Nanotec®
PLUG & DRIVE


SMART BRUSHLESS DC SERVOS
MOTOR CONTROLLERS/DRIVES
BRUSHLESS DC MOTORS
STEPPER MOTORS
LINEAR ACTUATORS
THREADED SCREWS & NUTS
ENCODERS / GEARBOXES / BRAKES

# PRODUCT CATALOG

www.nanotec.com

## About us


Nanotec Electronic GmbH & Co. KG, headquartered in Feldkirchen near Munich, is among the world's leading manufacturers of motors and motor controllers for high-quality drive solutions. The company has been developing and marketing a broad range of products since 1991. Nanotec technology is primarily used in automation systems, automatic laboratory equipment and medical devices.

In 1996, Nanotec came out with the first Plug & Drive motor with an integrated controller, setting a cornerstone that would ultimately be central to the company's growth.

Still today, Nanotec focuses heavily on research and development to create drive solutions that closely meet the needs and requirements of our customers.





## Standard and custom solutions for optimum drives

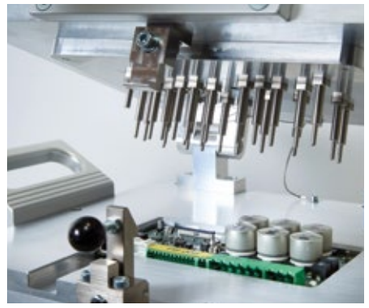
When drive systems with high precision, reliability and extensive functionality are required to fit in small spaces, Nanotec supplies the necessary technology – either as standard solutions or individualized designs. With prototype construction and the production of customized assemblies located in Germany, and due to our policy of extensive warehousing, we are able to respond quickly and flexibly to customer needs.

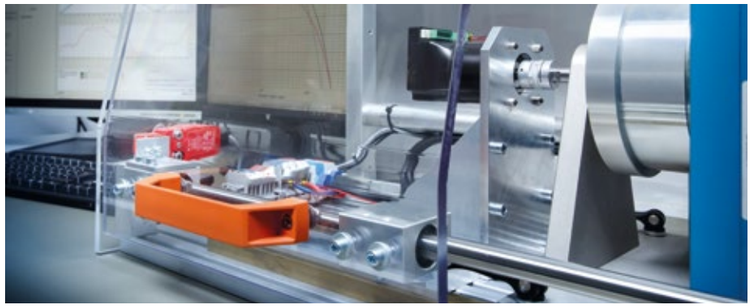
Our brushless DC and stepper motors, linear actuators and linear actuators, in sizes beginning at 10 mm, together with a variety of gears and encoders, combine into a modular system with over 100,000 possible combinations. In addition, you can choose from a range of shaft, flange and connector types that rapidly and reliably connect to existing device architecture.

The performance and resonance behavior of Nanotec motors is optimized by intelligent motor controllers that meet the latest technology standards.

Our products are manufactured at two Nanotec plants in China. Fully trained employees and high-quality machinery ensure stable processes and a high in-house production depth. Both production facilities in China operate according to German quality standards and are ISO certified.

By controlling and monitoring all stages of manufacture – from prototype construction to pre-series and final production – Nanotec is able to quickly and efficiently produce customized solutions in series production.





## Integrated management system

Nanotec relies on an integrated management system that takes effect in the areas of quality, environment, occupational health and safety, risk management and data protection.

This system is designed to secure the continuing success of the company by guaranteeing our ability to promptly and efficiently meet customer needs and expectations while keeping our environmental impact to a minimum. By doing so, it lays the foundation for high quality standards and continuous improvement.

Nanotec quality assurance and environmental protection policies are in line with ISO 9001:2015 and ISO 14001:2015. Our occupational health and safety standards are designed according to the OHRIS concept and have been certified since 2014.

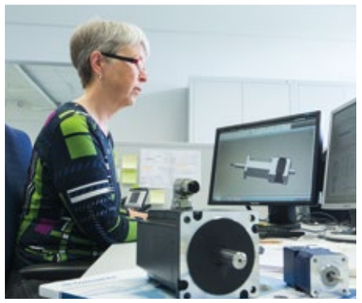
As part of our corporate policies and guidelines, we consider it our duty to ensure the viability of our company over the long term. Well-trained and responsible employees, a forward-looking personnel policy and a positive corporate culture all contribute to this aim. We adhere to pertinent national and international quality standards, integrate suppliers and customers in decision-making processes, detect and assess errors and risks at an early stage, and regularly reevaluate and update our goals.


CERTIFICATE

Nanotec Electronic GmbH & Co. KG
Kapellenstraße 6, 85622 Feldkirchen
Germany

Development, manufacturing and sales of motion control components.

ISO 9001:2015
ISO 14001:2015





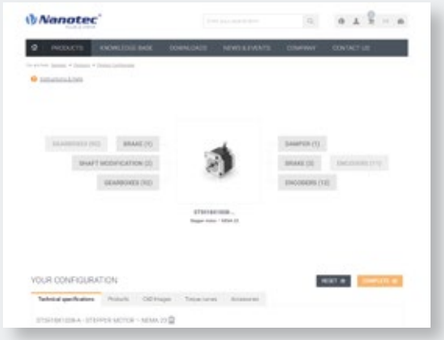


## Worldwide sales network


Nanotec products are available both directly from us and via a worldwide network of sales partners.
A list of our sales partners can be found on our website.

## Our complete range of products can be found at www.nanotec.com

- Order quantities of up to 25 pieces directly on our website
- Our product finder will help you find a suitable motor
- Product configurator: Just a few clicks to find your individual motor combination with encoder, brake and gear
- Free access to datasheets and 3D-data
- Display of torque curves at different operating voltages and control modes



# Contents





# Contents

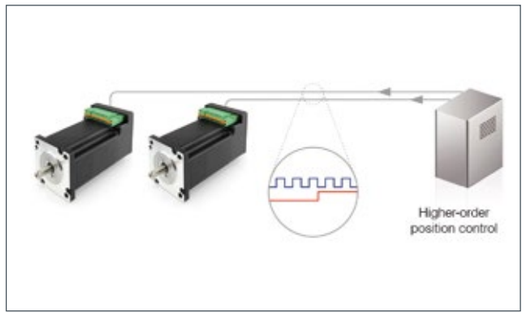






## CONTROL OPTIONS FOR MOTORS WITH CONTROLLER AND CONTROLLERS/DRIVES

Just as our controllers/drives, our brushless DC motors with integrated controller/drive, can be controlled via a wide variety of methods. Dip switches, configuration files or software enable the user to switch between the different methods. Information on which control version can be used in each case is provided in the data sheets.

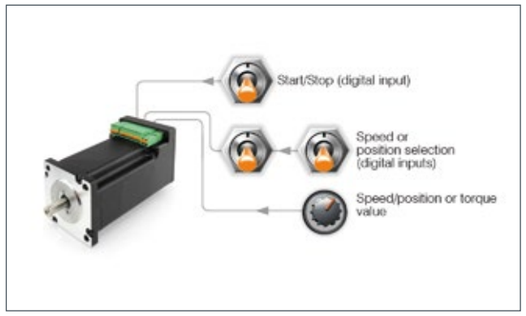



**Clock & direction**

In clock-direction mode, the motor is operated with a clock and direction signal via digital inputs by a higher-level positioning controller. With each clock signal, the motor moves one step in the direction given by the direction signal.

The software-based control of the Nanotec controllers enables a flexile interplay between the clock signal and position. No microstepping is required to achieve sine commutation for the motor, as the input signals are always interpolated in the background.

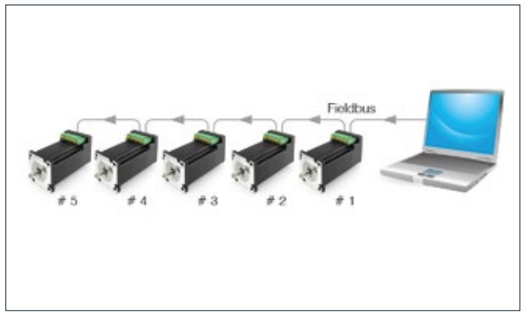
The number of steps per revolution can also be specified as a rational number (numerator/denominator). A right/left rotation mode (CW/CCW) is available in addition to the conventional clock-direction mode, in which the input used is decisive for the direction.




**Set Value Settings Via Analog and Digital Inputs**

The digital and analog inputs of the Nanotec controllers can be read out in milliseconds and processed in an internal sequence program. This means that, for example, the speed, position, or even the torque can be controlled via an analog input. The digital inputs can also be used to start a movement or to select different speeds, for example.

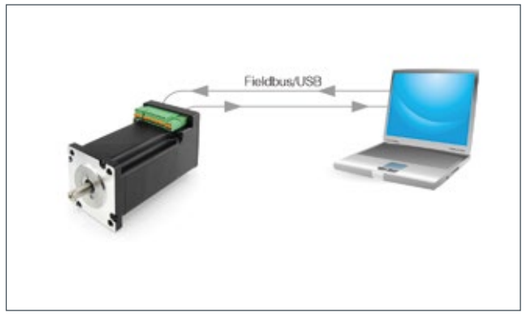
The inputs are assigned to functions via a program that uses the NanoJ V2 programming language. This program is created in Plug & Drive Studio.




**Fieldbus**

The Nanotec controllers and the motors with integrated controllers can be operated via the fieldbus with a wide range of master controllers (PLCs). In this case, the controllers act as slaves that convert the commands of the higher-level controller. Nanotec offers the following fieldbus options:

EtherCAT CANopen Modbus EtherNet/IP




**Sequence Control for Standalone Operation or Distributed Intelligence**

The programming environment provided in Plug & Drive Studio makes it possible to create programs in the C++ based programming language NanoJ V2. These programs run autonomously and directly on the controller or motor with integrated controller and can be saved on the controller via fieldbus or USB.

In addition to simple applications for controlling via digital/analog inputs for standalone operation, complex applications that are controlled via the fieldbus are also possible. This distributed intelligence means that the bus capacity utilization for fieldbus applications can be kept low when a large number of subscribers are connected. In addition, time-sensitive functions can be performed directly via the fieldbus without delay.

- Access to all control parameters and inputs/outputs at millisecond intervals
- Variables, branches, loops as well as logical and mathematical functions

# Smart Brushless DC Servos

## NANOTEC CLOSED-LOOP TECHNOLOGY

Closed loop-capable stepper motors merge the benefits of stepper and servo motor technology. They are smooth-running with less resonance than stepper motors. They offer position feedback and control, short settling and release times and no longer exhibit step loss. They are an alternative to a stepper motor if energy efficiency, smooth running and load tolerance are required. Compared to servo motors, they have advantages due to high torque at low speeds, short settling times and correct positioning without back swing.

**What is closed loop?**
Sinusoidal commutation via encoder with field-oriented control is referred to as closed-loop process. The rotor position is detected using the encoder's signals and sinusoidal phase currents are generated in the motor windings. Controlling the vector of the magnetic field ensures that the stator magnetic field is vertical relative to the rotor magnetic field and the field strength corresponds exactly to the desired torque. The controlled current level in the windings provides uniform motor force and leads to a particularly quiet-running motor that can be controlled precisely.

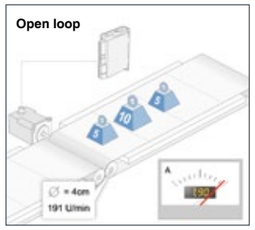
**True/pseudo closed loop**
There are stepper motors that dress themselves up as being closed loops and work with encoders but do not provide any field-oriented control with sinusoidally commutated current control. They only check the step position, and cannot correct step losses during operation. True closed loop with field-oriented control compensates step losses during the run or prevents them from occurring by increasing the motor current.

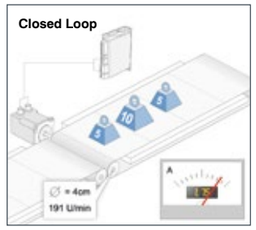
**Advantages over standard stepper motors**
A stepper motor is used wherever movement to defined positions is required. The classic stepper motor transfers electric energy into precise mechanical movements as long as the motor's torque is not exceeded. Since there is no position feedback or control, the motor loses steps if unexpected load jumps or resonance occurs and it no longer moves to the desired position. A closed-loop stepper motor will readjust in those instances and reach the specified position reliably. Using an open loop, a standard stepper motor is always operated with the same current regardless of the load and it therefore becomes relatively hot in many applications. By controlling current in a closed loop, the current level can be ajusted to the required torque; less heat is generated and energy consumption drops accordingly.

**Advantages over servo motors**
In many cases, closed-loop stepper motors from Nanotec are an alternative to servo drives, such as in winding applications or belt drives. The speed and position, and even the torque, can be controlled with precision. This not only achieves the highest maximum torque, the best efficiency and the best dynamics, it also results in the lowest torque ripple and excellent running smoothness.

**Applications for closed loop systems:**
Dosing pumps, filler systems, semi-conductor mounting, wafer production, industrial sewing machines. Textile machines, robotics, test and optical inspection systems, tape and belt drives, general multi-axis applications and applications requiring smooth operation, short settling times or accurate positioning.

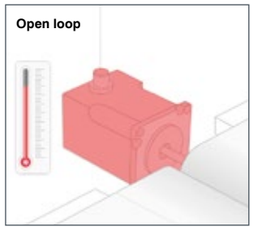
### Energy efficiency

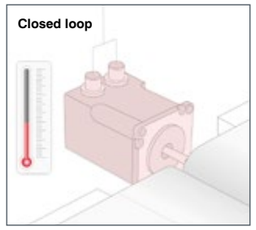



In an open loop, the stepper motor is dimensioned such that it is certain to move the maximum required load. For this reason, normally a safety factor of 20% is calculated, which causes wasted energy in the application. When the load is reduced, the open loop motor cannot react and wastes even more energy.

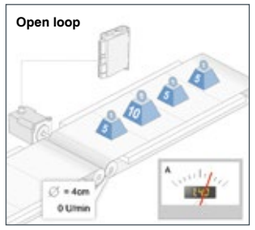
### Service life

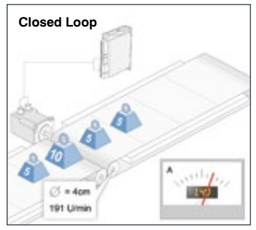



Efficient power regulation generates less heat in the motor, which stays significantly cooler. Reduced heating protects the motor bearings.

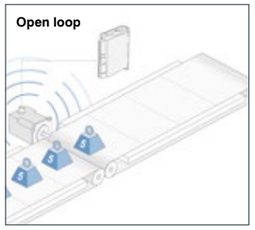
### Overload

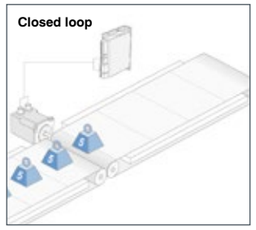



With a 20% safety reserve and a design for a continuous load of 20 kg, an additional load of only 5 kg exceeds the power reserve and the open-loop drive stops without an error message. By contrast, with its overload reserve the closed loop stepper motor will handle this load increase easily.

### Resonances




Resonance frequencies occurring in the open loop depend on external loads (the greater the torque reserve, the greater is the resonance stimulation) and can bring the motor to a stop. In closed loop mode, the motor receives only as much energy as needed for the external load; the torque reserve and its resonance stimulation do not exist, so there is practically no resonance behavior.



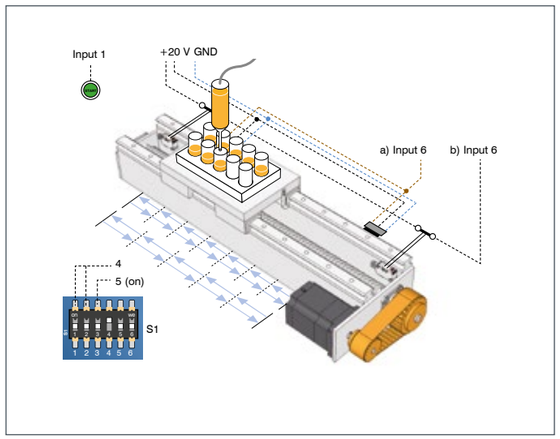
# Smart Brushless DC Servo



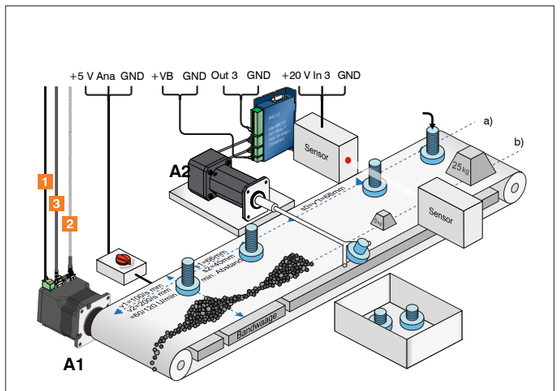
## IDEAL APPLICATION AREAS FOR BRUSHLESS DC MOTORS WITH INTEGRATED CONTROLLER/DRIVE

- Multi-axis applications (CANopen, EtherCAT, Modbus RTU/TCP, Ethernet/IP)
- Positioning tasks with load changes
- Windings
- Belt drives (start/stop, positioning)
- Dosing pumps, filler systems
- Semi-conductor mounting
- Wafer production
- Textile machines, industrial sewing machines
- Robotics
- Testing and inspection systems
- Applications that require smooth operation, short settling times and precision positioning

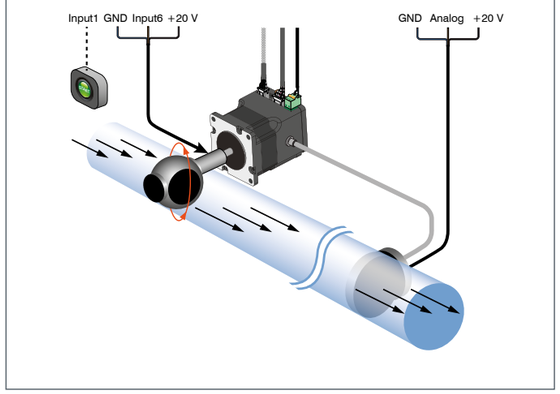
**Linear axes** (for processing, assembling, etc.)



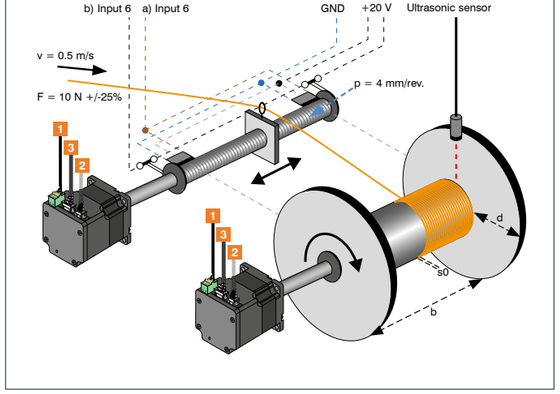

**Conveyor belts**




**Decentralized flow control**




**Winding and laying**



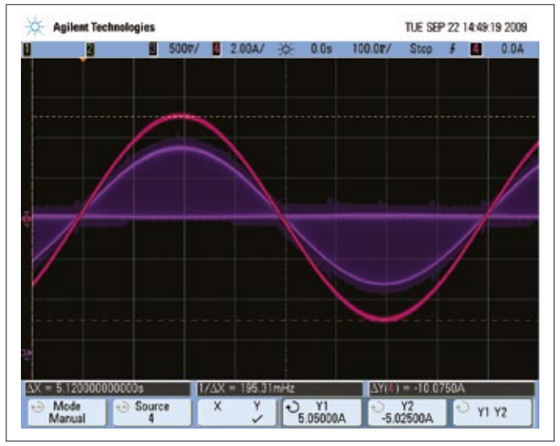
## COMPREHENSIVE SOFTWARE FUNCTIONALITY

**dspDrive® – Software-based current control with high resolution in the open loop**

In the newest generation of Nanotec hardware, the current in the motor is no longer controlled by an integrated component but directly by a digital signal processor instead. Compared to commercially available ICs, which only provide a resolution of 6 or 8 bits for measuring current in the winding and specifying the target current, the entire control process can be carried out using 12-bit resolution with the new dspDrive. The parameters of the PI current controller are adjusted depending on speed.

This has the following application advantages:

- Very quiet, low-resonance operation with sinusoidal current waveform in the windings. Jumps and noise, which encourage the motor towards resonance, no longer occur thanks to the high resolution of the controller.




- Even more flexible: Now 3-phase stepper motors and BLDC motors can be controlled by the direct activation of half-bridges using DSP, just like their 2-phase counterparts.

**Sinusoidal commutation with encoder in operation**

In contrast to conventional stepper motor controllers where only the motor is actuated or the position adjusted via the encoder, sinusoidal commutation controls the stator magnetic field via the encoder as in a servo motor. The stepper motor behaves no different than a multi-pole servo motor in this operating type, i.e. classic stepper motor noises and resonance are gone. The motor no longer loses steps up to its maximum torque. The current level is always adjusted to the momentarily needed torque by the controller; as a result, current consumption and heat generation are reduced significantly compared to a classic stepper motor controller if the maximum torque is not used continuously.

Especially with speeds of up to 1500 rpm or torques of up to 10 Nm, the sinus commutated stepper motor presents an economic alternative to conventional servo systems as it doesn´t require a gear.

**NanoJ V2**

The second generation of our NanoJ programming language features two major improvements:

1. The internal operating system of the new controller generation ensures that the program will run with a stable timing of 1 ms with minimal jitter. The mapped objects, such as the inputs or controller sizes, are updated every millisecond and can be processed by NanoJ. This makes it possible to employ user programs to create solutions for dynamic applications, which until now often required firmware adjustments.

2. Byte code is no longer executed in a virtual machine. Instead, real machine code is used, which accelerates execution several times over.

# PD2-C

## Stepper motor with integrated controller – NEMA 17

## OPTIONS

Gearbox

## SOFTWARE

Plug&Drive Studio

## TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 4 - 6 |
| **Type of Digital Inputs** | 24 V, 5/24 V switchable |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-20 mA/0-10 V switchable |
| **Number of Digital Outputs** | 2 - 3 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute |
| **Encoder Resolution** | 1024 CPR |

## VERSIONS

| Type | Holding Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|
| PD2-C4118L1804 | 50 | 1.8 | 3 | USB, IO (clock direction; analog), CANopen | 74 | 0.5 |

## ORDER IDENTIFIER

**PD2-C4118L1804-E-**
01 = USB, IO (clock direction; analog)
08 = CANopen

## ACCESSORIES

**ZK-MICROUSB** Micro USB cable, 1.5m
**ZK-PD4-C-CAN-4-500-S** CAN in/out cable 0.5m
**Z-K4700/50** Capacitor
**ZCPHOF-MC1,5-8** 8-pin terminal connector



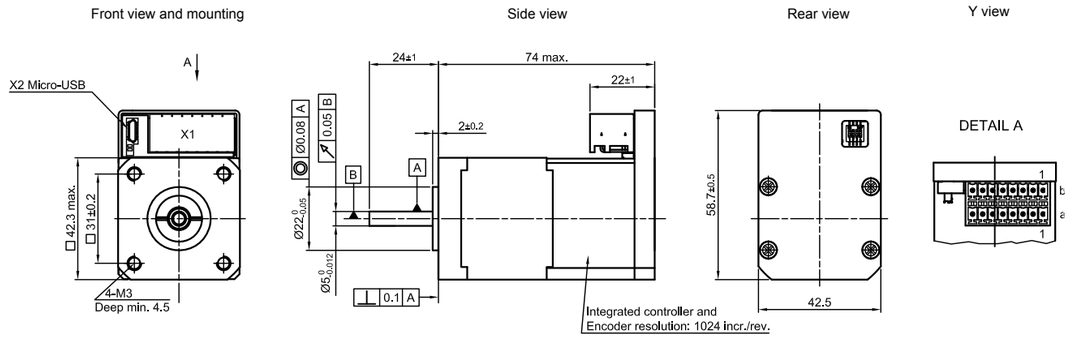
PD2-C

Stepper motor with integrated controller – NEMA 17

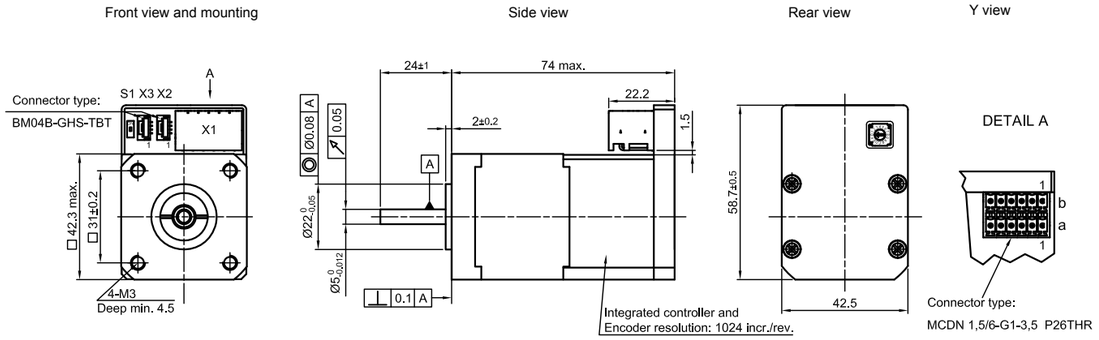


## DIMENSIONS (IN MM)

**PD2-C4118L1804-E-01**

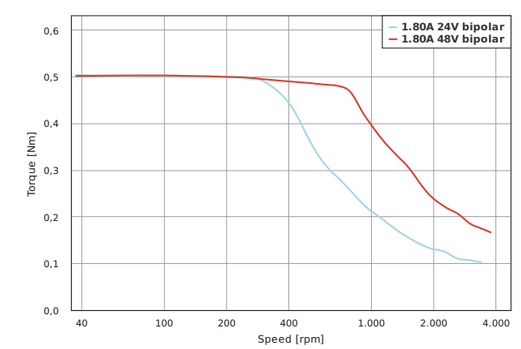



**PD2-C4118L1804-E-08**




## TORQUE CURVES

**PD2-C4118L1804**



# PD2-C-IP

## Stepper motor with integrated controller IP65 – NEMA 17

### OPTIONS

Gearbox

### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 4 - 5 |
| **Type of Digital Inputs** | 24 V, 5/24 V switchable |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-20 mA/0-10 V switchable |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute |
| **Encoder Resolution** | 1024 CPR |

### VERSIONS

| Type | Holding Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|
| PD2-C411L18-E-65 | 50 | 1.8 | 3 | USB, IO (clock direction; analog), CANopen | 74.4 | 0.5 |

### ORDER IDENTIFIER

**PD2-C411L18-E-65-**
01 = USB, IO (clock direction; analog)
08 = CANopen

### ACCESSORIES

**ZK-USB** Mini USB cable, 1.5m
**ZK-M8-3-2M-1-AFF** Power straight, 2m
**ZK-M8-8-2M-1-PUR-S** IO straight, 2m
**ZK-M8-5-2M-1-PUR-S-F** CAN in straight, 2m
**ZK-M8-5-2M-1-PUR-S-M** CAN out straight, 2m
**ZK-M12F-M8M-5-200-S** CAN out straight, 0.2m
**ZK-M12M-M8F-5-200-S** CAN in straight, 0.2m
**Z-K4700/50** Capacitor



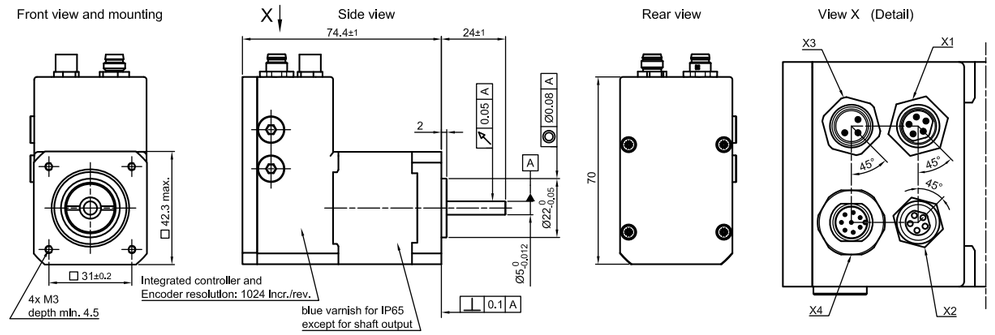
PD2-C-IP

Stepper motor with integrated controller IP65 – NEMA 17

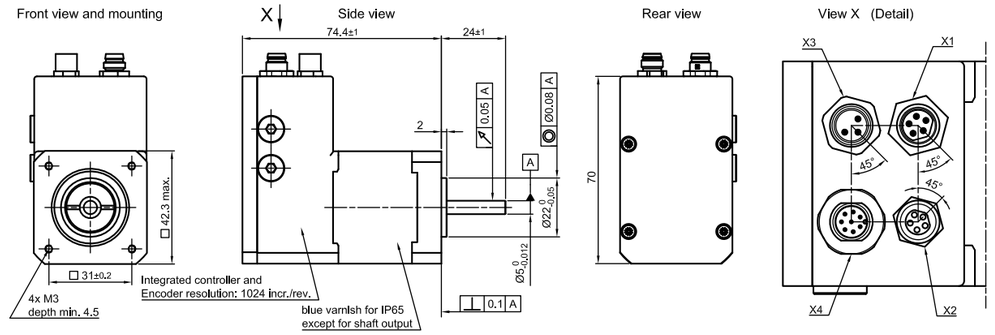


### DIMENSIONS (IN MM)

**PD2-C411L18-E-65-08**

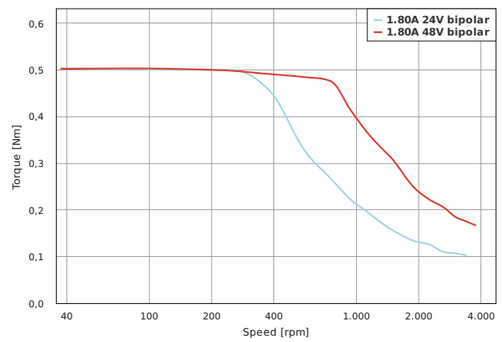



**PD2-C411L18-E-65-08**




### TORQUE CURVES

**PD2-C411L18-E-65**



# PD2-CB

## Brushless DC motor with integrated controller – NEMA 17

## OPTIONS

Gearbox

## SOFTWARE

Plug&Drive Studio

## TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 4 - 6 |
| **Type of Digital Inputs** | 24 V, 5/24 V switchable |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-20 mA/0-10 V switchable |
| **Number of Digital Outputs** | 2 - 3 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute |
| **Encoder Resolution** | 1024 CPR |

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Rated Speed rpm | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| PD2-CB42C048040 | 105 | 25 | 3.3 | 10 | 4000 | USB, IO (clock direction; analog), CANopen | 123.4 | 0.85 |
| PD2-CB42M024040 | 52.5 | 12.5 | 3.47 | 10.6 | 4000 | USB, IO (clock direction; analog), CANopen | 83.4 | 0.85 |

## ORDER IDENTIFIER

**PD2-CB42C048040-E-**
01 = USB, IO (clock direction; analog)
08 = CANopen

## ACCESSORIES

**ZK-MICROUSB** Micro USB cable, 1.5m
**ZK-PD4-C-CAN-4-500-S** CAN in/out bridge 0.5m
**Z-K4700/50** Capacitor
**ZCPHOF-MC1,5-6** 6-pin terminal connector

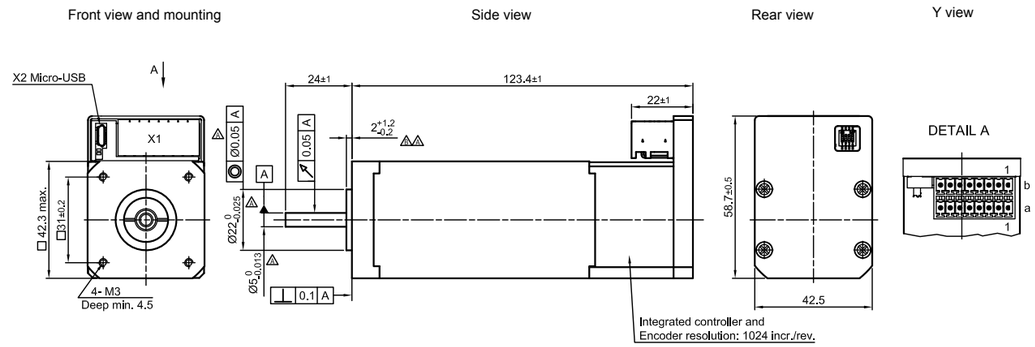


PD2-CB
Brushless DC motor with integrated controller – NEMA 17

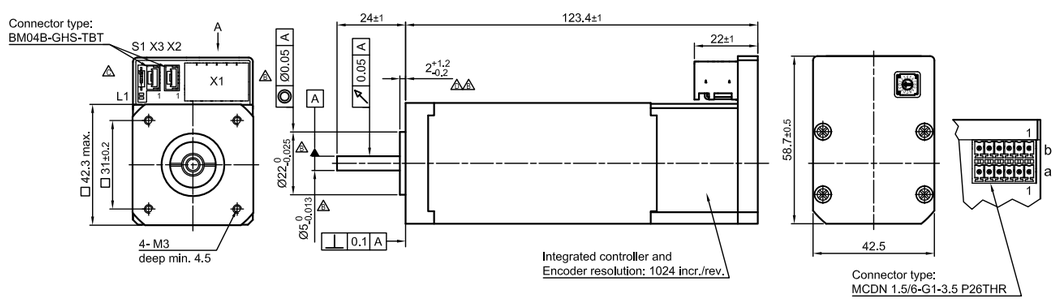


## DIMENSIONS (IN MM)

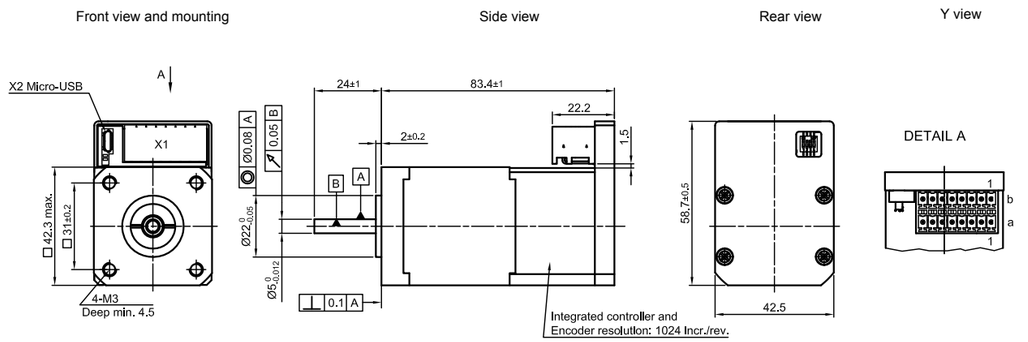
**PD2-CB42C048040-E-01**




**PD2-CB42C048040-E-08**




**PD2-CB42M024040-E-01**

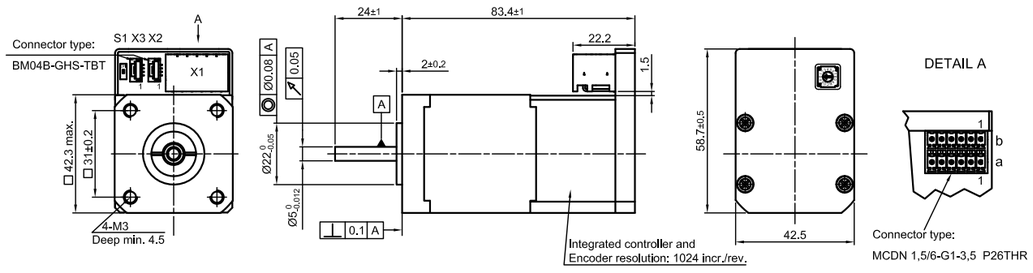


# PD2-CB

## Brushless DC motor with integrated controller – NEMA 17

### DIMENSIONS (IN MM)

**PD2-CB42M024040-E-08**

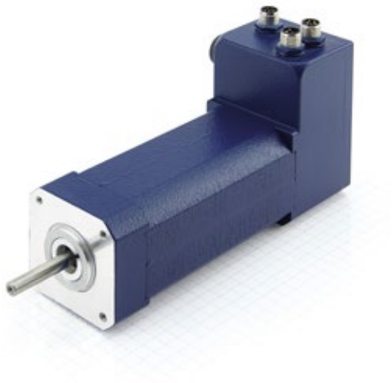





# Notes

# PD2-CB-IP

## Brushless DC motor with integrated controller IP65 – NEMA 17



### OPTIONS

Gearbox

### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 4 - 5 |
| **Type of Digital Inputs** | 24 V, 5/24 V switchable |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-20 mA/0-10 V switchable |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute |
| **Encoder Resolution** | 1024 CPR |

### VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Rated Speed rpm | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| PD2-CB42CD-E-65 | 105 | 25 | 3.3 | 10 | 4000 | USB, IO (clock direc-tion; analog), CANopen | 123.9 | 0.9 |

### ORDER IDENTIFIER

**PD2-CB42CD-E-65-**
01 = USB, IO (clock direction; analog)
08 = CANopen

### ACCESSORIES

**ZK-USB** Mini USB cable, 1.5m
**ZK-M8-3-2M-1-AFF** Power cable straight, 2m
**ZK-M8-8-2M-1-PUR-S** IO straight, 2m
**ZK-M8-5-2M-1-PUR-S-F** CAN in straight, 2m
**ZK-M8-5-2M-1-PUR-S-M** CAN out straight, 2m
**ZK-M12F-M8M-5-200-S** CAN out straight, 0.2m
**ZK-M12M-M8F-5-200-S** CAN in straight, 0.2m
**Z-K4700/50** Capacitor



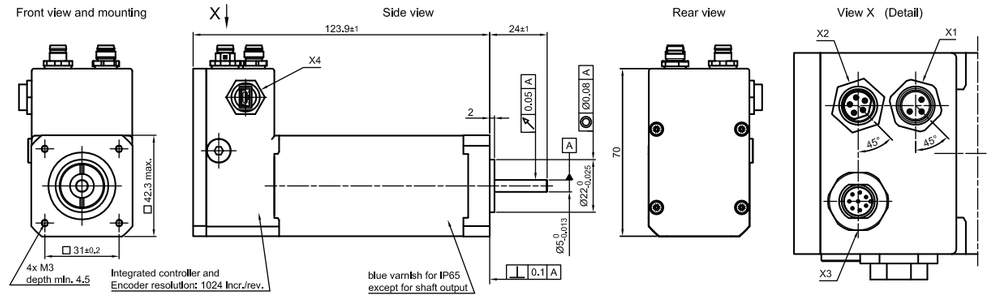
PD2-CB-IP

Brushless DC motor with integrated controller IP65 – NEMA 17

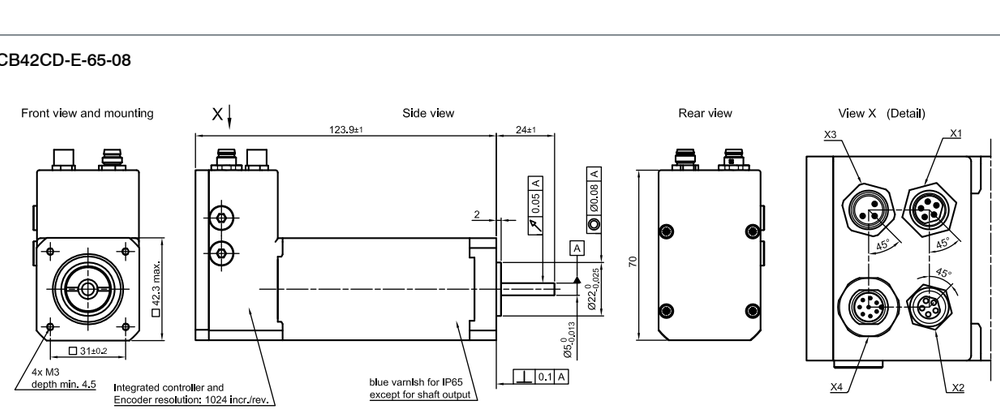


### DIMENSIONS (IN MM)

**PD2-CB42CD-E-65-01**




**PD2-CB42CD-E-65-08**



# PD4-C

## Stepper motor with integrated controller – NEMA 23/24

## OPTIONS

Gearbox

## SOFTWARE

Plug&Drive Studio

## TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 4 - 6 |
| **Type of Digital Inputs** | 24 V, 5/24 V switchable |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-10 V |
| **Number of Digital Outputs** | 1 - 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute |
| **Encoder Resolution** | 1024 CPR |

## VERSIONS

| Type | Holding Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|
| PD4-C5918X4204 | 53.7 | 4.2 | 5.4 | USB, IO (clock direction; analog), CANopen | 65 | 0,6 |
| PD4-C5918M4204 | 124 | 4.2 | 5.4 | USB, IO (clock direction; analog), CANopen | 79 | 0,8 |
| PD4-C5918L4204 | 187 | 4.2 | 5.4 | USB, IO (clock direction; analog), CANopen | 100 | 1.2 |
| PD4-C6018L4204 | 354 | 4.2 | 5.4 | USB, IO (clock direction; analog), CANopen | 112.5 | 1.6 |

## ORDER IDENTIFIER

**PD4-C5918X4204-E-**
01 = USB, IO (clock direction; analog)
08 = CANopen

## ACCESSORIES

**ZK-MICROUSB** Micro USB cable, 1.5m
**ZK-PD4-C-CAN-4-500-S** CAN in/out cable 0.5m
**Z-K4700/50** Capacitor
**IO-PD4-C-01** Test board for PD4-Cxx-E-01
**ZCPHOFK-MC0,5-4** Connector
**ZCPHOFK-MC0,5-10** Connector
**ZCPHOF-MC1,5-2** Connector



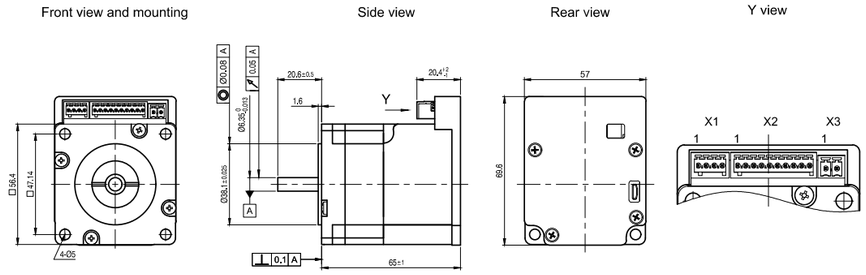
PD4-C

Stepper motor with integrated controller – NEMA 23/24

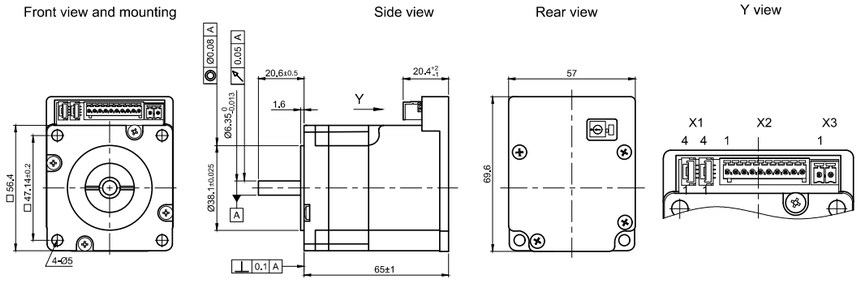


## DIMENSIONS (IN MM)

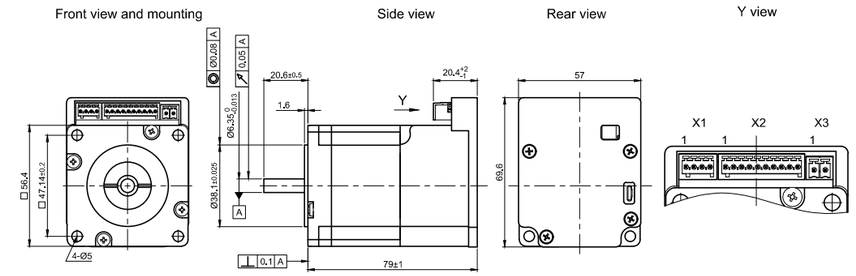
**PD4-C5918X4204-E-01**




**PD4-C5918X4204-E-08**

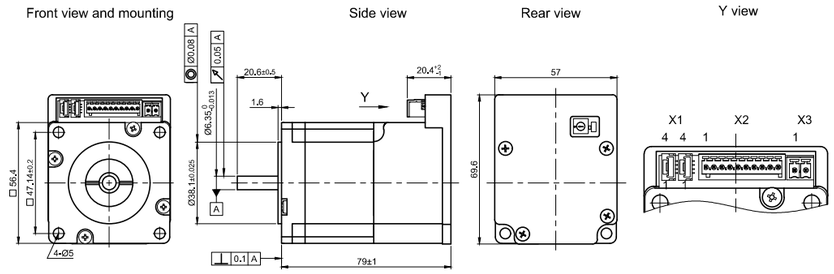



**PD4-C5918M4204-E-01**

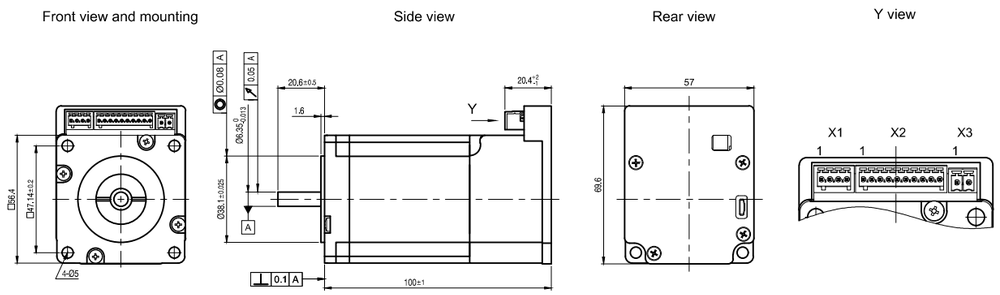


## DIMENSIONS (IN MM)

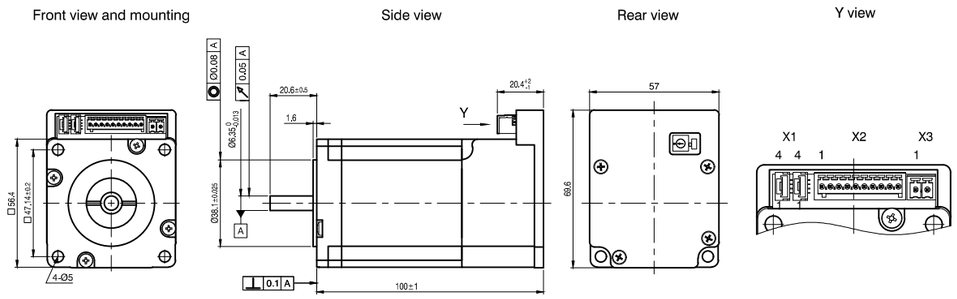
### PD4-C5918M4204-E-08




### PD4-C5918L4204-E-01




### PD4-C5918L4204-E-08



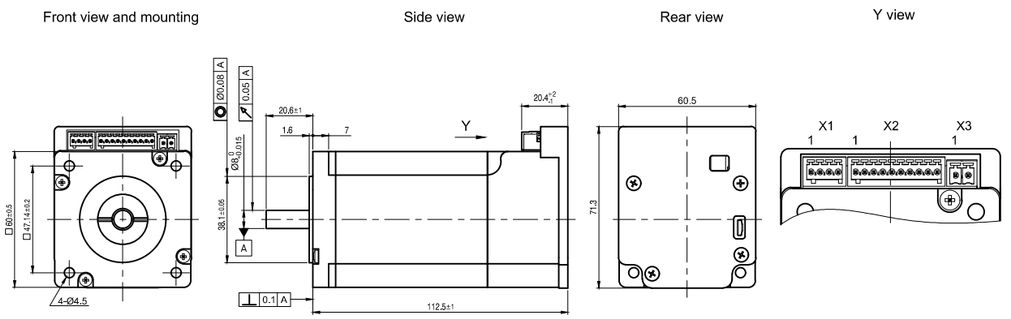




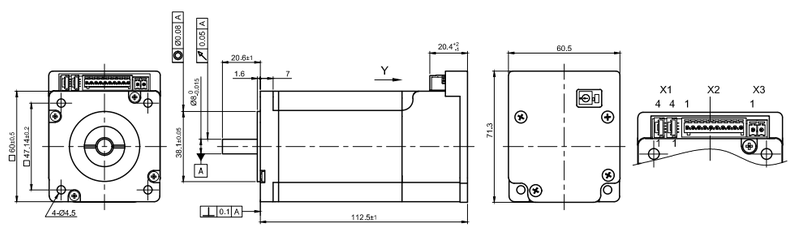



## DIMENSIONS (IN MM)

### PD4-C6018L4204-E-01




### PD4-C6018L4204-E-08

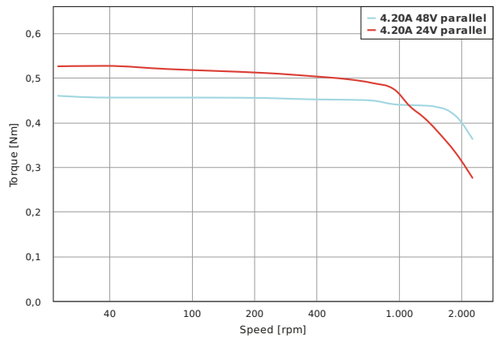


# PD4-C

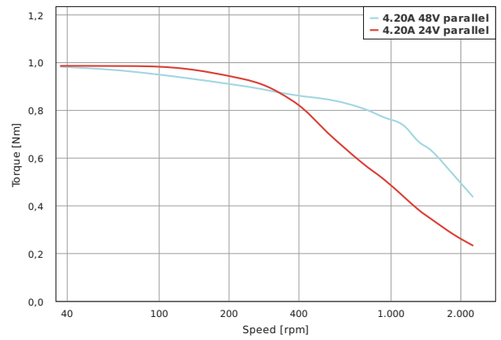
## Stepper motor with integrated controller – NEMA 23/24

### TORQUE CURVES

**PD4-C5918X4204**




**PD4-C5918M4204**




**PD4-C5918L4204**




**PD4-C6018L4204**






# Notes

# PD4-E

## Stepper motor with integrated controller IP65 – NEMA 23/24

### OPTIONS

Gearbox

### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 6 |
| **Type of Digital Inputs** | 5/24 V switchable |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-20 mA/0-10 V switchable |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute, multi-turn absolute |
| **Encoder Resolution** | 1024 CPR |
| **Multiturn Resolution** | 18 bit |

### VERSIONS

| Type | Holding Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|
| PD4-E591L42-E | 187 | 4.2 | 4.2 | EtherCAT, CANopen, EtherNet/IP, Modbus TCP, Modbus RTU, USB, IO (clock direction; analog) | 103 | 1.3 |
| PD4-E591L42-EB | 187 | 4.2 | 4.2 | EtherCAT, CANopen | 144.5 | 1.6 |
| PD4-E591L42 | 187 | 4.2 | 4.2 | EtherCAT, CANopen | 126.5 | 1.4 |
| PD4-E601L42-E | 354 | 4.2 | 4.2 | EtherCAT, CANopen, EtherNet/IP, Modbus TCP, Modbus RTU, USB, IO (clock direction; analog) | 116 | 1.5 |



PD4-E

Stepper motor with integrated controller IP65 – NEMA 23/24



### ORDER IDENTIFIER

**PD4-E591L42-E-65-**
1 = EtherCAT
2 = CANopen
3 = EtherNet/IP
4 = Modbus TCP
5 = Modbus RTU
7 = USB, IO (clock direction; analog)
Without brake

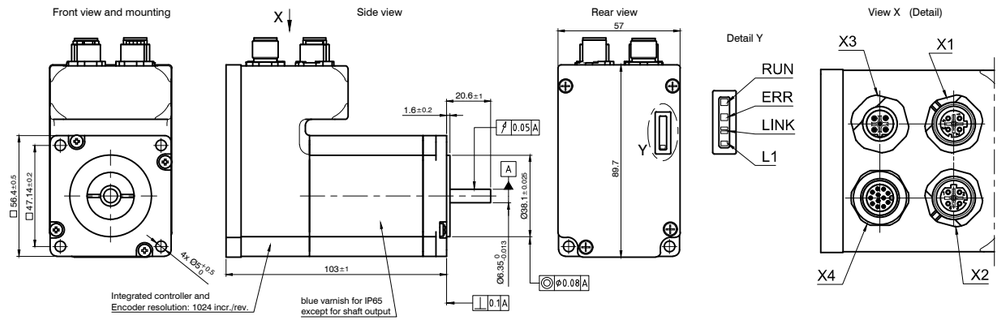
**PD4-E591L42-EB-65-**
1 = EtherCAT
2 = CANopen
3 = EtherNet/IP
4 = Modbus TCP
5 = Modbus RTU
7 = USB, IO (clock direction; analog)
With brake

### ACCESSORIES

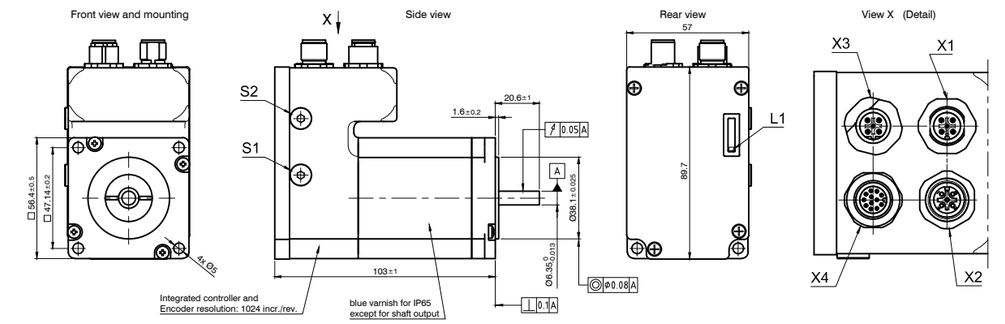
**ZK-USB** Mini USB cable, 1.5m
**ZK-M12-5-2M-1-AFF** Modbus RTU in straight, 2m
**ZK-M12-12-2M-1-AFF** IO straight, 2m
**ZK-M12-5-2M-1-B-S** Power straight, 2m
**ZK-M12-5-2M-1-A-S-M** Modbus RTU out straight, 2m
**ZK-M12-4-2M-1-D-RJ45** Modbus TCP straight, 2m
**ZK-M12F-M8M-5-200-S** CAN in straight, 0.2m
**ZK-M12M-M8F-5-200-S** CAN out straight, 0.2m
**ZK-M12M-M12F-5-500-S** CAN in/out straight, 0.5m
**Z-K4700/50** Capacitor

### DIMENSIONS (IN MM)

PD4-E591L42-E-65-1

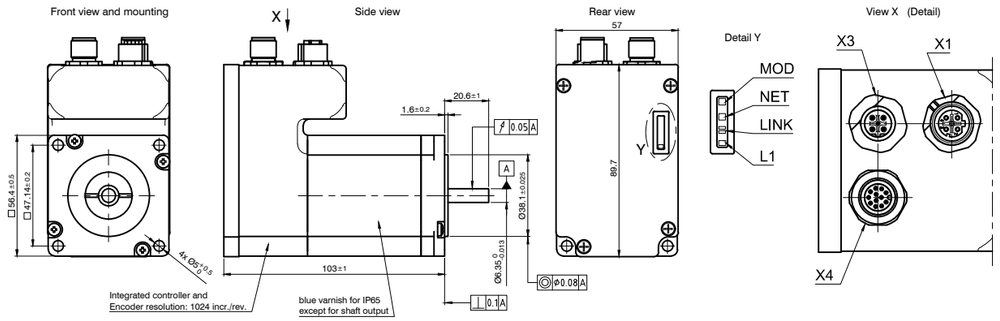



PD4-E591L42-E-65-2

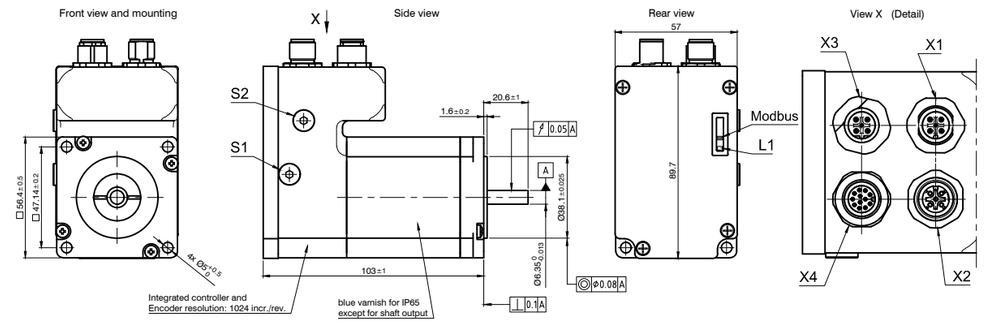


## DIMENSIONS (IN MM)

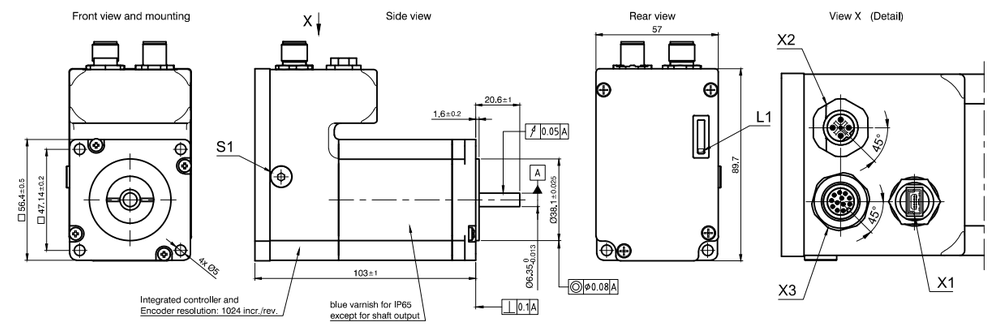
### PD4-E591L42-E-65-3




### PD4-E591L42-E-65-5




### PD4-E591L42-E-65-7



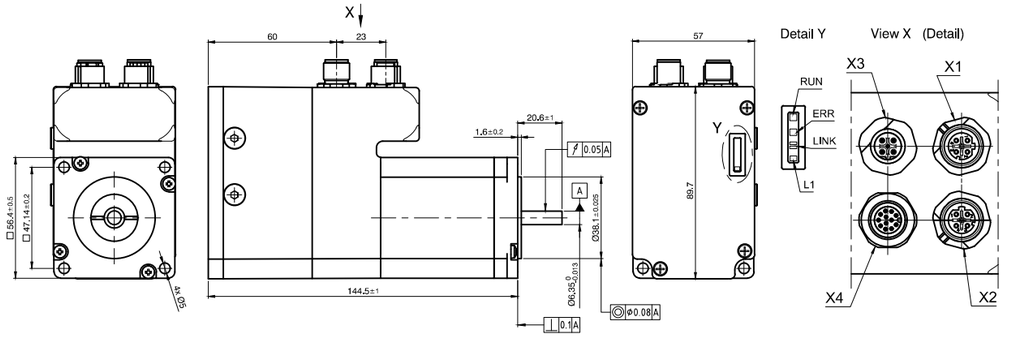




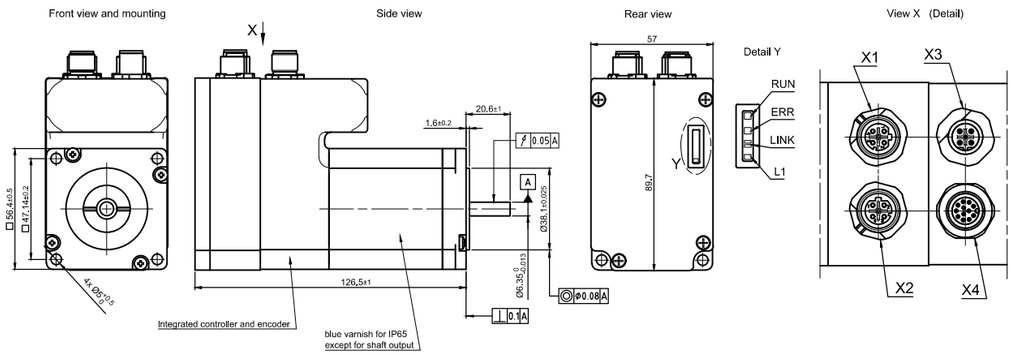



## DIMENSIONS (IN MM)

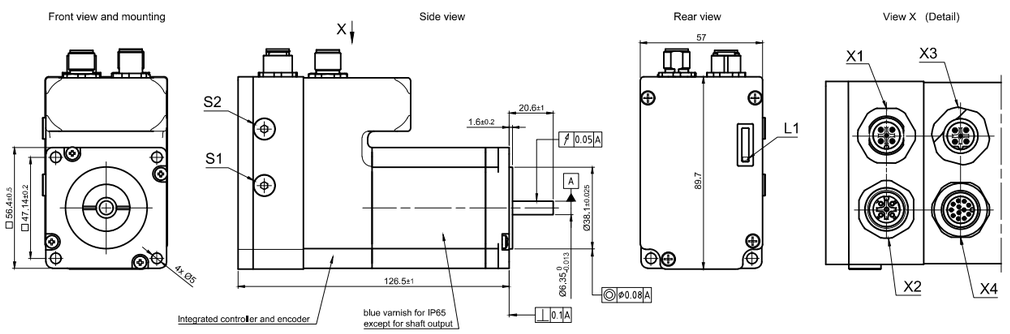
### PD4-E591L42-EB-65-1_2




### PD4-E591L42-M-65-1

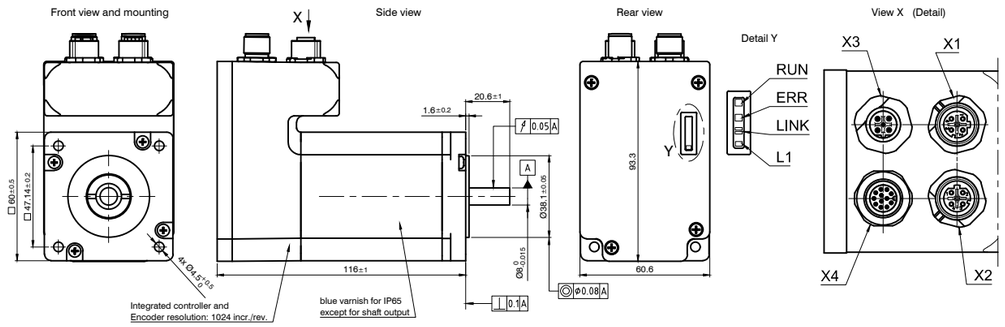



### PD4-E591L42-M-65-2

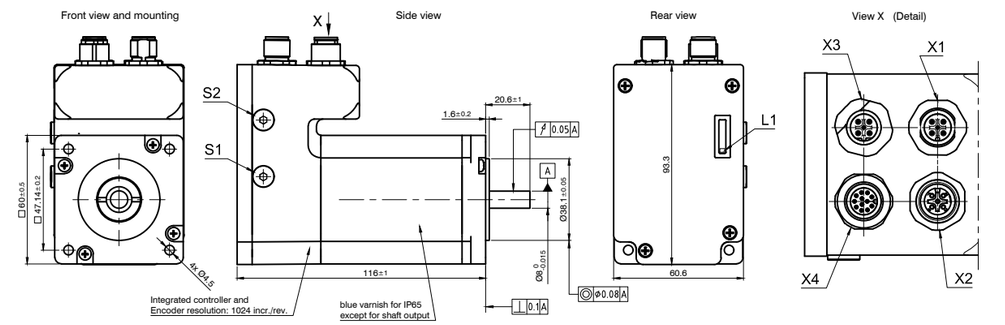


## DIMENSIONS (IN MM)

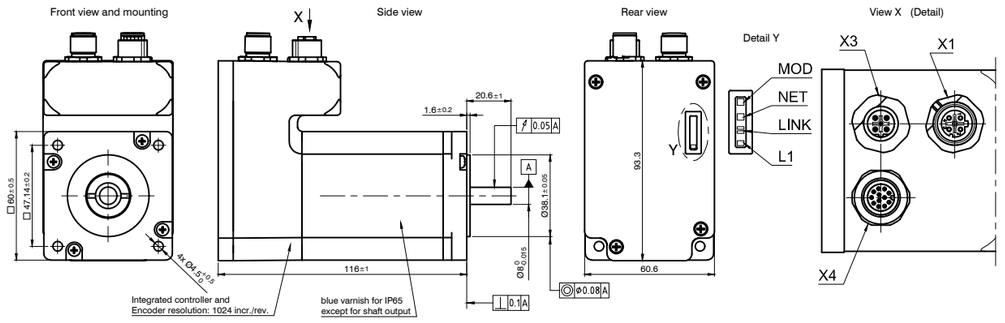
### PD4-E601L42-E-65-1




### PD4-E601L42-E-65-2




### PD4-E601L42-E-65-3



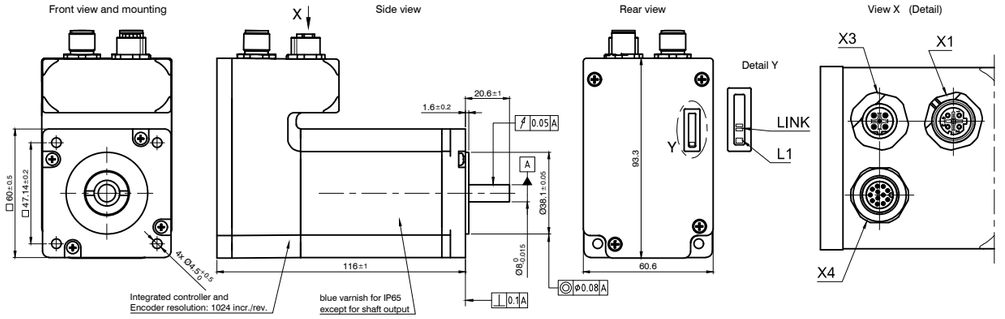




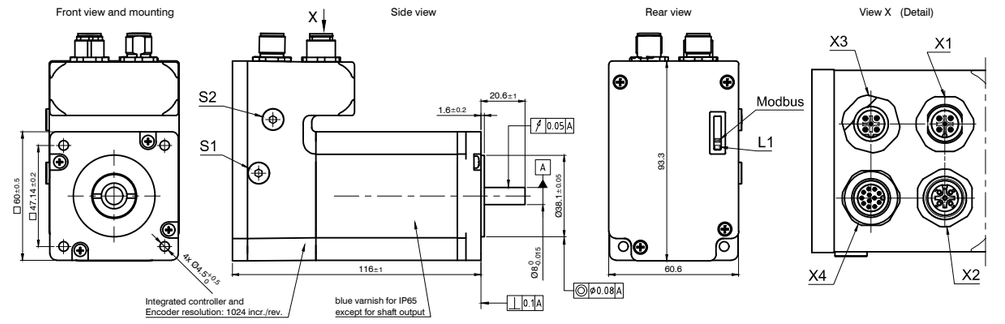



## DIMENSIONS (IN MM)

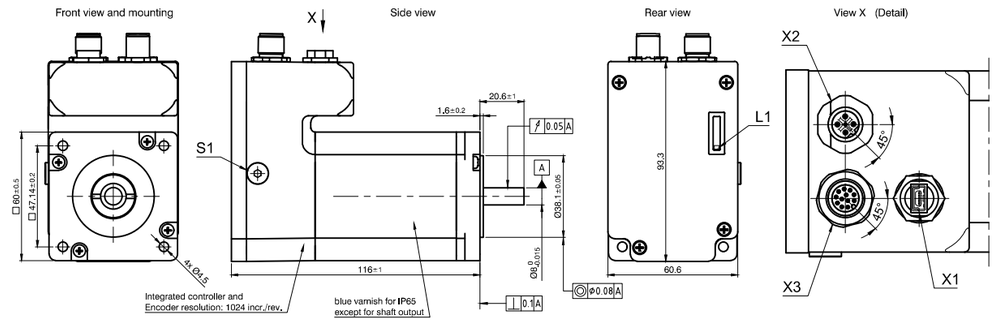
### PD4-E601L42-E-65-4




### PD4-E601L42-E-65-5




### PD4-E601L42-E-65-7

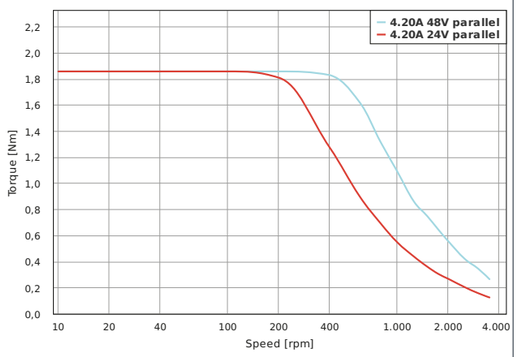


# PD4-E

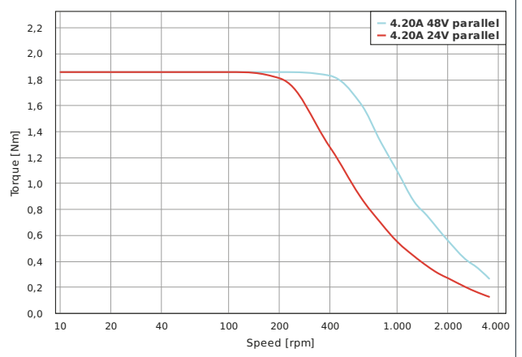
## Stepper motor with integrated controller IP65 – NEMA 23/24

### TORQUE CURVES

**PD4-E591L42-E**




**PD4-E591L42-EB**




**PD4-E591L42**




**PD4-E601L42-E**






## Notes

# PD4-CB

## Brushless DC motor with integrated controller – NEMA 23

### OPTIONS

Gearbox

### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 24 VDC |
| **Number of Digital Inputs** | 4 - 6 |
| **Type of Digital Inputs** | 24 V, 5/24 V switchable |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-10 V |
| **Number of Digital Outputs** | 1 - 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute |
| **Encoder Resolution** | 1024 CPR |

### VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Rated Speed rpm | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| PD4-CB59M024035-E | 135 | 37 | 8 | 20 | 3500 | USB, IO (clock direction; analog), CANopen | 95 | 0.9 |

### ORDER IDENTIFIER

**PD4-CB59M024035-E-**
01 = USB, IO (clock direction; analog)
08 = CANopen

### ACCESSORIES

**ZK-MICROUSB** Micro USB cable, 1.5m
**ZK-PD4-C-CAN-4-500-S** CAN in/out bridge 0.5m
**Z-K4700/50** Capacitor
**IO-PD4-C-01** Test board for PD4-Cxx-E-01
**ZCPHOFK-MC0,5-4** Connector
**ZCPHOFK-MC0,5-10** Connector
**ZCPHOF-MC1,5-2** Connector

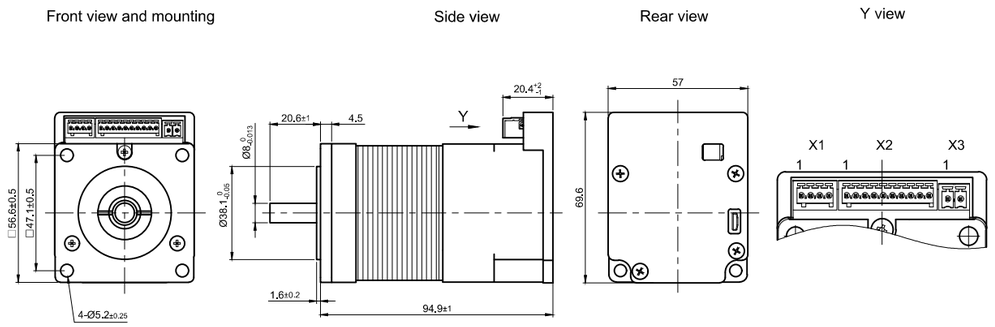


PD4-CB
Brushless DC motor with integrated controller – NEMA 23

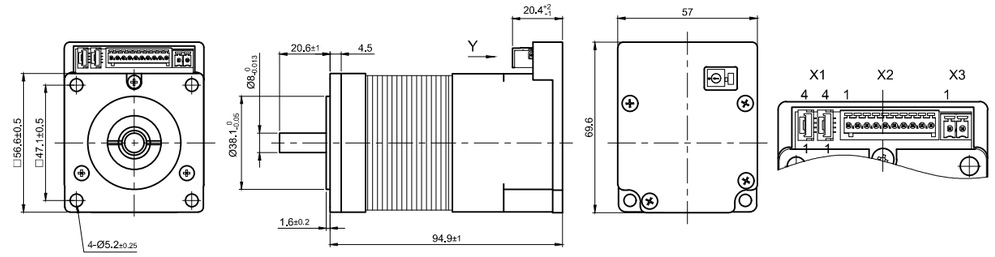


### DIMENSIONS (IN MM)

**PD4-CB59M024035-E-01**

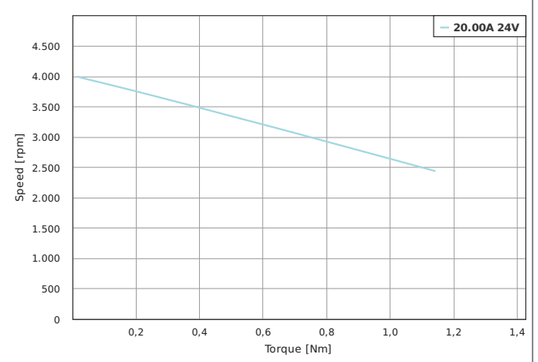



**PD4-CB59M024035-E-08**




### TORQUE CURVES

**PD4-CB59M024035-E**



# PD4-EB

## Brushless DC motor with integrated controller IP65 – NEMA 23

### OPTIONS

Gearbox

### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 6 |
| **Type of Digital Inputs** | 5/24 V switchable |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-20 mA/0-10 V switchable, 0-10 V |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute, multi-turn absolute |
| **Multiturn Resolution** | 18 bit |
| **Singleturn Resolution** | 18 bit |

### VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Rated Speed rpm | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| PD4-EB59CD-E | 220 | 60 | 6 | 18 | 3500 | EtherCAT, CANopen, EtherNet/IP, Modbus TCP, Modbus RTU, USB, IO (clock direction; analog) | 123 | 1.35 |
| PD4-EB59CD-EB | 220 | 60 | 6 | 18 | 3500 | EtherCAT, CANopen | 161 | 1.6 |
| PD4-EB59CD-M | 220 | 60 | 6 | 18 | 3500 | EtherCAT, CANopen | 146.5 | 1.45 |



PD4-EB

Brushless DC motor with integrated controller IP65 – NEMA 23



### ORDER IDENTIFIER

**PD4-EB59CD-E-65-**
1 = EtherCAT
2 = CANopen
3 = EtherNet/IP
4 = Modbus TCP
5 = Modbus RTU
7 = USB, IO (clock direction; analog)
Without brake

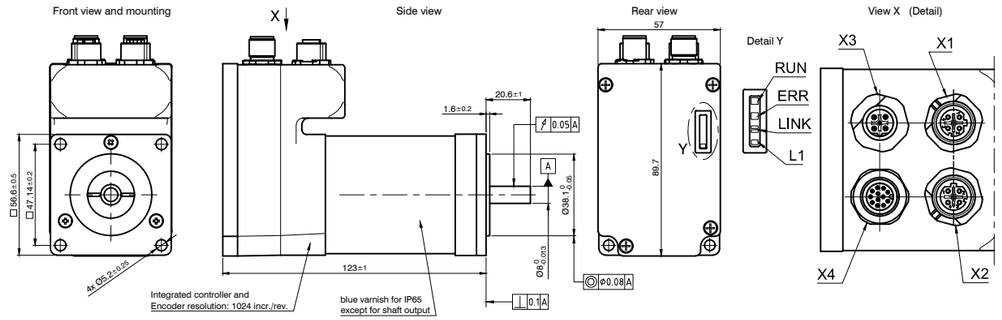
**PD4-EB59CD-EB-65-**
1 = EtherCAT
2 = CANopen
3 = EtherNet/IP
4 = Modbus TCP
5 = Modbus RTU
7 = USB, IO (clock direction; analog)
With brake

### ACCESSORIES

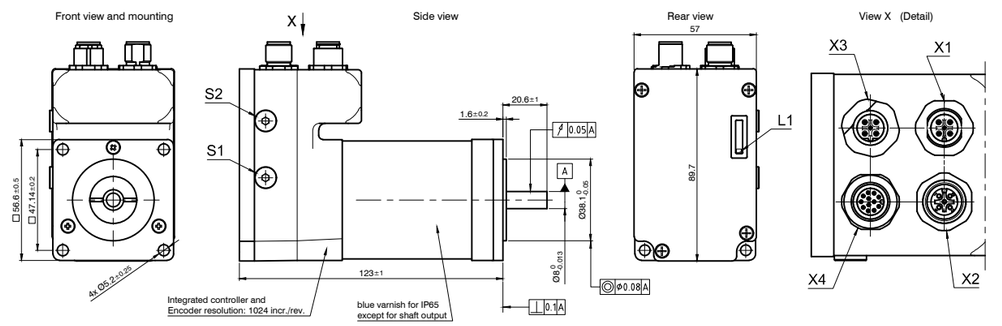
**ZK-USB** Mini USB cable, 1.5m
**ZK-M12-5-2M-1-AFF** CAN in straight, 2m
**ZK-M12-12-2M-1-AFF** IO straight, 2m
**ZK-M12-5-2M-1-B-S** Power straight, 2m
**ZK-M12-5-2M-1-A-S-M** CAN out straight, 2m
**ZK-M12-4-2M-1-D-RJ45** EtherCAT in/out straight, 2m
**ZK-M12F-M8M-5-200-S** CAN in straight, 0.2m
**ZK-M12M-M8F-5-200-S** CAN out straight, 0.2m
**ZK-M12M-M12F-5-500-S** CAN in/out straight, 0.5m
**Z-K4700/50** Capacitor

### DIMENSIONS (IN MM)

**PD4-EB59CD-E-65-1**

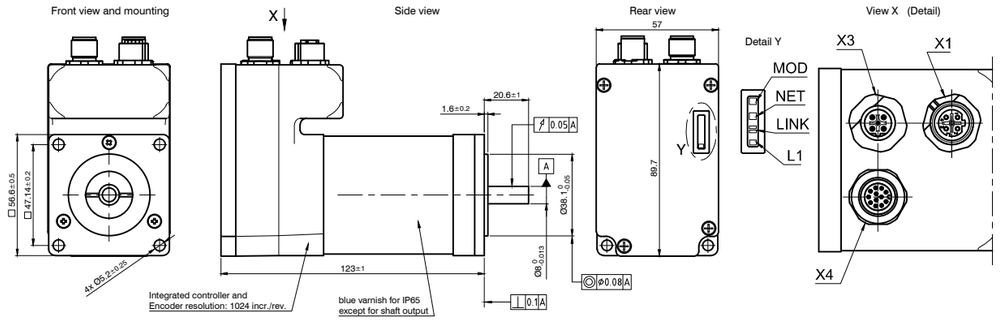



**PD4-EB59CD-E-65-2**

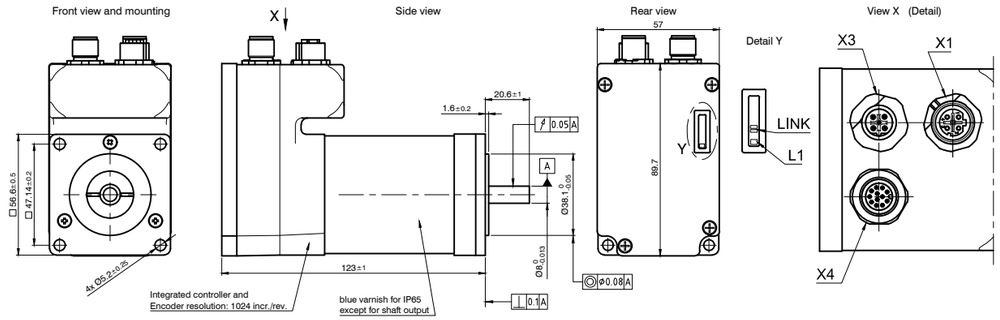


## DIMENSIONS (IN MM)

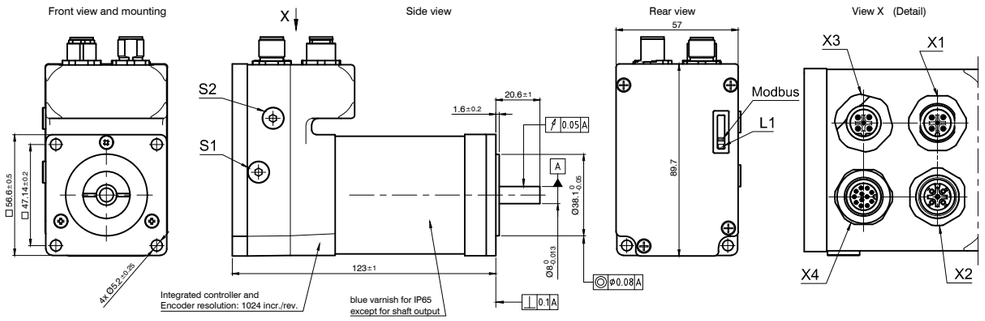
### PD4-EB59CD-E-65-3




### PD4-EB59CD-E-65-4




### PD4-EB59CD-E-65-5

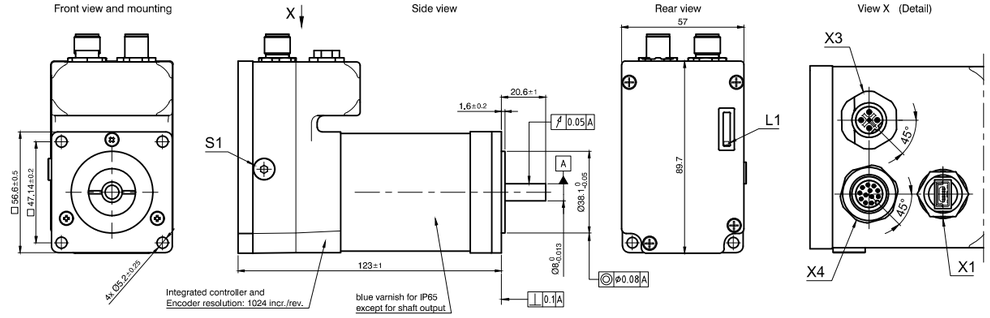




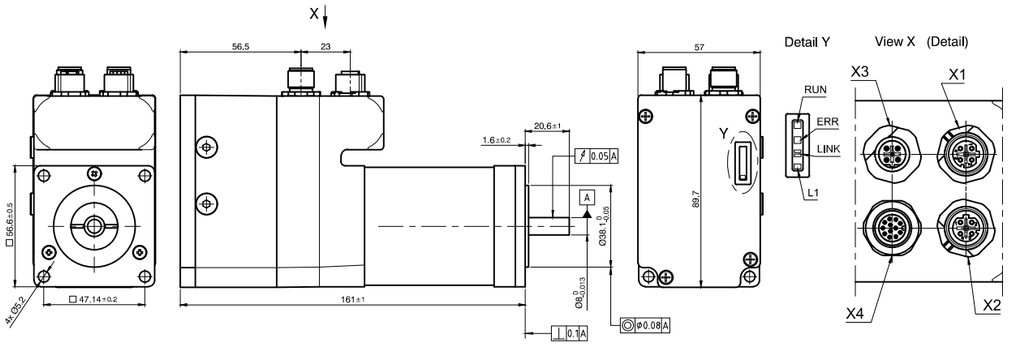



## DIMENSIONS (IN MM)

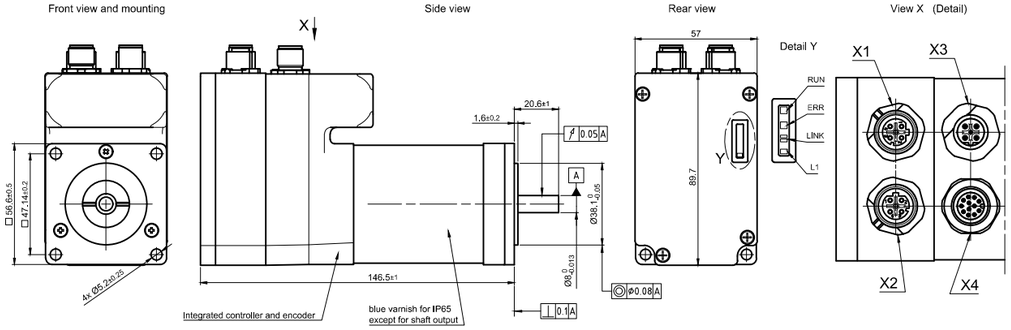
### PD4-EB59CD-E-65-7




### PD4-EB59CD-EB-65-1_2




### PD4-EB59CD-M-65-1

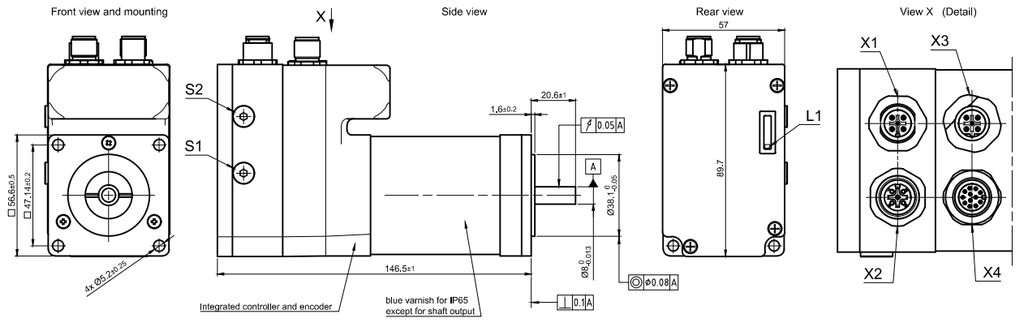


# PD4-EB

## Brushless DC motor with integrated controller IP65 – NEMA 23

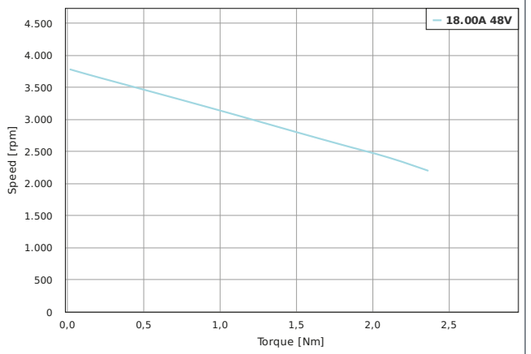
### DIMENSIONS (IN MM)

**PD4-EB59CD-M-65-2**




### TORQUE CURVES

**PD4-EB59CD-E**






# Notes

# PD6-C

## Stepper motor with integrated controller – NEMA 34

## OPTIONS

Gearbox

## SOFTWARE

Plug&Drive Studio

## TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 6 |
| **Type of Digital Inputs** | 5/24 V switchable |
| **Number of Analog Inputs** | 2 |
| **Type of Analog Input** | 0-10 V, 0-20 mA/0-10 V switchable |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute |
| **Encoder Resolution** | 1024 CPR |

## VERSIONS

| Type | Holding Torque Ncm | Rated Current (RMS) A | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|
| PD6-C8918S6404-E-09 | 360 | 6.4 | CANopen, USB, IO (clock direction; analog) | 91 | 1.85 |
| PD6-C8918M9504-E-09 | 594 | 9.5 | CANopen, USB, IO (clock direction; analog) | 123 | 2.95 |
| PD6-C8918L9504-E-09 | 933 | 9.5 | CANopen, USB, IO (clock direction; analog) | 153 | 4.1 |

## ACCESSORIES

**ZK-MICROUSB** Micro USB cable, 1.5m
**Z-K10000/100** Capacitor
**ZCPHOFK-MC0,5-12** Connector
**ZCPHOFKC-2,5HC-2** Connector

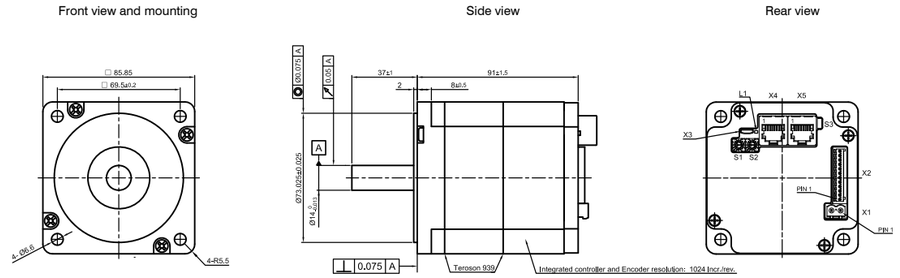


PD6-C
Stepper motor with integrated controller – NEMA 34

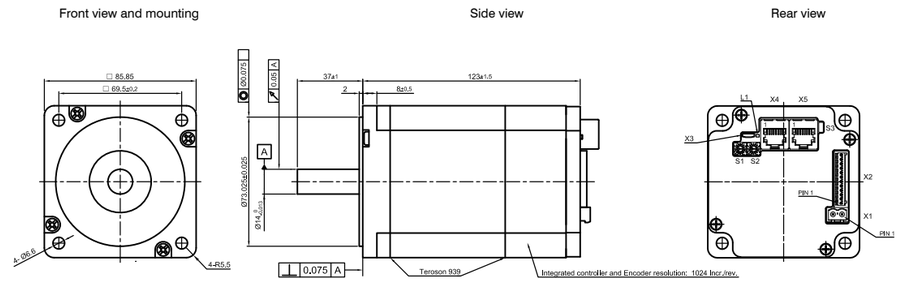


## DIMENSIONS (IN MM)

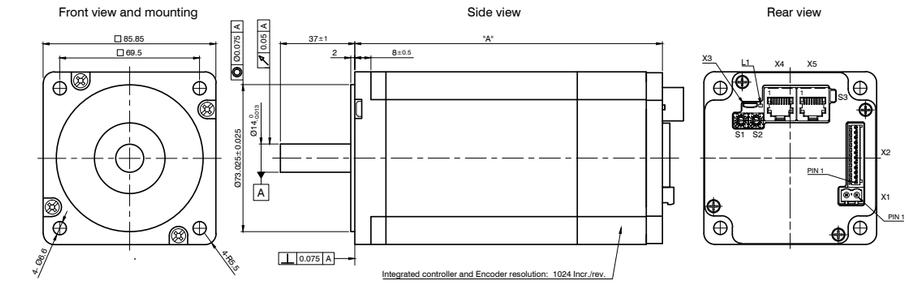
**PD6-C8918S6404-E-09**




**PD6-C8918M9504-E-09**




**PD6-C8918L9504-E-09**

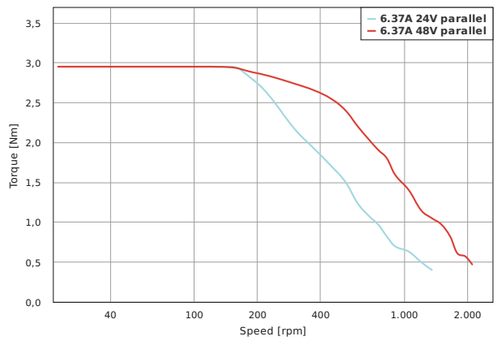


# PD6-C

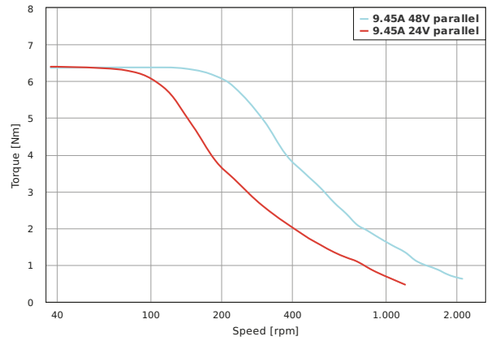
## Stepper motor with integrated controller – NEMA 34

### TORQUE CURVES

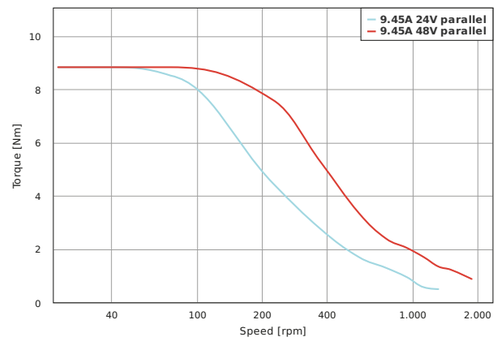
**PD6-C8918S6404-E-09**




**PD6-C8918M9504-E-09**




**PD6-C8918L9504-E-09**

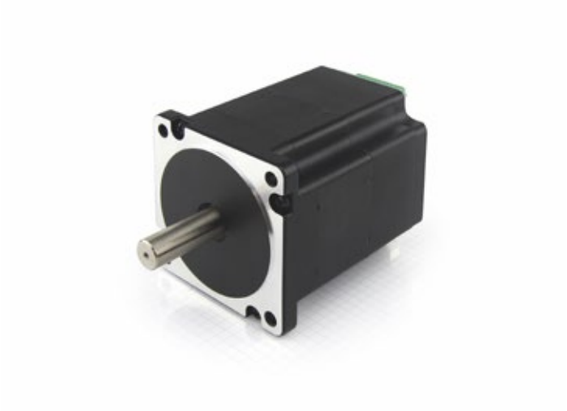





# Notes

# PD6-CB

## Brushless DC motor with integrated controller – NEMA 34 and flange size 80 mm



## OPTIONS

Gearbox

## SOFTWARE

Plug&Drive Studio

## TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 12 VDC - 48 VDC |
| **Number of Digital Inputs** | 6 |
| **Type of Digital Inputs** | 5/24 V switchable |
| **Number of Analog Inputs** | 2 |
| **Type of Analog Input** | 0-10 V, 0-20 mA/0-10 V switchable |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Encoder** | ✓ |
| **Encoder Type** | single-turn absolute |
| **Encoder Resolution** | 1024 CPR |

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current (RMS) A | Peak Current (RMS) A | Rated Speed rpm | Interface | Length mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| PD6-CB87S048030-E-09 | 220 | 70 | 6.25 | 20 | 3000 | CANopen, USB, IO (clock direction; analog) | 96.9 | 2 |
| PD6-CB80M048030-E-09 | 534 | 170 | 14 | 40 | 3000 | CANopen, USB, IO (clock direction; analog) | 113 | 1.35 |

## ACCESSORIES

**ZK-MICROUSB** Micro USB cable, 1.5m
**Z-K10000/100** Capacitor
**ZCPHOFK-MC0,5-12** Connector
**ZCPHOFKC-2,5HC-2** Connector



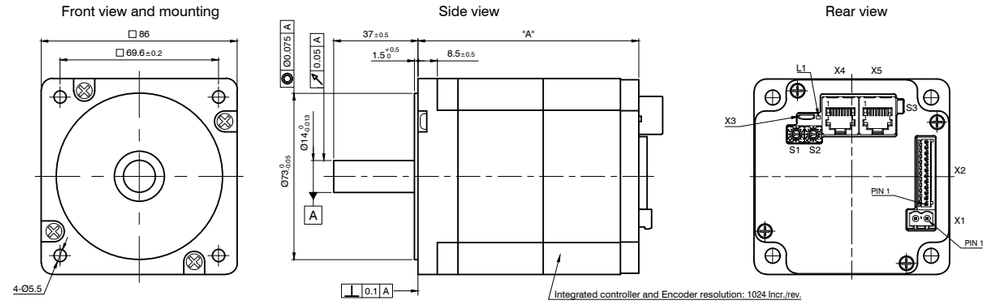
PD6-CB

Brushless DC motor with integrated controller – NEMA 34 and flange size 80 mm

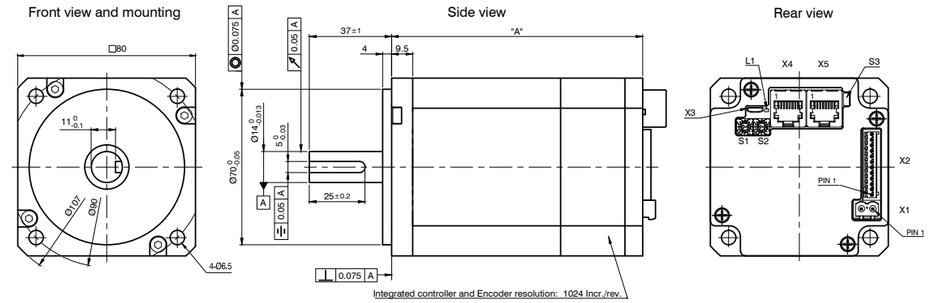


## DIMENSIONS (IN MM)

**PD6-CB87xx-E-09**

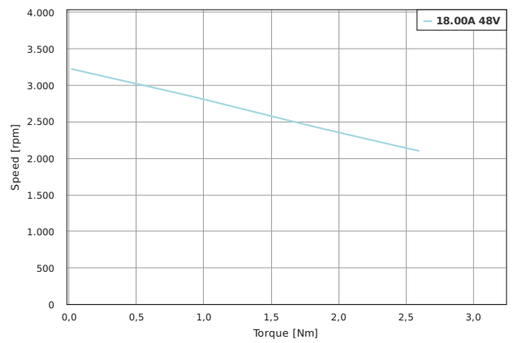



**PD6-CB80xx-E-09**

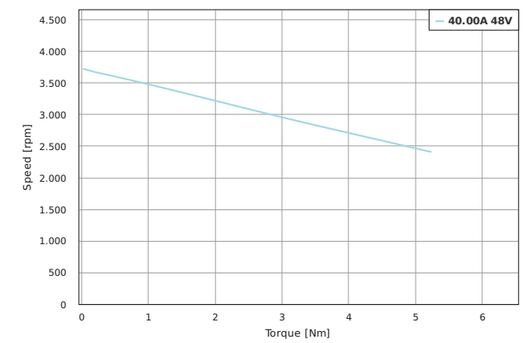



## TORQUE CURVES

**PD6-CB87S048030-E-09**




**PD6-CB80M048030-E-09**




Fieldbus IN
Fieldbus OUT
X1
C5-E
Motor Controller
Encoder
Hall sensor
X2
10V Output
Input 1
Input 2
Input 3
Input 4
Input 5
Analog Input 1
Analog Input 2
Output 1
Output 2
Output 3
GND
X3
Brake +
Brake -
X4
A (U)
A\ (V)
B (W)
B\
X5
+UB
GND
X6
Nanotec
PLUG & DRIVE
www.nanotec.com
X1
X2
X3
X4
X5
X6
X9
X8
X7
L3
L2
L1

# N5

## Motor controller for CANopen, EtherCAT, EtherNet/IP or Modbus RTU/TCP

### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Temperature Range** | -10 °C - 40 °C |
| **Number of Digital Inputs** | 6 |
| **Type of Digital Inputs** | 5/24 V switchable or 5-24 V |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | open-drain (max. 24 V/500 mA) |
| **Number of Analog Inputs** | 2 |
| **Type of Analog Input** | -10 - +10 V/0-20 mA switchable |
| **Encoder Signal Type** | incremental |

### VERSIONS

| Type | Interface | Rated Current (RMS) A | Peak Current (RMS) A | Operating Voltage VDC | Encoder Input | Brake Output | Matching Motors | Weight kg |
|---|---|---|---|---|---|---|---|---|
| N5-1 | EtherCAT, CANopen, EtherNet/IP, Modbus TCP, Modbus RTU | 10 | 10 | 1 - 2 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.38 |
| N5-2 | EtherCAT, CANopen, EtherNet/IP, Modbus TCP, Modbus RTU | 18 | 40 | 1 - 2 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.38 |

### ORDER IDENTIFIER

**N5-1-**
1 = EtherCAT
2 = CANopen
3 = EtherNet/IP
4 = Modbus TCP
5 = Modbus RTU

### ACCESSORIES

**ZK-MCM-12-2,0-S-JPAD** Encoder cable NME2/3 2.0m
**ZK-MCM-12-500-S-JPAD** Encoder cable NME2/3 0.5m
**ZK-NOE-10-500-S-PADP** Encoder cable NOE, 0.5m
**ZK-NTO3-10-500-PADP** Encoder cable NTO3, 0.5m
**ZK-NTO3-10-1000-PADP** Encoder cable NTO3, 1m
**ZK-PADP-12-500-S** Encoder cable controller, 0.5m
**ZK-WEDL-500-S-PADP** Encoder cable WEDL, 0.5m
**ZK-M12-8-2M-2-PADP** Encoder cable angled, 2m
**ZK-M12-12-2M-2-PADP** Encoder cable angled, 2m
**Z-K4700/50** Capacitor
**Z-K10000/100** Capacitor
**EB-BRAKE-48V** Brake module
**ZCPHOFK-MC0,5-2** Connector
**ZCPHOFK-MC0,5-12** Connector
**ZCWE-RM5-3** Connector
**ZCWE-RM5-6** 6-pin terminal connector

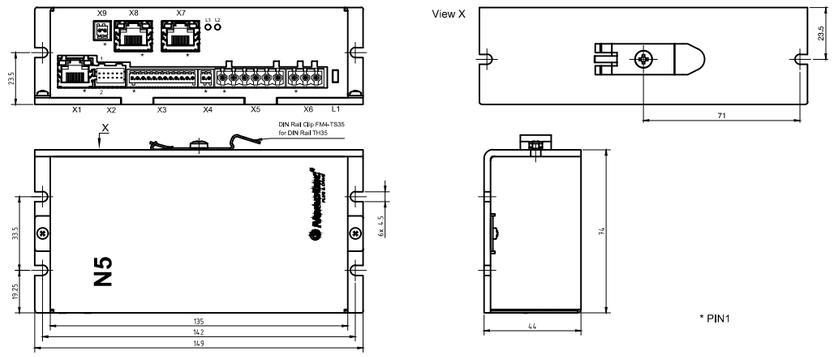


N5
Motor controller for CANopen, EtherCAT, EtherNet/IP or Modbus RTU/TCP

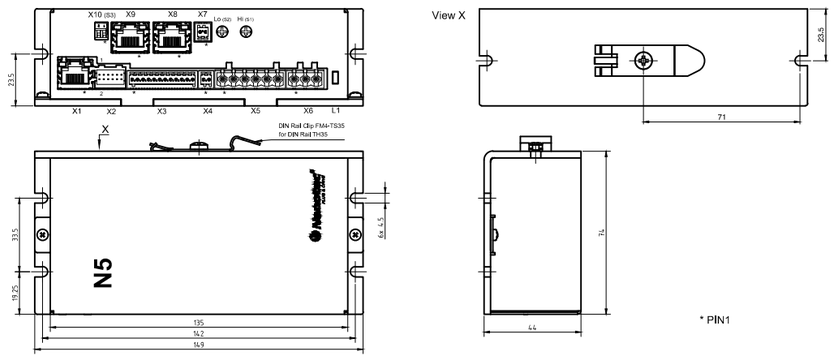


### DIMENSIONS (IN MM)

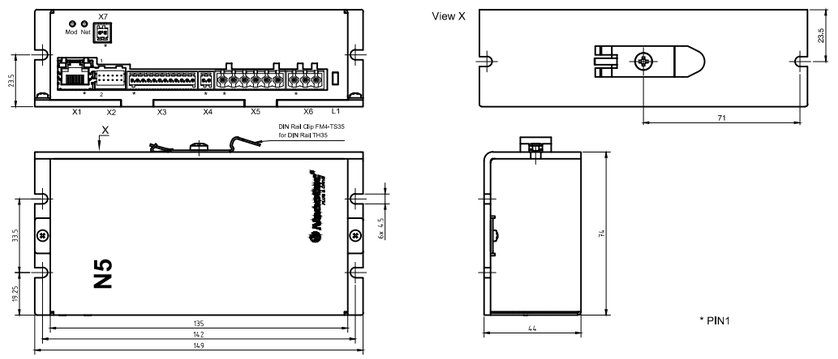
**N5-x-1 EtherCAT**




**N5-x-2 CANopen**




**N5-x-3 EtherNet/IP**

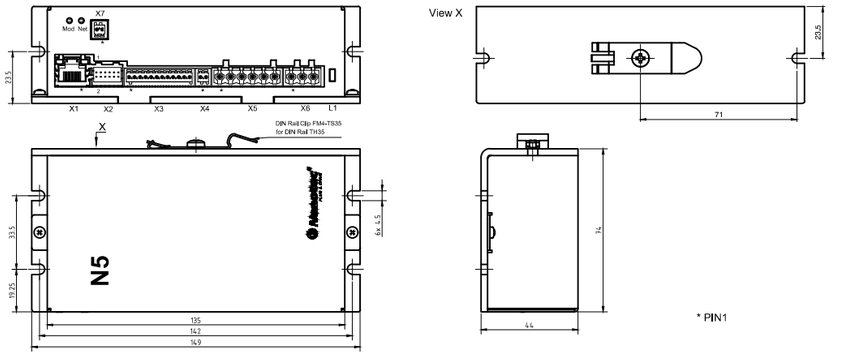


# N5

## Motor controller for CANopen, EtherCAT, EtherNet/IP or Modbus RTU/TCP

### DIMENSIONS (IN MM)

**N5-x-4 Modbus TCP**






# C5

## Open-loop stepper motor controller


### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Temperature Range** | -10 °C - 40 °C |
| **Number of Digital Inputs** | 6 |
| **Type of Digital Inputs** | 24 V, 5/24 V switchable |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-20 mA/0-10 V switchable |

### VERSIONS

| Type | Interface | Rated Current (RMS) A | Peak Current (RMS) A | Operating Voltage VDC | Encoder Input | Brake Output | Matching Motors | Weight kg |
|---|---|---|---|---|---|---|---|---|
| C5-01 | USB, IO (clock direction; analog) | 6 | 6 | 12 - 48 | – | – | Stepper Motors | 0.13 |

### ACCESSORIES

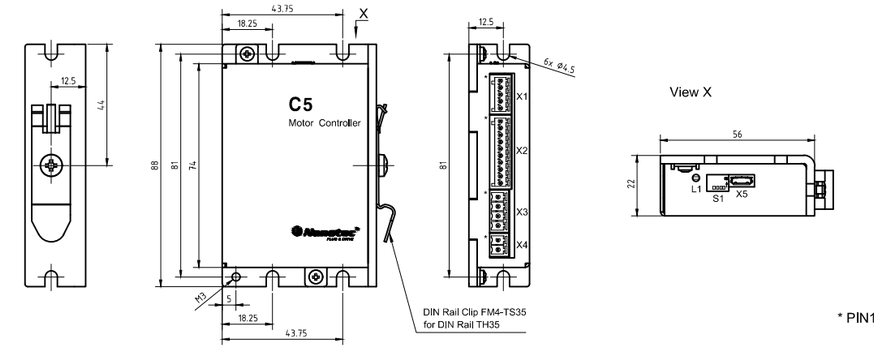
**ZK-MICROUSB** Micro USB cable, 1.5m
**Z-K4700/50** Capacitor
**Z-K10000/100** Capacitor
**ZCPHOFK-MC0,5-5** Connector
**ZCPHOFK-MC0,5-10** Connector
**ZCPHOF-MC1,5-2** Connector
**ZCPHOF-MC1,5-4** 4-pin terminal connector

# C5

## Open-loop stepper motor controller

### DIMENSIONS (IN MM)

C5-01






# C5-E

## Motor controller for CANopen, EtherCAT, EtherNet/IP, USB or Modbus RTU/TCP




### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Temperature Range** | -10 °C - 40 °C |
| **Number of Digital Inputs** | 5 |
| **Type of Digital Inputs** | 5/24 V switchable |
| **Number of Digital Outputs** | 3 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Number of Analog Inputs** | 2 |
| **Type of Analog Input** | 0-10 V, 0-20 mA/0-10 V switchable |
| **Encoder Signal Type** | incremental |

### VERSIONS

| Type | Interface | Rated Current (RMS) A | Peak Current (RMS) A | Operating Voltage VDC | Encoder Input | Brake Output | Matching Motors | Weight kg |
|---|---|---|---|---|---|---|---|---|
| C5-E-1-03 | Modbus RTU, USB, IO (clock direction; analog) | 6 | 6 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-1-09 | CANopen, USB, IO (clock direction; analog) | 6 | 6 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-1-11 | EtherNet/IP, USB, IO (clock direction; analog) | 6 | 6 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-1-21 | EtherCAT, USB, IO (clock direction; analog) | 6 | 6 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-1-81 | Modbus TCP, USB, IO (clock direction; analog) | 6 | 6 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-2-03 | Modbus RTU, USB, IO (clock direction; analog) | 10 | 30 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-2-09 | CANopen, USB, IO (clock direction; analog) | 10 | 30 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-2-11 | EtherNet/IP, USB, IO (clock direction; analog) | 10 | 30 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-2-21 | EtherCAT, USB, IO (clock direction; analog) | 10 | 30 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |
| C5-E-2-81 | Modbus TCP, USB, IO (clock direction; analog) | 10 | 30 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.27 |

# C5-E

## Motor controller for CANopen, EtherCAT, EtherNet/IP, USB or Modbus RTU/TCP

### ORDER IDENTIFIER

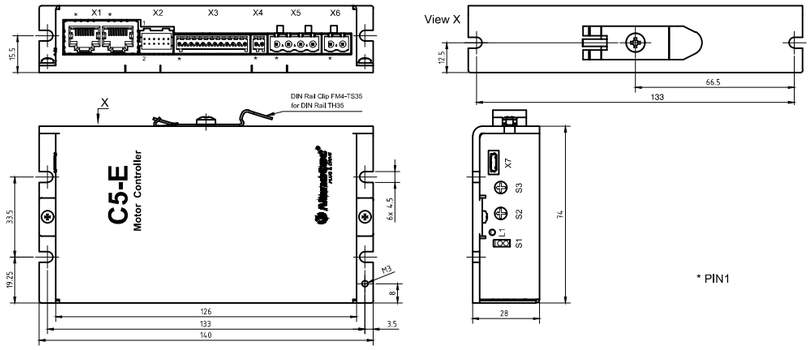
**C5-E-**
1-09 = Low-current version
2-09 = High-current version

### ACCESSORIES

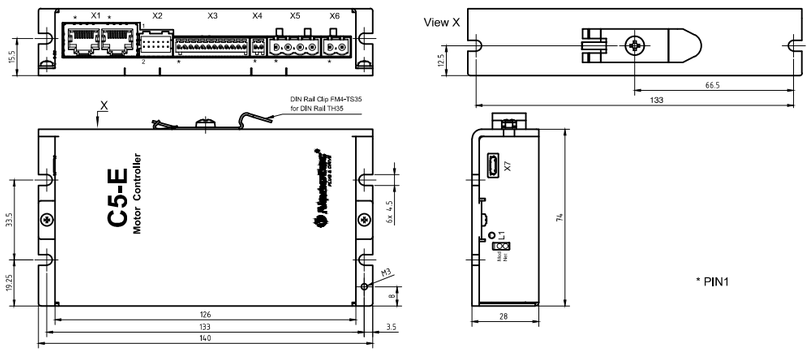
**ZK-MICROUSB** Micro USB cable, 1.5m
**ZK-MCM-12-2,0-S-JPAD** Encoder cable NME2/3 2.0m
**ZK-MCM-12-500-S-JPAD** Encoder cable NME2/3 0.5m
**ZK-NOE-10-500-S-PADP** Encoder cable NOE, 0.5m
**ZK-NTO3-10-500-PADP** Encoder cable NTO3, 0.5m
**ZK-NTO3-10-1000-PADP** Encoder cable NTO3, 1m
**ZK-PADP-12-500-S** Encoder cable controller, 0.5m
**ZK-WEDL-500-S-PADP** Encoder cable WEDL, 0.5m
**ZK-M12-8-2M-2-PADP** Encoder cable angled, 2m
**ZK-M12-12-2M-2-PADP** Encoder cable angled, 2m
**Z-K4700/50** Capacitor
**Z-K10000/100** Capacitor
**EB-BRAKE-48V** Brake module
**ZCPHOFK-MC0,5-2** Connector
**ZCPHOFK-MC0,5-12** Connector
**ZCPHOFKC-2,5HC-2** Connector
**ZCPHOFKC-2,5HC-4** Connector

### DIMENSIONS (IN MM)

C5-E




C5-E-...-11





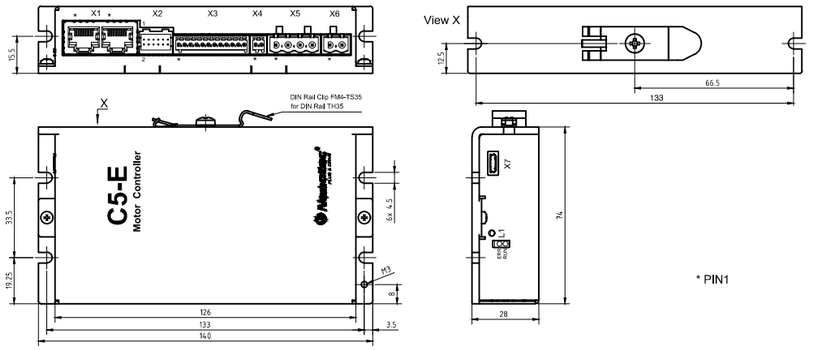

C5-E

Motor controller for CANopen, EtherCAT, EtherNet/IP, USB or Modbus RTU/TCP

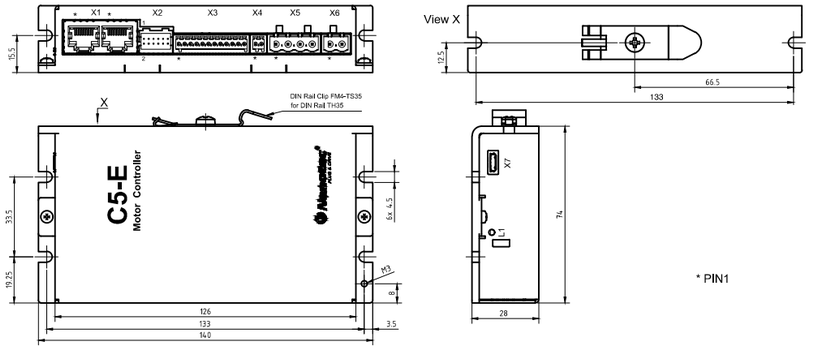


### DIMENSIONS (IN MM)

C5-E-...-21




C5-E-...-81



# CL3-E

## Motor controller for CANopen, Modbus RTU or USB

### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Temperature Range** | -10 °C - 40 °C |
| **Number of Digital Inputs** | 5 |
| **Type of Digital Inputs** | 5 V |
| **Number of Digital Outputs** | 3 |
| **Type of Digital Output** | open-drain (max. 24 V/100 mA) |
| **Number of Analog Inputs** | 2 |
| **Type of Analog Input** | 0-10 V, 0-20 mA/0-10 V switchable |
| **Encoder Signal Type** | incremental |

### VERSIONS

| Type | Interface | Rated Current (RMS) A | Peak Current (RMS) A | Operating Voltage VDC | Encoder Input | Brake Output | Matching Motors | Weight kg |
|---|---|---|---|---|---|---|---|---|
| CL3-E-1-0F | CANopen, Modbus RTU, USB, IO (clock direction; analog) | 3 | 3 | 12 - 24 | ✓ | – | Brushless DC motors, Stepper Motors | 0.02 |
| CL3-E-2-0F | CANopen, Modbus RTU, USB, IO (clock direction; analog) | 3 | 6 | 12 - 24 | ✓ | – | Brushless DC motors, Stepper Motors | 0.02 |

### ORDER IDENTIFIER

**CL3-E-**
1-0F = Low-current version
2-0F = High-current version

### ACCESSORIES

**ZK-GHR3-500-S** RS232 cable, 0.5m
**ZK-GHR12-500-S** IO cable, 0.5m
**ZK-MICROUSB** Micro USB cable, 1.5m
**ZK-PD4-C-CAN-4-500-S** CAN in/out cable 0.5m
**ZK-XHP4-300** Motor cable, 0.3m
**ZK-XHP2-500-S** Power cable, 0.5m
**ZK-GHR10-500-S-GHR** Encoder cable NOE, 0.5m
**ZK-GHR13-500-S-GHR** Encoder cable NME, 0.5m
**ZK-JZH-8-500-S-JGH** Encoder cable WEDL 0.5m
**ZK-MCM-12-500-S-JGH** Encoder cable NME2/3 0.5m
**ZK-TM4-10-500-S-JGH** Encoder cable NTO3 0.5m



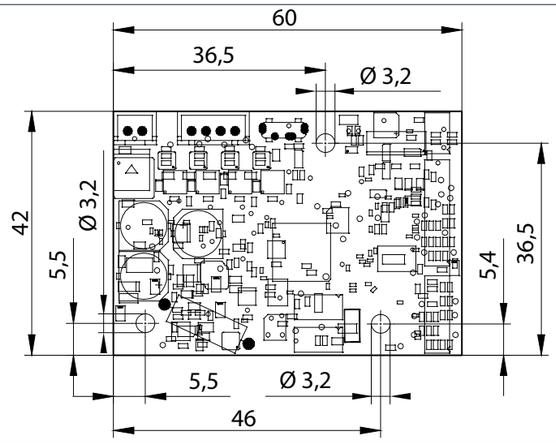
CL3-E

Motor controller for CANopen, Modbus RTU or USB



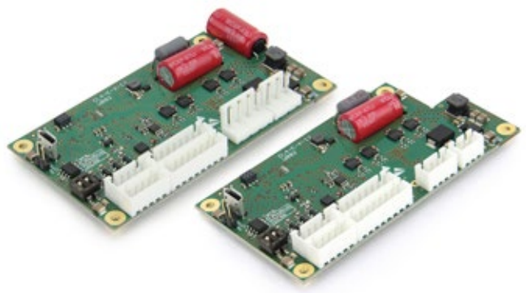
### DIMENSIONS (IN MM)

CL3-E



# CL4-E

## Motor controller for CANopen, Modbus RTU or USB



### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Temperature Range** | -10 °C - 40 °C |
| **Number of Digital Inputs** | 4 |
| **Type of Digital Inputs** | 24 V, 5 V |
| **Number of Digital Outputs** | 2 |
| **Type of Digital Output** | high side switch (max. 30 V/100 mA) |
| **Number of Analog Inputs** | 1 |
| **Type of Analog Input** | 0-10 V |
| **Encoder Signal Type** | incremental |

### VERSIONS

| Type | Interface | Rated Current (RMS) A | Peak Current (RMS) A | Operating Voltage VDC | Encoder Input | Brake Output | Matching Motors | Weight kg |
|---|---|---|---|---|---|---|---|---|
| CL4-E-1-12 | CANopen, Modbus RTU, USB, IO (clock direction; analog) | 3 | 6 | 12 - 58 | ✓ | – | Brushless DC motors, Stepper Motors | 0.028 |
| CL4-E-1-12-5VDI | CANopen, Modbus RTU, USB, IO (clock direction; analog) | 3 | 6 | 12 - 58 | ✓ | – | Brushless DC motors, Stepper Motors | 0.028 |
| CL4-E-2-12 | CANopen, Modbus RTU, USB, IO (clock direction; analog) | 6 | 18 | 12 - 58 | ✓ | – | Brushless DC motors, Stepper Motors | 0.032 |
| CL4-E-2-12-5VDI | CANopen, Modbus RTU, USB, IO (clock direction; analog) | 6 | 18 | 12 - 58 | ✓ | – | Brushless DC motors, Stepper Motors | 0.032 |

### ORDER IDENTIFIER

**CL4-E-**
1-... = Low-current version
2-... = High-current version

### ACCESSORIES

**ZK-MICROUSB** Micro USB cable, 1.5m
**ZK-VHR-3-500** Power cable, 0.5m
**ZK-VHR-4-500** Motor cable, 0.5m
**ZK-XHP-3-500** Power cable, 0.5m
**ZK-XHP-5-500-S** CAN/RS485 in/out 0.5m
**ZK-XHP-8-500-S** Enc.-/Hall cable or in/out, 0.5m
**ZK-XHP4-300** Motor cable, 0.3m
**ZK-JZH-8-500-S-JXH** Encoder cable WEDL 0.5m
**ZK-MCM-12-500-S-JXH** Encoder cable NME2/3 0.5m
**ZK-TM4-10-500-S-JXH** Encoder cable NTO3 0.5m
**Z-K4700/50** Capacitor



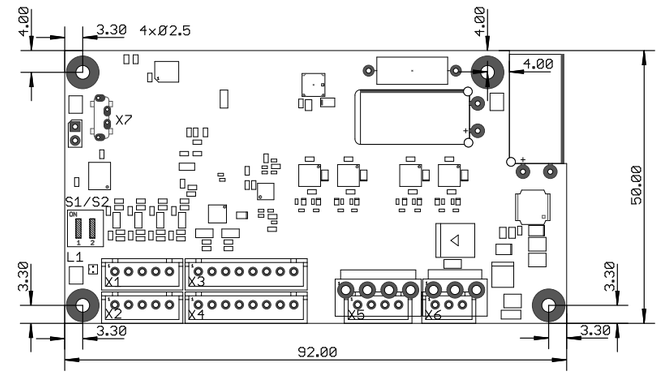
CL4-E

Motor controller for CANopen, Modbus RTU or USB



### DIMENSIONS (IN MM)

CL4-E-...-12-...



# NP5

## Motor controller for CANopen, EtherCAT, Modbus RTU or SPI

### SOFTWARE

Plug&Drive Studio

### TECHNICAL DATA

| | |
|---|---|
| **Temperature Range** | -10 °C - 40 °C |
| **Number of Digital Inputs** | 6 |
| **Type of Digital Inputs** | 3.3 V |
| **Number of Digital Outputs** | 4 |
| **Type of Digital Output** | 3.3 V |
| **Number of Analog Inputs** | 2 |
| **Type of Analog Input** | 0...3.3 V |
| **Encoder Signal Type** | incremental |

### VERSIONS

| Type | Interface | Rated Current (RMS) A | Peak Current (RMS) A | Operating Voltage VDC | Encoder Input | Brake Output | Matching Motors | Weight kg |
|---|---|---|---|---|---|---|---|---|
| NP5-02 | Modbus RTU | 6 | 10 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.035 |
| NP5-08 | CANopen | 6 | 10 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.035 |
| NP5-20 | EtherCAT | 6 | 10 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.035 |
| NP5-40 | SPI | 6 | 10 | 12 - 48 | ✓ | ✓ | Brushless DC motors, Stepper Motors | 0.035 |

### ORDER IDENTIFIER

**NP5-**
02 = Modbus RTU
08 = CANopen
20 = EtherCAT
40 = SPI

### ACCESSORIES

**DK-NP5-4A** Development board for NP5
**DK-NP5-48** Development board for NP5
**DK-NP5-68** Development board for NP5



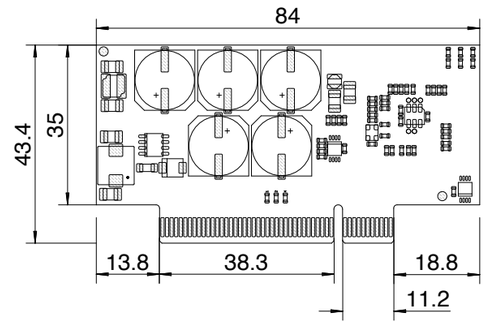
NP5

Motor controller for CANopen, EtherCAT, Modbus RTU or SPI



### DIMENSIONS (IN MM)

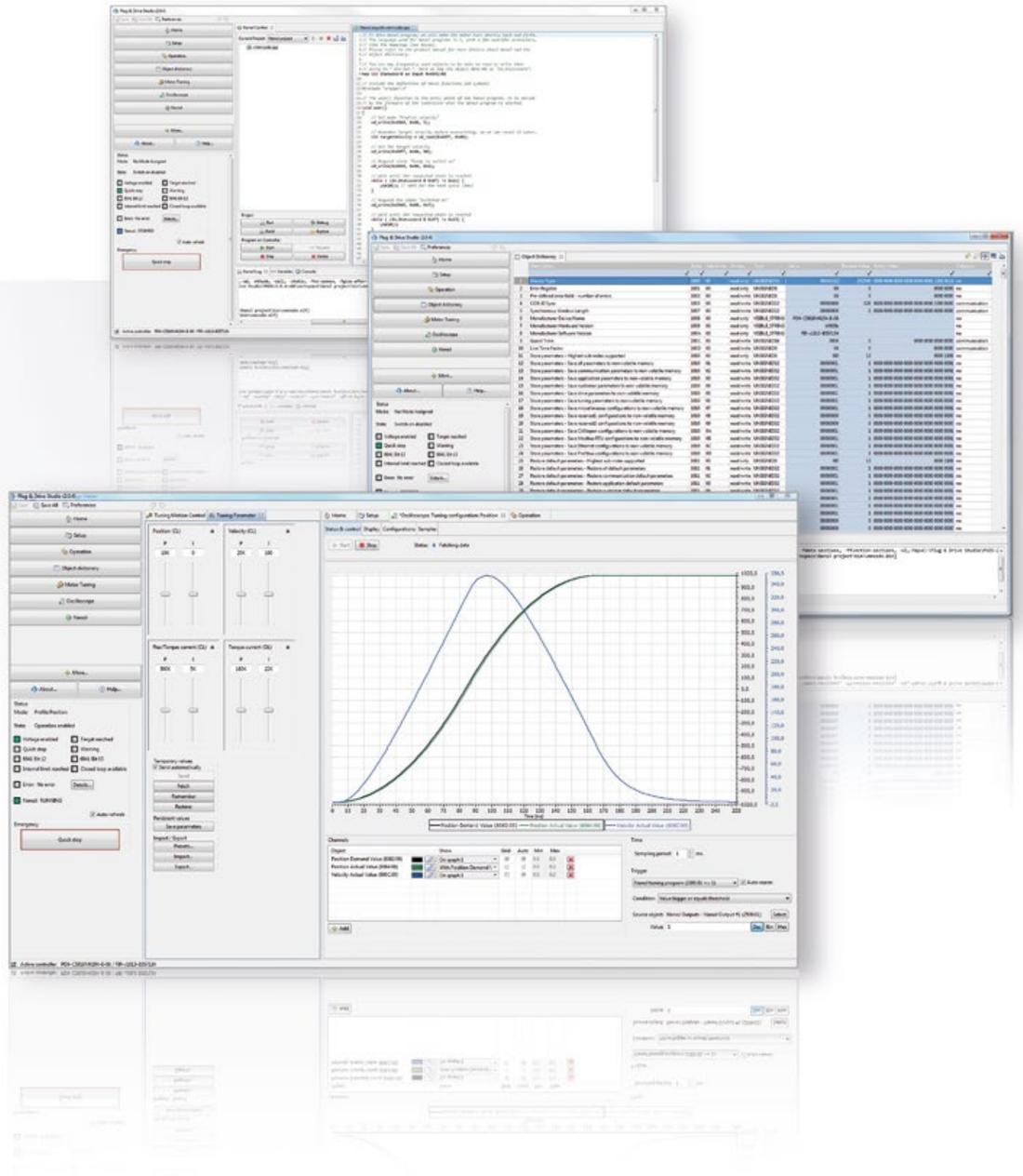
NP5



# Notes



# SOFTWARE

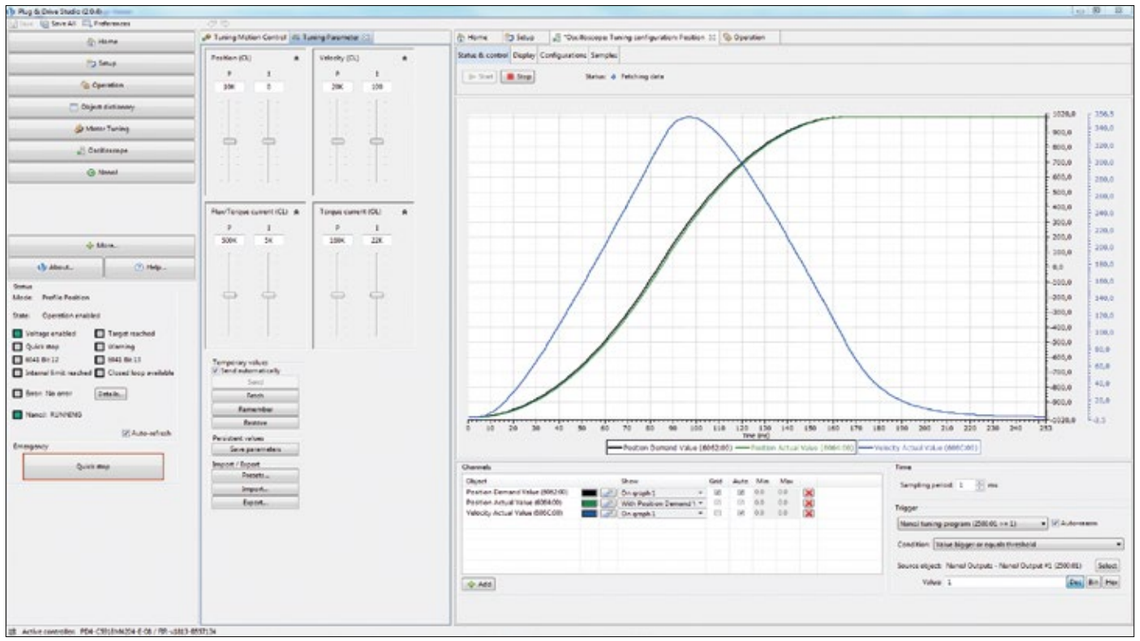


# Plug & Drive Studio

Plug & Drive Studio is a free software for commissioning and programming the Nanotec controllers and tuning the motor. The software supports products with CAN (IXXAT & PEAK), serial, Ethernet and USB interfaces.

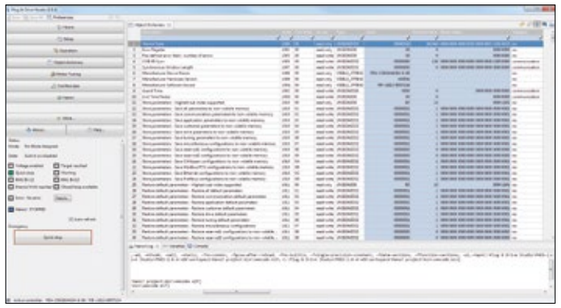
For setup, the object directory holding the controller configuration can be read and written via a table. Pre-defined filters enable the user to only display the parts of CiA 402 objects that pertain to a certain task, such as setup or a certain operating mode, i.e. the speed. Experienced users can configure the objects via an integrated command line.

To tune the controller parameters, an integrated oscilloscope displays up to eight objects simultaneously with a resolution of up to one millisecond. Recording can be controlled by freely configurable start and stop triggers that define conditions for the displayed objects, such as the reaching of a certain position or the activation of a digital input. Oscilloscope settings that contain required objects such as following errors, target positions and actual positions are predefined for a standard tuning. These settings can be adjusted at any time.

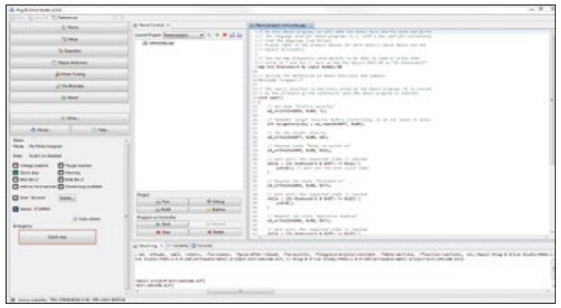


Oscilloscope with target and actual positions and following errors

To program the controller with NanoJ V2, an integrated development environment is available that consists of a source text editor with automatic code completion, a compiler and a debugger. The debugger allows programmers to set up three breakpoints in the program at which values of variables can be read out. Because all of the Plug & Drive Studio functions can be used simultaneously, controller behavior can be examined during program execution using the object directory and oscilloscope. As a result, customer-specific functions can be easily and quickly programmed.



Object dictionary



Programming editor



# Notes

# Notes



# Brushless DC Motors

## General information on brushless DC motors

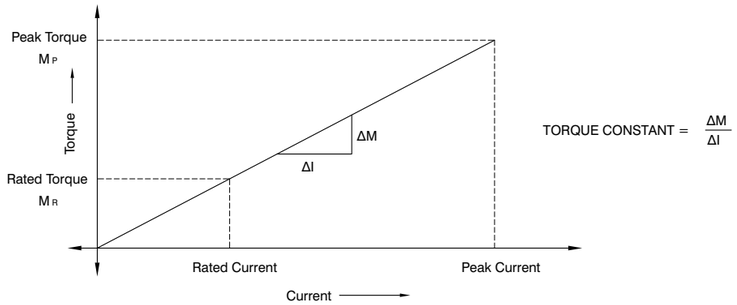
### ADVANTAGES

- Significantly higher efficiency and power density than induction motors (approx. 35% volume and weight reduction)
- Very long life span and smooth running due to brushless technology and precision ball bearings
- Exceptionally large speed range at full motor output thanks to the linear torque curve, therefore better adjustment to the required load conditions
- Reduced electrical interference emission along with excellent thermal properties
- Mechanically interchangeable with stepper motor hence less construction expense and greater parts variety

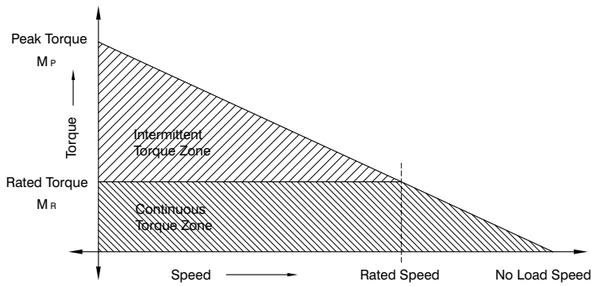
Affordable electronically commutated 3-phase brushless motors (EC motors) are particularly well suited for applications requiring smooth running and a long service life. High acceleration and speeds of up to 25,000 rpm with exceptional efficiency due to the high-energy permanent magnets. The rotor position is reported electronically using three hall sensors offset by 120°. Optional encoders facilitate high-resolution position controlling.

### PROPERTIES

### TORQUE/CURRENT CHARACTERISTICS




### TORQUE/SPEED CHARACTERISTICS






# DB22

## Brushless DC motor

### OPTIONS

Gearbox

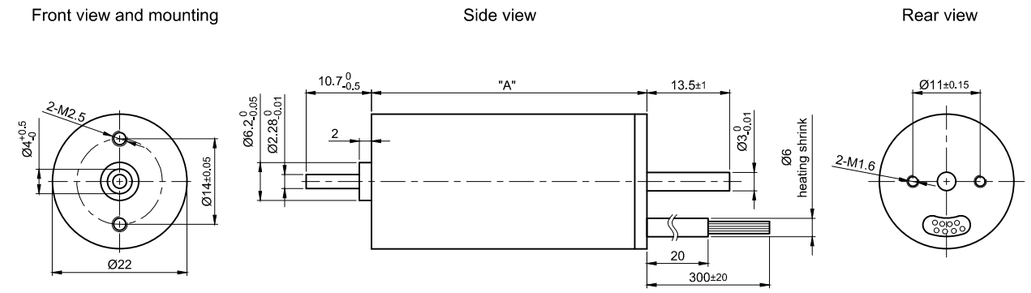
Controller

### VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB22M01 | 4 | 0.8 | 0.265 | 0.795 | 24 | 4800 | 3.02 | 0.66 | 45 | 0.07 |
| DB22L01 | 7.7 | 2.2 | 0.62 | 1.6 | 24 | 3500 | 3.55 | 1.32 | 68 | 0.13 |

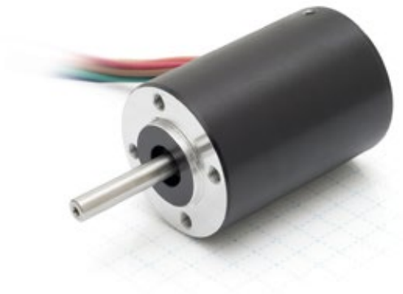
### DIMENSIONS (IN MM)

**DB22**



# DB28

## Brushless DC motor



## OPTIONS

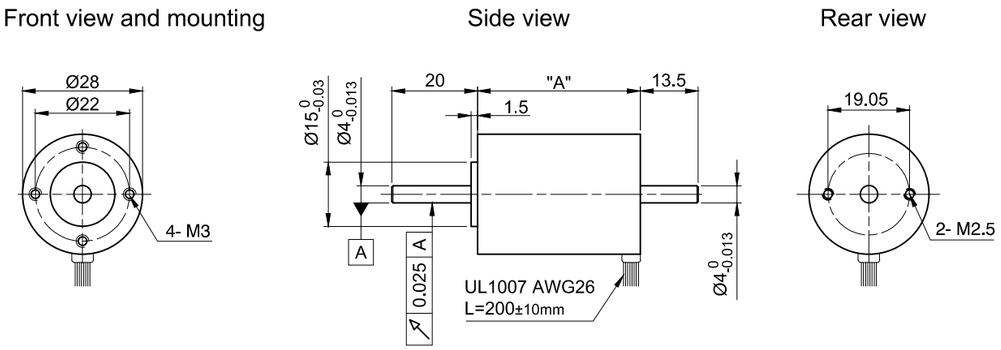
Gearbox | Controller | Encoder

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB28S01 | 4.2 | 0.5 | 0.45 | 1.3 | 15 | 8000 | 1.43 | 2.35 | 28 | 0.06 |
| DB28M01 | 14.6 | 1.4 | 0.95 | 2.7 | 24 | 10000 | 1.69 | 3.69 | 38 | 0.082 |
| DB28L01 | 20.9 | 5 | 1.45 | 4.5 | 24 | 4000 | 3.56 | 10.98 | 77 | 0.195 |

## DIMENSIONS (IN MM)

**DB28**

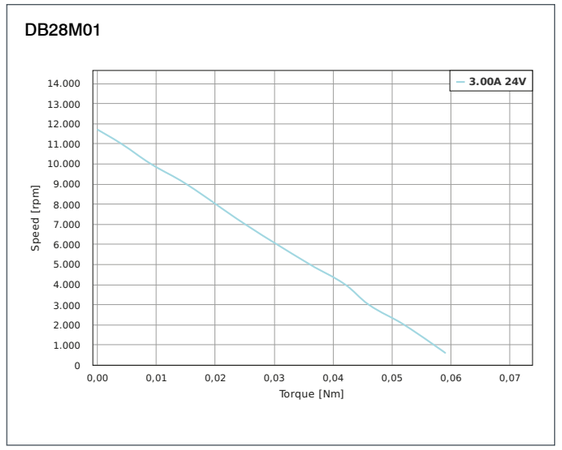





DB28

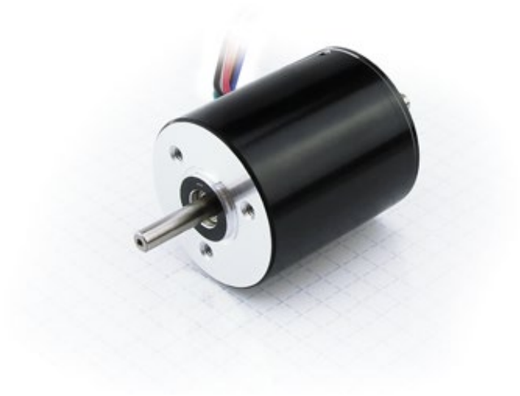
Brushless DC motor

## TORQUE CURVES



# DB33

## Brushless DC motor



## OPTIONS

Controller

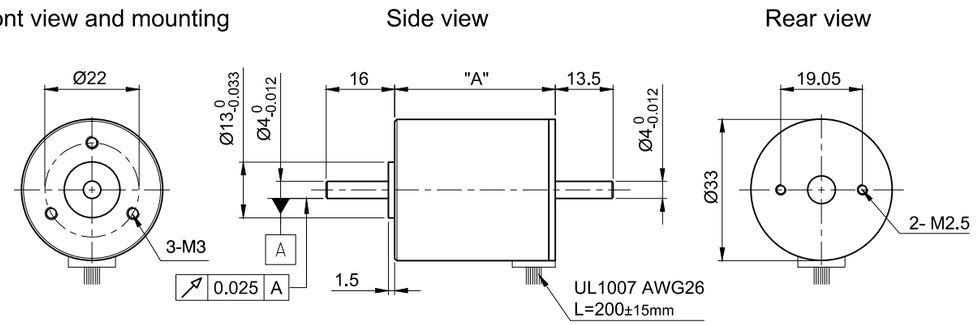
Encoder

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB33S01 | 7 | 2.2 | 0.56 | 1.4 | 24 | 3000 | 4.6 | 2.94 | 37.5 | 0.115 |

## DIMENSIONS (IN MM)

**DB33**

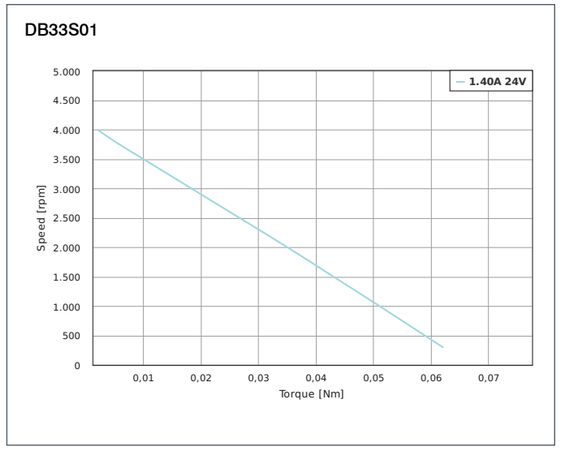





DB33

Brushless DC motor

## TORQUE CURVES



# DBL36

## Brushless DC motor

## OPTIONS

Controller

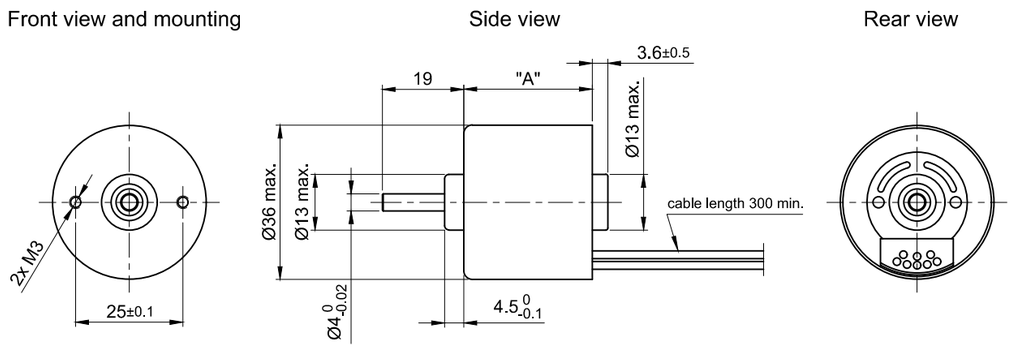
Encoder

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DBL36S024048-A | 7.5 | 1.5 | 0.5 | 1.5 | 24 | 4800 | 3 | 6 | 30 | 0.12 |
| DBL36M024048-A | 18 | 3.5 | 1 | 3 | 24 | 4800 | 3.5 | 12 | 40 | 0.16 |
| DBL36L024045-A | 33 | 7 | 1.9 | 5.7 | 24 | 4500 | 3.7 | 27 | 57 | 0.25 |

## DIMENSIONS (IN MM)

**DBL36**



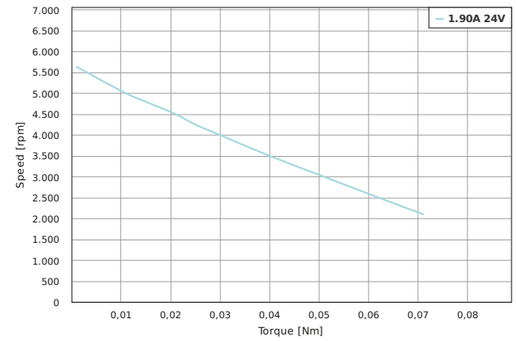



DBL36

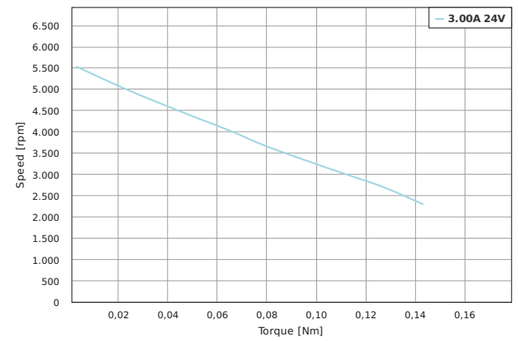
Brushless DC motor

## TORQUE CURVES

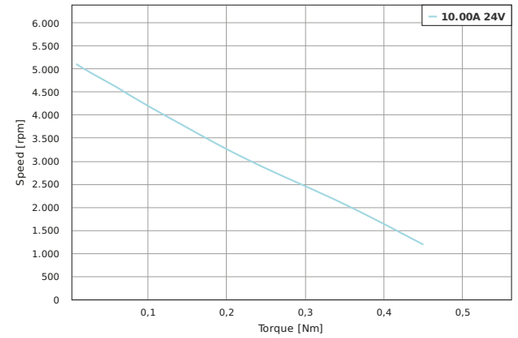
**DBL36S024048-A**




**DBL36M024048-A**




**DBL36L024045-A**



# DB41

## Brushless DC motor

## OPTIONS

Gearbox

Controller

## VERSIONS

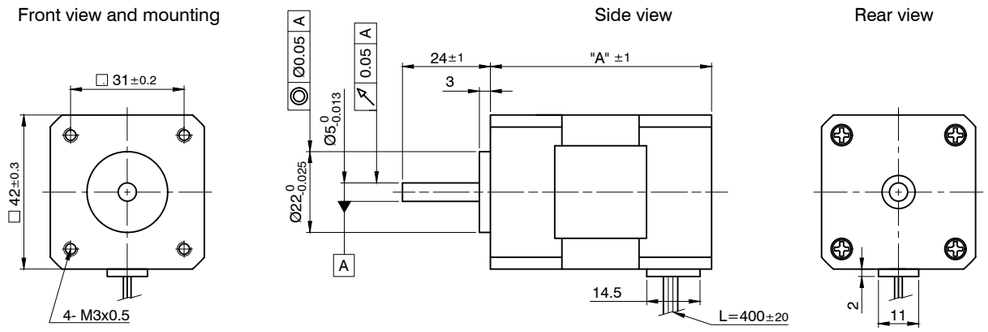
| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB41S024030-A | 22 | 7 | 1.3 | 4.4 | 24 | 3000 | 5.42 | 48 | 40.3 | 0.3 |
| DB41M024030-A | 50 | 16 | 3 | 9.2 | 24 | 3000 | 5.41 | 101 | 60.3 | 0.45 |
| DB41L024030-A | 82 | 26 | 4.8 | 14.8 | 24 | 3000 | 5.4 | 154 | 80.3 | 0.65 |
| DB41C024030-A | 113 | 36 | 6.7 | 22.2 | 24 | 3000 | 5.4 | 207 | 100.3 | 0.8 |

## ACCESSORIES

**ZD-D28** Damper
**ZD-D40** Damper
**ZD-DF40** Damper

## DIMENSIONS (IN MM)

DB41



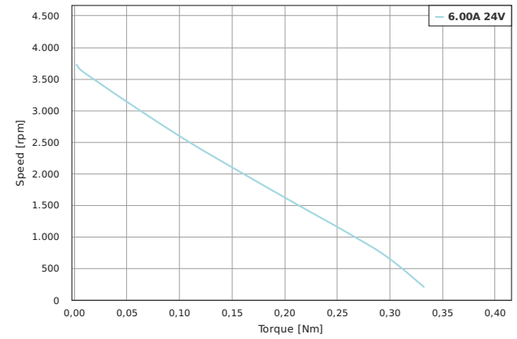



DB41

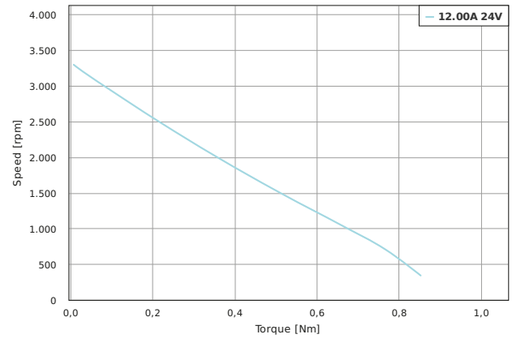
Brushless DC motor

## TORQUE CURVES

DB41S024030-A




DB41M024030-A



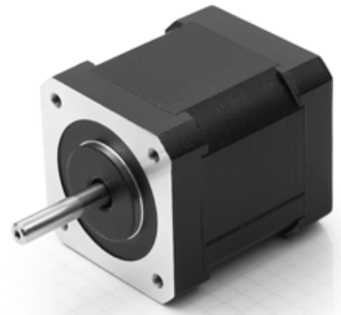

DB41L024030-A




DB41C024030-A

# DB42

## Brushless DC motor



## OPTIONS

Gearbox | Brake | Controller | Encoder

## ACCESSORIES

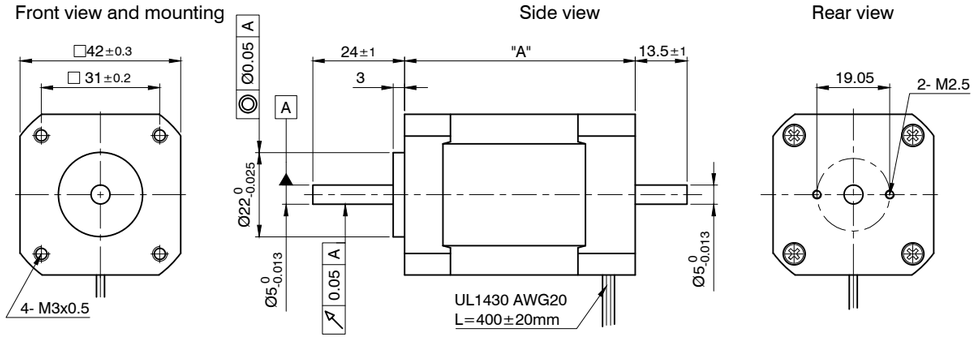
**ZD-D28** Damper
**ZD-D40** Damper
**ZD-DF40** Damper

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB42S01 | 31 | 5 | 0.88 | 2.63 | 48 | 6000 | 5.7 | 24 | 41 | 0.25 |
| DB42S02 | 42 | 5 | 3.57 | 10.78 | 17 | 8000 | 1.4 | 24 | 41 | 0.25 |
| DB42S03 | 26 | 6.25 | 1.79 | 5.4 | 24 | 4000 | 3.5 | 24 | 41 | 0.3 |
| DB42M01 | 69 | 11 | 2.12 | 5.77 | 48 | 6000 | 5.2 | 48 | 60.3 | 0.45 |
| DB42M02 | 62 | 7 | 1.63 | 4.88 | 48 | 8500 | 4.3 | 48 | 60.3 | 0.45 |
| DB42M03 | 52 | 12.5 | 3.47 | 10.6 | 24 | 4000 | 3.6 | 48 | 60.3 | 0.45 |
| DB42L01 | 75 | 18 | 5.14 | 15.5 | 24 | 4000 | 3.6 | 67 | 80.3 | 0.65 |
| DB42C01 | 157 | 25 | 4.63 | 13.89 | 48 | 6000 | 5.4 | 89 | 100 | 0.75 |
| DB42C02 | 147 | 10 | 3.57 | 10.71 | 48 | 14000 | 2.8 | 89 | 100 | 0.75 |
| DB42C03 | 105 | 25 | 6.65 | 20 | 24 | 4000 | 3.76 | 89 | 100 | 0.75 |

## DIMENSIONS (IN MM)

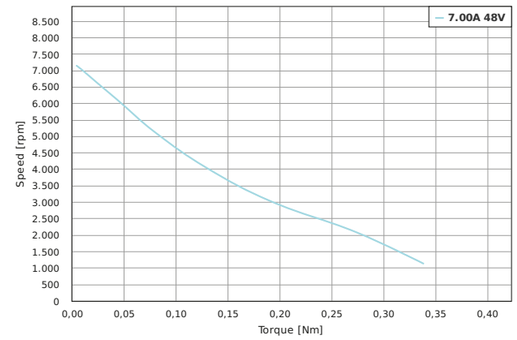
**DB42**



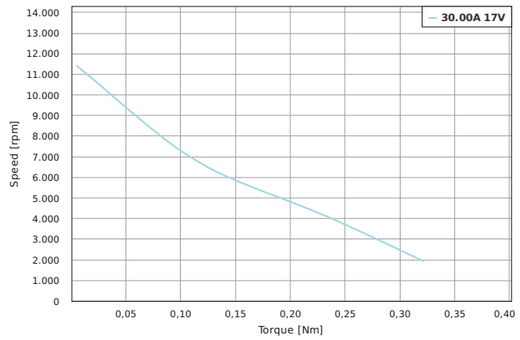



## TORQUE CURVES

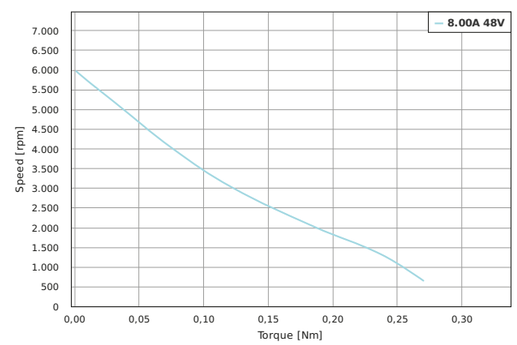
**DB42S01**



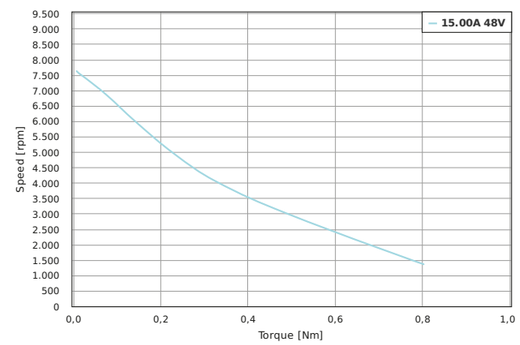

**DB42S02**



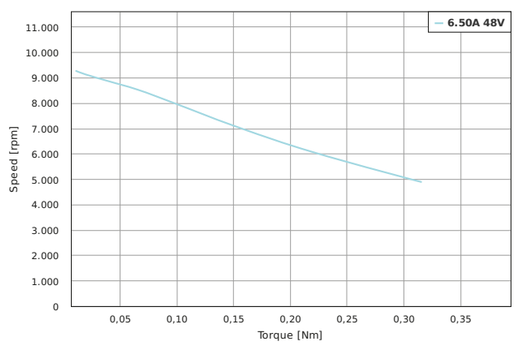

**DB42S03**



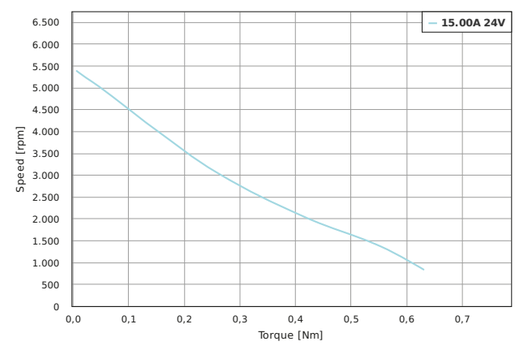

**DB42M01**




**DB42M02**




**DB42M03**

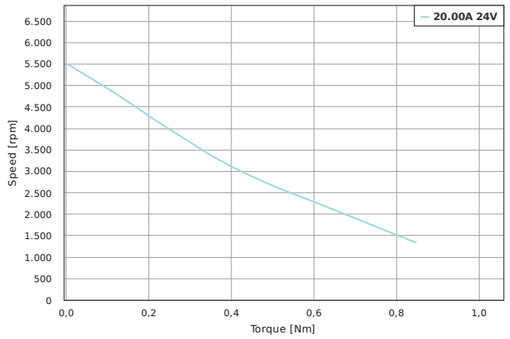


# DB42

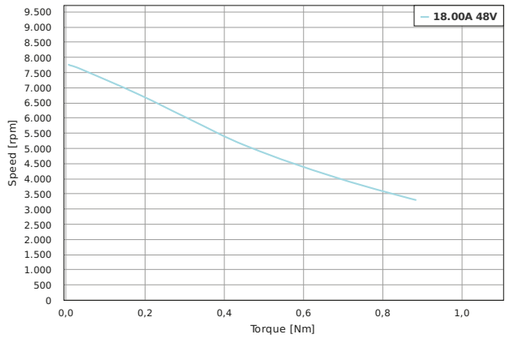
## Brushless DC motor

### TORQUE CURVES

**DB42L01**




**DB42C01**




**DB42C02**




**DB42C03**






# DBL42

## Brushless DC motor

### OPTIONS

Controller

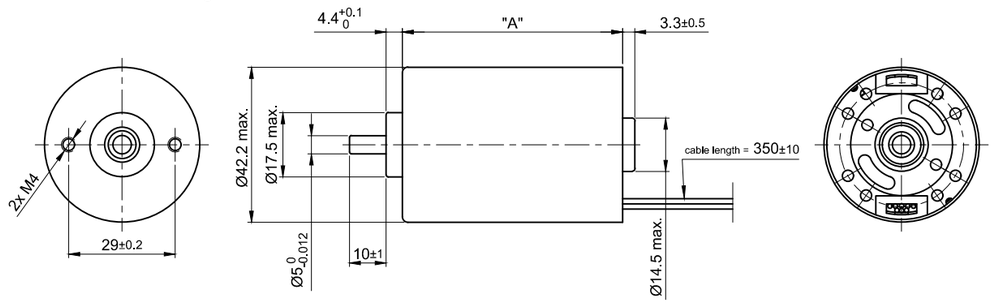
Encoder

### VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DBL42L024032-A | 40 | 12 | 2.1 | 6.3 | 24 | 3200 | 5.4 | 44 | 60 | 0.35 |

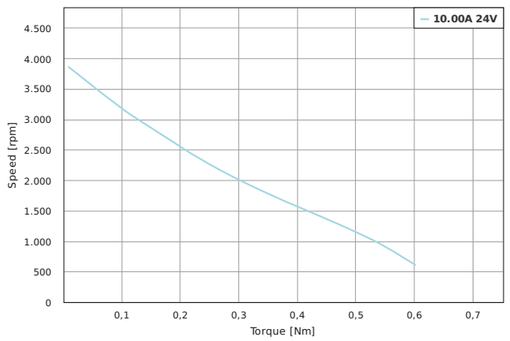
### DIMENSIONS (IN MM)

**DBL42**




### TORQUE CURVES

**DBL42L024032-A**



# DB43

## Brushless DC motor

## OPTIONS

Gearbox

Controller

## VERSIONS

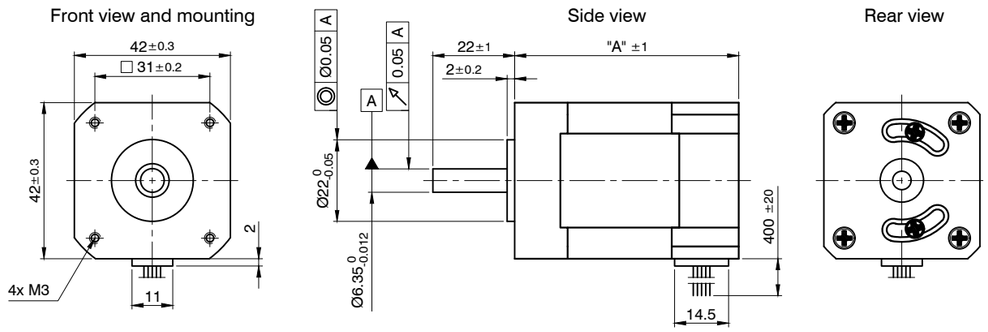
| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB43M024030 | 53 | 17 | 3.1 | 9.3 | 24 | 3000 | 5.5 | 60 | 60.3 | 0.6 |
| DB43M048030 | 53 | 17 | 1.5 | 4.6 | 48 | 3000 | 11 | 60 | 60.3 | 0.6 |
| DB43L024030 | 94 | 30 | 4.8 | 14.4 | 24 | 3000 | 6.25 | 80 | 80.3 | 0.8 |
| DB43L048030 | 94 | 30 | 2.4 | 7.2 | 48 | 3000 | 12.5 | 80 | 80.3 | 0.8 |
| DB43C048030 | 138 | 44 | 3.66 | 11 | 48 | 3000 | 12 | 167 | 100.3 | 1 |

## ACCESSORIES

**ZD-D28** Damper
**ZD-D40** Damper
**ZD-DF40** Damper
**MK-DH-6,35-8-GPLE40**
Spacer Sleeves

## DIMENSIONS (IN MM)

DB43



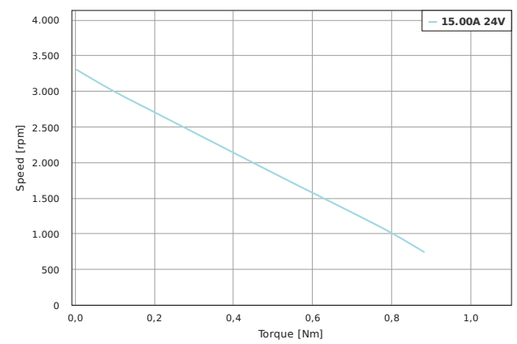



DB43

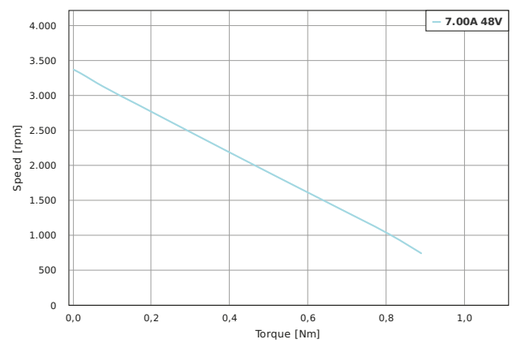
Brushless DC motor

## TORQUE CURVES

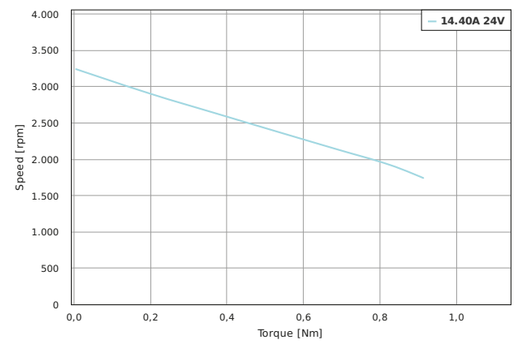
DB43M024030



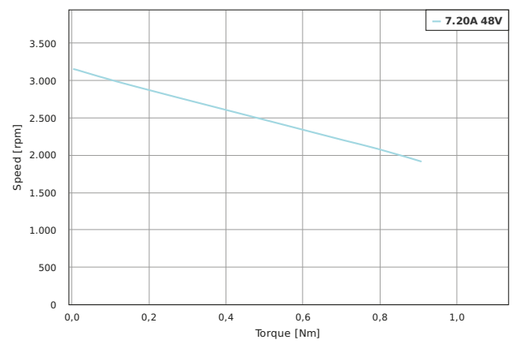

DB43M048030



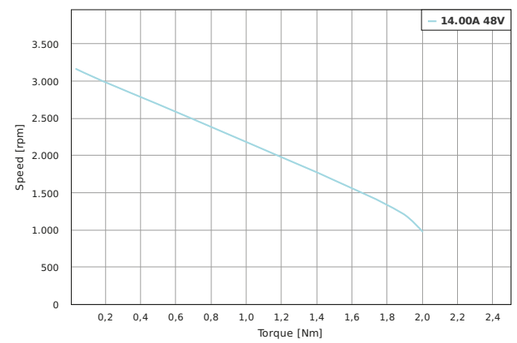

DB43L024030




DB43L048030




DB43C048030



# DB56

## Bürstenloser DC-Motor

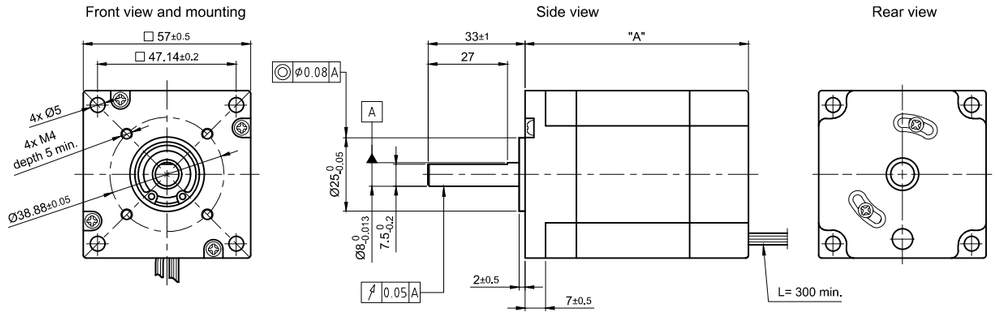
## OPTIONS


## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB56L036030-A | 94 | 30 | 4 | 12 | 36 | 3000 | 7.3 | 260 | 76 | 1 |
| DB56C036030-A | 141 | 45 | 5.4 | 16.2 | 36 | 3000 | 8 | 360 | 96 | 1.1 |
| DB56D036030-A | 188 | 60 | 7.5 | 22.5 | 36 | 3000 | 8 | 460 | 116 | 1.2 |

## DIMENSIONS (IN MM)

**DB56-A**



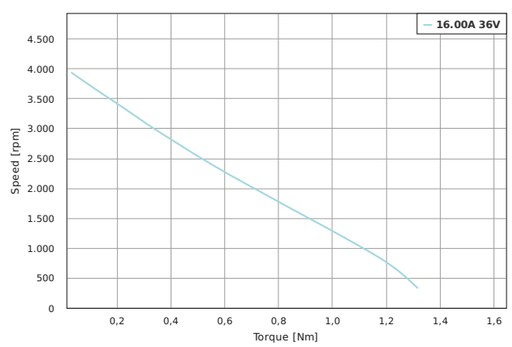



# DB56

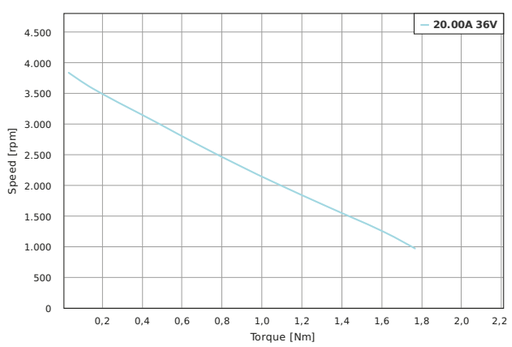
## Brushless DC motor

## TORQUE CURVES

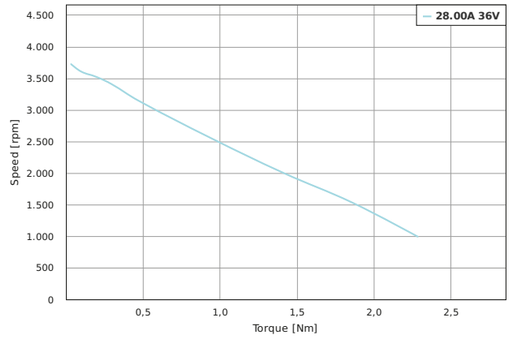
**DB56L036030-A**




**DB56C036030-A**




**DB56D036030-A**



# DB59

## Brushless DC motor

## OPTIONS

Gearbox · Brake · Controller · Encoder

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB59S024035 | 84 | 23 | 5 | 15 | 24 | 3500 | 4.5 | 75 | 53.6 - 56.1 | 0.52 |
| DB59M024035 | 135 | 37 | 8 | 24 | 24 | 3500 | 4.6 | 105 | 68.6 - 71.1 | 0.65 |
| DB59L024035 | 172 | 47 | 9.4 | 28 | 24 | 3500 | 5 | 119 | 73.6 - 76.1 | 0.72 |
| DB59C024035 | 220 | 60 | 13.6 | 40 | 24 | 3500 | 4.4 | 173 | 93.6 - 96.1 | 0.95 |
| DB59S024035-R | 84 | 23 | 5 | 15 | 24 | 3500 | 4.5 | 75 | 51.8 - 53.6 | 0.52 |
| DB59M024035-R | 135 | 37 | 8 | 24 | 24 | 3500 | 4.6 | 105 | 66.8 - 68.6 | 0.65 |
| DB59L024035-R | 172 | 47 | 9.4 | 28 | 24 | 3500 | 5 | 119 | 71.8 - 73.6 | 0.72 |
| DB59C024035-R | 220 | 60 | 13.6 | 40 | 24 | 3500 | 4.4 | 173 | 91.8 - 93.6 | 0.95 |
| DB59L048035 | 172 | 47 | 5.33 | 16 | 48 | 3500 | 10 | 119 | 73.6 - 76.1 | 0.72 |
| DB59C048035 | 220 | 60 | 6 | 18 | 48 | 3500 | 10 | 173 | 93.6 - 96.1 | 0.95 |

## ORDER IDENTIFIER

**DB59S024035-**
A = Single shaft end
B* = Double shaft end
B3* = Longer shaft end
*Available for individual configuration with encoder or encoder and brake on our website.

## ACCESSORIES

**ZD-DF56** Damper

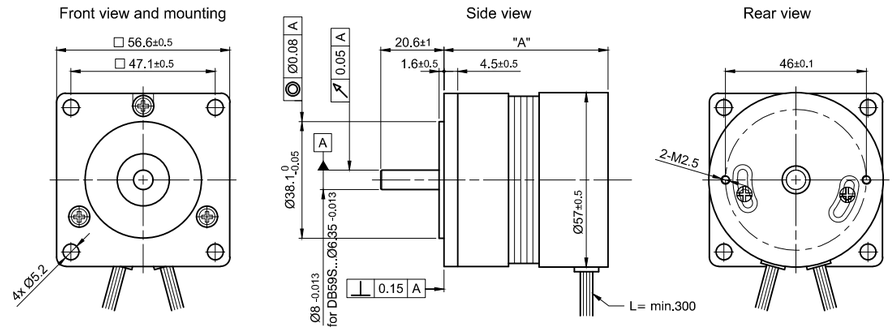


DB59
Brushless DC motor

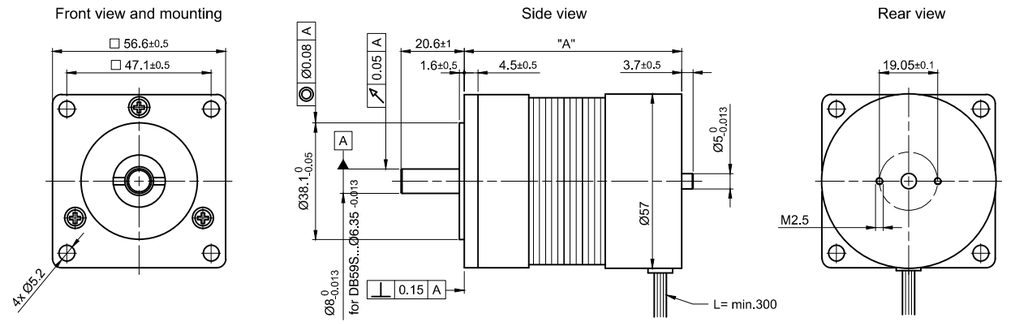


## DIMENSIONS (IN MM)

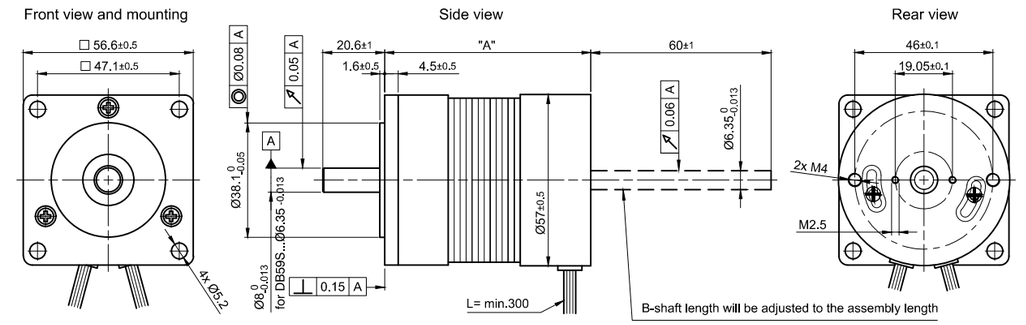
**DB59-A**




**DB59-B**

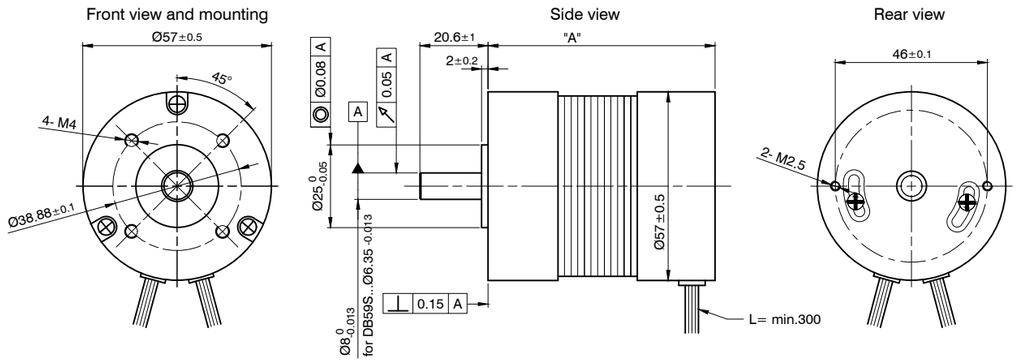



**DB59-B3**

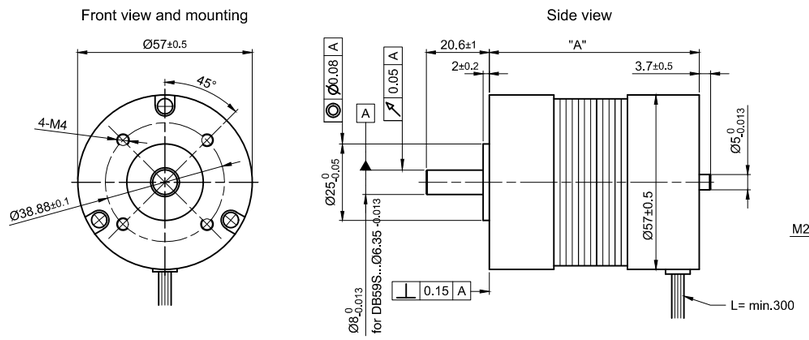


## DIMENSIONS (IN MM)

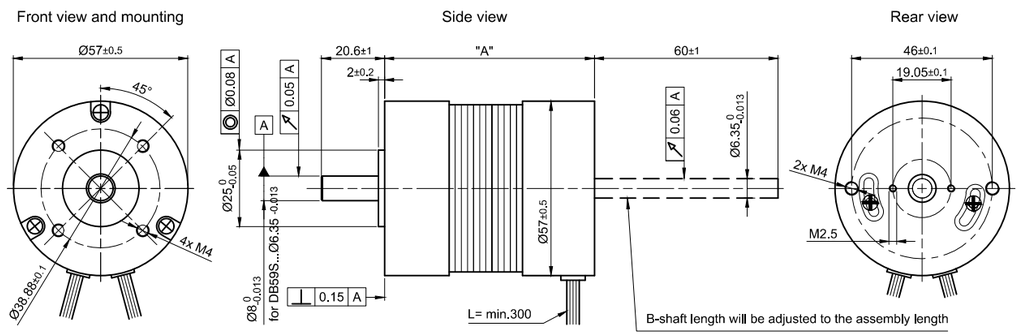
### DB59R-A




### DB59R-B




### DB59R-B3

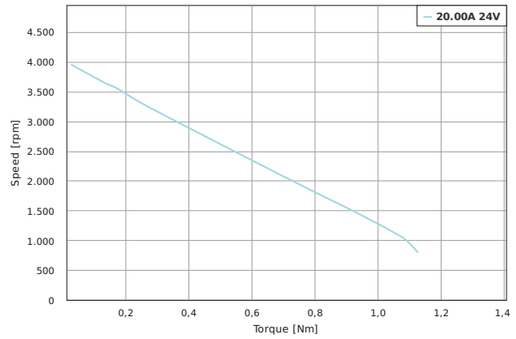




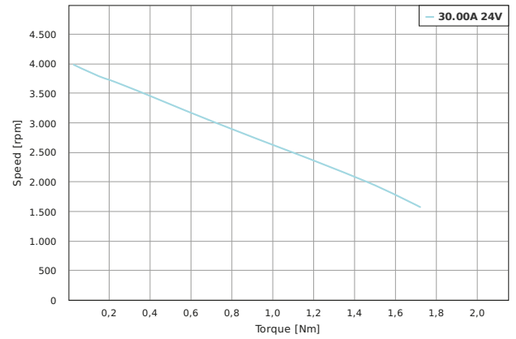

DB59
Brushless DC motor

## TORQUE CURVES

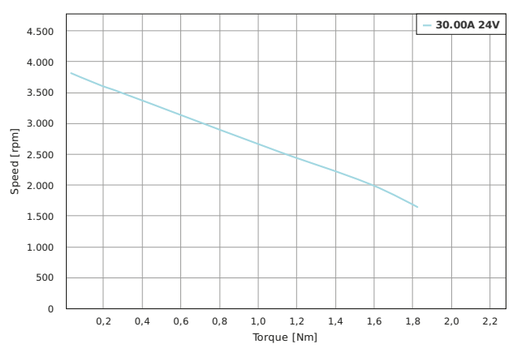
### DB59S024035



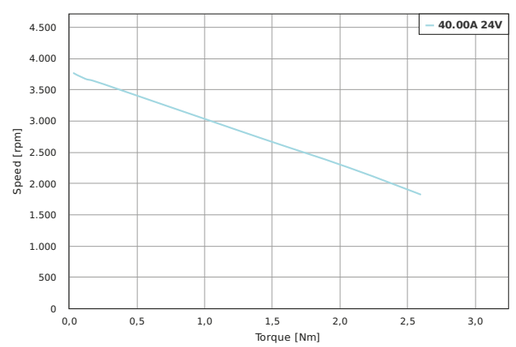

### DB59M024035



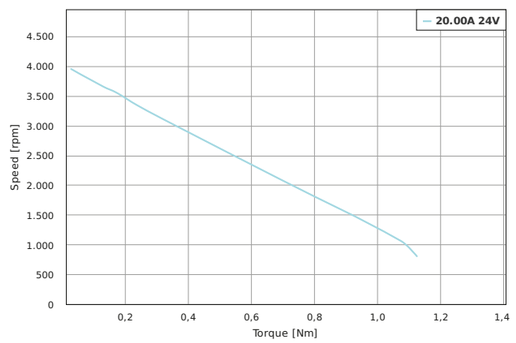

### DB59L024035



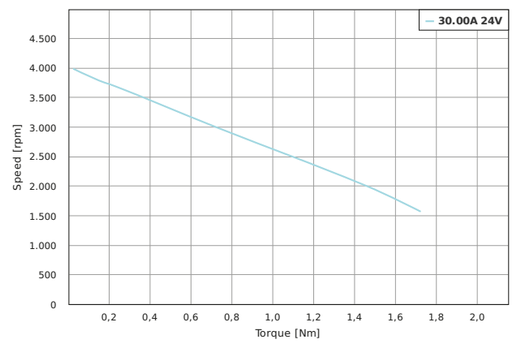

### DB59C024035




### DB59S024035-R




### DB59M024035-R

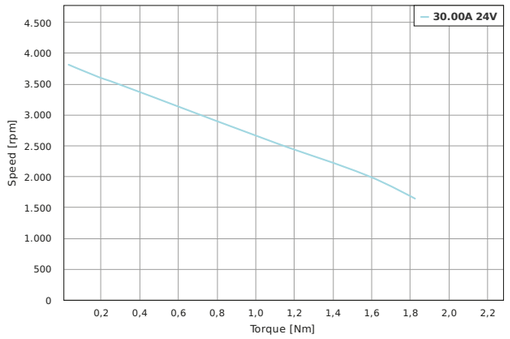


# DB59

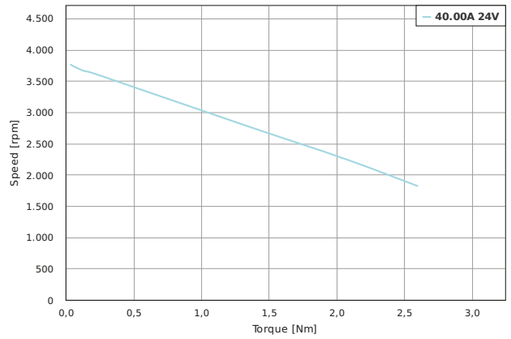
## Brushless DC motor

### TORQUE CURVES

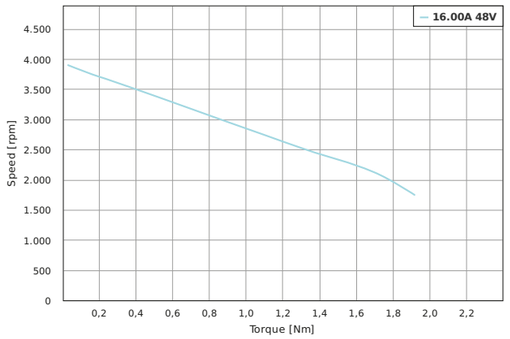
**DB59L024035-R**



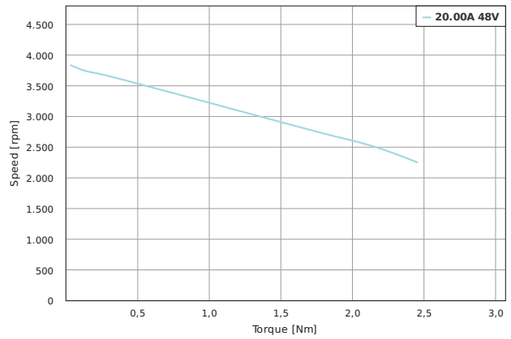

**DB59C024035-R**




**DB59L048035**




**DB59C048035**






# Notes

# DB80

## Brushless DC motor

## OPTIONS

Gearbox

Controller

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB80S048030 | 283 | 90 | 6.9 | 20 | 48 | 3000 | 13 | 544 | 87 | 1.5 |
| DB80M048030 | 534 | 170 | 14 | 40 | 48 | 3000 | 12 | 1020 | 108 | 2.1 |
| DB80L048030 | 706 | 225 | 18.75 | 65 | 48 | 3000 | 12 | 1360 | 123 | 2.6 |
| DB80C048030 | 942 | 300 | 25 | 85 | 48 | 3000 | 12 | 1900 | 143 | 3.3 |

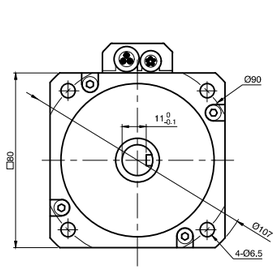
## ORDER IDENTIFIER

**DB80S048030-**
A = Without encoder
ENM05J = With incremental encoder

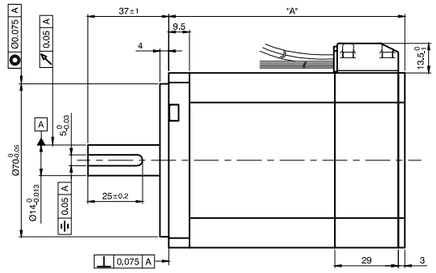
## DIMENSIONS (IN MM)

**DB80**

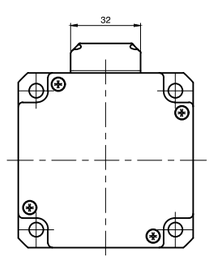
Front view and mounting




Side view




Rear view



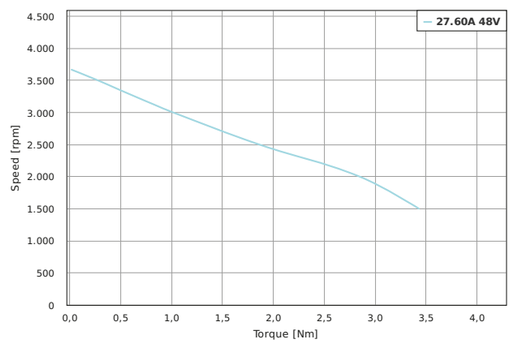



DB80

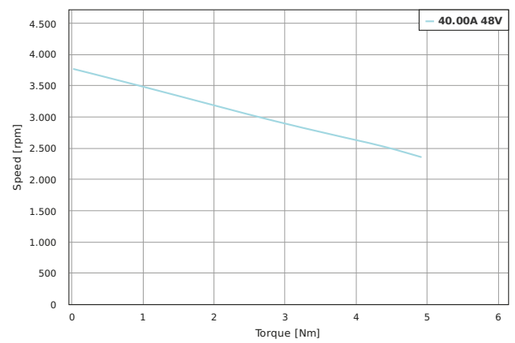
Brushless DC motor

## TORQUE CURVES

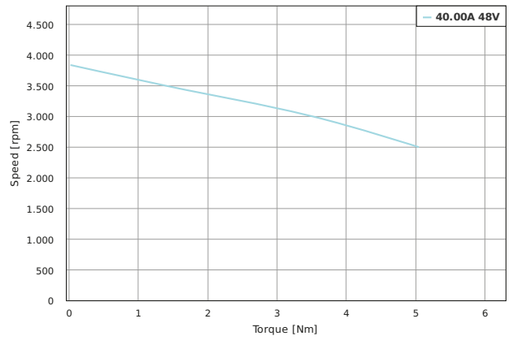
**DB80S048030**



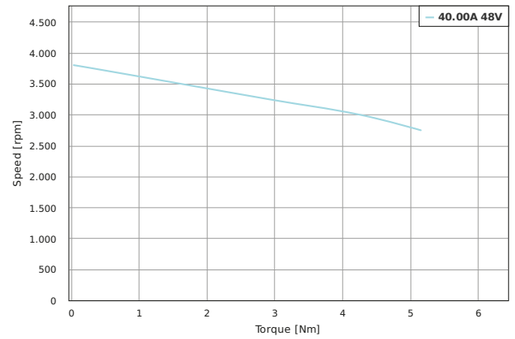

**DB80M048030**




**DB80L048030**




**DB80C048030**



# DB87

## Brushless DC motor

## OPTIONS

Gearbox · Brake · Controller · Encoder

## VERSIONS

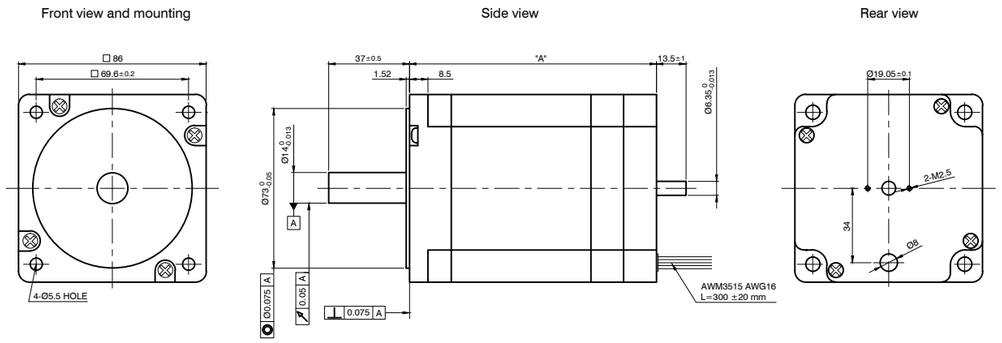
| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DB87S01-S | 220 | 70 | 6.25 | 19 | 48 | 3000 | 11.2 | 800 | 86 | 1.85 |
| DB87M01-S | 440 | 140 | 10.77 | 32.31 | 48 | 3000 | 13 | 1600 | 113 | 2.6 |
| DB87L01-S | 660 | 210 | 17.95 | 53.85 | 48 | 3000 | 11.7 | 2400 | 140 | 4 |

## ACCESSORIES

**ZD-D56** Damper

## DIMENSIONS (IN MM)

**DB87**

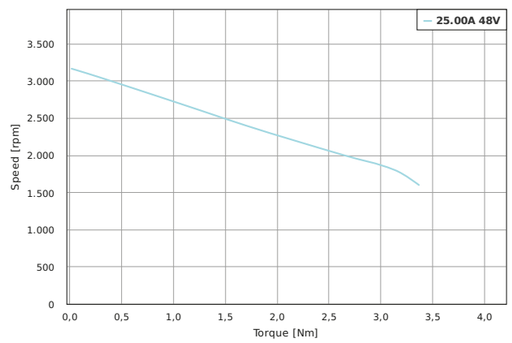




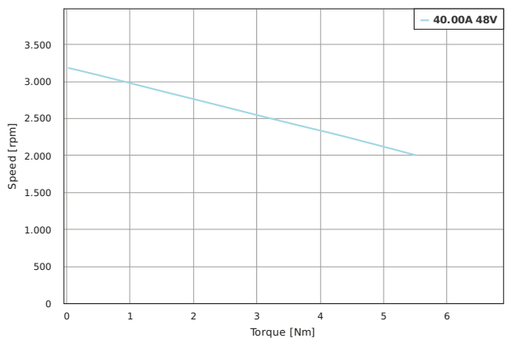

DB87
Brushless DC motor

## TORQUE CURVES

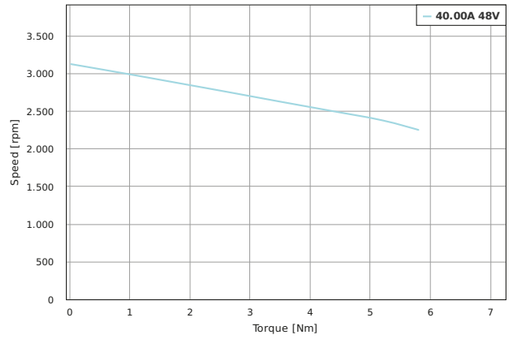
**DB87S01-S**




**DB87M01-S**




**DB87L01-S**




BLDC MOTORS

# DF20

## Brushless DC motor

### ACCESSORIES

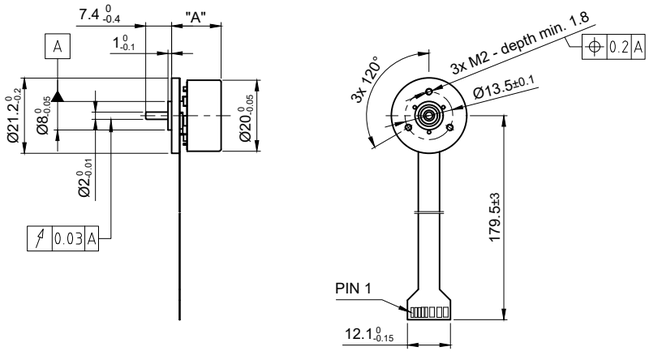
**ZIB-DF32** Additional board

### VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DF20M012052-A | 5 | 0.76 | 0.54 | 1.62 | 12 | 5170 | 1.2 | 5.1 | 14 | 0.023 |

### DIMENSIONS (IN MM)

**DF20-A**






# DF32

## Brushless DC motor

### OPTIONS

Controller

### ACCESSORIES

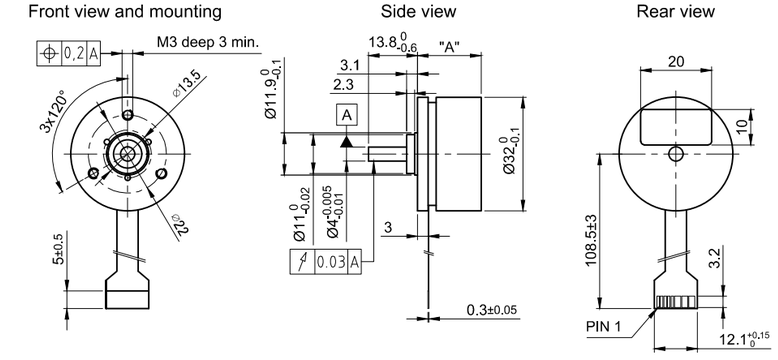
**ZIB-DF32** Additional board

### VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DF32M024027-A | 7.4 | 2.55 | 0.5 | 1.5 | 24 | 2760 | 5.1 | 35 | 17.9 | 0.05 |

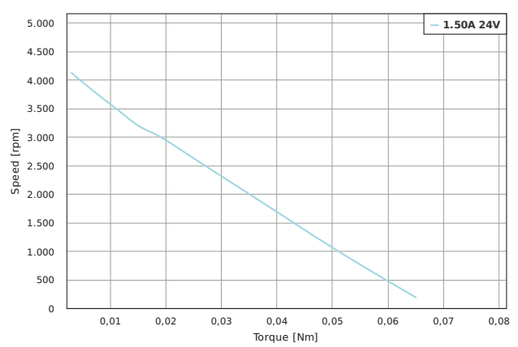
### DIMENSIONS (IN MM)

**DF32-A**




### TORQUE CURVES

**DF32M024027-A**



# DF45

## Brushless DC motor

## OPTIONS

Controller

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DF45S024050 | 30 | 5 | 1.58 | 4.8 | 24 | 5000 | 3.55 | 99 | 18 | 0.08 |
| DF45M024053 | 50 | 8.4 | 2.36 | 7 | 24 | 5260 | 3.35 | 135 | 21.6 | 0.12 |
| DF45L024048 | 65 | 13 | 3.26 | 9.5 | 24 | 4840 | 3.69 | 181 | 27 | 0.15 |

## ORDER IDENTIFIER

**DF45S024050-**
A = PCB connection
A2 = Connection with leads

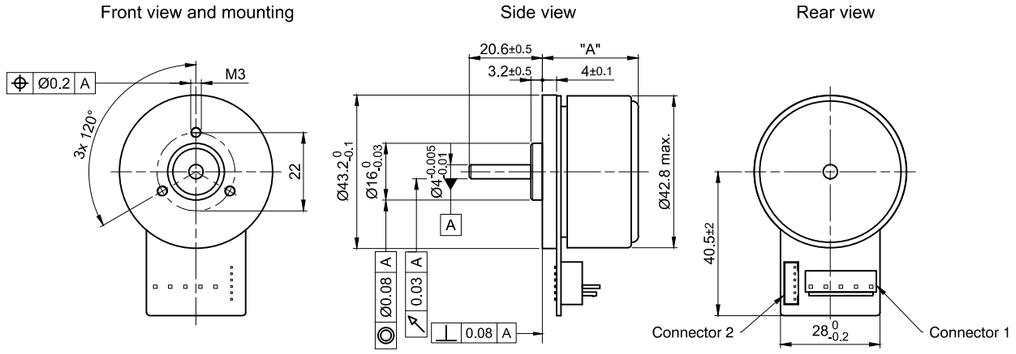
## ACCESSORIES

**ZK-JST-PHR-6-0.3M**
Hall cable DF45, 0.3m

**ZK-JST-VHR-5N-0.3M**
Motor cable DF45, 0.3m

## DIMENSIONS (IN MM)

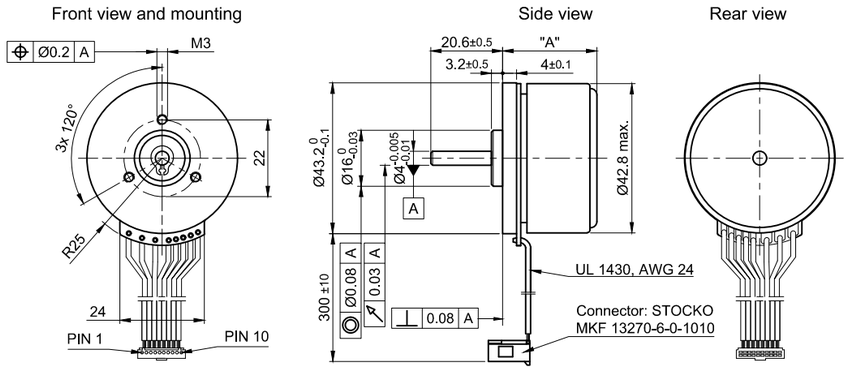
**DF45-A**





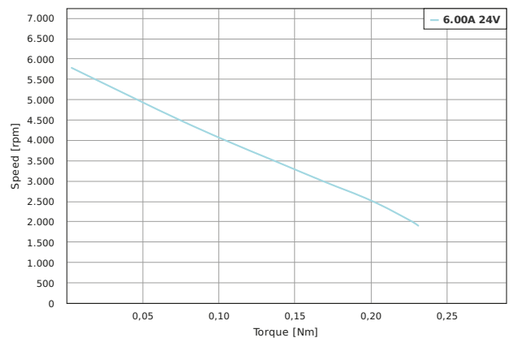

## DIMENSIONS (IN MM)

**DF45-A2**

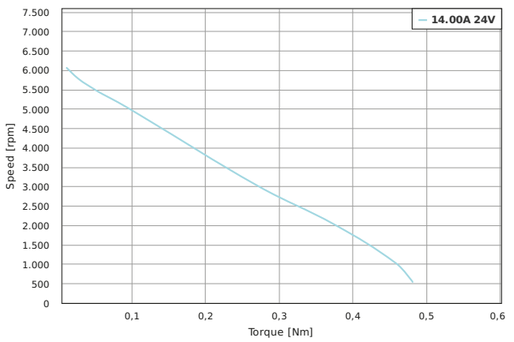



## TORQUE CURVES

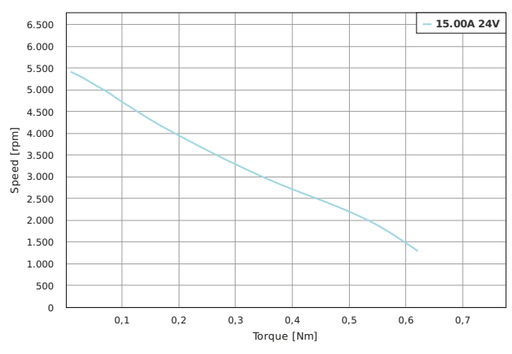
**DF45S024050**




**DF45M024053**




**DF45L024048**



# DFA68

## Brushless DC motor

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DFA68M024037-A | 110 | 29 | 5.6 | 17 | 24 | 3700 | 5.4 | 1000 | 42 | 0.47 |
| DFA68M024035-E | 106 | 29 | 5.8 | 17 | 24 | 3500 | 5 | 1000 | 42 | 0.5 |

## ORDER IDENTIFIER

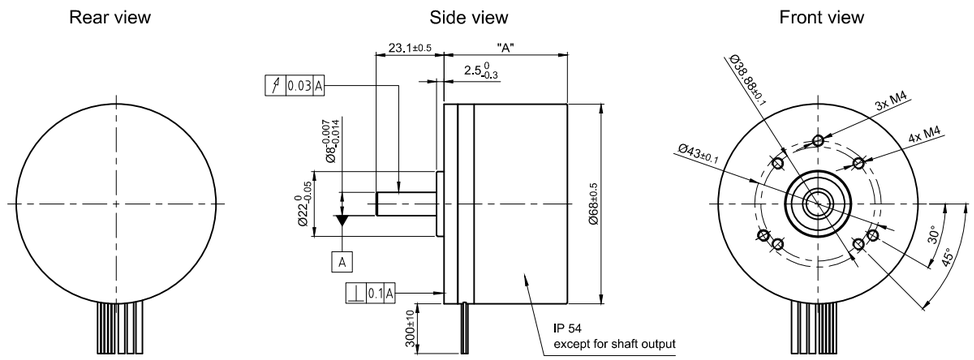
**DFA68M024037-**
A = Without encoder
E = With encoder

## ACCESSORIES

**ZK-DF90-E-500** Connection cable
**ZK-NME2-12-500-S**
Encoder cable NME2/3 0.5m

## DIMENSIONS (IN MM)

**DFA68**



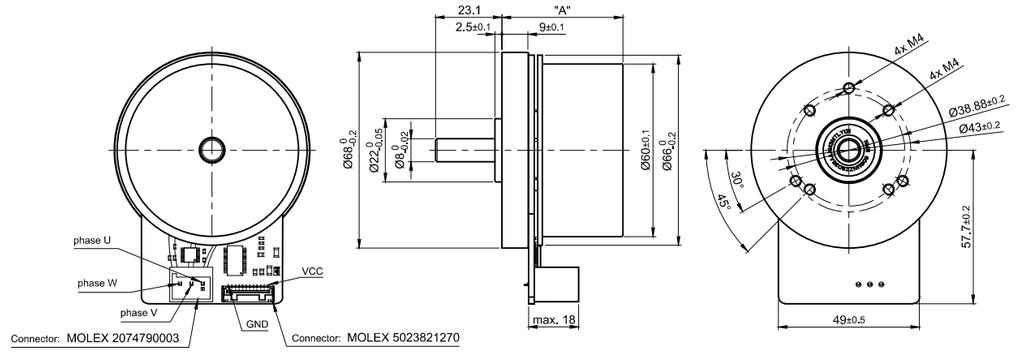



# DFA68

## Brushless DC motor

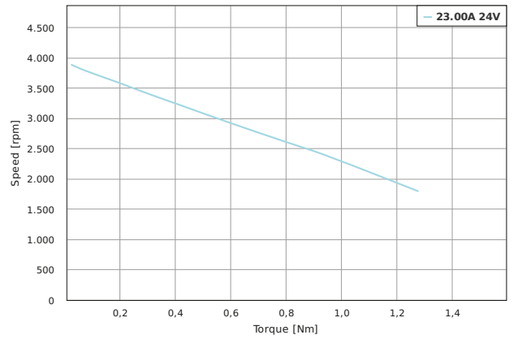
## DIMENSIONS (IN MM)

**DFA68-E**




## TORQUE CURVES

**DFA68M024037-A**



# DFA90

## Brushless DC motor

## VERSIONS

| tType | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DFA90S024027-A | 130 | 45.7 | 7.4 | 23 | 24 | 2720 | 6.1 | 3000 | 27 | 0.62 |
| DFA90L048017-A | 170 | 96.4 | 4.3 | 13 | 48 | 1670 | 23 | 5000 | 40 | 1 |
| DFA90L048017-E | 168 | 96.4 | 4.3 | 13 | 48 | 1670 | 23 | 5000 | 41.5 | 1.2 |

## ORDER IDENTIFIER

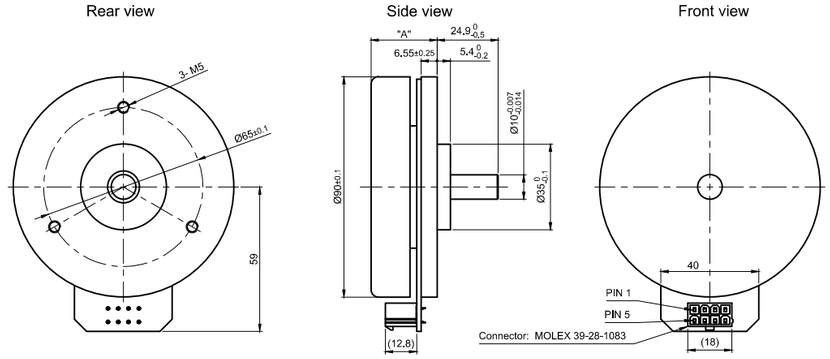
**DFA90S024027-**
A = Without encoder
E = With encoder

## ACCESSORIES

**ZK-DF90-500** Connection cable
**ZK-DF90-E-500** Connection cable
**ZK-NME2-12-500-S**
Encoder cable NME2/3 0.5m

## DIMENSIONS (IN MM)

**DFA90**



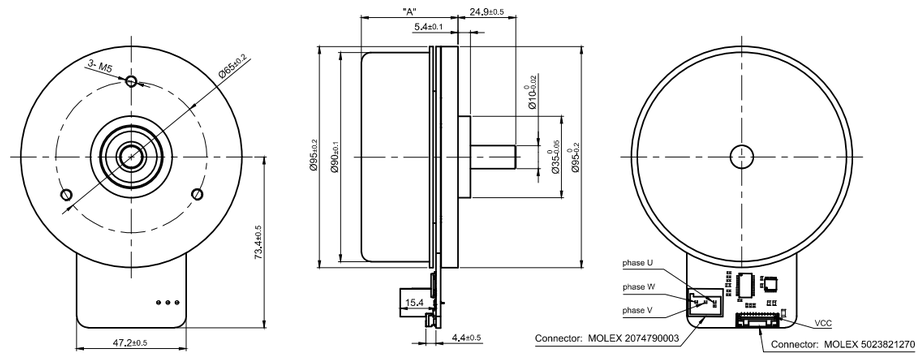



# DFA90

## Brushless DC motor

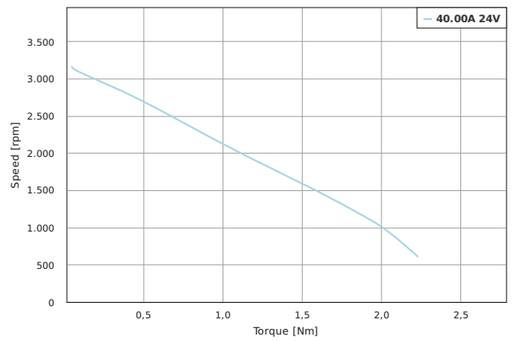
## DIMENSIONS (IN MM)

**DFA90-E**

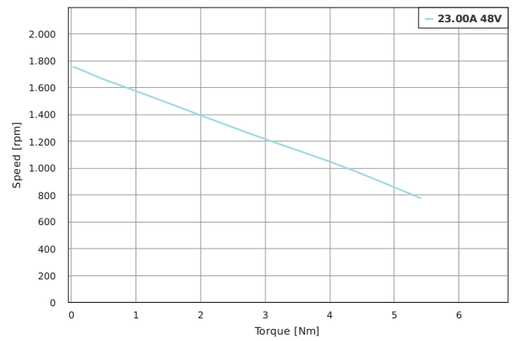



## TORQUE CURVES

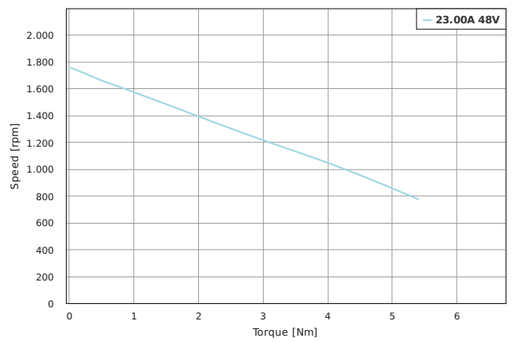
**DFA90S024027-A**




**DFA90L048017-A**




**DFA90L048017-E**



# DS16

## Brushless DC motor

### OPTIONS

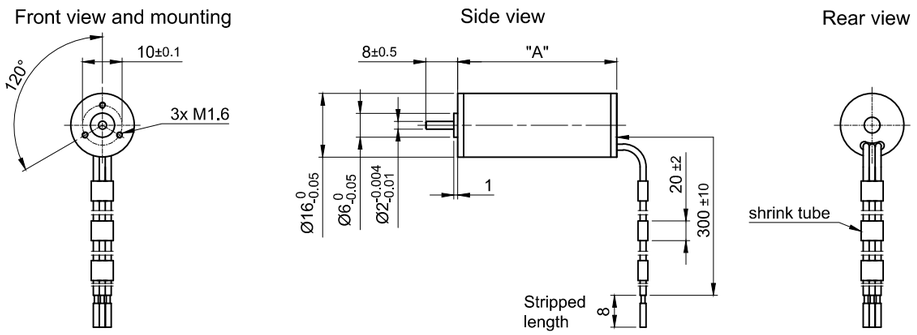
Controller

### VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DS16S012220-A | 3.7 | 0.16 | 0.4 | 1.18 | 12 | 22000 | 0.406 | 4 | 28 | 0.03 |
| DS16M024250-A | 10 | 0.4 | 0.5 | 1.6 | 24 | 25000 | 0.75 | 6.6 | 40 | 0.04 |
| DS16L024240-A | 25 | 1 | 1.33 | 4 | 24 | 24000 | 0.748 | 10.2 | 58 | 0.065 |

### DIMENSIONS (IN MM)

**DS16**






# DS28

## Brushless DC motor

### OPTIONS

Gearbox Controller Encoder

### VERSIONS

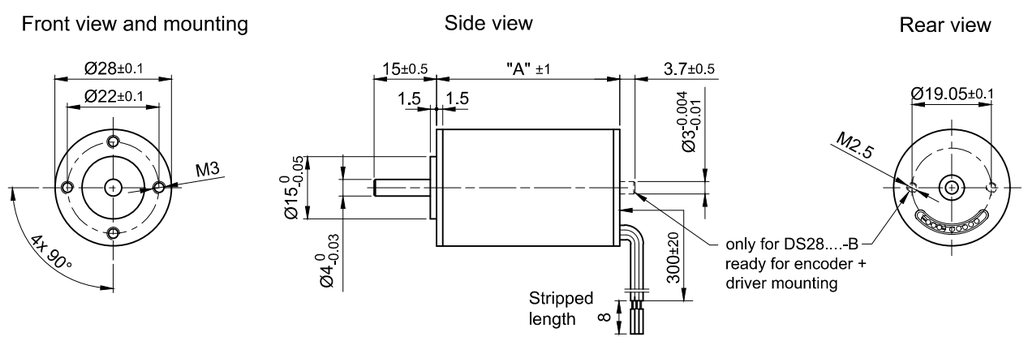
| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| DS28M024080 | 15.1 | 1.8 | 0.86 | 2.6 | 24 | 8000 | 2.1 | 8.8 | 45 | 0.14 |
| DS28L024080 | 29 | 3.5 | 1.35 | 4 | 24 | 8000 | 2.6 | 16 | 67 | 0.22 |

### ORDER IDENTIFIER

**DS28M024080-**
A = Single Shaft end
B = Double Shaft end

### DIMENSIONS (IN MM)

**DS28**



# Notes



# ASB42

## Brushless DC motor IP65 – NEMA 17

### OPTIONS

Gearbox

Controller

### VERSIONS

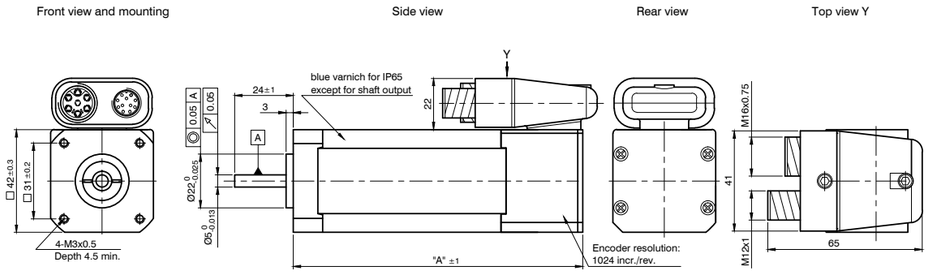
| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| ASB42C048060-ENM | 160 | 25 | 4.63 | 13.89 | 48 | 6000 | 5.4 | 96 | 121 | 0.75 |

### ACCESSORIES

**ZK-M12-12-2M-1-PUR-S** M12 Cable for IO Plug
**ZK-M12-5-2M-1-A-S-M** M12 Cable
**ZK-M12-12-2M-2-PADP** M12 Cable
**ZK-TW-4-2M** M16 (TW) Cable

### DIMENSIONS (IN MM)

**ASB42C048060-ENM**






# ASB87

## Brushless DC motor IP65 – NEMA 34

### OPTIONS

Gearbox

Controller

### VERSIONS

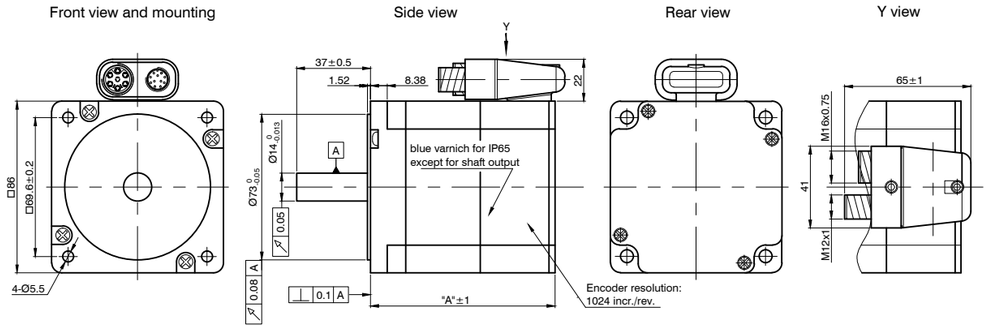
| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| ASB87S048030-ENM | 250 | 70 | 6.25 | 17.95 | 48 | 3000 | 11.2 | 800 | 91.9 | 1.85 |

### ACCESSORIES

**ZK-M12-12-2M-1-AFF** Encoder cable straight, 2m
**ZK-M12-12-2M-2-PADP** Encoder cable angled, 2m
**ZK-TW-7-2M** Motor cable straight, 2m

### DIMENSIONS (IN MM)

**ASB87S048030-ENM**



# APBA60

## Brushless DC motor IP65 – 60 mm

## ORDER IDENTIFIER

**APBA60M048030-**
E = With encoder
EB = With encoder and brake

## VERSIONS

| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| APBA60M048030-E | 200 | 64 | 6 | 18 | 48 | 3000 | 10.7 | 210 | 110 | 1 |
| APBA60M048030-EB | 200 | 64 | 6 | 18 | 48 | 3000 | 10.7 | 210 | 150 | 1.43 |
| APBA60L048030-E | 400 | 127 | 12 | 36 | 48 | 3000 | 10.7 | 430 | 135 | 1.4 |
| APBA60L048030-EB | 400 | 127 | 12 | 36 | 48 | 3000 | 10.7 | 430 | 175 | 1.87 |

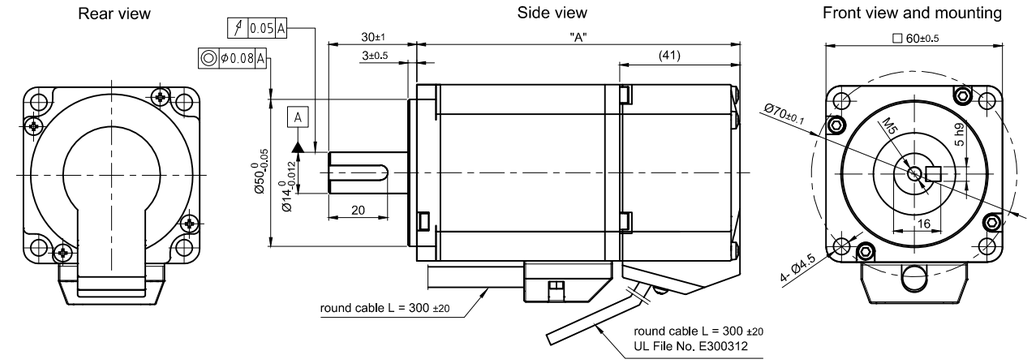


APBA60

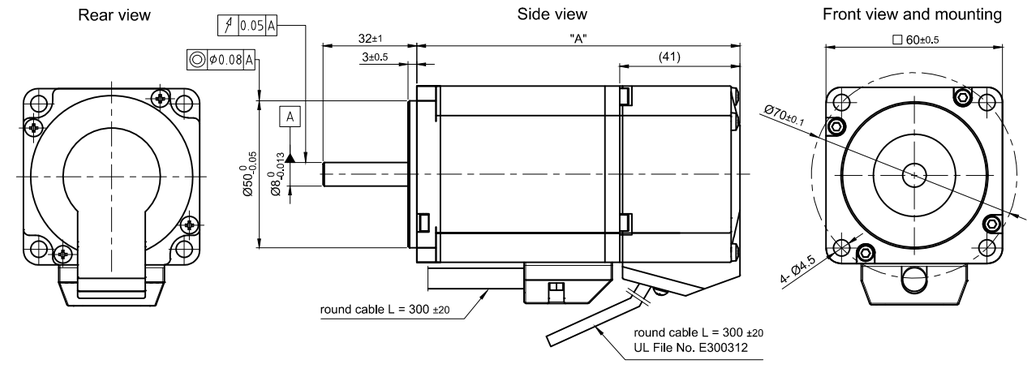
Brushless DC motor IP65 – 60 mm

## DIMENSIONS (IN MM)

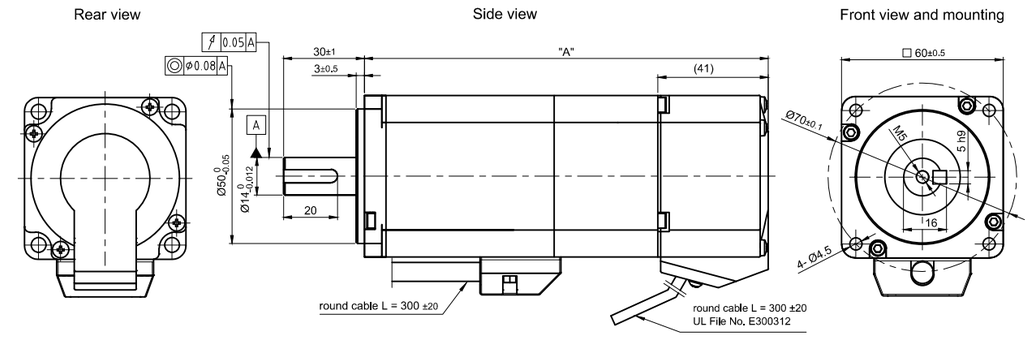
**APBA60-E**




**APBA60-E2**




**APBA60-EB**

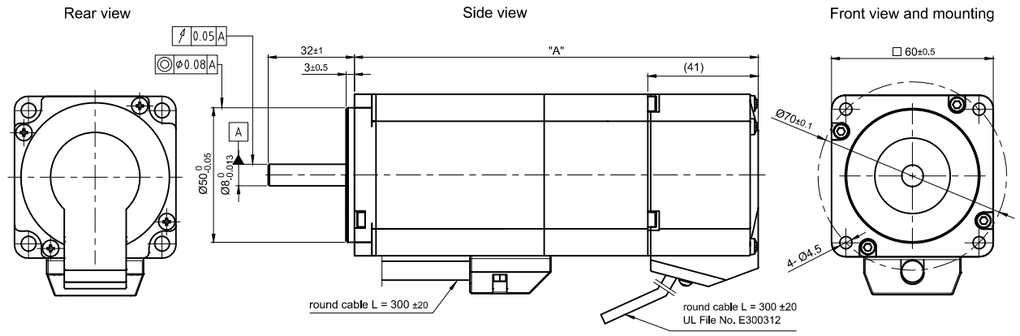


# APBA60

## Brushless DC motor IP65 – 60 mm

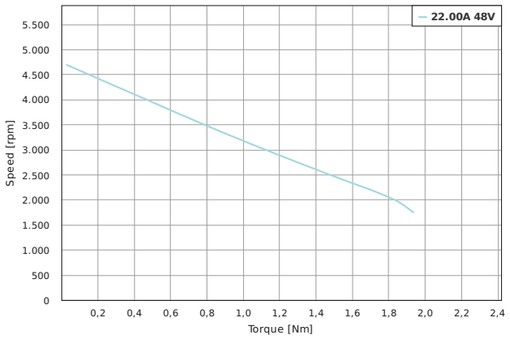
## DIMENSIONS (IN MM)

**APBA60-EB2**

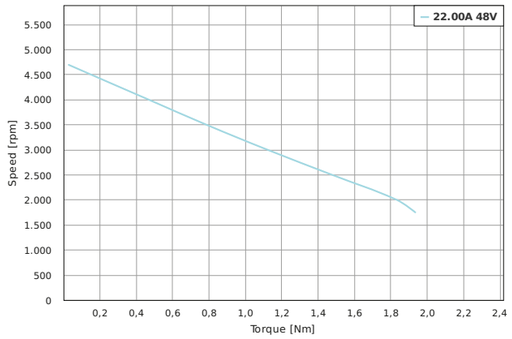



## TORQUE CURVES

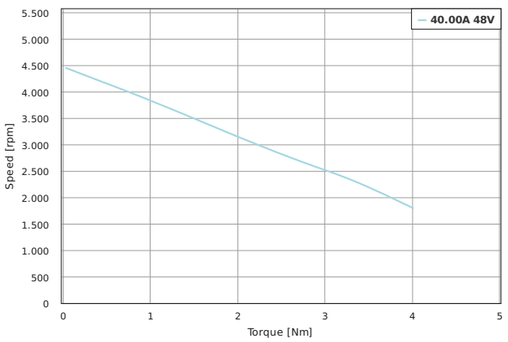
**APBA60M048030-E**



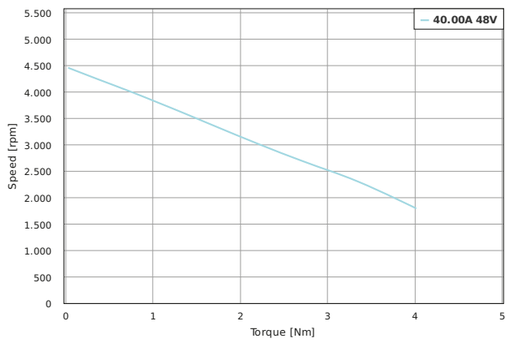

**APBA60M048030-EB**




**APBA60L048030-E**




**APBA60L048030-EB**






# APBA80

## Brushless DC motor IP65 – 80 mm

## ORDER IDENTIFIER

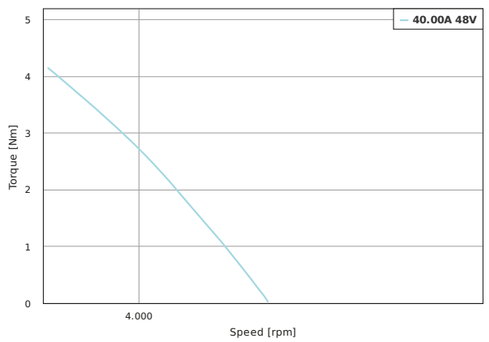
**APBA80M048030-**
E = With encoder
EB = With encoder and brake

## VERSIONS

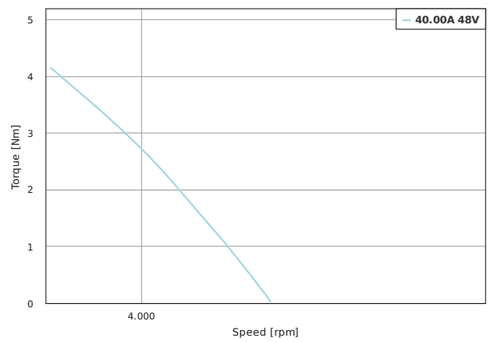
| Type | Rated Power W | Rated Torque Ncm | Rated Current A | Peak Current A | Rated Voltage V | Rated Speed rpm | Torque Constant Ncm/A | Rotor Inertia gcm² | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| APBA80M048030-E | 750 | 238 | 22.2 | 66.7 | 48 | 3000 | 10.7 | 124 | 142 | 2.9 |
| APBA80M048030-EB | 750 | 238 | 22.2 | 66.7 | 48 | 3000 | 10.7 | 124 | 181.5 | 3.4 |
| APBA80L048030-E | 1000 | 320 | 30 | 90 | 48 | 3000 | 10.7 | 170 | 162 | 3.2 |
| APBA80L048030-EB | 1000 | 320 | 30 | 90 | 48 | 3000 | 10.7 | 170 | 201.5 | 3.7 |

## TORQUE CURVES

**APBA80M048030-E**

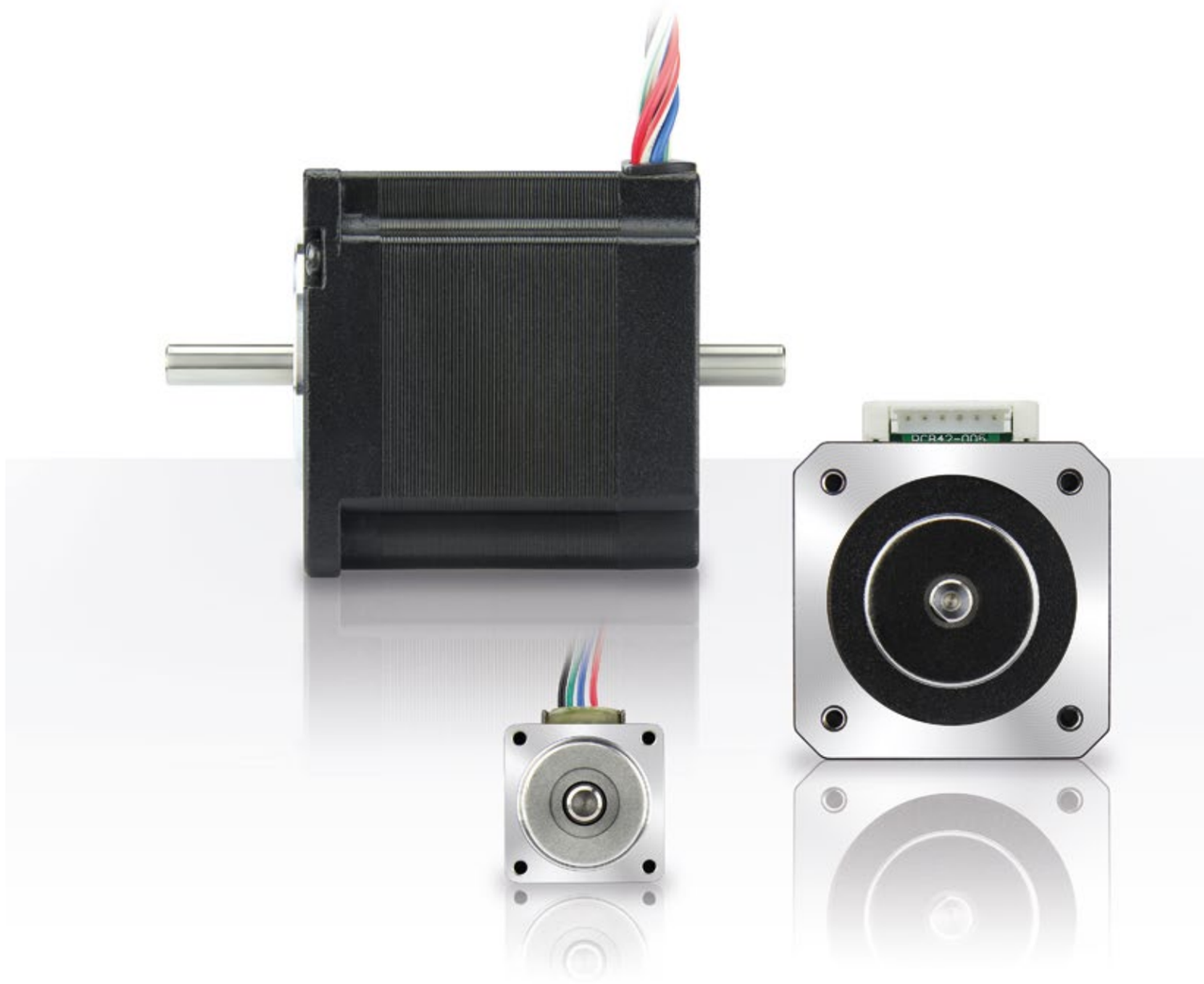



**APBA80M048030-EB**

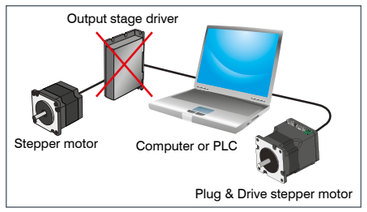


# Notes

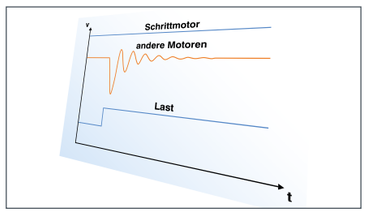




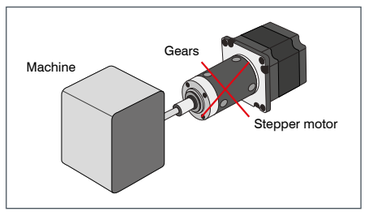
## APPLICATION BENEFITS



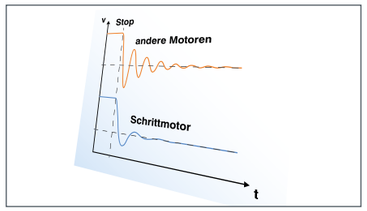

**a) PC+PLC-capable** (directly controllable via PC, PLC and microprocessor)
Brushless DC motors with integrated controller/drive have the highest productivity increase due to the use of PCs even at the lowest, decentralized machine level. Not only do these motors drastically reduce the development, wiring and installation effort for a complete drive unit and increase EMC compatibility and machine availability, but they also greatly simplify setup, installation and servicing.



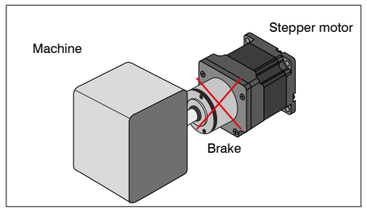

**b) Turning speed stability**
"No drop in speed when load changes" - the stepper motor meets this requirement like no other motor, without additional effort. Especially when using controllers for precise speed, synchronicity or ratios (such as for precise metering pumps), the stepper motor can achieve higher or finer resolutions thanks to digital processing. The improved control, process and surface quality are further advantages.



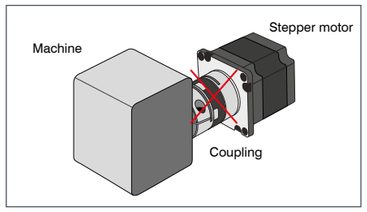

**c) Direct drive**
Stepper motors have their maximum torque in the lower speed range and the Nanotec micro stepper drivers still achieve concentricity properties of up to approx. 2 rpm. Other motors often need gears in order to fulfill speed and force requirements. Direct drives reduce system costs while increasing operating safety and service life. Gears are certainly indispensable for adjusting performance and power if space is limited or when the external inertia torque is high.




**d) Positioning accuracy**
As a result of the small step angle, stepper motors also have, in addition to the lowest over run, the smallest transient response. Even without external path or angle sensors, stepper motors fulfill outstanding speed and positioning tasks. The precision or resolution can even be increased further without additional effort using Nanotec motor controllers thanks to microstep switching. All Nanotec stepper motors are also available with encoders for detecting blockages and closed-loop applications.




**e) High stiffness without brake**
Stepper motors have the highest holding torque when idle and thus offer a high degree of system rigidity. Therefore an external brake can be omitted unless a safety brake is required for the Z-axis.




**f) Avoiding damage to machines and injuries**
The disadvantage of "falling out of step" when a motor is blocked, an issue that is sometimes brought up in connection with stepper motors, can actually be of advantage in some cases in view of increasingly stringent safety requirements. Slip and overload couplings are not normally required in statutory safety requirements in conjunction with stepper motors.

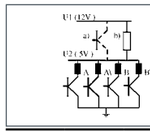




## CONTROLLERS AND SWITCHING FEATURES

Almost all stepper motors can be provided with 4, 6 or 8 connection lines/leads. 4 leads are suited solely for bipolar operation, 6 leads for unipolar and limited bipolar operation and 8 leads for unipolar and bipolar operation. Even though unipolar operation is extremely simple using just 4 switches, it is rarely used today due to the availability of highly integrated constant current bipolar driver ICs with an approximately 30 % higher torque. This is also true for constant voltage operation where the power losses are high.

### UNIPOLAR CONNECTION



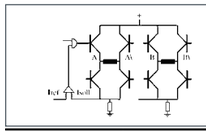

e.g. Constant voltage operation

a) Bilevel
b) Series resistor

**Unipolar switching sequences**

| Mode | | winding | | | |
|---|---|---|---|---|---|
| 1/1 | 1/2 | A | A\ | B | B\ |
| 1 | 1 | + | 0 | 0 | + |
| | 2 | + | 0 | 0 | 0 |
| 2 | 3 | + | 0 | + | 0 |
| | 4 | 0 | 0 | + | 0 |
| 3 | 5 | 0 | + | + | 0 |
| | 6 | 0 | + | 0 | 0 |
| 4 | 7 | 0 | + | 0 | + |
| | 8 | 0 | 0 | 0 | + |
| 1 | 1 | + | 0 | 0 | + |

### BIPOLAR SWITCHING SEQUENCES

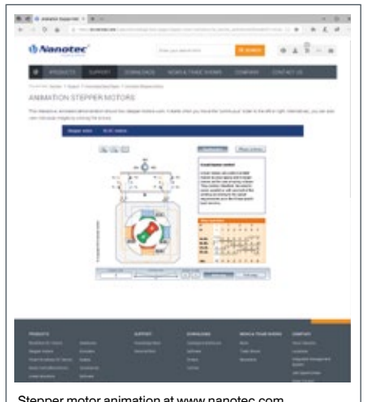



e.g. constant current operation

**Bipolar switching sequences**

| Mode | | winding | |
|---|---|---|---|
| 1/1 | 1/2 | A | B |
| 1 | 1 | + | + |
| | 2 | + | 0 |
| 2 | 3 | + | - |
| | 4 | 0 | - |
| 3 | 5 | - | - |
| | 6 | - | 0 |
| 4 | 7 | - | + |
| | 8 | 0 | + |
| 1 | 1 | + | + |

### STEPPER MOTOR ANIMATION



Stepper motor animation at www.nanotec.com

**Connecting options for stepper motors**
Stepper motors offered by Nanotec can be operated using various connecting options that each lend the motor different characteristics. The 4-lead design is already connected internally; there is only one connection option. Motors with 6 leads can be operated with one winding half or in series, those with 8 wires can be operated in all of the listed connection arrangements. Only bipolar activation, which is used almost exclusively today, is taken into consideration here.

**1. One half winding:** Only half of the motor's windings are used in this case. Therefore, the holding torque that can be achieved is less than in the other circuits. This circuit only provides benefits at the high speed range of 6-lead motors, which can be seen clearly in the motor curves.

**2. Parallel:** The highest motor output is achieved in this circuit. Due to the low inductance, the motor continues to keep the torque constant even at high speeds, however, a high phase current is also required.

**3. Series:** This circuit is well-suited for the low speed range where high torque is achieved with low current. Due to the high inductance, the torque quickly drops off at high speeds, however.

The values in the data sheet always refer to one half winding. The rule for converting to series or parallel circuits for individual parameters is shown in the following table.

| Value | 1 winding half as in data sheet | Series | Parallel |
|---|---|---|---|
| Resistance | R | 2 * R | R / 2 |
| Inductance | L | 4 * L | L |
| Phase current | I | I / √2 | I * √2 |
| Holding torque | M | M * √2 | M * √2 |

The holding torque is achieved at the corresponding nominal current. If the current deviates, then the value can be calculated accordingly from the proportionality between phase current and holding torque. Thus, half the current results in half of the holding torque (for the same circuit).

### CAUTION

This rule only applies to the holding torque and to the low speed range (where torque does not yet drop off), but not to the entire motor curve. At high speeds, the configured current can no longer achieve its maximum value since the switching processes at the winding are then too fast. This (real) current reduction leads to a decrease in the motor curve as speed increases.

It is also possible to operate the motor briefly with higher current. In that case, however, care must be taken not to exceed a housing temperature of 80 °. Saturation occurs at 1.5-2 times the value of the nominal current in the process depending on the motor, after which the moment no longer increases.

# SCA2018

## Stepper motor – NEMA 8

## OPTIONS

Gearbox | Controller | Encoder

## VERSIONS

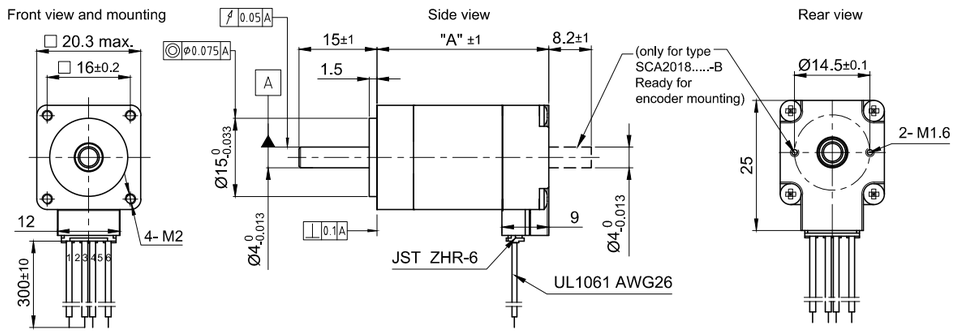
| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| SCA2018S0604 | 0.6 | 2.2 | 6.5 | 2.6 | 2 | 0.06 | 33 |
| SCA2018M0804 | 0.8 | 3.6 | 5.6 | 2.3 | 2.9 | 0.07 | 40 |

## ORDER IDENTIFIER

**SCA2018S0604-**
A = Single shaft end
B = Double shaft end

## DIMENSIONS (IN MM)

**SCA2018**



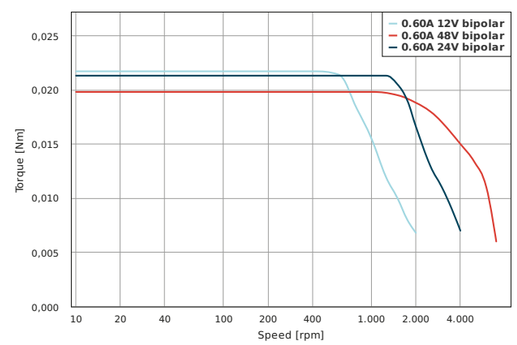



SCA2018

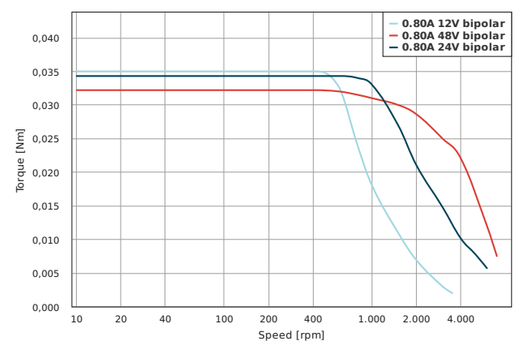
Stepper motor – NEMA 8

## TORQUE CURVES

**SCA2018S0604**

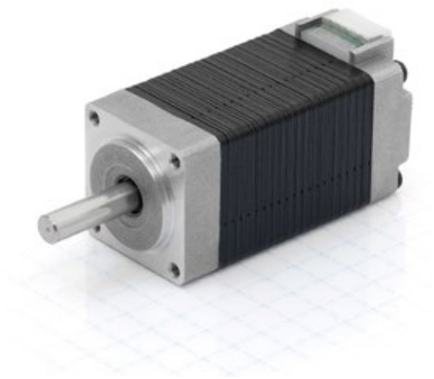



**SCA2018M0804**



# ST2018

## Stepper motor – NEMA 8



## OPTIONS

Gearbox | Controller | Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST2018S0604 | 0.6 | 1.8 | 6.5 | 1.7 | 2 | 0.06 | 33 |
| ST2018M0804 | 0.8 | 3 | 5.4 | 1.5 | 3.6 | 0.08 | 42 |
| ST2018L0804 | 0.8 | 3.6 | 6 | 2.2 | 4.3 | 0.09 | 48 |

## ORDER IDENTIFIER

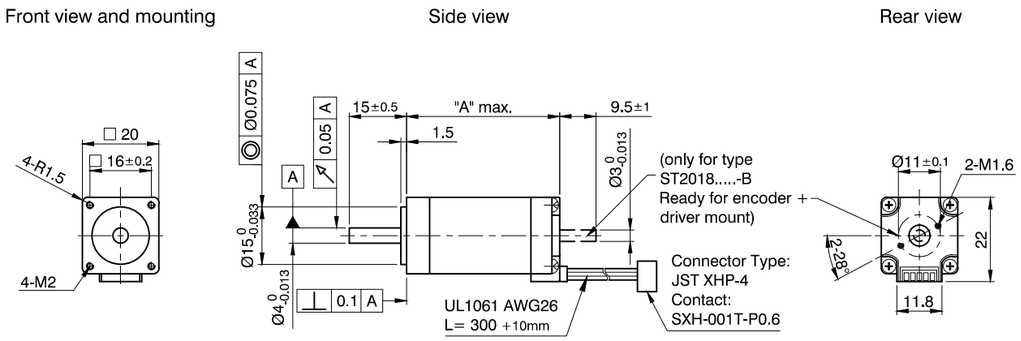
**ST2018S0604-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

**ZK-JST-VL-4** Extension cable, 2m

## DIMENSIONS (IN MM)

**ST2018**



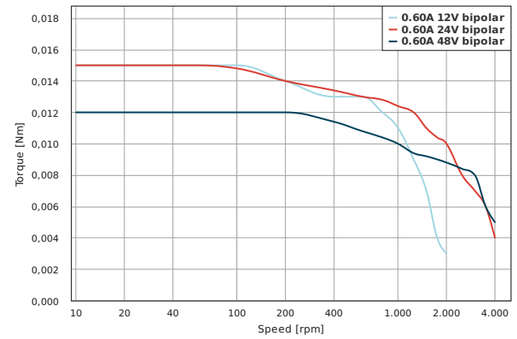



ST2018

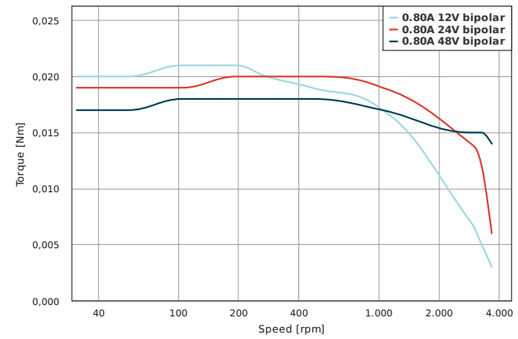
Stepper motor – NEMA 8

## TORQUE CURVES

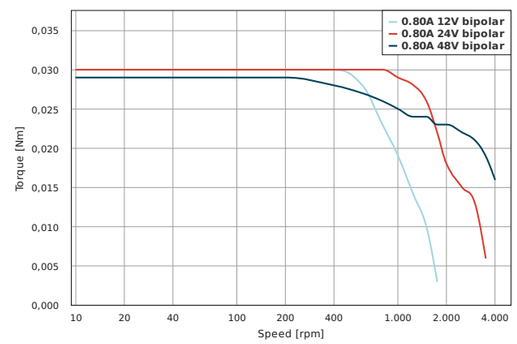
ST2018S0604




ST2018M0804

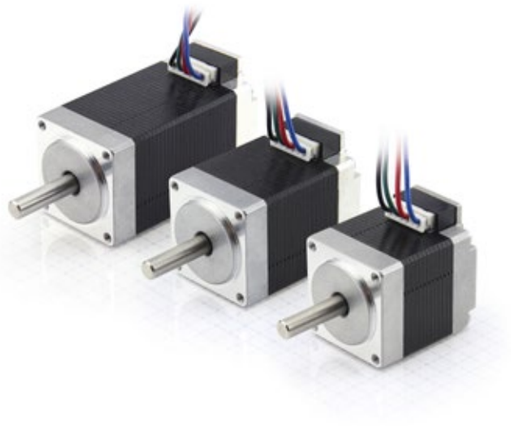



ST2018L0804



# SC2818

## Stepper motor – NEMA 11



## OPTIONS

Gearbox

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| SC2818S0604 | 0.67 | 9 | 6.2 | 5.76 | 9 | 0.11 | 33 |
| SC2818S1504 | 1.5 | 9 | 1.3 | 1 | 9 | 0.11 | 33 |
| SC2818M0604 | 0.6 | 13.5 | 7.3 | 6.52 | 12 | 0.14 | 41 |
| SC2818M1504 | 1.5 | 13.5 | 1,45 | 1.25 | 12 | 0.14 | 41 |
| SC2818L0604 | 0.6 | 18 | 9.2 | 8.4 | 18 | 0.2 | 52.5 |
| SC2818L1504 | 1.5 | 18 | 1.9 | 1.9 | 18 | 0.2 | 52.5 |

## ORDER IDENTIFIER

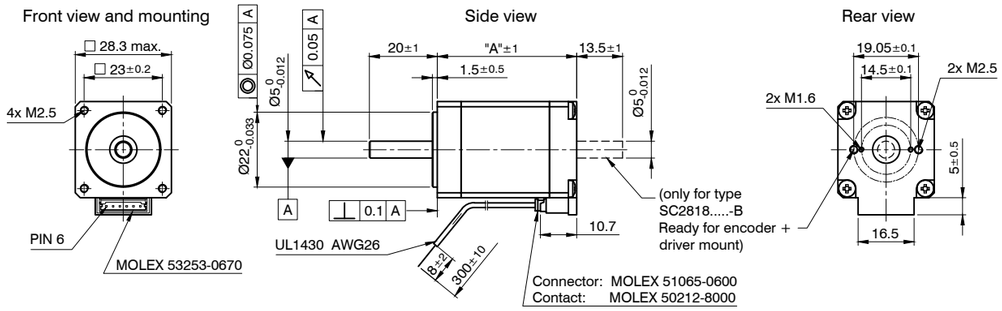
**SC2818S0604-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

**ZD-D28** Damper

## DIMENSIONS (IN MM)

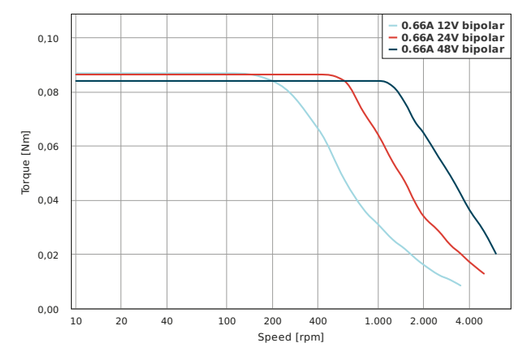
SC2818



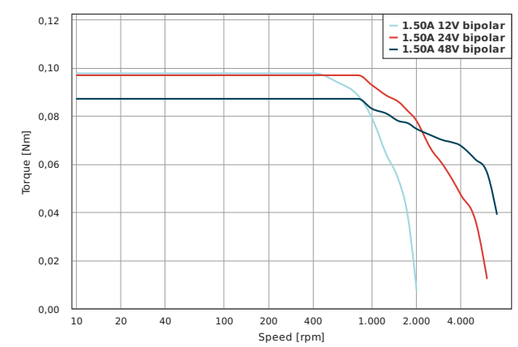



## TORQUE CURVES

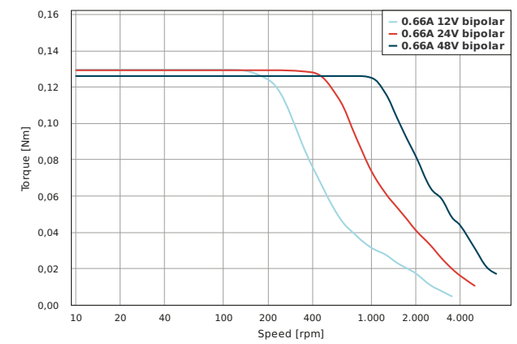
SC2818S0604



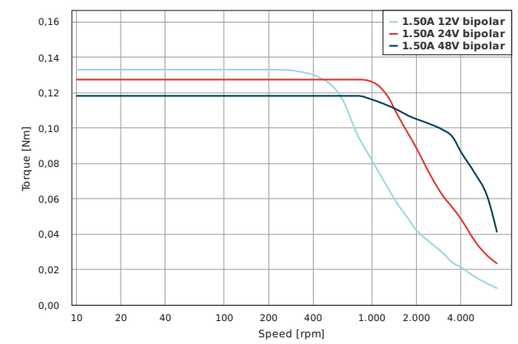

SC2818S1504



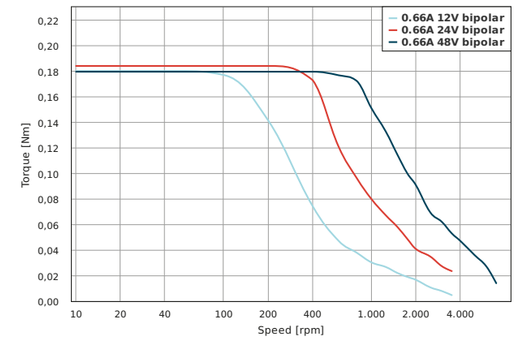

SC2818M0604



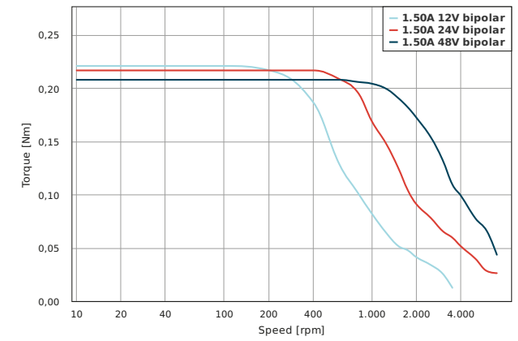

SC2818M1504




SC2818L0604




SC2818L1504



# ST2818

## Stepper motor – NEMA 11

## OPTIONS

Gearbox | Controller | Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST2818S1006 | 0.67 | 6.08 | 2.8 | 1 | 9 | 0.11 | 31.5 |
| ST2818M1006 | 0.67 | 10.61 | 3.4 | 1.2 | 12 | 0.176 | 44.5 |
| ST2818L1006 | 0.67 | 12.73 | 4.6 | 1.8 | 18 | 0.25 | 50.5 |
| ST2818L1404 | 1.4 | 11.7 | 2.3 | 1.8 | 18 | 0.25 | 50.5 |

The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.

## ORDER IDENTIFIER

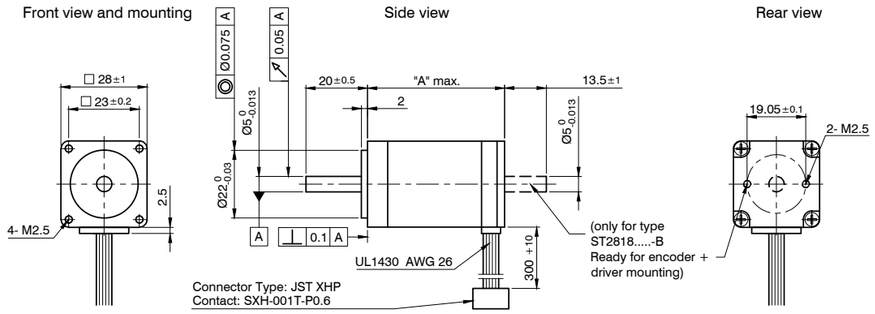
**ST2818S1006-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

**ZK-JST-VL-4** Extension cable, 2m
**ZK-JST-VL-6** Extension cable, 2m
**ZD-D28** Damper

## DIMENSIONS (IN MM)

**ST2818**



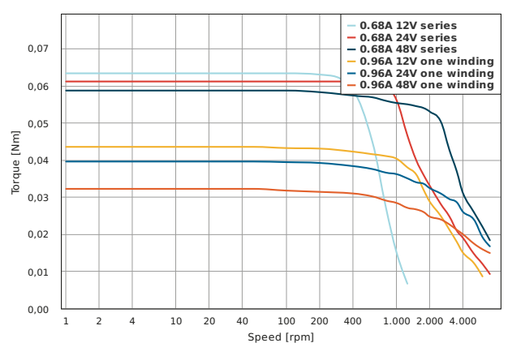



ST2818

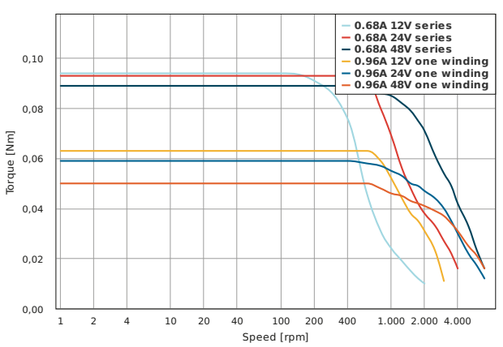
Stepper motor – NEMA 11

## TORQUE CURVES

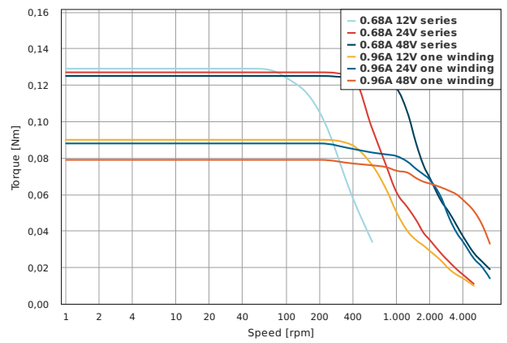
ST2818S1006



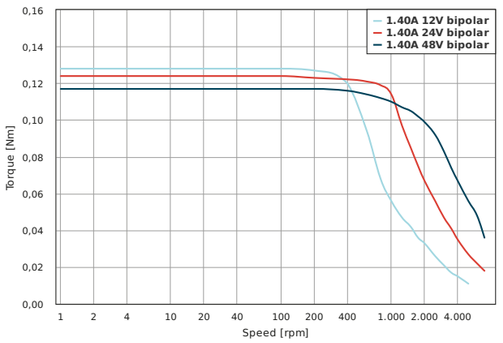

ST2818M1006




ST2818L1006




ST2818L1404



# SC3518

## Stepper motor – NEMA 14

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| SC3518M1204 | 1.2 | 18 | 2.5 | 2.9 | 20 | 0.18 | 39.5 |
| SC3518L1204 | 1.2 | 32 | 3.8 | 5.2 | 43 | 0.3 | 56.5 |

## ORDER IDENTIFIER

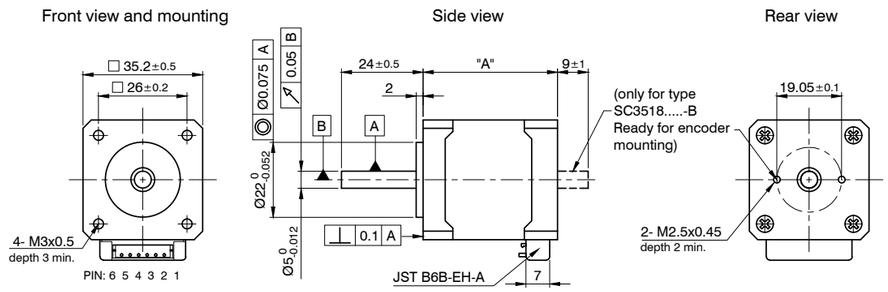
**SC3518S1204-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

**ZK-JST-EHR-6-0.5M-S** Motor cable, 0.5m
**ZD-D28** Damper
**ZD-D40** Damper

## DIMENSIONS (IN MM)

**SC3518**



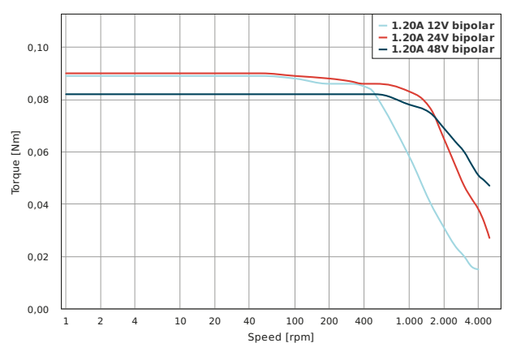



SC3518

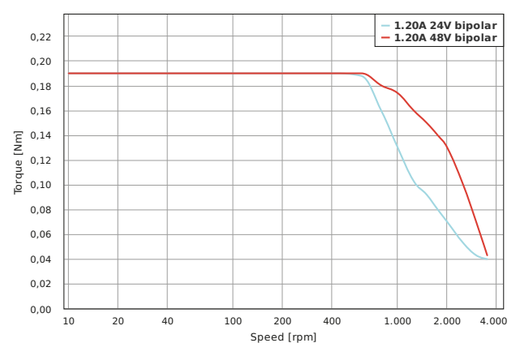
Stepper motor – NEMA 14

## TORQUE CURVES

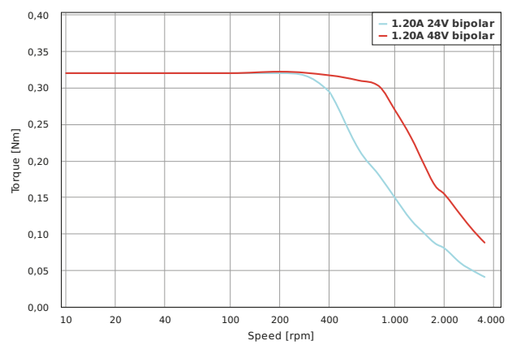
SC3518S1204




SC3518M1204




SC3518L1204



# ST3518

## Stepper motor – NEMA 14

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST3518S0804 | 0.8 | 5 | 4 | 2.3 | 10 | 0.15 | 26 |
| ST3518M1004 | 1 | 14 | 2.7 | 4.3 | 14 | 0.18 | 36 |
| ST3518L1204 | 1.2 | 23 | 3.4 | 4.5 | 43 | 0.3 | 52 |

## ORDER IDENTIFIER

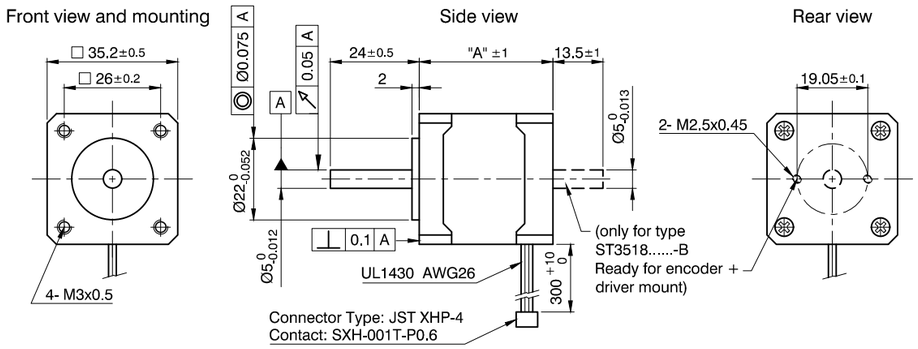
**ST3518S0804-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

**ZK-JST-EHR-6-0.5M-S** Motor cable, 0.5m
**ZD-D28** Damper
**ZD-D40** Damper

## DIMENSIONS (IN MM)

**ST3518**



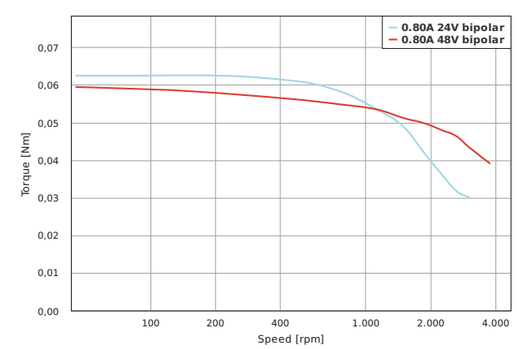



ST3518

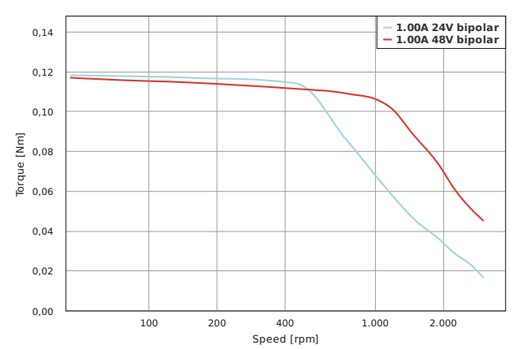
Stepper motor – NEMA 14

## TORQUE CURVES

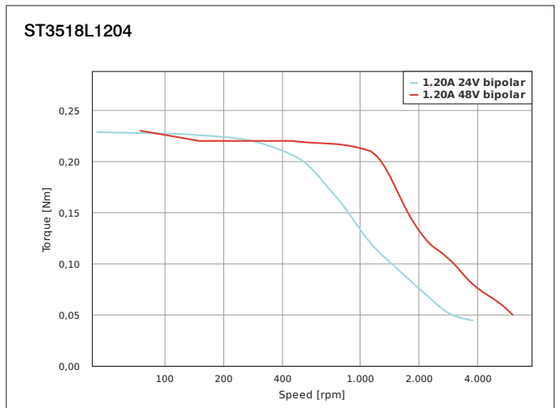
ST3518S0804




ST3518M1004




ST3518L1204



# SC4118

## Stepper motor – NEMA 17

## OPTIONS

Gearbox

Controller

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| SC4118L1804 | 1.8 | 50 | 1.75 | 3.3 | 82 | 0.34 | 62 |

## ORDER IDENTIFIER

**SC4118L1804-**
ENO05K = 5V encoder voltage
ENO24K = 24V encoder voltage

## ACCESSORIES

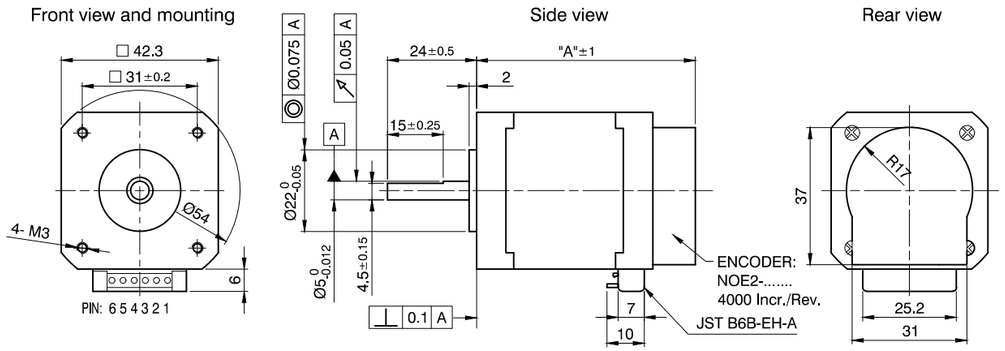
**ZK-JST-EHR-6-0.5M-S** Motor cable, 0.5m

**ZK-NOE1-10-2000-S**
Encoder cable NOE, 2m

**ZK-NOE1-10-500-S**
Encoder cable NOE, 0.5m

## DIMENSIONS (IN MM)

**SC4118L1804-EN**

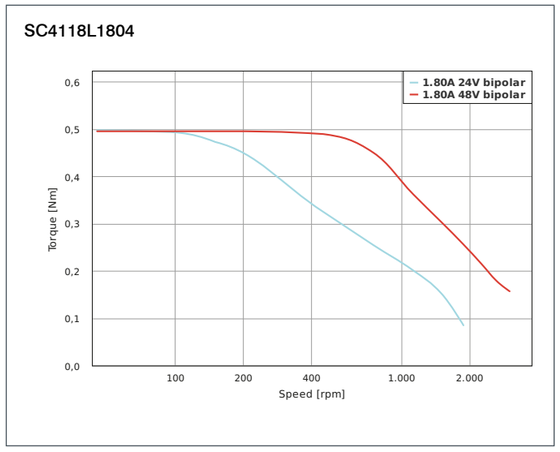





# SC4118

## Stepper motor – NEMA 17

## TORQUE CURVES



# ST4118

## Stepper motor – NEMA 17

## OPTIONS

Gearbox · Brake · Controller · Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST4118X0404 | 0.4 | 17 | 24 | 36 | 20 | 0.15 | 26 |
| ST4118X1404 | 1.4 | 9 | 2 | 1.6 | 20 | 0.15 | 26 |
| ST4118S0206 | 0.16 | 21.21 | 75 | 53 | 38 | 0.2 | 30.5 |
| ST4118S0406 | 0.25 | 22.63 | 30 | 21.7 | 38 | 0.2 | 30.5 |
| ST4118S0706 | 0.49 | 22.63 | 7.6 | 6.8 | 38 | 0.2 | 30.5 |
| ST4118S1006 | 0.67 | 21.21 | 3.9 | 2.8 | 38 | 0.2 | 30.5 |
| ST4118S1404 | 1.4 | 20 | 2 | 3 | 38 | 0.2 | 30.5 |
| ST4118M0406 | 0.28 | 39.6 | 30 | 25 | 57 | 0.24 | 38 |
| ST4118M0706 | 0.49 | 39.6 | 9.5 | 8 | 57 | 0.24 | 38 |
| ST4118M0906 | 0.64 | 39.6 | 5.7 | 5 | 57 | 0.24 | 38 |
| ST4118M1206 | 0.85 | 39.6 | 3.1 | 2.9 | 57 | 0.24 | 38 |
| ST4118M1404 | 1.4 | 24 | 1.2 | 1.7 | 57 | 0.24 | 38 |
| ST4118M1804 | 1.8 | 28 | 1.1 | 1.85 | 57 | 0.24 | 38 |
| ST4118L0804 | 0.8 | 50 | 9.3 | 17 | 83 | 0.34 | 48.5 |
| ST4118L1206 | 0.85 | 49.5 | 3.3 | 3.4 | 82 | 0.34 | 48.5 |
| ST4118L1804 | 1.8 | 50 | 1.75 | 3.3 | 82 | 0.34 | 48.5 |
| ST4118L3004 | 3 | 50 | 0.63 | 1.03 | 82 | 0.34 | 48.5 |
| ST4118D1804 | 1.8 | 80 | 3 | 7 | 102 | 0.5 | 60 |
| ST4118D3004 | 3 | 80 | 1.1 | 2.7 | 102 | 0.5 | 60 |

The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.



ST4118

Stepper motor – NEMA 17

## ORDER IDENTIFIER

**ST4118X0404-**
A = Single shaft end
B = Double shaft end

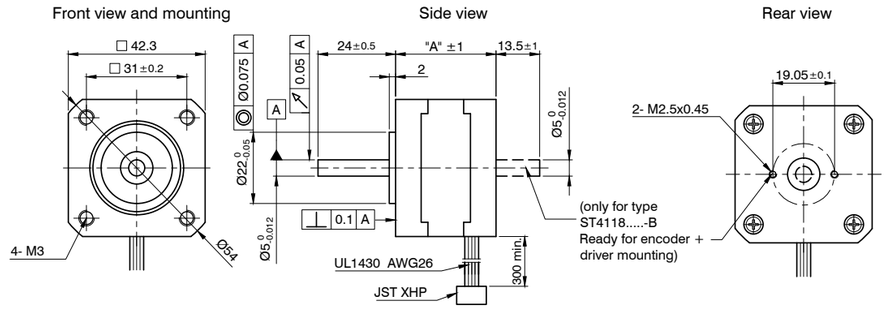
## ACCESSORIES

**ZK-JST-VL-4** Extension cable, 2m
**ZK-JST-VL-6** Extension cable, 2m
**ZD-D40** Damper
**ZD-DF40** Damper



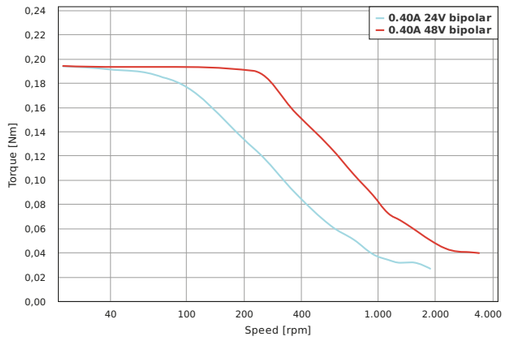
## DIMENSIONS (IN MM)

**ST4118**

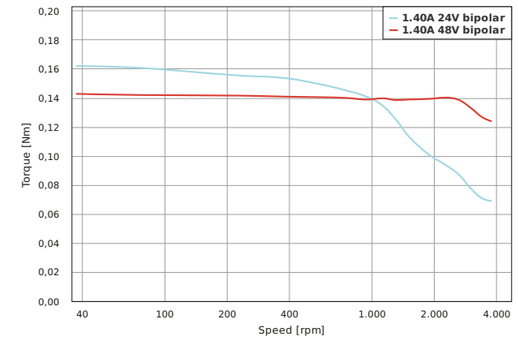



## TORQUE CURVES

**ST4118X0404**




**ST4118X1404**

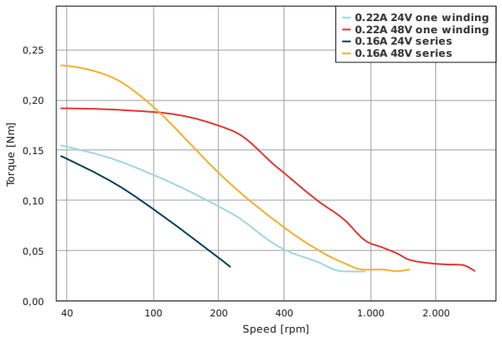


# ST4118

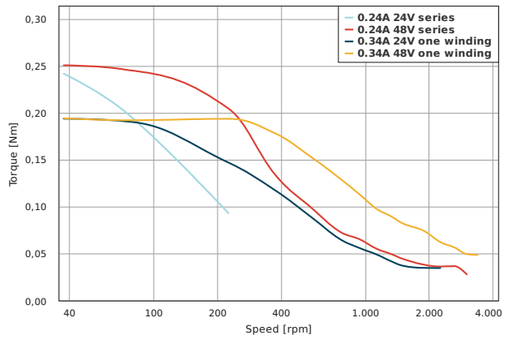
## Stepper motor – NEMA 17

### TORQUE CURVES

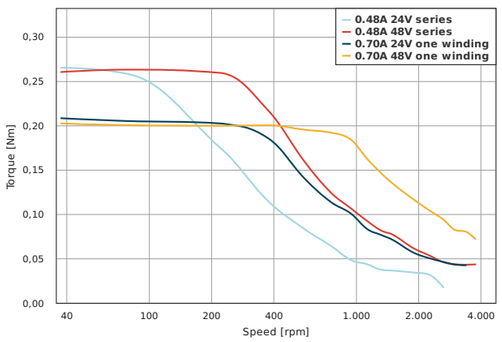
**ST4118S0206**



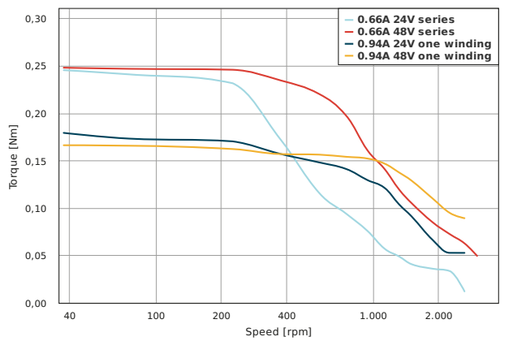

**ST4118S0406**



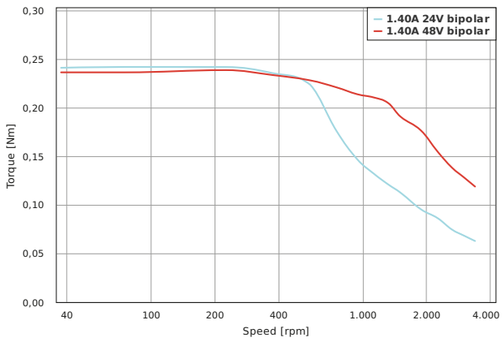

**ST4118S0706**



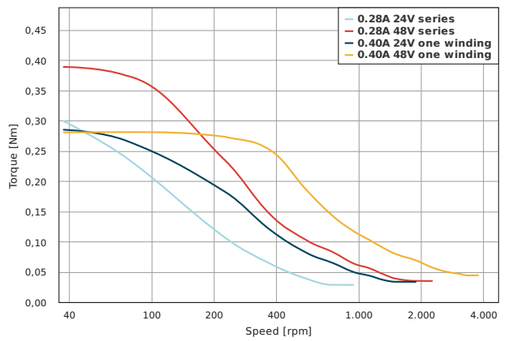

**ST4118S1006**




**ST4118S1404**




**ST4118M0406**



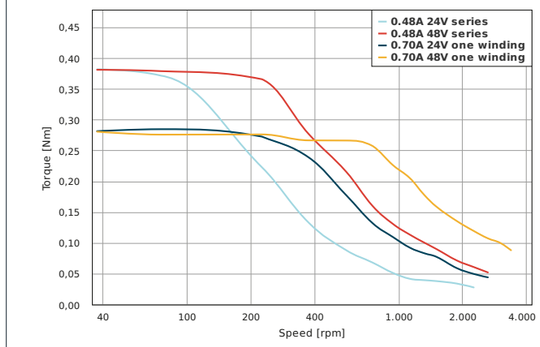



ST4118

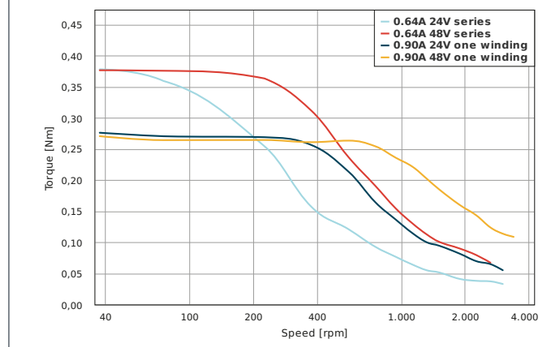
Stepper motor – NEMA 17

TORQUE CURVES

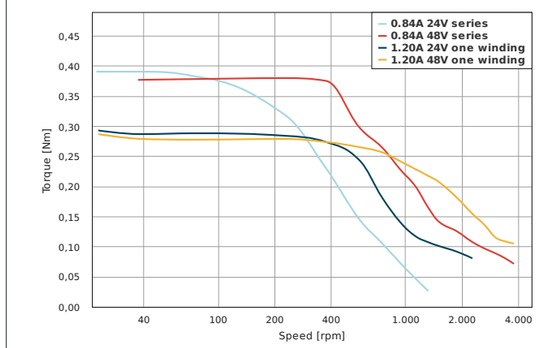
**ST4118M0706**



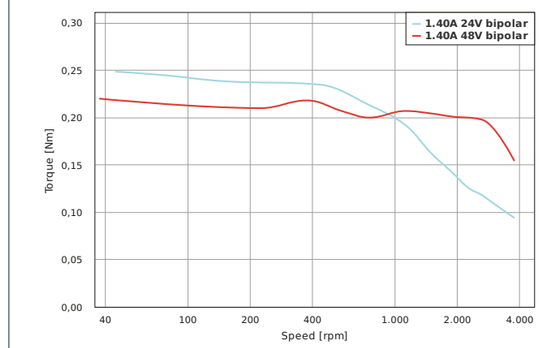

**ST4118M0906**



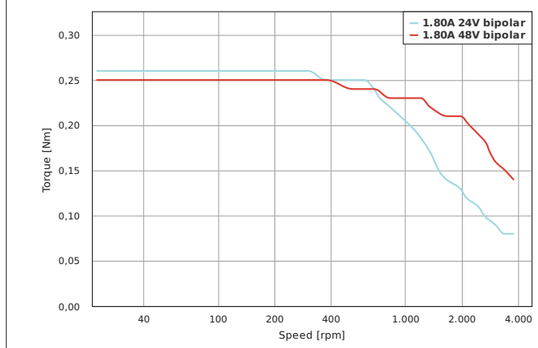

**ST4118M1206**



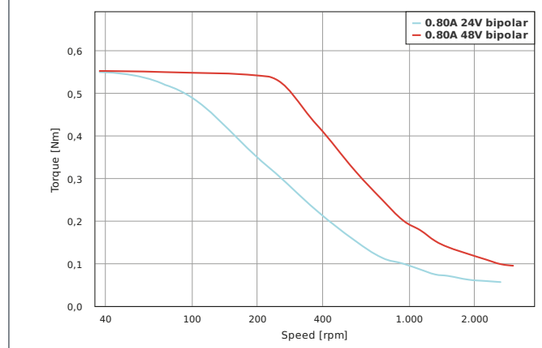

**ST4118M1404**




**ST4118M1804**




**ST4118L0804**

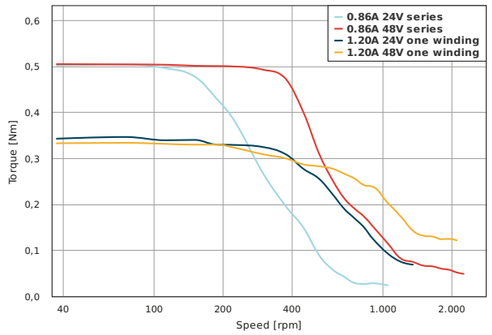


# ST4118

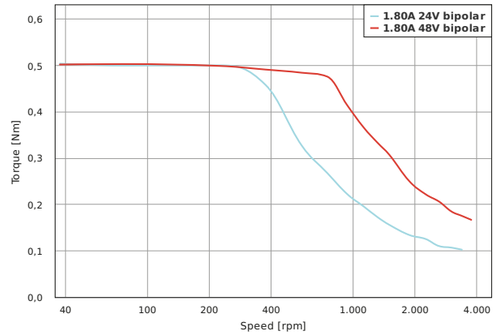
## Stepper motor – NEMA 17

### TORQUE CURVES

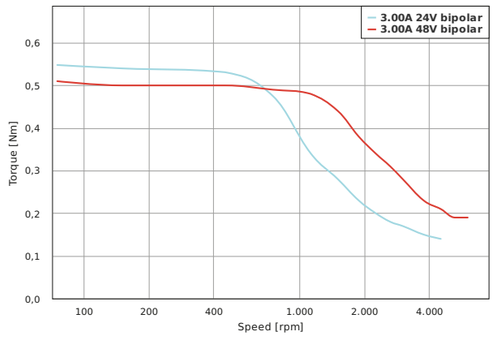
**ST4118L1206**



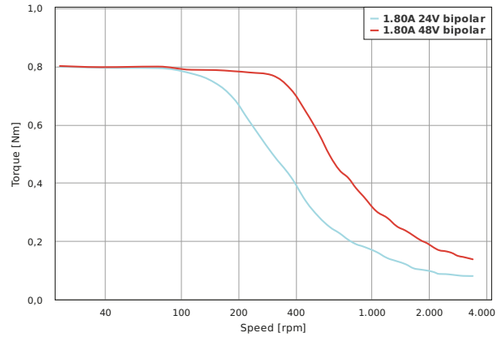

**ST4118L1804**



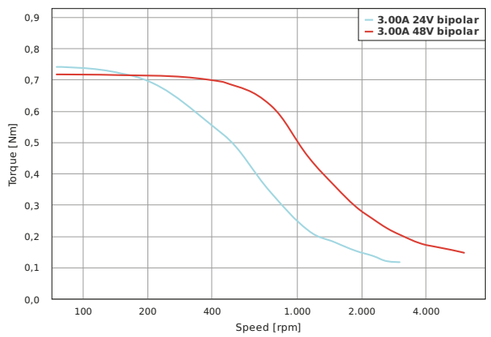

**ST4118L3004**




**ST4118D1804**




**ST4118D3004**






# Notes

# ST4209

## Stepper motor 0.9° – NEMA 17

## OPTIONS

Gearbox · Brake · Controller · Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST4209X1004 | 1 | 17 | 8.7 | 18 | 20 | 0.15 | 22 |
| ST4209S0404 | 0.42 | 17.6 | 13 | 7.5 | 35 | 0.22 | 33.5 |
| ST4209S1006 | 0.67 | 21.21 | 4.2 | 4 | 35 | 0.22 | 33.5 |
| ST4209S1404 | 1.33 | 22 | 2.1 | 5.2 | 35 | 0.22 | 33.5 |
| ST4209M1206 | 0.85 | 35.36 | 3.3 | 4 | 54 | 0.28 | 39.5 |
| ST4209M1704 | 1.68 | 36 | 1.9 | 4 | 54 | 0.28 | 39.5 |
| ST4209L1206 | 0.85 | 43.84 | 3.3 | 4.8 | 68 | 0.35 | 47.5 |
| ST4209L1704 | 1.68 | 44 | 1.8 | 5 | 68 | 0.35 | 47.5 |

The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.

## ORDER IDENTIFIER

**ST4209X1004-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

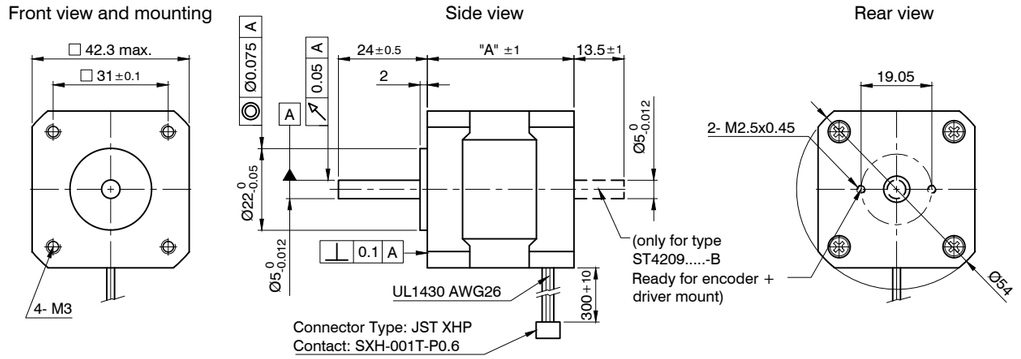
**ZK-JST-VL-4** Extension cable, 2m
**ZK-JST-VL-6** Extension cable, 2m
**ZD-D40** Damper
**ZD-DF40** Damper



ST4209
Stepper motor 0.9° – NEMA 17

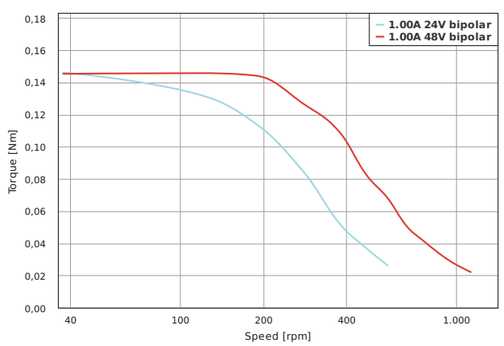
## DIMENSIONS (IN MM)

**ST4209**

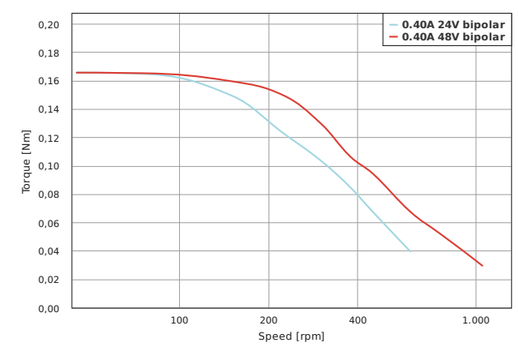



## TORQUE CURVES

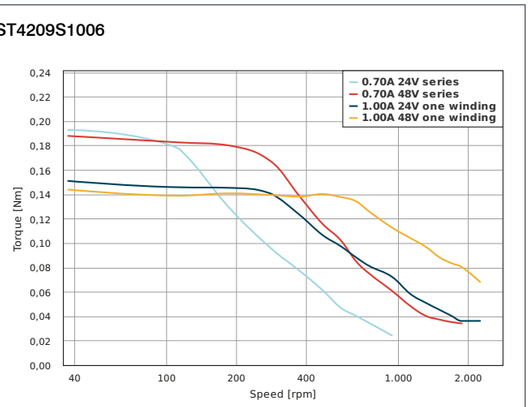
**ST4209X1004**



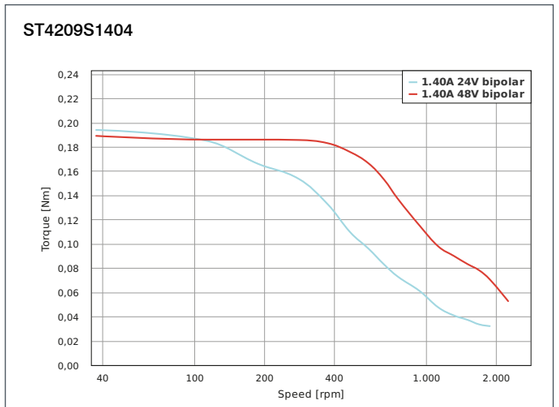

**ST4209S0404**




**ST4209S1006**




**ST4209S1404**

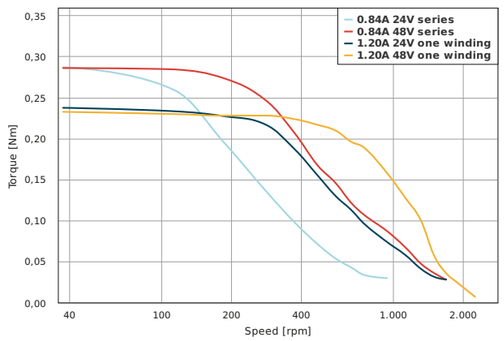


# ST4209

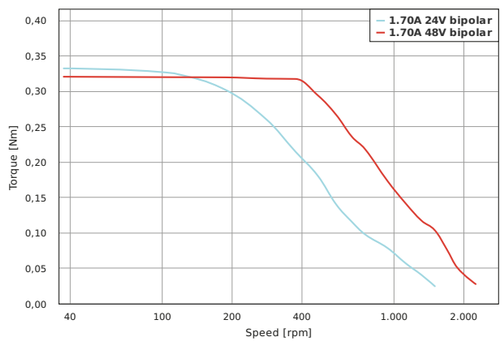
## Stepper motor 0.9° – NEMA 17

### TORQUE CURVES

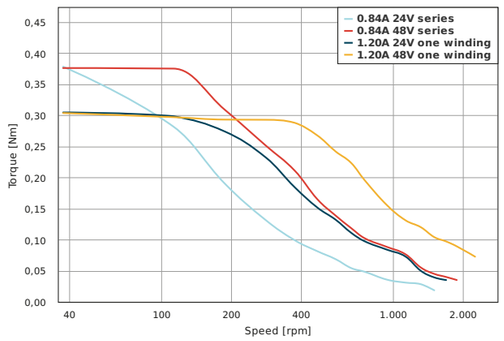
**ST4209M1206**



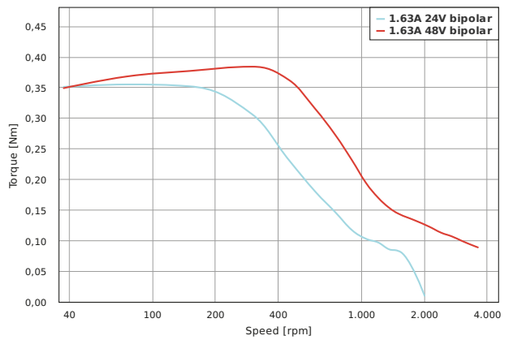

**ST4209M1704**




**ST4209L1206**




**ST4209L1704**






# Notes

# SCA5618

## Stepper motor – NEMA 23

## OPTIONS

Brake

Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| SCA5618X2804 | 2.8 | 60 | 0.78 | 1.8 | 120 | 0.45 | 40.5 |
| SCA5618X2804-2 | 2.8 | 60 | 0.78 | 1.8 | 120 | 0.45 | 40.5 |
| SCA5618X4204 | 4.2 | 60 | 0.35 | 0.8 | 120 | 0.45 | 40.5 |
| SCA5618X4204-2 | 4.2 | 60 | 0.35 | 0.8 | 120 | 0.45 | 40.5 |
| SCA5618M2804 | 2.8 | 140 | 1 | 3.2 | 300 | 0.72 | 56 |
| SCA5618M2804-2 | 2.8 | 140 | 1 | 3.2 | 300 | 0.72 | 56 |
| SCA5618M4204 | 4.2 | 140 | 0.5 | 1.6 | 300 | 0.72 | 56 |
| SCA5618M4204-2 | 4.2 | 140 | 0.5 | 1.6 | 300 | 0.72 | 56 |
| SCA5618L2804 | 2.8 | 230 | 1.3 | 5.3 | 480 | 1.08 | 76.5 |
| SCA5618L2804-2 | 2.8 | 230 | 1.3 | 5.3 | 480 | 1.08 | 76.5 |
| SCA5618L4204 | 4.2 | 230 | 0.55 | 2.1 | 480 | 1.08 | 76.5 |
| SCA5618L4204-2 | 4.2 | 230 | 0.55 | 2.1 | 480 | 1.08 | 76.5 |

## ORDER IDENTIFIER

**SCA5618X2804-**
A = Single shaft end
B = Double shaft end
A2 = Single shaft end
B2 = Double shaft end

## ACCESSORIES

**ZK-VHR-6-300-4** Motor cable SCA56, SCB56, LA56, LSA56, 0.3m
**ZD-D56** Damper
**ZD-DF56** Damper

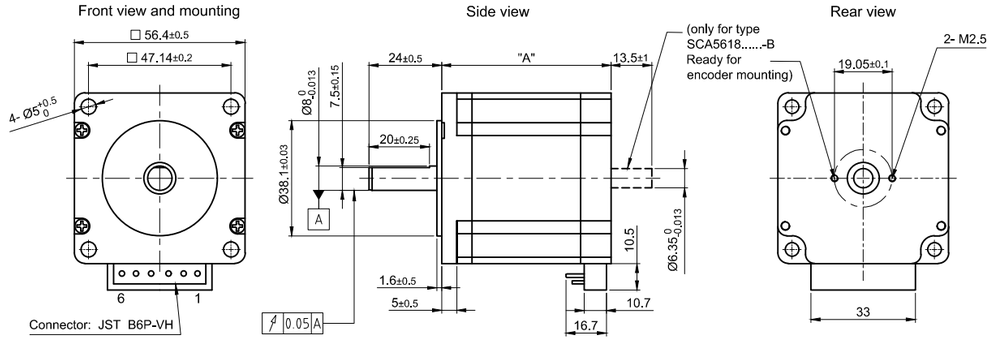


SCA5618

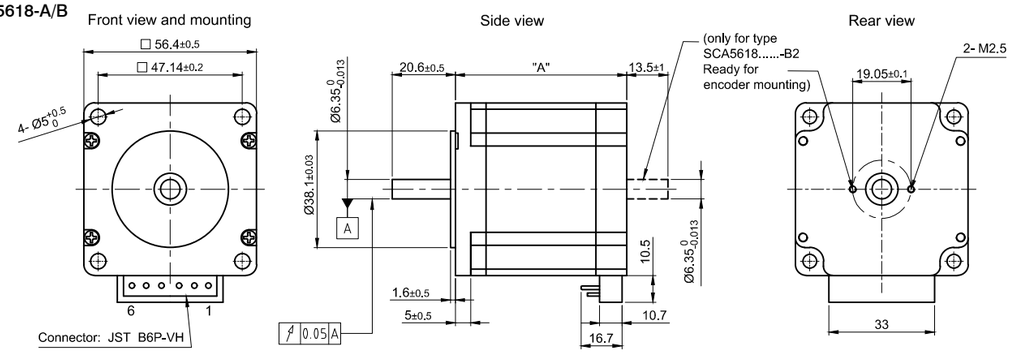
Stepper motor – NEMA 23

## DIMENSIONS (IN MM)

**SCA5618-A/B**

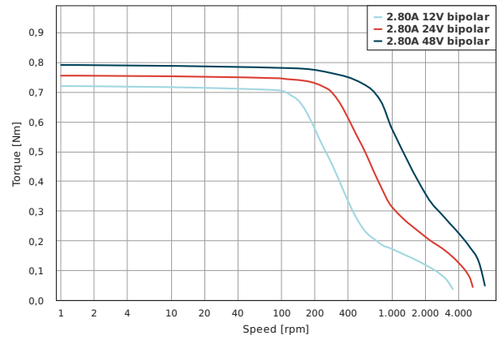



**SCA5618-A/B**

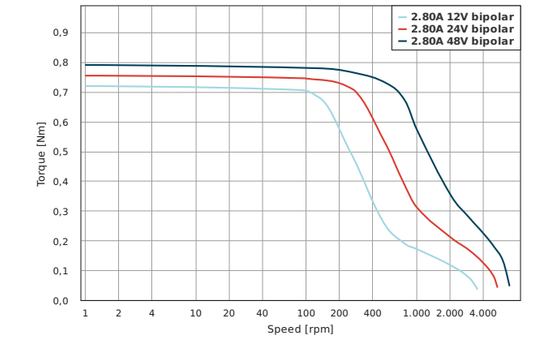



## TORQUE CURVES

**SCA5618X2804**

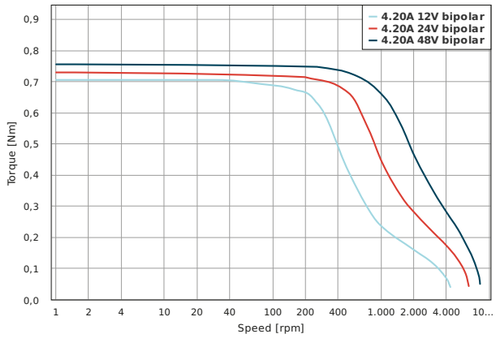



**SCA5618X2804-2**

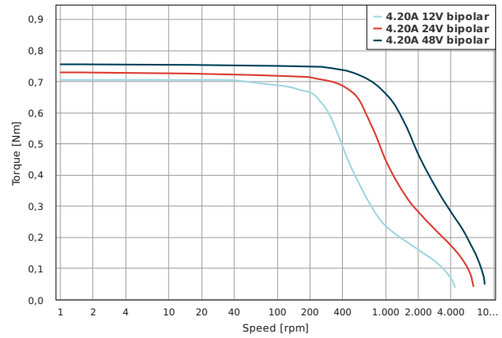


## TORQUE CURVES

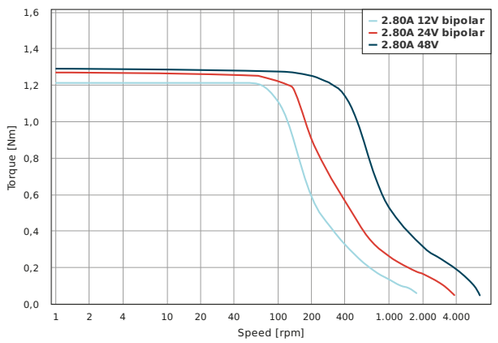
### SCA5618X4204



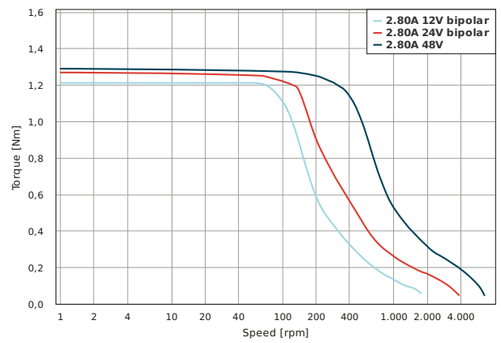

### SCA5618X4204-2



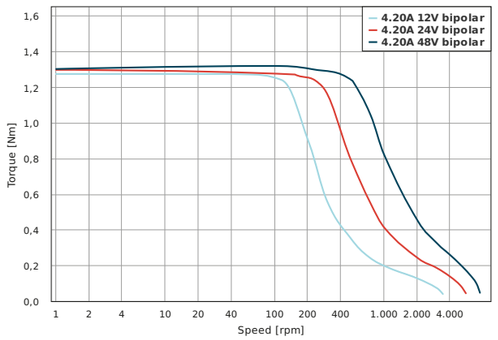

### SCA5618M2804



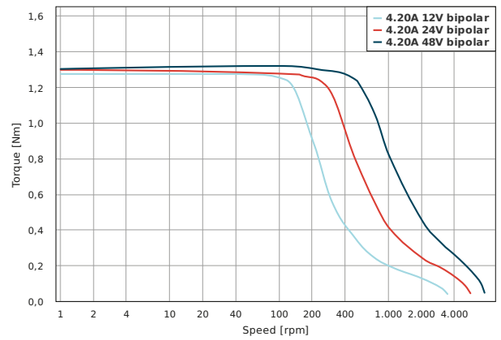

### SCA5618M2804-2




### SCA5618M4204




### SCA5618M4204-2

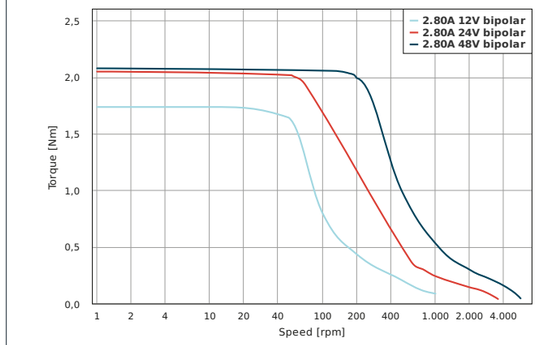




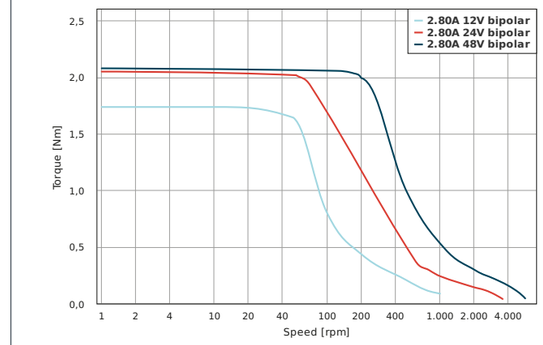

SCA5618
Stepper motor – NEMA 23

## TORQUE CURVES

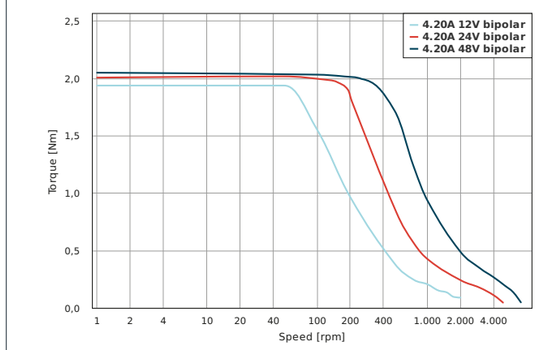
### SCA5618L2804



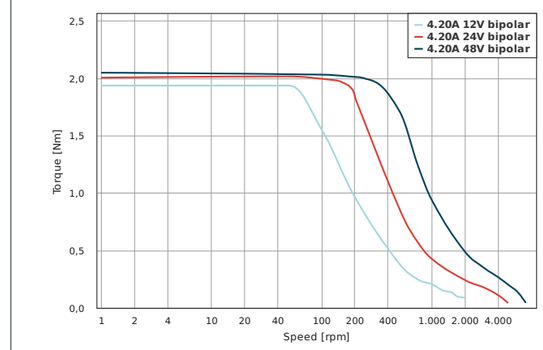

### SCA5618L2804-2




### SCA5618L4204




### SCA5618L4204-2



# SCB5618

## Stepper motor with FluxFocus technology – NEMA 23


## OPTIONS

Encoder

Brake

## VERSIONS

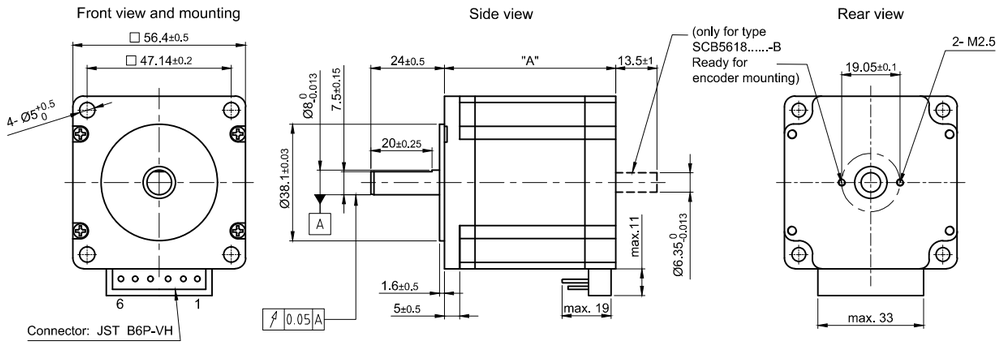
| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Resolution °/step | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| SCB5618M4204-B | 4.2 | 185 | 0.5 | 1.2 | 300 | 1.8 | 56 |
| SCB5618L4204-B | 4.2 | 295 | 0.55 | 1.7 | 480 | 1.8 | 76.5 |

## ACCESSORIES

**ZK-VHR-6-300-4** Motor cable SCA56, SCB56, LA56, LSA56, 0.3m
**ZD-D56** Damper
**ZD-DF56** Damper

## DIMENSIONS (IN MM)

**SCB5618**



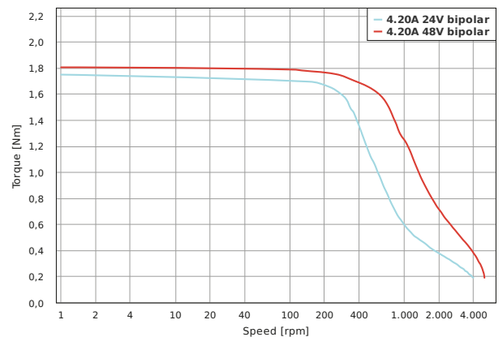



SCB5618

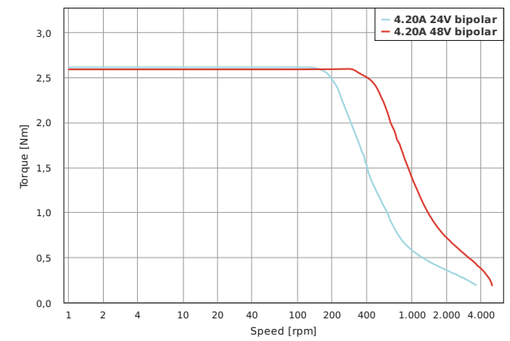
Stepper motor with FluxFocus technology – NEMA 23

## TORQUE CURVES

SCB5618M4204-B




SCB5618L4204-B



# ST5909

## Stepper motor 0.9° – NEMA 23

## OPTIONS

Gearbox | Brake | Controller | Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST5909X2508 | 1.77 | 60.81 | 0.85 | 1.6 | 120 | 0.45 | 41 |
| ST5909S1008 | 0.71 | 101.82 | 6.6 | 13 | 275 | 0.65 | 51 |
| ST5909M2008 | 1.41 | 104.65 | 1.8 | 4.5 | 300 | 0.7 | 56 |
| ST5909L1008 | 0.71 | 179.61 | 8.6 | 23 | 480 | 1 | 76 |
| ST5909L2008 | 1.41 | 179.61 | 2.4 | 6.7 | 480 | 1 | 76 |
| ST5909L3008 | 2.12 | 179.61 | 1 | 2.6 | 480 | 1 | 76 |

The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.

## ORDER IDENTIFIER

**ST5909X2508-**
A = Single shaft end
B = Double shaft end

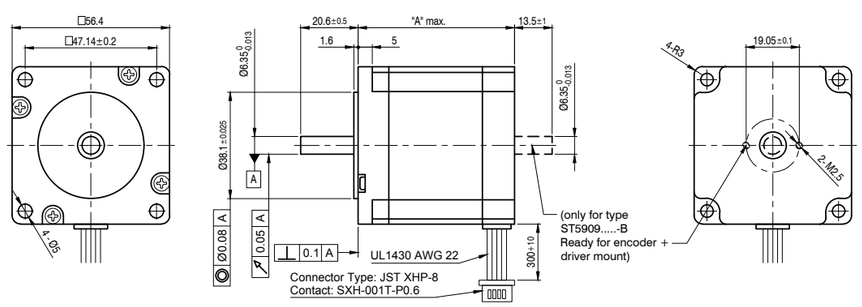
## ACCESSORIES

**ZD-D56** Damper
**ZD-DF56** Damper

## DIMENSIONS (IN MM)

**ST5909**

Front view and mounting | Side view | Rear view



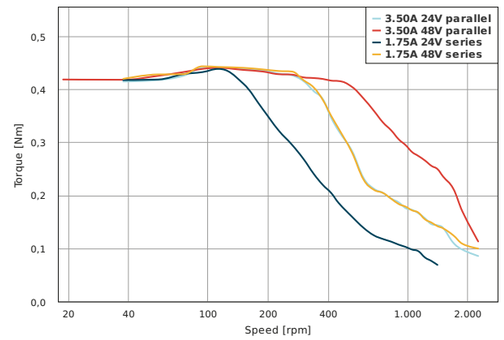



# ST5909

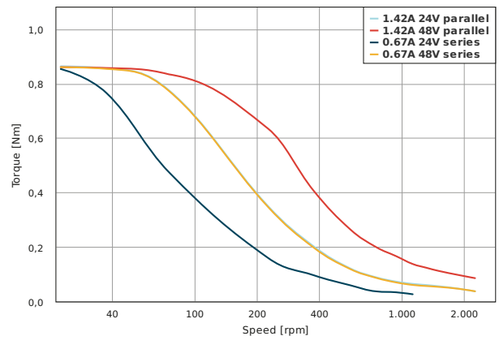
## Stepper motor 0.9° – NEMA 23

## TORQUE CURVES

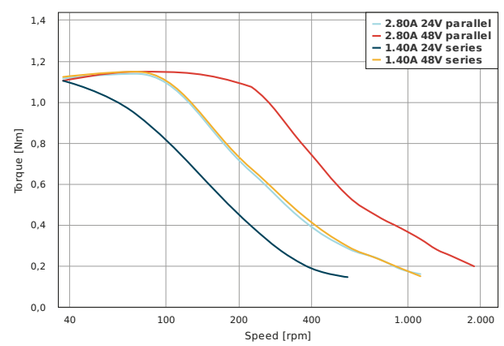
**ST5909X2508**



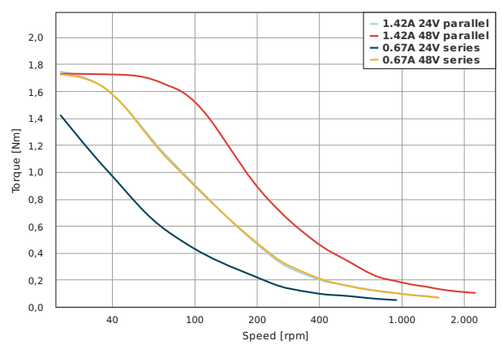

**ST5909S1008**



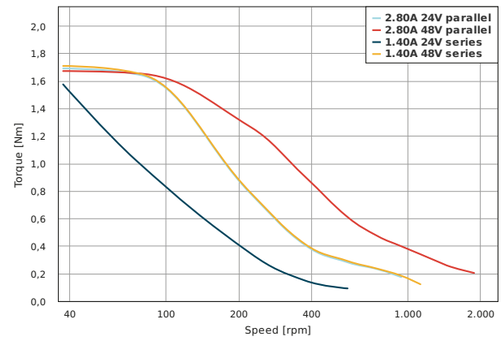

**ST5909M2008**



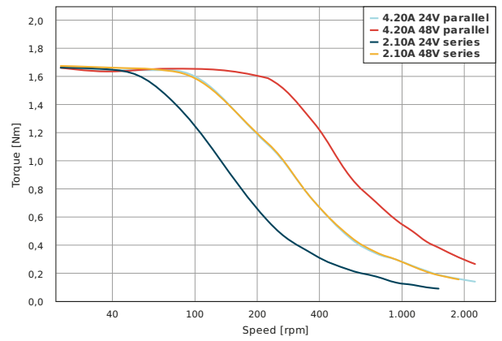

**ST5909L1008**




**ST5909L2008**

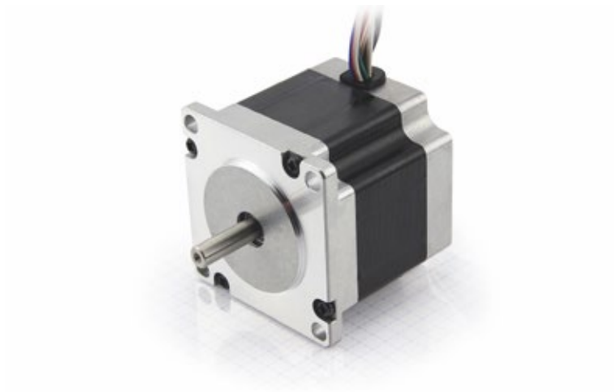



**ST5909L3008**



# ST5918

## Stepper motor – NEMA 23



## OPTIONS

Gearbox · Brake · Controller · Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST5918X1008 | 0.71 | 53.74 | 5 | 5.4 | 135 | 0.49 | 41 |
| ST5918X2008 | 1.41 | 53.74 | 1.2 | 1.3 | 135 | 0.49 | 41 |
| ST5918X3008 | 2.12 | 53.74 | 0.5 | 0.54 | 135 | 0.49 | 41 |
| ST5918S1008 | 0.71 | 98.99 | 6.2 | 7.5 | 275 | 0.65 | 51 |
| ST5918S2008 | 1.41 | 98.99 | 1.5 | 2.6 | 275 | 0.65 | 51 |
| ST5918S3008 | 2.12 | 98.99 | 0.72 | 0.9 | 275 | 0.65 | 51 |
| ST5918M1008 | 0.71 | 124.45 | 6.9 | 14 | 300 | 0.7 | 56 |
| ST5918M2008 | 1.41 | 124.45 | 1.7 | 2.5 | 300 | 0.7 | 56 |
| ST5918M3008 | 2.12 | 124.45 | 0.7 | 1.3 | 300 | 0.7 | 56 |
| ST5918L1008 | 0.71 | 186.68 | 8.8 | 15.4 | 480 | 1 | 76 |
| ST5918L2008 | 1.41 | 186.68 | 2.4 | 5.1 | 480 | 1 | 76 |
| ST5918L3008 | 2.12 | 186.68 | 1 | 1.9 | 480 | 1 | 76 |
| ST5918L4508 | 3.18 | 186.68 | 0.5 | 0.95 | 480 | 1 | 76 |

The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.

## ORDER IDENTIFIER

**ST5918X1008-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

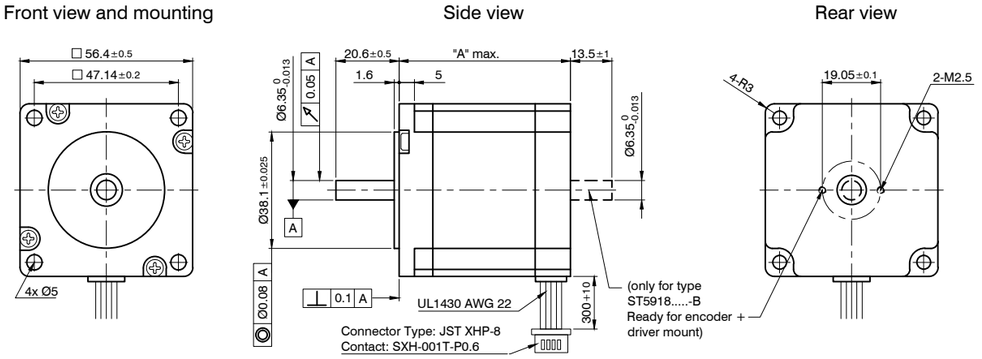
**ZD-D56** Damper
**ZD-DF56** Damper



ST5918
Stepper motor – NEMA 23

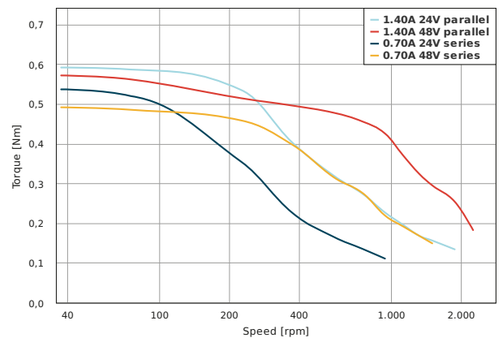
## DIMENSIONS (IN MM)

**ST5918**

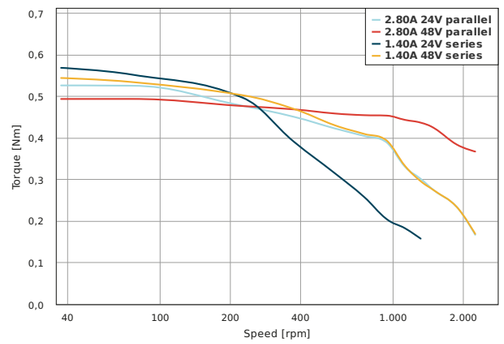



## TORQUE CURVES

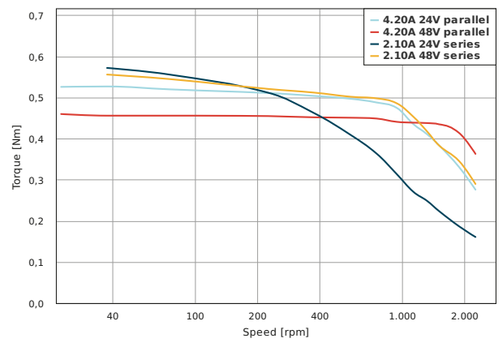
**ST5918X1008**



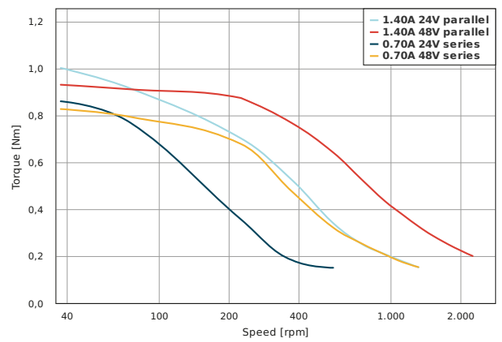

**ST5918X2008**




**ST5918X3008**




**ST5918S1008**

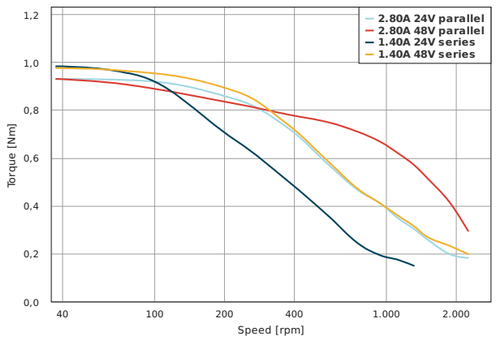


# ST5918

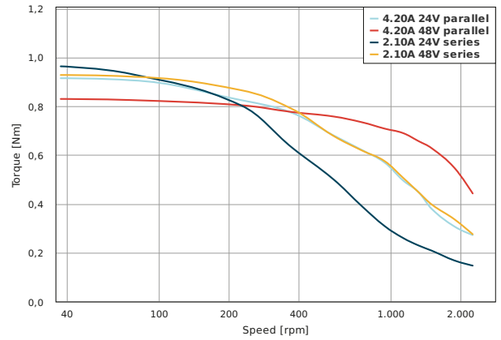
## Stepper motor – NEMA 23

### TORQUE CURVES

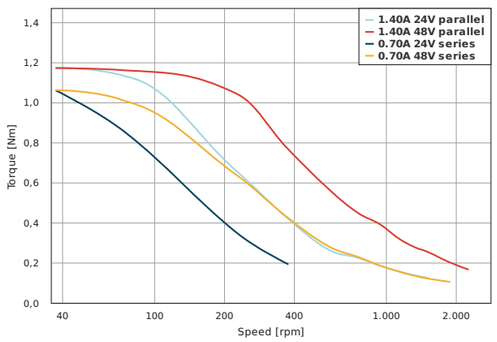
**ST5918S2008**



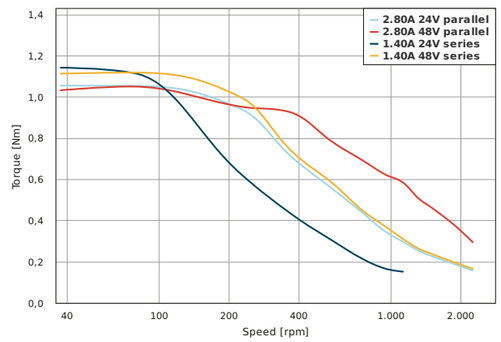

**ST5918S3008**



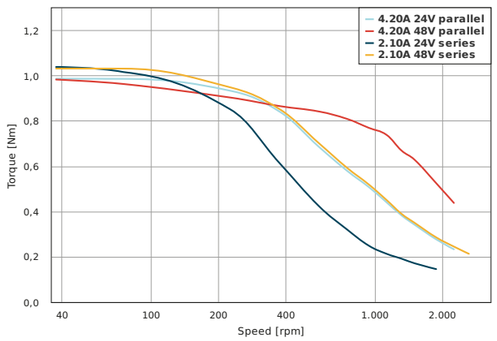

**ST5918M1008**



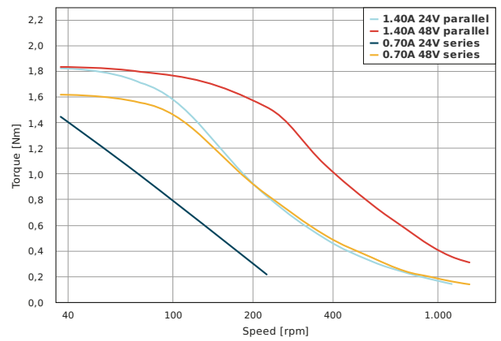

**ST5918M2008**




**ST5918M3008**




**ST5918L1008**



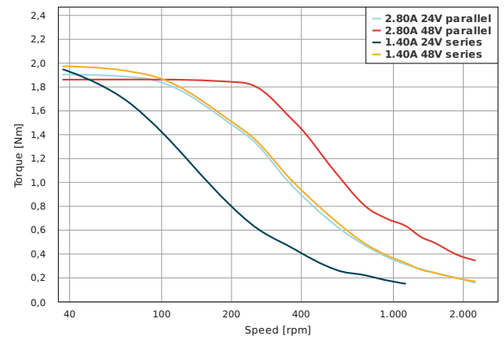



ST5918

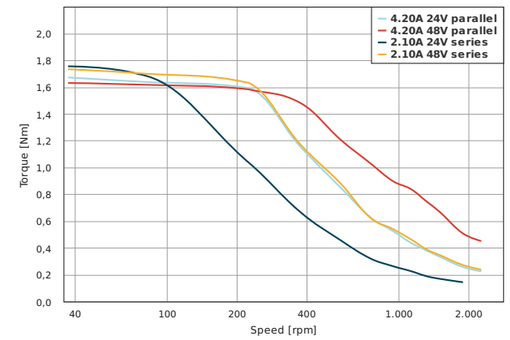
Stepper motor – NEMA 23

### TORQUE CURVES

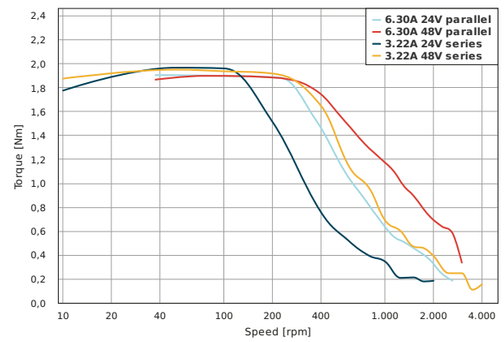
**ST5918L2008**




**ST5918L3008**




**ST5918L4508**



# SC6018

## Stepper motor – NEMA 24

## OPTIONS

Gearbox

Controller

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| SC6018L4204 | 4.2 | 354 | 0.65 | 3.2 | 840 | 1.4 | 88 |

## ORDER IDENTIFIER

**SC6018L4204-**
ENO05K = 5V encoder voltage
ENO24K = 24V encoder voltage

## ACCESSORIES

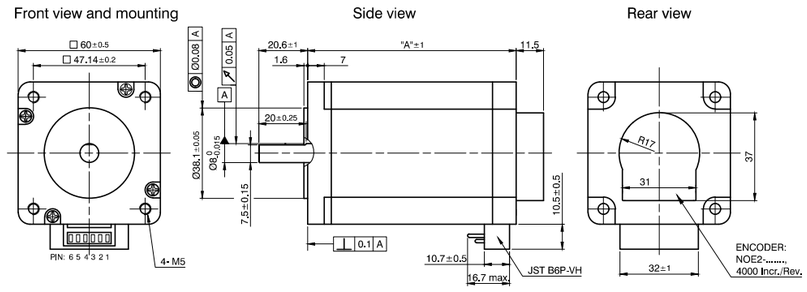
**ZK-JST-VHR-6N-0.5M-S**
Motor cable SC60, 0.5m

**ZK-NOE1-10-2000-S**
Encoder cable NOE, 2m

**ZK-NOE1-10-500-S**
Encoder cable NOE, 0.5m

## DIMENSIONS (IN MM)

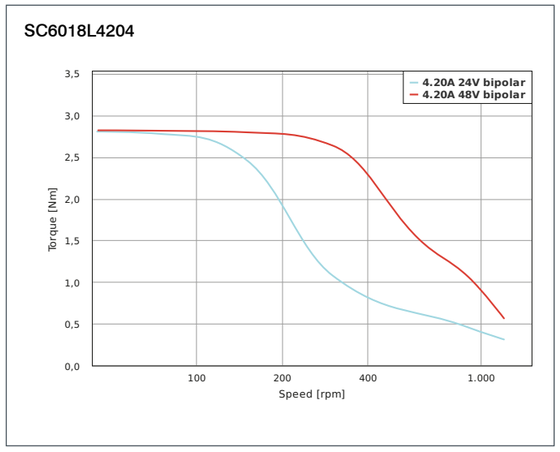
**SC6018L4204-EN**






SC6018
Stepper motor – NEMA 24

## TORQUE CURVES



# ST6018

## Stepper motor – NEMA 24

## OPTIONS

Gearbox · Brake · Controller · Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST6018X2008 | 1.41 | 106.07 | 1.7 | 2.2 | 275 | 0.6 | 47 |
| ST6018X3008 | 2.12 | 110.31 | 0.68 | 0.8 | 275 | 0.6 | 47 |
| ST6018M2008 | 1.41 | 195.16 | 2 | 4.6 | 400 | 0.77 | 56 |
| ST6018M3008 | 2.12 | 165.46 | 0.8 | 1.38 | 400 | 0.77 | 56 |
| ST6018K2008 | 1.41 | 212.13 | 2.4 | 4.6 | 570 | 1.2 | 67 |
| ST6018L3008 | 2.12 | 353.55 | 1.44 | 3.2 | 840 | 1.45 | 88 |
| ST6018D4508 | 3.18 | 400.22 | 0.75 | 1.4 | 1100 | 1.9 | 111 |

The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.

## ORDER IDENTIFIER

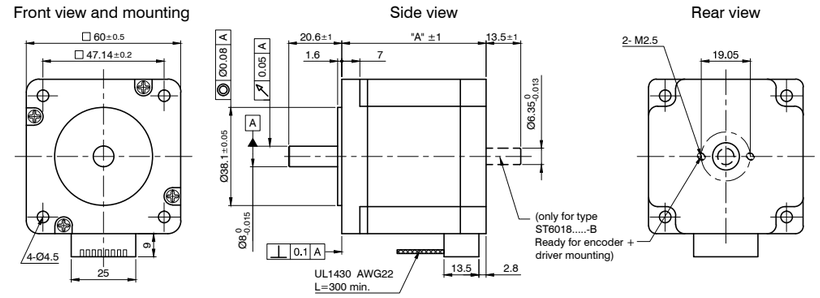
**ST6018X2008-**
A = Single shaft end
B = Double shaft end



ST6018
Stepper motor – NEMA 24

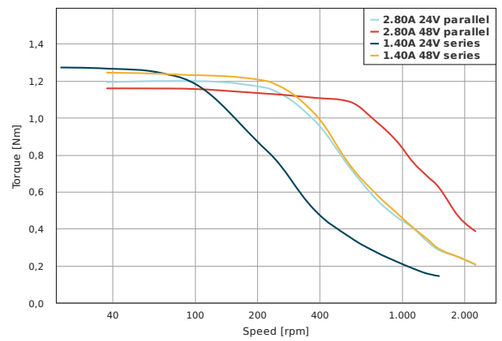
## DIMENSIONS (IN MM)

**ST6018**

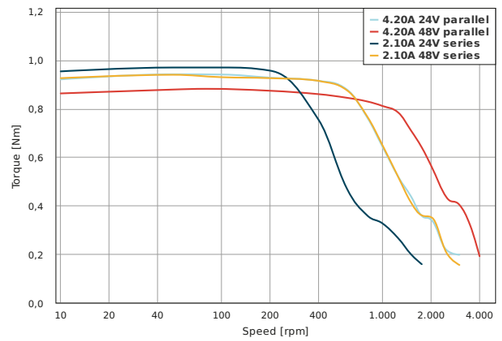



## TORQUE CURVES

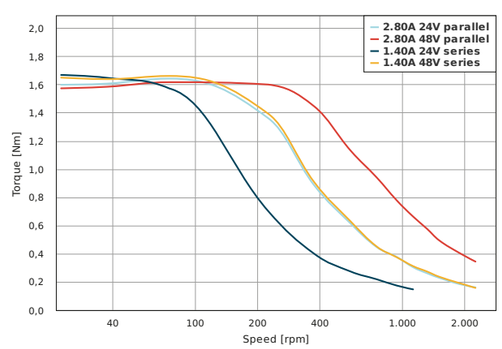
**ST6018X2008**



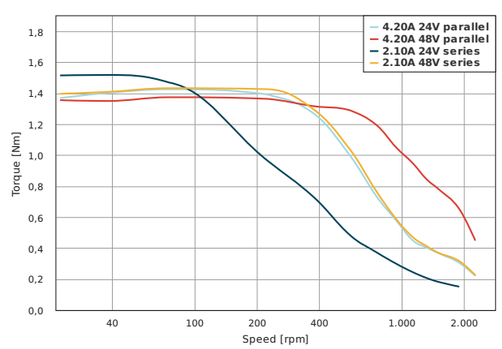

**ST6018X3008**




**ST6018M2008**




**ST6018M3008**

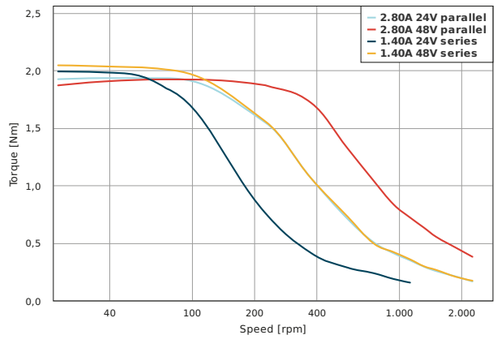


# ST6018

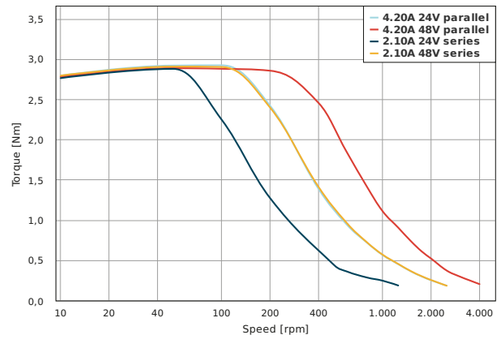
## Stepper motor – NEMA 24

### TORQUE CURVES

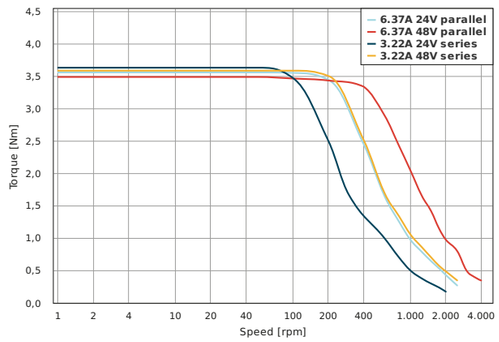
**ST6018K2008**




**ST6018L3008**




**ST6018D4508**






# Notes

# ST8918

## Stepper motor – NEMA 34

## OPTIONS

Gearbox · Brake · Controller · Encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST8918S4508 | 3.18 | 353.55 | 0.6 | 1.9 | 1000 | 1.7 | 65 |
| ST8918M4508 | 3.18 | 593.97 | 0.66 | 3 | 1900 | 2.8 | 96 |
| ST8918M6708 | 4.74 | 593.97 | 0.45 | 2.1 | 1900 | 2.8 | 96 |
| ST8918L4508 | 3.18 | 933.38 | 1.1 | 6.3 | 3000 | 3.95 | 126 |
| ST8918L6708 | 4.74 | 933.38 | 0.54 | 2.7 | 3000 | 3.95 | 126 |
| ST8918D6708 | 4.74 | 1202.08 | 0.75 | 4.9 | 4000 | 5.4 | 156 |

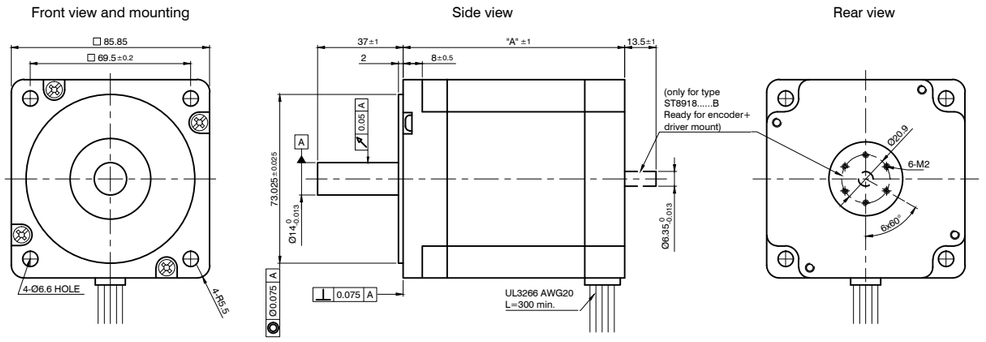
The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.

## ORDER IDENTIFIER

**ST8918S4508-**
A = Single shaft end
B = Double shaft end

## DIMENSIONS (IN MM)

**ST8918**



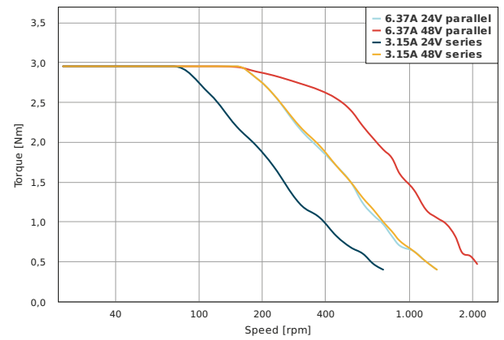



# ST8918

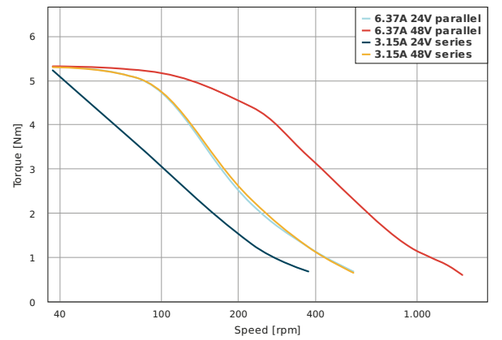
## Stepper motor – NEMA 34

## TORQUE CURVES

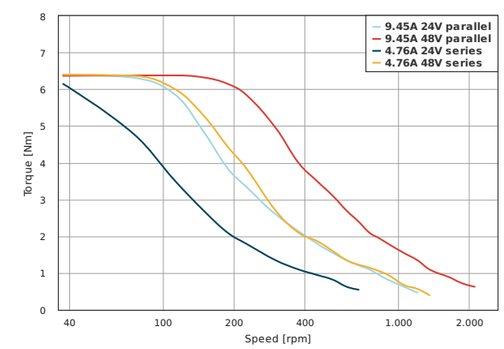
**ST8918S4508**



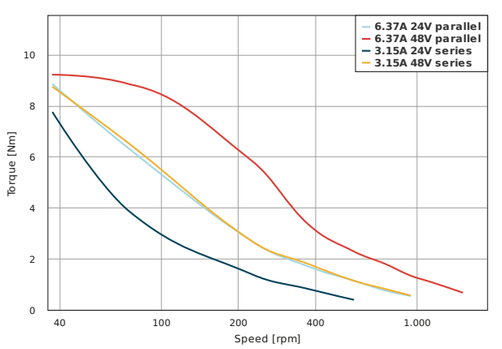

**ST8918M4508**



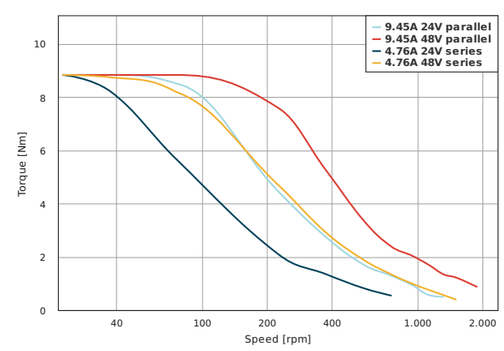

**ST8918M6708**



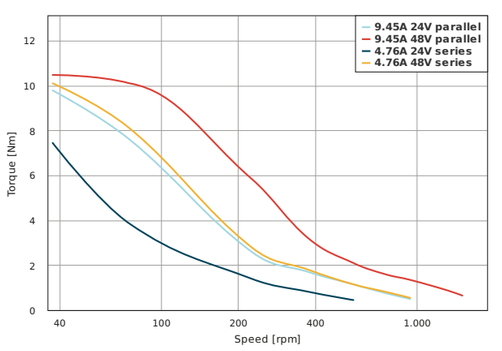

**ST8918L4508**




**ST8918L6708**




**ST8918D6708**



# ST11018

## Stepper motor – NEMA 42

## OPTIONS

Controller

Encoder

## VERSIONS

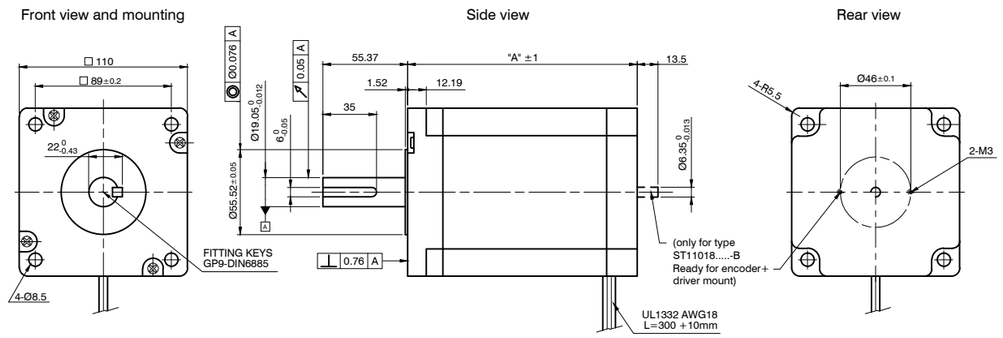
| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| ST11018S5504 | 5.5 | 1170 | 0.7 | 9.8 | 5500 | 5 | 99 |
| ST11018M6504 | 6.5 | 2100 | 1.15 | 15.2 | 10900 | 8.4 | 150 |
| ST11018L8004 | 8 | 2500 | 1 | 17.1 | 16200 | 11.7 | 201 |

## ORDER IDENTIFIER

**ST11018S5504-**
A = Single shaft end
B = Double shaft end

## DIMENSIONS (IN MM)

**ST11018**



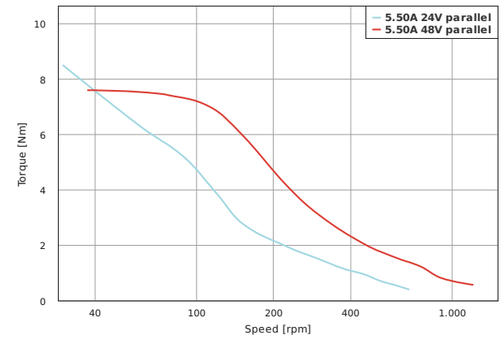



ST11018

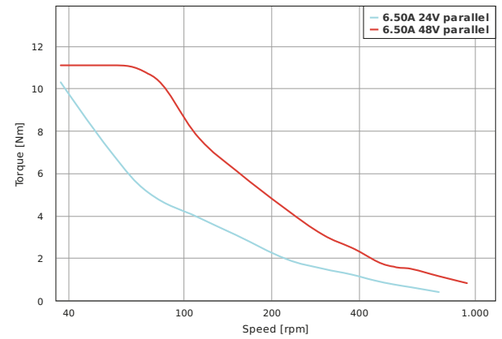
Stepper motor – NEMA 42

## TORQUE CURVES

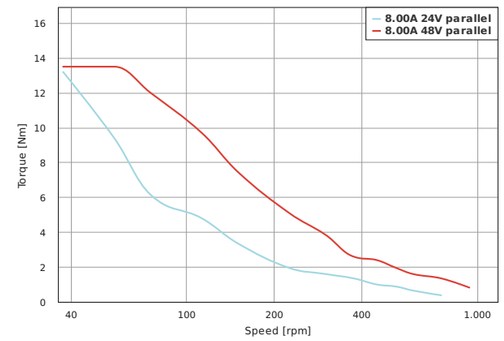
ST11018S5504




ST11018M6504

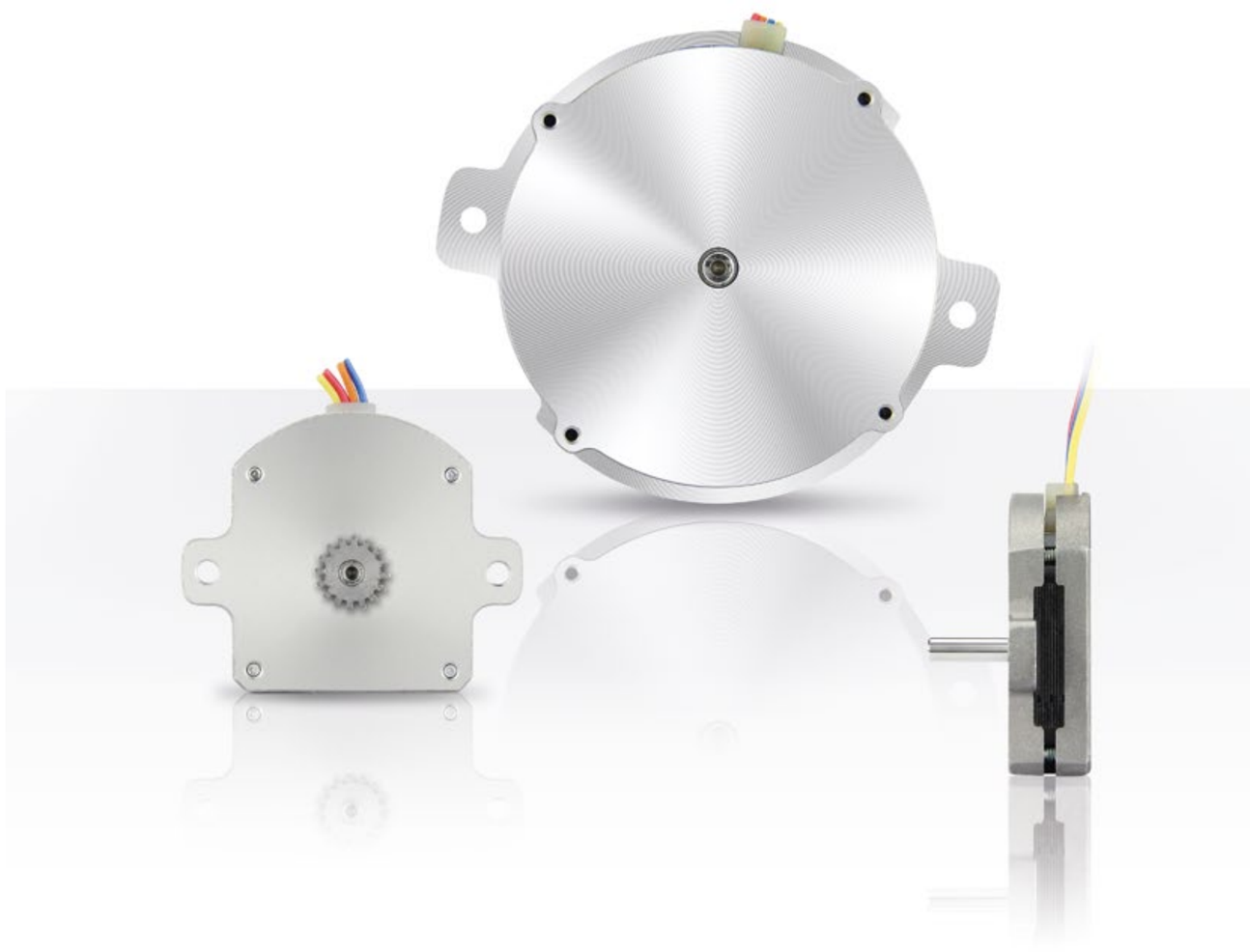



ST11018L8004



# Notes





# STF2818

## Ultraflat stepper motor

## OPTIONS

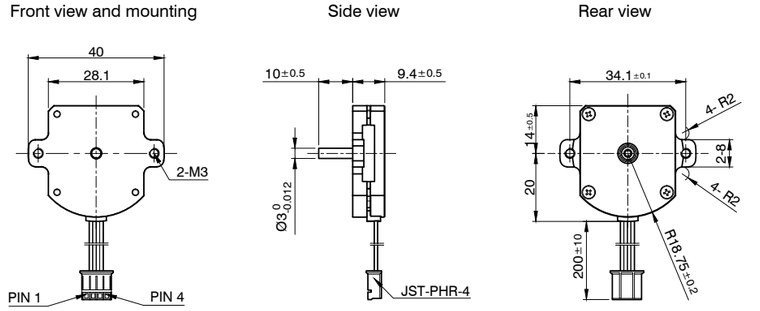
Controller

## VERSIONS

| Type | Size mm | Holding Torque Ncm | Current per Winding A | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Calculated Length mm | Resolution °/step | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| STF2818X0504-A | 28 | 0.98 | 0.5 | 3.7 | 0.88 | 1.7 | 9.4 | 1.8 | 0.028 |

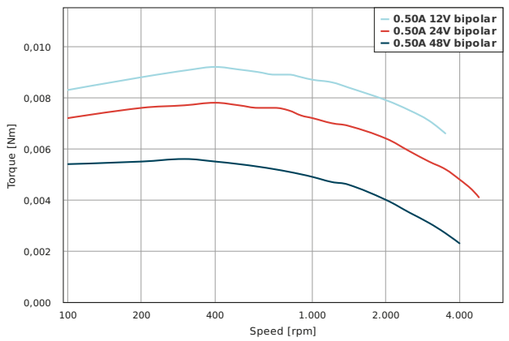
## DIMENSIONS (IN MM)

**STF2818**




## TORQUE CURVES

**STF2818X0504-A**






# ST6318

## Ultraflat stepper motor

## OPTIONS

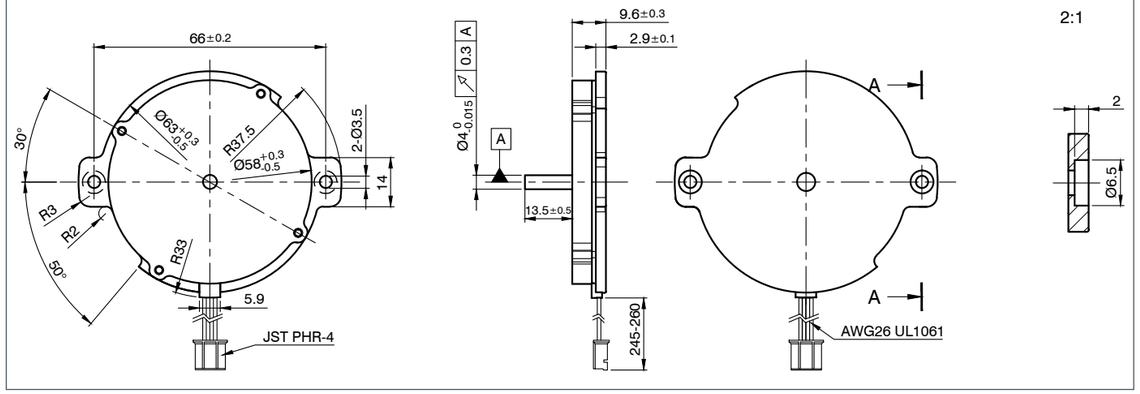
Controller

## VERSIONS

| Type | Size mm | Holding Torque Ncm | Current per Winding A | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Calculated Length mm | Resolution °/step | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| ST6318F1004-A | 63 | 6 | 1 | 3.8 | 2 | 16 | 9.6 | 1.8 | 0.095 |

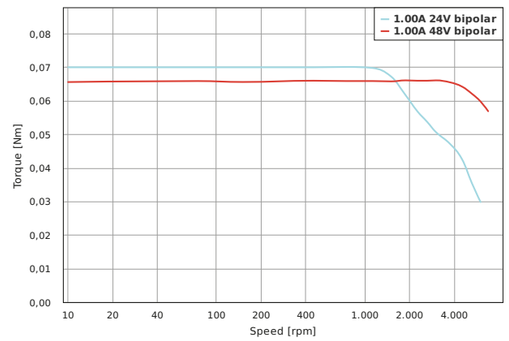
## DIMENSIONS (IN MM)

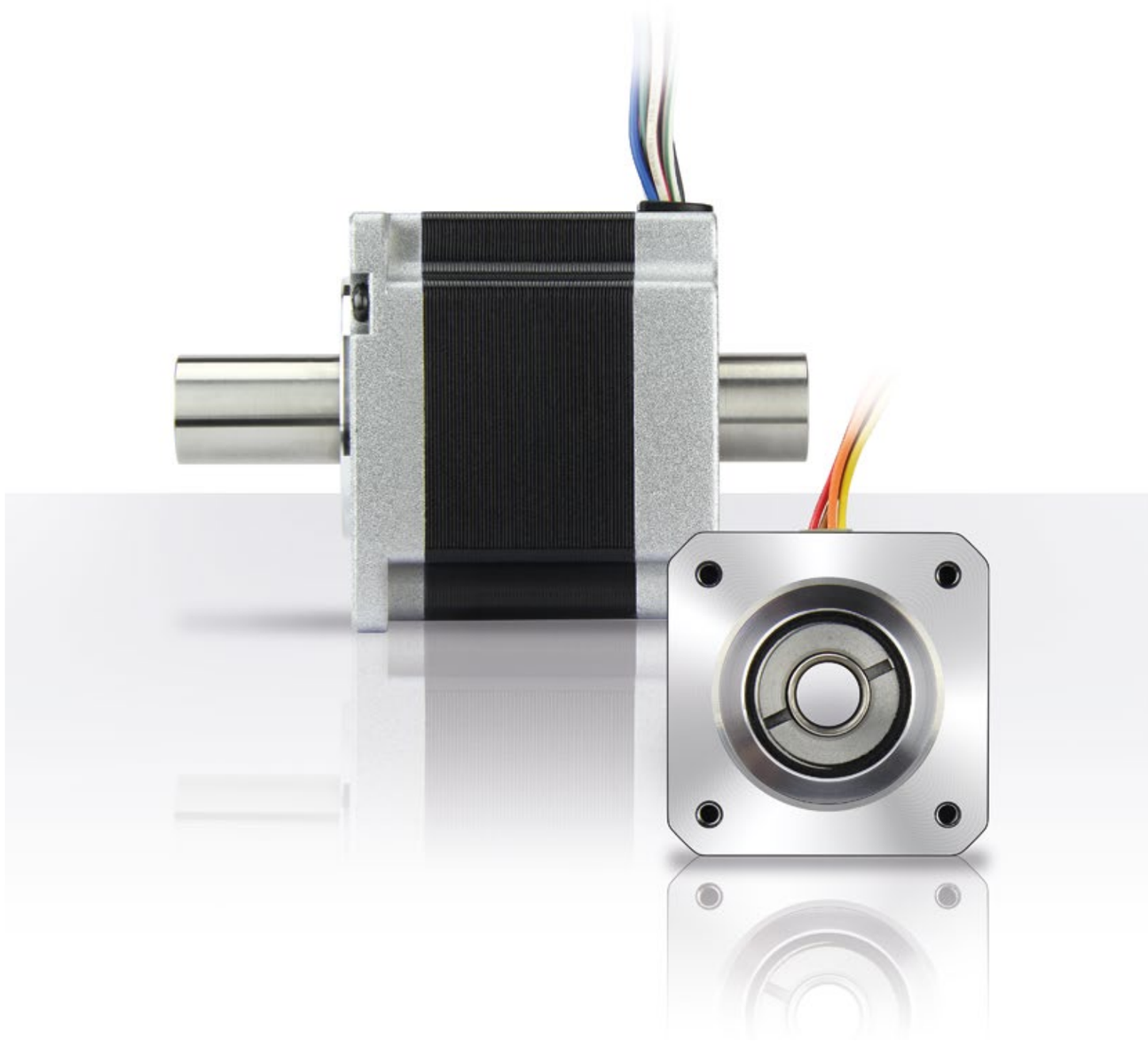
**ST6318**




## TORQUE CURVES

**ST6318F1004-A**





# ST4118

## Stepper motor with hollow shaft – NEMA 17

### OPTIONS

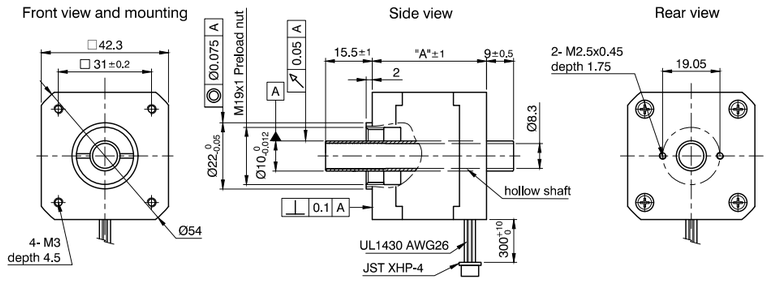
Controller

### VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Rotor Inertia gcm² | Resistance per Winding Ohm | Inductance per Winding mH | Resolution °/step | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| ST4118M1804-L | 1.8 | 28 | 57 | 1.1 | 1.85 | 1.8 | 38 | 0.24 |

### DIMENSIONS (IN MM)

**ST4118M1804-L**






# ST5918

## Stepper motor with hollow shaft – NEMA 23

### OPTIONS

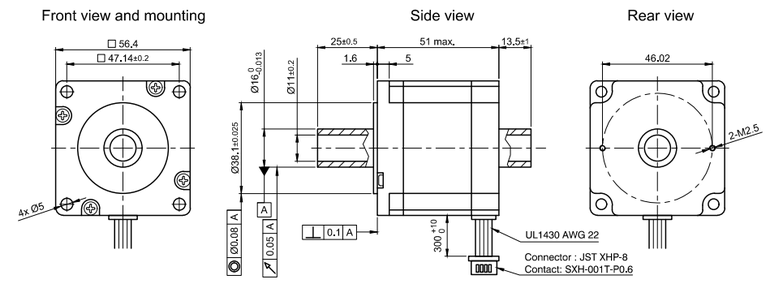
Controller

### VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Rotor Inertia gcm² | Resistance per Winding Ohm | Inductance per Winding mH | Resolution °/step | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| ST5918S3008-L2 | 3 | 65 | 275 | 1.44 | 1.1 | 1.8 | 51 | 0.65 |

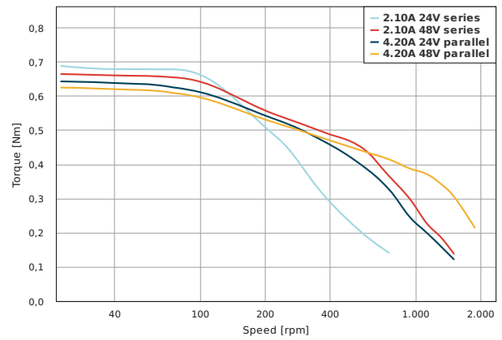
### DIMENSIONS (IN MM)

**ST5918S3008-L2**




### TORQUE CURVES

**ST5918S3008-L2**



# AS2818

## Stepper motor with M12 connector IP65 – NEMA 11

## OPTIONS

Gearbox

## VERSIONS

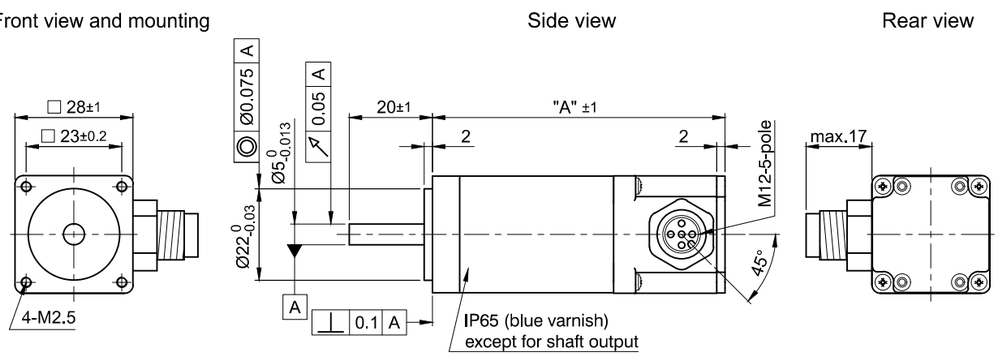
| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm |
|---|---|---|---|---|---|---|---|
| AS2818S0604 | 0.67 | 7.1 | 5.6 | 4 | 9 | 0.13 | 51 |
| AS2818L0604 | 0.67 | 12.7 | 9.2 | 7.2 | 18 | 0.22 | 70 |

## ACCESSORIES

**ZK-M12-5-2M-1-AFF** Motor cable straight, 2m
**ZK-M12-5-2M-2-AFF** Motor cable angled, 2m
**ZK-M12-5-5M-1-AFF** Motor cable straight, 5m
**ZK-M12-5-5M-2-AFF** Motor cable angled, 5m

## DIMENSIONS (IN MM)

**AS2818**



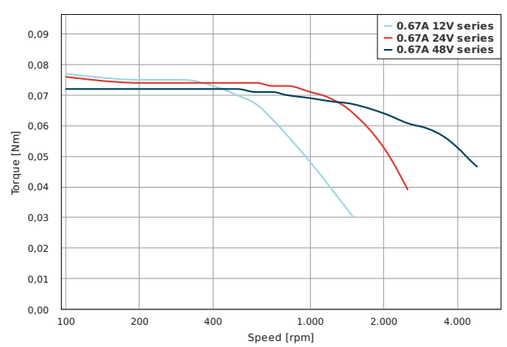



AS2818

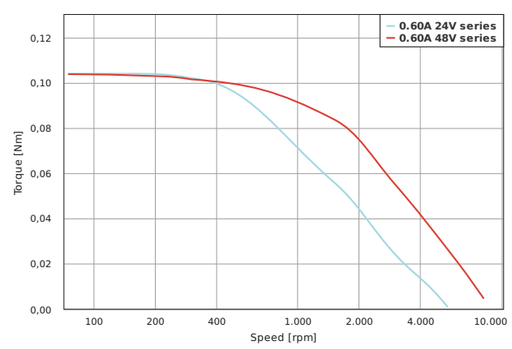
Stepper motor with M12 connector IP65 – NEMA 11

## TORQUE CURVES

**AS2818S0604**




**AS2818L0604**



# AS4118

## Stepper motor with M12 connector IP65 – NEMA 17

## OPTIONS

Gearbox

Controller

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Rotor Inertia gcm² | Resistance per Winding Ohm | Inductance per Winding mH | Length „A“ mm | Weight kg | Encoder | Brake |
|---|---|---|---|---|---|---|---|---|---|
| AS4118L1804 | 1.8 | 50 | 82 | 1.75 | 3.3 | 70.4 | 0.34 | – | – |
| AS4118L1804-E | 1.8 | 50 | 82 | 1.75 | 3.3 | 70.4 | 0.34 | ✓ | – |
| AS4118L1804-EB | 1.8 | 50 | 82 | 1.75 | 3.3 | 108.4 | 0.42 | ✓ | ✓ |
| AS4118L1804-ENM24 | 1.8 | 50 | 82 | 1.75 | 3.3 | 70.4 | 0.34 | ✓ | – |
| AS4118L1804-ENM24B | 1.8 | 50 | 82 | 1.75 | 3.3 | 108.4 | 0.42 | ✓ | ✓ |

## ORDER IDENTIFIER

**AS4118L1804-**
E = With encoder
EB = With encoder and brake
ENM24 = With 24V encoder

## ACCESSORIES

**ZK-M8-3-2M-1-AFF** Brake cable straight, 2m
**ZK-M12-5-2M-1-AFF** Motor cable straight, 2m
**ZK-M12-5-2M-2-AFF** Motor cable angled, 2m
**ZK-M12-5-5M-1-AFF** Motor cable straight, 5m
**ZK-M12-5-5M-2-AFF** Motor cable angled, 5m
**ZK-M12-8-2M-1-AFF** Encoder cable straight, 2m
**ZK-M12-8-2M-2-AFF** Encoder cable angled, 2m
**ZK-M12-8-5M-1-AFF** Encoder cable straight, 5m
**ZK-M12-8-5M-2-AFF** Encoder cable angled, 5m
**ZK-M12-8-2M-2-PADP** Encoder cable angled, 2m

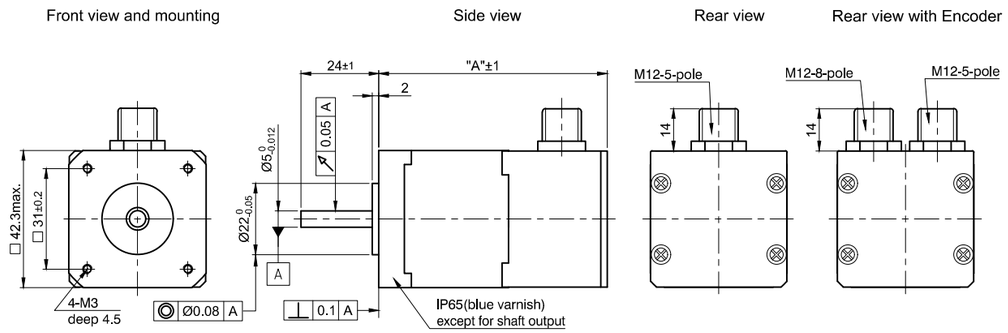


AS4118

Stepper motor with M12 connector IP65 – NEMA 17

## DIMENSIONS (IN MM)

**AS4118L1804**



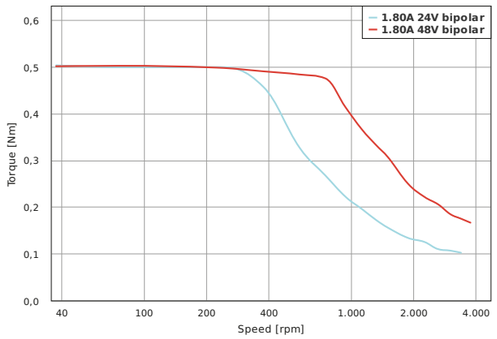

**AS4118L1804-EB**

# AS4118

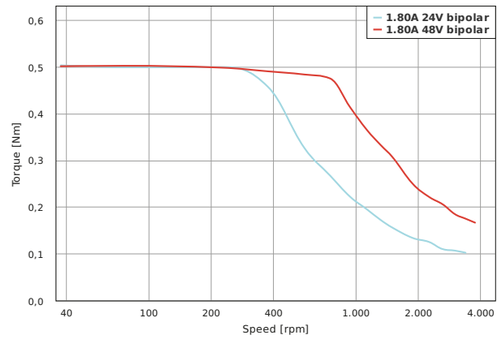
## Stepper motor with M12 connector IP65 – NEMA 17

### TORQUE CURVES

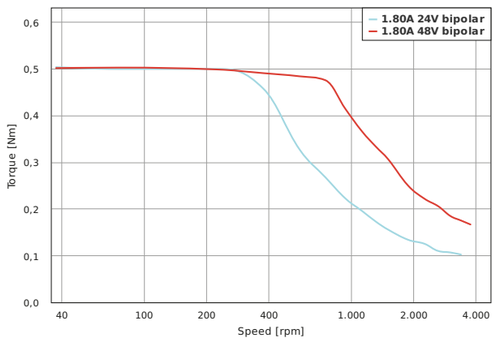
**AS4118L1804**



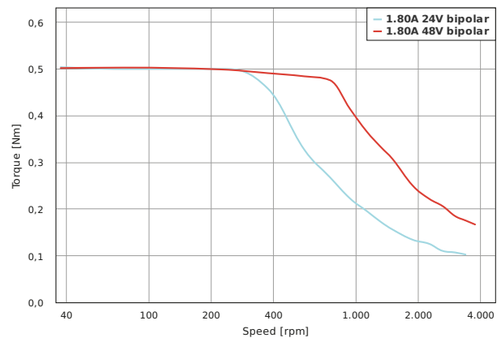

**AS4118L1804-E**




**AS4118L1804-EB**




**AS4118L1804-ENM24**






# Notes

# AS5918

## Stepper motor with M12 connector IP65 – NEMA 23

## OPTIONS

Gearbox

Controller

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Rotor Inertia gcm² | Resistance per Winding Ohm | Inductance per Winding mH | Length „A“ mm | Weight kg | Encoder | Brake |
|---|---|---|---|---|---|---|---|---|---|
| AS5918S2804 | 2.83 | 99 | 230 | 0.75 | 2.6 | 73 | 0.8 | _ | – |
| AS5918S2804-E | 2.83 | 99 | 230 | 0.75 | 2.6 | 73 | 0.8 | ✓ | – |
| AS5918M2804 | 2.82 | 124 | 300 | 0.85 | 2.5 | 77 | 0.85 | – | – |
| AS5918M2804-E | 2.82 | 124 | 300 | 0.85 | 2.5 | 77 | 0.85 | ✓ | – |
| AS5918L4204 | 4.2 | 187 | 480 | 0.58 | 1.9 | 98 | 1.14 | – | – |
| AS5918L4204-E | 4.2 | 187 | 480 | 0.58 | 1.9 | 98 | 1.14 | ✓ | – |
| AS5918L4204-EB | 4.2 | 187 | 480 | 0.58 | 1.9 | 138 | 1.33 | ✓ | ✓ |
| AS5918L4204-ENM24 | 4.2 | 187 | 480 | 0.58 | 1.9 | 98 | 1.14 | ✓ | – |
| AS5918L4204-ENM24B | 4.2 | 187 | 480 | 0.58 | 1.9 | 138 | 1.33 | ✓ | ✓ |

## ORDER IDENTIFIER

**AS5918S2804-**
E = With encoder
EB = With encoder and brake
ENM24 = With 24V encoder
ENM24B = With 24V encoder and brake

## ACCESSORIES

**ZK-M8-3-2M-1-AFF** Brake cable straight, 2m
**ZK-M12-5-2M-1-AFF** Motor cable straight, 2m
**ZK-M12-5-2M-2-AFF** Motor cable angled, 2m
**ZK-M12-5-5M-1-AFF** Motor cable straight, 5m
**ZK-M12-5-5M-2-AFF** Motor cable angled, 5m
**ZK-M12-8-2M-1-AFF** Encoder cable straight, 2m
**ZK-M12-8-2M-2-AFF** Encoder cable angled, 2m
**ZK-M12-8-5M-1-AFF** Encoder cable straight, 5m
**ZK-M12-8-5M-2-AFF** Encoder cable angled, 5m
**ZK-M12-8-2M-2-PADP** Encoder cable angled, 2m

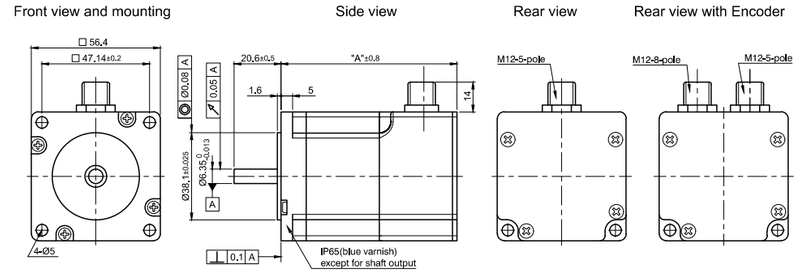


AS5918

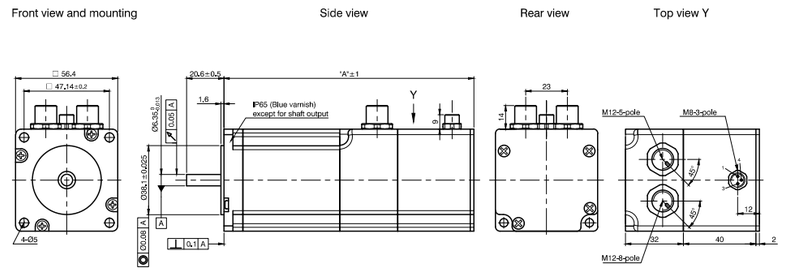
Stepper motor with M12 connector IP65 – NEMA 23

## DIMENSIONS (IN MM)

**AS5918.../AS5918...-E/-ENM24**

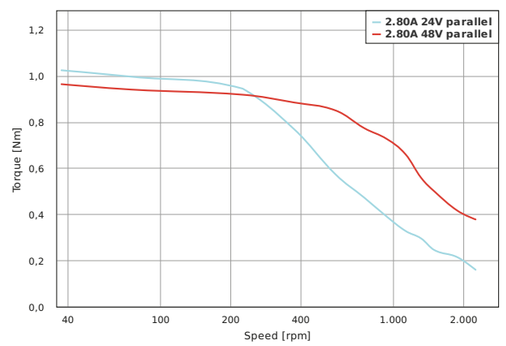



**AS5918L...-EB/-ENM24B**

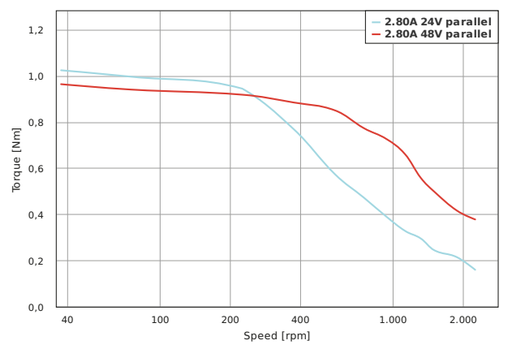



## TORQUE CURVES

**AS5918S2804**

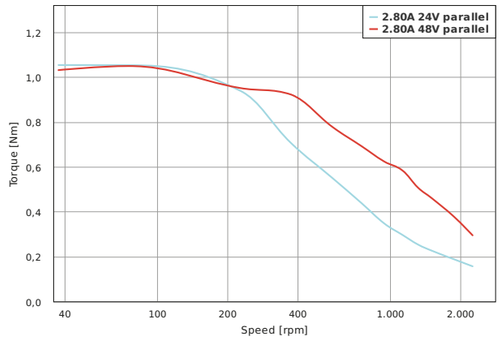



**AS5918S2804-E**

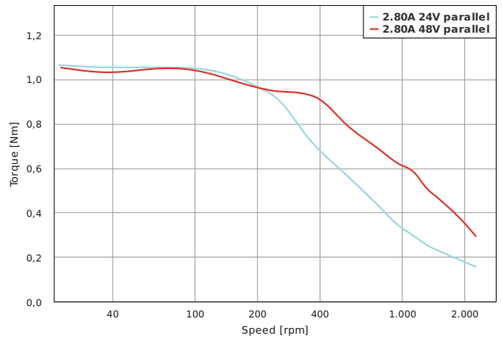


## TORQUE CURVES

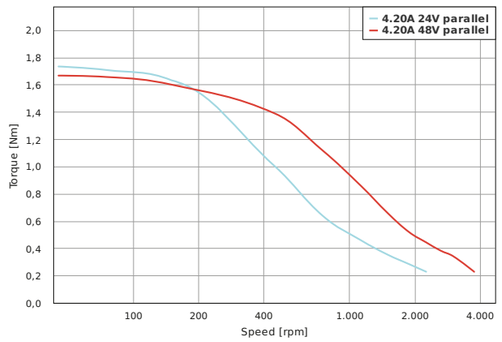
### AS5918M2804



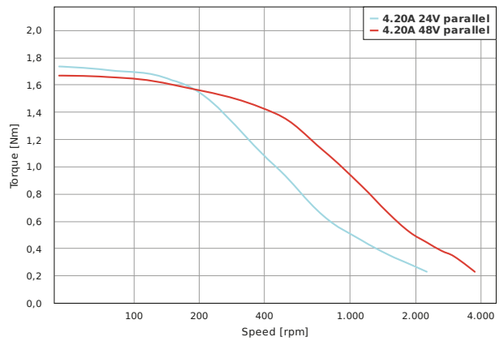

### AS5918M2804-E



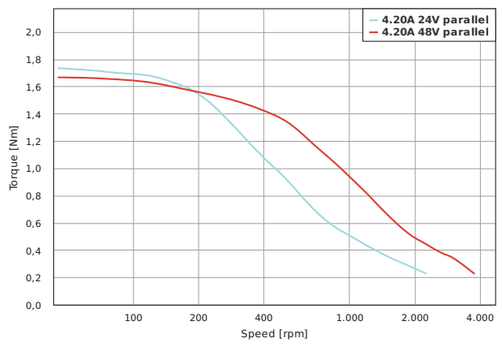

### AS5918L4204



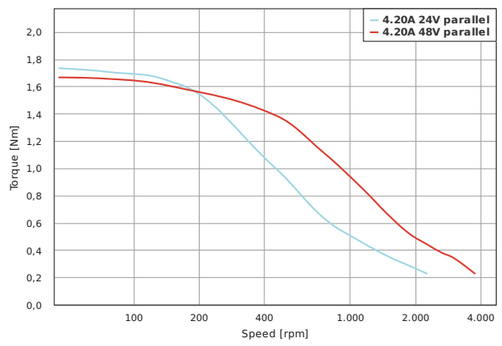

### AS5918L4204-E




### AS5918L4204-EB




### AS5918L4204-ENM24

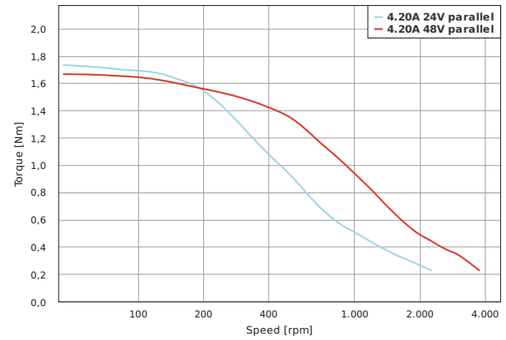





AS5918
Stepper motor with M12 connector IP65 – NEMA 23

## TORQUE CURVES

### AS5918L4204-ENM24B



# AS8918

## Stepper motor IP65 – NEMA 34

## OPTIONS

Gearbox

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm | Encoder | Brake |
|---|---|---|---|---|---|---|---|---|---|
| AS8918L9504-E24 | 9.5 | 933 | 0.26 | 2.7 | 3000 | 4.35 | 148 | ✓ | – |
| AS8918L9504-E24B | 9.5 | 933 | 0.26 | 2.7 | 3000 | 5 | 218 | ✓ | ✓ |

## ORDER IDENTIFIER

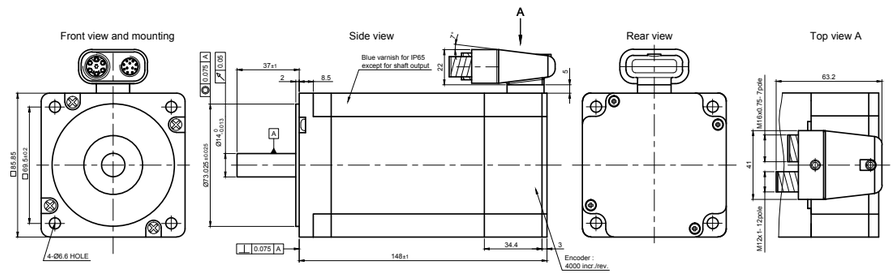
**AS8918L9504-**
E24 = With 24V encoder
E24B = With 24V encoder and brake

## ACCESSORIES

**ZK-M12-12-2M-1-AFF** Encoder cable straight, 2m
**ZK-TW-7-2M** Motor cable straight, 2m

## DIMENSIONS (IN MM)

**AS8918L9504-E24**

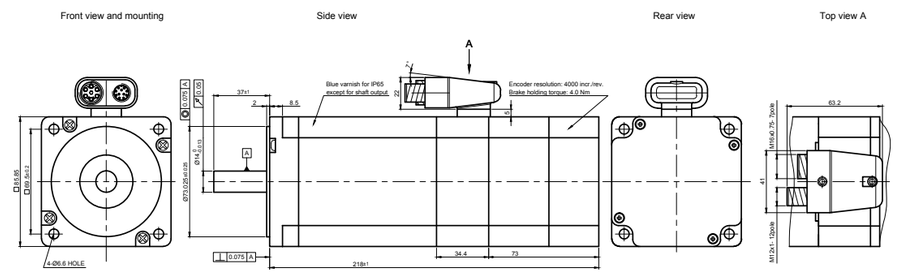





AS8918
Stepper motor IP65 – NEMA 34

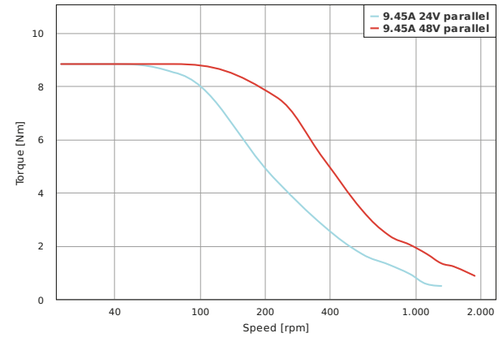
## DIMENSIONS (IN MM)

**AS8918L9504-E24B**

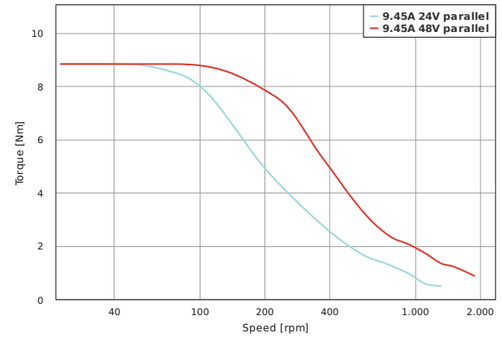



## TORQUE CURVES

**AS8918L9504-E24**




**AS8918L9504-E24B**




IP65 STEPPER MOTORS

# AP8918

## Stepper motor with PG fitting IP65 – NEMA 34

## OPTIONS

Gearbox

Controller

## ORDER IDENTIFIER

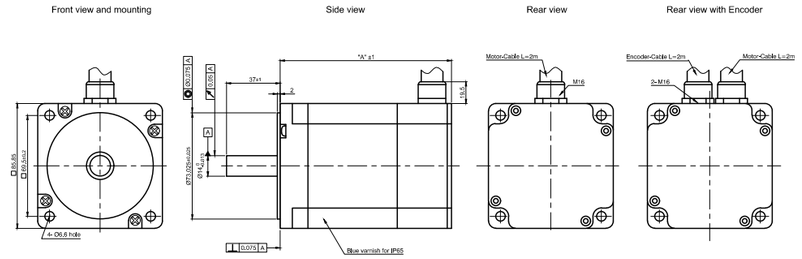
**AP8918M6404-**
E = With encoder

## VERSIONS

| Type | Current per Winding A | Holding Torque Ncm | Resistance per Winding Ohm | Inductance per Winding mH | Rotor Inertia gcm² | Weight kg | Length „A“ mm | Encoder |
|---|---|---|---|---|---|---|---|---|
| AP8918M6404 | 6.4 | 594 | 0.33 | 3 | 1900 | 3.4 | 118 | – |
| AP8918M6404-E | 6.4 | 594 | 0.33 | 3 | 1900 | 3.5 | 118 | ✓ |
| AP8918L9504 | 9.5 | 933 | 0.26 | 2.7 | 3000 | 4.6 | 148 | – |
| AP8918L9504-E | 9.5 | 933 | 0.26 | 2.7 | 3000 | 4.7 | 148 | ✓ |

## DIMENSIONS (IN MM)

**AP8918**



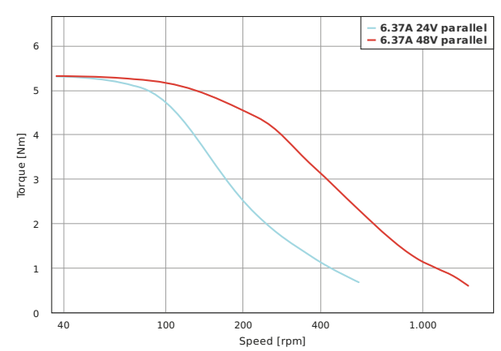



AP8918

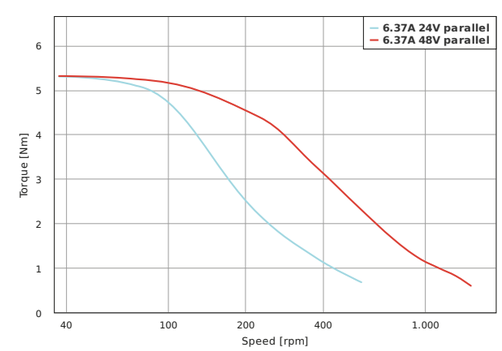
Stepper motor with PG fitting IP65 – NEMA 34

## TORQUE CURVES

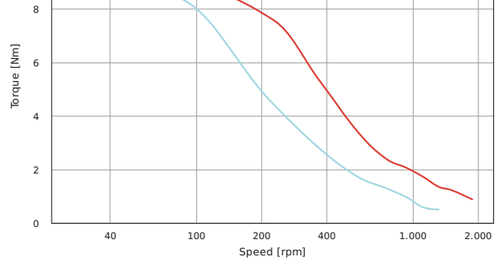
**AP8918M6404**



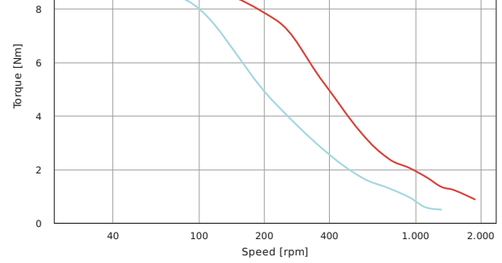

**AP8918M6404-E**




**AP8918L9504**

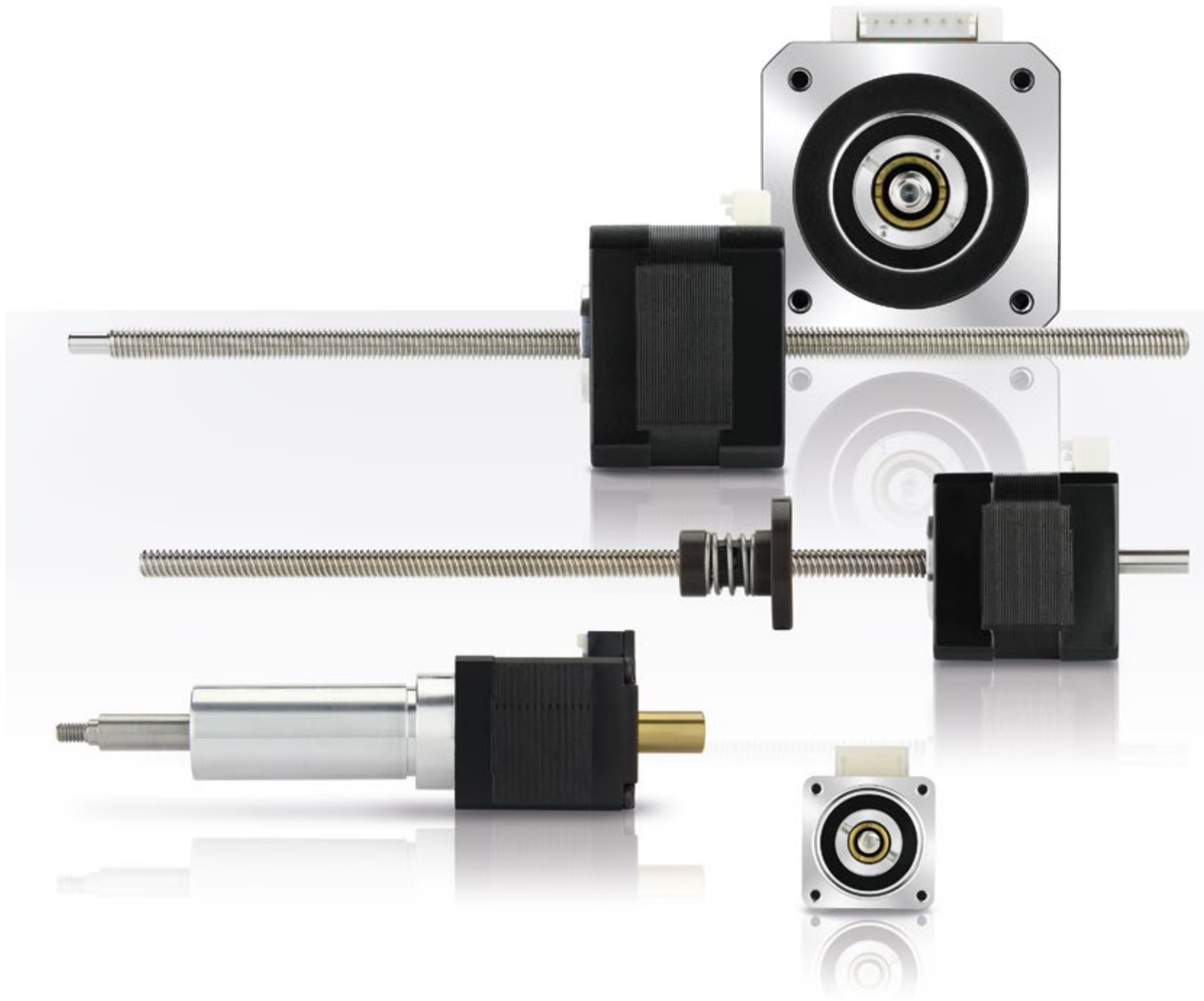



**AP8918L9504-E**



# Notes





# Linear Actuators

## General information on linear actuators

### WHAT LINEAR ACTUATORS ARE AVAILABLE?

1. **Non-captive linear actuator**

   A threaded nut is worked into the motor's hollow shaft. It converts the rotary motion of the motor into linear motion for a screw. The screw has to be prevented from rotating in order to achieve linear motion.

2. **Captive linear actuator**

   The linear actuator's screw is coupled with a rod, thereby securing it from being twisted out of position.

3. **External linear actuator**

   The thread is attached to the motor shaft. A nut on the shaft carries out the linear motion.

### NANOTEC LINEAR DRIVES

- Simple and flexible
- High and reproducible resolution (<5 $\mu$m) and fast feeding (>250 mm/sec.)
- Mechanically exchangeable with standard motors, possible to standardize construction platforms
- Designed to be energy-saving
- Partially self-locking, thus can be operated without a brake
- Low-friction and low-wear due to plastic nuts
- Designed to provide an affordable and flexible alternative to hydraulic and pneumatic cylinders

### SELECTING A SUITABLE DESIGN

1. Which stroke is necessary?
2. Will an encoder or a brake be connected?
3. Will a freely movable end move the load or is a fixed screw necessary?
4. Are there size limitations?

### SELECTING THE MOTOR OUTPUT

To find a suitable linear actuator, you need information about

1. The load being moved
2. The movement direction (vertical or horizontal)
3. The required feed speed
4. The acceleration torque
5. The required torque
6. The stroke
7. The positioning and repeatability
8. The maximum permitted screw clearance

### ESTIMATED SERVICE LIFE

The force and power rating specified in the data sheets are based on a duty cycle of 10% to 20% and need to be reduced accordingly for higher values.



Linear Actuators

General information on linear actuators

### PERFORMANCE CALCULATION FOR SELECTING LINEAR ACTUATORS

Resolutions, feed speeds and forces for stepper motors are calculated based on the screw pitch (p in mm), torque (Md in Nm) and efficiency as follows:

- **Resolution in mm/step**
  Formula: p/(360°/step angle)
  Example: 1 mm/(360°/1.8°) = 0.005 mm/step
- **Feed speed**
  Formula: Speed x screw lead
  Example: 900 rpm x 2 mm / 60 sec = 30 mm/s
- **Force in N**
  Formula: $Md_{Mot}$ x 2$\pi$ x efficiency/p
  Example: Motor L4118S, approx. 0.22 Nm at 48 V, 900 rpm, with a screw lead of 2 mm
  F = 0.22 Nm x 6.28 x 0.43/0.002 m = 297 N
- **Efficiency**
  The efficiency of a lead screw drive is approx. 0.3 – 0.8 depending on diameter, lead, nut material and lubrication.
- **Acceleration torque**
  Formula: Linear: $F = m \bullet a$
  $(a = v_e - v_a/t)$
  $v_e$ = end speed, $v_a$ = starting speed
  Formula: Linear: $F = m \bullet g \bullet \mu$
  The **frictional force F** (N) is determined primarily by the mass = **m** (weight, kg) and the coefficient of friction = $\boldsymbol{\mu}$.

The correct lead, motor size and step angle have a substantial influence on the precision, the axial forces and the speed of the linear drive.
A curve comparison facilitates the selection of a specific model if framework data is known.

### LUBRICATION

The material used for the thread nut and the nut is self-lubricating. However, we recommend lubricating these parts once during setup and installation for a longer service life. Suitable substances are dry lubricants (especially in the case of slower speeds and short duty cycles) or roller bearing greases such as Klüber Microlube GBUY131. You can also order grease directly from Nanotec with the order identifier "Nanolube".

The lubrication intervals, lubricant suitability and the resulting service life always depend on the application and the ambient conditions, and therefore need to be tested in the application.

# LA20

## Non-captive linear actuator – NEMA 8

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Socket Length „L“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LA201S06-A-TDBA | 46 | 40 | 0.6 | 5 | 6.4 | 2.6 | 3.5 | 1 | 33 | 8 | 0.054 |
| LA201S06-B-TDBA | 46 | 40 | 0.6 | 5 | 6.4 | 2.6 | 3.5 | 1 | 33 | 8 | 0.054 |
| LA201S06-A-UECB | 33.7 | 60 | 0.6 | 10 | 6.4 | 2.6 | 3.5 | 2 | 33 | 8 | 0.054 |
| LA201S06-B-UECB | 33.7 | 60 | 0.6 | 10 | 6.4 | 2.6 | 3.5 | 2 | 33 | 8 | 0.054 |

## ORDER IDENTIFIER

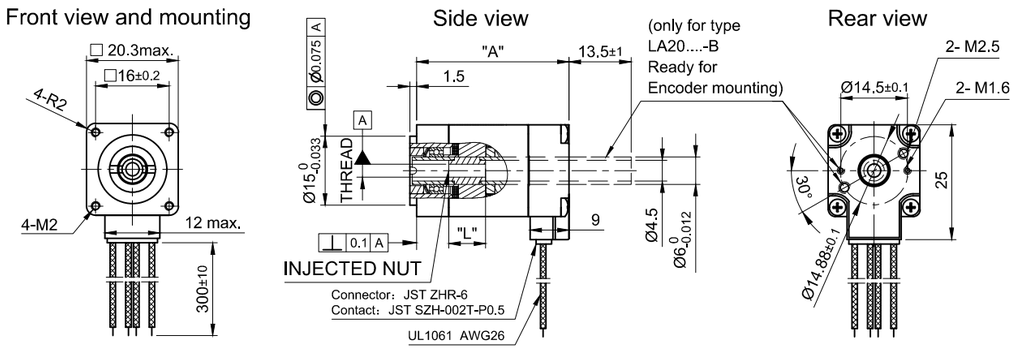
**LA201S06-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**ZST3,5-1-200-1** Lead screw with trapezoidal thread
**ZST3,5-1-500** Lead screw with trapezoidal thread
**SCREW-ABA-UECB-200** Lead screw with ACME thread
**SCREW-ABA-UECB-300** Lead screw with ACME thread
**SCREW-AAA-UECB-500** Lead screw with ACME thread
**NANOLUBE-50G** Bearing grease

## DIMENSIONS (IN MM)

**LA20**



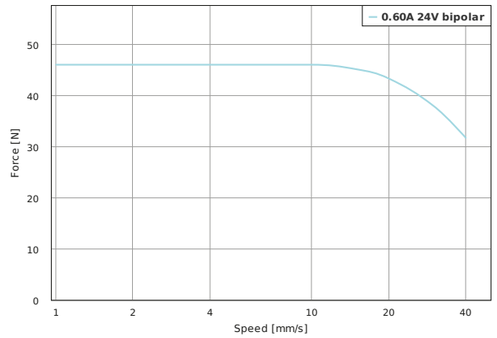



LA20

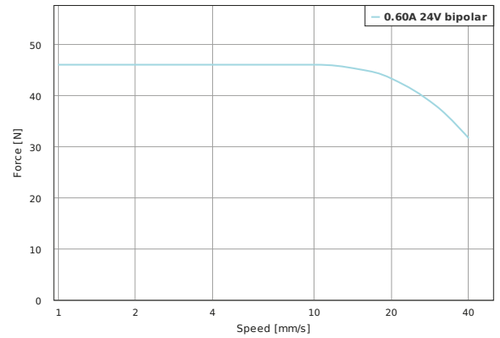
Non-captive linear actuator – NEMA 8

## FORCE-VELOCITY CURVES

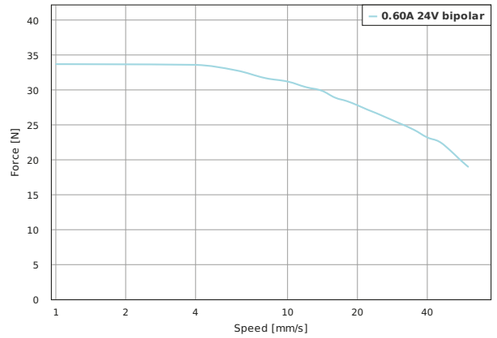
LA201S06-A-TDBA



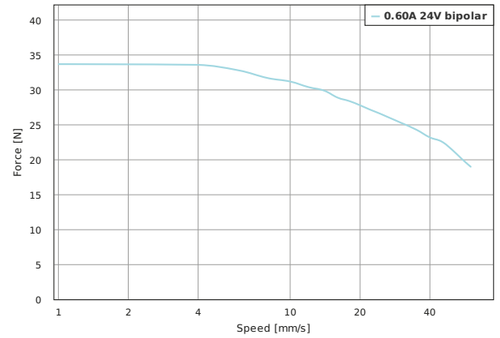

LA201S06-B-TDBA




LA201S06-A-UECB




LA201S06-B-UECB



# LGA20

## Captive linear actuator – NEMA 8

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Stroke Length „X“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LGA201S06-A-TDBA-019 | 46 | 40 | 0.6 | 5 | 6.4 | 2.6 | 3.5 | 1 | 33 | 19.05 | 0.054 |
| LGA201S06-B-TDBA-019 | 46 | 40 | 0.6 | 5 | 6.4 | 2.6 | 3.5 | 1 | 33 | 19.05 | 0.073 |
| LGA201S06-A-TDBA-038 | 46 | 40 | 0.6 | 5 | 6.4 | 2.6 | 3.5 | 1 | 33 | 38.1 | 0.15 |
| LGA201S06-B-TDBA-038 | 46 | 40 | 0.6 | 5 | 6.4 | 2.6 | 3.5 | 1 | 33 | 38.1 | 0.073 |
| LGA201S06-A-UECB-019 | 33.7 | 60 | 0.6 | 10 | 6.4 | 2.6 | 3.5 | 2 | 33 | 19.05 | 0.066 |
| LGA201S06-B-UECB-019 | 33.7 | 60 | 0.6 | 10 | 6.4 | 2.6 | 3.5 | 2 | 33 | 19.05 | 0.073 |
| LGA201S06-A-UECB-038 | 33.7 | 60 | 0.6 | 10 | 6.4 | 2.6 | 3.5 | 2 | 33 | 38.1 | 0.073 |
| LGA201S06-B-UECB-038 | 33.7 | 60 | 0.6 | 10 | 6.4 | 2.6 | 3.5 | 2 | 33 | 38.1 | 0.073 |

## ORDER IDENTIFIER

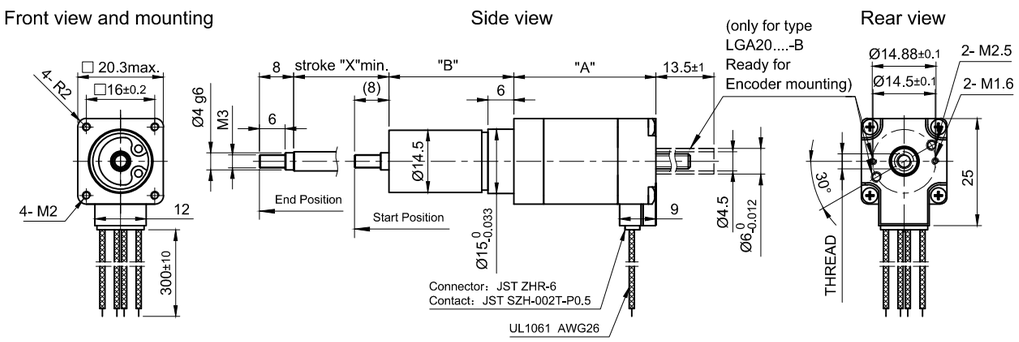
**LGA201S06-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

**NANOLUBE-50G** Bearing grease

## DIMENSIONS (IN MM)

LGA20



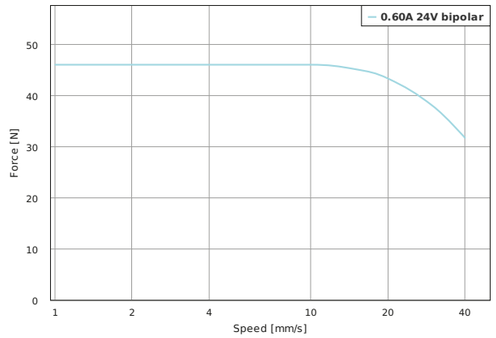



LGA20

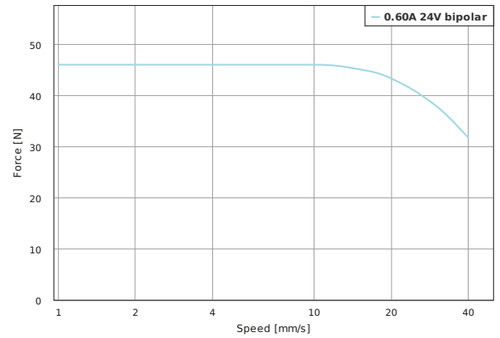
Captive linear actuator – NEMA 8

## FORCE-VELOCITY CURVES

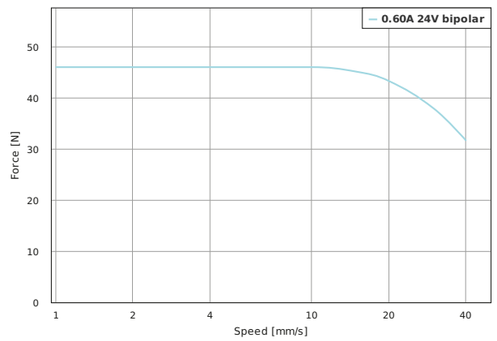
LGA201S06-A-TDBA-019



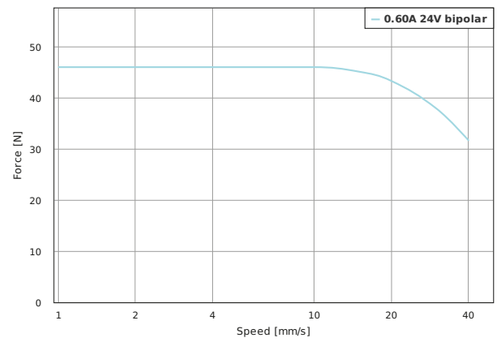

LGA201S06-B-TDBA-019



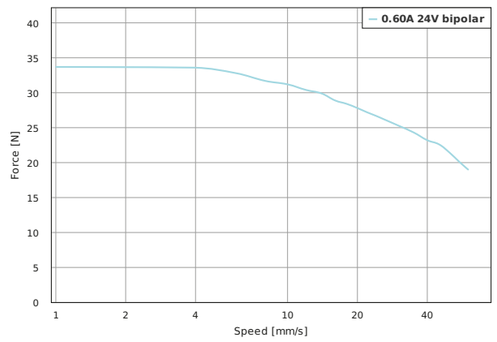

LGA201S06-A-TDBA-038



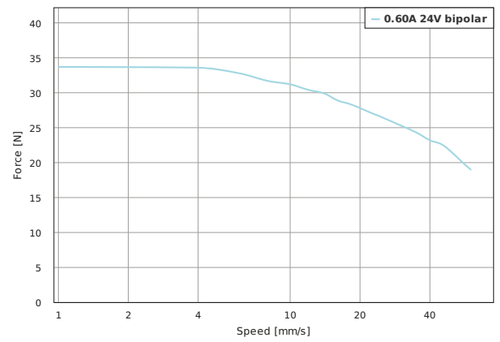

LGA201S06-B-TDBA-038




LGA201S06-A-UECB-019




LGA201S06-B-UECB-019

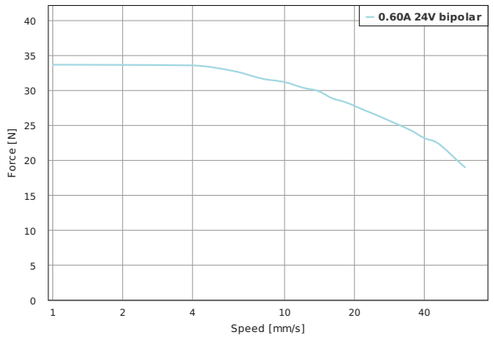


# LGA20

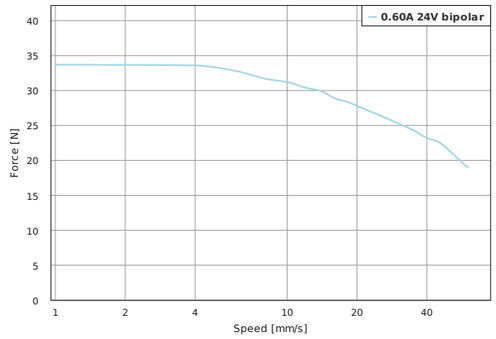
## Captive linear actuator – NEMA 8

### FORCE-VELOCITY CURVES

**LGA201S06-A-UECB-038**




**LGA201S06-B-UECB-038**






# Notes

# LSA20

## External linear actuator – NEMA 8

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Screw Length „L“ mm | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LSA201S06-A-TDBA-102 | 46 | 40 | 0.6 | 5 | 6.4 | 2.6 | 3.5 | 1 | 102 | 33 | 0.054 |
| LSA201S06-B-TDBA-102 | 46 | 40 | 0.6 | 5 | 6.4 | 2.6 | 3.5 | 1 | 102 | 33 | 0.054 |
| LSA201S06-A-UECB-102 | 33.7 | 60 | 0.6 | 10 | 6.4 | 2.6 | 3.5 | 2 | 102 | 33 | 0.063 |
| LSA201S06-B-UECB-102 | 33.7 | 60 | 0.6 | 10 | 6.4 | 2.6 | 3.5 | 2 | 102 | 33 | 0.063 |

## ORDER IDENTIFIER

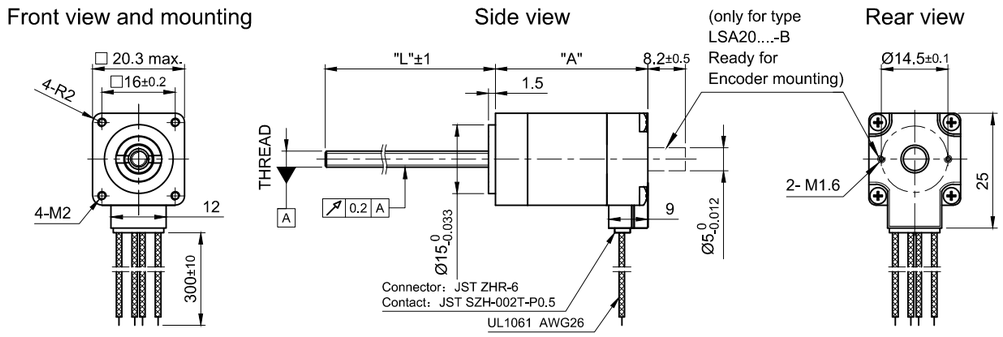
**LSA201S06-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**LSNUT-AAAA-TDBA** Threaded nut
**LSNUT-AAAA-UECB** Threaded nut
**LSNUT-AEAC-TDBA** Axial anti-backlash threaded nut with helical spring
**LSNUT-AGAC-TDBA** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAC-UECB** Anti-backlash threaded nut with torsion spring
**NANOLUBE-50G** Bearing grease

## DIMENSIONS (IN MM)

**LSA20**



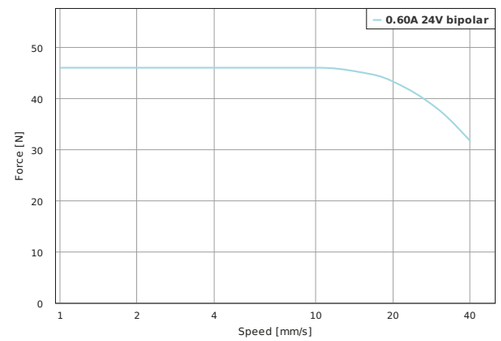



LSA20

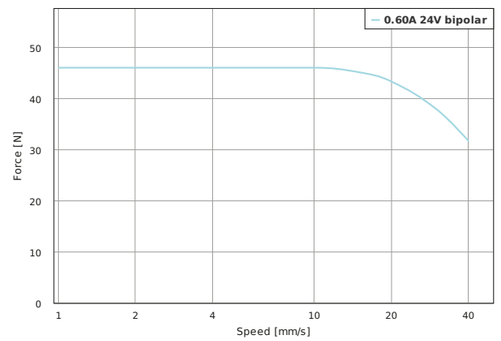
External linear actuator – NEMA 8

## FORCE-VELOCITY CURVES

LSA201S06-A-TDBA-102




LSA201S06-B-TDBA-102




LSA201S06-A-UECB-102




LSA201S06-B-UECB-102

# LA28

## Non-captive linear actuator – NEMA 11

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Socket Length „L“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LA281S10-A-UGAQ | 210 | 19 | 1 | 3.2 | 2.7 | 2.5 | 4.76 | 0.635 | 33 | 15 | 0.11 |
| LA281S10-B-UGAQ | 210 | 19 | 1 | 3.2 | 2.7 | 2.5 | 4.76 | 0.635 | 33 | 15 | 0.11 |
| LA281S10-A-UGFC | 50 | 120 | 1 | 25.4 | 2.7 | 2.5 | 4.76 | 5.08 | 33 | 15 | 0.11 |
| LA281S10-B-UGFC | 50 | 120 | 1 | 25.4 | 2.7 | 2.5 | 4.76 | 5.08 | 33 | 15 | 0.11 |
| LA281S10-A-THCA | 130.7 | 40 | 1 | 10 | 2.7 | 2.5 | 5 | 2 | 33 | 15 | 0.11 |
| LA281S10-B-THCA | 130.7 | 40 | 1 | 10 | 2.7 | 2.5 | 5 | 2 | 33 | 15 | 0.11 |
| LA281M06-A-THCA | 152.1 | 35 | 0.6 | 10 | 7.3 | 6.52 | 5 | 2 | 41 | 15 | 0.14 |
| LA281M06-B-THCA | 152.1 | 35 | 0.6 | 10 | 7.3 | 6.52 | 5 | 2 | 41 | 15 | 0.14 |
| LA281M15-A-THCA | 152.1 | 35 | 1.5 | 10 | 1.45 | 1.25 | 5 | 2 | 41 | 15 | 0.14 |
| LA281M15-B-THCA | 152.1 | 35 | 1.5 | 10 | 1.45 | 1.25 | 5 | 2 | 41 | 15 | 0.14 |

## ORDER IDENTIFIER

**LA281S10-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**ZST5-2-200-1** Lead screw with trapezoidal thread
**ZST5-2-300-1** Lead screw with trapezoidal thread
**SCREW-ABA-UGAQ-200** Lead screw with ACME thread
**SCREW-ABA-UGAQ-300** Lead screw with ACME thread
**SCREW-AAA-UGAQ-1000** Lead screw with ACME thread
**SCREW-ABA-UGFC-200** Lead screw with ACME thread
**SCREW-ABA-UGFC-300** Lead screw with ACME thread
**SCREW-AAA-UGFC-1000** Lead screw with ACME thread
**NANOLUBE-50G** Bearing grease

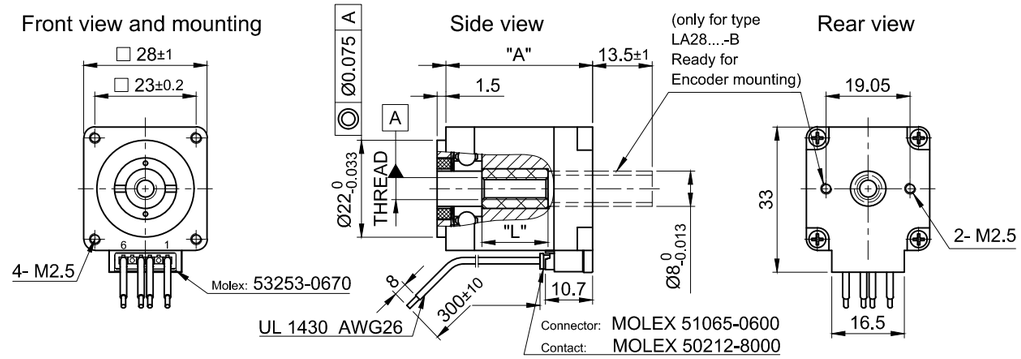


LA28

Non-captive linear actuator – NEMA 11

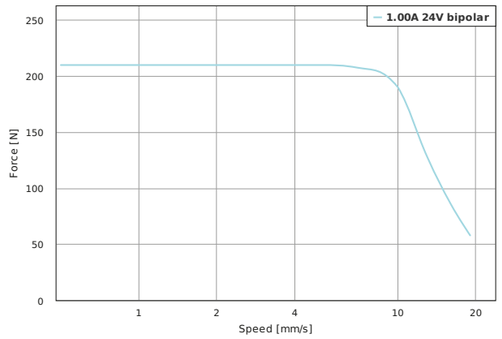
## DIMENSIONS (IN MM)

LA28-A/B

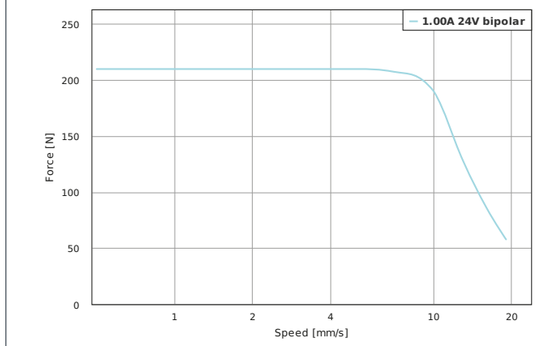



## FORCE-VELOCITY CURVES

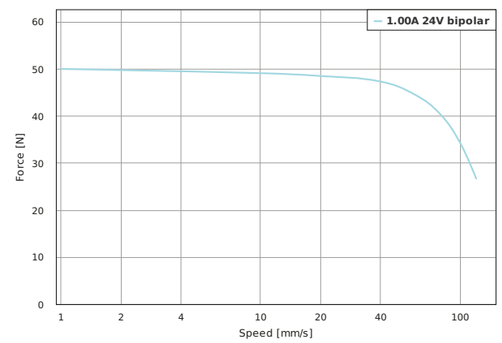
LA281S10-A-UGAQ



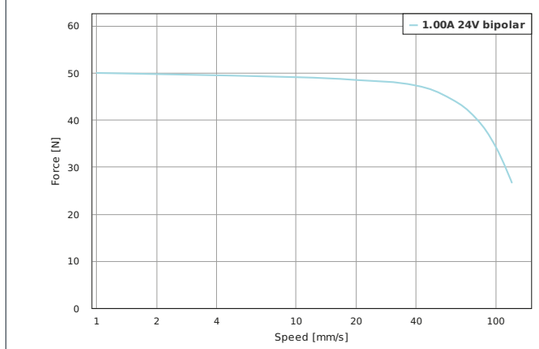

LA281S10-B-UGAQ




LA281S10-A-UGFC




LA281S10-B-UGFC

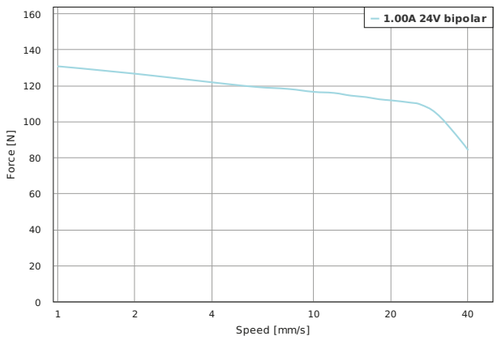


# LA28

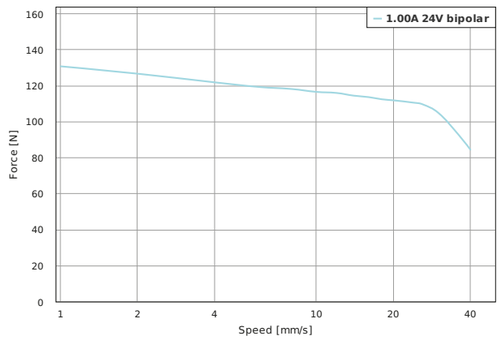
## Non-captive linear actuator – NEMA 11

### FORCE-VELOCITY CURVES

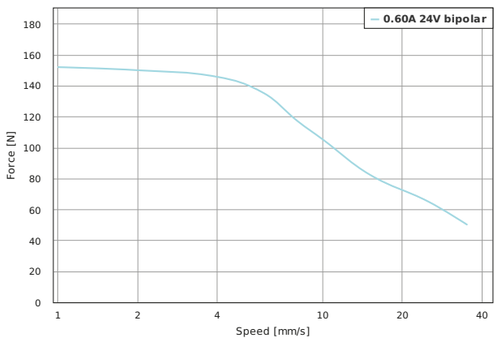
**LA281S10-A-THCA**



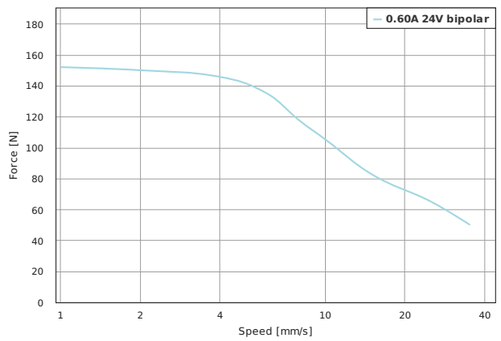

**LA281S10-B-THCA**



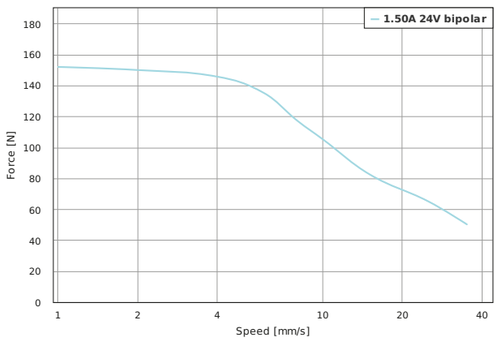

**LA281M06-A-THCA**



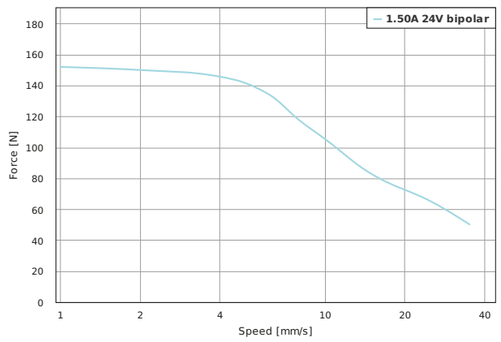

**LA281M06-B-THCA**




**LA281M15-A-THCA**




**LA281M15-B-THCA**






# Notes

# LGA28

## Captive linear actuator – NEMA 11

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Stroke Length „X“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LGA281S10-A-UGAQ-019 | 210 | 19 | 1 | 3.2 | 2.7 | 2.5 | 4.76 | 0.635 | 33 | 19.05 | 0.14 |
| LGA281S10-B-UGAQ-019 | 210 | 19 | 1 | 3.2 | 2.7 | 2.5 | 4.76 | 0.635 | 33 | 19.05 | 0.14 |
| LGA281S10-A-UGAQ-038 | 210 | 19 | 1 | 3.2 | 2.7 | 2.5 | 4.76 | 0.635 | 33 | 38.1 | 0.15 |
| LGA281S10-B-UGAQ-038 | 210 | 19 | 1 | 3.2 | 2.7 | 2.5 | 4.76 | 0.635 | 33 | 38.1 | 0.15 |
| LGA281S10-A-UGFC-019 | 50 | 120 | 1 | 25.4 | 2.7 | 2.5 | 4.76 | 5.08 | 33 | 19.05 | 0.14 |
| LGA281S10-B-UGFC-019 | 50 | 120 | 1 | 25.4 | 2.7 | 2.5 | 4.76 | 5.08 | 33 | 19.05 | 0.15 |
| LGA281S10-A-UGFC-038 | 50 | 120 | 1 | 25.4 | 2.7 | 2.5 | 4.76 | 5.08 | 33 | 38.1 | 0.14 |
| LGA281S10-B-UGFC-038 | 50 | 120 | 1 | 25.4 | 2.7 | 2.5 | 4.76 | 5.08 | 33 | 38.1 | 0.15 |
| LGA281S10-A-THCA-019 | 130.7 | 40 | 1 | 10 | 2.7 | 2.5 | 5 | 2 | 33 | 19.05 | 0.14 |
| LGA281S10-B-THCA-019 | 130.7 | 40 | 1 | 10 | 2.7 | 2.5 | 5 | 2 | 33 | 19.05 | 0.14 |
| LGA281S10-A-THCA-038 | 130.7 | 40 | 1 | 10 | 2.7 | 2.5 | 5 | 2 | 33 | 38.1 | 0.14 |
| LGA281S10-B-THCA-038 | 130.7 | 40 | 1 | 10 | 2.7 | 2.5 | 5 | 2 | 33 | 38.1 | 0.14 |

## ORDER IDENTIFIER

**LGA281S10-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

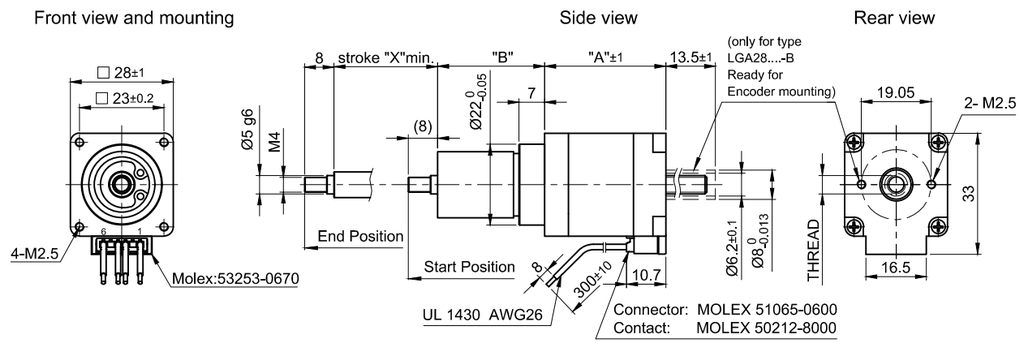
**NANOLUBE-50G** Bearing grease



LGA28
Captive linear actuator – NEMA 11

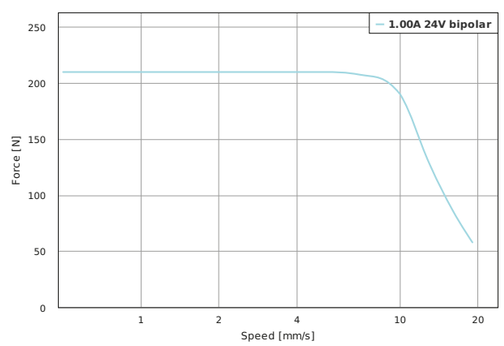
## DIMENSIONS (IN MM)

**LGA28-A/B**

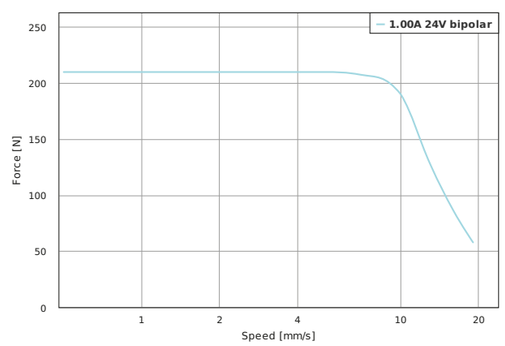



## FORCE-VELOCITY CURVES

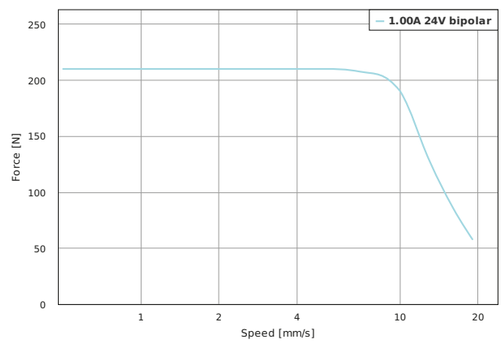
**LGA281S10-A-UGAQ-019**



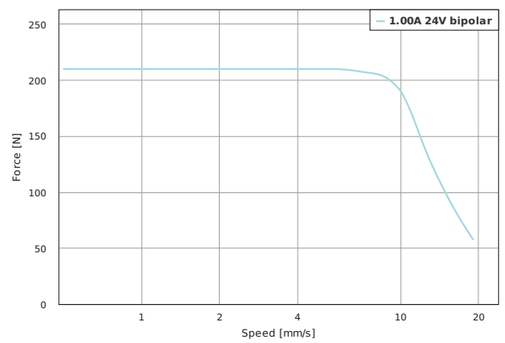

**LGA281S10-B-UGAQ-019**




**LGA281S10-A-UGAQ-038**

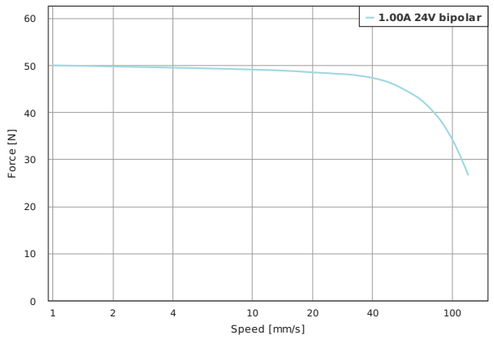



**LGA281S10-B-UGAQ-038**

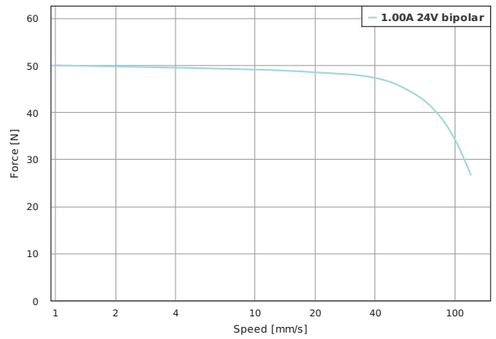


## FORCE-VELOCITY CURVES

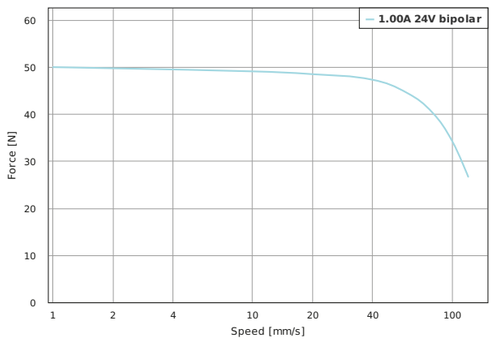
### LGA281S10-A-UGFC-019



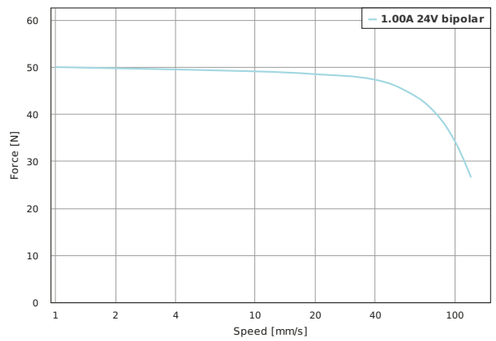

### LGA281S10-B-UGFC-019



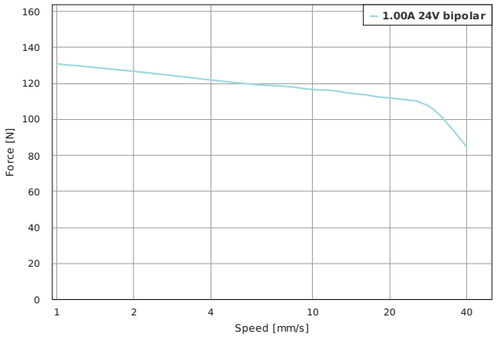

### LGA281S10-A-UGFC-038



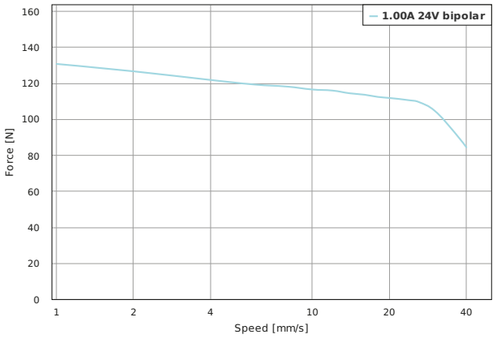

### LGA281S10-B-UGFC-038




### LGA281S10-A-THCA-019




### LGA281S10-B-THCA-019

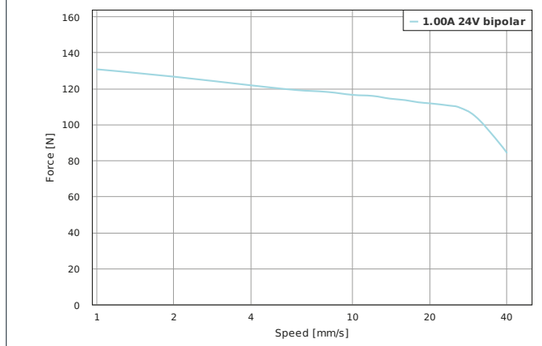




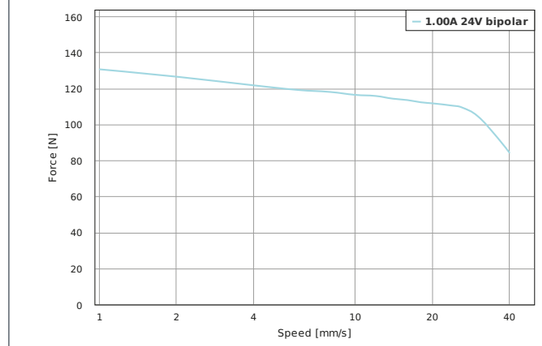

LGA28
Captive linear actuator – NEMA 11

## FORCE-VELOCITY CURVES

### LGA281S10-A-THCA-038




### LGA281S10-B-THCA-038



# LSA28

## External linear actuator – NEMA 11

### OPTIONS

Controller

Encoder

### VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Screw Length „L“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LSA281S10-A-UGAQ-152 | 210 | 19 | 1 | 3.2 | 2.7 | 2.5 | 4.76 | 0.635 | 33 | 152 | 0.13 |
| LSA281S10-B-UGAQ-152 | 210 | 19 | 1 | 3.2 | 2.7 | 2.5 | 4.76 | 0.635 | 33 | 152 | 0.13 |
| LSA281S10-A-UGFC-152 | 50 | 120 | 1 | 25.4 | 2.7 | 2.5 | 4.76 | 5.08 | 33 | 152 | 0.13 |
| LSA281S10-B-UGFC-152 | 50 | 120 | 1 | 25.4 | 2.7 | 2.5 | 4.76 | 5.08 | 33 | 152 | 0.13 |
| LSA281S10-A-THCA-152 | 130.7 | 40 | 1 | 10 | 2.7 | 2.5 | 5 | 2 | 33 | 152 | 0.13 |
| LSA281S10-B-THCA-152 | 130.7 | 40 | 1 | 10 | 2.7 | 2.5 | 5 | 2 | 33 | 152 | 0.13 |

### ORDER IDENTIFIER

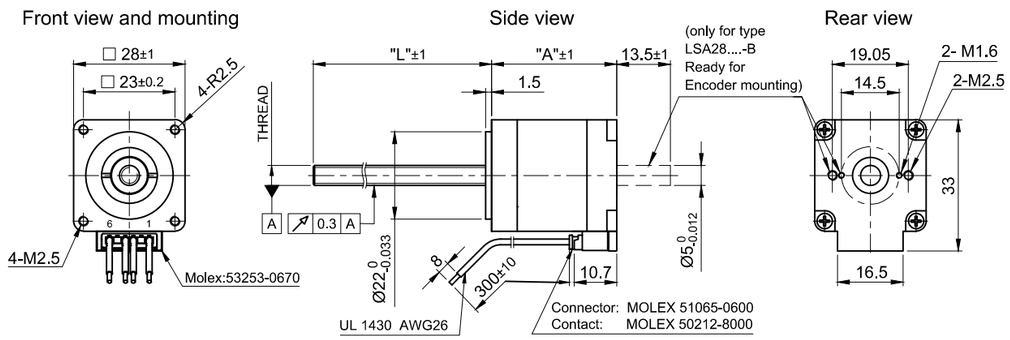
**LSA281S10-**
A-... = Single shaft end
B-... = Double shaft end

### ACCESSORIES

**LSNUT-AAAA-UGAQ** Threaded nut
**LSNUT-AAAA-UGFC** Threaded nut
**LSNUT-AAAA-THCA** Threaded nut
**LSNUT-AGAC-UGAQ** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAC-UGFC** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAC-THCA** Anti-backlash threaded nut with torsion spring
**NANOLUBE-50G** Bearing grease

### DIMENSIONS (IN MM)

LSA28-A/B



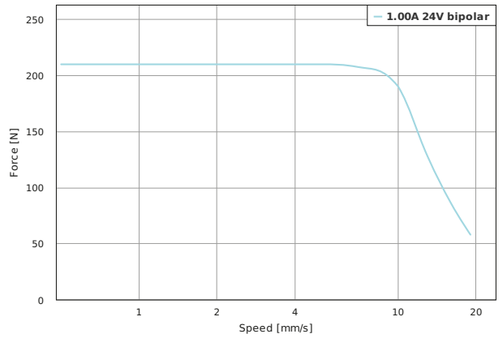



# LSA28

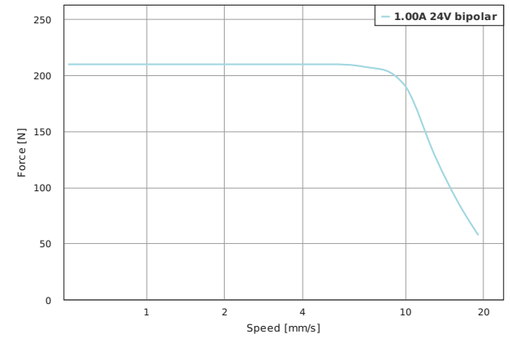
## External linear actuator – NEMA 11

### FORCE-VELOCITY CURVES

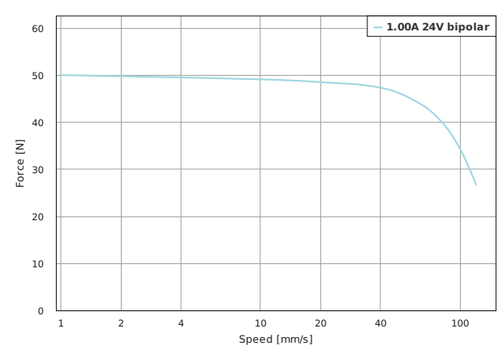
LSA281S10-A-UGAQ-152



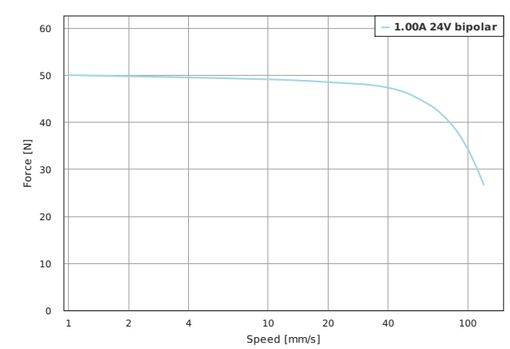

LSA281S10-B-UGAQ-152



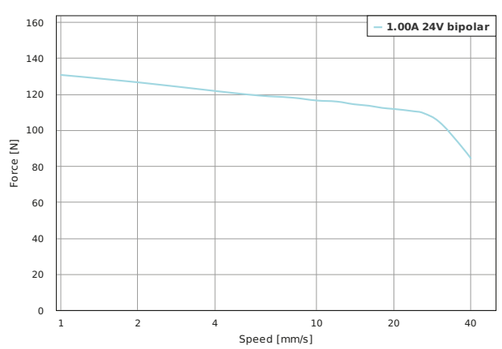

LSA281S10-A-UGFC-152



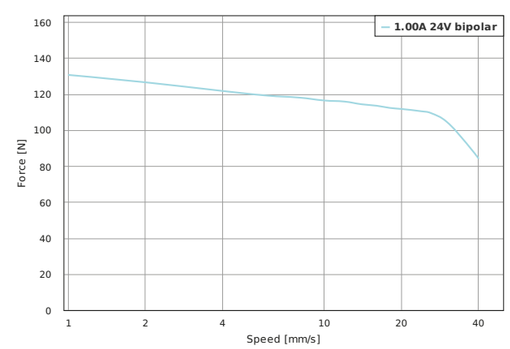

LSA281S10-B-UGFC-152




LSA281S10-A-THCA-152




LSA281S10-B-THCA-152



# LA35

## Non-captive linear actuator – NEMA 14

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Socket Length „L“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LA351S12-A-UIAP | 242.4 | 22 | 1.2 | 3 | 1.8 | 2.46 | 5.56 | 0.61 | 33.6 | 15 | 0.16 |
| LA351S12-B-UIAP | 242.4 | 36 | 1.2 | 3 | 1.8 | 2.46 | 5.56 | 0.61 | 33.6 | 15 | 0.16 |
| LA351S12-A-UIEV | 86.2 | 200 | 1.2 | 24.4 | 1.8 | 2.46 | 5.56 | 4.88 | 33.6 | 15 | 0.16 |
| LA351S12-B-UIEV | 86.2 | 22 | 1.2 | 24.4 | 1.8 | 2.46 | 5.56 | 4.88 | 33.6 | 15 | 0.16 |

## ORDER IDENTIFIER

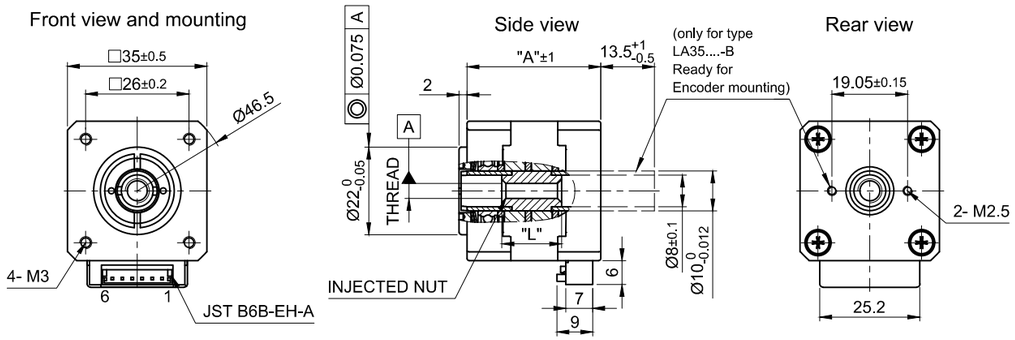
**LA351S12-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**SCREW-ABA-UIAP-200** Lead screw with ACME thread
**SCREW-ABA-UIAP-300** Lead screw with ACME thread
**SCREW-AAA-UIAP-1000** Lead screw with ACME thread
**SCREW-ABA-UIEV-200** Lead screw with ACME thread
**SCREW-ABA-UIEV-300** Lead screw with ACME thread
**SCREW-AAA-UIEV-1000** Lead screw with ACME thread
**ZK-JST-EHR-6-0.5M-S** Motor cable, 0.5m
**NANOLUBE-50G** Bearing grease

## DIMENSIONS (IN MM)

**LA35**



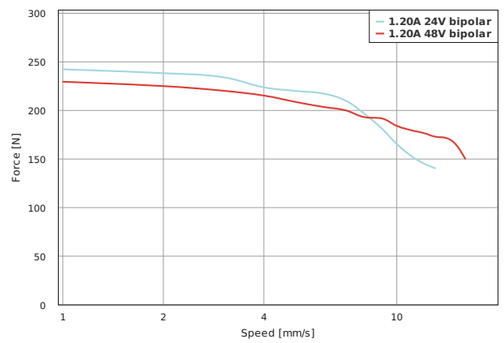



# LA35

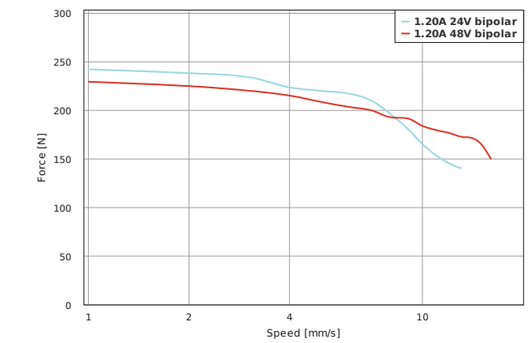
## Non-captive linear actuator – NEMA 14

## FORCE-VELOCITY CURVES

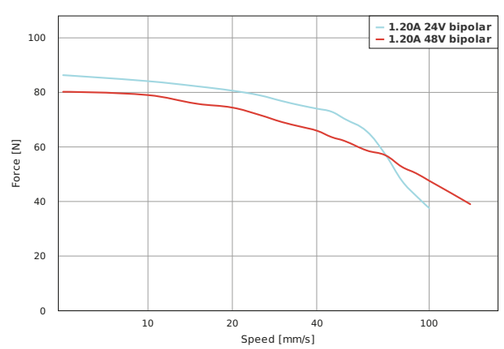
LA351S12-A-UIAP



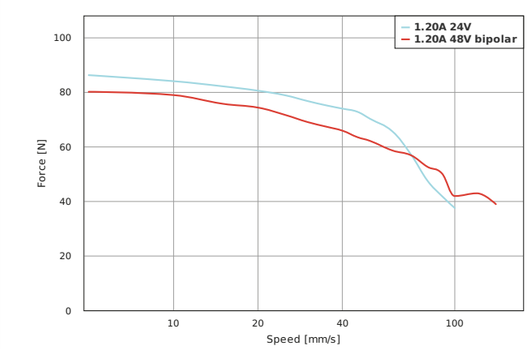

LA351S12-B-UIAP




LA351S12-A-UIEV




LA351S12-B-UIEV



# LGA35

## Captive linear actuator – NEMA 14

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Stroke Length „X“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LGA351S12-A-UIAP-019 | 242.4 | 22 | 1.2 | 3 | 1.8 | 2.46 | 5.56 | 0.61 | 33.6 | 19.05 | 0.19 |
| LGA351S12-B-UIAP-019 | 242.4 | 36 | 1.2 | 3 | 1.8 | 2.46 | 5.56 | 0.61 | 33.6 | 19.05 | 0.21 |
| LGA351S12-A-UIAP-038 | 242.4 | 200 | 1.2 | 3 | 1.8 | 2.46 | 5.56 | 0.61 | 33.6 | 38.1 | 0.21 |
| LGA351S12-B-UIAP-038 | 242.4 | 22 | 1.2 | 3 | 1.8 | 2.46 | 5.56 | 0.61 | 33.6 | 38.1 | 0.19 |
| LGA351S12-A-UIEV-019 | 86.2 | 36 | 1.2 | 24.4 | 1.8 | 2.46 | 5.56 | 4.88 | 33.6 | 19.05 | 0.19 |
| LGA351S12-B-UIEV-019 | 86.2 | 200 | 1.2 | 24.4 | 1.8 | 2.46 | 5.56 | 4.88 | 33.6 | 19.05 | 0.19 |
| LGA351S12-A-UIEV-038 | 86.2 | 22 | 1.2 | 24.4 | 1.8 | 2.46 | 5.56 | 4.88 | 33.6 | 38.1 | 0.21 |
| LGA351S12-B-UIEV-038 | 86.2 | 36 | 1.2 | 24.4 | 1.8 | 2.46 | 5.56 | 4.88 | 33.6 | 38.1 | 0.21 |

## ORDER IDENTIFIER

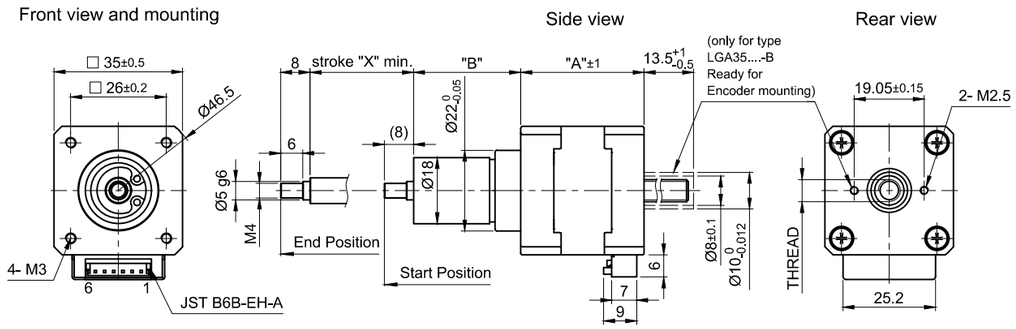
**LGA351S12-...-**
A = Single shaft end
B = Double shaft end

## ACCESSORIES

**ZK-JST-EHR-6-0.5M-S** Motor cable, 0.5m

## DIMENSIONS (IN MM)

LGA35



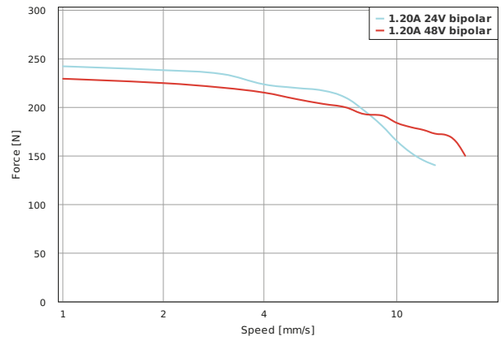



# LGA35

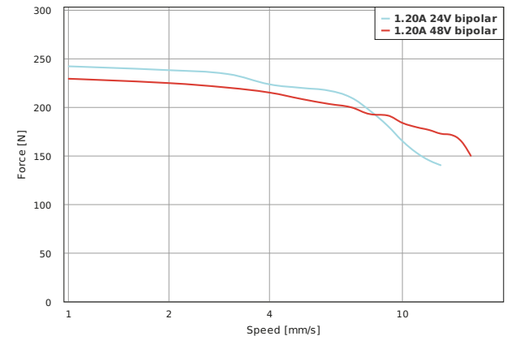
## Captive linear actuator – NEMA 14

## FORCE-VELOCITY CURVES

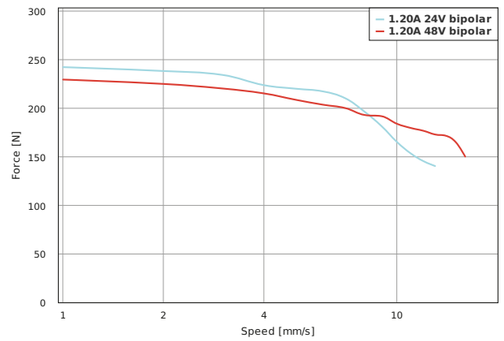
LGA351S12-A-UIAP-019



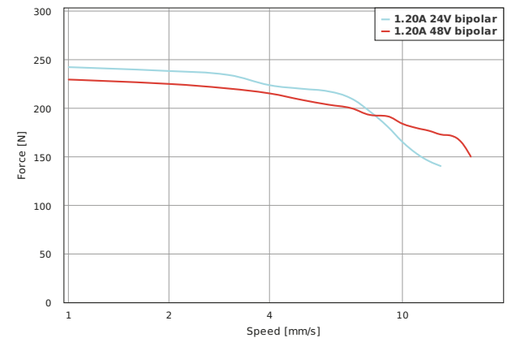

LGA351S12-B-UIAP-019



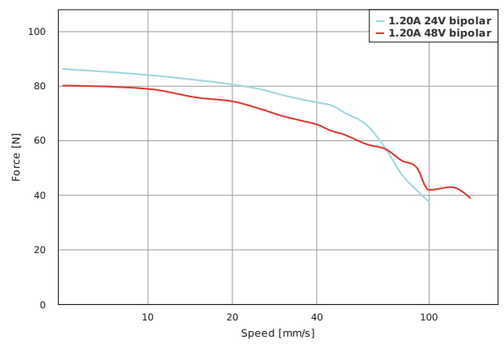

LGA351S12-A-UIAP-038



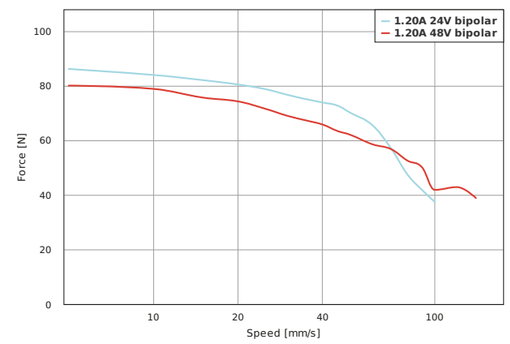

LGA351S12-B-UIAP-038




LGA351S12-A-UIEV-019




LGA351S12-B-UIEV-019

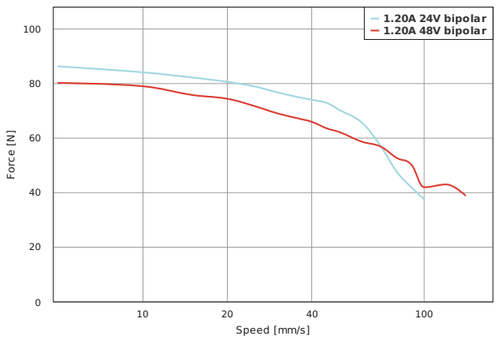


# LGA35

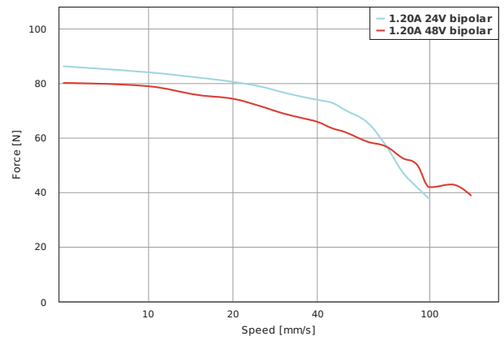
## Captive linear actuator – NEMA 14

### FORCE-VELOCITY CURVES

**LGA351S12-A-UIEV-038**




**LGA351S12-B-UIEV-038**






# Notes

# LSA35

## External linear actuator – NEMA 14

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Screw Length „L“ mm | Length „A“ mm |
|---|---|---|---|---|---|---|---|---|---|---|
| LSA351S12-A-UIAP-152 | 242.4 | 200 | 1.2 | 3 | 1.8 | 2.46 | 5.56 | 0.61 | 152 | 33.6 |
| LSA351S12-B-UIAP-152 | 242.4 | 22 | 1.2 | 3 | 1.8 | 2.46 | 5.56 | 0.61 | 152 | 33.6 |
| LSA351S12-A-UIEV-152 | 86.2 | 36 | 1.2 | 24.4 | 1.8 | 2.46 | 5.56 | 4.88 | 152 | 33.6 |
| LSA351S12-B-UIEV-152 | 86.2 | 200 | 1.2 | 24.4 | 1.8 | 2.46 | 5.56 | 4.88 | 152 | 33.6 |

## ORDER IDENTIFIER

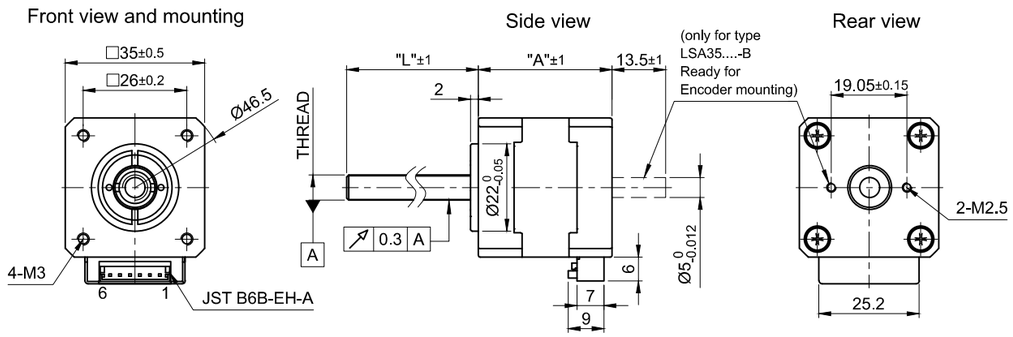
**LSA381S12-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**LSNUT-AAAE-UIAP** Threaded nut
**LSNUT-AAAE-UIEV** Threaded nut
**LSNUT-AEAE-UIAP** Axial anti-backlash threaded nut with helical spring
**LSNUT-AEAE-UIEV** Axial anti-backlash threaded nut with helical spring
**LSNUT-AGAE-UIAP** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAE-UIEV** Anti-backlash threaded nut with torsion spring
**ZK-JST-EHR-6-0.5M-S** Motor cable, 0.5m
**NANOLUBE-50G** Bearing grease

## DIMENSIONS (IN MM)

**LSA35**



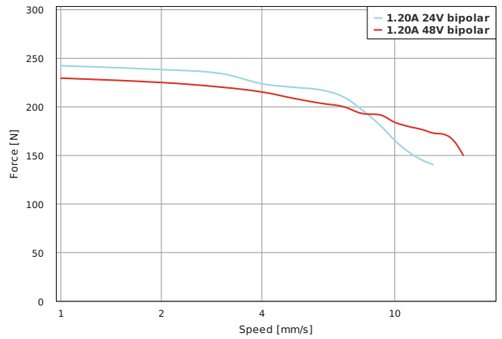



# LSA35

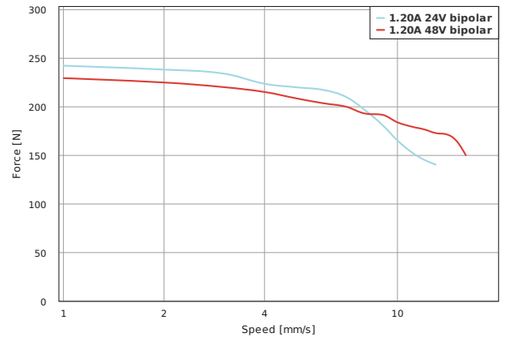
## External linear actuator – NEMA 14

## FORCE-VELOCITY CURVES

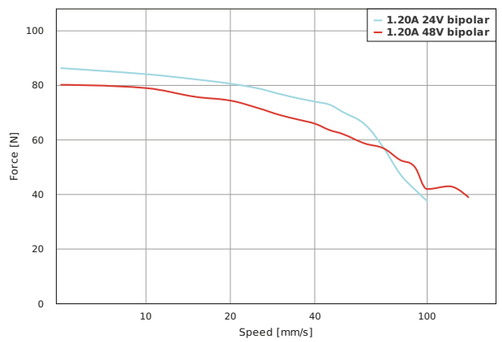
LSA351S12-A-UIAP-152



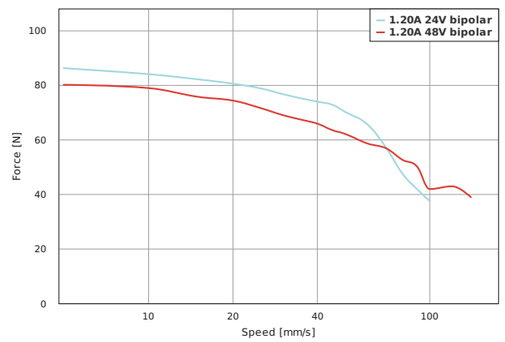

LSA351S12-B-UIAP-152




LSA351S12-A-UIEV-152




LSA351S12-B-UIEV-152



# LA42

## Non-captive linear actuator – NEMA 17

## OPTIONS

Controller

Encoder

## ORDER IDENTIFIER

**LA421S07-**
A-... = Single shaft end
B-... = Double shaft end

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Socket Length „L“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LA421S14-A-TJBA | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 33.4 | 15 | 0.2 |
| LA421S14-B-TJBA | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 33.4 | 15 | 0.2 |
| LA421S07-A-TJCA | 258.3 | 55 | 0.7 | 10 | 9.3 | 12.8 | 6 | 2 | 33.4 | 15 | 0.2 |
| LA421S07-B-TJCA | 258.3 | 55 | 0.7 | 10 | 9.3 | 12.8 | 6 | 2 | 33.4 | 15 | 0.2 |
| LA421S14-A-TJCA | 258.3 | 55 | 1.4 | 10 | 2 | 2.8 | 6 | 2 | 33.4 | 15 | 0.2 |
| LA421S14-B-TJCA | 258.3 | 55 | 1.4 | 10 | 2 | 2.8 | 6 | 2 | 33.4 | 15 | 0.2 |
| LA421S14-A-UIEV | 232.6 | 100 | 1.4 | 24.4 | 2 | 2.8 | 5.56 | 4.877 | 33.4 | 15 | 0.2 |
| LA421S14-B-UIEV | 232.6 | 100 | 1.4 | 24.4 | 2 | 2.8 | 5.56 | 4.877 | 33.4 | 15 | 0.2 |
| LA421S14-A-UKAS | 498.5 | 14 | 1.4 | 4 | 2 | 2.8 | 6.35 | 0.79 | 33.4 | 15 | 0.2 |
| LA421S14-B-UKAS | 498.5 | 14 | 1.4 | 4 | 2 | 2.8 | 6.35 | 0.79 | 33.4 | 15 | 0.2 |
| LA421S14-A-UKBN | 451.6 | 36 | 1.4 | 7.9 | 2 | 2.8 | 6.35 | 1.59 | 33.4 | 15 | 0.2 |
| LA421S14-B-UKBN | 451.6 | 36 | 1.4 | 7.9 | 2 | 2.8 | 6.35 | 1.59 | 33.4 | 15 | 0.2 |
| LA421S14-A-UKDE | 278.7 | 50 | 1.4 | 15.9 | 2 | 2.8 | 6.35 | 3.175 | 33.4 | 15 | 0.2 |
| LA421S14-B-UKDE | 278.7 | 50 | 1.4 | 15.9 | 2 | 2.8 | 6.35 | 3.175 | 33.4 | 15 | 0.2 |
| LA421S14-A-UKGI | 174.3 | 100 | 1.4 | 31.8 | 2 | 2.8 | 6.35 | 6.35 | 33.4 | 15 | 0.2 |
| LA421S14-B-UKGI | 174.3 | 100 | 1.4 | 31.8 | 2 | 2.8 | 6.35 | 6.35 | 33.4 | 15 | 0.2 |
| LA421L13-A-TJCA | 369 | 50 | 1.3 | 10 | 3.8 | 6.15 | 6 | 2 | 47.4 | 15 | 0.34 |
| LA421L13-B-TJCA | 369 | 50 | 1.3 | 10 | 3.8 | 6.15 | 6 | 2 | 47.4 | 15 | 0.34 |
| LA421L18-A-TJCA | 369 | 50 | 1.8 | 10 | 1.75 | 3.25 | 6 | 2 | 47.4 | 15 | 0.34 |
| LA421L18-B-TJCA | 369 | 50 | 1.8 | 10 | 1.75 | 3.4 | 6 | 2 | 47.4 | 15 | 0.34 |
| LA421L18-B-UKGI | 275.1 | 80 | 1.8 | 31.8 | 1.75 | 3.4 | 6.35 | 6.35 | 47.4 | 15 | 0.34 |



LA42

Non-captive linear actuator – NEMA 17

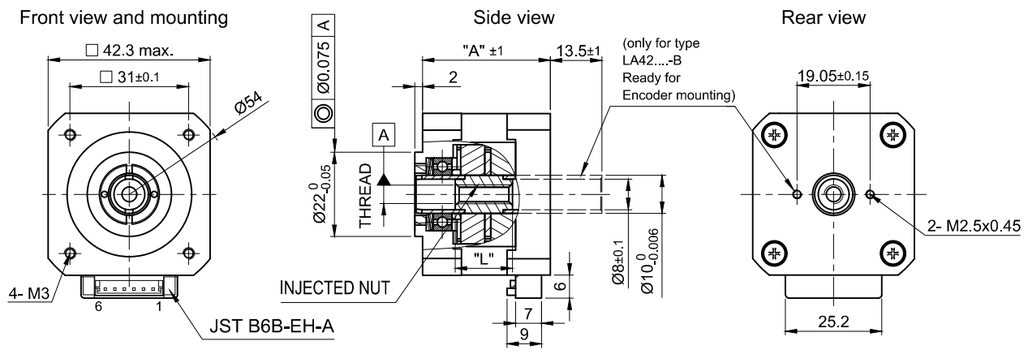


## ACCESSORIES

**SCREW-ABA-TJBA-200** Lead screw with trapezoidal thread
**SCREW-ABA-TJBA-300** Lead screw with trapezoidal thread
**SCREW-AAA-TJBA-1000** Lead screw with trapezoidal thread
**SCREW-ABA-TJCA-200** Lead screw with trapezoidal thread
**SCREW-ABA-TJCA-300** Lead screw with trapezoidal thread
**SCREW-AAA-TJCA-1000** Lead screw with trapezoidal thread
**SCREW-ABA-UIEV-200** Lead screw with ACME thread
**SCREW-ABA-UIEV-300** Lead screw with ACME thread
**SCREW-AAA-UIEV-1000** Lead screw with ACME thread
**SCREW-ABA-UKAS-200** Lead screw with ACME thread
**SCREW-ABA-UKAS-300** Lead screw with ACME thread
**SCREW-AAA-UKAS-1000** Lead screw with ACME thread
**SCREW-ABA-UKBN-200** Lead screw with ACME thread
**SCREW-ABA-UKBN-300** Lead screw with ACME thread
**SCREW-AAA-UKBN-1000** Lead screw with ACME thread
**SCREW-ABA-UKDE-200** Lead screw with ACME thread
**SCREW-ABA-UKDE-300** Lead screw with ACME thread
**SCREW-AAA-UKDE-1000** Lead screw with ACME thread
**SCREW-ABA-UKGI-200** Lead screw with ACME thread
**SCREW-ABA-UKGI-300** Lead screw with ACME thread
**SCREW-AAA-UKGI-1000** Lead screw with ACME thread
**ZK-JST-EHR-6-0.5M-S** Motor cable, 0.5m
**NANOLUBE-50G** Bearing grease

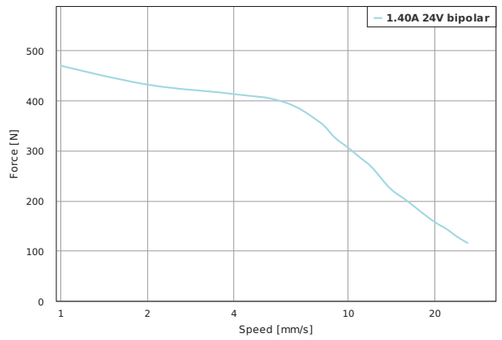
## DIMENSIONS (IN MM)

**LA42**

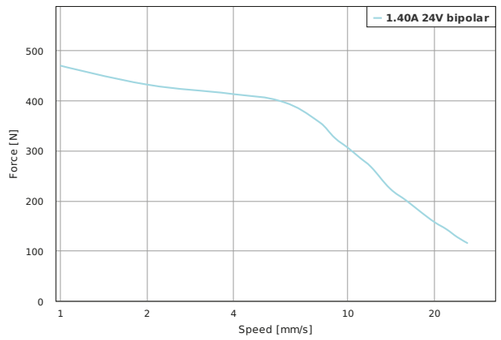


## FORCE-VELOCITY CURVES

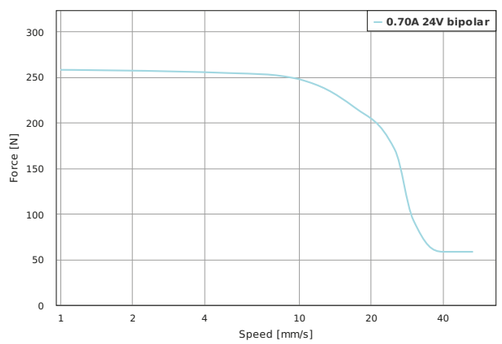
### LA421S14-A-TJBA



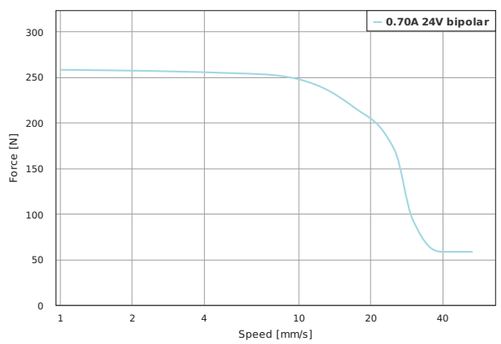

### LA421S14-B-TJBA



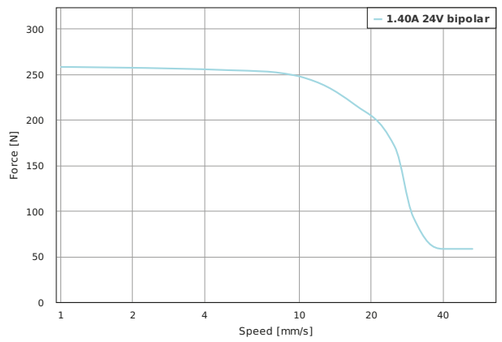

### LA421S07-A-TJCA



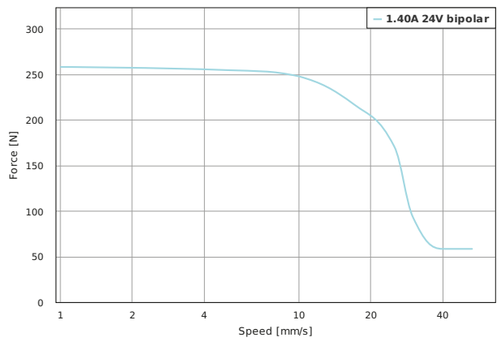

### LA421S07-B-TJCA




### LA421S14-A-TJCA




### LA421S14-B-TJCA

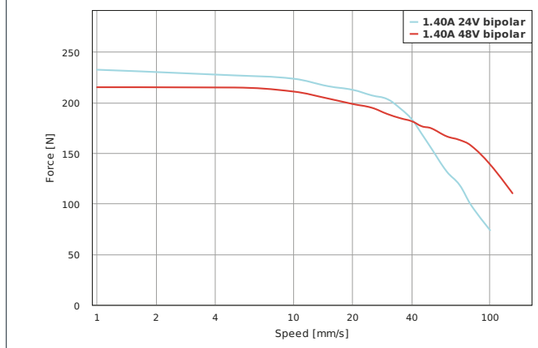




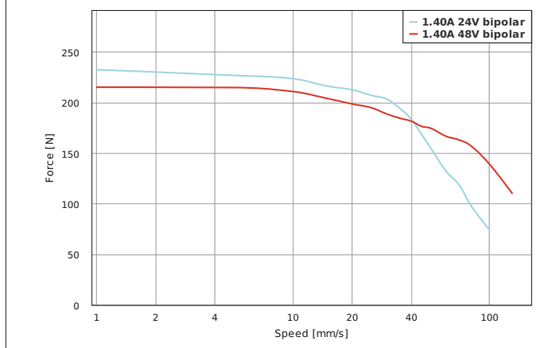



## FORCE-VELOCITY CURVES

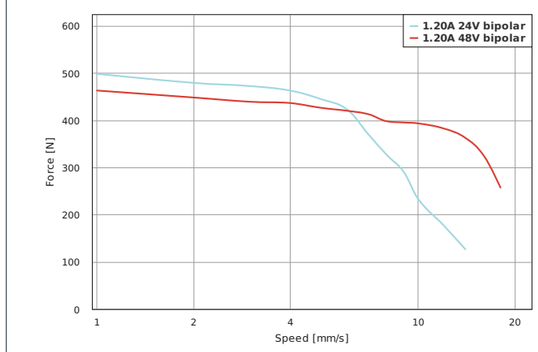
### LA421S14-A-UIEV



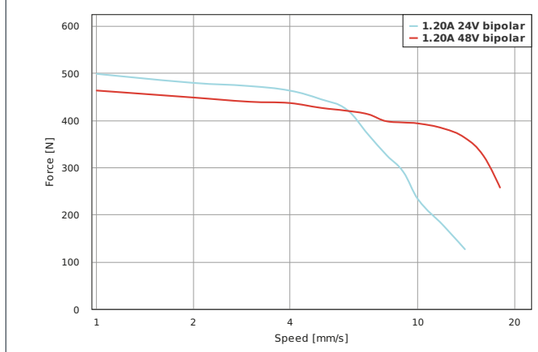

### LA421S14-B-UIEV



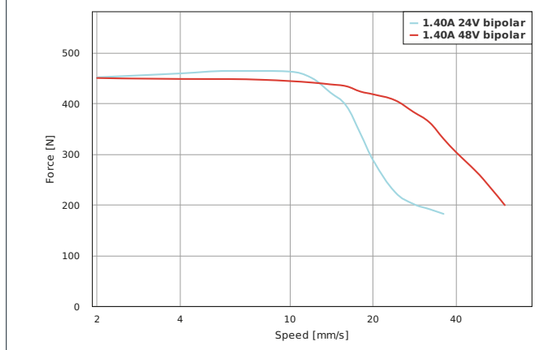

### LA421S14-A-UKAS



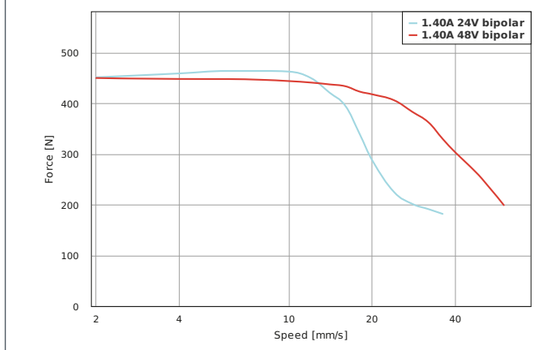

### LA421S14-B-UKAS




### LA421S14-A-UKBN

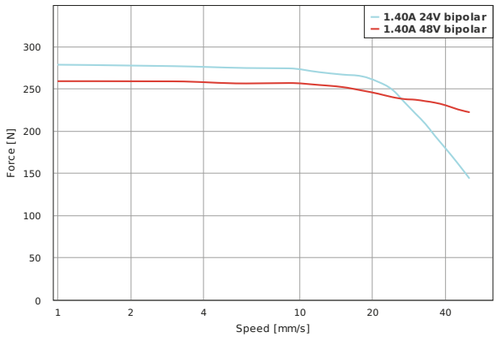



### LA421S14-B-UKBN

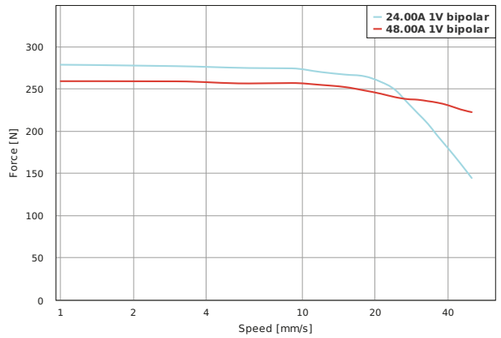


## FORCE-VELOCITY CURVES

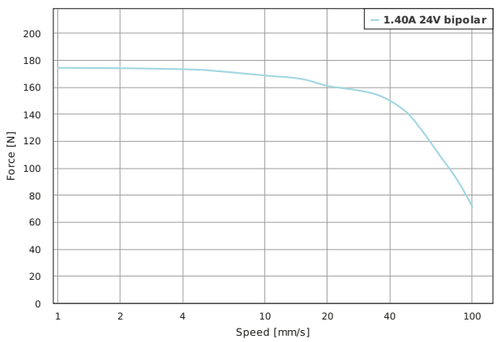
### LA421S14-A-UKDE



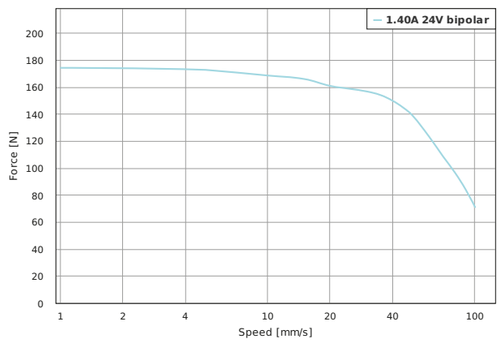

### LA421S14-B-UKDE



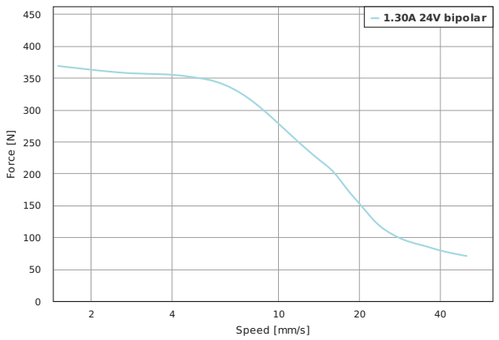

### LA421S14-A-UKGI



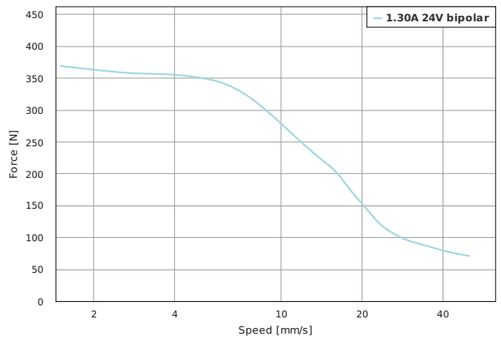

### LA421S14-B-UKGI




### LA421L13-A-TJCA




### LA421L13-B-TJCA

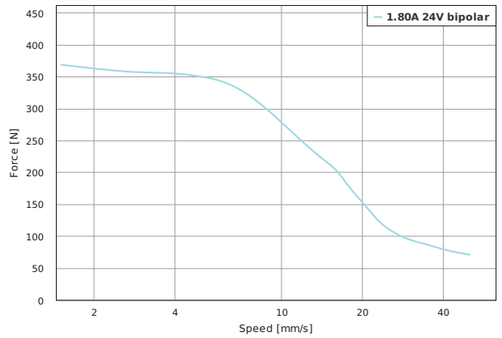




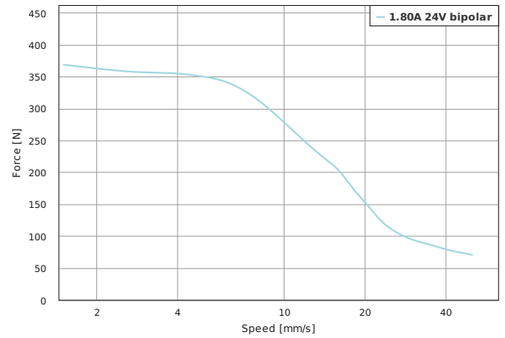

LA42
Non-captive linear actuator – NEMA 17

## FORCE-VELOCITY CURVES

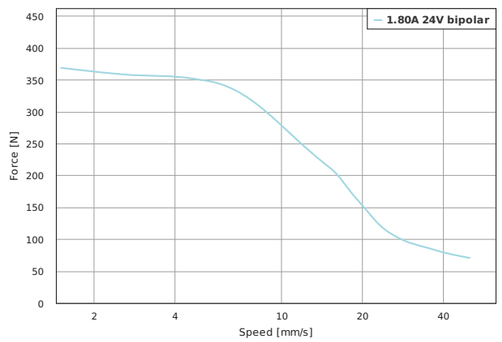
### LA421L18-A-TJCA



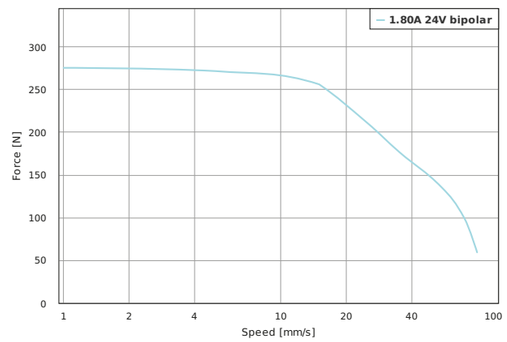

### LA421L18-B-TJCA




### LA421L18-B-TJCA




### LA421L18-B-UKGI



# LGA42

## Captive linear actuator – NEMA 17

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Stroke Length „X“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LGA421S14-A-TJBA-019 | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 33.4 | 19.05 | 0.24 |
| LGA421S14-B-TJBA-019 | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 33.4 | 19.05 | 0.24 |
| LGA421S14-A-TJBA-038 | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 33.4 | 38.1 | 0.25 |
| LGA421S14-B-TJBA-038 | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 33.4 | 38.1 | 0.25 |
| LGA421S14-A-TJCA-019 | 258.3 | 55 | 1.4 | 10 | 2 | 2.8 | 6 | 2 | 33.4 | 19.05 | 0.24 |
| LGA421S14-B-TJCA-019 | 258.3 | 55 | 1.4 | 10 | 2 | 2.8 | 6 | 2 | 33.4 | 19.05 | 0.24 |
| LGA421S14-A-TJCA-038 | 258.3 | 55 | 1.4 | 10 | 2 | 2.8 | 6 | 2 | 33.4 | 38.1 | 0.25 |
| LGA421S14-B-TJCA-038 | 258.3 | 55 | 1.4 | 10 | 2 | 2.8 | 6 | 2 | 33.4 | 38.1 | 0.25 |
| LGA421S14-A-UIEV-019 | 232.6 | 100 | 1.4 | 24.4 | 2 | 2.8 | 5.56 | 4.877 | 33.4 | 19.05 | 0.24 |
| LGA421S14-B-UIEV-019 | 232.6 | 100 | 1.4 | 24.4 | 2 | 2.8 | 5.56 | 4.877 | 33.4 | 19.05 | 0.24 |
| LGA421S14-A-UIEV-038 | 232.6 | 100 | 1.4 | 24.4 | 2 | 2.8 | 5.56 | 4.877 | 33.4 | 38.1 | 0.25 |
| LGA421S14-B-UIEV-038 | 232.6 | 100 | 1.4 | 24.4 | 2 | 2.8 | 5.56 | 4.877 | 33.4 | 38.1 | 0.25 |
| LGA421S14-A-UKAS-019 | 498.5 | 14 | 1.4 | 4 | 2 | 2.8 | 6.35 | 0.79 | 33.4 | 19.05 | 0.24 |
| LGA421S14-B-UKAS-019 | 498.5 | 14 | 1.4 | 4 | 2 | 2.8 | 6.35 | 0.79 | 33.4 | 19.05 | 0.24 |
| LGA421S14-A-UKAS-038 | 498.5 | 14 | 1.4 | 4 | 2 | 2.8 | 6.35 | 0.79 | 33.4 | 38.1 | 0.25 |
| LGA421S14-B-UKAS-038 | 498.5 | 14 | 1.4 | 4 | 2 | 2.8 | 6.35 | 0.79 | 33.4 | 38.1 | 0.25 |
| LGA421S14-A-UKBN-019 | 451.6 | 36 | 1.4 | 7.9 | 2 | 2.8 | 6.35 | 1.59 | 33.4 | 19.05 | 0.24 |
| LGA421S14-B-UKBN-019 | 451.6 | 36 | 1.4 | 7.9 | 2 | 2.8 | 6.35 | 1.59 | 33.4 | 19.05 | 0.24 |
| LGA421S14-A-UKBN-038 | 451.6 | 36 | 1.4 | 7.9 | 2 | 2.8 | 6.35 | 1.59 | 33.4 | 38.1 | 0.25 |
| LGA421S14-B-UKBN-038 | 451.6 | 36 | 1.4 | 8 | 2 | 2.8 | 6.35 | 1.59 | 33.4 | 38.1 | 0.25 |
| LGA421S14-A-UKDE-019 | 278.7 | 50 | 1.4 | 15.9 | 2 | 2.8 | 6.35 | 3.175 | 33.4 | 19.05 | 0.24 |
| LGA421S14-B-UKDE-019 | 278.7 | 50 | 1.4 | 15.9 | 2 | 2.8 | 6.35 | 3.175 | 33.4 | 19.05 | 0.24 |
| LGA421S14-A-UKDE-038 | 278.7 | 50 | 1.4 | 15.9 | 2 | 2.8 | 6.35 | 3.175 | 33.4 | 38.1 | 0.25 |
| LGA421S14-B-UKDE-038 | 278.7 | 50 | 1.4 | 15.9 | 2 | 2.8 | 6.35 | 3.175 | 33.4 | 38.1 | 0.25 |
| LGA421S14-A-UKGI-019 | 174.3 | 100 | 1.4 | 31.8 | 2 | 2.8 | 6.35 | 6.35 | 33.4 | 19.05 | 0.24 |
| LGA421S14-B-UKGI-019 | 174.3 | 100 | 1.4 | 31.8 | 2 | 2.8 | 6.35 | 6.35 | 33.4 | 19.05 | 0.24 |
| LGA421S14-A-UKGI-038 | 174.3 | 100 | 1.4 | 31.8 | 2 | 2.8 | 6.35 | 6.35 | 33.4 | 38.1 | 0.25 |
| LGA421S14-B-UKGI-038 | 174.3 | 100 | 1.4 | 31.8 | 2 | 2.8 | 6.35 | 6.35 | 33.4 | 38.1 | 0.25 |



LGA42

Captive linear actuator – NEMA 17

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Stroke Length „X“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LGA421L18-B-UKGI-025 | 275 | 80 | 1.8 | 31.8 | 1.75 | 3.4 | 6.35 | 6.35 | 47.4 | 25.4 | 0.34 |
| LGA421L18-B-UKGI-063 | 275 | 80 | 1.8 | 31.8 | 1.75 | 3.4 | 6.35 | 6.35 | 47.4 | 63.5 | 0.39 |

## ORDER IDENTIFIER

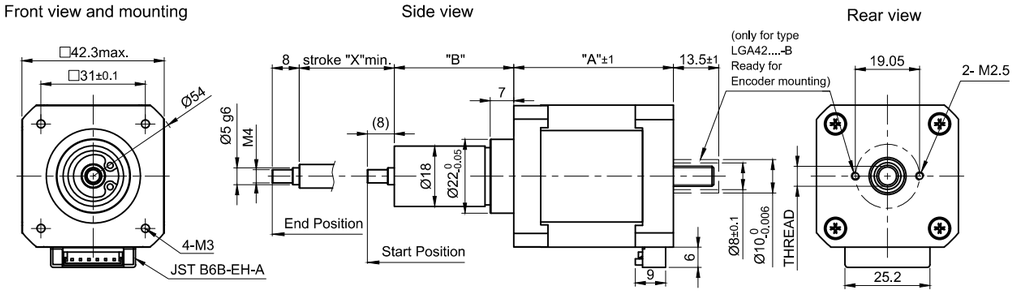
**LGA421S14-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**ZK-JST-EHR-6-0.5M-S**
Motor cable, 0.5m

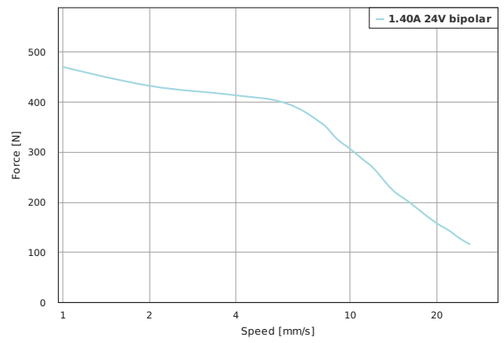
## DIMENSIONS (IN MM)

**LGA42**

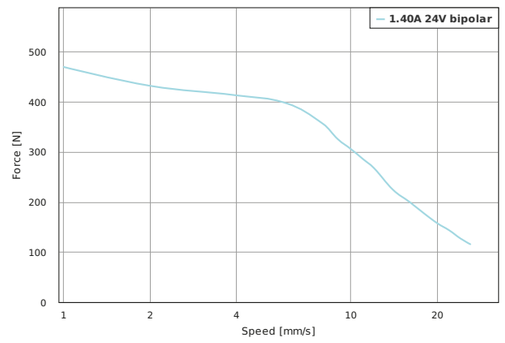



## FORCE-VELOCITY CURVES

**LGA421S14-A-TJBA-019**

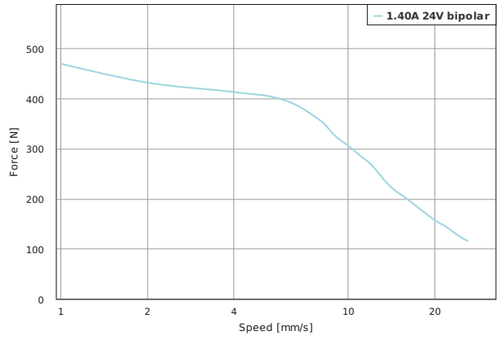



**LGA421S14-B-TJBA-019**

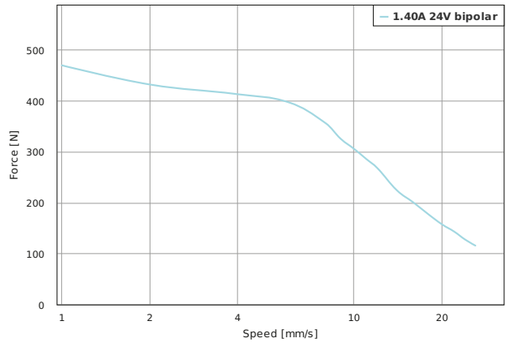


## FORCE-VELOCITY CURVES

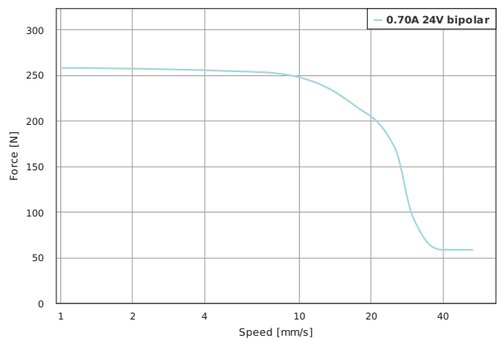
### LGA421S14-A-TJBA-038



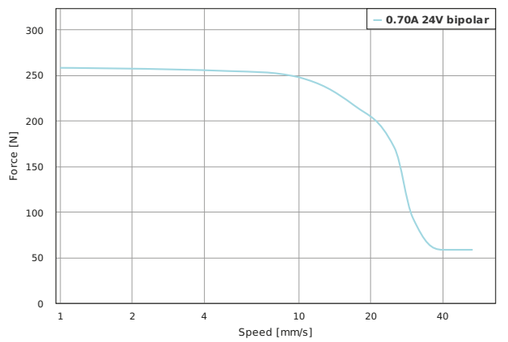

### LGA421S14-B-TJBA-038



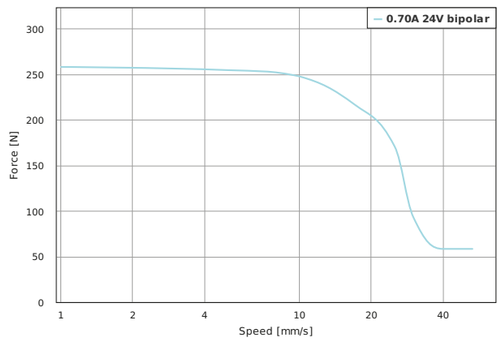

### LGA421S14-A-TJCA-019




### LGA421S14-B-TJCA-019




### LGA421S14-A-TJCA-038

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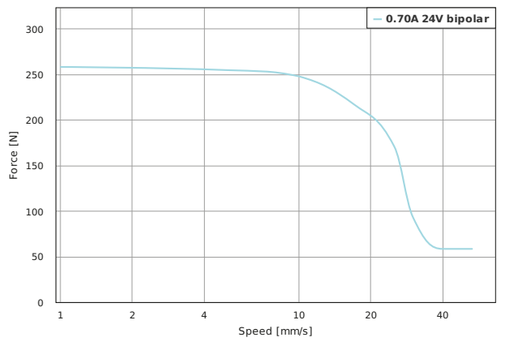


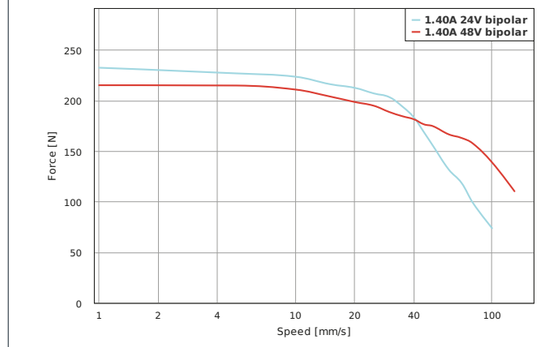



LGA42
Captive linear actuator – NEMA 17



## FORCE-VELOCITY CURVES

### LGA421S14-A-UIEV-019

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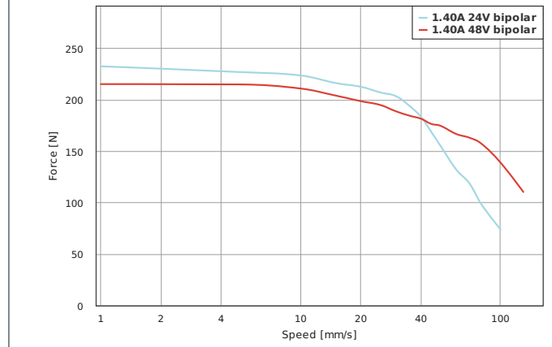
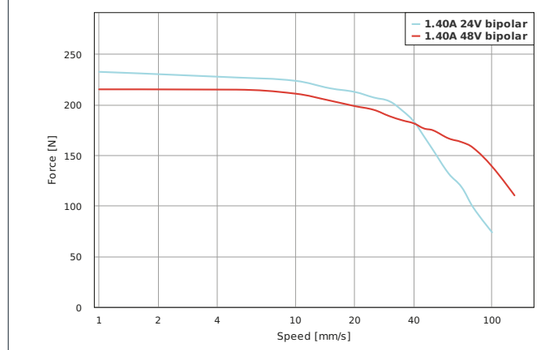
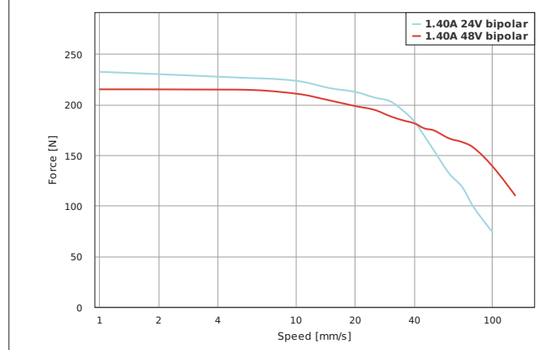


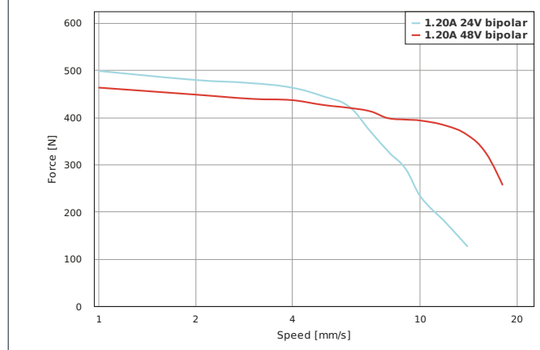

### LGA421S14-A-UIEV-038



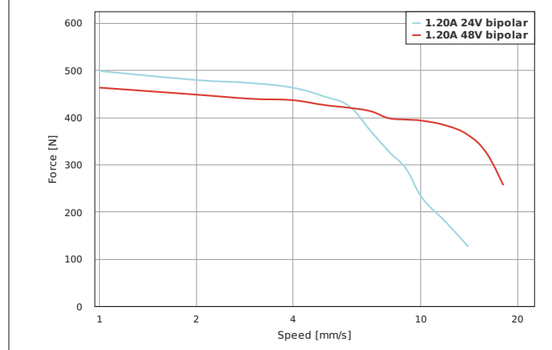

### LGA421S14-B-UIEV-038




### LGA421S14-A-UKAS-019

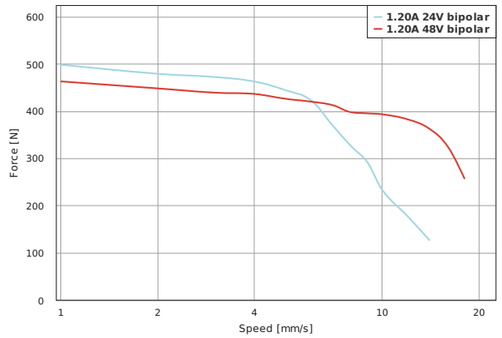



### LGA421S14-B-UKAS-019

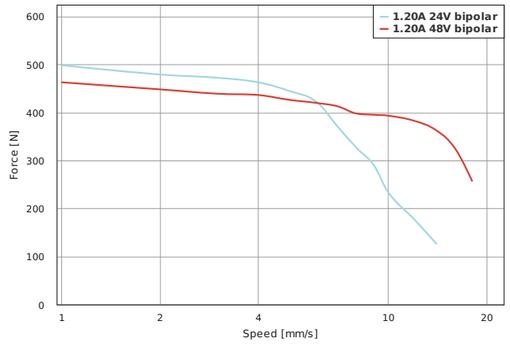


## FORCE-VELOCITY CURVES

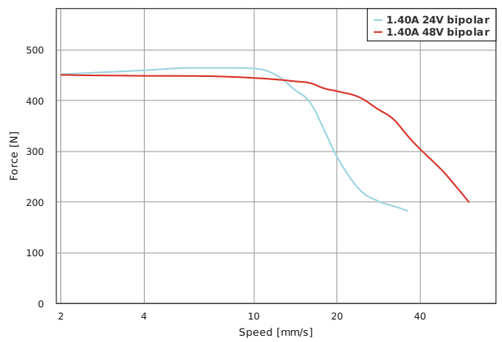
### LGA421S14-A-UKAS-038



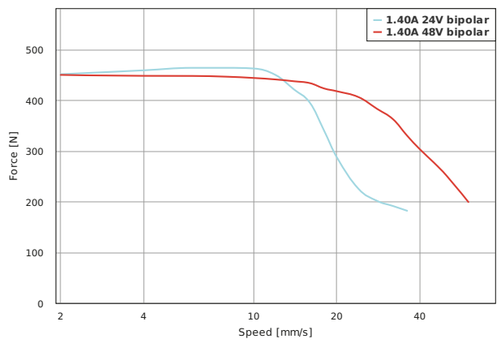

### LGA421S14-B-UKAS-038




### LGA421S14-A-UKBN-019




### LGA421S14-B-UKBN-019

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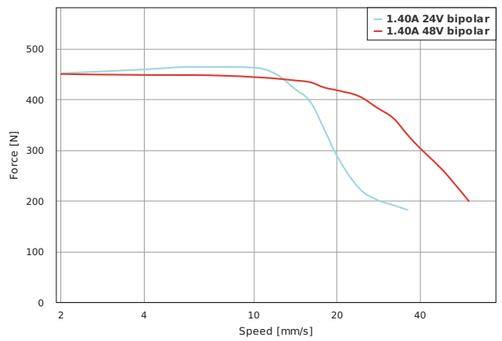


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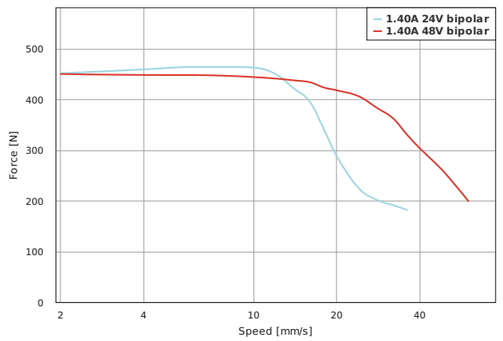
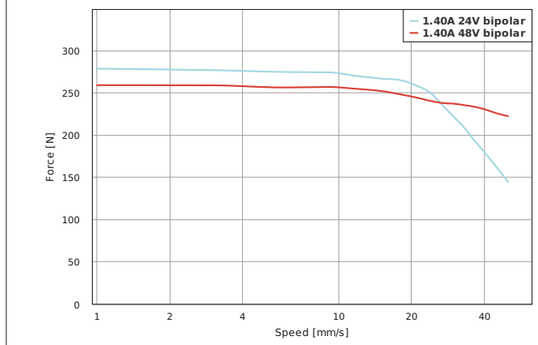





LGA42
Captive linear actuator – NEMA 17

## FORCE-VELOCITY CURVES

### LGA421S14-A-UKDE-019

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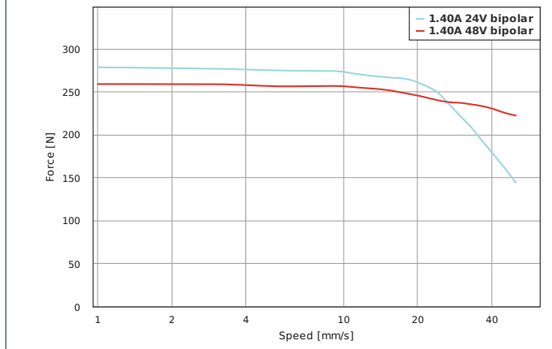
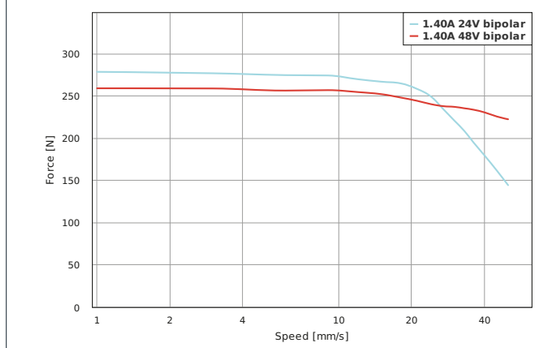
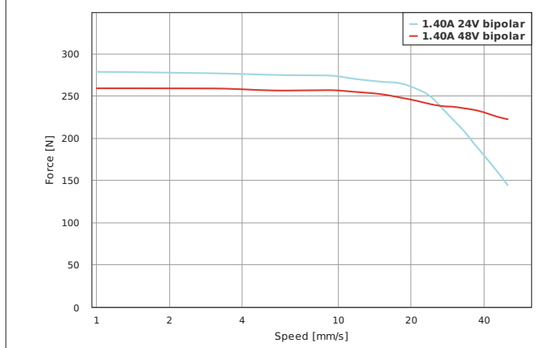


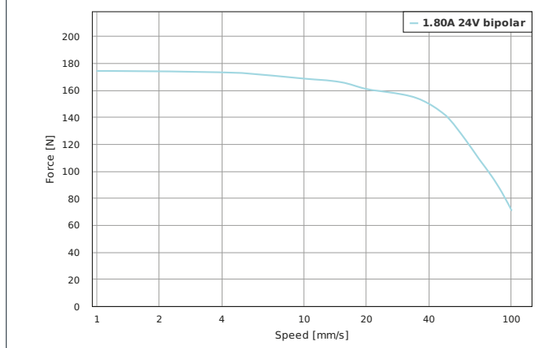

### LGA421S14-A-UKDE-038




### LGA421S14-B-UKDE-038




### LGA421S14-A-UKGI-019

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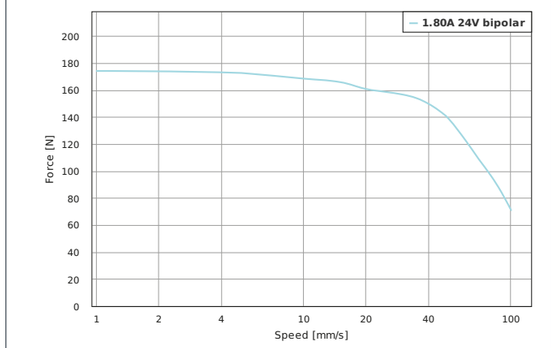
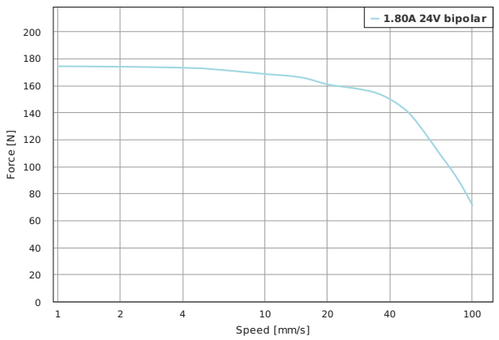
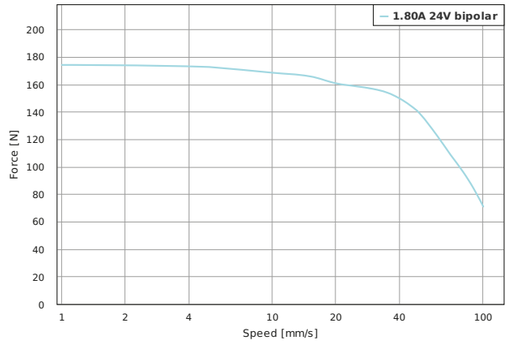


## FORCE-VELOCITY CURVES

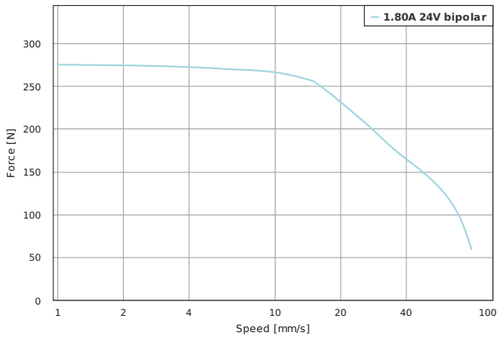
LGA421S14-A-UKGI-038




LGA421S14-B-UKGI-038




LGA421L18-B-UKGI-025



# LSA42

## External linear actuator – NEMA 17

## OPTIONS

Controller

Encoder

## ORDER IDENTIFIER

**LSA421S14-**
A-... = Single shaft end
B-... = Double shaft end

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Screw Length „L“ mm | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LSA421S14-A-TJBA-152 | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 152 | 33.4 | 0.26 |
| LSA421S14-B-TJBA-152 | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 152 | 33.4 | 0.26 |
| LSA421S14-A-TJCA-152 | 258.3 | 55 | 1.4 | 10 | 2 | 2.8 | 6 | 2 | 152 | 33.4 | 0.26 |
| LSA421S14-B-TJCA-152 | 469.8 | 26 | 1.4 | 5 | 2 | 2.8 | 6 | 1 | 152 | 33.4 | 0.26 |
| LSA421S14-A-UIEV-152 | 232.6 | 100 | 1.4 | 24.4 | 2 | 2.8 | 5.56 | 4.877 | 152 | 33.4 | 0.26 |
| LSA421S14-B-UIEV-152 | 232.6 | 100 | 1.4 | 24.4 | 2 | 2.8 | 5.56 | 4.877 | 152 | 33.4 | 0.26 |
| LSA421S14-A-UKAS-152 | 498.5 | 14 | 1.4 | 4 | 2 | 2.8 | 6.35 | 0.79 | 152 | 33.4 | 0.26 |
| LSA421S14-B-UKAS-152 | 498.5 | 14 | 1.4 | 4 | 2 | 2.8 | 6.35 | 0.79 | 152 | 33.4 | 0.26 |
| LSA421S14-A-UKBN-152 | 451.6 | 36 | 1.4 | 7.9 | 2 | 2.8 | 6.35 | 1.59 | 152 | 33.4 | 0.26 |
| LSA421S14-B-UKBN-152 | 451.6 | 36 | 1.4 | 7.9 | 2 | 2.8 | 6.35 | 1.59 | 152 | 33.4 | 0.26 |
| LSA421S14-A-UKDE-152 | 278.7 | 50 | 1.4 | 15.9 | 2 | 2.8 | 6.35 | 3.175 | 152 | 33.4 | 0.26 |
| LSA421S14-B-UKDE-152 | 278.7 | 50 | 1.4 | 15.9 | 2 | 2.8 | 6.35 | 3.175 | 152 | 33.4 | 0.26 |
| LSA421S14-A-UKGI-152 | 174.3 | 100 | 1.4 | 31.8 | 2 | 2.8 | 6.35 | 6.35 | 152 | 33.4 | 0.26 |
| LSA421S14-B-UKGI-152 | 174.3 | 100 | 1.4 | 31.8 | 2 | 2.8 | 6.35 | 6.35 | 152 | 33.4 | 0.26 |
| LSA421L18-B-TJCA-152 | 369 | 50 | 1.8 | 10 | 1.75 | 3.4 | 6 | 2 | 152 | 47.4 | 0.4 |
| LSA421L18-B-UKGI-152 | 275 | 80 | 1.8 | 31.8 | 1.75 | 3.4 | 6.35 | 6.35 | 152 | 47.4 | 0.4 |



LSA42

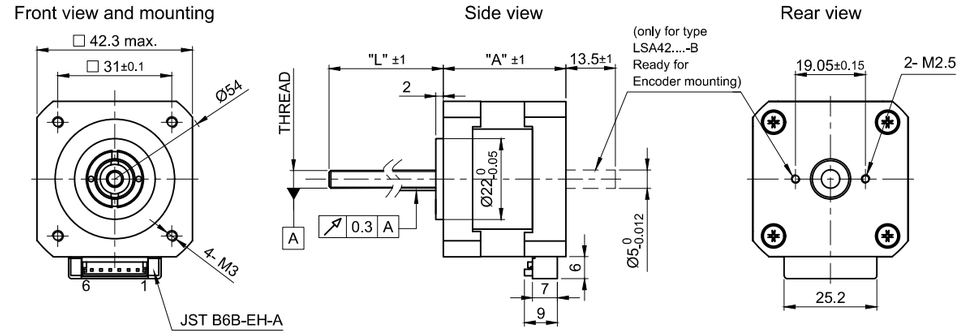
External linear actuator – NEMA 17

## ACCESSORIES

**LSNUT-AAAE-UIEV** Threaded nut
**LSNUT-AAAE-TJBA** Threaded nut
**LSNUT-AAAE-TJCA** Threaded nut
**LSNUT-AAAE-UKAS** Threaded nut
**LSNUT-AAAE-UKBN** Threaded nut
**LSNUT-AAAE-UKDE** Threaded nut
**LSNUT-AAAE-UKGI** Threaded nut
**LSNUT-AEAE-UIEV** Axial anti-backlash threaded nut with helical spring
**LSNUT-AEAE-TJBA** Axial anti-backlash threaded nut with helical spring
**LSNUT-AEAE-TJCA** Axial anti-backlash threaded nut with helical spring
**LSNUT-AEAE-UKAS** Axial anti-backlash threaded nut with helical spring
**LSNUT-AEAE-UKBN** Axial anti-backlash threaded nut with helical spring
**LSNUT-AEAE-UKDE** Axial anti-backlash threaded nut with helical spring
**LSNUT-AEAE-UKGI** Axial anti-backlash threaded nut with helical spring
**LSNUT-AFAE-TJBA** Radial anti-backlash threaded nut with helical spring
**LSNUT-AFAE-TJCA** Radial anti-backlash threaded nut with helical spring
**LSNUT-AFAE-UKAS** Radial anti-backlash threaded nut with helical spring
**LSNUT-AFAE-UKBN** Radial anti-backlash threaded nut with helical spring
**LSNUT-AFAE-UKDE** Radial anti-backlash threaded nut with helical spring
**LSNUT-AFAE-UKGI** Radial anti-backlash threaded nut with helical spring
**LSNUT-AGAE-UIEV** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAE-TJBA** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAE-TJCA** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAE-UKAS** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAE-UKBN** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAE-UKDE** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAE-UKGI** Anti-backlash threaded nut with torsion spring
**ZK-JST-EHR-6-0.5M-S** Motor cable, 0.5m
**NANOLUBE-50G** Bearing grease

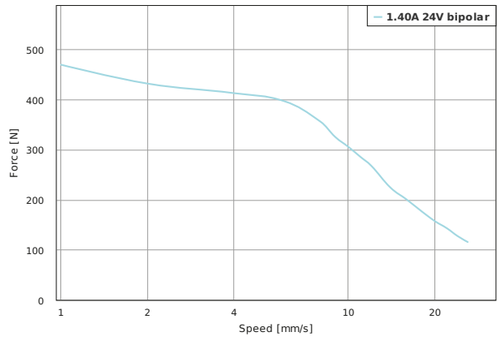
## DIMENSIONS (IN MM)

**LSA42**

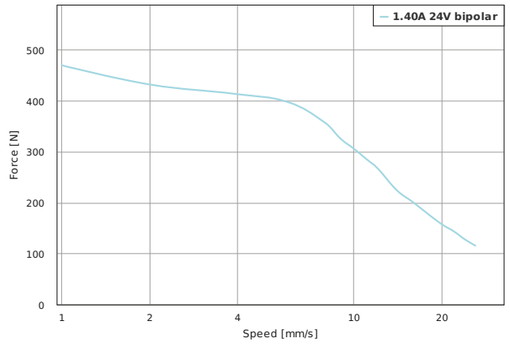


## FORCE-VELOCITY CURVES

### LSA421S14-A-TJBA-152




### LSA421S14-B-TJBA-152

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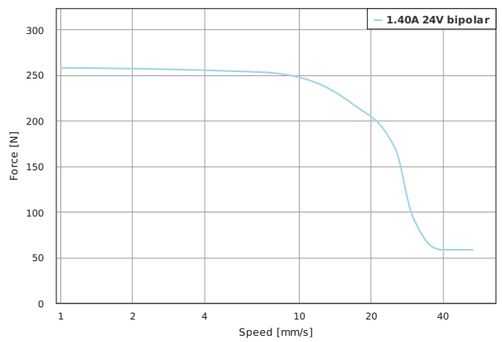


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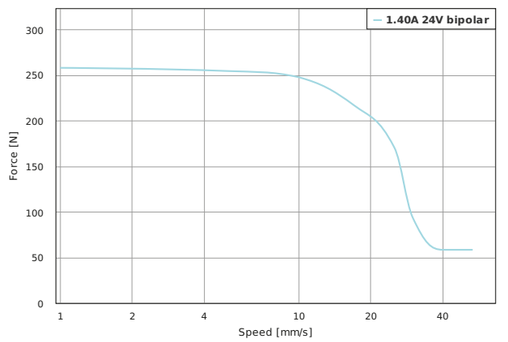


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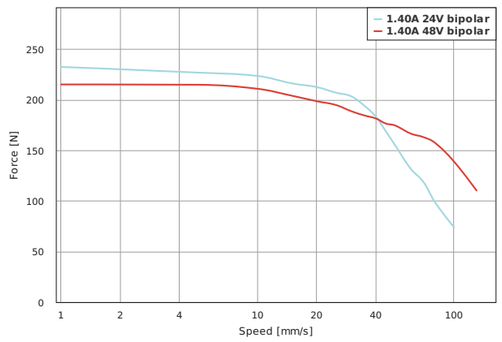


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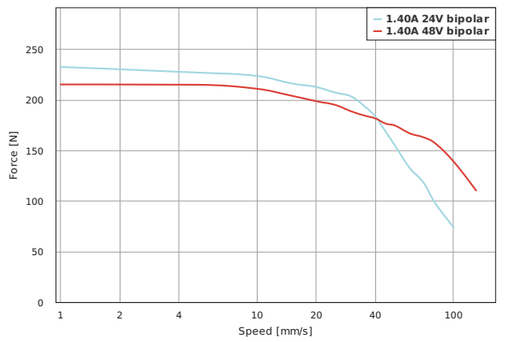


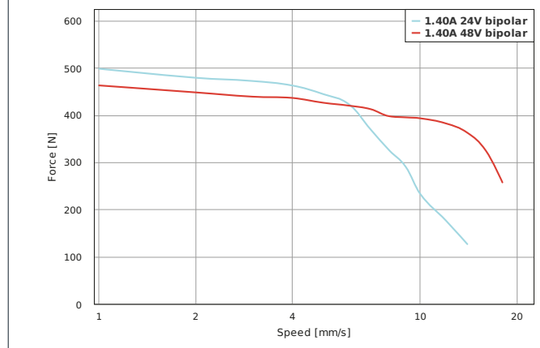



LSA42
External linear actuator – NEMA 17



## FORCE-VELOCITY CURVES

### LSA421S14-A-UKAS-152

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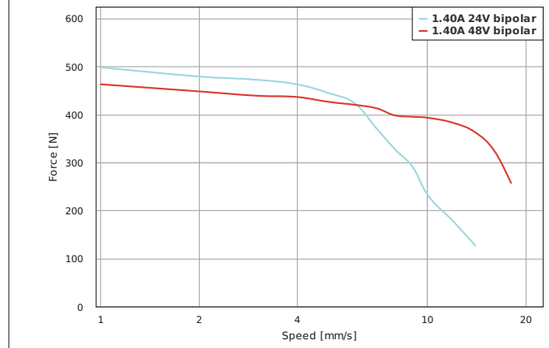


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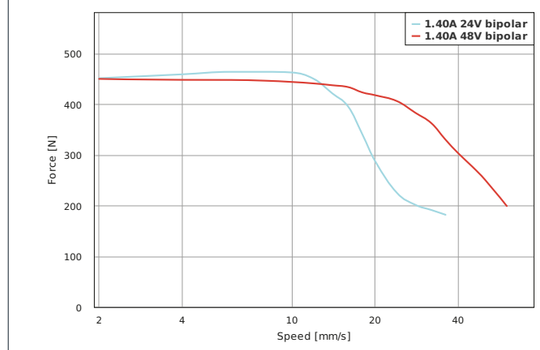


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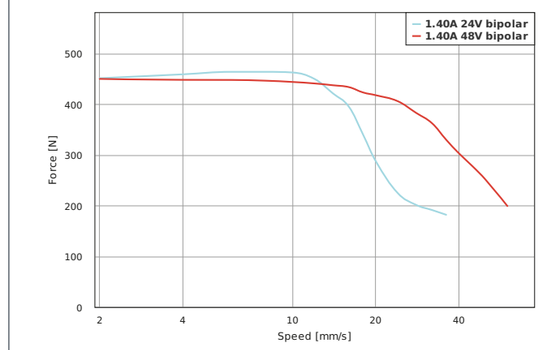


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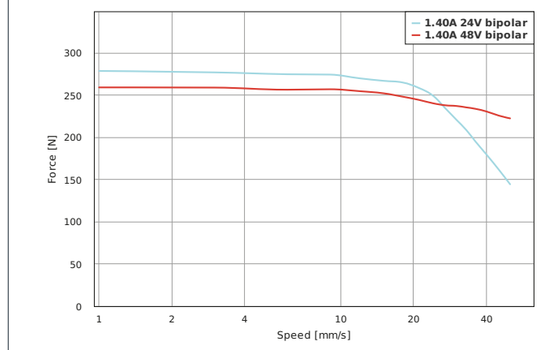


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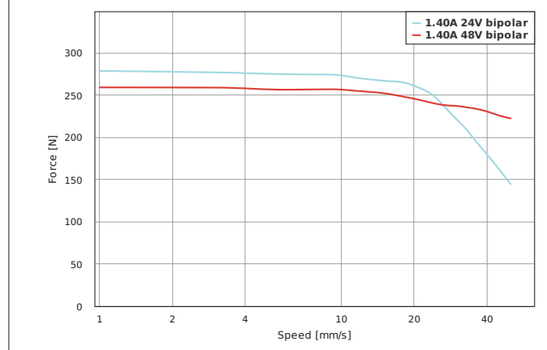
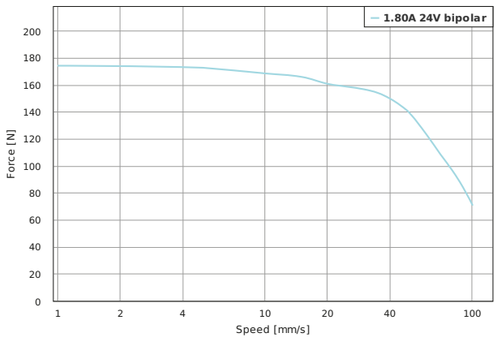


## FORCE-VELOCITY CURVES

### LSA421S14-A-UKGI-152

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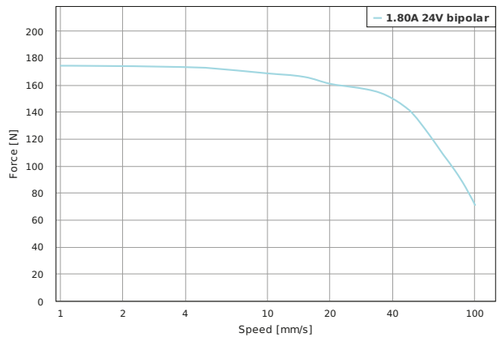
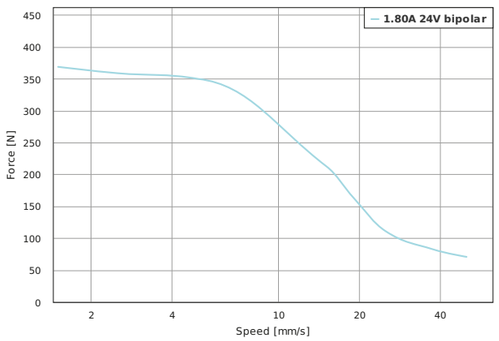
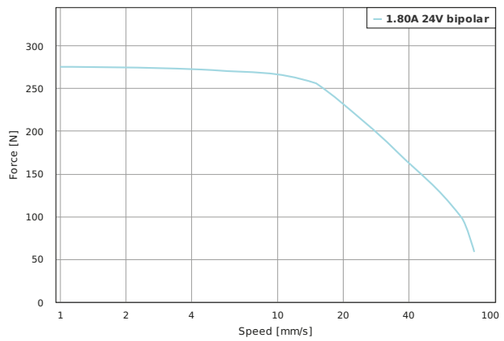



### LSA421L18-B-TJCA-152




### LSA421L18-B-UKGI-152






# Notes

# LA56

## Non-captive linear actuator – NEMA 23

## OPTIONS

Controller

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Socket Length „L“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LA561S20-A-UQBN | 966.3 | 22 | 2 | 7.9 | 1.5 | 4.3 | 9.53 | 1.59 | 50.3 | 22 | 0.65 |
| LA561S20-B-UQBN | 966.3 | 22 | 2 | 7.9 | 1.5 | 4.3 | 9.53 | 1.59 | 50.3 | 22 | 0.65 |
| LA561S20-A-UQKE | 352.2 | 150 | 2 | 50.8 | 1.5 | 4.3 | 9.53 | 10.16 | 50.3 | 22 | 0.65 |
| LA561S20-B-UQKE | 352.2 | 150 | 2 | 50.8 | 1.5 | 4.3 | 9.53 | 10.16 | 50.3 | 22 | 0.65 |
| LA561S20-A-TSCA | 938.9 | 30 | 2 | 10 | 1.5 | 4.3 | 10 | 2 | 50.3 | 22 | 0.65 |
| LA561S20-B-TSCA | 938.9 | 30 | 2 | 10 | 1.5 | 4.3 | 10 | 2 | 50.3 | 22 | 0.65 |
| LA561S20-A-TSGA | 476.7 | 100 | 2 | 30 | 1.5 | 4.3 | 10 | 6 | 50.3 | 22 | 0.65 |
| LA561S20-B-TSGA | 476.7 | 100 | 2 | 30 | 1.5 | 4.3 | 10 | 6 | 50.3 | 22 | 0.65 |

## ORDER IDENTIFIER

**LA561S20-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**SCREW-ABA-TSCA-200** Lead screw with trapezoidal thread
**SCREW-ABA-TSCA-300** Lead screw with trapezoidal thread
**SCREW-AAA-TSCA-1000** Lead screw with trapezoidal thread
**SCREW-ABA-TSGA-200** Lead screw with trapezoidal thread
**SCREW-ABA-TSGA-300** Lead screw with trapezoidal thread
**SCREW-AAA-TSGA-1000** Lead screw with trapezoidal thread
**SCREW-ABA-UQBN-200** Lead screw with ACME thread
**SCREW-ABA-UQBN-300** Lead screw with ACME thread
**SCREW-AAA-UQBN-1000** Lead screw with ACME thread
**SCREW-ABA-UQKE-200** Lead screw with ACME thread
**SCREW-ABA-UQKE-300** Lead screw with ACME thread
**SCREW-AAA-UQKE-1000** Lead screw with ACME thread
**ZK-VHR-6-300-4** Motor cable SCA56, SCB56, LA56, LSA56, 0.3m
**NANOLUBE-50G** Bearing grease

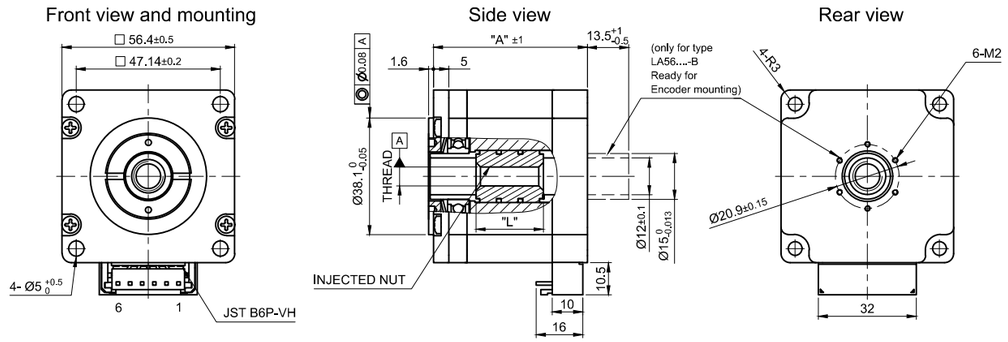


LA56

Non-captive linear actuator – NEMA 23

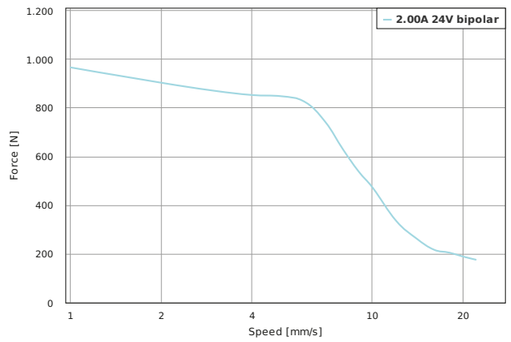
## DIMENSIONS (IN MM)

**LA56**

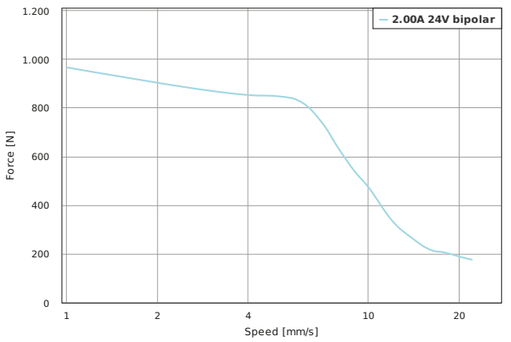



## FORCE-VELOCITY CURVES

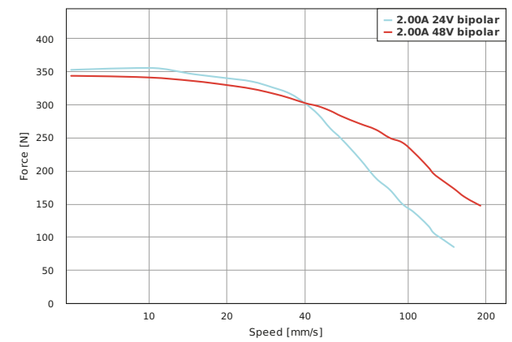
**LA561S20-A-UQBN**



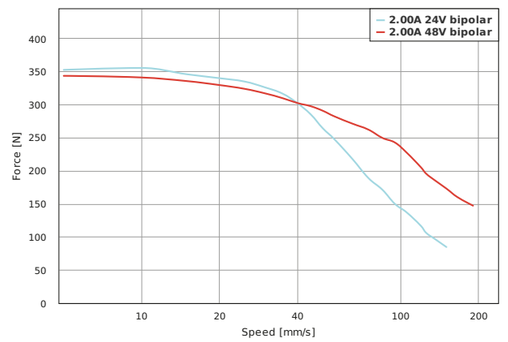

**LA561S20-B-UQBN**




**LA561S20-A-UQKE**

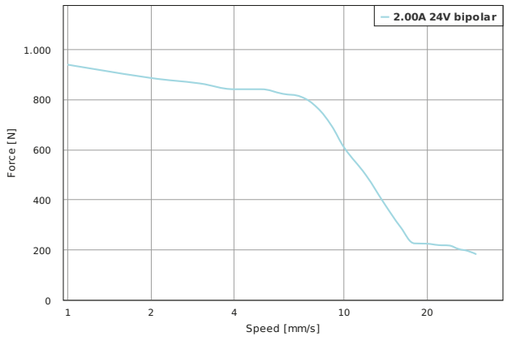



**LA561S20-B-UQKE**

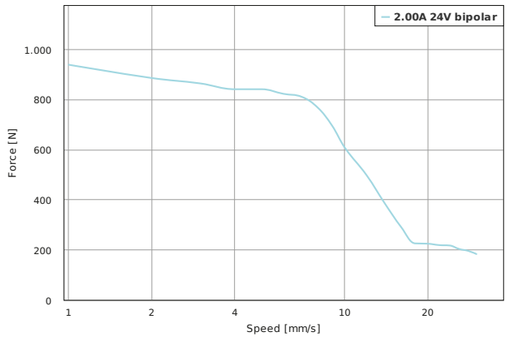


## FORCE-VELOCITY CURVES

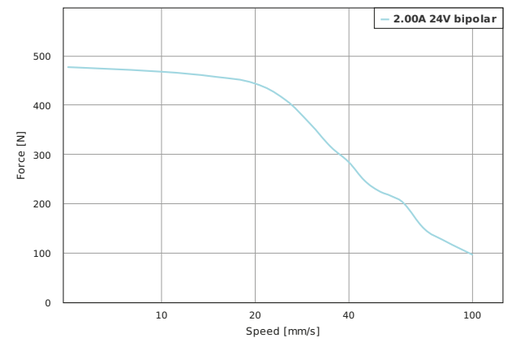
### LA561S20-A-TSCA



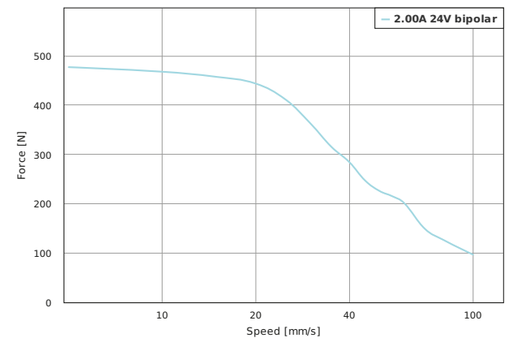

### LA561S20-B-TSCA




### LA561S20-A-TSGA




### LA561S20-B-TSGA






# Notes

# LGA56

## Captive linear actuator – NEMA 23

## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Length „A“ mm | Stroke Length „X“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LGA561S20-A-UQBN-019 | 966.3 | 22 | 2 | 7.9 | 1.5 | 4.3 | 9.53 | 1.59 | 50.3 | 19.05 | 0.73 |
| LGA561S20-B-UQBN-019 | 966.3 | 22 | 2 | 7.9 | 1.5 | 4.3 | 9.53 | 1.59 | 50.3 | 19.05 | 0.73 |
| LGA561S20-A-UQBN-038 | 966.3 | 22 | 2 | 7.9 | 1.5 | 4.3 | 9.53 | 1.59 | 50.3 | 38.1 | 0.75 |
| LGA561S20-B-UQBN-038 | 966.3 | 22 | 2 | 7.9 | 1.5 | 4.3 | 9.53 | 1.59 | 50.3 | 38.1 | 0.75 |
| LGA561S20-A-UQKE-019 | 352.2 | 150 | 2 | 50.8 | 1.5 | 4.3 | 9.53 | 10.16 | 50.3 | 19.05 | 0.73 |
| LGA561S20-B-UQKE-019 | 352.2 | 150 | 2 | 50.8 | 1.5 | 4.3 | 9.53 | 10.16 | 50.3 | 19.05 | 0.73 |
| LGA561S20-A-UQKE-038 | 352.2 | 150 | 2 | 50.8 | 1.5 | 4.3 | 9.53 | 10.16 | 50.3 | 38.1 | 0.75 |
| LGA561S20-B-UQKE-038 | 352.2 | 150 | 2 | 50.8 | 1.5 | 4.3 | 9.53 | 10.16 | 50.3 | 38.1 | 0.75 |
| LGA561S20-A-TSCA-019 | 938.9 | 30 | 2 | 10 | 1.5 | 4.3 | 10 | 2 | 50.3 | 19.05 | 0.73 |
| LGA561S20-B-TSCA-019 | 938.9 | 30 | 2 | 10 | 1.5 | 4.3 | 10 | 2 | 50.3 | 19.05 | 0.73 |
| LGA561S20-A-TSCA-038 | 938.9 | 30 | 2 | 10 | 1.5 | 4.3 | 10 | 2 | 50.3 | 38.1 | 0.75 |
| LGA561S20-B-TSCA-038 | 938.9 | 30 | 2 | 10 | 1.5 | 4.3 | 10 | 2 | 50.3 | 38.1 | 0.75 |
| LGA561S20-A-TSGA-019 | 476.7 | 100 | 2 | 30 | 1.5 | 4.3 | 10 | 6 | 50.3 | 19.05 | 0.73 |
| LGA561S20-B-TSGA-019 | 476.7 | 100 | 2 | 30 | 1.5 | 4.3 | 10 | 6 | 50.3 | 19.05 | 0.73 |
| LGA561S20-A-TSGA-038 | 476.7 | 100 | 2 | 30 | 1.5 | 4.3 | 10 | 6 | 50.3 | 38.1 | 0.75 |
| LGA561S20-B-TSGA-038 | 476.7 | 100 | 2 | 30 | 1.5 | 4.3 | 10 | 6 | 50.3 | 38.1 | 0.75 |

## ORDER IDENTIFIER

**LGA561S20-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**ZK-VHR-6-300-4** Motor cable SCA56, SCB56, LA56, LSA56, 0.3m

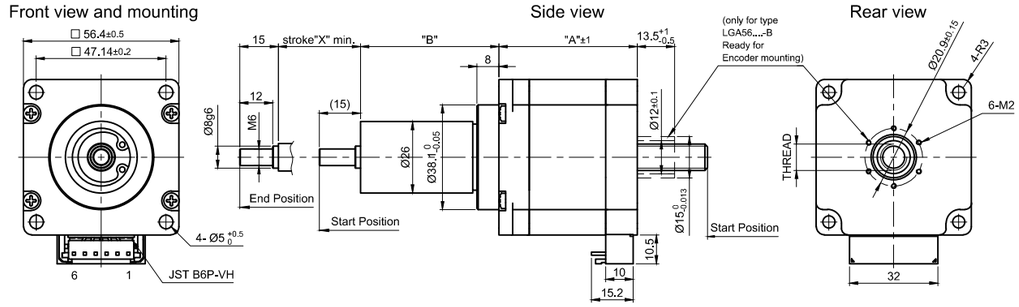


LGA56

Captive linear actuator – NEMA 23

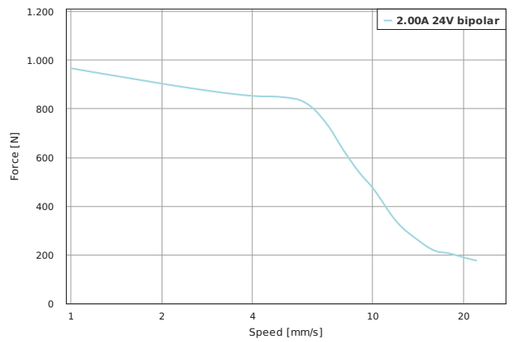
## DIMENSIONS (IN MM)

**LGA56**

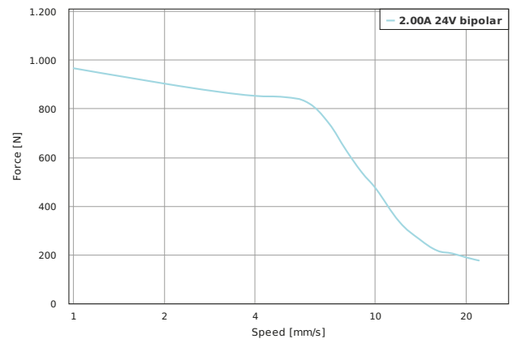



## FORCE-VELOCITY CURVES

**LGA561S20-A-UQBN-019**




**LGA561S20-B-UQBN-019**

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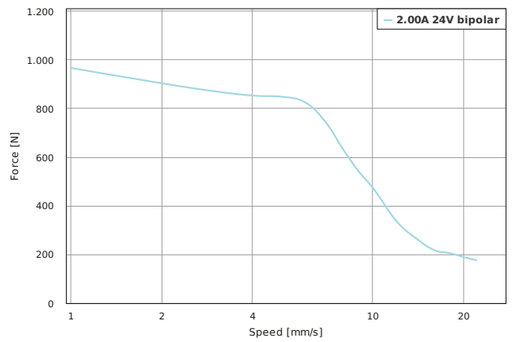
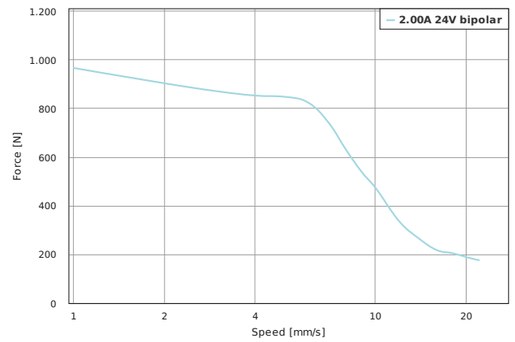
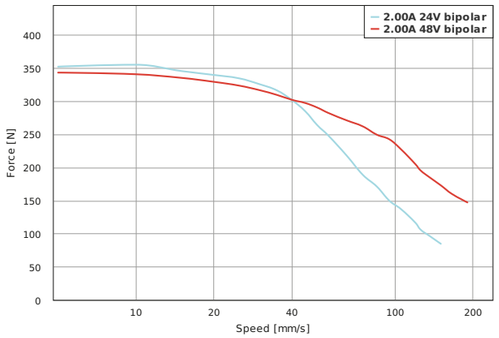



**LGA561S20-B-UQBN-038**

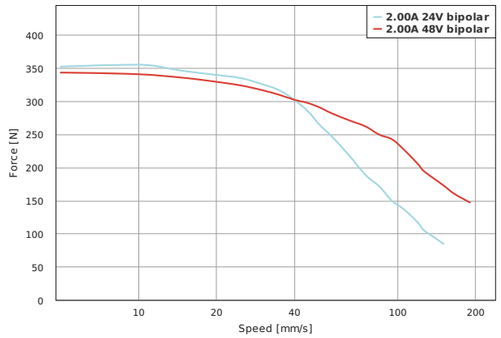


## FORCE-VELOCITY CURVES

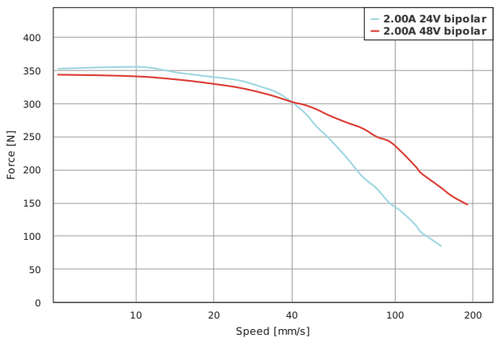
### LGA561S20-A-UQKE-019



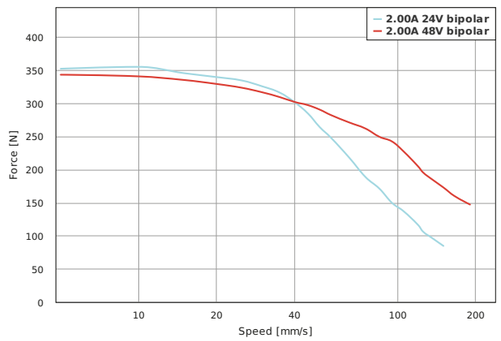

### LGA561S20-B-UQKE-019



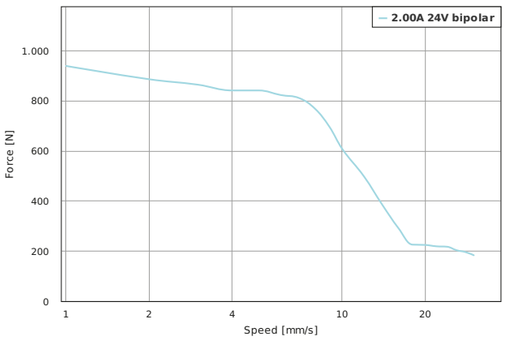

### LGA561S20-A-UQKE-038



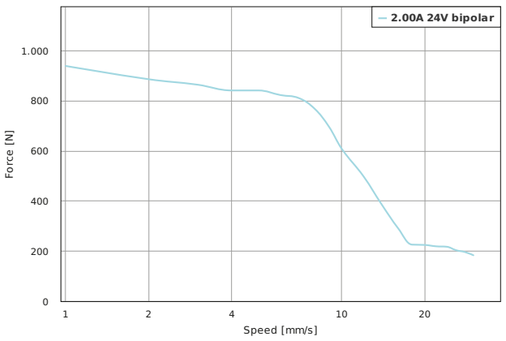

### LGA561S20-B-UQKE-038




### LGA561S20-A-TSCA-019




### LGA561S20-B-TSCA-019



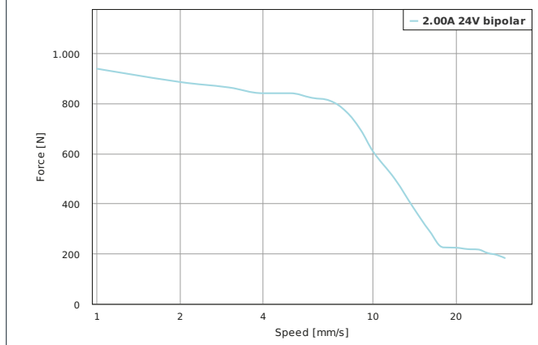



LGA56
Captive linear actuator – NEMA 23

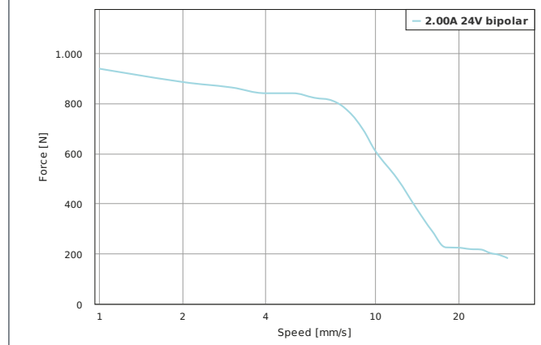


## FORCE-VELOCITY CURVES

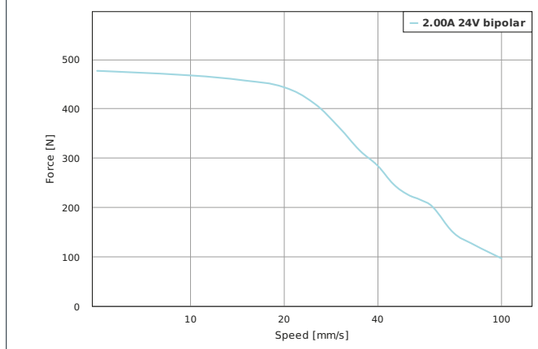
### LGA561S20-A-TSCA-038



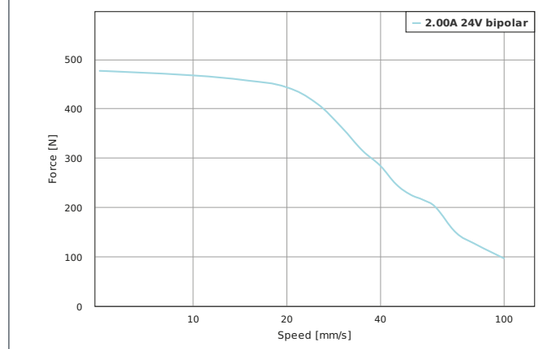

### LGA561S20-B-TSCA-038



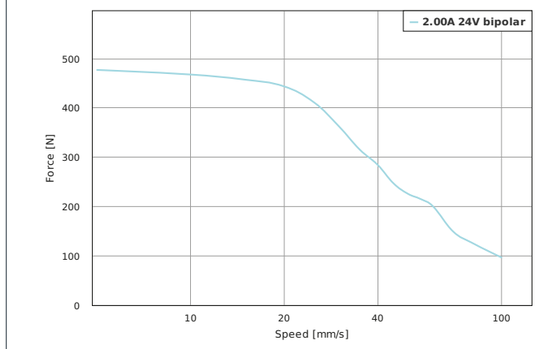

### LGA561S20-A-TSGA-019



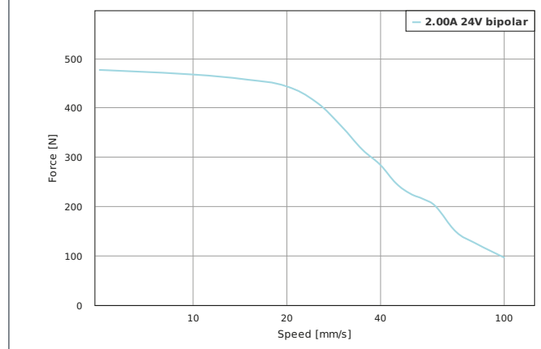

### LGA561S20-B-TSGA-019




### LGA561S20-A-TSGA-038

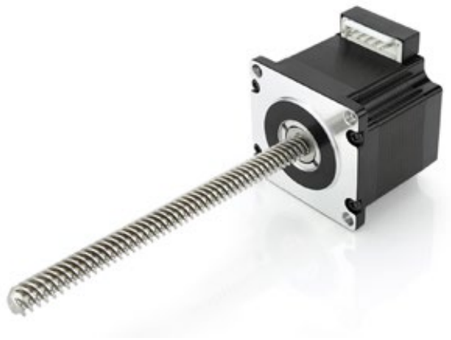



### LGA561S20-B-TSGA-038



# LSA56

## External linear actuator – NEMA 23



## OPTIONS

Controller

Encoder

## VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Diameter mm | Thread Lead mm | Screw Length „L“ mm |
|---|---|---|---|---|---|---|---|---|---|
| LSA561S20-A-UQBN-152 | 966.3 | 22 | 2 | 7.9 | 1.5 | 4.3 | 9.53 | 1.59 | 152 |
| LSA561S20-B-UQBN-152 | 966.3 | 22 | 2 | 7.9 | 1.5 | 4.3 | 9.53 | 1.59 | 152 |
| LSA561S20-A-UQKE-152 | 352.2 | 150 | 2 | 50.8 | 1.5 | 4.3 | 9.53 | 10.16 | 152 |
| LSA561S20-B-UQKE-152 | 352.2 | 150 | 2 | 50.8 | 1.5 | 4.3 | 9.53 | 10.16 | 152 |
| LSA561S20-A-TSCA-152 | 938.9 | 30 | 2 | 10 | 1.5 | 4.3 | 10 | 2 | 152 |
| LSA561S20-B-TSCA-152 | 938.9 | 30 | 2 | 10 | 1.5 | 4.3 | 10 | 2 | 152 |
| LSA561S20-A-TSGA-152 | 476.7 | 100 | 2 | 30 | 1.5 | 4.3 | 10 | 6 | 152 |
| LSA561S20-B-TSGA-152 | 476.7 | 100 | 2 | 30 | 1.5 | 4.3 | 10 | 6 | 152 |

## ORDER IDENTIFIER

**LSA561S20-**
A-... = Single shaft end
B-... = Double shaft end

## ACCESSORIES

**LSNUT-AAAG-UQBN** Threaded nut
**LSNUT-AAAG-UQKE** Threaded nut
**LSNUT-AAAG-TSCA** Threaded nut
**LSNUT-AAAG-TSGA** Threaded nut
**LSNUT-AGAJ-UQBN** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAJ-UQKE** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAJ-TSCA** Anti-backlash threaded nut with torsion spring
**LSNUT-AGAJ-TSGA** Anti-backlash threaded nut with torsion spring
**ZK-VHR-6-300-4** Motor cable SCA56, SCB56, LA56, LSA56, 0.3m
**NANOLUBE-50G** Bearing grease

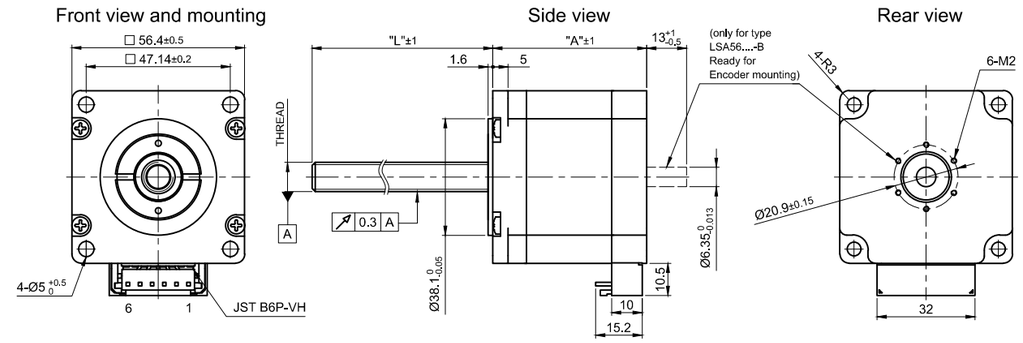


LSA56

External linear actuator – NEMA 23

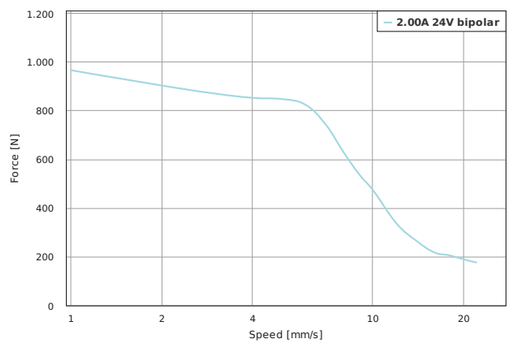
## DIMENSIONS (IN MM)

**LSA56**

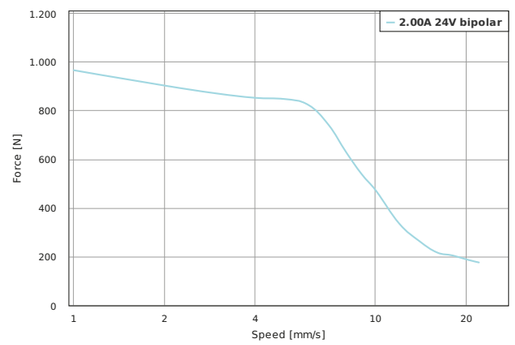



## FORCE-VELOCITY CURVES

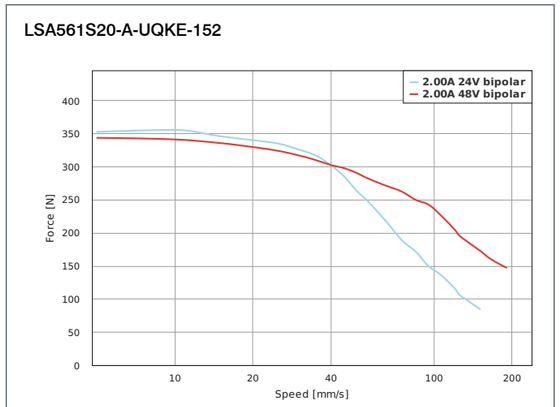
**LSA561S20-A-UQBN-152**



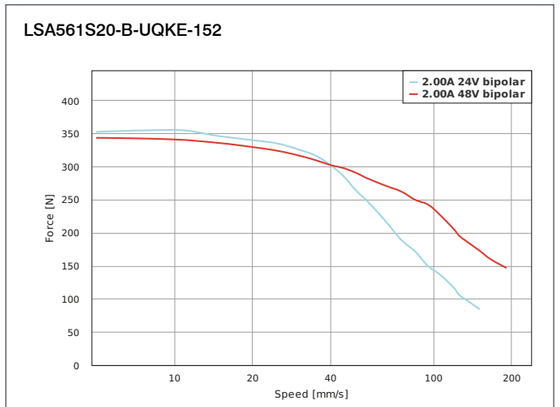

**LSA561S20-B-UQBN-152**




**LSA561S20-A-UQKE-152**




**LSA561S20-B-UQKE-152**

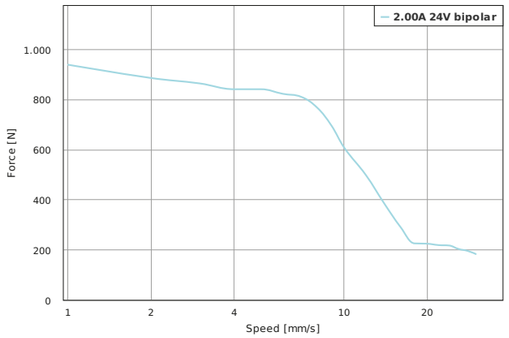


# LSA56

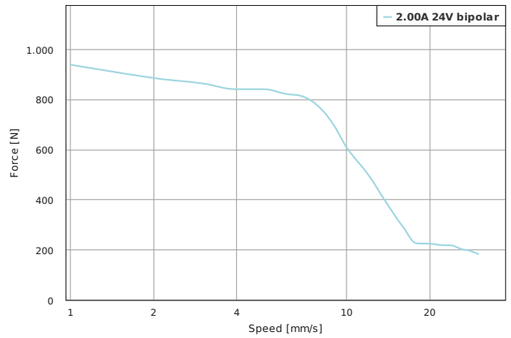
## External linear actuator – NEMA 23

### FORCE-VELOCITY CURVES

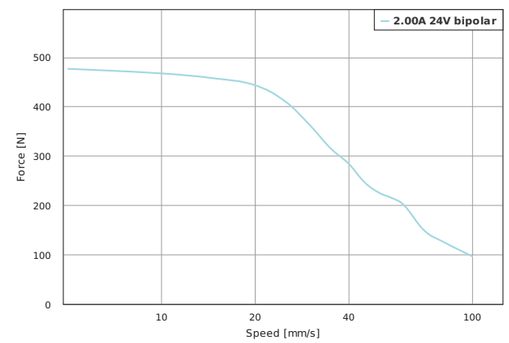
**LSA561S20-A-TSCA-152**



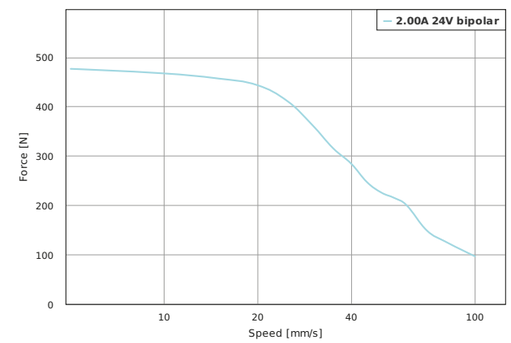

**LSA561S20-B-TSCA-152**




**LSA561S20-A-TSGA-152**



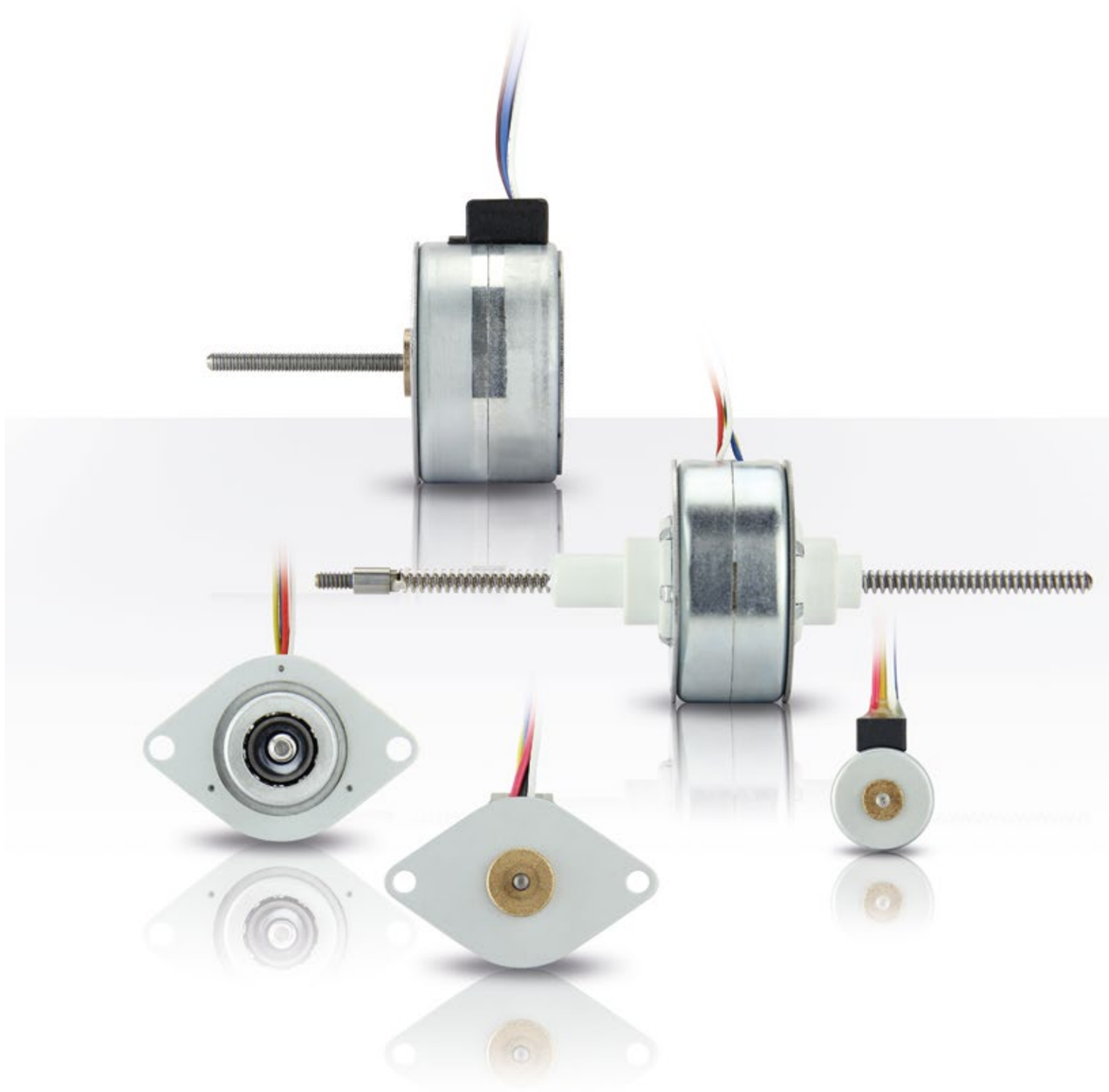

**LSA561S20-B-TSGA-152**




## Notes

# Notes





# LSP15-LSP42

## Permanent-magnet external linear actuators

### OPTIONS

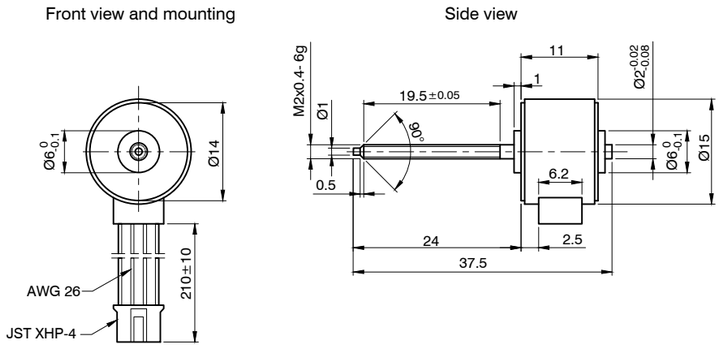
Controller

### VERSIONS

| Type | Force N | Speed mm/s | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Inductance per Winding mH | Thread Lead mm | Screw Length mm | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| LSP1518M0104-M2X0,4 | 3 | 20 | 0.071 | 20 | 170 | 28 | 0.4 | 19.5 | 11 | 0.013 |
| LSP2575M0506-M2X0,4 | 10 | 15 | 0.5 | 8.3 | 10 | 2 | 0.4 | 28.5 | 15 | 0.0312 |
| LSP3575M0206-M3X0,5 | 40 | 10 | 0.22 | 10 | 60 | 45 | 0.5 | 28.5 | 22 | 0.094 |
| LSP4275M0206-M3X0,5 | 50 | 10 | 0.18 | 10 | 70 | 50.5 | 0.5 | 28.5 | 22 | 0.134 |

### DIMENSIONS (IN MM)

**LSP1518M0104**



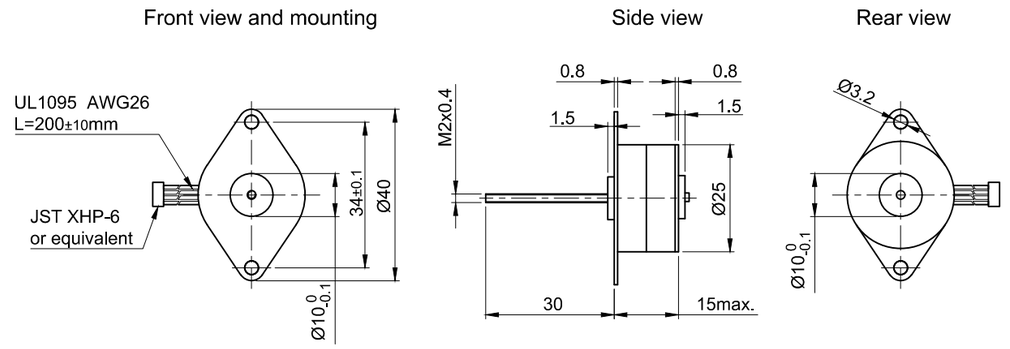



LSP15-LSP42

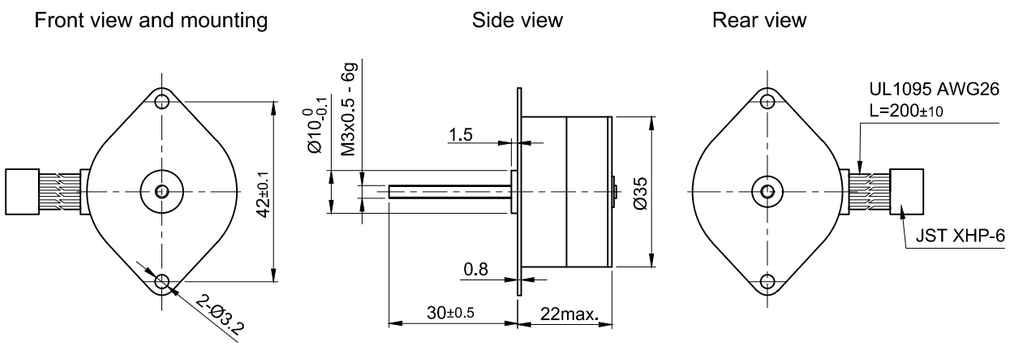
Permanent-magnet external linear actuators

### DIMENSIONS (IN MM)

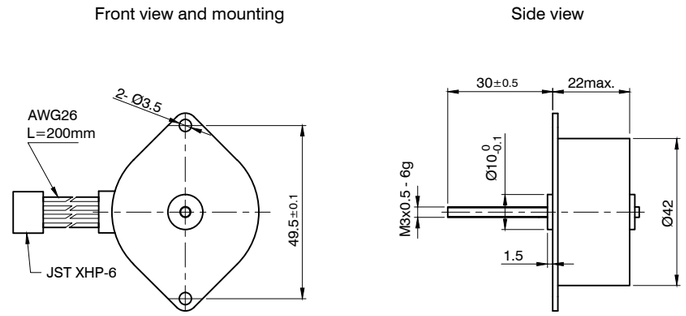
**LSP2575M0506**




**LSP3575M0206**

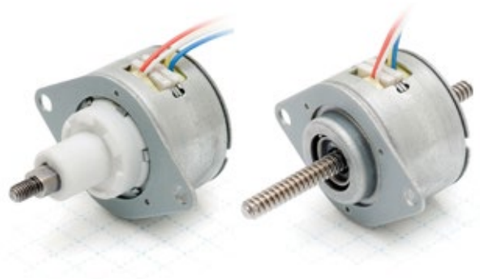



**LSP4275M0206**



# LP(V)25-LP35

## Permanent magnet linear actuators



## OPTIONS

Controller

## VERSIONS

| Type | Force N | Current per Winding A | Resolution µm/step | Resistance per Winding Ohm | Thread Lead mm | Stroke Length „X“ mm | Length „A“ mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| LPV2515S0104-TR3,5X1 | 5 | 0.1 | 41.7 | 53 | 1 | 12 | 16 | 0.04 |
| LP2515S0104-TR3,5X1 | 5 | 0.1 | 41.7 | 53 | 1 | 30 | 16.5 | 0.036 |
| LP3575S0504-TR3.5X1 | 55 | 0.46 | 25.4 | 11 | 1.22 | 75 | 17.5 | 0.086 |

This linear actuator is available in a captive version (LPV2515S0104-TR3,5x1) and a non-captive version.

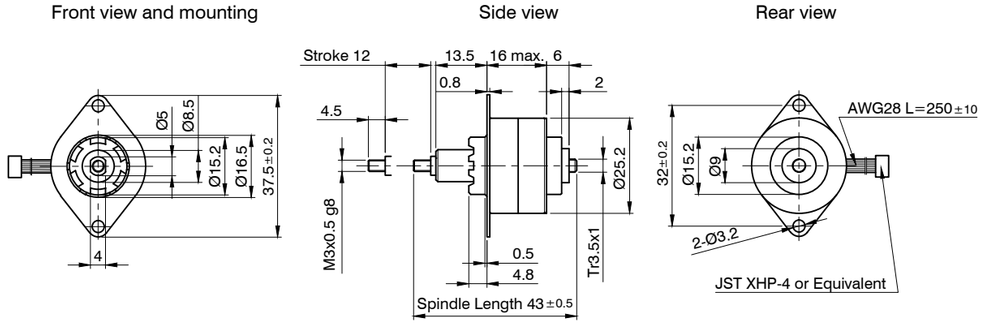


LP(V)25-LP35

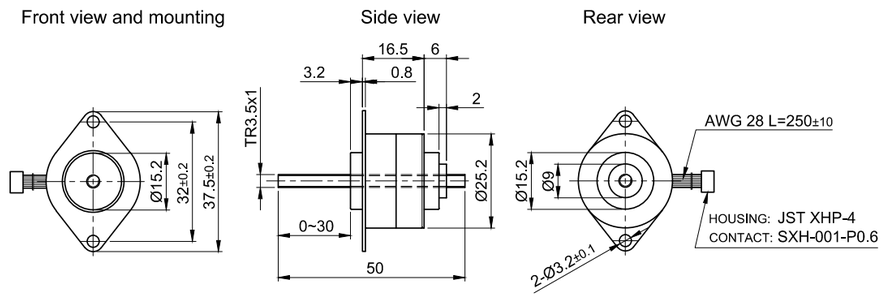
Permanent magnet linear actuators

## DIMENSIONS (IN MM)

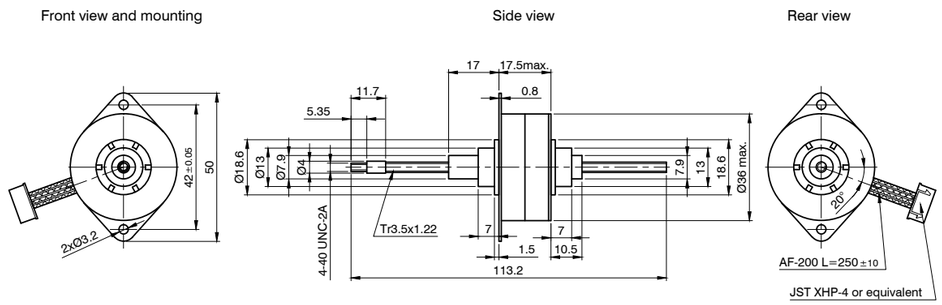
**LPV2515S0104**




**LP2515S0104**

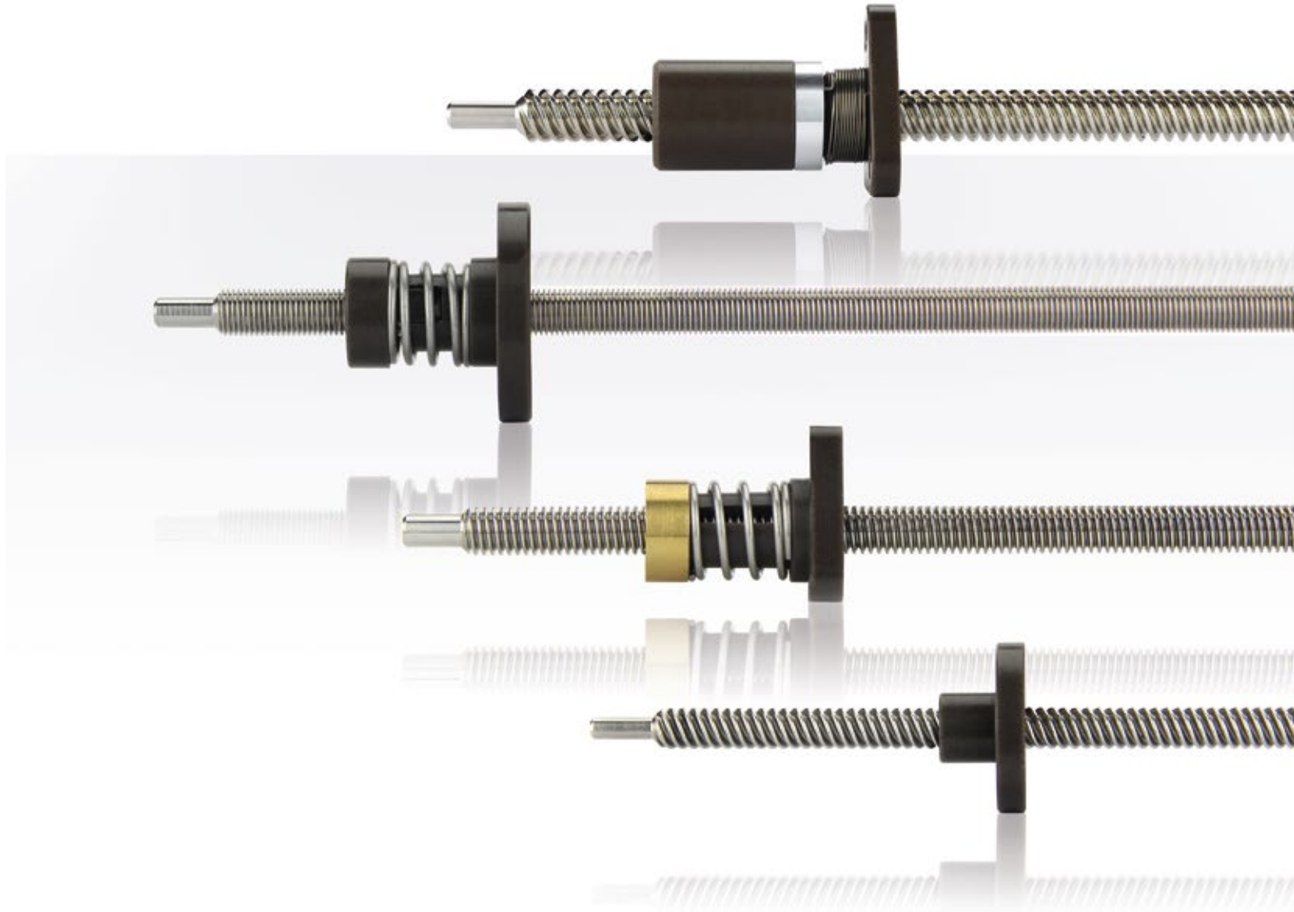



**LP3575S0504**



# Notes





# Lead screw

## with trapezoidal thread

### ORDER IDENTIFIER

**SCREW-...-**
200 = Screw length, with end machining
300 = Screw length, with end machining
1000 = Screw length, without end machining

### TECHNICAL DATA

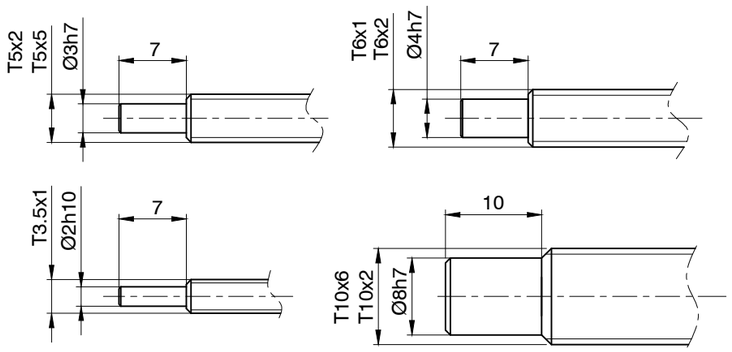
| | |
|---|---|
| **Screw Material** | stainless (not resistant to acid and salt water) |
| **Tensile Strength** | 760 N/mm² |
| **Thread Lead Delay** | ±0.1/300 mm travel |

### VERSIONS

| Type | Thread Diameter mm | Core Diameter mm | Thread Lead mm | Corresponding Motors | Standard Axial Play mm | Max. Axial Play mm | Material Number | Screw Length mm |
|---|---|---|---|---|---|---|---|---|
| ZST3.5-1 | 3.5 | 2.3 | 1 | L.....-T3.5x1 | 0.03 | ±0.05 | 1.4404 | 200 - 500 |
| ZST5-2 | 5 | 3.7 | 2 | L.....-T5x2 | 0.03 | ±0.05 | 1.4404 | 200 - 300 |
| SCREW-ABA-TJBA | 6 | 4.465 | 1 | LA.....-TJBA | 0.03 | ±0.05 | 1.4305 | 200 - 1000 |
| SCREW-ABA-TJCA | 6 | 4.444 | 2 | LA…-TJCA | 0.03 | ±0.06 | 1.4305 | 200 - 1000 |
| SCREW-ABA-TSCA | 10 | 7.191 | 2 | LA...-TSCA | 0.04 | ±0.07 | 1.4305 | 200 - 1000 |
| SCREW-ABA-TSGA | 10 | 6.15 | 6 | LSA…TSGA | 0.05 | ±0.09 | 1.4305 | 200 - 1000 |

### DIMENSIONS (IN MM)

ZST...



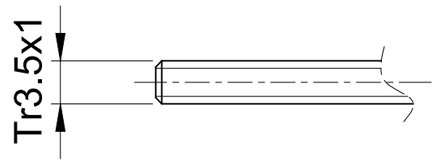



# Lead screw

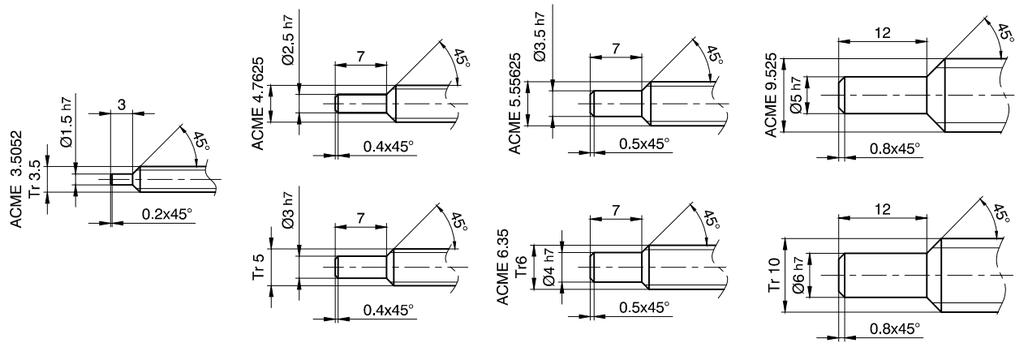
## with trapezoidal thread

### DIMENSIONS (IN MM)

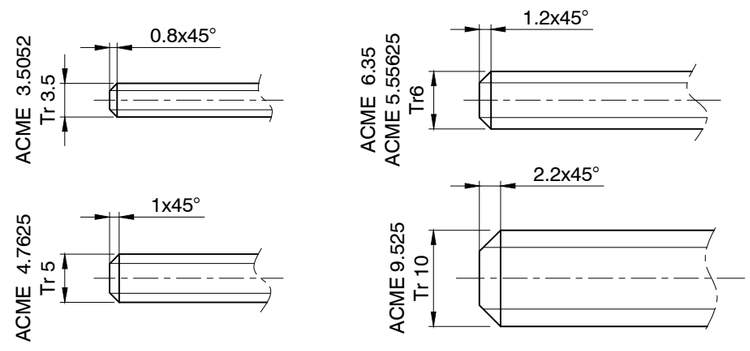
ZST3,5-1-500




SCREW-ABA-...




SCREW-AAA-...



# Lead screw

## with ACME thread

### ORDER IDENTIFIER

**SCREW-...-**
200 = Screw length, with end machining
300 = Screw length, with end machining
1000 = Screw length, without end machining

### TECHNICAL DATA

| | |
|---|---|
| **Screw Material** | stainless (not resistant to acid and salt water) |

### VERSIONS

| Type | Thread Diameter mm | Core Diameter mm | Thread Lead mm | Corresponding Motors | Standard Axial Play mm | Max. Axial Play mm | Material Number | Screw Length mm |
|---|---|---|---|---|---|---|---|---|
| SCREW-ABA-UECB | 3.5 | 1.91 | 2 | LA...-UECB | 0.04 | ±0.07 | 1.4305 | 200 - 500 |
| SCREW-ABA-UGAQ | 4.76 | 3.579 | 0.635 | LA...-UGAQ | 0.03 | ±0.06 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UGFC | 4.763 | 2.868 | 5.08 | LA.....-UGFC | 0.04 | ±0.08 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UIAP | 5.56 | 4.402 | 0.6096 | LA.....-UIAP | 0.04 | ±0.06 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UIEV | 5.56 | 3.719 | 4.877 | LA…-UIEV | 0.05 | ±0.09 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UKAS | 6.35 | 4.983 | 0.7938 | LA...-UKAS | 0.04 | ±0.07 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UKBN | 6.35 | 4.107 | 1.5875 | LA...-UKBN | 0.05 | ±0.08 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UKDE | 6.35 | 4.107 | 3.175 | LA...-UKDE | 0.05 | ±0.09 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UKGI | 6.35 | 4.107 | 6.35 | LA.....-UKGI | 0.05 | ±0.10 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UQBN-200 | 9.53 | 7.257 | 1.59 | LA...-UQBN | 0.05 | 0.09 | 1.4305 | 200 - 1000 |
| SCREW-ABA-UQKE | 9.53 | 5.977 | 10.16 | LA...-UQKE | 0.07 | 0.12 | 1.4305 | 200 - 1000 |

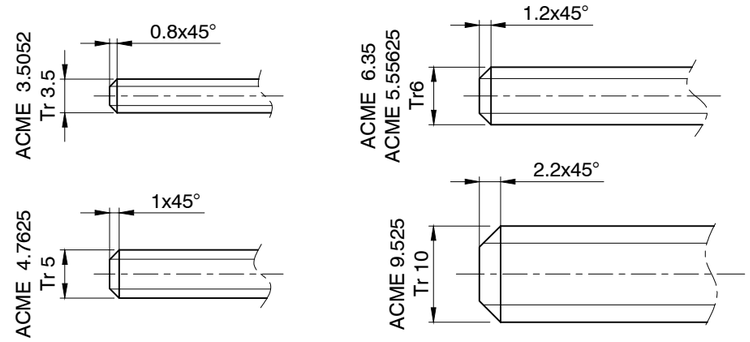


Lead screw

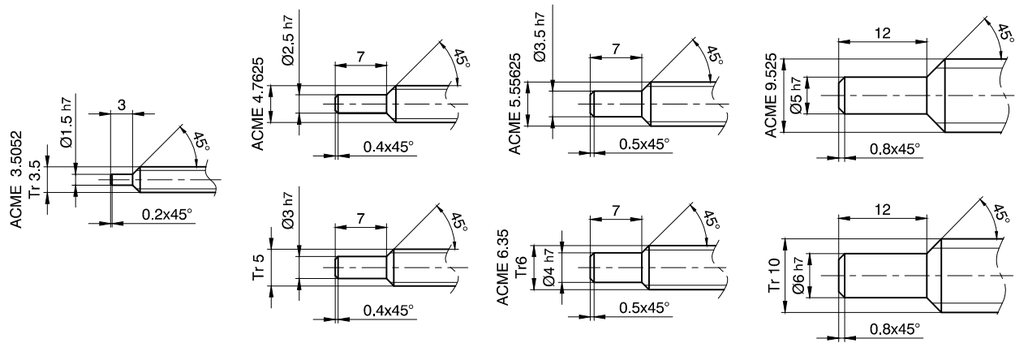
with ACME thread

### DIMENSIONS (IN MM)

SCREW-AAA-...




SCREW-ABA-...



# Threaded nut

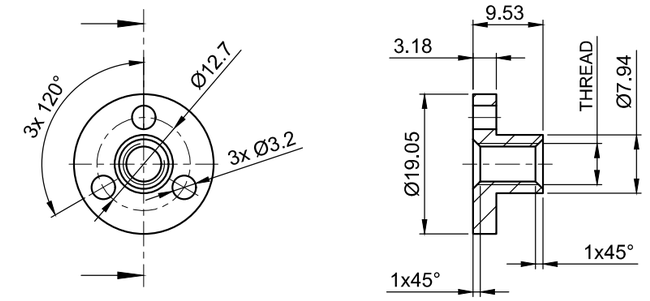
## VERSIONS

| Type | Thread Code | Thread Type | Thread Diameter mm | Thread Lead mm | Number of Threads | Corresponding Motors | Bolt Circle mm | Mounting Hole Diameter mm |
|---|---|---|---|---|---|---|---|---|
| LSNUT-AAAA-TDBA | TDBA | Trapezoidal | 3.5 | 1 | 1 | LSA…-TDBA | 12.7 | 3.2 |
| LSNUT-AAAA-UECB | UECB | ACME | 3.5 | 2 | 2 | LSA...UECB | 12.7 | 3.2 |
| LSNUT-AAAA-UGAQ | UGAQ | ACME | 4.76 | 0.635 | 1 | LSA...-UGAQ | 12.7 | 3.2 |
| LSNUT-AAAA-UGFC | UGFC | ACME | 4.76 | 5.08 | 4 | LSA…-UGFC | 12.7 | 3.2 |
| LSNUT-AAAA-THCA | THCA | Trapezoidal | 5 | 2 | 2 | LSA...-THCA | 12.7 | 3.2 |
| LSNUT-AAAE-UIAP | UIAP | ACME | 5.56 | 0.6096 | 1 | LSA...-UIAP | 19.05 | 3.6 |
| LSNUT-AAAE-UIEV | UIEV | ACME | 5.56 | 4.877 | 4 | LSA...-UIEV | 19.05 | 3.6 |
| LSNUT-AAAE-TJBA | TJBA | Trapezoidal | 6 | 1 | 1 | LSA...-TJBA | 19.05 | 3.6 |
| LSNUT-AAAE-TJCA | TJCA | Trapezoidal | 6 | 2 | 2 | LSA…-TJCA | 19.05 | 3.6 |
| LSNUT-AAAE-UKAS | UKAS | ACME | 6.35 | 0.794 | 1 | LSA...-UKAS | 19.05 | 3.6 |
| LSNUT-AAAE-UKBN | UKBN | ACME | 6.35 | 1.588 | 1 | LSA...-UKBN | 19.05 | 3.6 |
| LSNUT-AAAE-UKDE | UKDE | ACME | 6.35 | 3.175 | 2 | LSA...-UKDE | 19.05 | 3.6 |
| LSNUT-AAAE-UKGI | UKGI | ACME | 6.35 | 6.35 | 4 | LSA…-UKGI | 19.05 | 3.6 |
| LSNUT-AAAG-UQBN | UQBN | ACME | 9.53 | 1.59 | 1 | LSA…UQBN | 22.22 | 3.6 |
| LSNUT-AAAG-UQKE | UQKE | ACME | 9.53 | 10.16 | 4 | LSA...-UQKE | 22.22 | 3.6 |
| LSNUT-AAAG-TSCA | TSCA | Trapezoidal | 10 | 2 | 1 | LSA…TSCA | 22.22 | 3.6 |
| LSNUT-AAAG-TSGA | TSGA | Trapezoidal | 10 | 6 | 2 | LSA…TSGA | 22.22 | 3.6 |

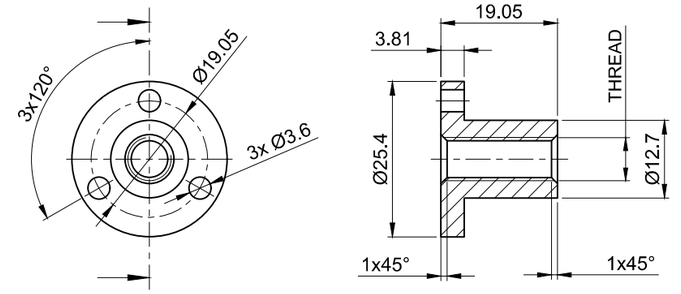


## DIMENSIONS (IN MM)

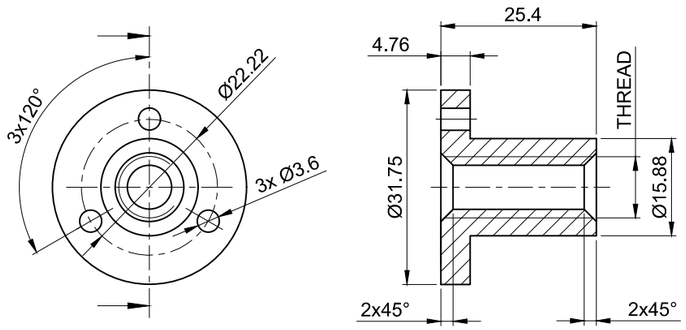
**LSNUT NEMA 8/11**




**LSNUT NEMA 14/17**




**LSNUT-AAAG-UQKE**



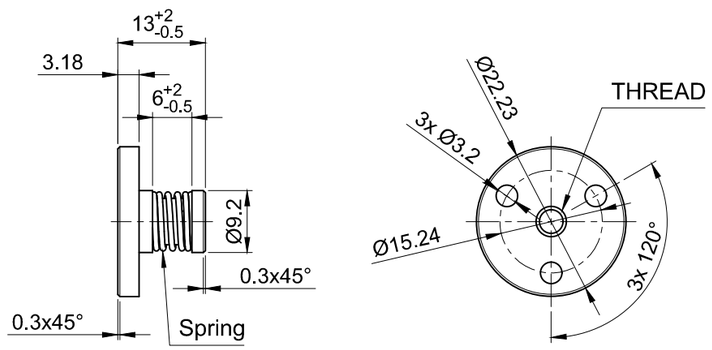
# Axial anti-backlash threaded nut with helical spring

## VERSIONS

| Type | Thread Code | Thread Type | Thread Diameter mm | Thread Lead mm | Number of Threads | Corresponding Motors | Bolt Circle mm | Mounting Hole Diameter mm |
|---|---|---|---|---|---|---|---|---|
| LSNUT-AEAC-TDBA | TDBA | Trapezoidal | 3.5 | 1 | 1 | LSA…-TDBA | 15.24 | 3.2 |
| LSNUT-AEAE-UIAP | UIAP | ACME | 5.56 | 0.6096 | 1 | LSA...-UIAP | 19.05 | 3.6 |
| LSNUT-AEAE-UIEV | UIEV | ACME | 5.56 | 4.877 | 4 | LSA...-UIEV | 19.05 | 3.6 |
| LSNUT-AEAE-TJBA | TJBA | Trapezoidal | 6 | 1 | 1 | LSA...-TJBA | 19.05 | 3.6 |
| LSNUT-AEAE-TJCA | TJCA | Trapezoidal | 6 | 2 | 2 | LSA…-TJCA | 19.05 | 3.6 |
| LSNUT-AEAE-UKAS | UKAS | ACME | 6.35 | 0.794 | 1 | LSA...-UKAS | 19.05 | 3.6 |
| LSNUT-AEAE-UKBN | UKBN | ACME | 6.35 | 1.588 | 1 | LSA...-UKBN | 19.05 | 3.6 |
| LSNUT-AEAE-UKDE | UKDE | ACME | 6.35 | 3.175 | 2 | LSA...-UKDE | 19.05 | 3.6 |
| LSNUT-AEAE-UKGI | UKGI | ACME | 6.35 | 6.35 | 4 | LSA…-UKGI | 19.05 | 3.6 |

## DIMENSIONS (IN MM)

**LSNUT-AEAC-TDBA**

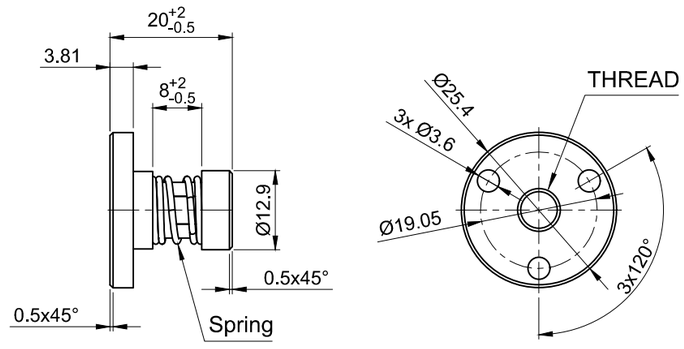





# Axial anti-backlash threaded nut with helical spring

## DIMENSIONS (IN MM)

**LSNUT NEMA 17**



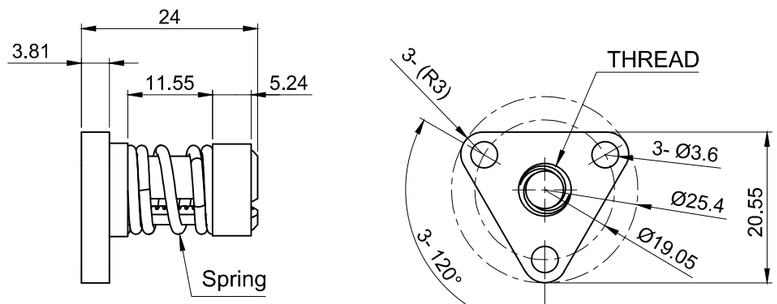
# Radial anti-backlash threaded nut with helical spring

## VERSIONS

| Type | Thread Code | Thread Type | Thread Diameter mm | Thread Lead mm | Number of Threads | Corresponding Motors | Bolt Circle mm | Mounting Hole Diameter mm |
|---|---|---|---|---|---|---|---|---|
| LSNUT-AFAE-TJBA | TJBA | Trapezoidal | 6 | 1 | 1 | LSA...-TJBA | 19.05 | 3.6 |
| LSNUT-AFAE-TJCA | TJCA | Trapezoidal | 6 | 2 | 1 | LSA...-TJCA | 19.05 | 3.6 |
| LSNUT-AFAE-UKAS | UKAS | ACME | 6.35 | 0.794 | 1 | LSA...-UKAS | 19.05 | 3.6 |
| LSNUT-AFAE-UKBN | UKBN | ACME | 6.35 | 1.588 | 1 | LSA...-UKBN | 19.05 | 3.6 |
| LSNUT-AFAE-UKDE | UKDE | ACME | 6.35 | 3.175 | 2 | LSA...-UKDE | 19.05 | 3.6 |
| LSNUT-AFAE-UKGI | UKGI | ACME | 6.35 | 6.35 | 4 | LSA...-UKGI | 19.05 | 3.6 |

## DIMENSIONS (IN MM)

**LSNUT NEMA14-17**






# Notes

# Anti-backlash threaded nut with torsion spring

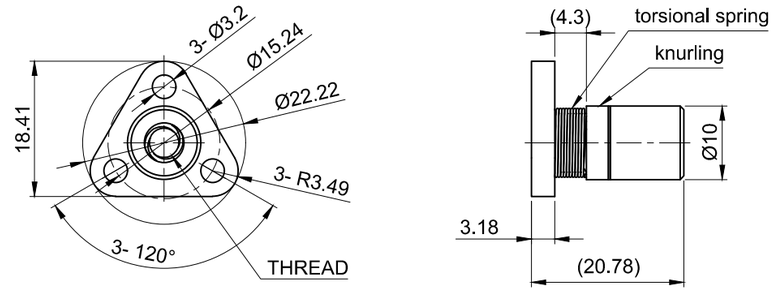
## VERSIONS

| Type | Thread Code | Thread Type | Thread Diameter mm | Thread Lead mm | Number of Threads | Corresponding Motors | Bolt Circle mm | Mounting Hole Diameter mm |
|---|---|---|---|---|---|---|---|---|
| LSNUT-AGAC-TDBA | TDBA | Trapezoidal | 3.5 | 1 | 1 | LSA…-TDBA | 15.24 | 3.2 |
| LSNUT-AGAC-UECB | UECB | ACME | 3.5 | 2 | 2 | LSA...UECB | 15.24 | 3.2 |
| LSNUT-AGAC-UGAQ | UGAQ | ACME | 4.76 | 0.635 | 1 | LSA...-UGAQ | 15.24 | 3.2 |
| LSNUT-AGAC-UGFC | UGFC | ACME | 4.76 | 5.08 | 4 | LSA…-UGFC | 15.24 | 3.2 |
| LSNUT-AGAC-THCA | THCA | Trapezoidal | 5 | 2 | 2 | LSA...-THCA | 15.24 | 3.2 |
| LSNUT-AGAE-UIAP | UIAP | ACME | 5.56 | 0.6096 | 1 | LSA...-UIAP | 19.05 | 3.6 |
| LSNUT-AGAE-UIEV | UIEV | ACME | 5.56 | 4.877 | 4 | LSA...-UIEV | 19.05 | 3.6 |
| LSNUT-AGAE-TJBA | TJBA | Trapezoidal | 6 | 1 | 1 | LSA...-TJBA | 19.05 | 3.6 |
| LSNUT-AGAE-TJCA | TJCA | Trapezoidal | 6 | 2 | 1 | LSA…-TJCA | 19.05 | 3.6 |
| LSNUT-AGAE-UKAS | UKAS | ACME | 6.35 | 0.794 | 1 | LSA...-UKAS | 19.05 | 3.6 |
| LSNUT-AGAE-UKBN | UKBN | ACME | 6.35 | 1.588 | 1 | LSA...-UKBN | 19.05 | 3.6 |
| LSNUT-AGAE-UKDE | UKDE | ACME | 6.35 | 3.175 | 2 | LSA...-UKDE | 19.05 | 3.6 |
| LSNUT-AGAE-UKGI | UKGI | ACME | 6.35 | 6.35 | 4 | LSA…-UKGI | 19.05 | 3.6 |
| LSNUT-AGAJ-UQBN | UQBN | ACME | 9.53 | 1.59 | 1 | LSA…UQBN | 28.6 | 5.5 |
| LSNUT-AGAJ-UQKE | UQKE | ACME | 9.53 | 10.16 | 4 | LSA…UQKE | 28.6 | 5.5 |
| LSNUT-AGAJ-TSCA | TSCA | Trapezoidal | 10 | 2 | 1 | LSA…TSCA | 28.6 | 5.5 |
| LSNUT-AGAJ-TSGA | TSGA | Trapezoidal | 10 | 6 | 2 | LSA…TSGA | 28.6 | 5.5 |

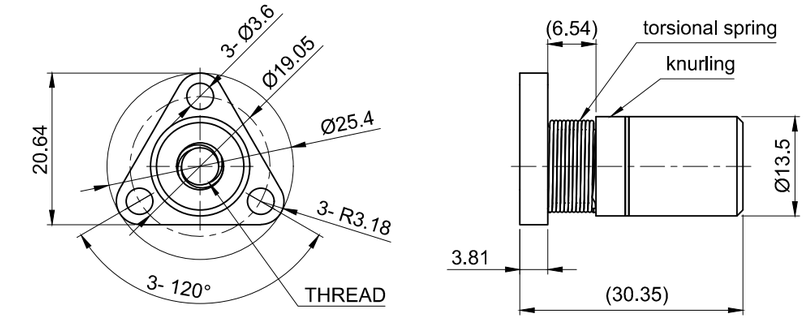


## DIMENSIONS (IN MM)

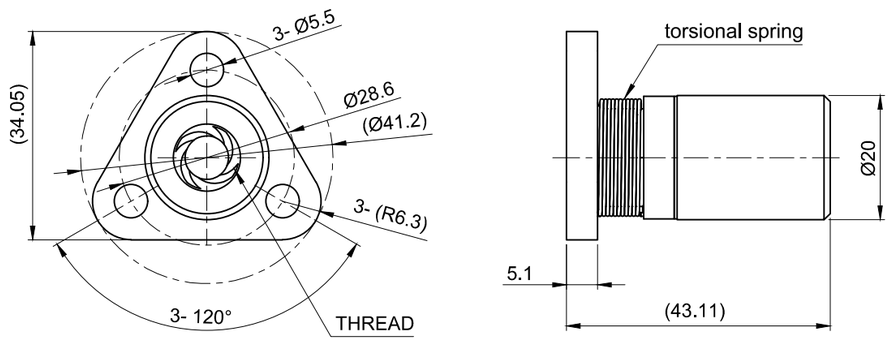
**LSNUT NEMA 8,11**




**LSNUT NEMA 14,17**

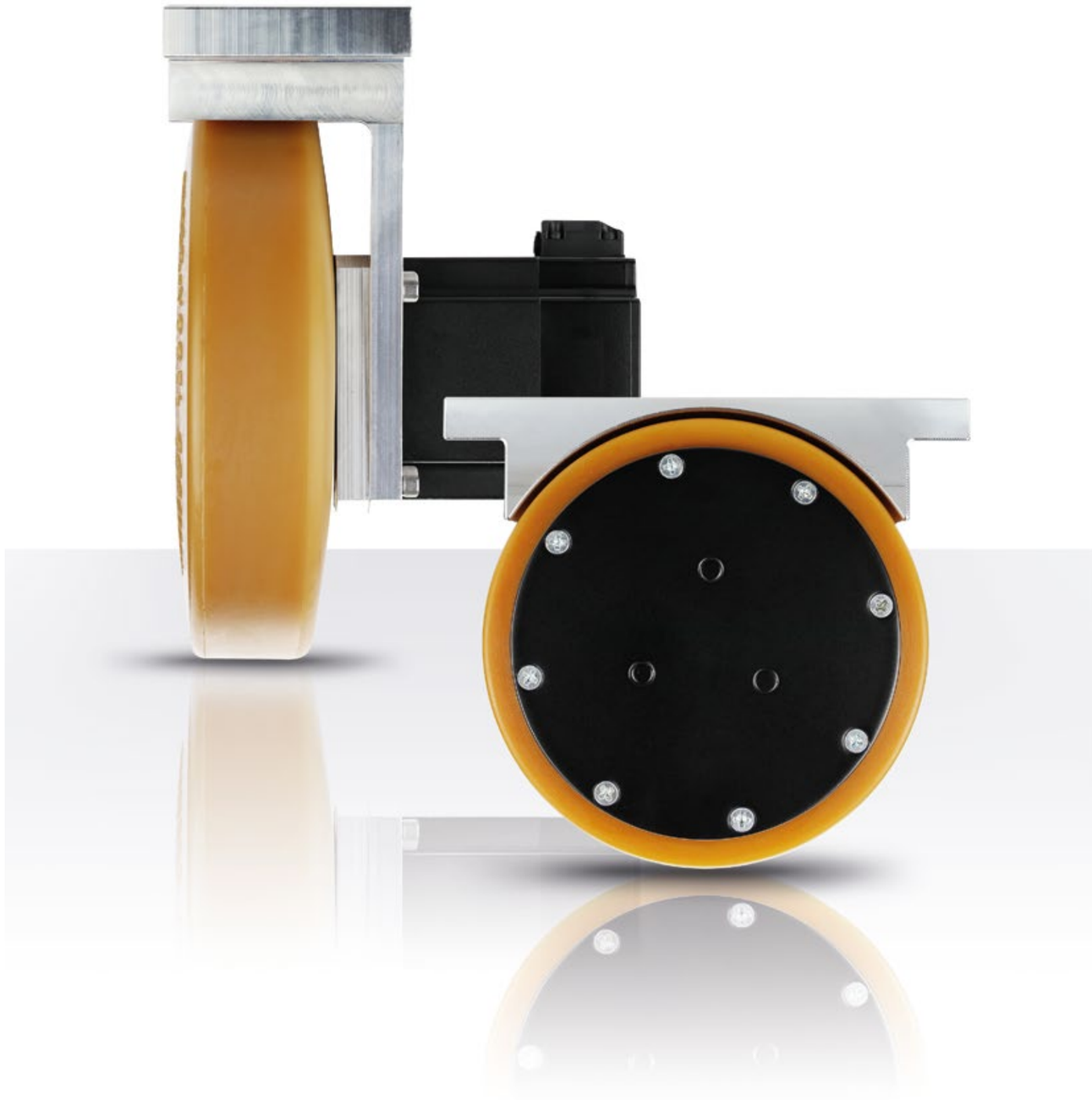



**LSNUT NEMA 23**



# Notes





## ORDER IDENTIFIER

**WD...-56??-...**
11 = Reduction ratio 11
16 = Reduction ratio 16
20 = Reduction ratio 20
26 = Reduction ratio 26

## VERSIONS

| Type | Wheel Diameter mm | Load Capacity kg | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | For Motor Size | Mounting Bracket |
|---|---|---|---|---|---|---|---|
| WD10030-5616-23B | 100 | 400 | 16 | 24.6 | 39.4 | NEMA 23, NEMA 24 | ✓ |
| WD14050-5611-23C | 140 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | ✓ |
| WD14050-5611-23X | 140 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | – |
| WD14050-5611-60C | 140 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | ✓ |
| WD14050-5611-60X | 140 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | – |
| WD14050-5611-80C | 140 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | ✓ |
| WD14050-5611-80X | 140 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | – |
| WD15050-5611-23D | 150 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | ✓ |
| WD15050-5611-23X | 150 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | – |
| WD15050-5611-60D | 150 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | ✓ |
| WD15050-5611-60X | 150 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | – |
| WD15050-5611-80D | 150 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | ✓ |
| WD15050-5611-80X | 150 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | – |
| WD16050-5611-23E | 160 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | ✓ |
| WD16050-5611-23X | 160 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | – |
| WD16050-5611-60E | 160 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | ✓ |
| WD16050-5611-60X | 160 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | – |
| WD16050-5611-80E | 160 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | ✓ |



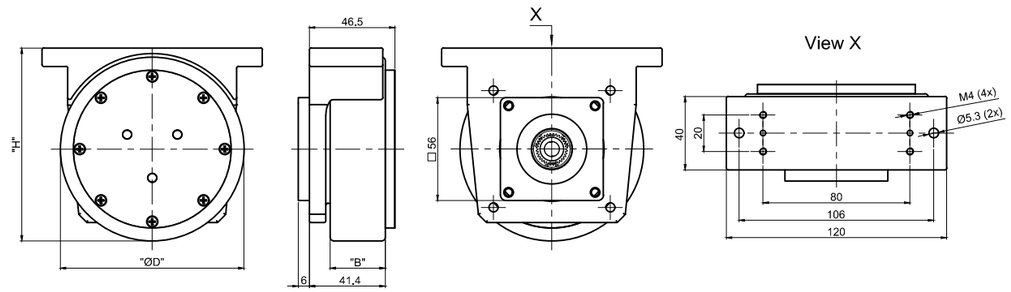


## VERSIONS

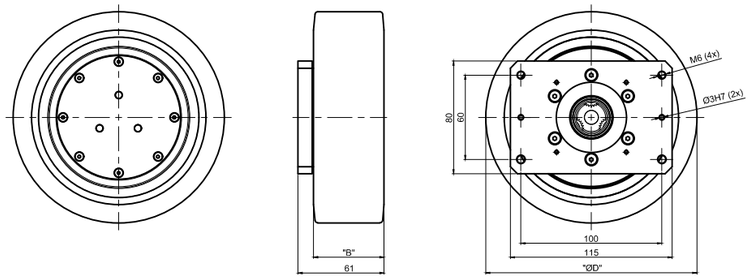
| Type | Wheel Diameter mm | Load Capacity kg | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | For Motor Size | Mounting Bracket |
|---|---|---|---|---|---|---|---|
| WD16050-5611-80X | 160 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | – |
| WD18050-5611-23F | 180 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | ✓ |
| WD18050-5611-23X | 180 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | – |
| WD18050-5611-60F | 180 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | ✓ |
| WD18050-5611-60X | 180 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | – |
| WD18050-5611-80F | 180 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | ✓ |
| WD18050-5611-80X | 180 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | – |
| WD20050-5611-23G | 200 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | ✓ |
| WD20050-5611-23X | 200 | 400 | 11 | 19.2 | 32.9 | NEMA 23, NEMA 24 | – |
| WD20050-5611-60G | 200 | 400 | 11 | 19.2 | 32.9 | 60 mm (BLDC) | ✓ |
| WD20050-5611-60X | 200 | 400vc | 11 | 19.2 | 32.9 | 60 mm (BLDC) | – |
| WD20050-5611-80G | 200 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | ✓ |
| WD20050-5611-80X | 200 | 400 | 11 | 19.2 | 32.9 | 80 mm (BLDC) | – |

## DIMENSIONS (IN MM)

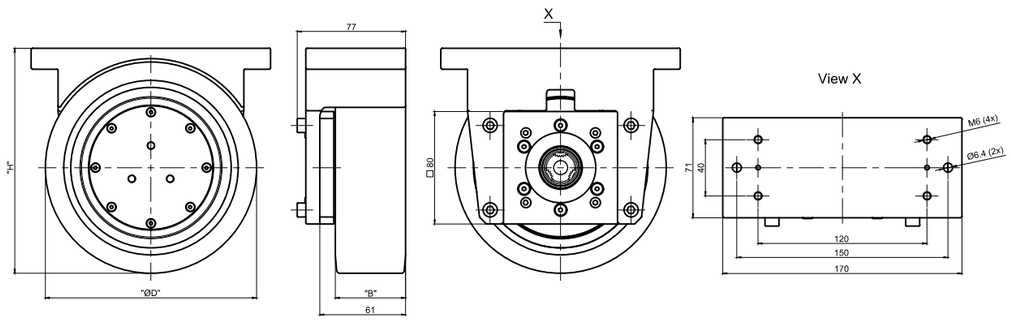
**WD10030**




**WD-X**




**WD15050**



# Modular Motor Configuration System

Our BLDC and stepper motors, linear actuators and motor controllers, together with a wide selection of gearboxes and encoders, create a modular system with over 100,000 possible combinations. Our easy-to-use online configurator will help you select the right products for your particular application:

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- Rapid and easy selection
- Comprehensive documentation
- Direct ordering

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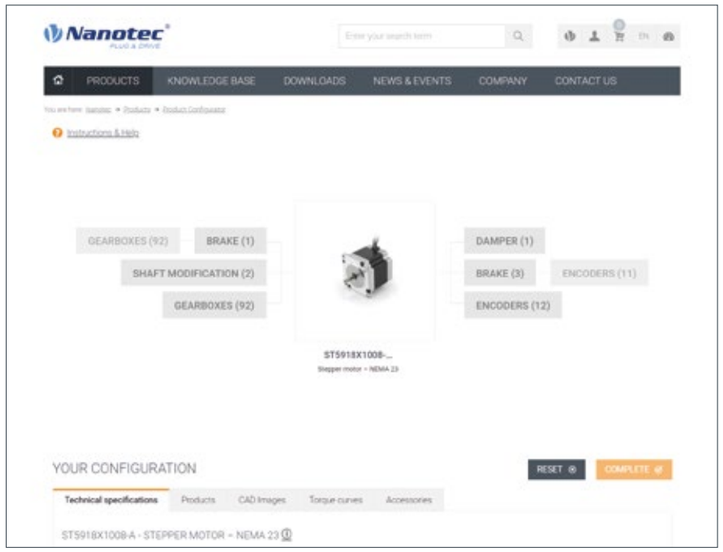


# WEDS/WEDL

## 3-channel encoder/rotary encoder

## TECHNICAL DATA

| | |
|---|---|
| **Encoder Signal Type** | incremental |
| **Current Consumption** | ≤ 60 mA |
| **Limit Frequency** | 100 kHz |
| **Phase Shift** | 90° ± 45° |
| **Signal Level** | VH 85% VCC, VL ≤ 0.3 V |
| **Max. Output Current per Channel** | 0 ~ 5 mA |
| **Operating Temperature** | -25 °C - 100 °C |
| **Storage Temperature** | -40 °C - 100 °C |
| **Humidity** | max. 90 % (no condensation) |

## VERSIONS

| Type | Index | Line Driver | Encoder Signal Type | Encoder Resolution CPR | Output Signals | Limit Speed RPM |
|---|---|---|---|---|---|---|
| WEDL5541-A | ✓ | ✓ | incremental | 500 | phase A, A\, B, B\, I, I\ | 12000 |
| WEDL5541-B | ✓ | ✓ | incremental | 1000 | phase A, A\, B, B\, I, I\ | 6000 |
| WEDS5541-A | ✓ | – | incremental | 500 | phase A, B, I | 12000 |
| WEDS5541-B | ✓ | – | incremental | 1000 | phase A, B, I | 6000 |

## ORDER IDENTIFIER

**WEDL5541-A**
14 = 5 mm shaft diameter
06 = 6.35 mm shaft diameter

## ACCESSORIES

**ZK-JZH-8-500-S-JGH** Encoder cable WEDL 0.5m
**ZK-JZH-8-500-S-JXH** Encoder cable WEDL 0.5m
**ZK-WEDL-8-500** Encoder cable WEDL, 0.5m
**ZK-WEDL-8-500-S** Encoder cable WEDL, 0.5m
**ZK-WEDL-500-S-PADP** Encoder cable WEDL, 0.5m
**ZK-WEDL-8-1000-S** Encoder cable WEDL, 1m
**ZK-WEDL-8-2000-S** Encoder cable WEDL, 2m
**ZK-WEDS-300-S-SMCI35** Encoder cable WEDS, 0.3m
**ZK-WEDS-5-500** Encoder cable WEDS, 0.5m
**ZK-WEDS-5-500-S** Encoder cable WEDS, 0.5m

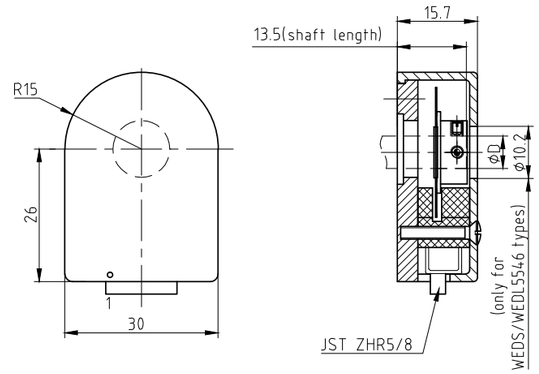


WEDS/WEDL

3-channel encoder/rotary encoder

## DIMENSIONS (IN MM)

**WEDL-WEDS5541 (500 Ink.)**




**WEDL-WEDS5541 (1000 Ink.)**


ENCODER

# NTO3

## Optical 3-channel encoder

## TECHNICAL DATA

| | |
|---|---|
| **Output Signals** | phase A, A\, B, B\, I, I\ |
| **Current Consumption** | 73, max. 88 mA |
| **Limit Frequency** | 360 kHz - 720 kHz |
| **Limit Speed** | 8640 RPM - 10800 RPM |
| **Max. Output Current per Channel** | 8 mA |
| **Signal Level** | low: ≤0.4 V, high: ≥2.4 V |
| **Operating Temperature** | -25 °C - 100 °C |
| **Output Rise Time** | 15 ns |
| **Output Fall Time** | 15 ns |
| **Vibration (5 Hz-2 kHz)** | 20 G |
| **ESD, IEC61000-4-2** | ±4 kV |

## VERSIONS

| Type | Index | Line Driver | Encoder Signal Type | Encoder Resolution CPR | Operating Voltage V | Limit Frequency kHz |
|---|---|---|---|---|---|---|
| NTO3-05-C | ✓ | ✓ | incremental | 2000 | 5 | 360 |
| NTO3-05-K | ✓ | ✓ | incremental | 4000 | 5 | 720 |
| NTO3-05-Z | ✓ | ✓ | incremental | 5000 | 5 | 720 |

## ORDER IDENTIFIER

**NTO3-05-C**
06 = 6.35 mm shaft diameter
14 = 5 mm shaft diameter

## ACCESSORIES

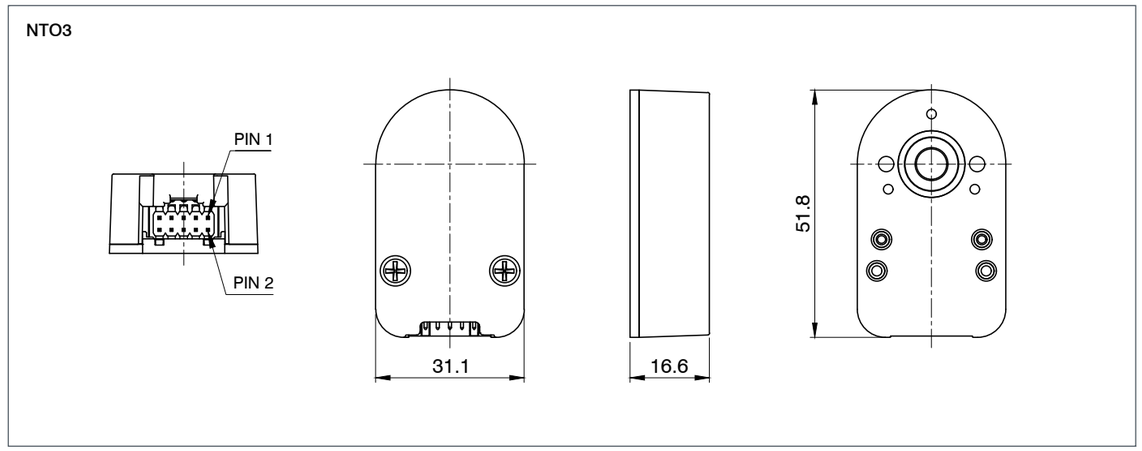
**ZK-NTO3-10-500-S** Encoder cable NTO3, 0.5m
**ZK-NTO3-10-500-PADP** Encoder cable NTO3, 0.5m
**ZK-NTO3-10-1000-S** Encoder cable NTO3, 1m
**ZK-NTO3-10-1000-PADP** Encoder cable NTO3, 1m
**ZK-TM4-10-500-S-JGH** Encoder cable NTO3 0.5m
**ZK-TM4-10-500-S-JXH** Encoder cable NTO3 0.5m



NTO3

Optical 3-channel encoder

## DIMENSIONS (IN MM)



# NTO4

## Optical Encoder

### TECHNICAL DATA

| | |
|---|---|
| **Output Signals** | phase A, A\, B, B\ |
| **Current Consumption** | 36, max. 44 mA |
| **Limit Frequency** | 100 kHz |
| **Limit Speed** | 6000 RPM |
| **Max. Output Current per Channel** | 4.5 mA |
| **Signal Level** | low: ≤0.6 V, high: ≥4.75 V |
| **Operating Temperature** | -20 °C - 100 °C |
| **Output Rise Time** | 20 ns |
| **Output Fall Time** | 20 ns |
| **Vibration (5 Hz-2 kHz)** | 20 G |
| **ESD, IEC61000-4-2** | ±7 kV |

### VERSIONS

| Type | Index | Line Driver | Encoder Signal Type | Encoder Resolution CPR | Operating Voltage V | Limit Frequency kHz |
|---|---|---|---|---|---|---|
| NTO4L-05-B12-HC (6 mm) | – | ✓ | incremental | 1000 | 5 | 100 |

### ACCESSORIES

**ZK-NTO4L-610** Encoder cable NTO4, 0.61m

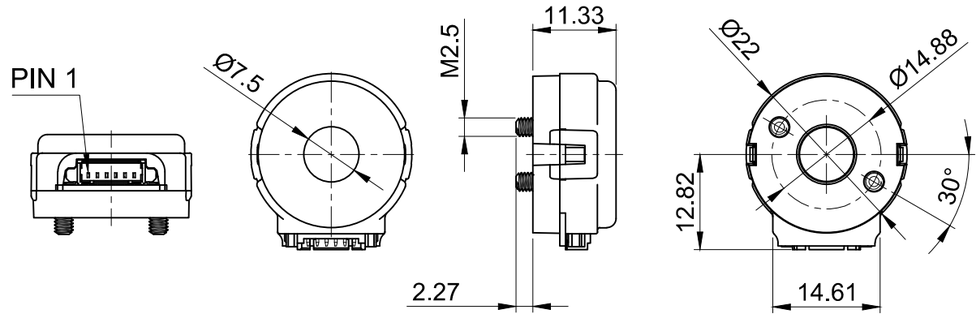


NTO4

Optical Encoder

### DIMENSIONS (IN MM)

NTO4



# NOE1

## 3-channel miniature encoder

## TECHNICAL DATA

| | |
|---|---|
| **Encoder Signal Type** | incremental |
| **Operating Voltage** | 5 V |
| **Output Signals** | phase A, A\, B, B\, I, I\ |
| **Current Consumption** | 30 mA |
| **Limit Speed** | 6600 RPM |
| **Pulse Width** | 180 ± 30°e |
| **Phase Shift** | 90° ± 18°e |
| **Signal Level** | low:<2.0 V (@I_load=20 mA), high: 3 V (@I_load=20 mA) |
| **Max. Output Current per Channel** | 40 mA (@Vcc=5 V, Vout=2.7 V) |
| **Operating Temperature** | -20 °C - 85 °C |
| **Storage Temperature** | -40 °C - 85 °C |
| **Humidity** | max. 90 % (no condensation) |

## VERSIONS

| Type | Index | Line Driver | Encoder Resolution CPR | Operating Voltage V | Limit Frequency kHz |
|---|---|---|---|---|---|
| NOE1-05-A | ✓ | ✓ | 500 | 5 | 60 |
| NOE1-05-B | ✓ | ✓ | 1000 | 5 | 120 |
| NOE1-05-C | ✓ | ✓ | 2000 | 5 | 240 |

## ORDER IDENTIFIER

**NOE1-05-A**
12 = 6 mm shaft diameter, type: hollow shaft
14 = 5 mm shaft diameter

## ACCESSORIES

**ZK-NOE-10-500-S-PADP** Encoder cable NOE, 0.5m
**ZK-NOE1-10-2000-S** Encoder cable NOE, 2m
**ZK-NOE1-10-500-S** Encoder cable NOE, 0.5m

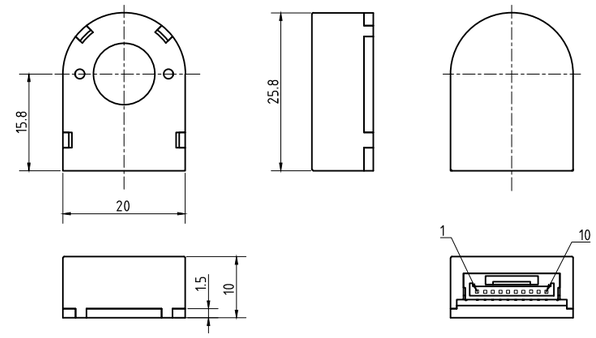


NOE1

3-channel miniature encoder

## DIMENSIONS (IN MM)

NOE1



# NOE2

## Optical 3-channel encoder

## TECHNICAL DATA

| | |
|---|---|
| **Encoder Signal Type** | incremental |
| **Operating Voltage** | 4.90 – 5.85, 11.40 – 28.00 V |
| **Output Signals** | phase A, A\, B, B\, I, I\ |
| **Current Consumption** | 15 mA - 30 mA |
| **Limit Speed** | 3300 RPM |
| **Pulse Width** | 180° ± 30°e |
| **Phase Shift** | 90° ± 18°e |
| **Max. Output Current per Channel** | 40 mA (@Vcc=5 V, Vout=2.7 V), 82 mA (@Vcc=24 V, Vout=18 V) |
| **Operating Temperature** | -20 °C - 85 °C |
| **Storage Temperature** | -40 °C - 85 °C |
| **Humidity** | max. 90 % (no condensation) |

## VERSIONS

| Type | Index | Line Driver | Encoder Resolution CPR | Operating Voltage V | Limit Frequency kHz | Signal Level |
|---|---|---|---|---|---|---|
| NOE2-05-B | ✓ | ✓ | 1000 | 4.90 – 5.85 | 55 | Low:<2.0 V (@I_load=20 mA), High: 3 V (@I_load=20 mA) |
| NOE2-05-K | ✓ | ✓ | 4000 | 4.90 – 5.85 | 220 | Low:<2.0 V (@I_load=20 mA), High: 3 V (@I_load=20 mA) |
| NOE2-24-B | ✓ | ✓ | 1000 | 11.40 – 28.00 | 55 | Low:<2.0 V (@I_load=20 mA), High: VCC-0.2 V (@I_load=20 mA) |
| NOE2-24-K | ✓ | ✓ | 4000 | 11.40 – 28.00 | 220 | Low:<2.0 V (@I_load=20 mA), High: VCC-0.2 V (@I_load=20 mA) |

## ORDER IDENTIFIER

**NOE2-05-B**
14 = 5 mm shaft diameter
06 = 6.35 mm shaft diameter
10 = 10 mm shaft diameter, type: hollow shaft
15 = 15 mm shaft diameter, type: hollow shaft

## ACCESSORIES

**ZK-NOE-10-500-S-PADP** Encoder cable NOE, 0.5m
**ZK-NOE1-10-2000-S** Encoder cable NOE, 2m
**ZK-NOE1-10-500-S** Encoder cable NOE, 0.5m

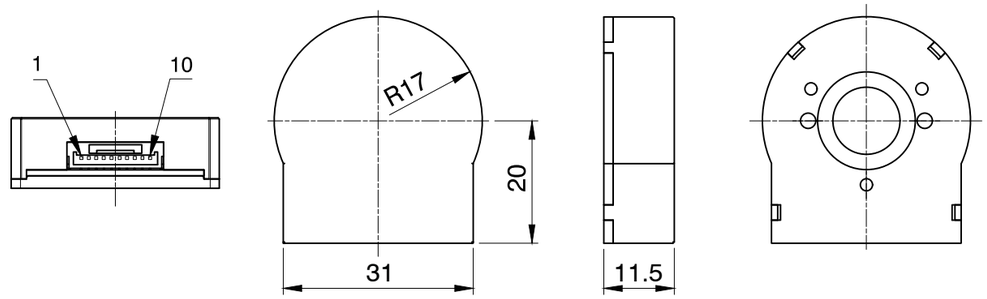


NOE2

Optical 3-channel encoder

## DIMENSIONS (IN MM)

NOE2



# NME1

## Magnetic encoder

## TECHNICAL DATA

| | |
|---|---|
| **Output Signals** | phase A, A\, B, B\, I, I\, H1, H2, H3 |
| **Current Consumption** | 30 mA |
| **Limit Speed** | 30000 RPM |
| **Signal Level** | low:<2.0 V (@I_load=20 mA), high: VCC-0.2 V (@I_load=20 mA) |
| **Max. Output Current per Channel** | 70 mA (@Vcc=5 V, Vout=3 V), 90 mA (@Vcc=24 V, Vout=18 V) |
| **Operating Temperature** | -20 °C - 80 °C |
| **Storage Temperature** | -40 °C - 85 °C |
| **Humidity** | max. 90 % (no condensation) |

## VERSIONS

| Type | Index | Line Driver | Encoder Signal Type | Encoder Resolution CPR | Operating Voltage V | Limit Frequency kHz |
|---|---|---|---|---|---|---|
| NME1-UVW-T06 | ✓ | ✓ | incremental | 1024 | 5.00 – 24.00 | 500 |
| NME1-UVW-T14 | ✓ | ✓ | incremental | 1024 | 5.00 – 24.00 | 500 |

## ACCESSORIES

**ZK-NME1-13-500-S** Encoder cable NME1, 0.5m

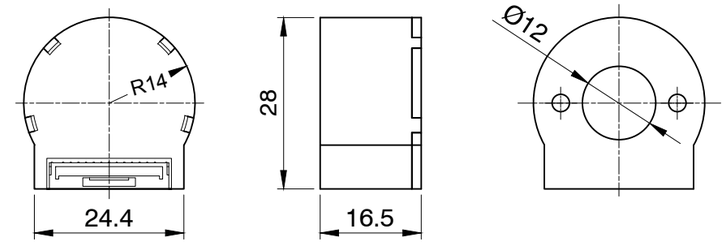


NME1

Magnetic encoder

## DIMENSIONS (IN MM)

NME1



# NME2

## High-resolution magnetic encoder

## TECHNICAL DATA

| | |
|---|---|
| **Output Signals** | phase A, A\, B, B\, I, I\, H1, H2, H3, SSI |
| **Limit Speed** | 12000 RPM |
| **Operating Temperature** | -25 °C - 105 °C |
| **Storage Temperature** | -25 °C - 105 °C |
| **Humidity** | max. 95% (no condensation) |

## VERSIONS

| Type | Index | Line Driver | Encoder Signal Type | Encoder Resolution CPR | Operating Voltage V | Shaft Diameter mm | Height mm |
|---|---|---|---|---|---|---|---|
| NME2-UVW-U06-05-C | ✓ | ✓ | incremental | 16384 | 4.50 – 5.50 | 6.35 | 16 |
| NME2-UVW-U10-05-O | ✓ | ✓ | incremental | 16384 | 4.50 – 5.50 | 10 | 13 |
| NME2-UVW-U14-05-C | ✓ | ✓ | incremental | 16384 | 4.50 – 5.50 | 5 | 16 |
| NME2-UVW-U15-05-O | ✓ | ✓ | incremental | 16384 | 4.50 – 5.50 | 15 | 13 |
| NME2-UVW-W06-05-C | ✓ | ✓ | incremental | 4096 | 4.50 – 5.50 | 6.35 | 16 |
| NME2-UVW-W10-05-O | ✓ | ✓ | incremental | 4096 | 4.50 – 5.50 | 10 | 13 |
| NME2-UVW-W14-05-C | ✓ | ✓ | incremental | 4096 | 4.50 – 5.50 | 5 | 16 |
| NME2-UVW-W15-05-O | ✓ | ✓ | incremental | 4096 | 4.50 – 5.50 | 15 | 13 |
| NME2-SSI-V06-12-C | – | – | SSI | | 9.00 – 30.00 | 6.35 | 16 |
| NME2-SSI-V10-12-O | – | – | SSI | | 9.00 – 30.00 | 10 | 13 |
| NME2-SSI-V14-12-C | – | – | SSI | | 9.00 – 30.00 | 5 | 16 |
| NME2-SSI-V15-12-O | – | – | SSI | | 9.00 – 30.00 | 15 | 13 |

## ACCESSORIES

**ZK-MCM-12-2,0-S-JPAD** Encoder cable NME2/3 2.0m
**ZK-MCM-12-500-S-JGH** Encoder cable NME2/3 0.5m
**ZK-MCM-12-500-S-JPAD** Encoder cable NME2/3 0.5m
**ZK-MCM-12-500-S-JXH** Encoder cable NME2/3 0.5m
**ZK-NME2-12-500-S** Encoder cable NME2/3 0.5m

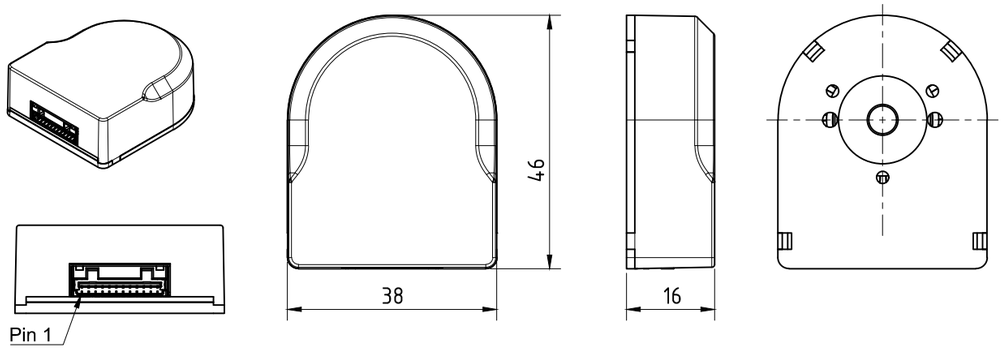


NME2

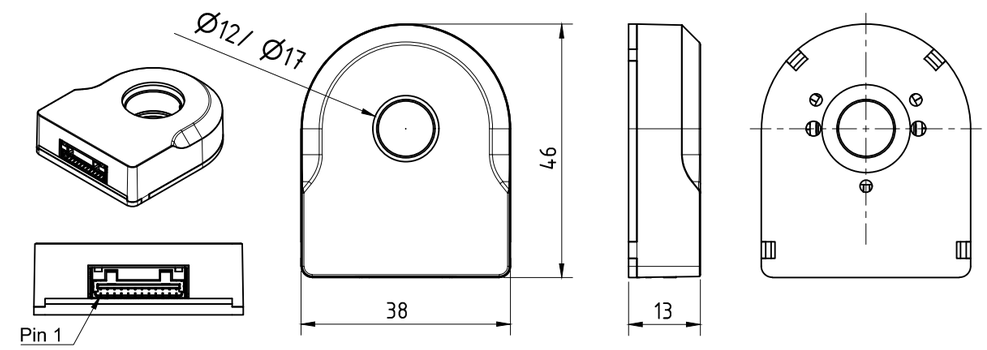
High-resolution magnetic encoder

## DIMENSIONS (IN MM)

NME2-C




NME-2-O



# NMM1

## Multiturn encoder

### TECHNICAL DATA

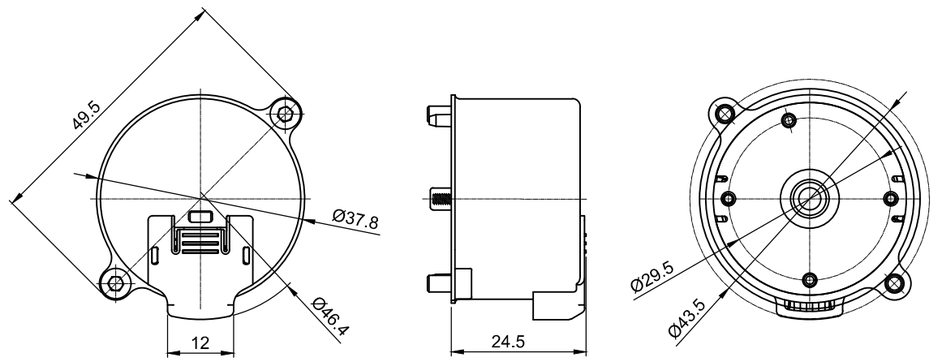
| | |
|---|---|
| **Output Signals** | SSI |
| **Limit Speed** | 12000 RPM |
| **Operating Temperature** | -40 °C - 105 °C |
| **Storage Temperature** | -40 °C - 105 °C |
| **Humidity** | max. 98% (no condensation) |

### VERSIONS

| Type | Index | Line Driver | Encoder Signal Type | Encoder Resolution CPR | Operating Voltage V | Limit Frequency kHz |
|---|---|---|---|---|---|---|
| NMM1-SSI-V11-05-C | – | – | SSI | 17 Bit (Single-Turn-Absolut) + 16 Bit (Multi-Turn-Absolut) | 4.75 – 15.00 | |

### DIMENSIONS (IN MM)

**NMM1-SSI-V11-05-C**






# Notes

# GP42

## High-torque planetary gearboxes

## TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Gearbox** | IP54 |
| **Service Life*** | 10000 h |
| **For Motor Size** | NEMA 17 |
| **Operating Temperature** | -15 °C - 90 °C |

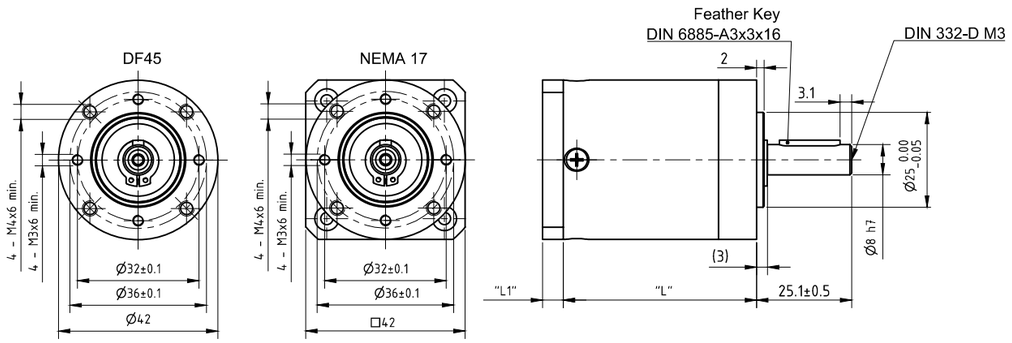
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Max. Input Speed rpm | Max. Backlash ´(arc minutes) | Efficiency % | Moment of Inertia kg mm² | Admissible Axial Shaft Load N |
|---|---|---|---|---|---|---|---|---|
| GP42-S1-4-SR | 3.93 | 7.5 | 13 | 8232 | 39 | 91 | 0.81 | 843 |
| GP42-S1-5-SR | 5.25 | 6.4 | 17.3 | 11937 | 44 | 91 | 0.48 | 843 |
| GP42-S1-7-SR | 7.07 | 3.2 | 7 | 17052 | 46 | 90 | 0.28 | 843 |
| GP42-S1-9-SR | 8.73 | 1.8 | 7.2 | 18000 | 57 | 89 | 0.22 | 843 |
| GP42-S2-15-SR | 15.45 | 9.6 | 17.7 | 8232 | 49 | 86 | 0.62 | 843 |
| GP42-S2-21-SR | 20.64 | 9.8 | 17.7 | 11937 | 51 | 85 | 0.51 | 843 |
| GP42-S2-26-SR | 25.62 | 9.9 | 16.2 | 14043 | 51 | 85 | 0.4 | 843 |
| GP42-S2-46-SR | 45.82 | 8.9 | 15.8 | 18000 | 53 | 83 | 0.22 | 843 |

## DIMENSIONS (IN MM)

**GP42**






# Notes

# GP56

## High-torque planetary gearboxes

## TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Gearbox** | IP54 |
| **Service Life*** | 10000 h |
| **For Motor Size** | NEMA 23, NEMA 24 |
| **Operating Temperature** | -15 °C - 90 °C |

*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Max. Input Speed rpm | Max. Backlash ´(arc minutes) | Efficiency % | Moment of Inertia kg mm² | Admissible Axial Shaft Load N |
|---|---|---|---|---|---|---|---|---|
| GP56-S1-3-SR | 3.29 | 17.5 | 24.7 | 4658 | 34 | 92 | 8.5 | 1302 |
| GP56-S1-5-SR | 5.09 | 21.6 | 38.2 | 8304 | 32 | 92 | 3.4 | 1302 |
| GP56-S1-7-SR | 6.53 | 12.1 | 26.1 | 8988 | 34 | 92 | 3.7 | 1302 |
| GP56-S1-8-SR | 7.71 | 6 | 30.9 | 10913 | 35 | 92 | 2.1 | 1302 |
| GP56-S1-10-SR | 9.55 | 3.6 | 38.2 | 13000 | 35 | 91 | 3.2 | 1302 |
| GP56-S2-11-SR | 10.84 | 19.2 | 32.9 | 4658 | 31 | 89 | 8.4 | 1302 |
| GP56-S2-16-SR | 15.51 | 24.6 | 39.4 | 5968 | 32 | 89 | 6.2 | 1302 |
| GP56-S2-20-SR | 20.03 | 28.6 | 39.4 | 8304 | 32 | 89 | 3.4 | 1302 |
| GP56-S2-26-SR | 25.71 | 29.1 | 39.4 | 8988 | 32 | 88 | 3.7 | 1302 |
| GP56-S2-33-SR | 32.72 | 21.6 | 42.7 | 10913 | 32 | 88 | 2.1 | 1302 |
| GP56-S2-43-SR | 42.63 | 17.4 | 26.1 | 8988 | 32 | 87 | 3.6 | 1302 |
| GP56-S2-62-SR | 62.33 | 18.3 | 26.1 | 13000 | 33 | 86 | 3.1 | 1302 |
| GP56-T1-3-HR | 3.29 | 17.5 | 24.7 | 4658 | 29 | 95 | 9.6 | 1532 |
| GP56-T1-5-HR | 5.09 | 21.6 | 38.2 | 8304 | 32 | 95 | 3.7 | 1532 |
| GP56-T1-7-HR | 6.53 | 12.1 | 26.1 | 8988 | 34 | 95 | 4 | 1532 |
| GP56-T1-8-HR | 7.71 | 6 | 30.9 | 10913 | 35 | 94 | 2.3 | 1532 |
| GP56-T1-10-HR | 9.55 | 3.6 | 38.2 | 13000 | 35 | 94 | 3.3 | 1532 |
| GP56-T2-11-HR | 10.84 | 19.2 | 32.9 | 4658 | 31 | 94 | 8.4 | 1532 |
| GP56-T2-16-HR | 15.51 | 24.6 | 39.4 | 5968 | 32 | 94 | 6.3 | 1532 |



GP56

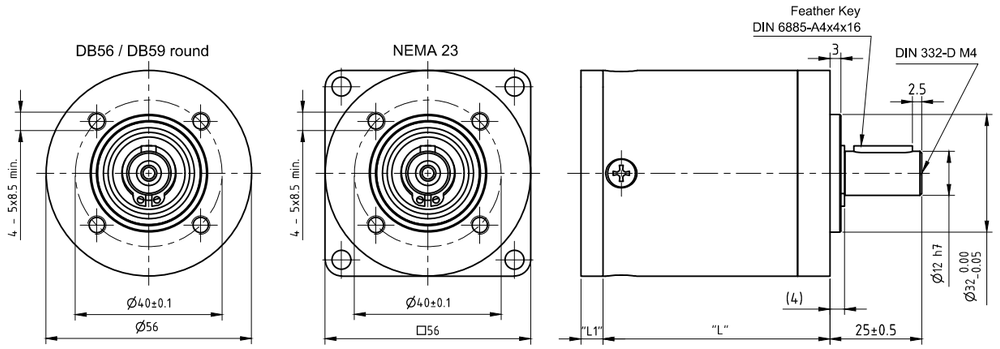
High-torque planetary gearboxes

## VERSIONS

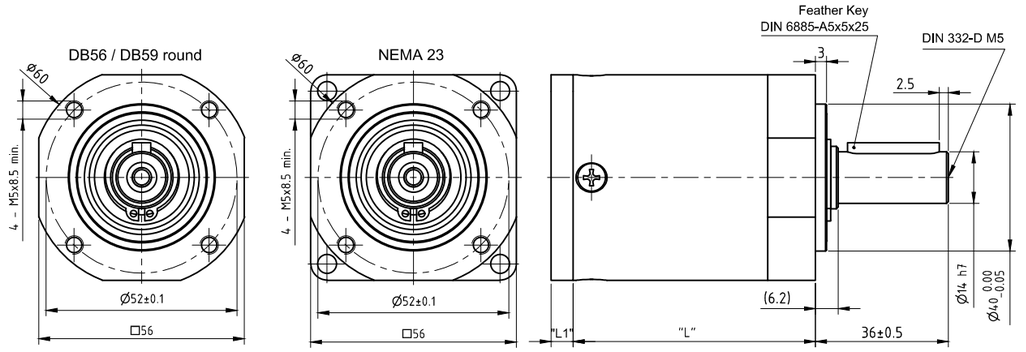
| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Max. Input Speed rpm | Max. Backlash ´(arc minutes) | Efficiency % | Moment of Inertia kg mm² | |
|---|---|---|---|---|---|---|---|---|
| GP56-T2-20-HR | 20.03 | 28.6 | 39.4 | 8304 | 32 | 94 | 3.4 | 1532 |
| GP56-T2-26-HR | 25.71 | 29.1 | 39.4 | 8988 | 32 | 94 | 3.7 | 1532 |
| GP56-T2-33-HR | 32.72 | 21.6 | 42.7 | 10913 | 32 | 93 | 2.1 | 1532 |
| GP56-T2-43-HR | 42.63 | 17.4 | 26.1 | 8988 | 32 | 92 | 3.6 | 1532 |
| GP56-T2-62-HR | 62.33 | 18.3 | 26.1 | 13000 | 33 | 92 | 3.2 | 1532 |

## DIMENSIONS (IN MM)

**GP56-S**




**GP56-T**



# GP56-N

## Low-noise planetary gearboxes

### TECHNICAL DATA

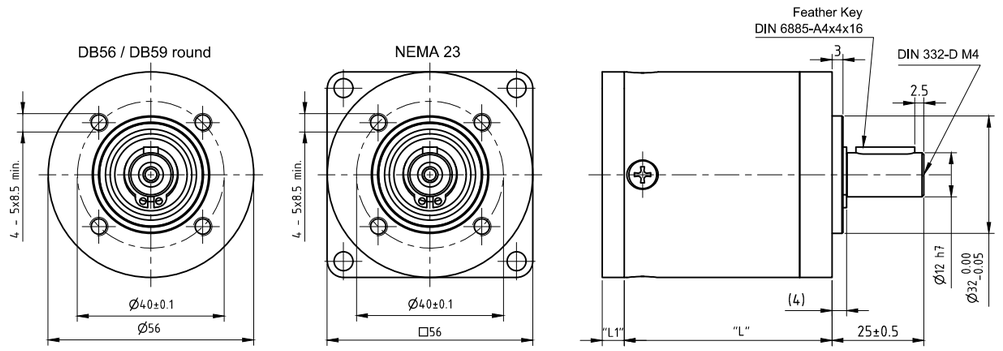
| | |
|---|---|
| **IP-Protection Gearbox** | IP54 |
| **Service Life*** | 5000 h |
| **For Motor Size** | NEMA 23, NEMA 24 |
| **Operating Temperature** | -10 °C - 50 °C |

### VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Max. Input Speed rpm | Max. Backlash ´(arc minutes) | Efficiency % | Moment of Inertia kg mm² | Admissible Axial Shaft Load N |
|---|---|---|---|---|---|---|---|---|
| GP56-N1-3-SR | 3.24 | 2 | 6.09 | 4700 | 39 | 93 | 5.5 | 740 |
| GP56-N1-4-SR | 3.96 | 2 | 5.9 | 6050 | 39 | 93 | 3.5 | 790 |
| GP56-N1-5-SR | 5.37 | 1.7 | 5 | 8800 | 42 | 92 | 2.3 | 880 |
| GP56-N1-6-SR | 6.19 | 1.5 | 4.6 | 10100 | 43 | 92 | 2 | 920 |
| GP56-N2-11-SR | 10.68 | 6.4 | 12.6 | 4700 | 22 | 86 | 5.6 | 1100 |
| GP56-N2-16-SR | 15.61 | 7.4 | 15.1 | 6050 | 21 | 86 | 3.5 | 1250 |
| GP56-N2-20-SR | 20.17 | 9.2 | 14.8 | 6050 | 19 | 86 | 3.4 | 1275 |
| GP56-N2-26-SR | 25.88 | 11.8 | 19 | 6050 | 18 | 86 | 3.3 | 1275 |
| GP56-N2-35-SR | 35.05 | 10.1 | 19 | 8800 | 19 | 85 | 2.2 | 1275 |

### DIMENSIONS (IN MM)

**GP56-N**






# GPLE22

## Precision planetary gearboxes

### TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Motor (Except Shaft Output)** | |
| **Service Life*** | 10000 h |
| **For Motor Size** | NEMA 8, NEMA 11, NEMA 17 |
| **Operating Temperature** | -25 to +90 °C |
| **Admissible Axial Shaft Load** | 20 N |
| **Admissible Radial Shaft Load** | 20 N |
| **Max. Input Speed** | 4500 rpm |

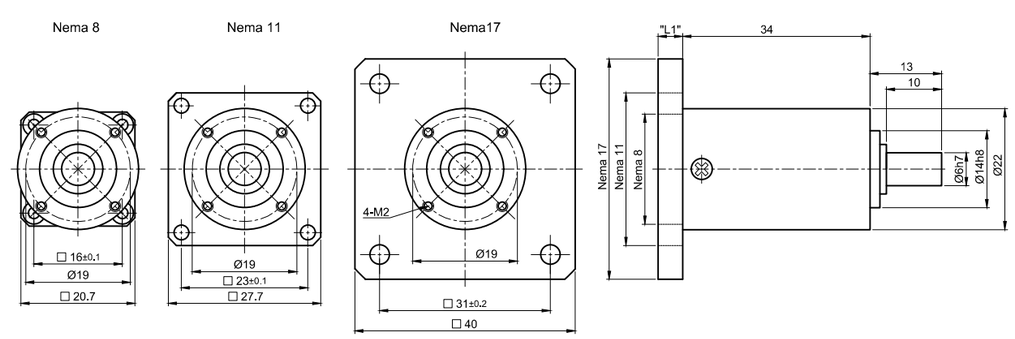
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

### VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| GPLE22-2S-9 | 9 | 1.5 | 80 | 55 | 0.09 | 34 | 4.4 | 0.1 |
| GPLE22-2S-12 | 12 | 1.5 | 80 | 55 | 0.09 | 34 | 4.4 | 0.1 |
| GPLE22-2S-15 | 15 | 1.5 | 80 | 55 | 0.09 | 34 | 4.4 | 0.1 |

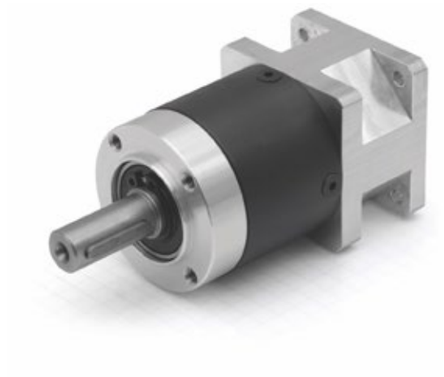
### DIMENSIONS (IN MM)

**GPLE22**



# GPLE40

## Precision planetary gearboxes



## TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Motor (Except Shaft Output)** | IP54 |
| **Service Life*** | 30000 h |
| **For Motor Size** | NEMA 17, NEMA 23, NEMA 24 |
| **Operating Temperature** | -25 to +90 °C |
| **Admissible Axial Shaft Load** | 160 N |
| **Admissible Radial Shaft Load** | 160 N |
| **Max. Input Speed** | 18000 rpm |

*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1* mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLE40-1S-3 | 3 | 11 | 17.5 | 97 | 15 | 3.1 | 39 | 24.5 - 27.5 | 0.35 |
| GPLE40-1S-4 | 4 | 15 | 24 | 97 | 15 | 2.2 | 39 | 24.5 - 27.5 | 0.35 |
| GPLE40-1S-5 | 5 | 14 | 22 | 97 | 15 | 1.9 | 39 | 11 - 27.5 | 0.35 |
| GPLE40-1S-8 | 8 | 6 | 10 | 97 | 15 | 1.7 | 39 | 24.5 - 27.5 | 0.35 |
| GPLE40-1S-10 | 10 | 5 | 8 | 97 | 15 | 1.6 | 39 | 27.5 | 0.35 |
| GPLE40-2S-9 | 9 | 16.5 | 26 | 95 | 19 | 3 | 52 | 24.5 - 27.5 | 0.45 |
| GPLE40-2S-12 | 12 | 20 | 32 | 95 | 19 | 2.9 | 52 | 24.5 - 27.5 | 0.45 |
| GPLE40-2S-15 | 15 | 18 | 29 | 95 | 19 | 2.3 | 52 | 24.5 - 27.5 | 0.45 |
| GPLE40-2S-16 | 16 | 20 | 32 | 95 | 19 | 2.2 | 52 | 24.5 - 27.5 | 0.45 |
| GPLE40-2S-20 | 20 | 20 | 32 | 95 | 19 | 1.9 | 52 | 24.5 - 27.5 | 0.45 |
| GPLE40-2S-25 | 25 | 18 | 29 | 95 | 19 | 1.9 | 52 | 11 - 27.5 | 0.45 |
| GPLE40-2S-32 | 32 | 20 | 32 | 95 | 19 | 1.7 | 52 | 24.5 - 27.5 | 0.45 |
| GPLE40-2S-40 | 40 | 18 | 29 | 95 | 19 | 1.6 | 52 | 24.5 - 27.5 | 0.45 |
| GPLE40-2S-64 | 64 | 7.5 | 12 | 95 | 19 | 1.6 | 52 | 24.5 - 27.5 | 0.45 |
| GPLE40-3S-60 | 60 | 20 | 32 | 91 | 22 | 2.9 | 64.5 | 24.5 - 27.5 | 0.55 |
| GPLE40-3S-80 | 80 | 20 | 32 | 91 | 22 | 1.9 | 64.5 | 24.5 - 27.5 | 0.55 |
| GPLE40-3S-100 | 100 | 20 | 32 | 91 | 22 | v | 64.5 | 24.5 - 27.5 | 0.55 |



GPLE40

Precision planetary gearboxes

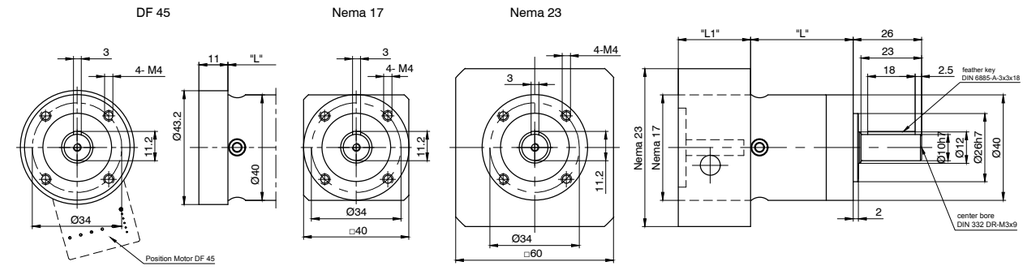
## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLE40-3S-120 | 120 | 18 | 29 | 91 | 22 | 2.9 | 64.5 | 24.5 - 27.5 | 0.55 |
| GPLE40-3S-160 | 160 | 20 | 32 | 91 | 22 | 1.6 | 64.5 | 24.5 - 27.5 | 0.55 |
| GPLE40-3S-200 | 200 | 18 | 29 | 91 | 22 | 1.6 | 64.5 | 24.5 - 27.5 | 0.55 |
| GPLE40-3S-256 | 256 | 20 | 32 | 91 | 22 | 1.6 | 64.5 | 24.5 - 27.5 | 0.55 |
| GPLE40-3S-320 | 320 | 18 | 29 | 91 | 22 | 1.6 | 64.5 | 24.5 - 27.5 | 0.55 |
| GPLE40-3S-512 | 512 | 7.5 | 12 | 91 | 22 | 1.6 | 64.5 | 24.5 - 27.5 | 0.55 |

* The intermediate flange size (L1) of NEMA 23 and 24 motors is 24.5 mm and 27.5 mm for NEMA 17 motors. **GPLE40-1S-10 only for NEMA 17 Motors.

## DIMENSIONS (IN MM)

GPLE40



# GPLE60

## Precision planetary gearboxes

## TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Motor (Except Shaft Output)** | |
| **Service Life*** | 30000 h |
| **For Motor Size** | NEMA 23, NEMA 24, NEMA 34, 80 mm (BLDC) |
| **Operating Temperature** | -25 to +90 °C |
| **Admissible Axial Shaft Load** | 450 N |
| **Admissible Radial Shaft Load** | 340 N |
| **Max. Input Speed** | 13000 rpm |

*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1* mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLE60-1S-3 | 3 | 28 | 45 | 97 | 10 | 13.5 | 47 | 24 - 39 | 0.9 |
| GPLE60-1S-4 | 4 | 38 | 61 | 97 | 10 | 9.3 | 47 | 24 - 39 | 0.9 |
| GPLE60-1S-5 | 5 | 40 | 64 | 97 | 10 | 7.8 | 47 | 24 - 41 | 0.9 |
| GPLE60-1S-8 | 8 | 18 | 29 | 97 | 10 | 6.5 | 47 | 24 - 39 | 0.9 |
| GPLE60-1S-10 | 10 | 15 | 24 | 97 | 10 | 6.5 | 47 | 24 - 41 | 0.9 |
| GPLE60-2S-9 | 9 | 44 | 70 | 95 | 12 | 13.1 | 59.5 | 24 - 39 | 1.1 |
| GPLE60-2S-12 | 12 | 44 | 70 | 95 | 12 | 12.7 | 59.5 | 24 - 39 | 1.1 |
| GPLE60-2S-15 | 15 | 44 | 70 | 95 | 12 | 7.7 | 59.5 | 24 - 39 | 1.1 |
| GPLE60-2S-16 | 16 | 44 | 70 | 95 | 12 | 8.8 | 59.5 | 24 - 39 | 1.1 |
| GPLE60-2S-20 | 20 | 44 | 70 | 95 | 12 | 7.5 | 59.5 | 24 - 39 | 1.1 |
| GPLE60-2S-25 | 25 | 40 | 64 | 95 | 12 | 7.5 | 59.5 | 24 - 41 | 1.1 |
| GPLE60-2S-32 | 32 | 44 | 70 | 95 | 12 | 6.4 | 59.5 | 24 - 39 | 1.1 |
| GPLE60-2S-40 | 40 | 40 | 64 | 95 | 12 | 6.4 | 59.5 | 24 - 39 | 1.1 |
| GPLE60-2S-64 | 64 | 18 | 29 | 95 | 12 | 6.4 | 59.5 | 24 - 39 | 1.1 |
| GPLE60-3S-60 | 60 | 44 | 70 | 91 | 15 | 7.6 | 72 | 24 - 39 | 1.3 |
| GPLE60-3S-80 | 80 | 44 | 70 | 91 | 15 | 7.5 | 72 | 24 - 39 | 1.3 |
| GPLE60-3S-100 | 100 | 44 | 70 | 91 | 15 | 7.5 | 72 | 24 | 1.3 |



GPLE60

Precision planetary gearboxes

## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLE60-3S-120 | 120 | 44 | 70 | 91 | 15 | 6.4 | 72 | 24 | 1.3 |
| GPLE60-3S-160 | 160 | 44 | 70 | 91 | 15 | 6.4 | 72 | 24 | 1.3 |
| GPLE60-3S-200 | 200 | 40 | 64 | 91 | 15 | 6.4 | 72 | 24 | 1.3 |
| GPLE60-3S-256 | 256 | 44 | 70 | 91 | 15 | 6.4 | 72 | 24 | 1.3 |
| GPLE60-3S-320 | 320 | 40 | 64 | 91 | 15 | 6.4 | 72 | 24 | 1.3 |
| GPLE60-3S-512 | 512 | 18 | 29 | 91 | 15 | 6.4 | 72 | 24 | 1.3 |

* The intermediate flange size (L1) of NEMA 23 and 24 motors is 24 mm and 39 mm for NEMA 34 motors.

## ORDER IDENTIFIER

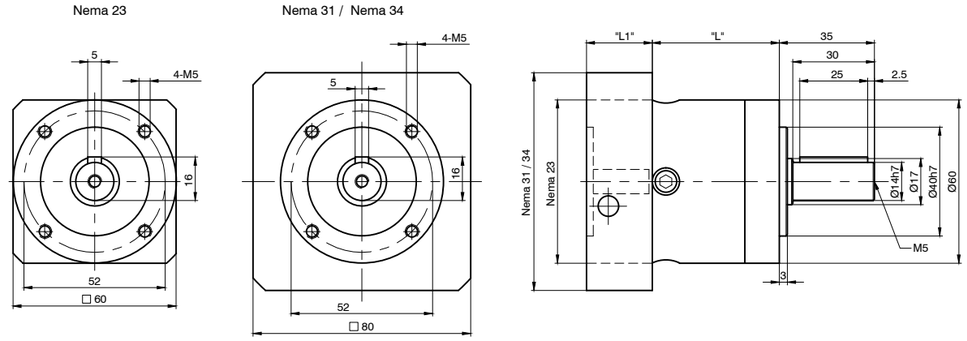
**GPLE60-1S-3**
= For NEMA 23/24 motors
-F87 = For NEMA 34 motors

## ACCESSORIES

**MK-DH-8-11-GPLE** Spacer sleeve

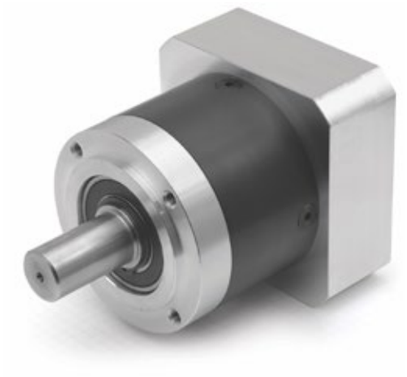
## DIMENSIONS (IN MM)

GPLE60



# GPLE80

## Precision planetary gearboxes



### ORDER IDENTIFIER

**GPLE80-1S-3-F87**
= For NEMA 34 motors

### TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Motor (Except Shaft Output)** | |
| **Service Life*** | 30000 h |
| **For Motor Size** | NEMA 34, 80 mm (BLDC) |
| **Operating Temperature** | -25 to +90 °C |
| **Admissible Axial Shaft Load** | 900 N |
| **Admissible Radial Shaft Load** | 650 N |
| **Max. Input Speed** | 7000 rpm |

*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

### VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLE80-1S-3 | 3 | 85 | 136 | 97 | 7 | 77 | 60.5 | 41.5 | 2.1 |
| GPLE80-1S-4 | 4 | 115 | 184 | 97 | 7 | 52 | 60.5 | 41.5 | 2.1 |
| GPLE80-1S-5 | 5 | 110 | 176 | 97 | 7 | 45 | 60.5 | 41.5 - 43.5 | 2.1 |
| GPLE80-1S-8 | 8 | 50 | 80 | 97 | 7 | 39 | 60.5 | 41.5 | 2.1 |
| GPLE80-1S-10 | 10 | 38 | 61 | 97 | 7 | 39 | 60.5 | 41.5 - 43.5 | 2.1 |
| GPLE80-2S-9 | 9 | 130 | 208 | 95 | 9 | 74 | 77.5 | 41.5 | 2.6 |
| GPLE80-2S-12 | 12 | 120 | 192 | 95 | 9 | 72 | 77.5 | 41.5 | 2.6 |
| GPLE80-2S-15 | 15 | 110 | 176 | 95 | 9 | 71 | 77.5 | 41.5 | 2.6 |
| GPLE80-2S-16 | 16 | 120 | 192 | 95 | 9 | 50 | 77.5 | 41.5 | 2.6 |
| GPLE80-2S-20 | 20 | 120 | 192 | 95 | 9 | 50 | 77.5 | 41.5 | 2.6 |
| GPLE80-2S-25 | 25 | 110 | 176 | 95 | 9 | 44 | 77.5 | 41.5 - 43.5 | 2.6 |
| GPLE80-2S-32 | 32 | 120 | 192 | 95 | 9 | 39 | 77.5 | 41.5 | 2.6 |
| GPLE80-2S-40 | 40 | 110 | 176 | 95 | 9 | 39 | 77.5 | 41.5 | 2.6 |
| GPLE80-2S-64 | 64 | 50 | 80 | 95 | 9 | 39 | 77.5 | 41.5 | 2.6 |
| GPLE80-3S-60 | 60 | 110 | 176 | 91 | 11 | 51 | 95 | 41.5 | 3.1 |
| GPLE80-3S-80 | 80 | 120 | 192 | 91 | 11 | 50 | 95 | 41.5 | 3.1 |
| GPLE80-3S-100 | 100 | 120 | 192 | 91 | 11 | 44 | 95 | 41.5 | 3.1 |



GPLE80

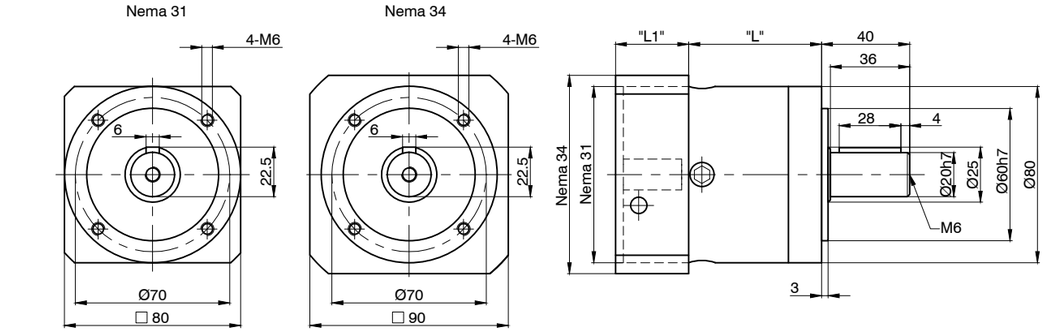
Precision planetary gearboxes

### VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLE80-3S-120v | 120 | 110 | 176 | 91 | 11 | 70 | 95 | 41.5 | 3.1 |
| GPLE80-3S-160 | 160 | 120 | 192 | 91 | 11 | 39 | 95 | 41.5 | 3.1 |
| GPLE80-3S-256 | 256 | 120 | 192 | 91 | 11 | 39 | 95 | 41.5 | 3.1 |
| GPLE80-3S-320 | 320 | 110 | 176 | 91 | 11 | 39 | 95 | 41.5 | 3.1 |
| GPLE80-3S-512 | 512 | 50 | 80 | 91 | 11 | 39 | 95 | 41.5 | 3.1 |

### DIMENSIONS (IN MM)

**GPLE80**



# GPLEP50

## Precision planetary gearboxes

### ACCESSORIES

**MK-DH-6,35-8** Spacer sleeve

### TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Gearbox** | IP54 |
| **Service Life*** | 30000 h |
| **For Motor Size** | NEMA 17 |
| **Operating Temperature** | -25 to +90 °C |
| **Admissible Axial Shaft Load** | 800 N |
| **Admissible Radial Shaft Load** | 700 N |
| **Max. Input Speed** | 18000 rpm |

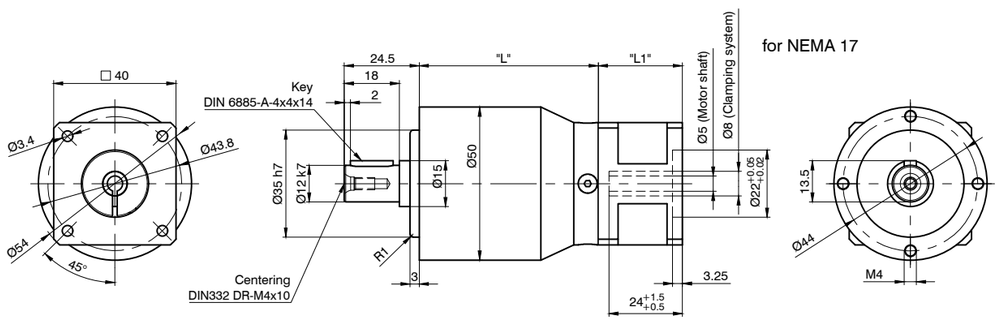
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

### VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLEP50-1S-5 | 5 | 13 | 21 | 97 | 15 | ≤3 | 46 | 27.5 | 0.7 |
| GPLEP50-1S-10 | 10 | 5 | 8 | 97 | 15 | ≤1.5 | 46 | 27.5 | 0.7 |
| GPLEP50-2S-25 | 25 | 13 | 21 | 95 | 19 | ≤1.8 | 58.5 | 27.5 | 0.8 |

### DIMENSIONS (IN MM)

GPLEP50






# GPLEP70

## Precision planetary gearboxes

### ACCESSORIES

**MK-DH-8-11-GPLE** Spacer sleeve

### TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Gearbox** | IP54 |
| **Service Life*** | 30000 h |
| **For Motor Size** | NEMA 23, NEMA 24 |
| **Operating Temperature** | -25 to +90 °C |
| **Admissible Axial Shaft Load** | 1000 N |
| **Admissible Radial Shaft Load** | 900 N |
| **Max. Input Speed** | 13000 rpm |

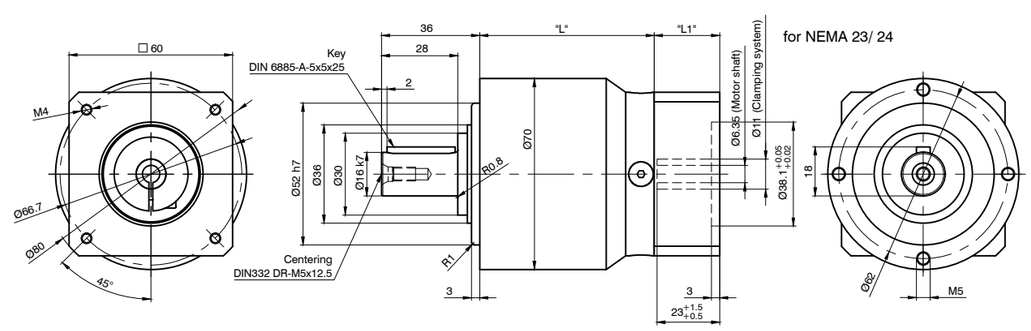
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

### VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLEP70-1S-5 | 5 | 30 | 48 | 97 | 10 | ≤17.4 | 51 | 24 | 1.5 |
| GPLEP70-1S-10 | 10 | 15 | 24 | 97 | 10 | ≤17.4 | 51 | 24 | 1.5 |
| GPLEP70-2S-25 | 25 | 30 | 48 | 95 | 12 | ≤12.6 | 64 | 24 | 1.8 |

### DIMENSIONS (IN MM)

GPLEP70



# GPLEP90

## Precision planetary gearboxes

## TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Gearbox** | IP54 |
| **Service Life*** | 30000 h |
| **For Motor Size** | NEMA 34 |
| **Operating Temperature** | -25 to +90 °C |
| **Admissible Axial Shaft Load** | 1500 N |
| **Admissible Radial Shaft Load** | 1700 N |
| **Service Life*** | 7000 rpm |

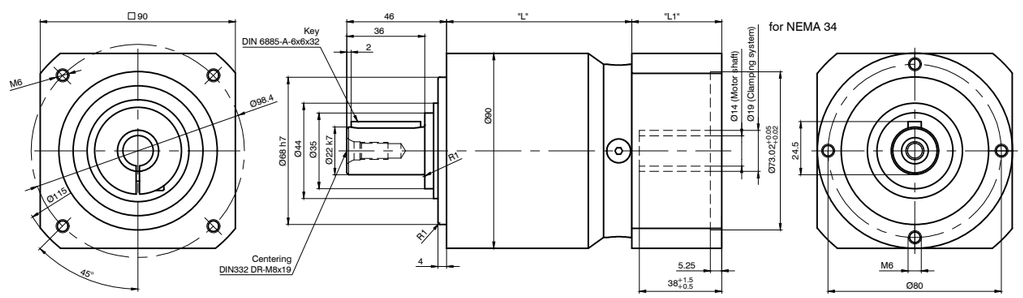
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLEP90-1S-5 | 5 | 82 | 131 | 97 | 7 | ≤78.9 | 67.5 | 41.5 | 3.1 |
| GPLEP90-1S-10 | 10 | 38 | 61 | 97 | 7 | ≤78.9 | 67.5 | 41.5 | 3.1 |
| GPLEP90-2S-25 | 25 | 82 | 131 | 95 | 9 | ≤62.6 | 85.5 | 41.5 | 3.8 |

## DIMENSIONS (IN MM)

GPLEP90






# GPLEF64

## Flange gearboxes

ACCESSORIES

**MK-DH-8-11-GPLE** Spacer sleeve

## TECHNICAL DATA

| | |
|---|---|
| **IP-Protection Gearbox** | IP54 |
| **Service Life*** | 30000 h |
| **For Motor Size** | NEMA 23, NEMA 24 |
| **Operating Temperature** | -25 to +90 °C |
| **Admissible Axial Shaft Load** | 1200 N |
| **Admissible Radial Shaft Load** | 500 N |
| **Max. Input Speed** | 13000 rpm |

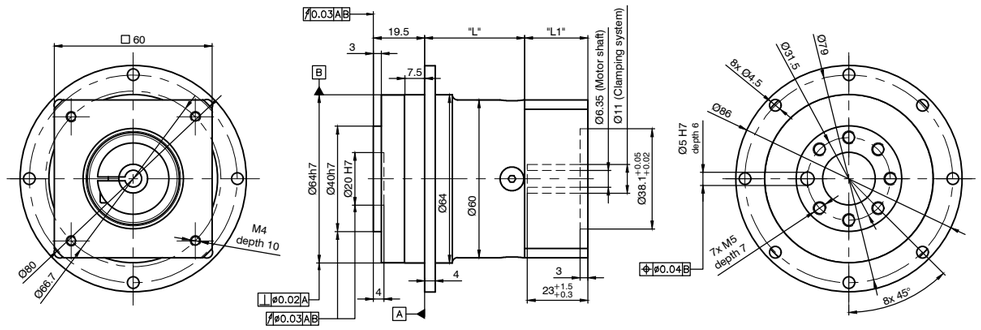
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Moment of Inertia kg mm² | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|---|
| GPLEF64-1S-5 | 5 | 40 | 80 | 97 | 10 | ≤21 | 25.5 | 24 | 1.1 |
| GPLEF64-1S-10 | 10 | 15 | 80 | 97 | 10 | ≤21 | 25.5 | 24 | 1.1 |
| GPLEF64-2S-25 | 25 | 40 | 80 | 95 | 12 | ≤13 | 38 | 24 | 1.5 |

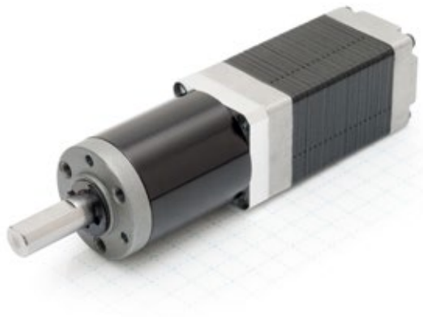
## DIMENSIONS (IN MM)

GPLEF64



# GPLL22

## Economy planetary gearboxes



## TECHNICAL DATA

| | |
|---|---|
| **Service Life*** | 1000 h |
| **For Motor Size** | NEMA 8, NEMA 11 |
| **Operating Temperature** | -10 to +80 °C |
| **Admissible Axial Shaft Load** | 7 N |
| **Admissible Radial Shaft Load** | 10 N |
| **Max. Input Speed** | 9000 rpm |

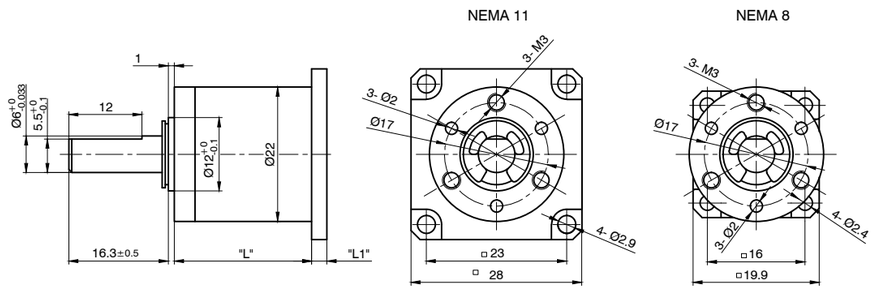
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

## VERSIONS

| Type | Reduction Ratio | Rated Output Torque Nm | Max. Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Length „L“ mm | Flange Length L1 mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| GPLL22-5 | 4.66 | 0.2 | 0.6 | 80 | 150 | 21.8 | 5 | 0.046 |
| GPLL22-25 | 25.2 | 0.3 | 0.9 | 70 | 150 | 28 | 5 | 0.051 |
| GPLL22-90 | 89.72 | 0.4 | 1.2 | 60 | 150 | 34.2 | 5 | 0.058 |

## DIMENSIONS (IN MM)

GPLL22






# GSGE60

## Worm gears

## VERSIONS

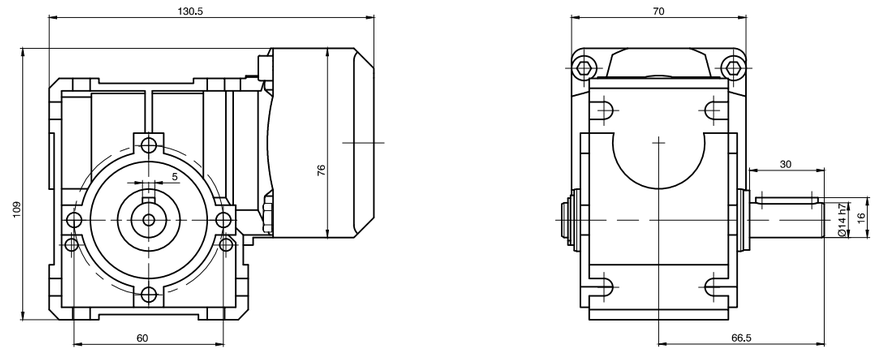
| Type | Reduction Ratio | Rated Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Max. Input Speed rpm | Length mm | For Motor Size | Self-Locking Torque | Admissible Axial Shaft Load N | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| GSGE60-5-1 | 5 | 11 | 82 | 120 | 1400 | 130.5 | NEMA 23 | – | 1800 | 1.7 |
| GSGE60-15-1 | 15 | 25.3 | 63 | 120 | 1400 | 130.5 | NEMA 23 | – | 1800 | 1.7 |
| GSGE60-25-1 | 25 | 35.8 | 54 | 120 | 1400 | 130.5 | NEMA 23 | – | 1800 | 1.7 |
| GSGE60-50-1 | 50 | 34 | 36 | 120 | 1400 | 130.5 | NEMA 23 | ✓ | 1800 | 1.7 |

## ACCESSORIES

**MG-DW-GSGE60** Double shaft for GSGE60 gearbox
**MG-D-GSGE60** Cover for GSGE60 gearbox

## DIMENSIONS (IN MM)

GSGE60



# GSGE80

## Worm gears

### VERSIONS

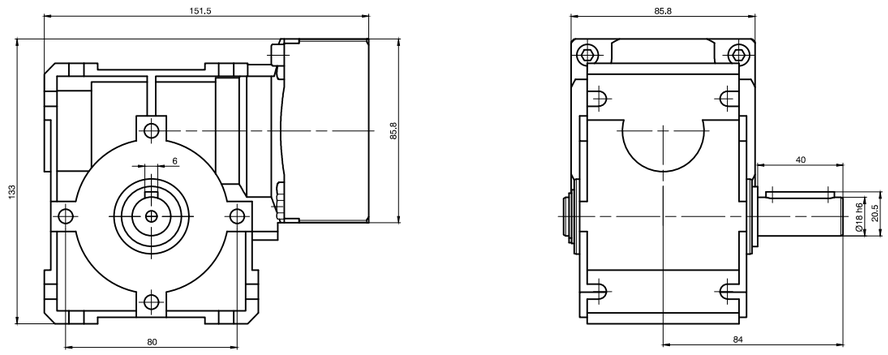
| Type | Reduction Ratio | Rated Output Torque Nm | Efficiency % | Max. Backlash ´(arc minutes) | Max. Input Speed rpm | Length mm | For Motor Size | Self-Locking Torque | Admissible Axial Shaft Load N | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|
| GSGE80-12.5-1 | 12.5 | 62.3 | 72 | 120 | 1400 | 151.5 | NEMA 34 | – | 3200 | 3 |
| GSGE80-25-1 | 25 | 65.5 | 57 | 120 | 1400 | 151.5 | NEMA 34 | – | 3200 | 3 |
| GSGE80-50-1 | 50 | 67.3 | 39 | 120 | 1400 | 151.5 | NEMA 34 | ✓ | 3200 | 3 |

### ACCESSORIES

**MG-DW-GSGE80** Double shaft for GSGE80 gearbox
**MG-D-GSGE80** Cover for GSGE80 gearbox

### DIMENSIONS (IN MM)

**GSGE80**






# Notes

# BKE

## Permanent-magnet brake

## TECHNICAL DATA

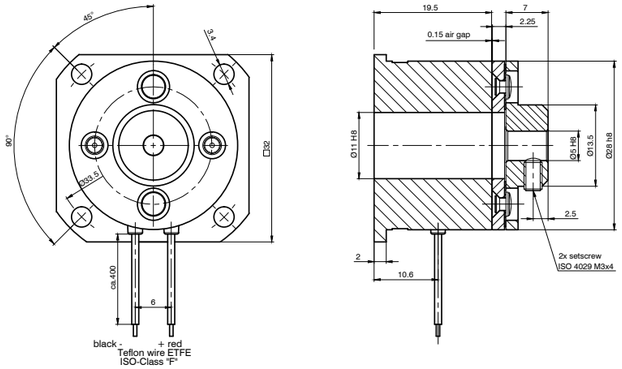
| | |
|---|---|
| **Operating Voltage** | 24 VDC |
| **Hub** | borehole ... H8 with 2 grub screws AM3x4 |
| **Fastening** | with 4 M3 screws |
| **Connection** | leads L=400 mm |

## VERSIONS

| Type | Rated Power W | Holding Torque Ncm | Moment of Inertia kg mm² | Switch-On Time ms | Switch-Off Time ms | Size mm | Shaft Diameter mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| Brake-BKE-0,4-5,0 | 8 | 40 | 1.3 | 10 | 6 | 32 | 5 | 0.08 |
| Brake-BKE-1,0-6,35 | 10 | 100 | 2.1 | 12 | 8 | 34 | 6.35 | 0.11 |
| Brake-BKE-2,0-6,35 | 11 | 200 | 6,7 | 25 | 7 | 42 | 6.35 | 0.185 |

## DIMENSIONS (IN MM)

**BKE-0.4-5.0**



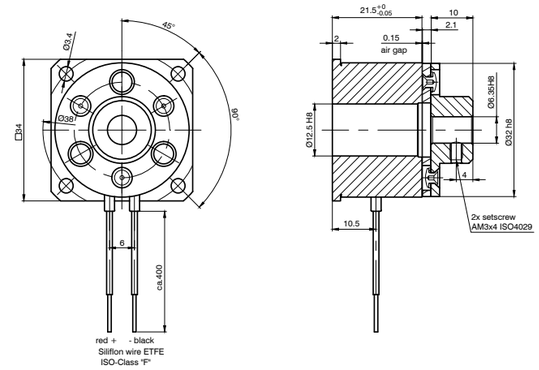



BKE

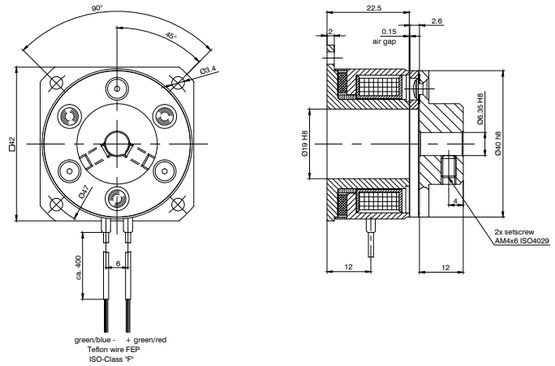
Permanent-magnet brake

## DIMENSIONS (IN MM)

**BKE-1.0-6.35**



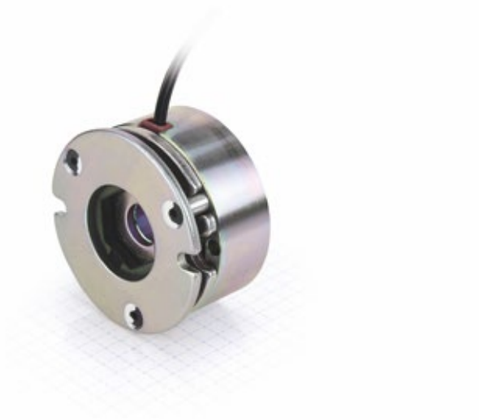

**BKE-2.0-6.35**




BRAKES

# BWA

## Spring-loaded brake



### TECHNICAL DATA

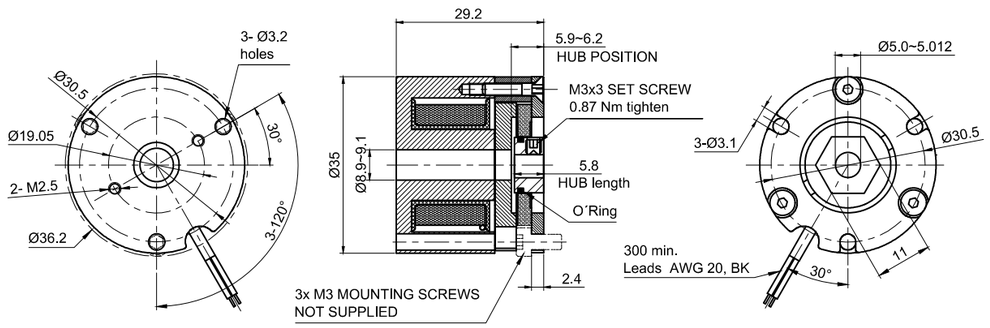
| | |
|---|---|
| **Operating Voltage** | 24 VDC |
| **Fastening** | with 3 screws M3 (BWA-0,35-5), with 2 screws M4 (BWA-1,5-6,35) |
| **Connection** | leads L=300 mm |

### VERSIONS

| Type | Rated Power W | Holding Torque Ncm | Switch-On Time ms | Switch-Off Time ms | Hub | Size mm | Shaft Diameter mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| BRAKE-BWA-0,35-5 | 5.9 | 35 | 100 | 10 | borehole ø5 H8 with grub screw M3x3 | 35 | 5 | 0.15 |
| BRAKE-BWA-1,5-6,35 | 11 | 150 | 100 | 30 | borehole ø6.35 H7 with 2 grub screws M3x5 | 51.5 | 6.35 | 0.3 |

### DIMENSIONS (IN MM)

**BWA-0.35-5**

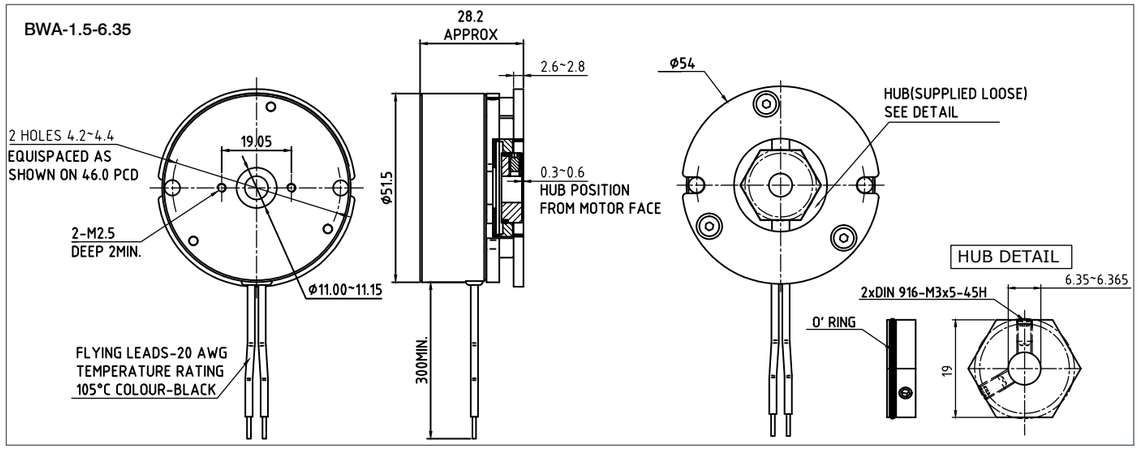





BWA

Spring-loaded brake

### DIMENSIONS (IN MM)



# BCD

## Spring-loaded brake

### TECHNICAL DATA

| | |
|---|---|
| **Operating Voltage** | 24 VDC |
| **Fastening** | clamping system with screw |
| **Connection** | clamping system |

### VERSIONS

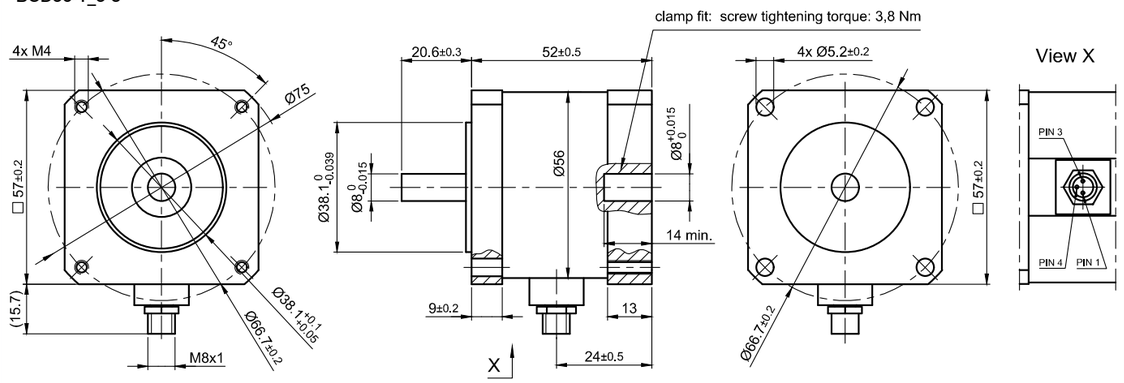
| Type | Rated Power W | Holding Torque Ncm | Switch-On Time ms | Switch-Off Time ms | Hub | Size mm | Shaft Diameter mm | Weight kg |
|---|---|---|---|---|---|---|---|---|
| BRAKE-BCD56-1,5-8 | 7.2 | 150 | 60 | 20 | borehole ø5 H8 with grub screw M3x3 | 57 | | 0.53 |

### ZUBEHÖR

**ZK-M8-3-2M-1-AFF** Connection cable M8

### DIMENSIONS (IN MM)

**BCD56-1_5-8**






# Notes

# Notes

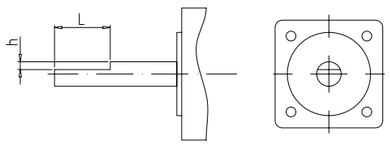



Nanotec
PULS
analog
frequency
In1
In2
In3
In4/EN
In5/DIR
In6/Clock
Al Electrolytic Capacitor
F&T 25813 Husum
Made in Germany
10000µF -10+30% 100V
AL-ELKO Typ LF IEC 60

## SHAFT MODIFICATION

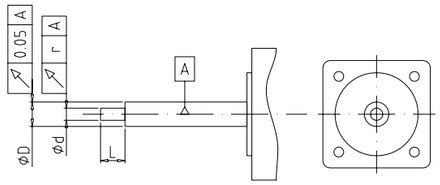
Nanotec also supplies shafts with customer-specific designs. The flattening or shortening of shafts, the drilling of a cross bore or the milling of a keyway is generally possible within two weeks. Special shaft modifications, such as knurling or direct gearing, are offered for larger quantities ex works. Please refer to our website for all options: www.nanotec.com

### D-SHAFT



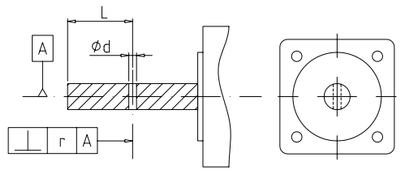

In addition to the Nanotec standard D-shaft (can be ordered via the online configurator), flat surfaces can also be prepared according to individual specifications. For special shaft-hub connections, a single flattening can be provided on nearly all motor shafts.

### THINNER SHAFT




Machined shafts are used when toothed wheels, pinions or pulleys with small bore diameter are to be directly attached to the motor shaft.

### CROSS BORE

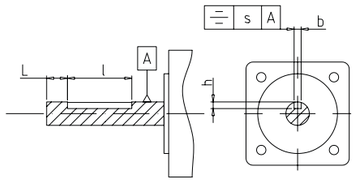



Cross bores are drilled into the shaft with the required diameter and enable, among other things, the use of clamping pins.

### SHORTER SHAFT

For applications with limited space, Nanotec offers motors with shortened shafts.

### KEYWAY




Shafts with keyway offer increased protection against rotation, especially for applications where the load changes direction. For shaft diameters of 6.35 mm and more, keyways are manufactured according to DIN 6885 P9.





## ATTACHMENT PARTS

Pre-mounted pinions, worm gears or pulleys are available in numerous versions. They can only be ordered in larger quantities and have a lead time of several weeks.

### TOOTHED WHEEL/PINIONS

Pinions made of steel, aluminum or plastic can be mounted in various versions directly on the shaft. The motors can thereby be used as direct drives for gearboxes or rack and pinion drives.

### WORM GEAR

Motors equipped with a worm gear can be installed at a 90° angle to the load and offer large reduction ratios and compact size. Worm gears are available in various sizes, materials, tooth types as well as with or without hub.

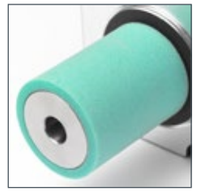
### BEVEL GEAR

Motors equipped with a bevel gear can be installed at a 90° angle to the load and offer large reduction ratios and compact size. Bevel gears are available in various materials and versions.

### WIRE CORD PULLEY

Wire cords and cables can be used for redirection, allowing the motor to be placed at any position.

### TRACK, FRICTION AND DRIVE ROLLER

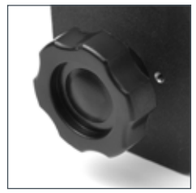


Shafts equipped with track and drive rollers are used above all in transport systems.

### PULLEY

Pulleys for round belts or V-belts are used mainly for driving light- to medium-weight objects. Pulleys for toothed (synchronous) belts can be used, for among other purposes, precise positioning.

### ADJUSTMENT ELEMENT



Handwheels, knobs, knurled knobs, star and cross handle grips as well as adjusting screws can be mounted on the rear motor shaft (B shaft) for manual and adjustment settings.

### TIMING DISK

Timing and slotted disks are available in various materials.

# Cable Assembly

## CABLE ASSEMBLY OPTIONS

Customer-specific connectors and cables allow simple and fast connection to existing machines. For orders with a minimum quantity of 100 pcs Nanotec offers connector and cable assemblies ex works.

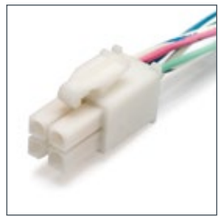
JST CONNECTOR

JST CONNECTOR

BERG CONNECTOR

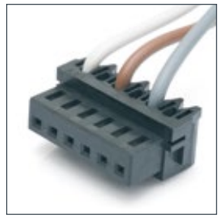
LUMBERG CONNECTOR

AMP CONNECTOR



WAGO CONNECTOR

IDC



SUB-D CONNECTOR

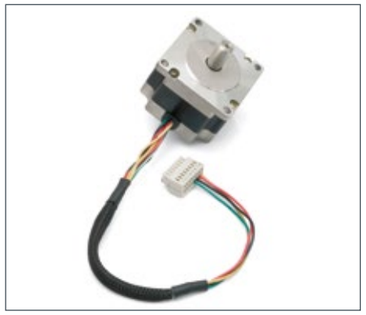
SUB-D CONNECTOR

M12 CONNECTOR

## CABLE ASSEMBLY

HEAT-SHRINKABLE TUBE

PROTECTIVE BRAID



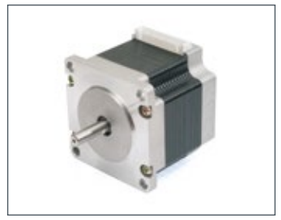
BRAIDING

## INTEGRATED PLUG

TWINTUS CONNECTOR

M12 CONNECTOR

JST CONNECTOR



M12 CONNECTOR



# Notes

# Product-specific connection cables

## VERSIONS

| Type | Suitable for | Cable Length m |
|---|---|---|
| ZK-GHR3-500-S | CL3-E | 0.5 |
| ZK-GHR12-500-S | CL3-E (IO) | 0.5 |
| ZK-JST-EHR-6-0.5M-S | SC41, LA42, LGA42, LSA42 | 0.5 |
| ZK-JST-PHR-6-0.3M | DF45...-A | 0.3 |
| ZK-JST-VHR-5N-0.3M | DF45...-A | 0.3 |
| ZK-JST-VHR-6N-0.5M-S | SC60 | 0.5 |
| ZK-MICROUSB | C5, C5-E, CL3-E, CL4-E, PD2-C (USB), PD4-C (USB), PD6-C | 1.5 |
| ZK-PD4-C-CAN-4-500-S | PD4-C(B) (CAN), PD2-C(B) (CAN), CL3-E (CAN) | 0.5 |
| ZK-USB | PD2-C-IP, PD4-E...-7, SMCI33 | 1.5 |
| ZK-VHR-3-500 | CL4-E-2 (Power) | 0.5 |
| ZK-VHR-4-500 | CL4-E-2 (Motor) | 0.5 |
| ZK-VHR-6-300-4 | SCA5618 (Motor), LA561, LSA561 | 0.3 |
| ZK-XHP-3-500 | CL4-E-1 (Power) | 0.5 |
| ZK-XHP-5-500-S | CL4-E (CANopen, RS485) | 0.5 |
| ZK-XHP-8-500-S | CL4-E (IO, Encoder) | 0.5 |
| ZK-XHP4-300 | CL3-E, CL4-E (Motor) | 0.3 |
| ZK-XHP2-500-S | CL3-E (Power) | 0.5 |
| ZK-DF90-500 | DFA90 | 0.5 |
| ZK-DF90-E-500 | DFA90-E, DFA68-E | 0.5 |



# Encoder cable

## VERSIONS

| Type | Suitable for | Cable Length m | Shielding | Cable Type |
|---|---|---|---|---|
| ZK-GHR10-500-S-GHR | CL3-E, NOE1, NOE2 | 0.5 | ✓ | Adapter Cable |
| ZK-GHR13-500-S-GHR | CL3-E | 0.5 | ✓ | Adapter Cable |
| ZK-JZH-8-500-S-JGH | WEDL, CL3 | 0.5 | ✓ | Signal Cable |
| ZK-JZH-8-500-S-JXH | WEDL, CL4 | 0.5 | ✓ | Signal Cable |
| ZK-MCM-12-2,0-S-JPAD | NME2, N5, C5E | 2 | ✓ | Signal Cable |
| ZK-MCM-12-500-S-JGH | NME2, CL3 | 0.5 | ✓ | Signal Cable |
| ZK-MCM-12-500-S-JPAD | NME2, N5, C5E | 0.5 | ✓ | Signal Cable |
| ZK-MCM-12-500-S-JXH | NME2, CL4 | 0.5 | ✓ | Signal Cable |
| ZK-NME1-13-500-S | NME1 | 0.5 | ✓ | Free Cable Ends |
| ZK-NME2-12-500-S | NME2 | 0.5 | ✓ | Free Cable Ends |
| ZK-NOE-10-500-S-PADP | C5-E, N5 | 0.5 | ✓ | Adapter Cable |
| ZK-NOE1-10-2000-S | NOE1, NOE2 | 2 | ✓ | Free Cable Ends |
| ZK-NOE1-10-500-S | NOE1, NOE2 | 0.5 | ✓ | Free Cable Ends |
| ZK-NTO3-10-500-S | NTO3 | 0.5 | ✓ | Free Cable Ends |
| ZK-NTO3-10-500-PADP | C5-E, N5, NTO3 | 0.5 | ✓ | Adapter Cable |
| ZK-NTO3-10-1000-S | NTO3 | 1 | ✓ | Free Cable Ends |
| ZK-NTO3-10-1000-PADP | C5-E, N5, NTO3 | 1 | ✓ | Adapter Cable |
| ZK-NTO4L-610 | NTO4L | 0.61 | – | Free Cable Ends |
| ZK-PADP-12-500-S | C5-E, N5 | 0.5 | ✓ | Free Cable Ends |
| ZK-TM4-10-500-S-JGH | NTO3, CL3 | 0.5 | ✓ | Signal Cable |
| ZK-TM4-10-500-S-JXH | NTO3, CL4 | 0.5 | ✓ | Signal Cable |
| ZK-WEDL-8-500 | WEDL | 0.5 | – | Free Cable Ends |
| ZK-WEDL-8-500-S | WEDL | 0.5 | ✓ | Free Cable Ends |
| ZK-WEDL-500-S-PADP | C5-E, N5, WEDL | 0.5 | ✓ | Adapter Cable |
| ZK-WEDL-8-1000-S | WEDL | 1 | ✓ | Free Cable Ends |
| ZK-WEDL-8-2000-S | WEDL | 2 | ✓ | Free Cable Ends |
| ZK-WEDS-5-500 | WEDS | 0.5 | – | Free Cable Ends |
| ZK-WEDS-5-500-S | WEDS | 0.5 | ✓ | Free Cable Ends |

# M8 cable

## VERSIONS

| Type | Suitable for | Number of Poles | Cable Length m | Connector Type | Shielding |
|---|---|---|---|---|---|
| ZK-M8-3-2M-1-AFF | AS28, AS41, AS59, PD2-C(B)-IP (Power) | 3 | 2 | Straight | ✓ |
| ZK-M8-8-2M-1-PUR-S | PD2-C(B)-IP (IO) | 8 | 2 | Straight | ✓ |
| ZK-M8-5-2M-1-PUR-S-F | PD2-C(B)-IP (CAN in) | 5 | 2 | Straight | ✓ |
| ZK-M8-5-2M-1-PUR-S-M | PD2-C(B)-IP (CAN out) | 5 | 2 | Straight | ✓ |

# M12 cable

## VERSIONS

| Type | Number of Poles | Cable Length m | Connector Type | Shielding |
|---|---|---|---|---|
| ZK-M12-5-2M-1-AFF | 5 | 2 | Straight | ✓ |
| ZK-M12M-M8F-5-200-S | 5 | 0.2 | Straight | ✓ |
| ZK-M12-5-5M-1-AFF | 5 | 5 | Straight | ✓ |
| ZK-M12-5-5M-2-AFF | 5 | 5 | Angled | ✓ |
| ZK-M12-8-2M-1-AFF | 8 | 2 | Straight | ✓ |
| ZK-M12-8-2M-2-AFF | 8 | 2 | Angled | ✓ |
| ZK-M12-8-5M-1-AFF | 8 | 5 | Straight | ✓ |
| ZK-M12-8-5M-2-AFF | 8 | 5 | Angled | ✓ |
| ZK-M12-12-2M-1-AFF | 12 | 2 | Straight | ✓ |
| ZK-M12-5-2M-1-B-S | 5 | 2 | Straight | ✓ |
| ZK-M12-5-2M-1-A-S-M | 5 | 2 | Straight | ✓ |
| ZK-M12-4-2M-1-D-RJ45 | 4 | 2 | Straight | ✓ |
| ZK-M12-8-2M-2-PADP | 8 | 2 | Angled | ✓ |
| ZK-M12-12-2M-2-PADP | 12 | 2 | Angled | ✓ |
| ZK-M12M-M8F-5-200-S | 5 | 0.2 | Straight | ✓ |
| ZK-M12M-M12F-5-500-S | 5 | 0.2 | Straight | ✓ |
| ZK-M12-17-1M-2-S-FIN | 17 | 1.5 | Angled | ✓ |

# M16 cable (TW cable)

## VERSIONS

| Type | Suitable for | Cable Type | Number of Poles | Cable Length m | Connector Type |
|---|---|---|---|---|---|
| ZK-TW-3-2M | PD6-N8918...-S | Motor Cable | 3 | 2 | Straight |
| ZK-TW-3-5M | PD6-N8918...-S | Motor Cable | 3 | 5 | Straight |
| ZK-TW-3-10M | PD6-N8918...-S | Motor Cable | 3 | 10 | Straight |
| ZK-TW-3-2M-2 | PD6-N8918...-S | Motor Cable | 3 | 2 | Angled |
| ZK-TW-3-5M-2 | PD6-N8918...-S | Motor Cable | 3 | 5 | Angled |
| ZK-TW-3-10M-2 | PD6-N8918...-S | Motor Cable | 3 | 10 | Angled |
| ZK-TW-7-2M | AS89, ASB87 | Motor Cable | 7 | 2 | Straight |
| ZK-TW-18-2M | PD6-N8918...-S | Signal Cable | 18 | 2 | Straight |
| ZK-TW-18-5M | PD6-N8918...-S | Signal Cable | 18 | 5 | Straight |
| ZK-TW-18-10M | PD6-N8918...-S | Signal Cable | 18 | 10 | Straight |
| ZK-TW-18-2M-2 | PD6-N8918...-S | Signal Cable | 18 | 2 | Angled |
| ZK-TW-18-5M-2 | PD6-N8918...-S | Signal Cable | 18 | 5 | Angled |
| ZK-TW-18-10M-2 | PD6-N8918...-S | Signal Cable | 18 | 10 | Angled |
| ZK-TW-4-2M | ASB42 | Motor Cable | 6 | 2 | Straight |



# Extension cables

## VERSIONS

| Type | Cable Type | Number of Poles | Cable Length m |
|---|---|---|---|
| ZK-JST-VL-4 | for JST XHP-4 Connector | 4 | 2 |
| ZK-JST-VL-6 | for JST XHP-6 Connector | 6 | 2 |

# Damper

## For B shaft

## VERSIONS

| Type | Corresponding Motors | Shaft Diameter mm | Weight kg |
|---|---|---|---|
| ZD-D28 | ST28, ST35 | 5 | 0.026 |
| ZD-D40 | ST41, ST42 | 5 | 0.04 |
| ZD-D56 | ST59 | 6.35 | 0.1 |



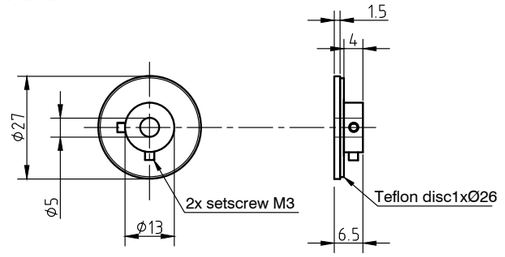
Damper

For B shaft

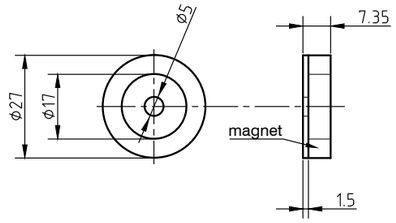
## DIMENSIONS (IN MM)

**ZD-D28**

Part 1

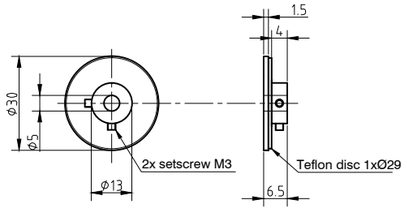



Part 2 (magnet)

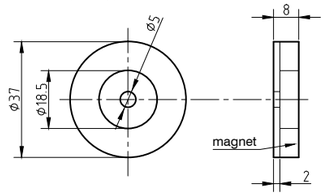



**ZD-D40**

Part 1

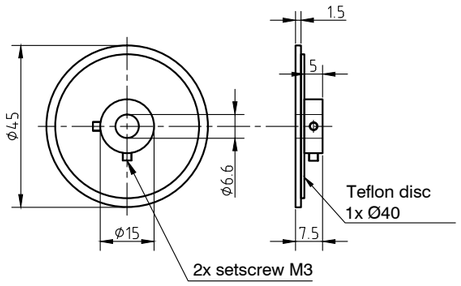



Part 2 (magnet)

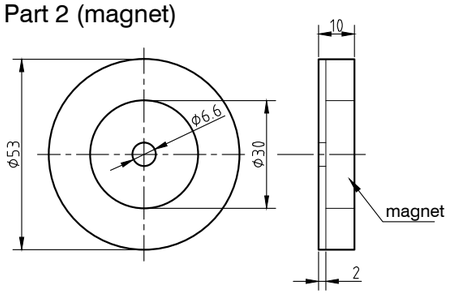



**ZD-D56**

Part 1




Part 2 (magnet)



# Damper

## For Mounting Flange

## VERSIONS

| Type | Corresponding Motors |
|---|---|
| ZD-DF40 | ST41, ST42 |
| ZD-DF56 | ST59 |

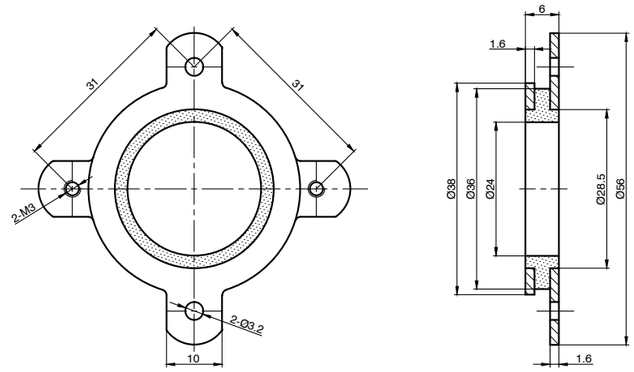


# Damper

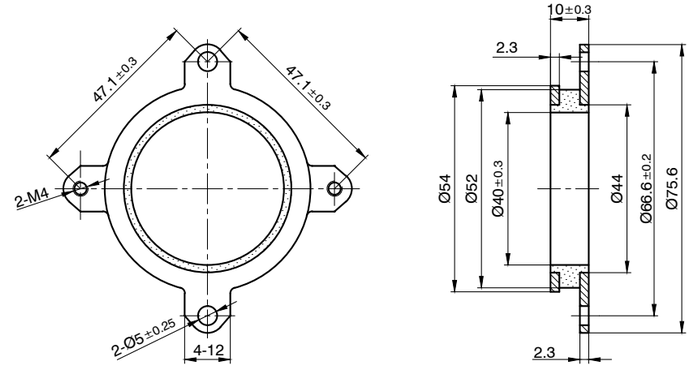
## For Mounting Flange

## DIMENSIONS (IN MM)

**ZD-DF40**




**ZD-DF56**



# Charging capacitor

## for SMC and PDx-I


## VERSIONS

| Type | Capacity µF | Lead mm | Capacitance Tolerance | Temperature Range °C | Max. Operating Voltage V | Dimensions |
|---|---|---|---|---|---|---|
| Z-K4700/50 | 4700 | 10 | ± 20% | -40 - 85 | 50 | Cylindrical Aluminum Cup, Ø 25 mm, 35 mm Length |
| Z-K10000/100 | 10000 | 20 | ± 20% | -40 - 85 | 100 | Cylindrical Aluminum Cup, Ø 40 mm, 95 mm Length |

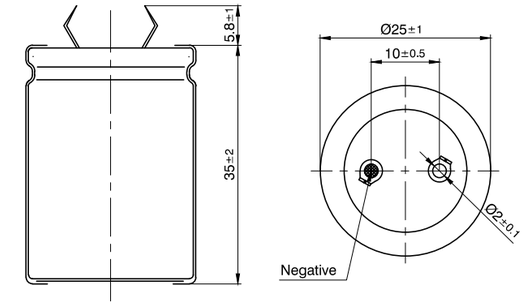


Charging capacitor

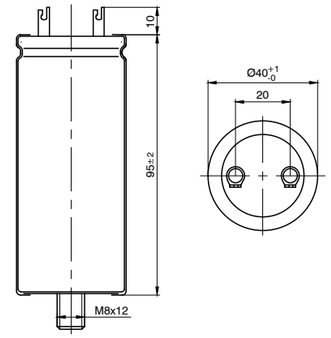
for SMC and PDx-I

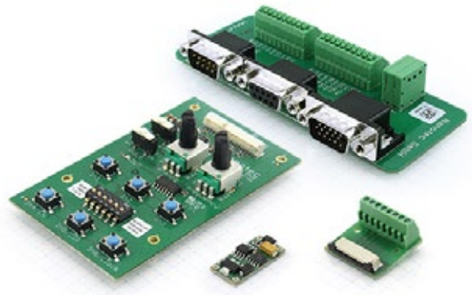
## DIMENSIONS (IN MM)

**Z-K4700-50**




**Z-K10000-100**





## VERSIONS

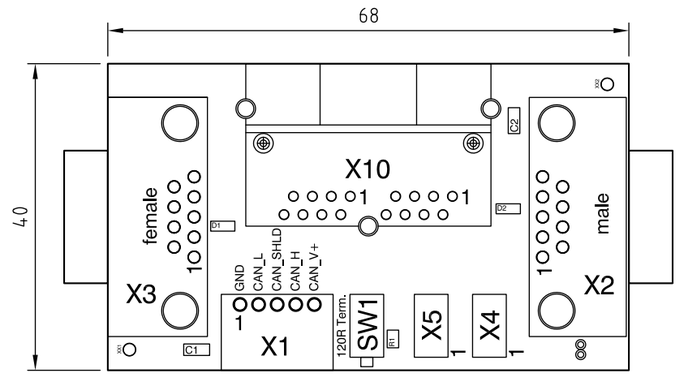
| Type | Type | Max. Operating Voltage V | Dimensions |
|---|---|---|---|
| EB-BRAKE-48V | PWM Controller for Brakes | 48 | 25.4 x 12.2 mm |
| EB-CAN-ADAPTER | Add-on Board for CANopen | 24 | 40 x 68 mm |
| ZIB-DF32 | | 24 | 23 x 21.5 mm |
| IO-PD4-C-01 | IO Board for PD4-C-01 (USB) with Cable Set | 12 | 86 x 50 mm |
| DK-NP5-4A | Discovery Board for NP5 Controllers | 48 | 85 x 160 mm |
| DK-NP5-48 | Discovery Board for NP5 Controllers | 48 | 85 x 160 mm |
| DK-NP5-68 | Discovery Board for NP5 Controllers | 48 | 85 x 160 mm |

## ACCESSORIES

**ZCPHOFK-MC0,5-5** Connector for X1

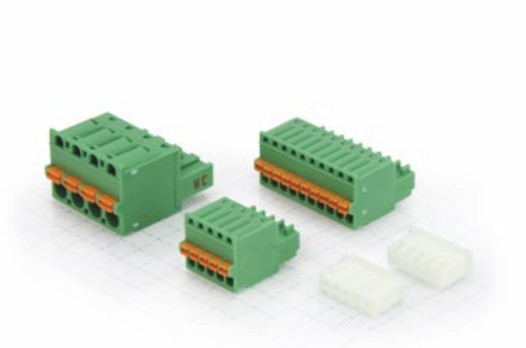
## DIMENSIONS (IN MM)

**EB-CAN-Adapter**







## VERSIONS

| Type | Description | Pin Configuration |
|---|---|---|
| ZCJST-XHP | Connector Socket Housing | 2 - 8 |
| ZCJST-SXH | JST Crimp Contacts for ZCJST-XHP | |
| ZCPHOFK-MC0,5 | Clip-on Plug | 2 - 12 |
| ZCPHOF-MC1,5 | Clip-on Plug | 2 - 8 |
| ZCPHOFKC-2,5HC | Clip-on Plug, big | 2 - 4 |
| ZCWE-RM5 | Clip-on Plug, 3-pin, RM 5 mm, Clip-on Plug, 6-pin, RM 5 mm | 3 - 6 |

## ORDER IDENTIFIER

**ZCJST-XHP-**
2 = 2 pin contacts
3 = 3 pin contacts
4 = 4 pin contacts
5 = 5 pin contacts
6 = 6 pin contacts
8 = 8 pin contacts

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