NEW PRODUCTS

NEW
- Motor controller with Ethercat
- Nema 17 Plug & Drive Stepper motor
- Linear actuators 20 up to 56 mm

Powerful, modular and energy-efficient drive concepts for BLDC and stepper motors

From the economical 50 W motor PCB solutions for device engineering to flexible, freely programmable, bus-compatible controllers through to powerful, compact Plug & Drive motors in closed and open loop for decentralized drive solutions
The company

Nanotec Electronic GmbH & Co. KG has been a valued partner in the implementation of drive systems since 1991. These 20 years of experience are reflected in our products. Our motors and controllers are available in a wide range of options and provide the optimum solution for virtually all drive tasks.

With ingenious designs, observation of narrow production tolerances and strict quality control at all process stages, we ensure high quality and long-lasting drives. Innovative new developments take into account the demand for energy-efficient, compact and precisely positionable stepper and BLDC motors. Advanced software technologies provide platform-independence and guarantee easy integration of our motors and control systems. A strong focus on research & development guarantees products that will continue to meet our customers’ needs in the future.

Certification to the latest ISO 9001:2008 standard by the TÜV Management Service, in addition to conformity with standards and regulations, is testament to the consistent customer orientation of our processes as well as our efforts to achieve continuous improvement of internal and external workflows.

Our vision: quality, innovation, reliability – and individuality

The requirements placed on a drive solution are many and varied. Only rarely can a standard motor or power electronics be used “out of the box” without any additional modifications to achieve the optimal result. This is precisely why we offer customized versions of our motors at relatively small order volumes. Our engineers develop the optimal mechanical and electrical design of a customized solution on request. Thanks to assembly at our production sites in Germany, and a comprehensive range of components kept in stock, we are able to respond quickly and flexibly to customer requirements.

Low-cost products thanks to high-end production

Series production of our drives is carried out by our subsidiary company Nanotec ChangZhou in China, and by a joint venture company also located there. Thanks to our 20 years of experience in motor production in Asia, we place the greatest emphasis on quality assurance. Since 2008, we test samples of mechanical components on a Zeiss 3D coordinate measuring machine. For the final inspection of motors, at many stages of the testing equipment developed in-house, e.g. for testing counter-electromotive force or the axial play of the motors. High quality factory equipment and in-depth staff training results in stable processes and a high vertical range of manufacture.

Example application: Output and size require a PD6-N Plug & Drive stepped motor from Nanotec

Joke with the mini-BagBoy for the first time without servomotor or pneumatics

Devices and machines for film sealing is the domain of joke Flörschschwelltechnik GmbH. With a new machine for smaller runs, the need was to cover the lower output range. "1000 plastic bags are expensive, 100,000 are cheap", explains Norbert Schumacher, Technical Manager at the company based in Bergisch-Gladbach, Germany. Bags are often required in different sizes. The desire for a small automated device has been noted, particularly from the automotive and semi-conductor industries and from the medical technology sector.

The search was on for stepper motors with the same functionality, recalls Schumacher, who was in charge of the development project. Two drives per machine were to ensure precise positioning accuracy and the speed to produce bags to the exact length. There was a hitch in this tried and tested solution, however: It was not compact enough for the planned size of the mini-BagBoy 400.

"The search was on for stepper motors with the same functionality", recalls Schumacher, who was in charge of the development project. "Two drives per machine were to ensure precise functioning for the bag length and a straight cut. One drive actuates the feed roller and controls the feed length corresponding to the bag length. The second stepper motor is required for the cutting and welding equipment. Joke uses the pulse welding process in all devices, where the sealing bar moves downwards simultaneously with the cutting movement of the top blade. In the lower position, the bag is then sealed against a rubber plate. After cutting, the bags drop onto a delivery table. Here the drive generates an entire working stroke with one rotation. The advantage of stepper motors is the optimal interplay between the feed and lifting movement that can be accurately coordinated with speed optimisation", according to the Project Manager.

All parameters, including stroke length, number of cycles, sealing cooling time, item quantities, etc. are entered via a touchscreen, and the system is controlled by an ST7 interface. As the length is set in millimetres, but the drive uses increments for its calculations, the millimetre measurements are converted into the required number of steps and forwarded to the drive control.

Following a comprehensive evaluation process, the choice was made in favor of the Plug & Drive motors from Nanotec Electronic. The combination of stepper motor with integrated controller met Joke’s requirements for a compact solution. After all, the mini-BagBoy is small enough to fit on any workbench or work table.

Two motors of model number PD6-N8918M9504, size 86, are now in use in every mini-BagBoy 400. With a length of 121 mm, the dimensions were correct and the holding torque of 0.9 N was right. They also impressed in terms of price, quality and performance.

The mini-BagBoy can produce bags with a film width between 400 and 600 mm and lengths of between 15 and 4000 mm and more, including on multiple tracks. "The machine is ideal for manufacturing small runs of different bag sizes at low-cost", confirms the Project Manager. Customers have found exactly the same thing, and several machines have already been sold.

Sheet rolls are clamped, rolled out to the required length, cut and welded with a base seam at the same time. All standard devices from Joke work in this way. This is why the decision in favor of drive components is clear: Servomotors with motion control, as used in all motors in the large range from the renowned manufacturer. They provided the positioning accuracy and the speed to produce bags to the exact length. There was a hitch in this tried and tested solution, however: It was not compact enough for the planned size of the mini-BagBoy 400.

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Nanotec Closed Loop technology

Closed loop-compatible stepper motors combine the advantages of stepper and servomotor technology. They run more quietly and have a lower resonance than stepper motors, provide position feedback and control, short settling times, and avoid step loss entirely. They represent an alternative to the stepper motor where energy efficiency, quiet operation and load tolerance are required.

In contrast to servo-motors, they offer the advantages of high torque at low speeds, short settling times, correct positioning with no oscillation and a lower price, often with a smaller size.

What is Closed Loop?

Sinusoidal commutation via encoder with field-oriented control is referred to as a closed loop process. Through the encoder, the rotor position is recorded and sinusoidal phase currents are generated in the motor coils. The vector control of the magnetic field ensures that the stator magnetic field is vertical to the rotor magnetic field and the field strength corresponds closely to the required torque. The regulated current level in the coils provide even motor force and result in an especially quiet-running motor that can be accurately regulated.

True / Pseudo Closed Loop

There are stepper motors that do add the closed loop flag and work with encoders, but offer no field-oriented, sinusoidal current control. These motors are just referred to as closed loop, but are not accurately regulated.

Advantages over standard stepper motors

Step motors are used where fixed positions are to be run. The traditional step motor transfers electrical energy into precise mechanical movements, as long as the motor torque is not exceeded. As there is no position feedback and control loop, the motor losses steps if unexpected load changes or resonance occur, and no longer moves to the required position. In these circumstances, the closed loop stepper motor can re-regulate, and reliably reaches the specified position. The open control circuit means that the standard stepper motor is always operated with the same current regardless of the load and therefore becomes relatively hot in many applications. Via the current control in the closed loop, the current level is adjusted for the required torque; no unnecessary heat loss is produced, and the energy consumption is reduced accordingly.

Advantages over servo-motors

Closed loop stepper motors from Nanotec represent an alternative to servos in many cases, such as winding applications or conveyor belt drives. The torque can also be accurately controlled in addition to the speed and position. This means that not only the maximum torque, highest level of efficiency and optimum dynamics is achieved, but also the lowest torque fluctuation and exceptionally quiet running.

Applications for closed loop systems:

- Dosing pumps, filler systems, semi-conductor mounting, wafer production, industrial sewing machines, and more.
- Textile machines, robotics, test and optical inspection systems, tape and belt drives, general multi-axis applications and applications requiring quiet operation, short transient recovery times or accurate positioning.

SMCI - external stepper motor controller with integrated positioning control, closed loop-compatible

<table>
<thead>
<tr>
<th>Model</th>
<th>Max. voltage / current (eff.)</th>
<th>Nominal current (eff.)</th>
<th>Interface</th>
<th>Motor type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMCI12</td>
<td>24 V / 2.7 A</td>
<td>1.8 A</td>
<td>RS485/USB</td>
<td>Stepper motor</td>
</tr>
<tr>
<td>SMCP33</td>
<td>48 V / 4.2 A</td>
<td>2 A / 4 A with</td>
<td>RS22/RS485/USB</td>
<td>Stepper motor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>without heat sink</td>
<td></td>
<td>BLDC motor</td>
</tr>
<tr>
<td>SMCI35</td>
<td>48 V / 6 A</td>
<td>6 A</td>
<td>RS485/USB CANopen</td>
<td>Stepper motor</td>
</tr>
<tr>
<td>SMCI36</td>
<td>72 V / 9 A</td>
<td>2 A</td>
<td>RS485/USB CANopen</td>
<td>BLDC motor</td>
</tr>
<tr>
<td>SMCI33</td>
<td>48 V / 3 A</td>
<td>7 A</td>
<td>RS485/USB</td>
<td>Stepper motor</td>
</tr>
<tr>
<td>SMCI47-S</td>
<td>48 V / 10.5 A</td>
<td></td>
<td>RS485/USB CANopen</td>
<td>Stepper motor</td>
</tr>
</tbody>
</table>

Price example for SMCI33: 1 pcs.: € 149.90 / Unit price from 25 pcs.: € 127.42

- **SMCI** is not closed loop compatible
- RS485/USB: CANopen

Simple commissioning and parameterization with NanoPro and NanoCAN

Via USB or the serial interface (or via a CAN converter from the manufacturers Ixxat or Peak for CANopen), all controls and Plug & Drive motors can be quickly and easily parameterized and tested using the two free software tools NanoPro and NanoCAN (using the example of NanoPro below):

Start preset record 1 (relative positioning) with standard parameters (relative positioning, speed, ramp, etc..) to test if the motor is correctly connected.

Optimise motor running for the application, e.g. in speed mode with different start/nominal speeds, ramps and motor currents, open and closed loop.

Select the relevant operation mode for the application (e.g. absolute positioning, speed control via analog input, torque, etc.) and save the parameters to the controller.

The connected control is identified automatically, and default values can be loaded for different motors. All motor-related parameters such as max. current level, current reduction, stepping mode, etc. can be parameterized here easily.

For the digital control inputs, the switching states (pos./neg. signal edge) can be defined and the debounce time with contact-dependent inputs. The function of the inputs, e.g. release, reference switch, start, quickstop, record selection can also be set here. The voltage threshold values of the analog input can be parameterized here, as well as filtering and a dead area to prevent oscillation around the zero position for joystick applications.

A closed loop wizard determines the necessary motor and encoder parameters for the closed loop control. An automatic calibration run is used to determine the load angle values.

Via autotuning and the option of manual adjustment of the PID parameters, the control loop can then be optimized further.

Simple changeover between open and closed loop operation to compare the running characteristics, performance, adjustment times, etc..
Plug & Drive stepper motors with integrated motor control

The Plug & Drive motors provide the same features as with our external controllers, but with encoders integrated directly into the motor. In comparison to a solution with an external controller, a large part of the wiring work is no longer required as only the supply voltage and the field bus interface need to be wired as a minimum. The option to connect other sensors and actuators to the additional inputs and outputs makes the decentralized automation solution even easier to use. The signals can be laid and outputs can be easily tested and monitored thanks to the additional LEDs and switches. At the same time, the signals can be laid and the field bus interface need to be wired as a minimum. The option to connect other sensors and actuators to the additional inputs.

The Plug & Drive stepper motors with integrated motor control

In comparison to a solution with an external controller, a large part of the wiring work is no longer required as only the supply voltage and the field bus interface need to be wired as a minimum. The option to connect other sensors and actuators to the additional inputs and outputs can be easily tested and monitored thanks to the additional LEDs and switches. At the same time, the signals can be laid and outputs can be freely configured for additional functions (e.g., reference switch, index for synchronous run, enable).

Holding torque

<table>
<thead>
<tr>
<th>Model</th>
<th>PD2-O4118</th>
<th>PD2-N4118</th>
<th>PD4-N5918</th>
<th>PD4-N5918IP65</th>
<th>PD6-N8918</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>42 mm</td>
<td>42 mm</td>
<td>56 mm</td>
<td>56 mm</td>
<td>86 mm</td>
</tr>
<tr>
<td>Max. voltage</td>
<td>24 V</td>
<td>48 V</td>
<td>48 V</td>
<td>48 V</td>
<td>48 V</td>
</tr>
<tr>
<td>Interface</td>
<td>RS485 CANopen</td>
<td>RS485 CANopen</td>
<td>RS485 CANopen</td>
<td>RS485 CANopen</td>
<td>RS485 CANopen</td>
</tr>
<tr>
<td>Holding torque</td>
<td>0.2 – 0.5 Nm</td>
<td>0.2 – 0.5 Nm</td>
<td>0.5-3 Nm</td>
<td>0.5-3 Nm</td>
<td>3.2 -9.3 Nm</td>
</tr>
</tbody>
</table>

Price example for PD4-N5918L4204: 1 pcs. €219.90 / Unit price from 25 pcs. €186.92

PD2-N4118

The Plug & Drive stepper motor in 42 size and 50 Ncm holding torque

Based on PD-N motor range

With RS485 or CANopen interface

Singleturn absolute encoder (12 bit resolution) for immediate operation in Closed Loop mode, no reference run

Available soon in an IP65 version with M12 plugs

ZIB2 start-up PCB

Commissioning the Nanotec controls and Plug & Drive motors is even easier with the new ZIB2 PCB. The functions of the digital inputs and outputs can be easily tested and monitored thanks to the additional LEDs and switches. At the same time, the signals can be laid via the clamp support directly onto the external sensors and actuators. It is also possible to connect a second PCB with permanently wired RS485 network and other terminals for the VOs on four motors via a flat ribbon cable.

NanoPro - flexible control via software configuration

Clock & direction

- Microstep up to 128th increment
- Automatic sinusoidal step multiplication/microstep emulation, so that older, high-level controls that output only full or half steps can also be used to produce quiet running at low speeds and good running properties of the microstep (ideal for CNC applications)

Control via digital and analog inputs

- Up to 16 movement runs (position or speed profiles) with trapezoidal or S-ramp can be stored on the control and selected, started and stopped via digital inputs
- The speed, position or torque can also be controlled via the analog input
- Inputs can be freely configured for additional functions (e.g., reference switch, index for synchronous run, enable)

Control via field bus

- Open protocol via RS232/RS485 with adjustable baud rate 9.6-115Kbps
- Standard protocol conforming to CANopen/DS402 via CAN-Bus

Sequential control with Nano

- Java-based programming language, programs run autonomously (without a PC) on the Plug & Drive motor
- Access to all control parameters and inputs/outputs
- Variables, branches, loops, logical and mathematical functions
- Programs can be stored via RS485/USB on the control

Multi-axis applications with CoDeSys and CANopen Interpolated Mode

Via the interpolated mode conforming to the CANopen standard DS402 it is possible to actuate Nanotec stepper motor controls or Plug & Drive motors directly via path controls with CANopen interface. For example, for the SoftPLC CoDeSys V3 SoftMotion from the company JS-Smart Software Solutions GmbH there is a ready-made driver available for easy integration of the controller.

For the production of our protection rating motors, it is necessary to spray sealant onto the covers. Due to the large number of variations depending on the motor size, or a customized design, the sprayed-on sealant shape must be easy to change in production. To automate this process, we have used our own Plug & Drive motors with CoDeSys. Two PD4-N5918 Plug & Drive motors move the dosing head on the track specified by the SoftPLC via toothed belt axes. Via the simple import of the contours from our CAD system, production staff can produce new seal contours without knowledge of PLC programming.

Integrating the Nanotec controls into CoDeSys

After installing the SoftPLC, in our case onto an industrial PC, the library provided is first installed for the Nanotec-CANopen drives. Both motors can then simply be added via the EDS (Electronic Datasheet) for the Plug & Drive motors and configured via the CAN-Bus.
New encoders for closed loop applications: NOE1 and NME4096

In addition to the motor and a good controller in software and hardware, the encoder is the third essential component for closed loop applications. Two newly developed encoder types now allow the field of closed loop technology to be extended to other applications.

**Optical encoder - NOE1 series**

The optical, 3-channel miniature encoder NOE1, with dimensions of just 20x26 mm and a depth of 10 mm can also be used for the smallest stepper and BLDC motors in our product range. With a resolution of up to 2000 pulses per rotation (6000 increments with quadrature), this produces a resolution of 40 increments per full step from a 1.8° stepper motor. This makes operation with very even running possible even at low speeds. Thanks to their high level of accuracy, optical encoders are ideal for applications where high positioning precision is required. The line driver for greater interference immunity is already integrated into the small housing.

**Magnetic encoder NME4096**

The magnetic encoder NME4096 has been specially developed for integration into IP-protected and Plug & Drive motors. Its dimensions are considerably smaller than those of an optical encoder. In addition to the incremental signals with 1024 pulses per rotation, the encoder generates the three hall channels for BLDC commutation internally from the same signal and once per rotation, an index pulse for referencing.

The reference signal is issued absolutely synchronously with the hall phase and therefore also supports the positioning accuracy. The generation of the hall signals from the encoder not only reduces the number of components, increasing the reliability level, but also provides greater accuracy in the phase distance of the hall signals than would normally be provided with individual hall sensors. In addition to 5 V signals, the NME4096 is also available in a version with 24 V line driver.

**NanoIP**

On every motor controller there is a Web server running, which is accessed via the browser based interface NanoIP.

- Easy access to the compact ObjectDictionary for parameterization of the drive, simple autotuning with integrated scope for analyzing the control behavior
- Custom interfaces, e.g. with reduced configuration options for the machine operator, can be easily created by changing the HTML source code of NanoIP and loaded via NanoIP into a subdirectory of the control
- NanoIP programs can be imported and started on the control. On the N10, the speed of NanoIP is increased greatly so that there is a response to time-critical signals from inputs within 2 ms

**N10 - the ideal motor control for field bus operation**

Based on our current controller generation, but with even faster hardware and a new software concept, the N10 is the first controller designed entirely for Ethernet and field bus operation. Parameterization is no longer carried out via Windows software; instead we have created a browser-based interface with NanoIP that makes the parameterization process platform-independent and that can be easily modified by the customers for their applications.

- Up to 80 V and 10 or 20 A continuous current depending on model
- For stepper motors and BLDC motors
- Standard Ethernet connection for parameterization with NanoIP
- Depending on the field bus module, either two Ethercat or CANopen interfaces
- 2 x 5-24 V inputs, 6 x 24 V inputs, 2 analog inputs - 10...+10 V, 4 switching outputs (up to 0.5 A)
- 2 Encoder inputs (one commutation, one optional external path regulation)
- Output for holding brake

**BLDC motors - 22 to 87 mm**

In the latest version, NanoPro and the corresponding firmware for our motor controllers with de/diveDrive also support the control of BLDC motors, both via hall sensors and via an encoder. Even if the motors are only operated with hall sensors, it is not basic block commutation that is used; instead the windings are sinusoidally commutated by interpolation of the hall signals. The motor configuration is carried out just as easily as the actuation of a stepper motor previously. After selecting the motor type, the continuous current and the peak current can be set. The controller also provides the option of current limit (50%)

The benefits to you, at a glance

- Significantly greater efficiency and greater power density than with induction motors (with the same output with approx. 35% volume and weight reduction)
- Maximum service life expectation and quiet running in brushless technology with precision ball bearings
- Mechanically interchangeable with stepper motors, and hence less design work and fewer parts required
- Large selection of cost-effective components such as gears or encoders up to 1000 rpm for high-resolution positioning accuracy
- Simple speed control via integrated hall sensors – can be expanded with optional Nanotec encoder for a powerful servomotor for high speeds
- Special low-cost gears with ratios of 1:4 up to 1:256 are available as an option

**Price example for DB87L01-S : Nominal output 650 W • 3000 rpm**

<table>
<thead>
<tr>
<th>Model</th>
<th>DB22</th>
<th>DB28</th>
<th>DB42</th>
<th>DB57</th>
<th>DB87</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>22 mm</td>
<td>28 mm</td>
<td>42 mm</td>
<td>56 mm</td>
<td>87 mm</td>
</tr>
<tr>
<td>Nominal output</td>
<td>3.8-7.7 W</td>
<td>6-16 W</td>
<td>30-150 W</td>
<td>50-120 W</td>
<td>220-660 W</td>
</tr>
</tbody>
</table>

Price per 1 pcs.: € 206.90 / Unit price from 25 pcs.: € 144.83

**DB33**

The DB33 model is a compact BLDC motor with exceptionally quiet operation. With an optional encoder (assembly by Nanotec), the motor can be upgraded to be a EC servo.

- 4Q controller with sinusoidal commutation
- Flexible control via RS485, CANopen
- Digital or analog inputs
- Speed 3000 rpm
- Nominal output 7 W

**IP65-rated BLDC motor: ASB42**

The magnetic encoder NME4096 has been specially developed for integration into IP-protected and Plug & Drive motors. Its dimensions are considerably smaller than those of an optical encoder. In addition to the incremental signals with 1024 pulses per rotation, the encoder generates the three hall channels for BLDC commutation internally from the same signal and once per rotation, an index pulse for referencing.
Linear actuators and linear actuating drives - sizes 20 - 56 mm

The linear drives requiring stepper motors with a trapezoidal thread are available in three versions in all sizes:

**Linear actuator**

- A thread nut is integrated into the hollow motor shaft, that converts the rotation of the motor into a linear movement of the lead screw. The lead screw must be secured against rotation to achieve the linear movement.

**Linear actuator with guidance**

- The linear actuator lead screw is coupled here to a push rod that is guided linearly internally and thus secured against rotation.

**Linear actuating drive**

- The lead screw itself is fitted here on the motor shaft, a nut on the shaft executes the linear movement.

<table>
<thead>
<tr>
<th>Series</th>
<th>L(S)2018</th>
<th>L(S)2818</th>
<th>L(S)4118</th>
<th>L(S)5918</th>
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</thead>
<tbody>
<tr>
<td>Size</td>
<td>20 mm</td>
<td>28 mm</td>
<td>42 mm</td>
<td>56 mm</td>
</tr>
<tr>
<td>Max. force</td>
<td>40 N</td>
<td>80 N</td>
<td>400 N</td>
<td>1000 N</td>
</tr>
<tr>
<td>Lead screw pitch</td>
<td>1 mm</td>
<td>5 mm</td>
<td>1, 2, 5 mm</td>
<td>2 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.005</td>
<td>0.025</td>
<td>0.005-0.025</td>
<td>0.01</td>
</tr>
<tr>
<td>Optional encoder</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

Price example for L4118S1404-T6x2: 1 pcs.: € 69.90 / Unit price from 25 pcs.: € 48.93

Ultraflat stepper motor

With step angle 1.8°; <10 mm installation depth, 6 Ncm, 4000 rpm Ideal for stirrer or feeder applications where high precision is required despite small dimensions!

Price example for ST6318F1004: 1 pcs.: € 49.90 - Unit price from 25 pcs.: € 34.93

AS4118 and AS5918 now also with optional brake

The AS4118 and AS5918 series are now also available in a design with brake and encoder, in addition to the encoder version. The integrated holding brake can also ensure the position of the motor even when de-energized, which is especially important with Z-axes and safety-critical applications.

 Motors for tough ambient conditions Stepper motors in protection rating IP65

<table>
<thead>
<tr>
<th>Model</th>
<th>AS2818</th>
<th>AS4118</th>
<th>AS5918</th>
<th>AP8918</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>28 mm</td>
<td>42 mm</td>
<td>56 mm</td>
<td>86 mm</td>
</tr>
<tr>
<td>Holding torque</td>
<td>0.07-0.12 Nm</td>
<td>0.5 Nm</td>
<td>0.85-1.98 Nm</td>
<td>5.94-9.33 Nm</td>
</tr>
<tr>
<td>Optional encoder</td>
<td>-</td>
<td>yes</td>
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<td>yes</td>
</tr>
<tr>
<td>Optional brake</td>
<td>-</td>
<td>yes</td>
<td>yes</td>
<td>-</td>
</tr>
</tbody>
</table>

Price example for AS5918S2804: Length 73 mm, holding torque 85 Ncm: 1 pcs.: € 59.90 / Unit price from 25 pcs.: € 41.93

Linear actuators for tough ambient conditions

For series applications (over 100 units), we are also able to supply our linear actuators and linear actuating drives in protection rating IP65. In the variant with guidance, the linear shaft output can also be designed in IP

- Series L41, L59 with integrated encoder as an option
- Series LS9 with integrated PD4-N control as an option
- Guidance optionally with hall sensor as end position switch

Motor modules - Over 4000 options available from stock

From our extensive range of stepper motor and BLDC motors in many different sizes and windings, as well as a large range of accessories consisting of gears, safety brakes, optical encoders and other options such as vibration dampers, shaft couplings, connection cables, etc., we can build the optimal drive solution for you within a matter of days. Over 4000 possible combinations are possible with our modular stepper motor system.
Nanotec products are available both directly from us and via a worldwide network of sales partners. A current list of our sales partners can be found at http://en.nanotec.com/nanotec_kontakt.html

Our complete range of products can be found online, and a selection of these products is provided here.

- Minimum order quantities up to 25 units can be ordered directly via our website
- Diagrams drawn to scale are available as PDF, DWG, DXF or 3D – with no registration or long-winded searching – directly on the product page
- Torque characteristics of all motors for different operating voltages and controls
- Selection tool: Our stepper motor wizard will help you to find the right motor quickly
- Product configurator: The corresponding controllers and other options such as encoders, gears, safety brakes, etc. are displayed straight away. There is no time-consuming searching through different information to find the products that go together