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Nanotec











ENGINEERED FOR *MOTION*

HIGHLIGHTS 2027

Motor controllers for complex motion control systems

Nanotec's motor controllers combine advanced control and communication functions in a compact unit. Featuring high-performance hardware, intelligent control algorithms, and intuitive software, they offer reliable drive solutions for demanding applications. Supporting both stepper and BLDC motors, our controllers integrate easily with PLC environments and Industrial Ethernet systems, ensuring maximum precision and smooth, efficient operation.

Hardware

- **4-Quadrant control (4Q):** supports both stepper and BLDC motors
- **Digital I/Os:** 6 user-configurable inputs (5/24 V), 3 outputs (up to 100 mA), switchable via software
- **Analog inputs:** 2 inputs (0 - 24 V, 12-bit resolution), scalable and freely assignable
- **Brake output:** PWM-controlled output (up to 1.5 A) for direct control of a motor brake
- **Integrated brake chopper:** for internal energy recovery; optional external braking resistor (max. 6.5 A for 1 s)

Control features

- **FOC (Field-Oriented Control):** high-precision control for BLDC and stepper motors
- **Cascaded control structure:** multi-level control (position → speed → current)
- **Overload protection (I^2t):** prevents thermal overload of the motor
- **Sensor feedback:** supports various sensor types – including sensorless operation, Hall sensors, incremental or SSI encoders
- **Jerk-limited ramps:** minimize vibration during acceleration and deceleration

Software

- **Touch probe/capture input:** accurate position detection via trigger signals on digital inputs
- **Custom units:** define your own units (mm, °, rpm, etc.), including gear ratios and feed constants
- **Object memory:** stores all settings and parameters internally
- **NanoJ programming:** built-in real-time scripting language for custom logic, signal processing, and cross-bus applications
- **NanoLib:** platform-independent library for direct USB or fieldbus communication with full object access and control of operating modes using C++, C#, Python, and Java

Interfaces & fieldbuses

- **CANopen** (CiA 301/402): full support for PDO/SDO, SYNC, EMCY, Heartbeat, Node Guarding, and LSS
- **USB:** for parameterization, diagnostics, firmware updates, and NanoJ programming
- **Modbus RTU** (RS485, Slave): easily connects to PLC and industrial systems
- **EtherCAT, EtherNet/IP, Modbus TCP**, and **PROFINET:** seamless integration into Industrial Ethernet environment

N series

The **N series** motor controllers are designed for stepper motors from NEMA 14 to 34 and BLDC motors up to 80 mm/NEMA 34. Versions with Safe Torque Off (STO) and UL certification are available for applications with specific safety requirements. The controllers support standalone operation as well as closed-loop control with an encoder. The compact units can be easily programmed using the free Plug & Drive Studio software. An integrated brake chopper ensures efficient energy management and safe deceleration.

- **Operating voltage:** 12 - 57.6 V
- **Rated current:** 6 - 30 A, peak current 6 - 90 A
- **Fieldbuses:** CANopen, EtherCAT, EtherNet/IP, Modbus RTU (RS485), Modbus TCP, PROFINET
- **I/O:** 6 digital inputs, 2 analog inputs, 3 digital outputs, PWM brake output
- **Encoder interfaces:** SSI, incremental, Hall sensors
- **Operating modes:** Profile Position, Velocity, Torque, Homing, Interpolated Position, Cyclic Sync Modes, Step & Direction



CLC series

The **CLC series** delivers high performance in a compact package. Offered in three sizes, these controllers drive both BLDC and stepper motors (CLC15: BLDC only) and are perfectly suited for modern industrial applications. They can be quickly configured using Plug & Drive Studio and programmed with NanoJ, providing maximum flexibility and precise control.

- **Operating voltage:** 12 - 57.6 V
- **Rated current:** 3 - 15 A, peak current up to 45 A for 5 s
- **Fieldbuses:** CANopen, EtherCAT, Modbus RTU (RS485)
- **I/O:** 6 digital inputs, 2 analog inputs, 2 digital outputs, PWM brake output
- **Encoder interfaces:** SSI, incremental, Hall sensors
- **Operating modes:** Profile Position, Velocity, Torque, Homing, Interpolated Position, Cyclic Sync Modes, Step & Direction
- **Overload protection:** integrated I^2t protection and overtemperature shutdown above 75 °C



MOTOR CONTROLLERS

Motor controllers







	N5	C5-E/C5	New N series
Operating voltage	12 - 72 V (low current) 12 - 48 V (high current)	12 - 48 V/12 - 48 V	12 - 57.6 V (N10/15/30; N6 low current) 12 - 48 V (N6 high current)
Rated current	10 A (low current) 18 A (high current)	6 A (low current)/6 A 10 A (high current)/-	6 A (N6), 10 A (N10), 15 A (N15), 30 A (N30)
Peak current	10 A (low current) 40 A (high current)	6 A (low current)/6 A 30 A (high current)/-	6/18 A (N6 low/high current), 18 A (N10), 45 A (N15), 90 A (N30)
Interface	-	USB/USB	Micro USB
Fieldbus	CANopen, EtherCAT, EtherNet/IP, Modbus RTU (RS485), Modbus TCP	CANopen, EtherCAT, EtherNet/IP, Modbus RTU (RS485), Modbus TCP/-	CANopen, EtherCAT, EtherNet/IP, Modbus RTU (RS485), Modbus TCP, PROFINET
Inputs/outputs	6 digital inputs 2 analog inputs 2 digital outputs 1 encoder input 1 brake output	5/6 digital inputs 2/1 analog inputs 3/2 digital outputs 1/- encoder input 1/- brake output	6 digital inputs 2 analog inputs 3 digital outputs 3 encoder inputs (Hall, QEI, SSI) 1 brake output







	CLC3	CLC6	CLC15
Operating voltage	12 - 58 V	12 - 58 V	12 - 58 V
Rated current	3 A	6 A	15 A
Peak current	9 A	18 A	45 A
Interface	USB	USB	USB
Fieldbus	CANopen, EtherCAT, Modbus RTU (RS485)	CANopen, EtherCAT, Modbus RTU (RS485)	CANopen, EtherCAT, Modbus RTU (RS485)
Inputs/outputs	6 digital inputs 2 analog inputs 2 digital outputs 3 encoder inputs (Hall, QEI, SSI) 1 brake output	6 digital inputs 2 analog inputs 2 digital outputs 3 encoder inputs (Hall, QEI, SSI) 1 brake output	6 digital inputs 2 analog inputs 2 digital outputs 3 encoder inputs (Hall, QEI, SSI) 1 brake output







	CL3-E	CL4-E	CM-CPB3-44 (4 axes)
Operating voltage	12 - 24 V	12 - 58 V	12 - 58 V
Rated current	3 A	3 A (low current) 6 A (high current)	3 A
Peak current	3 A (low current) 6 A (high current)	6 A (low current) 18 A (high current)	3 A (low current) 9 A (high current)
Interface	USB	USB	USB
Fieldbus	CANopen, Modbus RTU (RS485, RS232)	CANopen, Modbus RTU (RS485)	EtherCAT
Inputs/outputs	5 digital inputs 2 analog inputs 3 digital outputs 1 encoder input	4 digital inputs 1 analog input 2 digital outputs 1 encoder input	4 digital inputs (per axis) 2 digital outputs (per axis) 1 analog input (per axis) 2 encoder inputs (per axis) 1 brake output (per axis)







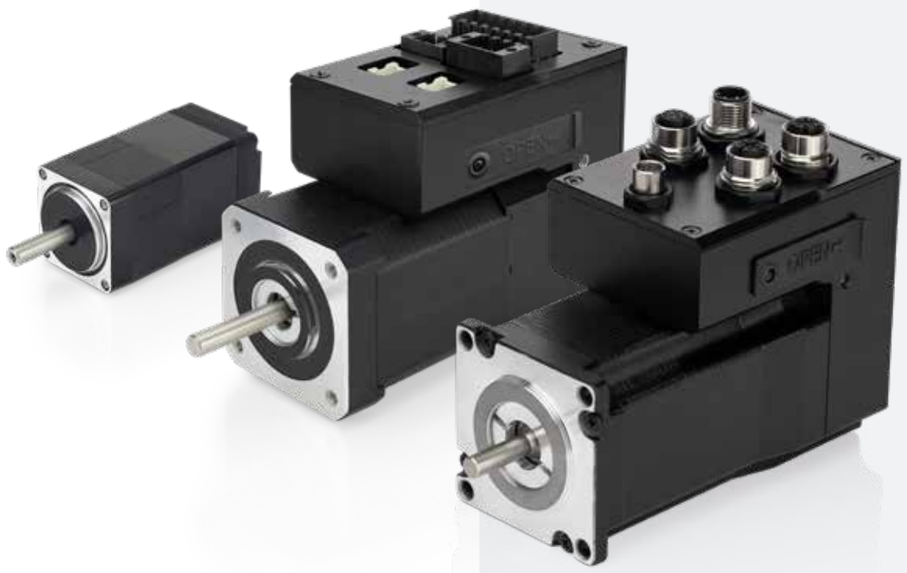
	CPB3	CPB6	CPB15
Operating voltage	12 - 58 V	12 - 58 V	12 - 58 V
Rated current	3 A	6 A	15 A
Peak current	9 A	18 A	45 A
Interface	-	-	-
Fieldbus	CANopen, EtherCAT, Modbus RTU, Modbus TCP	CANopen, EtherCAT, Modbus RTU, Modbus TCP	CANopen, EtherCAT, Modbus RTU, Modbus TCP
Inputs/outputs	11 digital in-/outputs 2 analog inputs 2 encoder inputs 1 brake output	11 digital in-/outputs 2 analog inputs 2 encoder inputs 1 brake output	11 digital in-/outputs 2 analog inputs 2 encoder inputs 1 brake output

PD series

The **PD series** combines motor and controller in a single, compact unit and is available as either a stepper or BLDC version. Offered in four sizes, from NEMA 11 to 34, these integrated motors support multiple operating modes and are ideal for applications requiring precise and reliable motion. Some sizes are also available with Safe Torque Off (STO) and UL certification.

- **Operating voltage:** 12 - 57.6 V
- **Fieldbusses:** CANopen, EtherCAT, EtherNet/IP, Modbus RTU (RS485), Modbus TCP, PROFINET
- **Feedback:** single-turn or multi-turn encoder
- **Operating modes:** Profile Position, Velocity, Torque, Homing, Interpolated Position, Cyclic Sync Modes, Step & Direction
- **Overload protection:** integrated I^2t protection and overtemperature shutdown > 75 °C
- **Protection class:** IP30 for standard applications, IP65 for harsh industrial environments

NEW



PD series in combination

With a wide range of add-on components, the **PD series** can be easily adapted to a variety of applications. Its modular design provides a compact, precise, and reliable system solution all from a single source.

- **Gearboxes:** Pairing the PD series with a **GP planetary** gearbox increases torque and allows optimal adjustment of output speed – perfect for high-dynamic positioning tasks.
- **Rotary tables:** Combined with a **hollow rotary table**, the PD motors offer a compact solution for rotary positioning systems and applications requiring high repeatability.
- **Brake systems:** The **BCD brakes** are reliable holding brakes, adding safety for vertical axes and low-power conditions.



PSA series

The **PSA series** combines Nanotec's LSA hybrid linear actuators and the intelligent controllers of the PD4-E series. It is designed for demanding applications that require high repeatability. With a resolution of 1,024 CPR, the integrated magnetic single-turn absolute encoder supports field-oriented control. The screw features a carbon coating that enhances sliding properties and extends nut life. Fully programmable, the PSA series reduces installation time and wiring complexity. Both the screw and the motor are available in different lengths. For applications with tight spaces, the compact **PSA28** – comprising the PD1-C28 and LSA28 – is the perfect solution.

- **Operating voltage:** 12 - 48 V
- **Interface:** USB
- **Fieldbuses:** CANopen, EtherCAT, EtherNet/IP, Modbus RTU, Modbus TCP
- **I/O:** 6 digital inputs, 1 analog input, 2 digital outputs, PWM brake output
- **Protection class:** IP65



Smart servos

For applications requiring precise control of position, speed, and torque, Nanotec offers **motors with integrated controllers** in four sizes. Both the brushless DC and stepper motor versions feature field-oriented control via a built-in magnetic single-turn absolute encoder. An optional battery-free multi-turn absolute encoder is also available.

Control options include fieldbus, I/O, clock & direction, and analog input, allowing easy integration into a wide range of system architectures. The free Plug & Drive Studio software enables fast commissioning and intuitive adjustment of parameters and motion profiles.







Stepper motors	PD1-C	PD2-C/E	PD4-C
Size	28 mm	42 mm	56/60 mm
Holding torque	9 - 18 Ncm	50 Ncm/28 - 80 Ncm	53.7 - 354 Ncm
Interface	-	USB/USB-C	USB
Fieldbus	CANopen, Modbus RTU	CANopen/CANopen, EtherCat, Modbus RTU	CANopen





BLDC motors	PD2-CB/EB	PD4-CB
Size	42 mm	56 mm
Rated power	53 – 105 W/53 - 138 W	135 W
Rated speed	4,000 rpm/3,000 rpm	3,500 rpm
Peak torque	up to 75 Ncm/up to 120 Ncm	up to 92 Ncm
Interface	USB/USB-C	USB
Fieldbus	CANopen/CANopen, EtherCAT, Modbus RTU	CANopen







Stepper motors	PD4-E	PD6-C	PD6-E
Size	56/60 mm	86 mm	86 mm
Holding torque	230 - 354 Ncm	360 - 933 Ncm	320 - 933 Ncm
Interface	USB-C	USB	USB
Fieldbus	CANopen, EtherCAT, EtherNet/IP, Modbus RTU, Modbus TCP, PROFINET	CANopen	CANopen, EtherCAT, EtherNet/IP, Modbus RTU, Modbus TCP, PROFINET







BLDC motors	PD4-EB	PD6-CB	PD6-EB
Size	60 mm	80/86 mm	80 mm
Rated power	200 - 400 W	220 - 534 W	283 - 940 W
Rated speed	3,000 rpm	3,000 rpm	3,000 rpm
Peak torque	up to 381 Ncm	up to 500 Ncm	900 Ncm
Interface	USB-C	USB	USB
Fieldbus	CANopen, EtherCAT, EtherNet/IP, Modbus RTU, Modbus TCP, PROFINET	CANopen	CANopen, EtherCAT, EtherNet/IP, Modbus RTU, Modbus TCP, PROFINET

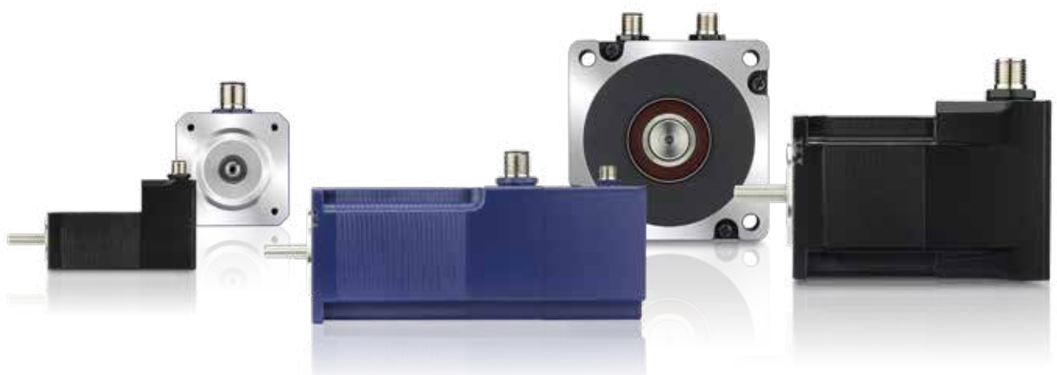
Stepper motors

Nanotec stepper motors are available in various performance classes and designs, including hybrid, flat, and hollow-shaft models, as well as IP-rated series. Combinations with gearboxes, motor controllers, encoders, and brakes cover a wide range of applications. Custom modifications are available upon request.



	NEMA 6	NEMA 8	NEMA 11	NEMA 14	NEMA 17	NEMA 23	NEMA 24	NEMA 34	NEMA 42
Holding torque Ncm	0.62	1.8 - 3.6	6.1 - 18	10 - 32	9 - 80	53.7 - 295	106 - 400	355 - 1,202	1,170 - 2,500
Length mm	30	33 - 48	31.5 - 107.9	30 - 56.5	22 - 70.4	40.5 - 109.5	47 - 111	65 - 156	99 - 201

IP65 motors



	NEMA 11	NEMA 17	NEMA 23	NEMA 34
Holding torque Ncm	7.1 - 18	50	99 - 230	594
Length mm	51 - 107.9	70.4	73 - 109.5	125 -155

ASA series

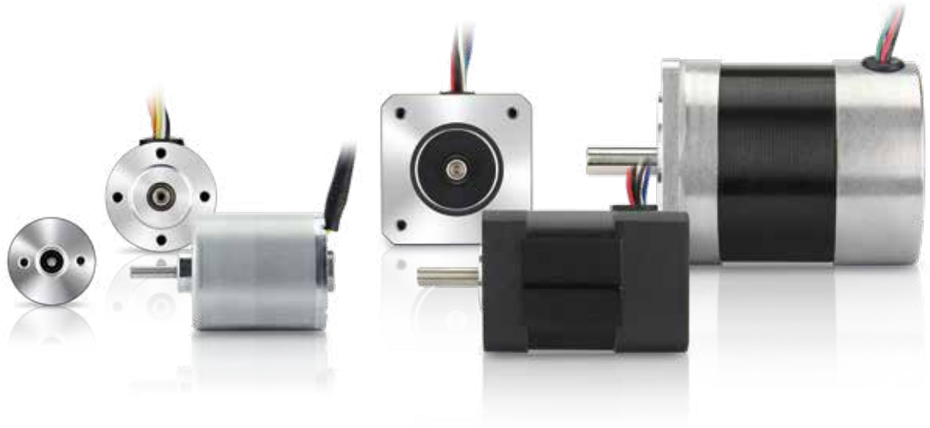
The high-torque stepper motors of the **ASA series** are UL/CSA-certified and have an IP65 rating (IP54 at the shaft output). They offer high electromagnetic compatibility, making them ideal for demanding applications. An encoder is already integrated, with two types available: multi-turn or incremental. The motors are offered in two lengths.

Larger quantities can also be ordered with an integrated holding brake.

- **Flange size:** NEMA 23 (56 mm)/NEMA 34 (86 mm)
- **Holding torque:** 140 - 933 Ncm
- **Incremental resolution:** 4,096 CPR/16,384 PPR
- **SSI resolution:** 16 bit multi-turn/17 bit single-turn

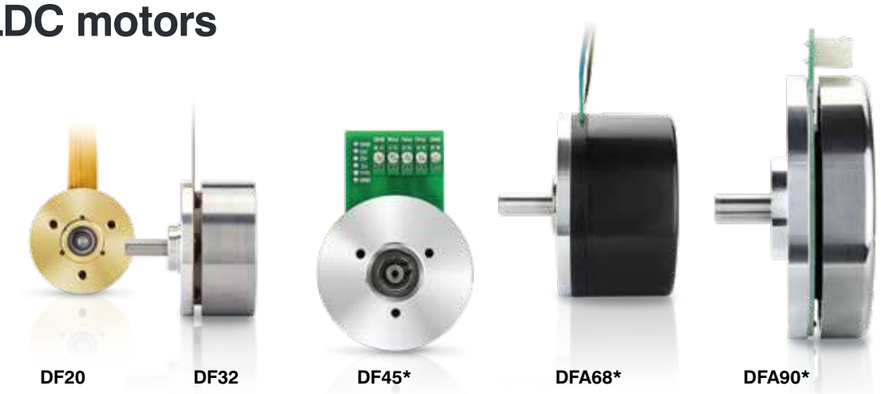


BLDC motors



	DB22	DB28	DBL36	DB43	DB59	DB80
Size	Ø 22 mm	Ø 28 mm	Ø 36 mm	42 mm	56 mm	80 mm
Rated voltage	24 V	15 - 24 V	24 V	24 - 48 V	24 - 48 V	48 V
Rated power	4 - 7.7 W	4.2 - 20.9 W	7.5 - 33 W	53 - 138 W	84 - 220 W	283 - 942 W
Peak torque	2.4 - 5 Ncm	1.5 - 15 Ncm	4.5 - 21 Ncm	51 - 132 Ncm	69 - 180 Ncm	250 - 850 Ncm
Rated torque	0.8 - 2.2 Ncm	0.5 - 5 Ncm	1.5 - 7 Ncm	17 - 44 Ncm	23 - 60 Ncm	90 - 300 Ncm
Rated speed	3,500 - 4,800 rpm	4,000 - 10,000 rpm	4,500 - 4,800 rpm	3,000 rpm	3,500 rpm	3,000 rpm

Flat BLDC motors



	DF20	DF32	DF45*	DFA68*	DFA90*
Size	Ø 20 mm	Ø 32 mm	Ø 45 mm	Ø 68 mm	Ø 90 mm
Rated voltage	12 V	24 V	24 V	24 V	24 - 48 V
Rated power	5 W	7.4 W	30 - 65 W	106 - 110 W	130 - 170 W
Peak torque	1.9 Ncm	7.65 Ncm	15 - 39 Ncm	87 Ncm	150 - 300 Ncm
Rated torque	0.76 Ncm	2.55 Ncm	5 - 13 Ncm	29 Ncm	45.7 - 96.4 Ncm
Rated speed	5,170 rpm	2,760 rpm	4,840 - 5,260 rpm	3,500 - 3,700 rpm	1,670 - 2,720 rpm

*DF45, DFA68 and DFA90 are also available with an integrated 3-channel encoder.

DKA series

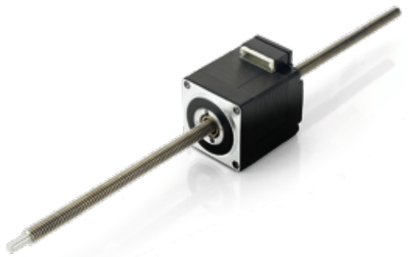
The **DKA series** frameless motor kits provide an efficient solution for compact drive units. Thanks to their modular design, they integrate easily into existing systems.
By eliminating the need for couplings and mounting components, these frameless BLDC motors reduce material use and costs. Typical applications include robotics, medical devices, and other space-constrained systems.

- **Outer diameter:** 25 - 115 mm
- **Rated voltage:** 24 - 48 V
- **Rated power:** 33 - 733 W
- **Peak torque:** 10.5 - 360 Ncm
- **Rated torque:** 3.2 - 780 Ncm
- **Rated speed:** up to 10,000 rpm



Linear actuators

Nanotec's product range includes stepper motor linear actuators in three versions and six sizes. Due to their special stator geometry and optimized magnetic materials, these actuators generate considerably more force than comparable drives. They are complemented by lead screws available in a wide range of leads, diameters, and lengths – both standard and customized versions. For applications requiring an exceptionally long service life, all lead screws can also be supplied with a DLC coating. Made of carbon, this coating improves friction characteristics and can increase the service life of the nuts by approximately 100%.



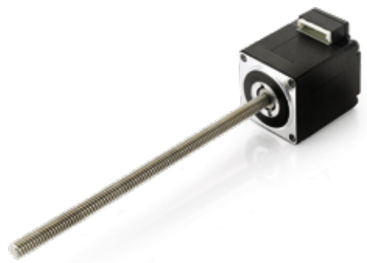
LA non-captive

- NEMA 8 to 23
- Force: up to 1,248 N
- Speed: up to 212 mm/s
- Lead screw available separately



LGA captive

- NEMA 8 to 23
- Stroke length: 12.7 - 63.8 mm
- Force: up to 1,248 N
- Speed: up to 212 mm/s



LSA external

- NEMA 6 to 23
- Force: up to 1,248 N
- Speed: up to 212 mm/s
- Nut available separately

Threaded nuts

Standard nuts (LSNUT-AA) are ideal when backlash is irrelevant and no preload is required.

Axial anti-backlash nuts with helical spring (LSNUT-AE) for small leads offer a cost-effective alternative to torsion-spring nuts.

Radial anti-backlash nuts with helical spring (LSNUT-AF) are perfect for precise positioning, especially in combination with NEMA 17 and NEMA 23 actuators.

Anti-backlash nuts with torsion spring (LSNUT-AG) automatically compensate for backlash during operation and are primarily used for fast and accurate positioning of small loads.



LBSA56

The **LBSA56** combines the compact design of a NEMA 23 stepper motor with the performance of a linear actuator. Thanks to its robust construction and high-quality ball screw, it delivers accuracy, dynamics, and durability.

Whether in automation, mechanical engineering, or medical technology, the LBSA56 integrates easily into existing systems and reliably performs a wide variety of motion profiles.

- **Precise positioning:** backlash-free ball screw
- **Long service life:** robust mechanical construction
- **Compact form factor:** flexible integration
- **Reliable operation:** 900 N recommended force; 2,000 N peak force



LBA series

The BLDC motors of the **LBA series** feature integrated ball screws and are designed for adjustment, positioning, and valve control applications. The ball screw extends the motor's service life, even when run at high speeds and loads. With a nominal voltage of 48 V, these compact linear actuators reach top speeds of 292 mm/s (LBA60) and 200 mm/s (LBA80). The built-in encoder ensures accurate positioning. The motors are also available with an integrated brake.

- **Flange size:** 60/80 mm
- **Rated force:** 500 - 1,000 N
- **Peak force:** 1,500 - 3,000 N
- **Rated current:** 6.2 - 7.8 A
- **Peak current:** 17.7 - 23.4 A
- **Stroke length:** 55 mm
- **Encoder resolution incremental:** 4,096 CPR/16,384 PPR
- **Encoder resolution SSI:** 17 bit
- **Max. speed:** 254 - 292 mm/s



NMM1

Equipped with an SSI interface, the **NMM1** magnetic absolute encoder offers a resolution of 17 bit single-turn and 16 bit multi-turn. Two shaft diameters are available.

Designed for durability, magnetic encoders are exceptionally robust and completely maintenance-free, requiring neither a battery nor a gearbox.

- **Compatibility:** motors with flange sizes NEMA 17 - 23
- **Incremental resolution:** 1,024 CPR/4,096 PPR
- **Max. speed:** 30,000 rpm
- **Shaft diameter:** 5 - 6.35 mm



NME series

The high resolution of the **NME2** encoder provides very accurate positioning and excellent speed control even at low speeds. It is available both as an incremental encoder and with an SSI interface (17 bit).

- **Compatibility:** motors with flange size of 42 mm and larger, and a maximum shaft of 15 mm
- **Incremental resolution:** 4,096 - 16,384 CPR/ 16,384 - 65,536 PPR
- **Max. speed:** 12,000 rpm
- **Shaft diameter:** 5 -15 mm



The compact **NME3** encoder is available with both an incremental interface – including commutation signals for BLDC motors – and a serial SSI interface (16 bit). It can be combined with a wide range of brushless DC and stepper motors.

- **Compatibility:** motors starting from size NEMA 8
- **Incremental resolution:** 500 - 4,096 CPR/ 2,000 - 16,384 PPR
- **Max. speed:** 30,000 rpm
- **Shaft diameter:** 4 - 6.35 mm



HRTA

Equipped with a cross-shaft bearing, the **HRTA** hollow shaft gearboxes deliver precise positioning, excellent runout characteristics, efficient operation, and a maximum load capacity of 2,000 N. Combining the hollow rotary tables with a stepper motor results in a rotary actuator ideally suited for rotary tables, end-of-arm tooling (EOAT), or pick-and-place tools.

- **Compatibility:** stepper motors NEMA 17 - 34
- **Rated output torque:** 3.5 - 50 Nm
- **Lifetime:** 20,000 h
- **Max. gear backlash:** 1´
- **Efficiency:** 98%



GP series

The high-torque planetary gearboxes of the **GP series** are available in one-, two-, and three-stage versions with a wide range of reduction ratios. They feature straight-cut, hardened gears and can be ordered with either square or round flanges. Custom modifications are also possible.

- **Compatibility:** BLDC and stepper motors
- **Rated output torque:** 6.5 - 116 Nm
- **Max. gear backlash:** 1´
- **Efficiency:** 70 - 92%
- **Reduction ratio:** 3.29 - 256.23



WD

The **WD** wheel drive combines a wheel, integrated planetary gearbox, and bearing into an extremely compact unit. When paired with Nanotec motors and controllers, it forms a compact drive system that simplifies the development and optimization of self-propelled systems, such as service robots or Automated Guided Vehicles (AGVs).

For applications requiring frequent and dynamic braking, the WD wheel drives are also available with a pre-mounted motor brake for reliable braking under load.

- **Space-saving design:** ideal for confined installation conditions
- **Robust construction:** withstands high radial loads
- **High flexibility:** 6 wheel diameters for optimal adaptation to the application and environment
- **Efficient:** few components, minimal cabling effort





	Ø (mm)	Height (mm)	Width (mm)	Payload (kg)	Reduction	Rated torque gearbox (Nm)	Matching motors
WD10030	100	105	30	400	16	24.6	NEMA 23/24
WD14050	140	150	50	400	11 / 16 / 20 / 26	19.2 / 24.6 / 28.6 / 29.1	NEMA 23/24 / DB80 / DFA90
WD15050	150	160	50	400	11 / 16 / 20 / 26	19.2 / 24.6 / 28.6 / 29.1	NEMA 23/24 / DB80 / DFA90
WD16050	160	170	50	400	11 / 16 / 20 / 26	19.2 / 24.6 / 28.6 / 29.1	NEMA 23/24 / DB80 / DFA90
WD18050	180	190	50	400	11 / 16 / 20 / 26	19.2 / 24.6 / 28.6 / 29.1	NEMA 23/24 / DB80 / DFA90
WD20050	200	210	50	400	11 / 16 / 20 / 26	19.2 / 24.6 / 28.6 / 29.1	NEMA 23/24 / DB80 / DFA90

WD42

The super-compact **WD42** wheel drive is a single, integrated unit combining wheel, gearbox, brushless DC motor, and encoder. By mounting all components directly at the wheel, the drive achieves an overall length of just 103 mm. Wheel diameters range from 75 to 140 mm, and the wheels can be easily replaced for maintenance. Upon request, these drives are also available without wheels for custom applications.





	Ø (mm)	Payload (kg)	Reduction	Rated torque (Nm)	Rated speed (m/s)
WD07530-4212	75	200	12	4.9	1.2
WD07530-4215	75	200	15	6.4	0.9
WD07530-4226	75	200	26	10.6	0.5
WD14030-4212	140	200	12	4.9	2.2
WD14030-4215	140	200	15	6.4	1.7
WD14030-4226	140	200	26	10.6	1.0

Modular wheel drives

Nanotec's DFA90 external rotor motor, featuring a built-in encoder, pairs perfectly with the **WD** wheel drive. This combination has an overall installation length of just 121.5 mm.

- **Voltage:** 48 V
- **Reduction:** 10.84
- **Diameter:** 200 mm
- **Payload:** 400 kg
- **Rated torque:** 9.8 Nm
- **Rated power:** 158 W



BC72-50

The **BC72-50** brake chopper module limits the voltage in an intermediate circuit to a safe level, protecting all controllers from overvoltage. During motor deceleration, the energy first charges the integrated buffer capacitor, and any remaining energy is safely dissipated as heat through the braking resistor.

- **Operating voltage:** 12 - 75 V
- **Switching voltage:** adjustable in 1 V steps via rotary switch
- **Rated power** (with integrated brake resistor): 20 W
- **Rated power** (with external brake resistor): up to 100 W



Fieldbus converter

Fieldbus converters allow Nanotec motor controllers or brushless DC motors with integrated controllers to communicate with a PC. The **ZK-USB-CAN-1** establishes a connection between the PC's USB interface and a CANopen interface, while the **ZK-USB-RS485-1** connects the PC to the controller's RS485 communication interface.



Customized solutions

Smart adjustment unit

The compact short-stroke actuator based on the **LGA28** ensures maximum process reliability. It combines a short design with IP protection, and thanks to the integrated encoder, provides high positioning accuracy.

- **Slim profile:** stroke reduced to 5 mm, ideal for confined installation spaces
- **Robust construction:** IP65-rated motor, protected against dust, oil, and water jets
- **Easy integration:** two M8 connectors for direct connection of motor and encoder to the controller



Stable low-speed performance

Based on the **PD4-C5918M4204** motor, this solution was precisely adapted to customer requirements. The modifications deliver smooth, consistent operation even at very low speeds.

- **Customized shaft:** shortened and equipped with two flats for optimal integration
- **Firmware & programming:** locked firmware with customer-specific NanoJ program
- **Slow operation:** motor can run extremely slowly via the analog input
- **Two analog speed ranges:** switchable between 0 - 5 rpm and 0 - 50 rpm



Space-saving integration

This unit combines motor and controller in a modular setup, offering maximum flexibility in a minimal form factor.

- **Compact design:** CL3-E controller functionality integrated into smaller electronics; motor length optimized
- **Modular concept:** controller < 42 mm, compatible with different motor sizes via adapter – here with NEMA 11 and NEMA 14 stepper motors
- **Magnetic encoder:** integrated chip for position feedback
- **Fieldbus:** CANopen
- **Optimized running behavior:** larger air gap reduces cogging torque, making torque loss in the application negligible



Plug & Drive Studio

Plug & Drive Studio 3 is a free software tool for commissioning and programming Nanotec motor controllers. It features an integrated UI Designer that allows users to adapt the interface to different applications and user groups.

- **Intuitive operating concept:** clear user guidance
- **User-friendly motor tuning:** integrated oscilloscope functions
- **Quick configuration:** easy adjustment of application-specific parameters
- **Effective analysis:** precise monitoring of operating states
- **App generator:** easy creation of sequence programs
- **Integrated programming environment:** C++ based NanoJ programming
- **Fieldbuses:** CANopen, EtherCAT, Ethernet, Modbus RTU, Modbus TCP, PROFINET

Training at your site

Are you interested in a training program that is perfectly tailored to your company? We'd be happy to define the learning objectives together with you and address your specific business needs directly at your site.
Get in touch with us!

Your advantages

- **Flexible:** you choose the date, location, and topics
- **Customized:** we tailor the training program to your needs
- **Effective:** your staff will reach the same level of knowledge
- **Creative:** you will develop new approaches to problem-solving
- **Free of charge:** no costs for you



NanoLib

The **NanoLib** software library simplifies the integration of Nanotec motor controllers into existing software applications. It is ready to use and includes all the functions required to communicate with controllers via CANopen, EtherCAT, Ethernet, Modbus RTU, Modbus TCP, and PROFINET.
NanoLib enables you to control motors, update firmware and upload NanoJ programs. The library supports the programming languages C++, C#, and Python.



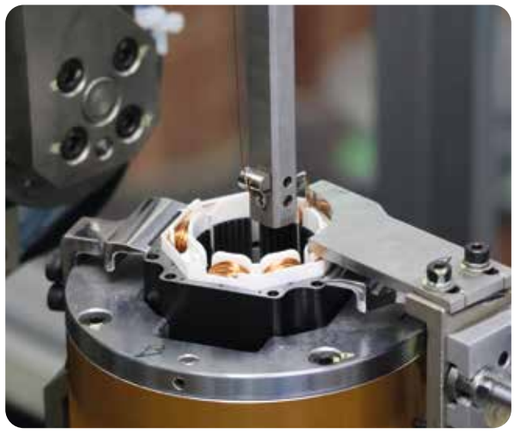
Precision right from the start

From development to production, our team of experts supports you at every stage of designing your drive system. In addition to standard modifications – such as shaft machining, cable assembly or special connection options – Nanotec also develops fully customized solutions with defined motor specifications, tailored electronics, and individual software.
In our in-house **EMC chamber**, we ensure that every detail is thoroughly checked.



Made by Nanotec

We **manufacture our motors in-house** to ensure consistently high quality in series production. Electronics, lead screws, and other key components are also produced on-site.
This fully integrated production chain, with all processes perfectly aligned, allows us to achieve reproducible results of the highest standard – supported by state-of-the-art manufacturing technologies.



Global presence

With our **headquarters in Feldkirchen** near Munich and locations in Auburn, USA (sales), Varna, Bulgaria (production and development), and Changzhou, China (development, production, and sales), Nanotec maintains a strong international presence and close ties to its markets.

New facility in China: Completed in 2026, the new 12,000 m² building in Changzhou brings production, warehousing, and offices together under one roof, further strengthening our presence in Asia.



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