



endüstriyel donanım ve otomasyon sistemleri



Our company was founded in 2006 and represents many reliable, high-quality brands, connecting the leading manufacturers in the Turkish machinery industry with the brands we represent.

Our main product groups include linear guides, lead screws, racks and pinions, servo motors, stepper motors, linear motors, low-backlash or backlash-free precision gearboxes, couplings, shaft end bearings, high-speed process motors, CNC control units, motion control cards, lubrication units and equipment for moving systems, and many other specialized products.



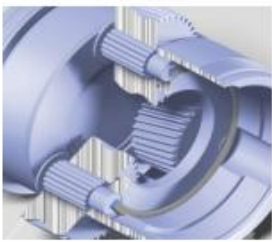


APEX DYNAMICS, INC.

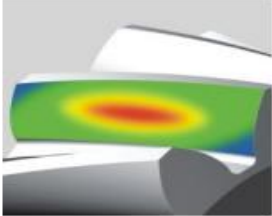
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- High-Precision Positioning
Low Backlash ≤ 1 arcmin
- High Efficiency
1.Stage $\geq 97\%$
2.Stage $\geq 94\%$
- Maintenance-Free
- Long Service Life (20,000–30,000 hours)
- Stainless Steel Construction
- Low Noise Level
- Optimized Moment of Inertia
- Various Shaft or Flange Output Options
- Gear Ratio Range: 1–10,000
- High Rigidity
- Increased Axial and Radial Load Capacity

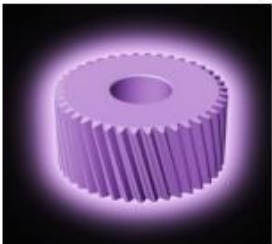




Planet gears rotate on **solid uncaged needle roller bearings** for increased stiffness and the maximum number of contact points. Hardened thrust washers allow the precise control of clearances in order to eliminate backlash.



Industry-leading gear performance is attained with our **HeliTopo technology**. **Ease off of the tooth profile and lead crowning** optimizes the gear mesh under load and achieves maximum tooth surface contact.



Our **In-house plasma nitriding** treatment process allows the hardness of the gear flanks to reach over 900Hv for superior wear resistance and still maintain a core hardness of 30HRC for toughness and resistance to shock loading.



One-piece carrier and output housing ensure 100% concentricity and alignment of all the rotating components. One-piece construction increases strength, rigidity and system reliability.



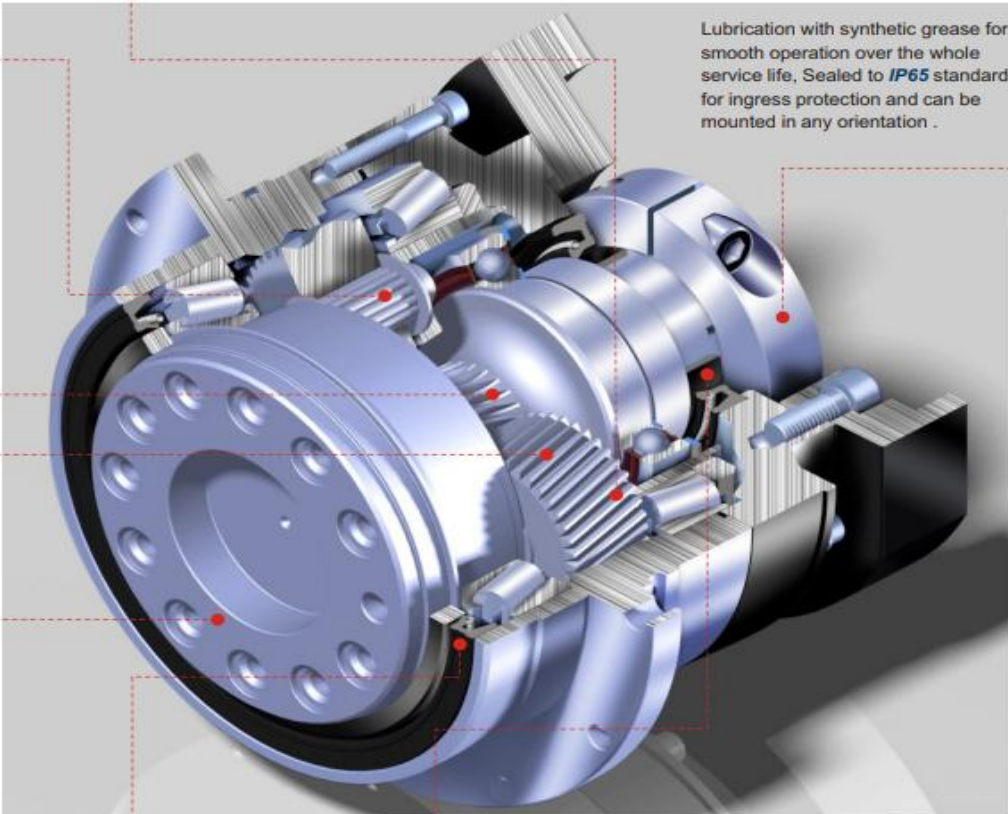
Helical gear design. Helical gearing increases the tooth to tooth contact ratio by as much as 33%. Benefits include increased torque capacity, ultimate smoothness, lower backlash and decreased noise. The helix angle is carefully chosen to gain these advantages while not producing excessive axial forces.



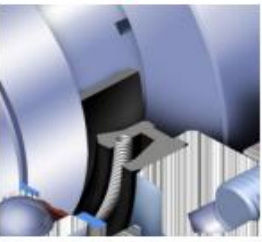
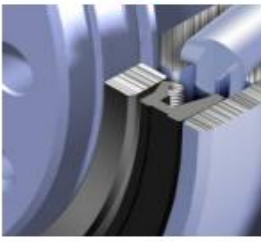
Patented planet carrier design mounts the sun gear bearing directly into the planet carrier in order to eliminate misalignment. This exclusive design offers great advantages in decreased noise, vibration and transmission errors and losses.



Triple-split collet and dynamically balanced set collar clamping system for efficient power transmission. Perfect concentricity from one-piece sun gear reduces backlash and allows higher input speeds.



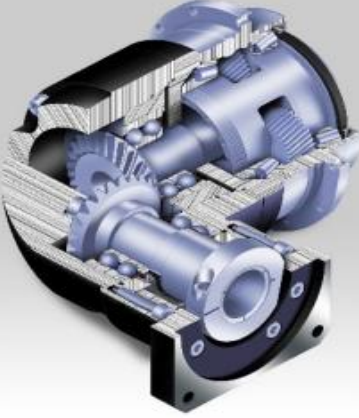
Lubrication with synthetic grease for smooth operation over the whole service life. Sealed to **IP65** standard for ingress protection and can be mounted in any orientation.



Patented sealing system featuring a TiCN coated shaft surface that eliminates leakage and increases service life to over 30,000 hours. The high tech coating, with a surface quality of 0.2 μ m and hardness of 3700 Hv. Interfaces with our proprietary seal, decreasing wear and running temperature.

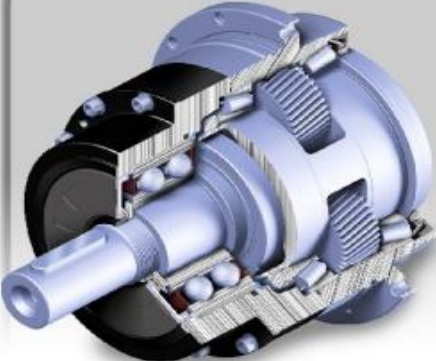
ADR version with 90° input via spiral bevel gear. Featuring an extremely short, rigid housing with full compatibility to any motor.

ADR Series



ADS version specially designed input shaft with key and threaded hole. Easy to drive via timing belt pulley or coupling. For increasing design flexibility and space saving for motor mounting. Ideal for highly dynamic cyclic duty or continuous running application.

ADS Series

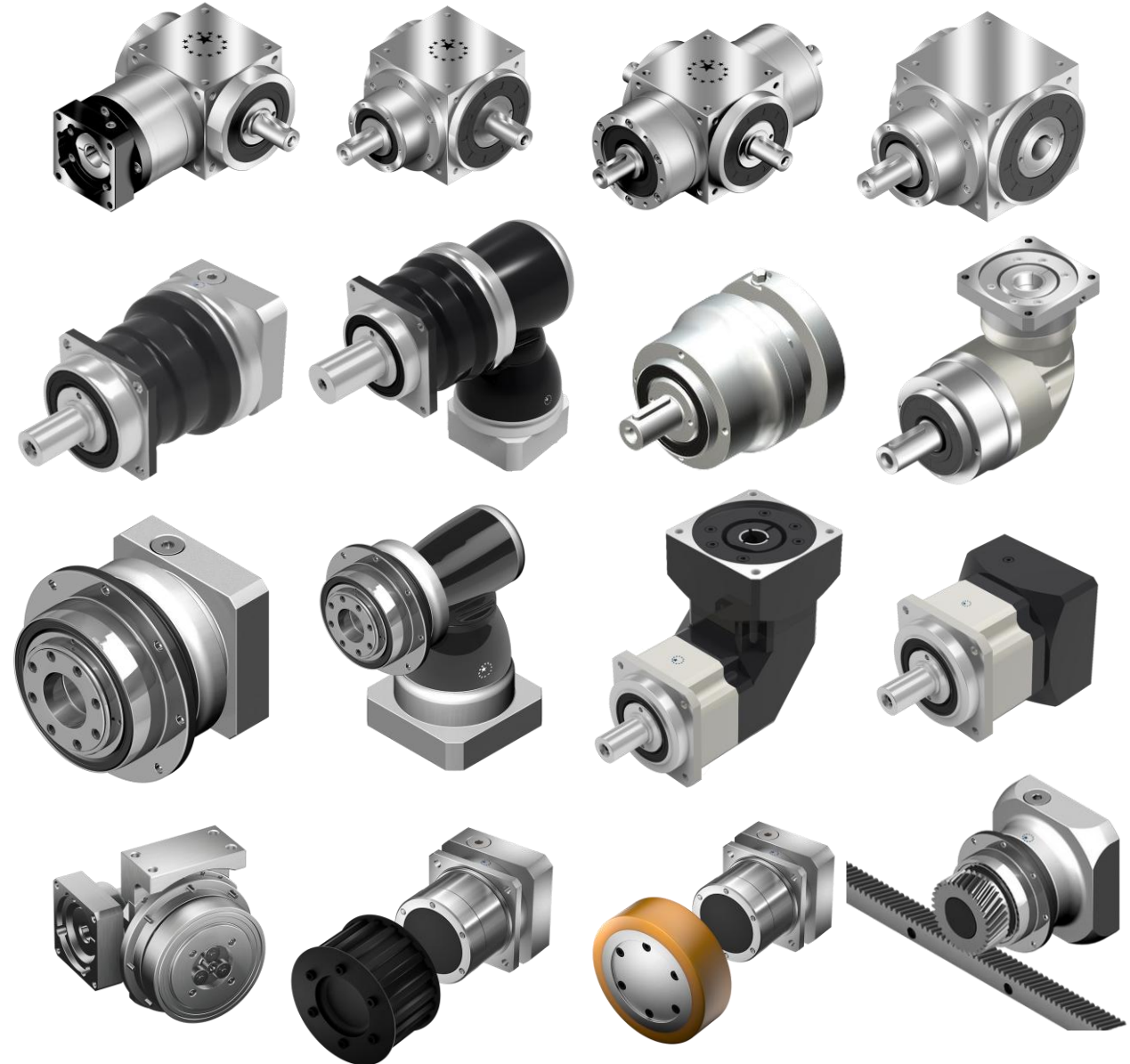




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- **Special Applications**
(Made-to-Order Responses, Electrolysis Nickel Plating, Stainless Steel Options, etc.)
- **Low-Temperature Lubrication Option** (-50°C ~ +120°C)
- **High Production Capacity**
- **High Variety** (Hypoid Bevel Rack & Pinion, AGV Pulley Drive, Stainless, Full Stainless, High Torque, Ultra Precision, 20+ varieties)
- **Compact Structure**
- **Mass Production Since 1987**
- **Long-Term Persistence of Low Backlash**
- **Standard ATEX Certification**
- **Easy and Omni-Directional Mounting**
- **Easy and Fast Engineering Calculation Selection Program for All Applications**
- **Fast 3D Download System**





APEX DYNAMICS, INC.



MANUFACTURING

1. The Strict Control Of Raw Material Costs

We selected materials' approach, we will use the material spectrum analyzer view their material composition makes no meet our requirements.

2. To Adjust The Physical Properties Of The Material

After initial processing of the workpiece, and then the transfer of heat treatment, adjusting the workpiece hardness of heart to the design requirements. the use of Rockwell (Rockwell) hardness of the workpiece hardness testing machine, metallographic microscope (Optical Microscope) observation of microstructure of materials (issue Vickers (Micro Vickers) microhardness test machine the workpiece surface nitride layer hardness distribution to ensure that the physical properties of components designed to meet the needs of reducer, filler, in line with the design of components.

3. The High-Precision Processing Technology and equipment

Subject to stringent quality control process after manufacture of semi-finished, in order to achieve the design requirements of products, at this stage, we use the most advanced precision machining equipment, such as 5Axis milling axis machines, Studer grinders, CNC/NC/ drilling machine, LIEBHERR hobbing machine, etc, will achieve our design to meet consumer demand for high-precision gearhead functional requirements.





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4. The Strict Size Requirements

To block gauge, ring gauge, air gauge, gauges and other than the right type geometry of the workpiece implement quality control, the use of CMM 3D dimensional measurement equipment, testing workpiece roundness, runout and total runout degrees, round tube, flatness, straightness, squareness, cone, parallelism and other geometric tolerances, can measure all the gear tooth per tooth, to detect the pitch and error.

5. The Careful Design Of Comprehensive Surface Treatment

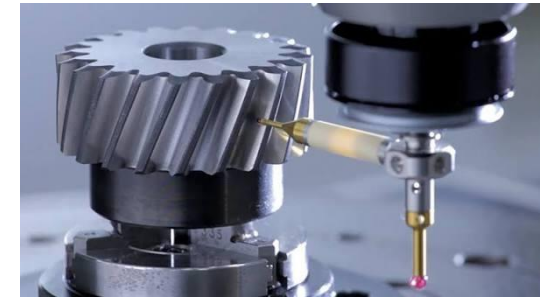
Gearbox surface using chemical pickle-plating to the surface thermal performance improvement, more quickly resolve the excess heat, reducing the temperature rise because of the various components deformed, causing errors, Motor having excellent paste, protective element to avoid internal oxidation, improving the corrosion resistance to the environment.

6. gear manufacturing process and advantages

The gear surface subjected to ion nitriding treatment (Plasma Nitriding), with a low amount of deformation, the advantages of high precision, high surface hardness of around 840Hv, (sports gear needed when providing abrasion properties. The gear core hardness adjusted to 30Rc moderate toughness can be obtained, so that the gear has a surface wear resistance and impact resistance core part and increase gear life. Take the high-tech interdentalal tooth trimming technology allows smoother engagement with detachment, reduce noise and heat generation.

7. product assembly and testing

After a series of each component quality control, then the precise assembly, finished goods and then be tested, measured its backlash and other performance specifications in order to ensure the quality of our products has been maintained in appearance when in the best condition.



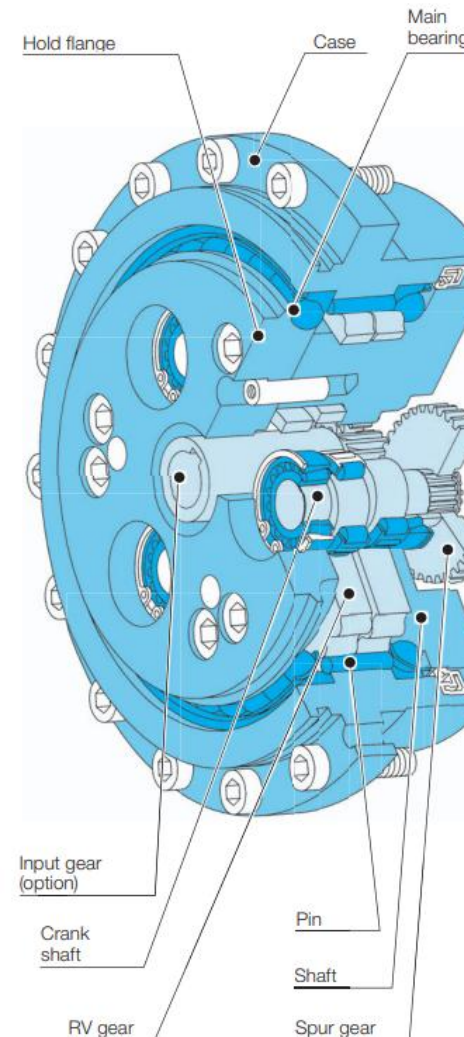
FAST AND PRECISE POSITIONING UNDER HIGH LOADS

Our cycloidal gear technology enables fast, precise, and repeatable positioning movements without causing resonance, even under high loads. This ensures the precise positioning of components, assembly groups, workpieces, and tools—even under heavy loads, high accelerations, and sudden movements.

KEY TECHNICAL ADVANTAGES

- Extreme precision: Hysteresis loss < 1 arcmin, pure torsional backlash 0.1–0.2 arcmin
- High torque capacity: Dynamic torque up to 70,000 Nm
- High torsional rigidity: Precise positioning and minimal deformation under high loads
- Superior shock load capacity: Withstands sudden shock loads of up to 500% of nominal torque
- High gear ratios: High reduction ratios within a compact housing
- Integrated main bearing: Compact and simple design requiring no additional bearings
- Wide range of hollow shaft options: Hollow shafts up to 138 mm
- Servo motor compatibility: Fully compatible with common servo motors
- Easy and quick installation: Simplified setup and user-friendly design
- Long service life: Extended operational life thanks to low wear
- High production reliability: Controlled and reliable production process

Features and construction of E series



Integrated angular ball bearings

Benefits:

- Increases reliability
- Reduces overall cost

Attributed to:

- Built-in angular ball bearing construction improves the ability to support external loads, increases moment rigidity and maximum allowable moment.
- Reduces the number of components required.
- Simplifies installation.

2-stage reduction

Benefits:

- Reduces vibration
- Reduces inertia (GD^2)

Attributed to:

- Low speed rotation of the RV gear reduces vibration.
- Reduced size of the motor coupling part (input gear) lowers inertia.

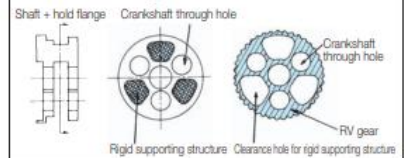
All main elements are supported on both sides

Benefits:

- Higher torsional stiffness
- Less vibration
- High shock load capability (5 times rated torque)

Detail:

- Crankshafts are supported on both sides of the reduction gear as shown below.



Rolling contact elements

Benefits:

- Excellent starting efficiency
- Low wear and longer life
- Low backlash (1 arc. min.)

Attributed to:

- Use of roller bearings throughout.

Pin & gear structure

Benefits:

- Very low backlash (1 arc. min.)
- Higher shock load capability (5 times rated torque)

Attributed to:

- Synchromeshing of many RV gear teeth and pins.

- Compact and slim design
- Lightweight construction
- Minimal backlash and lost motion: ≤ 1 arc.min.
- High shock load resistance: Withstands shock loads up to 5 times the nominal torque
- High acceleration performance: Torque capacity up to 2.5 times the nominal torque
- Excellent start-up efficiency
- Minimal backlash and lost motion: ≤ 1 arc.min.
- Wide product range



RV-N/E 58-14,700 Nm
31-203.52

- Solid shaft
- Backlash 1 arc.min.



RF-P 190-320 Nm
31-56

- Solid shaft
- Backlash 2 arc.min.
- High speed



RD2 RD_-C 98-3,136 Nm
81-258

- Hollow shaft
- Backlash 1-1.5 arc.min.
- 3 input options (straight, right angle, pulley)



RV-C/CA 98-11,760 Nm

- Hollow shaft
- Backlash 1 arc.min.



RV Original 137-5,390 Nm
57-192.4

- Solid shaft
- Backlash 1 arc.min.
- No support bearing



RH-CA 3,136 Nm
152

- Hollow shaft
- Backlash 1 arc.min.
- With base flange



RD2 RD_-E 58-3,136 Nm
31-185

- Solid shaft
- Backlash 1-2 arc.min.
- 3 input options (straight, right angle, pulley)



RS 2,548-8,820 Nm
120-240

- Hollow shaft
- Backlash 1 arc.min.
- Right angle input
- Table type



GH 69-980 Nm
10.74-31.43

- Solid shaft
- Backlash 6 arc.min.
- High speed



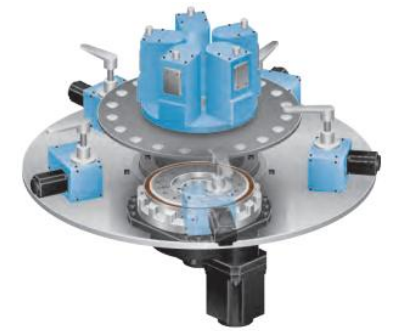
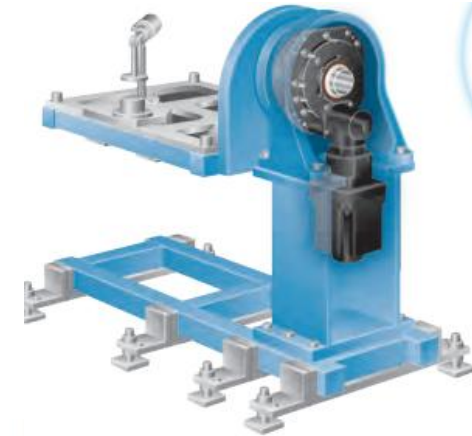
NT 1,470-2,156 Nm
60

- Hollow shaft
- Backlash 1 arc.min.
- Facial runout $\leq 8\mu\text{m}$
- For machine tools



RA 167-1,568 Nm
80-171

- Solid shaft
- Backlash 1 arc.min.
- For machine tools



Precision Reduction Gear RV™

Supporting Several Global Frontier Industries

Nabtesco Precision reduction gears have long been used in the joints of industrial robots to support their accurate and powerful motion. Nabtesco's stellar track record in this field covers more than 30 years. Nowadays, Nabtesco's precision reduction gear is used in many fields in addition to industrial robots, including machine tools, FPD production machines, semi-conductor production machines, etc., due to its high accuracy, high rigidity and compactness.

By choosing **DYNABOX®** in your servo applications, you can benefit from the following advantages:

- **Low backlash**
- **High torque capacity** (up to 8,000 Nm)
- **Compact and space-saving design:** Less mounting space required thanks to the 90-degree (right-angle) structure
- **High torsional rigidity**
- **Up to 25,000 hours** of maintenance-free operation
- **Unbeatable price/performance ratio**
- **Various input and output options**



Output torsional backlash available in 3 ranges :

EXPERT : 1 arcminute for the most demanding applications

MEDIUM : 5 arcminutes, a good compromise price/quality

BASIC : 10 arcminutes, a budget gearhead to cut servo system costs

DYNABOX XL

Right angle
Servo gearheads
For heavy duty applications



Backlash down to 0,5 arc minute

Torque up to
8000 Nm



Preloaded input taper bearings :

provides higher stiffness.
2 bearings mounted on same side insure constant preload while temperature raises.
It maximizes bearing life.
On the opposite side, an axial-free ball bearing.
size 35 = angular contact ball bearing

Maintenance free :

life-lubricated unit
with high performance
synthetic lubricant

Oversized taper roller bearings,
providing unmatched radial loads
(size 25 = ball bearings)

Single piece housing, made of cast and
heat treated aluminium-magnesium alloy.
Offering superior rigidity and low weight

Optimized contact pattern : a unique process to cut gears,
combined to a state of the art assembly lead to a nearly 90%
pattern surface, reducing drastically the contact pressure.



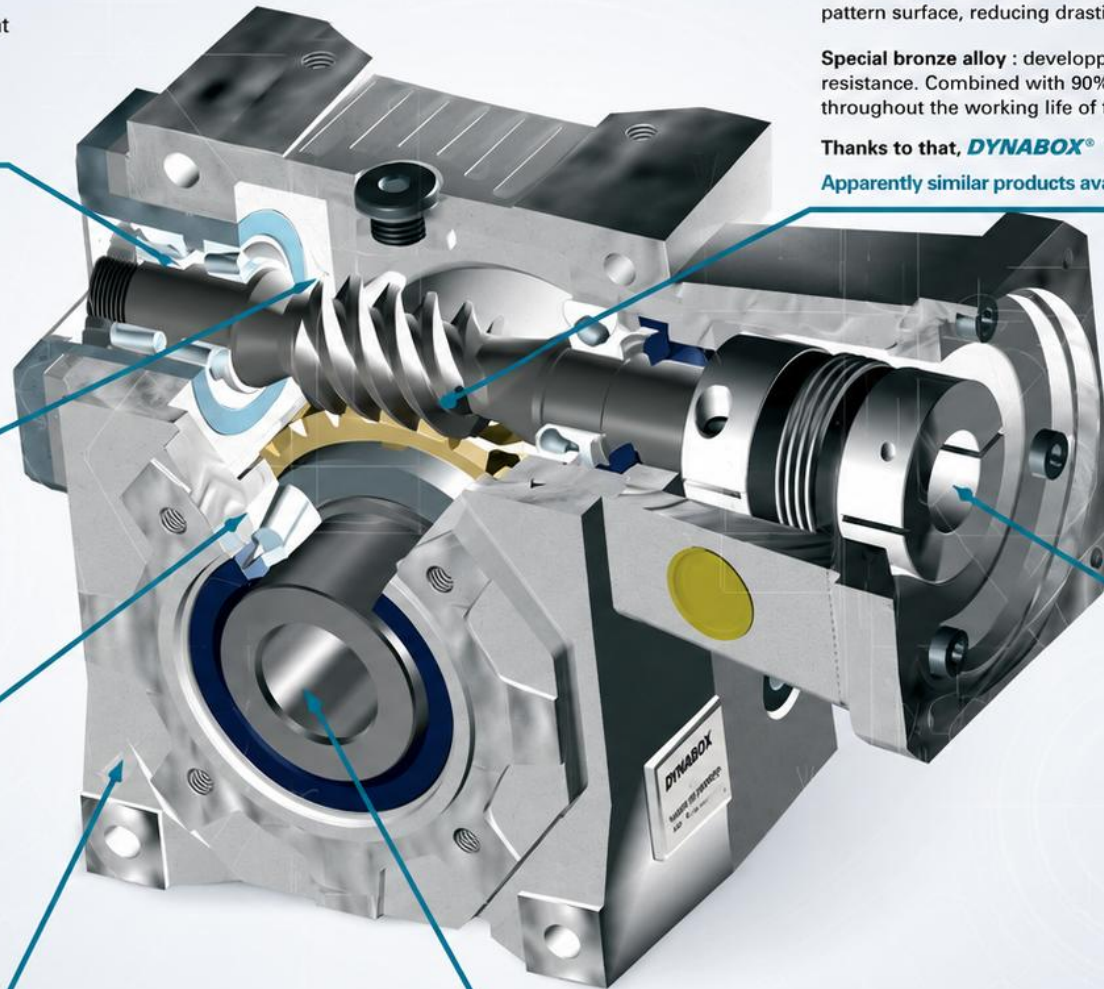
Special bronze alloy : developed by ourselves, it provides an unmatched wear
resistance. Combined with 90% contact pattern, lowest backlash is maintained
throughout the working life of the gearhead.

Thanks to that, **DYNABOX®** gearheads can run up to 6000RPM

Apparently similar products available on the market do not offer such performance

Servomotor mounted within 5 minutes :

a high stiffness below coupling eliminates
shaft alignment problems.
A mating flange to *your* servomotor can
always be supplied from our stock.





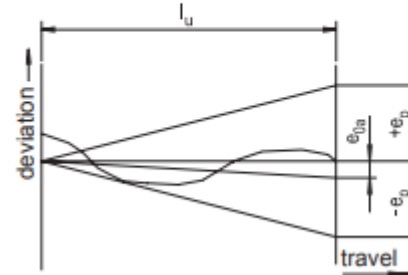
Very High Precision

Steinmeyer offers ball screws in ISO/DIN accuracy classes 1, 3, 5, 7, and 10. In particular, the P-class positioning ball screws are designed for high-precision applications.

Hardened and tempered screws are used specifically in applications requiring high precision.

- Accuracy options ranging from ISO accuracy classes 1 to 10
- Superior lead accuracy with precision grinding technology
- High positioning accuracy with low lead error
- High repeatability thanks to low lead wobble
- Stable servo motion with controlled, low-friction torque
- Minimal backlash thanks to optimized preload
- Minimal elastic deformation under load due to high axial rigidity
- Application-specific preload options with single- and double-nut configurations
- Ball screw systems optimized for applications requiring high speed and acceleration
- High dynamic load capacity and long service life
- Application-specific configuration of shaft, nut, lead, and preload parameters
- System design that simultaneously optimizes precision, rigidity, and service life
- Custom engineering solutions for demanding operating conditions
- Technology suitable for defense, aerospace, and critical applications requiring high precision

Lead error over the entire useful travel



l _u [mm]		Limit e _p for the average lead error e _{la} [μm]									
		Tolerance class									
from	to	P0	P1	P2	P3	P4	P5	T7	T10	$e_p = 2 \cdot \frac{l_u}{300} \cdot v_{300p}$	
-	200	3	5	7	10	15	20				
200	315	4	6	8	12	18	23				
315	400	5	7	9	13	19	25				
400	500	6	8	10	15	21	27				
500	630	6	9	11	16	23	30				
630	800	7	10	13	18	27	35				
800	1000	8	11	15	21	31	40				
1000	1250	9	13	18	24	35	46				
1250	1600	11	15	21	29	42	54				
1600	2000	-	18	25	35	50	65				
2000	2500	-	22	30	41	59	78				
2500	3150	-	26	36	50	72	96				
3150	4000	-	32	44	62	88	115				
4000	5000	-	-	-	76	108	140				
5000	6300	-	-	-	92	131	170				

➤ GROUND (P0-P5)

➤ ROLLED (T5-T10)





Precision and Geometric Accuracy

Precision classes in accordance with DIN 69051 / ISO 3408 standards: P0, P1, P2, P3, P4, P5

Accuracy classes P0–P5 for positioning lead screws and T5–T10 for load-carrying lead screws

Thread pitch accuracy at the μm level with a precision-ground thread profile. In addition to thread pitch accuracy, control of lead error, lead fluctuation, and lead wobble values. High geometric accuracy even on shafts in the $\varnothing 25\text{--}32\text{ mm}$ and $\varnothing 60\text{--}125\text{ mm}$ ranges; for example, run-out values in the P3 class can be controlled down to $10\text{--}13\text{ }\mu\text{m}$. Perpendicularity values are controlled at the μm level depending on the shaft diameter and accuracy class.

Low error – high positioning accuracy

One of the key technical distinctions highlighted in Steinmeyer's catalog is that lead accuracy is not evaluated solely based on error per 300 mm.

For example, while a simple cumulative evaluation of errors in 300-mm segments for P3 class at a 900-mm stroke could reach $36\text{ }\mu\text{m}$, the total pitch deviation (ep) value defined by Steinmeyer is $21\text{ }\mu\text{m}$. This approach is important for controlling total positioning error along long axes.

Controlled Friction Torque

Steinmeyer controls not only geometric accuracy but also variations in friction torque.

Friction torque tolerance can be defined for preloaded double nuts. Variations in friction torque are controlled depending on the accuracy class and nut geometry. Steinmeyer goes beyond the standard accuracy class, e.g.



Wipers

Steinmeyer's patented segmented wipers set the premium standard in mechanical engineering applications. They reliably prevent chips and coarse dirt particles from seeping in, while allowing a specific amount of lubricant to pass through. In conjunction with automatic oil or grease lubrication, this creates a flushing effect on the nut, thereby ensuring a high level of operational safety. Thanks to spring-preloaded segments, segmented wipers fit onto the shaft threads with virtually zero clearance.

All wiper types: segment wipers, felt wipers, or double wipers

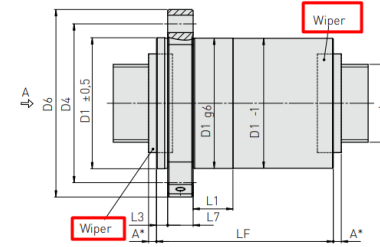
The special, patented felt system located on both sides of the nuts in our Steinmeyer brand operates on the same principle as that found in linear guide carriages. It prevents any dust, dirt, or foreign matter from entering the nut while also retaining our special lubricant inside, thereby minimizing lubricant consumption and reducing your maintenance costs to a minimum.

Custom Wiper Solutions

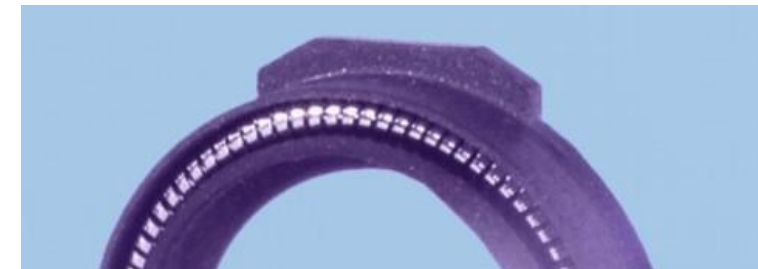
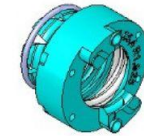
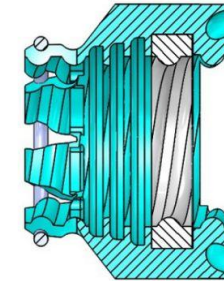
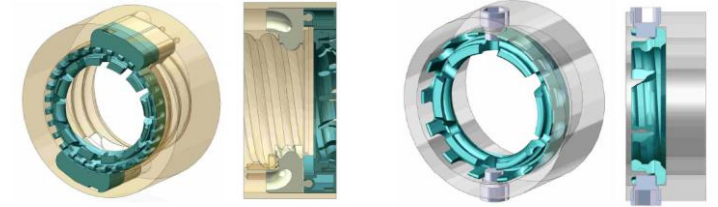
Protect against common contaminants

Wipers used in aerospace applications must withstand a wide range of conditions, including a broad temperature range, icing, water spray, and chemicals. Additionally, their integration into the nut may be subject to space and weight constraints.

Since aerospace threaded shafts are manufactured in virtually every size—including non-standard pitches and diameters—there is no true standard. Steinmeyer wipers have proven to perform exceptionally well under demanding conditions.



Hole pattern 1, flange form B according to ISO 3408.



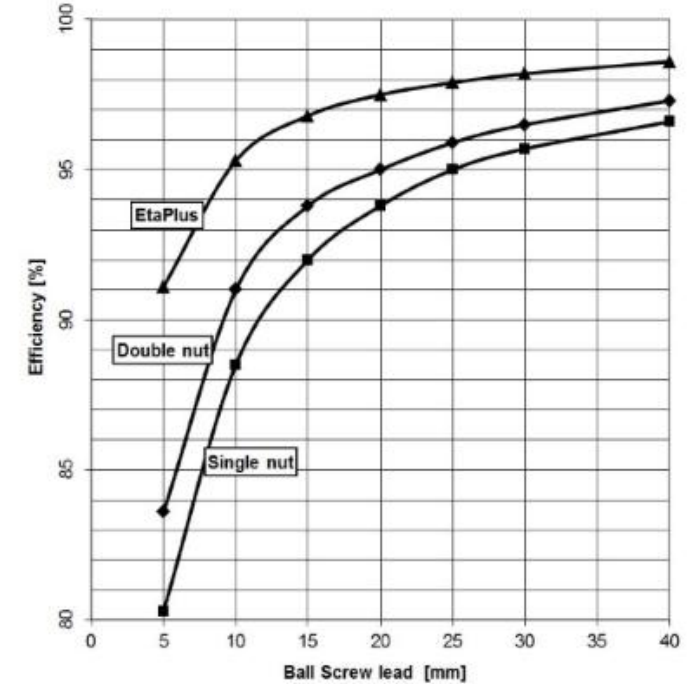


ETA+ Ball Screws

The innovative "ETA+" ball screw from Steinmeyer comes very close to providing the ideal linkage between motor and slide. From the reduced friction and at the same time increased stiffness results a significant improvement in efficiency. A 50% increase in rigidity and a 67% decrease in friction is accomplished. And reversing error has been eliminated altogether, which means that the ETA+ ball screw has a perfectly linear behavior regardless of speeds and direction of motion. This performance break-through is easily demonstrated with ball-bar tests, where the "quadrant changing" error is reduced to a fraction of the value achieved with conventional ball screws. A bonus side effect of the dramatic reduction in friction is reduced heat generation, allowing machine builders to eliminate their costly and troublesome forced cooling systems. All users will welcome the reduced noise that is another characteristic of ETA+. It even outperforms ball chain technology. And the reduced friction yields significantly higher lifetime.

Guard Plus Technology

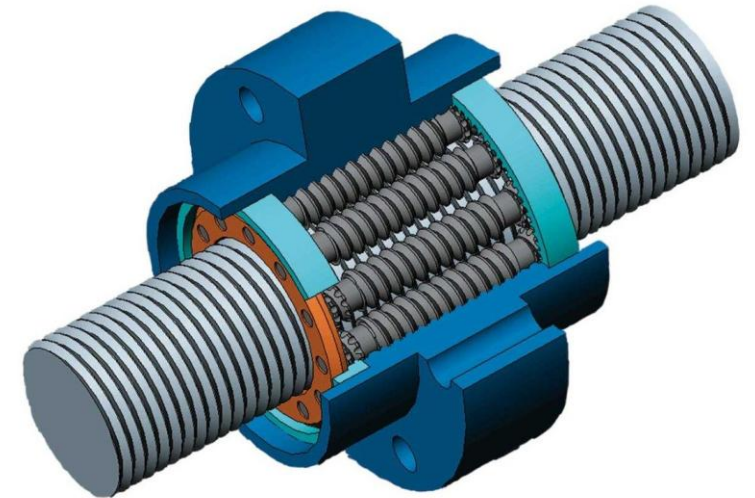
- Maintenance Processes Become Predictable and Plannable
- Maintenance Costs Decrease
- Overload Detection
- Automatic Data Detection



Roller Screws

Roller screw technology offers higher axial load capacity and operational durability compared to ball screw systems. While delivering these strengths, it also provides the advantage of a compact structure. It ensures long-lasting and reliable motion control in applications requiring high precision, and supports performance continuity in critical mission applications.

- ISO3408-3 classes 1-3
- Diameter from 15 mm [0.6 in] to 100 mm [3.93 in]
- Pitch from 2 mm [0.08 in] to 42 mm [1.65 in]
- Length up to 4,000 mm [157.5 in]
- Load capacity:
 - Dynamic load up to 1,230 kN
 - Static Load up to 3,500 kN
- Acceleration up to 40m/sec² Number of starts: 5-6



The "**Ultrapower Planetary Roller Screws**" series has been developed by Moog for applications with extreme performance requirements that standard planetary roller screws cannot meet. The Ultrapower series provides a static load capacity of up to **3,000 kN**, generating force levels competitive with hydraulic actuators, while simultaneously offering the high precision and control capability that only electric motion control systems can provide. Moog engineers have optimized this technology to deliver maximum performance compared to other linear actuation solutions, achieving superior service life and high power density.

KEY ADVANTAGES OF ULTRAPOWER TECHNOLOGY

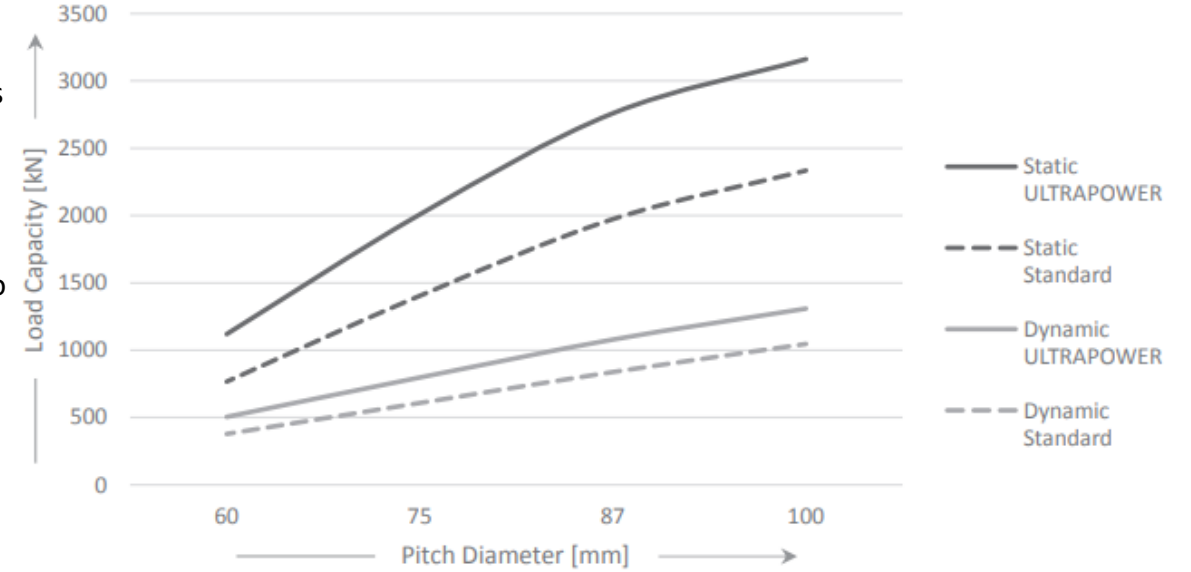
Ultrapower roller screws combine the core advantages of Planetary Roller Screw technology—such as:

- High precision
- High speed and acceleration capacity
- Low axial backlash
- with up to **50% higher load capacity** compared to standard products.

Thanks to the delivery of all these features within a compact design, the Ultrapower series forms an ideal solution even for designs with extremely restricted installation space and high force requirements.

HIGHLIGHTED TECHNICAL ADVANTAGES

- Static load capacity up to **3,000 kN**
- Up to **50% higher load capacity** compared to standard products
- Electric alternative to hydraulic actuators
- High-precision electrical control
- High power transmission
- Long and superior service life
- Compact design / low installation volume
- High speed and acceleration
- Low axial backlash



Miniature Ball Screws

Miniature ball screws are used particularly in the control fin actuation systems of guidance kits, undertaking one of the most critical missions by changing fin angles with high precision according to guidance commands to achieve pinpoint accuracy on targets. They feature a wide variety of nut types and are available in precision classes such as C0, C1, C3, C5, and C7. They offer customization options with special coating technologies.

International Accuracy Standard of Ball Screw

Grade Classification		Ground Grade			Rolled Grade	
		C0	C1	C3	C5	C7
V ₃₀₀	ISO-DIN	※	6	12	23	52
	JIS	3.5	5	8	18	50
	GMT	3.5	5	8	18	50

※ V₃₀₀: Max. variation within 300mm randomly retrieved from effective length of the shaft section.



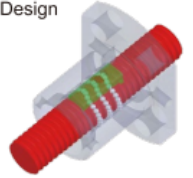
BS Series Unique Features

◎Reflux Design

Internal Circulation Structure

- One circulation counts on crossing ball screw thread peak along internal return retainer.
- Fits to short lead thin shaft needs.
- Performed by high rigidity & secured by steel material been heat-treatment.

Reflux Design



◎Extended Usage Life

Reliable Internal Circulation Structure

- Ball run endless inside along the internal circulation retainer.
- Fits to short lead thin shaft needs.
- Retainer in POM adapted to increase reliability & decrease noise.

Extended Usage Life



Low Temperature Black & Chrome Plating



◎Surface Treatment-Low Temperature Black & Chrome Plating

Hardness	Color	Thickness of Layer	Material Applicability	Characteristics
800HV	Black Extinction	1~2μm	Steel Copper Stainless Steel	1. Good corrosion 2. Rust proof 3. Abrasion proof 4. Ultra thin layer

◎Salt Spray Test

	Thickness of Layer (μm)	Corrosion Proof (hr)
Brand A	2.5	48
Brand B	1.75	96
Brand C	2	96
GMT	2	120

Trapezoidal Screw and Nut Applications

We provide the most optimal selection tailored to defense industry demands, carrying out precision workmanship and straightening processes for our production.

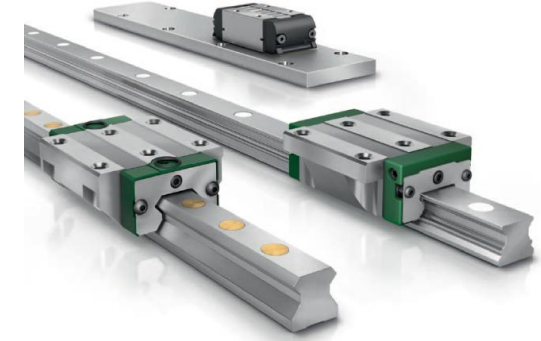
- **Short lead times in production**
- **Wide range of diameter and lead options**
- **Extensive customization options tailored to specific applications**



Schaeffler Linear Motion Group

As a leading representative of German engineering and industry, Schaeffler offers advanced linear motion technologies to deliver bespoke solutions for linear axis applications that demand high precision and reliable performance.

To increase corrosion resistance specifically for the defense industry, we customize linear guides and carriages to provide a specialized manganese phosphate coating.



Preload classes

Preload class	Preload setting
Linear recirculating roller bearing and guideway assemblies RUE...E	
V1	$0,04 \cdot C$
V2	$0,08 \cdot C$
V3 ¹⁾	$0,1 \cdot C$
V4	$0,13 \cdot C$
V5	$0,15 \cdot C$
Linear recirculating ball bearing and guideway assemblies KUSE	
V0	Very small clearance to clearance-free
V1 ¹⁾	$0,04 \cdot C_{II}^{(2)}$
V2	$0,13 \cdot C_{II}^{(2)}$
Linear recirculating ball bearing and guideway assemblies KUBE...B, KUBE...W	
V0	Very small clearance to clearance-free
V1 ¹⁾	$0,04 \cdot C$
V2	$0,1 \cdot C$



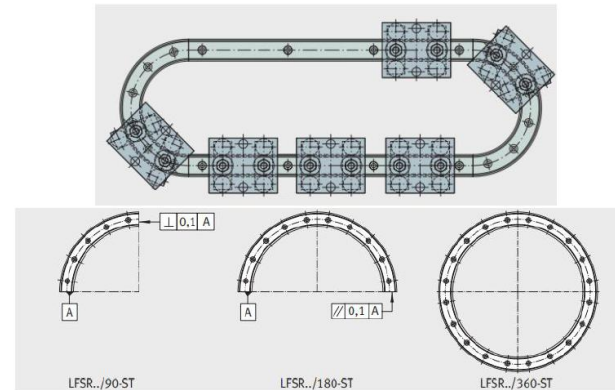
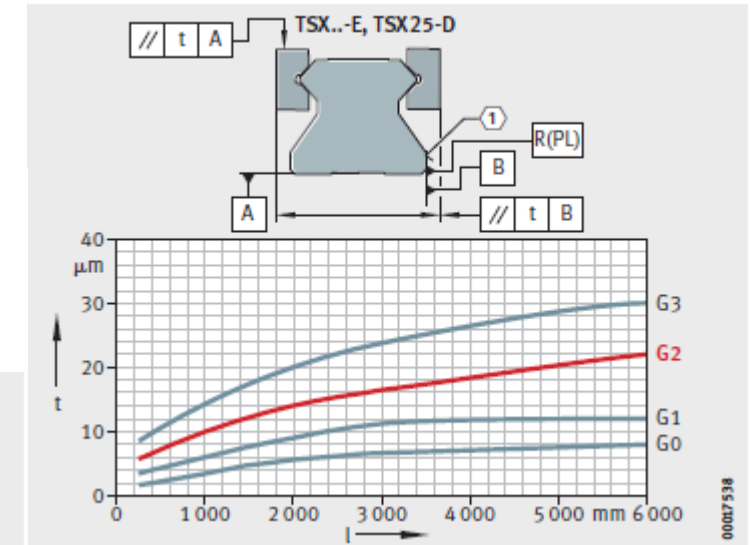
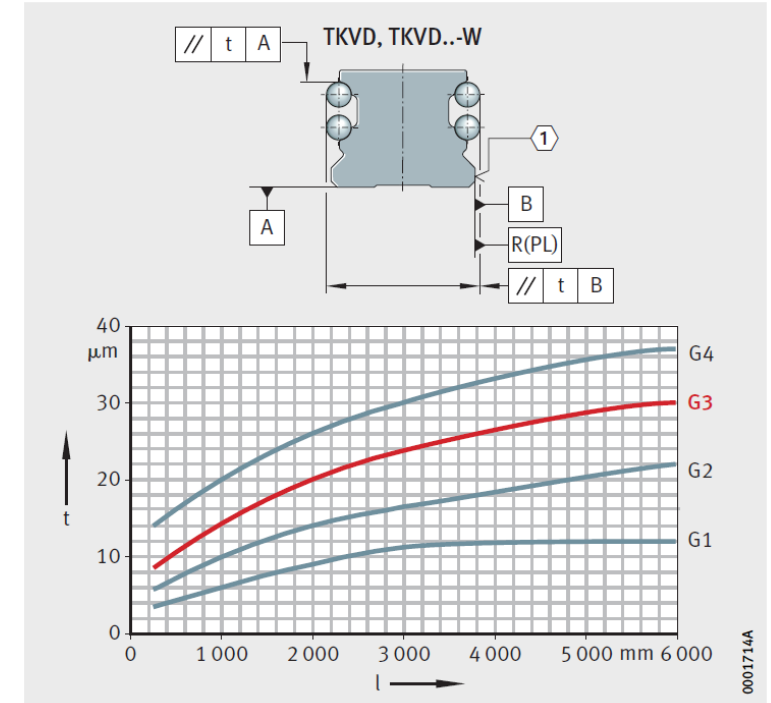
Advantages of the Schaeffler Linear Group

- Industry-leading product variety (all linear guide applications, including linear guides with measuring scales, 4-row ball guides, 6-row ball guides, curved guides, miniature guides, etc.)
- Customization options for demanding operating conditions (RRF, RROC, chrome, etc.)
- Very high load-carrying capacity
- High rigidity
- High precision
- Precise linear motion under heavy loads
- High dynamic performance

t = parallelism tolerance
l = total guideway length

① Locating face

Figure 23
Accuracy classes
and parallelism tolerances
of guideways



Rotary Table Bearings

Rotary table bearings are specially designed, ready-to-mount bearings for systems requiring high precision and simultaneous loads from multiple directions. These bearings operate completely backlash-free (with micrometric precision) against radial, axial, and tilting/bending (moment) loads. Thanks to these characteristics, they provide an exceptional solution, particularly for military mechanisms where extremely high rotational and targeting precision is demanded.

Up to 80% higher speed: Shorter machine cycle times achieved through a higher limiting speed compared to the previous YRTC design.

Up to 20% higher tilting rigidity: Enhanced operational stability and precision under high moment and eccentric loads.

Up to 50% lower frictional torque: Reduced energy loss and operating costs under continuous running conditions.

Integrated absolute angular measuring system – YRTCMA: Eliminates the need for an external encoder/measuring system by integrating the measurement system directly into the bearing, offering a compact solution.

High measurement accuracy: In the YRTCMA series, the accuracy of the measuring system reaches down to 4.4–9.7 arcsec, depending on the model.

Absolute measurement requiring no reference point: Position data can be acquired without the need for a referencing movement thanks to the absolute measurement system. This reduces machine commissioning time and cycle losses.

Hollow bearing center design: The integrated measuring system creates more space in the center of the bearing for other machine components, increasing design flexibility.

High dynamic and precise control capability: The integration of the measuring system directly into the bearing facilitates the implementation of precise, high-dynamic control loops.

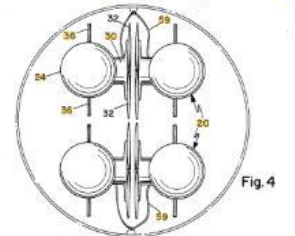
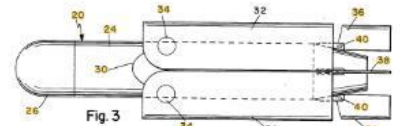
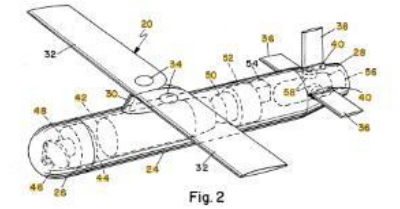
Easy installation and maintenance: External easy access to the measuring head allows it to be mounted and removed without requiring additional adjustments, facilitating maintenance and servicing operations.

Suitability for harsh operating environments: The measuring system is designed to be resistant to oils, greases, and coolants. Furthermore, the operating temperature is specified as -10°C to $+85^{\circ}\text{C}$, and the storage temperature as -20°C to $+85^{\circ}\text{C}$.



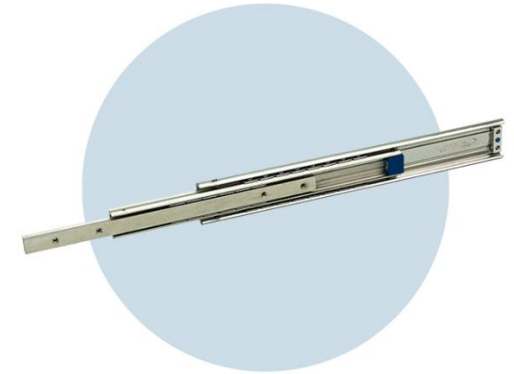
Rotary Bearings

Schaeffler offers rigid tapered roller bearings that support very high axial loads and shock loads while requiring minimal axial installation space. We ensure a robust and reliable supply of specialized bearing solutions for the defense industry, including applications requiring exceptional performance in extreme conditions (such as aerospace, space, and systems operating at high or low temperatures).



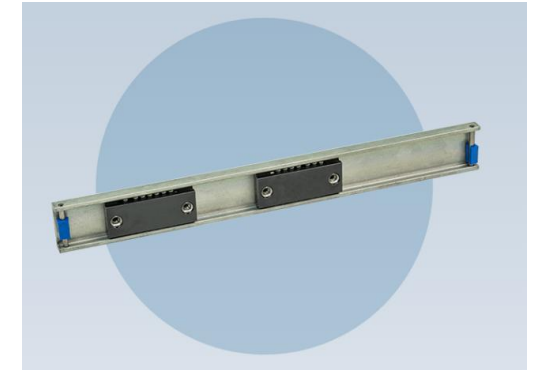
Drawer Slide

A **drawer slide** is an assembly of metal profiles sliding on ball bearings held in ball cages. It is equipped with stops in opening and closing, and ensures the sliding of loads up to 1500 kg or over lengths of 2 meters. Available in steel, aluminum or stainless steel, the **telescopic ball bearing slides** manufactured by Chambrelan allow for partial, total and super-extensions



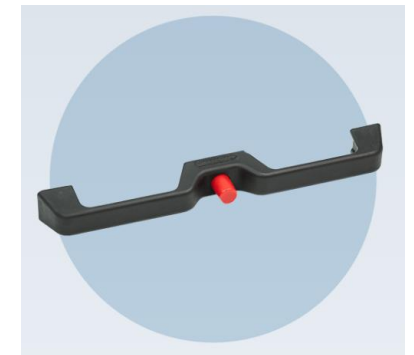
Sliding Rail

A **sliding rail** is an assembly composed of a fixed guide profile completed by one or several mobile shoes (up to 3 usually). This wide range of industrial rails is composed of 15 models of ball-Bearing sliding rails or rollers and 2 types of lengths, for a smooth and regular sliding under loads from 11.0231 to 1322.7747 pound per shoe.



Locking handle

This kit is a handle with a central control button that allows the drawer to be locked in different positions: drawer in closed position, and/or in open position. It comes in the form of a kit, whose rods can be cut to the dimensions of the mobile device.



Partial Extension Drawer slide



Double Expansion Drawer runner



Full Extension Drawer slide



Heavy-duty telescopic slides



Super Extension Drawer slide

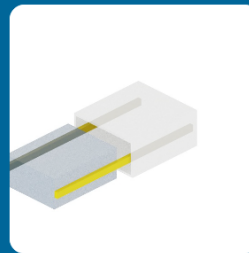


Various Material Options Tailored to the Applications

- Aluminum
- Steel
- Stainless Steel

AI-Powered Easy Selection Assistant

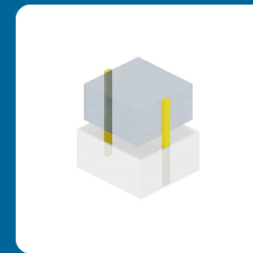
In which direction does the device move?



Horizontal

The guiding direction is horizontal.
This is the most commonly used assembly.

... More



Vertical Upright

Slides are installed vertically and extend UPWARD.

... More



Save time searching for your
telescopic slide



Intelligence assistant

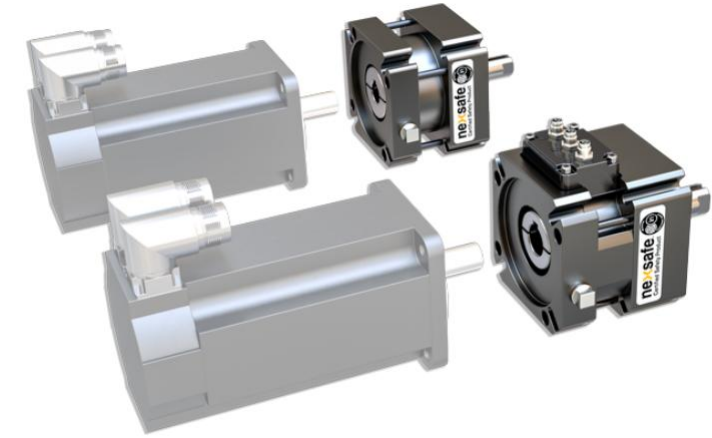
About our NexSafe® Safety Certified Servomotor

Nexen Group offers a full line of **NexSafe®** safety certified servomotor brakes that mount directly to servomotor flange for increased safety. Nexen Group's spring engaged, air released servomotor brakes are available safety certified to comply with international safety standard ISO 13849-1. Category Level up to 4 and Performance Level up to e, can be achieved using NexSafe® products in recommended configuration.

- Integral clamp collar with backup keyway
- Three operating mode sensors are available
- Multiple engagement springs
- Default to lock
- Easily mounts directly to a servomotor flange

Nexen Group's servomotor operating mode sensors for engagement, disengagement and wear are Industry 4.0 compatible and can provide information to maximize machine efficiency.

- Motor/Drive Programming
- Predictive Maintenance
- Operational Feedback



Minimum Static Brake Torque	4.7 to 125 Nm [42 to 1106 in-lb]
Brake Backlash	Zero
Braking Capabilities	Power-Off Holding, Occasional E-Stop Dynamic
Mounting Flange	Flanges on each side with pilots support brake
Input Hub Options	Keyed Clamp Collar
Output Shaft Options	Keyed Shaft
Available Input & Output Bore Diameters	6.35 to 65 mm [.25 to 2.56 in]
Available Input & Output Flange Bolt Circle	63 to 350 mm [2.48 to 13.78 in]
Safety Certification Standard	NexSafe safety certified to comply with international safety standard ISO 13849-1 by Intertek
Operational Mode Feedback Sensors	Up to 3 optional sensors: Engagement, Disengagement, Wear
Overhung Load Capacity	Up to 3114 N, not all units allow overhung load
Maximum RPM	5,000 to 10,000 RPM

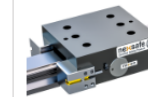
About our Rail Brakes

Nexen Group's Safety Rated Linear Profile Guide Rail Brakes use spring force to secure the load in holding applications.

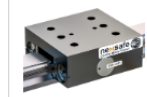
Superior response time and high force for stopping and holding in e-stop and power-off situations, Nexen Group's Rail Brake clamps directly onto the guide rail to provide positive braking and holding in all axes, with no effect on bearing surfaces.

Key features include:

- Large friction-facing contact area for consistent performance and low rail wear
- Ideal for power-off, e-stop, and holding applications
- Low backlash for accurate position-holding
- Brake geometry is similar to linear bearing cassettes for easy installation
- Provides stiffness and eliminates vibration in linear drives
- Large clearance between brake and rail compensates for installation misalignment
- No lubrication or periodic maintenance is required
- Models available to fit most common profile guide rails
- The highest spring engaged / air-released holding force on the market
- Long-rated life (B_{10D}) of four million cycles



NexSafe-RBB with Sensors



NexSafe-RBB without Sensors

	NexSafe-RBB with Sensors	NexSafe-RBB without Sensors
Profile Rail Sizes	15, 20, 25, 30, 35, 45	15, 20, 25, 30, 35, 45
Rail Manufacturers	ABBA, HIWIN, IKO, INA, LINTECH, NB, NOOK, NSK, PMI, ROCKFORD, ROLLON, SBC, SCHNEEBEERGER, EWELLIX (SKF), STAR (BOSCH REXROTH), TBI, THK, THOMSON	ABBA, HIWIN, IKO, INA, LINTECH, NB, NOOK, NSK, PMI, ROCKFORD, ROLLON, SBC, SCHNEEBEERGER, EWELLIX (SKF), STAR (BOSCH REXROTH), TBI, THK, THOMSON
Minimum Holding Force	500 to 2600 N [112 to 585 lbs]	500 to 2600 N [112 to 585 lbs]
Minimum Release Pressure	5.5 bar (Lower pressures available) [80 psi]	5.5 bar (Lower pressures available) [80 psi]
Max Backlash at Full Brake Force	0.10 mm to 0.20 mm [0.004 in] [0.008 in]	0.10 mm to 0.20 mm [0.004 in] [0.008 in]
Starting Engagement Time	0.049 to 0.080 seconds	0.049 to 0.080 seconds
Cycle Life (B10)	2 million cycles	2 million cycles
Operating Mode Sensor(s)	1 or 2 sensors. Can be configured to sense engagement or disengagement.	none
Safety Rating	ISO 13849-1 Safety Certified	ISO 13849-1 Safety Certified

High Indexing Precision: With an indexing precision of up to ± 11 ArcSec and repeatability of up to ± 1.2 ArcSec, Nexen's Indexers offer unmatched mechanical system capabilities.

Zero Backlash: Unlike other mechanical drive systems, Nexen's Indexers offer zero backlash options from the motor through the driven load.

High Load Capacity: Nexen Group's Rotary Indexers can handle loads up to 1575 kN (on PRD) by utilizing precision grade, high load capacity cross-roller bearing,

High Output Torque: Rotary Indexers have a maximum acceleration torque of up to 4,811 Nm and a Nominal torque of up to 2,625 Nm.

High Speed: Indexers are designed for speeds up to 304 RPM.

Large Open Center: The Indexer's design allows for a large open center for more application possibilities.

Smooth in Motion: Combining Nexen Group's RPS technology with a preloaded cross-roller bearing and an integrated motor/precision gearhead gives a rigid, smooth system.

Nexen Roller Pinion Gear System

Nexen Group's Roller Pinion Gear System includes a patented pinion consisting of bearing-supported rollers and a proprietary tooth profile. Configurations include gears and gear segments with either external or internal teeth, which can be configured to meet the application. Gears pre-installed on heavy-duty bearings are also available.

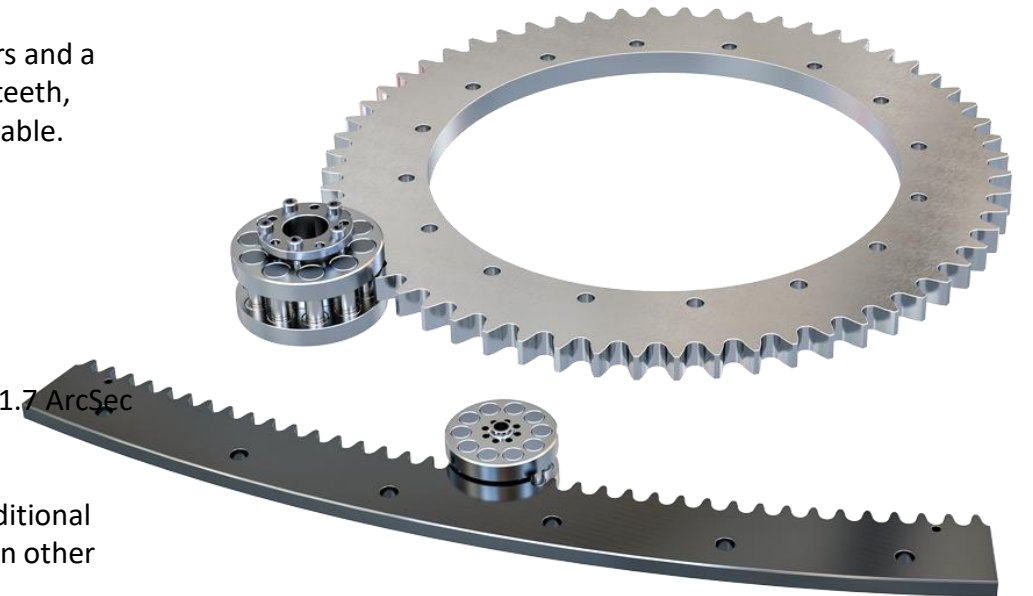
- High Positional Accuracy, Zero Backlash
- No Cumulative Error, Low-Velocity Ripple
- High Speed, Rigidity, Low Noise, Low Maintenance
- Corrosion Resistance, Long Life

High Indexing Precision: Unmatched mechanical system capabilities with an indexing precision of up to ± 1.7 ArcSec and repeatability of up to ± 0.3 ArcSec.

Zero Backlash: Unlike other mechanical drive systems, Nexen Group's Gears offer Zero Backlash.

High Speed : Nexen Group's Roller Pinion Gear Systems can handle speeds up to 607 RPM, and unlike traditional cam-driven systems, it can handle peak torque inputs at any time. This allows for faster indexing times than other options.

Solutions, including gears and gear segments with either external or internal teeth, can be configured to meet the specification. Pre-installed gears on heavy-duty bearings are also available.



NEXEN Roller Pinion Racks Systems

Nexen Group's Roller Pinion System revolutionizes the possibilities for linear and rotary motion control. As an alternative to traditional rack and pinion systems, the Roller Pinion System overcomes the limitations of conventional drive systems and offers unmatched performance, increased accuracy, and efficiency.

The patented Roller Pinion System begins with a pinion comprising bearing-supported rollers that engage a unique tooth profile. Two or more rollers engage the teeth in opposition at all times to eliminate backlash. The pinion rollers glide effortlessly along a tangent path and roll smoothly down the tooth face for quiet, low-friction operation.

Even installation is worry-free, with a simple alignment tool to ensure positional accuracy over multiple rack sections, and it is designed for reliable and easy operation, delivering constant positional accuracy regardless of the distance traveled.

Fully customizable, including the finish, the RPS can be designed to meet the specific needs of any application.

Key features include:

- Zero Backlash
- Lube free operation
- No cumulative error
- High corrosion resistance
- 99% Efficient
- Accuracy of $\pm 30\mu\text{m}$ [.001 in]
- Rated life of up to 30 million contacts
- Speeds of up to 8 m/s [26 ft/s]
- Unlimited length possible



Our Other Mechanical Motion Group Products



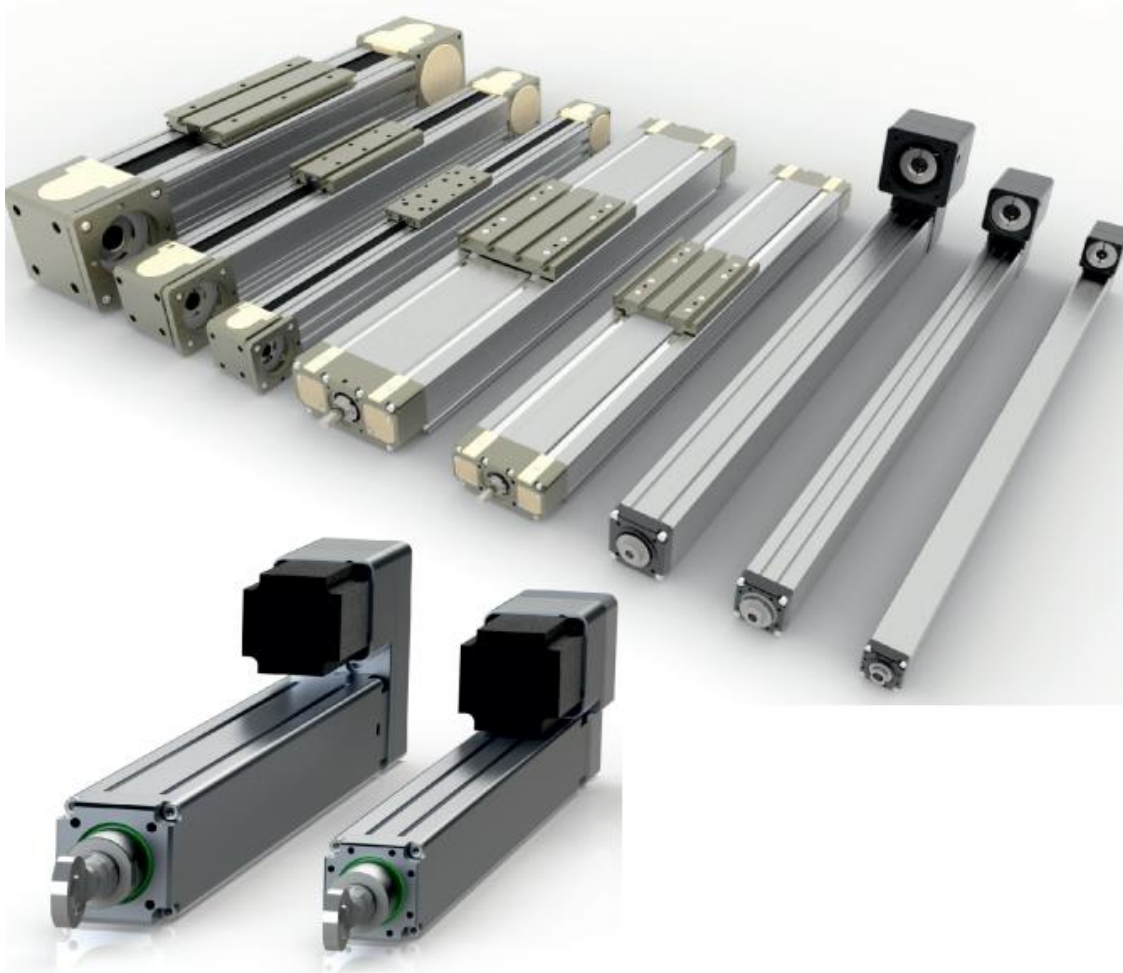
SCHAEFFLER
CPC CHIEFTEK
THOMSON
STEINMEYER
WMH HERION
ZUAZO
YYC - YUAN YI CHANG
SERVOMECH SPA
LINEARMECH SRL
DLS SCHMIERSYSTEME
NB LINEAR SYSTEM
HELIX Linear
ENIDINE
TOLLO

ALULINEARTECHNIK
NEXEN GROUP
GMT GLOBAL Inc.
SIT SPA
CHAMBRELAN
ROSE SYSTEMTECHNIK
ELESA GANTER
PNEUMAX
HEMA GROUP
CEME
ZD MOTOR
SFT
THOMAS REGOUT
MOOG

GERMANY
TAIWAN
GERMANY
GERMANY
GERMANY
SPAIN
TAIWAN
ITALY
ITALY
GERMANY
NETHERLANDS
USA
USA
SWEDEN
SWITZERLAND
BELGIUM
TAIWAN
ITALY
FRANCE
GERMANY
GERMANY
ITALY
GERMANY
ITALY
CHINA
TAIWAN
NETHERLANDS
ITALY

ENDO Linear Modules & Actuators

High-precision, stable, and project-specific linear motion solutions manufactured in-house.

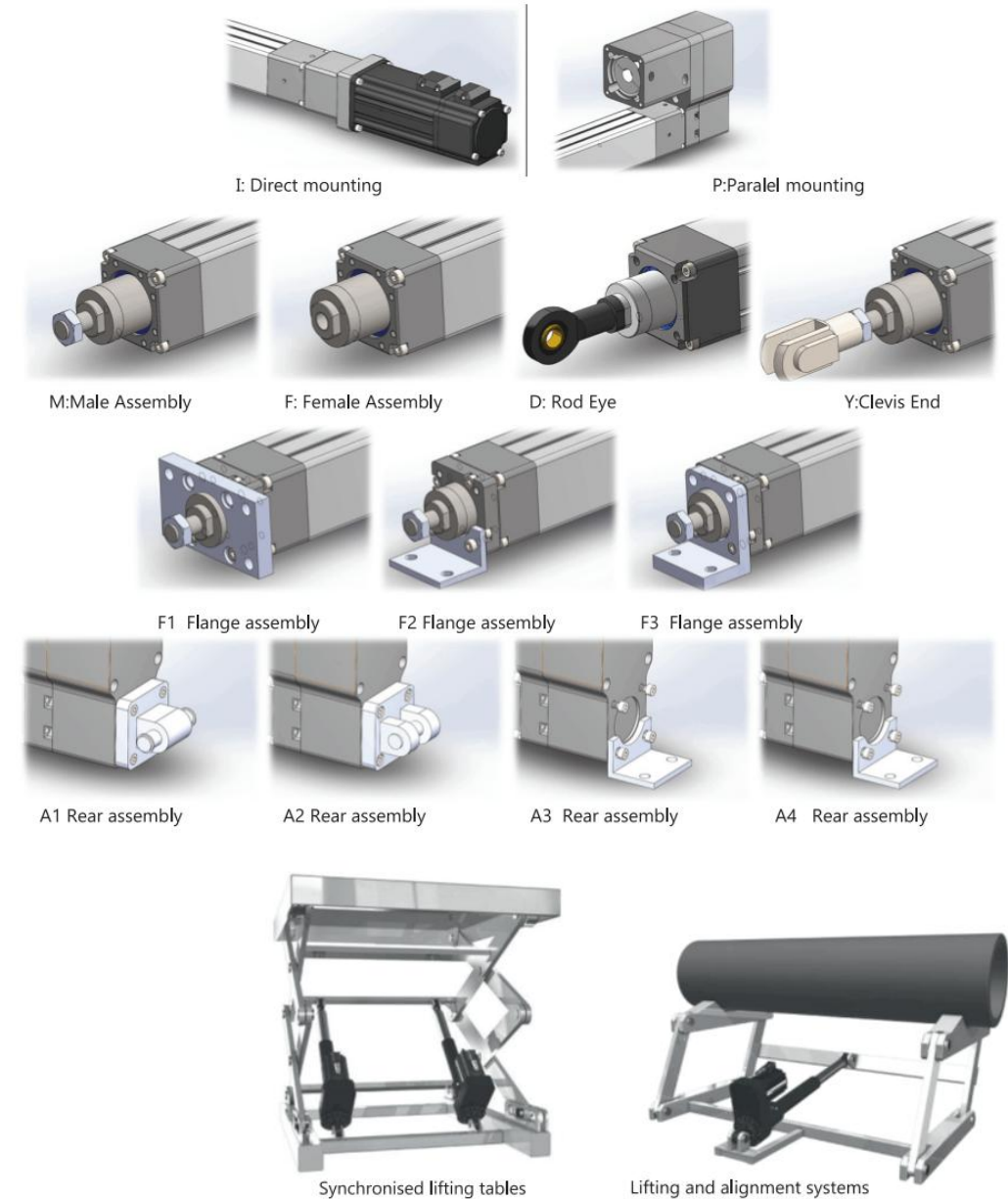
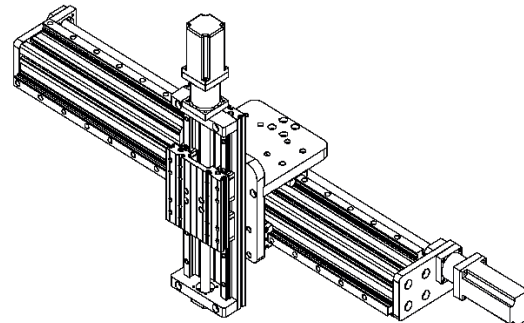
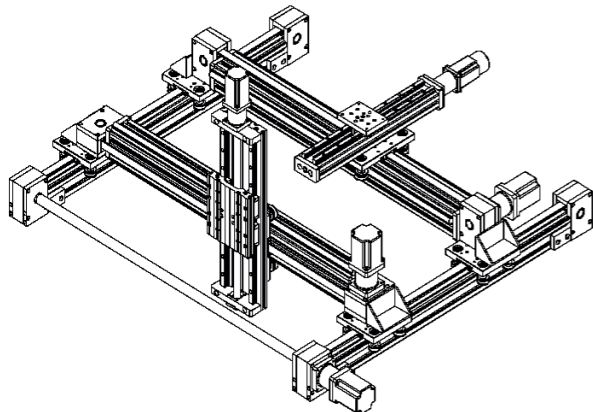


EMS	ELECTROMECHANICAL CYLINDER
EMV	SCREW-DRIVEN AXIS
EMZ	BELT-AND-PULY-DRIVEN Z AXIS
EMTT	GRIPPER-HOLDER AXIS
EMTT	BELT-AND-PULY-DRIVEN AXIS
EMK	RACK-AND-PINION-DRIVEN AXIS

ENDO Linear Modules & Actuators

Product Advantages

- Manufacturing to International Standards & High Quality
- Rapid Production with Optimized Manufacturing Processes
- On-Time Delivery with Short Lead Times
- A Wide Range of Customization Options Tailored to Your Requirements
- Plug & Play, Integrated System Solution



Siemens Automation Products



Other Automation Products



Panasonic



Our Brands and Product Groups

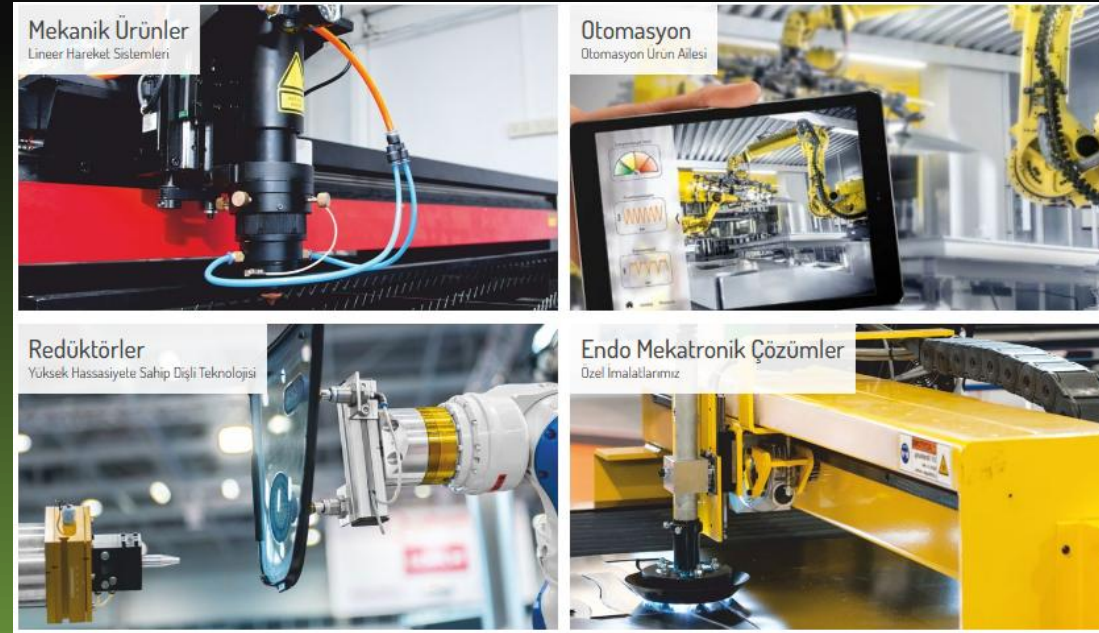
BRAND	PRODUCT GROUP
APEX DYNAMICS	Planetary Gearboxes
NABTESCO	Cycloidal Gearboxes
DYNABOX	Shaft Mounted Gearboxes
SCHAEFFLER	Special Linear Guideways, Rotary Tables, Rotary Actuators, Linear Actuators, Linear Guides and Bearings, Ball Screws etc. Linear Motion Products
CPC CHIEFTEK	Special Linear Guideways, Miniature Robots, Multi-Axis Linear Motion Tables
THOMSON	All Kinds of Ball Screws, Linear Actuators, Linear Actuators, Screw Jacks, Telescopic Ball Screws
STEINMEYER	All Kinds of Heavy Duty Ball Screws Products
WMH HERION	Rack and Pinion, Trapezoidal Screw, All Special Gear Production; Straight Bevel Gear, Spiral Bevel Gear, Spur Gear etc.
ZUAZO	All Kinds of Heavy Duty Ball Screws Products
YYC - YUAN YI CHANG	Rack and Pinion, Rack, Gear Rack, All Special Gear Production
SERVOMECH SPA	Acme Screw Jacks, Ball Screw Jacks, Mechanical Linear Actuators, Electromechanical Cylinders
LINEARMECH SRL	Actuators, Electromechanical Servo Actuators, Electromechanical Cylinders
DLS SCHMIERSYSTEME	Lubrication Systems
MOOG	Slip Ring, Roller Screw, Brushless Servo Motors, Brushless DC Motors, Servo Motors and Actuators, Hexapod Positioning Systems
NEXEN GROUP	Linear Systems, Torque Limiters, Backlash-Free Rotary Pinion and Rack Systems
ALULINEARTECHNIK	Linear Rail Systems
SIT SPA	All Kinds of Gear Products, Taper Bushings, Heavy Duty Hubs, Couplings
CHAMBRELAN	All Kinds of Telescopic Slides
GMT GLOBAL Inc.	7000 series special ball screws, all kinds of precision ball screws, linear guideways, linear bearings, telescopic ball screws, rack and pinion systems

BRAND	PRODUCT GROUP
ELESA GANTER	All kinds of industrial machine elements; handwheels, knobs, handles, hinges, leveling feet, clamps, vibration dampers and conveyor components etc.
PNEUMAX	All Pneumatic Automation Products
ROSE SYSTEMTECHNIK	Industrial Panels, Operating Control Consoles and Pallet Systems (Ex) Control Enclosures
NB LINEAR SYSTEM	Linear Guideways, Linear Bearings, Linear Linear Motion Tables
HELIX Linear	Hybrid Linear Actuators, High Precision Linear Actuators, Miniature Trapezoidal Screws and Ball Screws Products
ENIDINE	All Shock Absorber Products and Air Springs
HEMA GROUP	Linear and Protective Systems, Manual Positioning Systems, Pneumatic Positioning Systems, LED Lighting Systems, Safety Viewing Windows
CEME	All Kinds of Control Elements
ZD MOTOR	AC/DC Geared Motor Sets, BLDC Geared Motor Sets, Brushless DC Geared Motor Sets
SFT	Rotary Tables and Gonio Way Products, Manual Positioning Tables
THOMAS REGOUT	Telescopic Slides
SIEMENS	All Servo Motors, Drives and Automation group components
ESTUN	All Servo Motors, Drives and Automation group components
PANASONIC	All Servo Motors, Drives and Automation group components
AUTONICS	Sensor and Control Technology Products
PROMAX MOTION	CNC Control Units
FULLING MOTOR	Step Motors and Drivers, Servo Motors, Brushless Motors
TECNOTION	Linear Servo Motor Products
SINADRIVES	Linear Servo Motor Products
ENDO HANDWHEEL	CNC Handwheel

REFERENCES



THANK YOU FOR YOUR VALUABLE TIME AND INTEREST



To access product links: <https://www.endo.com.tr/tr/#categories>

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