LinMot Product Brochure

V2023 NOV

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NTI AG is a renowned worldwide producer of tubular-style linear motors and linear motor systems. The company specializes in the advancement, manufacturing, and distribution of high-quality linear direct drives for industrial applications. Initially established in 1993 as part of the Sulzer Group, NTI AG has been operating independently since 2000. Their product lineup includes the globally recognized brands LinMot® for industrial linear motors and MagSpring® for magnetic springs. NTI AG supplies the products in 80 countries worldwide.

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1.1 Linear Motors

Tubular linear motors made by LinMot are of very high quality and efficiency. With such great efficiency, less heat is produced and position precision is improved. The unmatched force density is achieved by the simple, clean tubular design, which also reduces the footprint. Contrary to typical drive solutions, LinMot solutions don't need any mechanical transmission elements, which simplifies the design while lowering wear to nearly nothing and so minimising maintenance. Since they move with such accuracy, smoothness, quietness, and great dynamic range, LinMot motors are the best choice for practically all applications and industries.

1.1.1 Series P01

Selection Parameters

Parameters	Min	Max
Max.Stroke	1830 mm	1860 mm
Force	29-255 N	44-1024 N
Nominal Force	13-68 N	11-354 N
Stator Length	90 mm	409 mm
Peak Velocity	6.9	8.2

Industries it caters to

- Food and Beverage
- Pharmaceutical
- Automation and Robotics
- Packaging and Printing

Product Application

- Zellwag AG filling and sealing
- CNC
- Pick and Place
- Plastic injection molding
- Wood processing
- Glass processing

The LinMot P01 linear motors have integrated position measuring and over-load protection. They are permanently operated ironless synchronous servo motors. Direct generation of the linear motion is accomplished by the slider's strong rare-earth magnets and the stator's windings.

1.1.2 Series P10 – 3x400VAC

Selection Parameters

Parameters	Min	Max
Max.Stroke	1770 mm	2240 mm
Force	892 N	2720 N
Nominal Force	278 N	68-914 N
Stator Length	180-500 mm	222-402 mm
Peak Velocity	7.4 m/s	11.1 m/s

Industries it caters to

- Aerospace and Defence
- Textile and Printing
- Food and Beverages
- Medical and Pharmaceutical

Product Application

- Printing Presses
- Zellwag AG filling and sealing
- Packaging and Labeling
- Wood processing
- Glass processing
- Ceramic processing

The strongest LinMot motors for dynamic linear motions. They employ a 3x400VAC technology, which enables the motors to be more readily incorporated into the machine and used as a component. The P10 series has been purposefully outfitted with common encoders and temperature signals that can be read by almost all external drives.

1.1 Linear Motors (continued)

1.1.3 Stainless Steel

Selection Parameters

Parameters	Min	Max
Max.Stroke	780 mm	1530 mm
Force	67.1 N	2180 N
Velocity	2.3 m/s	7.3 m/s

Industries it caters to

- Marine and Offshore
- Medical and Pharmaceutical
- Food
- Automation

Product Application

- Pick and Place
- Vertical Slicer for Roast Meat Flexible filling and closing
- VX-8 machine
- Wood processing
- Glass processing
- Ceramic processing

The small LinMot SSC linear motors are constructed of stainless steel EN 1.4404/AISI 316 and were designed for harsh environments. The emphasis during this motor family's production was on hygienic design. The motors are made without extra edges, corners, holes, and screw connections to prevent the buildup of dirt, Because the linear motors' windings are completely coated in epoxy resin, the copper filling and the stator package are shielded from moisture and corrosion.

1.1.4 Explosion Proof

Selection Parameters

Parameters	Min	Max
Max.Stroke	860 mm	980 mm
Force	310 N	721 N
Continuous Force	65/-/175 N	139/-/389 N
Velocity	2.3 m/s	3.4 m/s

Industries it caters to

- Oil and Gas
- Chemical
- Petrochemical and Pharmaceutical

Product Application

- Printing Presses
- Zellwag AG filling and sealing
- Packaging and Labeling
- Wood processing
- Glass processing
- Ceramic processing

Special electric drives are necessary in environments where explosive gases, vapor-air mixtures, or combustible dust can occur. For these unique circumstances, the linear motor LinMot ATEX was created.

1.1 Linear Motors (continued)

1.1.5 With integrated Drive

Selection Parameters

Parameters	Min	Max
Max. Stroke	40 mm	400 mm
Peak Force		255 N
Nominal Voltage Power		72 VDC
Nominal Voltage Signal		24 VDC
Nominal Current Signal		150 mA

Industries it caters to

- Automation
- Robotics
- Printing and Packaging

Product Application

- CNC
- Packaging
- Material Handling
- Automated

The integrated drive plus a small linear motor make up the PD03 drive unit. With the help of this ground-breaking idea, the controller for linear direct drives may be removed from the electrical enclosure, significantly decreasing the time and effort required for installation. Additionally, this creates the opportunity to join numerous devices together efficiently using a daisy chain. Modular machine designs can simply be implemented using this new generation of motors.

1.2 Linear Modules And Guides

LinMot linear modules and guides are precise, ready-to-install linear systems that use little installation space and are energy-efficient. These solutions support external forces, torques, and bending moments while providing excellent guiding precision, enabling dynamic and precise load positioning. The product line includes the necessary stroke lengths and different strength classes to ensure millions of exact load adjustments. There are numerous sizes, endless stroke lengths, and other variations accessible between the linear modules and guides.

1.2.1 Modules DM01

Selection Parameters

Parameters	Min	Max
Max. Stroke	60 mm	575 mm
Force	67 N	572 N
Total weight	1039 g	12483 g
Carriage length L	210 mm	818 mm

Industries it caters to

- Industrial Automation
- Robotics
- Printing and Packaging Semiconductor

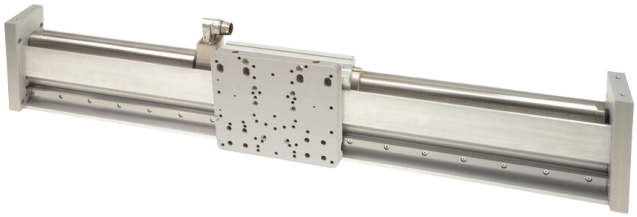
Product Application

- Kraft VPS100
- PARO-Blitz
- Assembly
- CNC
- Material Handling

The DM01 linear modules are complete drive solutions consisting of linear guide and firmly integrated LinMot stators and optionally built-in “magnetic springs” MagSpring and a pneumatic holding brake.

1.2 Linear Modules And Guides (continued)

1.2.2 F01/E01 – Moving Stator



Selection Parameters

Parameters	Min	Max
Module Size	37	48
Max. Stroke	80 mm	2235 mm
Force	128 N	1020 N
Total Length	330 mm	2490 mm

Industries it caters to

- Packaging
- Electronics
- Laboratory Automation
- Food processing
- Automotive

Product Application

- Printing
- Packaging
- CNC
- Inspection
- Industrial Robots

The LinMot FM01 and EM01 modules use linear tubular motors in moving stator applications. Up to two high-precision profile rail modules are linked to a specific aluminium profile, which serves as the foundation for the mechanical structure. Ball bearings in the carriages ensure dependable and error-free operation as well as the absorption of outside stresses, torques, and bending moments. These solutions enable precise and dynamic load positioning and have great guiding accuracy.

1.2.3 Modules P04

Selection Parameters

Parameters	Min	Max
Max. Stroke	80 mm	150 mm
Peak Force	255 N	572 N
Continuous Force	63 N	190 N
Max. Velocity	2.9 m/s	3.8 m/s
Length	355.3 mm	567.5 mm

Industries it caters to

- Semiconductor
- Electronics
- Printing and Paper
- Medical

Product Application

- Packaging
- CNC
- Printing and Paper Handling
- Pick and place System

The P04 actuator can be equipped with the mechanical accessories known from pneumatics. This makes the replacement of pneumatics even easier, as all mounting options known from pneumatics can be realized. With its free positionability and accelerations of up to 50 m/s2, dynamic and precise movements are the main discipline of this motor type.

1.2 Linear Modules And Guides (continued)

1.2.4 Modules Stainless Steel

Selection Parameters

Parameters	Min	Max
Max. Stroke	75 mm	975 mm
Peak Force	128 N	477 N
Continuous Force	58 N	139 N

Industries it caters to

- Pharmaceutical
- Food processing
- Automation and Robotics

Product Application

- Valka's grading and sorting

The stainless steel linear modules SM01 and SM02 are full drive systems made up of linear guides with built-in LinMot linear motors and optionally attached vertical load-compensating devices called "MagSpring." The modules were created especially for uses in the food or pharmaceutical industries that call for stainless steel products with a high level of protection.

1.2.5 Modules P04

Selection Parameters

Parameters	Min	Max
Max. Stroke	60 mm	530 mm
Peak Force	67 N	2720 N
Continuous Force	14/23	400/610/1100 N
Max. Velocity	3.8 m/s	9.9 m/s
Length	205.5 mm	1010 mm

Industries it caters to

- Food and Beverage
- Pharmaceutical
- Automation and Robotics
- Automotive
- Printing and Paper Handling

Product Application

- Printing
- Packaging
- CNC
- AGVs
- Industrial Robots

LinMot linear guides are small guide units with built-in ball bushings or bearings for the LinMot linear motors. To handle outside forces, torques, and bending moments, the guides use load bearings. The linear guides also function as an anti-twist mechanism. They enable the load to be dynamically and precisely positioned and offer high-precision steering.

1.3 Linear Rotary motors

LinMot's linear rotary motors are renowned for their exceptional flexibility, dynamics, and speed, setting them apart in the industry. These motors ingeniously combine two electromagnetic servo motors within a compact housing, enabling seamless integration of linear and rotary movements with utmost ease. With their near-zero wear characteristics, these modules offer outstanding durability and reliability. Additionally, LinMot provides customization options to tailor the motors to specific requirements, ensuring optimal performance for diverse applications. The availability of these motors is notably remarkable. LinMot offers two distinct series of linear rotary motors, providing customers with a range of choices to meet their unique needs and preferences.

1.3.1 Series PR01

Selection Parameters

Parameters	Min	Max
Peak Velocity	3.9m/s	3.9m/s
Peak torque	1.5m/s2	8.9m/s2
Max. num of rev.	1000rpm	1500rpm

Industries it caters to

- Food and Beverage
- Pharmaceutical
- Automation and Robotics

Product Application

- Assembly
- Packaging/Capping
- Milk and Icecream Packing

The PR01 product family combines a linear and a rotary motor in just one housing. The two electromagnetic servo motors are built in series and thus enable the installation of this machine element in the smallest possible footprint. Numerous options such as the MagSpring load compensation, pneumatic brake, emergency rail kit and wiper can be added to the module.

1.3.2 Series PR02

Selection Parameters

Parameters	Min	Max
Peak Velocity	2.9m/s	7.3m/s
Peak torque	1.2m/s2	10m/s2
Max. num of rev.	1000rpm	1500rpm

Industries it caters to

- Pharmaceutical
- Food processing
- Automation and Robotics

Product Application

- Assembly with optional Process Control
- Filling and Packing/Capping

The PR02 motor series is characterized by a design wherein the motors and additional components are integrated in a slim easy to clean housing. Options can be installed such as a hollow shaft, pneumatic pusher, a magnetic spring “MagSpring”, a torque sensor, and a force sensor.

1.4 MagSpring

MagSpring products can be best defined as "magnetic springs." Although they are referred to as springs, it is important to note that MagSpring components differ from traditional mechanical springs in terms of their force characteristics. Unlike mechanical springs where force increases with displacement, MagSpring components exert a constant force across their entire working range. This unique feature makes MagSprings highly suitable for compensating weight forces in vertical drive arrangements.

1.4.1 Magspring Stators

Selection Parameters

Parameters	Min	Max
Constant Force	11 N	60 N
Stator mass	75g	2200g
Slider mass	75g	420g

Industries it caters to

- Packaging
- Medical and Laboratory Automation and food processing
- Automotive

Product Application

- Packing and Assembly
- Weight balancing (for other make motors also)

"Magnetic spring" is the best way to explain MagSpring products. However, the name "spring" must be taken to mean that MagSpring components produce a constant force throughout their entire operating range, as opposed to a mechanical spring, where the force often increases as a function of displacement. MagSprings are a great option for balancing weight forces in vertical drive systems because they produce a force that is independent of displacement.