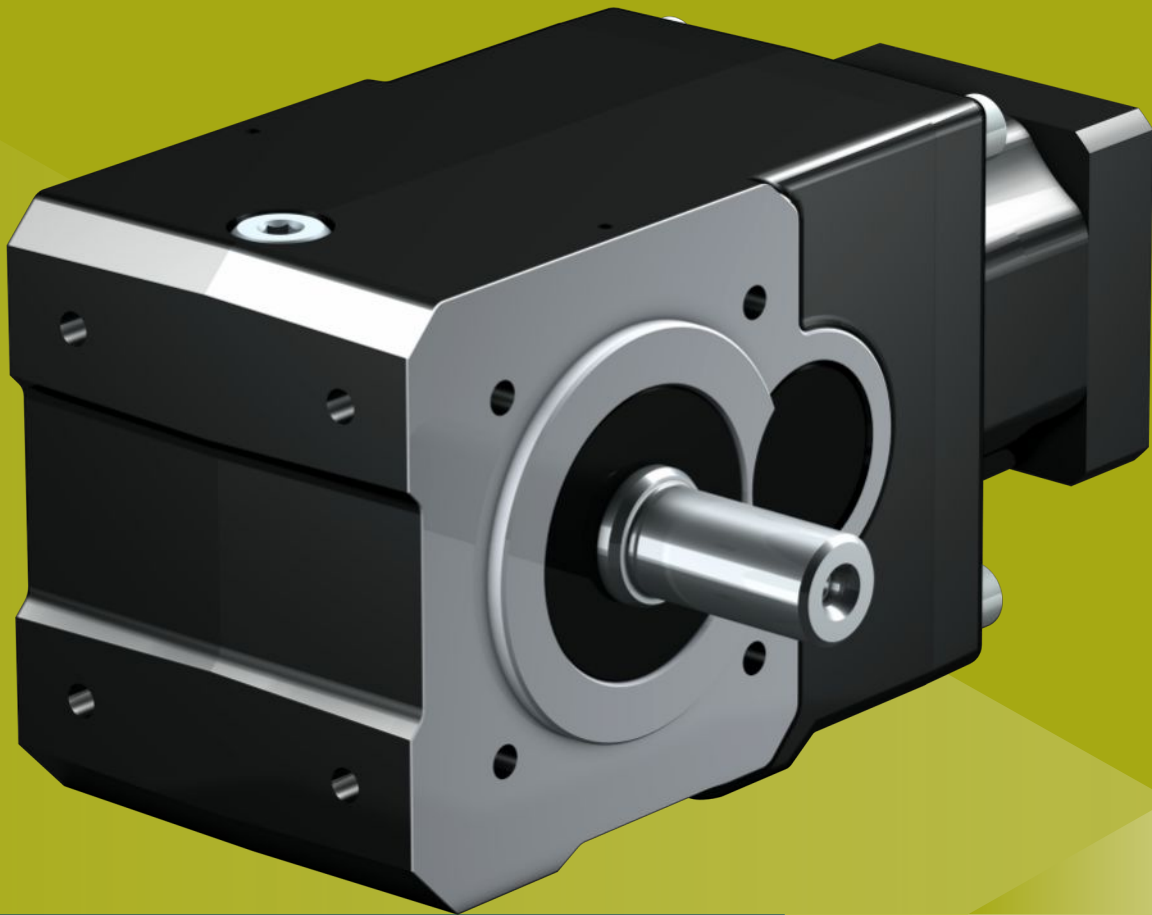


<http://www.stoeber.de/en/PHQKMB>

EZ synchronous servo motor



<http://www.stoeber.de/en/PHQKEZ>



2.14 Helical bevel gear units

KL

Compact, helical-gear right-angle gear units

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Small installation space	✓
FKM seal ring at the input	✓
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
KL102	4 – 32	22 – 32	5000 – 6000	20 – 25	0.99 – 1.8
KL202	4 – 32	50 – 65	5000 – 6000	16 – 20	1.8 – 3.9

Shaft design

Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓
Solid shaft without feather key	✓
Solid shaft with feather key	✓

Housing design

Pitch circle diameter	✓
Flange	✓
Foot + pitch circle diameter	✓

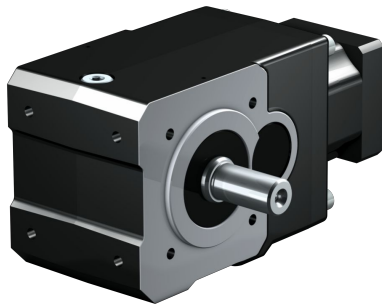
Motor adapter design

Motor adapter with plug-in coupling (MQ)	✓
--	---

On request, you can receive the gear units with MQ motor adapters in ATEX design (Directive 2014/34/EU).

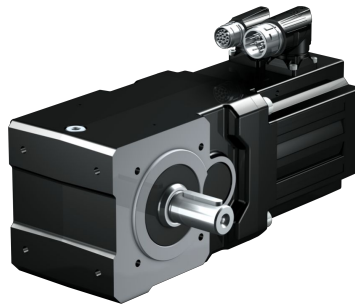
Input options

MQ motor adapter for attaching synchronous servo motors



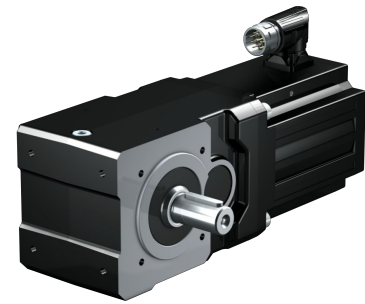
<http://www.stoeber.de/en/KLMQ>

EZ synchronous servo motor

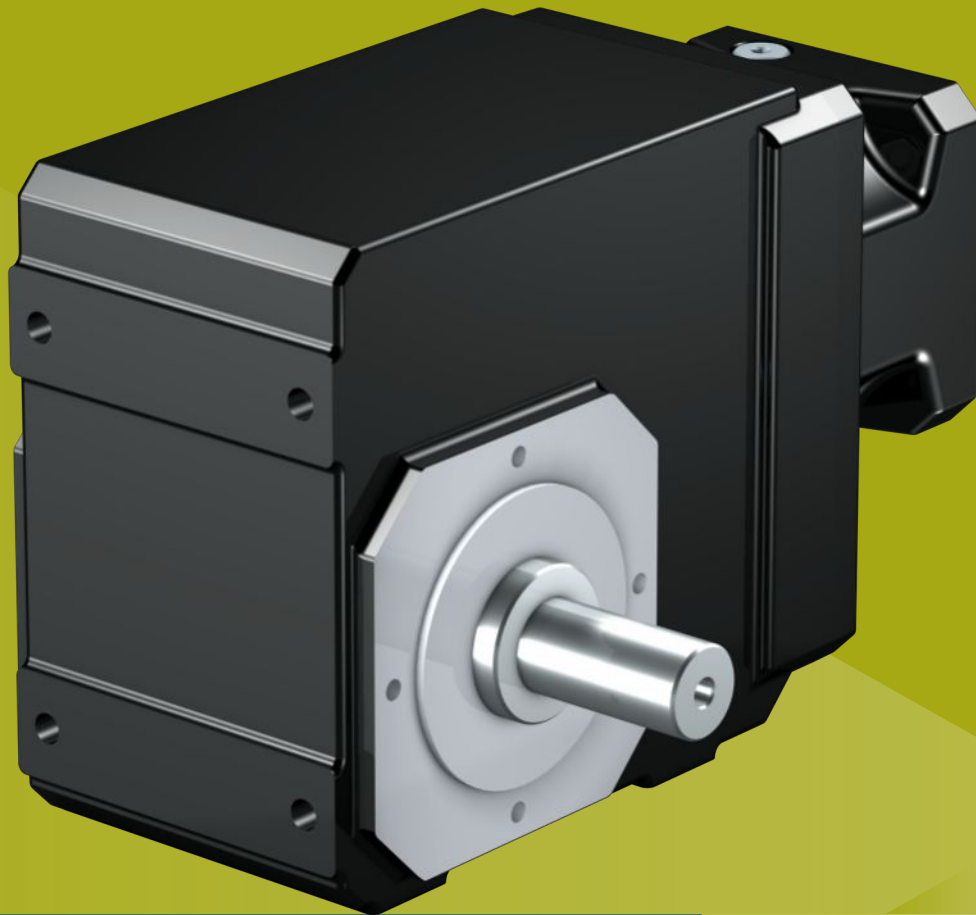


<http://www.stoeber.de/en/KLEZ>

LM Lean motor



<http://www.stoeber.de/en/KLLM>



2.15 Helical bevel gear units

K

Highly rigid, helical-gear right-angle gear units

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free (K1 – K4)	✓
FKM seal ring at the input	✓
Reinforced output bearing (K5 – K8)	✓ (on request)
Easy and reliable attachment to any synchronous servo motor	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
K102	4 – 70	60 – 135	5000 – 7000	6 – 12	6.3 – 6.8
K202	4 – 69	101 – 220	4500 – 6500	1.5 – 10	9.7 – 11
K203	39 – 272	160 – 220	6500	2.5 – 10	11
K302	4 – 69	178 – 385	4000 – 6000	1.5 – 10	16
K303	33 – 272	247 – 385	6000	2.5 – 10	16
K402	4 – 69	323 – 600	3800 – 5500	1.5 – 10	30 – 31
K403	32 – 272	340 – 600	5500	2.5 – 10	31
K513	7.3 – 97	827 – 1000	3200 – 5000	2 – 10	49 – 50
K514	85 – 374	827 – 1000	5000	3 – 10	49 – 50
K613	7.3 – 95	984 – 1600	3000 – 4500	2 – 10	81 – 82
K614	111 – 369	1165 – 1600	4500	3 – 10	82 – 83
K713	7.6 – 99	1802 – 2600	2700 – 4200	2 – 10	122 – 126
K714	89 – 381	1626 – 2600	4200	3 – 10	126
K813	7.4 – 97	2135 – 4650	2600 – 4000	2 – 10	187 – 196
K814	67 – 311	3552 – 4650	4000	3 – 10	196
K913	13 – 95	3592 – 7700	2800 – 3800	5 – 10	367 – 379
K914	92 – 374	2907 – 7700	3800	5 – 10	379
K1013	39 – 94	7330 – 13200	3500	5 – 10	722 – 724
K1014	93 – 290	10621 – 13200	3500	5 – 10	724 – 725

Shaft design	
Solid shaft with feather key	✓
Solid shaft without feather key	K1 – K4: ✓ Starting at K5: Request
Solid shaft on both sides	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓
Housing design	
Pitch circle diameter	K1 – K9: ✓
Round flange	K1 – K9: ✓
Pitch circle diameter + torque arm bracket	K1 – K9: ✓
Foot + pitch circle diameter + torque arm bracket	K10: ✓
Foot + pitch circle diameter	✓
Foot + round flange	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME)	✓
Motor adapter with curved tooth coupling (MR)	✓
Motor adapter with plug-in coupling (MQ)	✓
Motor adapter with ServoStop brake (MB)	✓

On request, you can receive the gear units with ME, MQ and MR motor adapters in ATEX design (Directive 2014/34/EU).

Input options

ME motor adapter for attaching synchronous servo motors



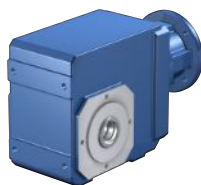
<http://www.stoerber.de/en/KME>

MB motor adapter with brake for attaching synchronous servo motors



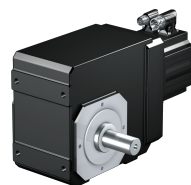
<http://www.stoerber.de/en/KMB>

MR motor adapter for attaching asynchronous motors



<http://www.stoerber.de/en/KMR>

EZ synchronous servo motor



<http://www.stoerber.de/en/KEZ>

LM Lean motor



<http://www.stoerber.de/en/KLM>

3 Rack and pinion drives

Table of contents

3.1	ZTRSPH rack and pinion drives	66
3.2	ZTRSPHQ rack and pinion drives	68
3.3	ZTRSPHV rack and pinion drives	70
3.4	ZTRPH rack and pinion drives	72
3.5	ZTRPHV rack and pinion drives	74
3.6	ZRPH rack and pinion drives	76
3.7	ZVP rack and pinion drives	78
3.8	ZVPE rack and pinion drives	80
3.9	ZVKS rack and pinion drives	82
3.10	ZVKL rack and pinion drives	84
3.11	ZVK rack and pinion drives	86



3.1 Rack and pinion drives

ZTRSPH

High-performance precision planetary gear units with supporting bearing holder

Features

Power density	★★★★★
Linear clearance	★★★★★
Price category	€€€€€
Smooth operation	★★★★☆
Linear rigidity	★★★★★
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 5 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓
Radial runout ≤ 10 µm (optional)	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

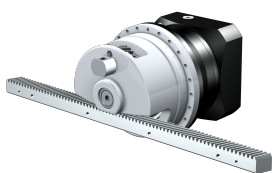
Technical data

Type	m_n [mm]	z	F_{t2acc} [kN]	$v_{t2maxZB}$ [m/s]	Δs [μ m]
ZTRS2_PH731	2	23	16	1.3 – 2.6	7 – 21
ZTRS2_PH732	2	23	16	0.18 – 0.96	7 – 21
ZTRS3_PH731	3	17	20	1.4 – 2.8	8 – 24
ZTRS3_PH732	3	17	20	0.2 – 1.1	8 – 24
ZTRS3_PH831	3	26 – 32	27 – 28	1.7 – 4.7	12 – 44
ZTRS3_PH832	3	26 – 32	27 – 28	0.26 – 1.5	12 – 44
ZTRS4_PH831	4	20	33 – 45	1.8 – 3.9	12 – 37
ZTRS4_PH832	4	20	33 – 45	0.27 – 1.3	12 – 37
ZTRS5_PH831	5	16	33 – 49	1.8 – 3.9	12 – 37
ZTRS5_PH832	5	16	33 – 49	0.27 – 1.3	12 – 37
ZTRS5_PH932	5	20	77	0.42 – 1.4	46
ZTRS6_PH932	6	16 – 20	61 – 77	0.4 – 1.7	44 – 56
ZTRS8_PH932	8	15	71 – 79	0.5 – 1.7	56
ZTRS8_PH1032	8	19	86 – 93	0.63 – 1.4	70
ZTRS10_PH1032	10	15	87 – 94	0.63 – 1.4	69

Linear backlash	
Standard	✓
Reduced	✓
Pinion gearing	
Helical gearing	✓
Accessories	
Felt gear for lubrication	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME/MEL)	✓
Motor adapter with FlexiAdapt coupling (MF/MFL)	✓
Motor adapter with ServoStop brake (MB)	✓

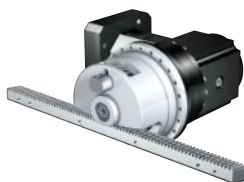
Input options

Motor adapter



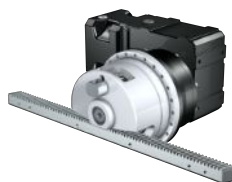
<http://www.stoeber.de/en/ZTRSPHME>

KX right-angle input with MF motor adapter



On request

K right-angle input with ME motor adapter



On request

MB motor adapter

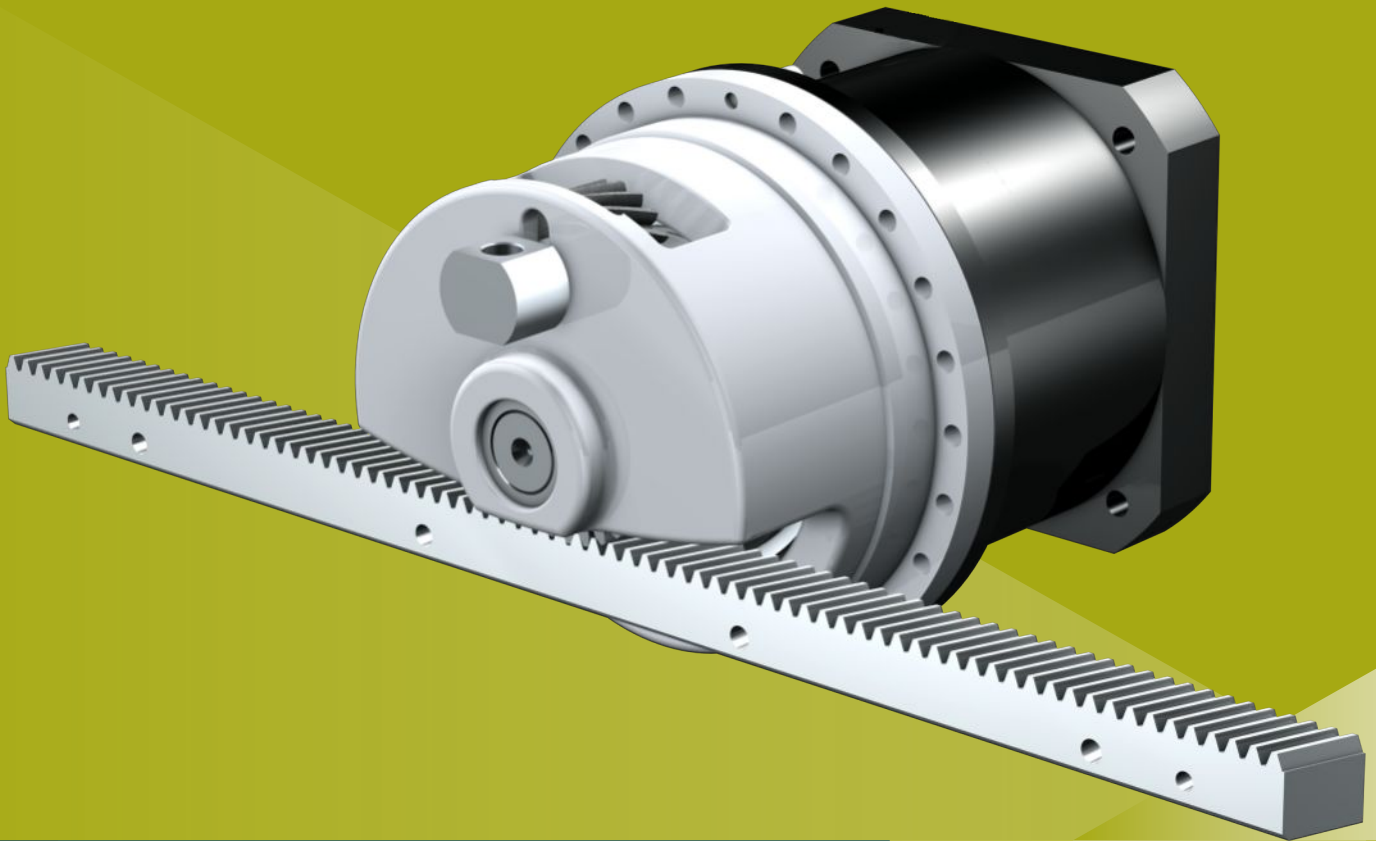


On request

EZ synchronous servo motor



On request



3.2 Rack and pinion drives

ZTRSPHQ

Quattro-Power precision planetary gear units with supporting bearing holder

Features

Power density	★★★★★
Linear clearance	★★★★☆
Price category	€€€€€
Smooth operation	★★★★☆
Linear rigidity	★★★★★
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 5 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓
Radial runout ≤ 10 µm (optional)	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

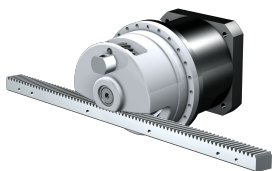
Technical data

Type	m_n [mm]	z	F_{r2acc} [kN]	$v_{r2maxZB}$ [m/s]	Δs [μ m]
ZTRS8_PHQ1032	8	19	124	0.56 – 1.1	70
ZTRS8_PHQ1033	8	19	124	0.06 – 0.31	70
ZTRS10_PHQ1032	10	15	126	0.56 – 1	69
ZTRS10_PHQ1033	10	15	126	0.06 – 0.3	69

Linear backlash	
Standard	✓
Pinion gearing	
Helical gearing	✓
Accessories	
Felt gear for lubrication	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME/MEL)	✓
Motor adapter with ServoStop brake (MB)	✓

Input options

Motor adapter



<http://www.stoeber.de/en/ZTRSPHQME>

K right-angle input with ME motor adapter



On request

MB motor adapter

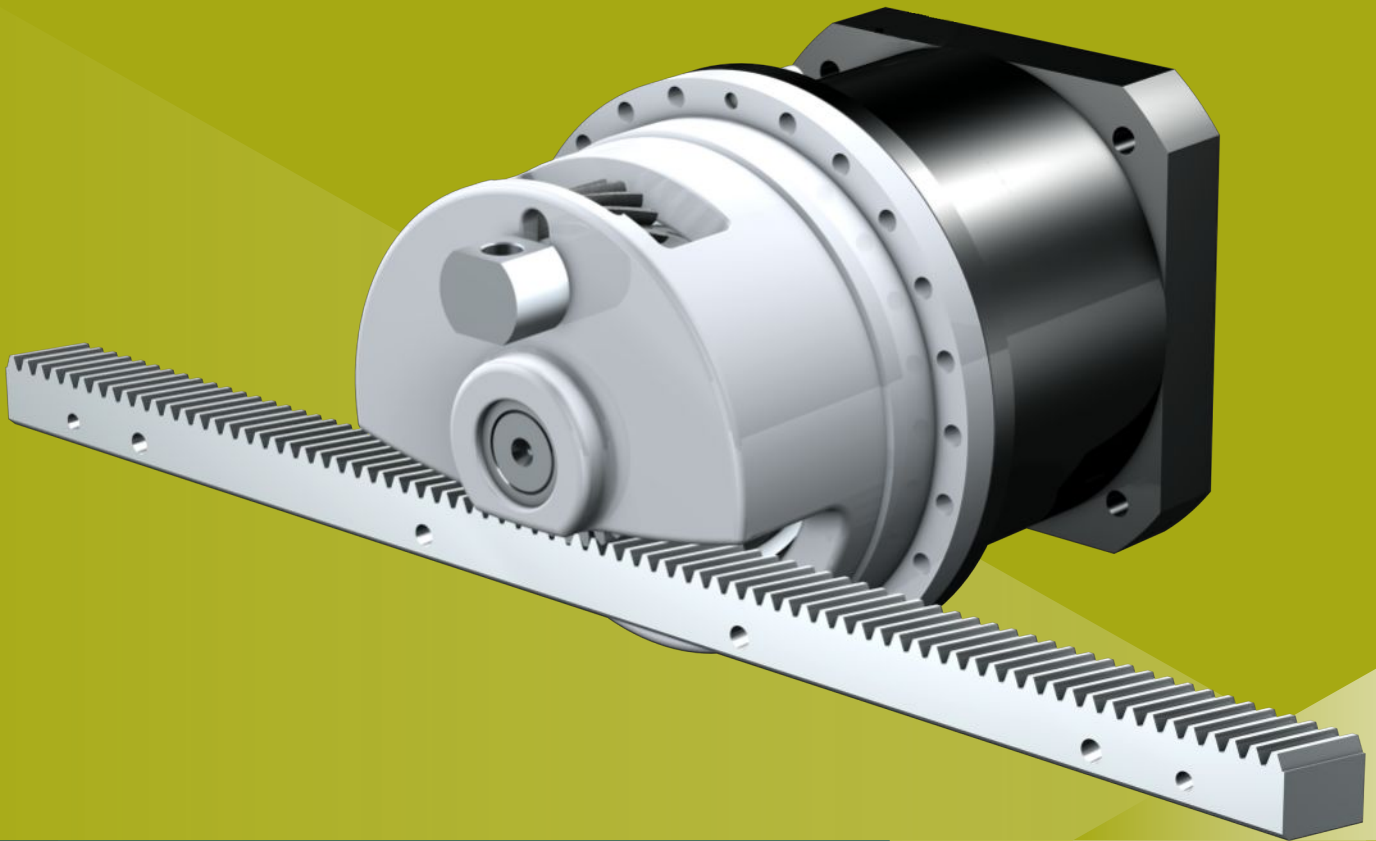


On request

EZ synchronous servo motor



On request



3.3 Rack and pinion drives

ZTRSPHV

High-performance precision planetary gear units with supporting bearing holder

Features

Power density	★★★★★
Linear clearance	★★★★☆
Price category	€€€€€
Smooth operation	★★★★☆
Linear rigidity	★★★★★
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 5 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓
Radial runout ≤ 10 µm (optional)	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

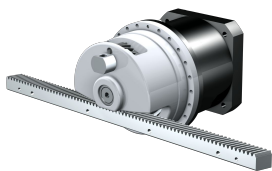
Technical data

Type	m_n [mm]	z	F_{r2acc} [kN]	$v_{r2maxZB}$ [m/s]	Δs [μ m]
ZTRS5_PHV933	5	20	77	0.21 – 0.41	46
ZTRS6_PHV933	6	16 – 20	61 – 67	0.2 – 0.49	44 – 56
ZTRS8_PHV933	8	15	67	0.25 – 0.49	56
ZTRS8_PHV1033	8	19	93	0.42 – 0.62	70
ZTRS10_PHV1033	10	15	94	0.41 – 0.62	69

Linear backlash	
Standard	✓
Pinion gearing	
Helical gearing	✓
Accessories	
Felt gear for lubrication	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME/MEL)	✓

Input options

Motor adapter

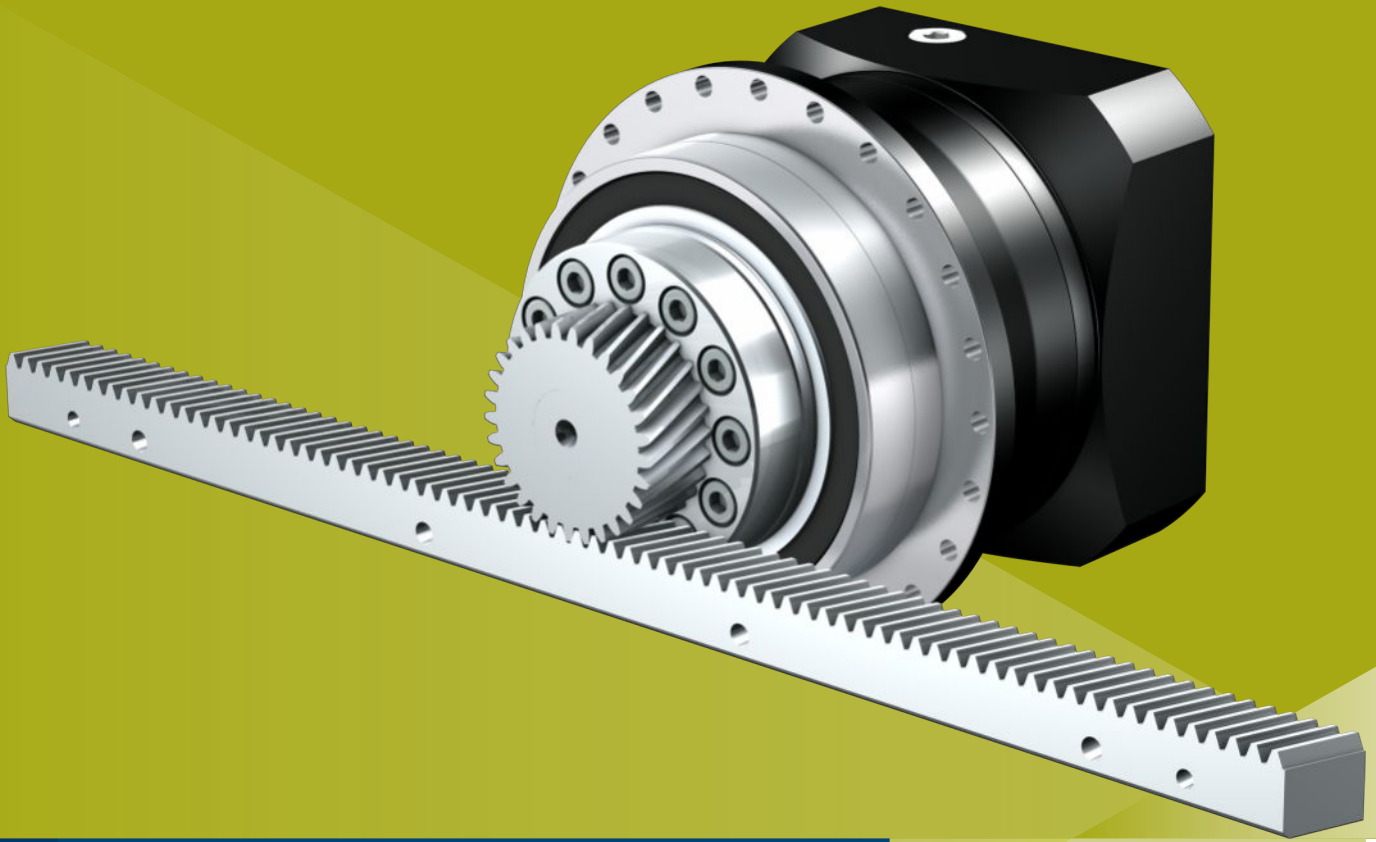


<http://www.stoeber.de/en/ZTRSPHVME>

EZ synchronous servo motor



On request



3.4 Rack and pinion drives

ZTRPH

High-performance precision planetary gear units with screwed flange pinion

Features

Power density	★★★★☆
Linear clearance	★★★★★
Price category	€€€€
Smooth operation	★★★★☆
Linear rigidity	★★★★☆
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 5 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓
Radial runout ≤ 10 µm (optional)	✓
Reinforced output bearing (PH3 – PH5)	✓ (optional)

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	m_n [mm]	z	F_{Zacc} [kN]	v_{ZmaxZB} [m/s]	Δs [μ m]
ZTR2_PH431	2	12 – 16	6.7	0.93 – 2.2	4 – 15
ZTR2_PH432	2	12 – 16	6.5 – 6.7	0.11 – 0.89	4 – 15
ZTR2_PH531	2	12 – 23	6.7 – 11	0.87 – 3.2	4 – 21
ZTR2_PH532	2	12 – 23	6.7 – 11	0.11 – 1.1	4 – 21
ZTR2_PH731	2	12 – 23	6.7 – 15	0.67 – 2.6	4 – 21
ZTR2_PH732	2	12 – 23	6.7 – 15	0.09 – 0.96	4 – 21
ZTR3_PH531	3	12 – 14	9.9 – 10	1.3 – 2.9	6 – 19
ZTR3_PH532	3	12 – 14	9.9 – 10	0.16 – 1	6 – 19
ZTR3_PH731	3	16 – 19	17 – 19	1.3 – 3.2	7 – 26
ZTR3_PH732	3	16 – 19	17 – 19	0.19 – 1.2	7 – 26
ZTR3_PH831	3	19 – 32	21 – 25	1.3 – 4.7	9 – 44
ZTR3_PH832	3	19 – 32	21 – 25	0.19 – 1.5	9 – 44
ZTR4_PH731	4	12	18	1.3 – 2.7	7 – 22
ZTR4_PH732	4	12	18	0.19 – 1	7 – 22
ZTR4_PH831	4	17 – 20	33 – 36	1.5 – 3.9	10 – 37
ZTR4_PH832	4	17 – 20	33 – 36	0.23 – 1.3	10 – 37
ZTR5_PH831	5	12 – 18	29 – 35	1.3 – 4.4	9 – 42
ZTR5_PH832	5	12 – 18	29 – 35	0.2 – 1.4	9 – 42
ZTR5_PH932	5	18 – 19	63 – 67	0.38 – 1.3	42 – 44
ZTR6_PH831	6	15	29 – 33	2 – 4.4	14 – 42
ZTR6_PH832	6	15	29 – 33	0.3 – 1.4	14 – 42
ZTR6_PH932	6	16	56	0.4 – 1.3	44
ZTR6_PH1032	6	16	56	0.4 – 0.89	44
ZTR8_PH1032	8	12	60	0.4 – 0.89	44

Linear backlash

Standard

✓

Reduced

✓

Bearing design

Standard

✓

Reinforced (PH3 – PH5)

✓

Pinion gearing

Helical gearing

✓

Motor adapter design

Motor adapter with EasyAdapt coupling (ME/MEL)

✓

Motor adapter with FlexiAdapt coupling (MF/MFL)

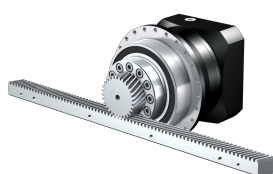
✓

Motor adapter with ServoStop brake (MB)

✓

Input options

Motor adapter



<http://www.stoeber.de/en/ZTRPHME>

KX right-angle input with MF motor adapter



On request

K right-angle input with ME motor adapter



On request

MB motor adapter

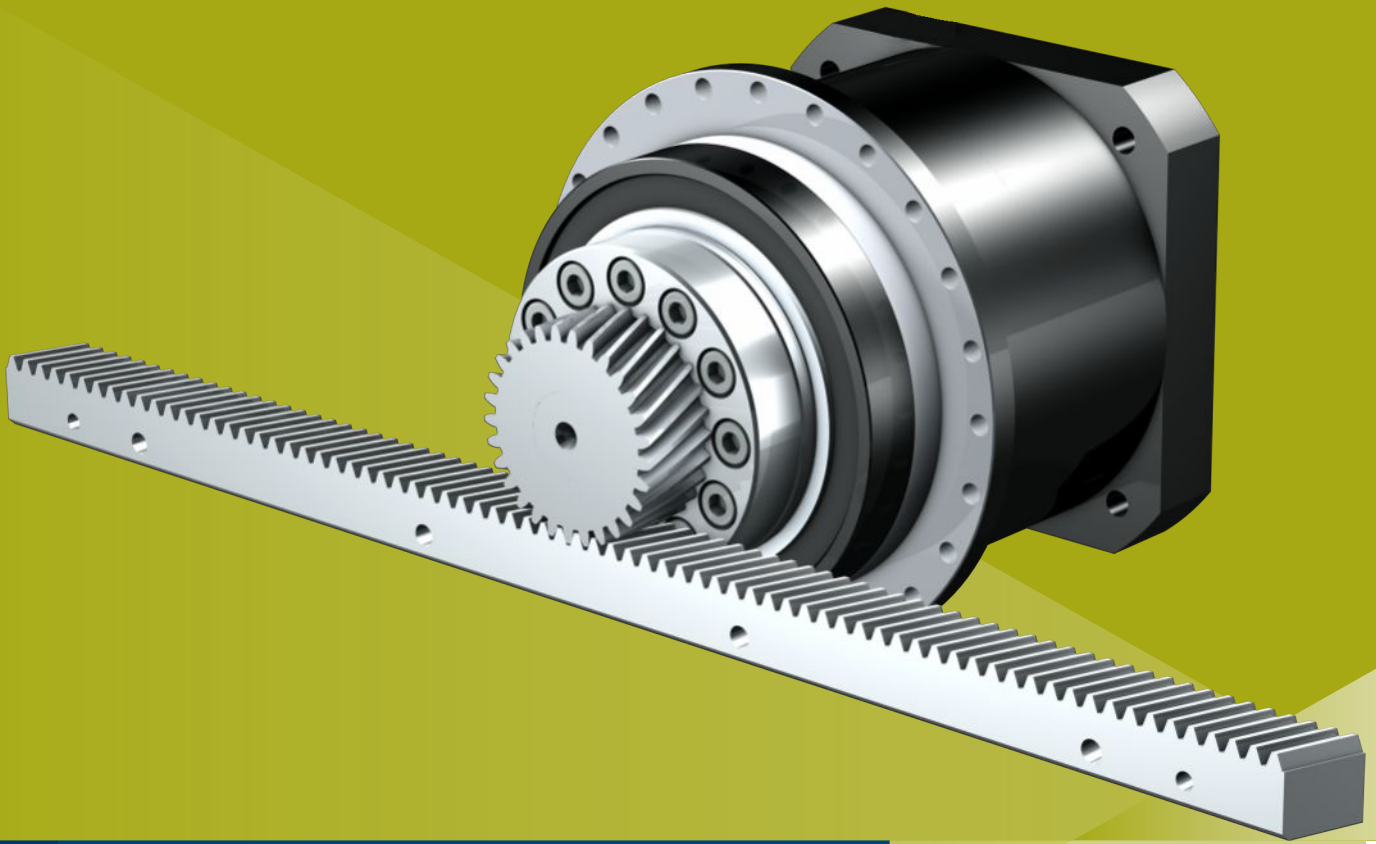


On request

EZ synchronous servo motor



On request



3.5 Rack and pinion drives

ZTRPHV

High-performance precision planetary gear units with screwed flange pinion

Features

Power density	★★★★☆
Linear clearance	★★★★☆
Price category	€€€€
Smooth operation	★★★★☆
Linear rigidity	★★★★☆
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 5 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓
Radial runout ≤ 10 µm (optional)	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

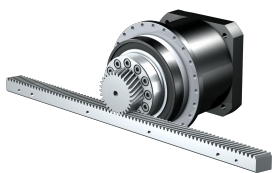
Technical data

Type	m_n [mm]	z	F_{r2acc} [kN]	$v_{r2maxZB}$ [m/s]	Δs [μ m]
ZTR5_PHV933	5	18 – 19	63 – 67	0.19 – 0.39	42 – 44
ZTR6_PHV933	6	16	56	0.2 – 0.39	44
ZTR6_PHV1033	6	16	56	0.26 – 0.39	44
ZTR8_PHV1033	8	12	60	0.26 – 0.39	44

Linear backlash	
Standard	✓
Pinion gearing	
Helical gearing	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME/MEL)	✓

Input options

Motor adapter



<http://www.stoeber.de/en/ZTRPHVME>

EZ synchronous servo motor



On request



3.6 Rack and pinion drives

ZRPH

High-performance precision planetary gear units with screwed pinion

Features

Power density	★★★★☆
Linear clearance	★★★★★
Price category	€€€
Smooth operation	★★★★☆
Linear rigidity	★★★★☆
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 5 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓
Reinforced output bearing (PH3 – PH5)	✓ (optional)

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	m_n [mm]	z	F_{Tzacc} [kN]	$v_{TzmaxZB}$ [m/s]	Δs [μ m]
ZR2_PH331	2	26	2.2	2.3 – 4.6	16 – 32
ZR2_PH332	2	26	2.2	0.23 – 1.2	16 – 32
ZR2_PH431	2	33 – 37	2.9 – 4.9	2.6 – 5.1	10 – 34
ZR2_PH432	2	33 – 37	2.8 – 4.6	0.29 – 2.1	10 – 34
ZR2_PH531	2	40	6.8 – 8.1	2.9 – 5.6	12 – 37
ZR2_PH532	2	40	6.8 – 8.1	0.36 – 1.9	12 – 37
ZR3_PH531	3	30	6 – 7.7	3.3 – 6.3	14 – 42
ZR3_PH532	3	30	6 – 7.7	0.4 – 2.2	14 – 42
ZR3_PH731	3	35 – 40	9 – 16	2.9 – 6.7	16 – 56
ZR3_PH732	3	35 – 40	8.6 – 16	0.41 – 2.5	16 – 56
ZR4_PH731	4	30	9 – 14	3.3 – 6.7	19 – 56
ZR4_PH732	4	30	8.6 – 14	0.47 – 2.5	19 – 56

Linear backlash	
Standard	✓
Reduced	✓
Bearing design	
Standard	✓
Reinforced (PH3 – PH5)	✓
Pinion gearing	
Helical gearing	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME/MEL)	✓
Motor adapter with FlexiAdapt coupling (MF/MFL)	✓
Motor adapter with ServoStop brake (MB)	✓

Input options

Motor adapter



<http://www.stoerber.de/en/ZRPHME>

KX right-angle input with MF motor adapter



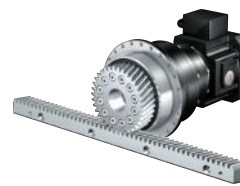
On request

K right-angle input with ME motor adapter



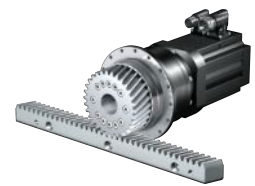
On request

MB motor adapter

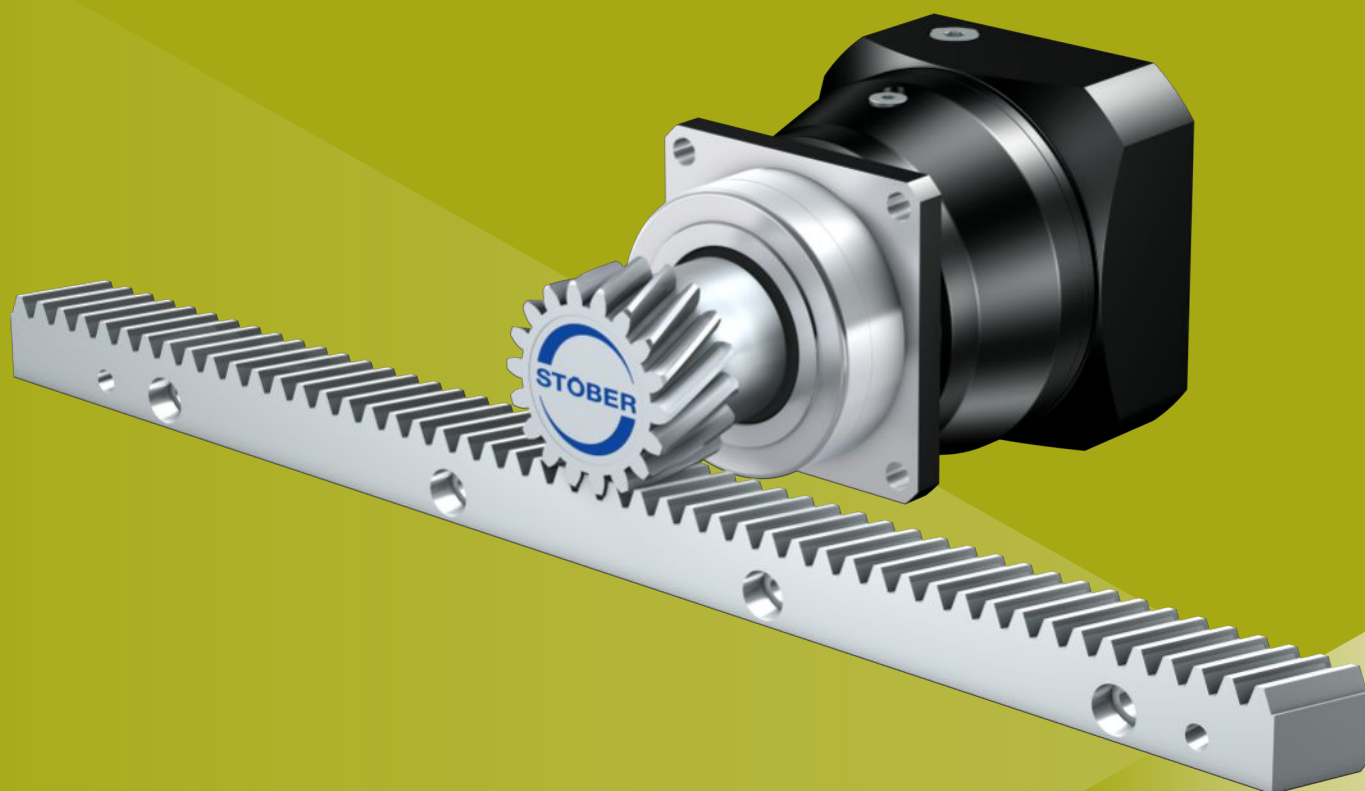


On request

EZ synchronous servo motor



On request



3.7 Rack and pinion drives

ZVP

Precision planetary gear units with plug-on pinion

Features

Power density	★★★★☆
Linear clearance	★★★★★
Price category	€€
Smooth operation	★★★★☆
Linear rigidity	★★★★☆
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 6 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

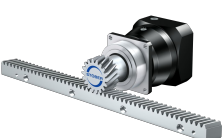





€ Economy | €€€€€ Premium

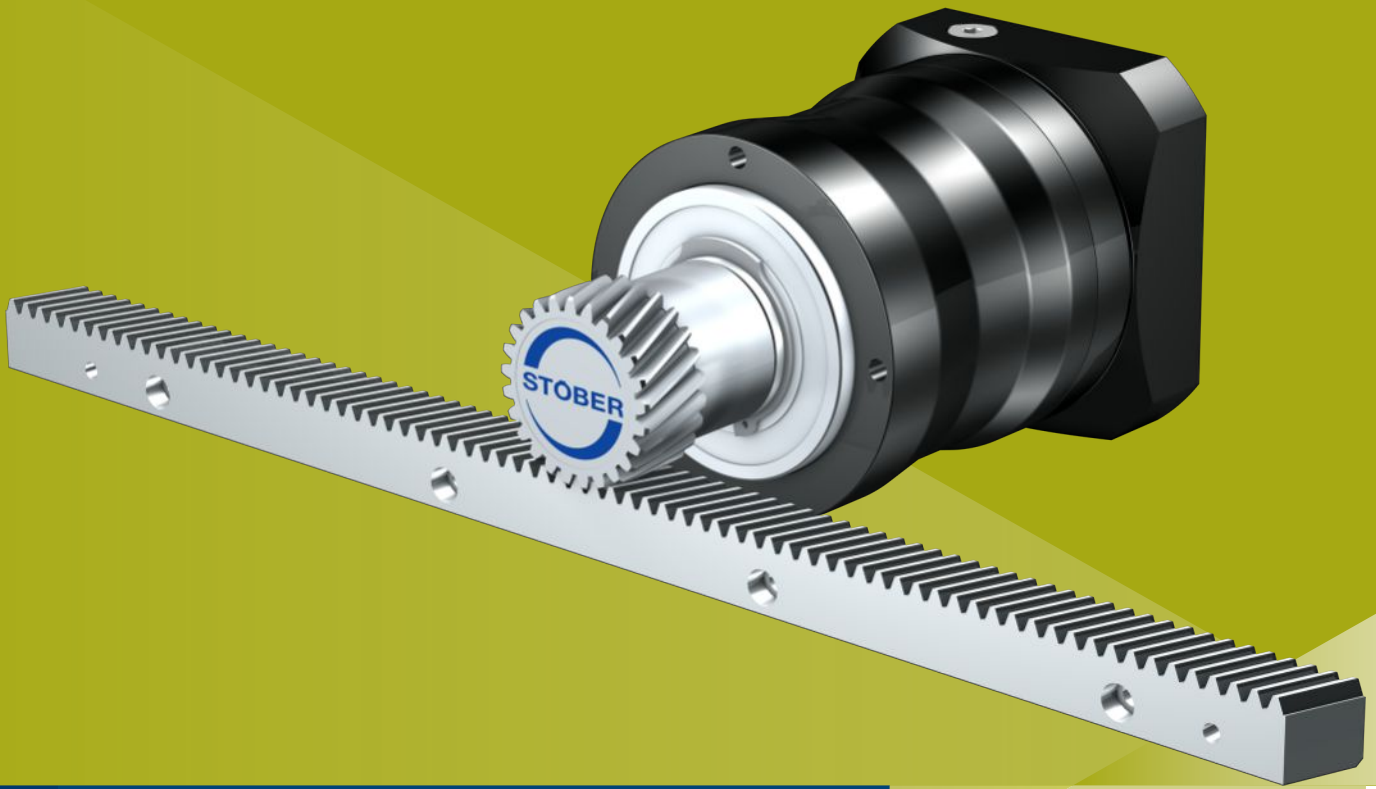
Technical data

Type	m_n [mm]	z	F_{fzacc} [kN]	$v_{fzmaxzB}$ [m/s]	Δs [μ m]
ZV2_P331	2	16	1.7 – 2	1.4 – 4.1	10 – 20
ZV2_P332	2	16	1.7 – 2	0.14 – 1.2	15 – 25
ZV2_P431	2	20	3.2 – 4.8	1.8 – 4.4	12 – 25
ZV2_P432	2	20	3.2 – 4.8	0.18 – 1.3	19 – 31
ZV2_P531	2	25	5.1 – 9.6	1.9 – 4.6	8 – 23
ZV2_P532	2	25	5.1 – 9.6	0.22 – 1.4	15 – 31
ZV3_P531	3	18	5.2 – 11	2.1 – 5	8 – 25
ZV3_P532	3	18	5.2 – 11	0.24 – 1.5	17 – 33
ZV3_P731	3	22	7 – 14	2.2 – 4.9	10 – 31
ZV3_P732	3	22	7 – 14	0.26 – 1.5	20 – 41
ZV4_P731	4	18	7.3 – 15	2.4 – 5.3	11 – 33
ZV4_P732	4	18	7.3 – 15	0.28 – 1.7	22 – 44

Linear backlash	
Standard	✓
Reduced	✓
Bearing design	
Standard	✓
Axially reinforced	✓
Pinion gearing	
Helical gearing	✓
Motor adapter design	
Motor adapter with EasyAdapt coupling (ME/MEL)	✓
Motor adapter with FlexiAdapt coupling (MF/MFL)	✓
Motor adapter with ServoStop brake (MB)	✓

Input options

Motor adapter	KX right-angle input with MF motor adapter	K right-angle input with ME motor adapter	MB motor adapter	EZ synchronous servo motor	LM Lean motor
					
http://www.stoeber.de/en/ZVPME	On request	On request	On request	On request	On request



3.8 Rack and pinion drives

ZVPE

Cost-efficient planetary gear units with plug-on pinion

Features

Power density	★★★★☆
Linear clearance	★★★★☆
Price category	€
Smooth operation	★★★★☆
Linear rigidity	★★★★☆
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 6 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	m_n [mm]	z	F_{t2acc} [kN]	$v_{t2maxZB}$ [m/s]	Δs [μm]
ZV2_PE321	2	16	1.7 – 1.9	1.2 – 3.6	40
ZV2_PE322	2	16	1.7 – 1.9	0.14 – 0.89	49
ZV2_PE421	2	20	2.1 – 2.7	1.3 – 4.1	49
ZV2_PE422	2	20	2.1 – 2.7	0.16 – 0.97	62
ZV2_PE521	2	25	3.8 – 6.1	1.4 – 4.2	62
ZV2_PE522	2	25	3.8 – 6.1	0.17 – 1	77
ZV3_PE521	3	18	3.9 – 5.8	1.5 – 4.5	67
ZV3_PE522	3	18	3.9 – 5.8	0.18 – 1.1	83

Pinion gearing

Helical gearing

✓

Motor adapter design

Motor adapter with EasyAdapt coupling (ME/MEL)

✓

Input options

ME motor adapter

EZ synchronous servo motor

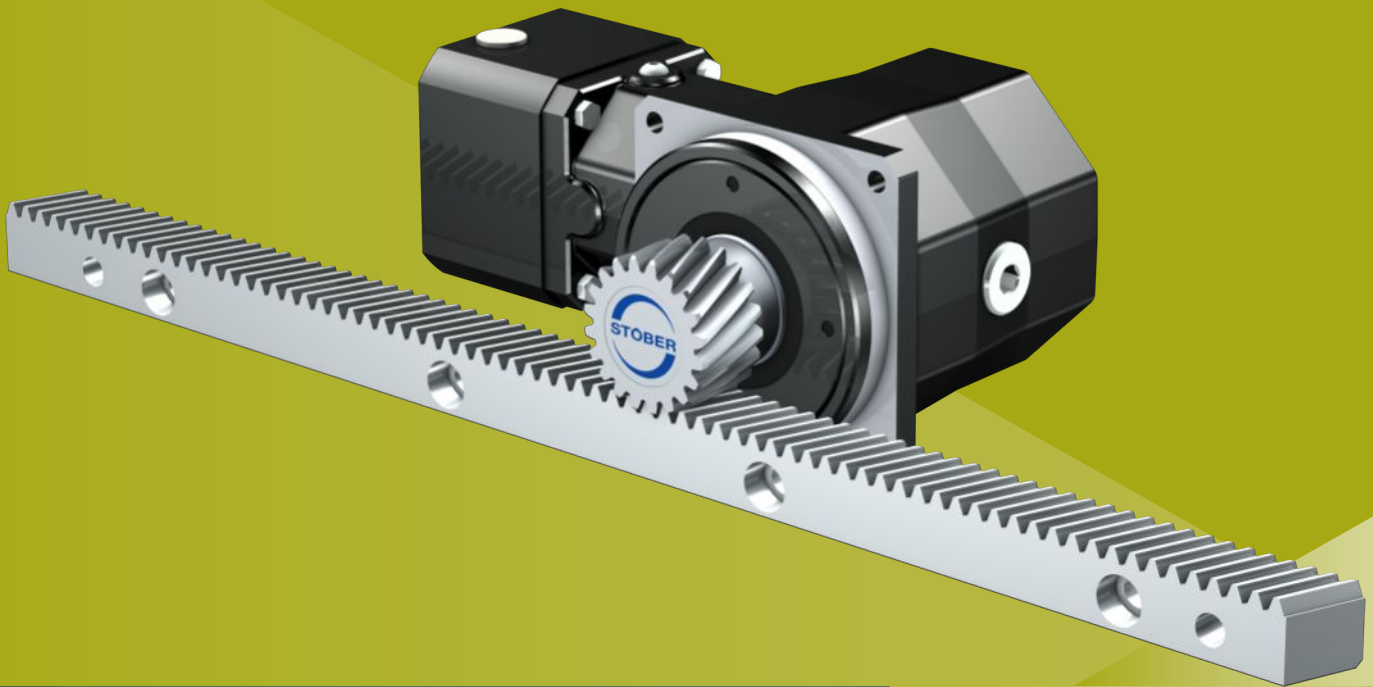
LM Lean motor



<http://www.stoeber.de/en/ZVPEME>

On request

On request



3.9 Rack and pinion drives

ZVKS

Right-angle servo gear units with plug-on pinion

Features

Power density	★★★★☆
Linear clearance	★★★★☆
Price category	€€€
Smooth operation	★★★★☆
Linear rigidity	★★★★☆
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 6 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	m_n [mm]	z	F_{t2acc} [kN]	$v_{t2maxZB}$ [m/s]	Δs [μm]
ZV2_KS402	2	20	3.2 – 4.2	0.67 – 2.2	37
ZV2_KS403	2	20	3.2 – 4.2	0.07 – 0.56	37
ZV2_KS502	2	25	5 – 7.5	0.83 – 2.5	39
ZV2_KS503	2	25	5 – 7.5	0.08 – 0.69	39
ZV3_KS502	3	18	5.2 – 7	0.9 – 2.8	42
ZV3_KS503	3	18	5.2 – 7	0.09 – 0.75	42
ZV3_KS702	3	22	6.4 – 11	1.1 – 2.8	41
ZV3_KS703	3	22	6.4 – 11	0.11 – 0.92	41
ZV4_KS702	4	18	6.7 – 10	1.2 – 3	44
ZV4_KS703	4	18	6.7 – 10	0.12 – 1	44

Pinion gearing

Helical gearing

✓

Motor adapter design

Motor adapter with EasyAdapt coupling (ME/MEL)

✓

Input options

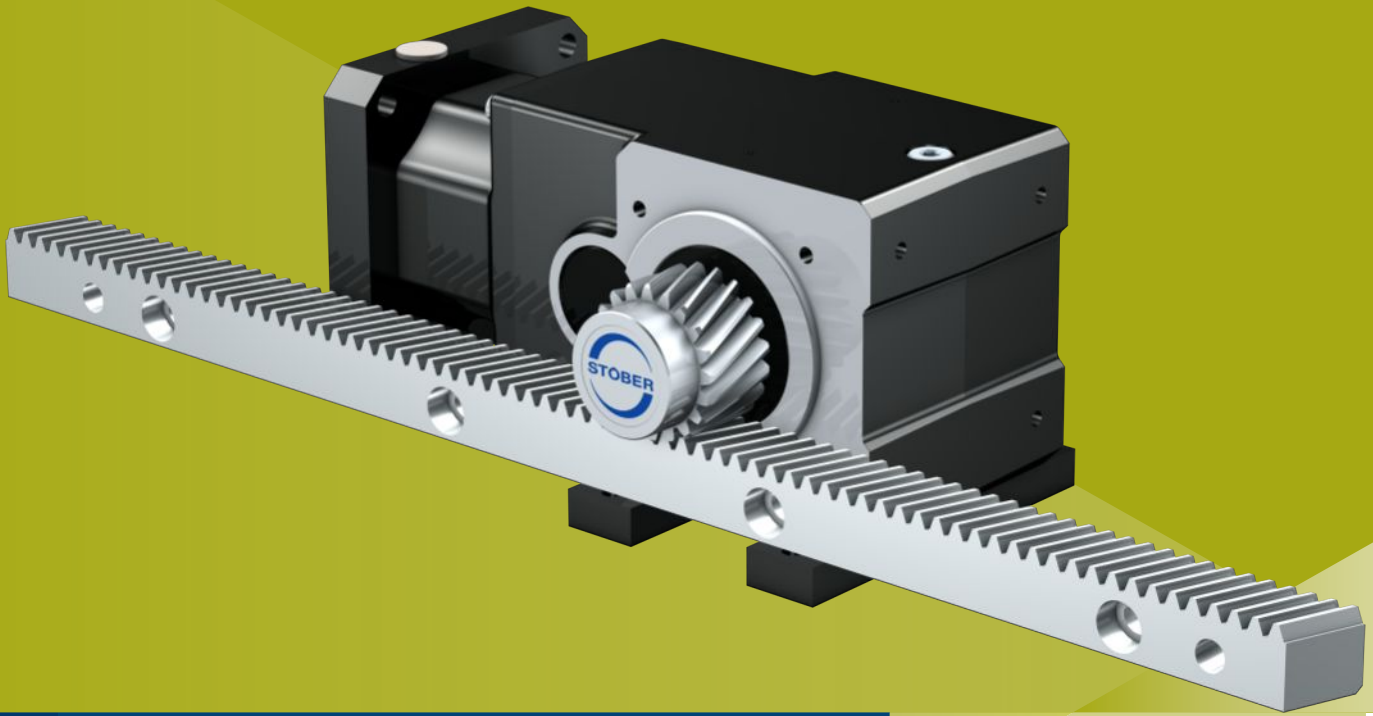
ME motor adapter

EZ synchronous servo motor



<http://www.stoeber.de/en/ZVKSME>

On request



3.10 Rack and pinion drives

ZVKL

Compact right-angle gear units with plug-on pinion

Features

Power density	★★★★☆
Linear clearance	★★★★☆
Price category	€
Smooth operation	★★★★☆
Linear rigidity	★★★★☆
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 6 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓

Key ★★★★★ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	m_n [mm]	z	F_{f2acc} [kN]	$v_{f2maxZB}$ [m/s]	Δs [μm]
ZV2_KL102	2	16	1.3 – 1.5	0.33 – 2.2	99 – 123
ZV2_KL202	2	20	2.3 – 2.7	0.42 – 2.8	99 – 123

Pinion gearing

Helical gearing

✓

Motor adapter design

Motor adapter with plug-in coupling (MQ)

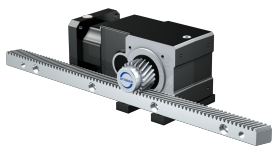
✓

Input options

MQ motor adapter

EZ synchronous servo motor

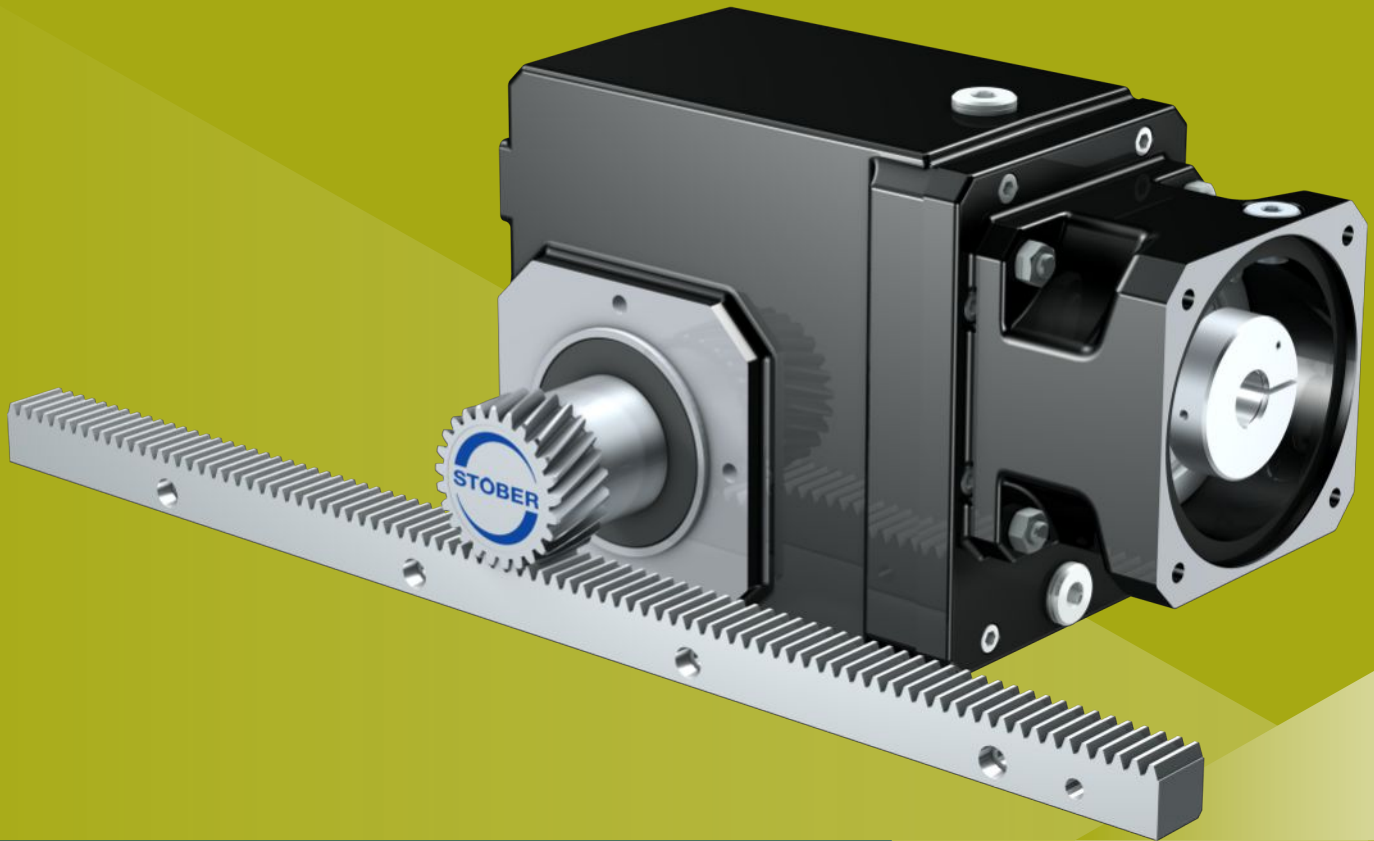
LM Lean motor



<http://www.stoeber.de/en/ZVKLMQ>

On request

On request



3.11 Rack and pinion drives

ZVK

Highly rigid right-angle gear units with plug-on pinion

Features

Power density	★☆☆☆☆
Linear clearance	★★★★☆
Price category	€
Smooth operation	★★★★☆
Linear rigidity	★☆☆☆☆
Mass moment of inertia	★★★★☆
Ready-to-install drive solution	✓
Pinion gearing quality 6 (DIN 3962)	✓
Helical gearing	✓
Case-hardened and smoothed	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	m_n [mm]	z	F_{fzacc} [kN]	$v_{fzmaxZB}$ [m/s]	Δs [μm]
ZV2_K102	2	20	2.8 – 4.9	0.22 – 2.8	37 – 74
ZV2_K202	2	25	3.8 – 8.3	0.26 – 3.1	12 – 77
ZV2_K203	2	25	5.2 – 8.3	0.07 – 0.46	19 – 77
ZV2_K302	2	25	5.2 – 10	0.24 – 2.8	12 – 77
ZV2_K303	2	25	5.2 – 10	0.06 – 0.51	19 – 77
ZV3_K202	3	18	3.5 – 7.7	0.28 – 3.4	12 – 83
ZV3_K203	3	18	5.4 – 7.7	0.07 – 0.49	21 – 83
ZV3_K302	3	18	5.3 – 11	0.26 – 3	12 – 83
ZV3_K303	3	18	5.3 – 11	0.07 – 0.55	21 – 83
ZV3_K402	3	22	6.6 – 15	0.29 – 3.5	15 – 102
ZV3_K403	3	22	6.6 – 15	0.07 – 0.62	25 – 102
ZV4_K402	4	18	6.9 – 15	0.32 – 3.8	17 – 111
ZV4_K403	4	18	6.9 – 15	0.08 – 0.68	28 – 111

Pinion gearing

Helical gearing

✓

Motor adapter design

Motor adapter with EasyAdapt coupling (ME)

✓

Motor adapter with plug-in coupling (MQ)

✓

Motor adapter with ServoStop brake (MB)

✓

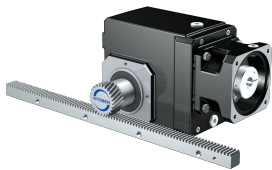
Input options

ME motor adapter

MB motor adapter

EZ synchronous servo motor

LM Lean motor



<http://www.stoeber.de/en/ZVKME>

On request

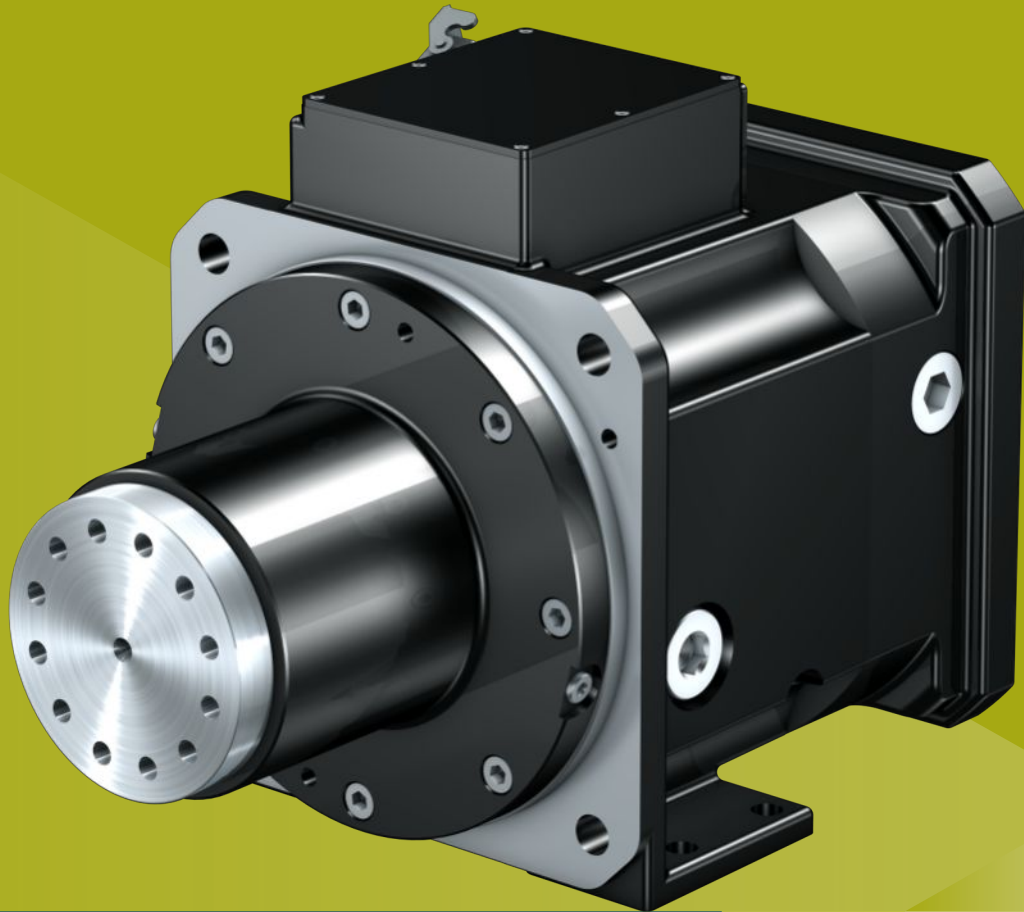
On request

On request

4 Two-speed gearboxes

Table of contents

4.1 PS two-speed gearboxes	90
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4.1 Two-speed gearboxes

PS

PS two-speed gearboxes with loss-optimized direct drive

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€€
Shaft load	★★★★★
Smooth operation	★★★★★
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Fast changeover between high speed and high torque	✓
High-precision, helical planetary gear unit	✓
Loss-optimized direct gear	✓
Splash lubrication or circulating lubrication (optional)	✓
Oil sight glass or oil level gauge (optional)	✓
Motor adapter for simple and safe attachment of different main feed motors	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

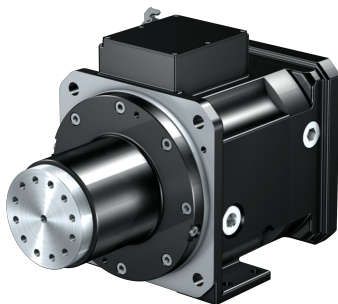
Technical data

Type	i	n_{1max} [rpm]	$P_{N,GB}$ [kW]	M_{2max} [Nm]	M_{2N} [Nm]	$\Delta\phi_2$ [arcmin]
PS2501	1 – 5.5	2500 – 10000	39	2200	1375	20 – 30
PS2501	1 – 4	2500 – 10000	47	1600	1200	20 – 30
PS3001	1 – 5.5	2500 – 10000	39	2200	1375	20 – 30
PS3001	1 – 4	2500 – 10000	47	1600	1200	20 – 30

Housing design							
Short bearing distance							✓
Medium bearing distance							✓
Long bearing distance							✓
Shaft design							
Flange shaft							✓
Solid shaft without feather key							✓
Solid shaft with two feather keys							✓
Bearing design							
Standard bearing (deep-groove ball bearing)							✓
Axially reinforced bearing (angular contact ball bearing)							✓
Radially reinforced bearing (cylindrical roller bearing)							✓
Lubrication							
Splash lubrication							✓
Circulating lubrication							✓
Housing design	S	M	S	M	M	L	
Shaft design	G		P		F		
Bearing design							
R	SGR	–	SPR	–	–	–	–
S	SGS	MGS	SPS	MPS	MFS	–	–
Z	–	MGZ	–	MPZ	MFZ	LFZ	–

Further information

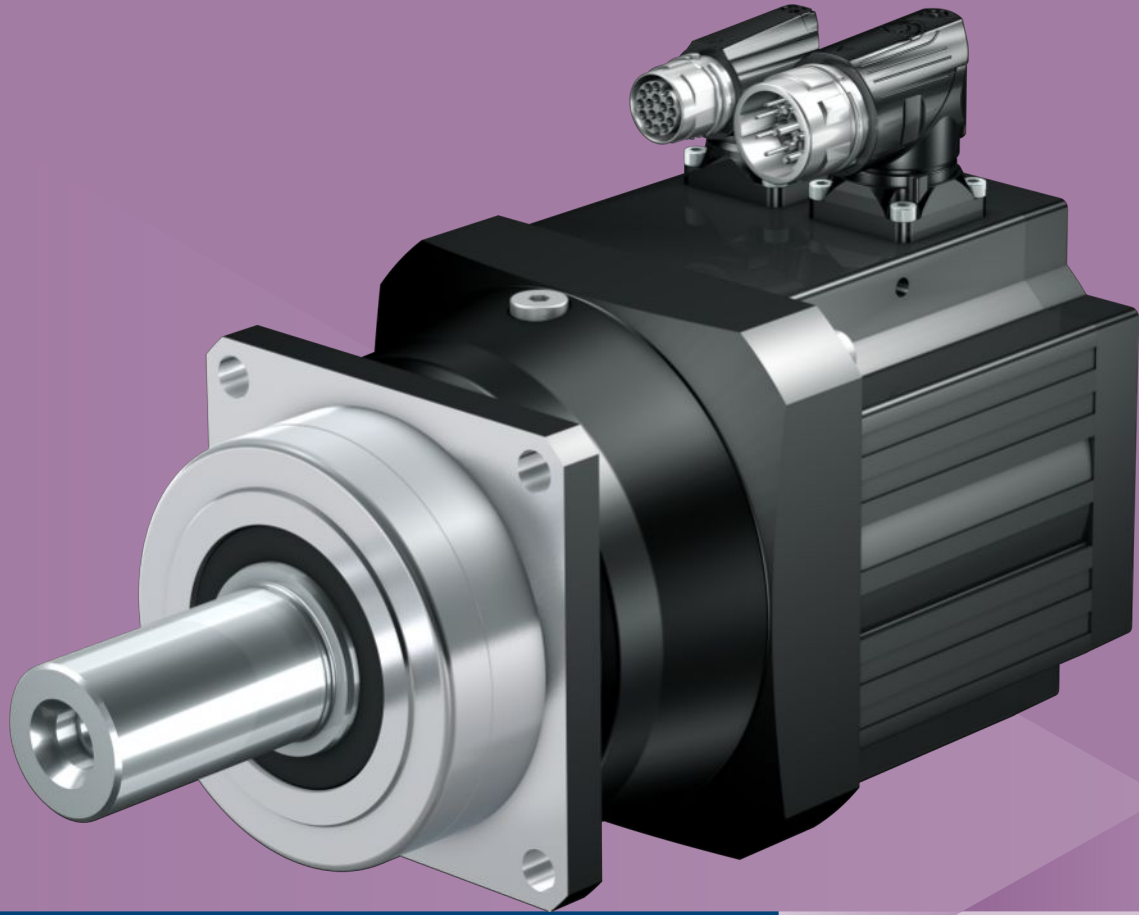
PS two-speed gearboxes


<http://www.stoeber.de/en/PS>

5 EZ synchronous servo geared motors

Table of contents

5.1	P planetary geared motors	94
5.2	PH planetary geared motors.....	96
5.3	PHQ planetary geared motors.....	98
5.4	PHV planetary geared motors	100
5.5	PE planetary geared motors.....	102
5.6	C helical geared motors.....	104
5.7	F offset helical geared motors	106
5.8	KS right-angle servo geared motors.....	108
5.9	PKX planetary geared motors	110
5.10	PK planetary geared motors.....	112
5.11	PHKX planetary geared motors.....	114
5.12	PHK planetary geared motors	116
5.13	PHQK planetary geared motors	118
5.14	KL helical bevel geared motors	120
5.15	K helical bevel geared motors	122



5.1 Planetary geared motors

P

Helical-gear precision planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★☆☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
P231	4 – 10	11 – 25	3.7 – 11	8000	6	1.6 – 1.9
P232	16	24	14	8000	8	1.8
P331	3 – 10	15 – 75	4.9 – 38	7000 – 8000	2 – 4	4.4 – 5.5
P332	12 – 50	32 – 75	11 – 52	8000	3 – 5	4.6 – 5.3
P431	3 – 10	47 – 139	13 – 104	6000 – 8000	2 – 4	9.1 – 13
P432	12 – 80	32 – 134	11 – 100	7000 – 8000	3 – 5	9.6 – 13
P531	3 – 10	58 – 350	23 – 205	5000 – 7000	1 – 3	25 – 35
P532	12 – 80	97 – 355	32 – 266	6000 – 8000	2 – 4	25 – 33
P731	3 – 10	194 – 805	77 – 513	4000 – 6000	1 – 3	55 – 69
P732	12 – 80	228 – 805	91 – 574	5000 – 7000	2 – 4	57 – 65
P831	4 – 10	776 – 1500	256 – 641	3500 – 4500	1 – 3	150 – 187
P832	12 – 100	608 – 1840	237 – 1256	4500 – 6000	2 – 4	148 – 177
P932	16 – 70	2204 – 3450	733 – 2294	3500 – 4500	4	372 – 407

Shaft design

Solid shaft with feather key

✓

Solid shaft without feather key

✓

Bearing design

Standard

✓

Axially reinforced

✓

Radially reinforced

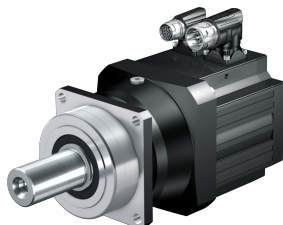
✓

Motor design

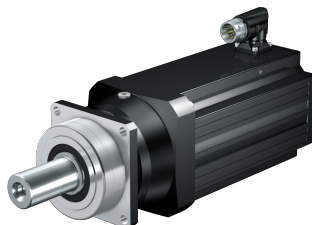
[> 8.1]

Input options

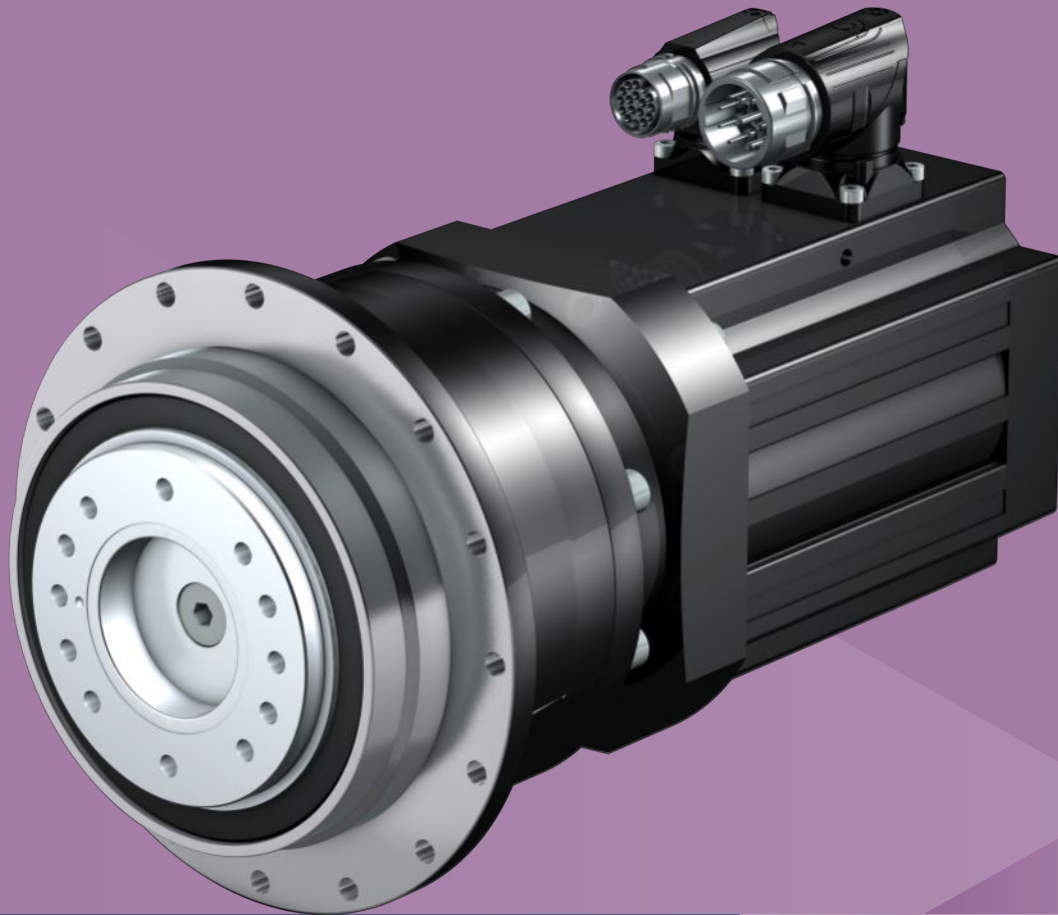
EZ synchronous servo motor



LM Lean motor



<http://www.stoeber.de/en/PEZ> <http://www.stoeber.de/en/PLM>



5.2 Planetary geared motors

PH

High-performance precision planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PH3 – PH5)	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PH331	5 – 10	24 – 77	8.1 – 35	8000	2 – 4	9.2 – 15
PH332	20 – 50	52 – 80	18 – 51	8000	2 – 4	9 – 14
PH431	4 – 10	57 – 172	18 – 103	5000 – 7000	1 – 3	21 – 39
PH432	16 – 70	65 – 161	22 – 114	8000	1 – 3	27 – 32
PH531	4 – 10	134 – 385	42 – 203	5000 – 6500	1 – 3	53 – 100
PH532	16 – 70	158 – 385	52 – 285	7000 – 8000	1 – 3	70 – 86
PH731	4 – 10	192 – 882	80 – 444	4000 – 5000	1 – 3	125 – 243
PH732	16 – 70	298 – 866	115 – 651	6000 – 7000	1 – 3	154 – 202
PH831	4 – 10	787 – 1392	254 – 635	3500 – 4000	1 – 3	344 – 620
PH832	16 – 100	744 – 2100	294 – 1604	4500 – 6000	1 – 3	333 – 526
PH932	16 – 60	2790 – 5000	984 – 2951	3000 – 4500	3	1057 – 1212
PH1032	24 – 60	4464 – 7500	1475 – 3688	3500 – 4500	3	1602 – 1753

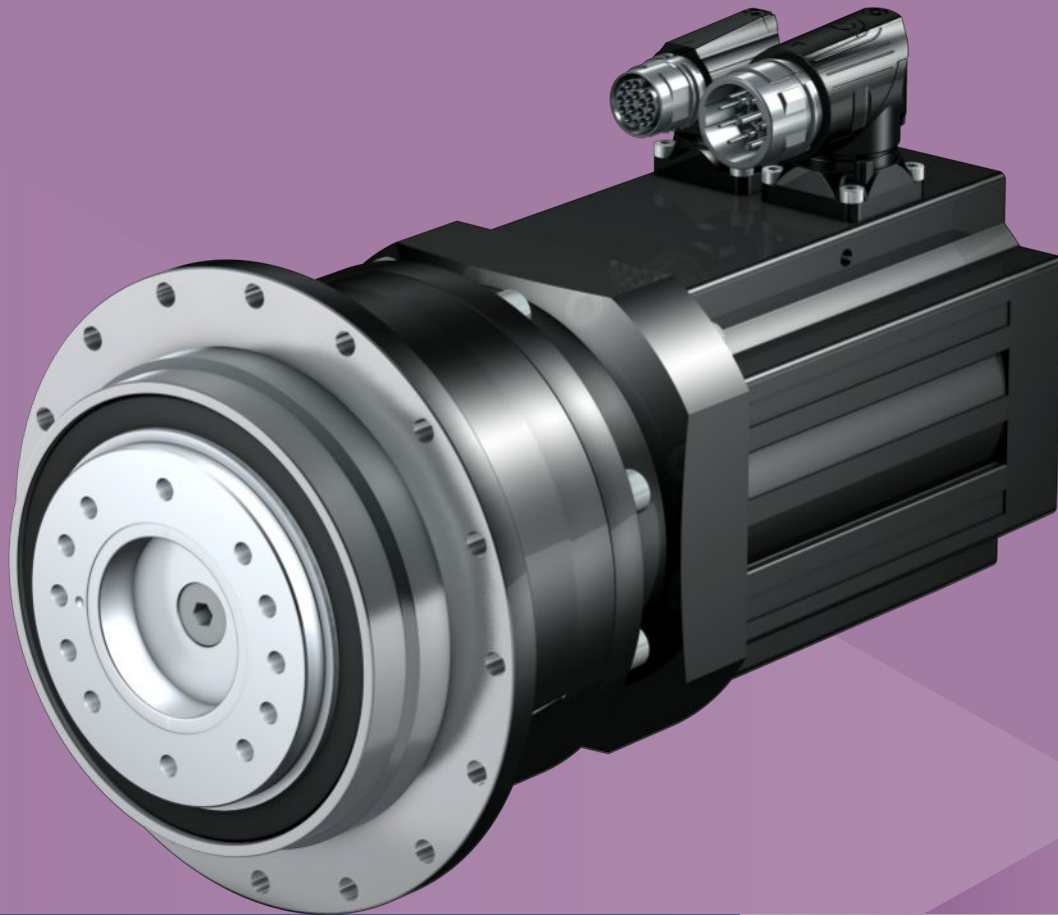
Shaft design	
Flange shaft	✓
Bearing design	
Standard	✓
Reinforced (PH3 – PH5)	✓
Motor design	[▶ 8.1]

Input options

EZ synchronous servo motor



<http://www.stoeber.de/en/PHEZ>



5.3 Planetary geared motors

PHQ

Quattro-Power for maximum power density

Features

Power density	★★★★★
Backlash	★★★★★
Price category	€€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★★
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position (single/two stage)	✓
High power density	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PHQ4 – PHQ5)	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PHQ431	5.5	84 – 200	23 – 84	6000	1 – 3	44
PHQ432	22 – 55	72 – 200	24 – 125	8000	1 – 3	38 – 41
PHQ531	5.5	216 – 549	76 – 159	5000	1 – 3	107
PHQ532	22 – 55	174 – 540	57 – 391	7000 – 8000	1 – 3	95 – 103
PHQ731	5.5	528 – 1050	196 – 349	5000	1 – 3	235
PHQ732	22 – 55	409 – 1050	158 – 783	6000 – 7000	1 – 3	213 – 226
PHQ733	88 – 220	673 – 1050	222 – 772	6000 – 7000	1 – 3	222 – 224
PHQ832	22 – 55	1023 – 2800	425 – 1898	4500 – 6000	1 – 3	670 – 720
PHQ833	88 – 385	1267 – 2800	372 – 2121	5000 – 6500	1 – 3	699 – 712
PHQ932	24 – 60	3906 – 6000	1449 – 3688	3500 – 4500	3	1149 – 1225
PHQ933	72 – 600	2160 – 6000	896 – 4566	4500 – 6000	3	1145 – 1207
PHQ1033	96 – 240	8640 – 10000	3205 – 7452	3500 – 4500	3	2055 – 2068
PHQ1133	96 – 300	13500 – 22000	5009 – 14278	3500 – 4500	3	3491 – 3533

Shaft design

Flange shaft

✓

Bearing design

Standard

✓

Reinforced (PHQ4 – PHQ5)

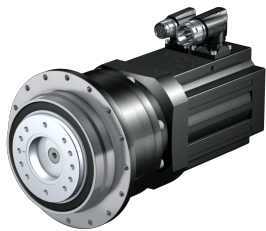
✓

Motor design

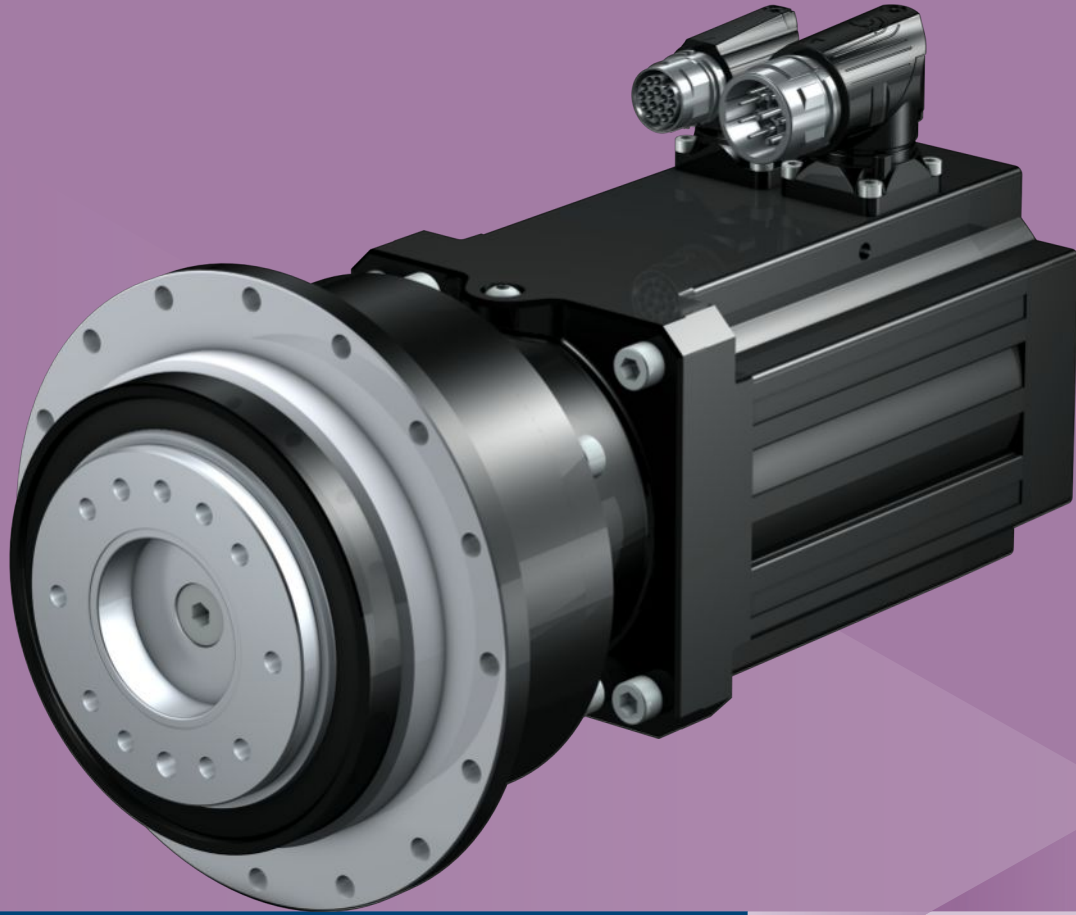
[▶ 8.1]

Input options

EZ synchronous servo motor



<http://www.stoeber.de/en/>
[PHQEZ](#)



5.4 Planetary geared motors

PHV

High-performance precision planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PHV933	61 – 121	1638 – 4250	680 – 3267	4500	3	805 – 850
PHV1033	61 – 91	7500	2646 – 5414	4500	3	1342 – 1370

Shaft design

Flange shaft

✓

Motor design

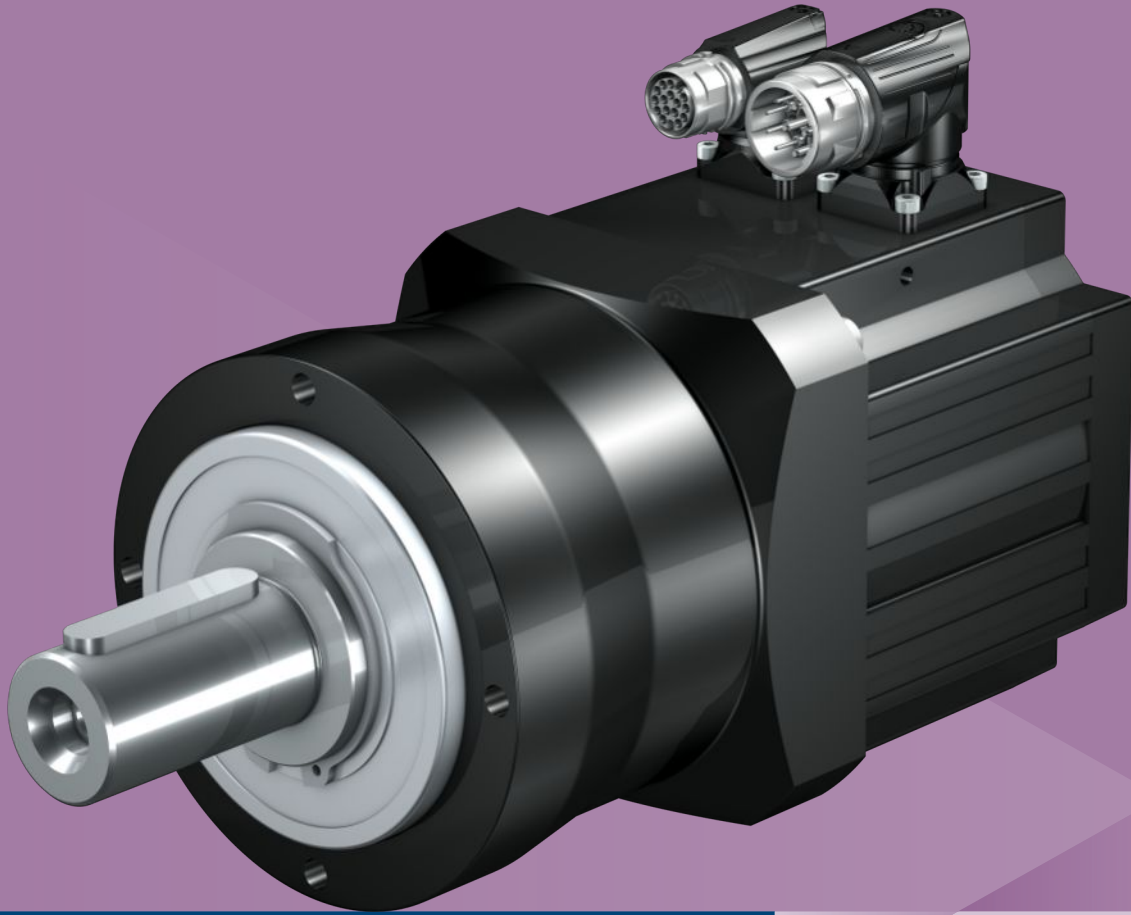
[> 8.1]

Input options

EZ synchronous servo motor



<http://www.stoeber.de/en/>
[PHVEZ](#)



5.5 Planetary geared motors

PE

Cost-efficient helical-gear planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Non-contact sealing at the input	✓
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PE221	4 – 7	11 – 19	3.7 – 6.5	8000	10	1.3 – 1.5
PE321	3 – 10	11 – 50	3.7 – 21	6000 – 7000	8	3.5 – 4.5
PE322	16 – 25	43 – 50	14 – 23	8000	10	4 – 4.2
PE421	3 – 10	25 – 109	8.7 – 59	5500 – 6000	8	10 – 14
PE422	16 – 50	43 – 104	14 – 52	7000	10	13
PE521	3 – 10	58 – 250	23 – 146	4500 – 5000	8	27 – 37
PE522	16 – 40	129 – 250	43 – 161	6000	10	33

Shaft design

Solid shaft with feather key

✓

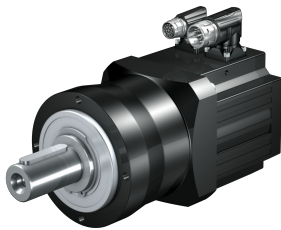
Solid shaft without feather key

Motor design

[> 8.1]

Input options

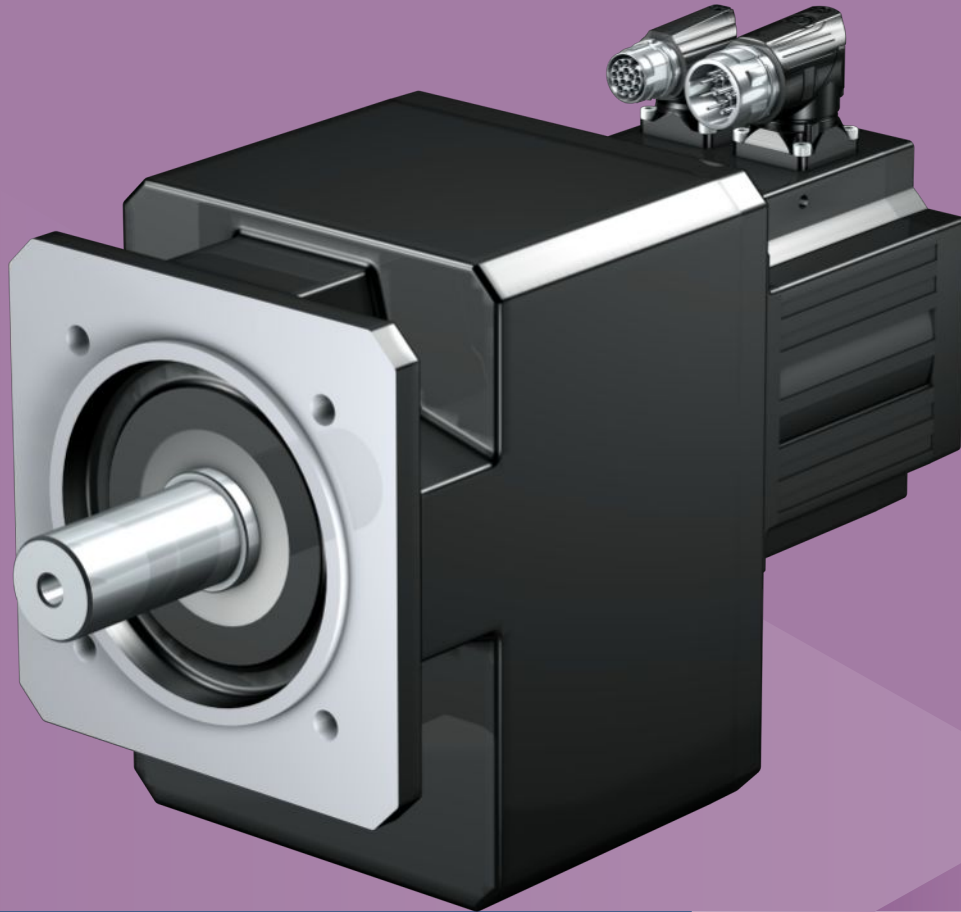
EZ synchronous servo motor



LM Lean motor



<http://www.stoeber.de/en/PEEZ> <http://www.stoeber.de/en/PELM>



5.6 Helical geared motors

C

Compact helical geared motors

Features

Power density	★☆☆☆☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free (C0 – C5)	✓
FKM seal ring at the input	✓
Reinforced output bearing	✓ (on request)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	M _{2,0} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
C002	2 – 50	9.7 – 72	3.3 – 55	6000 – 7000	16 – 20	1.3 – 1.6
C102	2 – 70	19 – 138	6.3 – 106	5000 – 6500	15 – 18	3.1 – 3.9
C103	82 – 111	138	74 – 101	6500	15	3.9
C202	2 – 70	52 – 230	22 – 177	4500 – 6500	14 – 17	6 – 8.3
C203	81 – 92	230	129 – 173	6500	14	8.3
C302	2 – 62	114 – 400	43 – 309	4000 – 6000	13 – 16	7.1 – 8.7
C303	81 – 137	350 – 400	131 – 264	6000	13	8.7
C402	2 – 70	186 – 600	58 – 462	3500 – 5500	12 – 15	17 – 22
C403	81 – 90	550 – 600	363 – 406	5500	12	22
C502	2 – 70	184 – 920	65 – 698	3200 – 5000	12 – 14	21 – 23
C503	81 – 135	850 – 920	362 – 616	5000	12	23
C612	4.2 – 69	629 – 1650	261 – 1257	3000 – 4500	10	74
C613	49 – 213	913 – 1650	341 – 1262	4500	10	74
C712	8.5 – 70	796 – 2760	330 – 1918	3500 – 4500	10	122
C713	51 – 223	1548 – 2760	642 – 2129	4500	10	122
C812	17 – 69	2528 – 4800	938 – 2920	3800 – 4300	10	145 – 204
C813	49 – 270	1517 – 4800	630 – 3600	4300	10	204
C913	78 – 110	5630 – 6500	2757 – 3917	4000	10	393

Shaft design

Solid shaft with feather key

✓

Solid shaft without feather key

C0 – C5: ✓
Starting at C6: Request

Housing design

Pitch circle diameter

✓

Round flange

✓

Square flange

C0 – C4: ✓

Foot

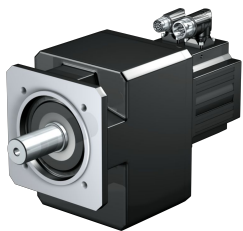
✓

Motor design

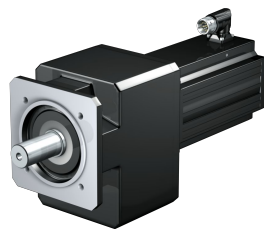
[▶ 8.1]

Input options

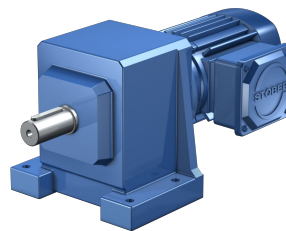
EZ synchronous servo motor

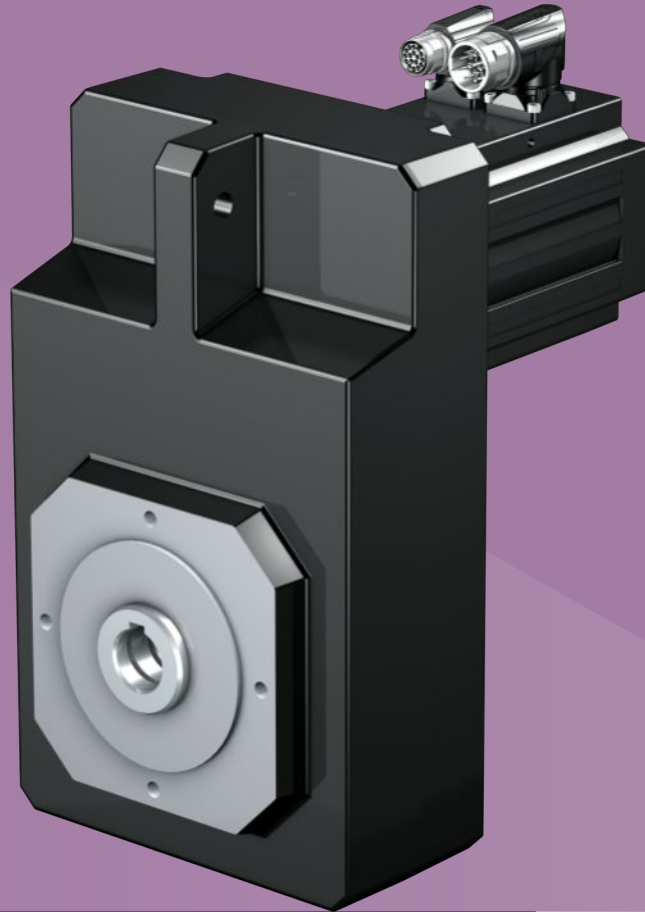


LM Lean motor



Asynchronous motor


<http://www.stoeber.de/en/CEZ>
<http://www.stoeber.de/en/CLM>
<http://www.stoeber.de/en/CIE3D>



5.7

Offset helical geared motors

F

Offset helical geared motors with large axial distances

Features

Power density	★☆☆☆☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
FKM seal ring at the input	✓
Large axial distances, suitable for confined situations	✓
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
F102	4.3 – 94	21 – 120	7 – 91	6000 – 7000	6 – 11	6.5 – 7.7
F202	4.7 – 141	44 – 270	15 – 205	5000 – 6500	6 – 11	16 – 18
F203	184 – 222	270	167 – 202	6500	7 – 11	18
F302	4.6 – 141	111 – 450	46 – 334	4500 – 6500	6 – 11	20 – 22
F303	185	450	297	6500	7 – 11	22
F402	4.7 – 112	263 – 700	101 – 537	4000 – 6000	5 – 10	39
F403	184 – 274	700	295 – 527	6000	6 – 10	39
F602	4.5 – 140	524 – 1100	140 – 837	3500 – 5500	5 – 10	73 – 77
F603	181	1100	812	5500	6 – 10	77

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓

Housing design

Pitch circle diameter	✓
Round flange	✓
Square flange	✓
Pitch circle diameter + side fastening	✓

Motor design

[\[> 8.1 \]](#)

Input options

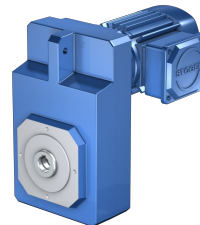
EZ synchronous servo motor

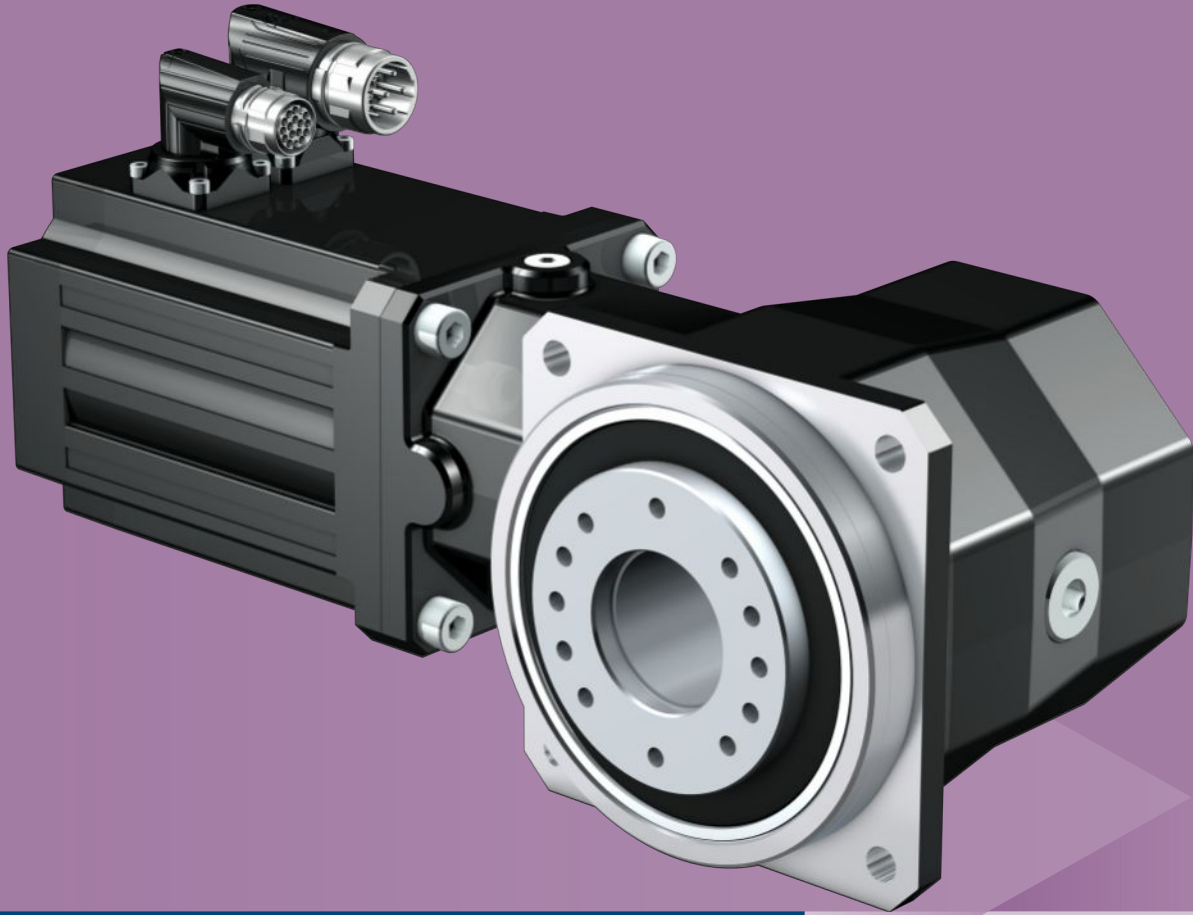


LM Lean motor



Asynchronous motor


<http://www.stoeber.de/en/FEZ>
<http://www.stoeber.de/en/FLM>
<http://www.stoeber.de/en/FIE3D>



5.8

Right-angle servo geared motors

KS

Precision right-angle servo geared motors

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
FKM seal ring at the input	✓
Stiff output bearings due to pretension	✓
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
KS402	6 – 20	27 – 90	9 – 60	6000	6	8.5
KS403	24 – 50	62 – 90	21 – 50	6000	6	8.5
KS502	6 – 20	65 – 200	21 – 136	5500 – 6000	5	17
KS503	24 – 100	62 – 200	21 – 109	6000	5	17
KS702	6 – 20	114 – 400	42 – 285	4500 – 6000	4	42
KS703	24 – 70	190 – 400	62 – 237	6000	4	42

Shaft design

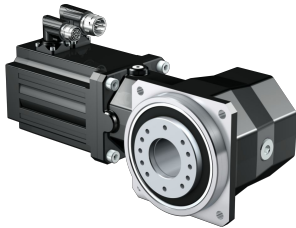
Flange hollow shaft	✓
Hollow shaft with shrink ring	✓
Solid shaft without feather key	✓
Solid shaft with feather key	✓

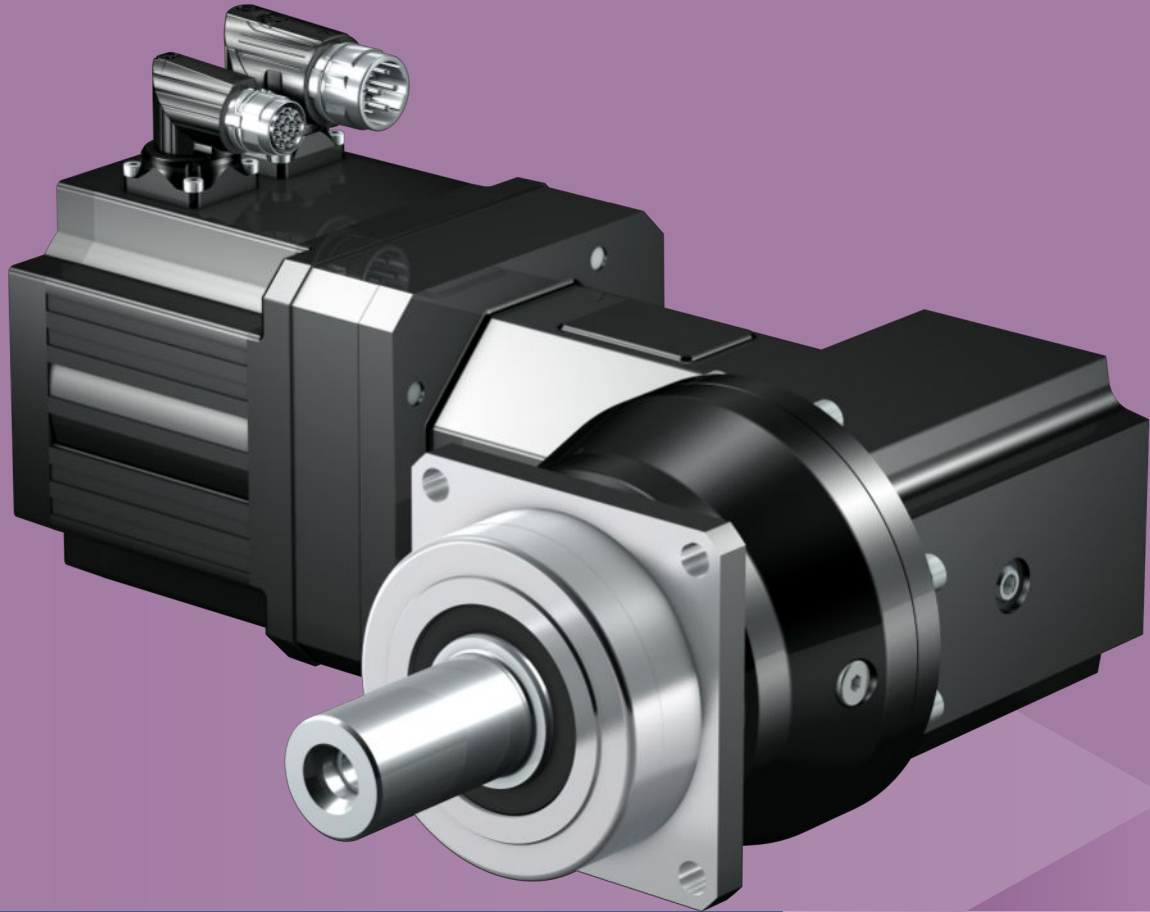
Motor design

[\[> 8.1\]](#)

Input options

EZ synchronous servo motor


<http://www.stoeber.de/en/KSEZ>



5.9 Planetary geared motors

PKX

Helical-gear precision right-angle planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Small installation space	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	M _{2,0} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
P231_KX301	4 – 15	11 – 25	3.6 – 17	4500 – 6000	7.5 – 8.5	1.5 – 1.7
P331_KX301	3 – 30	16 – 69	5.4 – 45	4500 – 6000	3 – 7.5	2.4 – 4.2
P332_KX301	32 – 60	65 – 75	28 – 53	4500 – 6000	3.5 – 5.5	5 – 5.2
P431_KX401	3 – 30	40 – 135	13 – 94	4000 – 5500	3 – 7.5	5.3 – 9.2
P432_KX301	32 – 105	84 – 134	28 – 102	4500 – 6000	3 – 5.5	9.4 – 12
P531_KX501	3 – 30	57 – 333	23 – 229	3500 – 5000	2 – 6.5	13 – 25
P532_KX401	32 – 210	147 – 355	50 – 264	4000 – 5500	2 – 4.5	25 – 32
P731_KX701	3 – 30	229 – 805	64 – 606	3000 – 4000	2 – 6.5	38 – 54
P732_KX501	32 – 300	299 – 805	101 – 604	3500 – 5000	2 – 4.5	54 – 62
P831_KX701	3 – 30	229 – 1213	64 – 866	3000 – 4000	2 – 6.5	59 – 130
P832_KX701	32 – 210	599 – 1840	240 – 1415	3000 – 4000	2 – 4.5	148 – 173
P932_KX701	16 – 300	1123 – 3300	332 – 2430	3000 – 4000	4 – 4.5	320 – 393

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	✓

Bearing design

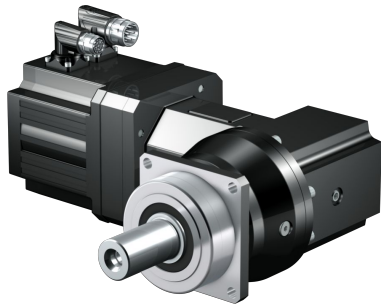
Standard	✓
Axially reinforced	✓
Radially reinforced	✓

Motor design

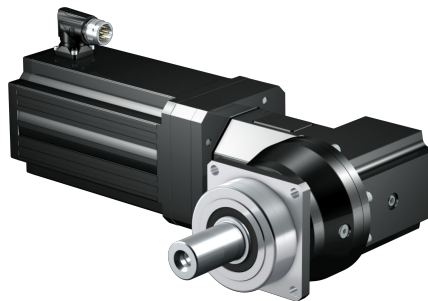
[> 8.1]

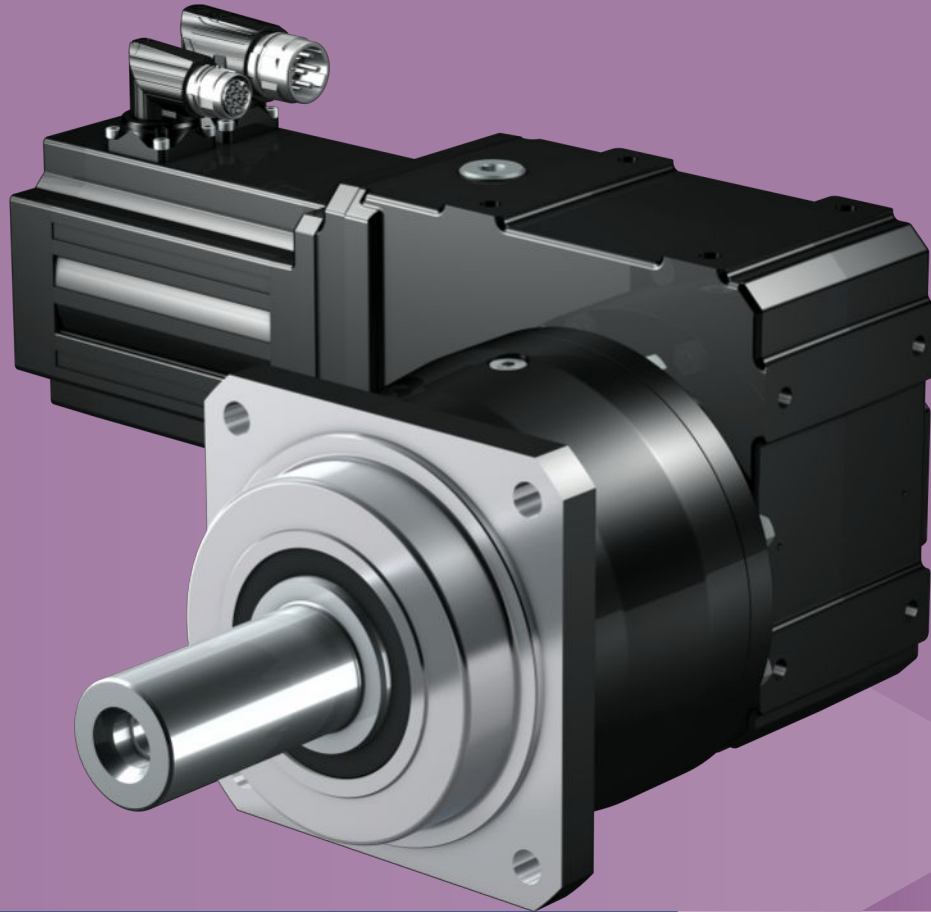
Input options

EZ synchronous servo motor


<http://www.stoeber.de/en/PKXEZ>

LM Lean motor


<http://www.stoeber.de/en/PKXLM>



5.10 Planetary geared motors

PK

Helical-gear precision right-angle planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
P531_K102	12 – 235	68 – 350	25 – 269	5000 – 7000	2 – 5	22 – 29
P731_K102	28 – 393	158 – 805	58 – 567	5000 – 7000	1.5 – 4	50 – 52
P731_K202	12 – 278	226 – 805	87 – 604	4500 – 6500	2 – 4.5	40 – 53
P831_K202	28 – 555	331 – 1494	121 – 1151	4500 – 6500	1.5 – 3.5	128 – 132
P831_K302	12 – 279	463 – 1840	163 – 1390	4000 – 6000	2 – 4.5	83 – 128
P931_K402	28 – 485	1217 – 3105	505 – 2398	3800 – 5500	3.5	305

Shaft design

Solid shaft with feather key

✓

Solid shaft without feather key

✓

Bearing design

Standard

✓

Axially reinforced

✓

Radially reinforced

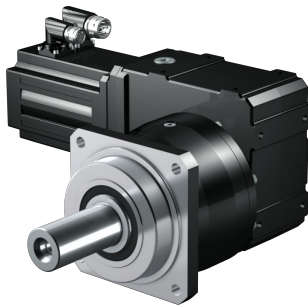
✓

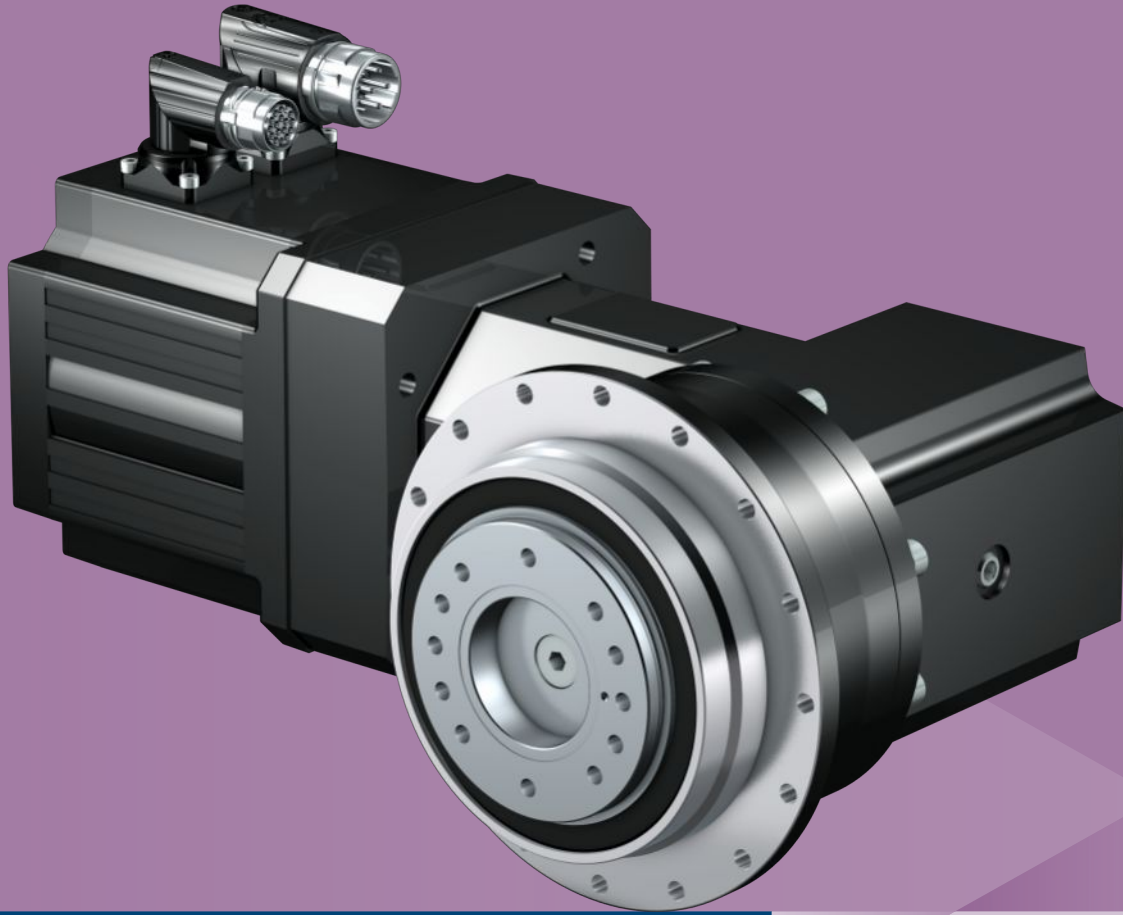
Motor design

[▶ 8.1]

Input options

EZ synchronous servo motor


<http://www.stoeber.de/en/PKEZ>



5.11 Planetary geared motors

PHKX

High-performance precision right-angle planetary geared motors

Features

Power density	★★★★★
Backlash	★★★★★
Price category	€€€€
Shaft load	★★★★★
Smooth operation	★★★☆☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★☆☆
Helical gearing	✓
Maintenance-free	✓
Small installation space	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PH3 – PH5)	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

Key ★★★☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	M _{2,0} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
PH331_KX301	5 – 30	26 – 75	9 – 45	4500 – 6000	3 – 6	6.9 – 8.4
PH332_KX301	35 – 56	75 – 80	30 – 49	4500 – 5500	2.5 – 4.5	12 – 13
PH431_KX401	4 – 30	53 – 160	17 – 93	4000 – 5500	2 – 5.5	11 – 19
PH432_KX301	32 – 140	82 – 161	28 – 122	4500 – 6000	1 – 3.5	25 – 30
PH531_KX501	4 – 30	121 – 370	39 – 265	3500 – 5000	2 – 5.5	28 – 46
PH532_KX401	32 – 210	147 – 385	49 – 289	4000 – 5500	1 – 3.5	52 – 78
PH731_KX701	4 – 30	227 – 840	84 – 600	3000 – 4000	2 – 5.5	94 – 122
PH732_KX501	32 – 300	308 – 866	96 – 667	3500 – 5000	1 – 3.5	121 – 176
PH831_KX701	4 – 30	227 – 1200	84 – 857	3000 – 4000	2 – 5.5	122 – 253
PH832_KX701	32 – 210	733 – 2100	241 – 1539	3500 – 4000	1 – 3.5	332 – 489

Shaft design

Flange shaft

✓

Bearing design

Standard

✓

Reinforced (PH3 – PH5)

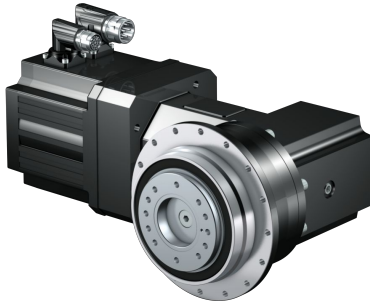
✓

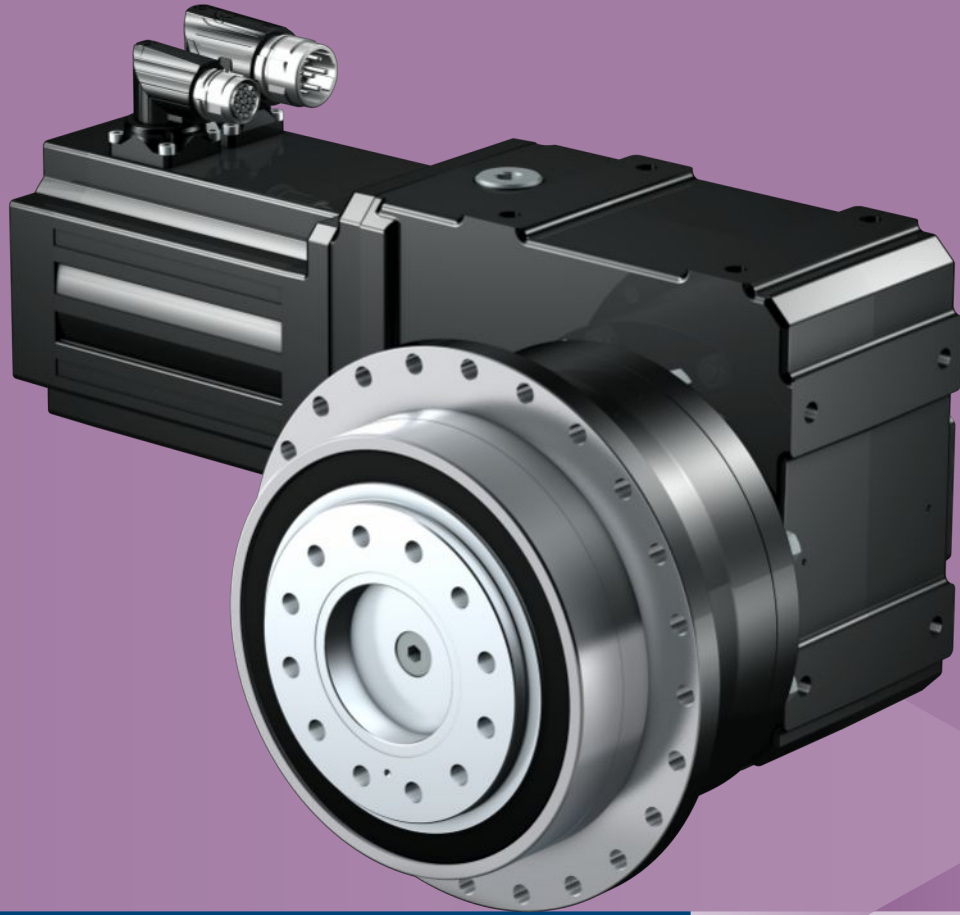
Motor design

[> 8.1]

Input options

EZ synchronous servo motor


<http://www.stoeber.de/en/PHKXEZ>



5.12 Planetary geared motors

PHK

High-performance precision right-angle planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€€
Shaft load	★★★★★
Smooth operation	★★★☆☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PH3 – PH5)	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
PH531_K102	16 – 235	89 – 385	33 – 266	5000 – 7000	2 – 4.5	52 – 62
PH731_K102	28 – 393	157 – 869	57 – 561	5000 – 7000	1.5 – 4	105 – 111
PH731_K202	16 – 278	234 – 882	86 – 655	4500 – 6500	2 – 4.5	100 – 117
PH831_K202	28 – 555	328 – 1478	120 – 1139	4500 – 6500	1.5 – 3.5	245 – 260
PH831_K302	16 – 279	501 – 1848	208 – 1376	4000 – 6000	2 – 4	185 – 245
PH931_K513	33 – 466	1772 – 4500	736 – 3399	3200 – 5000	4 – 4.5	525 – 730
PH1031_K613	49 – 457	3508 – 7500	1348 – 5776	3000 – 4500	4	1210

Shaft design

Flange shaft

✓

Bearing design

Standard

✓

Reinforced (PH3 – PH5)

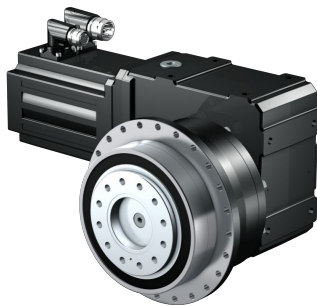
✓

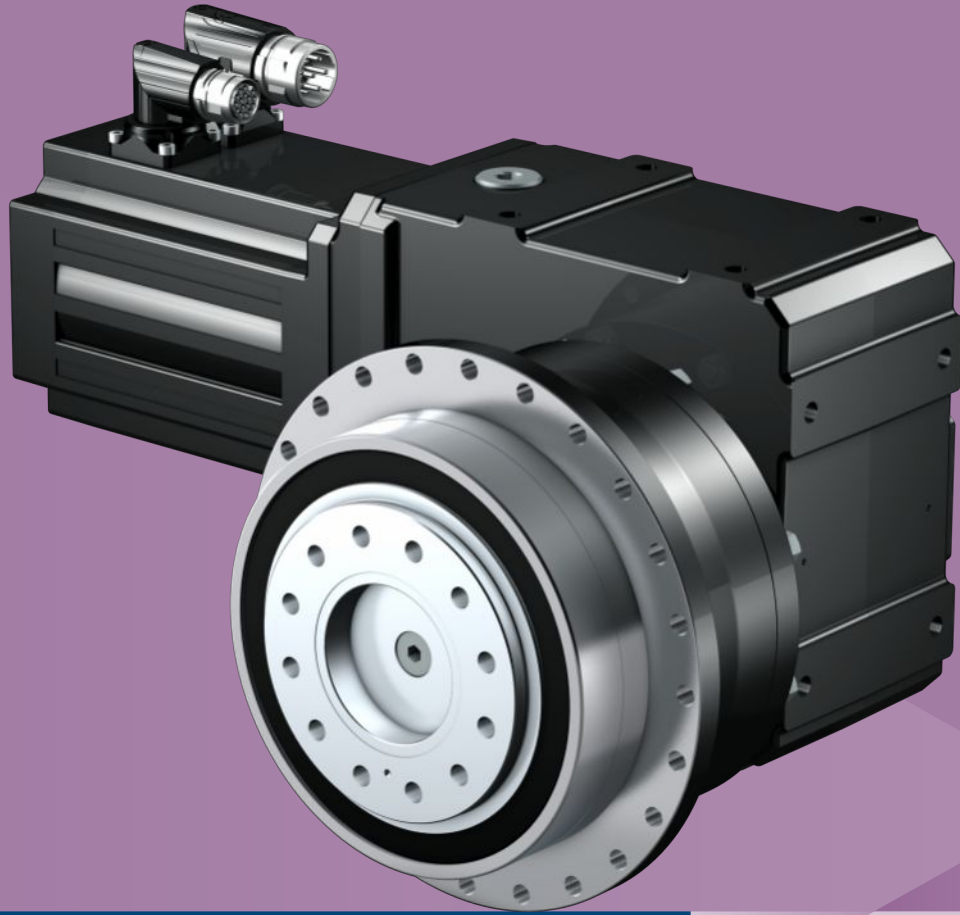
Motor design

[▶ 8.1]

Input options

EZ synchronous servo motor


<http://www.stoeber.de/en/PHKEZ>



5.13 Planetary geared motors

PHQK

Quattro-Power precision right-angle planetary geared motors

Features

Power density	★★★★★
Backlash	★★★★★
Price category	€€€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★★
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
High power density	✓
Continuous operation without cooling	✓
Stiff output bearings due to pretension	✓
Reinforced output bearing (PHQ4 – PHQ5)	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
PHQ531_K102	22 – 309	123 – 550	45 – 410	5000 – 7000	2 – 4	70
PHQ731_K202	22 – 305	257 – 1050	94 – 789	4500 – 6500	2 – 4	136
PHQ831_K402	22 – 306	858 – 2800	356 – 2133	3800 – 5500	1.5 – 3.5	400
PHQ931_K513	44 – 580	2131 – 5760	885 – 4413	3200 – 5000	4	771
PHQ1031_K713	45 – 591	3903 – 10000	1620 – 7492	2700 – 4200	4	1561
PHQ1131_K813	89 – 583	7897 – 22000	3277 – 16218	3000 – 4000	4	2623
PHQ1231_K913	144 – 572	26947 – 43000	8715 – 27300	3300 – 3800	4	4665
PHQ1231_K914	554 – 2242	13636 – 43000	5659 – 32363	3800	4	4665

Shaft design

Flange shaft

✓

Bearing design

Standard

✓

Reinforced (PHQ4 – PHQ5)

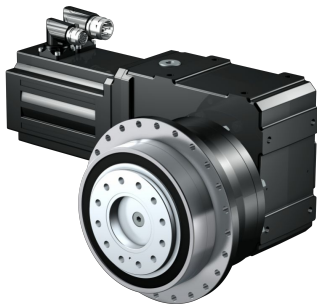
✓

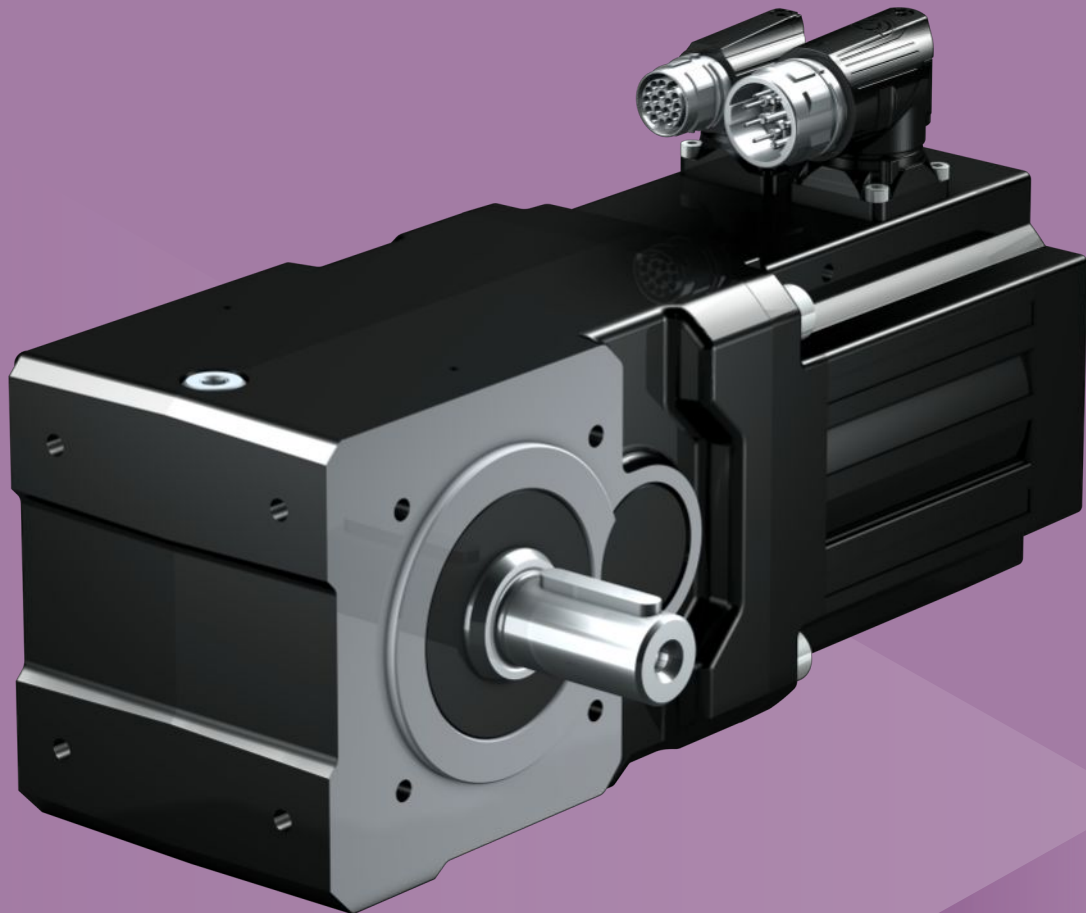
Motor design

[> 8.1]

Input options

EZ synchronous servo motor


<http://www.stoeber.de/en/PHQKEZ>



5.14 Helical bevel geared motors

KL

Compact helical-gear right-angle geared motors

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Small installation space	✓
FKM seal ring at the input	✓
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
KL102	4 – 16	11 – 30	3.7 – 17	5000 – 6000	20 – 25	1.3 – 1.8
KL202	4 – 32	22 – 65	7.4 – 43	5000 – 6000	16 – 20	2.4 – 4

Shaft design

Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓
Solid shaft without feather key	✓
Solid shaft with feather key	✓

Housing design

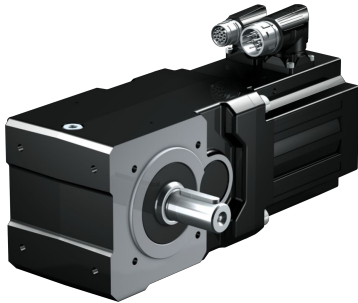
Pitch circle diameter	✓
Flange	✓
Foot + pitch circle diameter	✓

Motor design

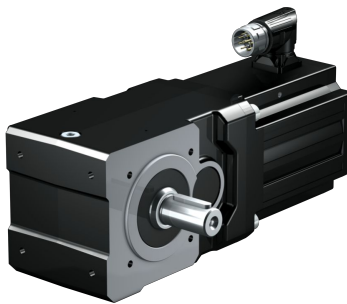
[> 8.1]

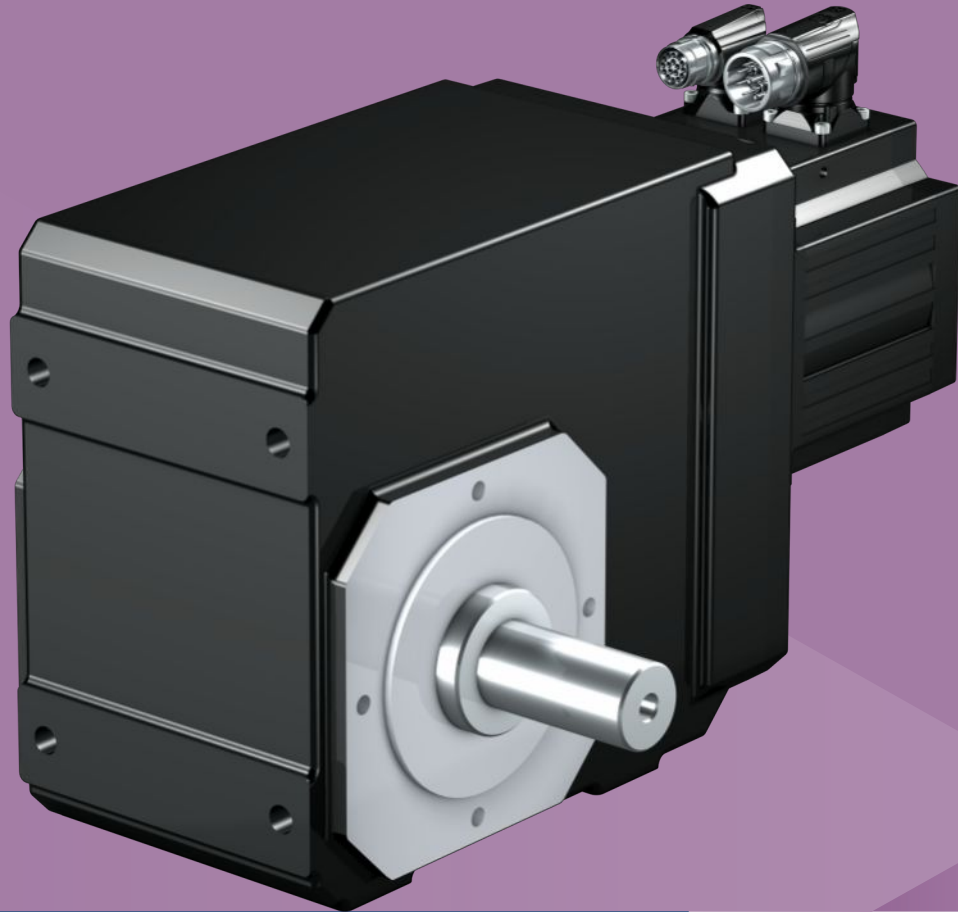
Input options

EZ synchronous servo motor


<http://www.stoeber.de/en/KLEZ>

LM Lean motor


<http://www.stoeber.de/en/KLLM>



5.15 Helical bevel geared motors

K

Highly rigid helical-gear right-angle geared motor

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free (K1 – K4)	✓
FKM seal ring at the input	✓
Reinforced output bearing (K5 – K8)	✓ (on request)
Compact and highly dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	M _{2,0} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
K102	4 – 56	23 – 135	8.5 – 102	5000 – 7000	6 – 12	6.8
K202	4 – 69	49 – 220	18 – 170	4500 – 6500	1.5 – 10	11
K203	39 – 181	189 – 220	63 – 167	6500	2.5 – 10	11
K302	4 – 69	104 – 385	43 – 290	4000 – 6000	1.5 – 10	16
K303	33 – 181	235 – 385	79 – 294	6000	2.5 – 10	16
K402	4 – 69	179 – 600	74 – 456	3800 – 5500	1.5 – 10	31
K403	32 – 218	317 – 600	107 – 414	5500	2.5 – 10	31
K513	7.3 – 97	466 – 1000	193 – 766	3200 – 5000	2 – 10	50
K514	85 – 168	1000	376 – 744	5000	3 – 10	50
K613	7.3 – 95	662 – 1600	211 – 1228	3000 – 4500	2 – 10	83
K614	111 – 266	1448 – 1600	492 – 1176	4500	3 – 10	83
K713	7.6 – 99	1120 – 2600	427 – 1872	2700 – 4200	2 – 10	126
K714	89 – 381	1626 – 2600	606 – 1984	4200	3 – 10	126
K813	15 – 97	1371 – 4650	569 – 3304	3000 – 4000	2 – 10	196
K814	67 – 311	2156 – 4650	895 – 3472	4000	3 – 10	196
K913	38 – 95	4678 – 7700	1736 – 4740	3800	5 – 10	379
K914	92 – 374	2367 – 7700	982 – 5619	3800	5 – 10	379
K1014	149 – 290	10621 – 13200	5198 – 10136	3500	5 – 10	725

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	K1 – K4: ✓ Starting at K5: Request
Solid shaft on both sides	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓

Housing design

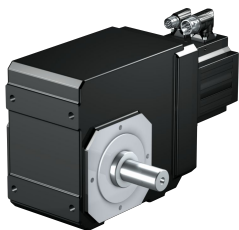
Pitch circle diameter	K1 – K9: ✓
Round flange	K1 – K9: ✓
Pitch circle diameter + torque arm bracket	K1 – K9: ✓
Foot + pitch circle diameter + torque arm bracket	K10: ✓
Foot + pitch circle diameter	✓
Foot + round flange	✓

Motor design

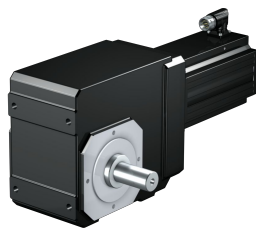
[▶ 8.1]

Input options

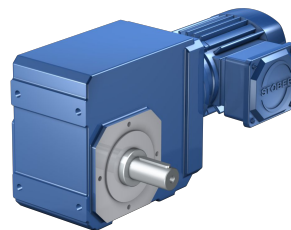
EZ synchronous servo motor



LM Lean motor



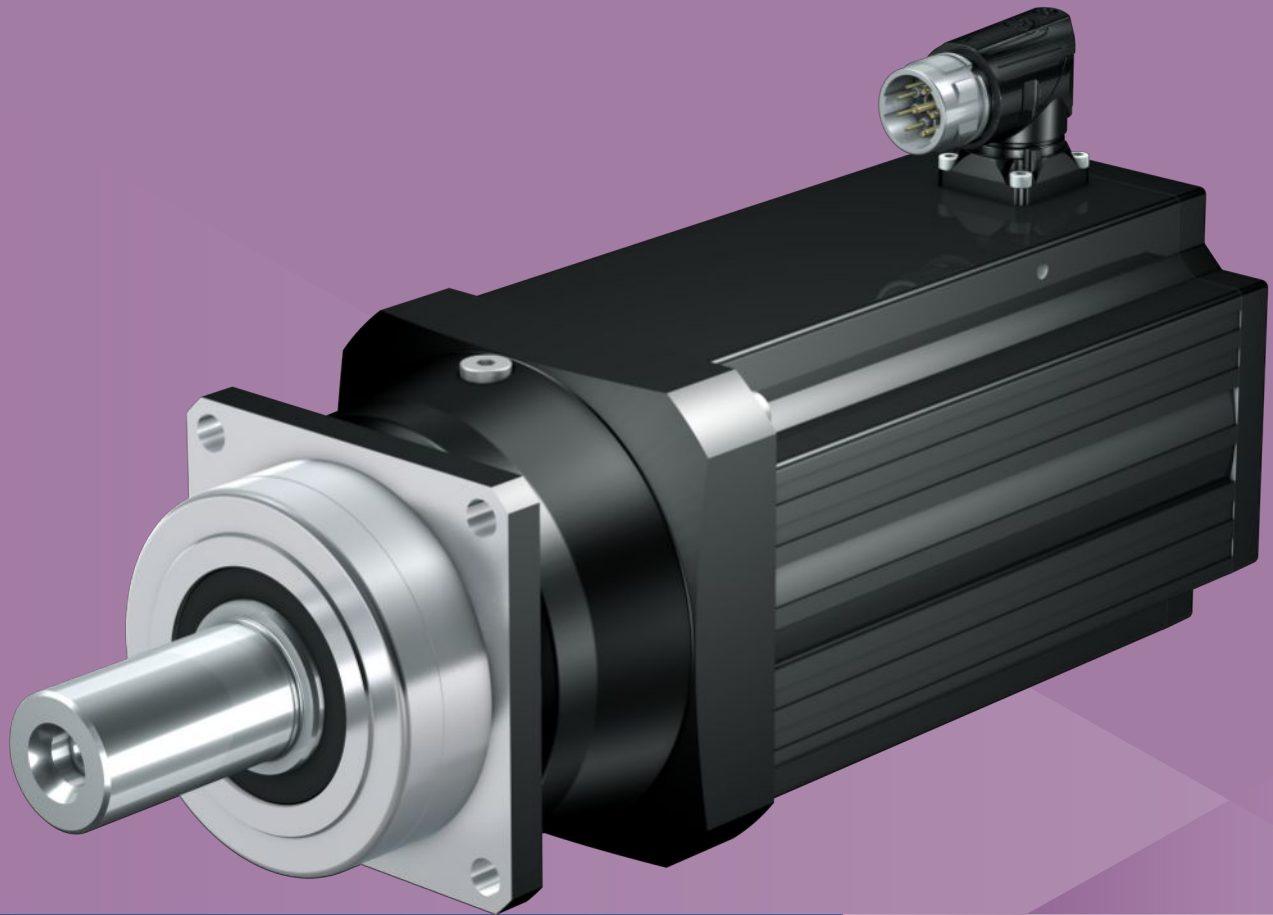
Asynchronous motor


<http://www.stoeber.de/en/KEZ>
<http://www.stoeber.de/en/KLM>
<http://www.stoeber.de/en/KIE3D>

6 LM Lean geared motors

Table of contents

6.1	P planetary geared motors	126
6.2	PE planetary geared motors	128
6.3	C helical geared motors	130
6.4	F offset helical geared motors	132
6.5	PKX planetary geared motors	134
6.6	KL helical bevel geared motors	136
6.7	K helical bevel geared motors	138



6.1 Planetary geared motors

P

Helical-gear precision planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★☆☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Compact and dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	M _{2,0} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
P331	3 – 10	13 – 66	7.1 – 35	7000 – 8000	2 – 4	4.4 – 5.5
P431	3 – 10	28 – 139	13 – 78	6000 – 8000	2 – 4	9.1 – 13
P432	12 – 50	51 – 134	28 – 120	7000 – 8000	3 – 5	9.6 – 13
P531	3 – 10	59 – 333	29 – 231	5000 – 7000	1 – 3	25 – 35
P532	12 – 70	111 – 355	51 – 335	6000 – 8000	2 – 4	25 – 33
P731	3 – 10	120 – 575	62 – 289	4000 – 6000	1 – 3	55 – 69
P732	12 – 70	232 – 805	115 – 735	5000 – 7000	2 – 4	57 – 65
P832	12 – 70	469 – 1840	242 – 1416	4500 – 6000	2 – 4	159 – 177

Shaft design

Solid shaft with feather key

✓

Solid shaft without feather key

✓

Bearing design

Standard

✓

Axially reinforced

✓

Radially reinforced

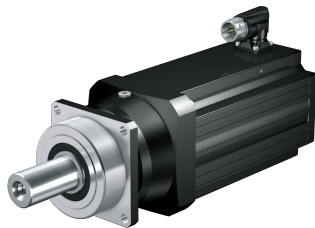
✓

Motor design

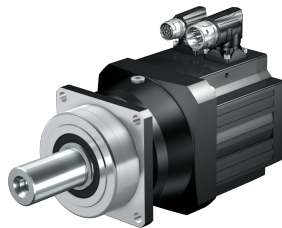
[> 8.5]

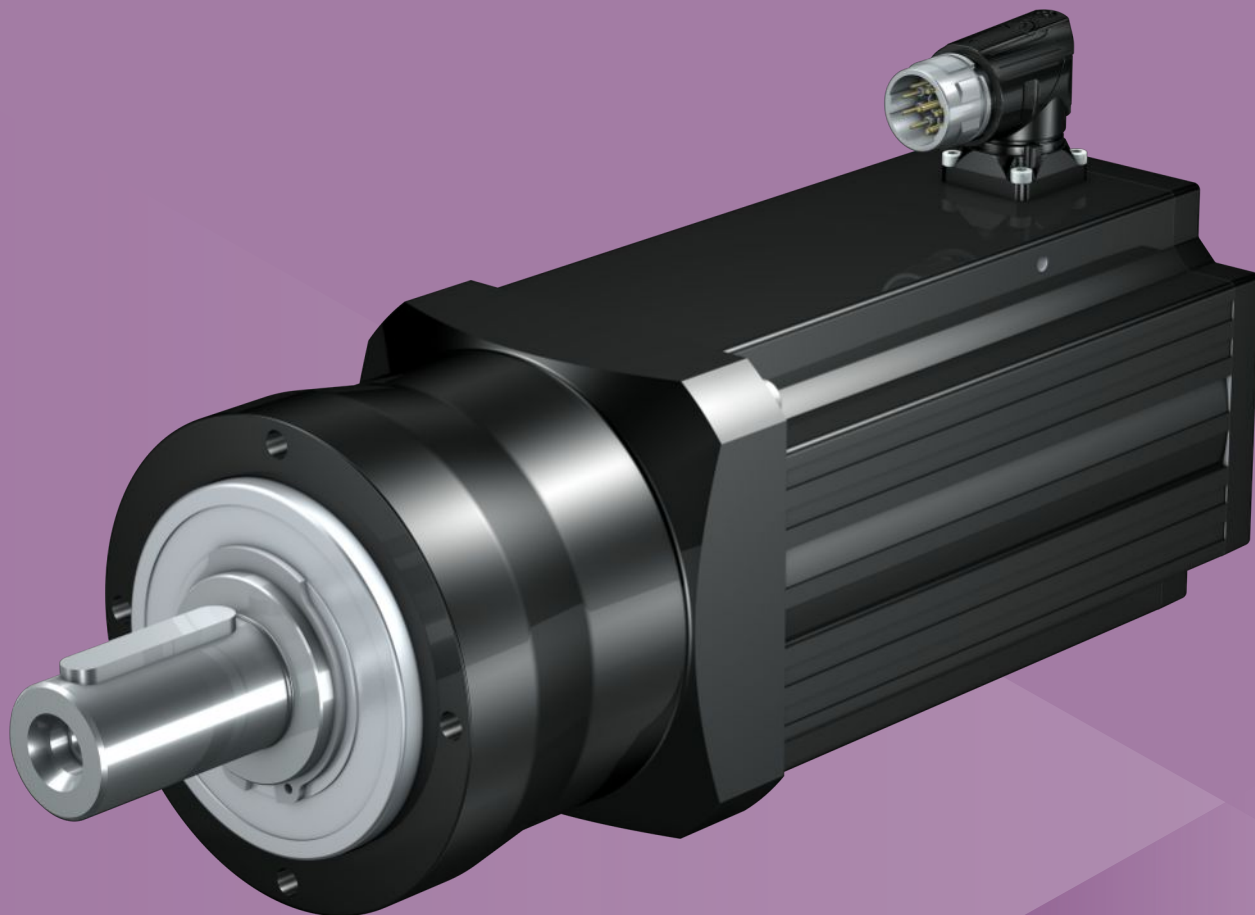
Input options

LM Lean motor


<http://www.stoerber.de/en/PLM>

EZ synchronous servo motor


<http://www.stoerber.de/en/PEZ>



6.2 Planetary geared motors

PE

Cost-efficient helical-gear planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Non-contact sealing at the input	✓
Compact and dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	M _{2,0} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
PE321	3 – 10	13 – 47	7.1 – 24	6000 – 7000	8	3.5 – 4.5
PE421	3 – 10	28 – 100	13 – 60	5500 – 6000	8	10 – 14
PE422	16 – 28	69 – 103	37 – 65	7000	10	13
PE521	3 – 10	59 – 250	29 – 145	4500 – 5000	8	27 – 37
PE522	16 – 35	147 – 250	68 – 153	6000	10	33

Shaft design

Solid shaft with feather key

✓

Solid shaft without feather key

Motor design

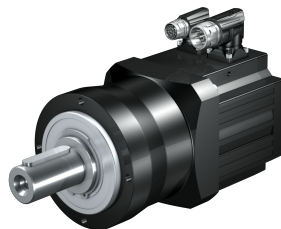
[\[> 8.5 \]](#)

Input options

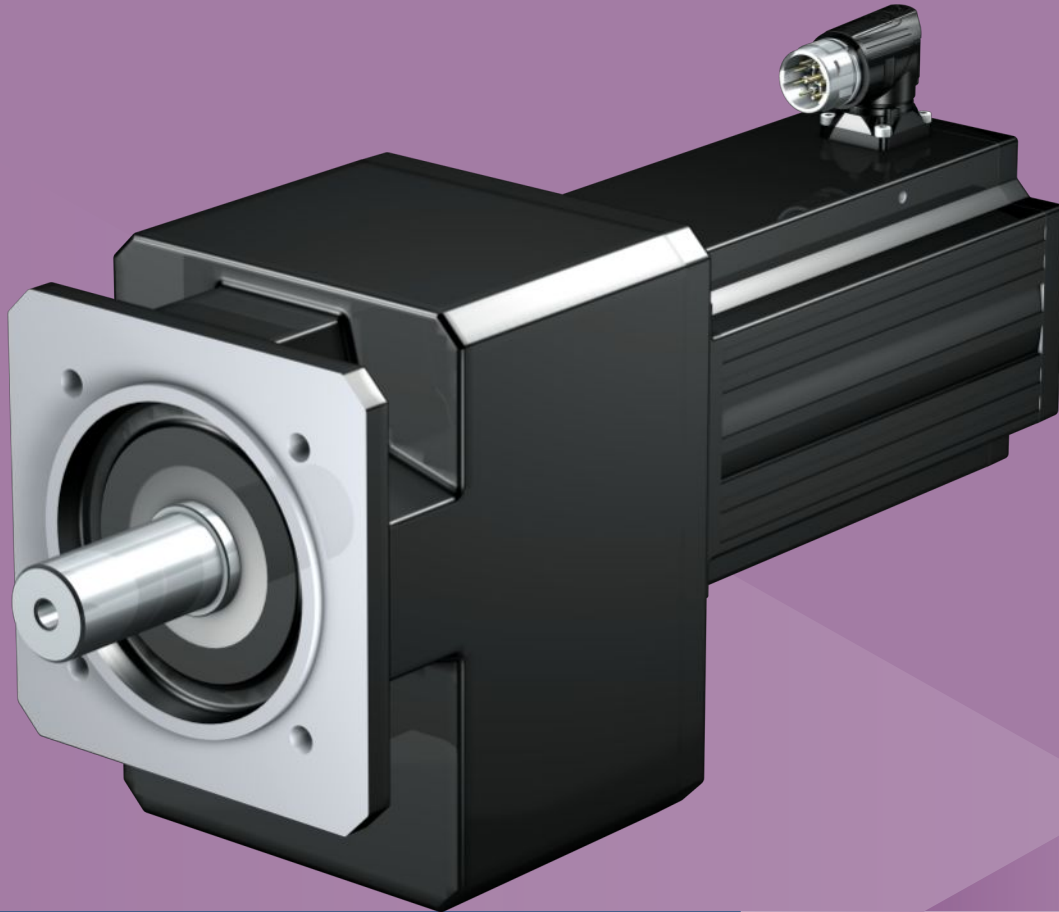
LM Lean motor



EZ synchronous servo motor



<http://www.stoeber.de/en/PELM> <http://www.stoeber.de/en/PEEZ>



6.3 Helical geared motors

C

Compact helical geared motors

Features

Power density	★☆☆☆☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free (C0 – C5)	✓
FKM seal ring at the input	✓
Reinforced output bearing	✓ (on request)
Compact and dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
C002	2 – 25	8.7 – 72	4.7 – 68	6000 – 7000	16 – 20	1.3 – 1.6
C102	2 – 56	17 – 138	9.2 – 137	5000 – 6500	15 – 18	3.1 – 3.9
C202	2 – 70	48 – 230	23 – 230	4500 – 6500	14 – 17	6 – 8.3
C203	81 – 92	230	187 – 215	6500	14	8.3
C302	3.1 – 35	124 – 400	64 – 372	4800 – 6000	13 – 16	7.1 – 8.7
C303	81 – 137	350 – 400	189 – 350	6000	13	8.7
C402	3.9 – 56	156 – 600	80 – 548	4500 – 5500	12 – 15	17 – 22
C502	4.6 – 70	185 – 920	95 – 903	4500 – 5000	12 – 14	21 – 23
C503	81	920	776	5000	12	23
C612	20 – 55	783 – 1465	404 – 1310	4500	10	74
C613	49 – 135	913 – 1650	730 – 1561	4500	10	74
C712	25 – 70	1011 – 2300	522 – 2010	4500	10	122
C713	81 – 132	2257 – 2760	1646 – 2690	4500	10	122
C813	79 – 178	2486 – 4140	1613 – 3625	4300	10	204

Shaft design

Solid shaft with feather key

✓

Solid shaft without feather key

C0 – C5: ✓
Starting at C6: Request

Housing design

Pitch circle diameter

✓

Round flange

✓

Square flange

C0 – C4: ✓

Foot

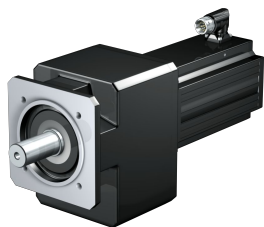
✓

Motor design

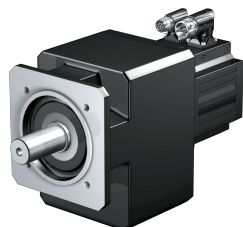
[> 8.5]

Input options

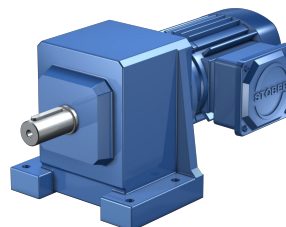
LM Lean motor



EZ synchronous servo motor



Asynchronous motor


<http://www.stoeber.de/en/CLM>
<http://www.stoeber.de/en/CEZ>
<http://www.stoeber.de/en/CIE3D>



6.4 Offset helical geared motors

F

Offset helical geared motors with large axial distances

Features

Power density	★☆☆☆☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
FKM seal ring at the input	✓
Large axial distances, suitable for confined situations	✓
Compact and dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
F102	4.3 – 46	19 – 120	10 – 111	6000 – 7000	6 – 11	6.5 – 7.7
F202	4.7 – 113	39 – 270	21 – 266	5000 – 6500	6 – 11	16 – 18
F302	4.6 – 141	112 – 450	54 – 424	4500 – 6500	6 – 11	20 – 22
F303	185	450	429	6500	7 – 11	22
F402	7.2 – 70	288 – 700	149 – 684	4800 – 6000	5 – 10	39
F403	184 – 274	700	427 – 637	6000	6 – 10	39
F602	9 – 112	359 – 1100	185 – 1096	4500 – 5500	5 – 10	73 – 77

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓

Housing design

Pitch circle diameter	✓
Round flange	✓
Square flange	✓
Pitch circle diameter + side fastening	✓

Motor design

[> 8.5]

Input options

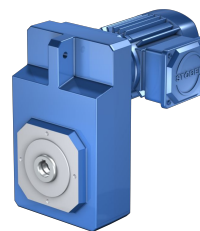
LM Lean motor

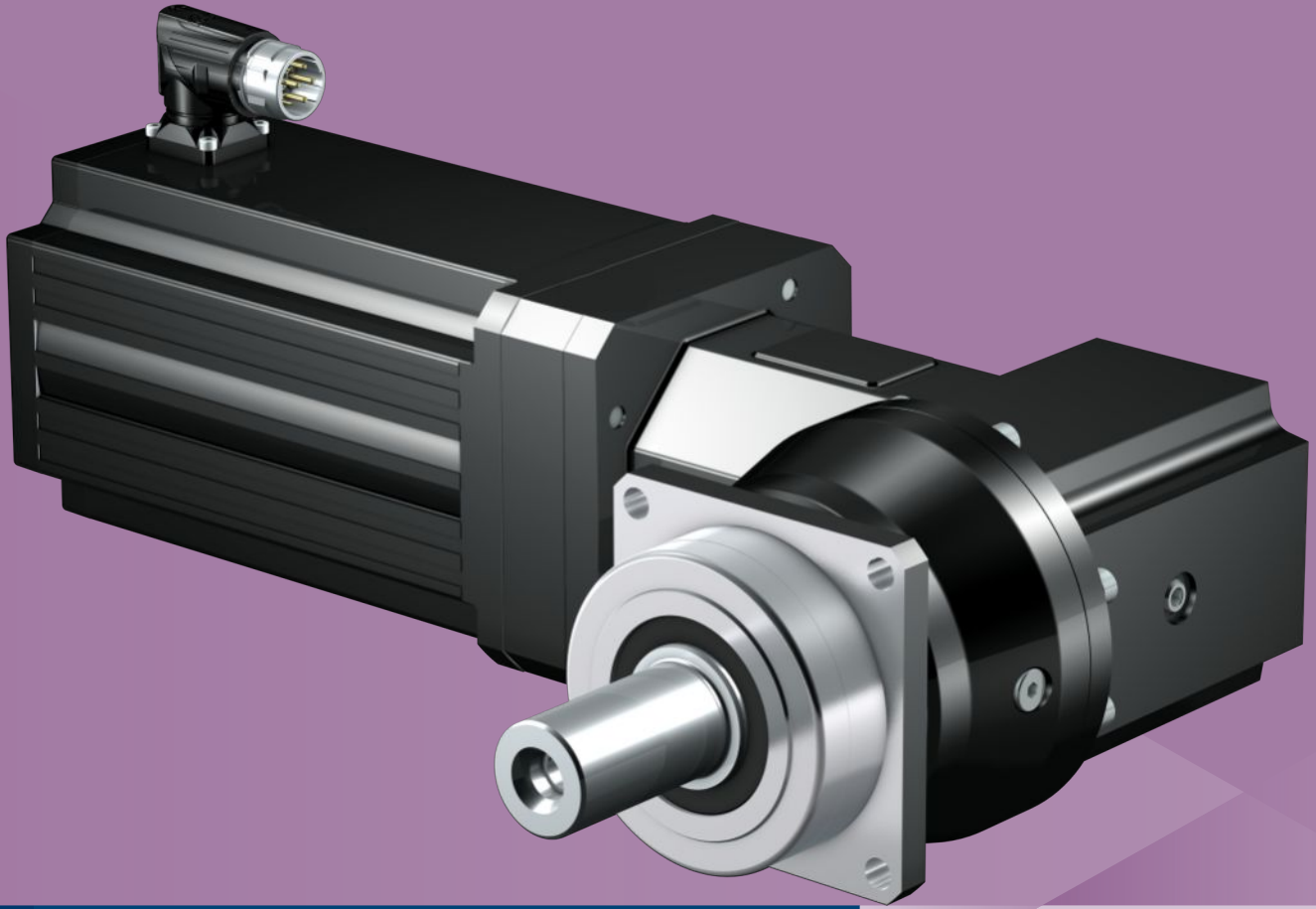


EZ synchronous servo motor



Asynchronous motor


<http://www.stoeber.de/en/FLM>
<http://www.stoeber.de/en/FEZ>
<http://www.stoeber.de/en/FIE3D>



6.5 Planetary geared motors

PKX

Helical-gear precision right-angle planetary geared motors

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★☆
Helical gearing	✓
Maintenance-free	✓
Small installation space	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Compact and dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M _{2acc} [Nm]	M _{2,0} [Nm]	n _{1maxZB} [rpm]	Δφ ₂ [arcmin]	C ₂ [Nm/arcmin]
P231_KX301	4 – 8	17 – 25	9.3 – 19	4500 – 5500	7.5 – 8.5	1.5 – 1.7
P331_KX301	3 – 21	13 – 69	7 – 49	4500 – 6000	3 – 7.5	2.4 – 4.2
P431_KX401	3 – 30	26 – 135	13 – 103	4000 – 5500	3 – 7.5	5.3 – 9.2
P432_KX301	32 – 56	130 – 134	73 – 127	4500 – 5500	3.5 – 5.5	11 – 12
P531_KX501	3 – 30	56 – 333	26 – 285	3500 – 5000	2 – 6.5	13 – 25
P532_KX401	32 – 150	135 – 355	73 – 341	4000 – 5500	2 – 4.5	25 – 32
P731_KX701	3 – 30	117 – 805	58 – 598	3000 – 4000	2 – 6.5	38 – 54
P732_KX501	32 – 210	211 – 805	114 – 696	3500 – 5000	2 – 4.5	54 – 62
P831_KX701	3 – 30	117 – 1213	58 – 854	3000 – 4000	2 – 6.5	59 – 130
P832_KX701	32 – 150	610 – 1840	302 – 1673	3000 – 4000	2 – 4.5	157 – 173
P932_KX701	16 – 210	610 – 3300	302 – 3040	3000 – 4000	4 – 4.5	320 – 393

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	✓

Bearing design

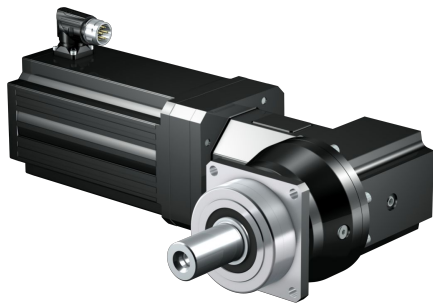
Standard	✓
Axially reinforced	✓
Radially reinforced	✓

Motor design

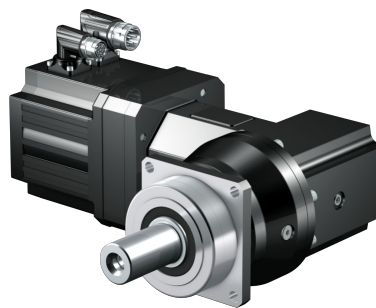
[> 8.5]

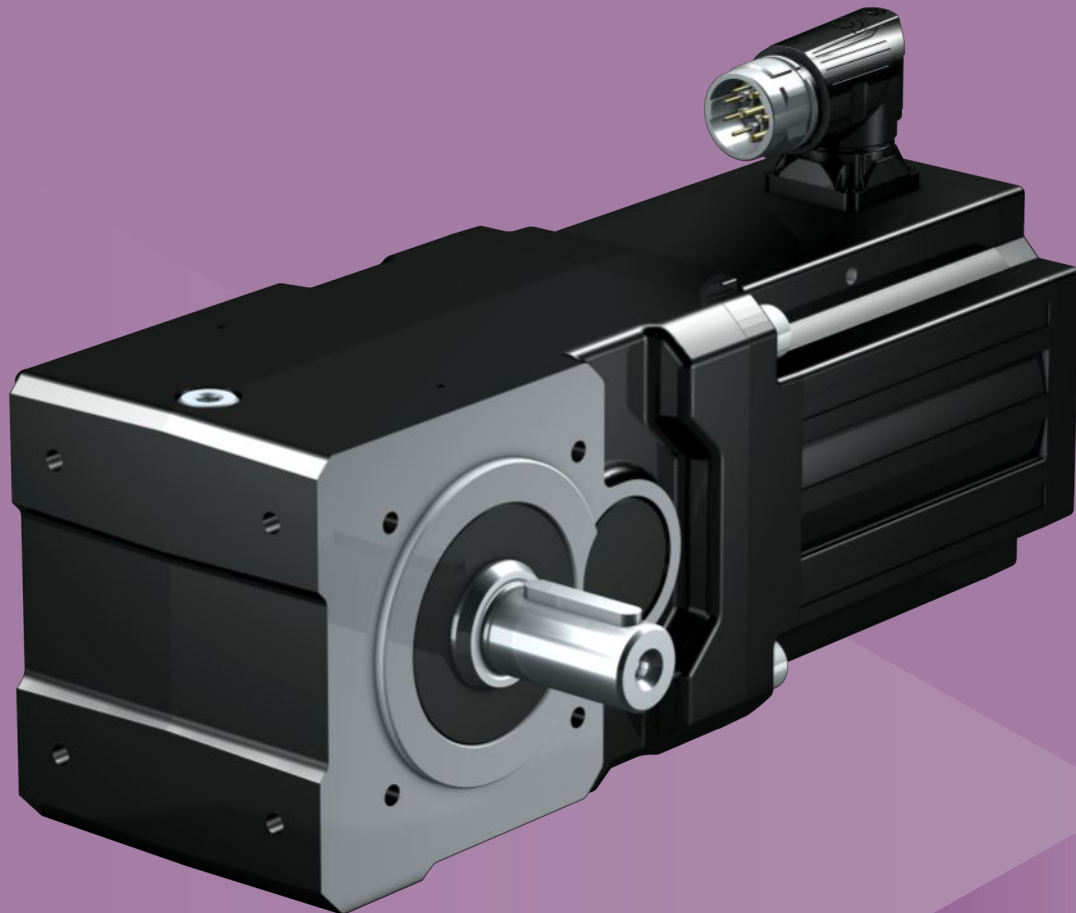
Input options

LM Lean motor


<http://www.stoeber.de/en/PKXLM>

EZ synchronous servo motor


<http://www.stoeber.de/en/PKXEZ>



6.6 Helical bevel geared motors

KL

Compact helical-gear right-angle geared motors

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any mounting position	✓
Small installation space	✓
FKM seal ring at the input	✓
Compact and dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]
KL202	4 – 16	35 – 60	17 – 48	5000 – 6000	16 – 20	2.4 – 4

Shaft design

Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓
Solid shaft without feather key	✓
Solid shaft with feather key	✓

Housing design

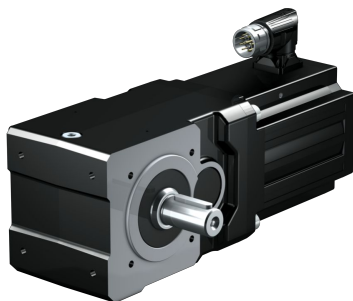
Pitch circle diameter	✓
Flange	✓
Foot + pitch circle diameter	✓

Motor design

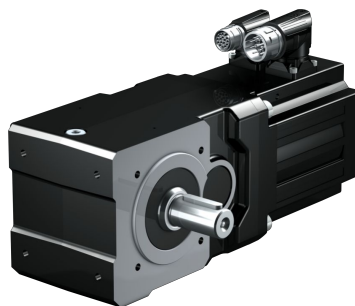
[\[> 8.5\]](#)

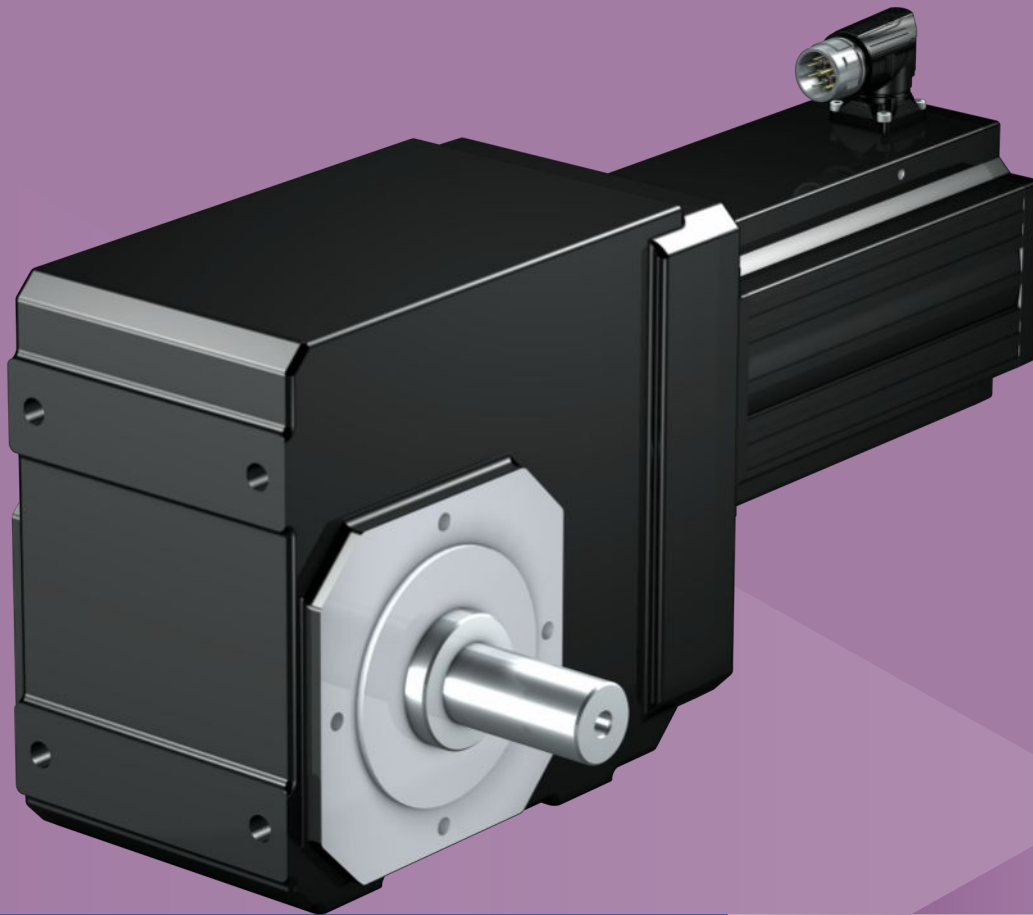
Input options

LM Lean motor


<http://www.stoeber.de/en/KLLM>

EZ synchronous servo motor


<http://www.stoeber.de/en/KLEZ>



6.7 Helical bevel geared motors

K

Highly rigid helical-gear right-angle geared motor

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free (K1 – K4)	✓
FKM seal ring at the input	✓
Reinforced output bearing (K5 – K8)	✓ (on request)
Compact and dynamic due to direct motor attachment	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

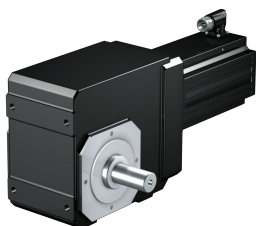
Technical data

Type	i	M_{2acc} [Nm]	$M_{2,0}$ [Nm]	n_{1maxZB} [rpm]	$\Delta\varphi_2$ [arcmin]	C_2 [Nm/arcmin]
K102	4 – 47	17 – 135	9.4 – 122	5000 – 7000	6 – 12	6.8
K202	4 – 56	37 – 220	20 – 207	4500 – 6500	1.5 – 10	11
K203	39 – 91	170 – 220	92 – 214	6500	2.5 – 10	11
K302	4 – 69	105 – 385	51 – 379	4000 – 6000	1.5 – 10	16
K303	33 – 136	212 – 385	114 – 377	6000	2.5 – 10	16
K402	6.7 – 46	268 – 600	139 – 584	4500 – 5500	1.5 – 10	31
K403	32 – 218	286 – 600	154 – 586	5500	2.5 – 10	31
K513	15 – 78	572 – 1000	295 – 991	3600 – 5000	2 – 10	50
K514	85 – 94	1000	806 – 892	5000	3 – 10	50
K613	17 – 95	675 – 1600	349 – 1548	4000 – 4500	2 – 10	83
K614	111 – 167	1448 – 1600	1054 – 1580	4500	3 – 10	83
K713	35 – 99	1395 – 2600	720 – 2246	4200	2 – 10	126
K714	89 – 193	1626 – 2600	1298 – 2541	4200	3 – 10	126
K813	44 – 97	1742 – 3727	899 – 2768	4000	2 – 10	196
K814	115 – 231	3552 – 4650	2292 – 4629	4000	3 – 10	196
K914	94 – 294	2907 – 6820	1876 – 5877	3800	5 – 10	379

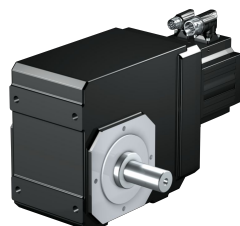
Shaft design	
Solid shaft with feather key	✓
Solid shaft without feather key	K1 – K4: ✓ Starting at K5: Request
Solid shaft on both sides	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓
Housing design	
Pitch circle diameter	K1 – K9: ✓
Round flange	K1 – K9: ✓
Pitch circle diameter + torque arm bracket	K1 – K9: ✓
Foot + pitch circle diameter + torque arm bracket	K10: ✓
Foot + pitch circle diameter	✓
Foot + round flange	✓
Motor design	
	▶ 8.5

Input options

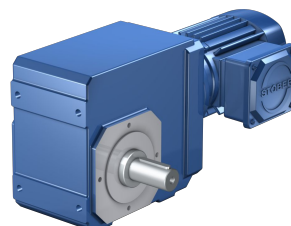
LM Lean motor



EZ synchronous servo motor



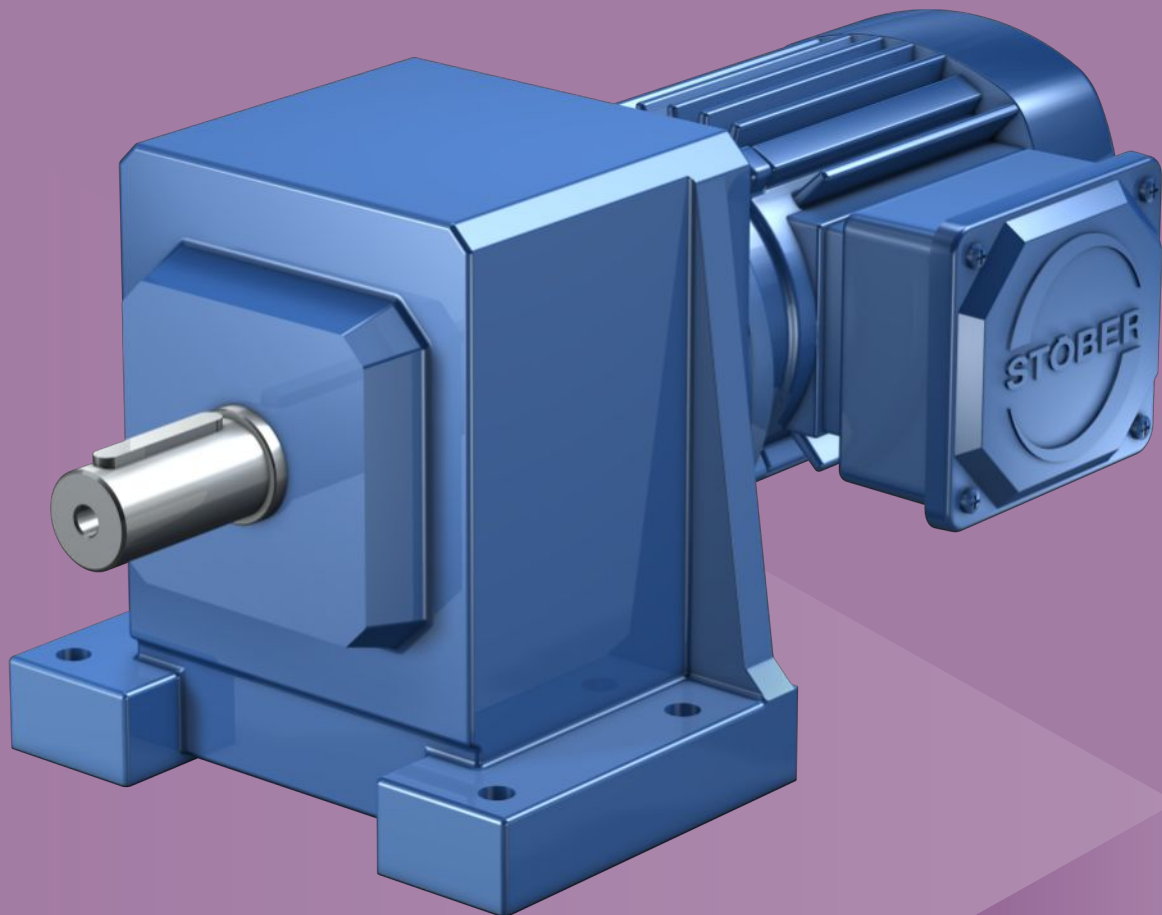
Asynchronous motor


<http://www.stoeber.de/en/KLM>
<http://www.stoeber.de/en/KEZ>
<http://www.stoeber.de/en/KIE3D>

7 Asynchronous geared motors

Table of contents

7.1 C helical geared motors.....	142
7.2 F offset helical geared motors	144
7.3 K helical bevel geared motors	146



7.1 Helical geared motors

C

Compact helical geared motors

Features

Power density	★☆☆☆☆
Backlash	★★☆☆☆
Price category	€
Shaft load	★★☆☆☆
Smooth operation	★★☆☆☆
Torsional stiffness	★★☆☆☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free (C0 – C5)	✓
FKM seal ring at the input	✓
Reinforced output bearing	✓ (on request)
Energy efficiency class IE3 in accordance with EN 60034-30-1	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	n_2 [rpm]	P_N [kW]	i	M_{2N} [Nm]
C002	20 – 729	0.12 – 1.5	2 – 70	2.3 – 73
C102	20 – 726	0.12 – 4	2 – 70	4.6 – 149
C103	7.6 – 18	0.12 – 0.25	82 – 184	64 – 147
C202	20 – 729	0.18 – 4	2 – 70	25 – 249
C203	7.7 – 18	0.18 – 0.37	81 – 183	93 – 221
C302	21 – 728	0.55 – 7.5	2 – 70	64 – 437
C303	5.2 – 18	0.25 – 0.75	80 – 274	130 – 437
C402	21 – 747	0.55 – 7.5	2 – 70	94 – 669
C403	8 – 18	0.55 – 1.1	81 – 180	282 – 644
C502	21 – 746	0.55 – 22	2 – 70	65 – 991
C503	5.3 – 18	0.55 – 1.5	81 – 271	281 – 944
C612	21 – 353	2.2 – 22	4.2 – 69	228 – 1741
C613	5.4 – 30	0.55 – 4	49 – 266	265 – 1759
C712	21 – 346	2.2 – 22	4.3 – 70	346 – 2847
C713	11 – 29	2.2 – 7.5	51 – 137	1122 – 2744
C812	21 – 350	5.5 – 30	4.2 – 69	597 – 4626
C813	5.4 – 30	2.2 – 7.5	49 – 270	1100 – 4708
C912	21 – 179	11 – 45	8.3 – 70	1560 – 7481
C913	6.8 – 23	5.5 – 19	65 – 215	2675 – 8677

Shaft design

Solid shaft with feather key

✓

Solid shaft without feather key

C0 – C5: ✓
Starting at C6: Request

Housing design

Pitch circle diameter

✓

Round flange

✓

Square flange

C0 – C4: ✓

Foot

✓

Motor design

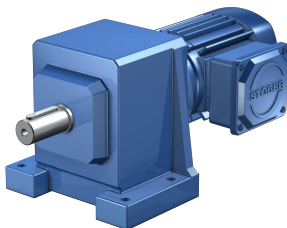
Asynchronous motor

[▶ 8.6](#)

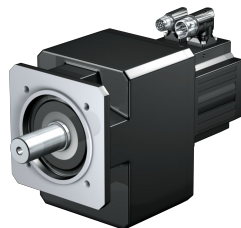
On request, you can receive the asynchronous geared motors in ATEX design (Directive 2014/34/EU).

Input options

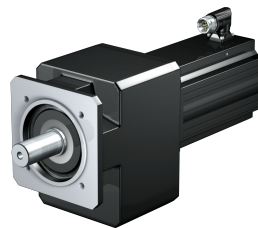
Asynchronous motor

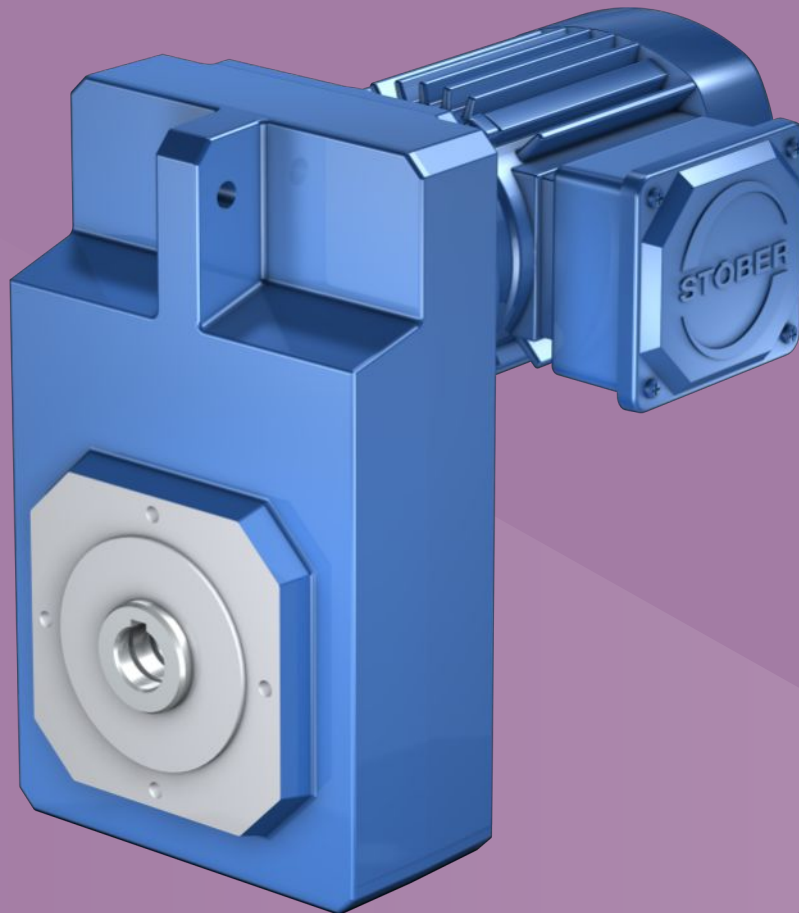


EZ synchronous servo motor



LM Lean motor


<http://www.stoeber.de/en/CIE3D>
<http://www.stoeber.de/en/CEZ>
<http://www.stoeber.de/en/CLM>



7.2

Offset helical geared motors

F

Offset helical geared motors with large axial distances

Features

Power density	★☆☆☆☆
Backlash	★★★★☆
Price category	€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★☆☆☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
FKM seal ring at the input	✓
Large axial distances, suitable for confined situations	✓
Energy efficiency class IE3 in accordance with EN 60034-30-1	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	n_2 [rpm]	P_N [kW]	i	M_{2N} [Nm]
F102	10 – 338	0.12 – 1.5	4.3 – 140	5.1 – 137
F202	10 – 313	0.18 – 4	4.7 – 141	15 – 275
F203	6.4 – 7.8	0.18 – 0.25	184 – 222	213 – 294
F302	10 – 315	0.18 – 4	4.6 – 141	65 – 498
F303	3.9 – 7.7	0.18 – 0.37	185 – 367	214 – 442
F402	10 – 314	0.55 – 7.5	4.7 – 140	138 – 811
F403	2.6 – 8	0.25 – 0.75	182 – 547	294 – 874
F602	10 – 323	0.55 – 7.5	4.5 – 140	159 – 1338
F603	4 – 8	0.55 – 1.1	181 – 361	630 – 1287

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓

Housing design

Pitch circle diameter	✓
Round flange	✓
Square flange	✓
Pitch circle diameter + side fastening	✓

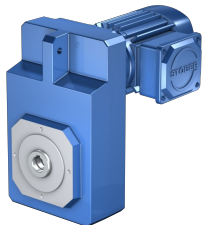
Motor design

Asynchronous motor	▶ 8.6
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On request, you can receive the asynchronous geared motors in ATEX design (Directive 2014/34/EU).

Input options

Asynchronous motor



EZ synchronous servo motor



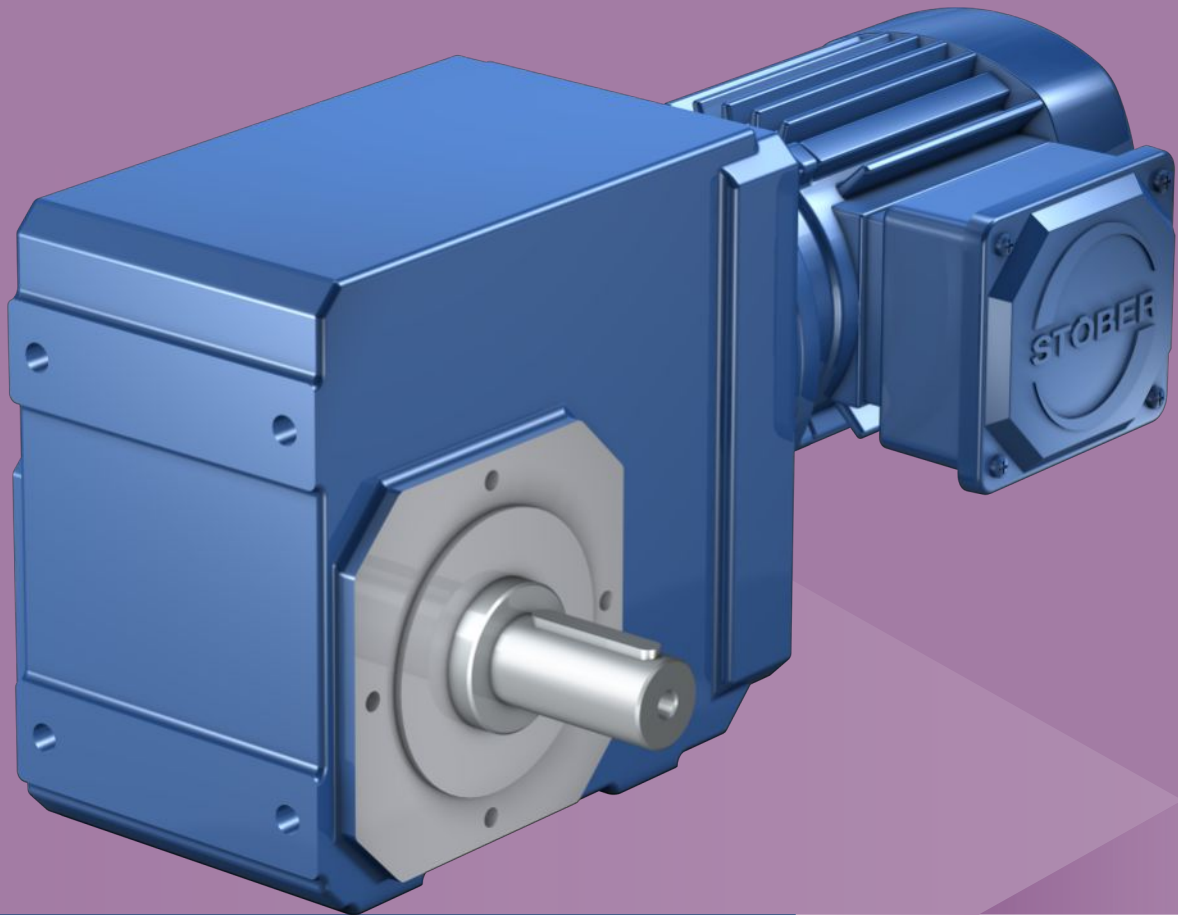
LM Lean motor



<http://www.stoeber.de/en/FIE3D>

<http://www.stoeber.de/en/FEZ>

<http://www.stoeber.de/en/FLM>



7.3 Helical bevel geared motors

K

Highly rigid helical-gear right-angle geared motor

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free (K1 – K4)	✓
FKM seal ring at the input	✓
Reinforced output bearing (K5 – K8)	✓ (on request)
Energy efficiency class IE3 in accordance with EN 60034-30-1	✓

Key ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

Type	n_2 [rpm]	P_N [kW]	i	M_{2N} [Nm]
K102	20 – 364	0.12 – 1.5	4 – 70	6.5 – 136
K202	20 – 366	0.18 – 4	4 – 69	15 – 245
K203	7.8 – 36	0.18 – 0.37	39 – 181	46 – 217
K302	20 – 366	0.18 – 4	4 – 69	61 – 392
K303	6.5 – 45	0.18 – 1.5	33 – 218	79 – 430
K402	21 – 368	0.55 – 7.5	4 – 69	129 – 668
K403	5.3 – 45	0.25 – 1.5	32 – 272	113 – 642
K513	15 – 200	0.55 – 7.5	7.3 – 97	152 – 1112
K514	4.8 – 17	0.55 – 1.5	85 – 300	292 – 1061
K613	15 – 201	0.55 – 22	7.3 – 95	240 – 1795
K614	3.9 – 13	0.55 – 1.5	111 – 369	382 – 1702
K713	15 – 195	2.2 – 22	7.6 – 99	405 – 2744
K714	3.8 – 16	0.55 – 4	89 – 381	471 – 2863
K813	15 – 198	2.2 – 22	7.4 – 97	596 – 4906
K814	4.7 – 22	2.2 – 7.5	67 – 311	1563 – 5228
K913	15 – 187	5.5 – 30	7.9 – 95	824 – 8562
K914	3.9 – 16	2.2 – 7.5	92 – 374	1280 – 8703
K1013	16 – 93	11 – 45	16 – 94	2944 – 14123
K1014	5 – 16	5.5 – 22	93 – 290	5044 – 13970

Shaft design

Solid shaft with feather key	✓
Solid shaft without feather key	K1 – K4: ✓ Starting at K5: Request
Solid shaft on both sides	✓
Hollow shaft with keyway	✓
Hollow shaft with shrink ring	✓

Housing design

Pitch circle diameter	K1 – K9: ✓
Round flange	K1 – K9: ✓
Pitch circle diameter + torque arm bracket	K1 – K9: ✓
Foot + pitch circle diameter + torque arm bracket	K10: ✓
Foot + pitch circle diameter	✓
Foot + round flange	✓

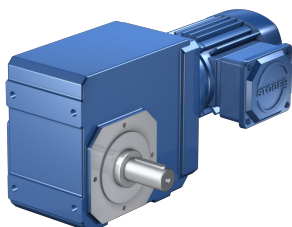
Motor design

Asynchronous motor	▶ 8.6
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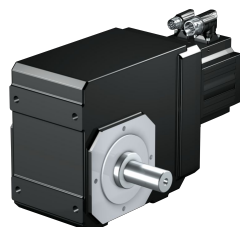
On request, you can receive the asynchronous geared motors in ATEX design (Directive 2014/34/EU).

Input options

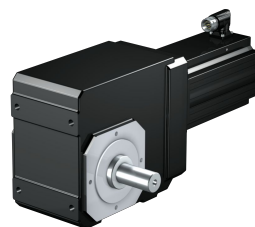
Asynchronous motor



EZ synchronous servo motor



LM Lean motor



<http://www.stoeber.de/en/KIE3D>

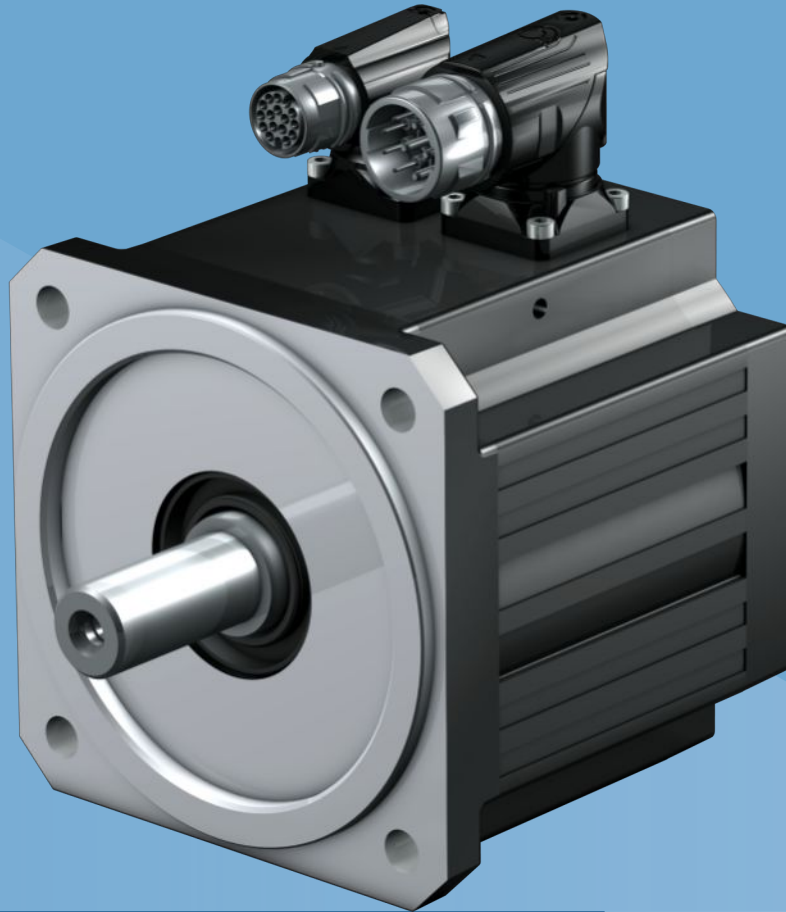
<http://www.stoeber.de/en/KEZ>

<http://www.stoeber.de/en/KLM>

8 Motors

Table of contents

8.1	EZ synchronous servo motors.....	150
8.2	EZHD synchronous servo motors with hollow shaft.....	152
8.3	EZM synchronous servo motors for screw drives.....	154
8.4	EZS synchronous servo motors for screw drives.....	156
8.5	LM Lean motors.....	158
8.6	Asynchronous motors.....	160



8.1 Synchronous servo motors

EZ

Synchronous servo motors with single tooth winding

Features

High dynamics	✓
Short length	✓
Super compact due to tooth-coil winding method with the highest possible copper fill factor	✓
Backlash-free holding brake (optional)	✓
Electronic nameplate for fast and reliable commissioning	✓
Convection cooling or forced ventilation (optional)	✓
Optical, inductive EnDat absolute encoders or resolvers	✓
Elimination of referencing with multi-turn absolute encoders (optional)	✓
One Cable Solution (OCS) with EnDat 3 encoder (optional)	✓
Rotating plug connectors with quick lock	✓

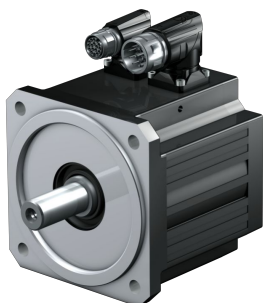
Technical data

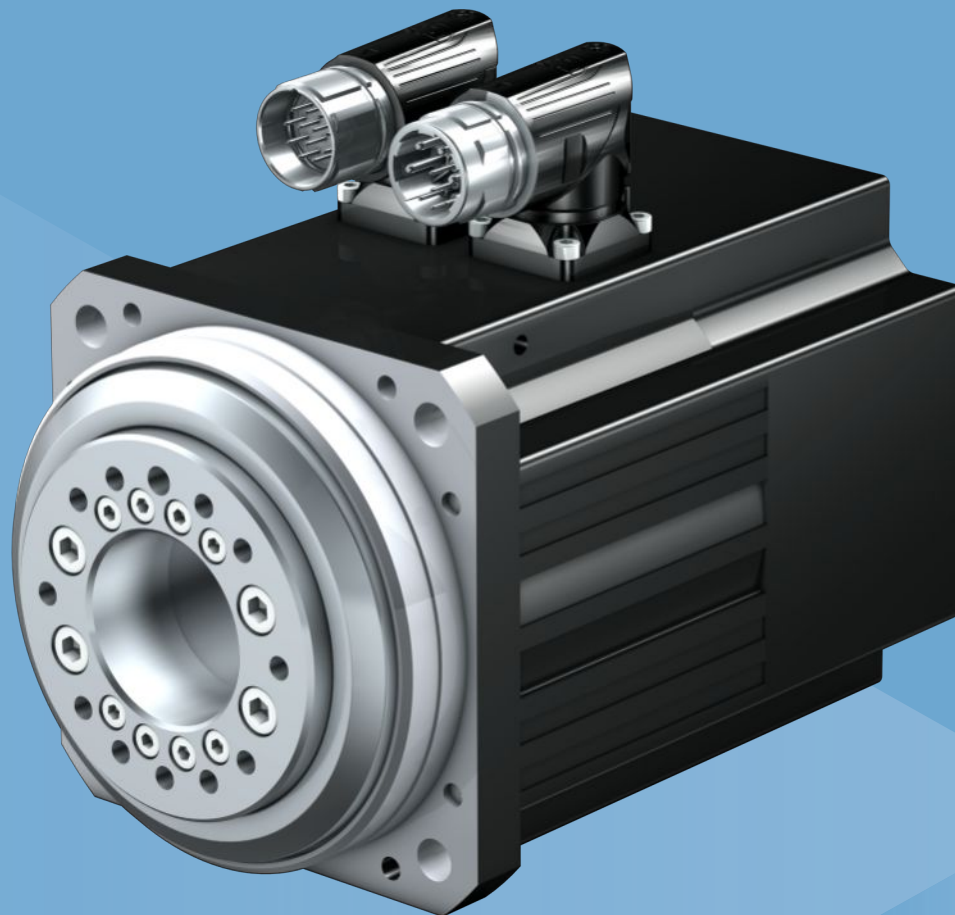
Type	n_N [rpm]	M_N [Nm]	I_N [A]	P_N [kW]	M_0 [Nm]	M_{max} [Nm]	J_{dyn} [kgcm ²]
EZ301	3000 – 6000	0.89 – 0.93	1.93 – 1.99	0.29 – 0.56	0.95	2.8	0.19
EZ302	3000 – 6000	1.5 – 1.59	1.6 – 3.18	0.5 – 0.94	1.68	5	0.29
EZ303	3000 – 6000	1.96 – 2.07	1.63 – 3.17	0.65 – 1.2	2.19 – 2.25	7	0.4
EZ401	3000 – 6000	2.3 – 3.4	2.74 – 5.62	0.88 – 1.8	2.8 – 3.7	8.5	0.93
EZ402	3000 – 6000	3.5 – 5.9	4.4 – 7.88	1.5 – 3.2	4.9 – 6.4	16	1.63
EZ404	3000 – 6000	8 – 10.2	5.8 – 9.98	2.2 – 5	8.6 – 10.5	29	2.98
EZ501	3000 – 6000	3.4 – 5.4	3.74 – 6.7	1.4 – 2.8	4.4 – 5.8	16	2.9
EZ502	3000 – 6000	8.2 – 10.3	7.8 – 11.4	2.3 – 5.2	8 – 10.5	31	5.2
EZ503	3000 – 6000	9.7 – 10.4	7.64 – 10.9	3.1 – 6.5	10.6 – 15.9	43	7.58
EZ505	3000 – 4500	9.5 – 13.5	8.94 – 13.7	4.2 – 7.7	15.3 – 23.4	67	12.2
EZ701	3000 – 6000	5.2 – 9.7	9.5 – 10.6	2.3 – 4.7	8.3 – 10.2	20	8.5
EZ702	3000 – 6000	7.2 – 12	8.96 – 11.8	3.8 – 7.9	14.3 – 19.3	41	13.7
EZ703	3000 – 4500	12.1 – 24	11.4 – 20.3	5.2 – 9.3	20 – 28	65	21.6
EZ705	3000 – 4500	16.4 – 33.8	14.2 – 25.4	7.7 – 11	30 – 41.8	104	34
EZ802	3000 – 4500	10.5 – 34.3	11.2 – 30.5	7 – 11	34.5 – 47.9	100	58
EZ803	3000	26.6 – 49	17.7 – 35.9	8.4 – 15	48.2 – 66.7	145	83.5
EZ805	2000	43.7 – 77.2	25.9 – 45.2	9.2 – 16	66.1 – 94	205	133

Shaft design	
Solid shaft without feather key	✓
Encoder	
EnDat 2.2 single-turn, multi-turn	✓
EnDat 2.1 single-turn, multi-turn	✓
EnDat 3 One Cable Solution (OCS) multi-turn	✓
Resolver	✓
Cooling	
Convection cooling	✓
Forced ventilation	✓
Brake	
Permanent magnet holding brake	✓
Marks and test symbols	
CE	✓
cURus	✓

Further information

EZ synchronous servo motors


<http://www.stoeber.de/en/EZ>



8.2

Synchronous servo motors with hollow shaft

EZHD

Synchronous servo motors with hollow shaft

Features

- Continuous flange hollow shaft for conveying media ✓
- Reinforced A-side bearing for absorbing radial forces ✓
- Reinforced B-side bearing for absorbing axial forces ✓
- High dynamics ✓
- Super compact due to tooth-coil winding method with the highest possible copper fill factor ✓
- Backlash-free holding brake (optional) ✓
- Inductive EnDat absolute encoders ✓
- Elimination of referencing with multi-turn absolute encoders (optional) ✓
- Electronic nameplate for fast and reliable commissioning ✓
- Rotating plug connectors with quick lock ✓

Technical data

Type	n_N [rpm]	M_N [Nm]	I_N [A]	P_N [kW]	M_0 [Nm]	M_{max} [Nm]	J_{dyn} [kgcm ²]
EZHD0411	3000	1.9	2.36	0.6	2.6	8.5	9.35
EZHD0412	3000	4.2	4.29	1.3	5.1	16	10.1
EZHD0414	3000	7.7	6.3	2.4	8.5	29	11.6
EZHD0511	3000	3	3.32	0.94	4.1	16	22.3
EZHD0512	3000	7	5.59	2.2	7.8	31	25.1
EZHD0513	3000	8.3	7.04	2.6	10.9	43	27.9
EZHD0515	3000	14	9.46	4.4	16.4	67	33.6
EZHD0711	3000	7.3	7.53	2.3	7.9	20	63.6
EZHD0712	3000	11.6	8.18	3.6	14.4	41	72.5
EZHD0713	3000	17.8	13.4	5.6	20.4	65	81.4
EZHD0715	3000	24.6	17.2	7.7	31.1	104	100

Shaft design

Flange hollow shaft

✓

Encoder

EnDat 2.2 multi-turn, single-turn

✓

EnDat 2.1 single-turn

✓

Cooling

Convection cooling

✓

Brake

Permanent magnet holding brake

✓

Marks and test symbols

CE

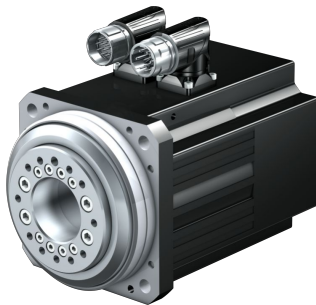
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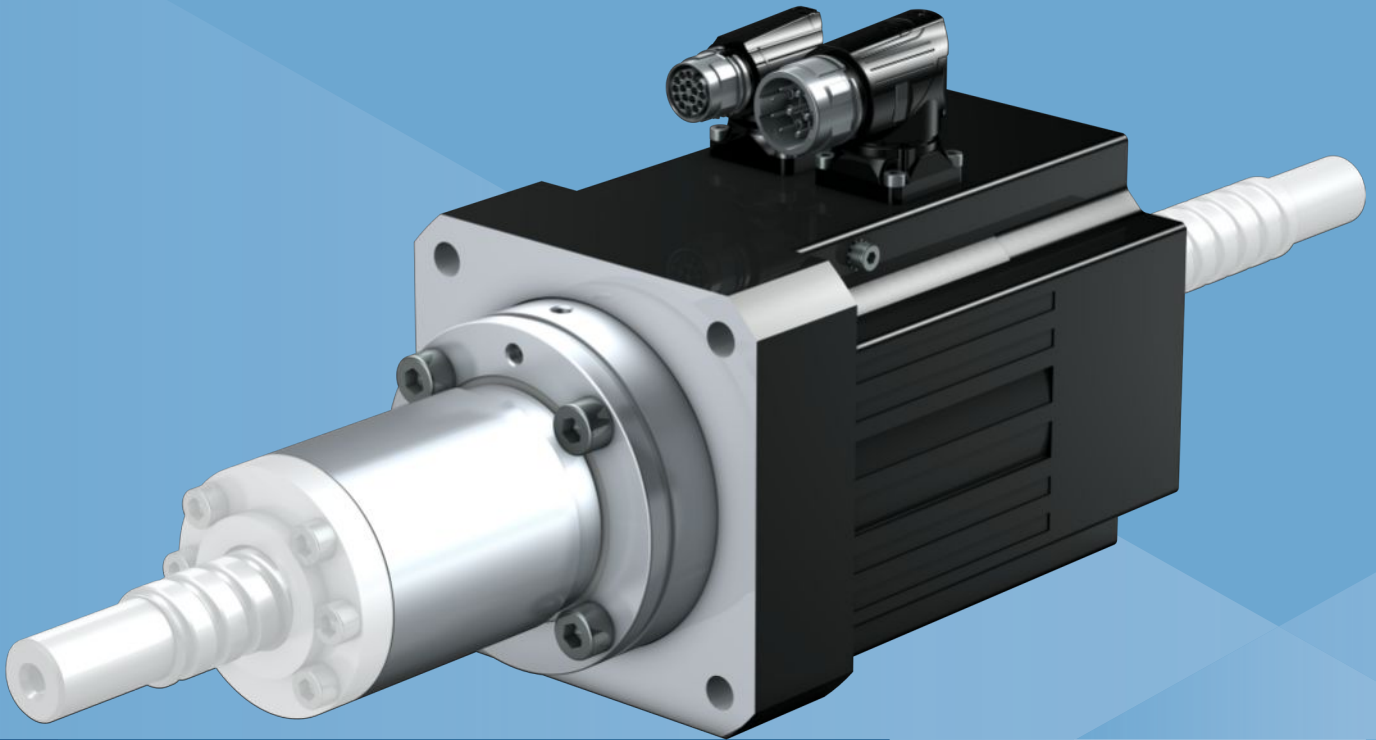
cURus

✓

Further information

EZHD synchronous servo motors


<http://www.stoeber.de/en/EZHD>



8.3

Synchronous servo motors for screw drives

EZM

Synchronous servo motor for screw drives (direct drive for threaded nut)

Features

- Designed for driving the ball-threaded nut of ball screws in accordance with DIN 69051-2. ✓
- Axial angular contact ball bearing acting on two sides for direct absorption of the threaded spindle forces ✓
- Super compact due to tooth-coil winding method with the highest possible copper fill factor ✓
- Backlash-free holding brake (optional) ✓
- Convection cooling ✓
- Inductive EnDat absolute encoders ✓
- Elimination of referencing with multi-turn absolute encoders (optional) ✓
- Electronic nameplate for fast and reliable commissioning ✓
- Rotating plug connectors with quick lock ✓

Technical data

Type	n_N [rpm]	M_N [Nm]	I_N [A]	P_N [kW]	M_0 [Nm]	M_{max} [Nm]	J_{dyn} [kgcm ²]
EZM511	3000	3.65	3.55	1.2	4.25	16	20.3
EZM512	3000	6.6	5.2	2.1	7.55	31	23.6
EZM513	3000	8.8	6.55	2.8	10.6	43	26.8
EZM711	3000	6.35	6.6	2	7.3	20	53.7 – 60.3
EZM712	3000	10.6	7.5	3.3	13	41	63.1 – 69.7
EZM713	3000	14.7	10.4	4.6	18.9	65	72.4 – 79

Shaft design

Direct drive of the threaded nut

✓

Encoder

EnDat 2.2 multi-turn, single-turn

✓

EnDat 2.1 single-turn

✓

Cooling

Convection cooling

✓

Brake

Permanent magnet holding brake

✓

Marks and test symbols

CE

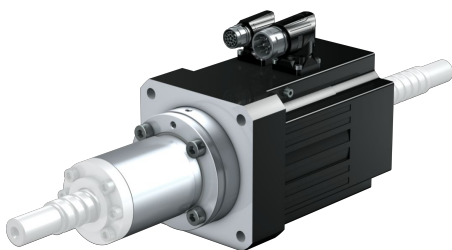
✓

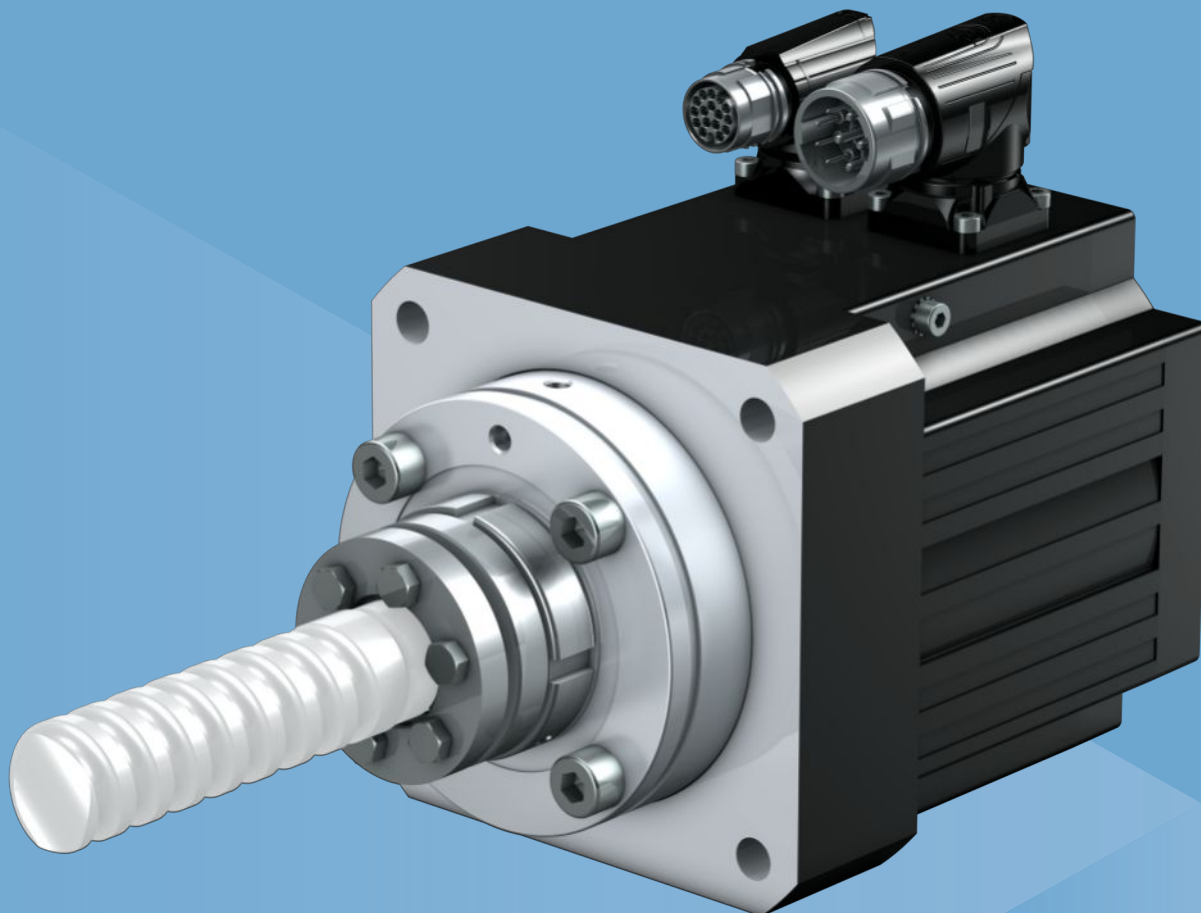
cURus

✓

Further information

EZM synchronous servo motors


<http://www.stoeber.de/en/EZM>



8.4

Synchronous servo motors for screw drives

EZS

Synchronous servo motors for screw drives (direct drive for threaded spindle)

Features

- Backlash-free connection with the threaded spindle using a clamping unit ✓
- Axial angular contact ball bearing acting on two sides for direct absorption of the threaded spindle forces ✓
- Super compact due to tooth-coil winding method with the highest possible copper fill factor ✓
- Backlash-free holding brake (optional) ✓
- Convection cooling or forced ventilation (optional) ✓
- Optical, inductive EnDat absolute encoders or resolvers ✓
- Elimination of referencing with multi-turn absolute encoders (optional) ✓
- One Cable Solution (OCS) with EnDat 3 encoder (optional) ✓
- Electronic nameplate for fast and reliable commissioning ✓
- Rotating plug connectors with quick lock ✓

Technical data

Type	n_N [rpm]	M_N [Nm]	I_N [A]	P_N [kW]	M_0 [Nm]	M_{max} [Nm]	J_{dyn} [kgcm ²]
EZS501	3000	3.85 – 5.1	3.65 – 4.7	1.2 – 1.6	4.3 – 5.45	16	6.5
EZS502	3000	6.9 – 10	5.3 – 7.8	2.2 – 3.1	7.55 – 10.9	31	8.8
EZS503	3000	9.1 – 14.1	6.7 – 10.9	2.9 – 4.4	10.7 – 15.6	43	11.1
EZS701	3000	6.65 – 9.35	6.8 – 9.5	2.1 – 2.9	7.65 – 10.2	20	20.3
EZS702	3000	11 – 16.3	7.75 – 11.8	3.5 – 5.1	13.5 – 19	41	25.6
EZS703	3000	15.3 – 23.7	10.8 – 18.2	4.8 – 7.4	19.7 – 27.7	65	30.8

Shaft design

Direct drive of the threaded spindle

✓

Encoder

EnDat 2.2 single-turn, multi-turn

✓

EnDat 2.1 single-turn, multi-turn

✓

EnDat 3 One Cable Solution (OCS) multi-turn

✓

Resolver

✓

Cooling

Convection cooling

✓

Forced ventilation

✓

Brake

Permanent magnet holding brake

✓

Marks and test symbols

CE

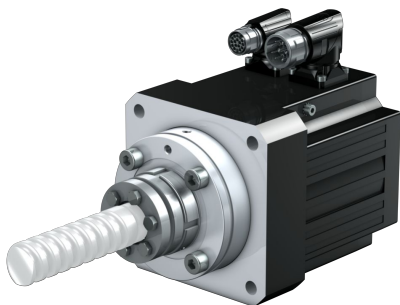
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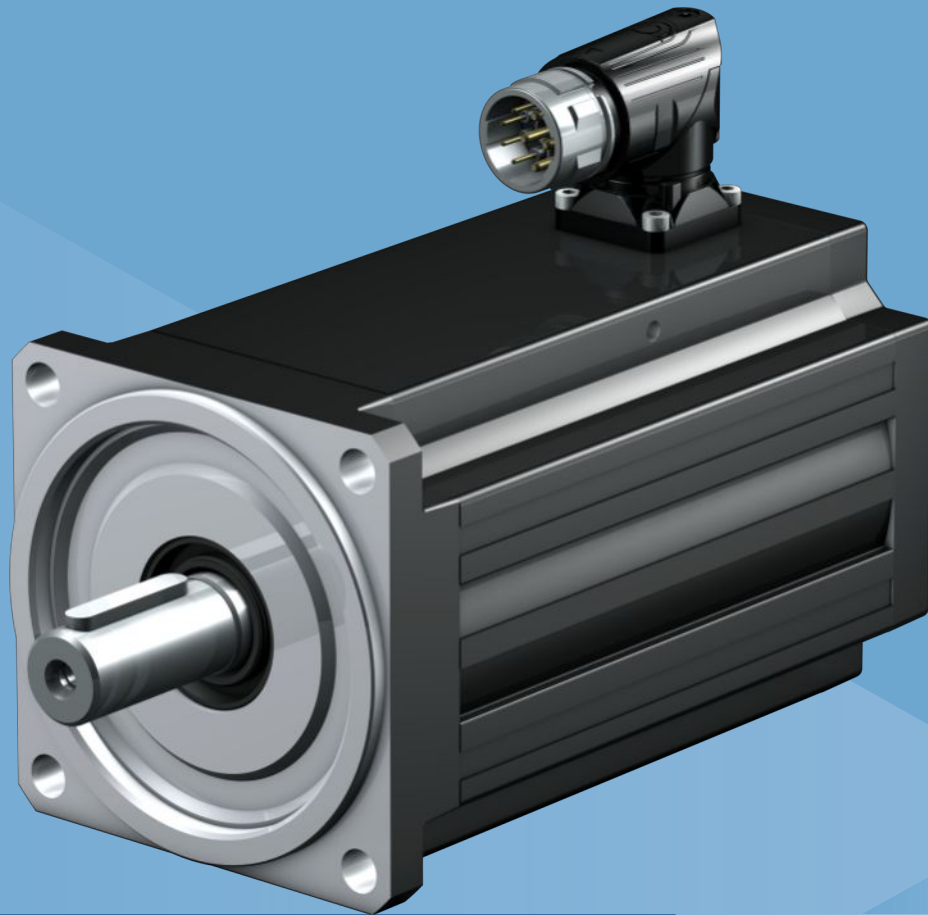
cURus

✓

Further information

EZS synchronous servo motors


<http://www.stoeber.de/en/EZS>



8.5 Lean motors

LM

High-efficiency synchronous motors

Features

- Higher energy efficiency than comparable IE4 asynchronous motors ✓
- Energy efficiency IE5 in accordance with IEC/TS 60034-30-2 ✓
- Higher acceleration performance than asynchronous motors ✓
- Substantially lighter and more compact than comparable asynchronous motors ✓
- Rugged thanks to absence of the encoder ✓
- Wiring reduced to the power connection cable ✓
- Rotating plug connector with quick lock ✓

Technical data

Type	n_N [rpm]	M_N [Nm]	I_N [A]	P_N [kW]	M_0 [Nm]	M_{max} [Nm]	J [kgcm ²]
LM401	3000	2.25	1.59	0.71	2.43	4.51	1.67
LM402	3000	4.41	2.88	1.4	4.5	9.7	3.01
LM403	3000	6.06	3.92	1.9	6.19	12.8	4.31
LM503	3000	9.48	5.62	3	10.1	20.4	10.4
LM505	3000	13.7	7.83	4.3	15.5	32.1	16.8
LM704	3000	19.3	10.6	6.1	21.3	41.2	36.5
LM706	3000	25.7	14.7	8.1	29.8	61.4	53.8

Shaft design

Solid shaft with feather key

✓

Cooling

Convection cooling

✓

Brake

Spring-loaded holding brake

✓

Marks and test symbols

CE

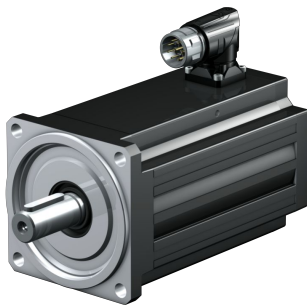
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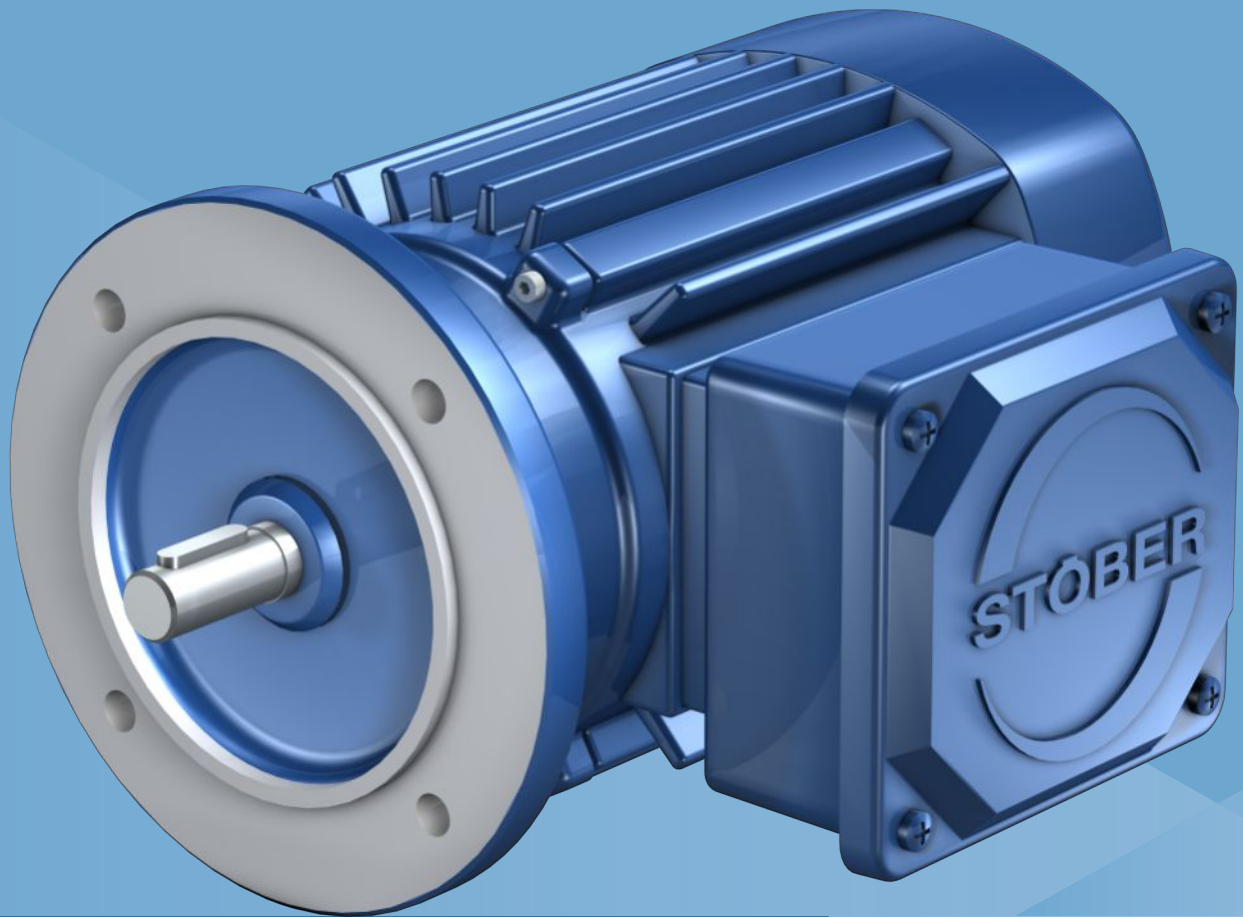
cURus

✓

Further information

LM Lean motors


<http://www.stoeber.de/en/LM>



8.6 Asynchronous motors

Asynchronous motors

Features

Self-ventilation or forced ventilation (optional)	✓
Spring-loaded brake (optional)	✓
Incremental encoder (optional) or SSI absolute encoder (optional)	✓
Elimination of referencing with multi-turn absolute encoders (optional)	✓
Terminal box	✓
Energy efficiency class IE3 in accordance with EN 60034-30-1	✓

Technical data (400 V ± 10%, 50 Hz)

Type	Y/Δ	n _N [rpm]	P _N [kW]	M _N [Nm]	I _N [A]	m [kg]
IE3D063K04	Y	1400	0.12	0.82	0.35	6.3
IE3D063M04	Y	1415	0.18	1.2	0.55	7.1
IE3D071K04	Y	1430	0.25	1.7	0.66	9.9
IE3D071L04	Y	1430	0.37	2.5	0.98	11
IE3D080K04	Y	1440	0.55	3.7	1.3	14.5
IE3D080L04	Y	1445	0.75	5	1.7	17
IE3D090S04	Y	1440	1.1	7.3	2.5	22.5
IE3D090LX04	Y	1455	1.5	9.8	3.4	31
IE3D100KX04	Y	1450	2.2	15	4.6	45
IE3D100LX04	Y	1450	3	20	6.4	50
IE3D112M04	Δ	1465	4	26	7.9	56
IE3D132SX04	Δ	1465	5.5	36	10	90
IE3D132MX04	Δ	1470	7.5	49	16	88
IE3D160MX04	Δ	1465	11	72	21	105
IE3D160LX04	Δ	1475	15	97	28	165
IE3D180MX04	Δ	1475	19	120	35	160
IE3D180LX04	Δ	1475	22	142	41	206
IE3D200LX04	Δ	1480	30	194	54	304
IE3D225SX04	Δ	1475	37	240	67	341
IE3D225MX04	Δ	1475	45	291	83	377

Shaft design

IEC design

✓

Encoder

Incremental encoder

✓

SSI multi-turn absolute encoder ¹

✓

Electrical connection

Terminal box

✓

Cooling

Self-ventilation

✓

Forced ventilation

✓

Marks and test symbols

CE

✓

cURus

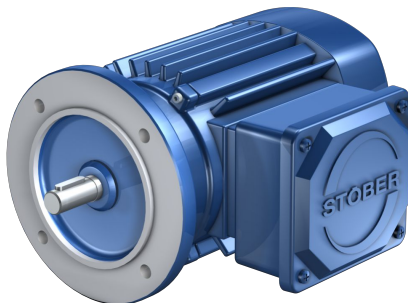
✓

EISA CC number including cURus (60 Hz, 265 V/460 V)

From 4 kW: ✓

Further information / Alternatives

Asynchronous motors


<http://www.stoeber.de/en/IE3D>

LM Lean motors


<http://www.stoeber.de/en/LM>
¹ only in combination with forced ventilation

9 Electronics

Table of contents

9.1	SC6 drive controllers	164
9.2	SI6 Drive controllers	166
9.3	SD6 Drive controllers.....	168
9.4	POSIDYN SDS 5000 servo inverters	170
9.5	POSIDRIVE FDS 5000 frequency inverters	172
9.6	Connection method	174



9.1 Drive controllers

SC6

Our more compact version for the encoderless Lean motor

Features

- Sensorless position control of STOBBER Lean motors
- Control of rotary synchronous servo motors, asynchronous motors and torque motors
- NEW: One Cable Solution EnDat 3
- Electronic motor nameplate via EnDat encoder interfaces
- Integrated EtherCAT or PROFINET communication
- STO safety technology using terminals or STO and SS1 using FSoE (Fail Safe over EtherCAT): SIL 3, PL e (cat. 4)
- Integrated brake control
- Single-ended nominal power consumption on double-axis controllers for operation of motors with different power
- Energy supply through direct power supply
- Flexible DC link connection for multi-axis applications

The compact stand-alone SC6 drive controller allows for sensorless control of Lean motors of the LM series. These motors provide energy efficiency at the performance level of synchronous servo motors. They also guarantee high investment protection, thanks to energy efficiency class IE5 and the corresponding higher efficiency compared to IE4 asynchronous motors. However, the SC6 can also be used in combination with asynchronous motors or synchronous servo motors with encoders (e.g. the EZ series). SC6 is available in three sizes with a nominal output current of up to 19 A: Sizes 0 and 1 as a double-axis controller, size 2 as a single-axis controller.

Technical data

Type	Baugröße	$I_{2N,PU}$ (4 kHz) [A]	I_{2maxPU} (4 kHz) [A]	$I_{2N,PU}$ (8 kHz) [A]	I_{2maxPU} (8 kHz) [A]	Dimensions [mm]
SC6A062	0	2 × 4.5	2 × 9.5	2 × 4	2 × 10	373 × 45 × 265
SC6A162	1	2 × 10	2 × 21	2 × 9	2 × 22.5	373 × 65 × 286
SC6A261	2	19	39.9	15	37.5	373 × 65 × 286

Applications

Drive-based motion control is recommended for the decentralized motion control of sophisticated machines.

The drive-based application package from STÖBER is the right choice wherever universal and flexible solutions are needed. The Drive Based application provides drive-based motion control for positioning, velocity and torque/force with the PLCopen Motion Control command set. These standard commands have been combined into operating modes for different applications and supplemented with additional functions such as motion block linking, cams and much more. For the command operating mode, all properties of the movements are specified directly by the controller. The properties of the movements in the drive are predefined in the motion block operating mode so that only a start signal is necessary to perform the movement. Linking can be used to define complete motion sequences. There is a separate operating mode available for applications controlled by velocity or torque/force such as pumps, fans or conveyor belts. This also allows for operation without a controller.

In addition, the CiA 402 application is also available, which includes both the controller-based and drive-based operating modes (csp, csv, cst, ip, pp, pv, pt).

Encoder interfaces

- EnDat 3 (OCS)
- EnDat 2.2 digital
- Incremental
- SSI
- Resolver
- Pulse/direction signals

Further information

SC6 Drive Controller



<http://www.stoeber.de/en/SC6>



9.2 Drive controllers

SI6

Drive control in a multi-axis drive system

Features

- Sensorless position control of STOBBER Lean motors
- Control of rotary synchronous servo motors, asynchronous motors and torque motors
- NEW: One Cable Solution EnDat 3
- Electronic motor nameplate via EnDat encoder interfaces
- Integrated EtherCAT or PROFINET communication
- STO safety technology using terminals or STO and SS1 using FSoE (Fail Safe over EtherCAT): SIL 3, PL e (cat. 4)
- Integrated brake control
- Energy supply over DC link connection
- Single-ended nominal power consumption on double-axis controllers for operation of motors with different power
- Variable feed-in power using supply modules that can be connected in parallel

The completely re-designed STOBBER multi-axis drive system consists of the SI6 drive controller and PS6 supply module combination. Matching Quick DC-Link modules handle the energy supply for the networked drive controllers. The SI6 drive controller is available in four sizes as a single or double-axis controller with a nominal output current of up to 50. The PS6 supply module is available in three sizes with a nominal power of 10 kW to 50 kW. As an economically attractive system with a minimized device width, the SI6 opens a new dimension in multi-axis applications.

Technical data

Type	Baugröße	$I_{2N,PU}$ (4 kHz) [A]	I_{2maxPU} (4 kHz) [A]	$I_{2N,PU}$ (8 kHz) [A]	I_{2maxPU} (8 kHz) [A]	Dimensions [mm]
SI6A061	0	5	10.5	4.5	11.3	373 × 45 × 265
SI6A062	0	2 × 5	2 × 10.5	2 × 4.5	2 × 11.3	373 × 45 × 265
SI6A161	1	12	25.2	10	25	373 × 65 × 286
SI6A162	1	2 × 12	2 × 25.2	2 × 10	2 × 25	373 × 65 × 286
SI6A261	2	22	46.2	20	50	373 × 65 × 286
SI6A262	2	2 × 25	2 × 52.5	2 × 20	2 × 50	373 × 105 × 286
SI6A361	3	50	105	40	100	373 × 105 × 286

Applications

Controller-based motion control is recommended for the central motion control of complex machines.

Using the controller-based operating modes of the CiA 402 application, you can implement applications with synchronized, cyclic set value specification (csp, csv, cst, ip) by a motion controller. In addition, the drive controllers can also independently handle motion tasks, such as referencing and jogging during commissioning.

Drive-based Drive Based and Drive Based Synchronous applications and drive-based operating modes (pp, pv, pt) of the CiA 402 application are also available for torque/force mode, velocity mode or positioning mode.

Encoder interfaces

- EnDat 3 (OCS)
- EnDat 2.2 digital
- Incremental
- SSI
- Resolver
- Pulse/direction signals

Further information

SI6 drive controllers



PS6 supply module



<http://www.stoeber.de/en/SI6>

<http://www.stoeber.de/en/PS6>



9.3 Drive controllers

SD6

High performance and flexibility

Features

- Control of linear and rotary synchronous servo motors and asynchronous motors
- Multi-functional encoder interfaces
- Automatic motor parameterization from the electronic motor nameplate
- Isochronic system bus (IGB motion bus) for parameterization and multi-axis applications
- Communication over CANopen, EtherCAT or PROFINET
- Safe Torque Off (STO) in the standard version, expanded safety technology (SS1, SS2, SLS, etc.) as an option
- Digital and analog inputs and outputs as an option
- Brake chopper, brake control and line filter
- Energy supply through direct power supply
- Flexible DC link connection for multi-axis applications
- Convenient operating unit consisting of graphical display and keys
- Paramodul removable data storage for quick commissioning and service

STOBER drive controllers of the SD6 series offer maximum precision and productivity for automation technology and mechanical engineering despite ever more complex functions. Highly dynamic drives ensure the shortest recovery times from fast changes in set value and load jumps. There is also an option of connecting the drive controllers in a DC link for multi-axis applications, which improves the energy footprint of the entire system. The SD6 drive controller is available in four sizes with a nominal output current of up to 85 A.

Technical data

Type	Baugröße	$I_{2N,PU}$ (4 kHz) [A]	I_{2maxPU} (4 kHz) [A]	$I_{2N,PU}$ (8 kHz) [A]	I_{2maxPU} (8 kHz) [A]	Dimensions [mm]
SD6A02	0	4	7.2	3	7.5	300 × 70 × 194
SD6A04	0	2.3	4.2	1.7	4.3	300 × 70 × 194
SD6A06	0	4.5	8.1	3.4	8.5	300 × 70 × 194
SD6A14	1	10	18	6	15	300 × 70 × 284
SD6A16	1	16	28.8	10	25	300 × 70 × 284
SD6A24	2	22	39.6	14	35	300 × 105 × 284
SD6A26	2	32	57.6	20	50	300 × 105 × 284
SD6A34	3	44	79.2	30	75	382.5 × 190 × 303
SD6A36	3	70	126	50	125	382.5 × 190 × 303
SD6A38	3	85	153	60	150	382.5 × 190 × 303

Applications

Drive-based motion control is recommended for the decentralized motion control of sophisticated machines.

The drive-based application package from STOBER is the right choice wherever universal and flexible solutions are needed. The Drive Based Synchronous application provides drive-based motion control for synchronous operation, positioning, velocity and torque/force with the PLCopen Motion Control command set. These standard commands have been combined into operating modes for different application cases and supplemented with additional functions such as motion block linking or cams. For the command operating mode, all properties of the movements are specified directly by the controller. The properties of the movements in the drive are predefined in the motion block operating mode so that only a start signal is necessary to perform the movement. Linking can be used to define complete motion sequences.

In addition, the CiA 402 application is also available, which includes both the controller-based and drive-based operating modes (csp, csv, cst, ip, pp, pv, pt).

Encoder interfaces (standard)

- EnDat 2.1/2.2 digital
- Incremental
- SSI

Encoder interfaces (optionally available)

- Resolver
- Pulse/direction signals
- EnDat 2.1 sin/cos
- Sin/cos

Expanded safety option

In addition to the safe stop functions Safe Stop 1 (SS1) and Safe Stop 2 (SS2), additional safety functions such as Safely-Limited Speed (SLS), Safe Brake Control (SBC), Safe Brake Test (SBT), Safe Direction (SDI) and Safely-Limited Increment (SLI) are also available.

Further information

SD6 drive controller



<http://www.stoeber.de/en/SD6>



9.4 Servo inverters

POSIDYN SDS 5000

High dynamics for fully digital servo axes

Features

- Control of rotary synchronous servo motors and asynchronous motors
- Multi-functional encoder interfaces
- Automatic motor parameterization from the electronic motor nameplate
- Isochronic system bus (IGB motion bus) for parameterization and multi-axis applications
- Communication using PROFIBUS DP, PROFINET, CANopen or EtherCAT
- Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions: SIL 3, PL e (cat. 3)
- Digital and analog inputs and outputs as an option
- Brake chopper, brake control and line filter
- Convenient operating unit consisting of plain-text display and buttons
- Paramodul removable data storage

The SDS 5000 servo inverter is the most powerful inverter of the 5th STOEBER inverter generation. It also offers the option of remote maintenance on par with on-site service work as well as a self-configuring isochronic system bus (IGB motion bus) for communication between up to 32 servo inverters. SDS 5000 can be ordered in four sizes with a nominal output current up to 85 A and a power range up to 45 kW.

Technical data

Type	Baugröße	$I_{2N,PU}$ (4 kHz) [A]	I_{2maxPU} (4 kHz) [A]	$I_{2N,PU}$ (8 kHz) [A]	I_{2maxPU} (8 kHz) [A]	Dimensions [mm]
SDS5007A	0	4	7.2	3	7.5	300 × 70 × 175
SDS5008A	0	2.3	4.2	1.7	4.3	300 × 70 × 175
SDS5015A	0	4.5	8.1	3.4	8.5	300 × 70 × 175
SDS5040A	1	10	18	6	15	300 × 70 × 260
SDS5075A	1	16	28.8	10	25	300 × 70 × 260
SDS5110A	2	22	39.6	14	35	300 × 105 × 260
SDS5150A	2	32	57.6	20	50	300 × 105 × 260
SDS5220A	3	44	79.2	30	75	382.5 × 190 × 276
SDS5370A	3	70	126	50	125	382.5 × 190 × 276
SDS5450A	3	85	153	60	150	382.5 × 190 × 276

Applications

Drive-based motion control is recommended for the decentralized motion control of sophisticated machines.

Standard drive-based applications are available for torque/force, velocity or positioning mode for series of the 5th STOEBER inverter generation. For multi-axis applications, master/slave mode is possible in the standard version. The electronic cam disk tailor-made application is available as an alternative.

Encoder interfaces (standard)

- EnDat 2.1/2.2 digital
- Incremental
- SSI

Encoder interfaces (optionally available)

- Resolver
- Pulse/direction signals
- EnDat 2.1 sin/cos

Further information

SDS 5000 servo inverters



<http://www.stoeber.de/en/SDS5000>



9.5 Frequency inverters

POSIDRIVE FDS 5000

The purpose-built asynchronous servo axis

Features

- Control of rotating asynchronous motors
- Interface for incremental encoder (HTL/TTL)
- Communication using PROFIBUS DP, PROFINET, CANopen or EtherCAT
- Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions: SIL 3, PL e (cat. 3)
- Digital and analog inputs and outputs
- Brake chopper and line filter
- Convenient operating unit consisting of plain-text display and buttons
- Paramodul removable data storage for quick commissioning and service

The FDS 5000 frequency inverter from the 5th STOBBER inverter generation was optimized for asynchronous geared motors and offers practical functionality for modern positioning and controller drives. It comes ready for fast fieldbus communication with different systems. FDS 5000 can be ordered in two sizes with a nominal output current up to 16 A and a power range up to 7.5 kW.

Technical data

Type	Baugröße	$I_{2N,PU}$ (4 kHz) [A]	I_{2maxPU} (4 kHz) [A]	$I_{2N,PU}$ (8 kHz) [A]	I_{2maxPU} (8 kHz) [A]	Dimensions [mm]
FDS5004A	0	1.3	2.4	1	2.5	300 × 70 × 157
FDS5007A	0	4	7.2	3	7.5	300 × 70 × 157
FDS5008A	0	2.3	4.2	1.7	4.3	300 × 70 × 157
FDS5015A	0	4.5	8.1	3.4	8.5	300 × 70 × 157
FDS5022A	1	5.5	9.9	4	10	300 × 70 × 242
FDS5040A	1	10	18	6	15	300 × 70 × 242
FDS5055A	1	12	21.6	7.5	18.8	300 × 70 × 242
FDS5075A	1	16	28.8	10	25	300 × 70 × 242

Applications

Drive-based motion control is recommended for the decentralized motion control of sophisticated machines.

Standard drive-based applications are available for torque/force, velocity or positioning mode for series of the 5th STOBBER inverter generation. For multi-axis applications, master/slave mode is possible in the standard version. The electronic cam disk tailor-made application is available as an alternative.

Encoder interfaces

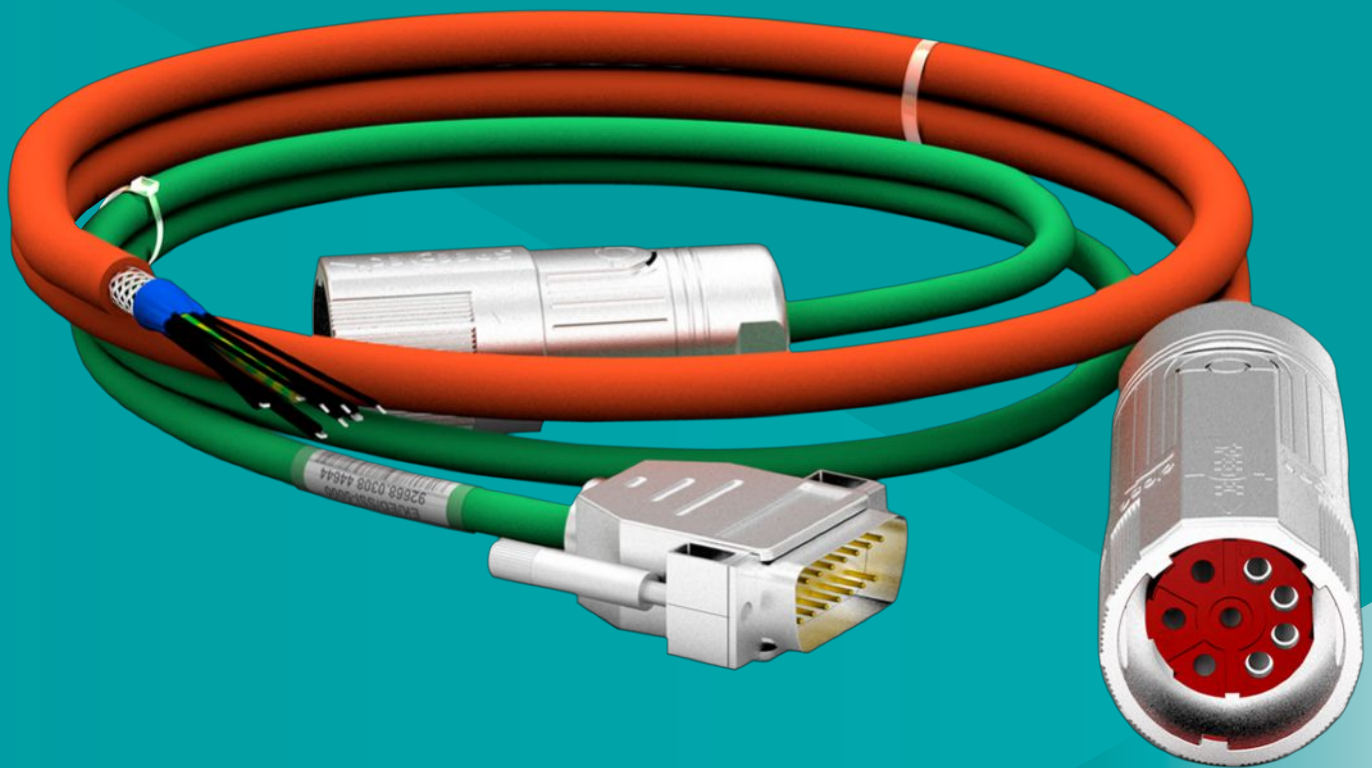
- Incremental
- Pulse/direction signals

Further information

FDS 5000 frequency inverter



<http://www.stoeber.de/en/FDS5000>



9.6 Connection method

Coordinated connection methods for STOBBER drive controllers

Features

- Torsional stress $\pm 30^\circ/\text{m}$
- Bending resistance
- Oil resistance
- Chemical resistance

A drive controller, cable and motor that are not coordinated with one another can lead to impermissibly high voltage peaks in the drive system, which may cause damage to the motor. The legal requirements of (EMC) Directive 2014/30/EU must also be observed.

Combining STOBBER motors, STOBBER cables and STOBBER drive controllers enables you to comply with these legal requirements.

STOBBER offers a range of cables to match. Cables are available in different lengths and are ready-made on both ends.

Using unsuitable connection cables may void any claims made under the warranty.

Power cables

Design	Motor plug connector size				
	con.15	con.23	con.40	con.58	
Quick lock	✓				
speedtec quick lock		✓	✓		
Screw technology		On request	On request	✓	
Power cores (3 + PE)	Brake cores	Temperature sensor cores	Cable Ø	Bending radius 1 (min.)	Bending radius 2 (min.)
4 × 1.0 mm ²	2 × 0.5 mm ²	2 × 0.34 mm ²	Max. 10.1 mm	101.0 mm	50.5 mm
4 × 1.5 mm ²	2 × 1.0 mm ²	2 × 0.5 mm ²	Max. 12.2 mm	122.0 mm	61.0 mm
4 × 2.5 mm ²	2 × 1.0 mm ²	2 × 1.0 mm ²	Max. 15.0 mm	150.0 mm	75.0 mm
4 × 4.0 mm ²	2 × 1.0 mm ²	2 × 0.75 mm ²	Max. 16.0 mm	160.0 mm	80.0 mm
4 × 6.0 mm ²	2 × 1.5 mm ²	2 × 1.0 mm ²	Max. 19.4 mm	194.0 mm	97.0 mm
4 × 10.0 mm ²	2 × 1.5 mm ²	2 × 1.0 mm ²	Max. 23.5 mm	235.0 mm	117.5 mm
4 × 16.0 mm ²	2 × 1.5 mm ²	2 × 1.5 mm ²	Max. 24.0 mm	180.0 mm	96.0 mm
4 × 25.0 mm ²	2 × 1.5 mm ²	2 × 1.5 mm ²	Max. 27.5 mm	206.3 mm	110.0 mm

Bending radius: 1 = free to move, 2 = fixed installation

Encoder cables

Design	Motor plug connector size				
	con.15	con.17	con.23		
Quick lock	✓				
speedtec quick lock		✓	✓		
Encoder	Motor plug connector size				
	con.15	con.17	con.23 synchronous	con.23 asynchronous	
EnDat 2.1/2.2 digital	✓	✓	On request		
Incremental (HTL)				✓	
SSI				✓	
Resolver	✓	✓	On request		
EnDat 2.1 sin/cos	✓	✓	On request		
Encoder	Supply cores	Pilot cores	Cable Ø	Bending radius 1 (min.)	Bending radius 2 (min.)
EnDat 2.1/2.2 digital	2 × 0.25 mm ²	3 × 2 × 0.14 mm ²	Max. 6.8 mm	68.0 mm	34.0 mm
Incremental (HTL)	2 × 0.25 mm ²	3 × 2 × 0.14 mm ²	Max. 6.8 mm	68.0 mm	34.0 mm
SSI	2 × 0.25 mm ²	3 × 2 × 0.14 mm ²	Max. 6.8 mm	68.0 mm	34.0 mm
Resolver	2 × 0.25 mm ²	3 × 2 × 0.14 mm ²	Max. 11.4 mm	114.0 mm	57.0 mm
EnDat 2.1 sin/cos	2 × 0.34 mm ²	2 × 2 × 0,25 mm ² + 4 × 2 × 0,14 mm ²	Max. 11.0 mm	110.0 mm	55.0 mm

Bending radius: 1 = free to move, 2 = fixed installation

One Cable Solution EnDat 3

Design	Motor plug connector size				
	con.23				
speedtec quick lock	✓				
Power cores (3 + PE)	Brake cores	Pilot cores	Cable Ø	Bending radius 1 (min.)	Bending radius 2 (min.)
4 × 1.5 mm ²	2 × 0.75 mm ²	2 × AWG22	Max. 14.7 mm	147.0 mm	73.5 mm
4 × 2.5 mm ²	2 × 0.75 mm ²	2 × AWG22	Max. 16.8 mm	168.0 mm	84.0 mm

Bending radius: 1 = free to move, 2 = fixed installation

Further information

Power cables


<http://www.stoeber.de/en/powercable>

Encoder cables


<http://www.stoeber.de/en/encodercable>

One Cable Solution


<http://www.stoeber.de/en/ocs>



24

10

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Germany

STÖBER Antriebstechnik GmbH + Co. KG

Kieselbronner Strasse 12

75177 Pforzheim, Germany

Phone: +49 7231 582-0

sales@stoerber.de

www.stoerber.com

Service hotline: +49 7231 582-3000

Subsidiaries

STOBER AUSTRIA www.stoerber.at Phone +43 7613 7600-0 sales@stoerber.at	STOBER SOUTH EAST ASIA www.stoerber.sg sales@stoerber.sg
STOBER CHINA www.stoerber.cn Phone +86 512 5320 8850 sales@stoerber.cn	STOBER SWITZERLAND www.stoerber.ch Phone +41 56 496 96 50 sales@stoerber.ch
STOBER FRANCE www.stoerber.fr Phone +33 4 78.98.91.80 sales@stoerber.fr	STOBER TAIWAN www.stoerber.tw Phone +886 4 2358 6089 sales@stoerber.tw
STOBER ITALY www.stoerber.it Phone +39 02 93909570 sales@stoerber.it	STOBER TURKEY www.stoerber.com Phone +90 216 510 2290 sales-turkey@stoerber.com
STOBER JAPAN www.stoerber.co.jp Phone +81 3 5875 7583 sales@stoerber.co.jp	STOBER UNITED KINGDOM www.stoerber.co.uk Phone +44 1543 458 858 sales@stoerber.co.uk
STOBER USA www.stoerber.com Phone +1 606 759 5090 sales@stoerber.com	

11 Appendix

11.1 Formula symbols

C_2	Nm/ arcmin	Torsional stiffness relative to the gear unit output
Δ	–	Delta connection
$\Delta\phi_2$	arcmin	Backlash at the output shaft with a blocked input
Δs	mm	Linear backlash resulting from the backlash of the gear unit
η	%	Efficiency
F_{ax}	N	Permitted axial force on the output
F_{f2acc}	kN	Permitted acceleration feed force at the gear unit output
i	–	Gear ratio
I_{2maxPU}	A	Maximum output current of the power unit
$I_{2N,PU}$	A	Nominal output current of the power unit
I_N	A	Nominal current
J_{dyn}	kgcm ²	Mass moment of inertia of a motor in dynamic operation
m	kg	Weight (for gear units without lubricant)
M_0	Nm	Stall torque: The continuous torque the motor is able to deliver at a speed of 10 rpm (tolerance $\pm 5\%$)
$M_{2,0}$	Nm	Stall torque on the gear unit output
M_{2acc}	Nm	Maximum permitted acceleration torque on the gear unit output
M_{2max}	Nm	Maximum torque at the gear unit output
M_{2N}	Nm	Nominal torque on the gear unit output (relative to n_{1N})
M_{max}	Nm	Maximum torque: the maximum permitted torque the motor is able to deliver over a short period (when accelerating or decelerating) (tolerance $\pm 10\%$)
m_n	mm	Module
M_N	Nm	Nominal torque: the maximum torque of a motor in S1 mode at nominal speed n_N (tolerance $\pm 5\%$)
n_{1max}	rpm	Maximum permitted input speed
n_{1maxZB}	min ⁻¹	Maximum permitted input speed of the gear unit in cyclic operation
n_2	rpm	Speed at the gear unit output
n_N	rpm	Nominal speed: The speed for which the nominal torque M_N is specified
P_N	kW	Nominal power: the power the motor is able to deliver long term in S1 mode at the nominal point (tolerance $\pm 5\%$)
$P_{N,GB}$	kW	Nominal power of the two-speed gearbox
$v_{f2maxZB}$	m/s	Maximum feed velocity at the gear unit output at n_{1maxZB}
Y	–	Star connection
z	–	Number of teeth

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You can find our current sales terms and delivery conditions at <http://www.stoeber.de/en/gtc>.

11.4 Publication details

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You can find current versions of PDF files online at <http://www.stoeber.de/en/downloads/>.

11.5 Explanation of product abbreviations

Gear unit

Series/Product	Product designation
C	Helical gear unit
F	Offset helical gear unit
K	Helical bevel gear unit
KL	Compact helical bevel gear unit
KS	Right-angle servo gear unit
P	Planetary gear unit
PE	Cost-efficient planetary gear unit
PH	Planetary gear unit with flange shaft
PHK	Right-angle planetary gear unit with flange shaft
PHKX	Planetary gear unit with flange shaft and single-stage helical bevel gear unit
PHQ	Planetary gear unit with flange shaft and 4-planet system
PHQK	Right-angle planetary gear unit with flange shaft and 4-planet system
PHV	Planetary gear unit with large gear ratio
PK	Right-angle planetary gear units
PKX	Planetary gear unit with single-stage helical bevel gear unit
PS	Two-speed gearboxes
ZRPH	PH planetary gear unit rack and pinion drive with screwed pinion
ZTRPH	PH planetary gear unit rack and pinion drive with screwed flange pinion
ZTRPHV	PHV planetary gear unit rack and pinion drive with screwed flange pinion
ZTRSPH	PH planetary gear unit rack and pinion drive with supporting bearing holder
ZTRSPHQ	PHQ planetary gear unit rack and pinion drive with supporting bearing holder
ZTRSPHV	PHV planetary gear unit rack and pinion drive with supporting bearing holder
ZVK	K helical bevel gear unit rack and pinion drive with plug-on pinion
ZVKL	KL compact helical bevel gear unit rack and pinion drive with plug-on pinion
ZVKS	KS right-angle servo gear unit rack and pinion drive with plug-on pinion
ZVP	P planetary gear unit rack and pinion drive with plug-on pinion
ZVPE	PE cost-efficient planetary gear unit rack and pinion drive with plug-on pinion

Motor adapter / input shaft

Series/Product	Product designation
MB	Motor adapter with ServoStop brake
ME	Motor adapter with EasyAdapt coupling
MEL	Motor adapter with EasyAdapt coupling for large motors
MF	Motor adapter with FlexiAdapt coupling
MFL	Motor adapter with FlexiAdapt coupling for large motors
MQ	Motor adapter with backlash-free plug-in coupling
MR	Round motor adapter with curved tooth coupling

Motors

Series/Product	Product designation
EZ	Synchronous servo motor
EZHD	Synchronous servo motor with hollow shaft
EZM	Synchronous servo motor for screw drives (direct drive for threaded nut)
EZS	Synchronous servo motors for screw drives (direct drive for threaded spindle)
IE3D	Asynchronous motor in energy efficiency class IE3
LM	Lean motor

Electronics

Series/Product	Product designation	Product affiliation
AES	Absolute Encoder Support; battery module for buffering the supply voltage when using encoders with battery-buffered multi-turn stage	Drive controllers of 5th/6th gen.
AP6	Adapter in various designs for connecting encoder cables	Drive controllers of 6th gen.
ASP 5001	Safety module for STO over terminals	Drive controllers of 5th gen.
AX 5000	POSISwitch axis switcher for sequential operation of up to 4 synchronous servo motors	MDS 5000, SDS 5000
BRM 5000	Brake module for controlling a brake and for connecting to the shield of the power cable	FDS 5000, MDS 5000
BRS 5001	Brake module for controlling up to 2 brakes and for connecting to the shield of the power cable	SDS 5000
CA6	Communication module for the CANopen connection	SD6
CAN 5000	Communication module for the CANopen connection	Drive controllers of 5th gen.
Control box	Operating device for parameterization and configuration of inverters	Inverters of the 4th gen., FDS 5000, MDS 5000
DL6A	Quick DC-Link rear section module for the DC link connection	SD6
DL6B	Quick DC-Link rear section module for the DC link connection	SC6, SI6, PS6
DP 5000	Communication module for the PROFIBUS connection	Drive controllers of 5th gen.
DS6	DriveControlSuite; project configuration and commissioning software for drive controllers	Drive controllers of 6th gen.
EC6	Communication module for the EtherCAT connection	SD6
EM 5000	EMC shroud for connecting to the shield of the power cable	Drive controllers of 5th gen.
EM6	EMC shroud for connecting to the shield of the power cable	SD6
ECS 5000	Communication module for the EtherCAT connection	Drive controllers of 5th gen.
FDS 5000	POSIDRIVE frequency inverter of the 5th generation for operating asynchronous motors	
HT6	Adapter for level conversion from HTL signals to TTL signals	SC6, SI6
IO6	Terminal module for connecting analog and digital signals	SD6
LEA 5000	Terminal module for connecting digital signals	FDS 5000
Paramodul	Removable data storage for quick commissioning and service	Drive controllers of 5th/6th gen.
PN 5000	Communication module for the PROFINET connection	Drive controllers of 5th gen.
PN6	Communication module for the PROFINET connection	SD6
POSITool	Project configuration und commissioning software for drive controllers	Drive controllers of 5th gen.
PS6	Supply module for multi-axis drive systems	SI6
RB 5000	Rear section braking resistor	Drive controllers of the 5th gen., SD6
REA 5001	Terminal module for connecting analog and digital signals as well as encoders and resolvers	MDS 5000, SDS 5000
RI6	Terminal module for connecting analog and digital signals as well as encoders and resolvers	SD6
SC6	Compact drive controller of the 6th generation for operating synchronous and asynchronous servo axes (with power supply and additional control mode for Lean motors)	

SD6	High-performance drive controller of the 6th generation with modular interface concept for operating synchronous and asynchronous servo axes (with power supply and additional control mode for linear motors)	
SDS 5000	Powerful POSIDYN servo inverter of the 5th generation	
SE6	Safety module for expanded safety technology (speed and position functions, safe brake management)	SD6
SEA 5001	Terminal module for connecting analog and digital signals	MDS 5000, SDS 5000
SI6	Compact drive controller of the 6th generation for multi-axis drive systems for operating synchronous and asynchronous servo axes (with DC supply and additional control mode for Lean motors)	
SR6	Safety module for STO over terminals, electronic and free of wear	SC6, SI6
ST6	Safety module for STO over terminals, electronic and free of wear	SD6
SY6	Safety module for STO and SS1 using FSoE, electronic and free of wear	SC6, SI6
SZ6	Option module without safety functions for bridging the safety-relevant interface of the drive controller	SC6, SI6
XEA 5001	Expanded terminal module for connecting analog and digital signals as well as encoders	MDS 5000, SDS 5000
XI6	Expanded terminal module for connecting analog and digital signals as well as encoders	SD6



STÖBER Antriebstechnik GmbH + Co. KG
Kieselbronner Strasse 12
75177 Pforzheim, Germany
Germany
Phone: +49 7231 582-0
mail@stoeber.de
www.stoeber.com

Service hotline:
+49 7231 582-3000

