Simplifying Motion Control

Tailor-made products for many industries

STEPPER MOTORS
- 10 mm to Nema 43
- Up to 25 Nm

BLDC MOTORS
- 22 mm to Nema 34
- 4 to 660 W
- Slotless and Slotted

HYBRID LINEAR ACTUATORS
- Nema 8 to 23
- Captive with Linear Slide
  Non-Captive Lead Screw and
  External Lead Screw with Nut

DC Servo Motors for dynamic, precise positioning

PLUG & DRIVE DC SERVO MOTORS
- Integrated Smart Motors
- Fully Programmable
- Torque, Velocity & Position Control
- CANopen or USB
- 1024 CPR / 4098 PPR Magnetic
  Single Turn Absolute Encoder
- High-Pole Servo (BLDC)
- Low Pole Servo (Stepping Motor)

MOTOR CONTROLLERS
Fieldbus-capable motor controllers for BLDC motors and stepper motors
Plug & Drive
Integrated DC servos for applications that require high performance and efficiency

PRECISE POSITIONING CONTROL, NO STEP LOSSES

Specifically designed for applications that require high performance and efficiency, Nanotec Electronic’s new generation of Plug & Drive motors feature closed-loop technology, integrated in a compact package.

TECHNICAL DATA:
- **PD4-C:** High-pole DC servo (stepper motor), 12-48 V/10 A (rms current), 5 A/mm²/3.5 Nm torque
- **PD4-CB:** Low-pole DC servo (BLDC motor), 12-36 V/6 A or 18 A (rms continuous), 4 A peak, torque: 0.37 Nm/1.1 Nm peak

**THE NEW GENERATION OF DC SERVO MOTOR CONTROLLERS - WITH ETHERCAT OR CANOPEN**

The new N5 generation of motor controllers can be operated with BLDC motors and with stepper motors, thus enabling a uniform control architecture. Both motor controllers support field-oriented control (closed loop), are programmable and offer a variety of control options. The N5 offers an economical solution for high-volume OEM-products and can be easily adapted for different applications.

TECHNICAL DATA:
- **N5:** 12-70 V/10 A (stepper motor) or 12-48 V/18 A (BLDC version)

NEW PRODUCTS WITH NEW FEATURES

Specifically for the open loop control of stepper motors sized Nema 17 to Nema 34, Nanotec offers the motor controller C5. It is fast and easy to parameterize and program via USB. Due to its innovative motor resonance suppression feature via software-based current control the C5 is particularly suitable for applications that require especially smooth running, low-resonance stepper motors in open loop.

TECHNICAL DATA:
- 12-48/6 A (rms current) or 12-48/18 A (BLDC version)
- 3 differential inputs for clock/direction, 3 general purpose IOs

The motor controller CL3-E was designed specifically for the use of small stepper and BLDC motors in device engineering. The cost-effective, housing-free board is ideally suited for integration into small devices such as those used for laboratory automation.

TECHNICAL DATA:
- 12-24 V/3 or 6 A (rms peak current)
- 5 digital inputs, 3 digital outputs, 2 analog outputs

More Torque, More Accuracy
Leading-edge technology for smoother motion and reduced resonance

ONE STEP AHEAD WITH FIELD-ORIENTED CONTROL

Nanotec Plug & Drive motors implement field-oriented control (closed loop) BLDC and stepper motors are controlled via the encoder as a function of the load and differ only in terms of the working points resulting from the differing number of poles. Because both the motor controller and the encoder are integrated in the unit, cabling work is limited to the communication connection and power supply.

RESONANCE BEHAVIOR

In closed-loop mode the motor receives only as much energy as needed for the external load.

SERVICE LIFE

Efficient power regulation generates loss heat in the motor, which stays significantly cooler. Reduced heating protects the motor bearings.

APPLICATION-SPECIFIC PROGRAMMING WITH NANOJ EASY

For programming our controllers we have developed the C++ based programming language NanoJ, where the user program runs in a so called “sandbox” and is called in a fixed interrupt of 1 ms. This enables the user to react to input changes with a few lines of code, but also solve complex problems - such as following a custom ramp according to a mathematical function, or changing the motor’s PID parameters while it is running. NanoJ can be combined with fieldbus communication, therefore time-critical tasks can be handled directly in the controller.

ENHANCED SYSTEM RELIABILITY THROUGH SENSORLESS CONTROL

Specifically for BLDC motors, Nanotec has developed a new sensor-free control. In contrast to conventional sensor-free methods, the new control includes an autotuning algorithm that adjusts the control to the motor’s resistance and inductance. The sensor-free control can be used within a speed range extending from 100,000 rpm down to approx. 3% of the nominal motor speed – even with a direction reversal. Available on request for all C-, N- and S-series controllers and Plug&Drive motors.

BRUSHLESS FLAT MOTOR

The new BLDC flat motors of the DF45 series are 16-pole external rotor motors. The permanent magnets are located on the rotor bell revolving around the internal stator with the windings. In addition to the shorter design, the advantage of this construction compared to internal rotor motors comes from having the same output with a lower torque ripple due to the rotor’s higher moment of inertia.

TECHNICAL DATA:
- 12-48 V, 25-80 W
- 45-mm diameter, length <30 mm
High-Performance Solutions for Motion Control Applications

Nanotec Electronic, founded in 1991 near Munich/Germany, specializes in precise, high-performance drive solutions. We offer a powerful range of stepper and servo motors, controllers, gears, linear actuators, and accessories to serve a broad range of industries. Our engineering experience allows us to provide our customers with excellent service in the design of their products and the selection of the best motion control solution for their application.

Advanced software technologies lead to platform independence and enable simple integration of our motors and motor controller systems. A strong focus on research & development guarantees products that will continue to meet our customers’ needs.

For additional information, technical assistance, and off-the-shelf delivery please contact us at (781) 219-3343 or at info@us.nanotec.com.