Nanotec®
PLUG & DRIVE

SNS INDUSTRIAL

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

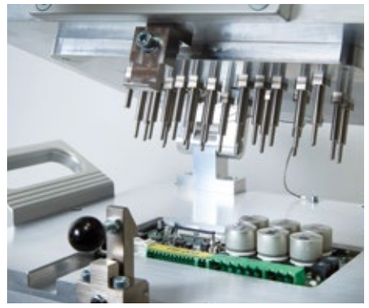
When drive systems with high precision, reliability and extensive functionality are required to fit in small spaces, Nanotec supplies the necessary technology – either as standard solutions or individualized designs. With prototype construction and the production of customized assemblies located in Germany,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

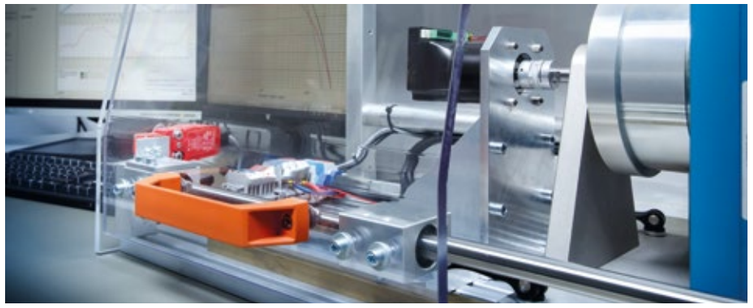
Our brushless DC and stepper motors, linear actuators and linear actuators, in sizes beginning at 10 mm, together with a variety of gears and encoders, combine into a modular system with over 100,000 possible combinations. In addition, you can choose from a range of shaft, flange and connector types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

The Certification Body of TÜV SÜD Management Service GmbH certifies that

Nanotec

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

has established and applies a Quality and Environmental Management System for the following scope of application:

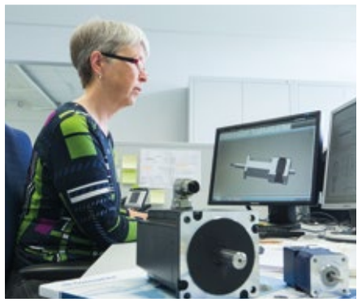
Development, manufacturing and sales of motion control components.

Performance of audits (Report No. 70006306) has furnished proof that the requirements under

ISO 9001:2015
ISO 14001:2015

are fulfilled.

The certificate is valid from 2019-06-05 until 2019-06-05
Certificate Registration No.: 12 100104 23636 TMS.

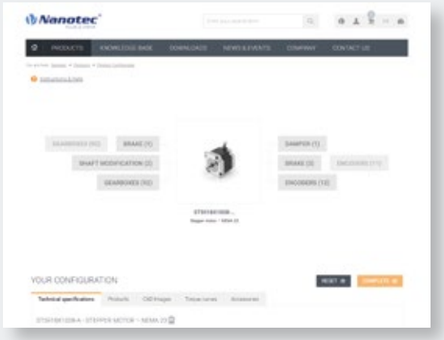


Worldwide sales network

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

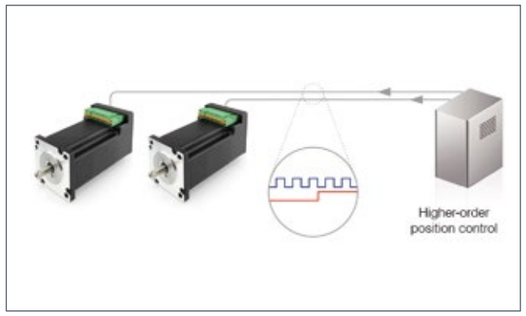


Contents

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.

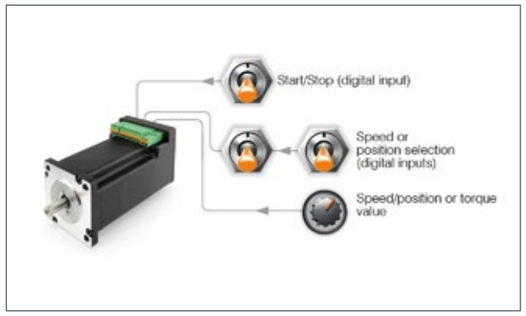


Clock & direction

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.

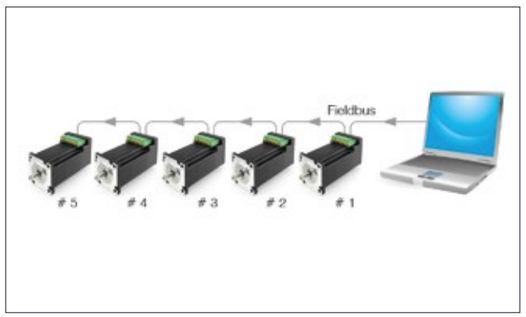
The number of steps per revolution can also be specified as a rational number (numerator/denominator). A right/left rotation mode (CW/CCW) is available in addition to the conventional clock-direction mode, in which the input used is decisive for the direction.



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.

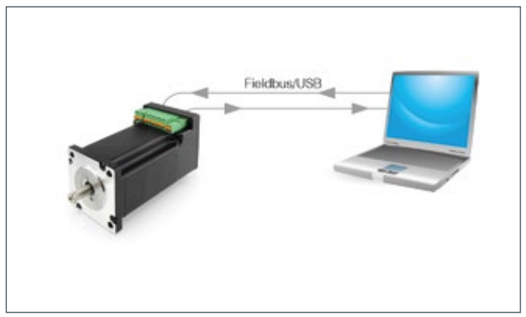
The inputs are assigned to functions via a program that uses the NanoJ V2 programming language. This program is created in Plug & Drive Studio.



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.

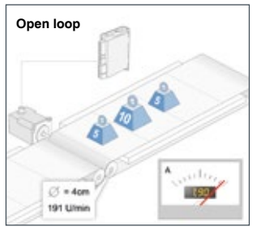
True/pseudo closed loop
There are stepper motors that dress themselves up as being closed loops and work with encoders but do not provide any field-oriented control with sinusoidally commutated current control. They only check the step position, and cannot correct step losses during operation. True closed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

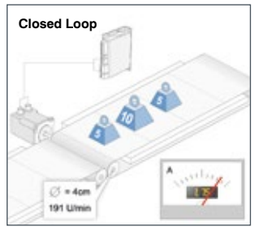
Advantages over standard stepper motors
A stepper motor is used wherever movement to defined positions is required. The classic stepper motor transfers electric energy into precise mechanical movements as long as the motor's torque is not exceeded. Since there is no position feedback or control, the 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.

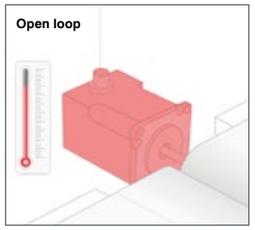
Energy efficiency

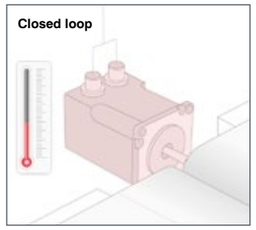




In an open loop, the stepper motor is dimensioned such that it is certain to move the maximum required load. For this reason, normally a safety factor of 20% is calculated, which causes wasted energy in the application. When the load is reduced, the open loop motor cannot react and wastes even more energy.

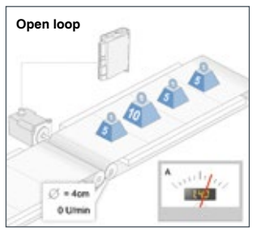
Service life

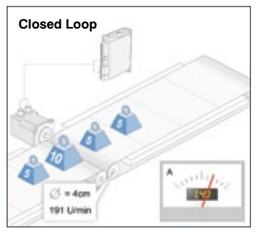




Efficient power regulation generates less heat in the motor, which stays significantly cooler. Reduced heating protects the motor bearings.

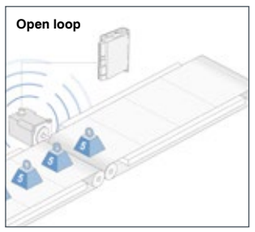
Overload

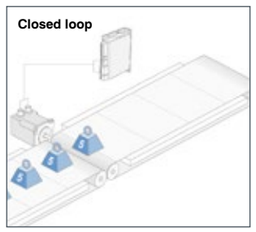




With a 20% safety reserve and a design for a continuous load of 20 kg, an additional load of only 5 kg exceeds the power reserve and the open-loop drive stops without an error message. By contrast, with its overload reserve the closed loop stepper motor will handle this load increase easily.

Resonances





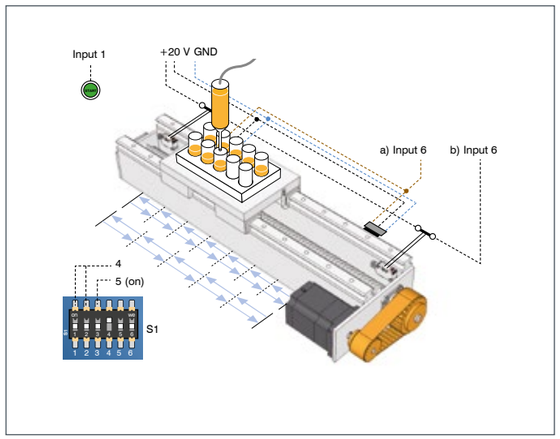
Resonance frequencies occurring in the open loop depend on external loads (the greater the torque reserve, the greater is the resonance stimulation) and can bring the motor to a stop. In closed loop mode, the motor receives only as much energy as needed for the external load; the torque reserve and its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

Smart Brushless DC Servo

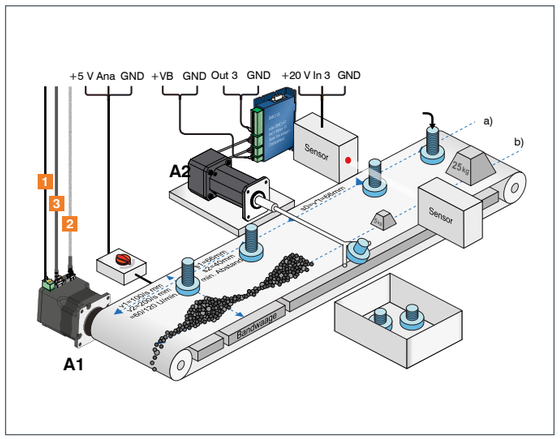
IDEAL APPLICATION AREAS FOR BRUSHLESS DC MOTORS WITH INTEGRATED CONTROLLER/DRIVE

- 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

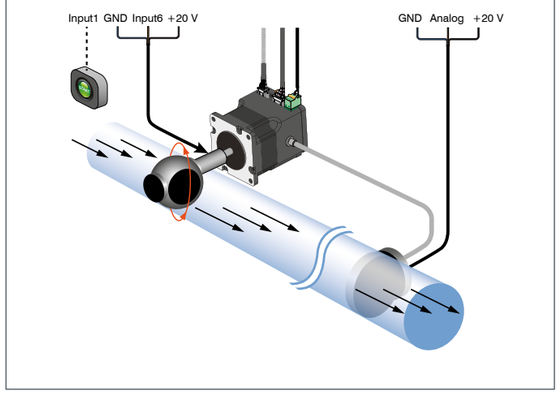
Linear axes (for processing, assembling, etc.)



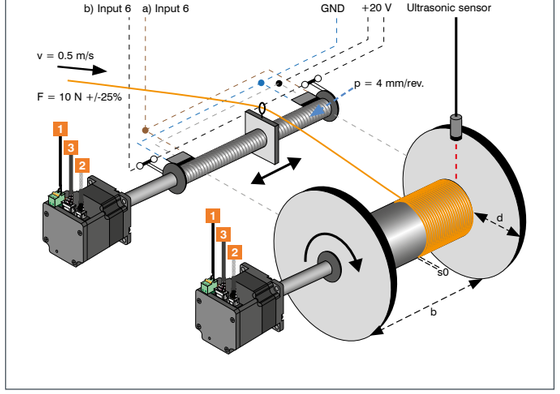
Conveyor belts



Decentralized flow control



Winding and laying



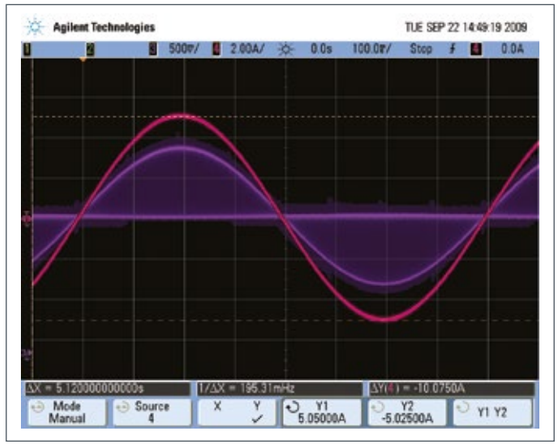
COMPREHENSIVE SOFTWARE FUNCTIONALITY

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.

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

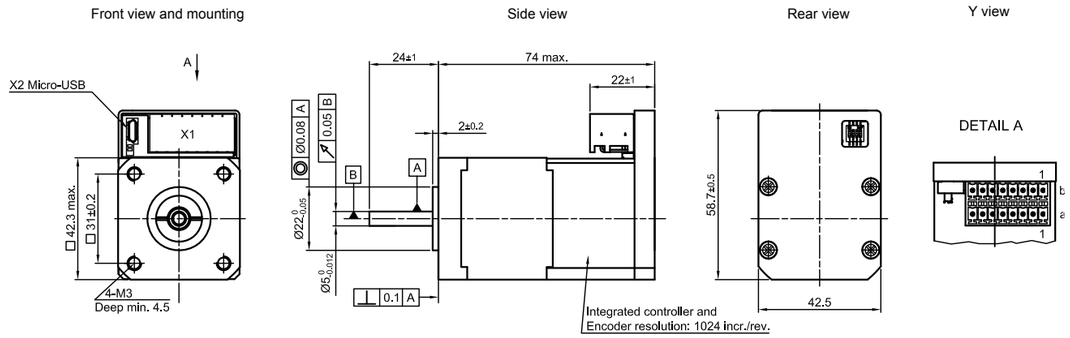
ACCESSORIES

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

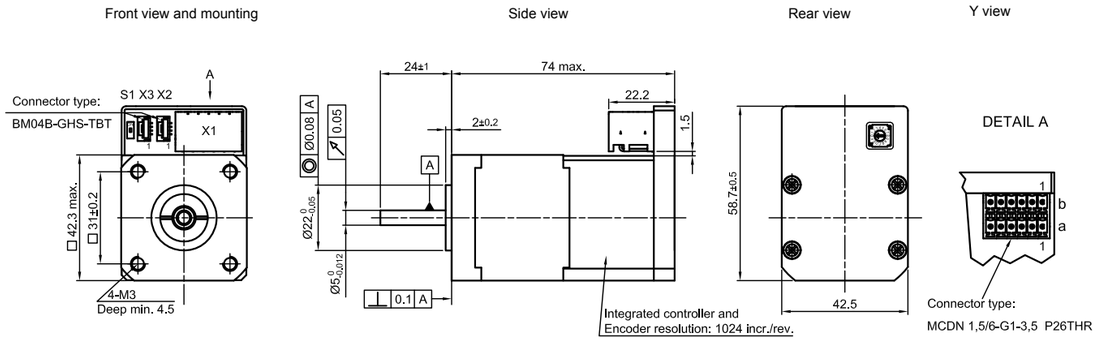
PD2-C
Stepper motor with integrated controller – NEMA 17

DIMENSIONS (IN MM)

PD2-C4118L1804-E-01

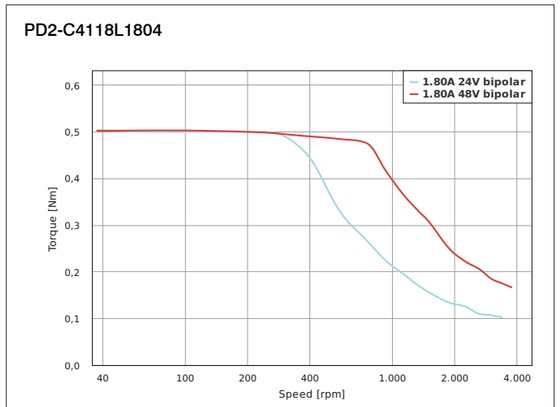


PD2-C4118L1804-E-08



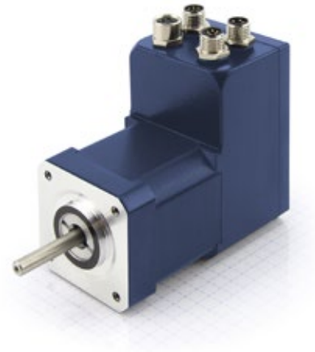
TORQUE CURVES

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

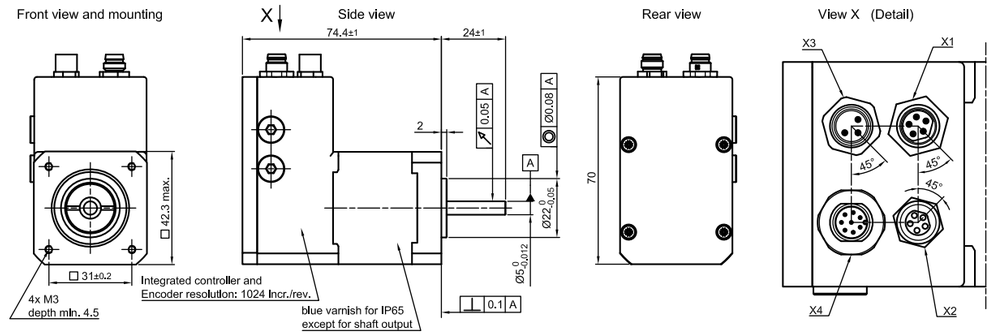
ZK-USB Mini USB cable, 1.5m
ZK-M8-3-2M-1-AFF Power straight, 2m
ZK-M8-8-2M-1-PUR-S IO straight, 2m
ZK-M8-5-2M-1-PUR-S-F CAN in straight, 2m
ZK-M8-5-2M-1-PUR-S-M CAN out straight, 2m
ZK-M12F-M8M-5-200-S CAN out straight, 0.2m
ZK-M12M-M8F-5-200-S CAN in straight, 0.2m
Z-K4700/50 Capacitor

PD2-C-IP

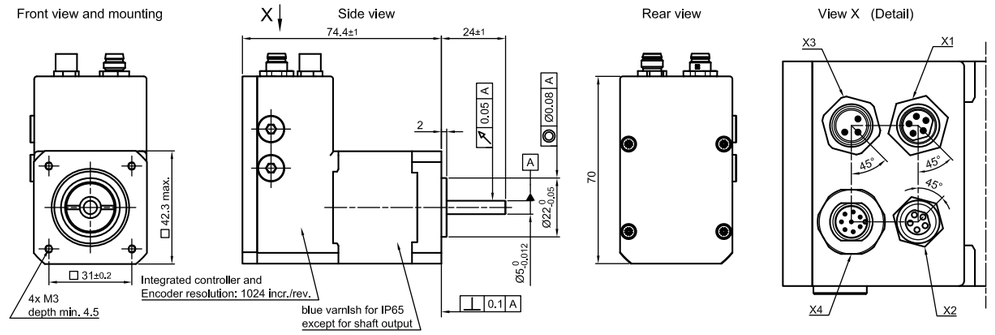
Stepper motor with integrated controller IP65 – NEMA 17

DIMENSIONS (IN MM)

PD2-C411L18-E-65-08

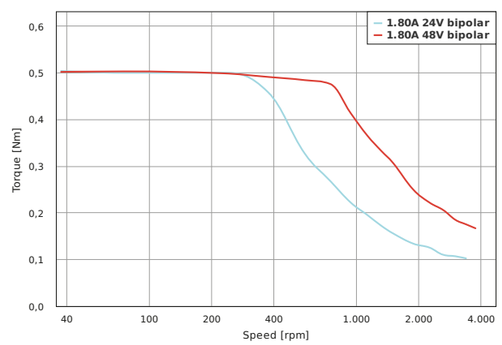


PD2-C411L18-E-65-08



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

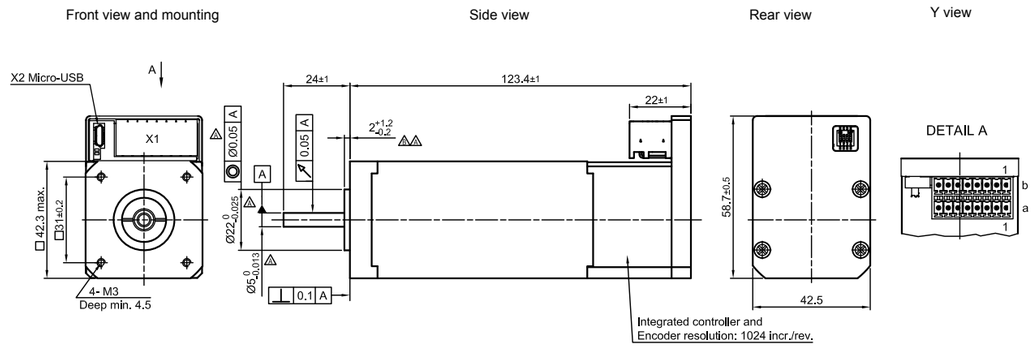
ACCESSORIES

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

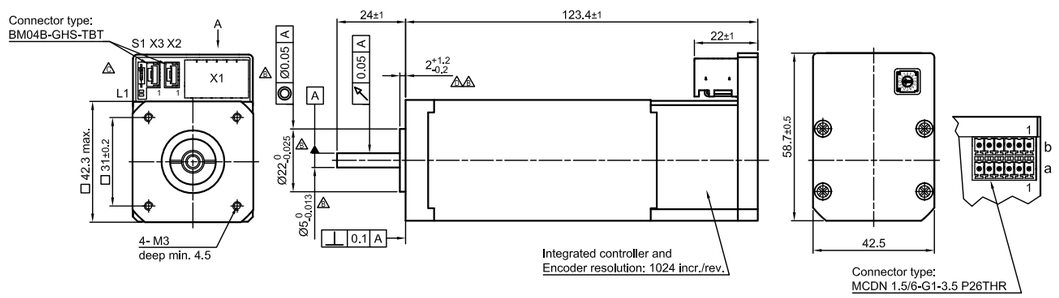
PD2-CB
Brushless DC motor with integrated controller – NEMA 17

DIMENSIONS (IN MM)

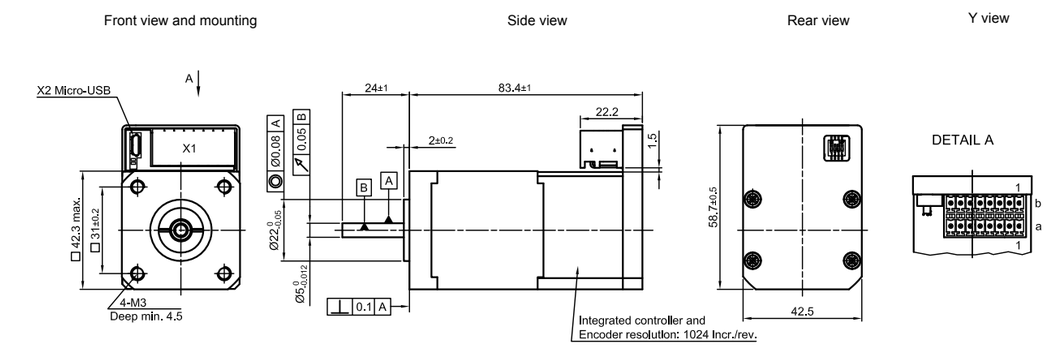
PD2-CB42C048040-E-01



PD2-CB42C048040-E-08



PD2-CB42M024040-E-01

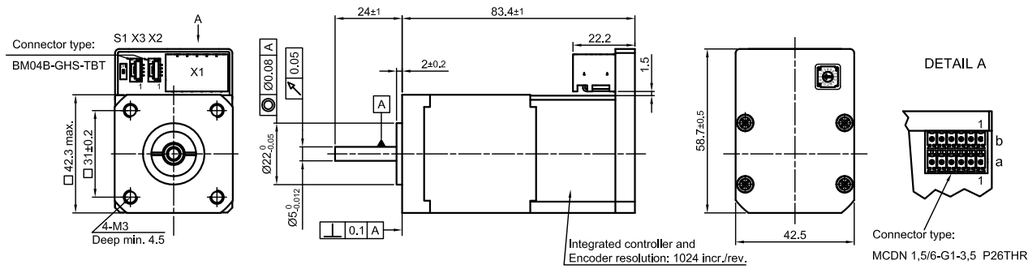


PD2-CB

Brushless DC motor with integrated controller – NEMA 17

DIMENSIONS (IN MM)

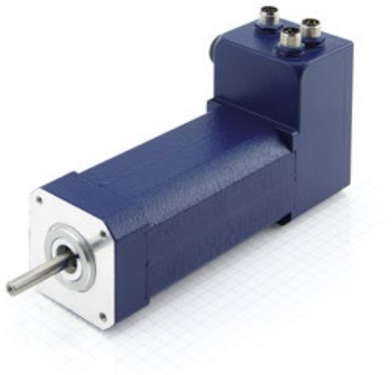
PD2-CB42M024040-E-08



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

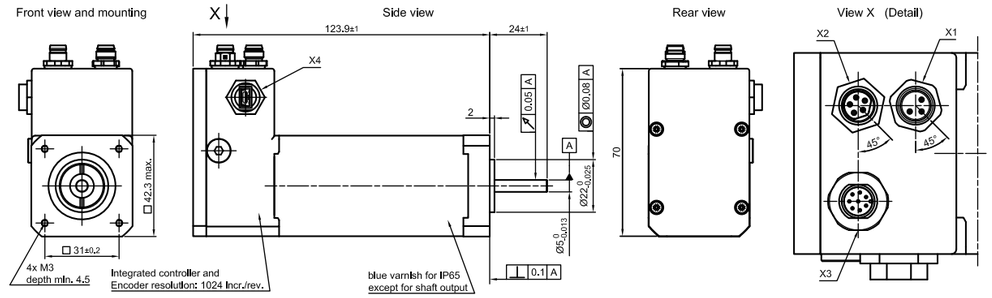
ZK-USB Mini USB cable, 1.5m
ZK-M8-3-2M-1-AFF Power cable straight, 2m
ZK-M8-8-2M-1-PUR-S IO straight, 2m
ZK-M8-5-2M-1-PUR-S-F CAN in straight, 2m
ZK-M8-5-2M-1-PUR-S-M CAN out straight, 2m
ZK-M12F-M8M-5-200-S CAN out straight, 0.2m
ZK-M12M-M8F-5-200-S CAN in straight, 0.2m
Z-K4700/50 Capacitor

PD2-CB-IP

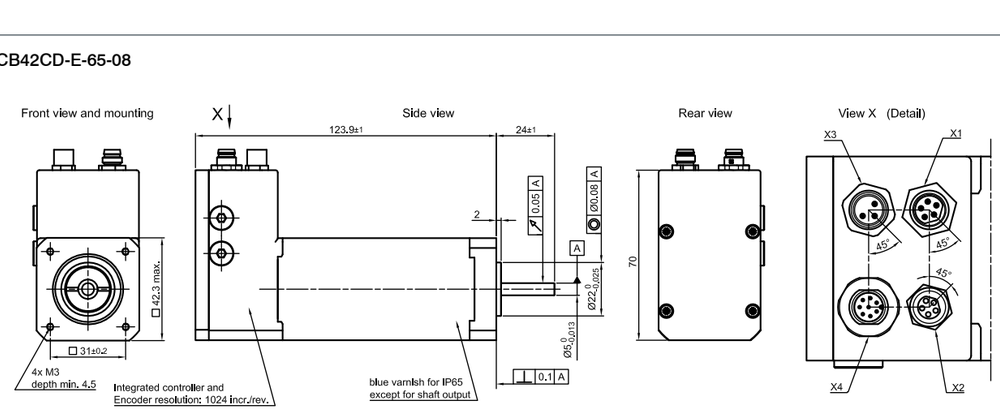
Brushless DC motor with integrated controller IP65 – NEMA 17

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

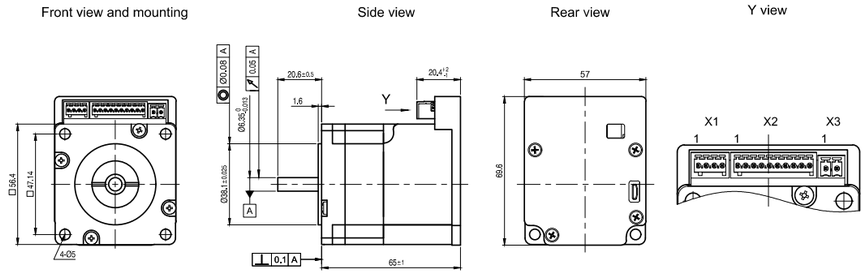
ZK-MICROUSB Micro USB cable, 1.5m
ZK-PD4-C-CAN-4-500-S CAN in/out cable 0.5m
Z-K4700/50 Capacitor
IO-PD4-C-01 Test board for PD4-Cxx-E-01
ZCPHOFK-MC0,5-4 Connector
ZCPHOFK-MC0,5-10 Connector
ZCPHOF-MC1,5-2 Connector

PD4-C

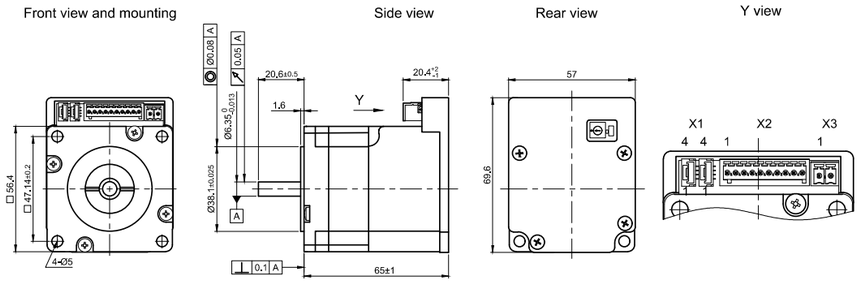
Stepper motor with integrated controller – NEMA 23/24

DIMENSIONS (IN MM)

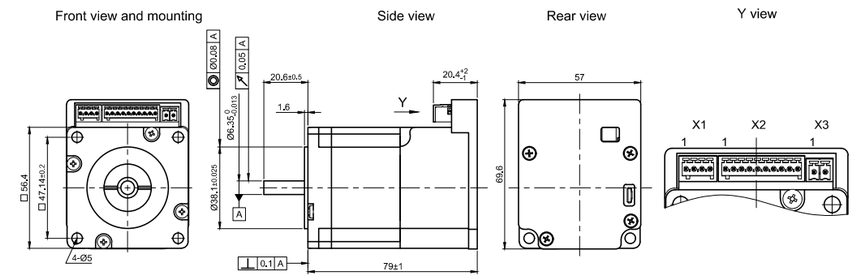
PD4-C5918X4204-E-01



PD4-C5918X4204-E-08

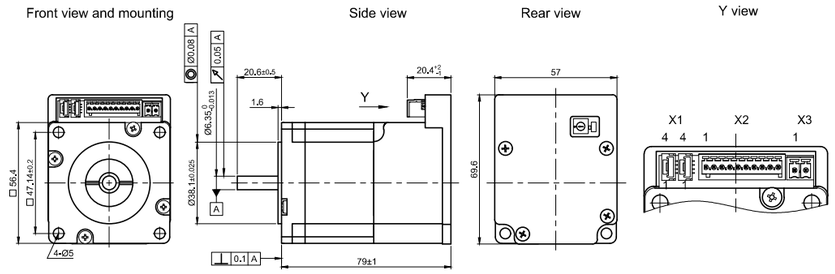


PD4-C5918M4204-E-01

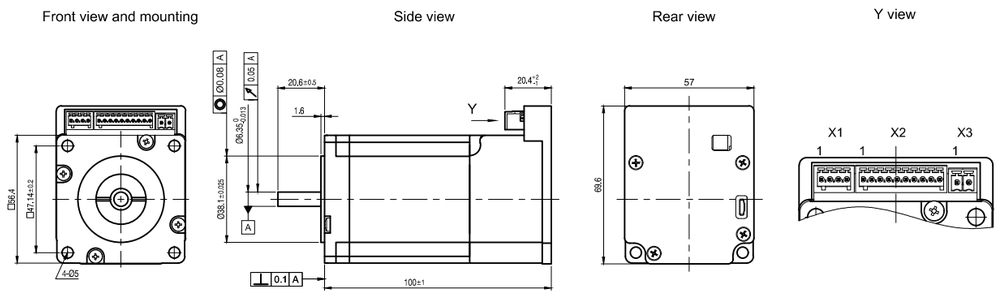


DIMENSIONS (IN MM)

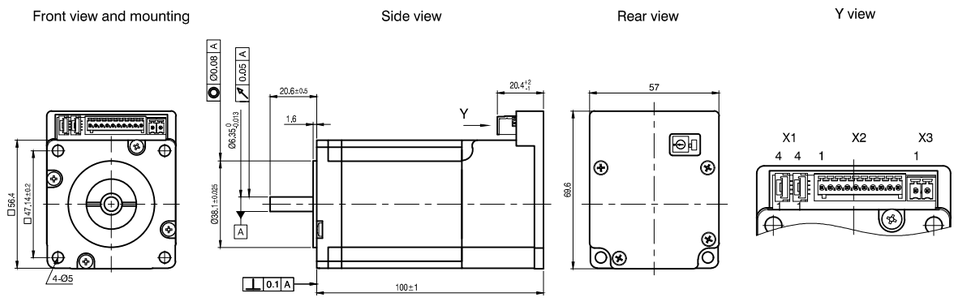
PD4-C5918M4204-E-08



PD4-C5918L4204-E-01

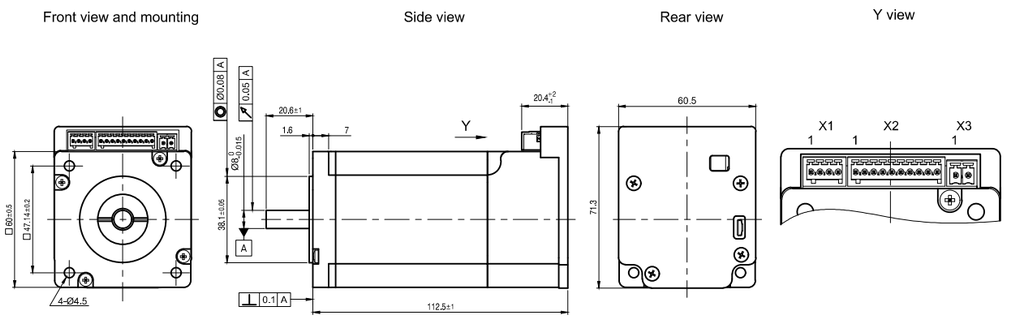


PD4-C5918L4204-E-08

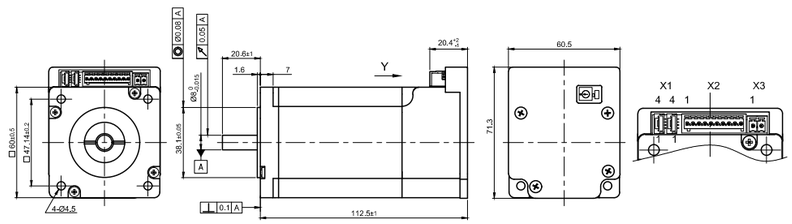


DIMENSIONS (IN MM)

PD4-C6018L4204-E-01



PD4-C6018L4204-E-08

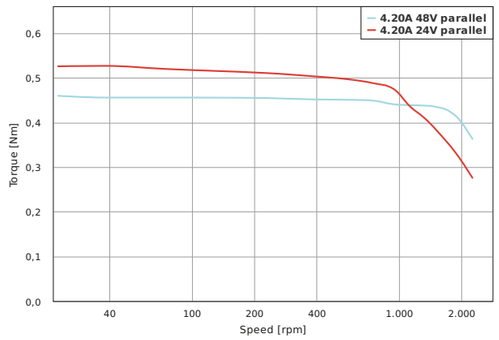


PD4-C

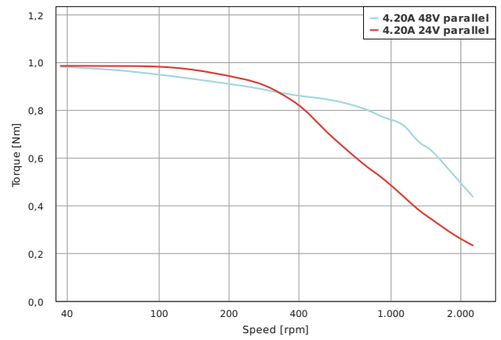
Stepper motor with integrated controller – NEMA 23/24

TORQUE CURVES

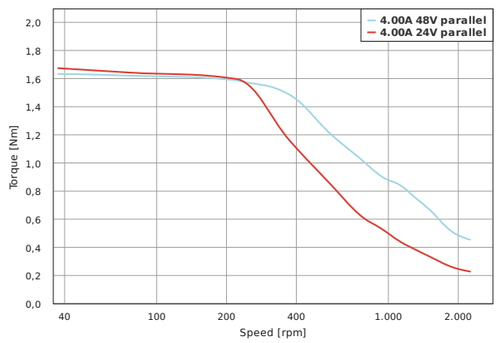
PD4-C5918X4204



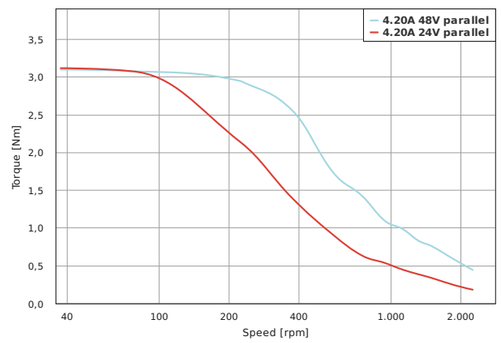
PD4-C5918M4204



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

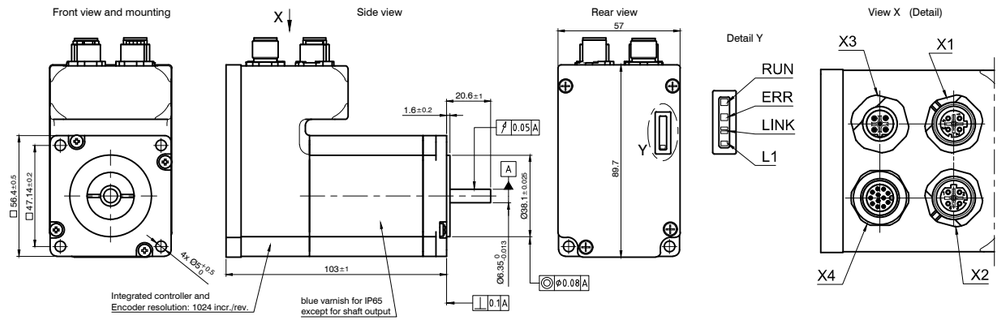
PD4-E591L42-EB-65-
1 = EtherCAT
2 = CANopen
3 = EtherNet/IP
4 = Modbus TCP
5 = Modbus RTU
7 = USB, IO (clock direction; analog)
With brake

ACCESSORIES

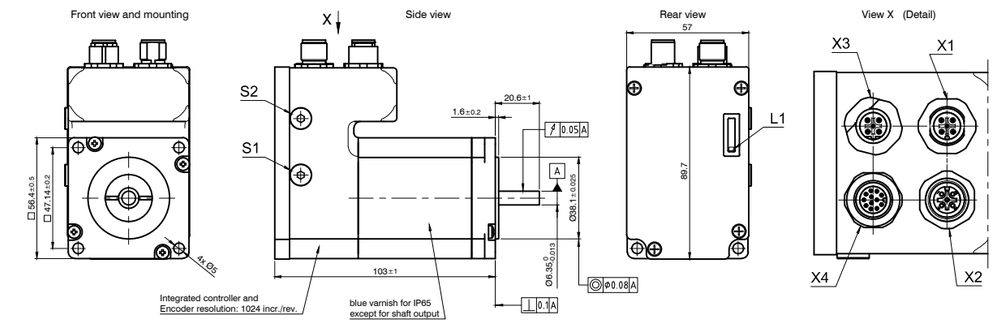
ZK-USB Mini USB cable, 1.5m
ZK-M12-5-2M-1-AFF Modbus RTU in straight, 2m
ZK-M12-12-2M-1-AFF IO straight, 2m
ZK-M12-5-2M-1-B-S Power straight, 2m
ZK-M12-5-2M-1-A-S-M Modbus RTU out straight, 2m
ZK-M12-4-2M-1-D-RJ45 Modbus TCP straight, 2m
ZK-M12F-M8M-5-200-S CAN in straight, 0.2m
ZK-M12M-M8F-5-200-S CAN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

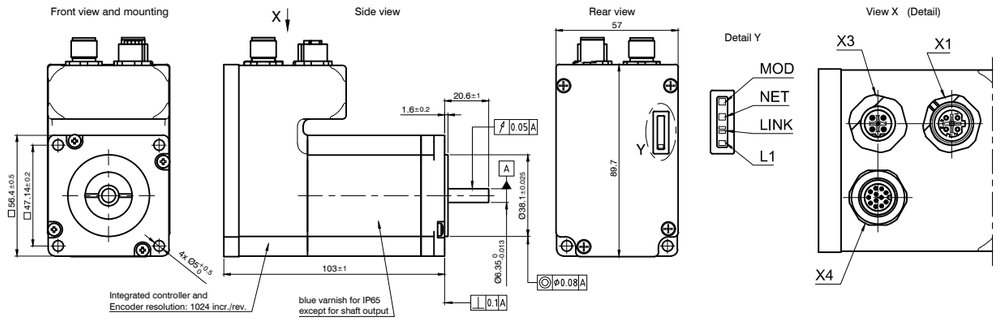


PD4-E591L42-E-65-2

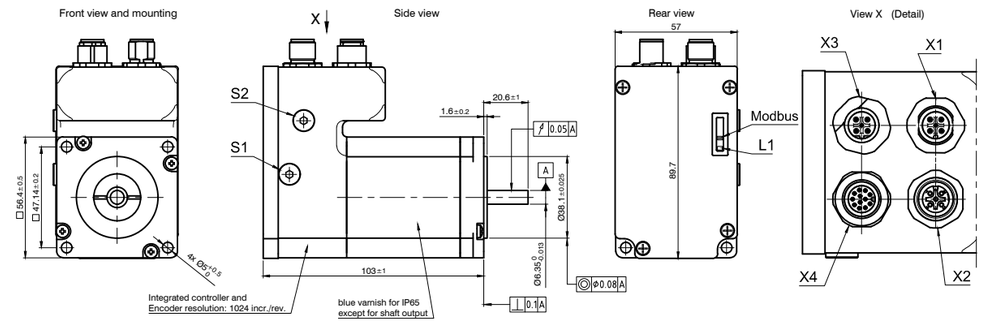


DIMENSIONS (IN MM)

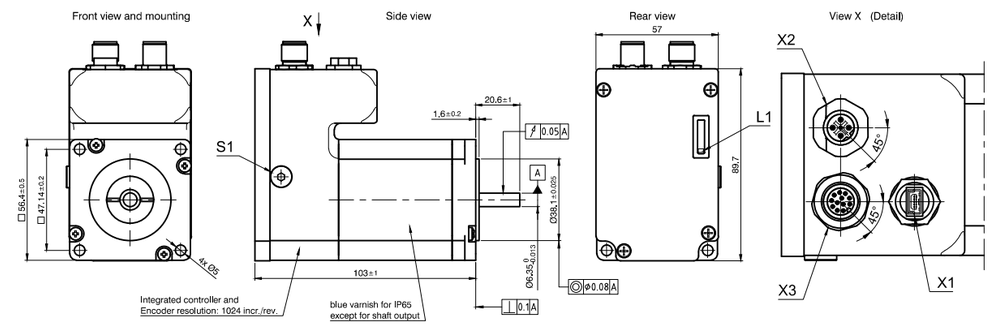
PD4-E591L42-E-65-3



PD4-E591L42-E-65-5

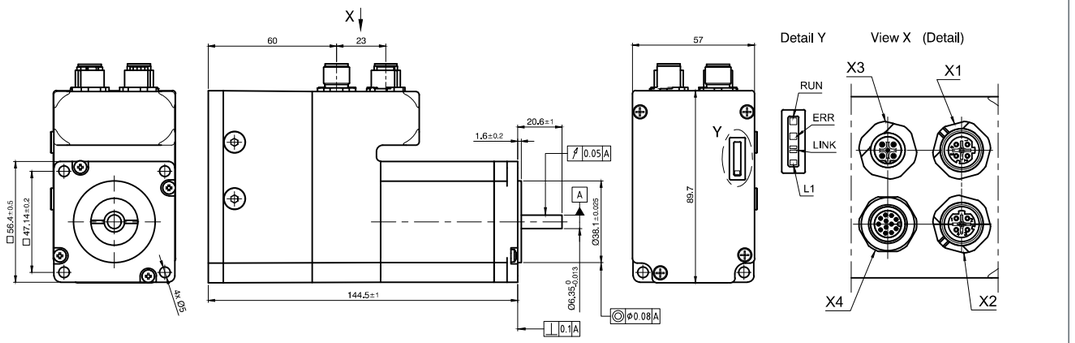


PD4-E591L42-E-65-7

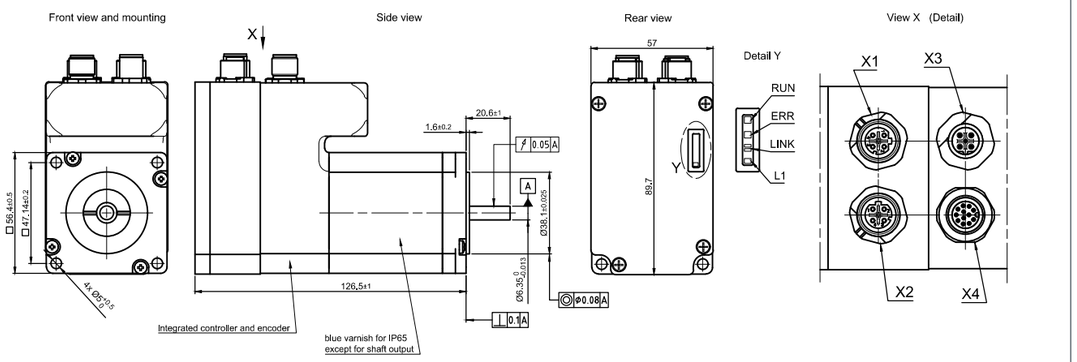


DIMENSIONS (IN MM)

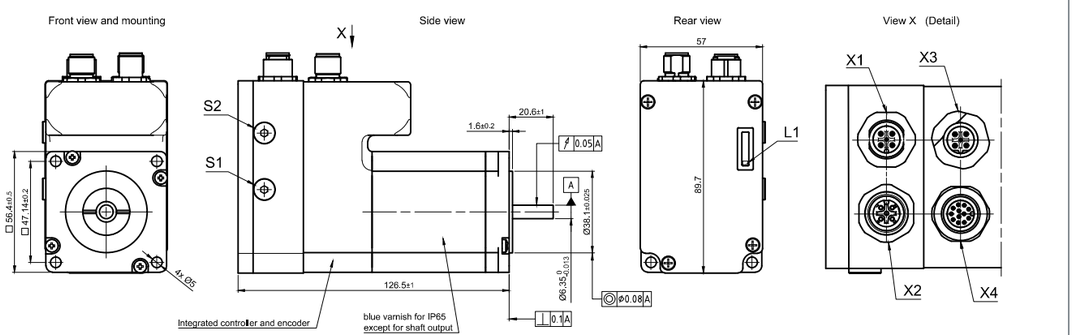
PD4-E591L42-EB-65-1_2



PD4-E591L42-M-65-1

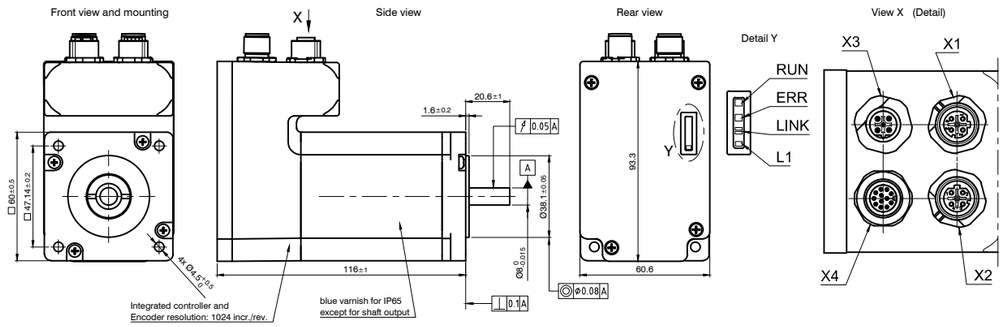


PD4-E591L42-M-65-2

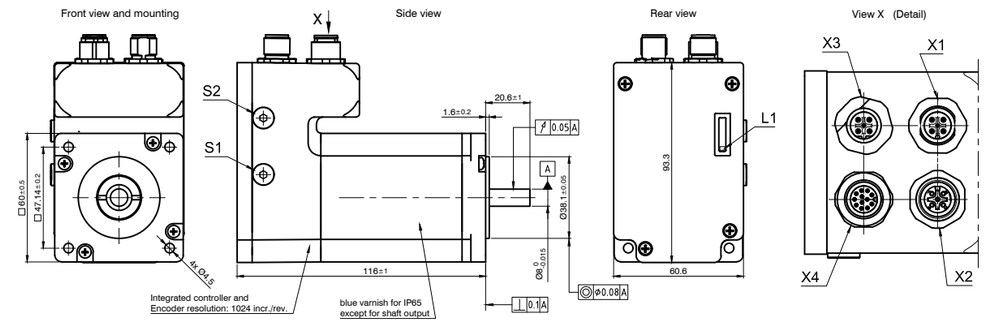


DIMENSIONS (IN MM)

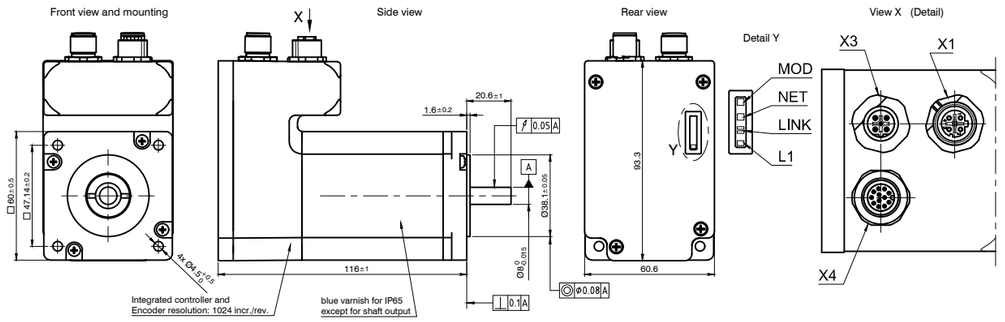
PD4-E601L42-E-65-1



PD4-E601L42-E-65-2

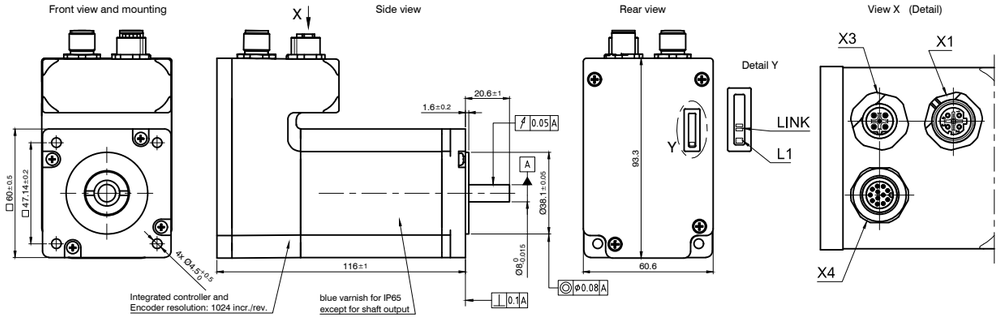


PD4-E601L42-E-65-3

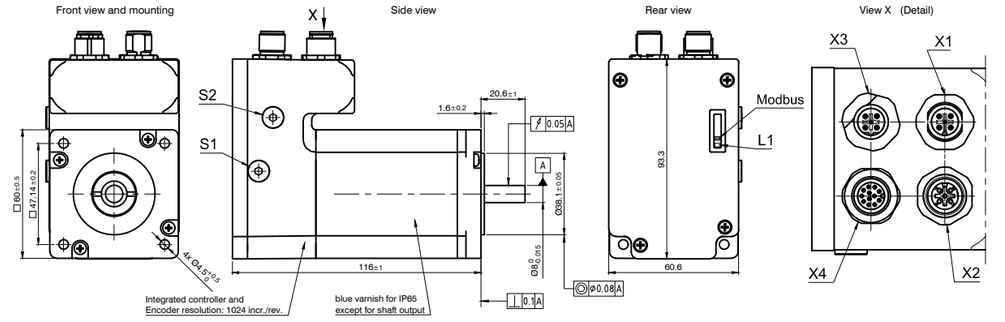


DIMENSIONS (IN MM)

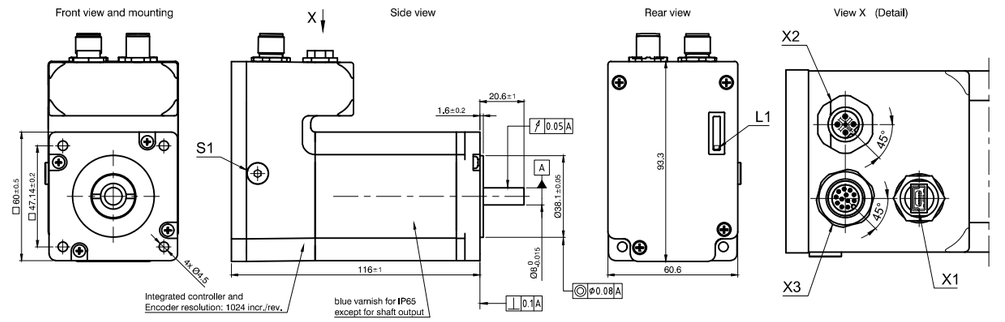
PD4-E601L42-E-65-4



PD4-E601L42-E-65-5



PD4-E601L42-E-65-7

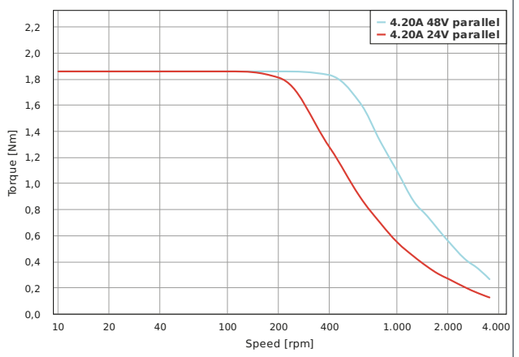


PD4-E

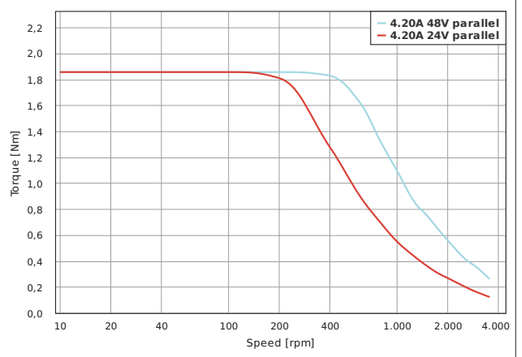
Stepper motor with integrated controller IP65 – NEMA 23/24

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

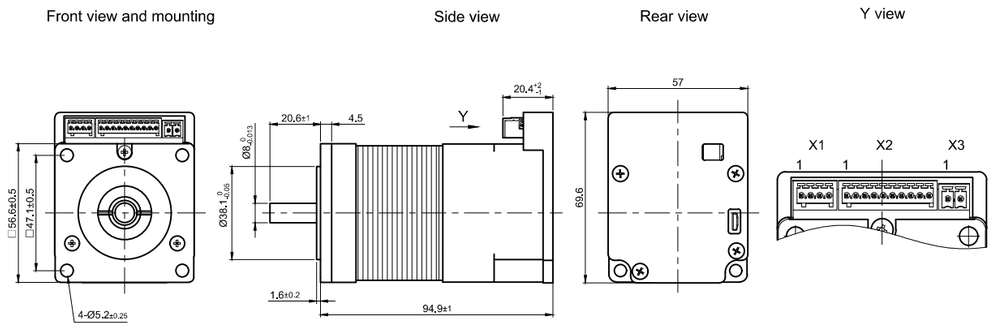
PD4-CB59M024035-E-
01 = USB, IO (clock direction; analog)
08 = CANopen

ACCESSORIES

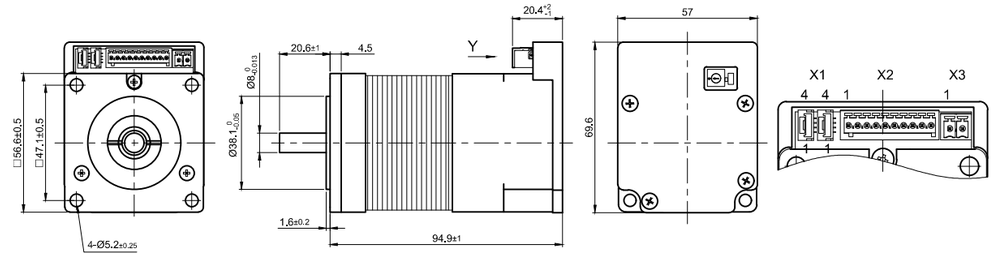
ZK-MICROUSB Micro USB cable, 1.5m
ZK-PD4-C-CAN-4-500-S CAN in/out bridge 0.5m
Z-K4700/50 Capacitor
IO-PD4-C-01 Test board for PD4-Cxx-E-01
ZCPHOFK-MC0,5-4 Connector
ZCPHOFK-MC0,5-10 Connector
ZCPHOF-MC1,5-2 Connector

DIMENSIONS (IN MM)

PD4-CB59M024035-E-01

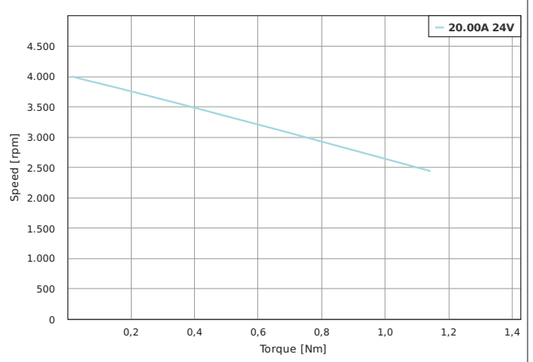


PD4-CB59M024035-E-08



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

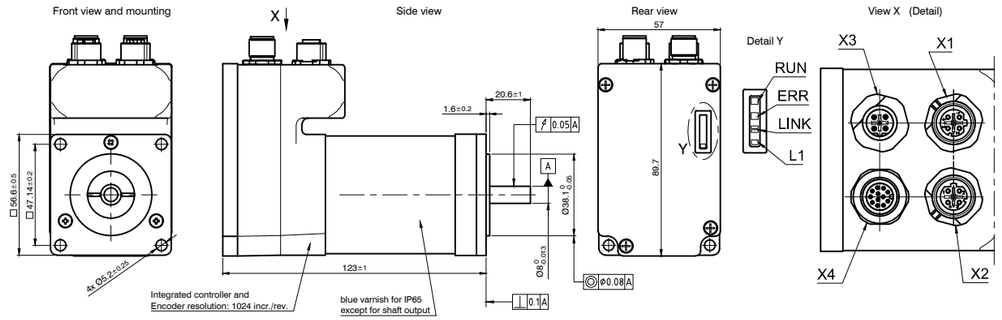
PD4-EB59CD-EB-65-
1 = EtherCAT
2 = CANopen
3 = EtherNet/IP
4 = Modbus TCP
5 = Modbus RTU
7 = USB, IO (clock direction; analog)
With brake

ACCESSORIES

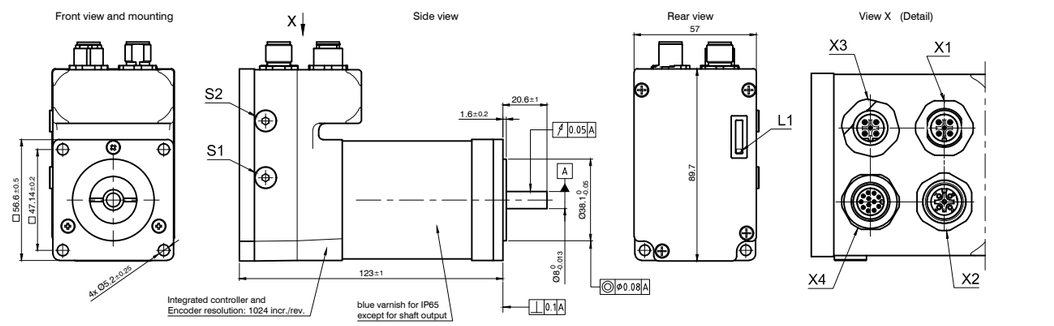
ZK-USB Mini USB cable, 1.5m
ZK-M12-5-2M-1-AFF CAN in straight, 2m
ZK-M12-12-2M-1-AFF IO straight, 2m
ZK-M12-5-2M-1-B-S Power straight, 2m
ZK-M12-5-2M-1-A-S-M CAN out straight, 2m
ZK-M12-4-2M-1-D-RJ45 EtherCAT in/out straight, 2m
ZK-M12F-M8M-5-200-S CAN in straight, 0.2m
ZK-M12M-M8F-5-200-S CAN out straight,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

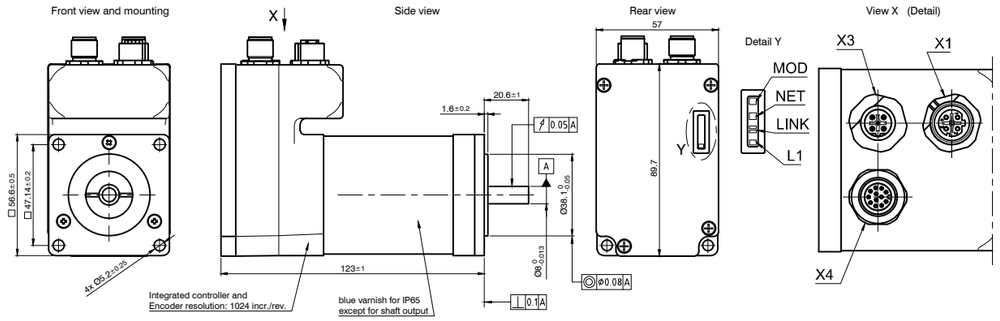


PD4-EB59CD-E-65-2

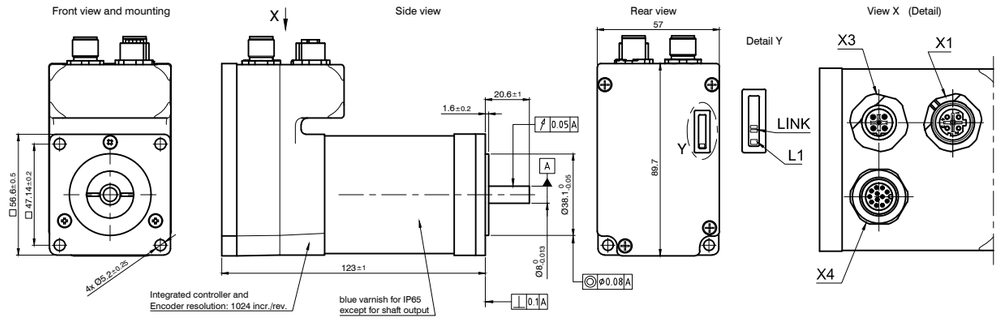


DIMENSIONS (IN MM)

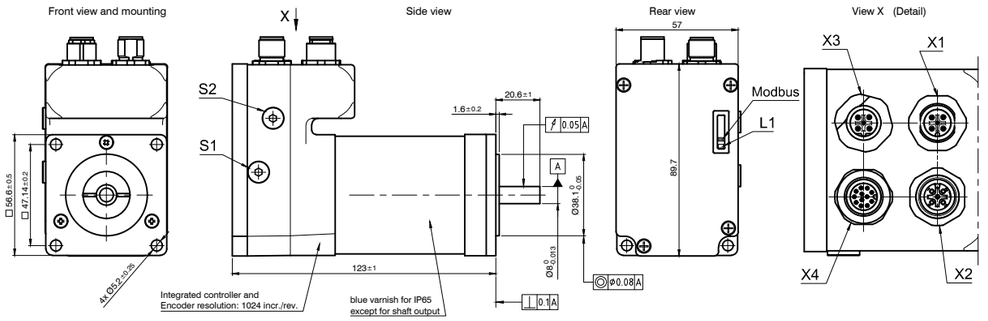
PD4-EB59CD-E-65-3



PD4-EB59CD-E-65-4

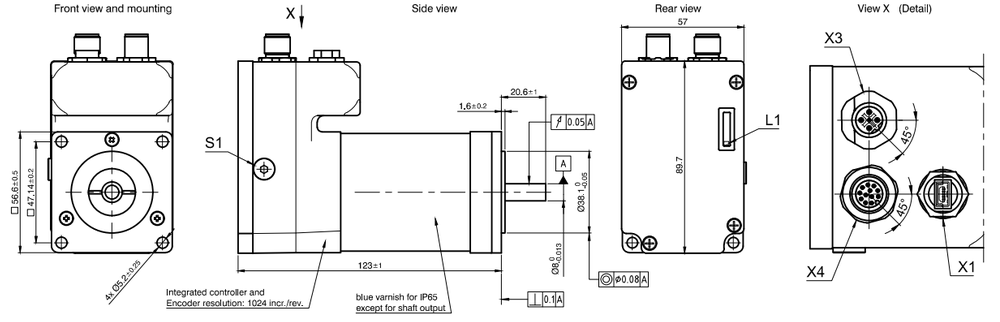


PD4-EB59CD-E-65-5

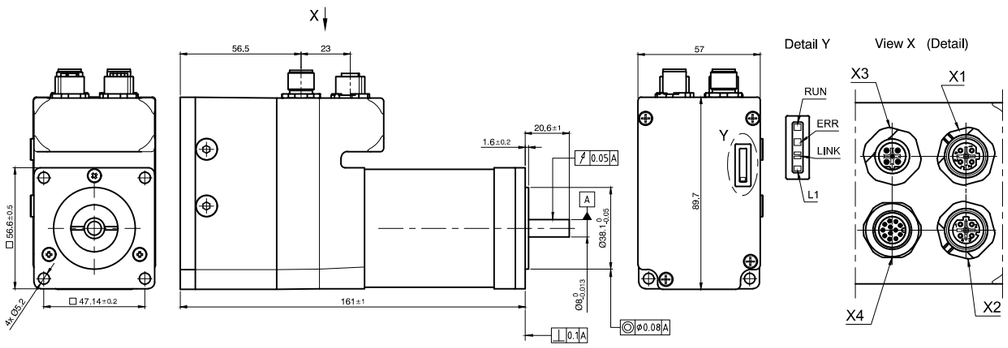


DIMENSIONS (IN MM)

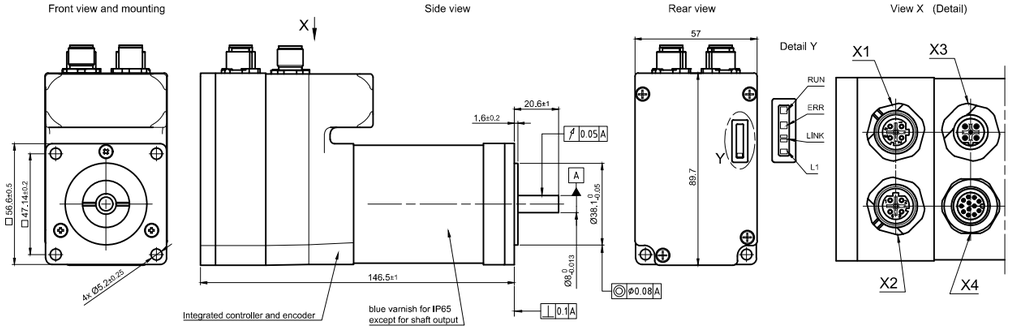
PD4-EB59CD-E-65-7



PD4-EB59CD-EB-65-1_2



PD4-EB59CD-M-65-1

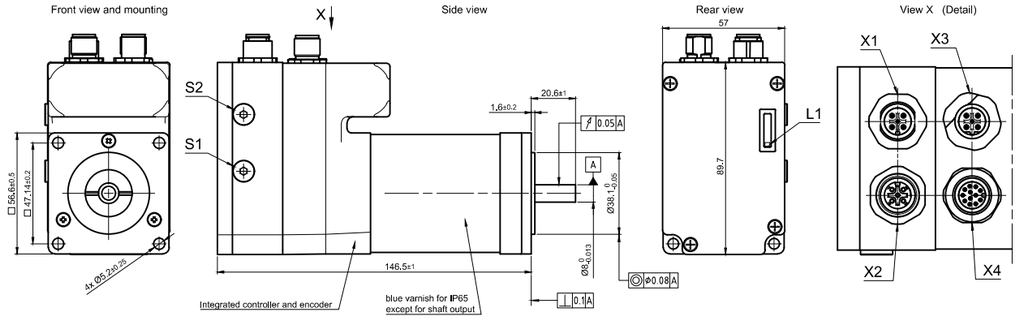


PD4-EB

Brushless DC motor with integrated controller IP65 – NEMA 23

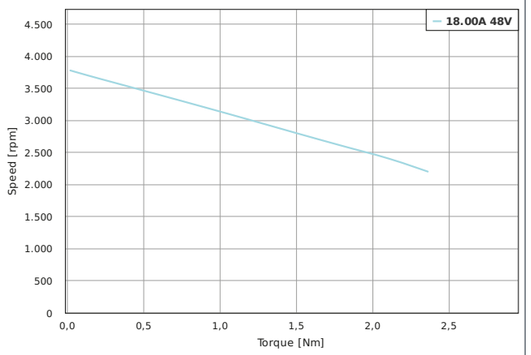
DIMENSIONS (IN MM)

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

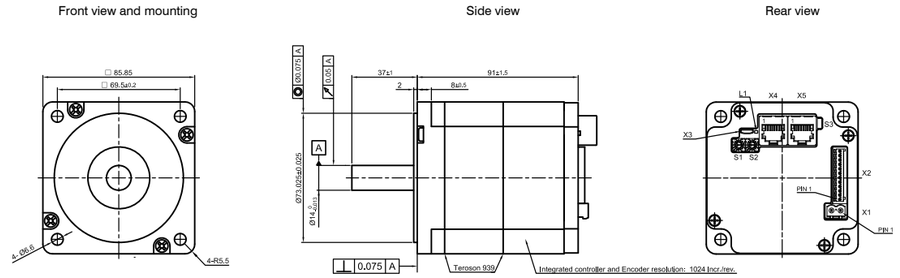
ACCESSORIES

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

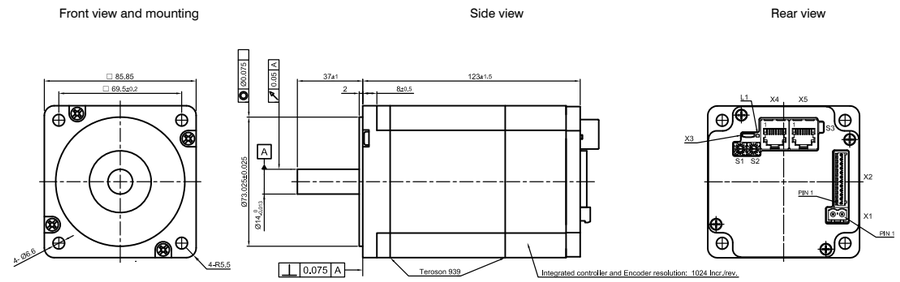
PD6-C
Stepper motor with integrated controller – NEMA 34

DIMENSIONS (IN MM)

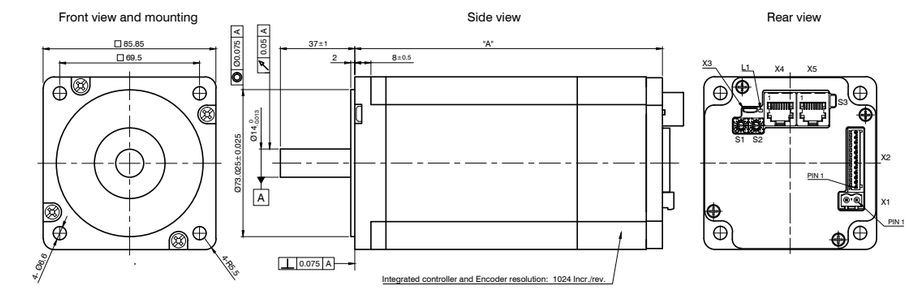
PD6-C8918S6404-E-09



PD6-C8918M9504-E-09



PD6-C8918L9504-E-09

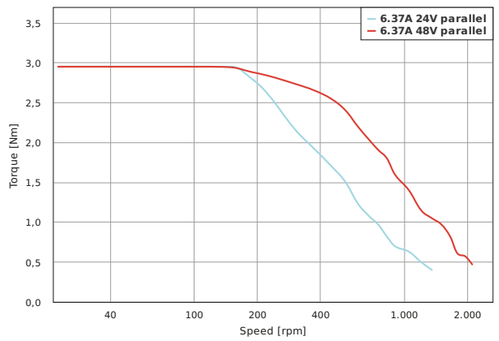


PD6-C

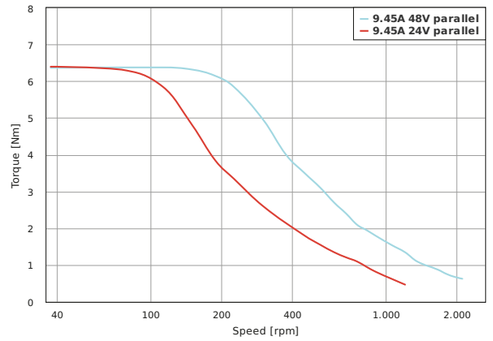
Stepper motor with integrated controller – NEMA 34

TORQUE CURVES

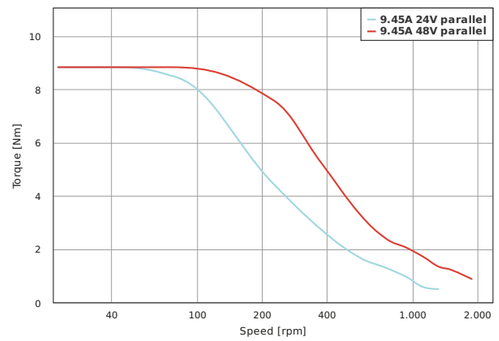
PD6-C8918S6404-E-09



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

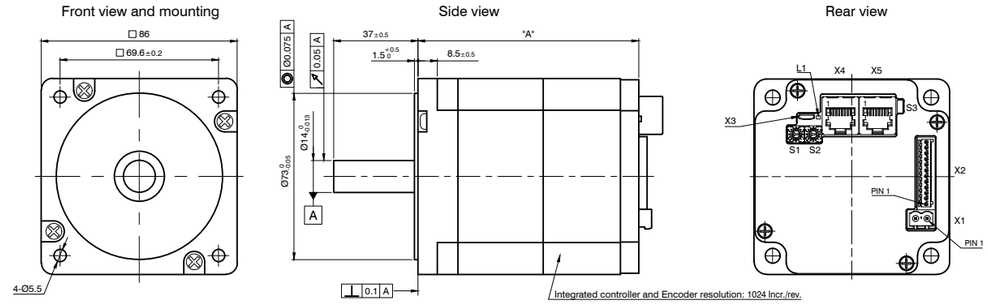
ZK-MICROUSB Micro USB cable, 1.5m
Z-K10000/100 Capacitor
ZCPHOFK-MC0,5-12 Connector
ZCPHOFKC-2,5HC-2 Connector

PD6-CB

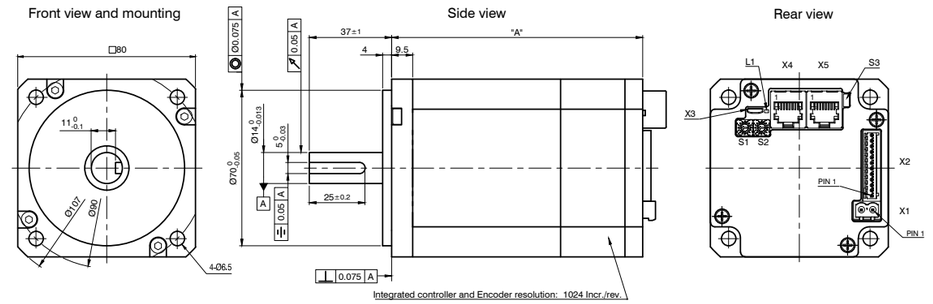
Brushless DC motor with integrated controller – NEMA 34 and flange size 80 mm

DIMENSIONS (IN MM)

PD6-CB87xx-E-09

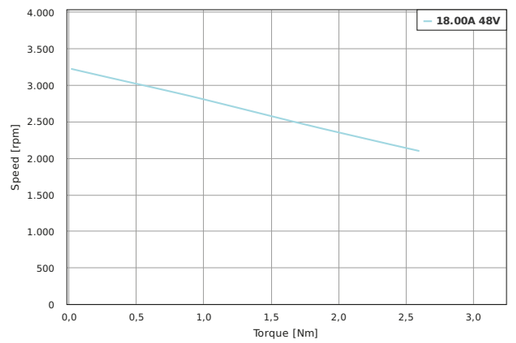


PD6-CB80xx-E-09

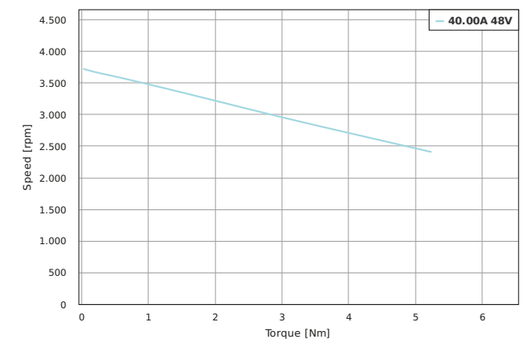


TORQUE CURVES

PD6-CB87S048030-E-09



PD6-CB80M048030-E-09



Notizen


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

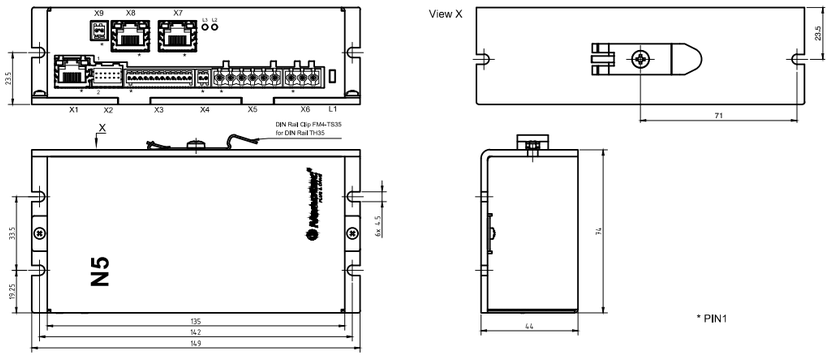
ZK-MCM-12-2,0-S-JPAD Encoder cable NME2/3 2.0m
ZK-MCM-12-500-S-JPAD Encoder cable NME2/3 0.5m
ZK-NOE-10-500-S-PADP Encoder cable NOE, 0.5m
ZK-NTO3-10-500-PADP Encoder cable NTO3, 0.5m
ZK-NTO3-10-1000-PADP Encoder cable NTO3, 1m
ZK-PADP-12-500-S Encoder cable controller, 0.5m
ZK-WEDL-500-S-PADP Encoder 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

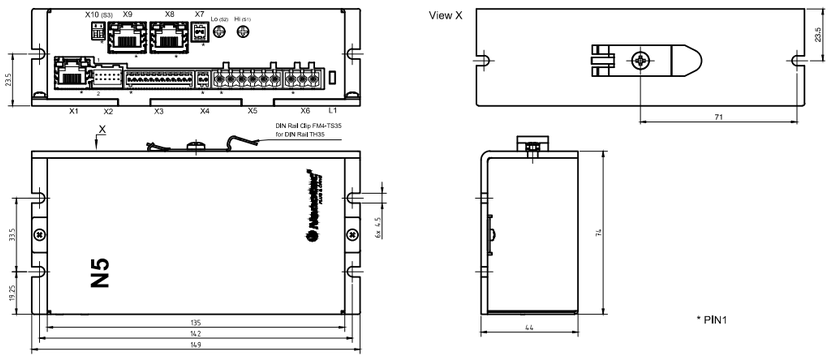
Motor controller for CANopen, EtherCAT, EtherNet/IP or Modbus RTU/TCP

DIMENSIONS (IN MM)

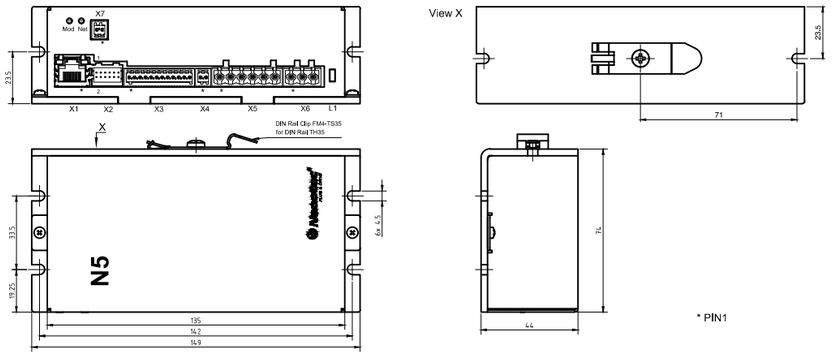
N5-x-1 EtherCAT



N5-x-2 CANopen



N5-x-3 EtherNet/IP

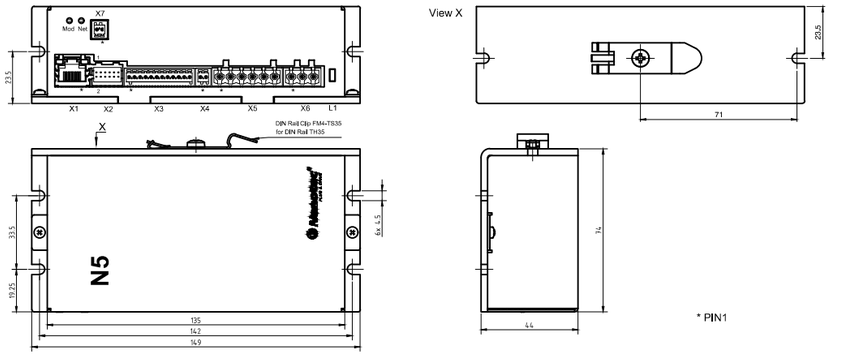


N5

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

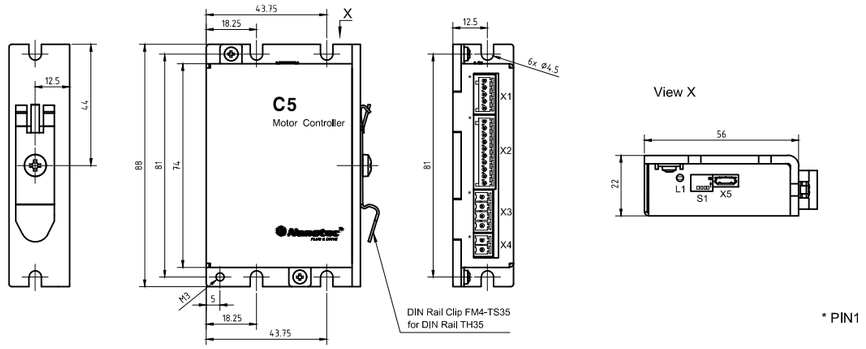
ZK-MICROUSB Micro USB cable, 1.5m
Z-K4700/50 Capacitor
Z-K10000/100 Capacitor
ZCPHOFK-MC0,5-5 Connector
ZCPHOFK-MC0,5-10 Connector
ZCPHOF-MC1,5-2 Connector
ZCPHOF-MC1,5-4 4-pin terminal connector

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

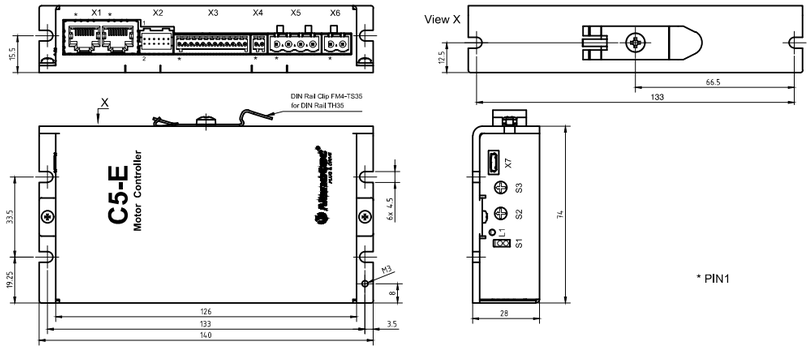
C5-E-
1-09 = Low-current version
2-09 = High-current version

ACCESSORIES

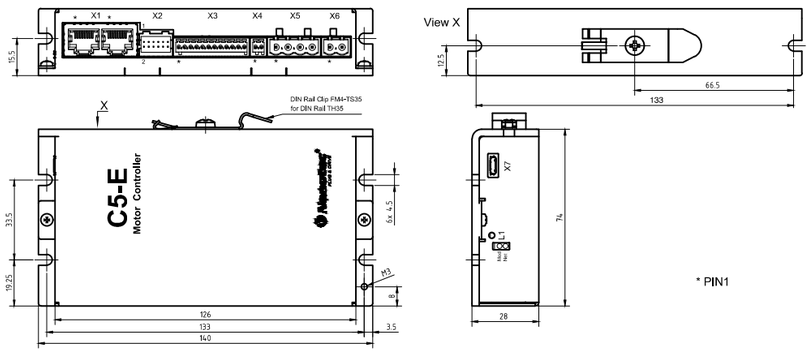
ZK-MICROUSB Micro USB cable, 1.5m
ZK-MCM-12-2,0-S-JPAD Encoder cable NME2/3 2.0m
ZK-MCM-12-500-S-JPAD Encoder cable NME2/3 0.5m
ZK-NOE-10-500-S-PADP Encoder cable NOE, 0.5m
ZK-NTO3-10-500-PADP Encoder cable NTO3, 0.5m
ZK-NTO3-10-1000-PADP Encoder cable NTO3, 1m
ZK-PADP-12-500-S Encoder cable controller, 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

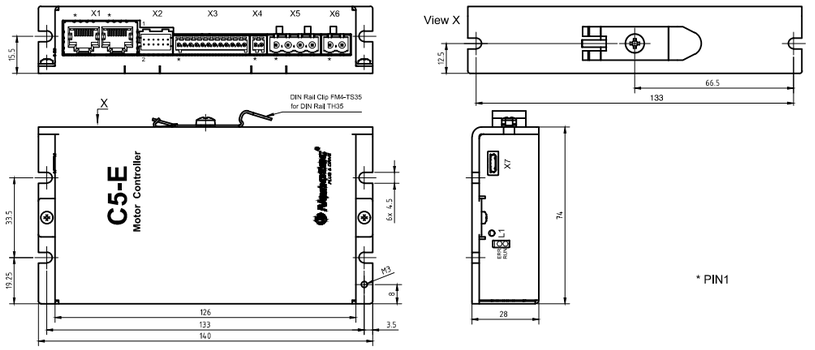


C5-E

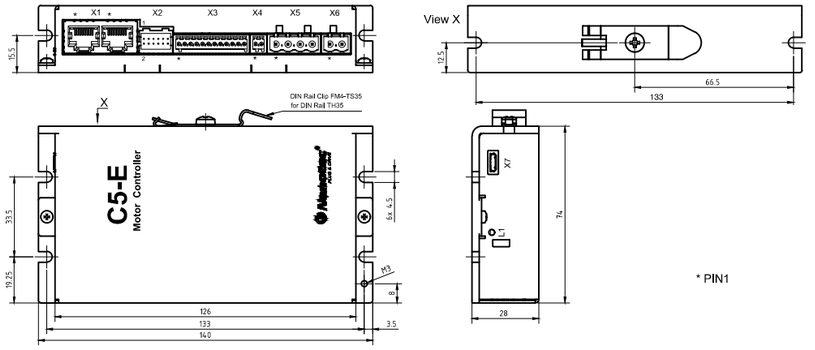
Motor controller for CANopen, EtherCAT, EtherNet/IP, USB or Modbus RTU/TCP

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

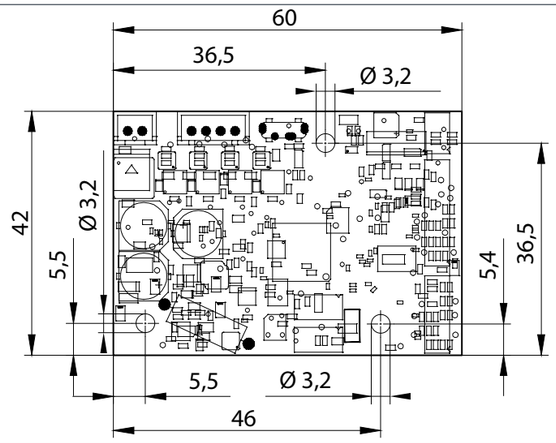
ZK-GHR3-500-S RS232 cable, 0.5m
ZK-GHR12-500-S IO cable, 0.5m
ZK-MICROUSB Micro USB cable, 1.5m
ZK-PD4-C-CAN-4-500-S CAN in/out cable 0.5m
ZK-XHP4-300 Motor cable, 0.3m
ZK-XHP2-500-S Power cable, 0.5m
ZK-GHR10-500-S-GHR Encoder cable NOE, 0.5m
ZK-GHR13-500-S-GHR Encoder cable NME, 0.5m
ZK-JZH-8-500-S-JGH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

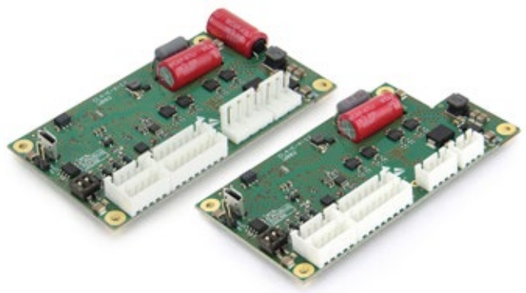
DIMENSIONS (IN MM)

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

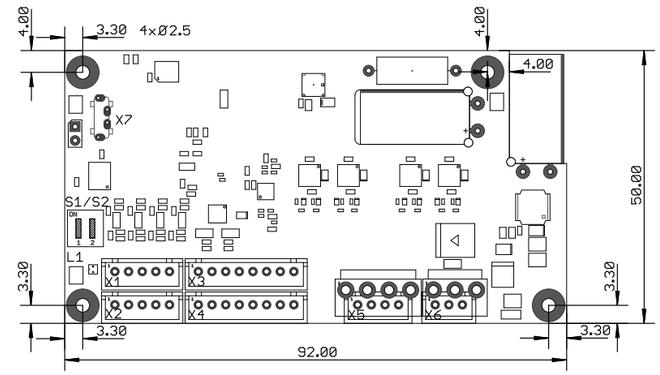
ZK-MICROUSB Micro USB cable, 1.5m
ZK-VHR-3-500 Power cable, 0.5m
ZK-VHR-4-500 Motor cable, 0.5m
ZK-XHP-3-500 Power cable, 0.5m
ZK-XHP-5-500-S CAN/RS485 in/out 0.5m
ZK-XHP-8-500-S Enc.-/Hall cable or in/out, 0.5m
ZK-XHP4-300 Motor cable, 0.3m
ZK-JZH-8-500-S-JXH Encoder cable WEDL 0.5m
ZK-MCM-12-500-S-JXH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

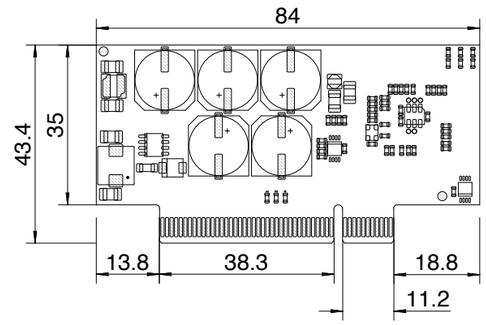
DK-NP5-4A Development board for NP5
DK-NP5-48 Development board for NP5
DK-NP5-68 Development board for NP5

NP5

Motor controller for CANopen, EtherCAT, Modbus RTU or SPI

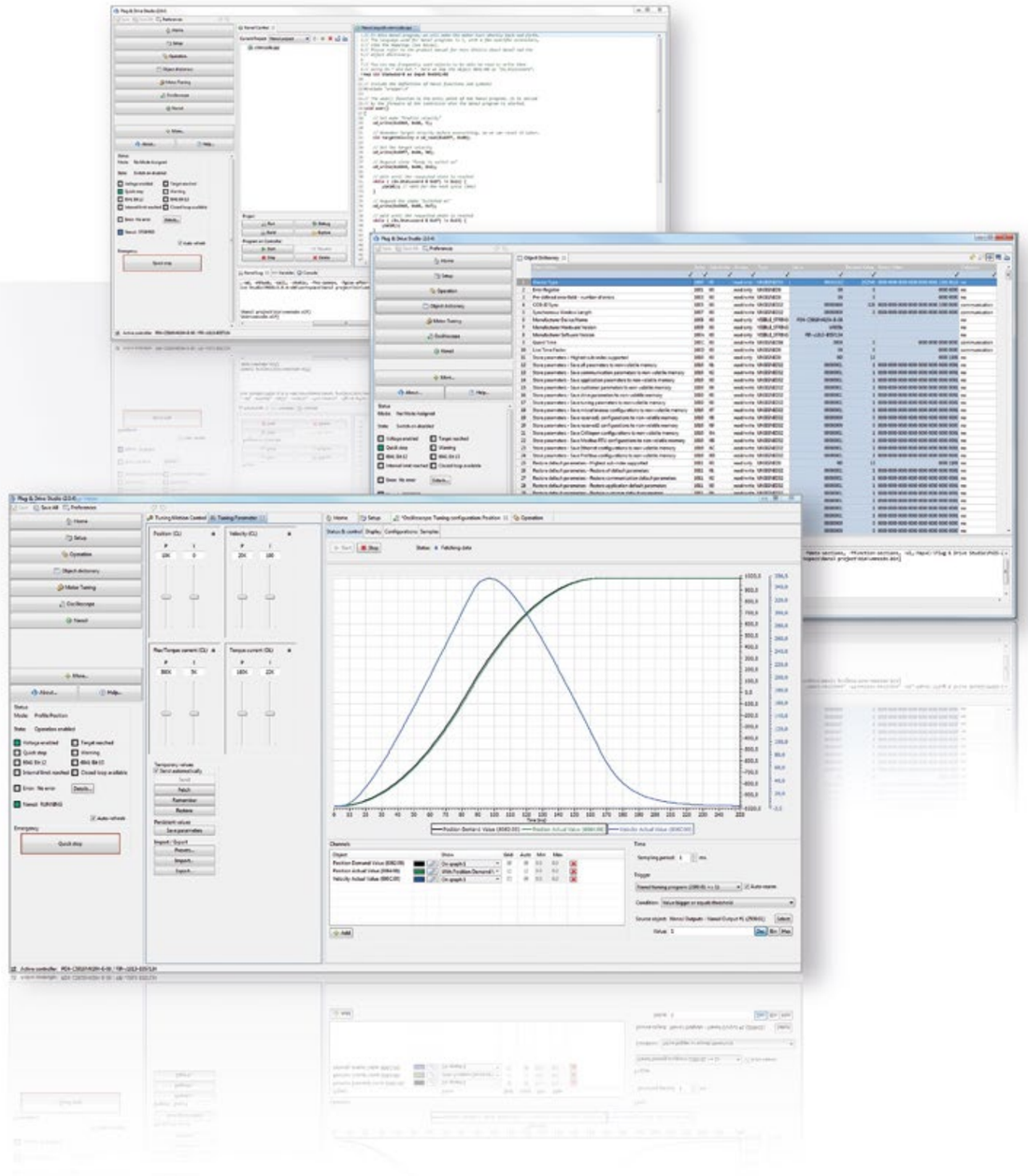
DIMENSIONS (IN MM)

NP5



Notes

SOFTWARE

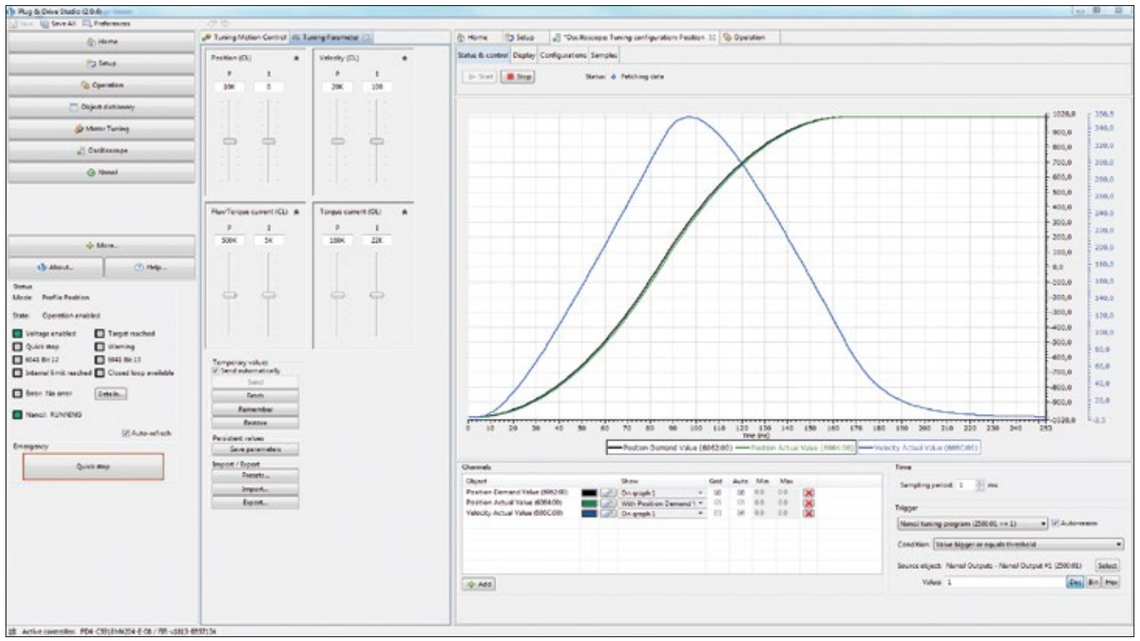


Plug & Drive Studio

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.

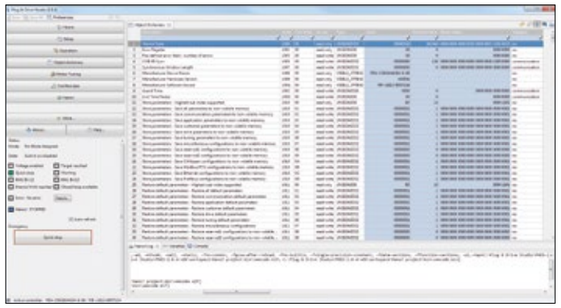
For setup, the object directory holding the controller configuration can be read and written via a table. Pre-defined filters enable the user to only display the parts of CiA 402 objects that pertain to a certain task, such as setup or a certain operating mode, i.e. the speed. Experienced users can configure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

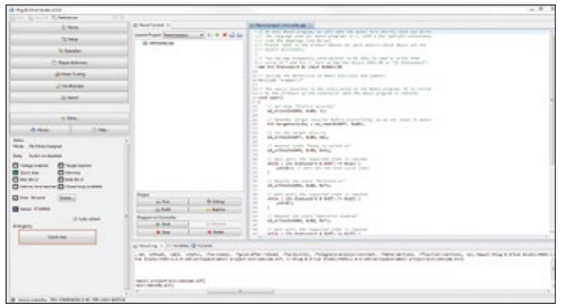


Oscilloscope with target and actual positions and following errors

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

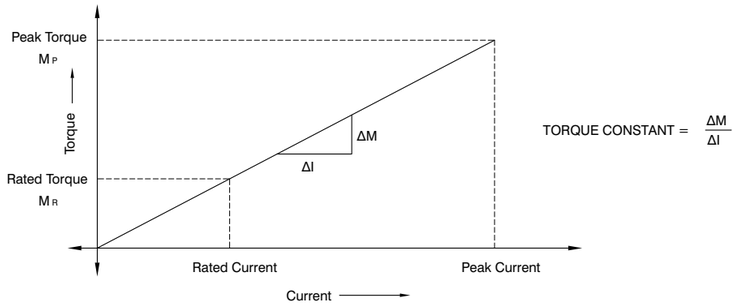
ADVANTAGES

- 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

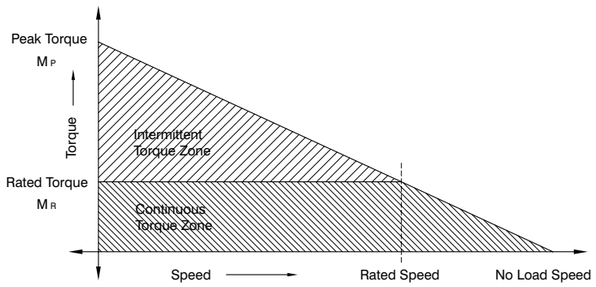
Affordable electronically commutated 3-phase brushless motors (EC motors) are particularly well suited for applications requiring smooth running and a long service life. High acceleration and speeds of up to 25,000 rpm with exceptional efficiency due to the high-energy permanent magnets. The rotor position 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

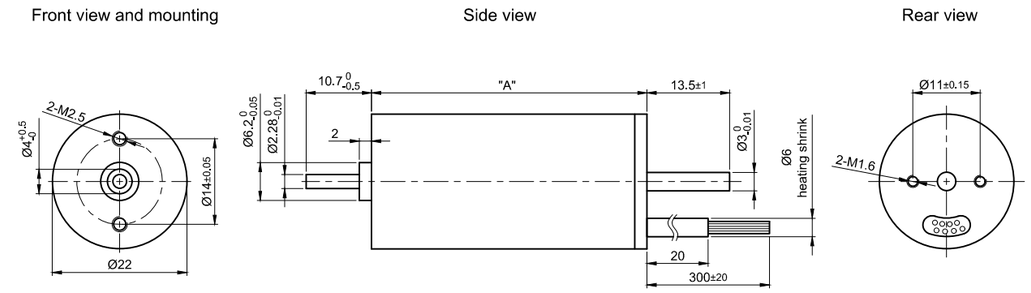
Controller

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

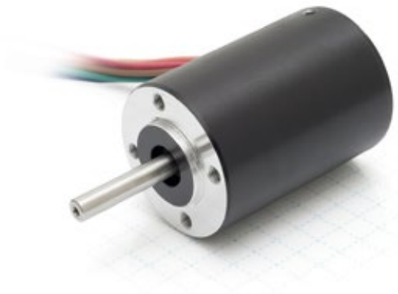
DIMENSIONS (IN MM)

DB22



DB28

Brushless DC motor



OPTIONS

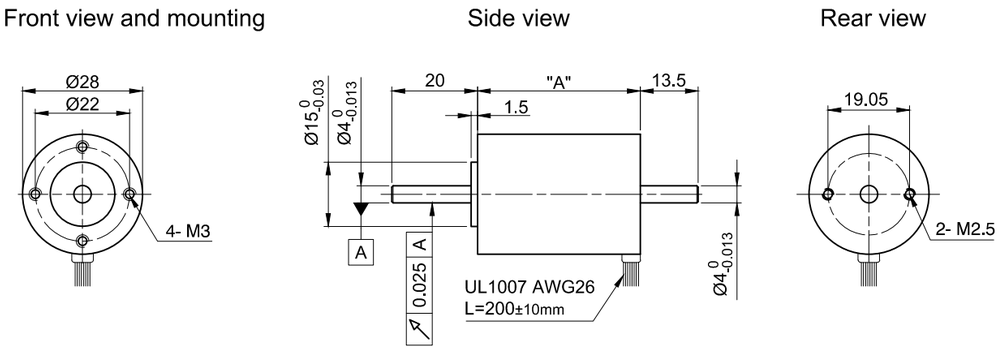
Gearbox | Controller | Encoder

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)

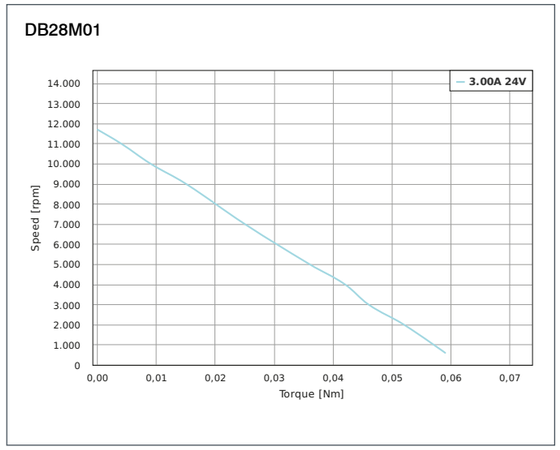
DB28



DB28

Brushless DC motor

TORQUE CURVES



DB33

Brushless DC motor

OPTIONS

Controller

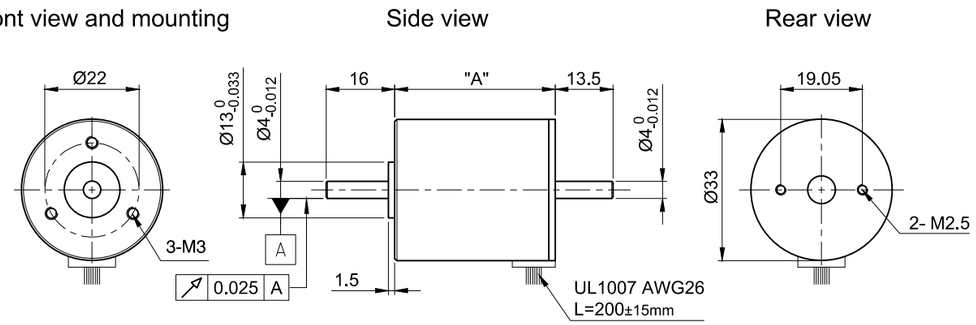
Encoder

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)

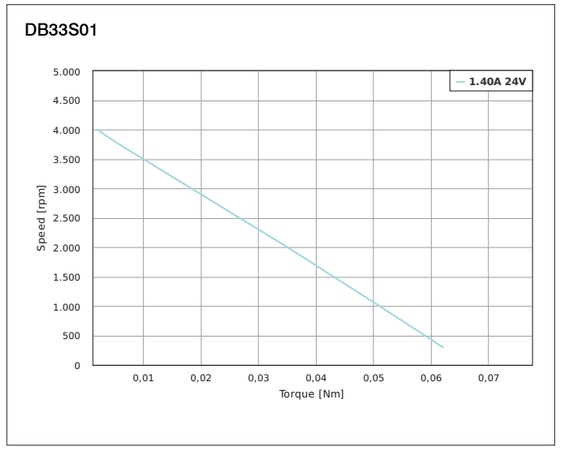
DB33



DB33

Brushless DC motor

TORQUE CURVES



DBL36

Brushless DC motor

OPTIONS

Controller

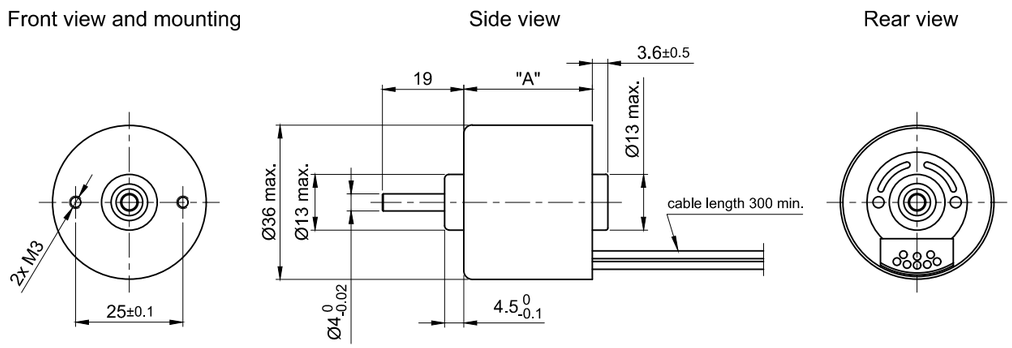
Encoder

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

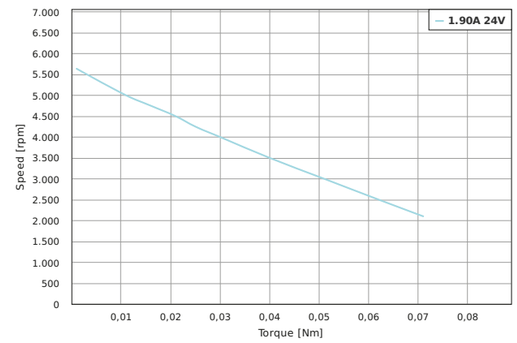


DBL36

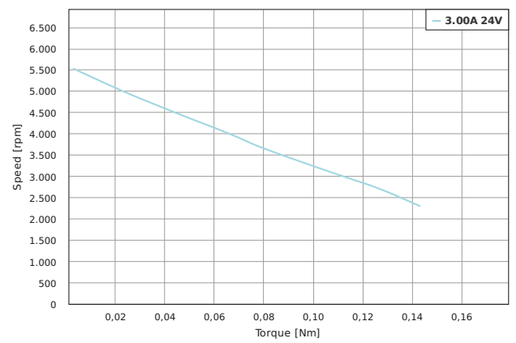
Brushless DC motor

TORQUE CURVES

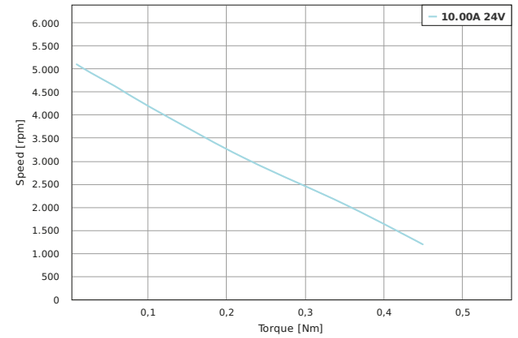
DBL36S024048-A



DBL36M024048-A



DBL36L024045-A



DB41

Brushless DC motor

OPTIONS

Gearbox

Controller

VERSIONS

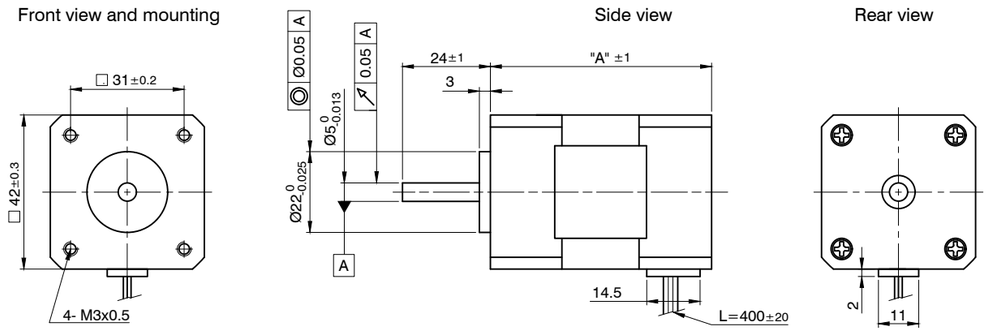
Type	Rated Power W	Rated Torque Ncm	Rated Current A	Peak Current A	Rated Voltage V	Rated Speed rpm	Torque Constant Ncm/A	Rotor Inertia gcm²	Length „A“ mm	Weight kg
DB41S024030-A	22	7	1.3	4.4	24	3000	5.42	48	40.3	0.3
DB41M024030-A	50	16	3	9.2	24	3000	5.41	101	60.3	0.45
DB41L024030-A	82	26	4.8	14.8	24	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

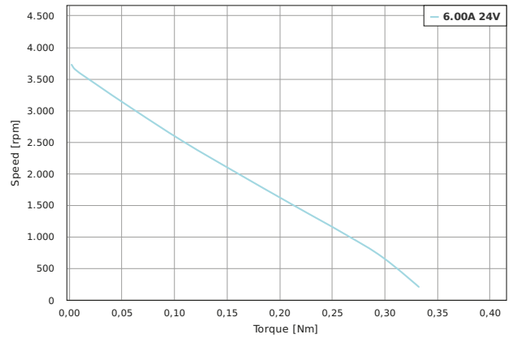


DB41

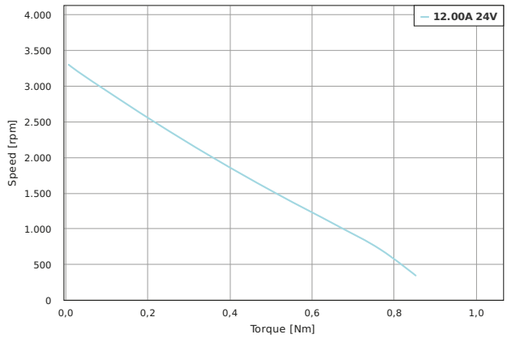
Brushless DC motor

TORQUE CURVES

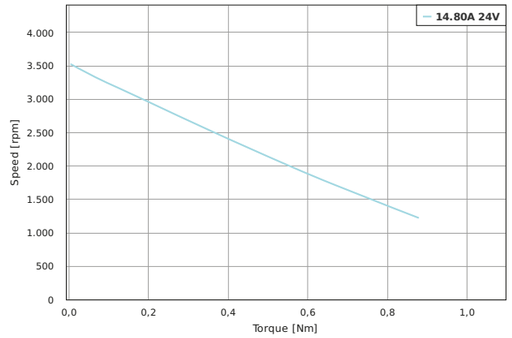
DB41S024030-A



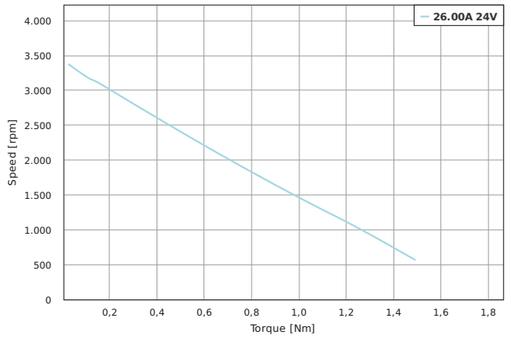
DB41M024030-A



DB41L024030-A

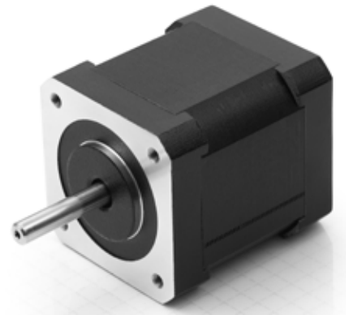


DB41C024030-A



DB42

Brushless DC motor



OPTIONS

Gearbox | Brake | Controller | Encoder

ACCESSORIES

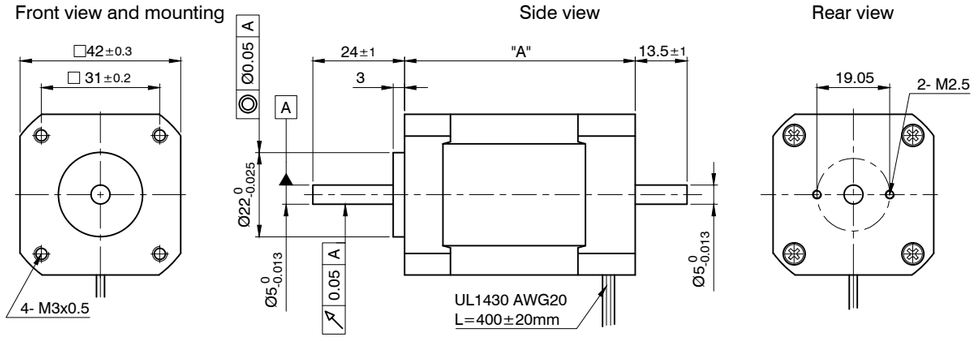
ZD-D28 Damper
ZD-D40 Damper
ZD-DF40 Damper

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

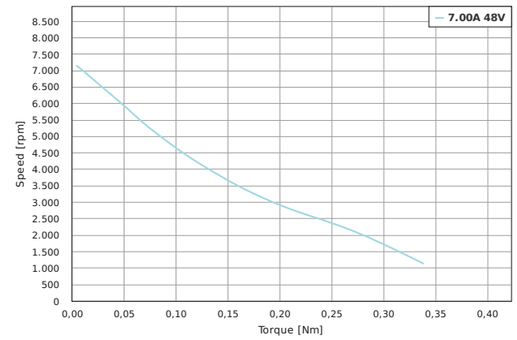
DIMENSIONS (IN MM)

DB42

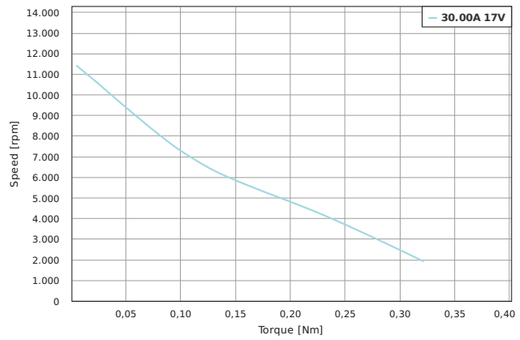


TORQUE CURVES

DB42S01



DB42S02



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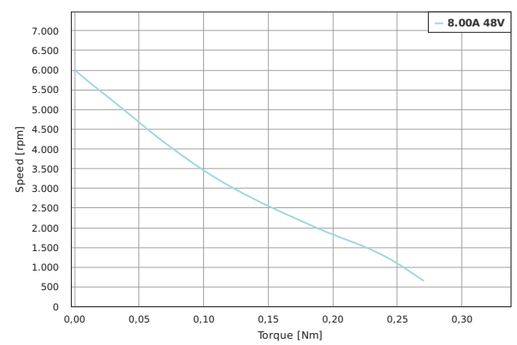
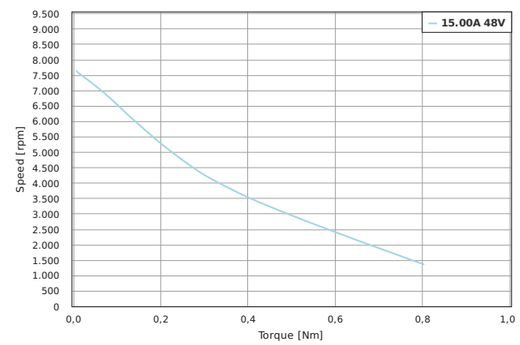


DB42M01



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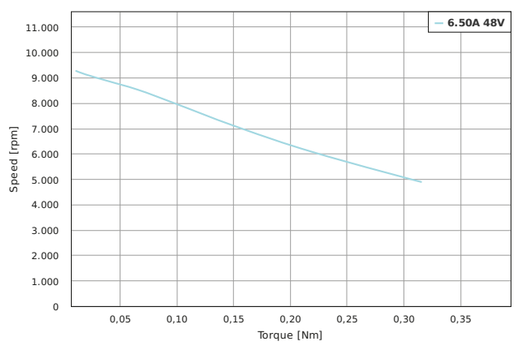

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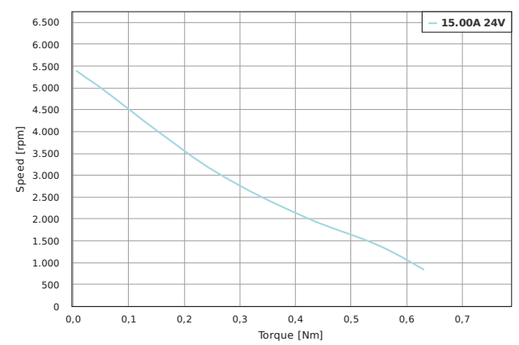


DB42

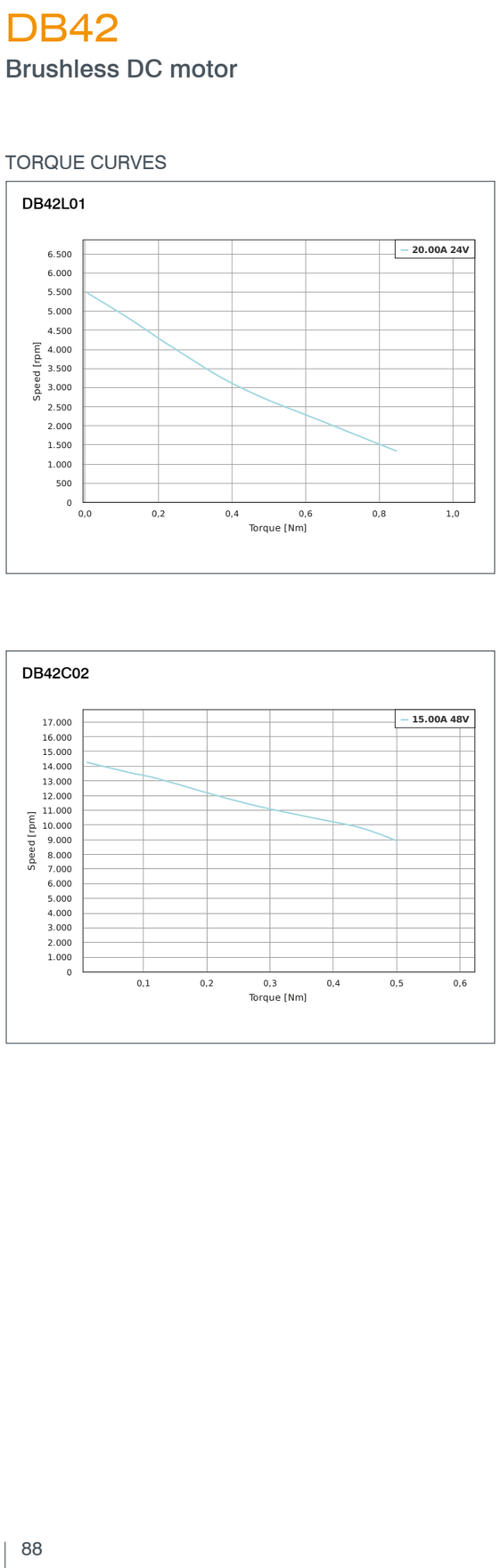
Brushless DC motor

TORQUE CURVES

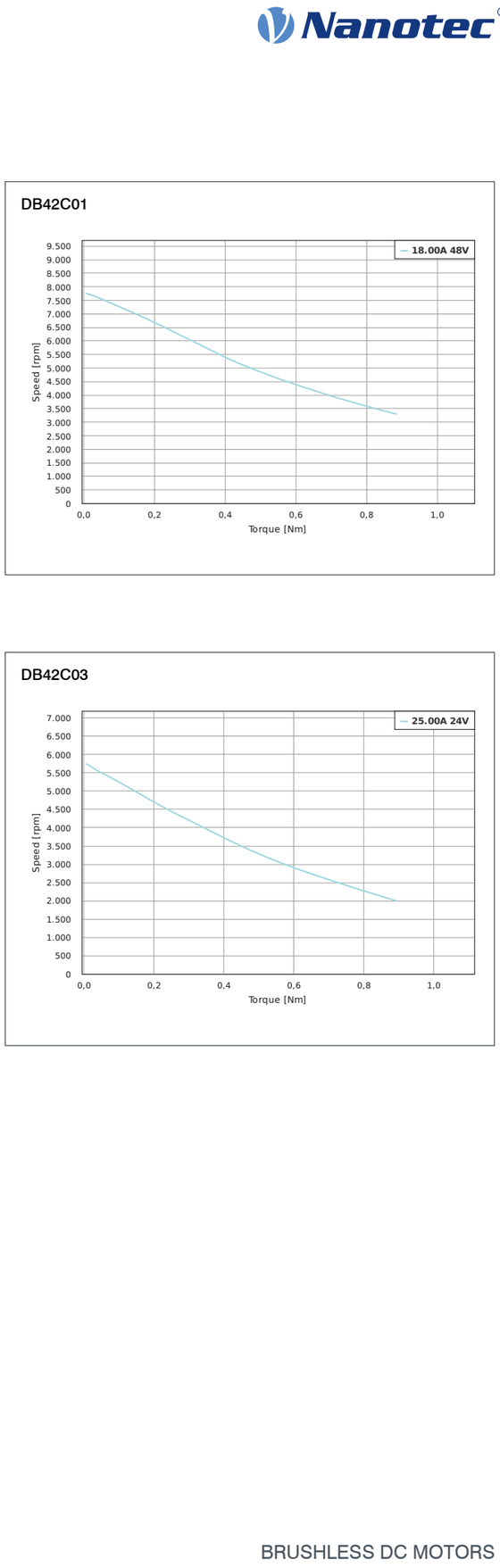
DB42L01

DB42C01

DB42C02



DB42C03



DBL42

Brushless DC motor

OPTIONS

Controller

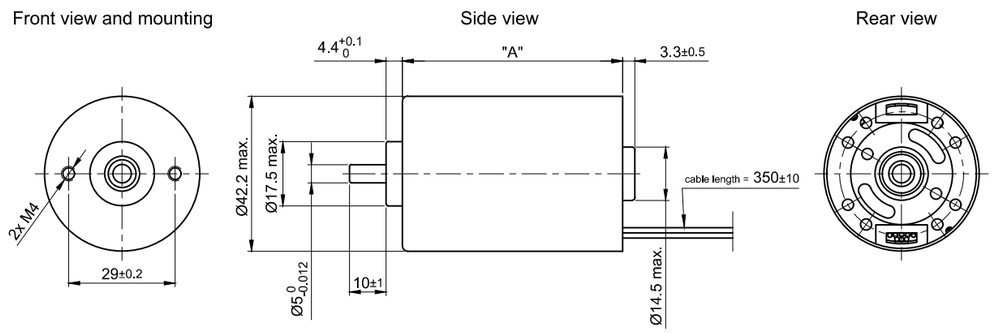
Encoder

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

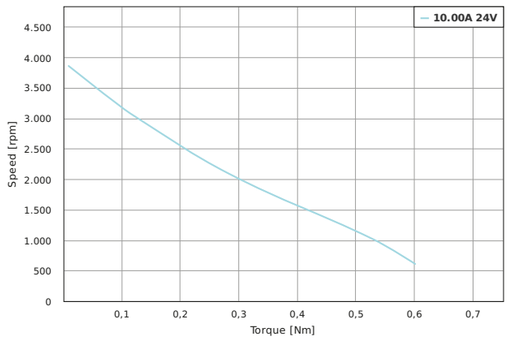
DIMENSIONS (IN MM)

DBL42



TORQUE CURVES

DBL42L024032-A



DB43

Brushless DC motor

OPTIONS

Gearbox

Controller

VERSIONS

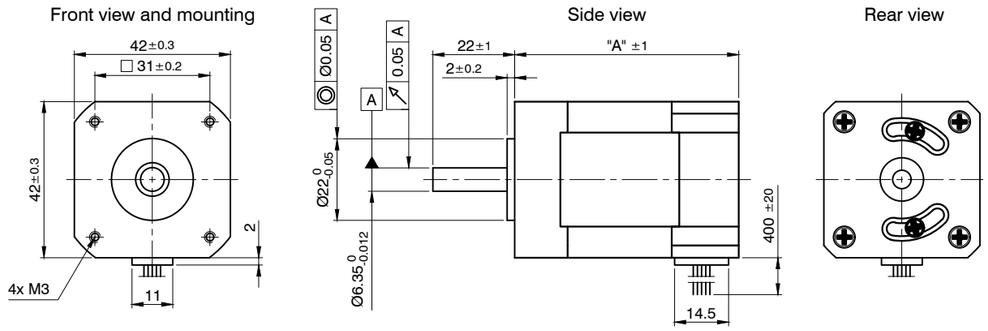
Type	Rated Power W	Rated Torque Ncm	Rated Current A	Peak Current A	Rated Voltage V	Rated Speed rpm	Torque Constant Ncm/A	Rotor Inertia gcm²	Length „A“ mm	Weight kg
DB43M024030	53	17	3.1	9.3	24	3000	5.5	60	60.3	0.6
DB43M048030	53	17	1.5	4.6	48	3000	11	60	60.3	0.6
DB43L024030	94	30	4.8	14.4	24	3000	6.25	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

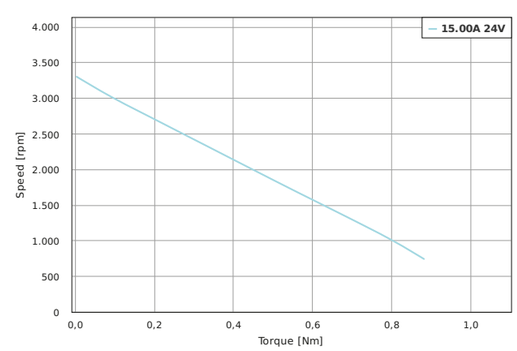


DB43

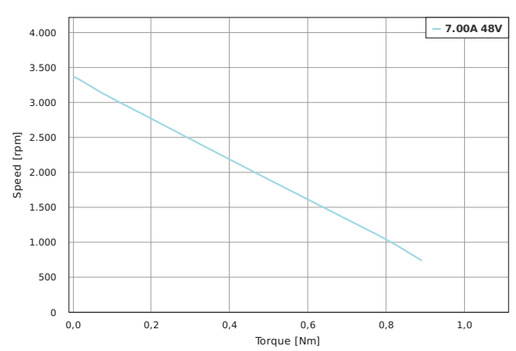
Brushless DC motor

TORQUE CURVES

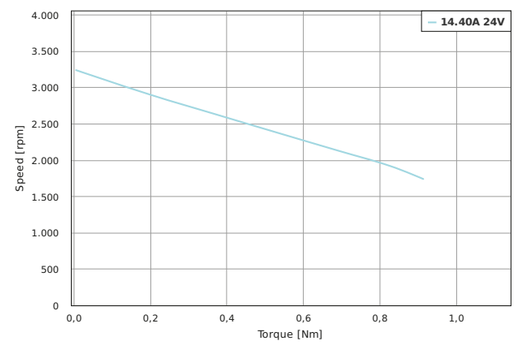
DB43M024030



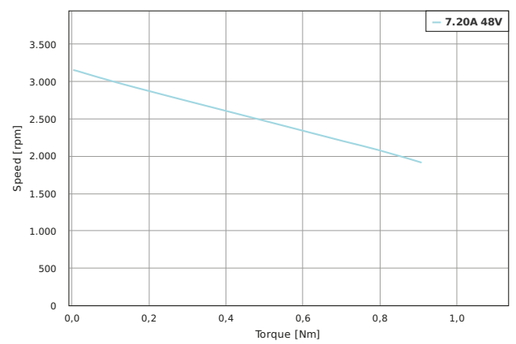
DB43M048030



DB43L024030



DB43L048030



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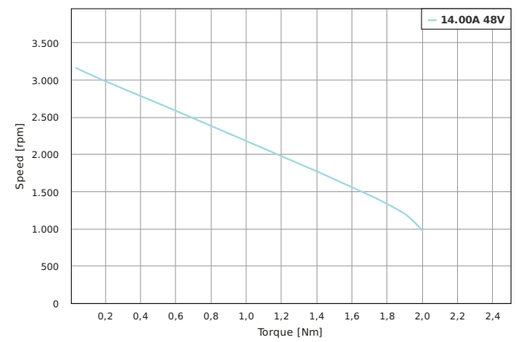


DB56

Bürstenloser DC-Motor

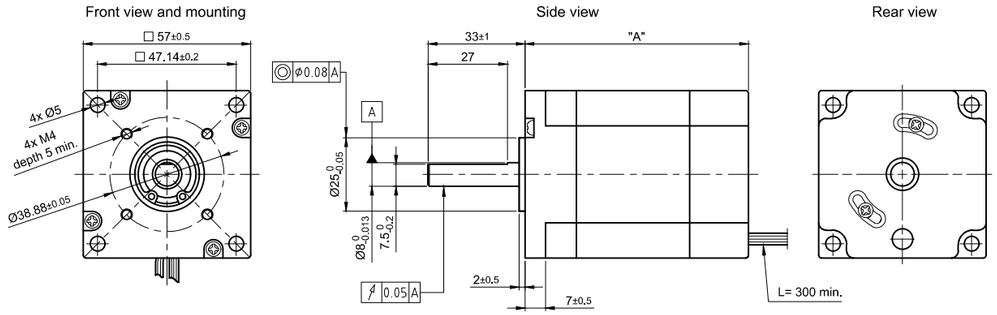
OPTIONS

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

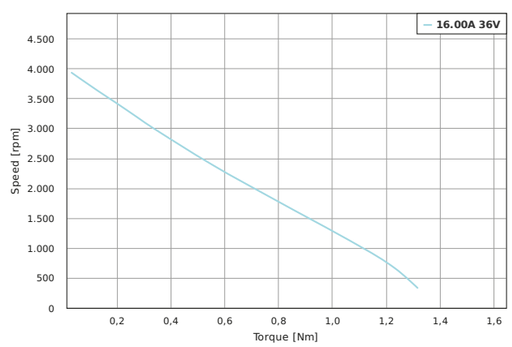


DB56

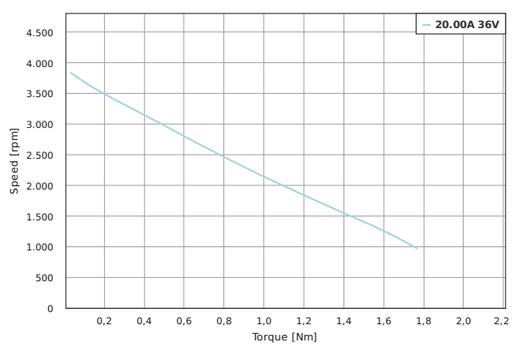
Brushless DC motor

TORQUE CURVES

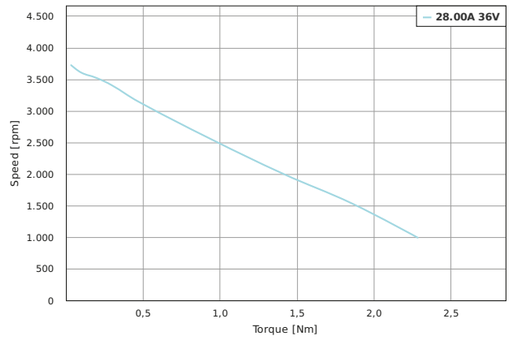
DB56L036030-A



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.

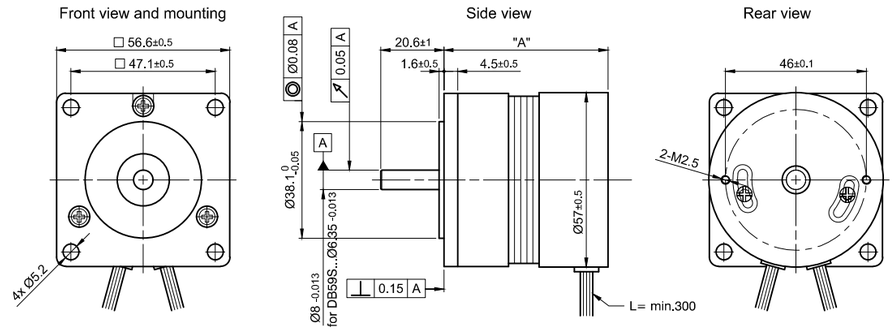
ACCESSORIES

ZD-DF56 Damper

DB59
Brushless DC motor

DIMENSIONS (IN MM)

DB59-A

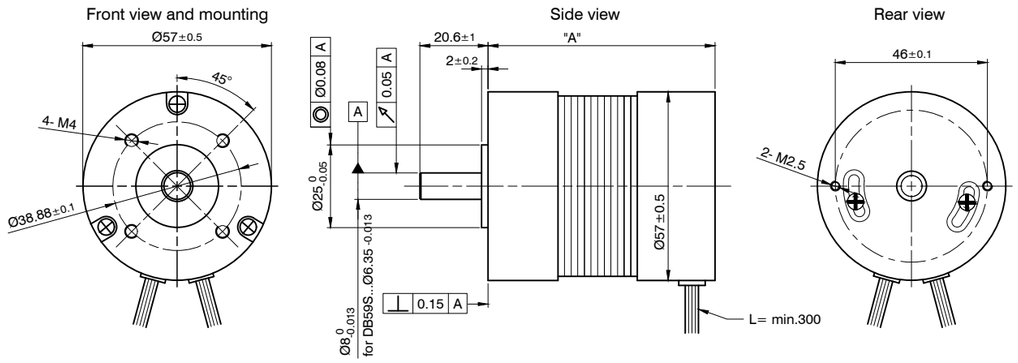


DB59-B

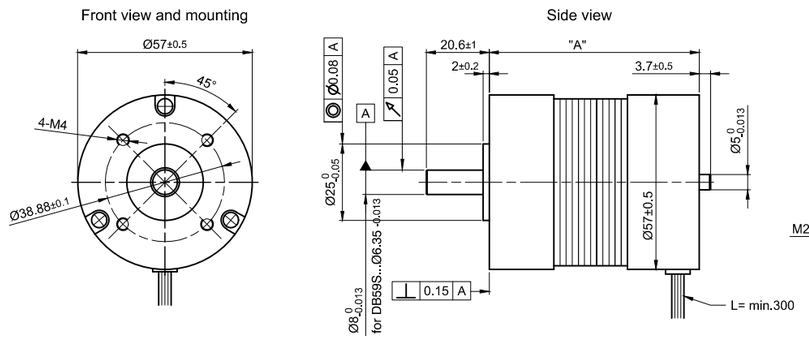
DB59-B3

DIMENSIONS (IN MM)

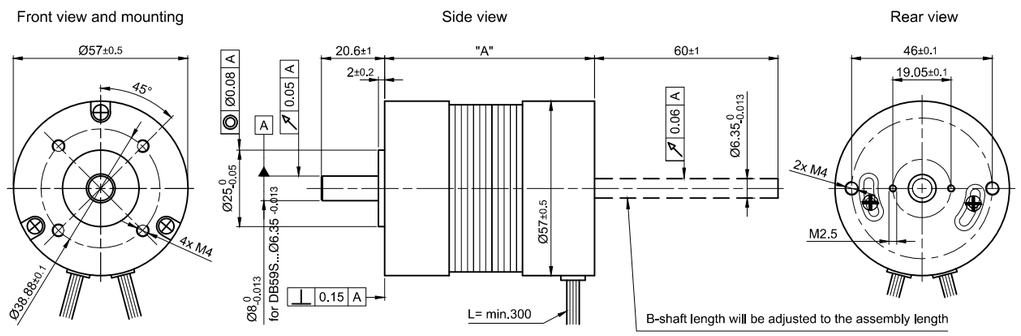
DB59R-A



DB59R-B



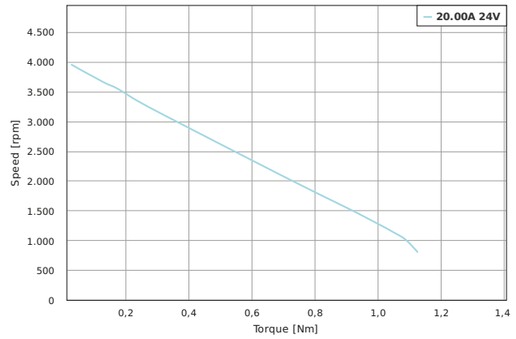
DB59R-B3



DB59
Brushless DC motor

TORQUE CURVES

DB59S024035



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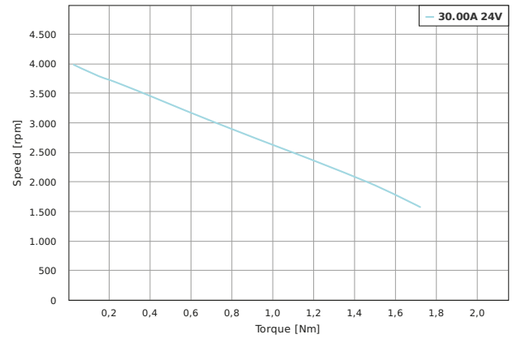
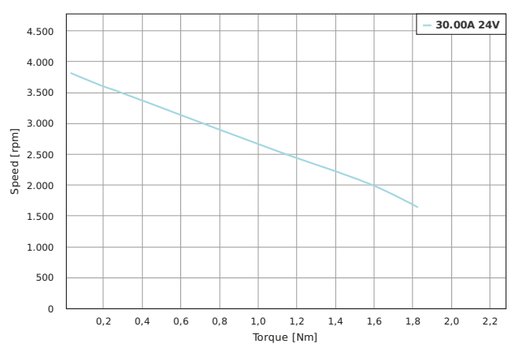


DB59L024035



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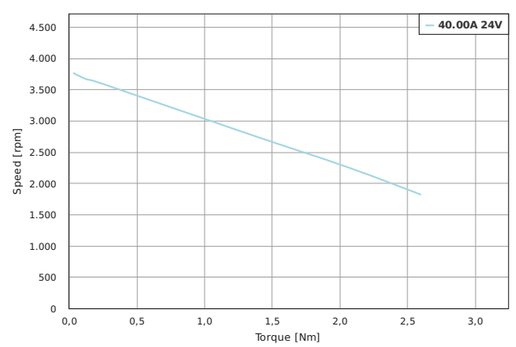
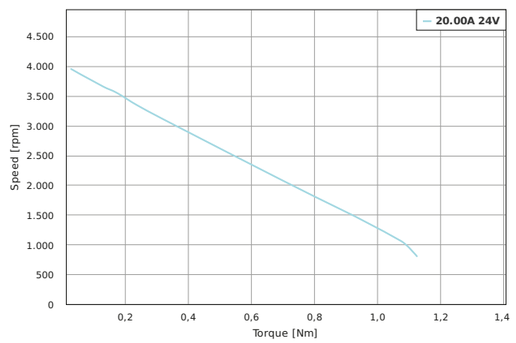
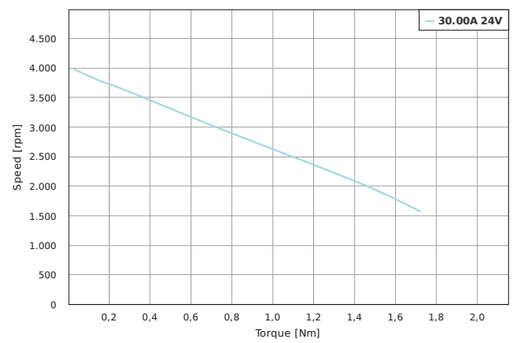


DB59S024035-R



DB59M024035-R

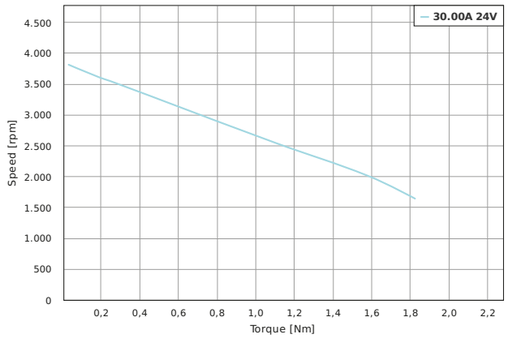


DB59

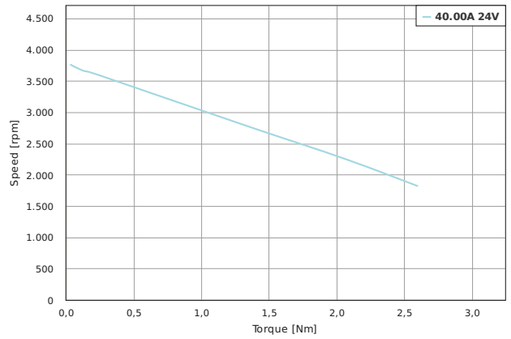
Brushless DC motor

TORQUE CURVES

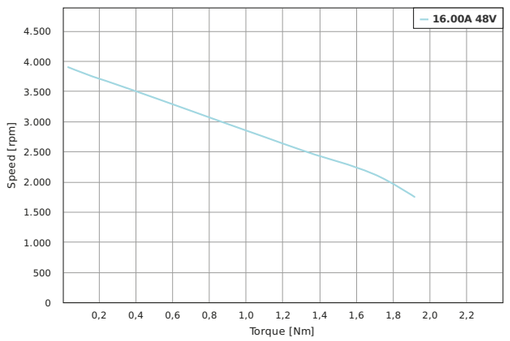
DB59L024035-R



DB59C024035-R



DB59L048035



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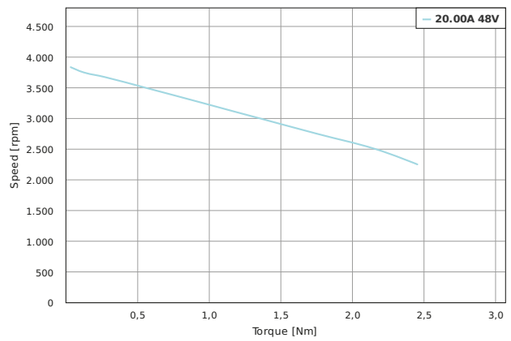


Notes

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

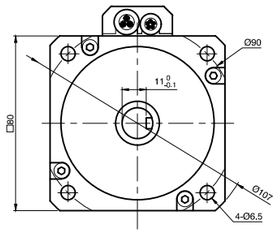
ORDER IDENTIFIER

DB80S048030-
A = Without encoder
ENM05J = With incremental encoder

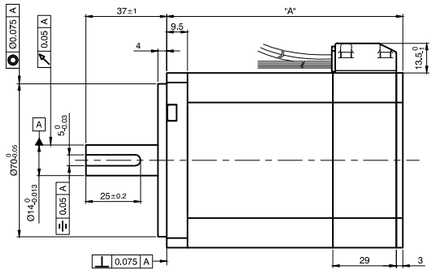
DIMENSIONS (IN MM)

DB80

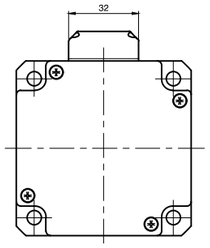
Front view and mounting



Side view



Rear view

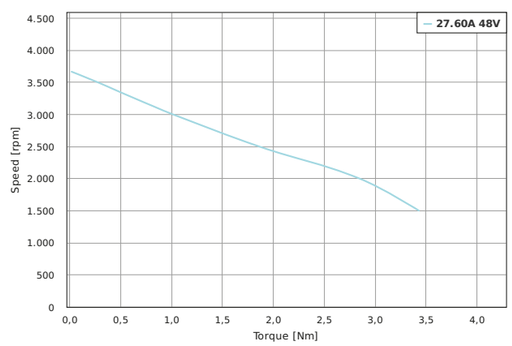


DB80

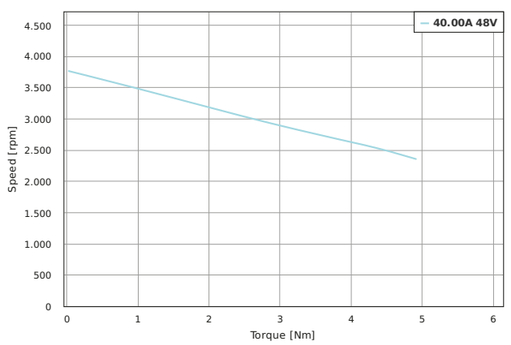
Brushless DC motor

TORQUE CURVES

DB80S048030



DB80M048030



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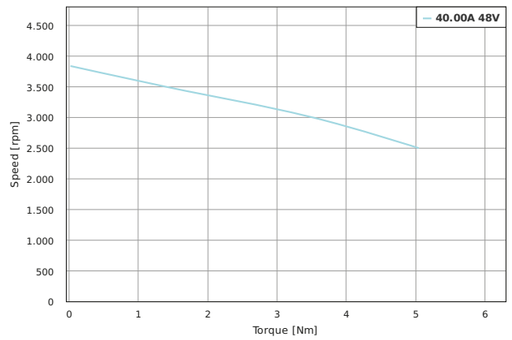

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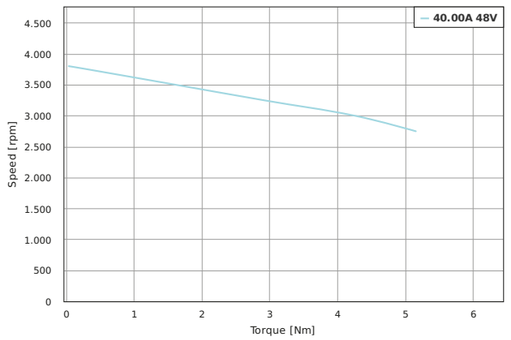


DB87

Brushless DC motor

OPTIONS

Gearbox · Brake · Controller · Encoder

VERSIONS

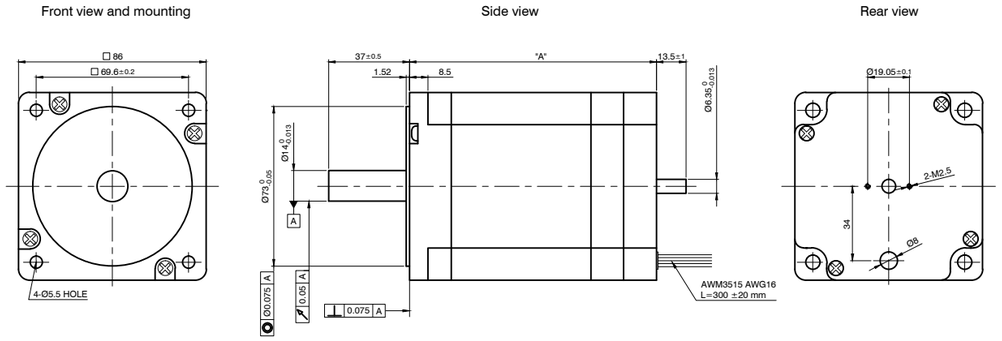
Type	Rated Power W	Rated Torque Ncm	Rated Current A	Peak Current A	Rated Voltage V	Rated Speed rpm	Torque Constant Ncm/A	Rotor Inertia gcm²	Length „A“ mm	Weight kg
DB87S01-S	220	70	6.25	19	48	3000	11.2	800	86	1.85
DB87M01-S	440	140	10.77	32.31	48	3000	13	1600	113	2.6
DB87L01-S	660	210	17.95	53.85	48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

ACCESSORIES

ZD-D56 Damper

DIMENSIONS (IN MM)

DB87

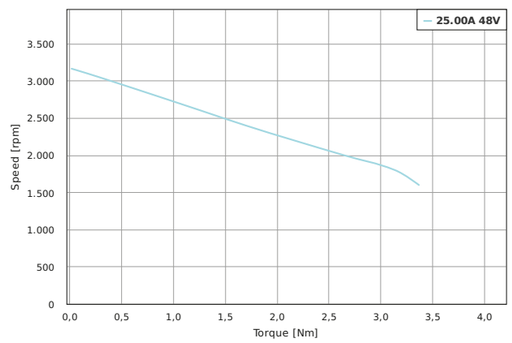


DB87

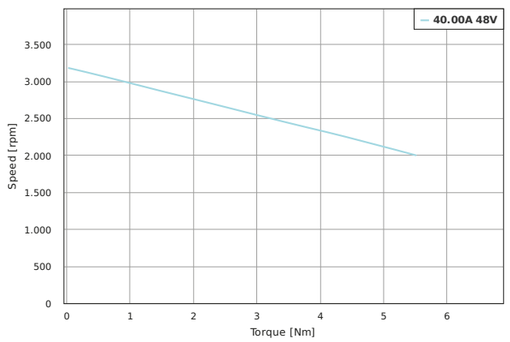
Brushless DC motor

TORQUE CURVES

DB87S01-S



DB87M01-S



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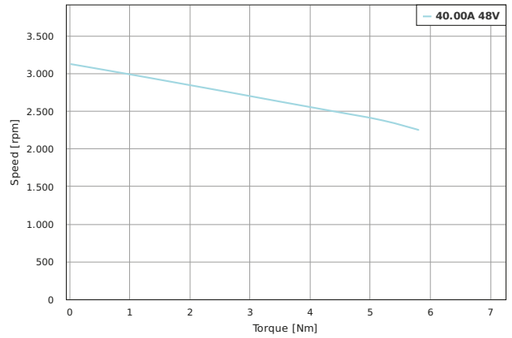


BLDC MOTORS

DF20

Brushless DC motor

ACCESSORIES

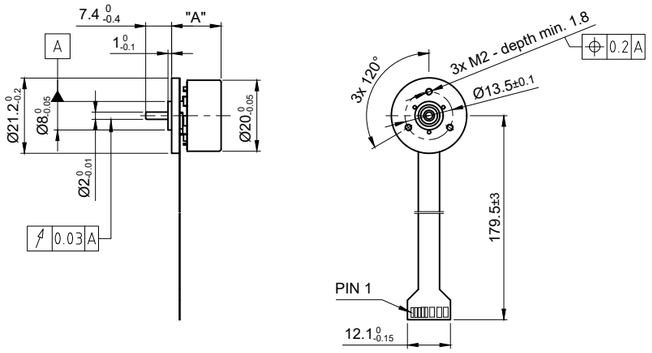
ZIB-DF32 Additional board

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

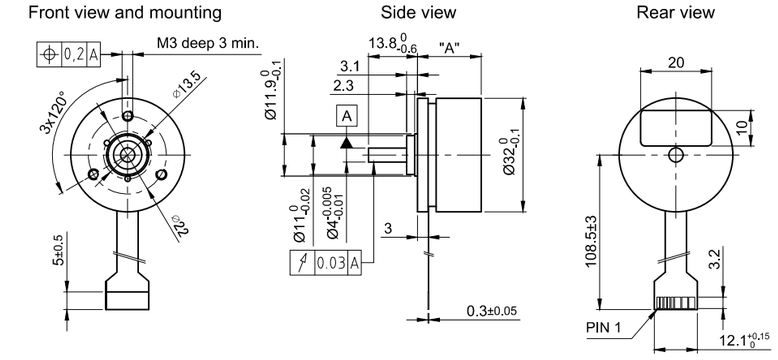
ZIB-DF32 Additional board

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

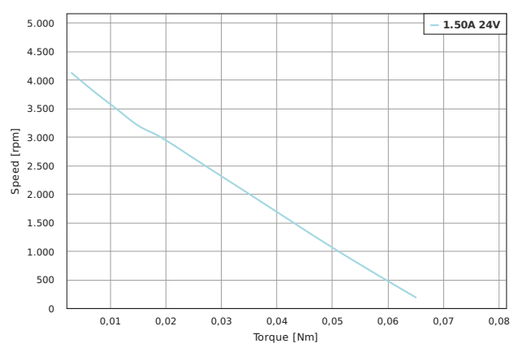
DIMENSIONS (IN MM)

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

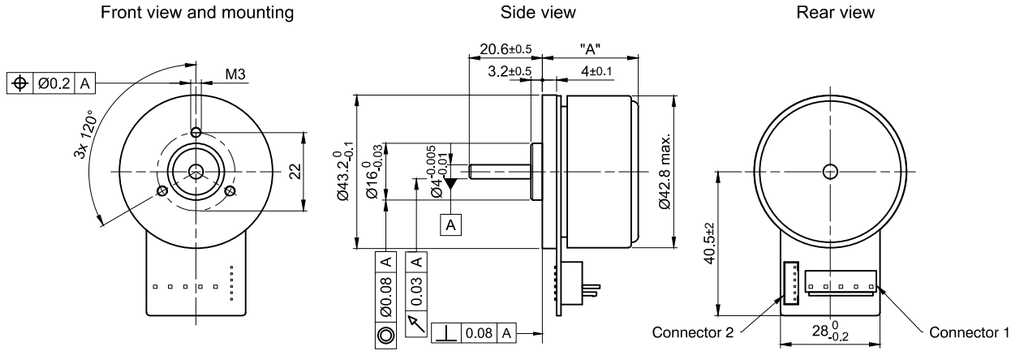
ACCESSORIES

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

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

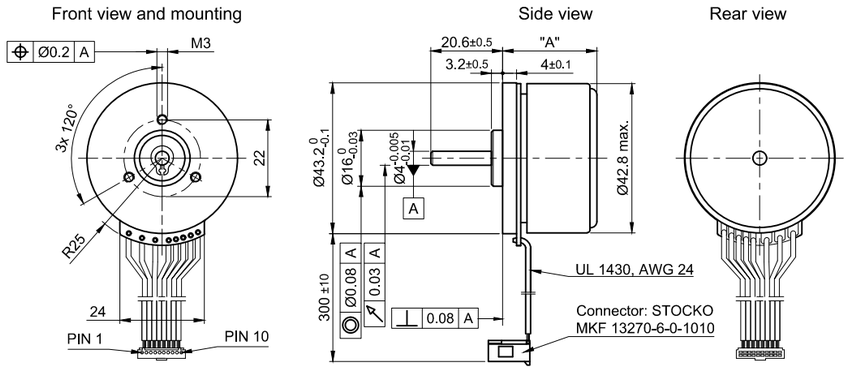
DIMENSIONS (IN MM)

DF45-A



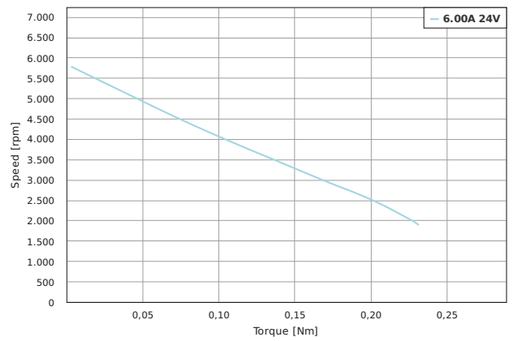
DIMENSIONS (IN MM)

DF45-A2

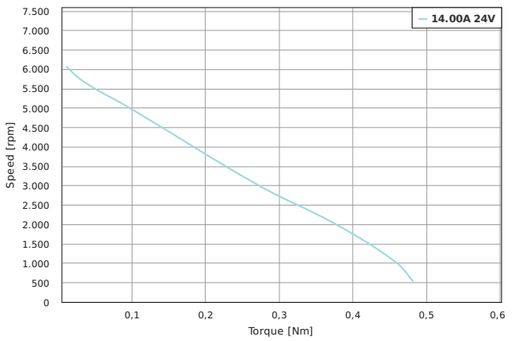


TORQUE CURVES

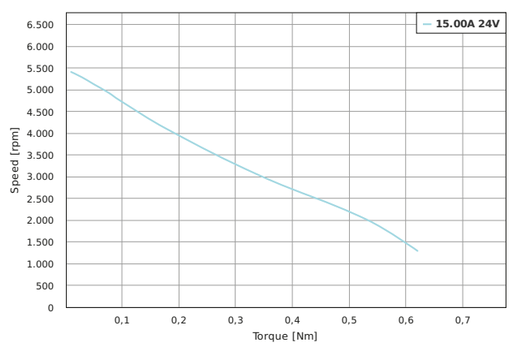
DF45S024050



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

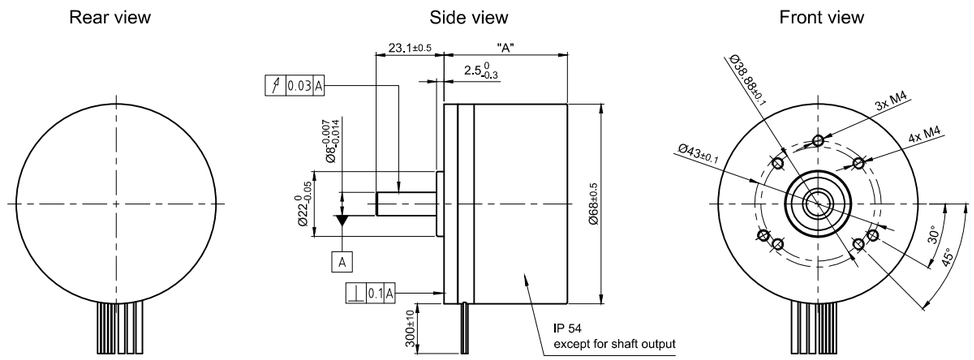
DFA68M024037-
A = Without encoder
E = With encoder

ACCESSORIES

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

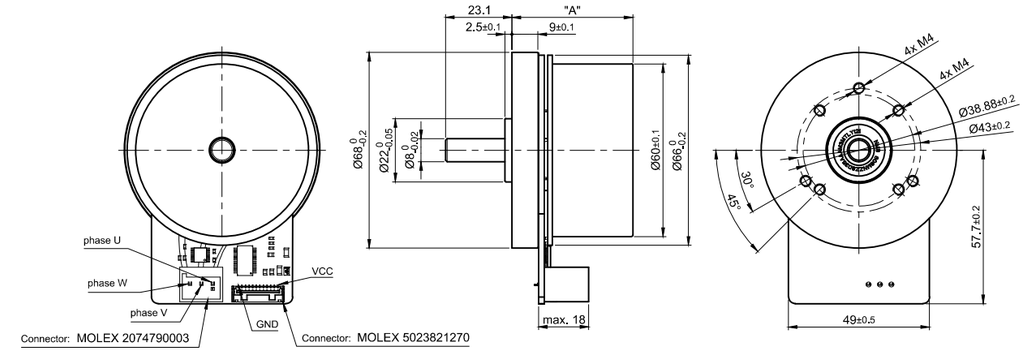
DIMENSIONS (IN MM)

DFA68



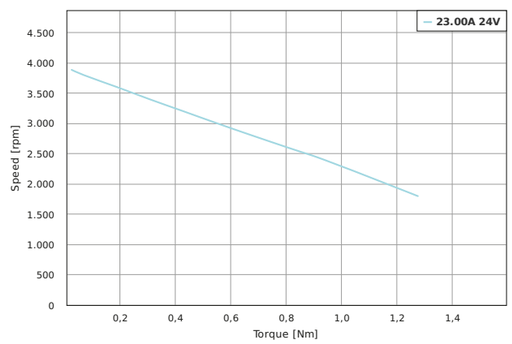
DIMENSIONS (IN MM)

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

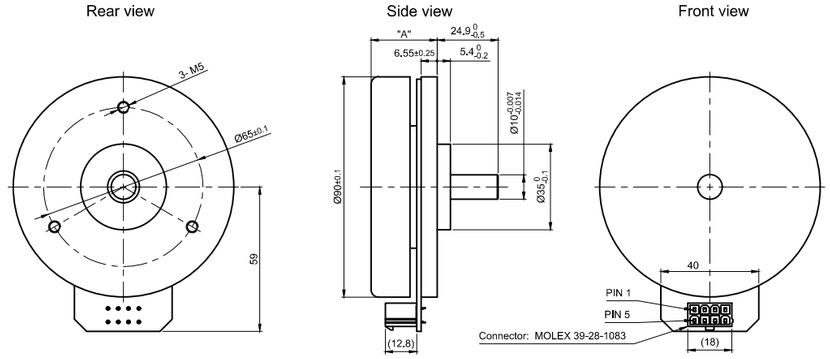
DFA90S024027-
A = Without encoder
E = With encoder

ACCESSORIES

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

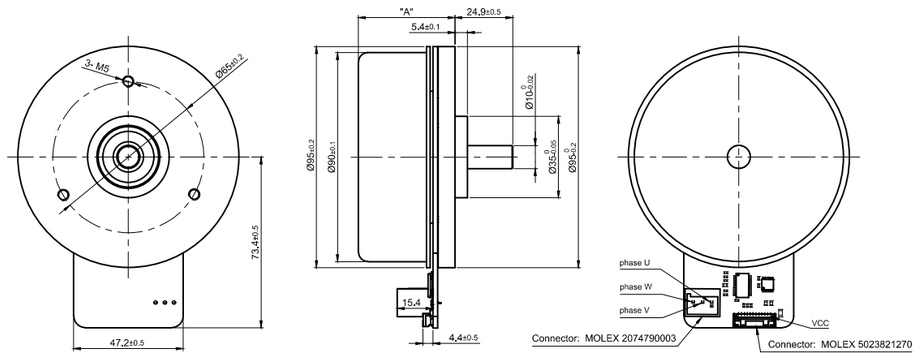
DIMENSIONS (IN MM)

DFA90



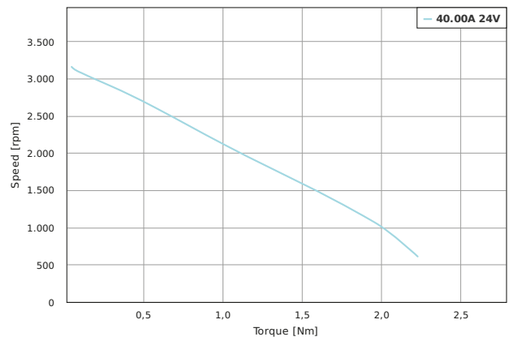
DIMENSIONS (IN MM)

DFA90-E

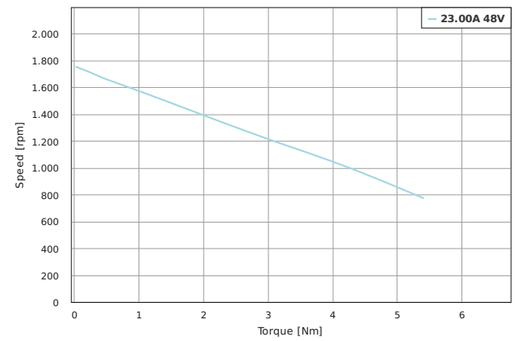


TORQUE CURVES

DFA90S024027-A



DFA90L048017-A



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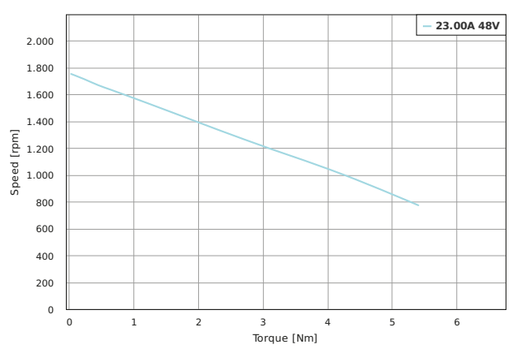


DS16

Brushless DC motor

OPTIONS

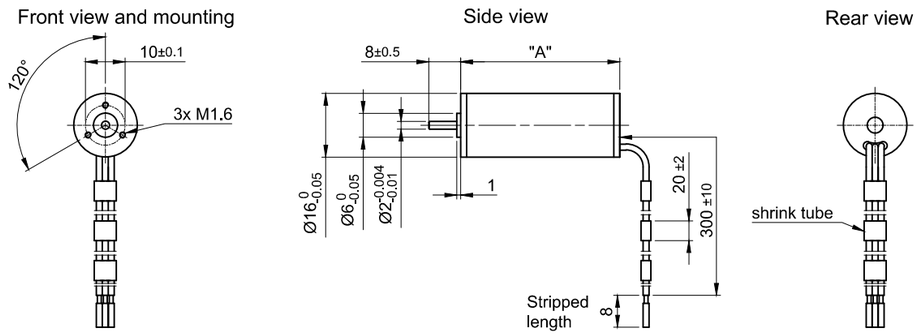
Controller

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

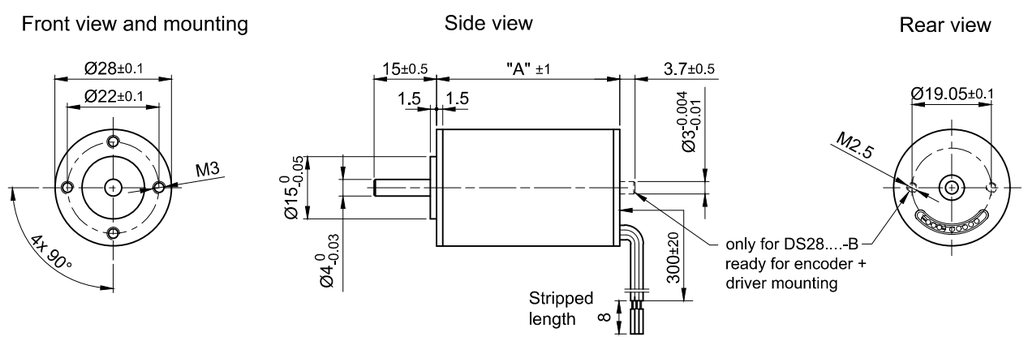
Type	Rated Power W	Rated Torque Ncm	Rated Current A	Peak Current A	Rated Voltage V	Rated Speed rpm	Torque Constant Ncm/A	Rotor Inertia gcm²	Length „A“ mm	Weight kg
DS28M024080	15.1	1.8	0.86	2.6	24	8000	2.1	8.8	45	0.14
DS28L024080	29	3.5	1.35	4	24	8000	2.6	16	67	0.22

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

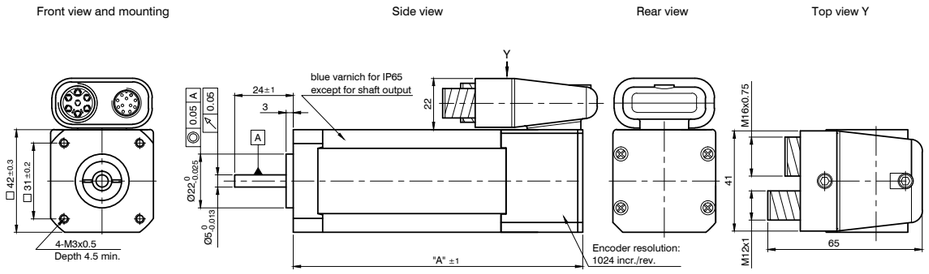
Type	Rated Power W	Rated Torque Ncm	Rated Current A	Peak Current A	Rated Voltage V	Rated Speed rpm	Torque Constant Ncm/A	Rotor Inertia gcm²	Length „A“ mm	Weight kg
ASB42C048060-ENM	160	25	4.63	13.89	48	6000	5.4	96	121	0.75

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

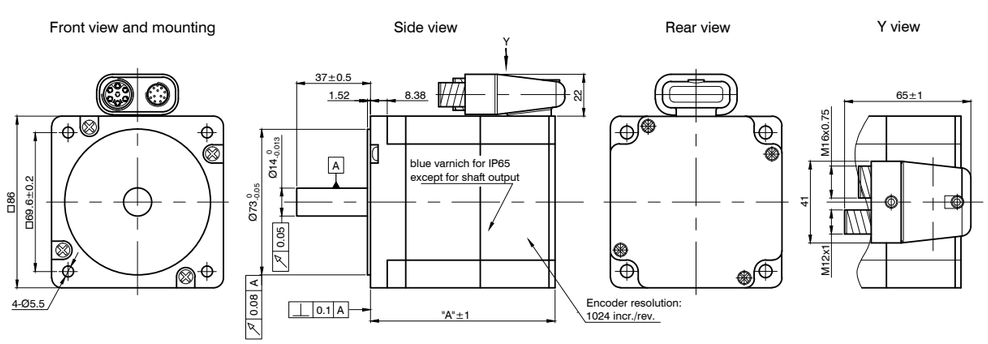
Type	Rated Power W	Rated Torque Ncm	Rated Current A	Peak Current A	Rated Voltage V	Rated Speed rpm	Torque Constant Ncm/A	Rotor Inertia gcm²	Length „A“ mm	Weight kg
ASB87S048030-ENM	250	70	6.25	17.95	48	3000	11.2	800	91.9	1.85

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

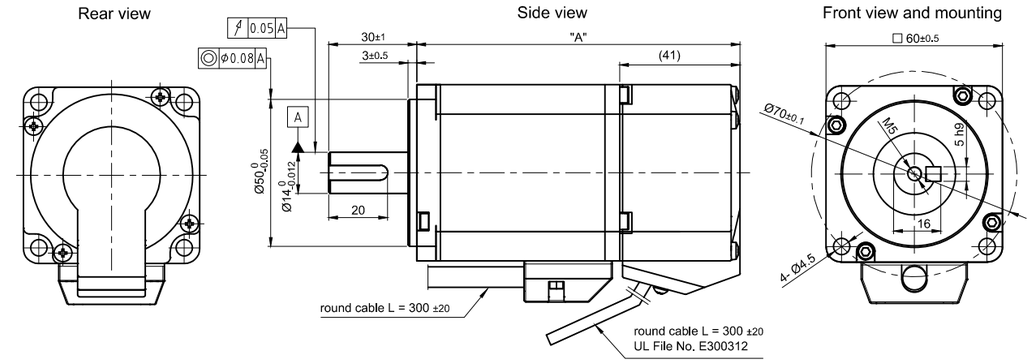
Type	Rated Power W	Rated Torque Ncm	Rated Current A	Peak Current A	Rated Voltage V	Rated Speed rpm	Torque Constant Ncm/A	Rotor Inertia gcm²	Length „A“ mm	Weight kg
APBA60M048030-E	200	64	6	18	48	3000	10.7	210	110	1
APBA60M048030-EB	200	64	6	18	48	3000	10.7	210	150	1.43
APBA60L048030-E	400	127	12	36	48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

APBA60

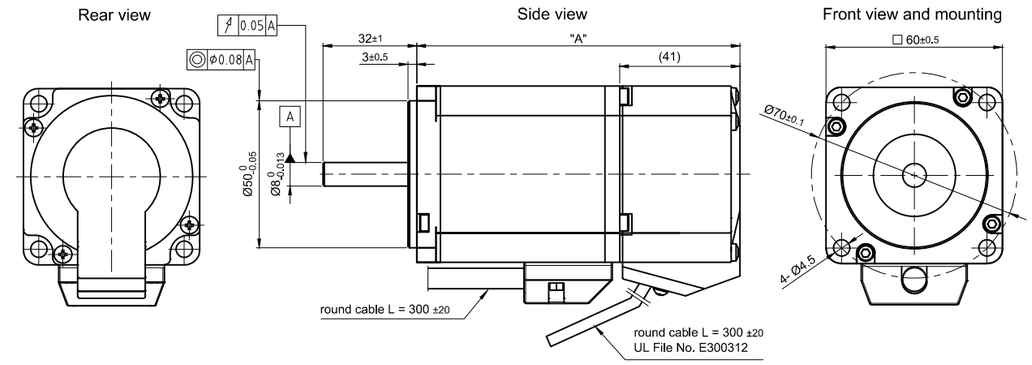
Brushless DC motor IP65 – 60 mm

DIMENSIONS (IN MM)

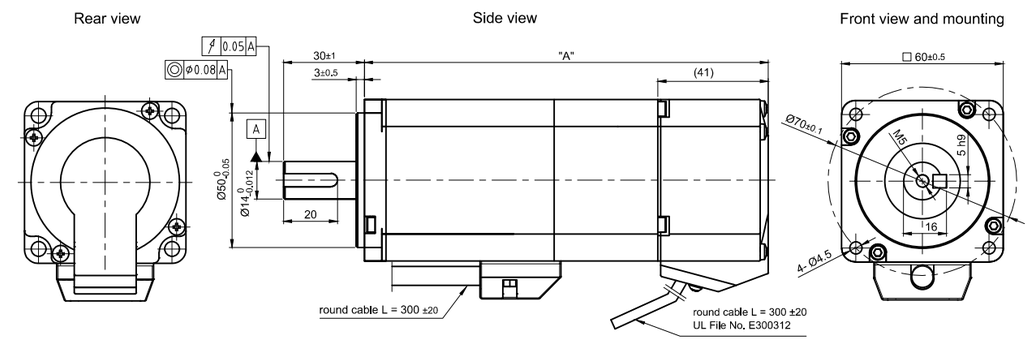
APBA60-E



APBA60-E2



APBA60-EB

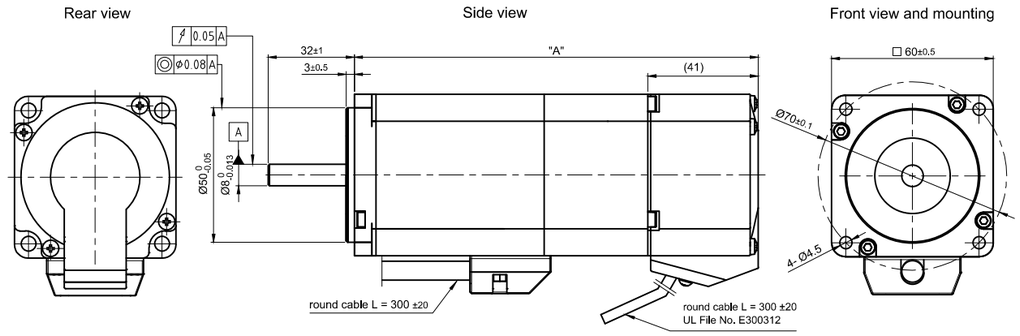


APBA60

Brushless DC motor IP65 – 60 mm

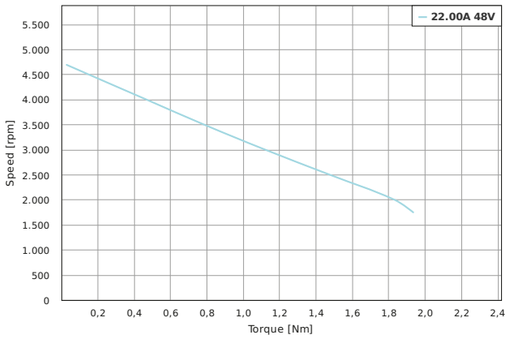
DIMENSIONS (IN MM)

APBA60-EB2

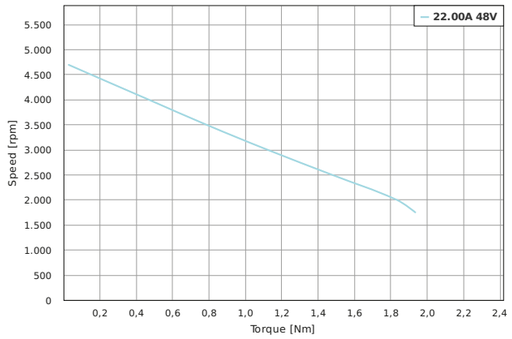


TORQUE CURVES

APBA60M048030-E



APBA60M048030-EB



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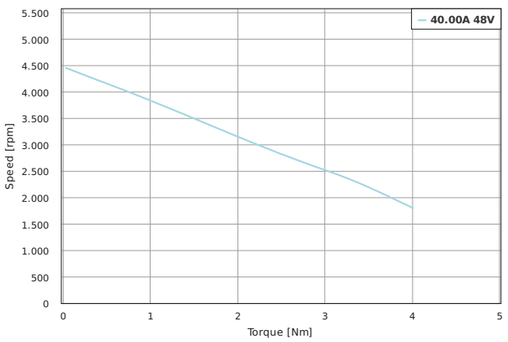

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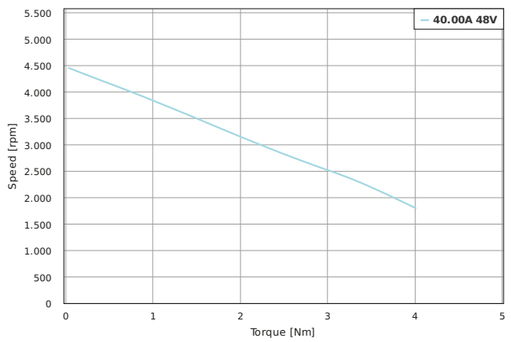


APBA80

Brushless DC motor IP65 – 80 mm

ORDER IDENTIFIER

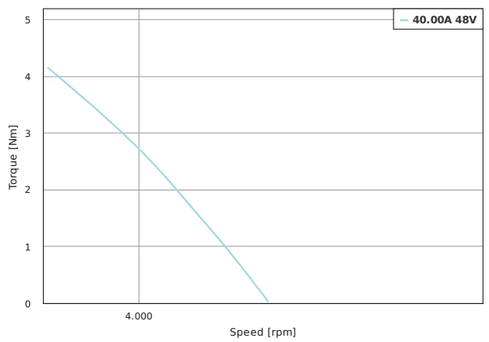
APBA80M048030-
E = With encoder
EB = With encoder and brake

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



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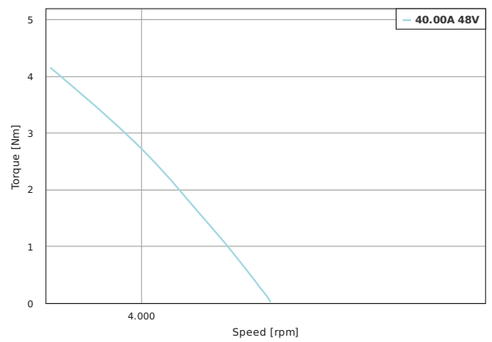
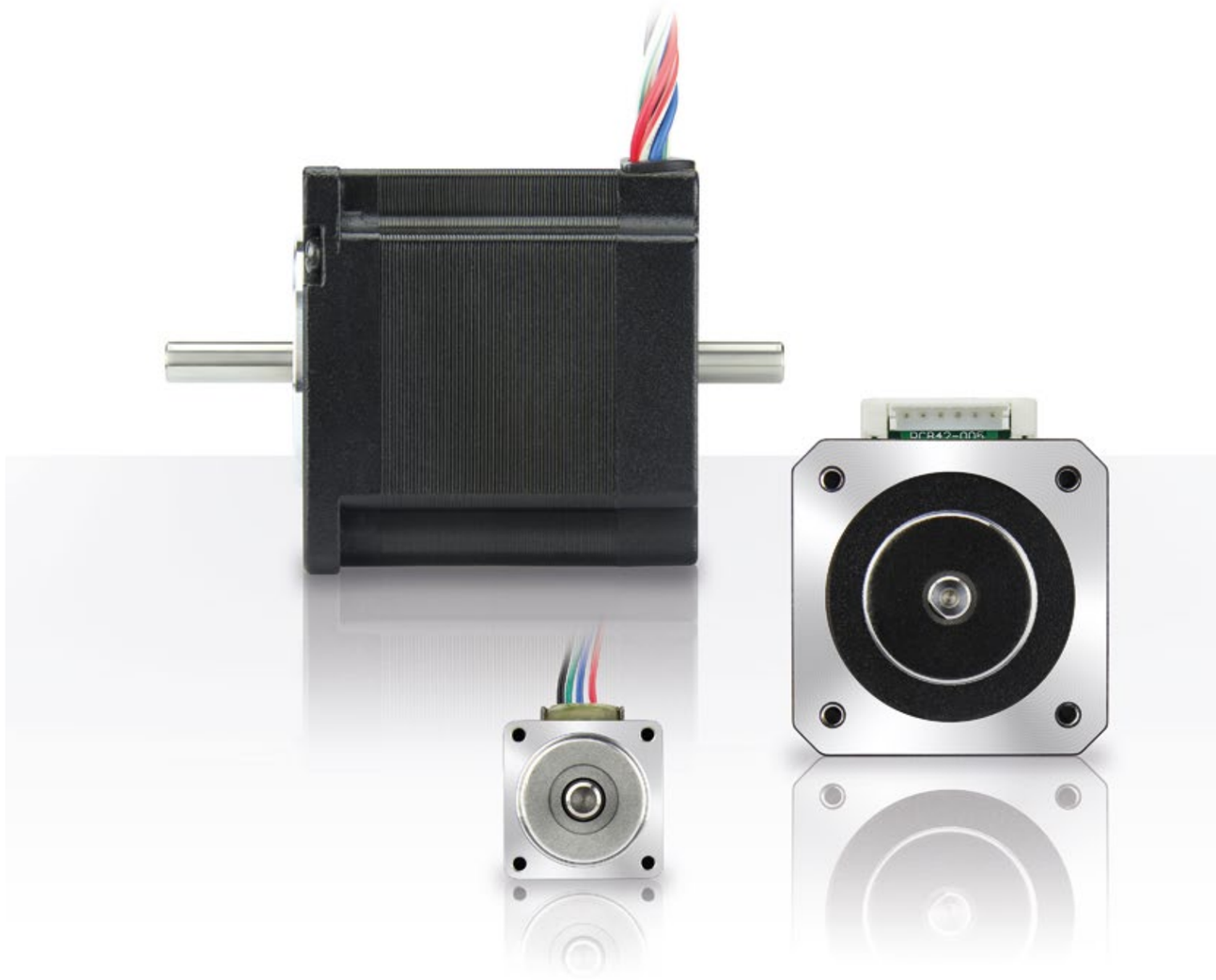
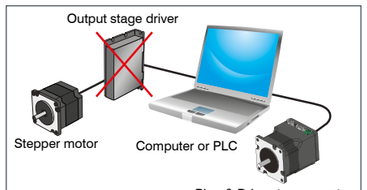


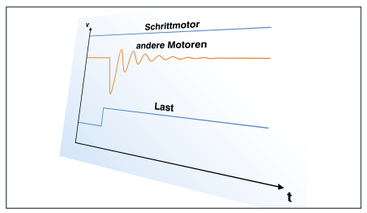
Notes



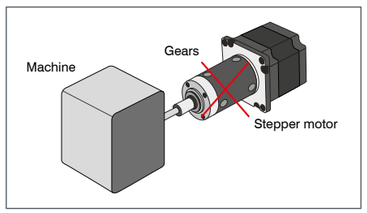
APPLICATION BENEFITS



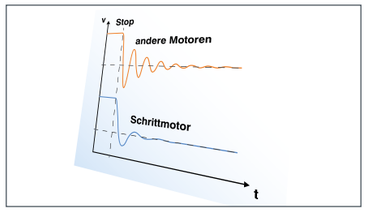
a) PC+PLC-capable (directly controllable via PC, PLC and microprocessor)
Brushless DC motors with integrated controller/drive have the highest productivity increase due to the use of PCs even at the lowest, decentralized machine level. Not only do these motors drastically reduce the development, wiring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



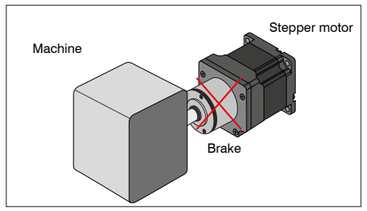
b) Turning speed stability
"No drop in speed when load changes" - the stepper motor meets this requirement like no other motor, without additional effort. Especially when using controllers for precise speed, synchronicity or ratios (such as for precise metering pumps), the stepper motor can achieve higher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



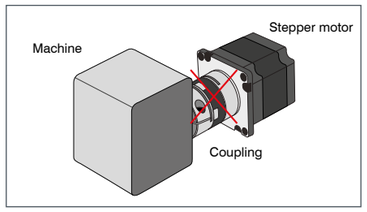
c) Direct drive
Stepper motors have their maximum torque in the lower speed range and the Nanotec micro stepper drivers still achieve concentricity properties of up to approx. 2 rpm. Other motors often need gears in order to fulfill speed and force requirements. Direct drives reduce system costs while 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.

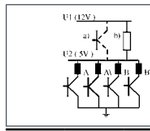


f) Avoiding damage to machines and injuries
The disadvantage of "falling out of step" when a motor is blocked, an issue that is sometimes brought up in connection with stepper motors, can actually be of advantage in some cases in view of increasingly stringent safety requirements. Slip and overload couplings 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



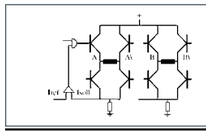
e.g. Constant voltage operation

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

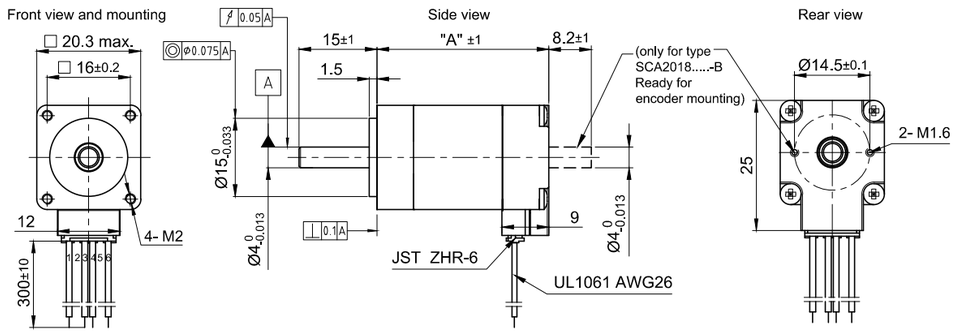
Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm²	Weight kg	Length „A“ mm
SCA2018S0604	0.6	2.2	6.5	2.6	2	0.06	33
SCA2018M0804	0.8	3.6	5.6	2.3	2.9	0.07	40

ORDER IDENTIFIER

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

DIMENSIONS (IN MM)

SCA2018

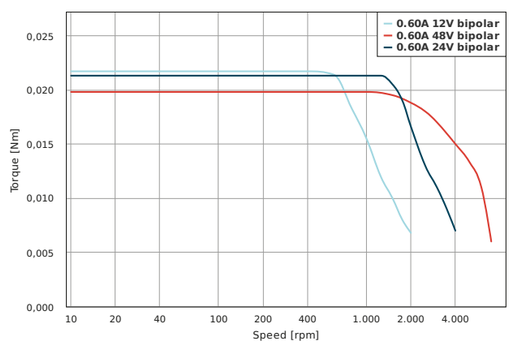


SCA2018

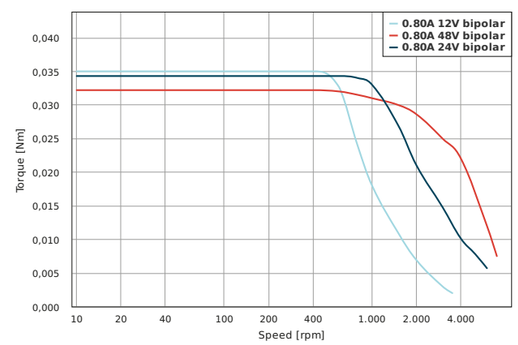
Stepper motor – NEMA 8

TORQUE CURVES

SCA2018S0604

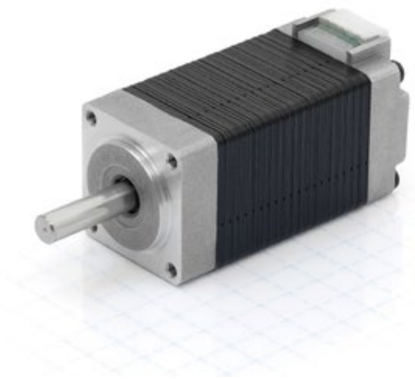


SCA2018M0804



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

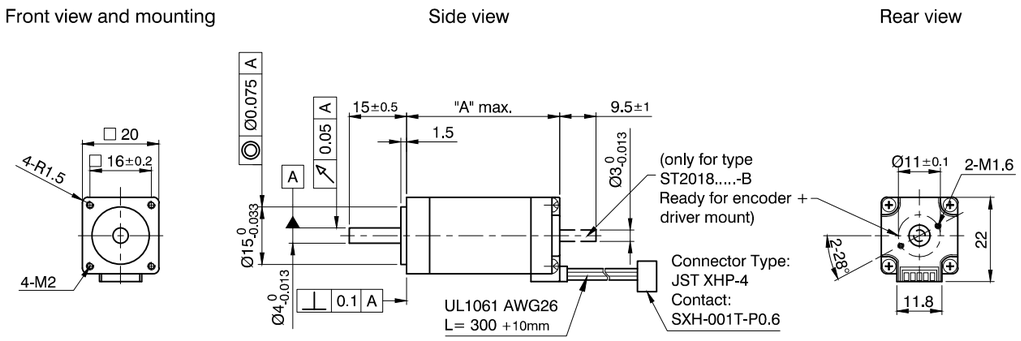
ST2018S0604-
A = Single shaft end
B = Double shaft end

ACCESSORIES

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

DIMENSIONS (IN MM)

ST2018

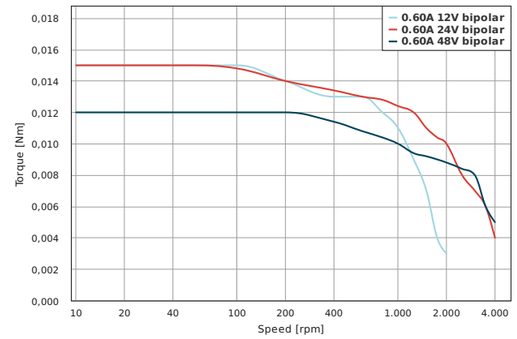


ST2018

Stepper motor – NEMA 8

TORQUE CURVES

ST2018S0604



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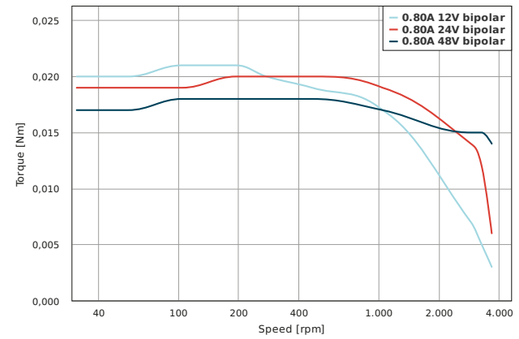
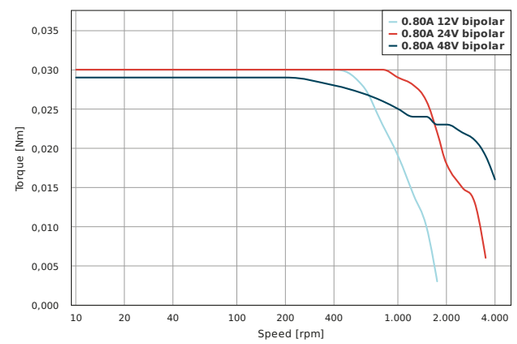
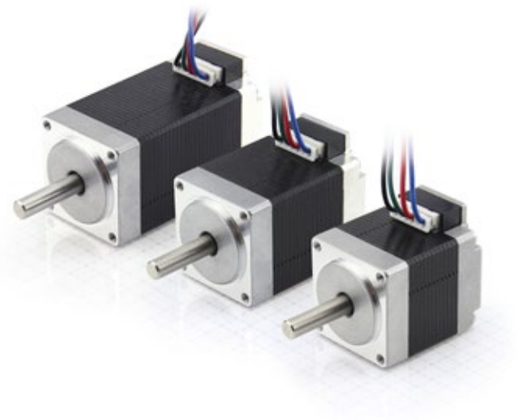


ST2018L0804



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

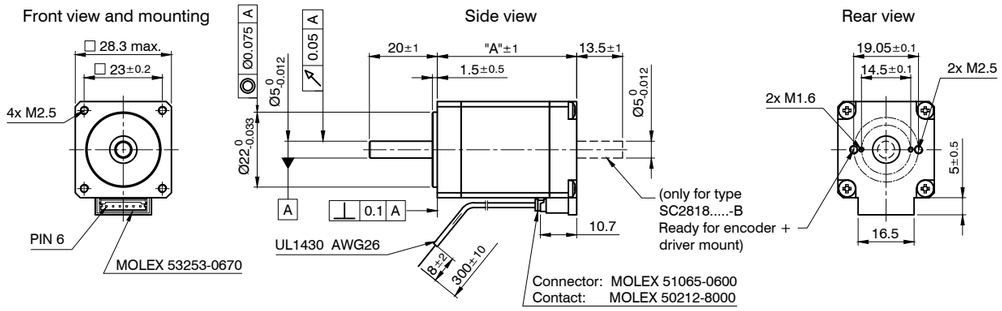
SC2818S0604-
A = Single shaft end
B = Double shaft end

ACCESSORIES

ZD-D28 Damper

DIMENSIONS (IN MM)

SC2818

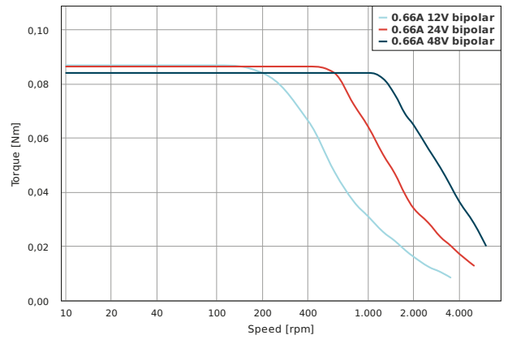


SC2818

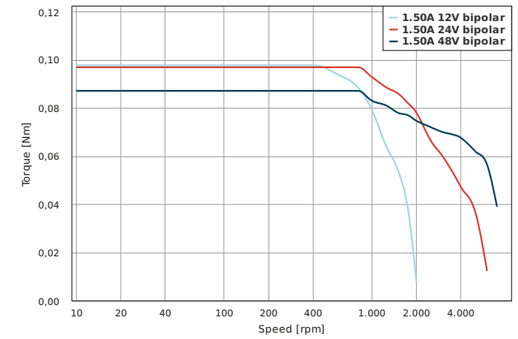
Stepper motor – NEMA 11

TORQUE CURVES

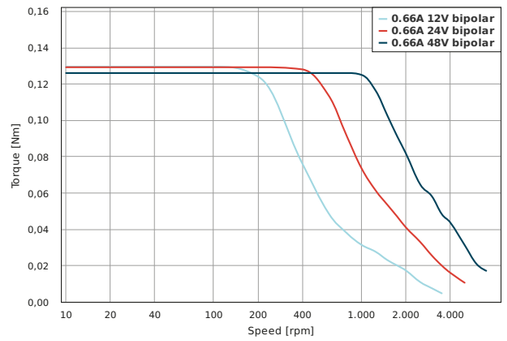
SC2818S0604



SC2818S1504



SC2818M0604



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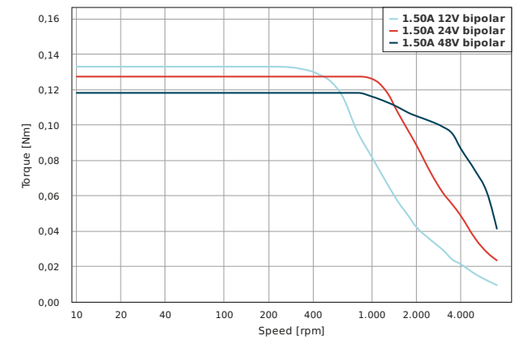

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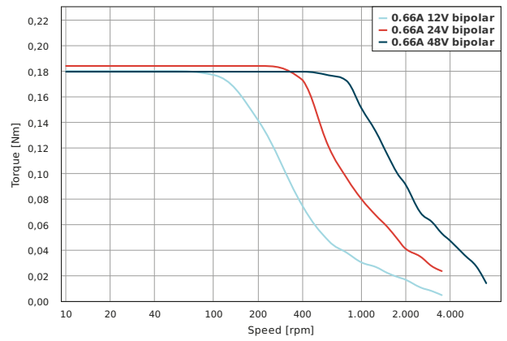

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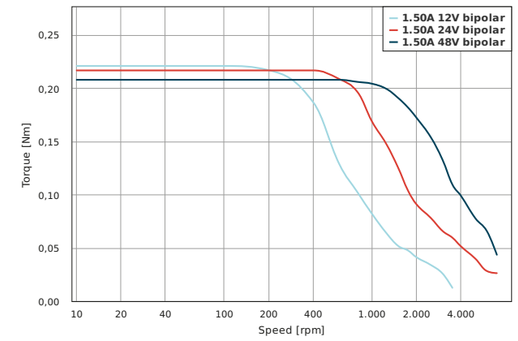


ST2818

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

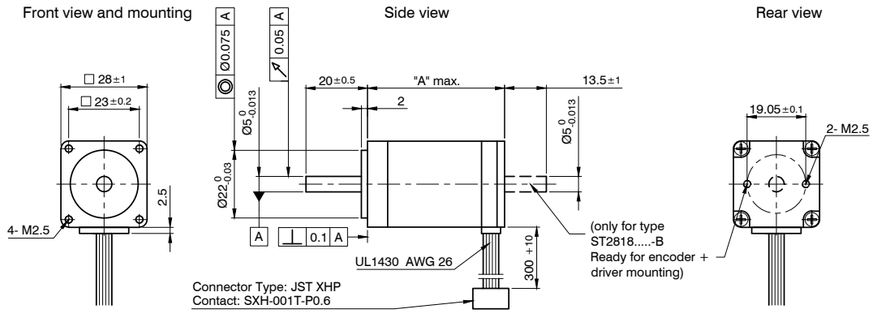
ST2818S1006-
A = Single shaft end
B = Double shaft end

ACCESSORIES

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

DIMENSIONS (IN MM)

ST2818

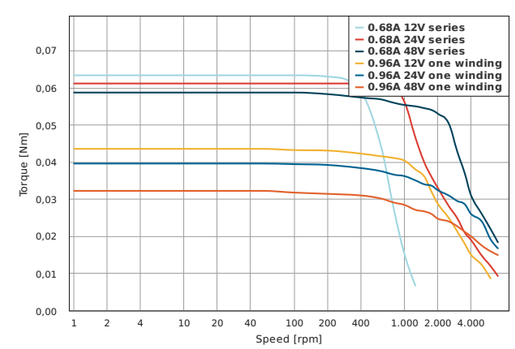


ST2818

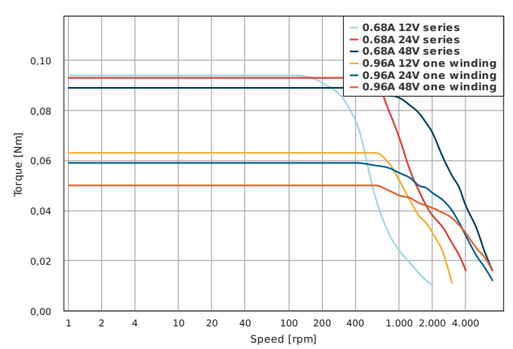
Stepper motor – NEMA 11

TORQUE CURVES

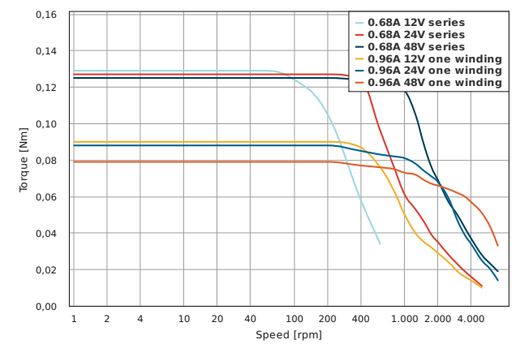
ST2818S1006



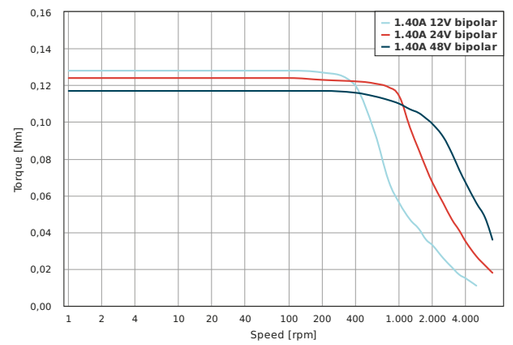
ST2818M1006



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

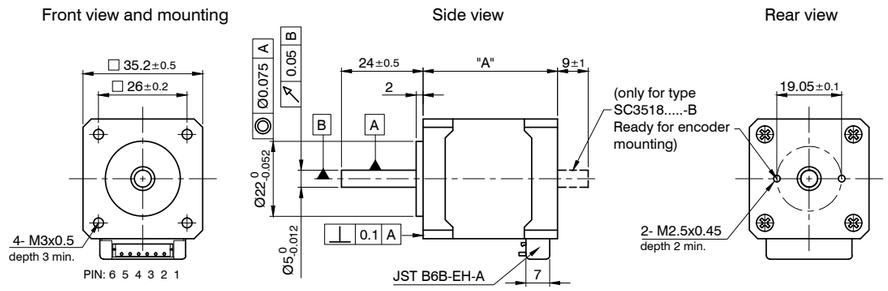
SC3518S1204-
A = Single shaft end
B = Double shaft end

ACCESSORIES

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

DIMENSIONS (IN MM)

SC3518

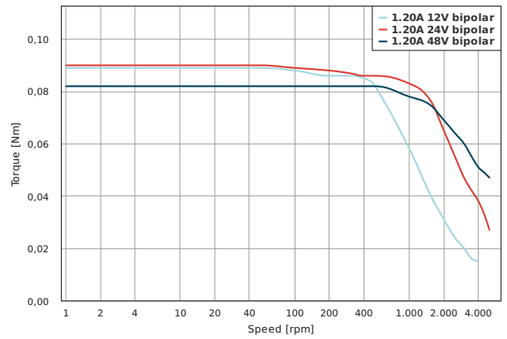


SC3518

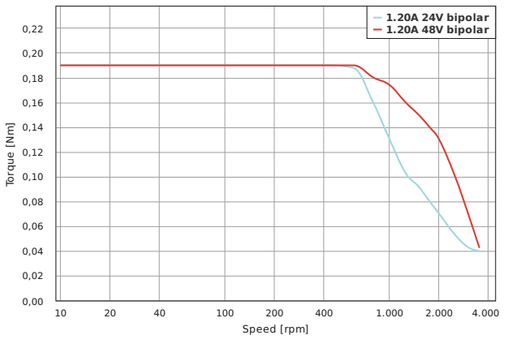
Stepper motor – NEMA 14

TORQUE CURVES

SC3518S1204



SC3518M1204



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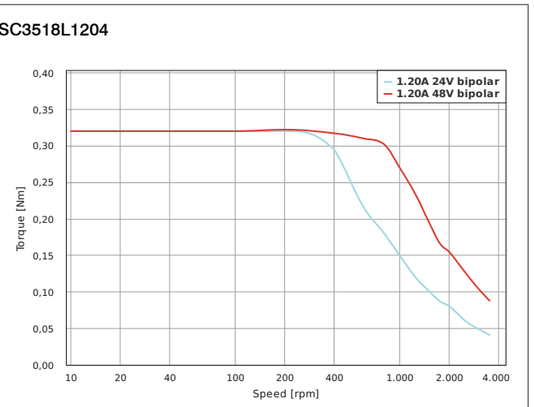


HYBRID STEPPER MOTORS

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

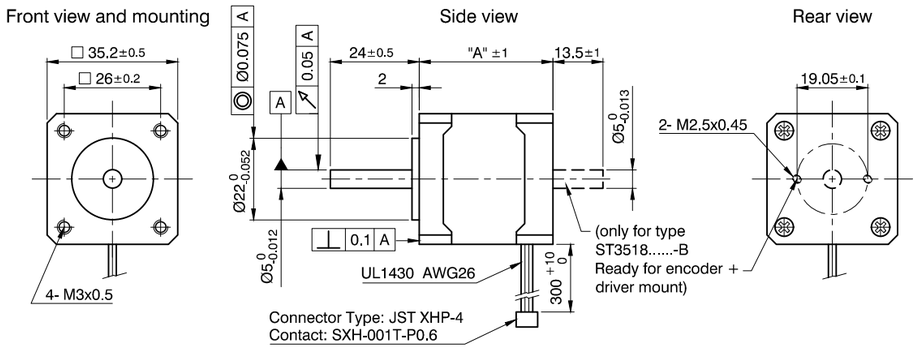
ST3518S0804-
A = Single shaft end
B = Double shaft end

ACCESSORIES

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

DIMENSIONS (IN MM)

ST3518

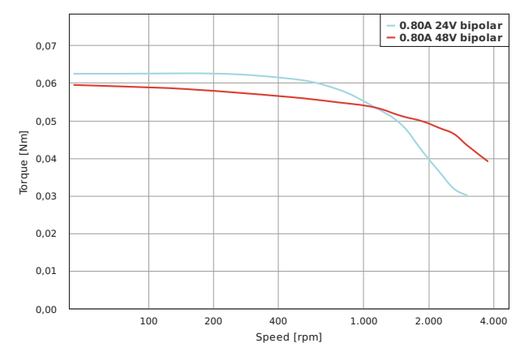


ST3518

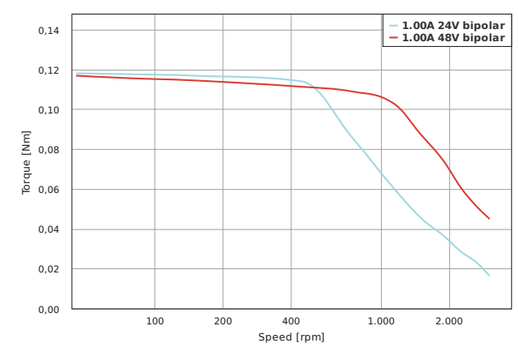
Stepper motor – NEMA 14

TORQUE CURVES

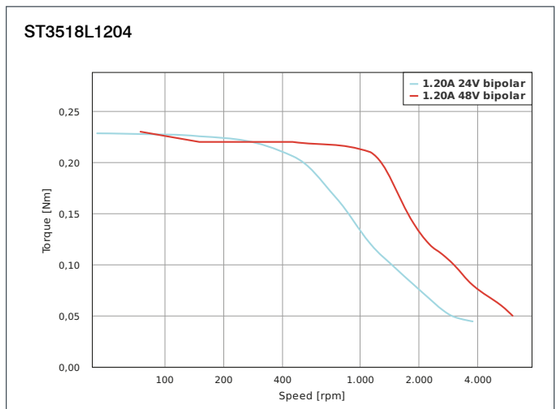
ST3518S0804



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

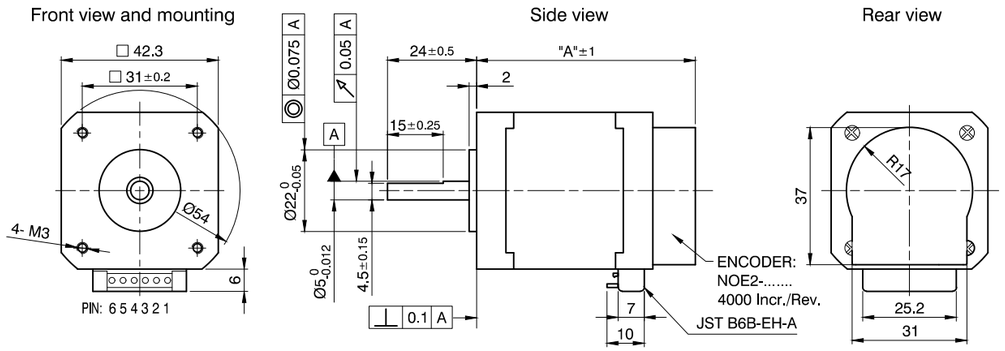
ZK-JST-EHR-6-0.5M-S Motor cable, 0.5m

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

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

DIMENSIONS (IN MM)

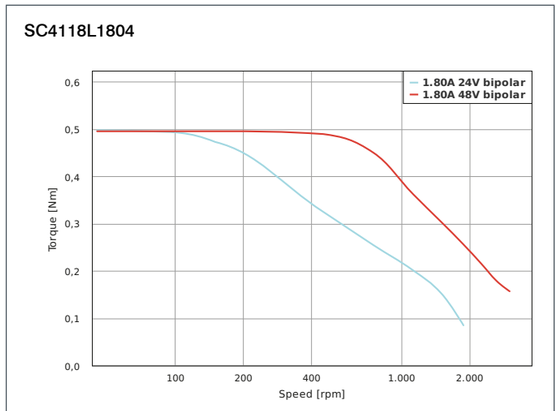
SC4118L1804-EN



SC4118

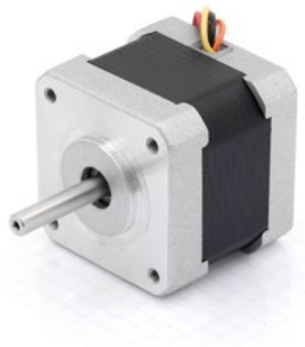
Stepper motor – NEMA 17

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

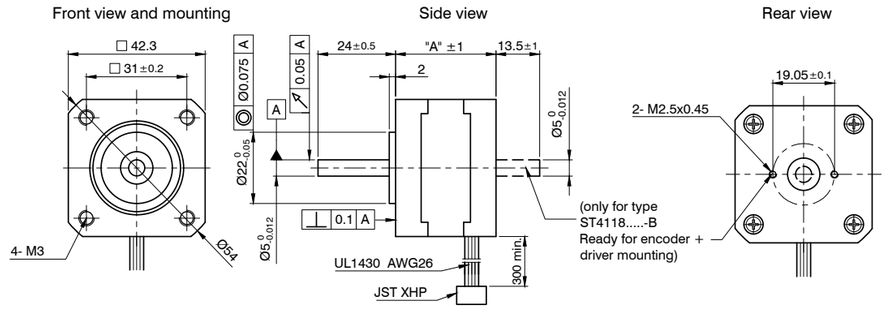
ST4118X0404-
A = Single shaft end
B = Double shaft end

ACCESSORIES

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

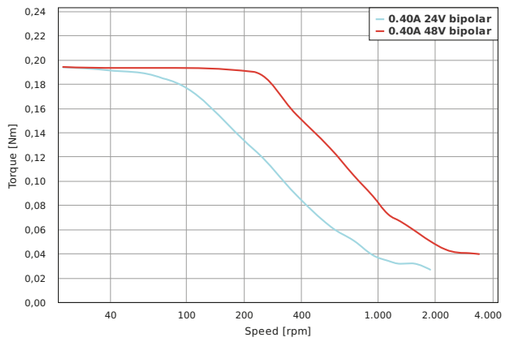
DIMENSIONS (IN MM)

ST4118

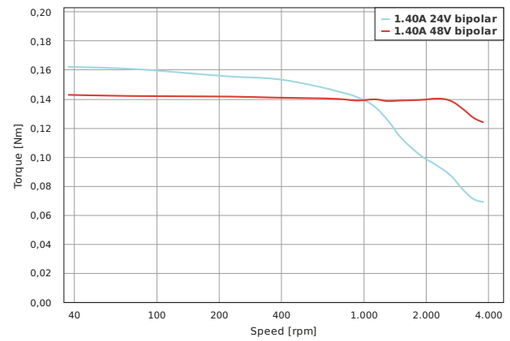


TORQUE CURVES

ST4118X0404



ST4118X1404

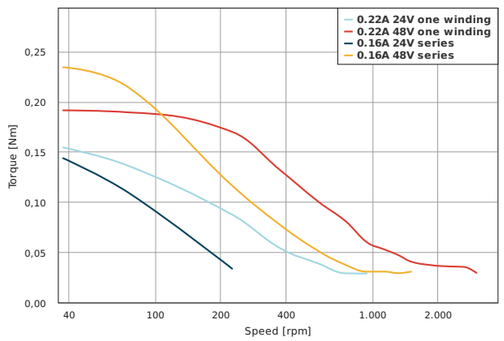


ST4118

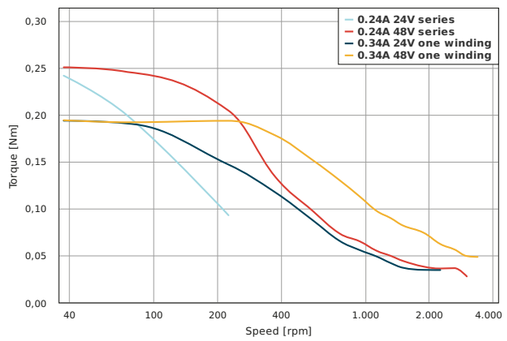
Stepper motor – NEMA 17

TORQUE CURVES

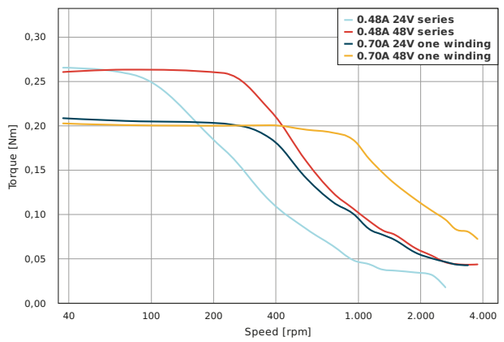
ST4118S0206



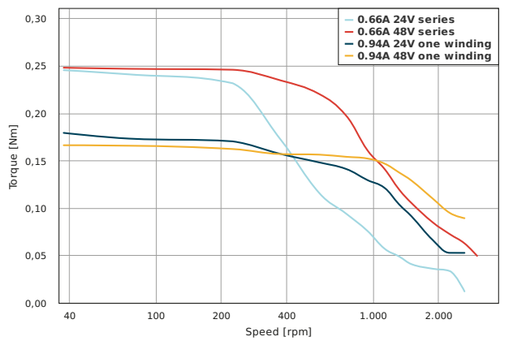
ST4118S0406



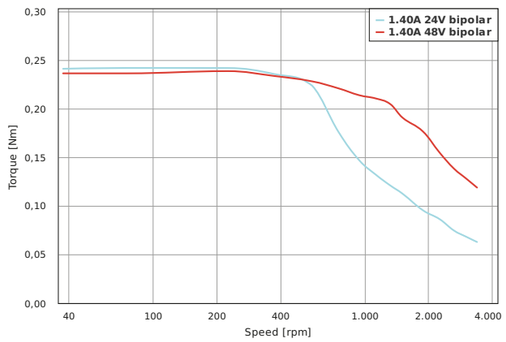
ST4118S0706



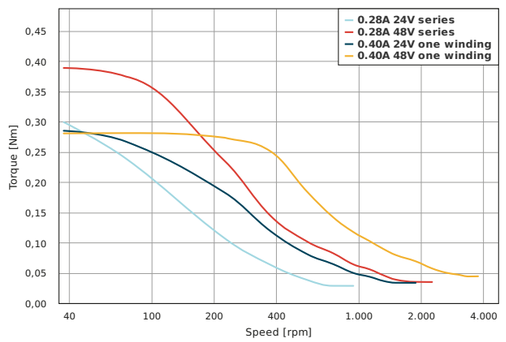
ST4118S1006



ST4118S1404



ST4118M0406

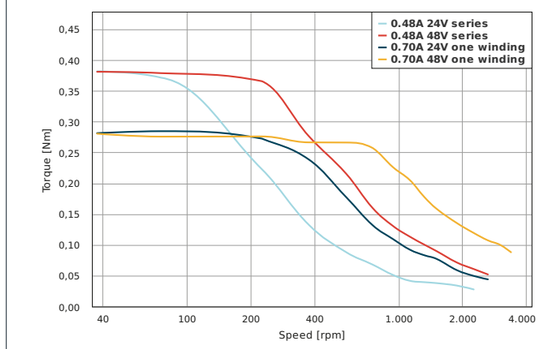


ST4118

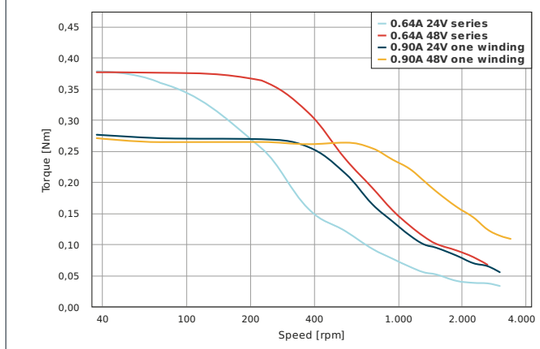
Stepper motor – NEMA 17

TORQUE CURVES

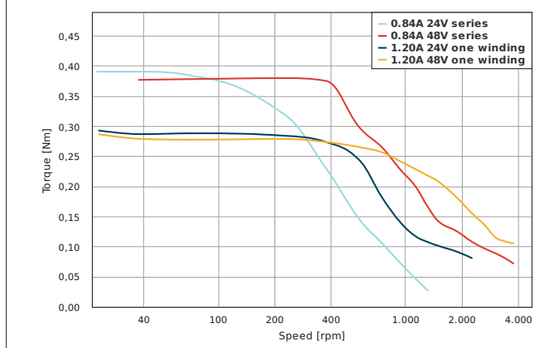
ST4118M0706



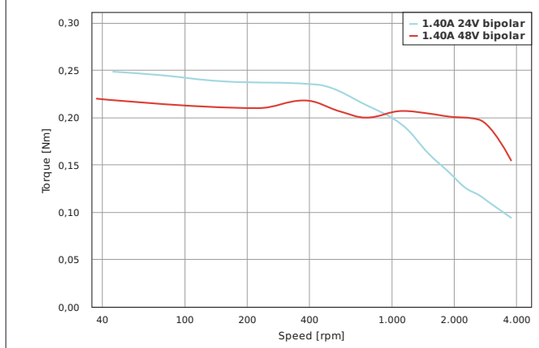
ST4118M0906



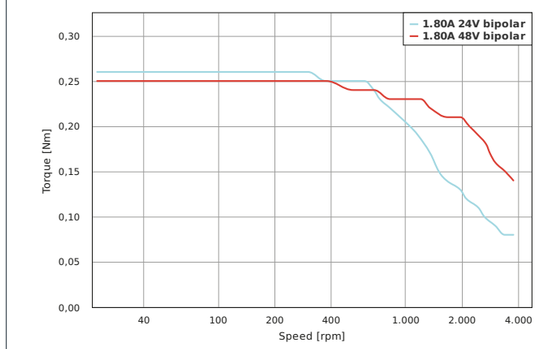
ST4118M1206



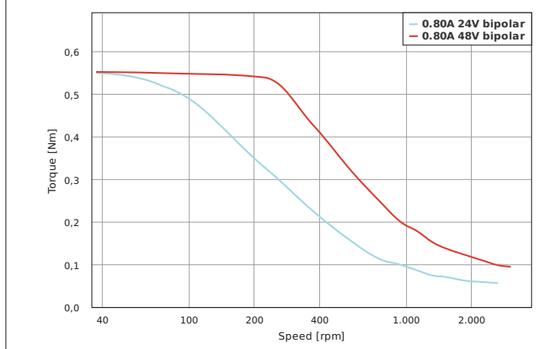
ST4118M1404



ST4118M1804



ST4118L0804

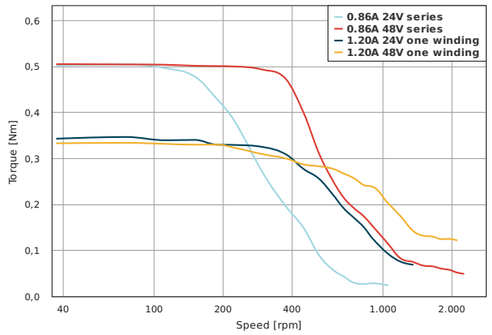


ST4118

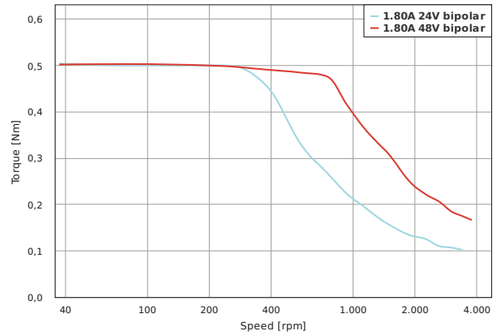
Stepper motor – NEMA 17

TORQUE CURVES

ST4118L1206



ST4118L1804



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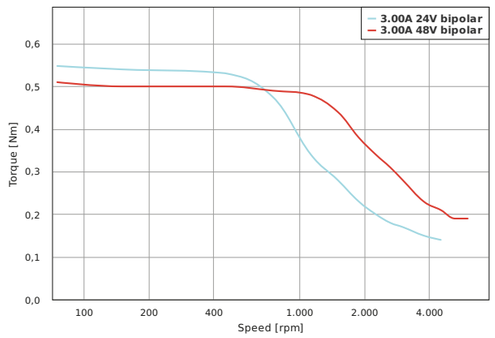
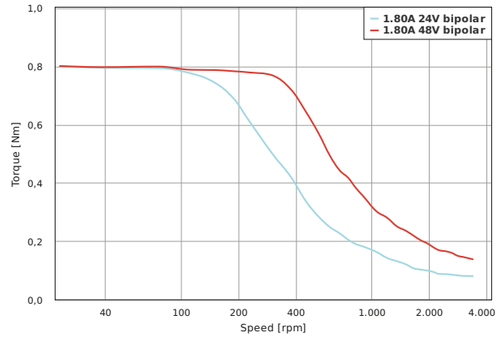
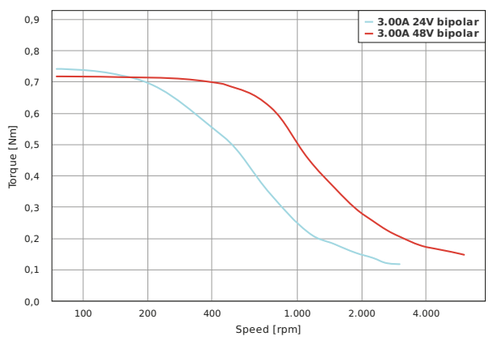


ST4118D1804



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

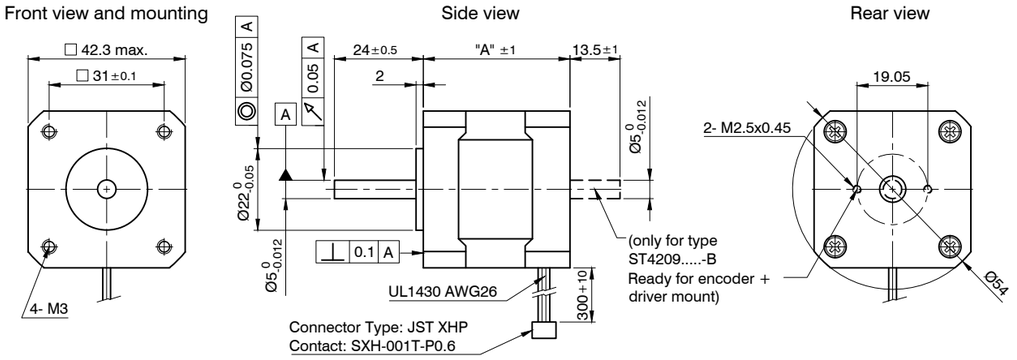
ACCESSORIES

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

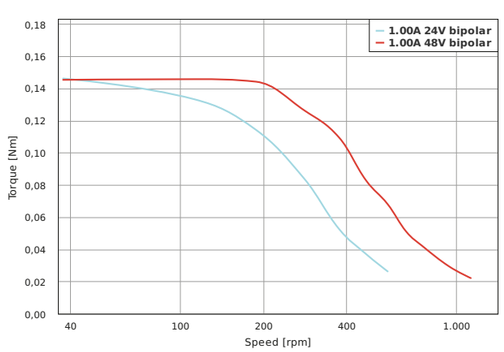
DIMENSIONS (IN MM)

ST4209

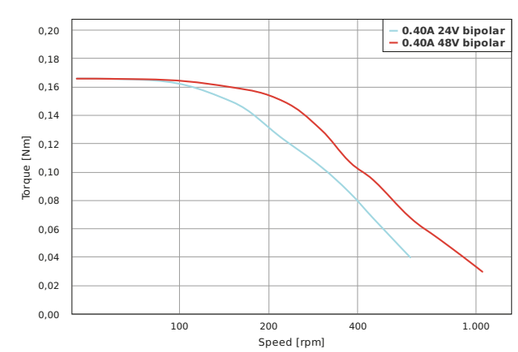


TORQUE CURVES

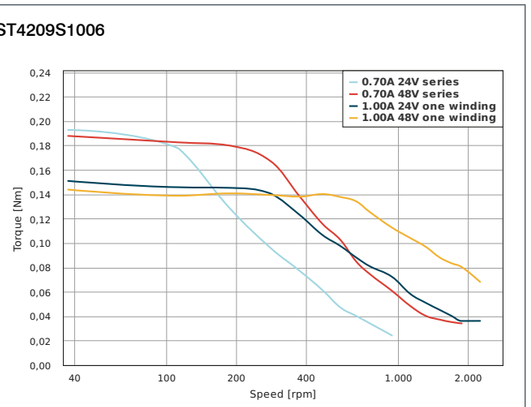
ST4209X1004



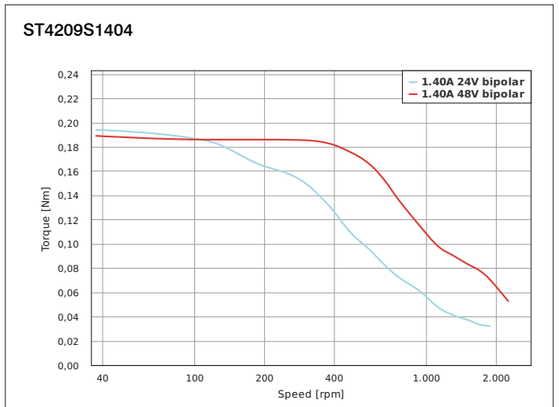
ST4209S0404



ST4209S1006



ST4209S1404

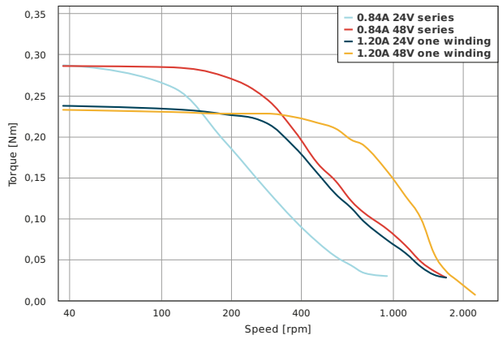


ST4209

Stepper motor 0.9° – NEMA 17

TORQUE CURVES

ST4209M1206



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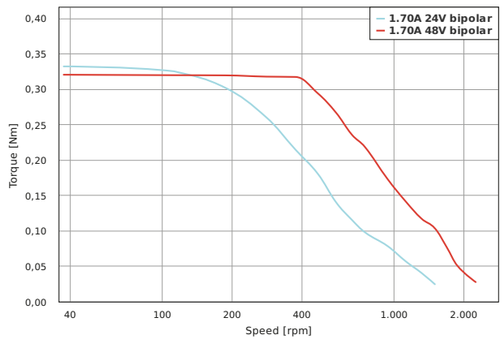


ST4209L1206

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

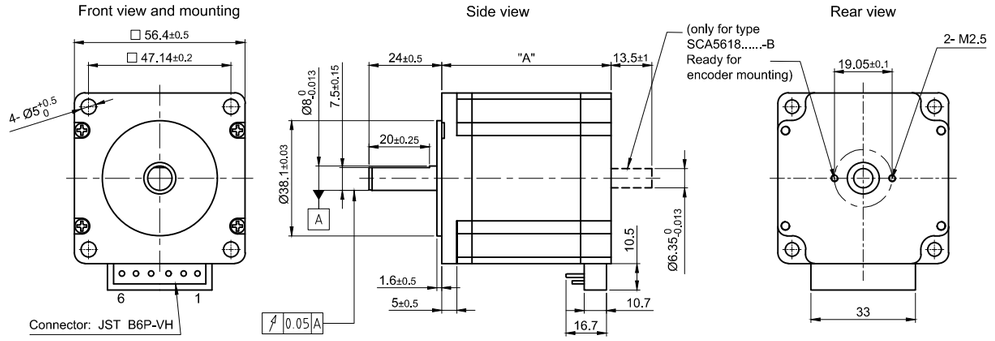
ZK-VHR-6-300-4 Motor cable SCA56, SCB56, LA56, LSA56, 0.3m
ZD-D56 Damper
ZD-DF56 Damper

SCA5618

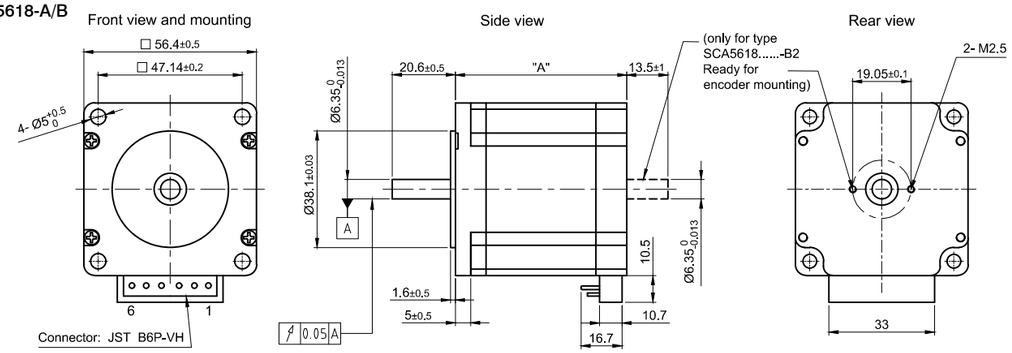
Stepper motor – NEMA 23

DIMENSIONS (IN MM)

SCA5618-A/B

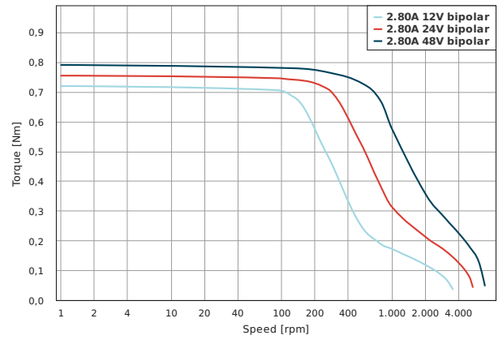


SCA5618-A/B



TORQUE CURVES

SCA5618X2804



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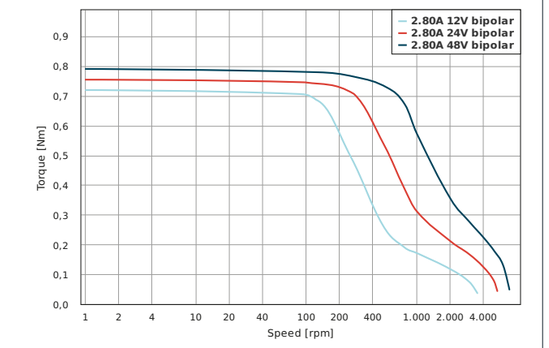
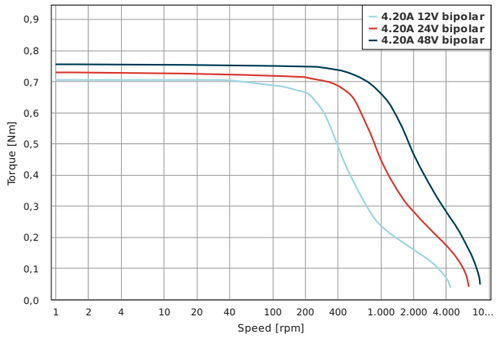


TORQUE CURVES

SCA5618X4204



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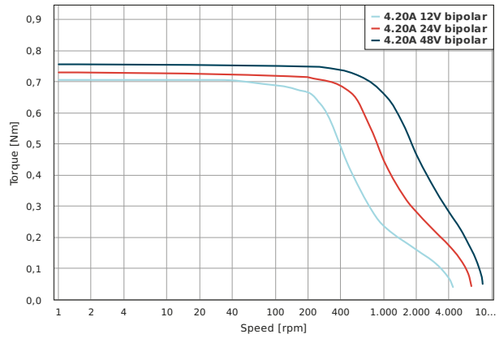

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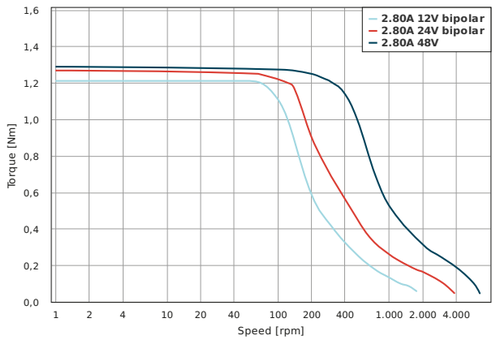

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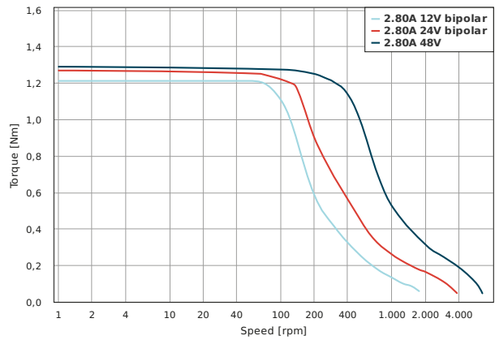

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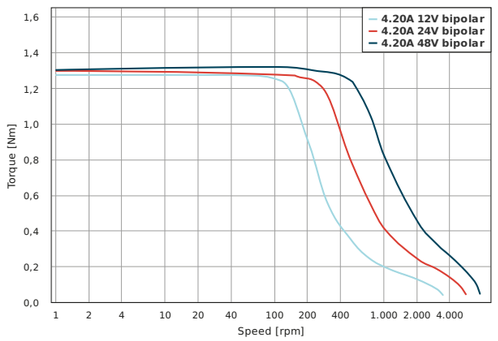
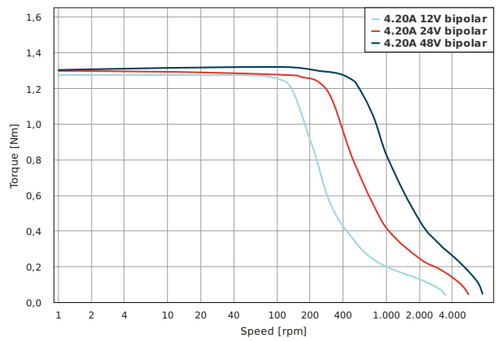


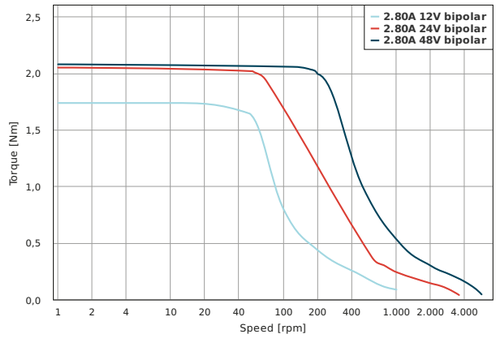
SCA5618M4204-2



SCA5618
Stepper motor – NEMA 23

TORQUE CURVES

SCA5618L2804



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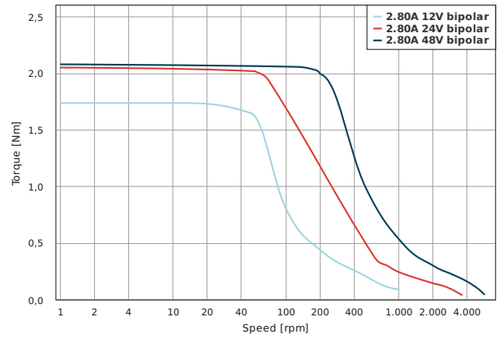

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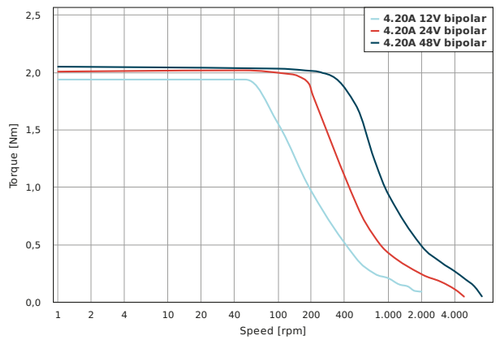

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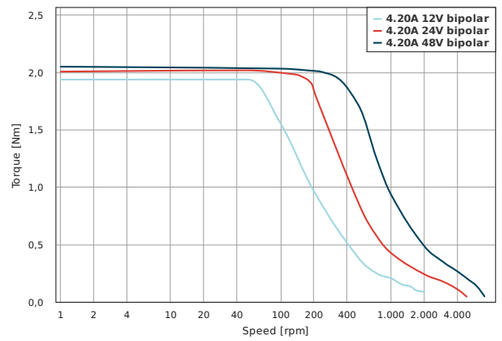


SCB5618

Stepper motor with FluxFocus technology – NEMA 23

OPTIONS

Encoder

Brake

VERSIONS

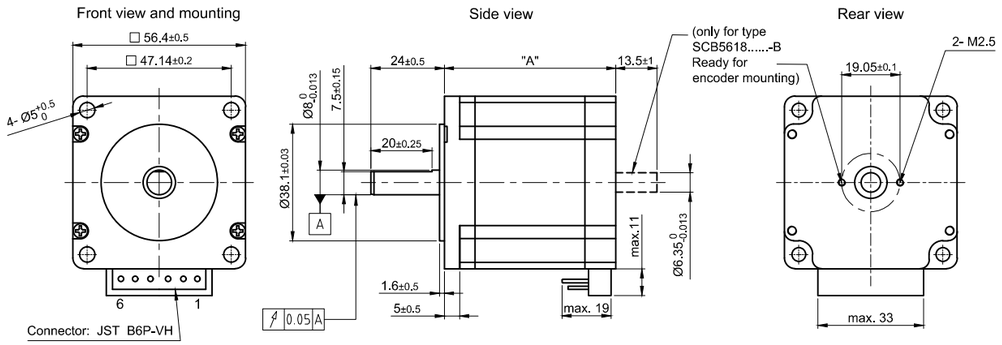
Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm²	Resolution °/step	Length „A“ mm
SCB5618M4204-B	4.2	185	0.5	1.2	300	1.8	56
SCB5618L4204-B	4.2	295	0.55	1.7	480	1.8	76.5

ACCESSORIES

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

DIMENSIONS (IN MM)

SCB5618

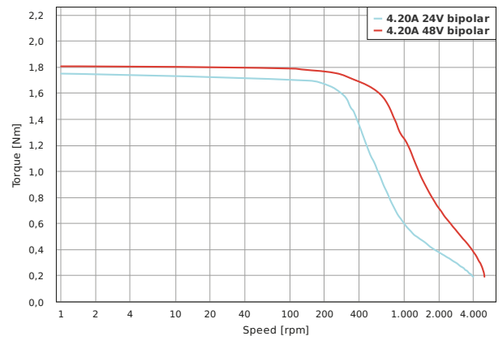


SCB5618

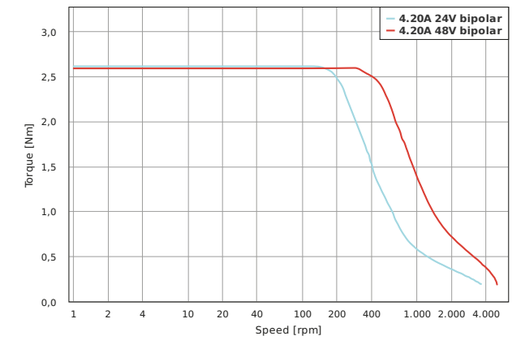
Stepper motor with FluxFocus technology – NEMA 23

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

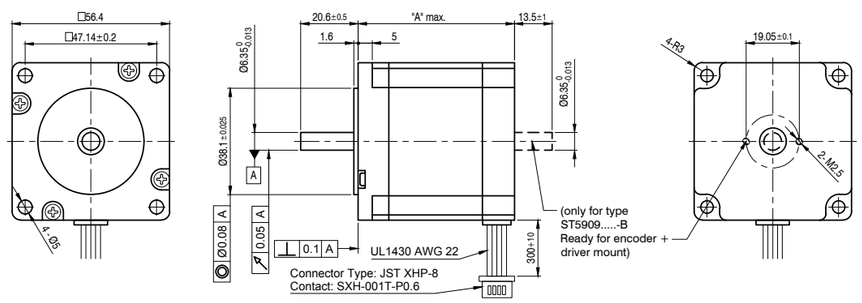
ACCESSORIES

ZD-D56 Damper
ZD-DF56 Damper

DIMENSIONS (IN MM)

ST5909

Front view and mounting | Side view | Rear view

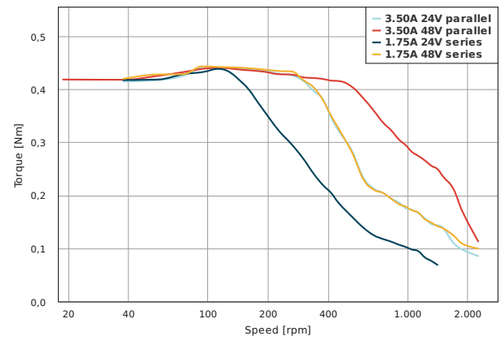


ST5909

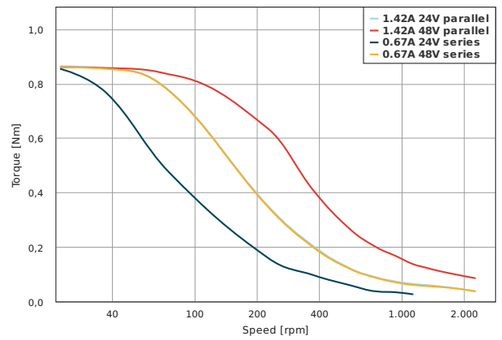
Stepper motor 0.9° – NEMA 23

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

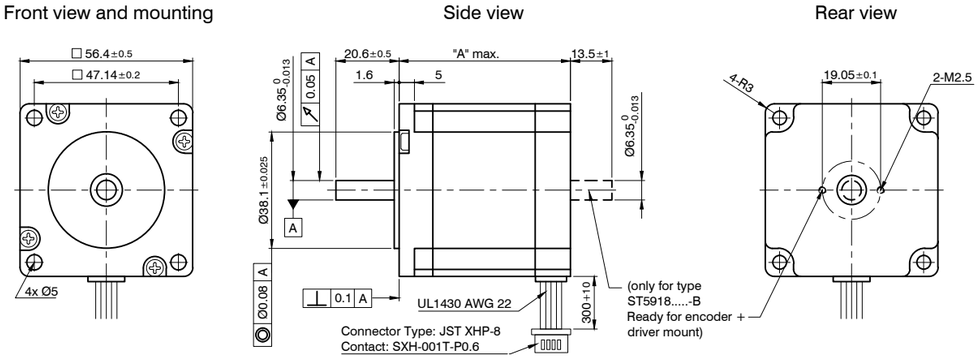
ACCESSORIES

ZD-D56 Damper
ZD-DF56 Damper

ST5918
Stepper motor – NEMA 23

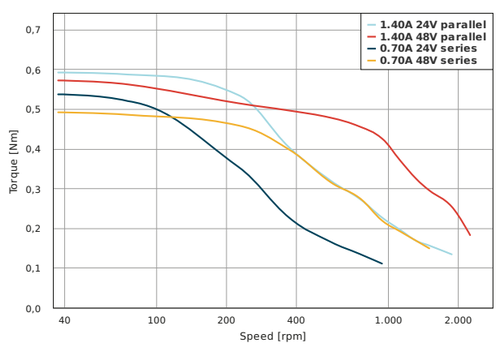
DIMENSIONS (IN MM)

ST5918

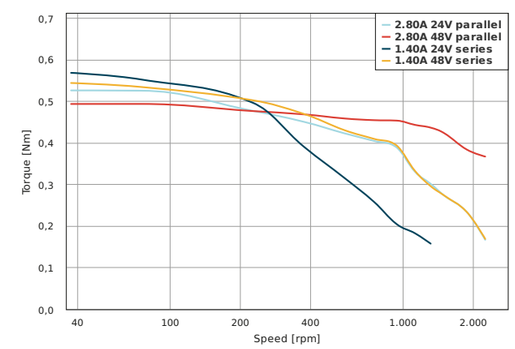


TORQUE CURVES

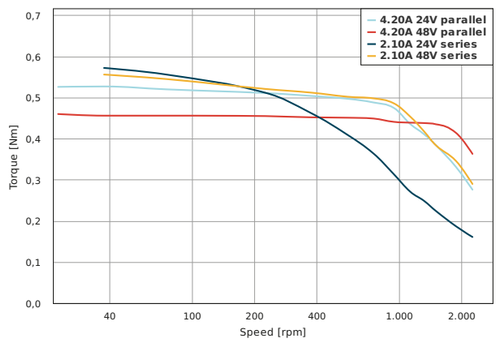
ST5918X1008



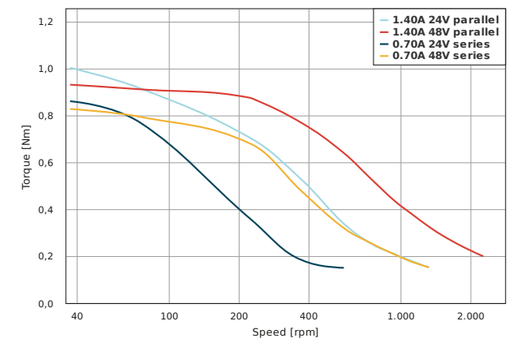
ST5918X2008



ST5918X3008

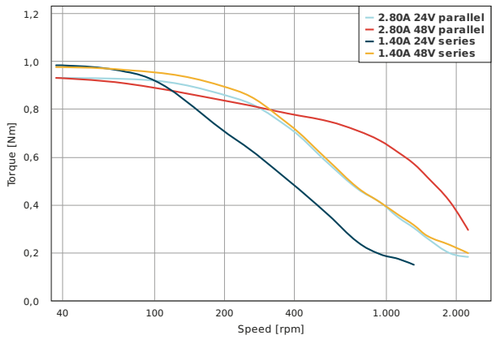


ST5918S1008

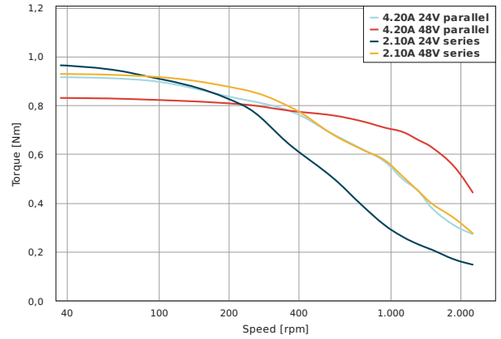


TORQUE CURVES

ST5918S2008



ST5918S3008



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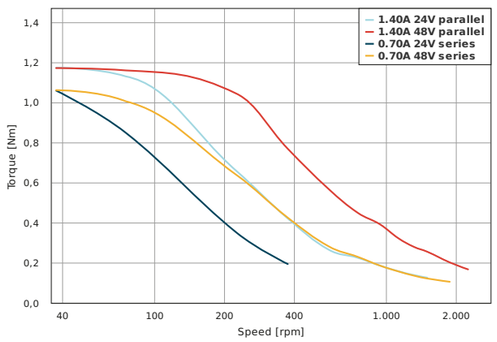

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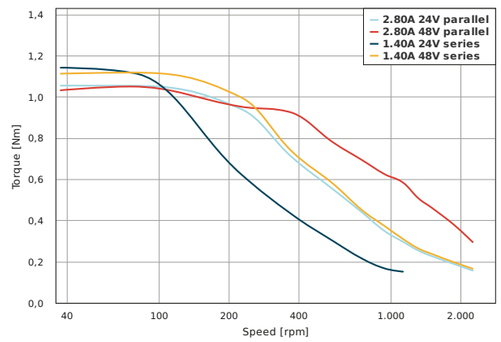

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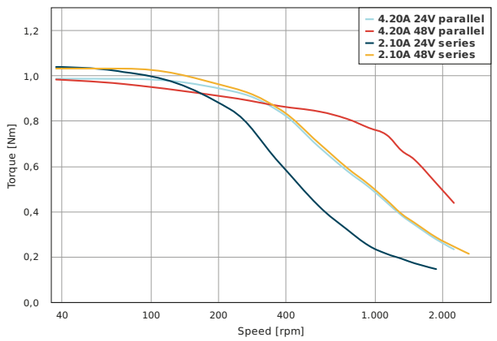
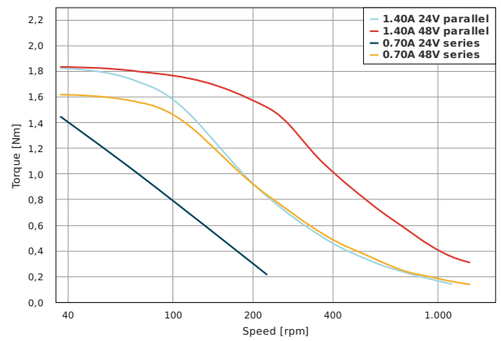


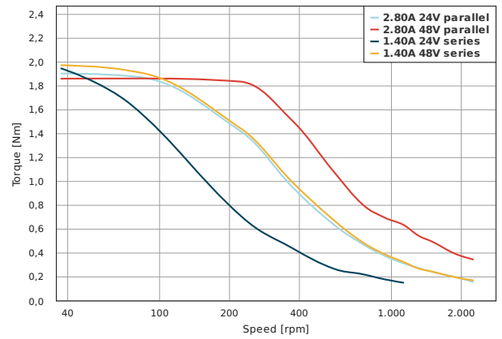
ST5918L1008



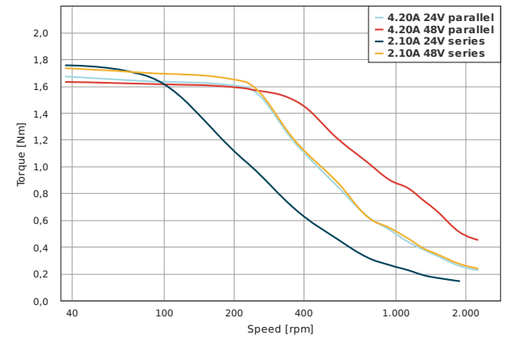
ST5918
Stepper motor – NEMA 23

TORQUE CURVES

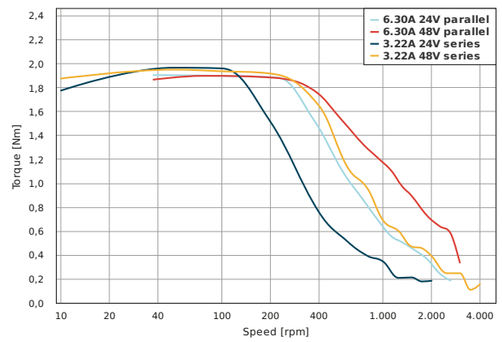
ST5918L2008



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

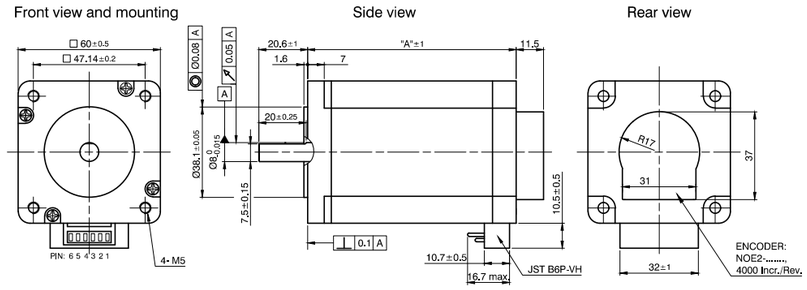
ZK-JST-VHR-6N-0.5M-S
Motor cable SC60, 0.5m

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

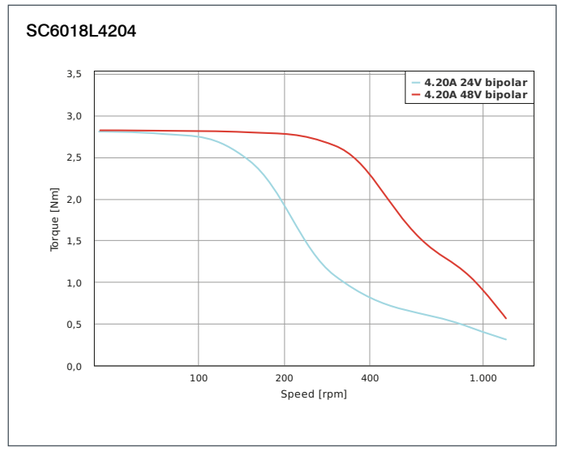
ZK-NOE1-10-500-S
Encoder cable NOE, 0.5m

DIMENSIONS (IN MM)

SC6018L4204-EN



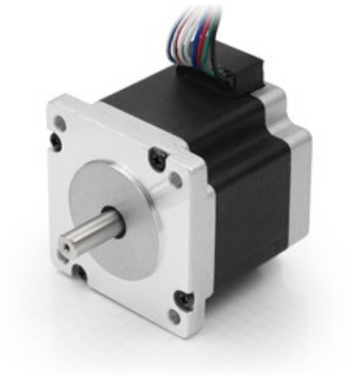
TORQUE CURVES



HYBRID STEPPER MOTORS

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.

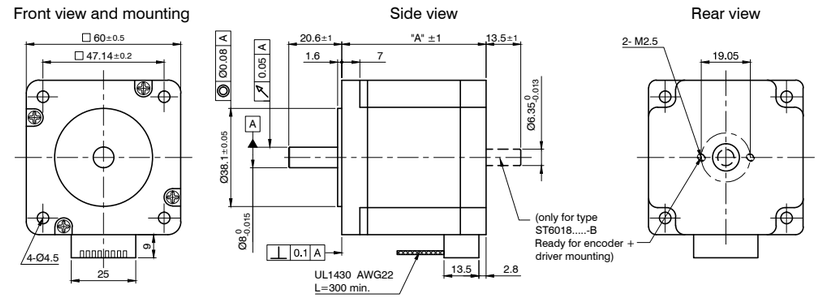
ORDER IDENTIFIER

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

ST6018
Stepper motor – NEMA 24

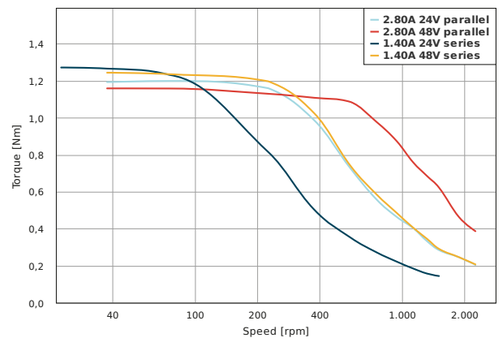
DIMENSIONS (IN MM)

ST6018

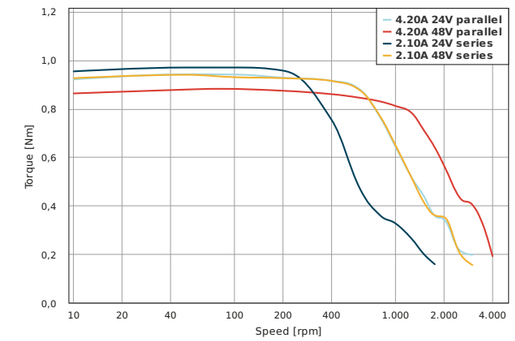


TORQUE CURVES

ST6018X2008



ST6018X3008



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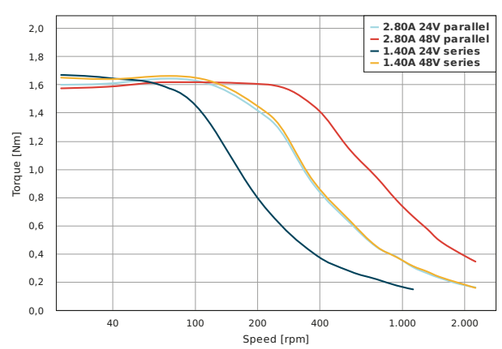

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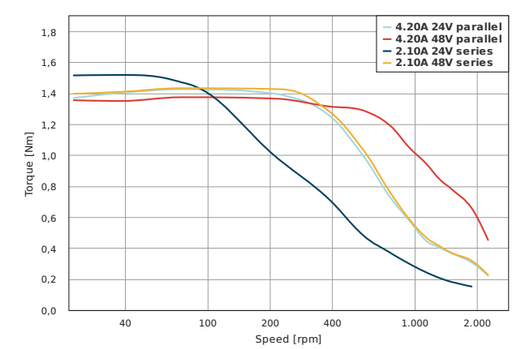
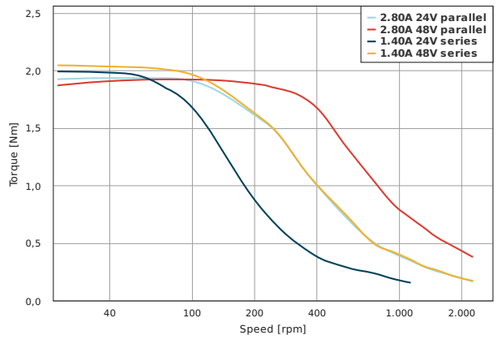


ST6018

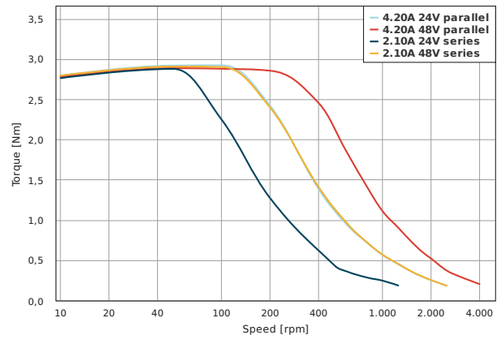
Stepper motor – NEMA 24

TORQUE CURVES

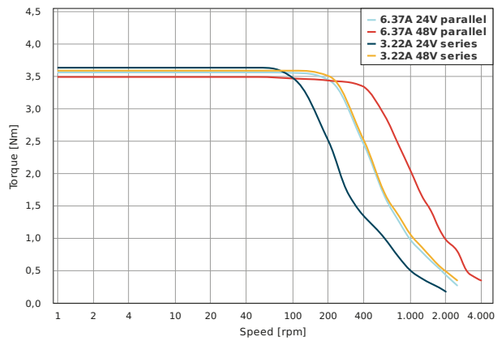
ST6018K2008



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

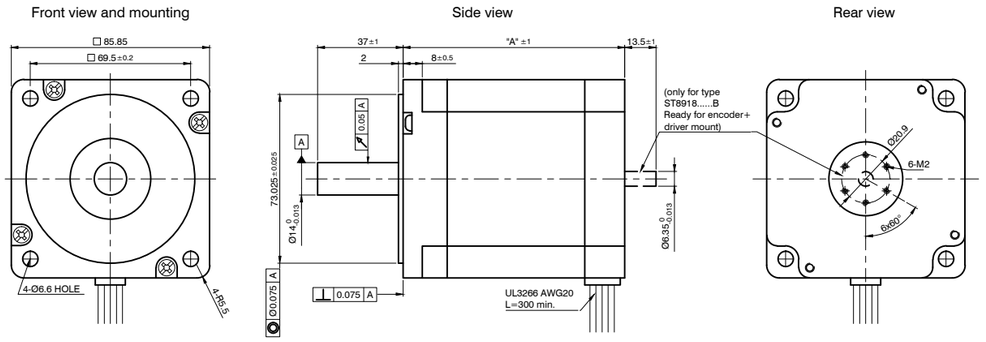
The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.

ORDER IDENTIFIER

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

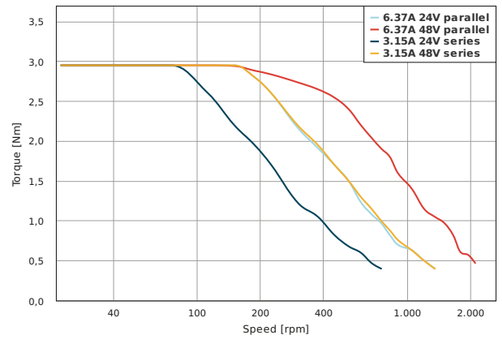
DIMENSIONS (IN MM)

ST8918

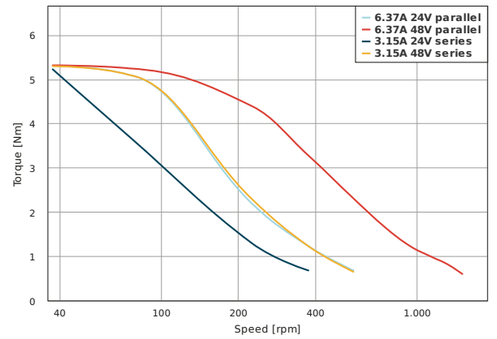


TORQUE CURVES

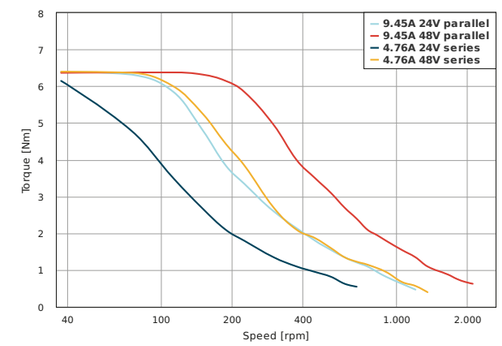
ST8918S4508



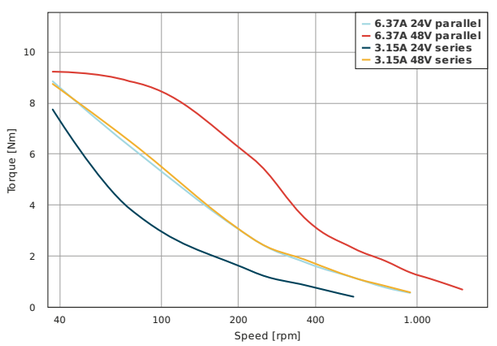
ST8918M4508



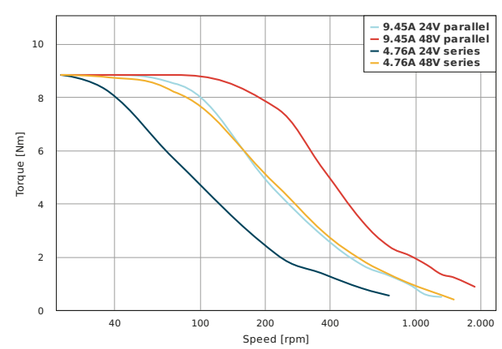
ST8918M6708



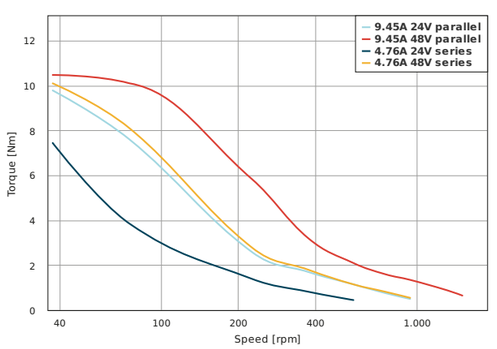
ST8918L4508



ST8918L6708



ST8918D6708



ST11018

Stepper motor – NEMA 42

OPTIONS

Controller

Encoder

VERSIONS

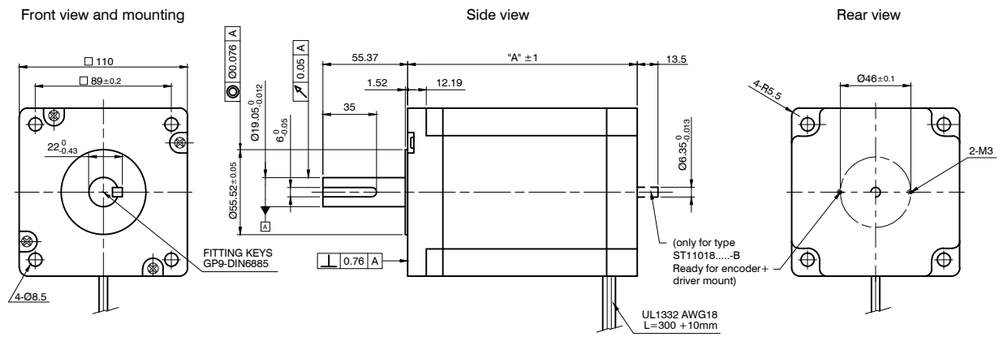
Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm²	Weight kg	Length „A“ mm
ST11018S5504	5.5	1170	0.7	9.8	5500	5	99
ST11018M6504	6.5	2100	1.15	15.2	10900	8.4	150
ST11018L8004	8	2500	1	17.1	16200	11.7	201

ORDER IDENTIFIER

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

DIMENSIONS (IN MM)

ST11018

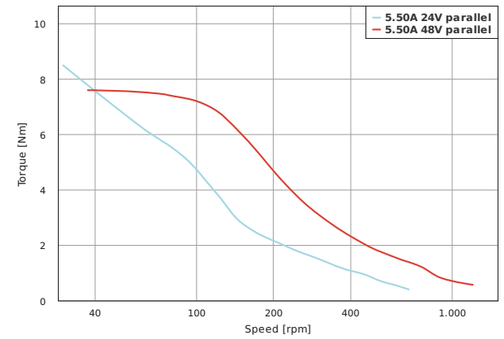


ST11018

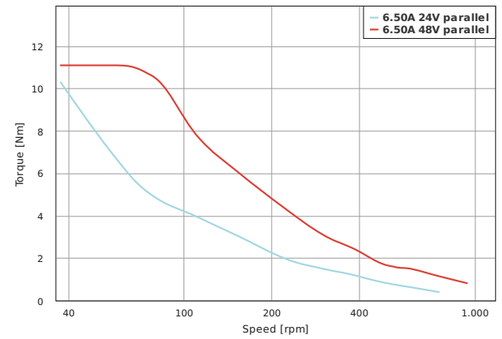
Stepper motor – NEMA 42

TORQUE CURVES

ST11018S5504



ST11018M6504



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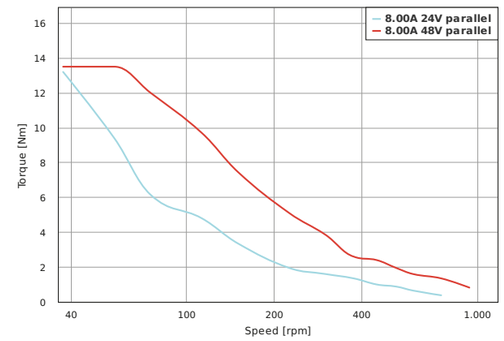
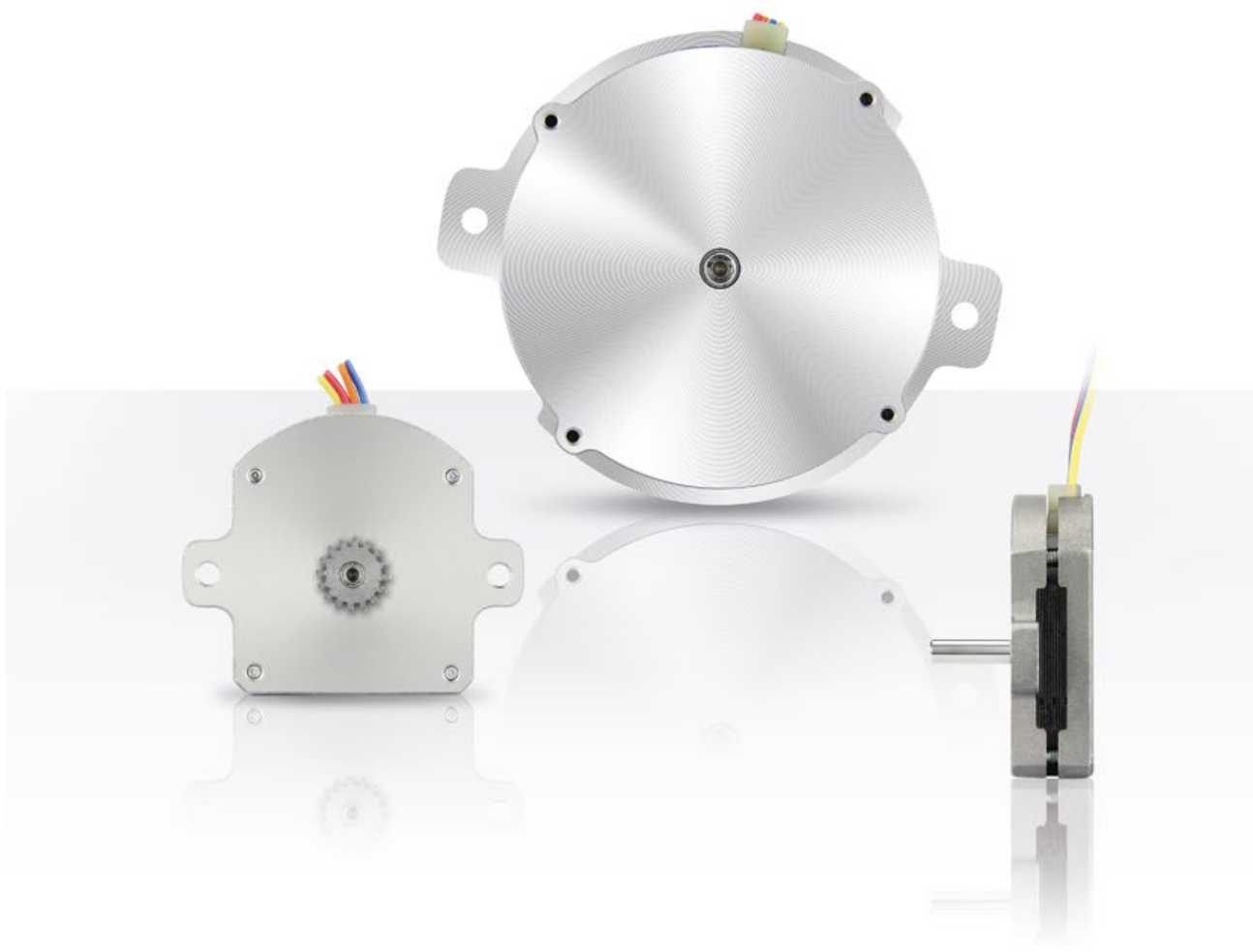


HYBRID STEPPER MOTORS

Notes



STF2818

Ultraflat stepper motor

OPTIONS

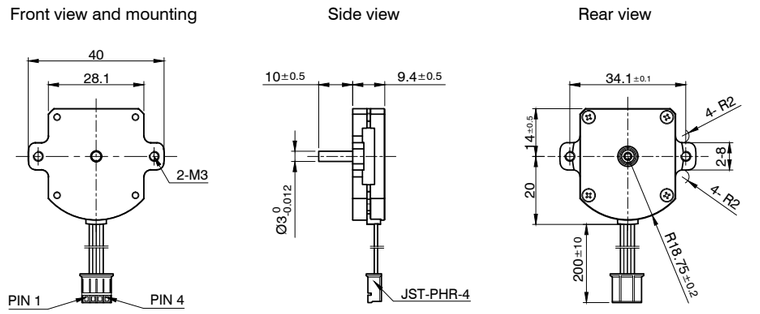
Controller

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

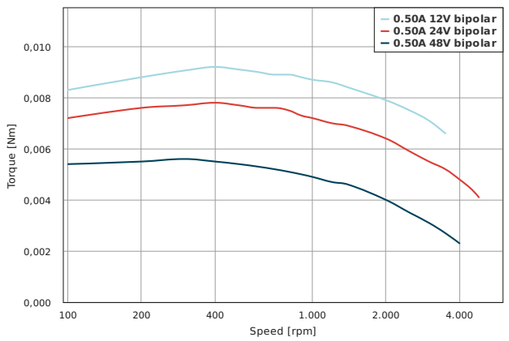
DIMENSIONS (IN MM)

STF2818



TORQUE CURVES

STF2818X0504-A



ST6318

Ultraflat stepper motor

OPTIONS

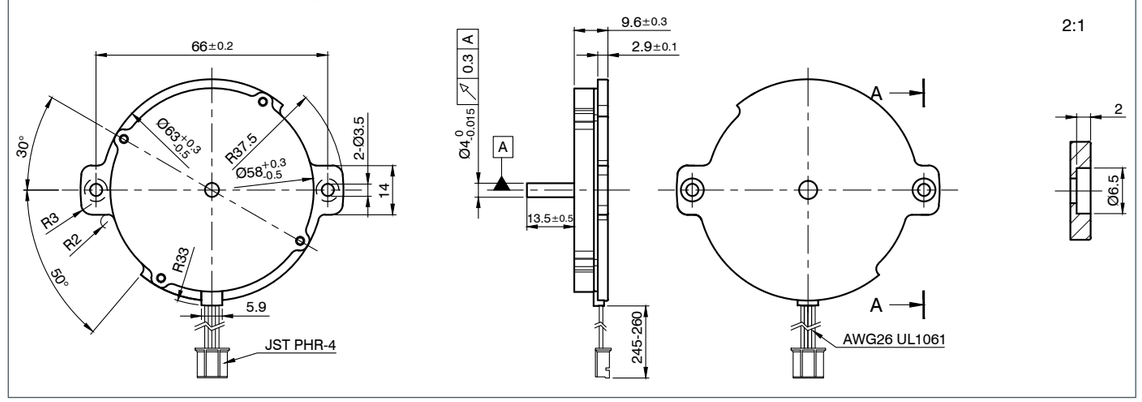
Controller

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

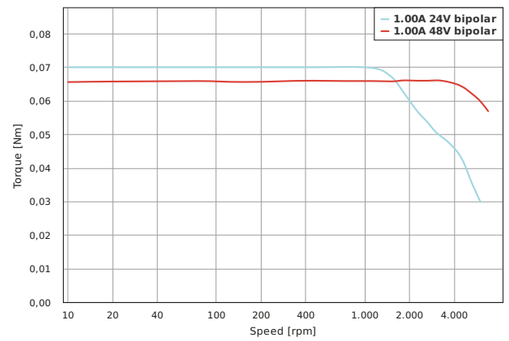
DIMENSIONS (IN MM)

ST6318



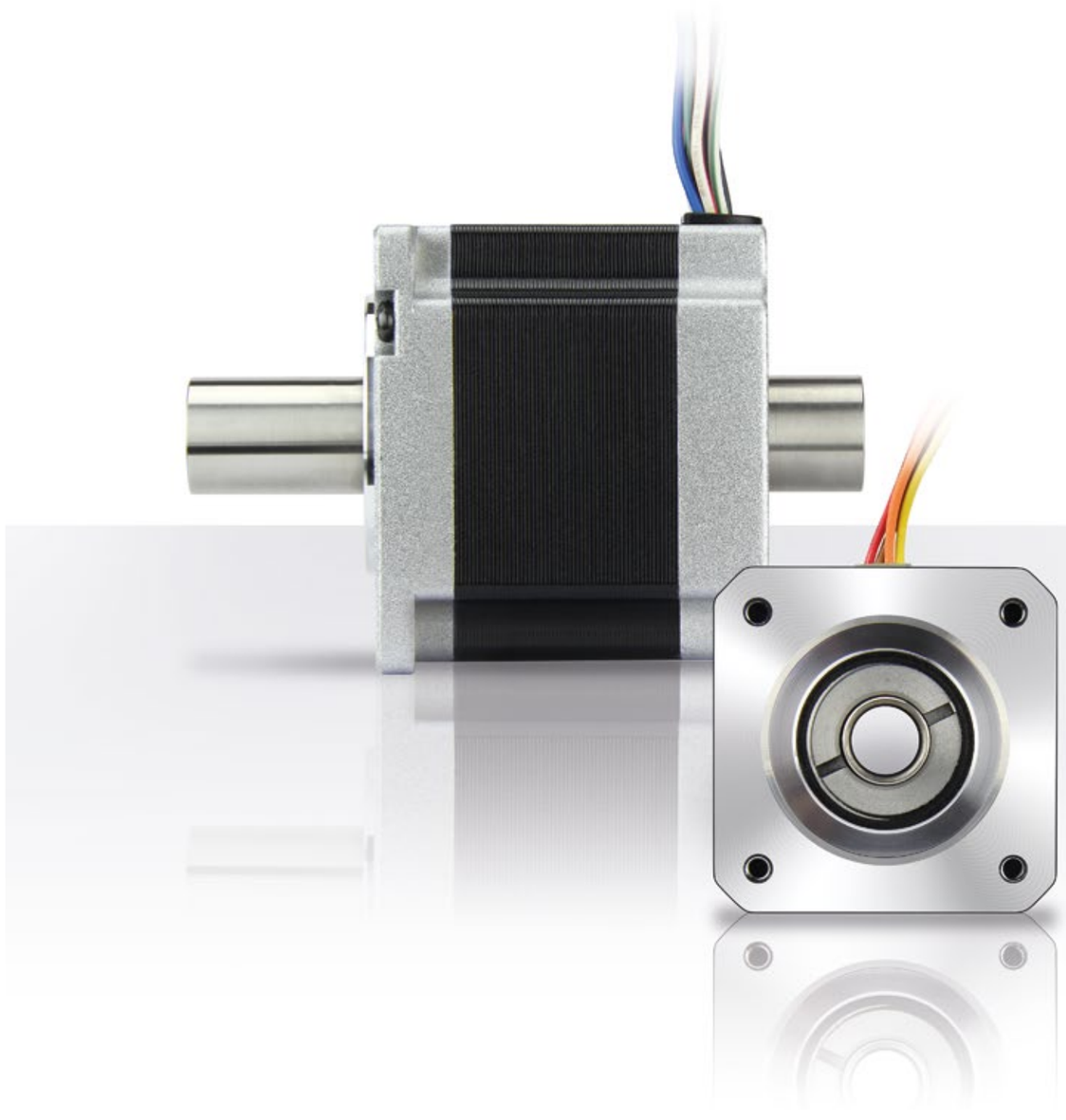
TORQUE CURVES

ST6318F1004-A



Notes

HOLLOW SHAFT MOTORS



ST4118

Stepper motor with hollow shaft – NEMA 17

OPTIONS

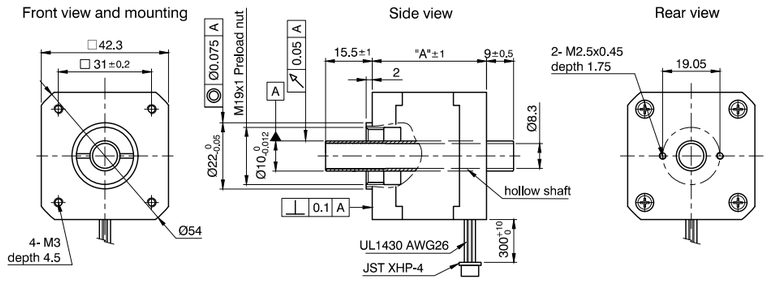
Controller

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

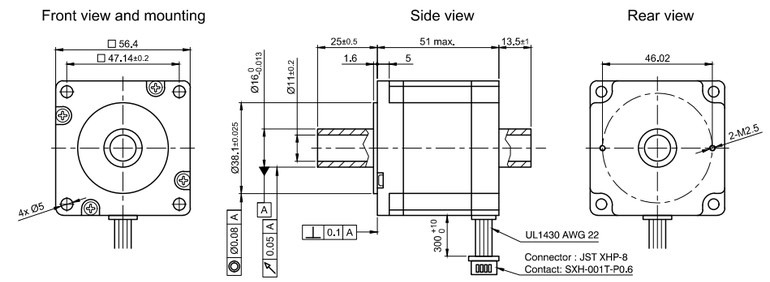
Controller

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

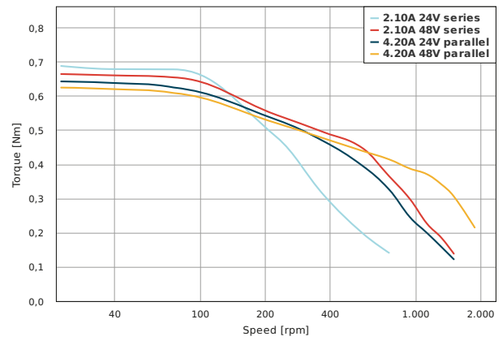
DIMENSIONS (IN MM)

ST5918S3008-L2



TORQUE CURVES

ST5918S3008-L2



Notes

AS2818

Stepper motor with M12 connector IP65 – NEMA 11

OPTIONS

Gearbox

VERSIONS

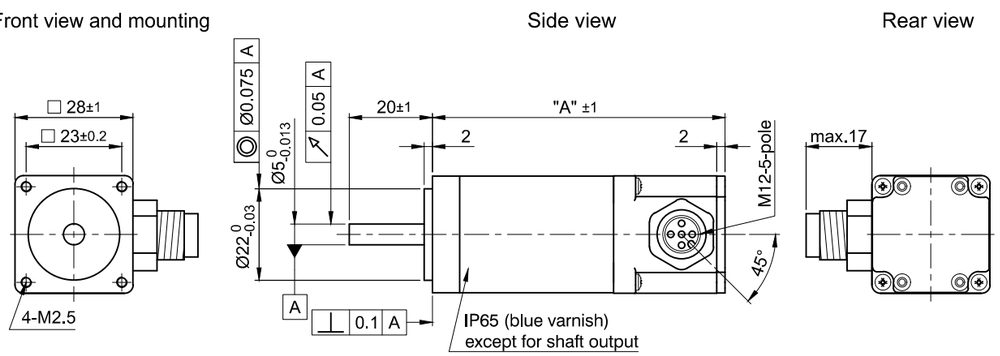
Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm²	Weight kg	Length „A“ mm
AS2818S0604	0.67	7.1	5.6	4	9	0.13	51
AS2818L0604	0.67	12.7	9.2	7.2	18	0.22	70

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

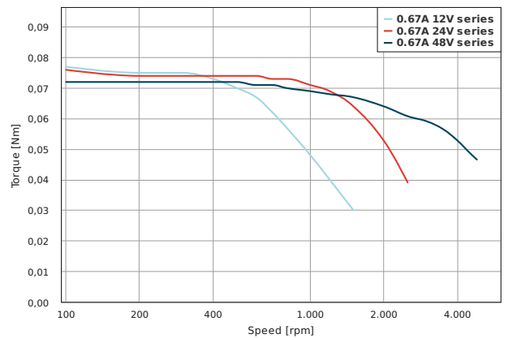


AS2818

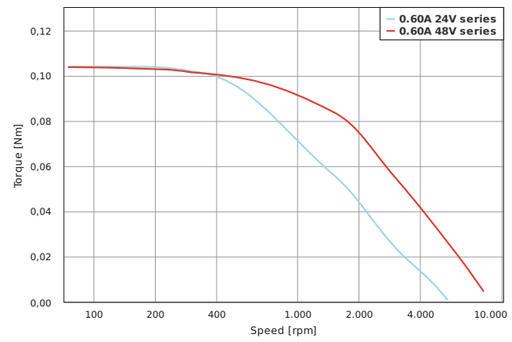
Stepper motor with M12 connector IP65 – NEMA 11

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

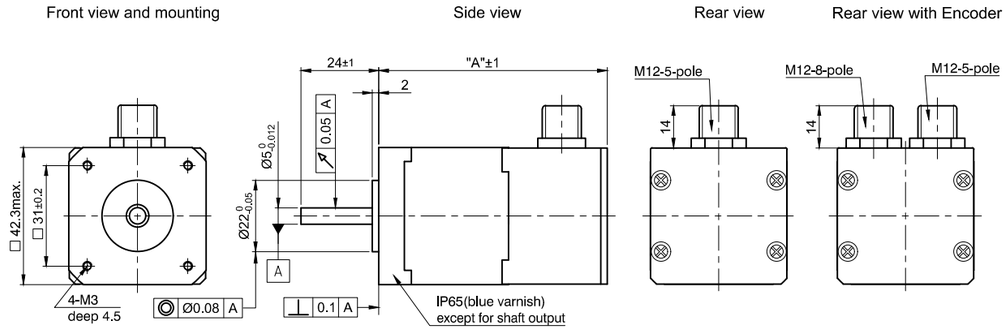
ZK-M8-3-2M-1-AFF Brake cable straight, 2m
ZK-M12-5-2M-1-AFF Motor cable straight, 2m
ZK-M12-5-2M-2-AFF Motor cable angled, 2m
ZK-M12-5-5M-1-AFF Motor cable straight, 5m
ZK-M12-5-5M-2-AFF Motor cable angled, 5m
ZK-M12-8-2M-1-AFF Encoder cable straight, 2m
ZK-M12-8-2M-2-AFF Encoder cable angled, 2m
ZK-M12-8-5M-1-AFF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

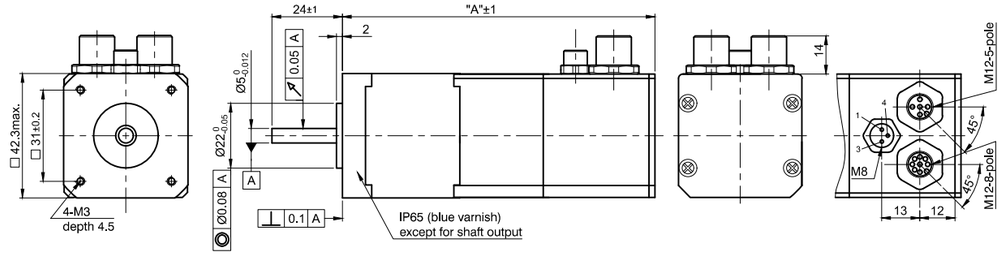
Stepper motor with M12 connector IP65 – NEMA 17

DIMENSIONS (IN MM)

AS4118L1804



AS4118L1804-EB

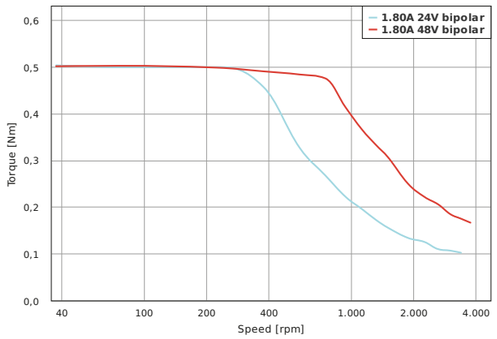


AS4118

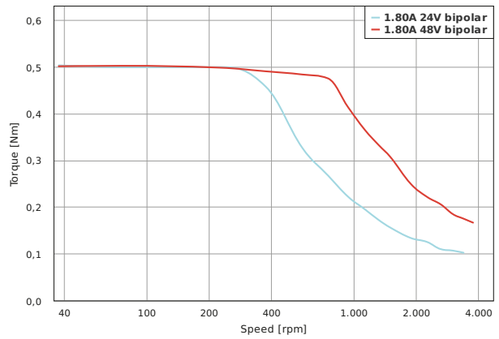
Stepper motor with M12 connector IP65 – NEMA 17

TORQUE CURVES

AS4118L1804



AS4118L1804-E



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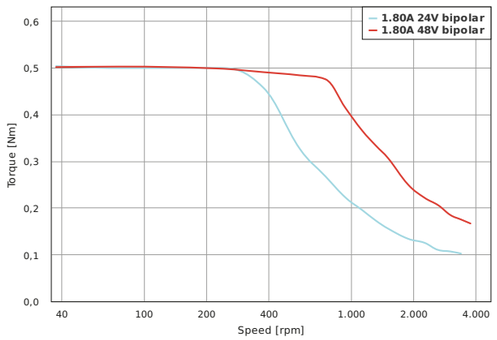
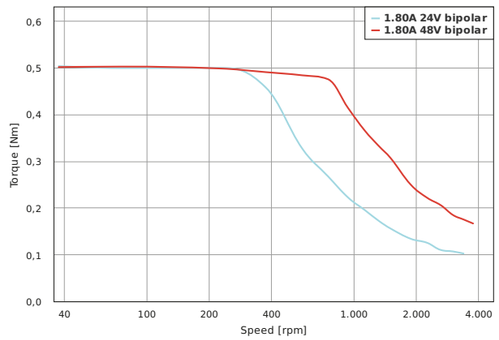


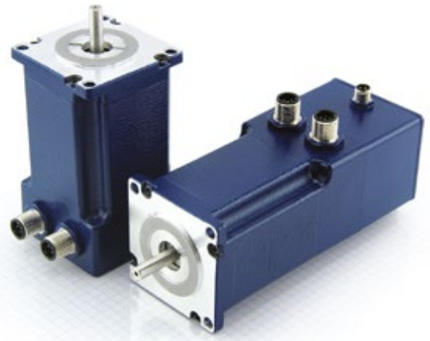
AS4118L1804-ENM24



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

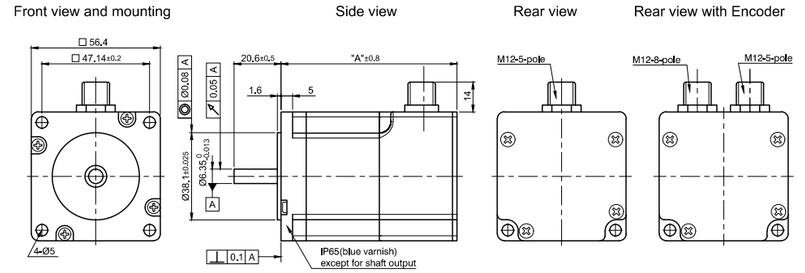
ACCESSORIES

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

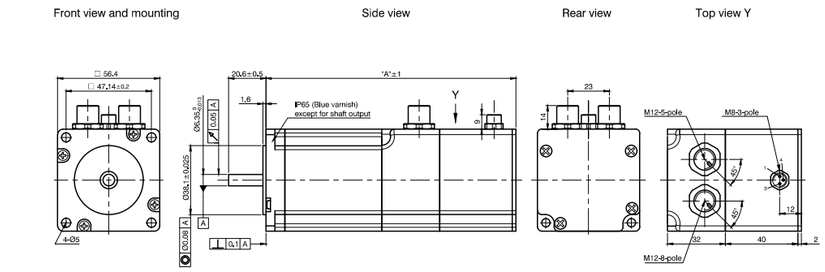
AS5918
Stepper motor with M12 connector IP65 – NEMA 23

DIMENSIONS (IN MM)

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

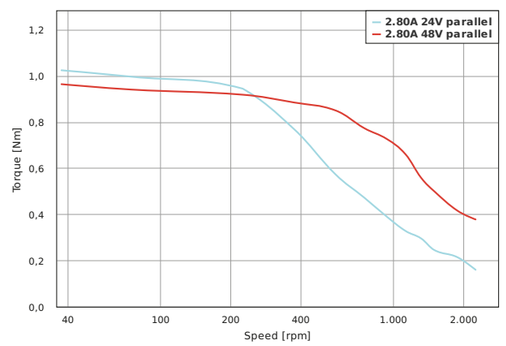


AS5918L...-EB/-ENM24B

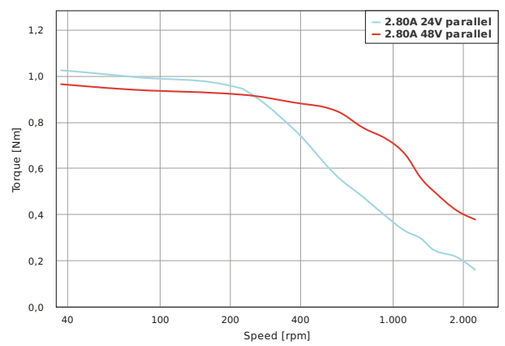


TORQUE CURVES

AS5918S2804

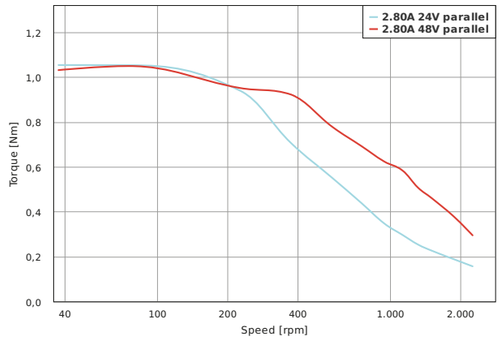


AS5918S2804-E

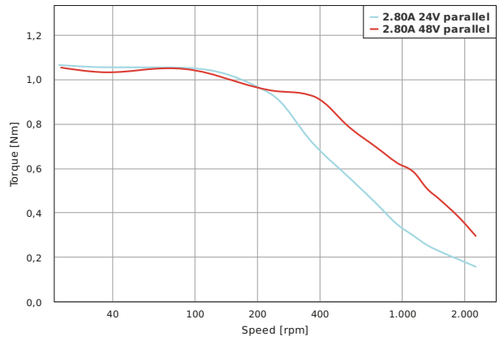


TORQUE CURVES

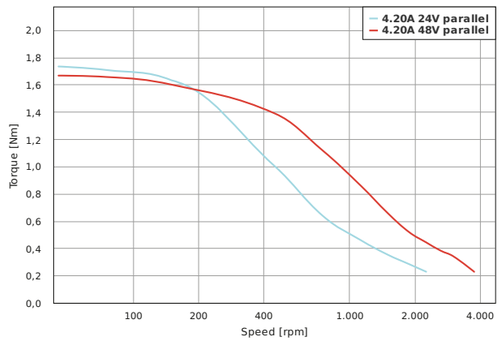
AS5918M2804



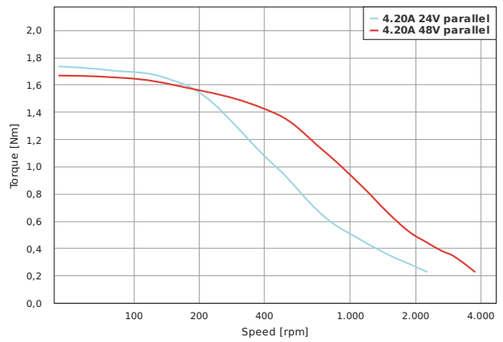
AS5918M2804-E



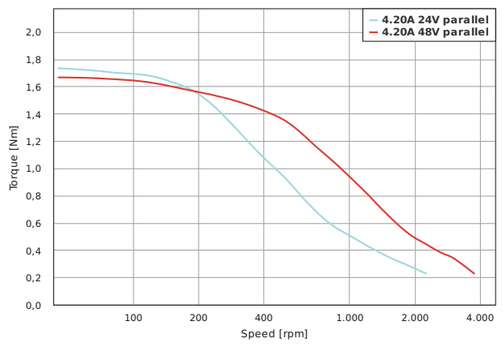
AS5918L4204



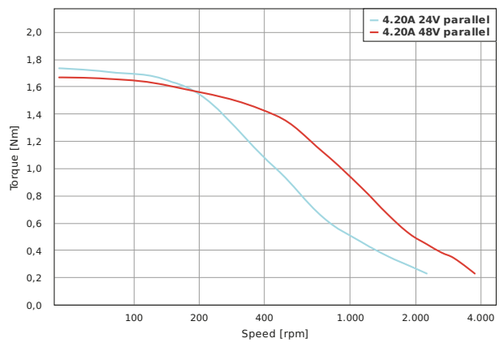
AS5918L4204-E



AS5918L4204-EB



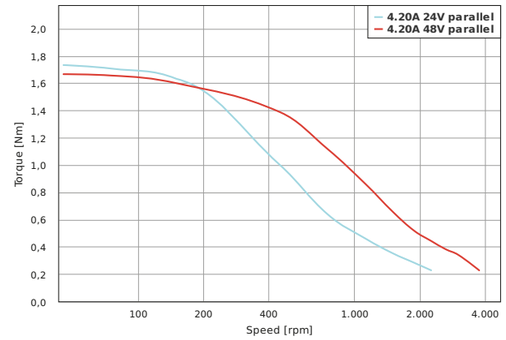
AS5918L4204-ENM24



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

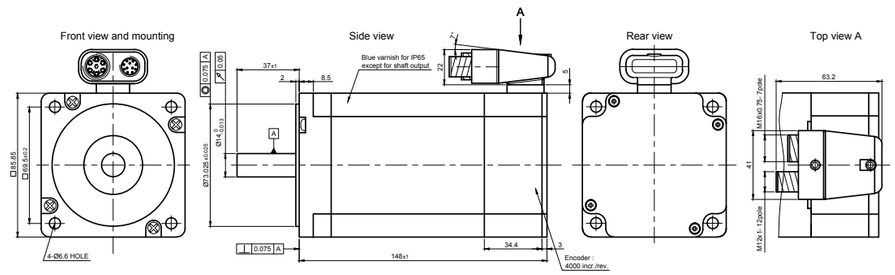
AS8918L9504-
E24 = With 24V encoder
E24B = With 24V encoder and brake

ACCESSORIES

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

DIMENSIONS (IN MM)

AS8918L9504-E24

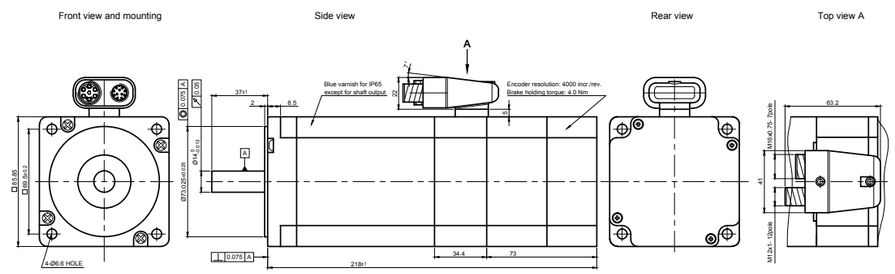


AS8918

Stepper motor IP65 – NEMA 34

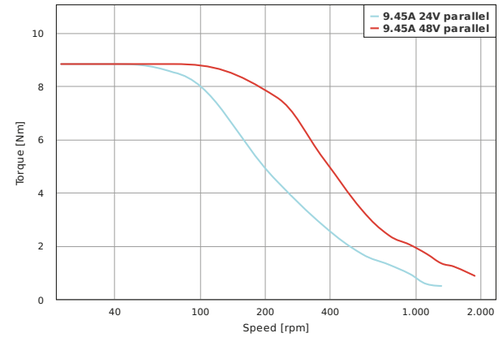
DIMENSIONS (IN MM)

AS8918L9504-E24B

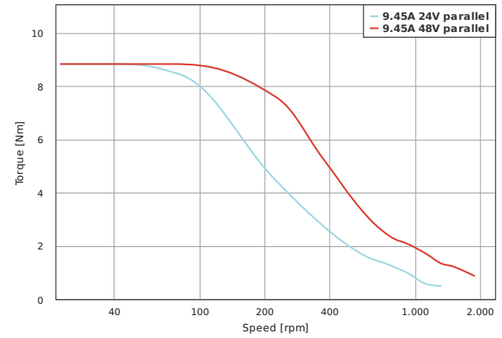


TORQUE CURVES

AS8918L9504-E24



AS8918L9504-E24B



IP65 STEPPER MOTORS

AP8918

Stepper motor with PG fitting IP65 – NEMA 34

OPTIONS

Gearbox

Controller

ORDER IDENTIFIER

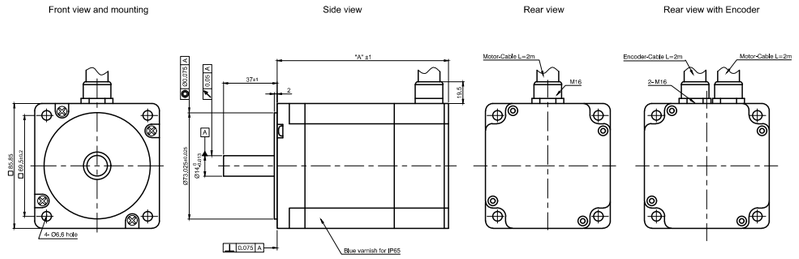
AP8918M6404-
E = With encoder

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

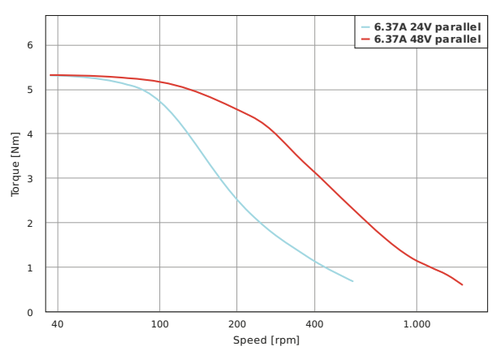


AP8918

Stepper motor with PG fitting IP65 – NEMA 34

TORQUE CURVES

AP8918M6404



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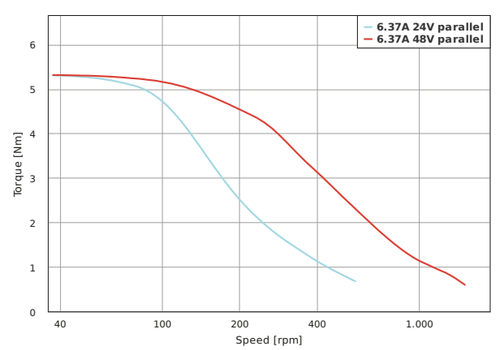

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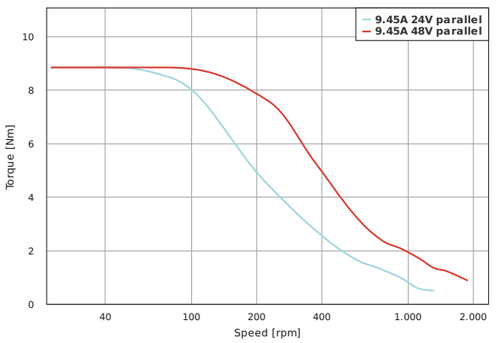

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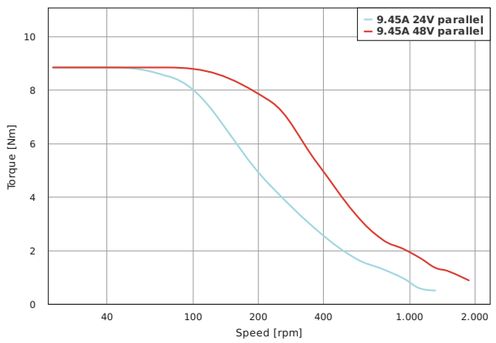
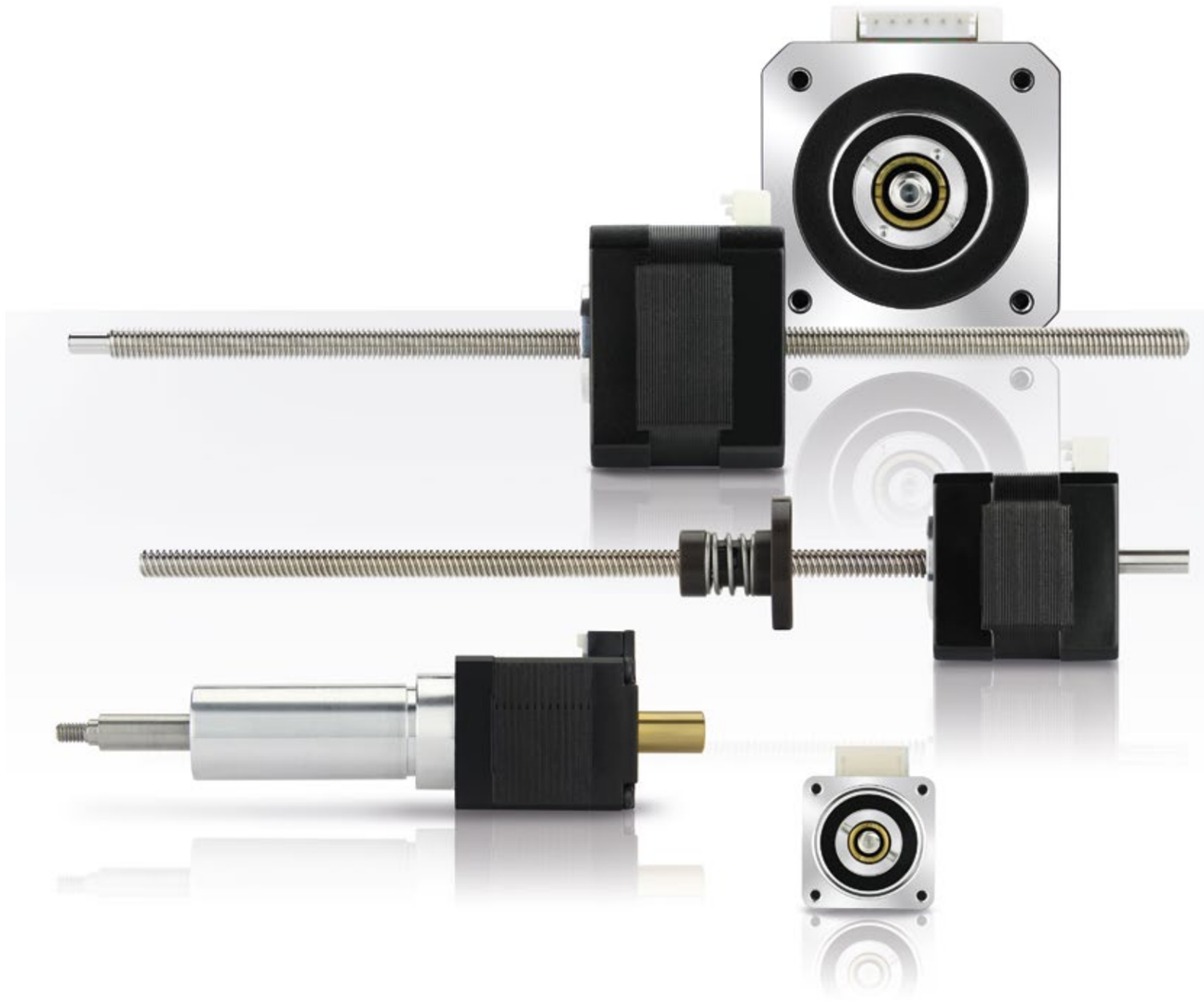




WHAT LINEAR ACTUATORS ARE AVAILABLE?

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 μm) 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 2π 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 • a ($a = v_e - v_a/t$) v_e = end speed, v_a = starting speed
	Formula:	Linear: F = m • g • μ 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

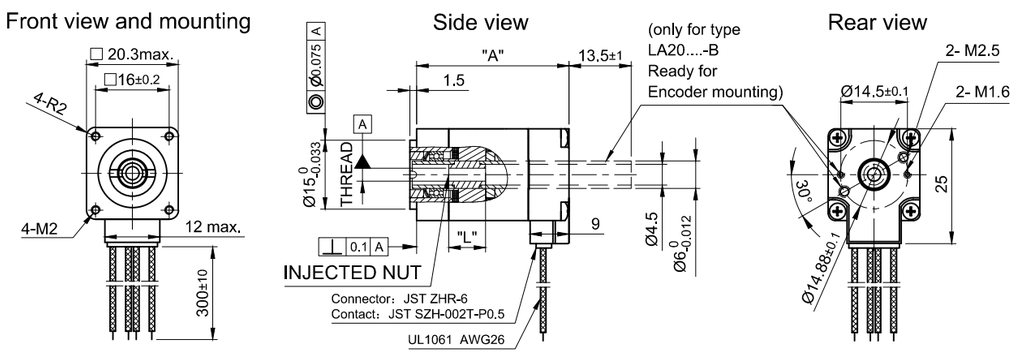
LA201S06-
A-... = Single shaft end
B-... = Double shaft end

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

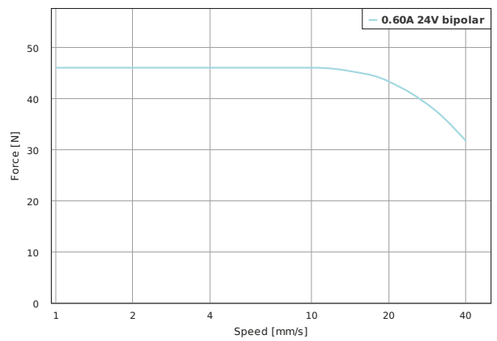


LA20

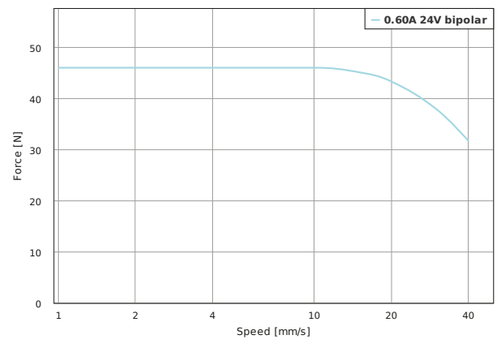
Non-captive linear actuator – NEMA 8

FORCE-VELOCITY CURVES

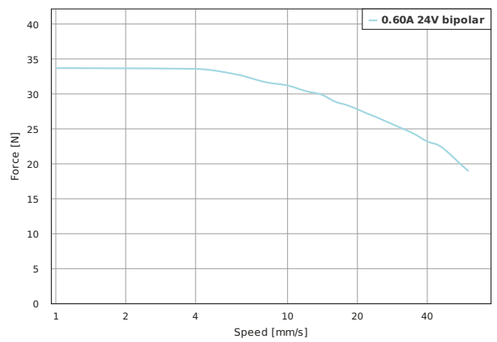
LA201S06-A-TDBA



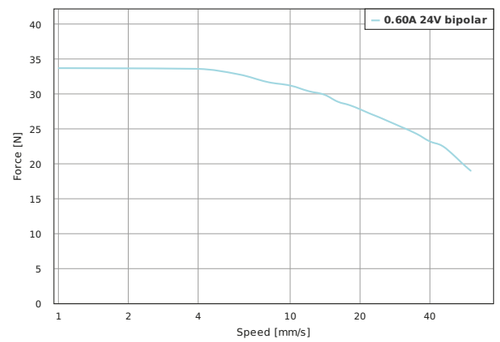
LA201S06-B-TDBA



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

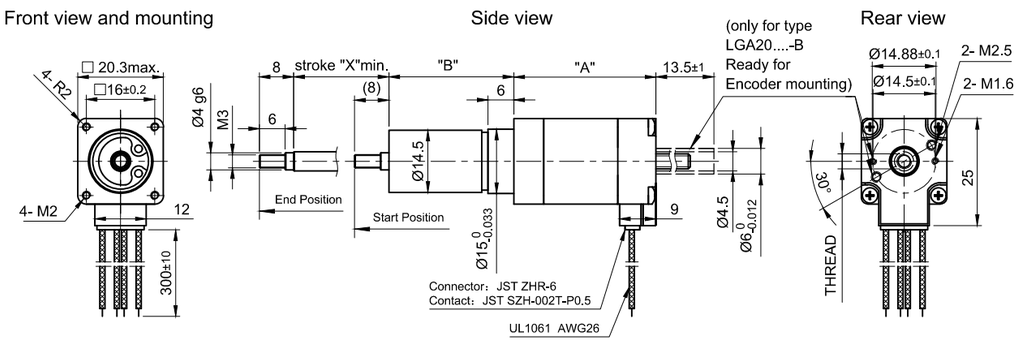
LGA201S06-
A = Single shaft end
B = Double shaft end

ACCESSORIES

NANOLUBE-50G Bearing grease

DIMENSIONS (IN MM)

LGA20

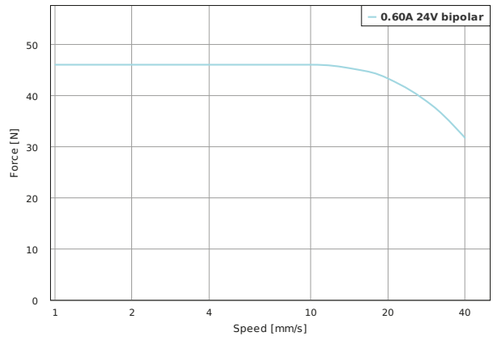


LGA20

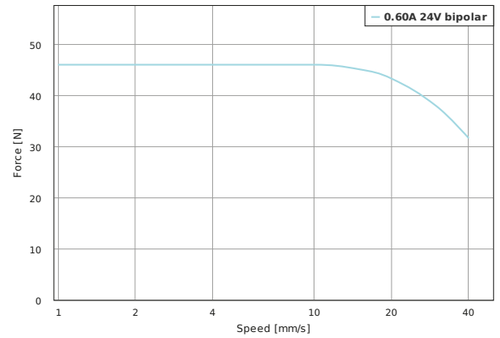
Captive linear actuator – NEMA 8

FORCE-VELOCITY CURVES

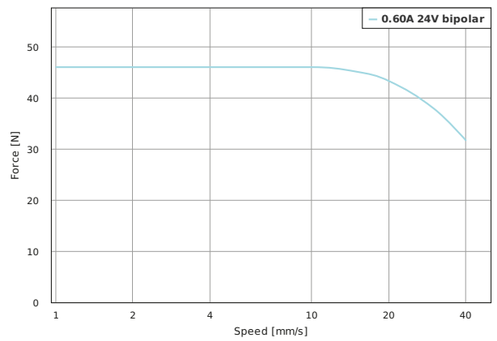
LGA201S06-A-TDBA-019



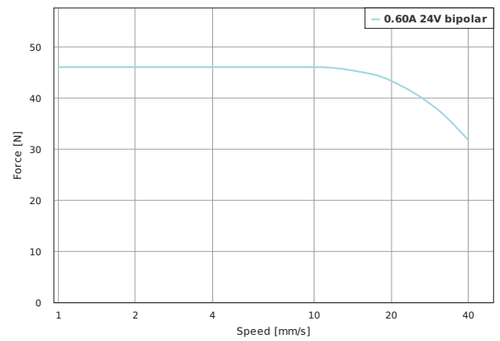
LGA201S06-B-TDBA-019



LGA201S06-A-TDBA-038



LGA201S06-B-TDBA-038



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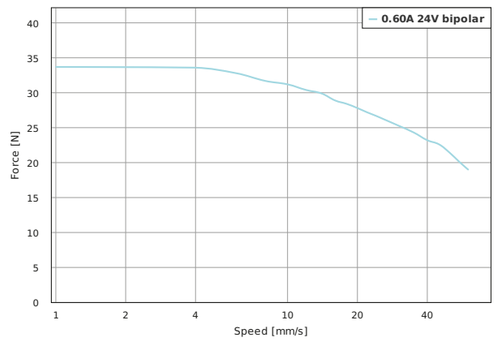

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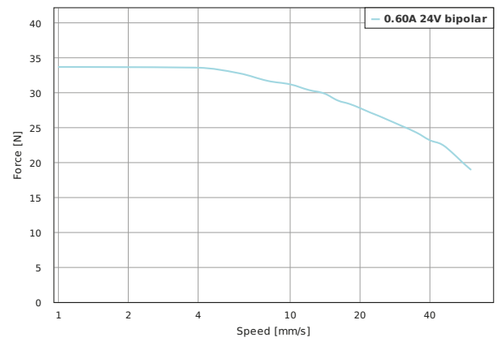
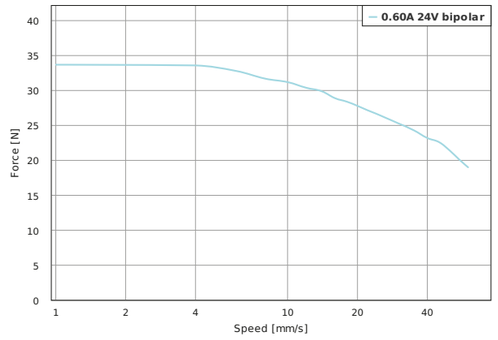


LGA20

Captive linear actuator – NEMA 8

FORCE-VELOCITY CURVES

LGA201S06-A-UECB-038



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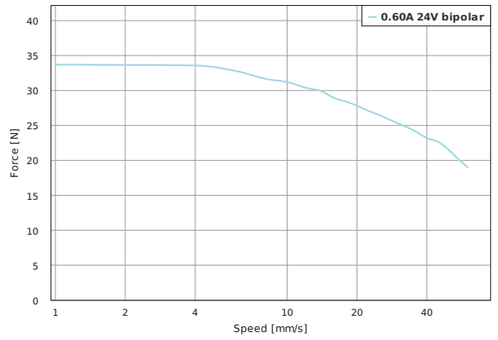


Notes

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

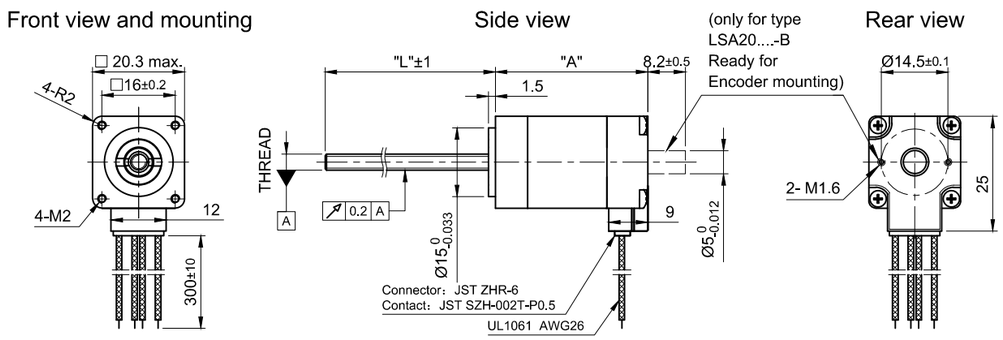
LSA201S06-
A-... = Single shaft end
B-... = Double shaft end

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

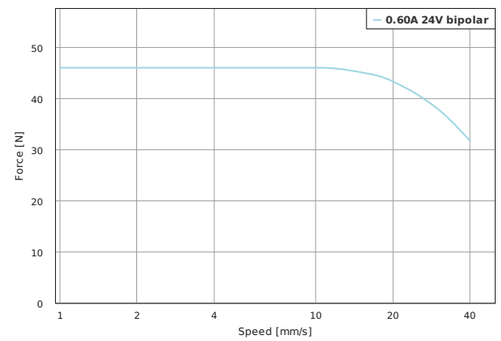


LSA20

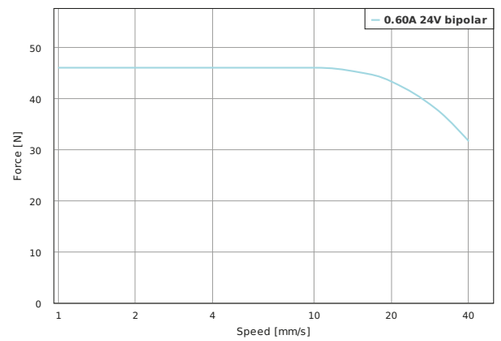
External linear actuator – NEMA 8

FORCE-VELOCITY CURVES

LSA201S06-A-TDBA-102



LSA201S06-B-TDBA-102



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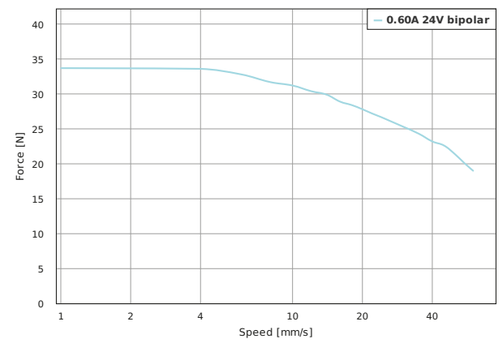

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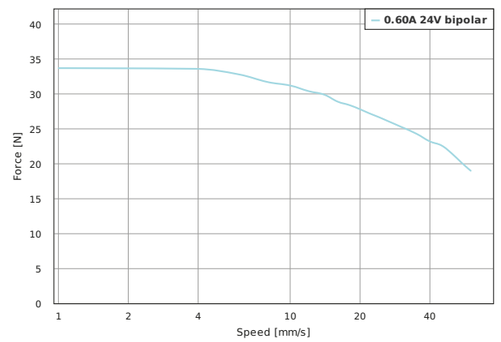


LA28

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

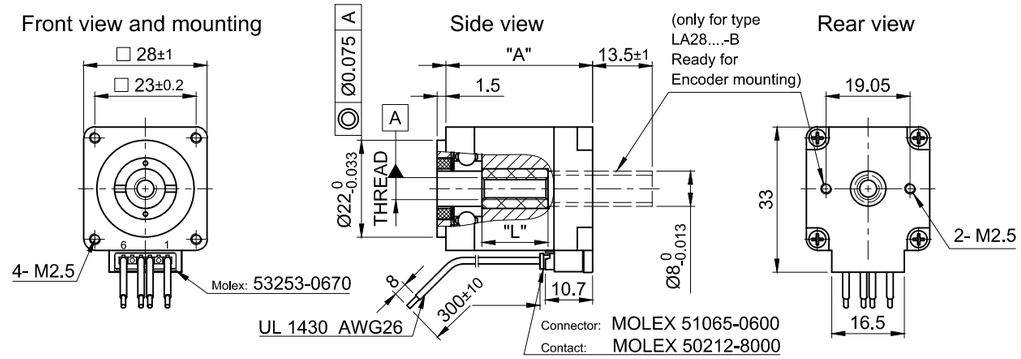
ZST5-2-200-1 Lead screw with trapezoidal thread
ZST5-2-300-1 Lead screw with trapezoidal thread
SCREW-ABA-UGAQ-200 Lead screw with ACME thread
SCREW-ABA-UGAQ-300 Lead screw with ACME thread
SCREW-AAA-UGAQ-1000 Lead screw with ACME thread
SCREW-ABA-UGFC-200 Lead screw with ACME thread
SCREW-ABA-UGFC-300 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

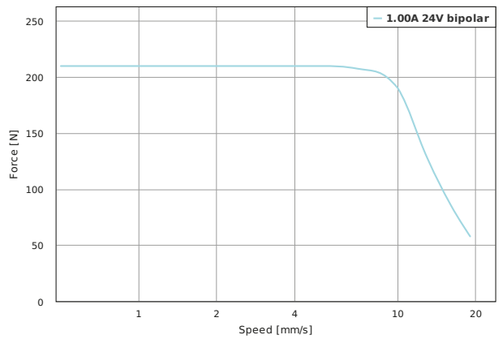
DIMENSIONS (IN MM)

LA28-A/B

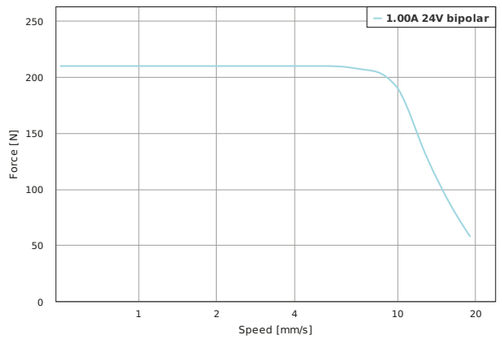


FORCE-VELOCITY CURVES

LA281S10-A-UGAQ



LA281S10-B-UGAQ



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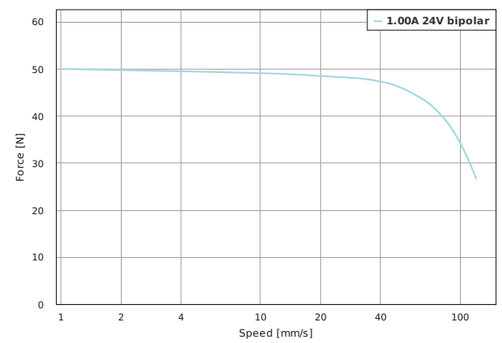

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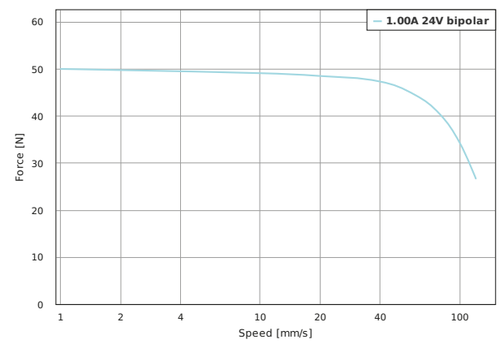
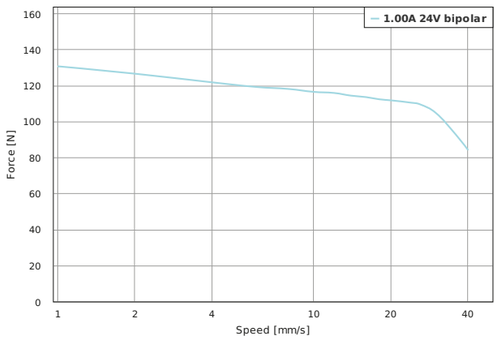
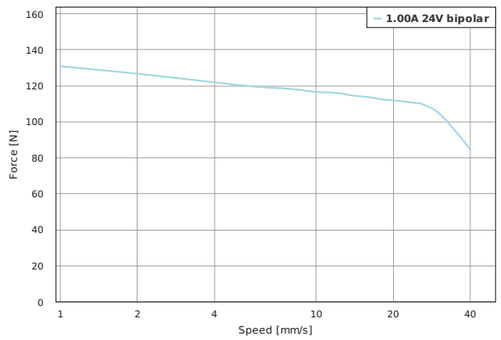


FORCE-VELOCITY CURVES

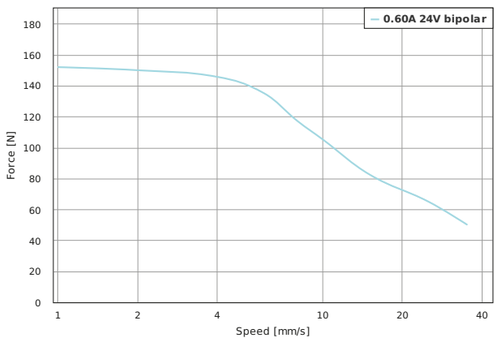
LA281S10-A-THCA



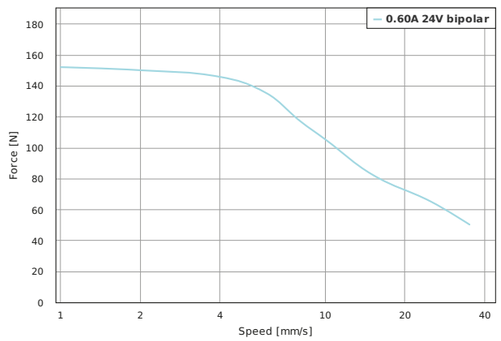
LA281S10-B-THCA



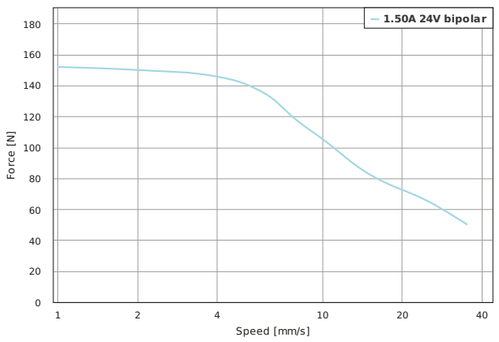
LA281M06-A-THCA



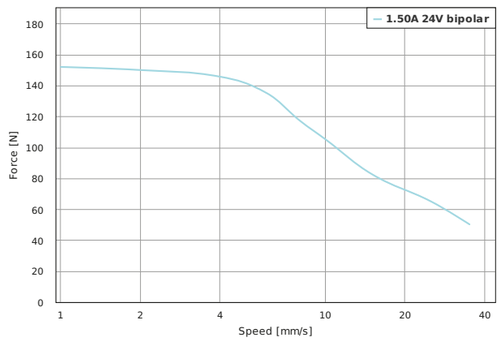
LA281M06-B-THCA



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

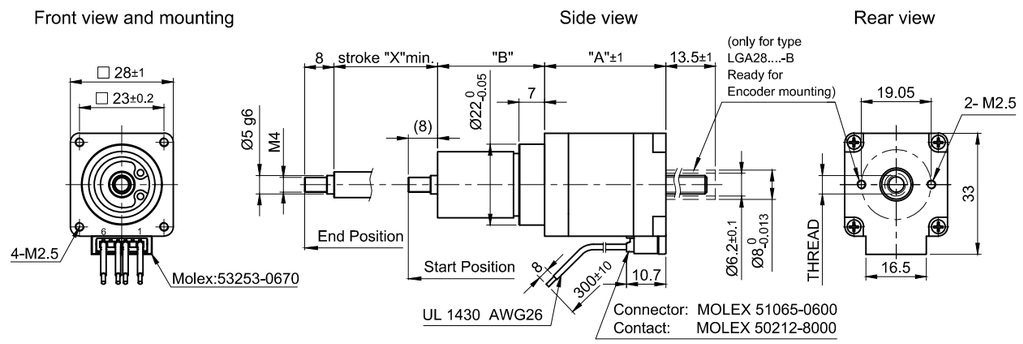
NANOLUBE-50G Bearing grease

LGA28

Captive linear actuator – NEMA 11

DIMENSIONS (IN MM)

LGA28-A/B



FORCE-VELOCITY CURVES

LGA281S10-A-UGAQ-019

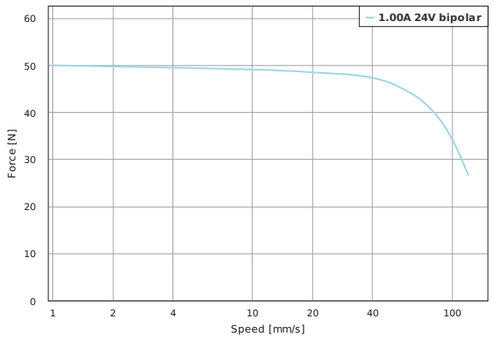
LGA281S10-B-UGAQ-019

LGA281S10-A-UGAQ-038

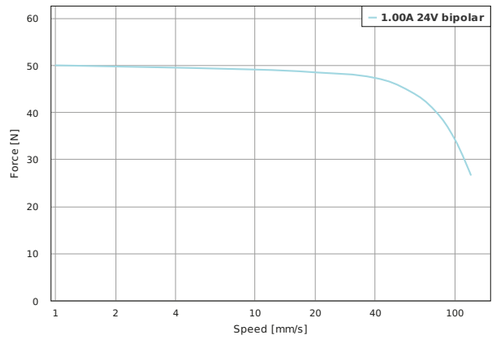
LGA281S10-B-UGAQ-038

FORCE-VELOCITY CURVES

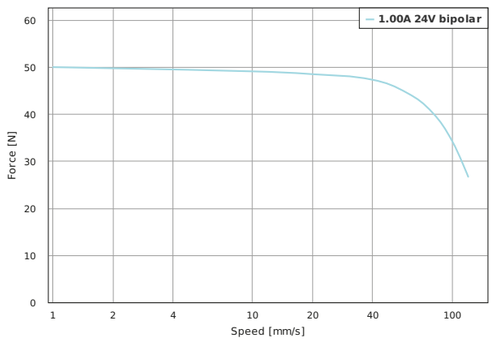
LGA281S10-A-UGFC-019



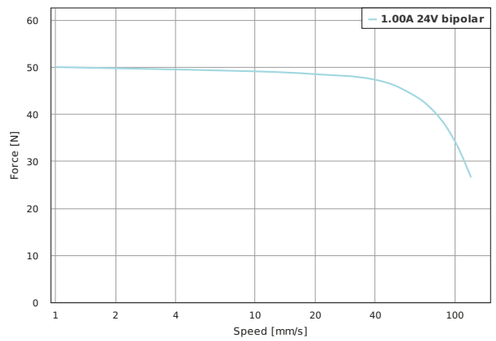
LGA281S10-B-UGFC-019



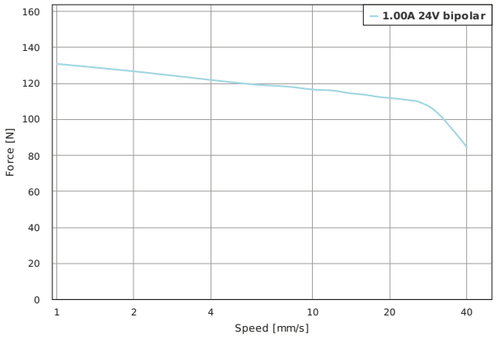
LGA281S10-A-UGFC-038



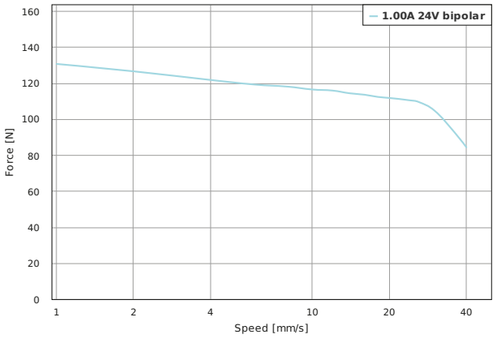
LGA281S10-B-UGFC-038



LGA281S10-A-THCA-019



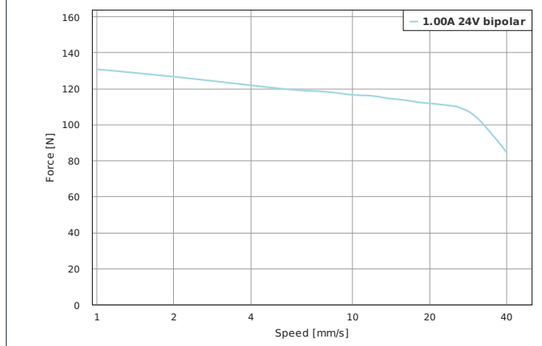
LGA281S10-B-THCA-019



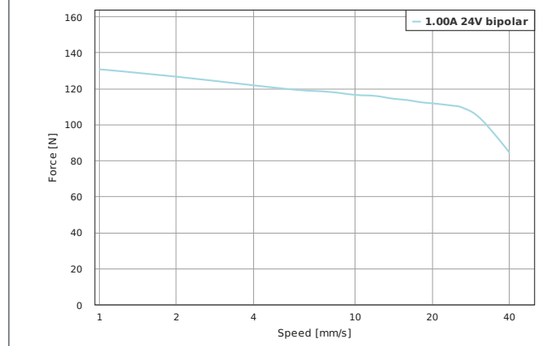
LGA28
Captive linear actuator – NEMA 11

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

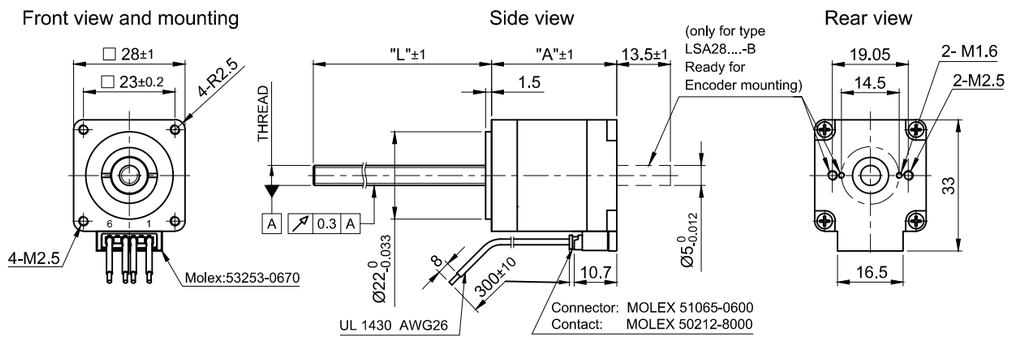
LSA281S10-
A-... = Single shaft end
B-... = Double shaft end

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

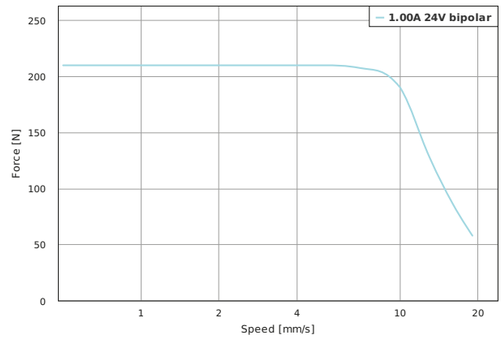


LSA28

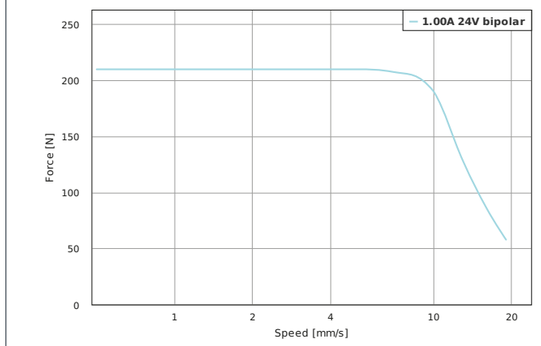
External linear actuator – NEMA 11

FORCE-VELOCITY CURVES

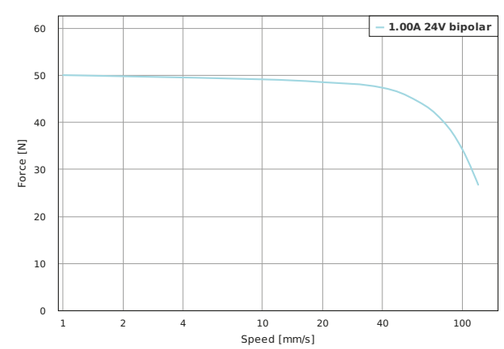
LSA281S10-A-UGAQ-152



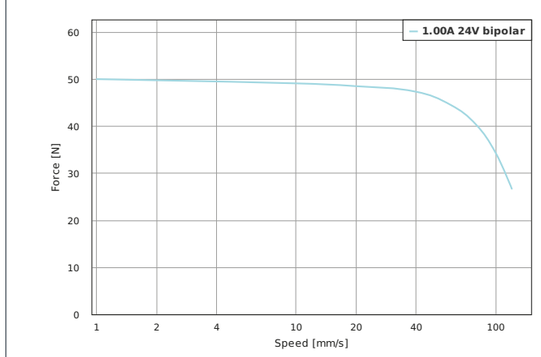
LSA281S10-B-UGAQ-152



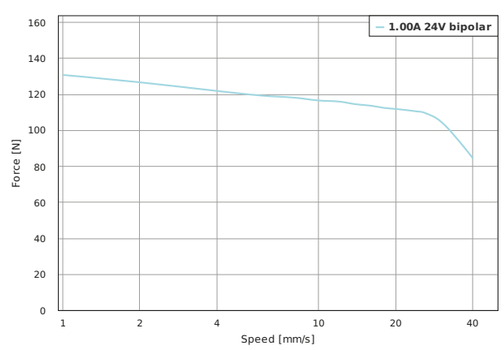
LSA281S10-A-UGFC-152



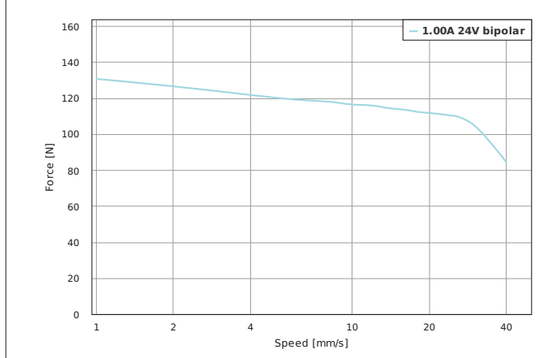
LSA281S10-B-UGFC-152



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

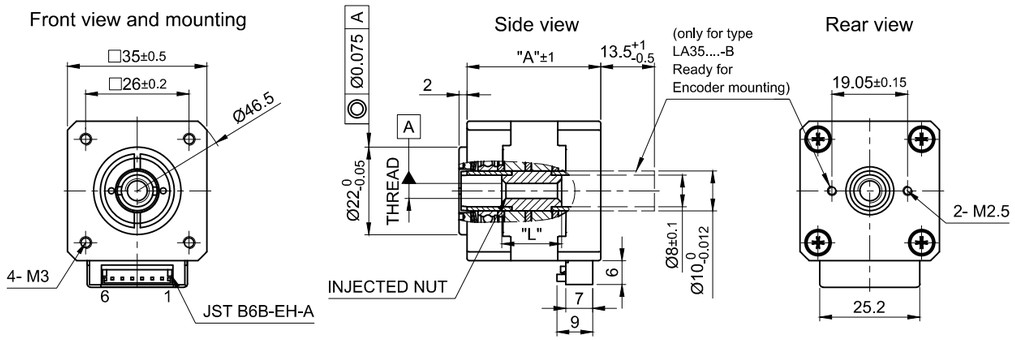
LA351S12-
A-... = Single shaft end
B-... = Double shaft end

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

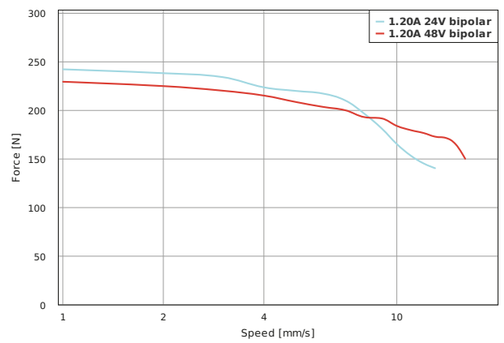


LA35

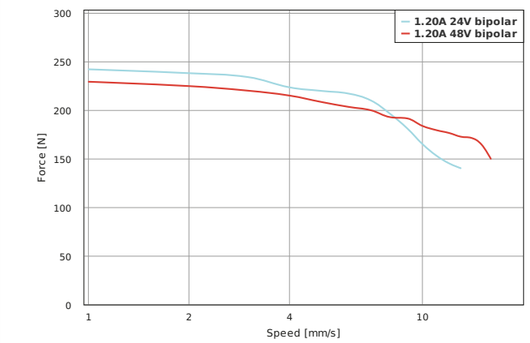
Non-captive linear actuator – NEMA 14

FORCE-VELOCITY CURVES

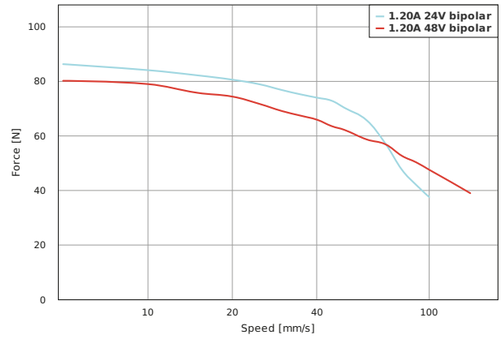
LA351S12-A-UIAP



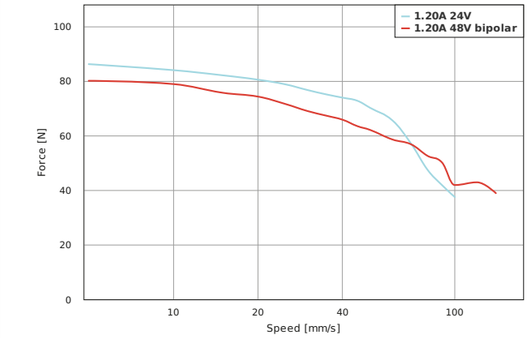
LA351S12-B-UIAP



LA351S12-A-UIEV



LA351S12-B-UIEV



HYBRID LINEAR ACTUATORS

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

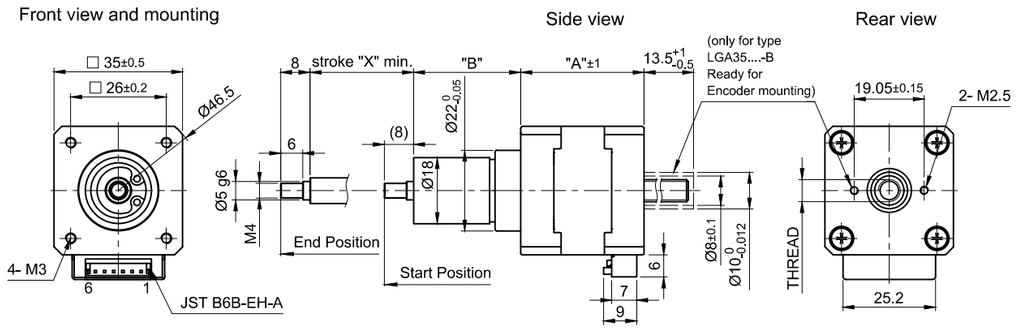
LGA351S12-...-
A = Single shaft end
B = Double shaft end

ACCESSORIES

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

DIMENSIONS (IN MM)

LGA35

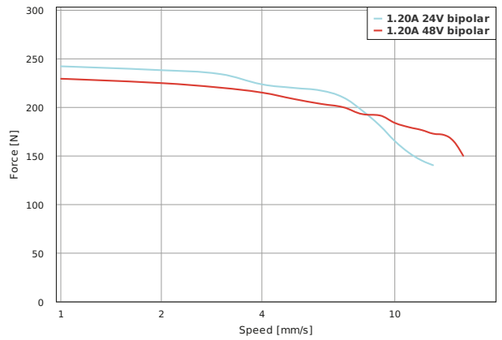


LGA35

Captive linear actuator – NEMA 14

FORCE-VELOCITY CURVES

LGA351S12-A-UIAP-019



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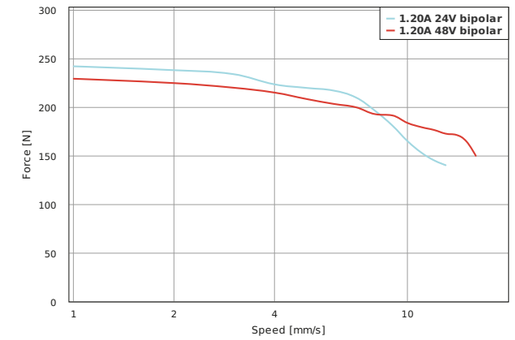

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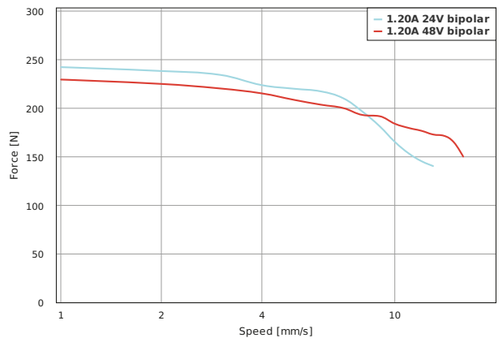
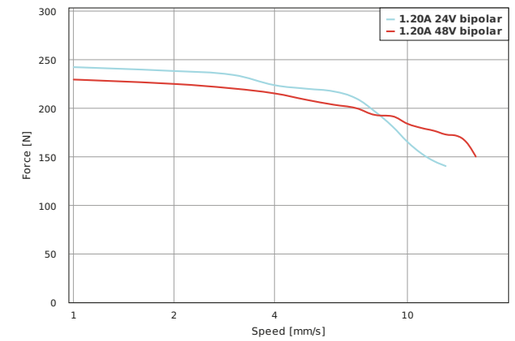
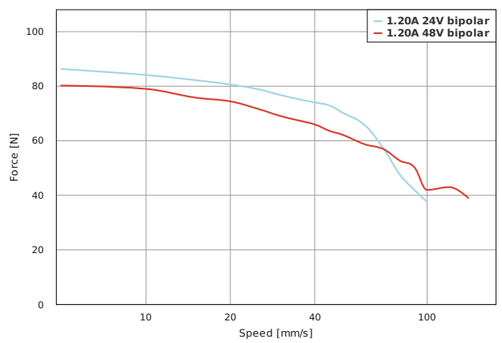


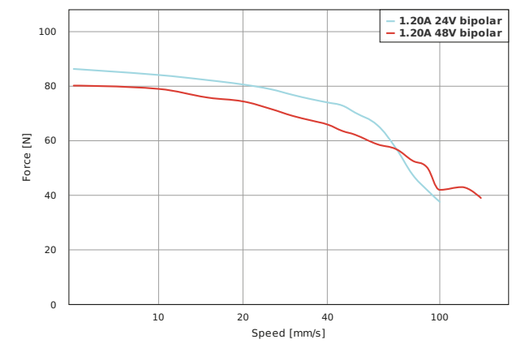
LGA351S12-B-UIAP-038



LGA351S12-A-UIEV-019



LGA351S12-B-UIEV-019

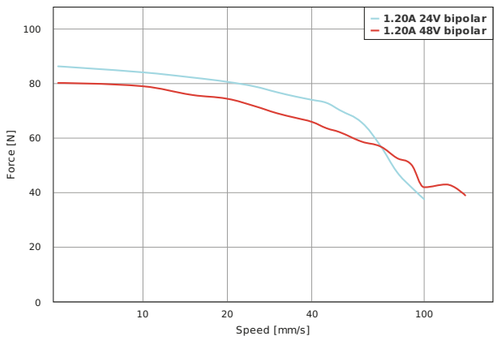


LGA35

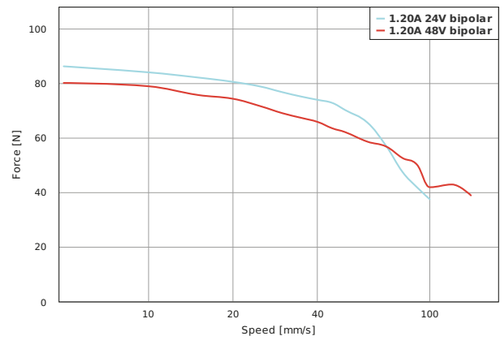
Captive linear actuator – NEMA 14

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

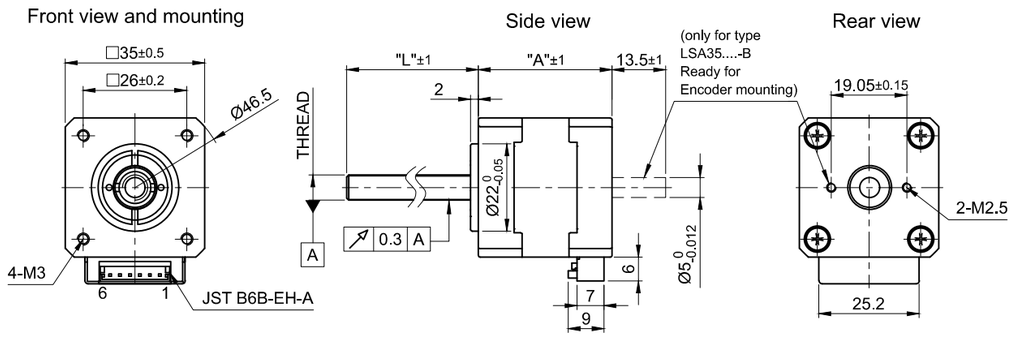
LSA381S12-
A-... = Single shaft end
B-... = Double shaft end

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

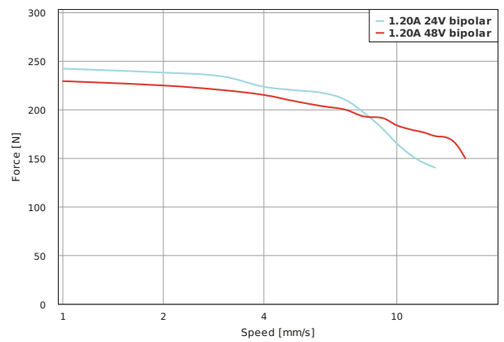


LSA35

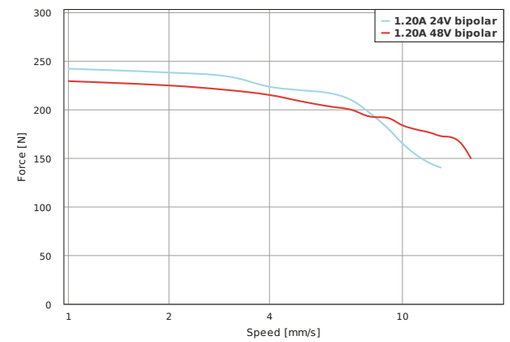
External linear actuator – NEMA 14

FORCE-VELOCITY CURVES

LSA351S12-A-UIAP-152



LSA351S12-B-UIAP-152



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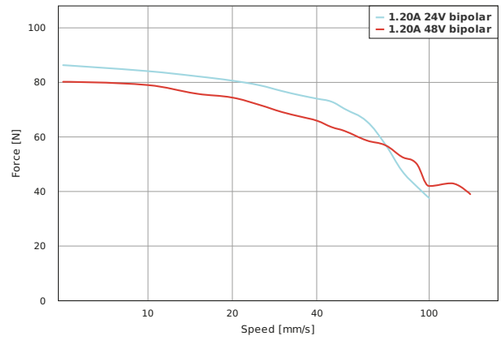

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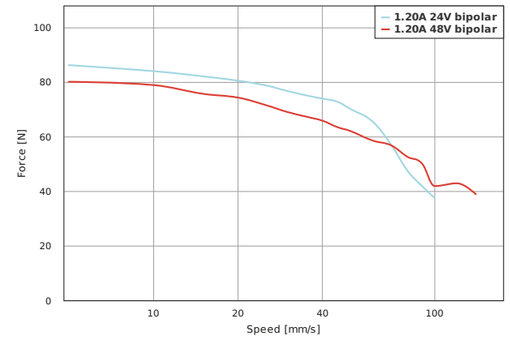


LA42

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

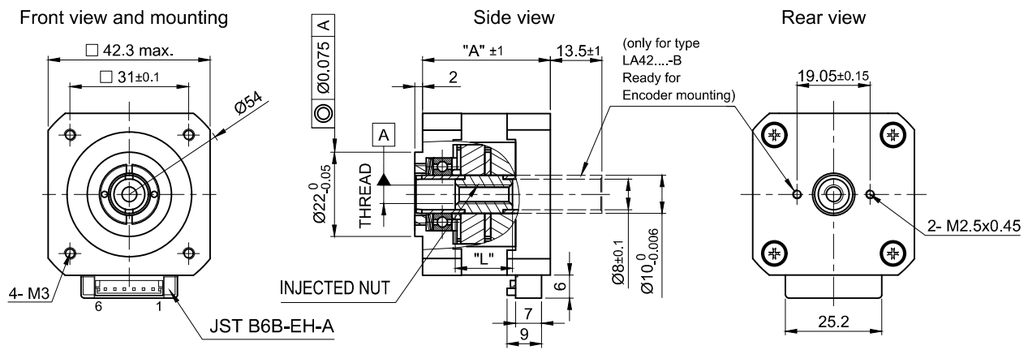
Non-captive linear actuator – NEMA 17

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

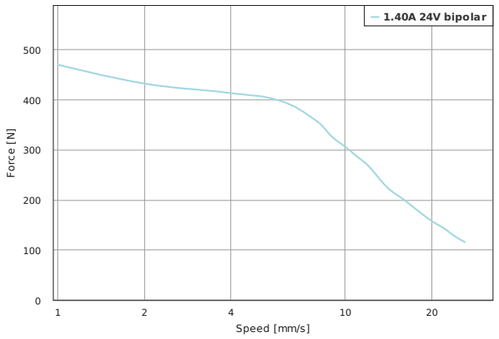
DIMENSIONS (IN MM)

LA42

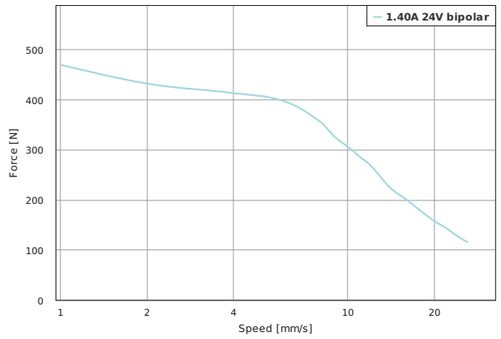


FORCE-VELOCITY CURVES

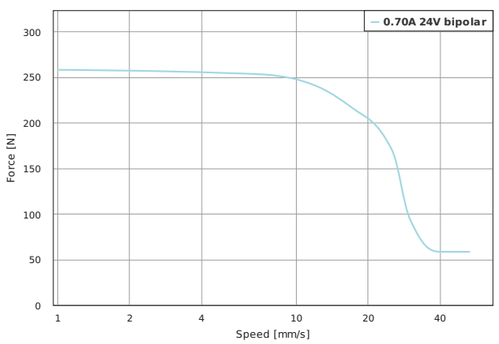
LA421S14-A-TJBA



LA421S14-B-TJBA



LA421S07-A-TJCA



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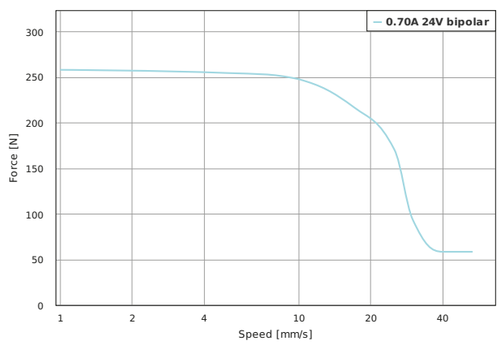

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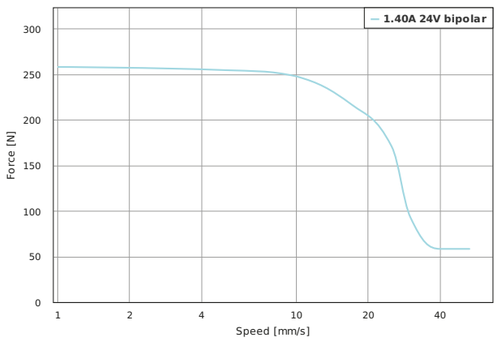

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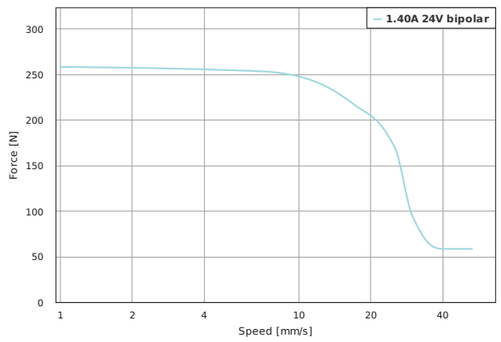
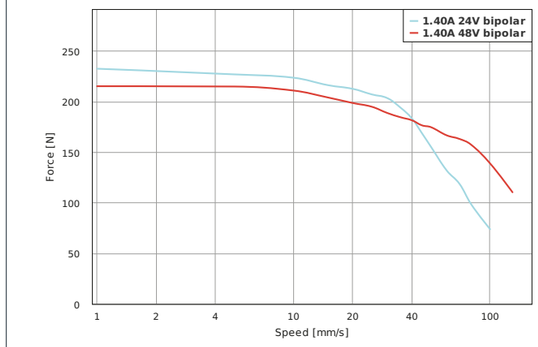
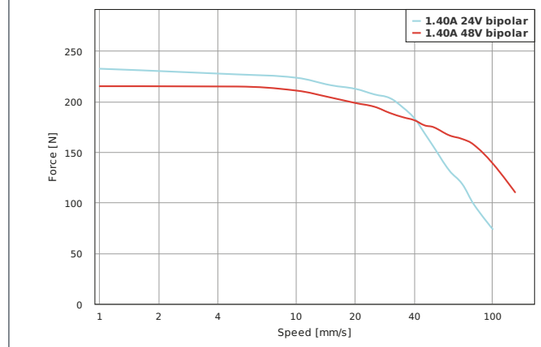


FORCE-VELOCITY CURVES

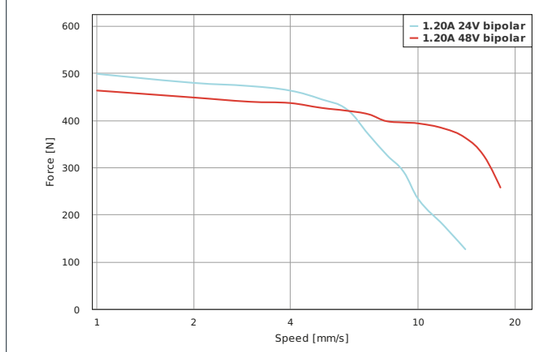
LA421S14-A-UIEV



LA421S14-B-UIEV



LA421S14-A-UKAS



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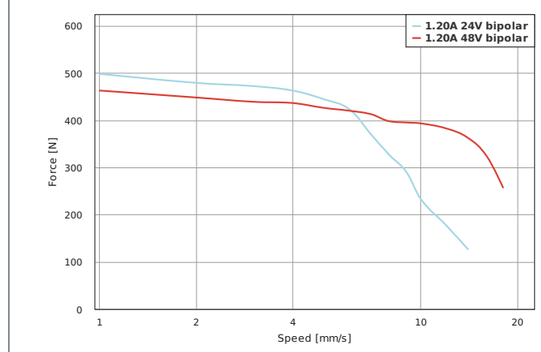

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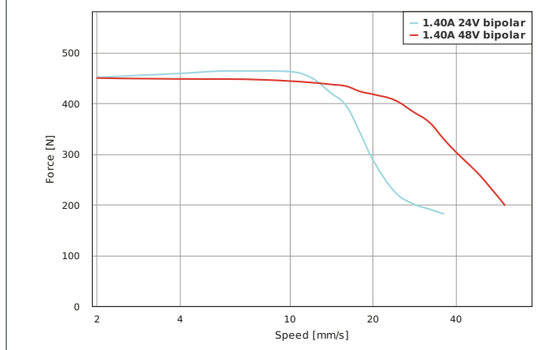
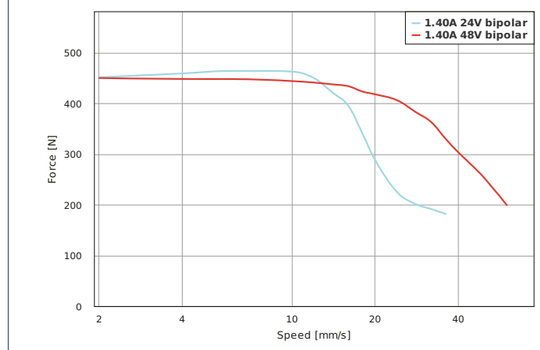
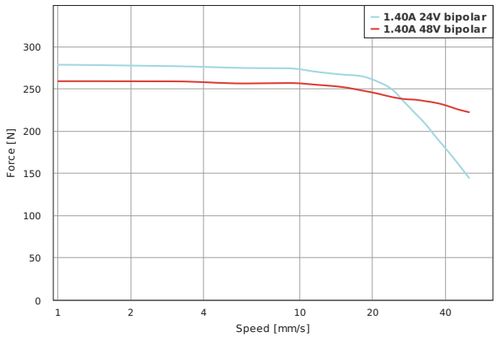


LA421S14-B-UKBN

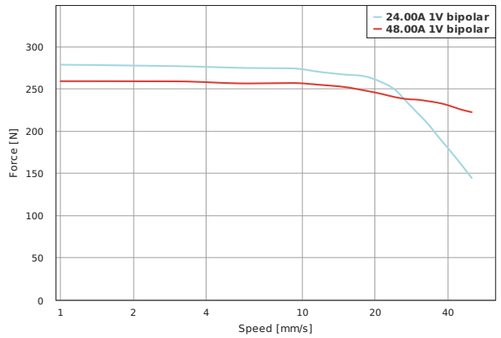


FORCE-VELOCITY CURVES

LA421S14-A-UKDE



LA421S14-B-UKDE



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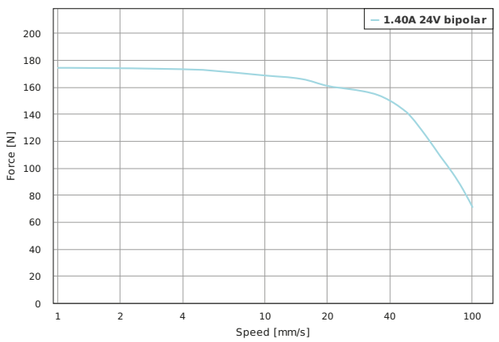
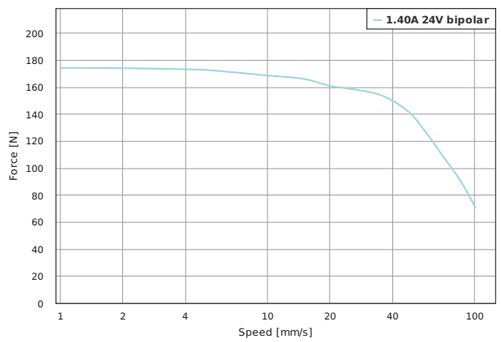
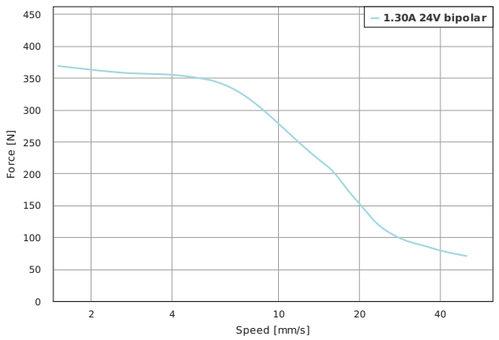


LA421S14-B-UKGI



LA421L13-A-TJCA



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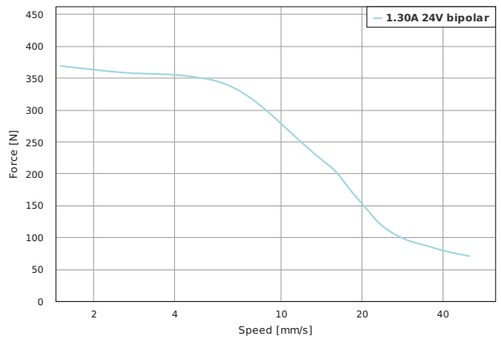
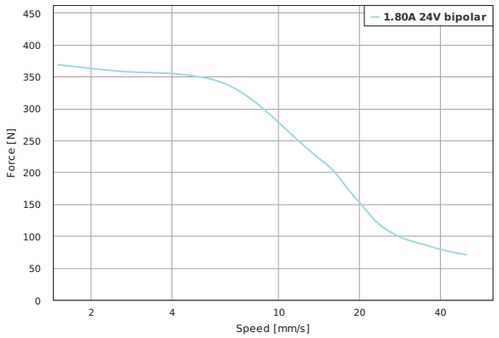


LA42
Non-captive linear actuator – NEMA 17

FORCE-VELOCITY CURVES

LA421L18-A-TJCA



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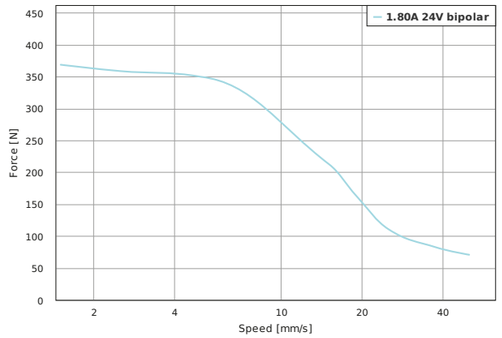

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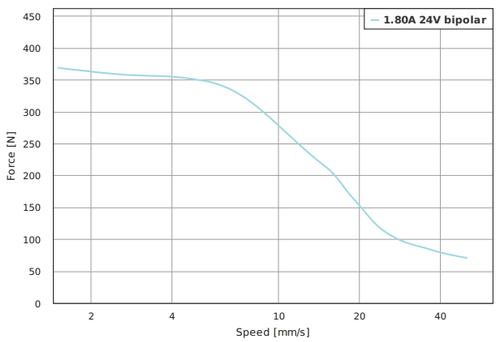

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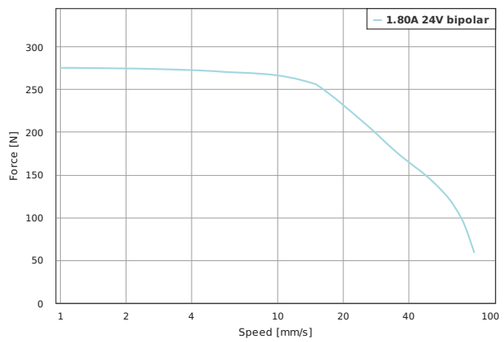


LGA42

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

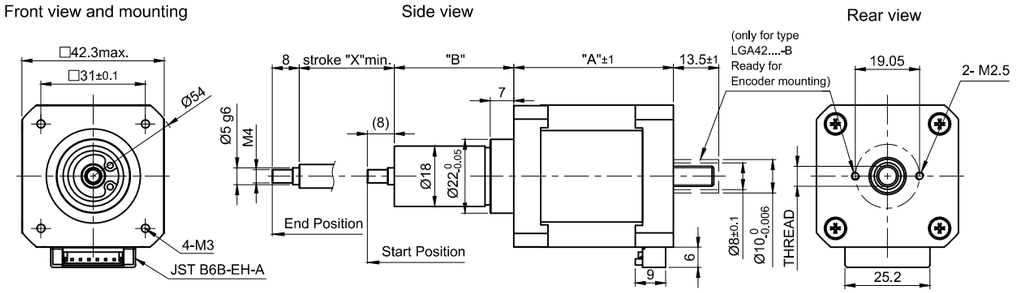
LGA421S14-
A-... = Single shaft end
B-... = Double shaft end

ACCESSORIES

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

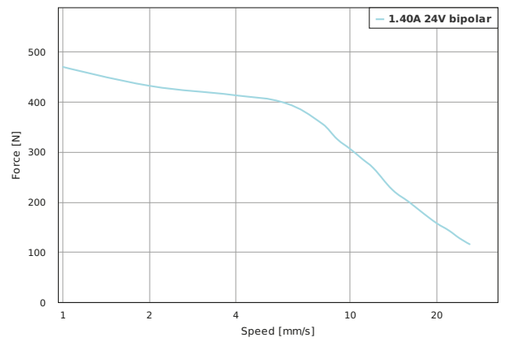
DIMENSIONS (IN MM)

LGA42



FORCE-VELOCITY CURVES

LGA421S14-A-TJBA-019



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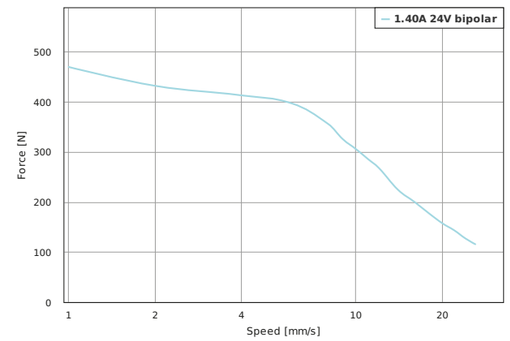
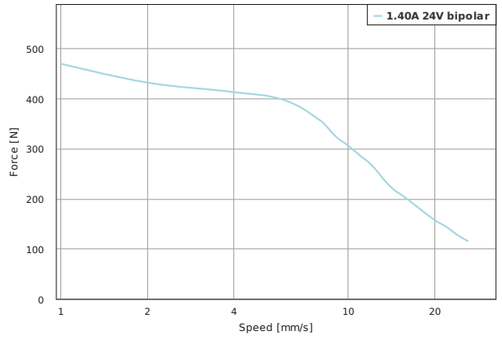
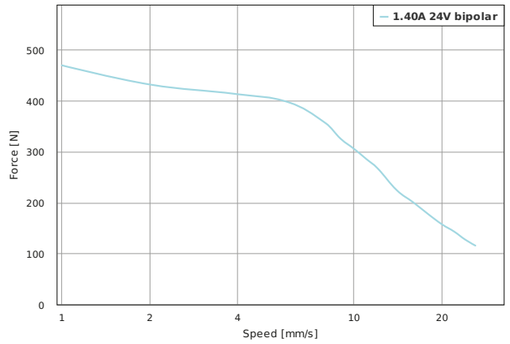


FORCE-VELOCITY CURVES

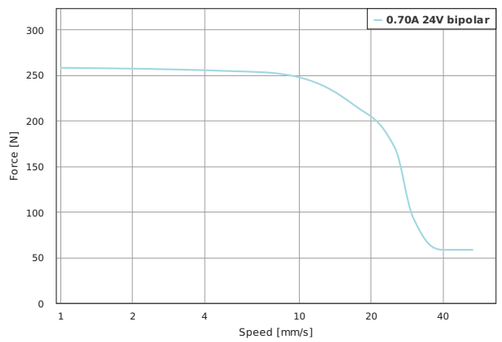
LGA421S14-A-TJBA-038



LGA421S14-B-TJBA-038



LGA421S14-A-TJCA-019



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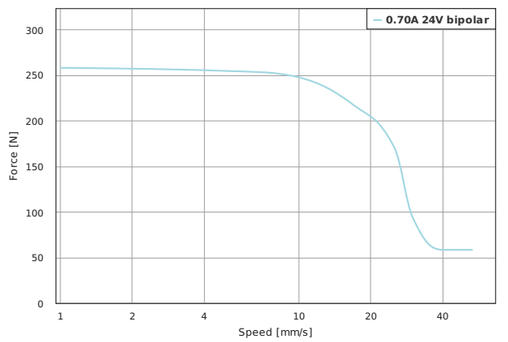

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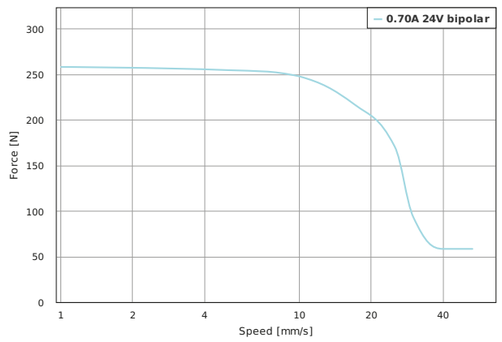

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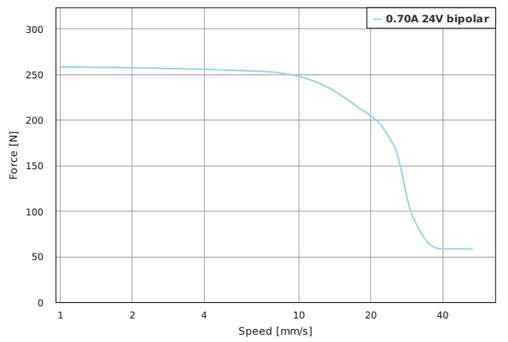
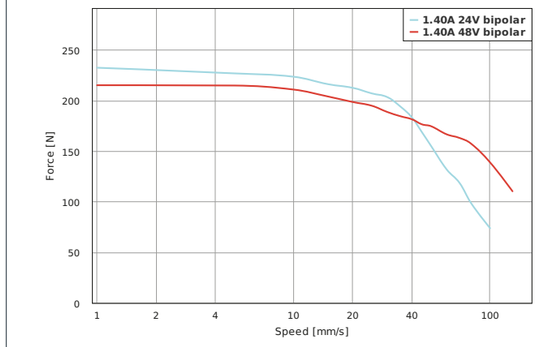


LGA42
Captive linear actuator – NEMA 17

FORCE-VELOCITY CURVES

LGA421S14-A-UIEV-019



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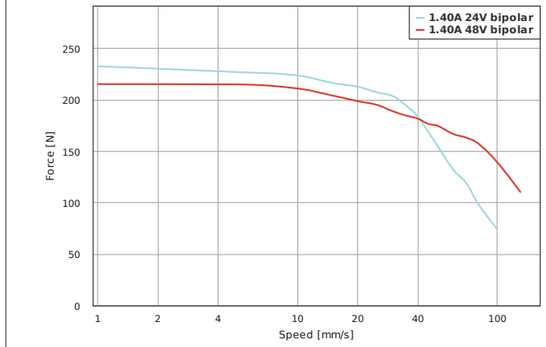

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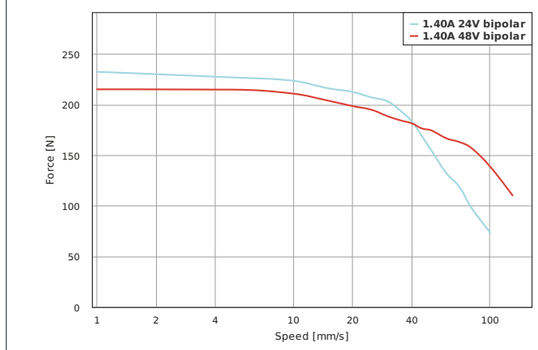

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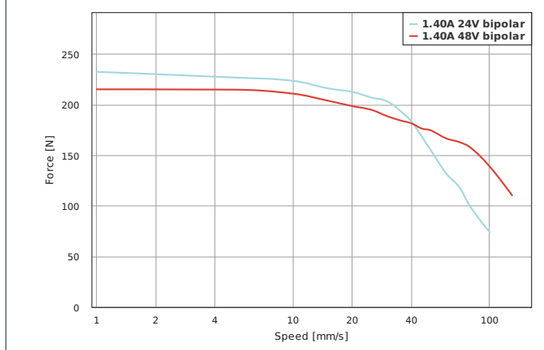

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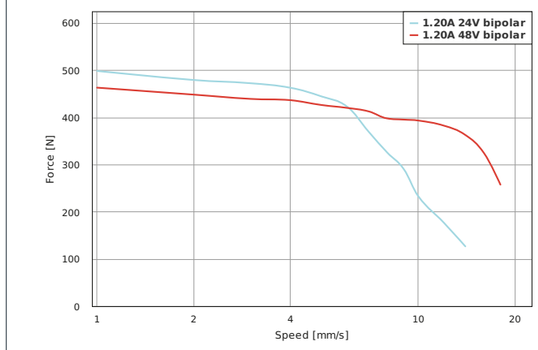

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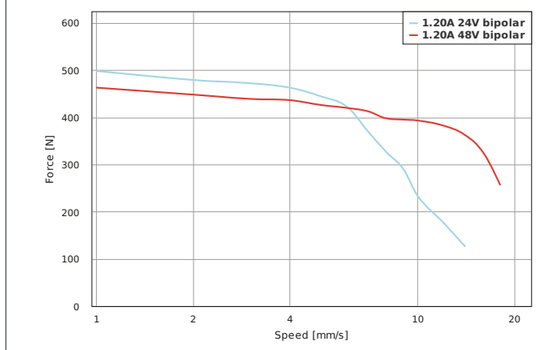
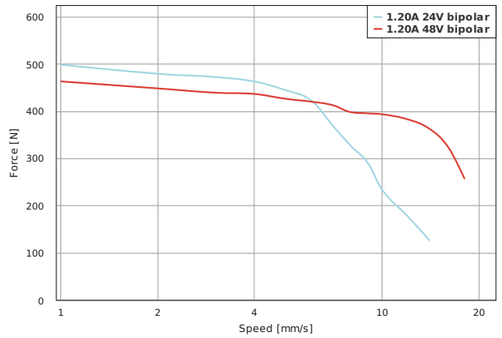


FORCE-VELOCITY CURVES

LGA421S14-A-UKAS-038



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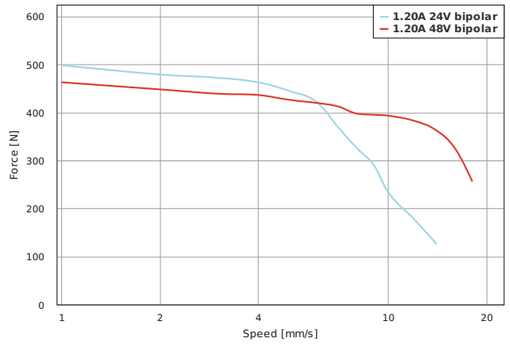

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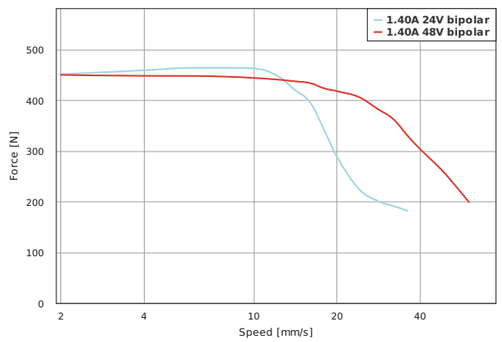

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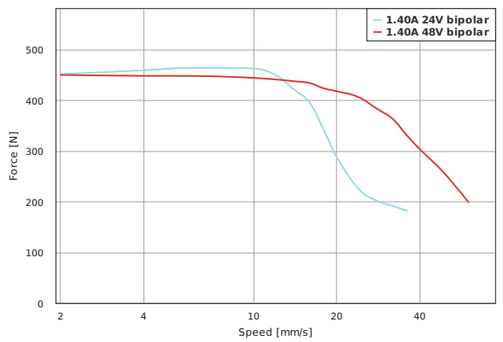

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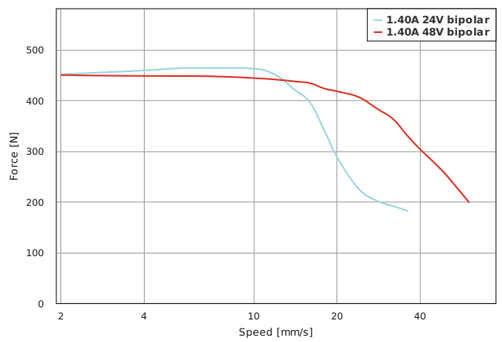

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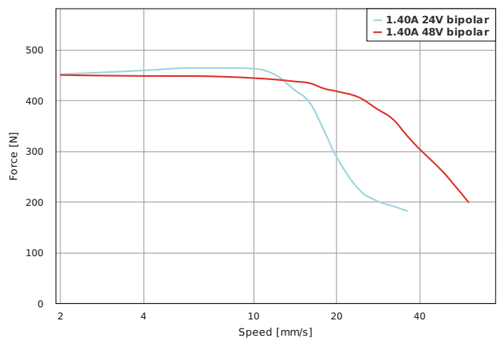
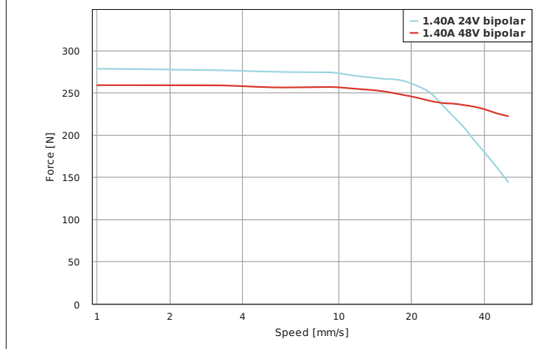


LGA42
Captive linear actuator – NEMA 17

FORCE-VELOCITY CURVES

LGA421S14-A-UKDE-019



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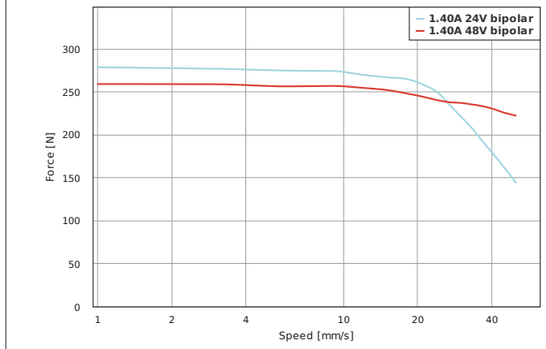

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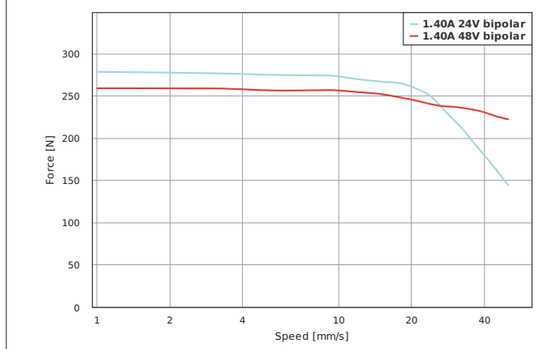

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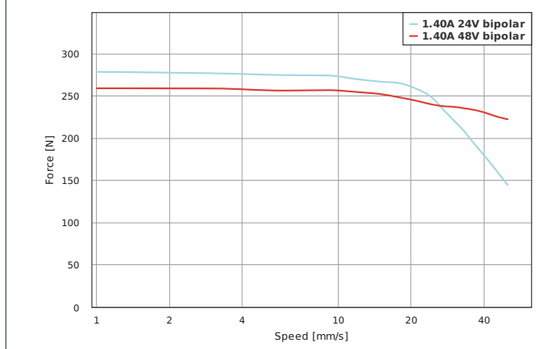

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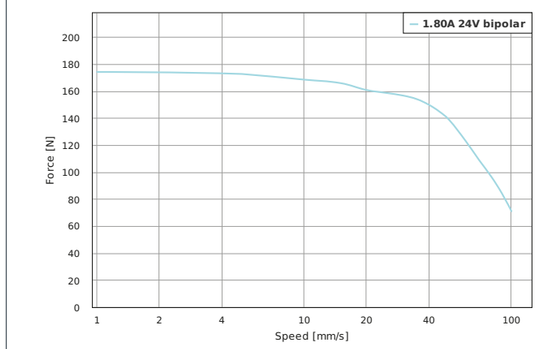

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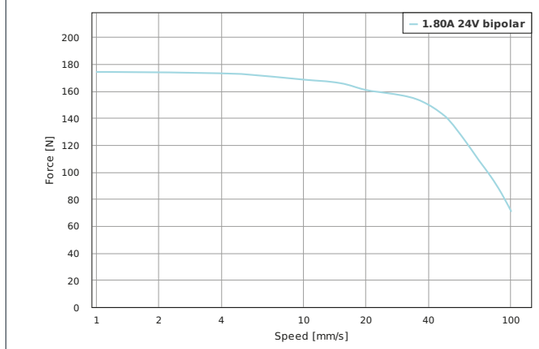
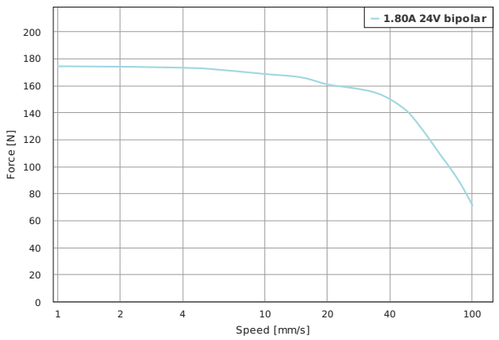


LGA42

Captive linear actuator – NEMA 17

FORCE-VELOCITY CURVES

LGA421S14-A-UKGI-038



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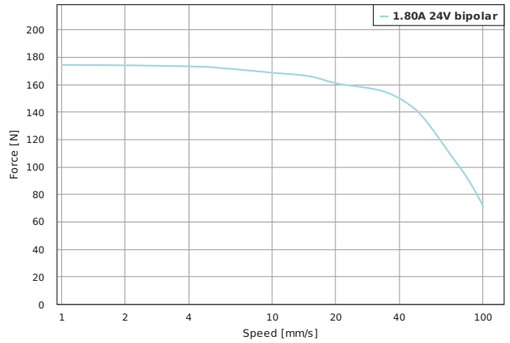
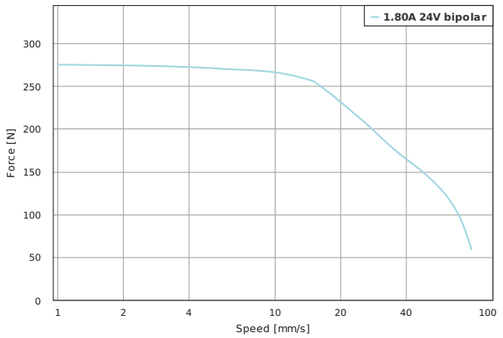


LGA421L18-B-UKGI-025



Notes

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	258.3	55	1.4	10	2	2.8	6	2	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

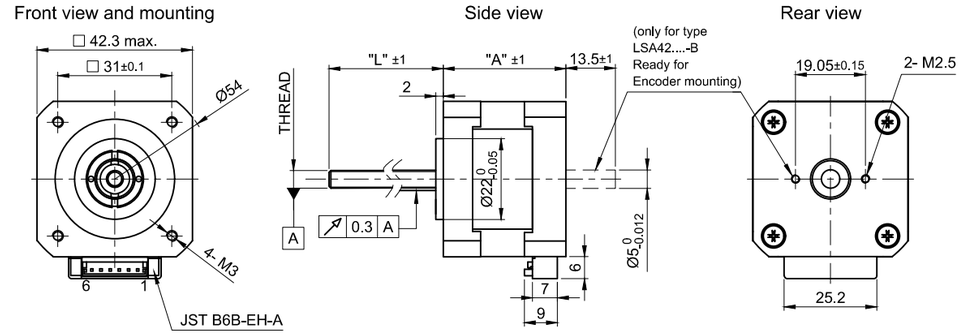
External linear actuator – NEMA 17

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

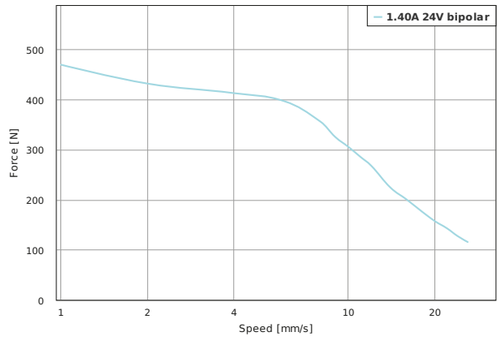
DIMENSIONS (IN MM)

LSA42



FORCE-VELOCITY CURVES

LSA421S14-A-TJBA-152



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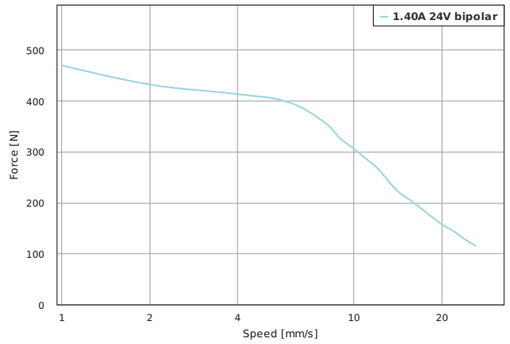

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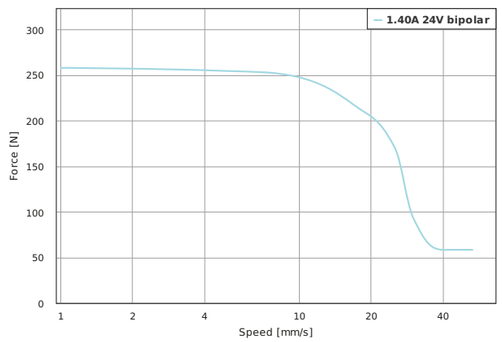

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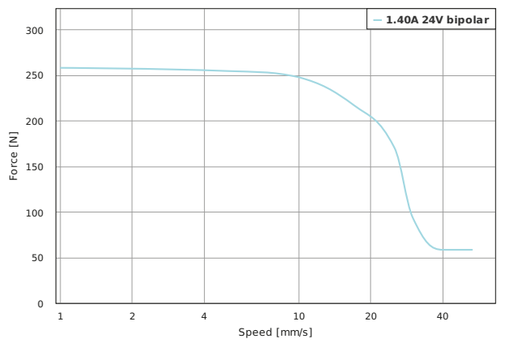

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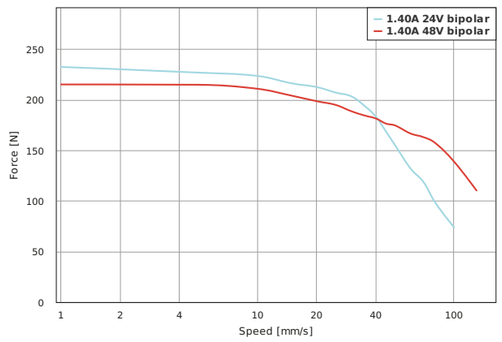

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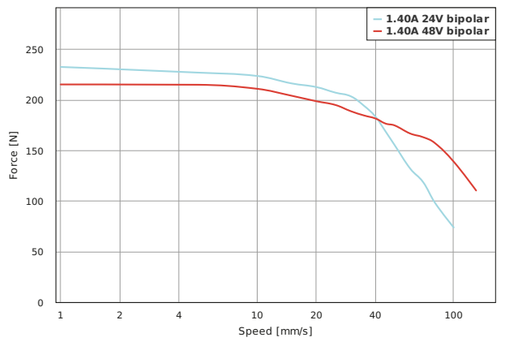
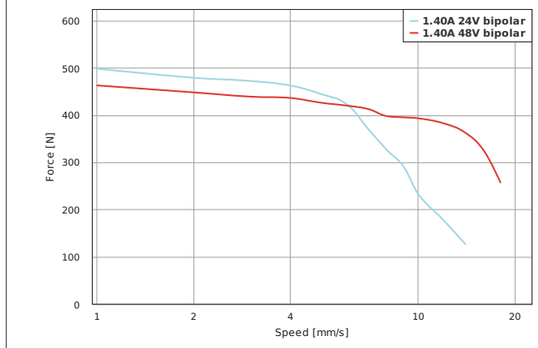


LSA42
External linear actuator – NEMA 17

FORCE-VELOCITY CURVES

LSA421S14-A-UKAS-152



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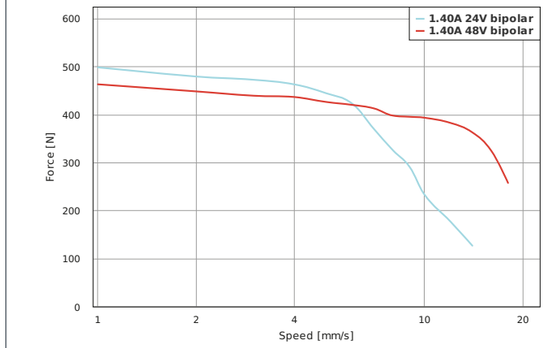

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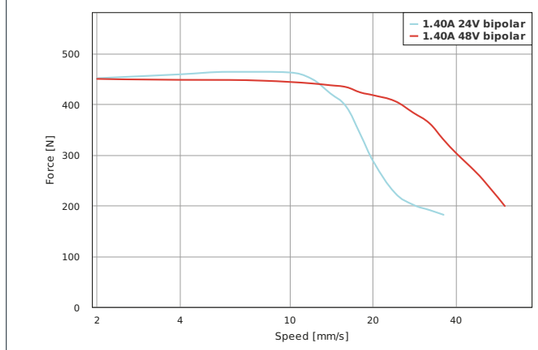

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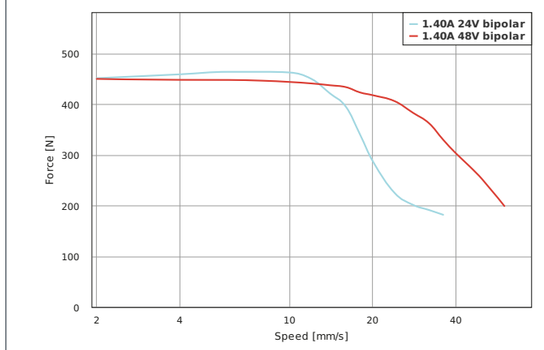

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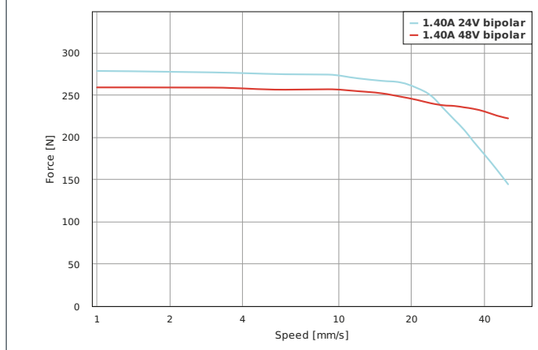

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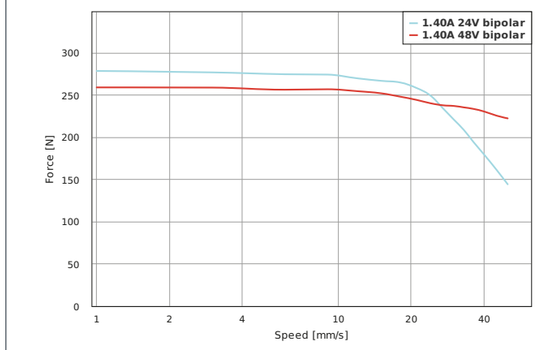
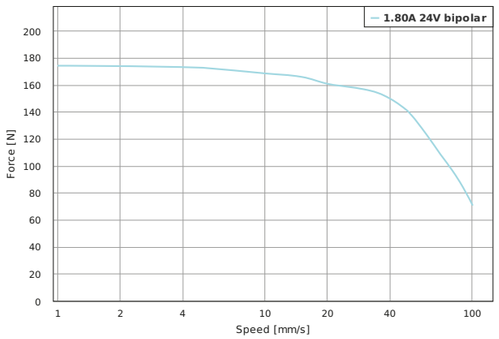


LSA42

External linear actuator – NEMA 17

FORCE-VELOCITY CURVES

LSA421S14-A-UKGI-152



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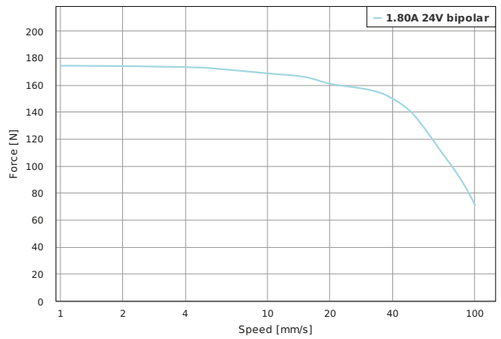
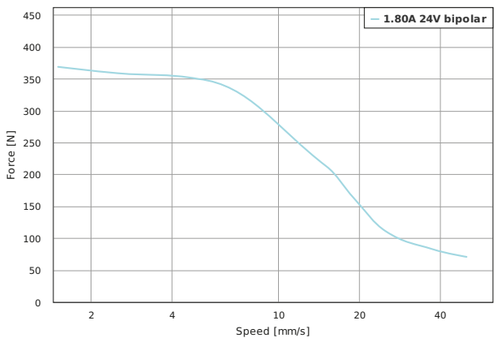


LSA421L18-B-TJCA-152



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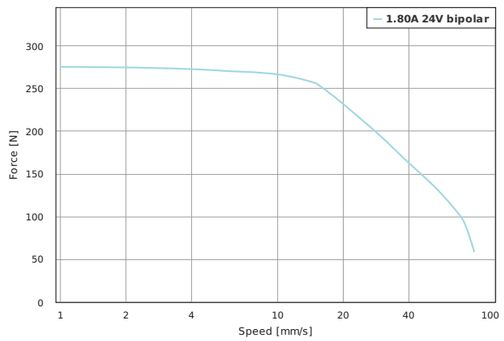


Notes

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

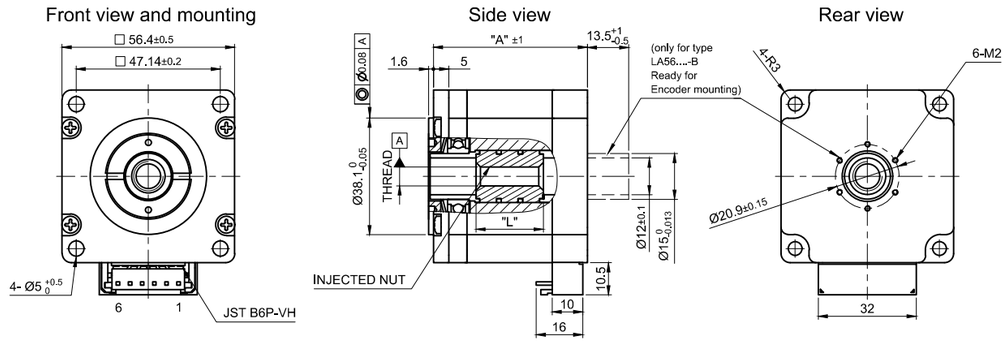
ACCESSORIES

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

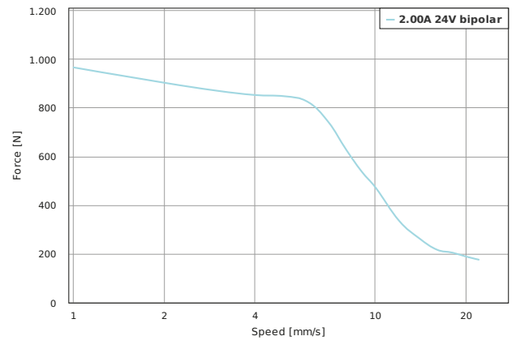
DIMENSIONS (IN MM)

LA56

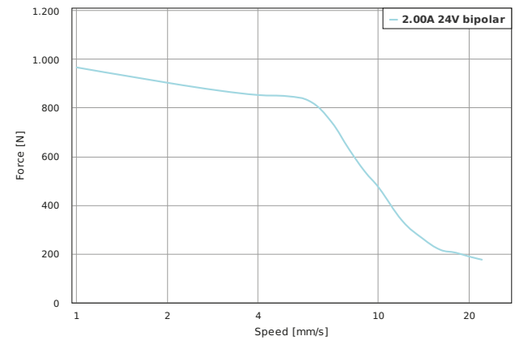


FORCE-VELOCITY CURVES

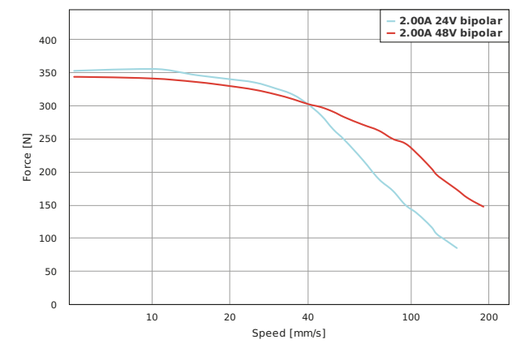
LA561S20-A-UQBN



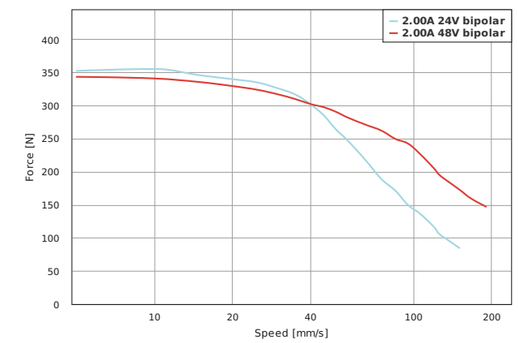
LA561S20-B-UQBN



LA561S20-A-UQKE



LA561S20-B-UQKE

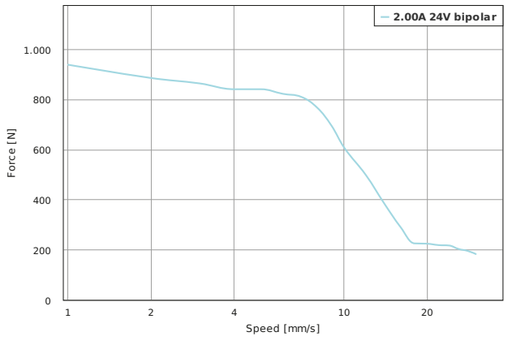


LA56

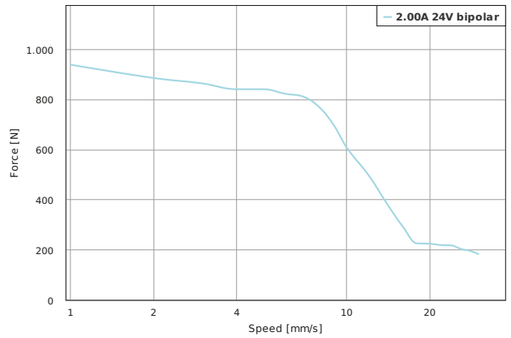
Non-captive linear actuator – NEMA 23

FORCE-VELOCITY CURVES

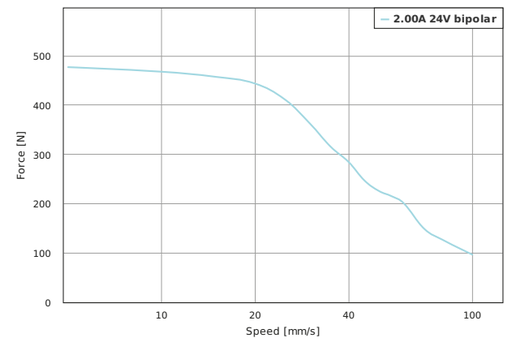
LA561S20-A-TSCA



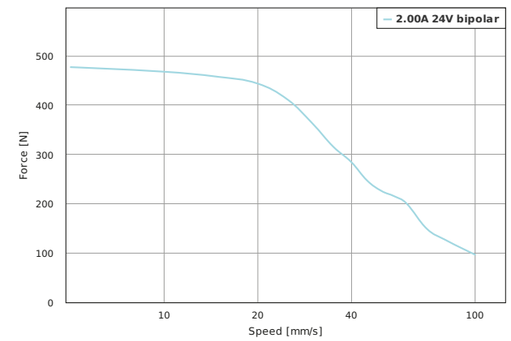
LA561S20-B-TSCA



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

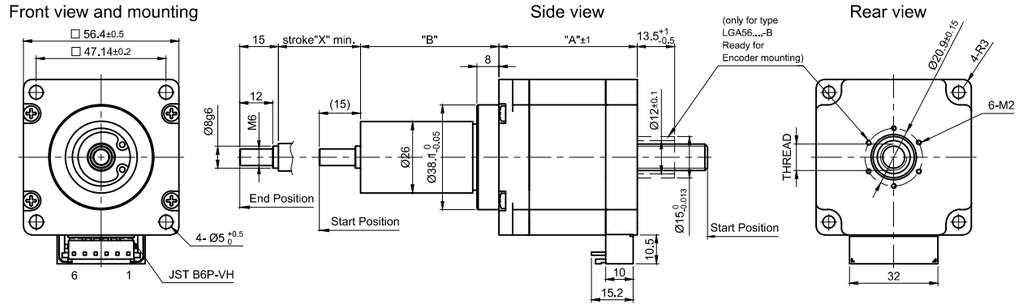
ZK-VHR-6-300-4 Motor cable SCA56, SCB56, LA56, LSA56, 0.3m

LGA56

Captive linear actuator – NEMA 23

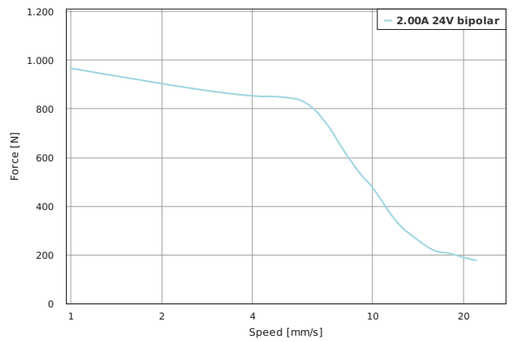
DIMENSIONS (IN MM)

LGA56

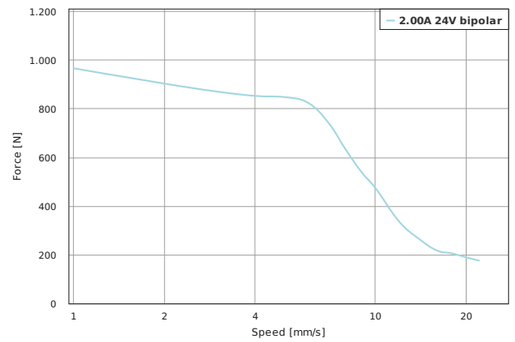


FORCE-VELOCITY CURVES

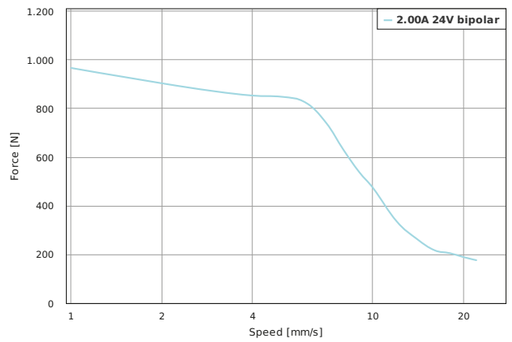
LGA561S20-A-UQBN-019



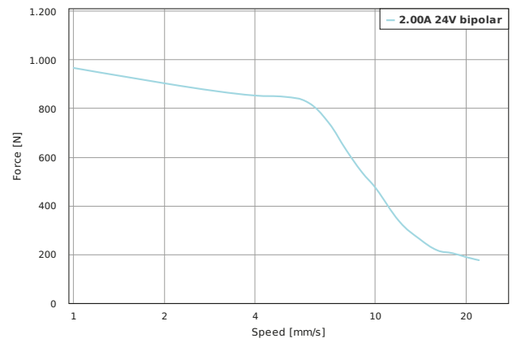
LGA561S20-B-UQBN-019



LGA561S20-A-UQBN-038

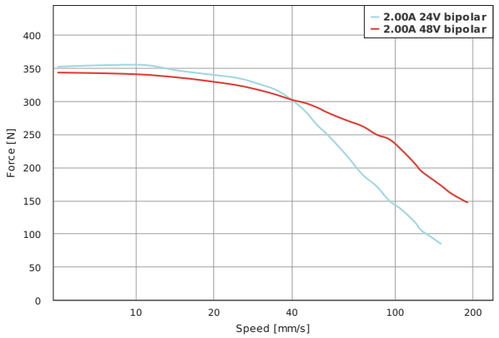


LGA561S20-B-UQBN-038



FORCE-VELOCITY CURVES

LGA561S20-A-UQKE-019



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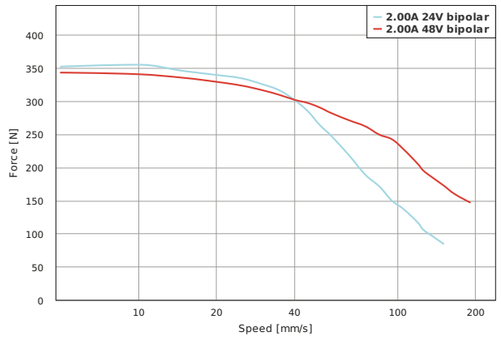

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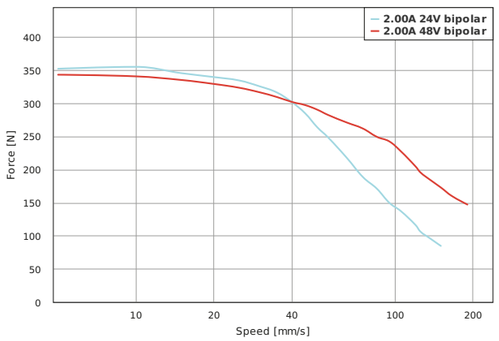

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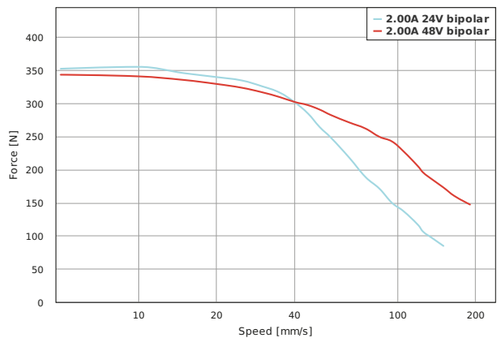
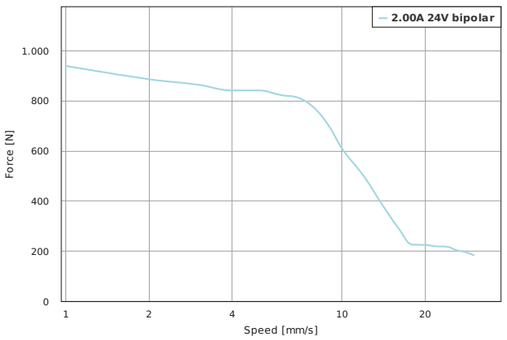


LGA561S20-A-TSCA-019



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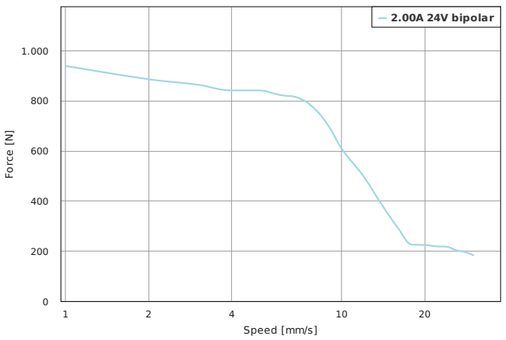
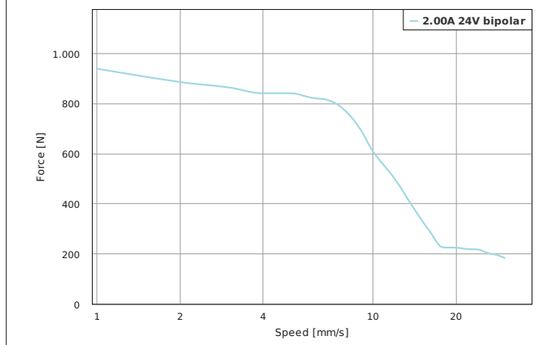


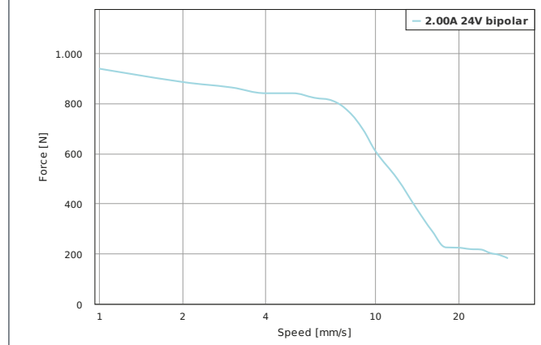
LGA56
Captive linear actuator – NEMA 23

FORCE-VELOCITY CURVES

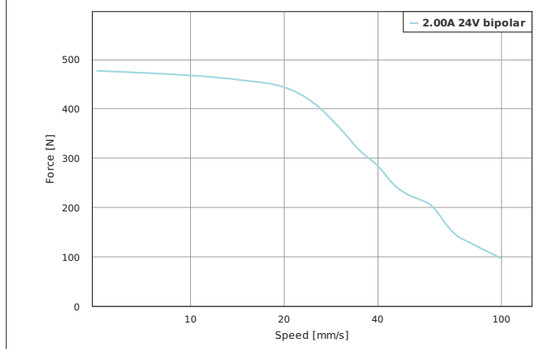
LGA561S20-A-TSCA-038



LGA561S20-B-TSCA-038



LGA561S20-A-TSGA-019



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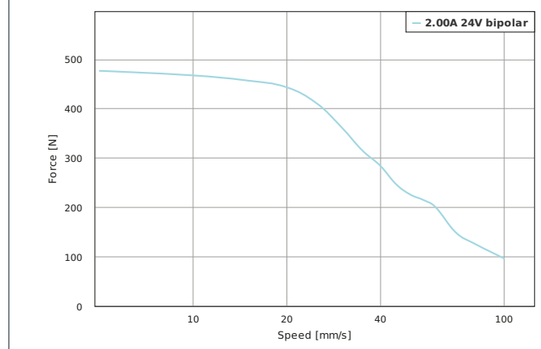

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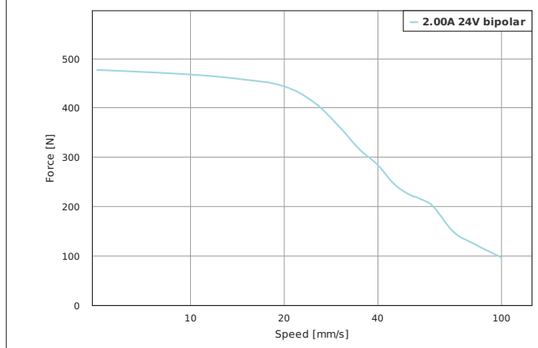

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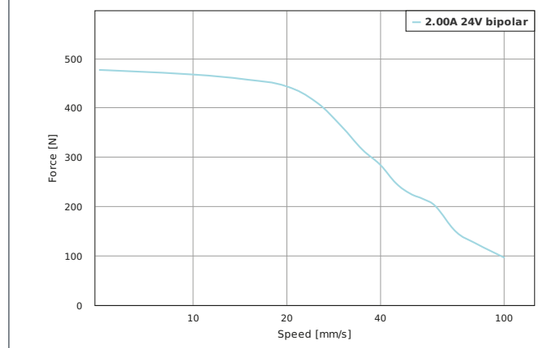
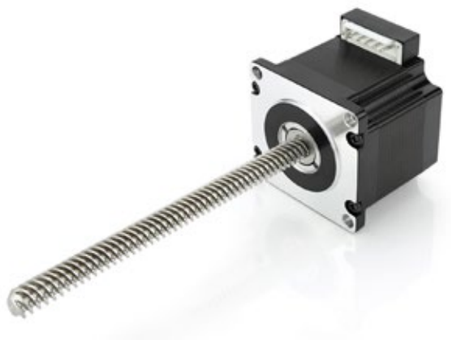


LSA56

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

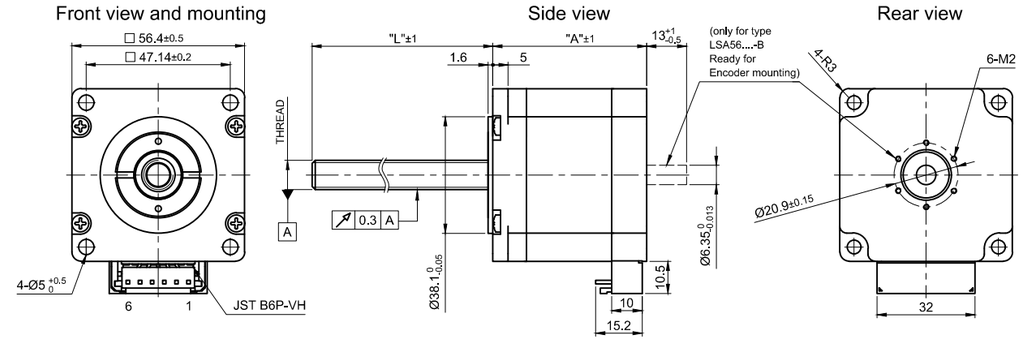
LSNUT-AAAG-UQBN Threaded nut
LSNUT-AAAG-UQKE Threaded nut
LSNUT-AAAG-TSCA Threaded nut
LSNUT-AAAG-TSGA Threaded nut
LSNUT-AGAJ-UQBN Anti-backlash threaded nut with torsion spring
LSNUT-AGAJ-UQKE Anti-backlash threaded nut with torsion spring
LSNUT-AGAJ-TSCA Anti-backlash threaded nut with torsion spring
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

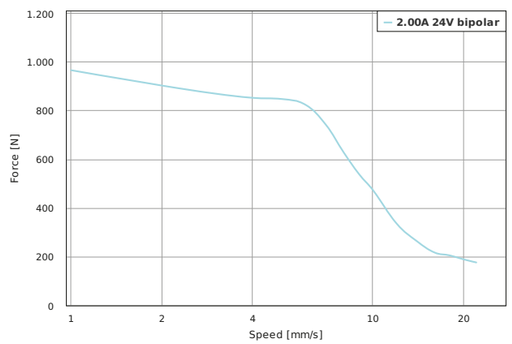
DIMENSIONS (IN MM)

LSA56

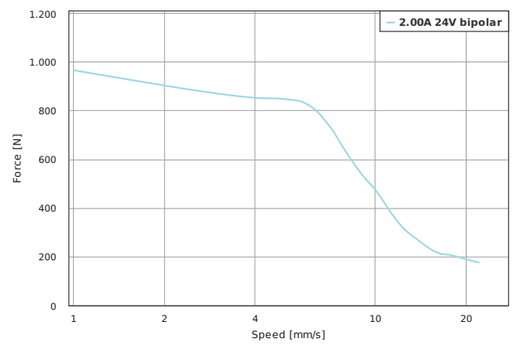


FORCE-VELOCITY CURVES

LSA561S20-A-UQBN-152



LSA561S20-B-UQBN-152



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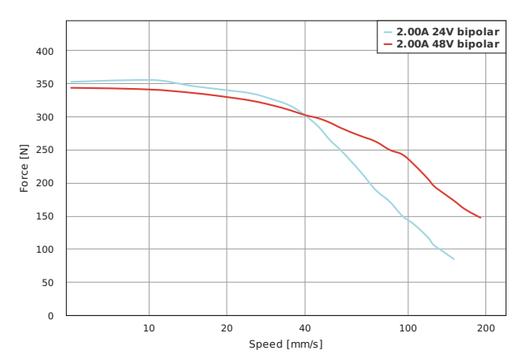

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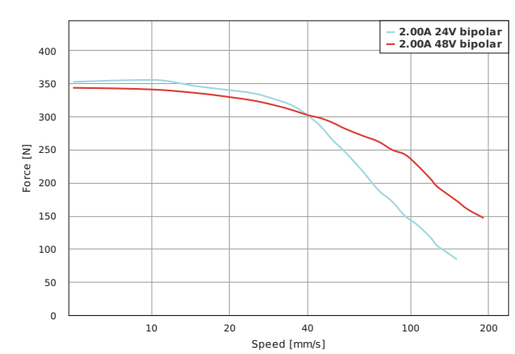
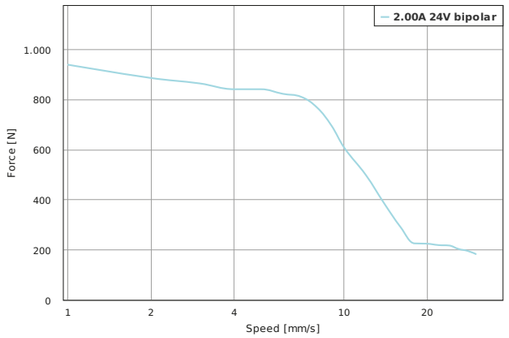


LSA56

External linear actuator – NEMA 23

FORCE-VELOCITY CURVES

LSA561S20-A-TSCA-152



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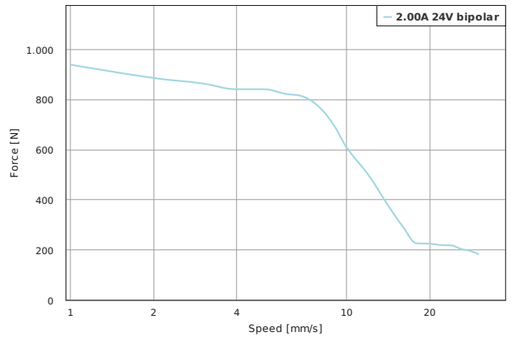
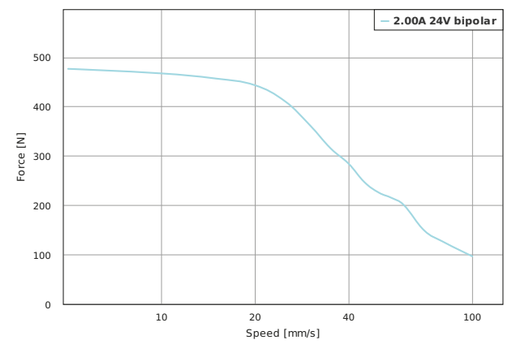
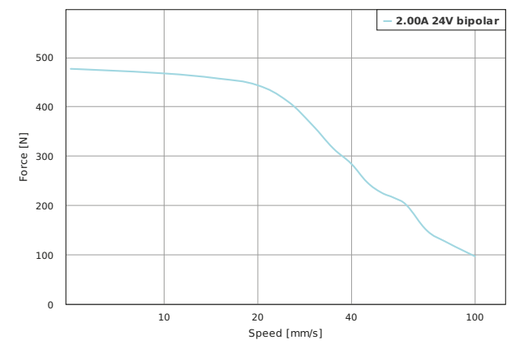


LSA561S20-A-TSGA-152

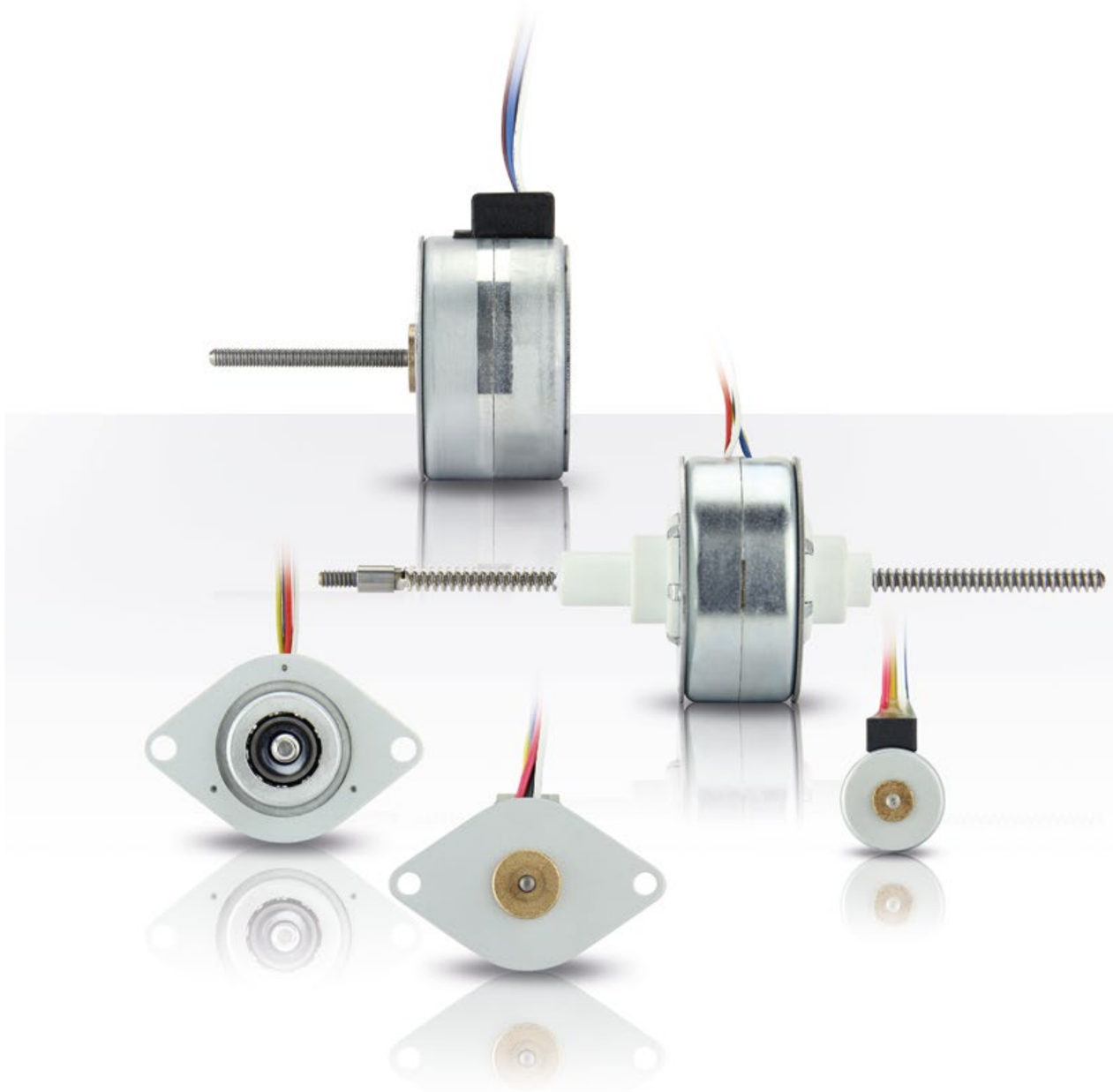


LSA561S20-B-TSGA-152



Notes

Notes



LSP15-LSP42

Permanent-magnet external linear actuators

OPTIONS

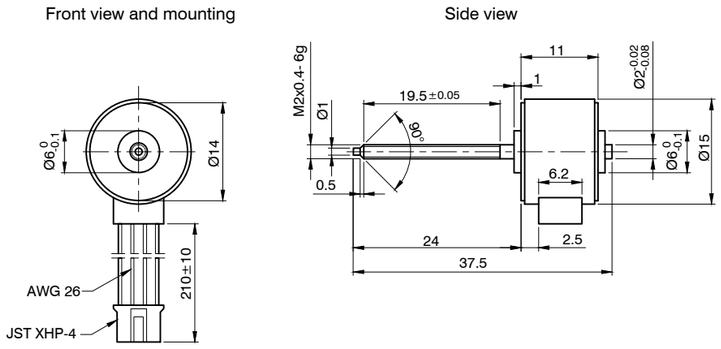
Controller

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

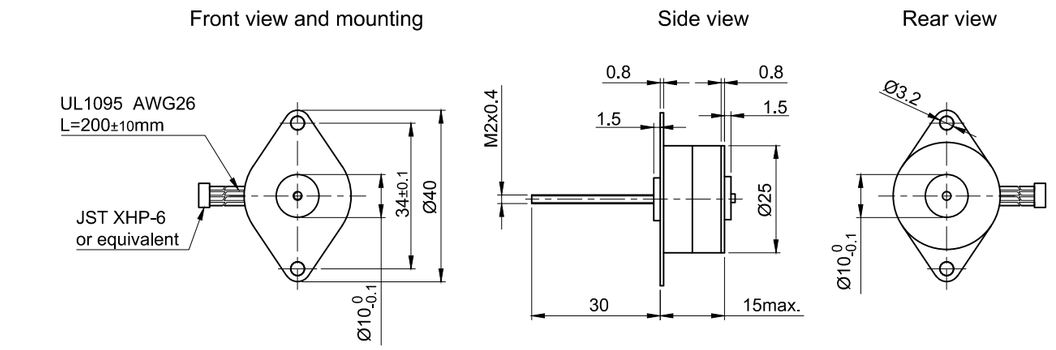


LSP15-LSP42

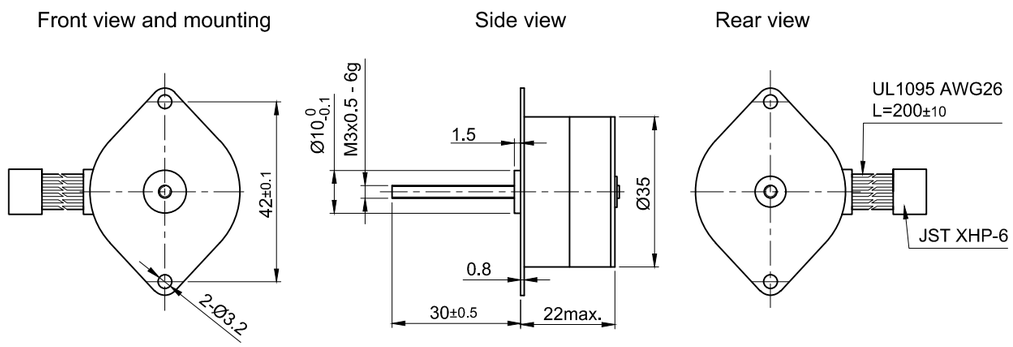
Permanent-magnet external linear actuators

DIMENSIONS (IN MM)

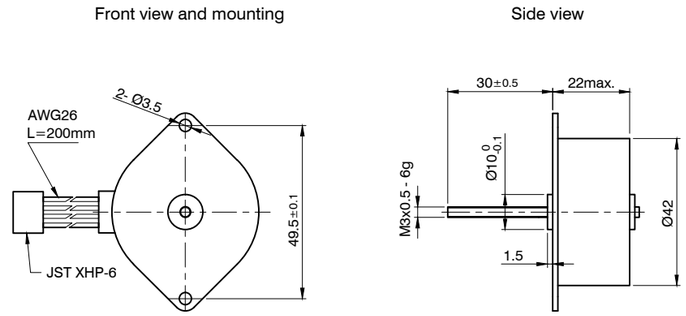
LSP2575M0506



LSP3575M0206

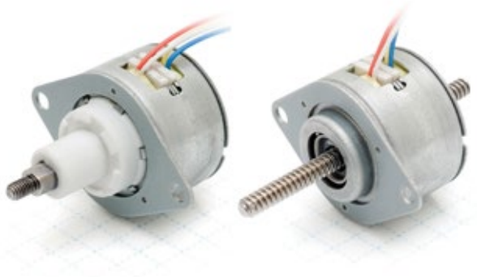


LSP4275M0206



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

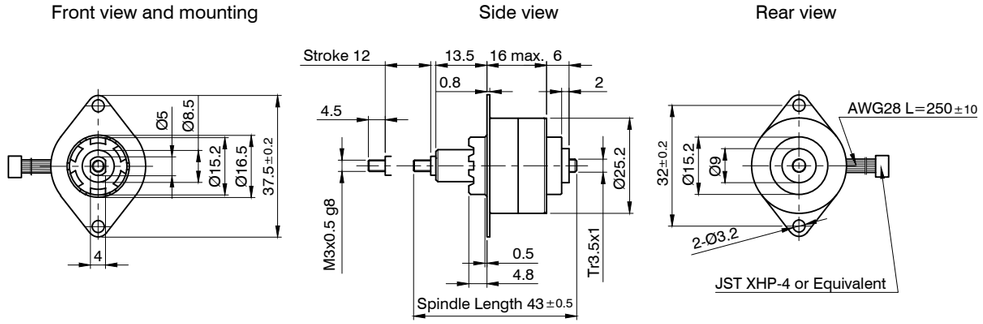
This linear actuator is available in a captive version (LPV2515S0104-TR3,5x1) and a non-captive version.

LP(V)25-LP35

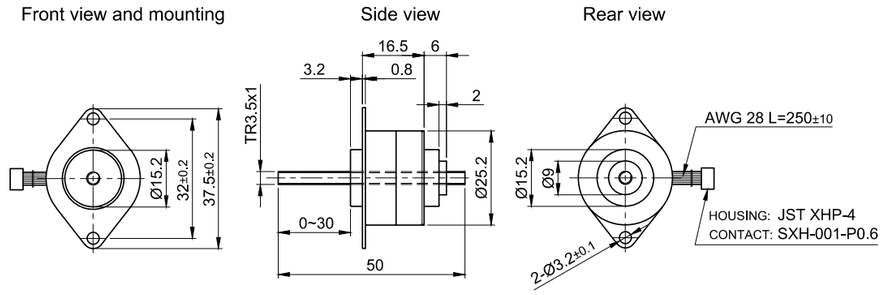
Permanent magnet linear actuators

DIMENSIONS (IN MM)

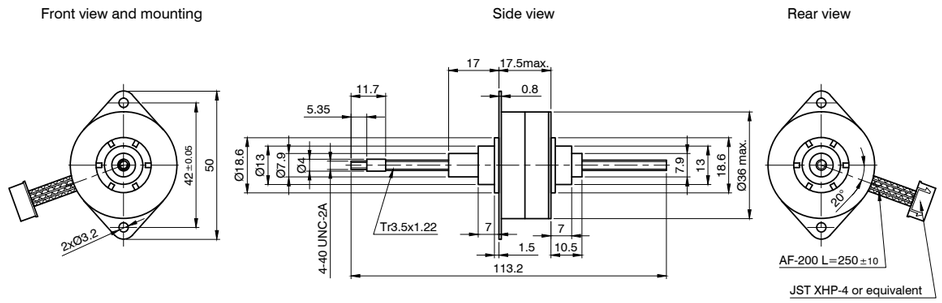
LPV2515S0104



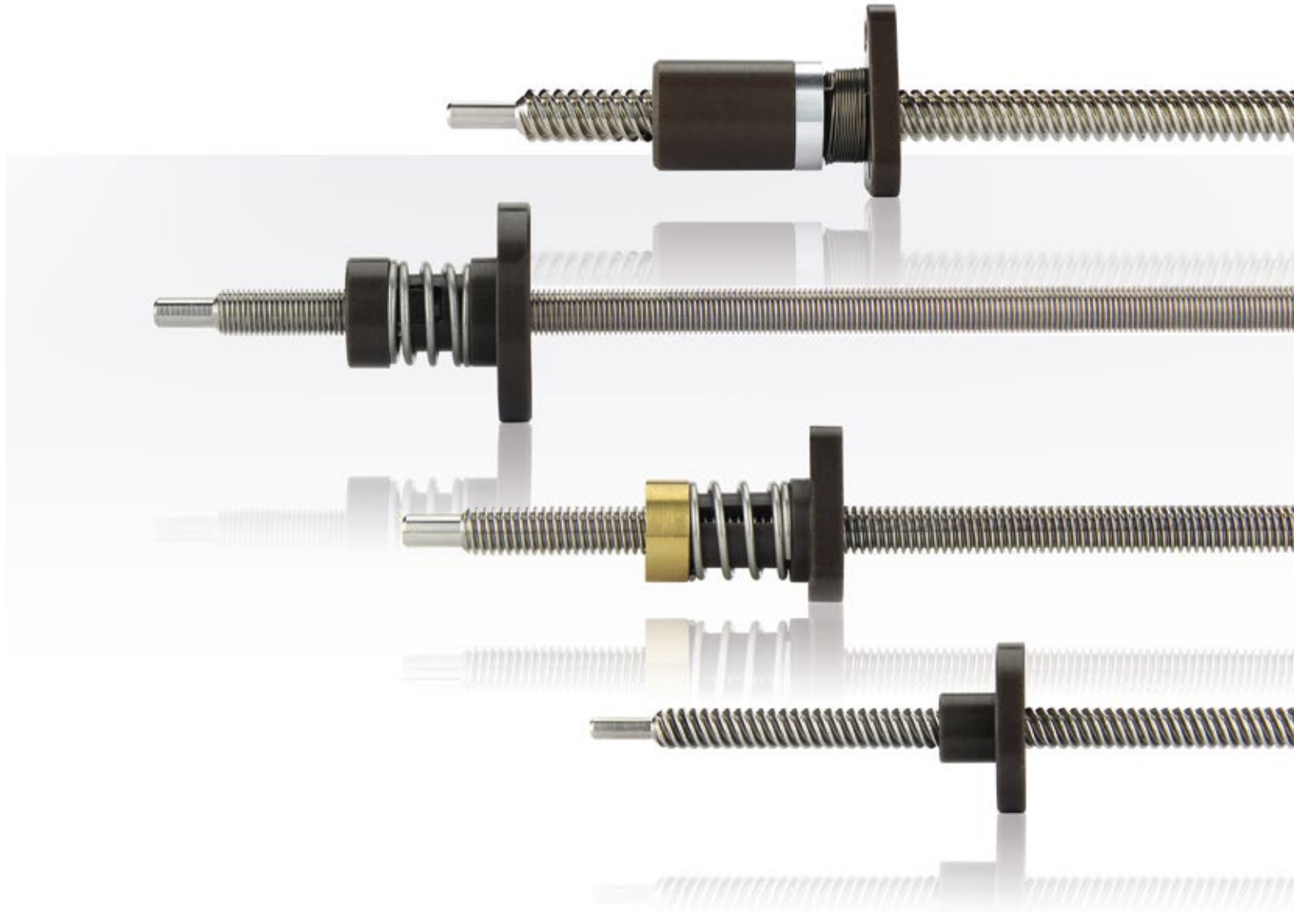
LP2515S0104



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

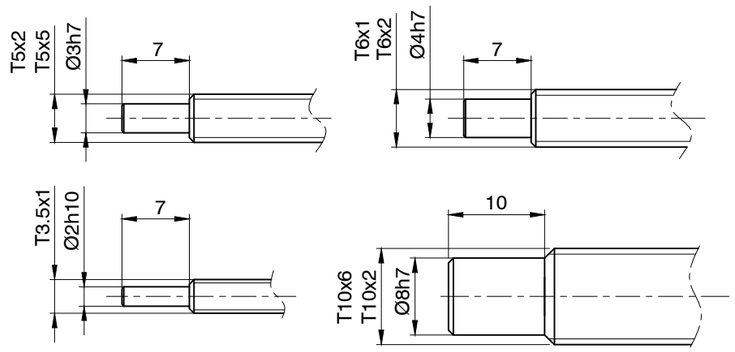
Screw Material	stainless (not resistant to acid and salt water)
Tensile Strength	760 N/mm²
Thread Lead Delay	±0.1/300 mm travel

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...

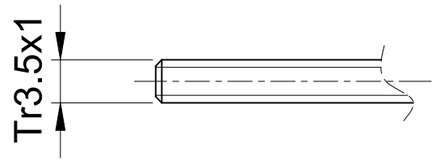


Lead screw

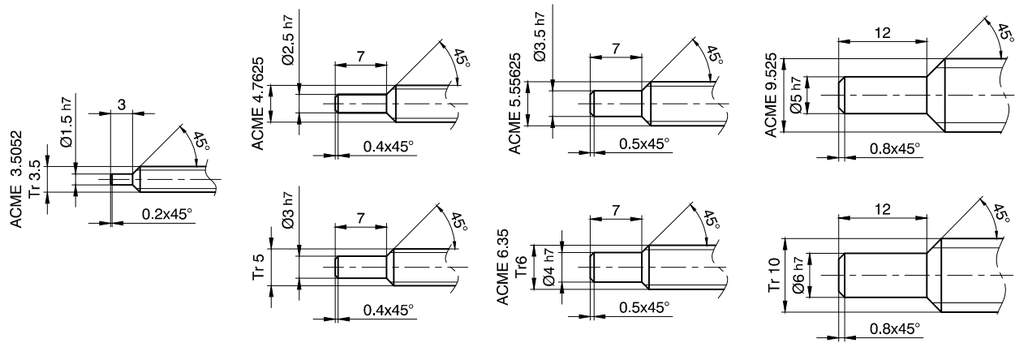
with trapezoidal thread

DIMENSIONS (IN MM)

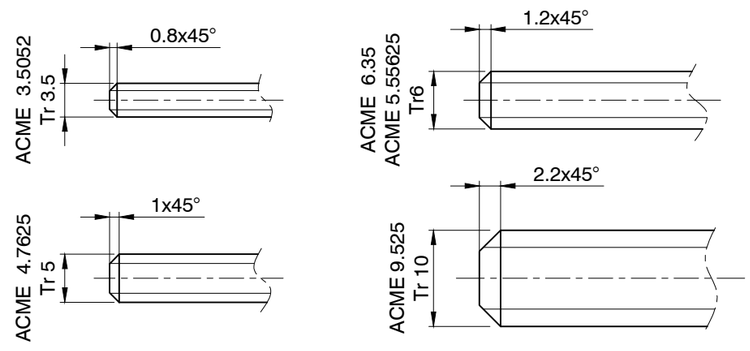
ZST3,5-1-500



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

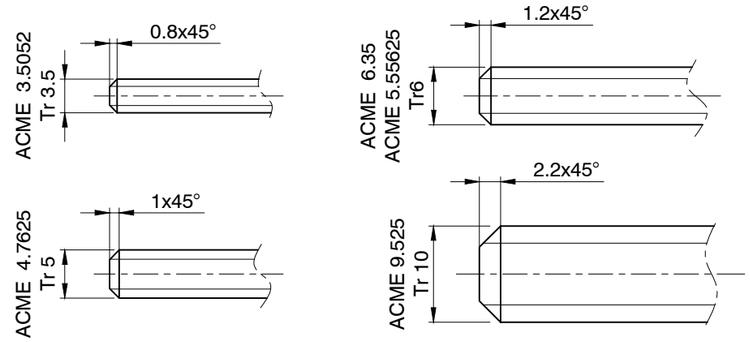
Type	Thread Diameter mm	Core Diameter mm	Thread Lead mm	Corresponding Motors	Standard Axial Play mm	Max. Axial Play mm	Material Number	Screw Length mm
SCREW-ABA-UECB	3.5	1.91	2	LA...-UECB	0.04	±0.07	1.4305	200 - 500
SCREW-ABA-UGAQ	4.76	3.579	0.635	LA...-UGAQ	0.03	±0.06	1.4305	200 - 1000
SCREW-ABA-UGFC	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

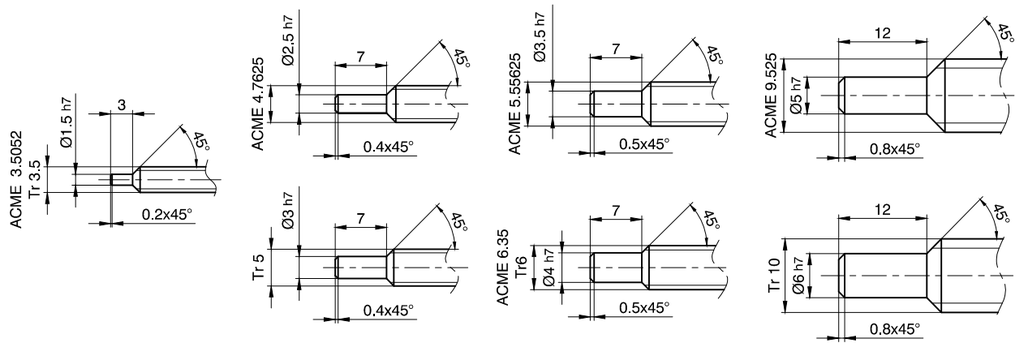
with ACME thread

DIMENSIONS (IN MM)

SCREW-AAA-...



SCREW-ABA-...



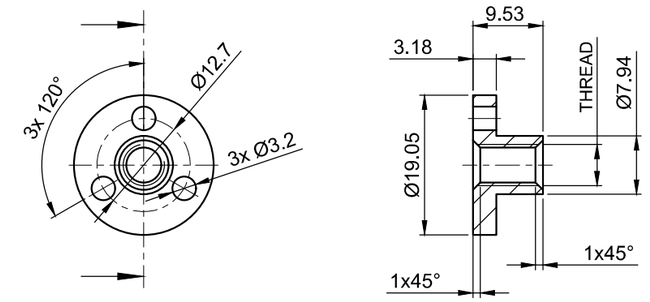
Threaded nut

VERSIONS

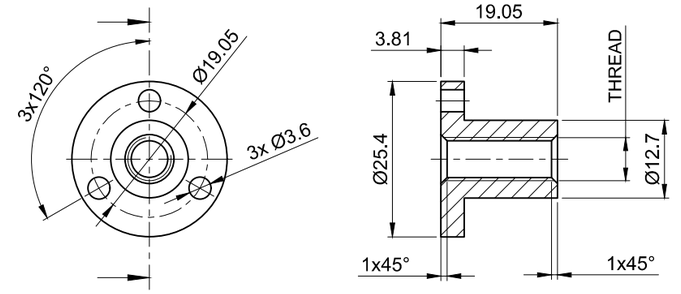
Type	Thread Code	Thread Type	Thread Diameter mm	Thread Lead mm	Number of Threads	Corresponding Motors	Bolt Circle mm	Mounting Hole Diameter mm
LSNUT-AAAA-TDBA	TDBA	Trapezoidal	3.5	1	1	LSA…-TDBA	12.7	3.2
LSNUT-AAAA-UECB	UECB	ACME	3.5	2	2	LSA...UECB	12.7	3.2
LSNUT-AAAA-UGAQ	UGAQ	ACME	4.76	0.635	1	LSA...-UGAQ	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)

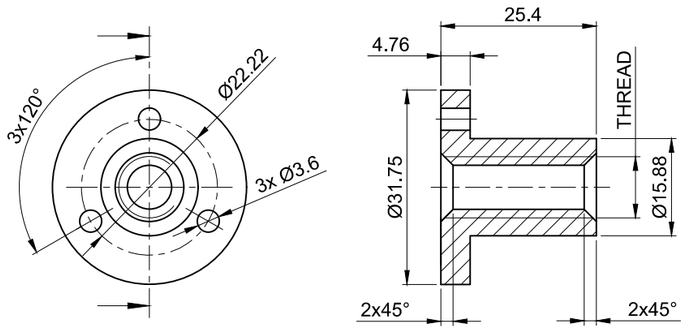
LSNUT NEMA 8/11



LSNUT NEMA 14/17



LSNUT-AAAG-UQKE



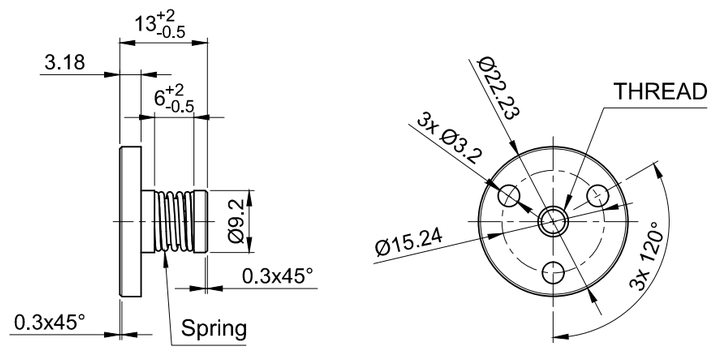
Axial anti-backlash threaded nut with helical spring

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)

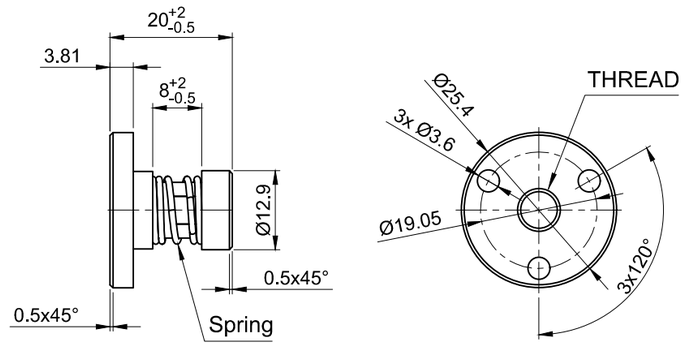
LSNUT-AEAC-TDBA



Axial anti-backlash threaded nut with helical spring

DIMENSIONS (IN MM)

LSNUT NEMA 17



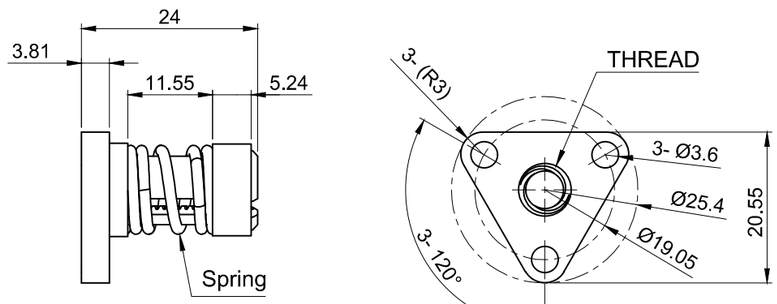
Radial anti-backlash threaded nut with helical spring

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

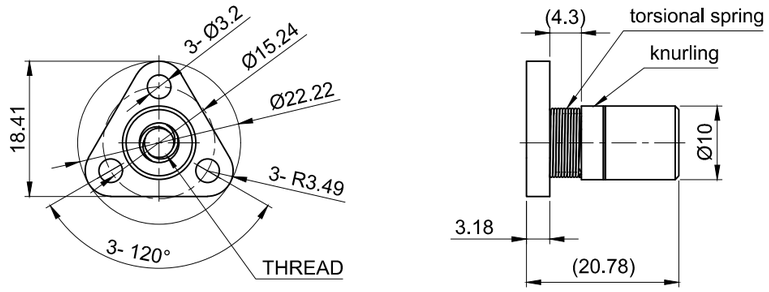
Anti-backlash threaded nut with torsion spring

VERSIONS

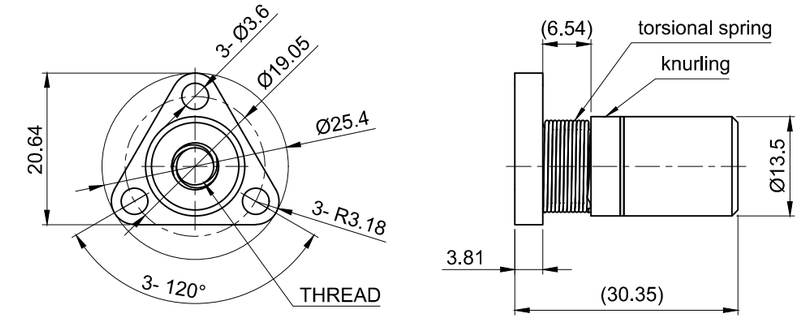
Type	Thread Code	Thread Type	Thread Diameter mm	Thread Lead mm	Number of Threads	Corresponding Motors	Bolt Circle mm	Mounting Hole Diameter mm
LSNUT-AGAC-TDBA	TDBA	Trapezoidal	3.5	1	1	LSA…-TDBA	15.24	3.2
LSNUT-AGAC-UECB	UECB	ACME	3.5	2	2	LSA...UECB	15.24	3.2
LSNUT-AGAC-UGAQ	UGAQ	ACME	4.76	0.635	1	LSA...-UGAQ	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)

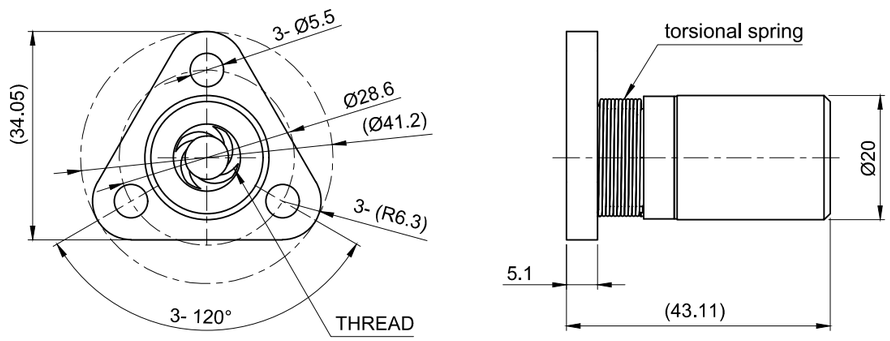
LSNUT NEMA 8,11



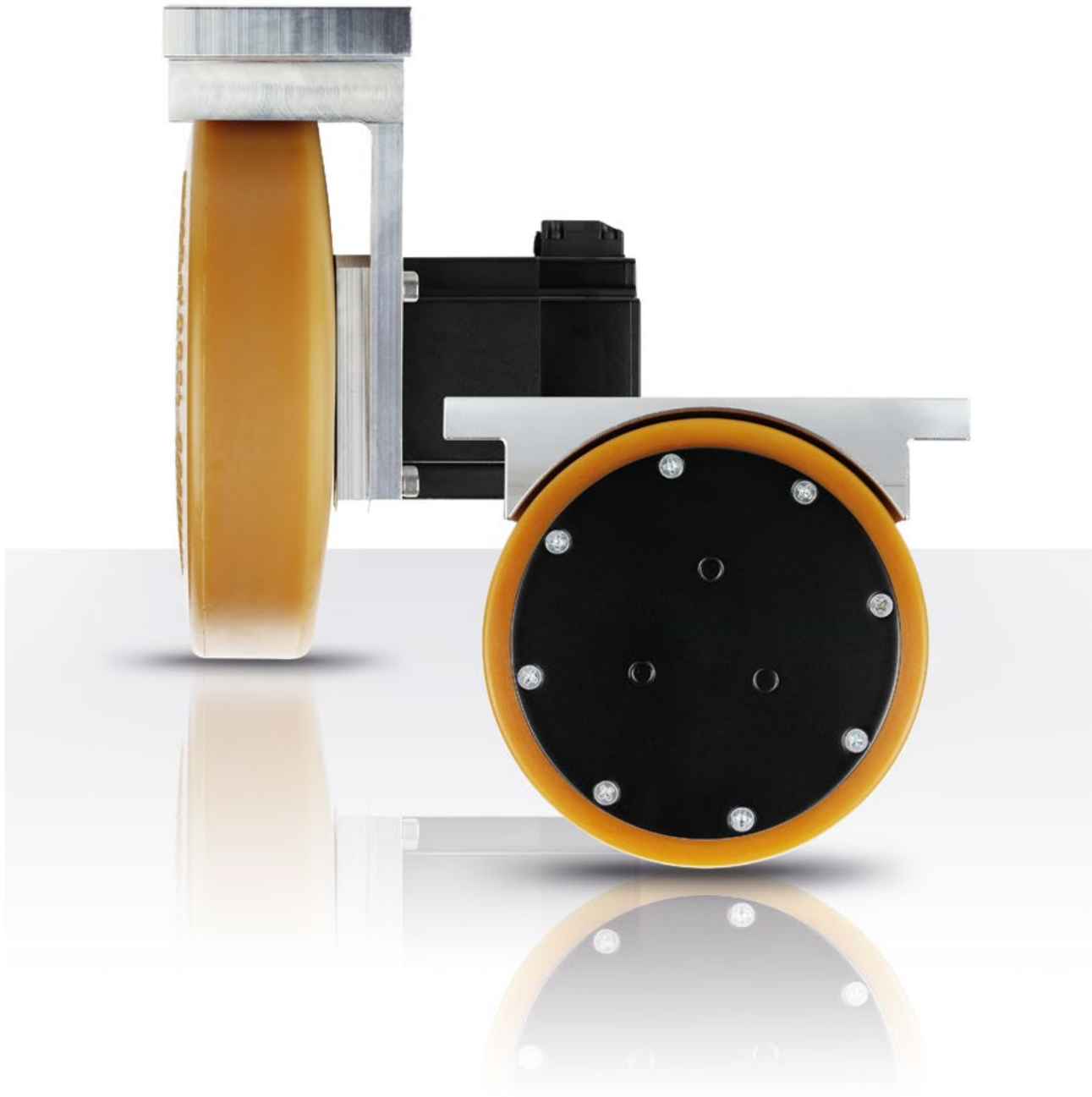
LSNUT NEMA 14,17



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

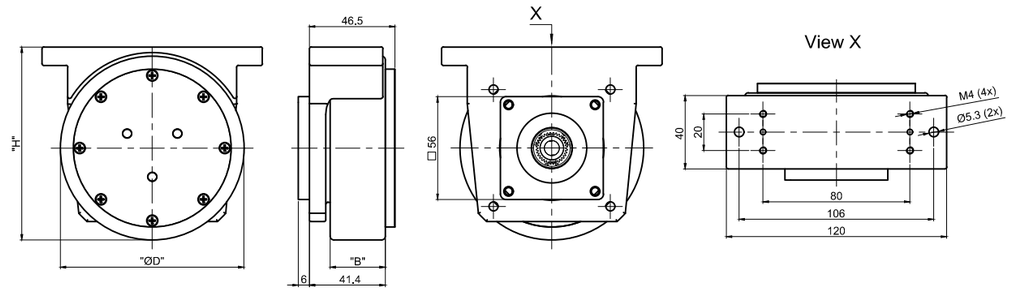
Type	Wheel Diameter mm	Load Capacity kg	Reduction Ratio	Rated Output Torque Nm	Max. Output Torque Nm	For Motor Size	Mounting Bracket
WD10030-5616-23B	100	400	16	24.6	39.4	NEMA 23, NEMA 24	✓
WD14050-5611-23C	140	400	11	19.2	32.9	NEMA 23, NEMA 24	✓
WD14050-5611-23X	140	400	11	19.2	32.9	NEMA 23, NEMA 24	–
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

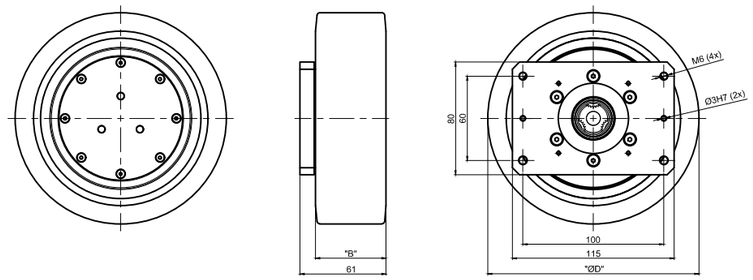
Type	Wheel Diameter mm	Load Capacity kg	Reduction Ratio	Rated Output Torque Nm	Max. Output Torque Nm	For Motor Size	Mounting Bracket
WD16050-5611-80X	160	400	11	19.2	32.9	80 mm (BLDC)	–
WD18050-5611-23F	180	400	11	19.2	32.9	NEMA 23, NEMA 24	✓
WD18050-5611-23X	180	400	11	19.2	32.9	NEMA 23, NEMA 24	–
WD18050-5611-60F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

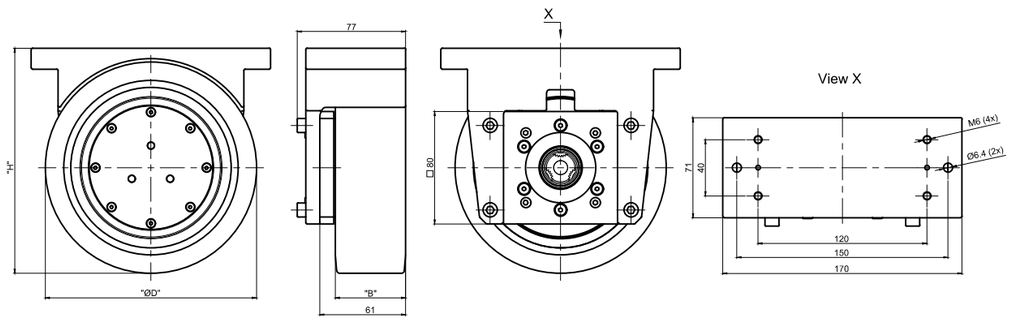
WD10030



WD-X



WD15050



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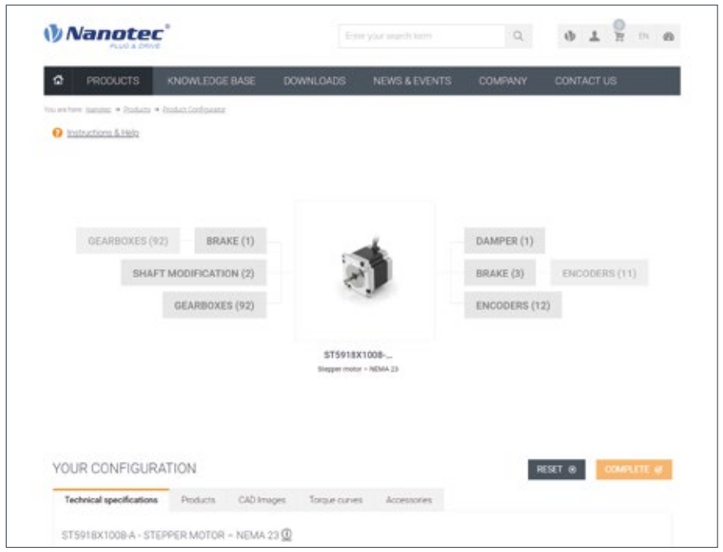


WEDS/WEDL

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

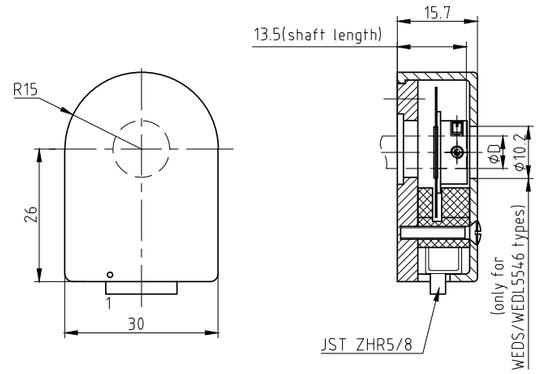
ZK-JZH-8-500-S-JGH Encoder cable WEDL 0.5m
ZK-JZH-8-500-S-JXH Encoder cable WEDL 0.5m
ZK-WEDL-8-500 Encoder cable WEDL, 0.5m
ZK-WEDL-8-500-S Encoder cable WEDL, 0.5m
ZK-WEDL-500-S-PADP Encoder cable WEDL, 0.5m
ZK-WEDL-8-1000-S Encoder cable WEDL, 1m
ZK-WEDL-8-2000-S Encoder cable WEDL, 2m
ZK-WEDS-300-S-SMCI35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

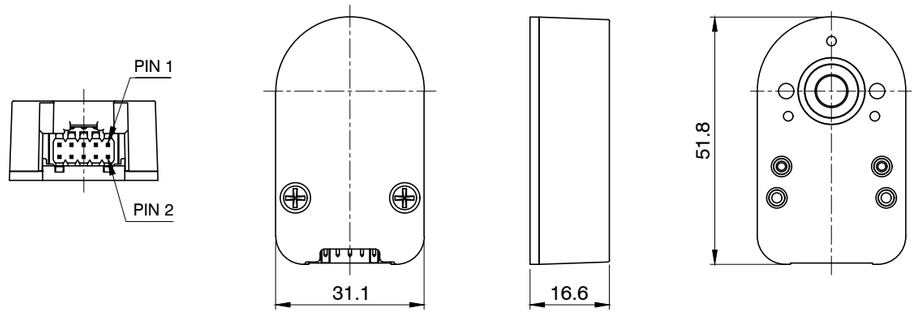
ZK-NTO3-10-500-S Encoder cable NTO3, 0.5m
ZK-NTO3-10-500-PADP Encoder cable NTO3, 0.5m
ZK-NTO3-10-1000-S Encoder cable NTO3, 1m
ZK-NTO3-10-1000-PADP Encoder cable NTO3, 1m
ZK-TM4-10-500-S-JGH Encoder cable NTO3 0.5m
ZK-TM4-10-500-S-JXH Encoder cable NTO3 0.5m

NTO3

Optical 3-channel encoder

DIMENSIONS (IN MM)

NTO3



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

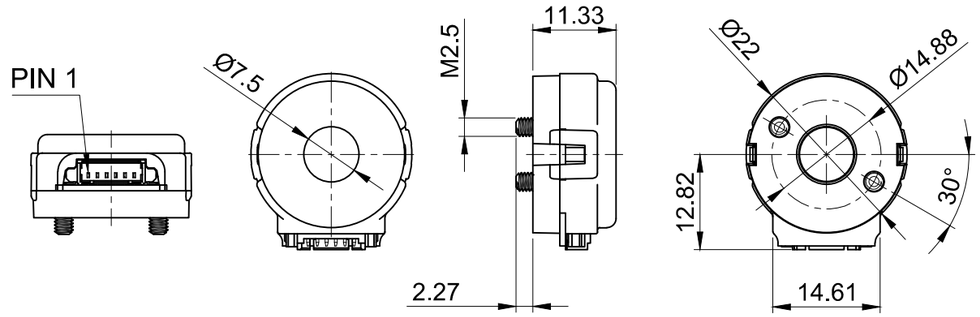
ZK-NTO4L-610 Encoder cable NTO4, 0.61m

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

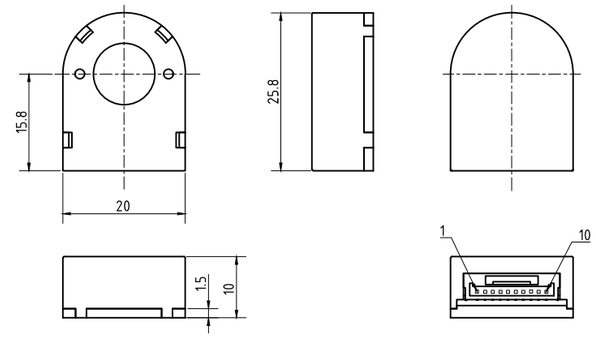
ZK-NOE-10-500-S-PADP Encoder cable NOE, 0.5m
ZK-NOE1-10-2000-S Encoder cable NOE, 2m
ZK-NOE1-10-500-S Encoder cable NOE, 0.5m

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

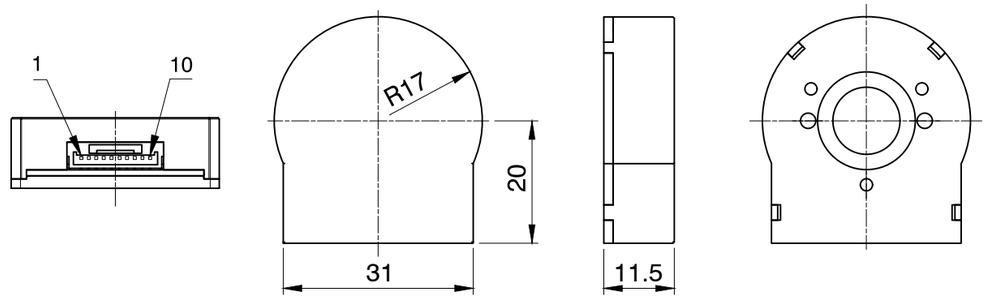
ZK-NOE-10-500-S-PADP Encoder cable NOE, 0.5m
ZK-NOE1-10-2000-S Encoder cable NOE, 2m
ZK-NOE1-10-500-S Encoder cable NOE, 0.5m

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

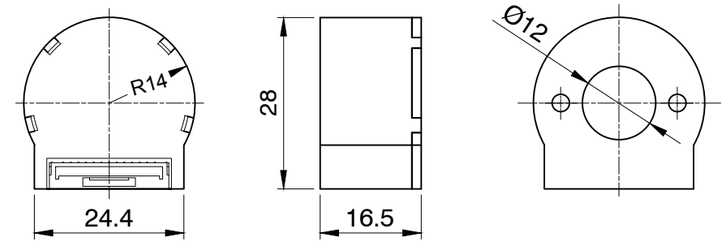
ZK-NME1-13-500-S Encoder cable NME1, 0.5m

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

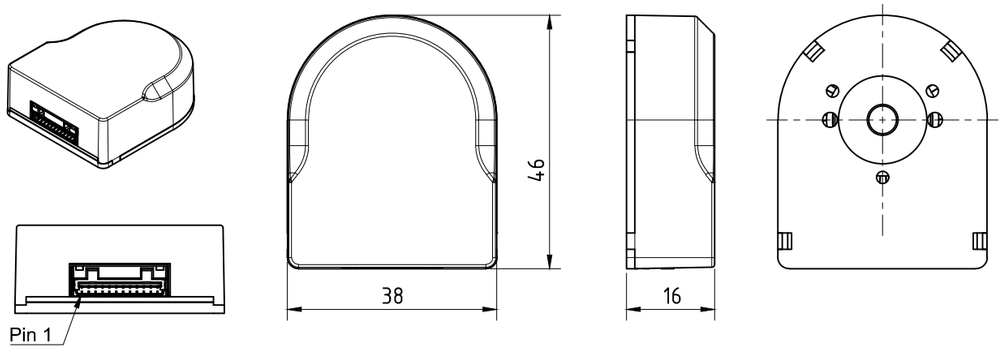
ZK-MCM-12-2,0-S-JPAD Encoder cable NME2/3 2.0m
ZK-MCM-12-500-S-JGH Encoder cable NME2/3 0.5m
ZK-MCM-12-500-S-JPAD Encoder cable NME2/3 0.5m
ZK-MCM-12-500-S-JXH Encoder cable NME2/3 0.5m
ZK-NME2-12-500-S Encoder cable NME2/3 0.5m

NME2

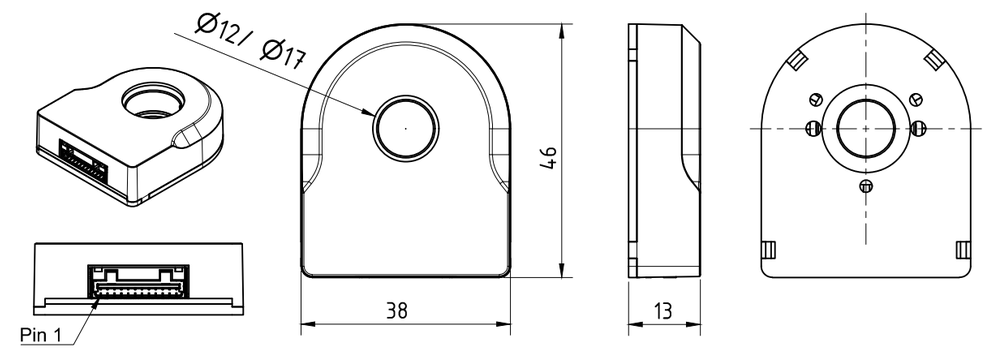
High-resolution magnetic encoder

DIMENSIONS (IN MM)

NME2-C



NME-2-O



NMM1

Multiturn encoder

TECHNICAL DATA

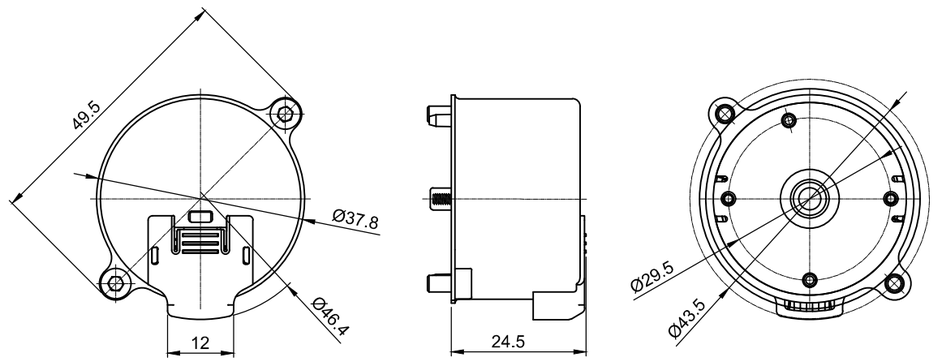
Output Signals	SSI
Limit Speed	12000 RPM
Operating Temperature	-40 °C - 105 °C
Storage Temperature	-40 °C - 105 °C
Humidity	max. 98% (no condensation)

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

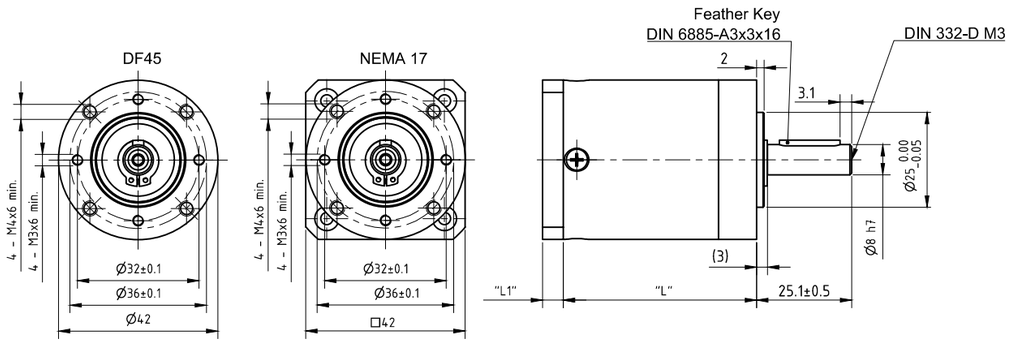
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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

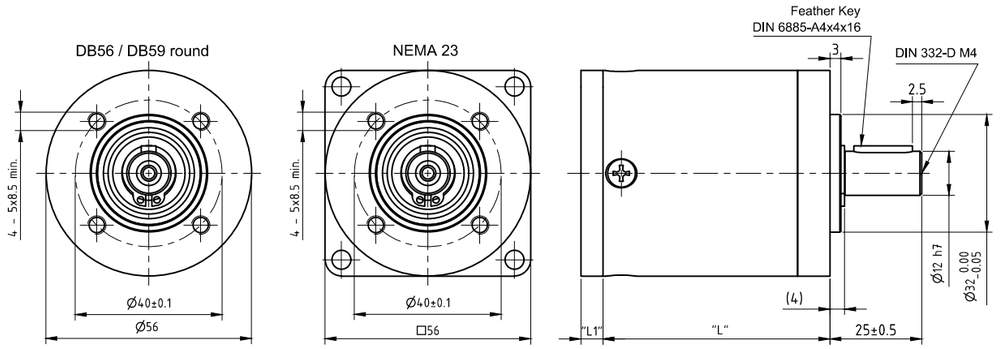
High-torque planetary gearboxes

VERSIONS

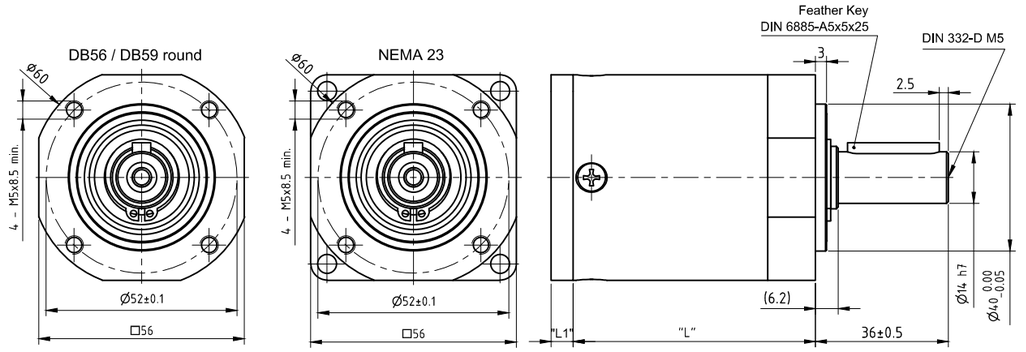
Type	Reduction Ratio	Rated Output Torque Nm	Max. Output Torque Nm	Max. Input Speed rpm	Max. Backlash ´(arc minutes)	Efficiency %	Moment of Inertia kg mm²	
GP56-T2-20-HR	20.03	28.6	39.4	8304	32	94	3.4	1532
GP56-T2-26-HR	25.71	29.1	39.4	8988	32	94	3.7	1532
GP56-T2-33-HR	32.72	21.6	42.7	10913	32	93	2.1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

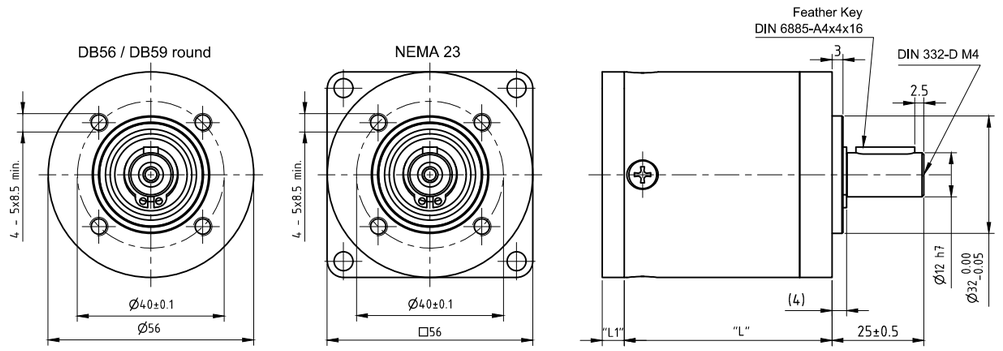
IP-Protection Gearbox	IP54
Service Life*	5000 h
For Motor Size	NEMA 23, NEMA 24
Operating Temperature	-10 °C - 50 °C

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

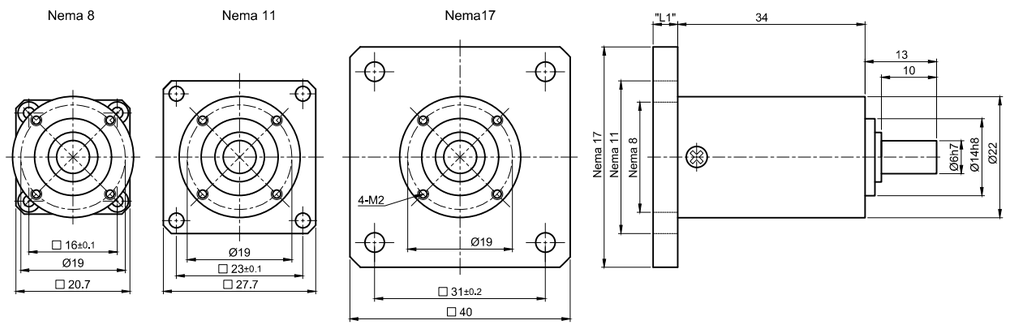
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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

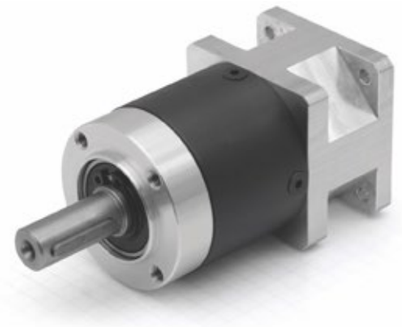
DIMENSIONS (IN MM)

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

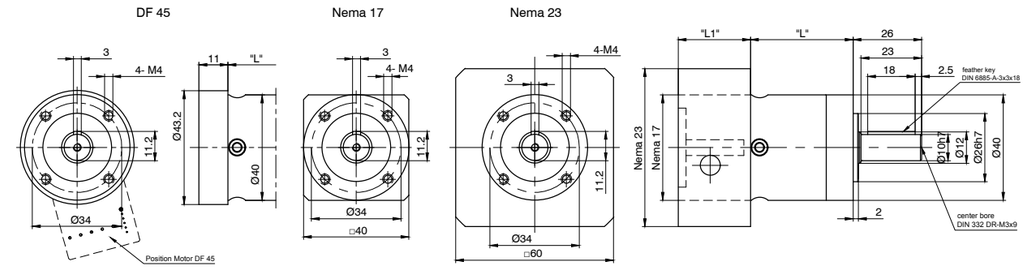
VERSIONS

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

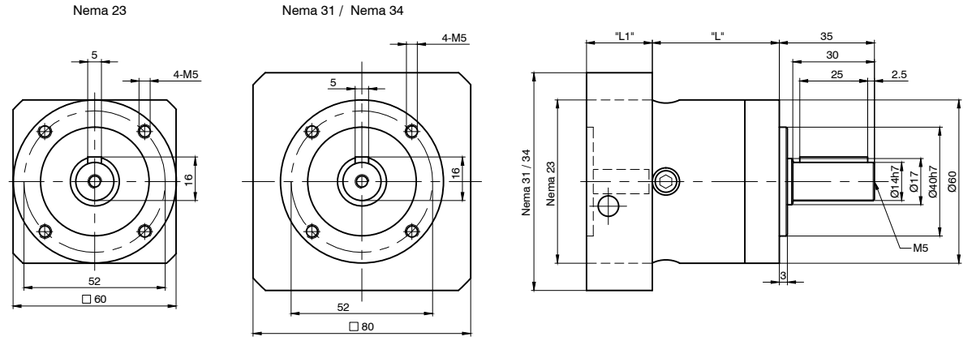
GPLE60-1S-3
= For NEMA 23/24 motors
-F87 = For NEMA 34 motors

ACCESSORIES

MK-DH-8-11-GPLE Spacer sleeve

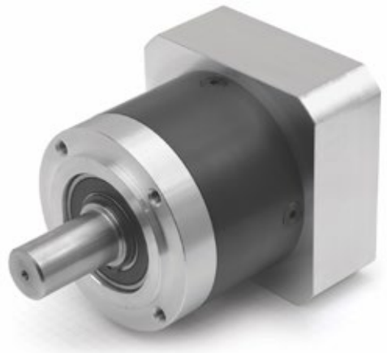
DIMENSIONS (IN MM)

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

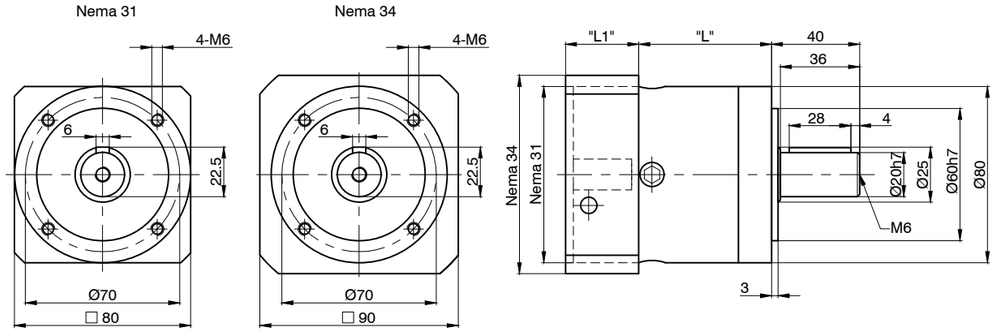
Precision planetary gearboxes

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

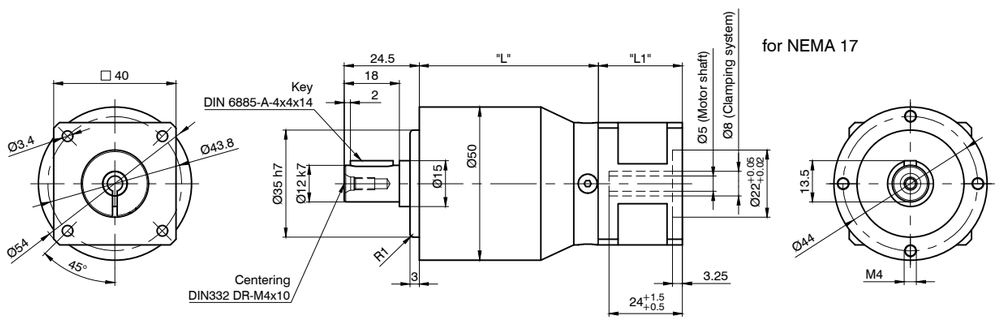
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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

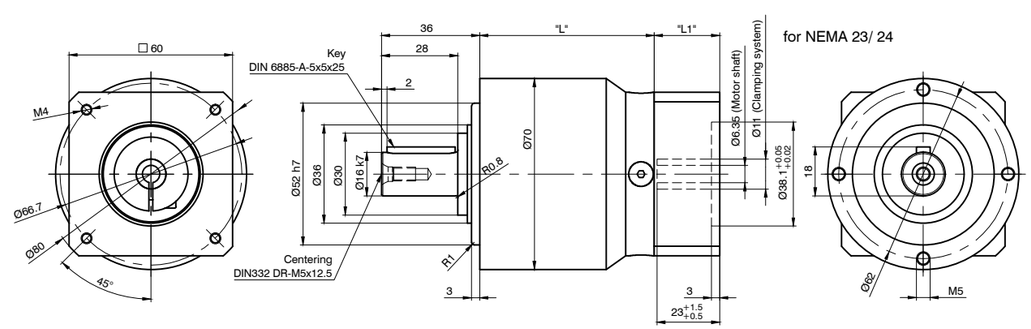
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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

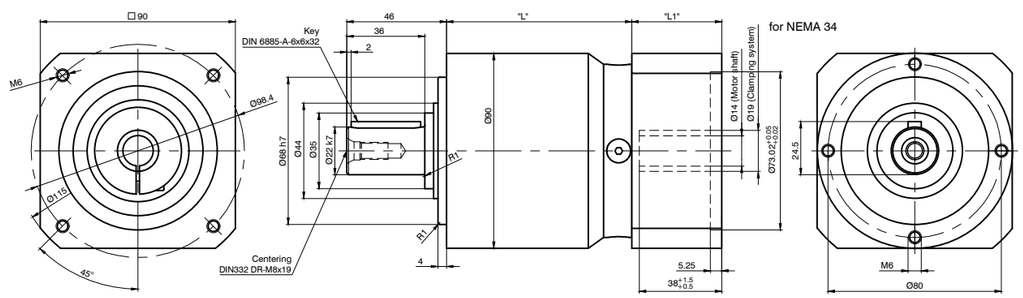
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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

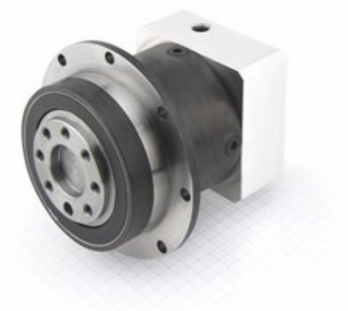
DIMENSIONS (IN MM)

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

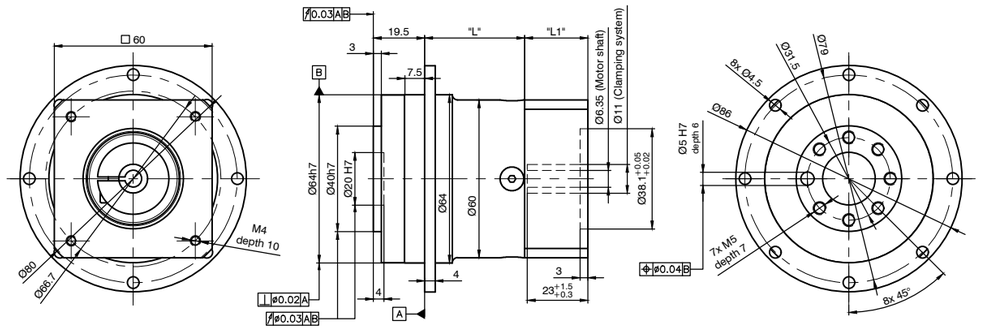
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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

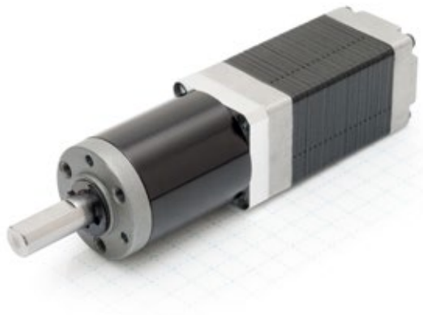
DIMENSIONS (IN MM)

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

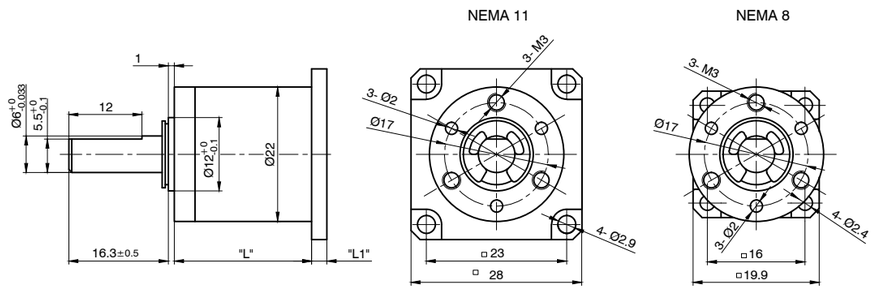
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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

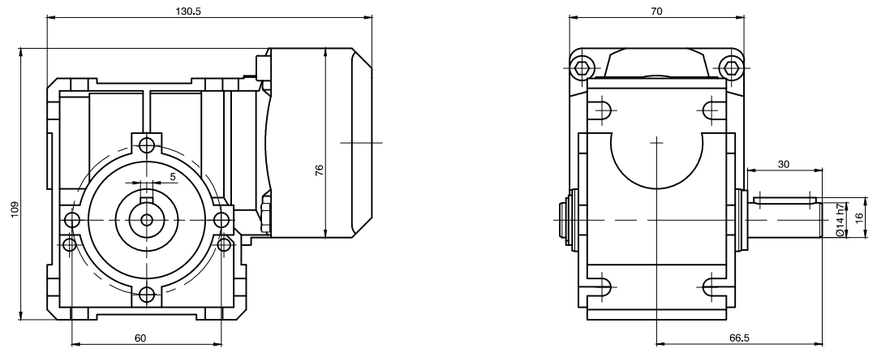
Type	Reduction Ratio	Rated Output Torque Nm	Efficiency %	Max. Backlash ´(arc minutes)	Max. Input Speed rpm	Length mm	For Motor Size	Self-Locking Torque	Admissible Axial Shaft Load N	Weight kg
GSGE60-5-1	5	11	82	120	1400	130.5	NEMA 23	–	1800	1.7
GSGE60-15-1	15	25.3	63	120	1400	130.5	NEMA 23	–	1800	1.7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

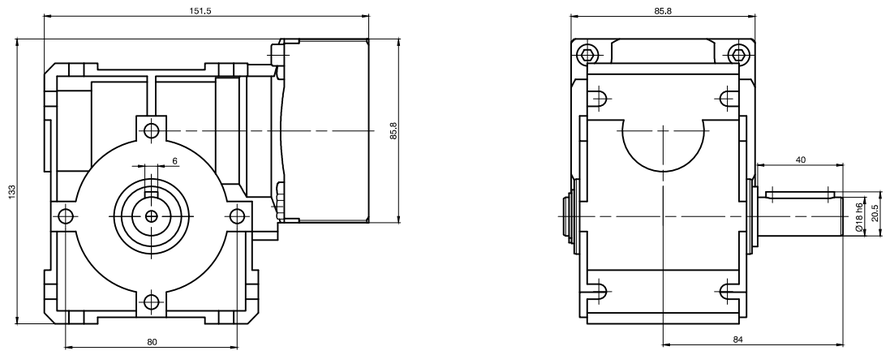
Type	Reduction Ratio	Rated Output Torque Nm	Efficiency %	Max. Backlash ´(arc minutes)	Max. Input Speed rpm	Length mm	For Motor Size	Self-Locking Torque	Admissible Axial Shaft Load N	Weight kg
GSGE80-12.5-1	12.5	62.3	72	120	1400	151.5	NEMA 34	–	3200	3
GSGE80-25-1	25	65.5	57	120	1400	151.5	NEMA 34	–	3200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

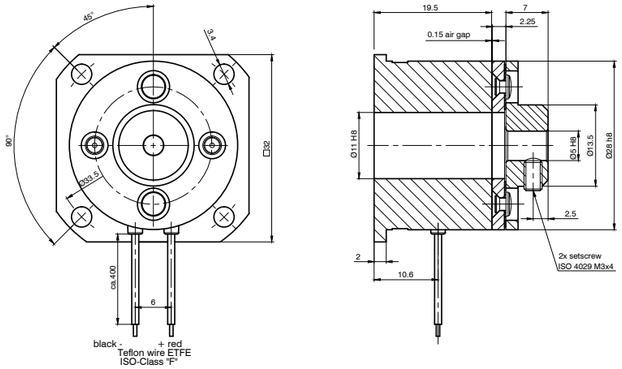
Operating Voltage	24 VDC
Hub	borehole ... H8 with 2 grub screws AM3x4
Fastening	with 4 M3 screws
Connection	leads L=400 mm

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

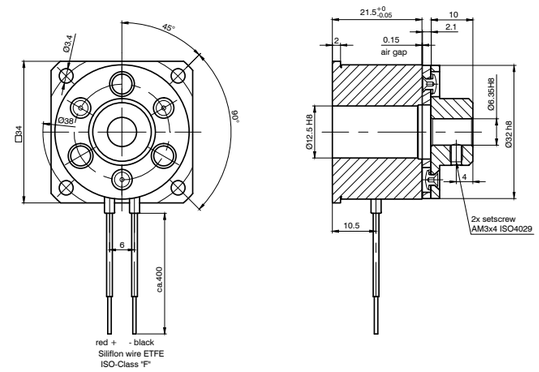


BKE

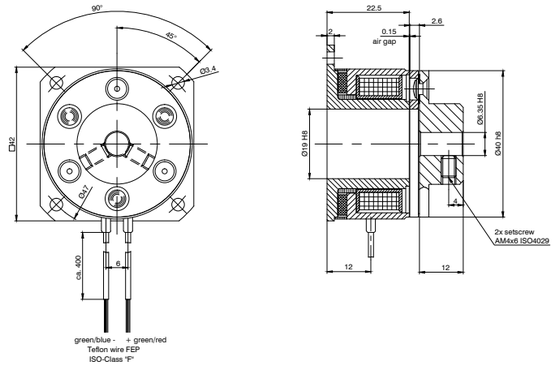
Permanent-magnet brake

DIMENSIONS (IN MM)

BKE-1.0-6.35

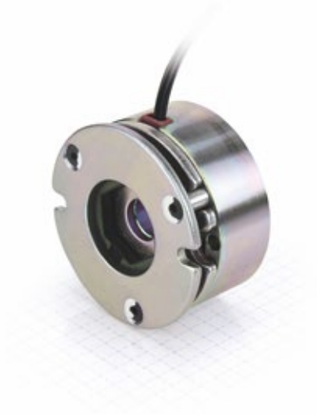


BKE-2.0-6.35



BWA

Spring-loaded brake



TECHNICAL DATA

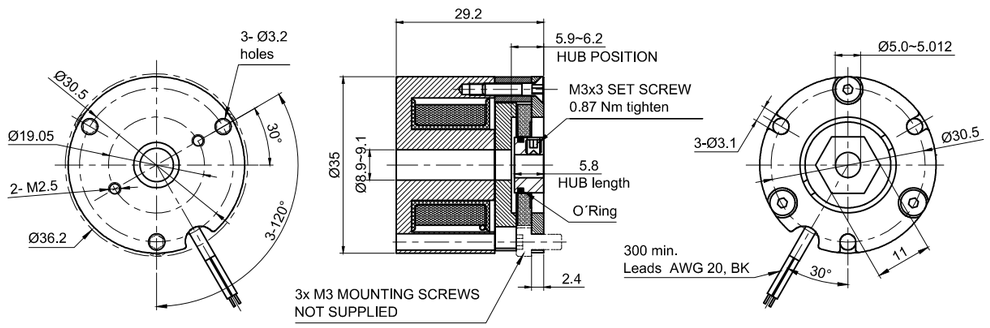
Operating Voltage	24 VDC
Fastening	with 3 screws M3 (BWA-0,35-5), with 2 screws M4 (BWA-1,5-6,35)
Connection	leads L=300 mm

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)

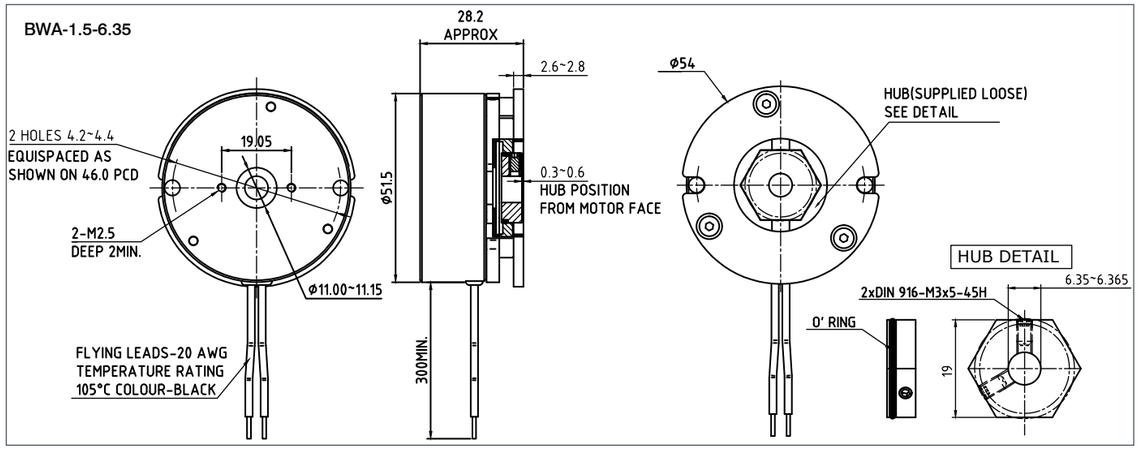
BWA-0.35-5



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

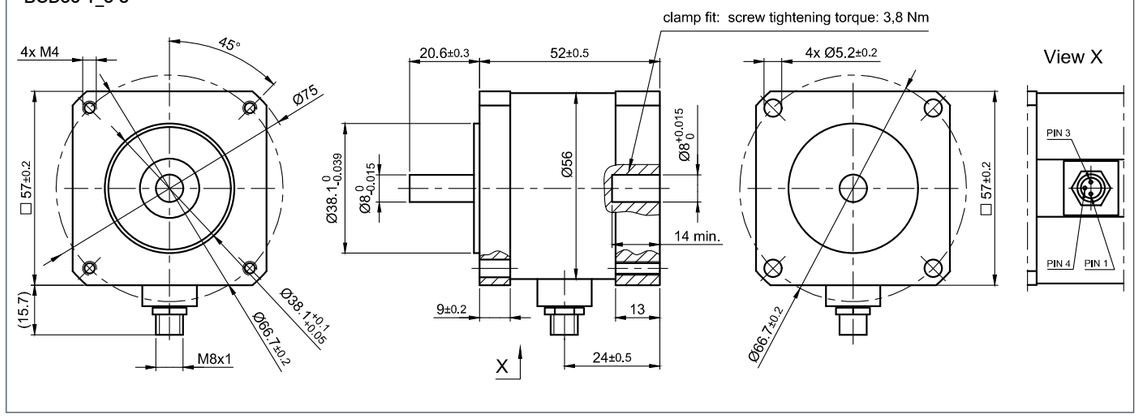
Type	Rated Power W	Holding Torque Ncm	Switch-On Time ms	Switch-Off Time ms	Hub	Size mm	Shaft Diameter mm	Weight kg
BRAKE-BCD56-1,5-8	7.2	150	60	20	borehole ø5 H8 with grub screw M3x3	57		0.53

ZUBEHÖR

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

DIMENSIONS (IN MM)

BCD56-1_5-8



Notes

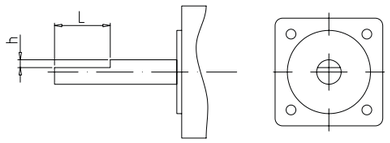
Notes


Nanotec
5V
24V
PULS
DIR
ANALOG
FREQUENCY
OUT
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 60 384-4
40/105/56

SHAFT MODIFICATION

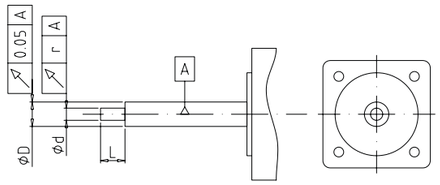
Nanotec also supplies shafts with customer-specific designs. The flattening or shortening of shafts, the drilling of a cross bore or the milling of a keyway is generally possible within two weeks. Special shaft modifications, such as knurling or direct gearing, are offered for larger quantities ex works.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

D-SHAFT



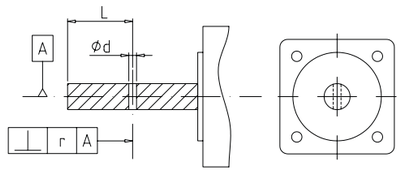
In addition to the Nanotec standard D-shaft (can be ordered via the online configurator), flat surfaces can also be prepared according to individual specifications. For special shaft-hub connections, a single flattening can be provided on nearly all motor shafts.

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

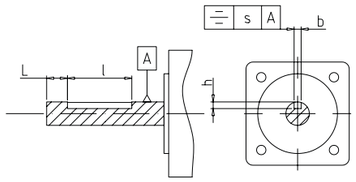


Cross bores are drilled into the shaft with the required diameter and enable, among other things, the use of clamping pins.

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.

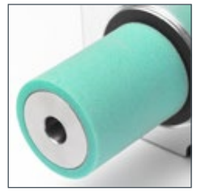
BEVEL GEAR

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

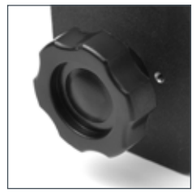


Shafts equipped with track and drive rollers are used above all in transport systems.

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.

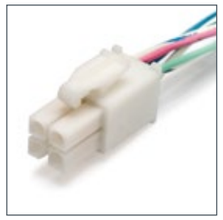
JST CONNECTOR

JST CONNECTOR

BERG CONNECTOR

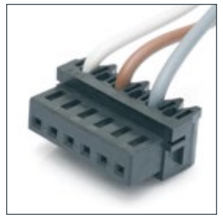
LUMBERG CONNECTOR

AMP CONNECTOR



WAGO CONNECTOR

IDC



SUB-D CONNECTOR

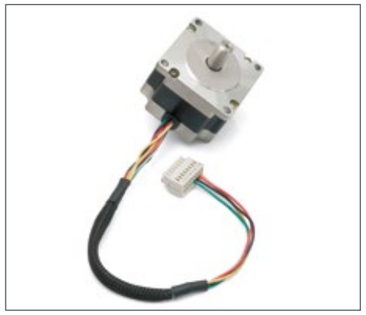
SUB-D CONNECTOR

M12 CONNECTOR

CABLE ASSEMBLY

HEAT-SHRINKABLE TUBE

PROTECTIVE BRAID



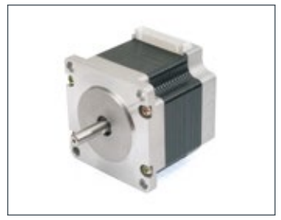
BRAIDING

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

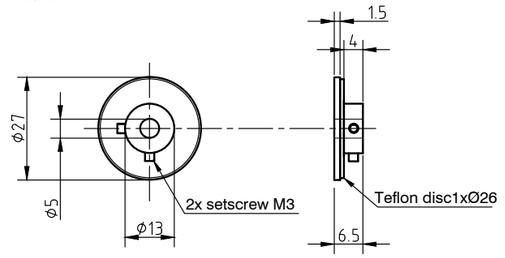
Damper

For B shaft

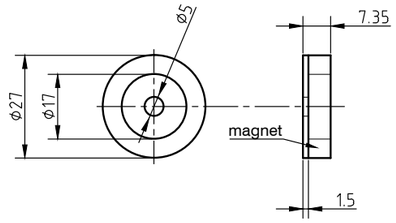
DIMENSIONS (IN MM)

ZD-D28

Part 1

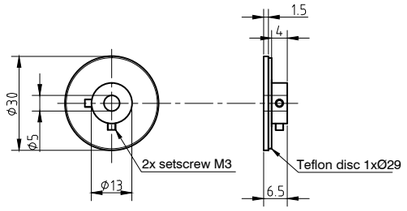


Part 2 (magnet)

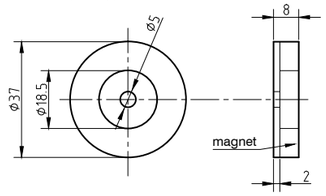


ZD-D40

Part 1

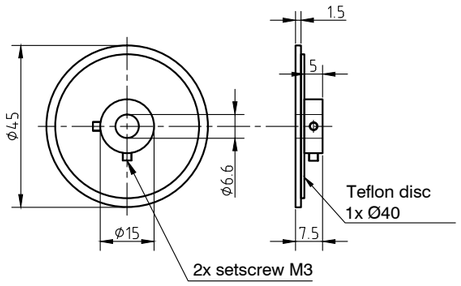


Part 2 (magnet)

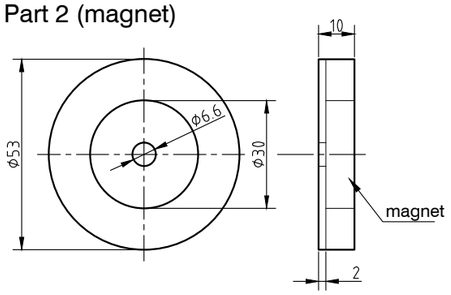


ZD-D56

Part 1



Part 2 (magnet)



Damper

For Mounting Flange

VERSIONS

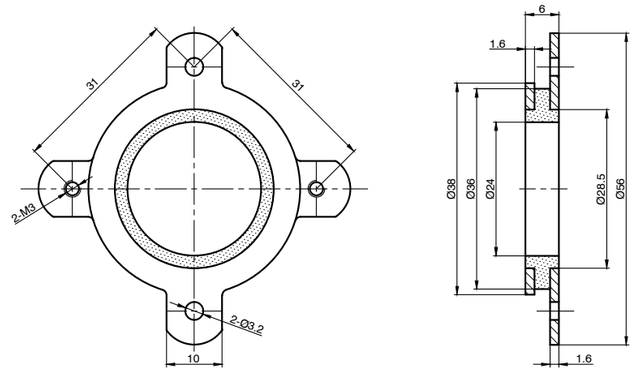
Type	Corresponding Motors
ZD-DF40	ST41, ST42
ZD-DF56	ST59

Damper

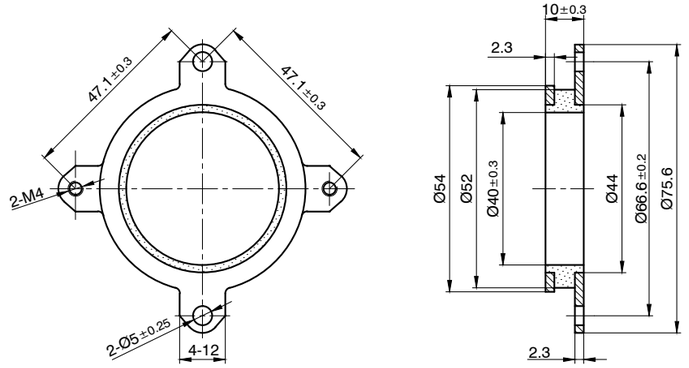
For Mounting Flange

DIMENSIONS (IN MM)

ZD-DF40



ZD-DF56



Charging capacitor

for SMC and PDx-I

VERSIONS

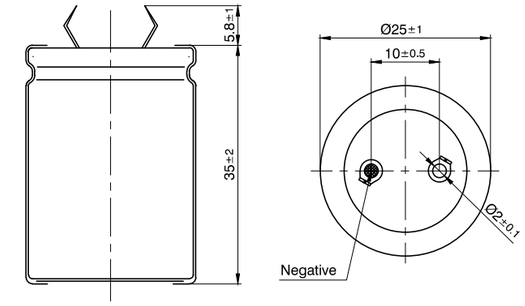
Type	Capacity µF	Lead mm	Capacitance Tolerance	Temperature Range °C	Max. Operating Voltage V	Dimensions
Z-K4700/50	4700	10	± 20%	-40 - 85	50	Cylindrical Aluminum Cup, Ø 25 mm, 35 mm Length
Z-K10000/100	10000	20	± 20%	-40 - 85	100	Cylindrical Aluminum Cup, Ø 40 mm, 95 mm Length

Charging capacitor

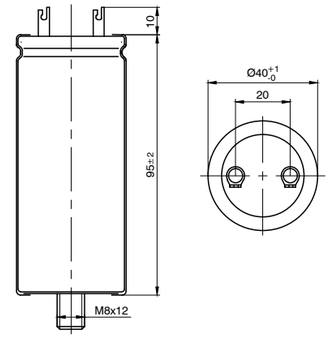
for SMC and PDx-I

DIMENSIONS (IN MM)

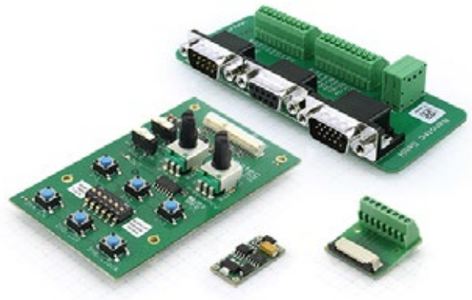
Z-K4700-50



Z-K10000-100



Electronics



VERSIONS

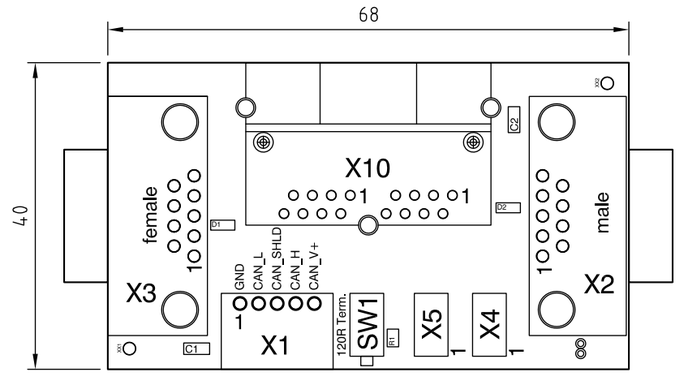
Type	Type	Max. Operating Voltage V	Dimensions
EB-BRAKE-48V	PWM Controller for Brakes	48	25.4 x 12.2 mm
EB-CAN-ADAPTER	Add-on Board for CANopen	24	40 x 68 mm
ZIB-DF32		24	23 x 21.5 mm
IO-PD4-C-01	IO Board for PD4-C-01 (USB) with Cable Set	12	86 x 50 mm
DK-NP5-4A	Discovery Board for NP5 Controllers	48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



Connectors

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

Canadian Distributor:

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