



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

PRODUCT CATALOG
2018/2019

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.

Together with subsidiaries in Changzhou, China, and Stoneham (Massachusetts), USA, and more than 20 sales partners, we provide Nanotec drive solutions and expert technical support to customers all over the world.



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 linear actuators, brushless DC and stepper motors, 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.



Worldwide sales network

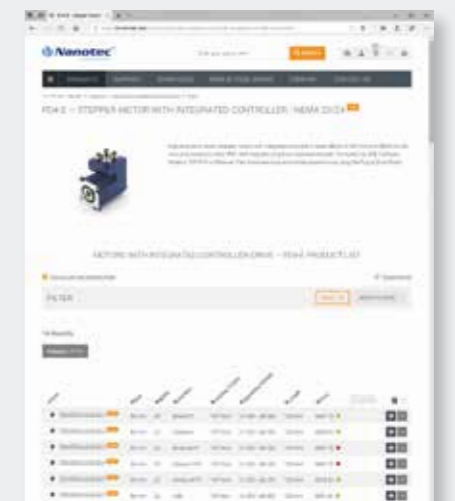


Nanotec products are available both directly from us and via a worldwide network of sales partners. A list of our sales partners can be found on our website.

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

Quick and easy online shopping for the right product:

- 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 configure 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



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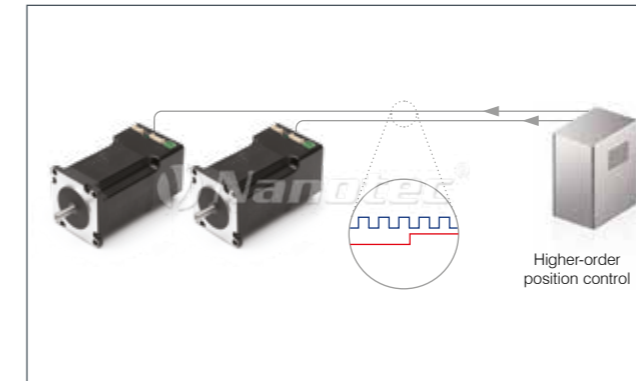
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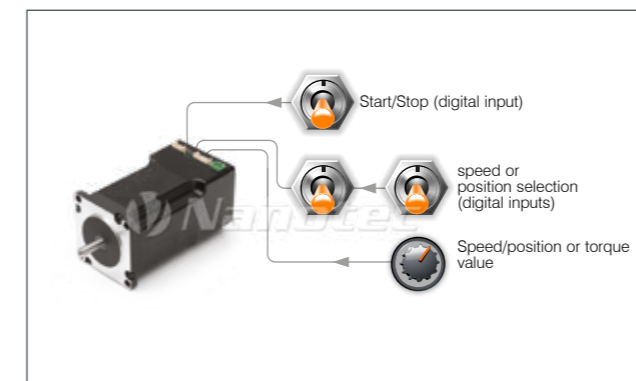
CONTROL OPTIONS FOR MOTORS WITH CONTROLLER AND CONTROLLERS/DRIVES

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.



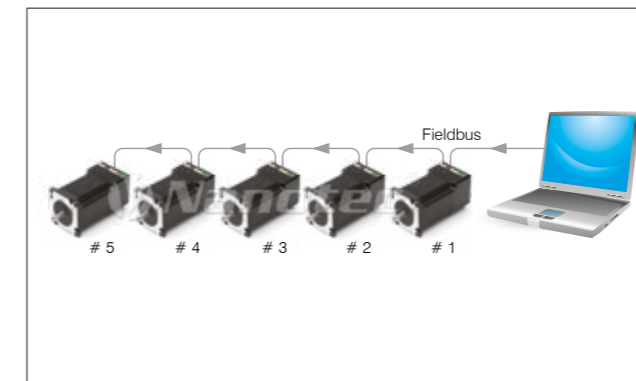
Clock & direction

- Microstep to one 64th of a step
- Step multiplication/microstep emulation so that the smooth running of the microstep can also be used with older higher-level controllers that only output full or half steps.



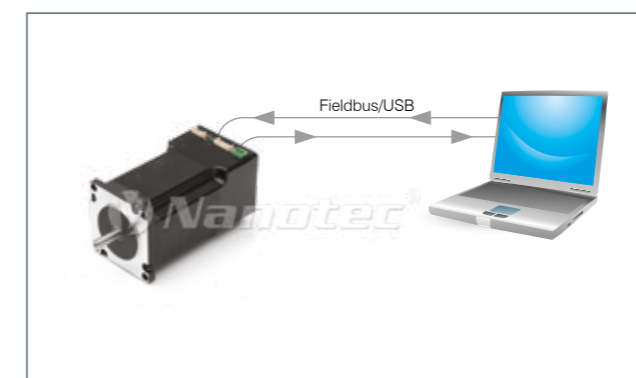
Control via digital and analog inputs

- Controllers/drives that are programmable with NanoJ V2: digital and analog I/Os can be read out every millisecond and processed in a sequence program.



Control via fieldbus

- Diverse fieldbus options with NanoJ V2:



Sequence control with NanoJ/NanoJ V2

- C-based programming language; these programs run autonomously (without a connected PC or master) directly on the motor controller or motor
- Access to all controller parameters and inputs/outputs
- Variables, branches, loops, logical and mathematical functions
- Programs can be stored in the motor controller via fieldbus/USB

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 adjusted to the required torque; less heat is generated and energy consumption drops accordingly.

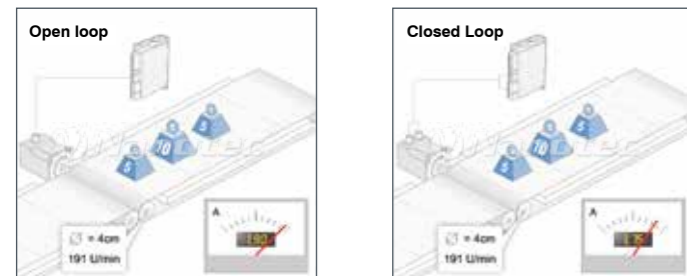
Advantages over servo motors

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, textile machines, industrial sewing machines, 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



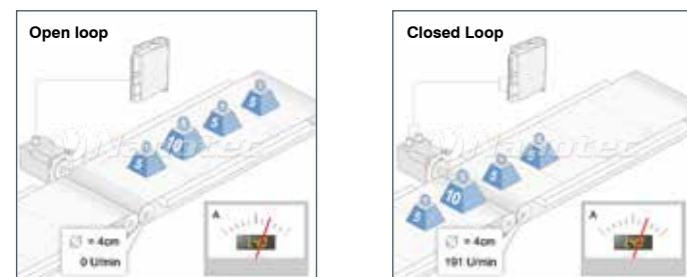
In an open loop, the stepper motor is dimensioned such that it is certain to move the maximum required load. For this reason, normally a safety factor of 20% is calculated, which causes wasted energy in the application. When the load is reduced, the open loop motor cannot react and wastes even more energy.

Service life



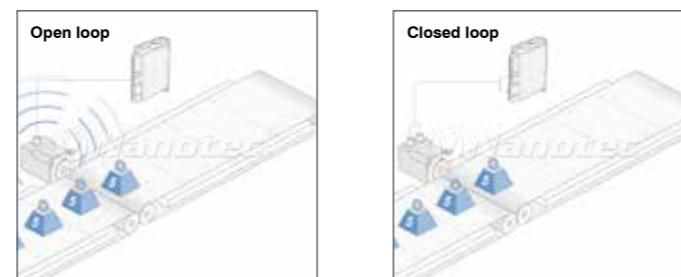
Efficient power regulation generates less heat in the motor, which stays significantly cooler. Reduced heating protects the motor bearings.

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.

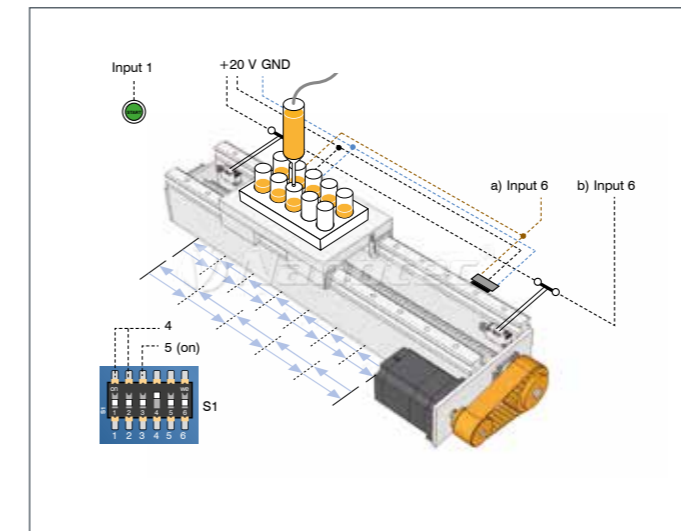
Resonances



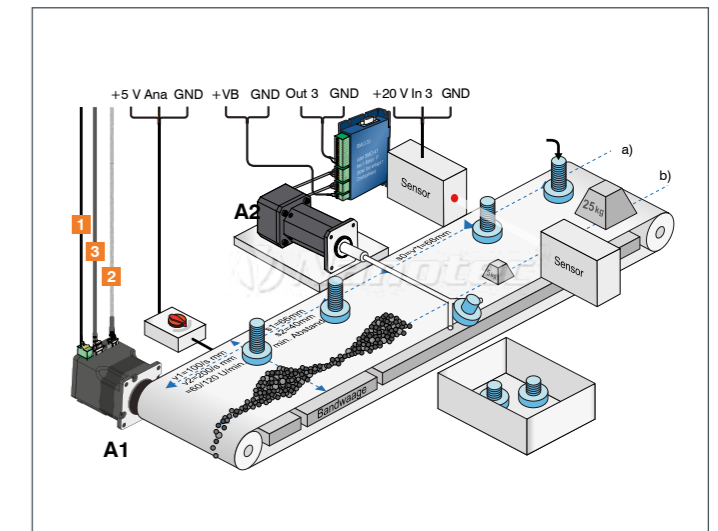
Resonance frequencies occurring in the open loop depend on external loads (the greater the torque reserve, the greater is the resonance stimulation) and can bring the motor to a stop. In closed loop mode, the motor receives only as much energy as needed for the external load; the torque reserve and its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

- 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

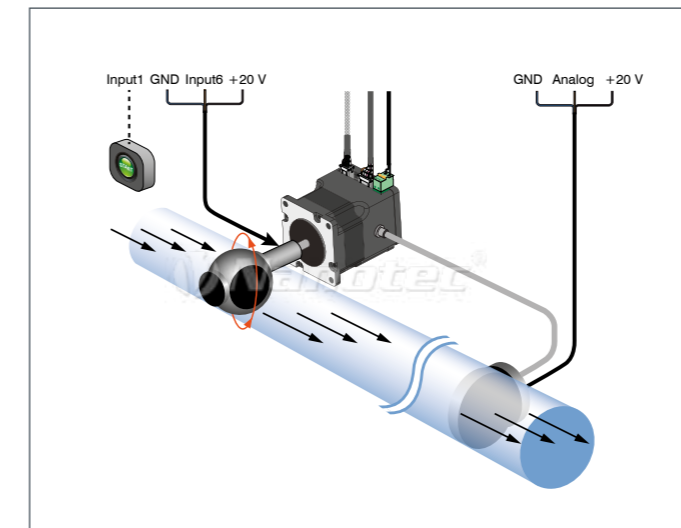
Linear axes (for processing, assembling, etc.)



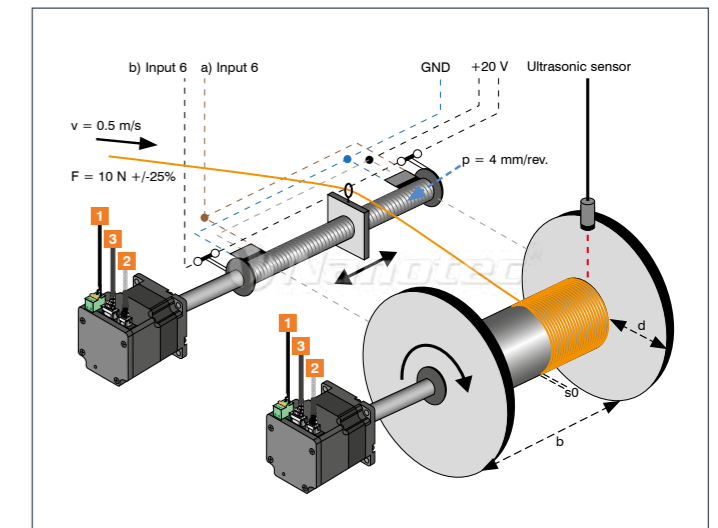
Conveyor belts



Decentralized flow control



Winding and laying



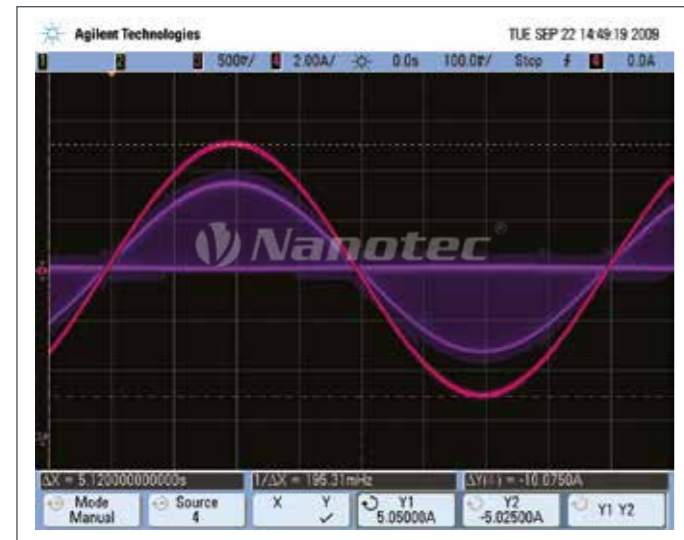
COMPREHENSIVE SOFTWARE FUNCTIONALITY

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.



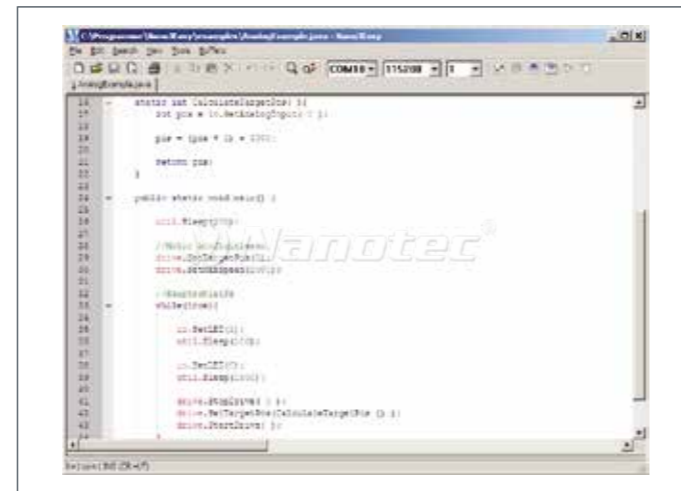
- Even more flexible: Now 3-phase stepper motors and BLDC motors can be controlled by the direct activation of half-bridges using DSP, just like their 2-phase counterparts.

Sinusoidal commutation with encoder in ClosedLoop 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.

Application programs with NanoJ

The integrated C-based NanoJ programming language can be used to implement complete autonomous application programs on the motor controllers. Querying and setting digital and analog I/Os and accessing all of the parameters for a movement program turns the motor controller into a full-fledged device controller in conjunction with variables, loops and mathematical functions and everything that distinguishes a higher level language. The programs can be created, compiled directly and written to the motor controller with the free NanoJEasy editor.



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



SOFTWARE



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
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 1.5 m
ZK-PD4-C-CAN-4-500-S
 CAN in/out Cable 0.5m
Z-K4700/50 Charging Capacitor

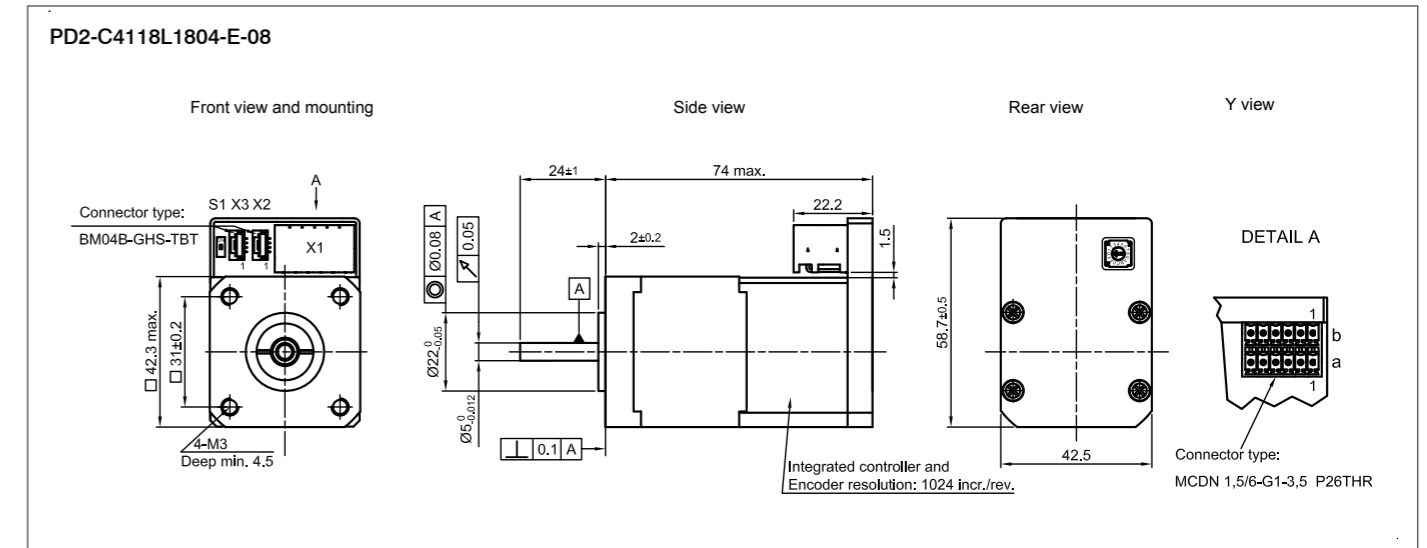
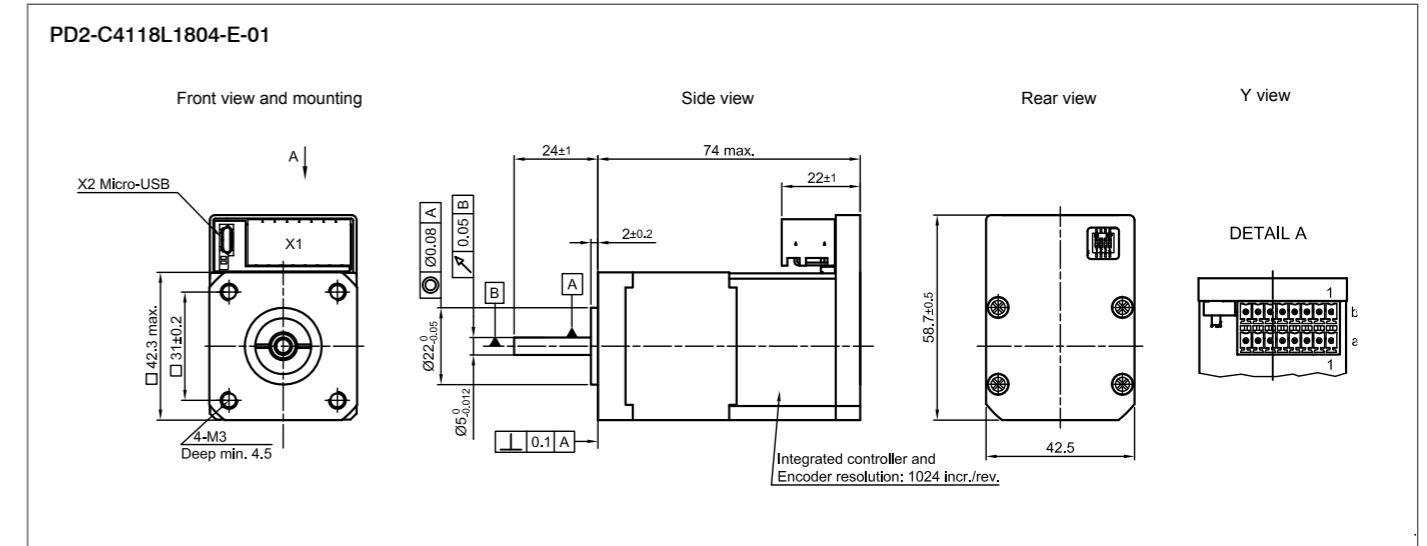


CAUTION

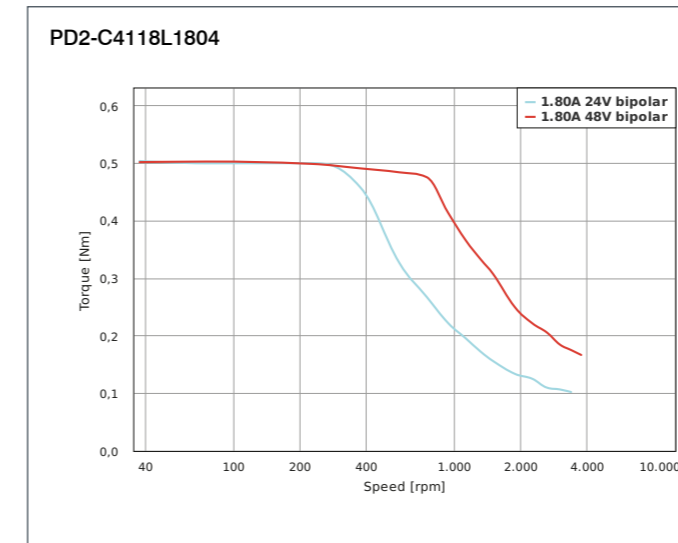
We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.



DIMENSIONS (IN MM)



TORQUE CURVES



PD2-C-IP

Stepper Motor with Integrated Controller in Protection Class IP65 - NEMA 17



OPTIONS



SOFTWARE



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
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	0.9

ORDER IDENTIFIER

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

ACCESSORIES

- ZK-USB Mini USB Cable 1.5 m
- 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 Charging Capacitor

CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

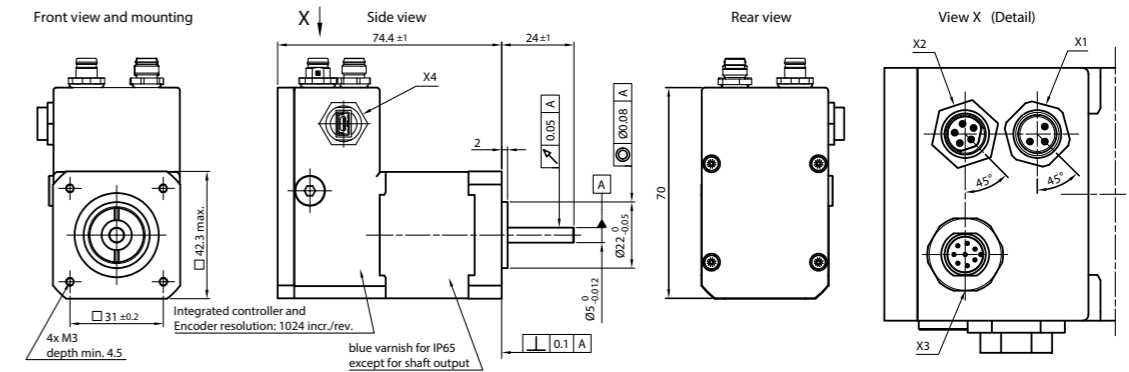
PD2-C-IP

Stepper Motor with Integrated Controller in Protection Class IP65 - NEMA 17

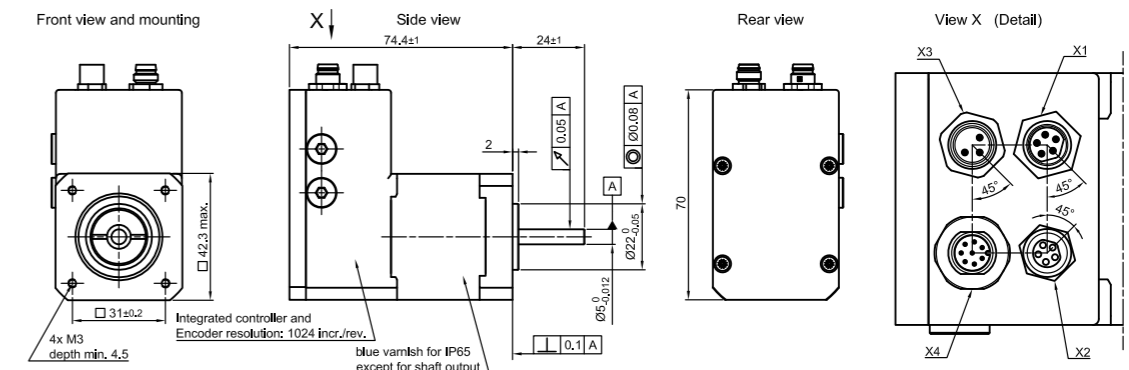


DIMENSIONS (IN MM)

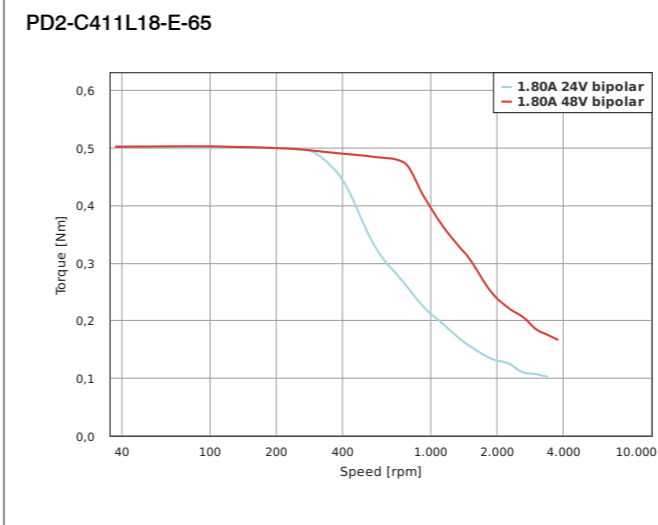
PD2-C411L18-E-65-01



PD2-C411L18-E-65-08



TORQUE CURVES





OPTIONS



SOFTWARE



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
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

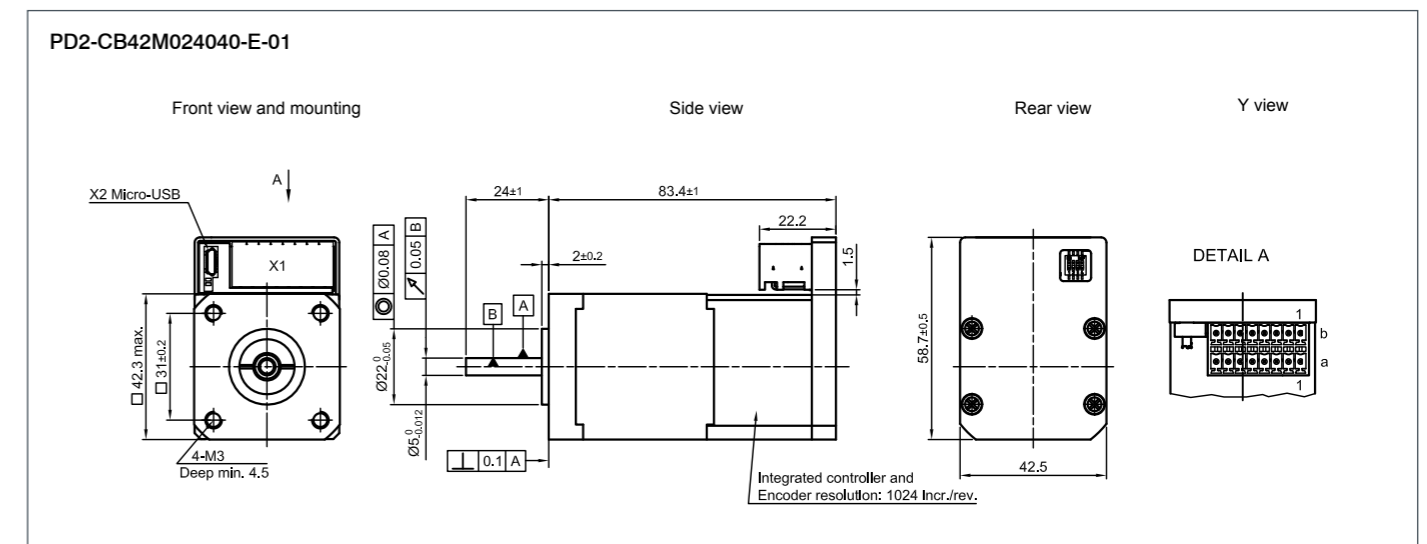
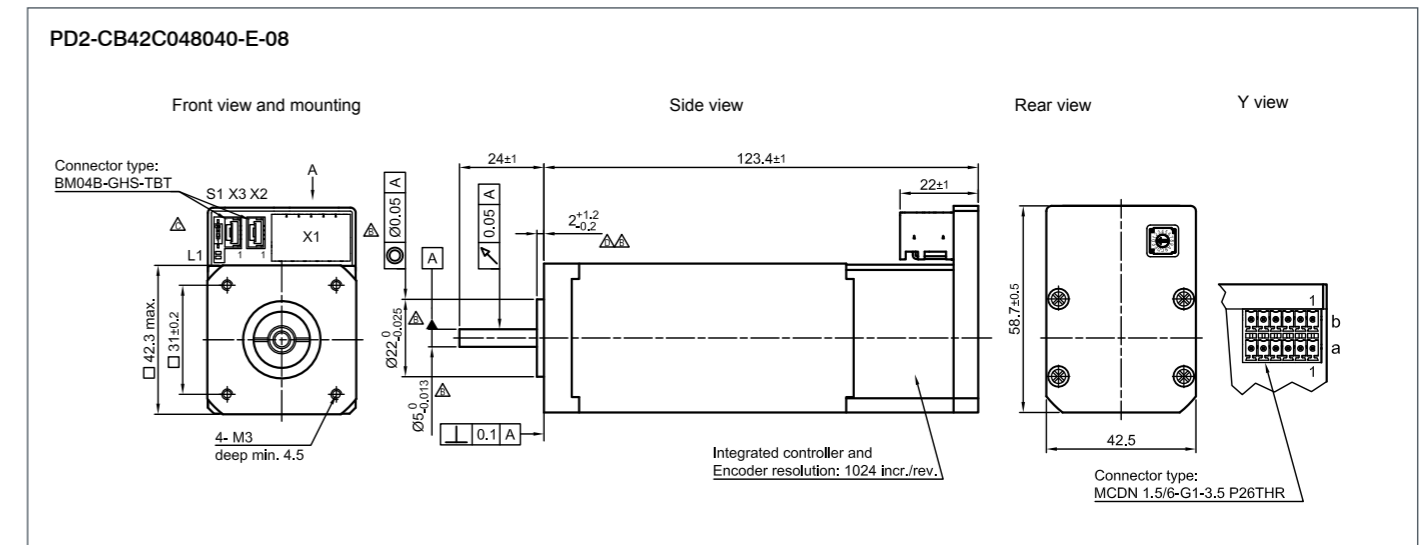
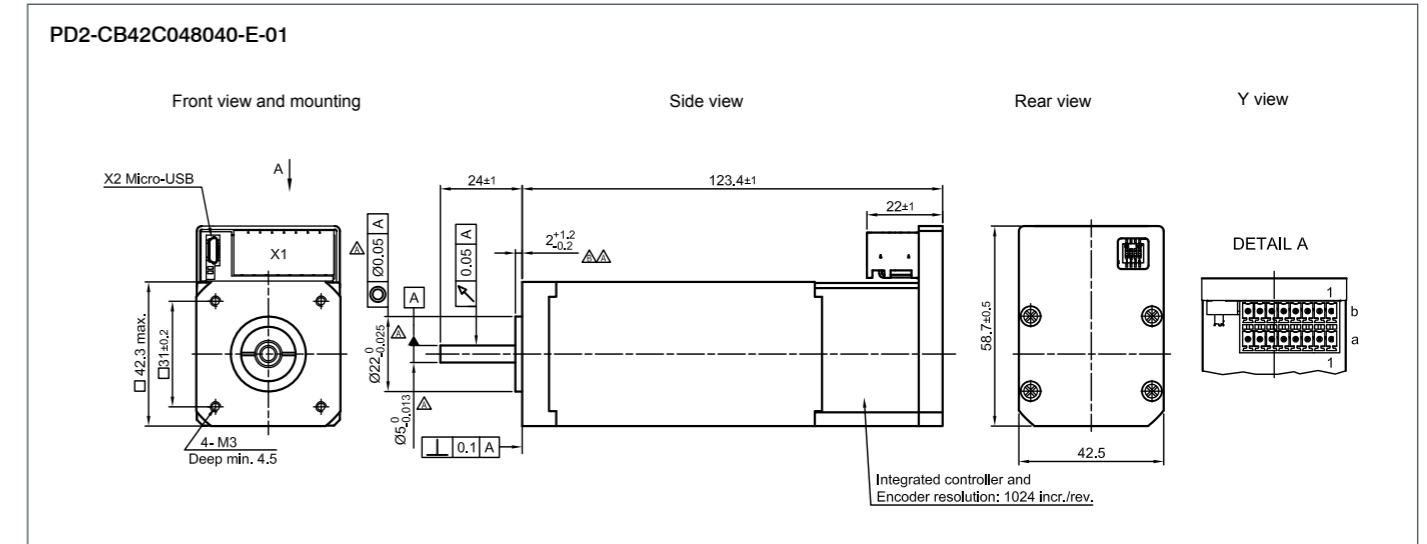
ACCESSORIES

ZK-MICROUSB
 Micro USB Cable 1.5 m
ZK-PD4-C-CAN-4-500-S
 CAN in/out Bridge 0.5m
Z-K4700/50 Charging Capacitor

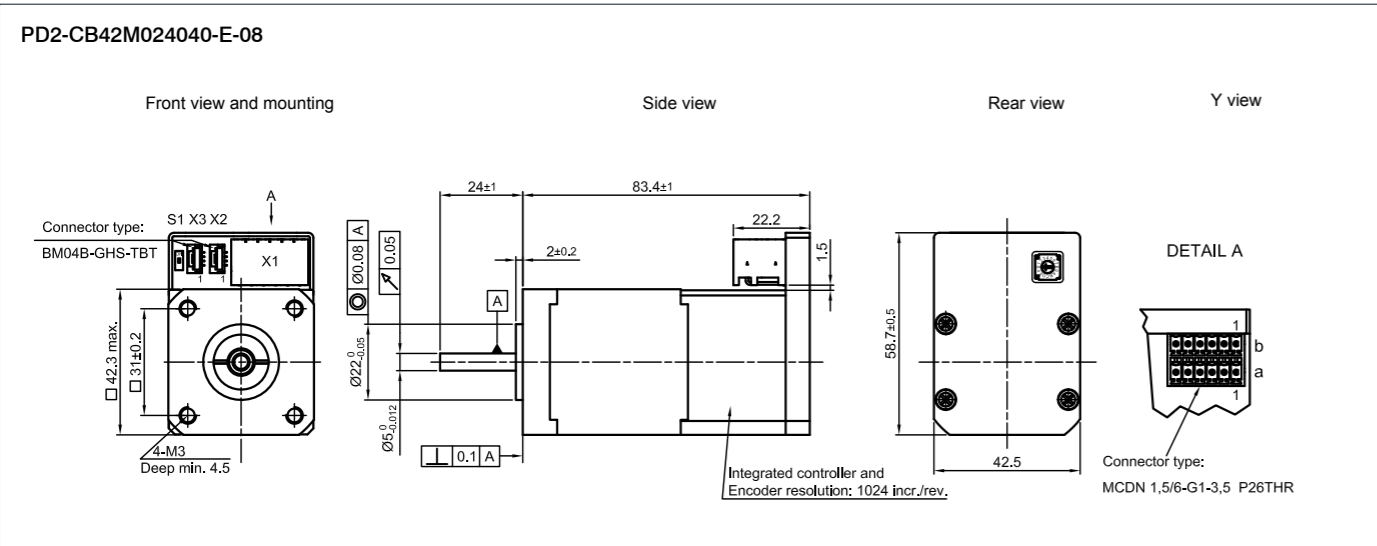
CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

DIMENSIONS (IN MM)



DIMENSIONS (IN MM)



PD2-CB-IP

Brushless DC Motor with Integrated Controller in Protection Class IP65 - NEMA 17



OPTIONS



SOFTWARE



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
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 direction; 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 1.5 m
- ZK-M8-3-2M-1-AFF**
Brake Cable straight 2m
- ZK-M8-8-2M-1-PUR-S** IO straight 2m
- ZK-M8-5-2M-1-PUR-S-F**
CAN in straight 2 m
- 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** Charging Capacitor

CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

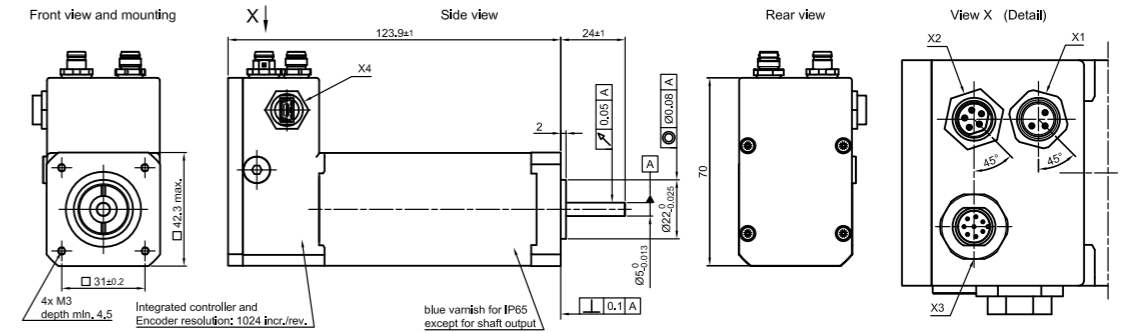
PD2-CB-IP

Brushless DC Motor with Integrated Controller in Protection Class IP65 - NEMA 17

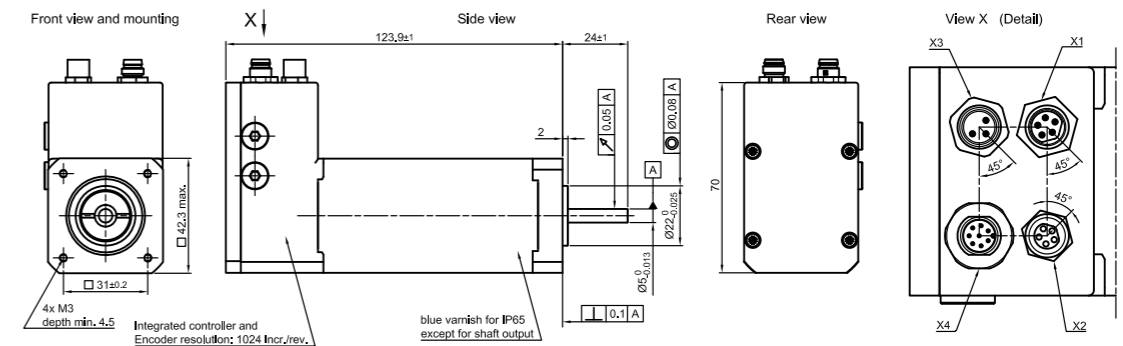


DIMENSIONS (IN MM)

PD2-CB42CD-E-65-01



PD2-CB42CD-E-65-08





OPTIONS



SOFTWARE



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
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	6.3	USB, IO (clock direction; analog), CANopen	65	0.6
PD4-C5918M4204	110	4.2	6.3	USB, IO (clock direction; analog), CANopen	79	0.8
PD4-C5918L4204	198	4.2	6.3	USB, IO (clock direction; analog), CANopen	100	1.2
PD4-C6018L4204	350	4.2	6.3	USB, IO (clock direction; analog), CANopen	112.5	1.6

ORDER IDENTIFIER

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

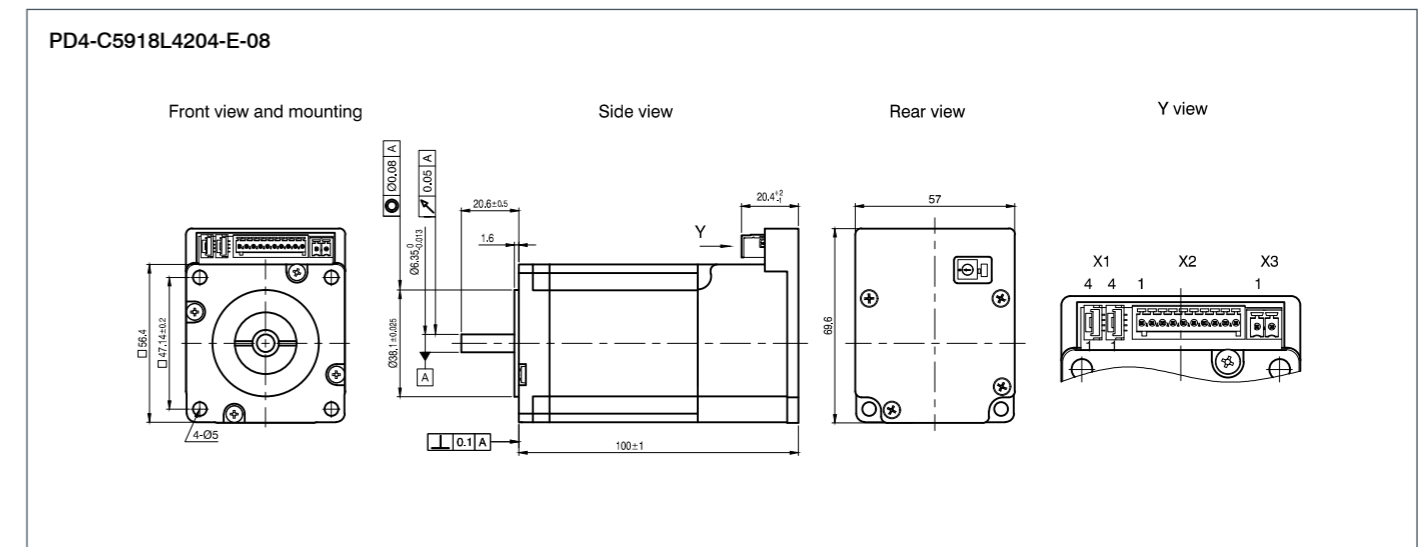
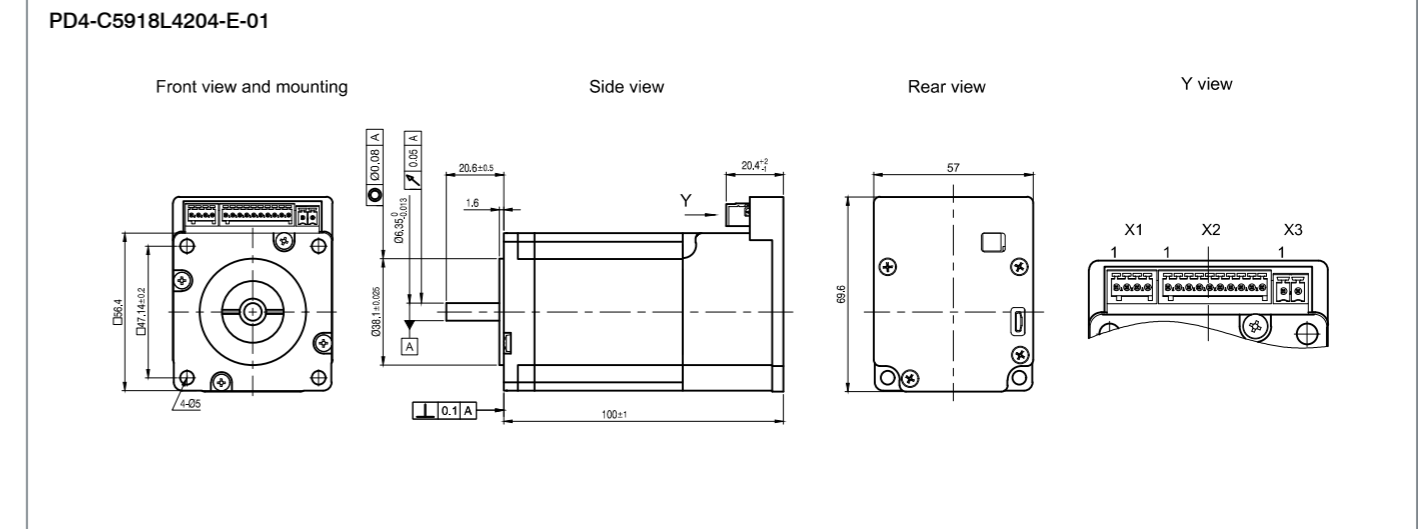
ACCESSORIES

ZK-MICROUSB Micro USB Cable 1.5 m
ZK-PD4-C-CAN-4-500-S
 CAN in/out Cable 0.5m
Z-K4700/50 Charging Capacitor
IO-PD4-C-01 IO Board for PD4-C-01
ZCPHOFK-MC0,5-4 Plug Connectors
ZCPHOFK-MC0,5-10 Plug Connectors
ZCPHOF-MC1,5-2 Plug Connectors

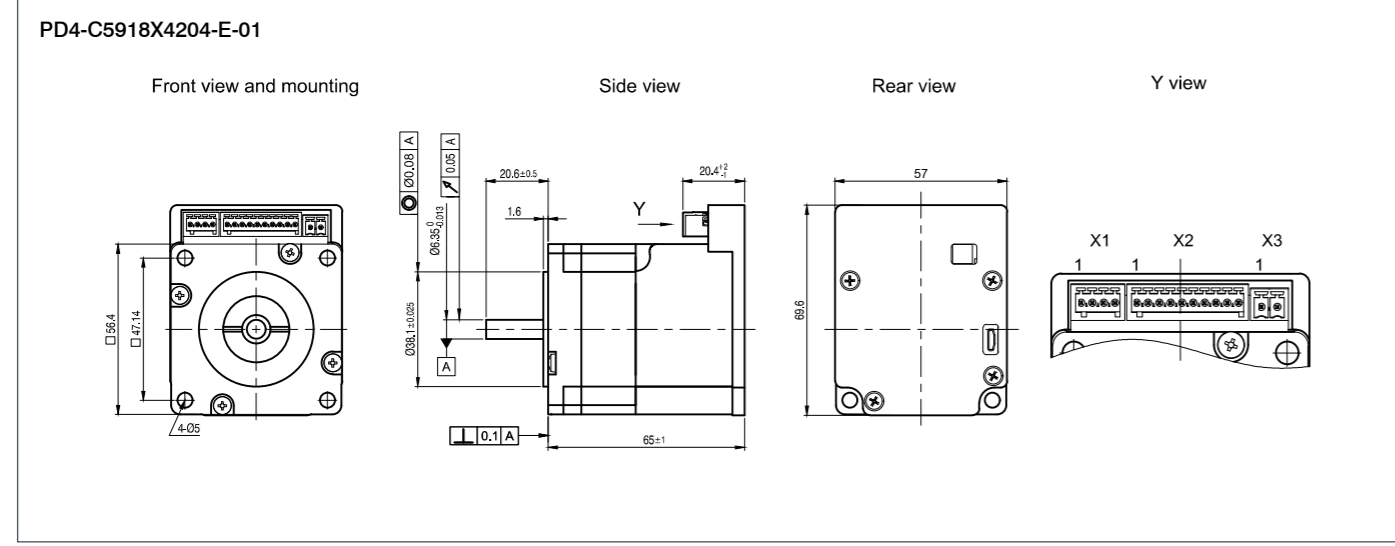
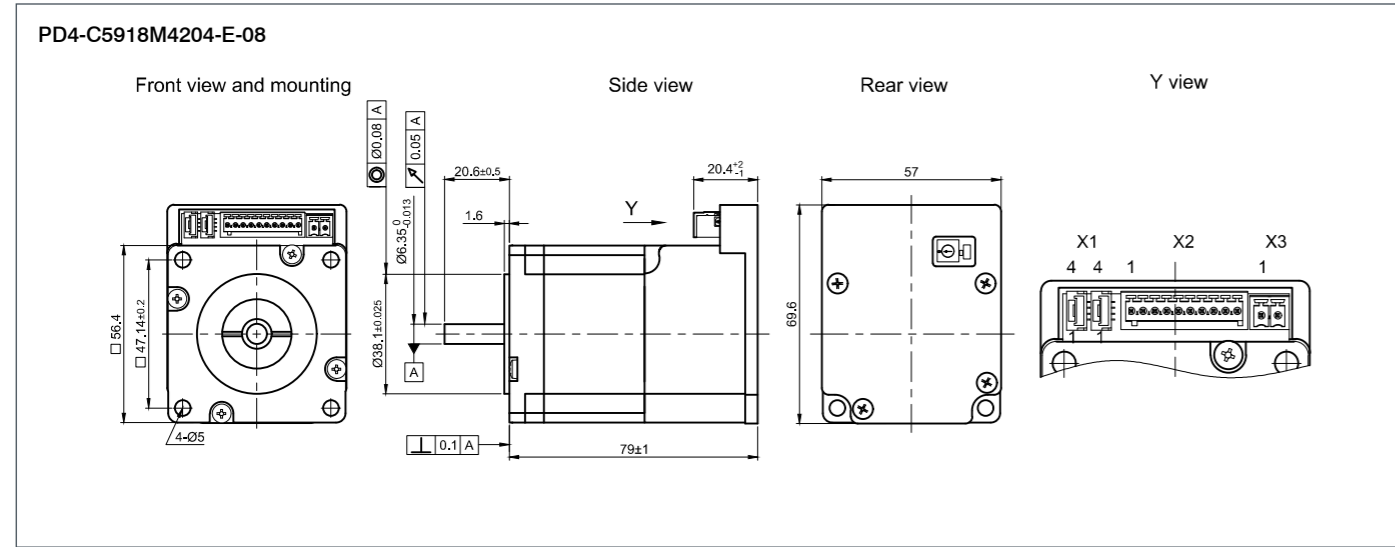
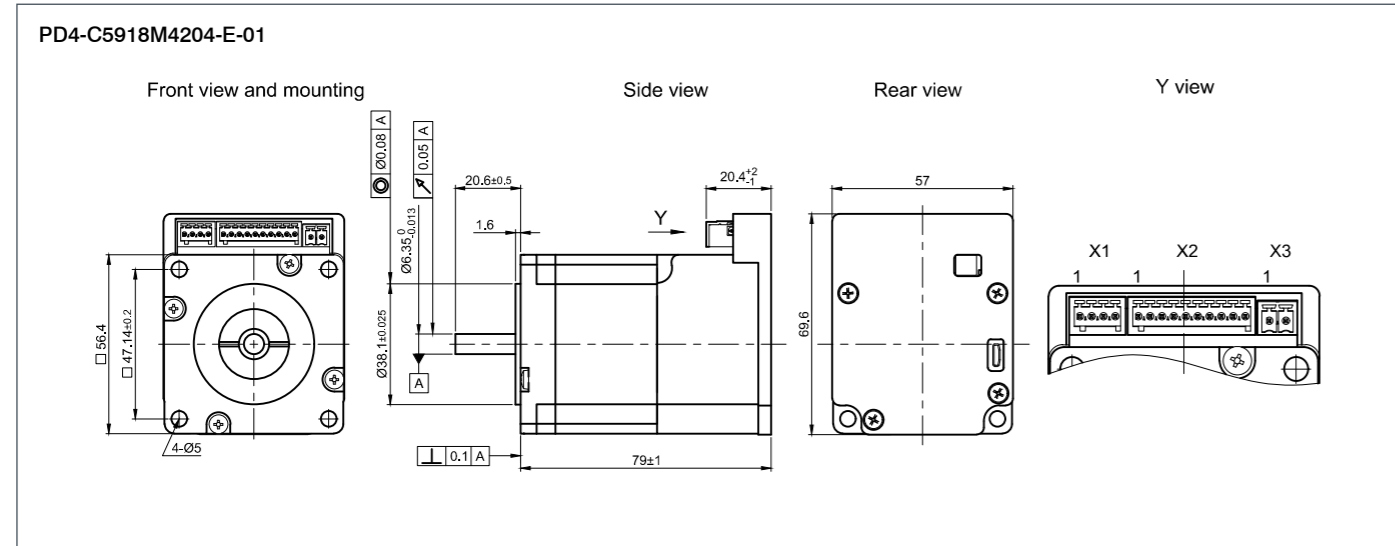
CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

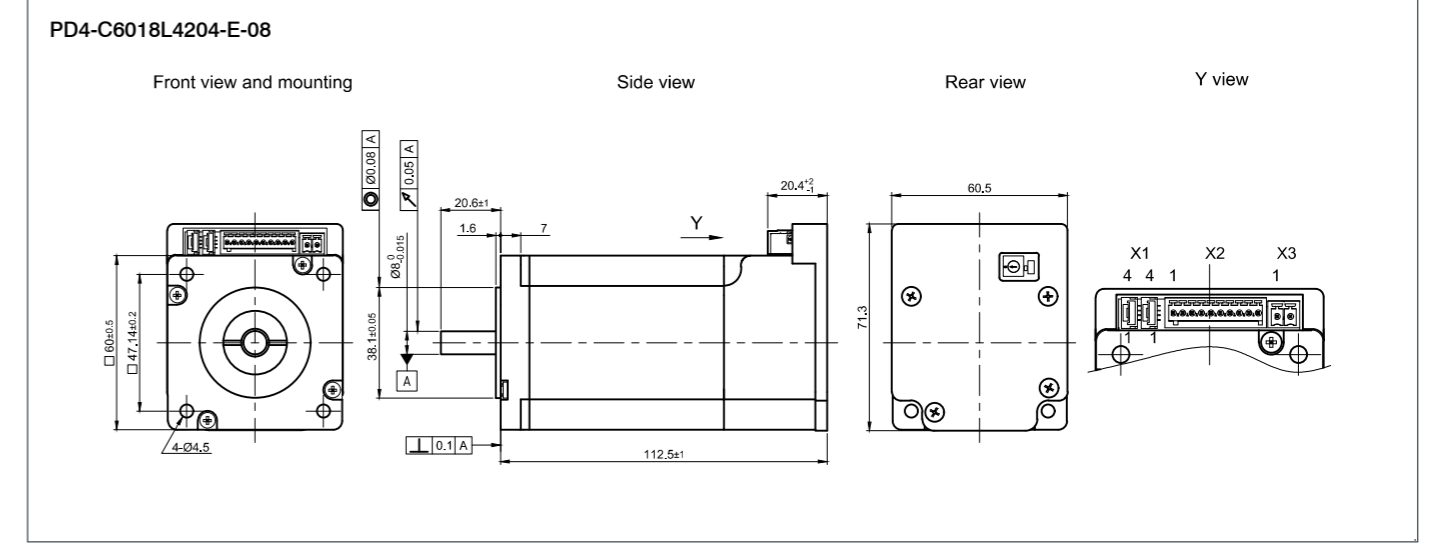
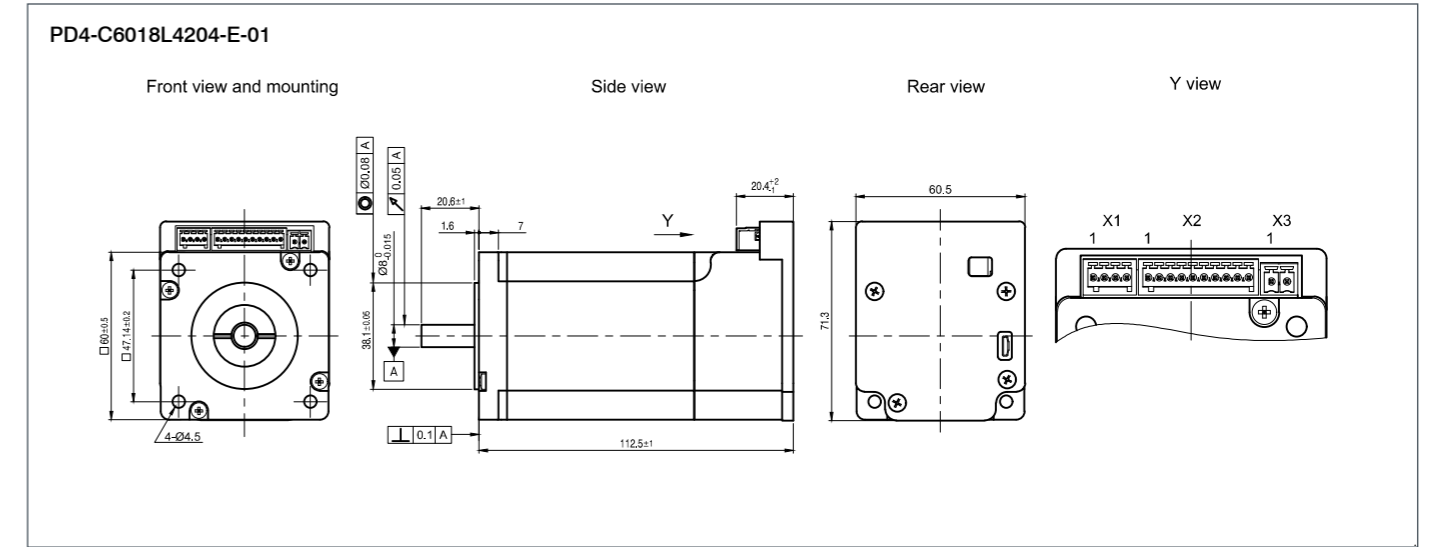
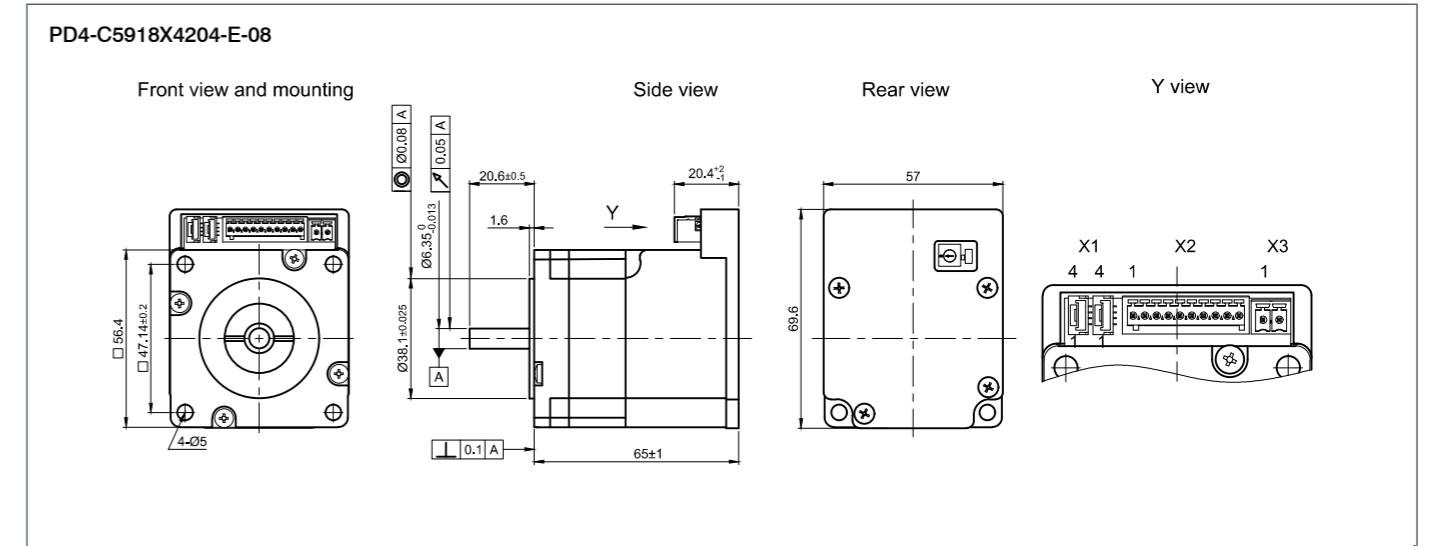
DIMENSIONS (IN MM)



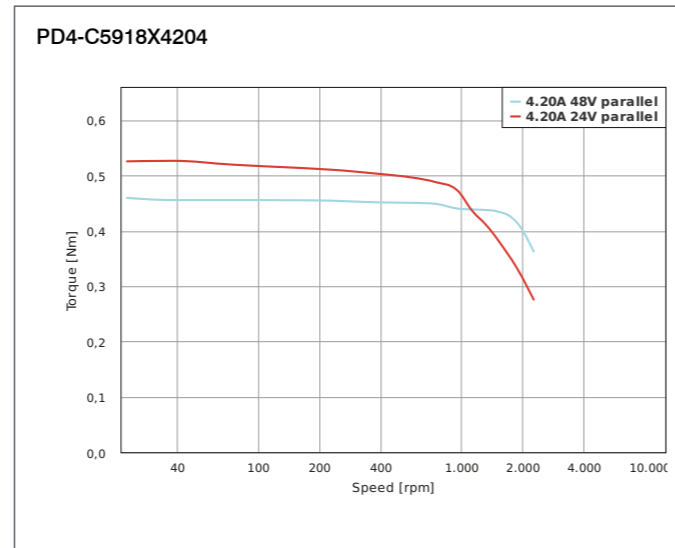
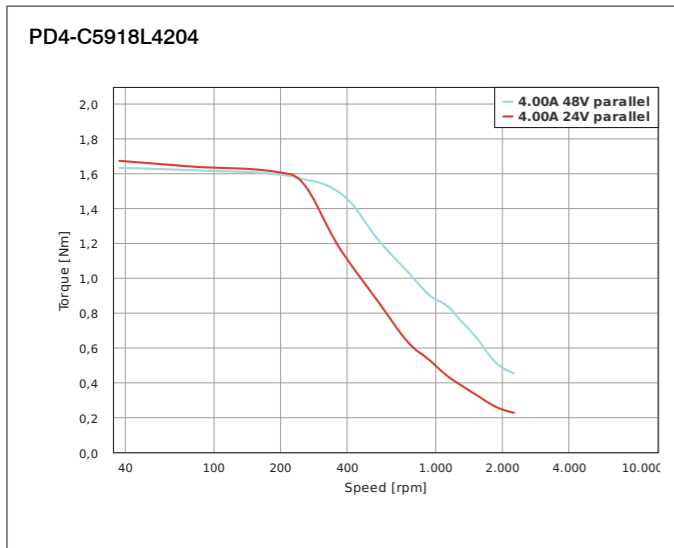
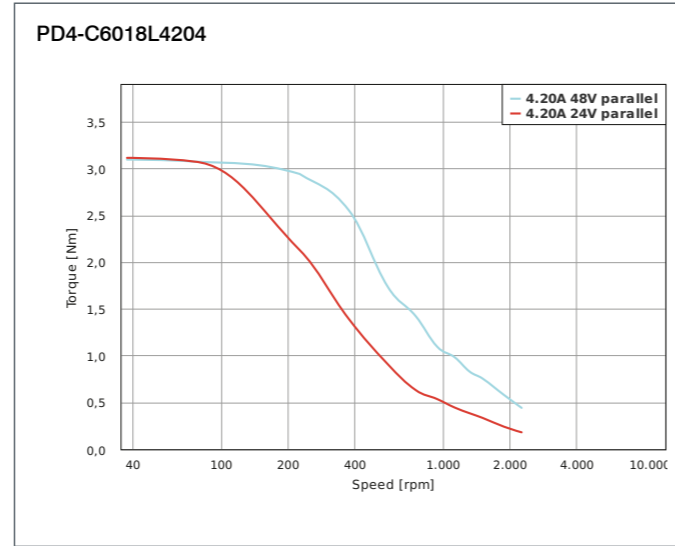
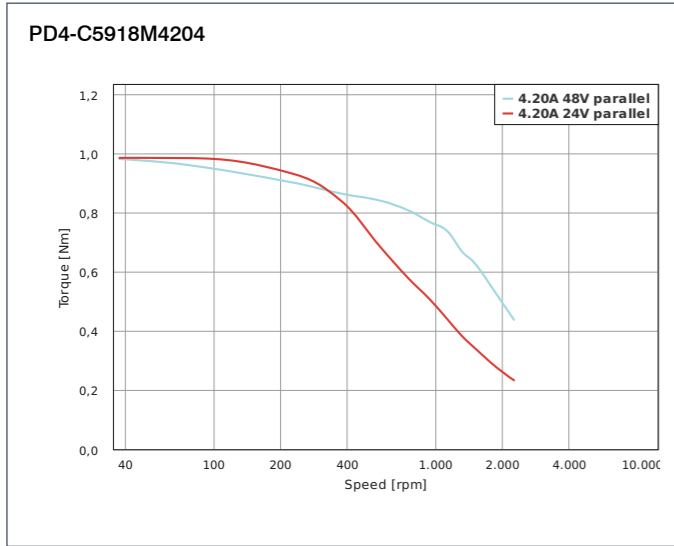
DIMENSIONS (IN MM)



DIMENSIONS (IN MM)



TORQUE CURVES



Notes section with horizontal lines for writing.

PD4-E

Stepper Motor with Integrated Controller and Protection Class IP65 - NEMA 23/24



OPTIONS



SOFTWARE



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
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

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)



ACCESSORIES

- ZK-USB** Mini USB Cable 1.5 m
- 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** Charging Capacitor



CAUTION



We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

PD4-E

Stepper Motor with Integrated Controller and Protection Class IP65 - NEMA 23/24

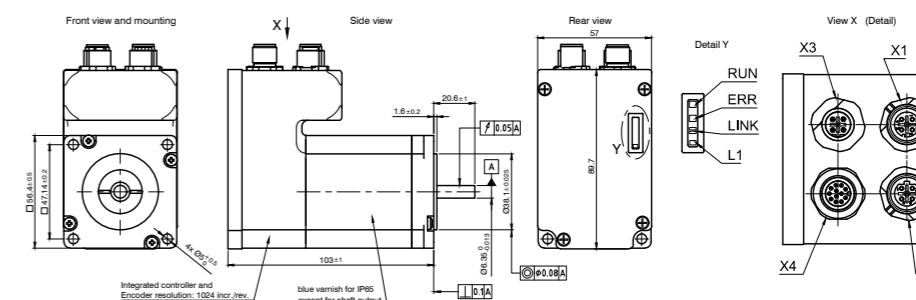


VERSIONS

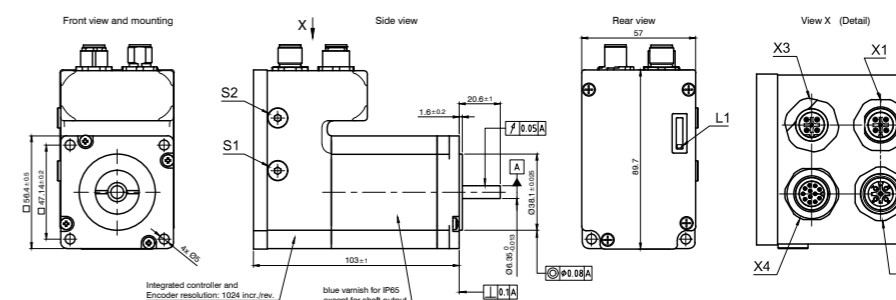
Type	Holding Torque Ncm	Rated Current (RMS) A	Peak Current (RMS) A	Interface	Length mm	Weight kg
PD4-E591L42-E	187	4.2	4.2	EtherCAT, CANopen, Modbus TCP, Modbus RTU, USB, IO (clock direction; analog)	103	1.3
PD4-E591L42-M	187	4.2	4.2	EtherCAT, CANopen	126.5	1.4
PD4-E601L42-E	354	4.2	4.2	EtherCAT, CANopen,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

DIMENSIONS (IN MM)

PD4-E591L42-E-65-1

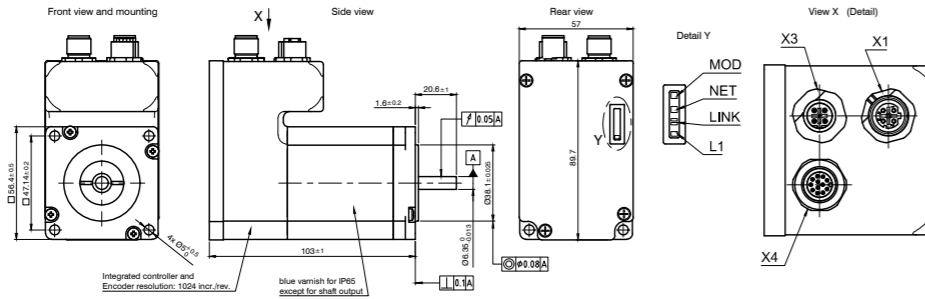


PD4-E591L42-E-65-2



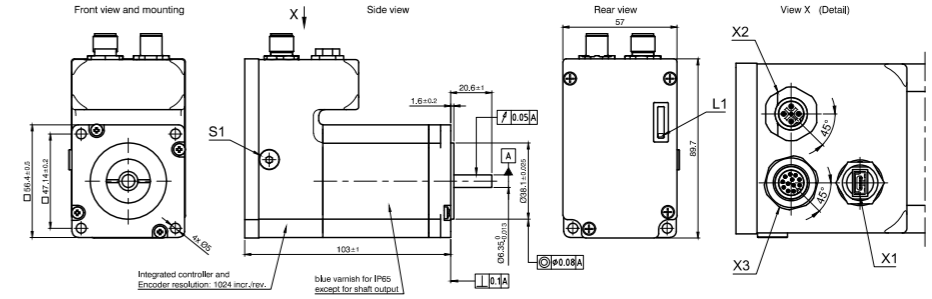
DIMENSIONS (IN MM)

PD4-E591L42-E-65-3

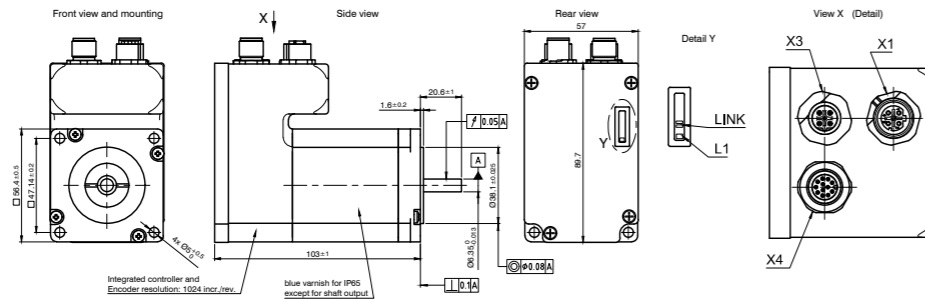


DIMENSIONS (IN MM)

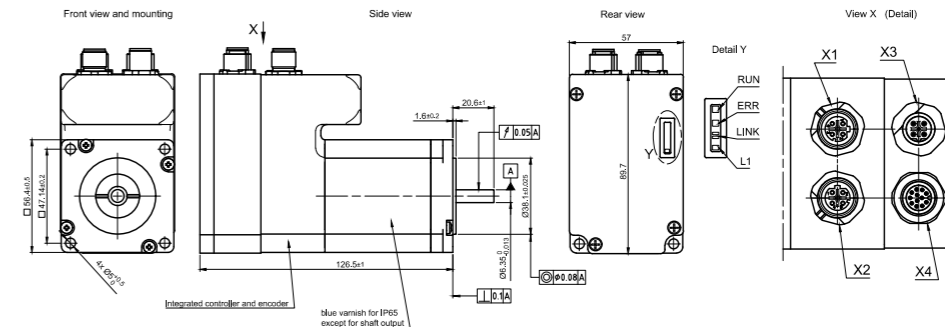
PD4-E591L42-E-65-7



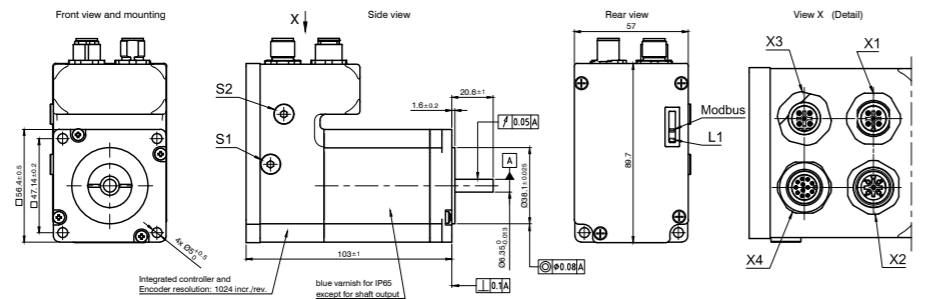
PD4-E591L42-E-65-4



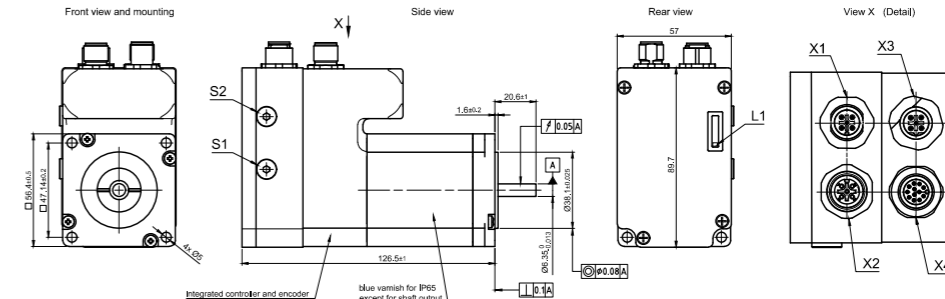
PD4-E591L42-M-65-1



PD4-E591L42-E-65-5

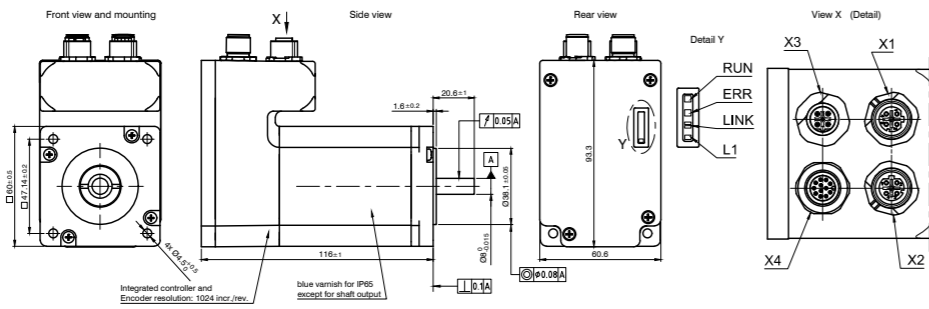


PD4-E591L42-M-65-2



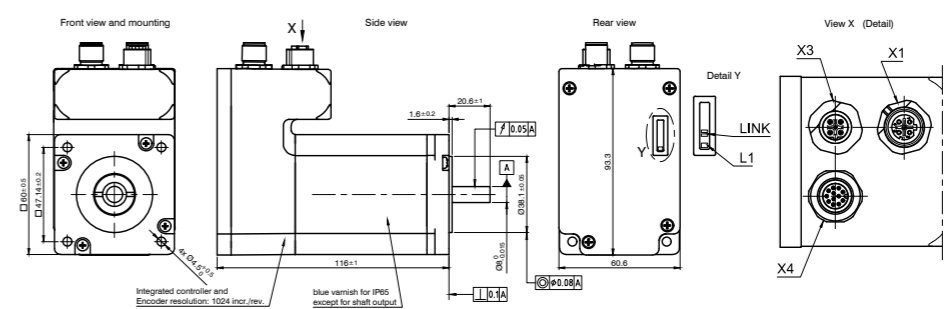
DIMENSIONS (IN MM)

PD4-E601L42-E-65-1

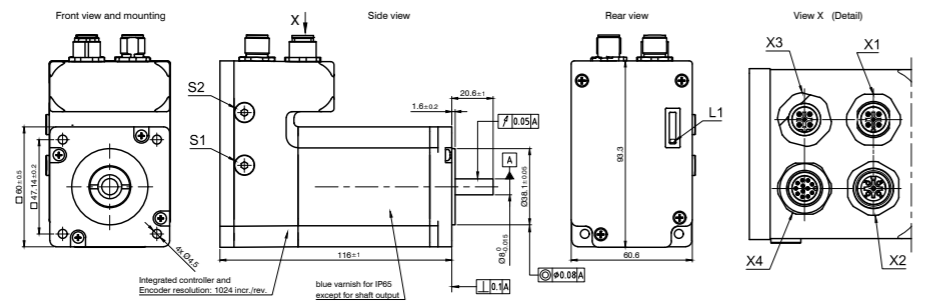


DIMENSIONS (IN MM)

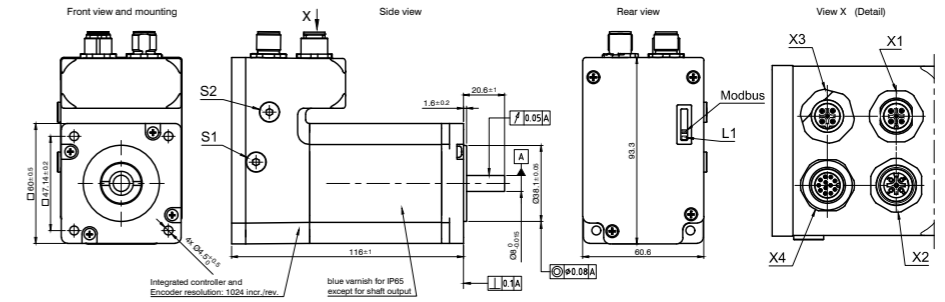
PD4-E601L42-E-65-4



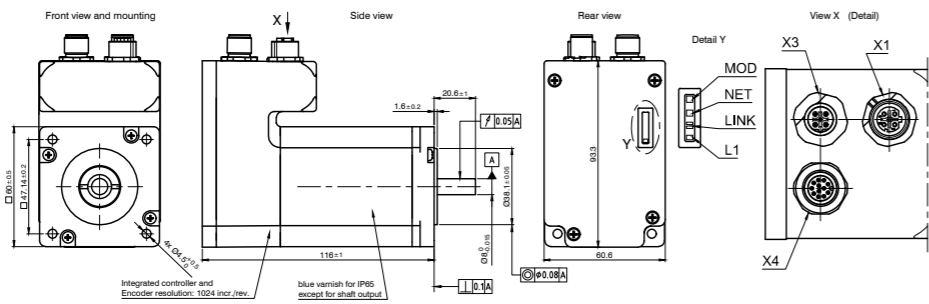
PD4-E601L42-E-65-2



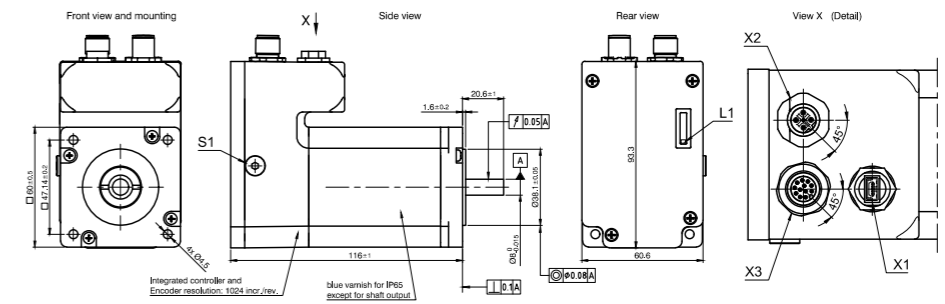
PD4-E601L42-E-65-5



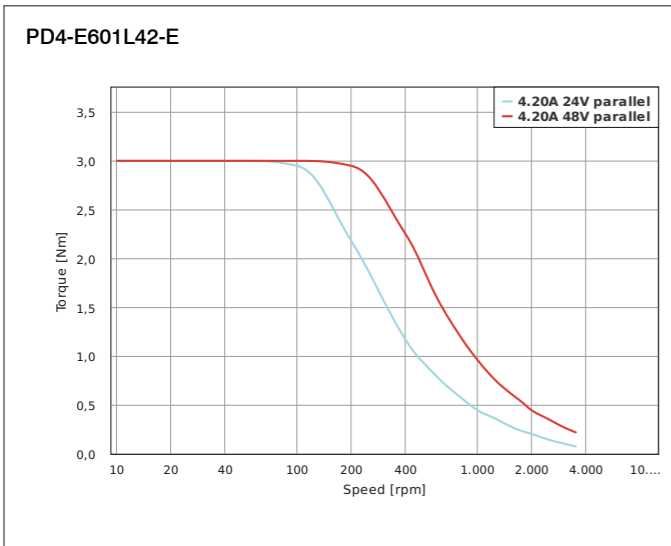
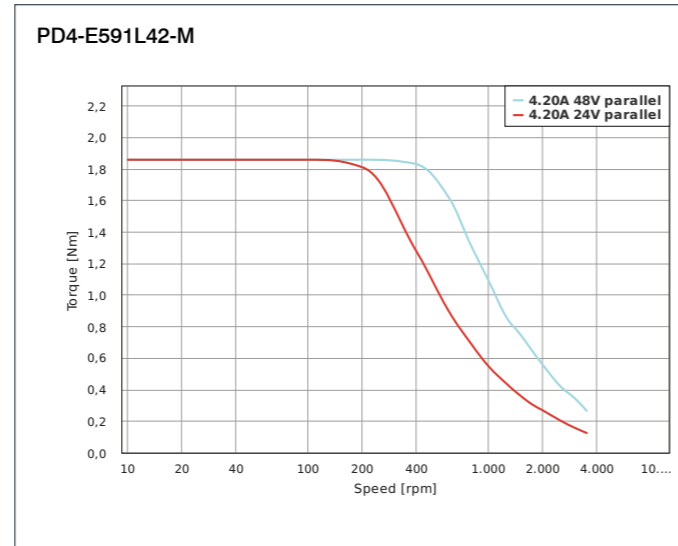
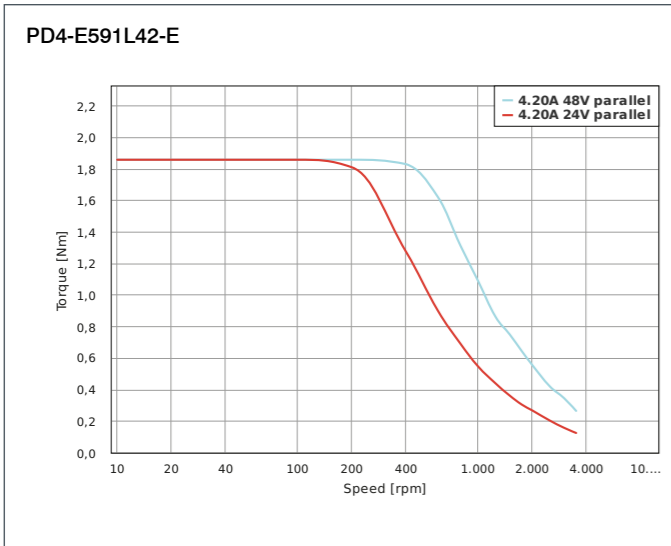
PD4-E601L42-E-65-3



PD4-E601L42-E-65-7



TORQUE CURVES



Notes section with horizontal lines for writing.



OPTIONS



SOFTWARE



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
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

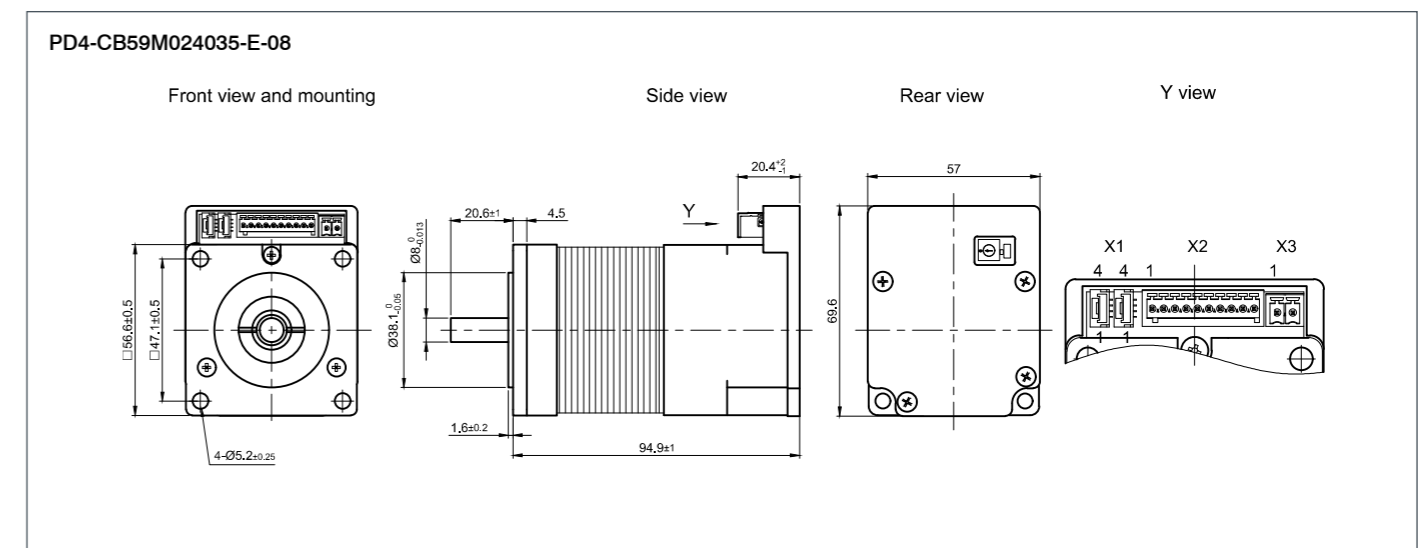
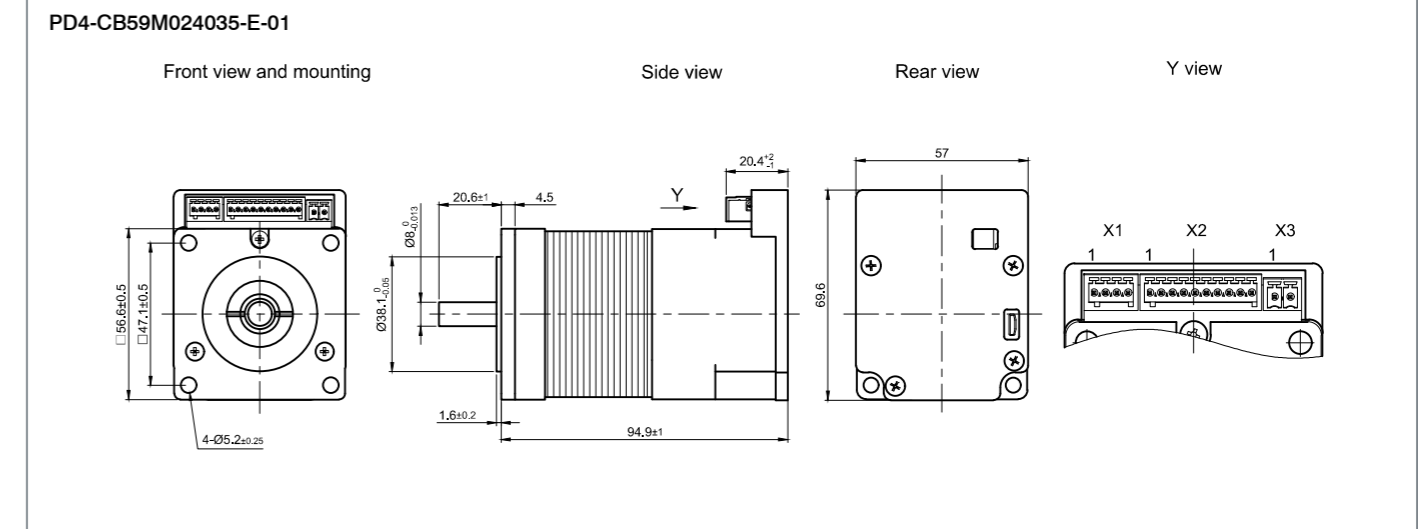
ACCESSORIES

ZK-MICROUSB Micro USB Cable 1.5 m
ZK-PD4-C-CAN-4-500-S
 CAN in/out Bridge 0.5m
Z-K4700/50 Charging Capacitor
IO-PD4-C-01 IO Board for PD4-C-01

CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

DIMENSIONS (IN MM)



PD4-EB

Brushless DC Motor with Integrated Controller and Protection Class IP65 - NEMA 23



OPTIONS



SOFTWARE



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
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	12 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-M	220	60	6	18	3500	EtherCAT, CANopen	146.5	1.45

PD4-EB

Brushless DC Motor with Integrated Controller and Protection Class 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)

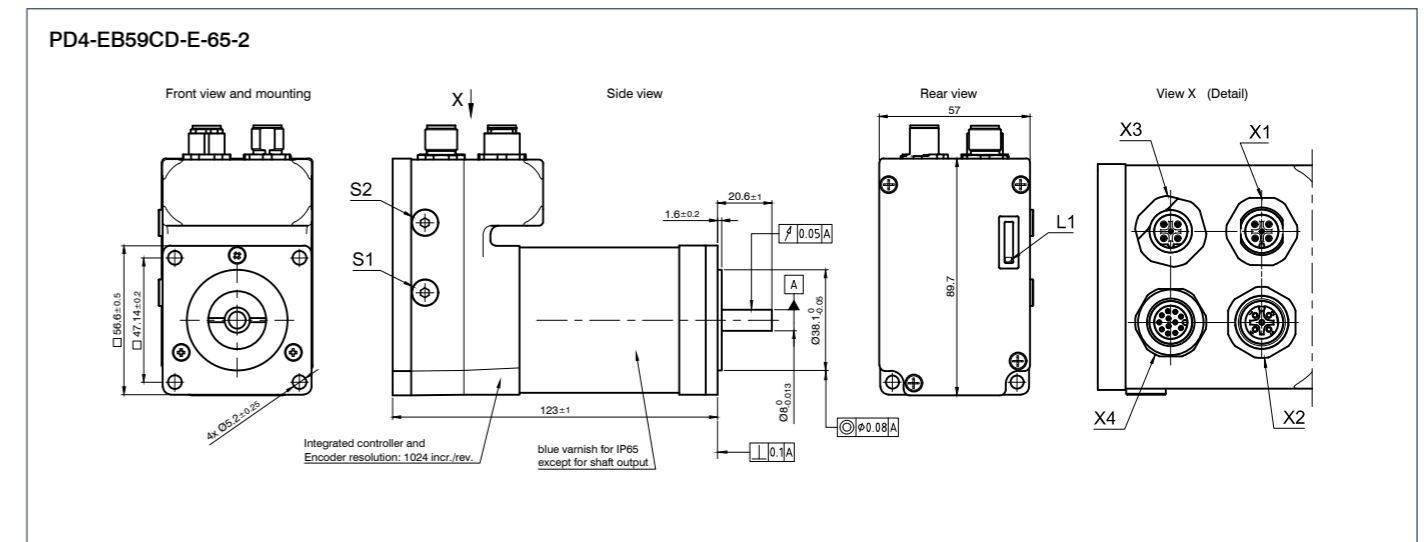
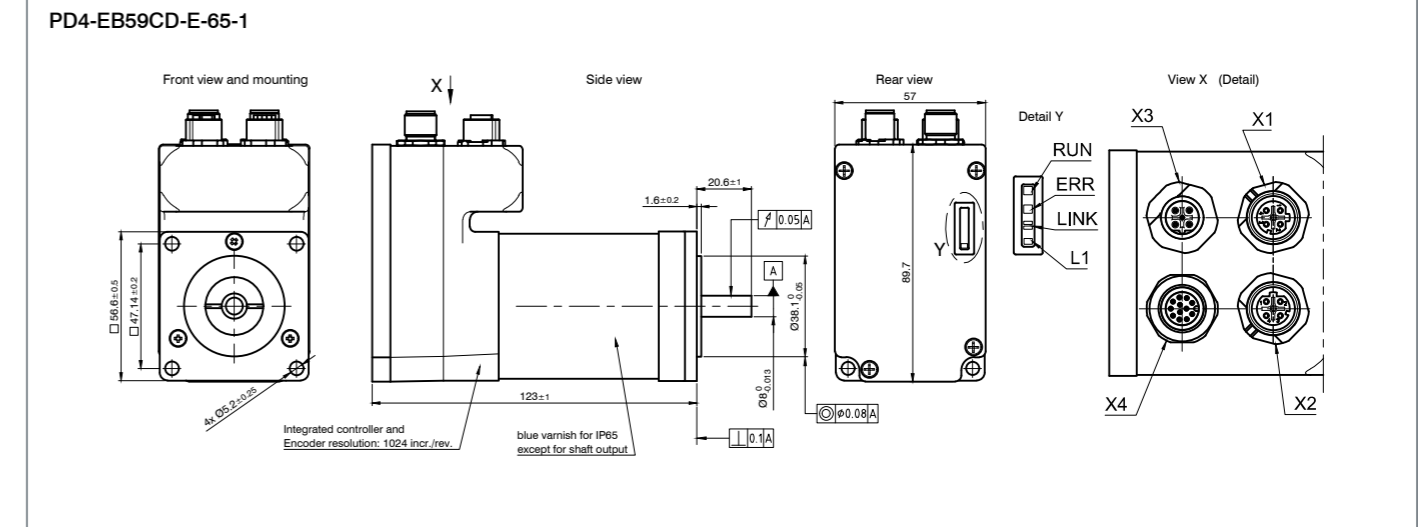
ACCESSORIES

ZK-USB Mini USB Cable 1.5 m
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 Charging Capacitor

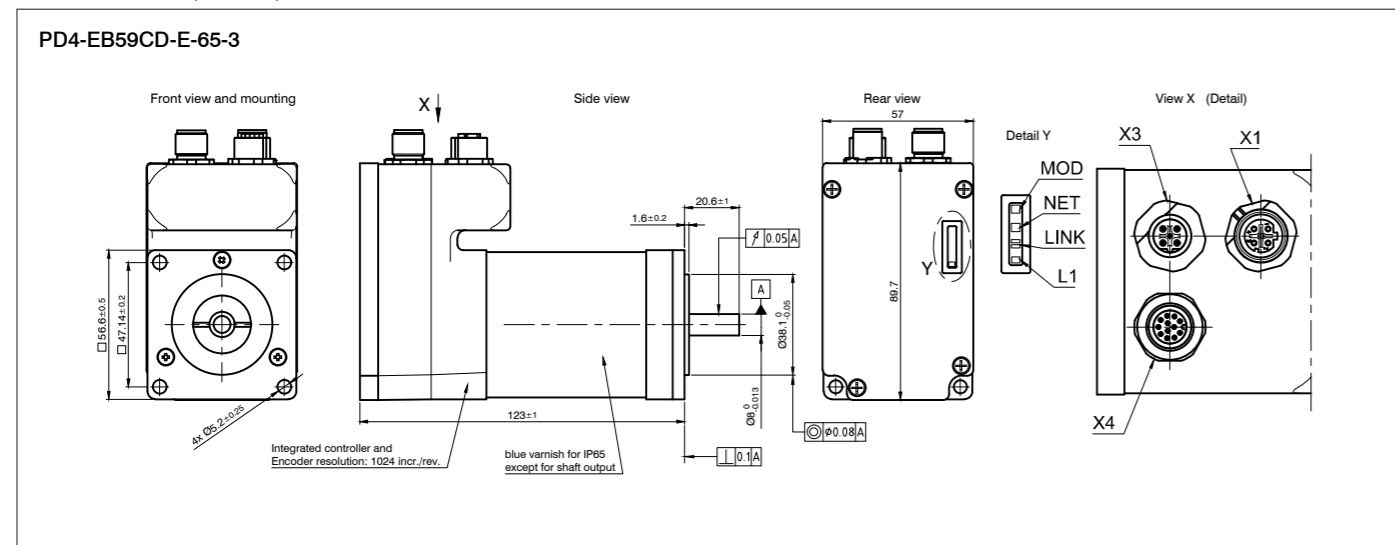
CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

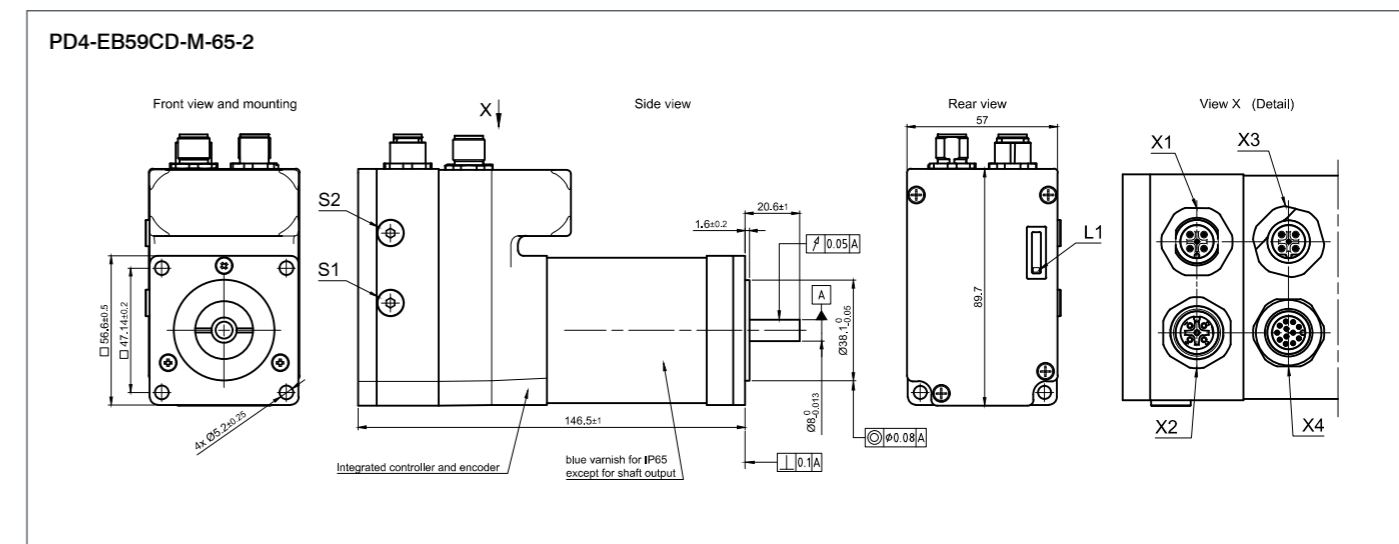
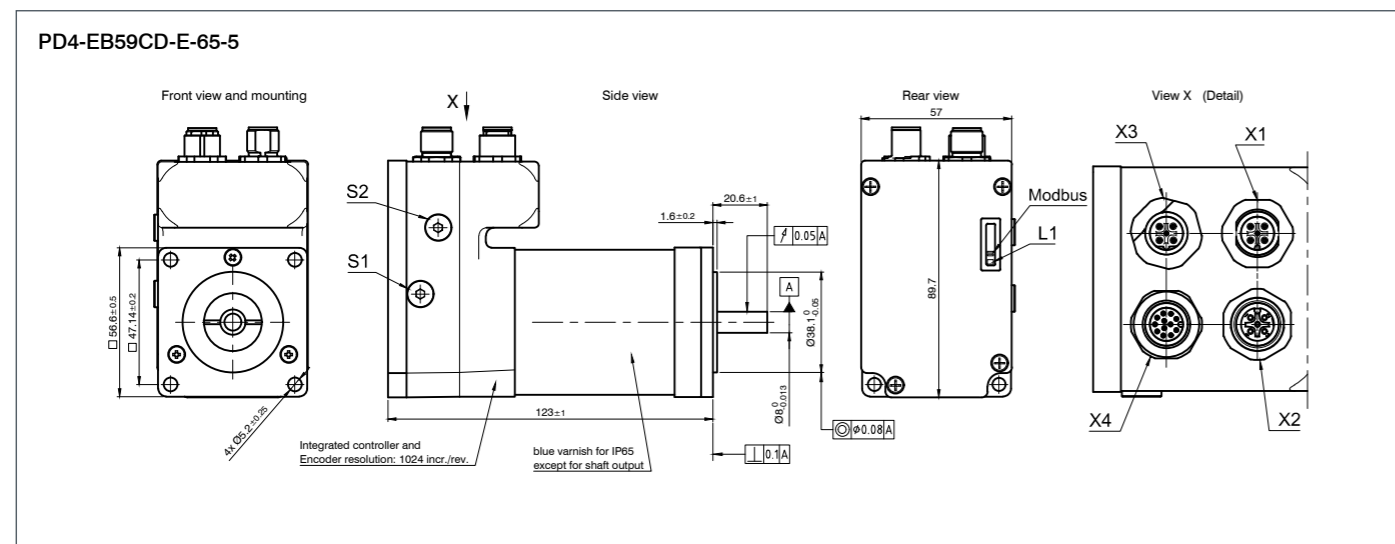
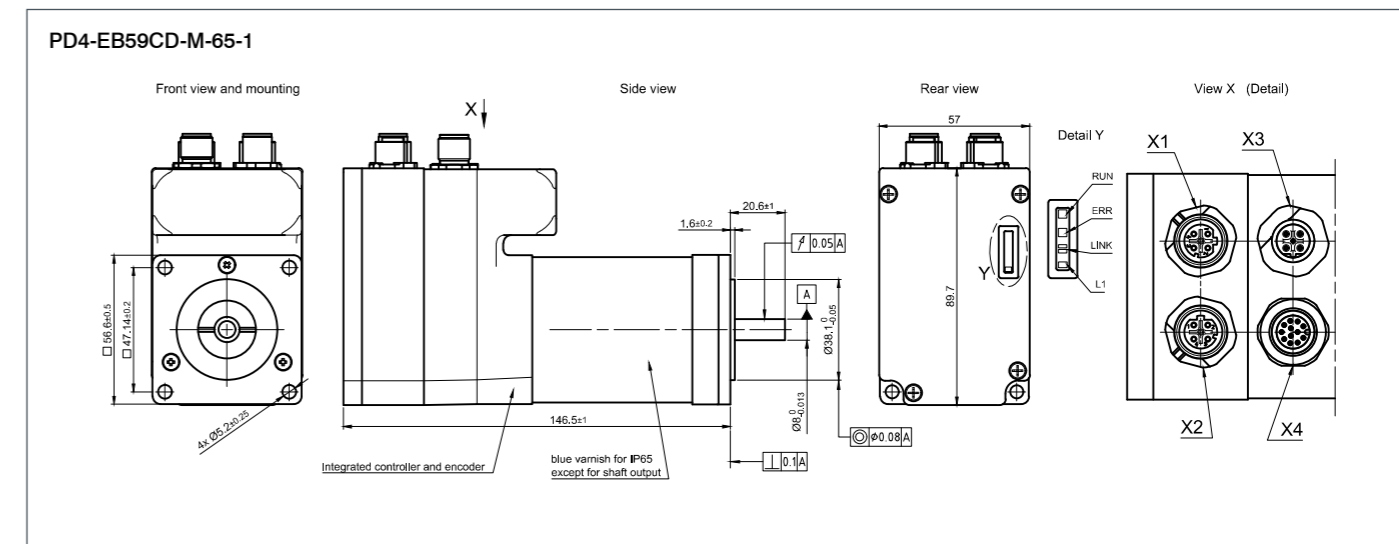
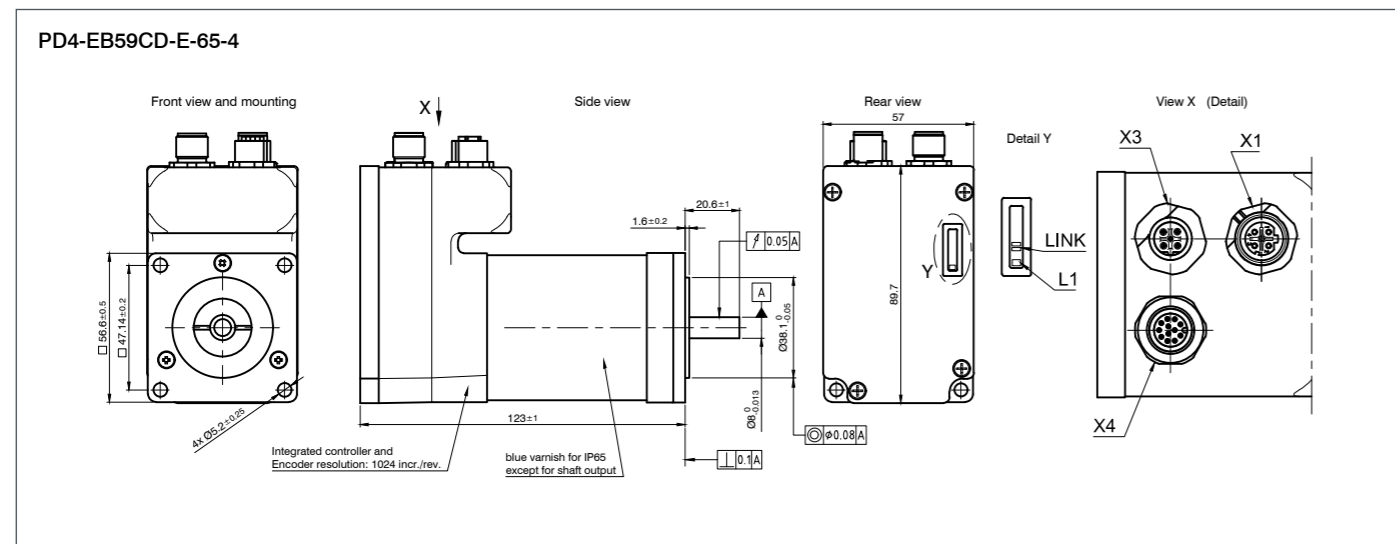
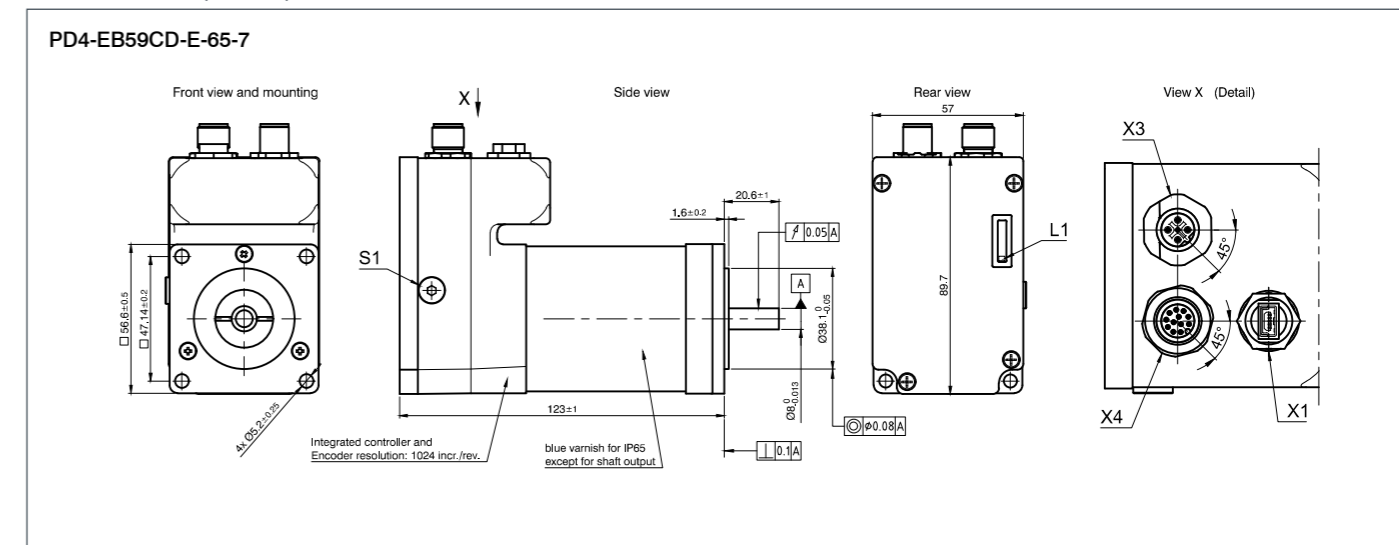
DIMENSIONS (IN MM)



DIMENSIONS (IN MM)



DIMENSIONS (IN MM)





OPTIONS



SOFTWARE



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	0-20 mA/0-10 V switchable, 0-10 V
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
PD6-C8918S6404-E-09	360	6.5	11	CANopen, USB, IO (clock direction; analog)	91	1.85
PD6-C8918M9504-E-09	594	9.5	11	CANopen, USB, IO (clock direction; analog)	123	2.95
PD6-C8918L9504-E-09	933	9.5	11	CANopen, USB, IO (clock direction; analog)	153	4.1

ORDER IDENTIFIER

PD6-C8918S6404-E-09 = CANopen, USB, IO (clock direction; analog)



ACCESSORIES

ZK-MICROUSB Micro USB Cable 1.5 m
Z-K4700/50 Charging Capacitor
Z-K10000/100 Charging Capacitor

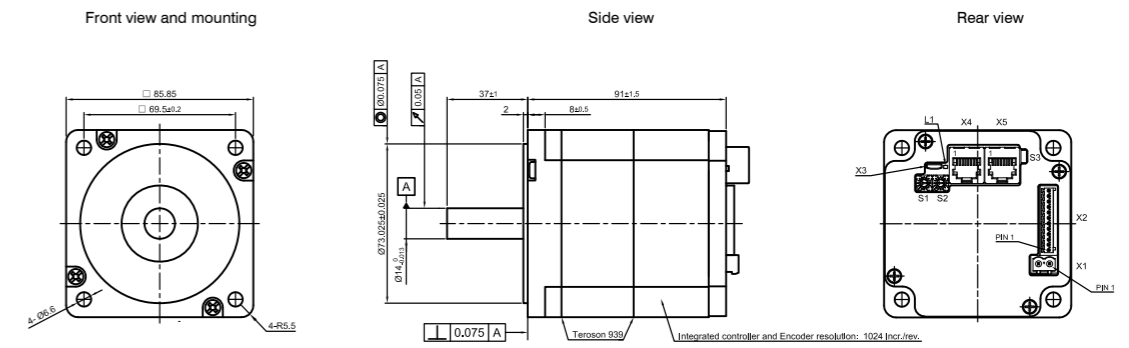


CAUTION

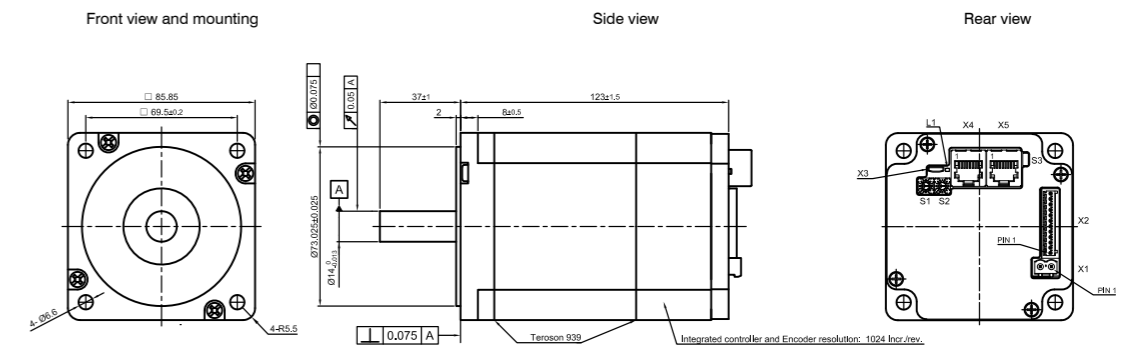
We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

DIMENSIONS (IN MM)

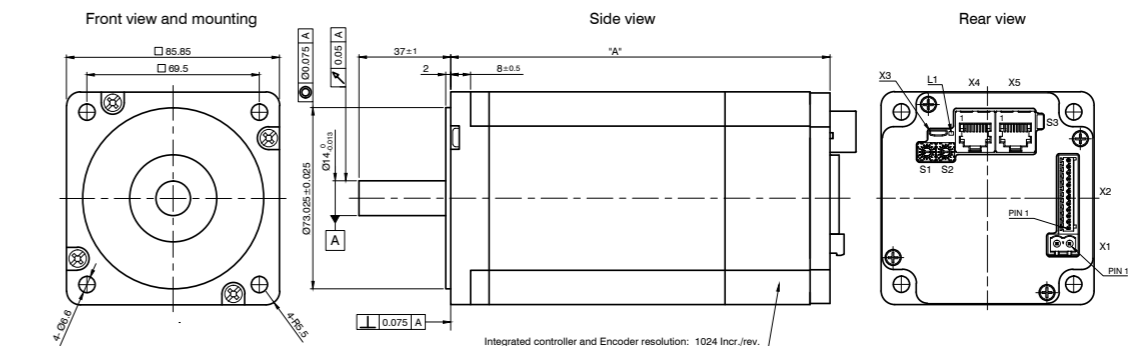
PD6-C8918S6404-E-09



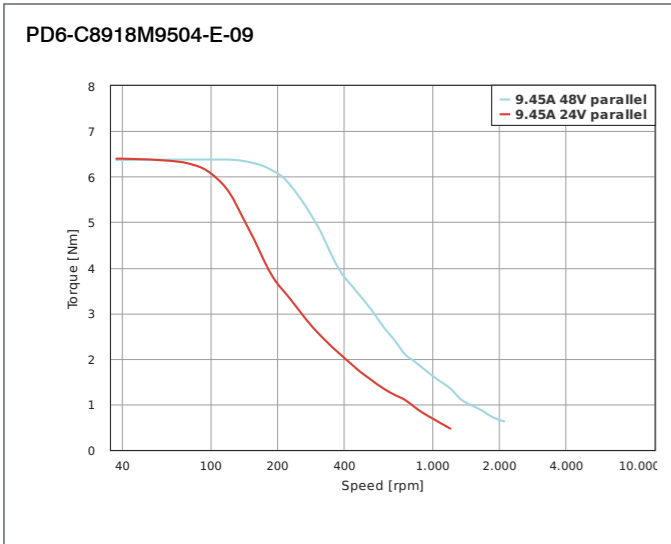
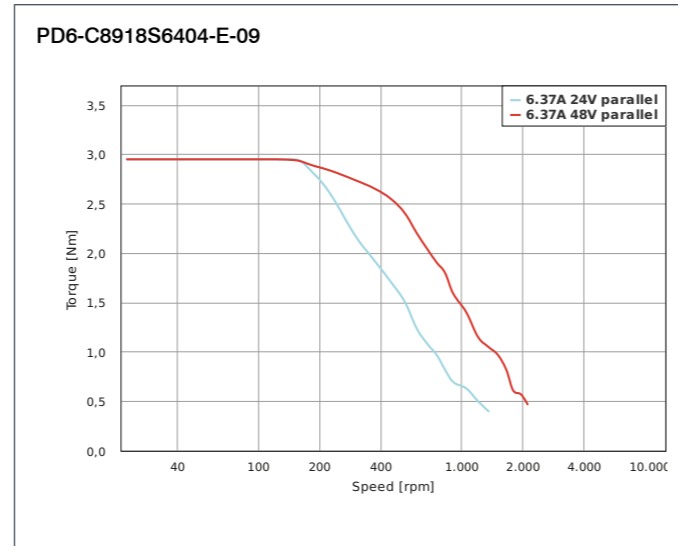
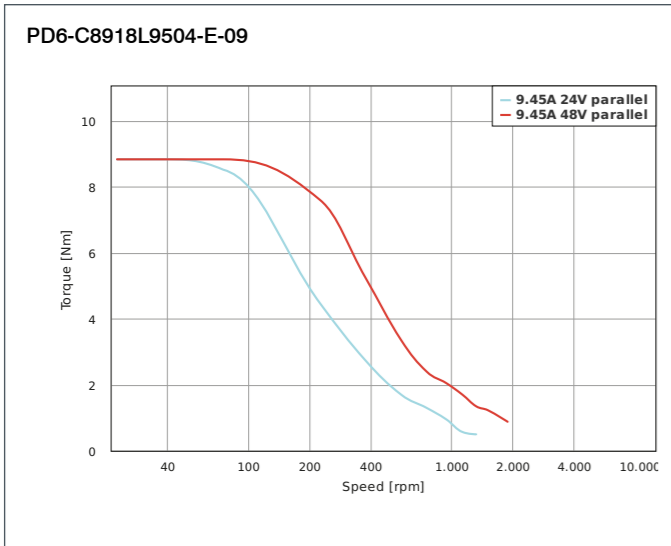
PD6-C8918M9504-E-09



PD6-C8918L9504-E-09



TORQUE CURVES



Notes section with horizontal lines for writing.

PD6-CB

Brushless DC Motor with Integrated Controller - NEMA 34 and Flange Size 80 mm



OPTIONS



SOFTWARE



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	0-20 mA/0-10 V switchable, 0-10 V
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	17.95	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

PD6-CB

Brushless DC Motor with Integrated Controller - NEMA 34 and Flange Size 80 mm



ORDER IDENTIFIER

PD6-CB87S048030-E-09 = CANopen, USB, IO (clock direction; analog)

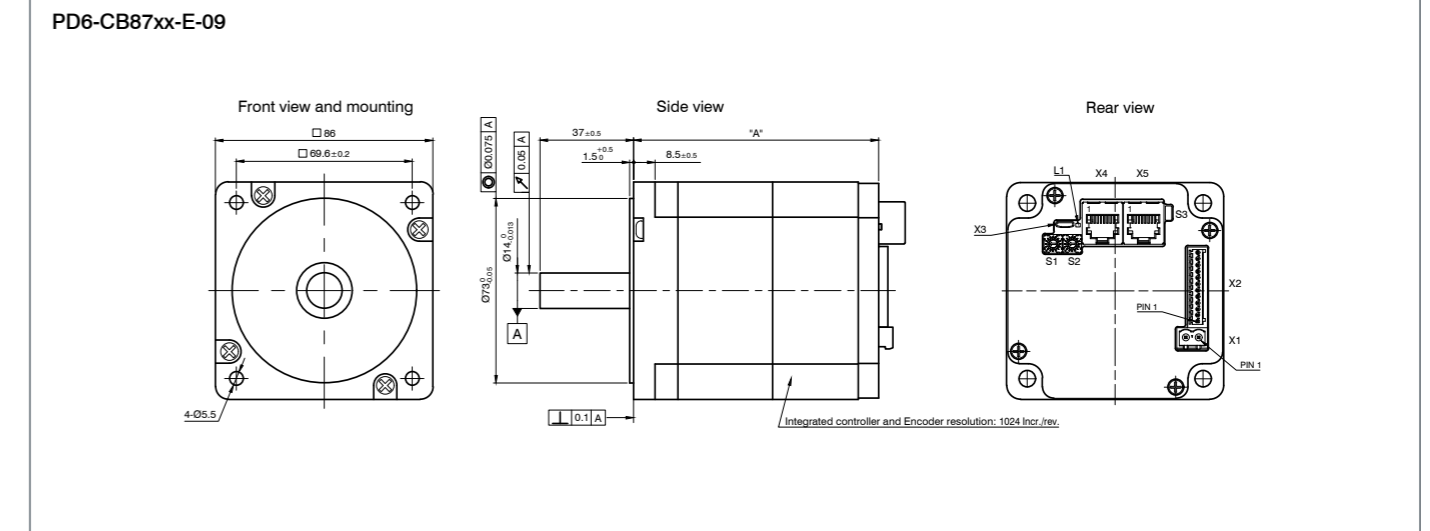
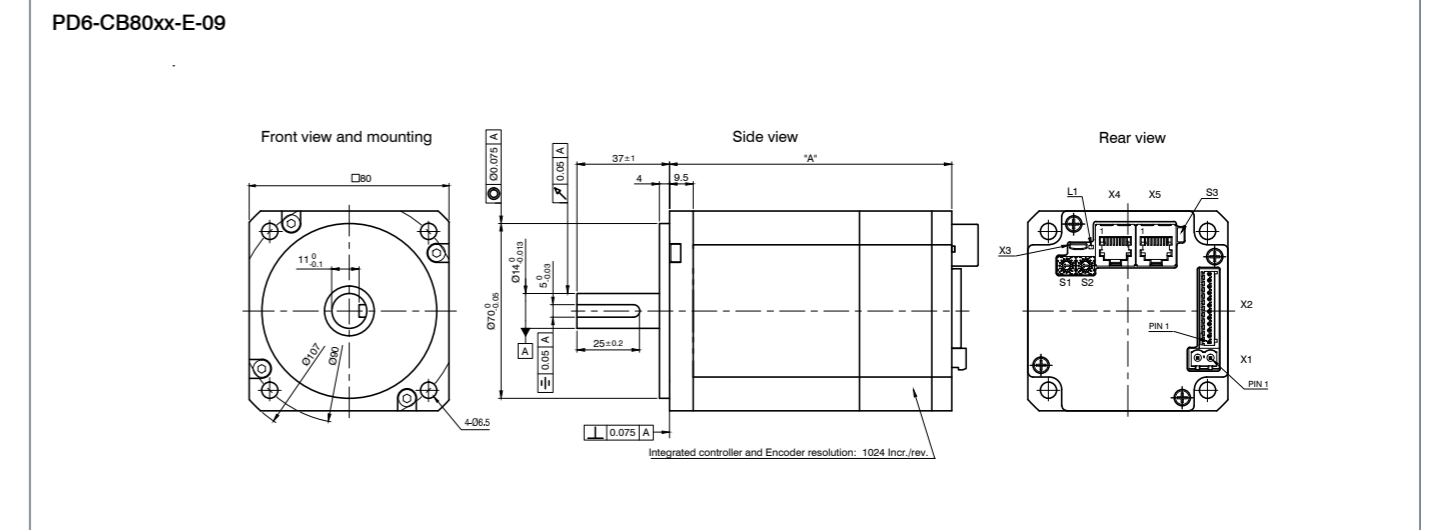
ACCESSORIES

ZK-MICROUSB Micro USB Cable 1.5 m
Z-K4700/50 Charging Capacitor
Z-K10000/100 Charging Capacitor

CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

DIMENSIONS (IN MM)







SOFTWARE



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
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	Corresponding Motors	Weight kg
N5-1	EtherCAT, CANopen, EtherNet/IP, Modbus TCP, Modbus RTU	10	10	1 - 2	✓	✓	Stepper Motors, Brushless DC motors	0.38
N5-2	EtherCAT, CANopen, EtherNet/IP, Modbus TCP, Modbus RTU	18	40	1 - 2	✓	✓	Stepper Motors, Brushless DC motors	0.38

ORDER IDENTIFIER

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



ACCESSORIES

- 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
ZCPHOFK-MC0,5-2 Plug Connectors
ZCPHOFK-MC0,5-12 Plug Connectors
ZCWE-RM5-3 Plug Connector
ZCWE-RM5-6 6-Pole Plug Connector



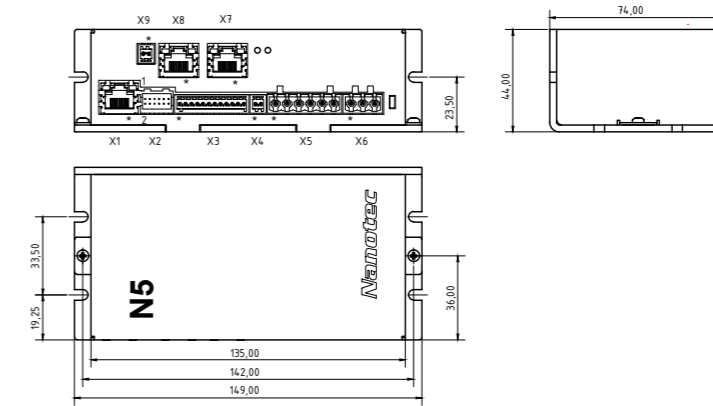
CAUTION



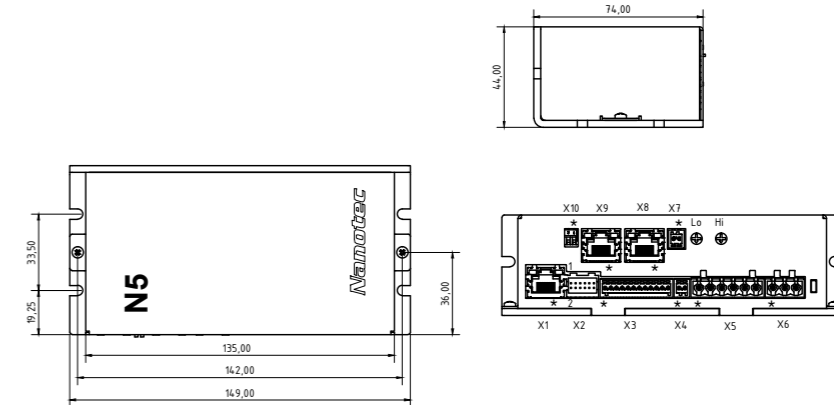
We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

DIMENSIONS (IN MM)

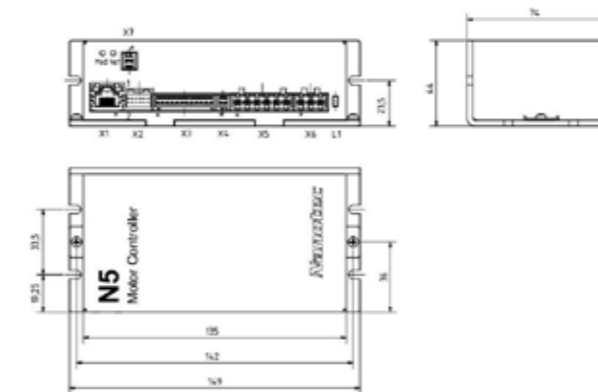
N5-x-1 EtherCAT



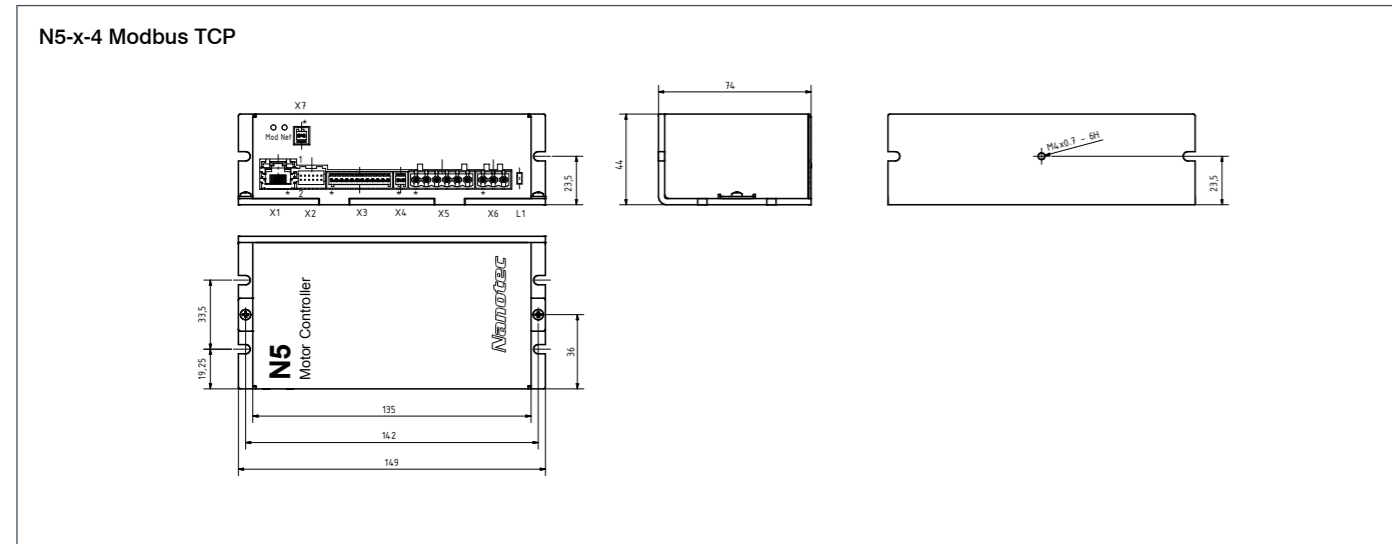
N5-x-2 CANopen



N5-x-3 EtherNet/IP



DIMENSIONS (IN MM)



SOFTWARE



TECHNICAL DATA

Temperature Range	-10 °C - 40 °C
Number of Digital Inputs	6
Type of Digital Inputs	24 V, 5/24 V switchable
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	Corresponding Motors	Weight kg
C5-01	USB, IO (clock direction; analog)	6	6	12 - 48	-	-	Stepper Motors	0.13

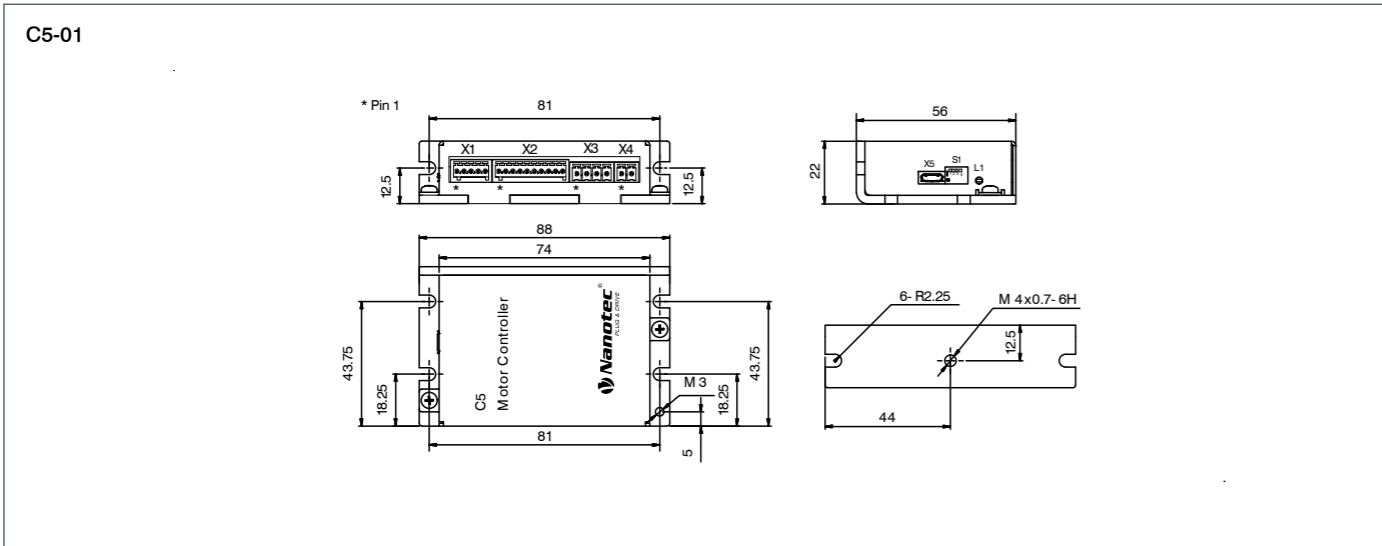
ACCESSORIES

ZK-MICROUSB
Micro USB Cable 1.5 m

CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

DIMENSIONS (IN MM)



SOFTWARE



TECHNICAL DATA

Temperature Range	-10 °C - 40 °C
Number of Digital Inputs	5
Type of Digital Inputs	5/24 V switchable
Digital Outputs	3
Type of Digital Output	open-drain (max. 24 V/100 mA)
Number of Analog Inputs	2
Type of Analog Input	0-20 mA/0-10 V switchable, 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	Corresponding Motors	Weight kg
C5-E-1-03	USB, Modbus RTU, IO (clock direction; analog)	6	6	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-2-03	USB, Modbus RTU, IO (clock direction; analog)	10	30	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-1-09	USB, CANopen, IO (clock direction; analog)	6	6	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-2-09	CANopen, USB, IO (clock direction; analog)	10	30	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-1-11	EtherNet/IP, USB, IO (clock direction; analog)	6	6	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-2-11	USB, EtherNet/IP, IO (clock direction; analog)	10	30	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-1-21	USB, EtherCAT, IO (clock direction; analog)	6	6	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-2-21	EtherCAT, USB, IO (clock direction; analog)	10	30	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-1-81	USB, Modbus TCP, IO (clock direction; analog)	6	6	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27
C5-E-2-81	USB, Modbus TCP, IO (clock direction; analog)	10	30	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.27

ORDER IDENTIFIER

C5-E-
1-09 = low-current version
2-09 = high-current version



ACCESSORIES

- ZK-MICROUSB** Micro USB Cable 1.5 m
- ZK-NOE-10-500-S-PADP**
Encoder Cable NOE 0.5m
- 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



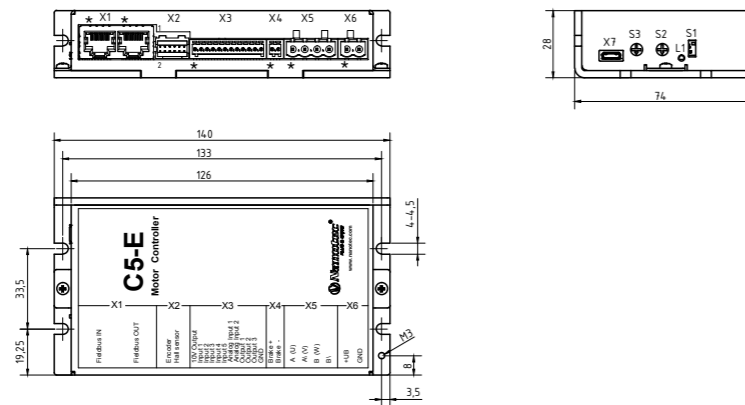
CAUTION

We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

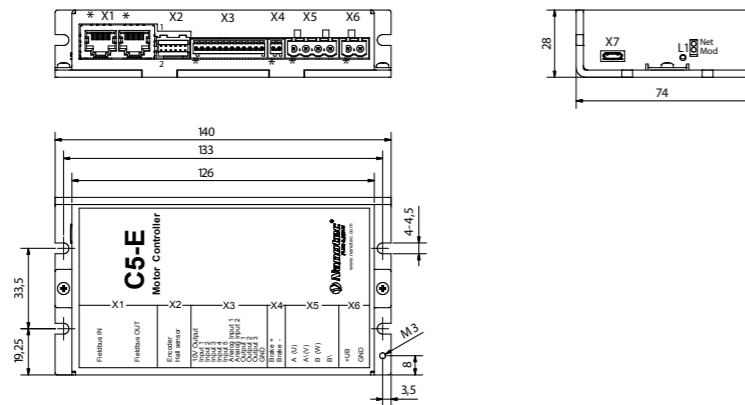


DIMENSIONS (IN MM)

C5-E

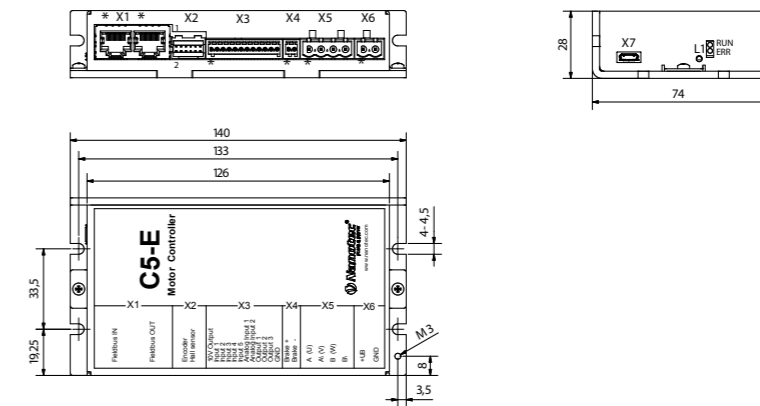


C5-E...-11



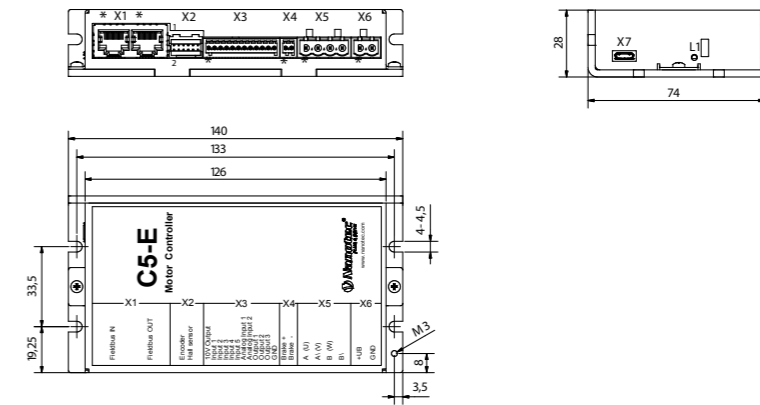
DIMENSIONS (IN MM)

C5-E...-21



DIMENSIONS (IN MM)

C5-E...-81





SOFTWARE



TECHNICAL DATA

Temperature Range	-10 °C - 40 °C
Number of Digital Inputs	5
Type of Digital Inputs	5 V
Digital Outputs	3
Type of Digital Output	open-drain (max. 24 V/100 mA)
Number of Analog Inputs	2
Type of Analog Input	0-20 mA/0-10 V switchable, 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	Corresponding Motors	Weight kg
CL3-E-1-0F	USB, CANopen, Modbus RTU, IO (clock direction; analog)	3	3	12 - 24	✓	-	Stepper Motors, Brushless DC motors	0.02
CL3-E-2-0F	USB, CANopen, Modbus RTU, IO (clock direction; analog)	3	6	12 - 24	✓	-	Stepper Motors, Brushless DC 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 1.5 m
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



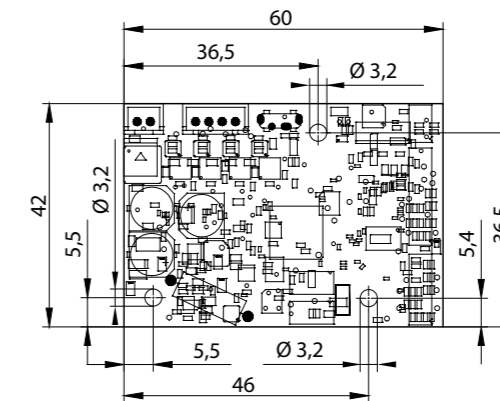
CAUTION



We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

DIMENSIONS (IN MM)

CL3-E





SOFTWARE



TECHNICAL DATA

Temperature Range	-10 °C - 40 °C
Number of Digital Inputs	4
Type of Digital Inputs	24 V, 5 V
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	Corresponding Motors	Weight kg
CL4-E-1-12	CANopen, USB, Modbus RTU, IO (clock direction; analog)	3	6	12 - 58	✓	-	Stepper Motors, Brushless DC motors	0.028
CL4-E-1-12-5VDI	CANopen, USB, Modbus RTU, IO (clock direction; analog)	3	6	12 - 58	✓	-	Stepper Motors, Brushless DC motors	0.028
CL4-E-2-12	CANopen, USB, Modbus RTU, IO (clock direction; analog)	6	18	12 - 58	✓	-	Stepper Motors, Brushless DC motors	0.032
CL4-E-2-12-5VDI	CANopen, USB, Modbus RTU, IO (clock direction; analog)	6	18	12 - 58	✓	-	Stepper Motors, Brushless DC motors	0.032

ORDER IDENTIFIER

CL3-E-
1-0F = low-current version
2-0F = high-current version



ACCESSORIES

ZK-MICROUSB Micro USB Cable 1.5 m
ZK-VHR-3-500 Power Cable 0.5 m
ZK-VHR-4-500 Motor Cable 0.5 m
ZK-XHP-3-500 Power Cable 0.5 m
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 0.3 m
Z-K4700/50 Charging Capacitor



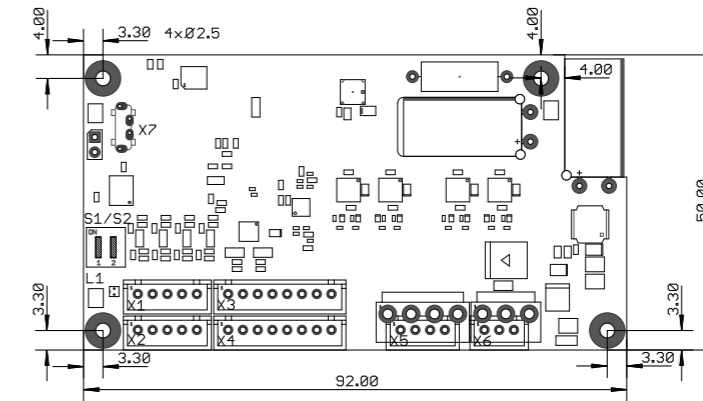
CAUTION



We recommend using a charging capacitor of sufficient size to stabilize the operating voltage.

DIMENSIONS (IN MM)

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



NP5

Motor Controller/Drive for CANopen, EtherCAT, Modbus RTU or SPI



SOFTWARE



TECHNICAL DATA

Temperature Range	-10 °C - 40 °C
Number of Digital Inputs	6
Type of Digital Inputs	3.3 V
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	Corresponding Motors	Weight kg
NP5-02	Modbus RTU	6	10	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.035
NP5-08	CANopen	6	10	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.035
NP5-20	EtherCAT	6	10	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.035
NP5-40	SPI	6	10	12 - 48	✓	✓	Stepper Motors, Brushless DC motors	0.035

ACCESSORIES

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

ORDER IDENTIFIER

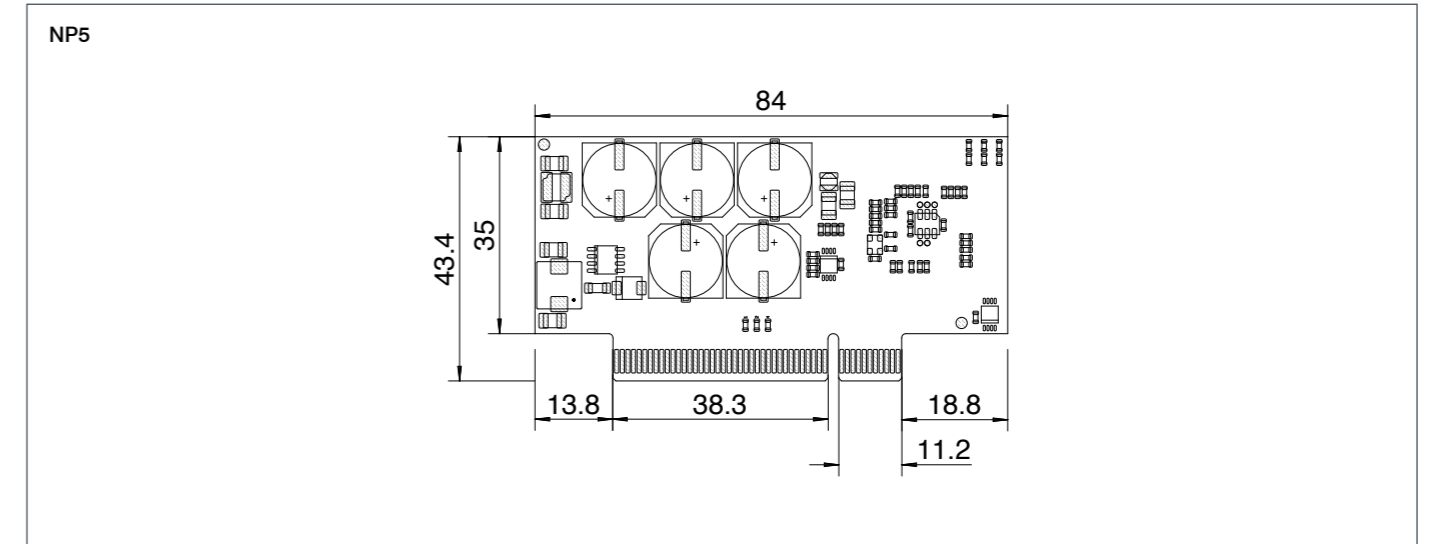
- NP5-**
- 02 = Modbus RTU
- 08 = CANopen
- 20 = EtherCAT
- 40 = SPI

NP5

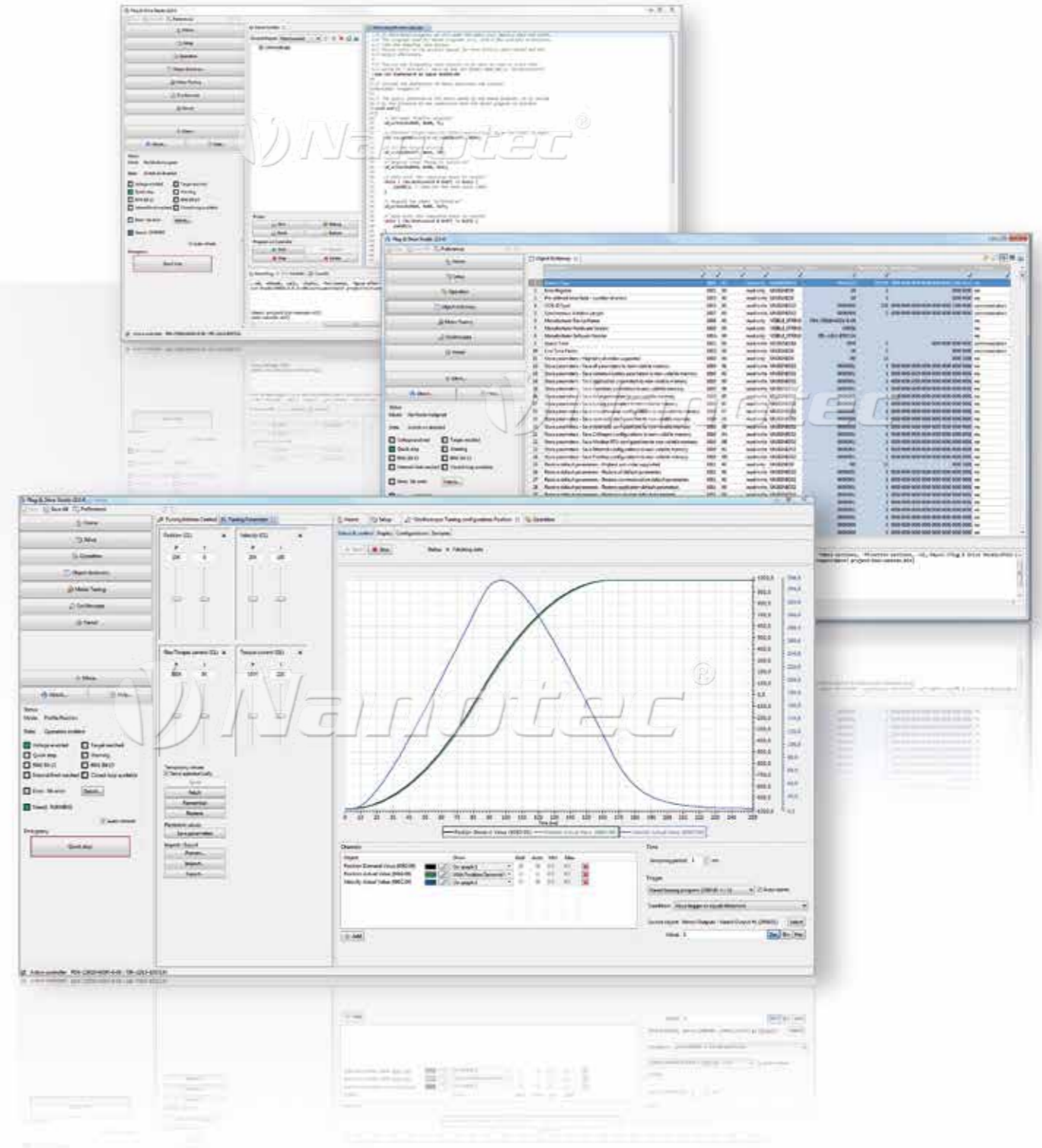
Motor Controller/Drive for CANopen, EtherCAT, Modbus RTU or SPI



DIMENSIONS (IN MM)



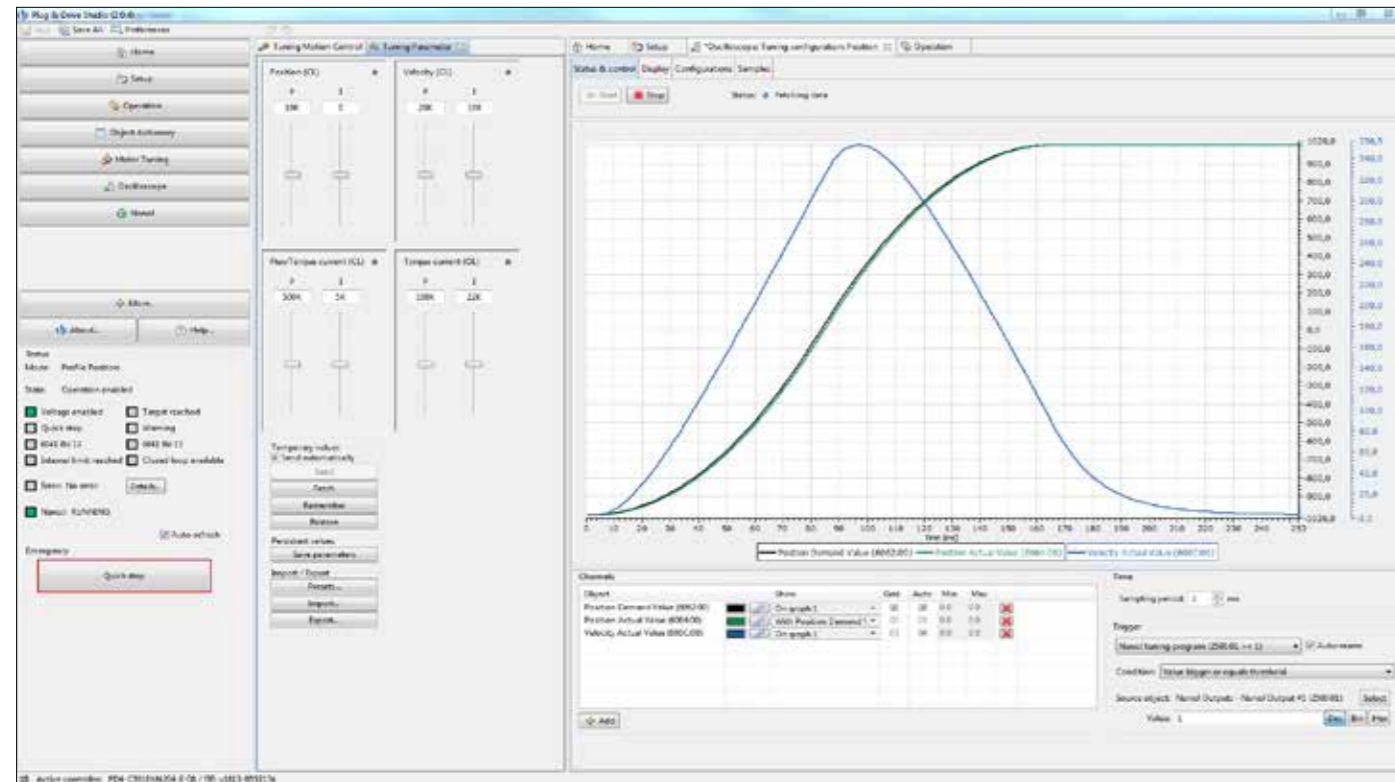
Lined area for notes.



A new software is now available for easy setup and programming of Nanotec's motor controllers: Plug & Drive Studio. The controller can be accessed from a PC via a variety of field buses (CANopen, EtherCAT, Ethernet, Modbus, USB).

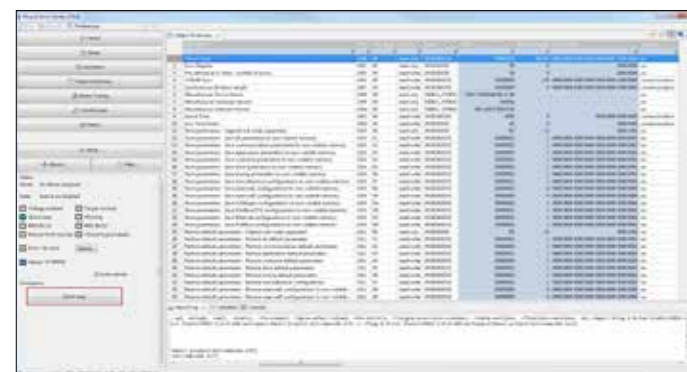
For setup, the object directory holding the controller configuration can be read and written via a table. Pre-defined filters enable the user to only display the parts of CiA 402 objects that pertain to a certain task, such as setup or a certain operating mode, i.e. the speed. Experienced users can configure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

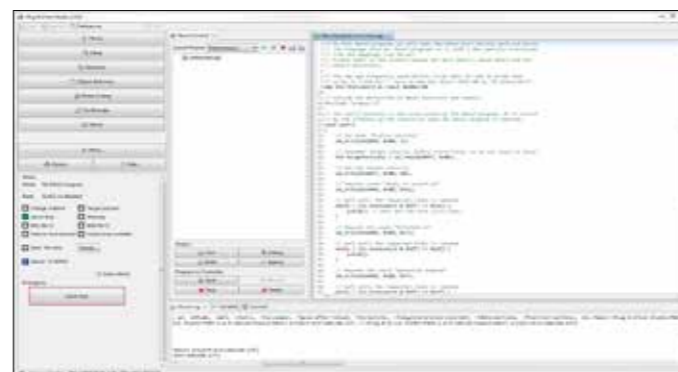


Oscilloscope with target and actual positions and following errors

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

Software for Motors with integrated Controller/Drive and Stepper Motor Controllers



Plug & Drive Studio is a free software for setting up and programming the Nanotec controllers, and tuning the motor. It also includes a programming environment for NanoJ V2. The software supports CAN (IXXAT), serial, Ethernet and USB interfaces. For more information, please see our Quick Start Guide or the article in our knowledge base.

PLUG & DRIVE STUDIO

VERSION	1.0.4	2.0.4
OPERATING SYSTEMS	Windows XP, Vista, 7, 8, 10	Windows XP, Vista, 7, 8, 10
COMPATIBLE PRODUCTS	C5-E-1-09, C5-E-2-09, C5, CL3-E, N5-1-1, N5-1-2, N5-1-3, N5-1-4, N5-2-1, N5-2-2, N5-2-3, N5-2-4, NP5-08, NP5-40, PD2-C, PD2-C-IP, PD2-CB, PD2-CB-IP, PD4-C, PD4-CB, PD6-C	C5-E-1-03, C5-E-2-03, C5-E-1-21, C5-E-2-21, C5-E-1-81, C5-E-2-81, CL4-E, N5-1-5, N5-2-5, NP5-02, NP5-20, PD4-E, PD4-EB
MANUAL	Quick Start Guide 1.0	Quick Start Guide 2.0.4



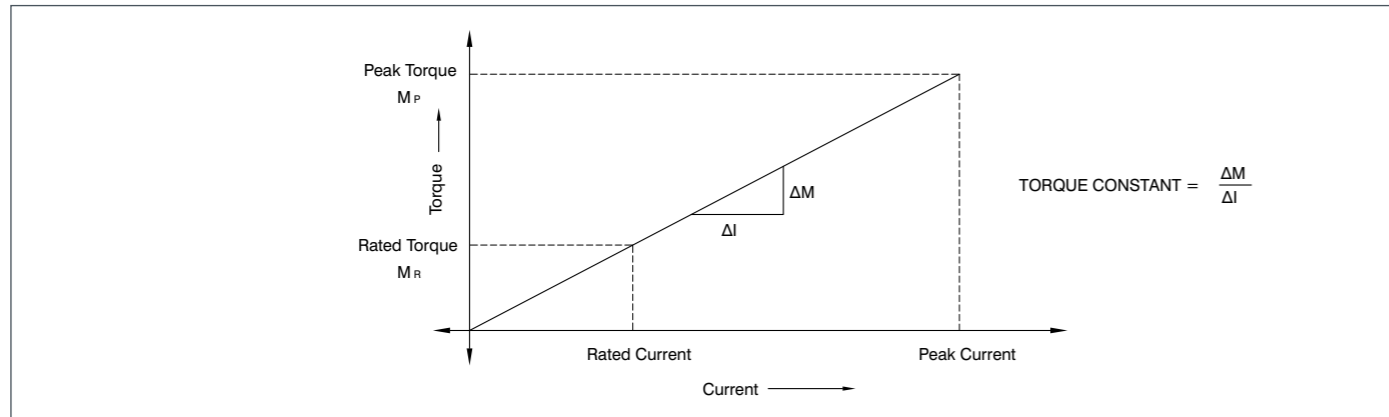
ADVANTAGES

- 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

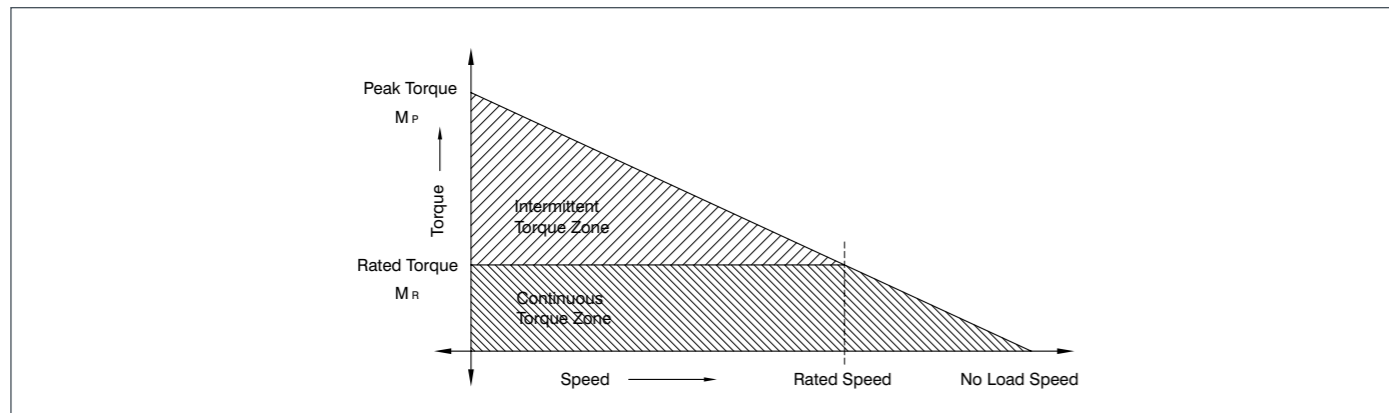
Affordable electronically commutated 3-phase brushless motors (EC motors) are particularly well suited for applications requiring smooth running and a long service life. High acceleration and speeds of up to 25,000 rpm with exceptional efficiency due to the high-energy permanent magnets. The rotor position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

PROPERTIES

TORQUE/CURRENT CHARACTERISTICS



TORQUE/SPEED CHARACTERISTICS



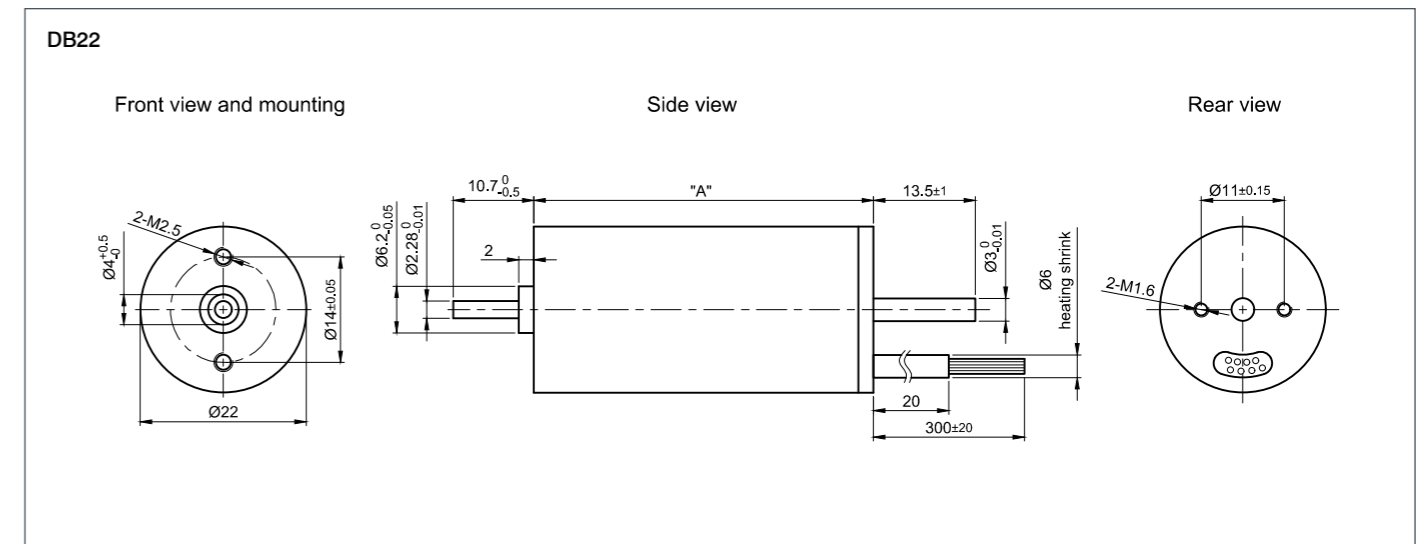
OPTIONS



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 gcm ²	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)





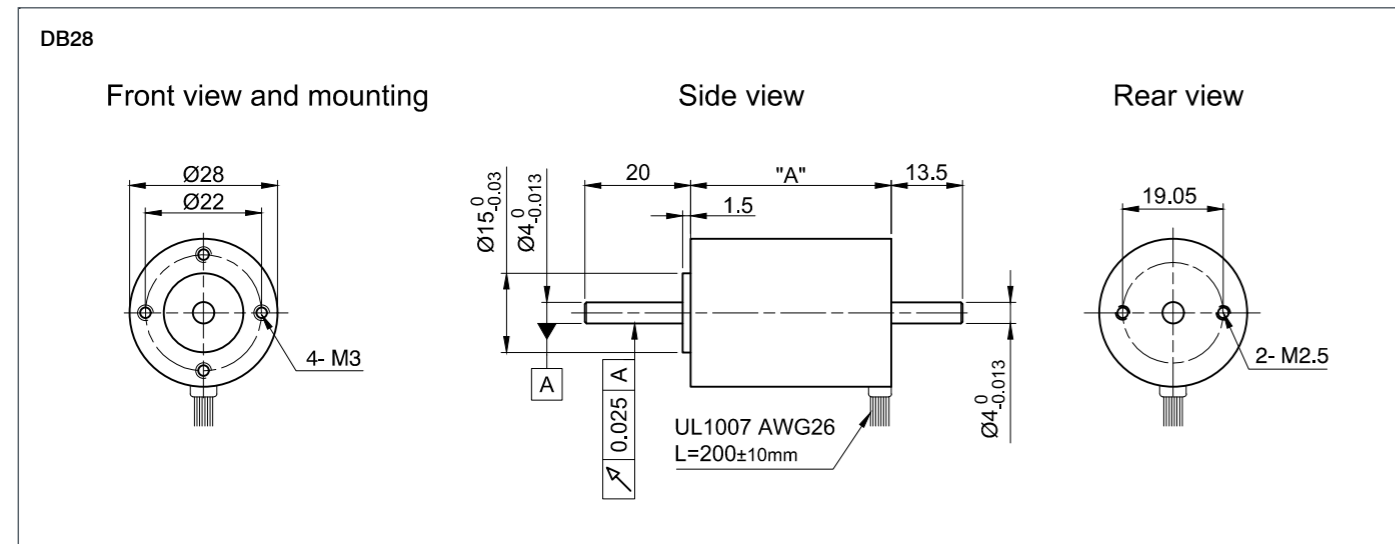
OPTIONS



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 gcm ²	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)



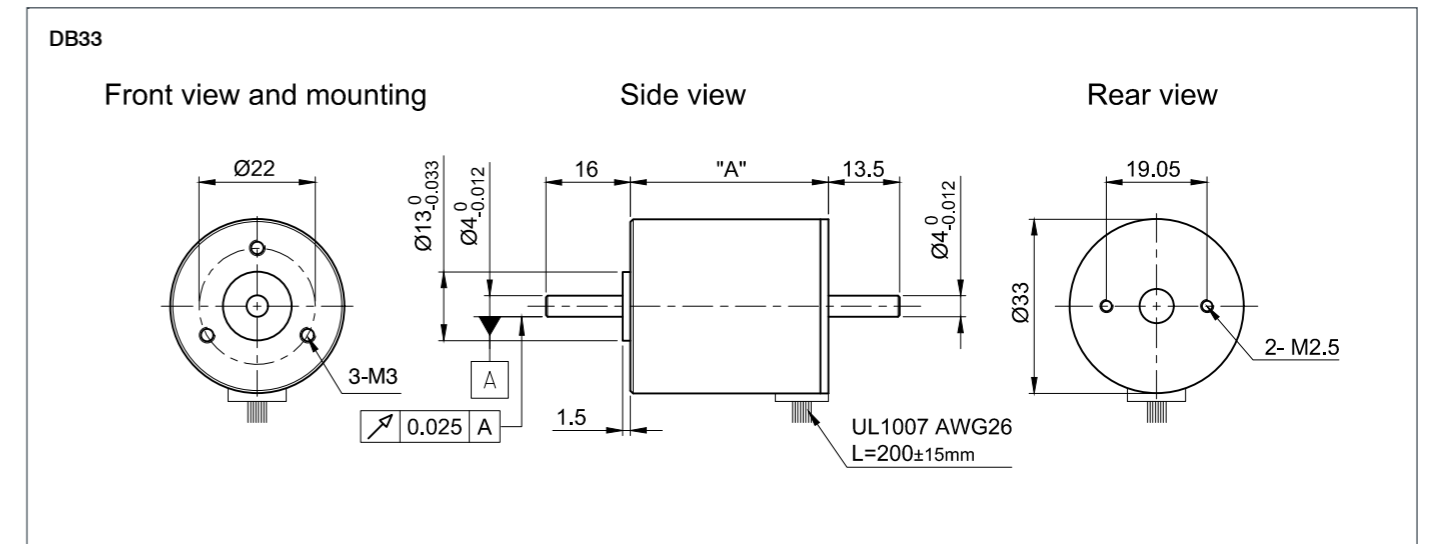
OPTIONS



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 gcm ²	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)





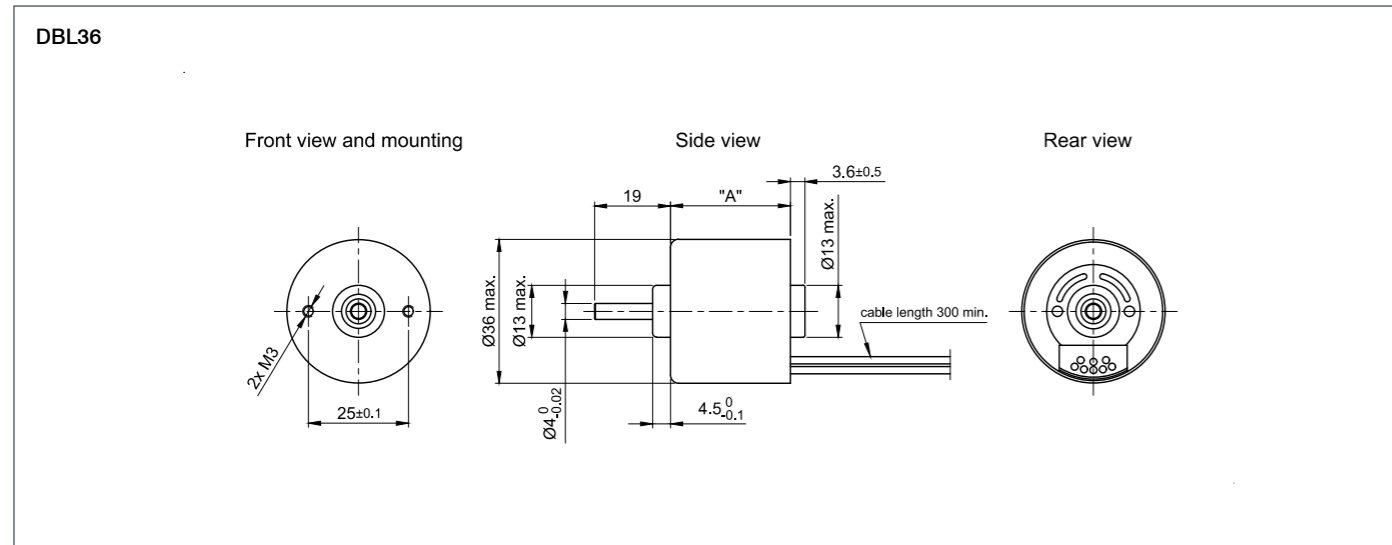
OPTIONS



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 gcm ²	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)



OPTIONS



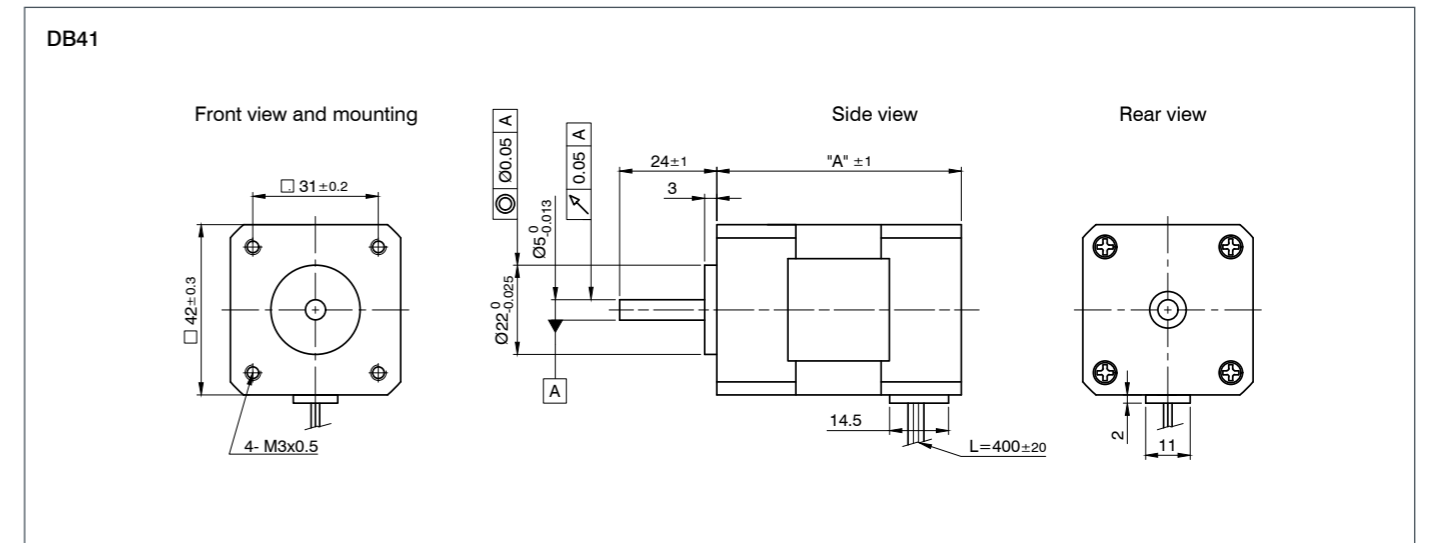
VERSIONS

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 gcm ²	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)





OPTIONS



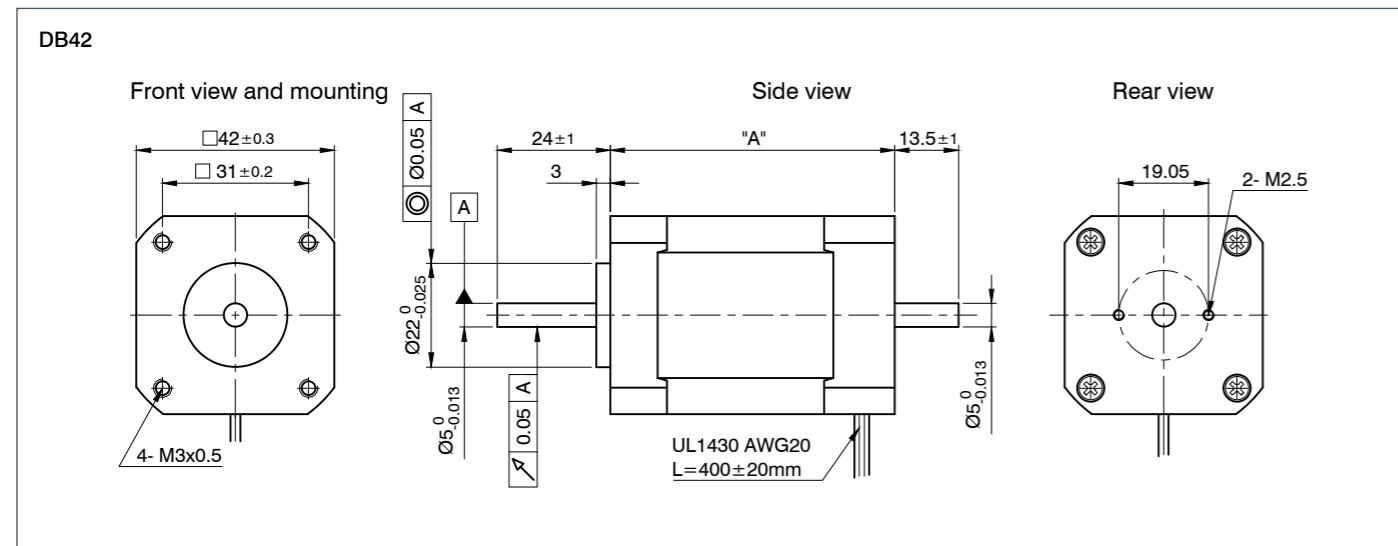
ACCESSORIES

- 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 gcm ²	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)



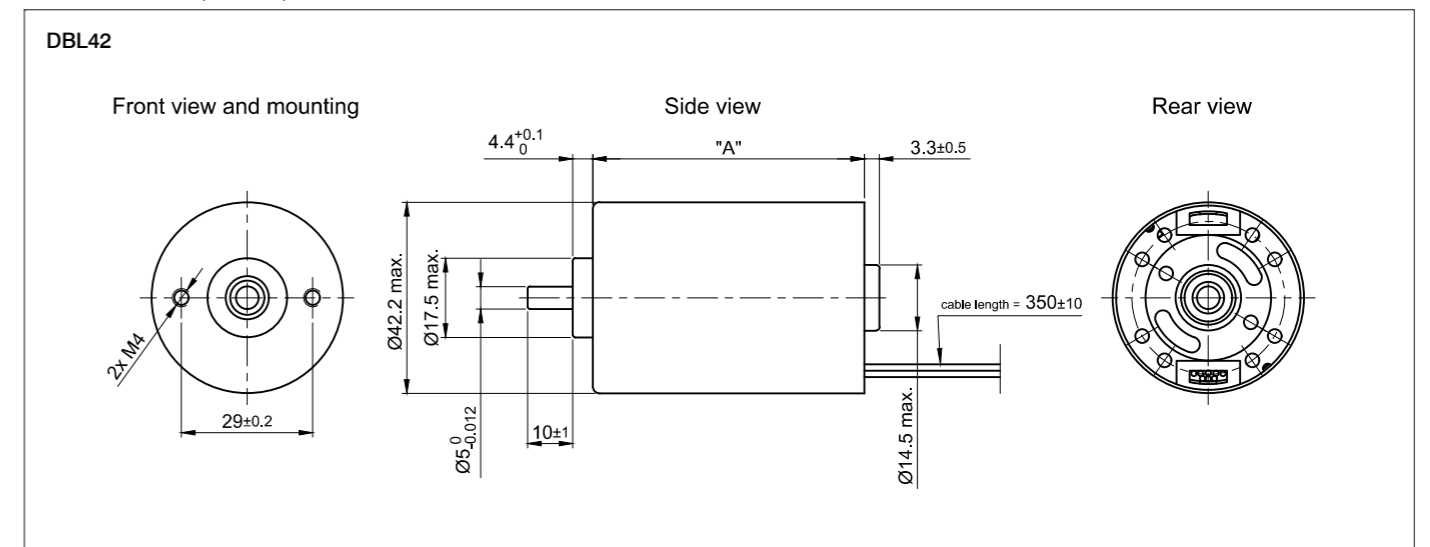
OPTIONS



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 gcm ²	Length „A“ mm	Weight kg
DBL42L024032-A	40	12	2.1	6.3	24	3200	5.4	44	60	0.35

DIMENSIONS (IN MM)





OPTIONS



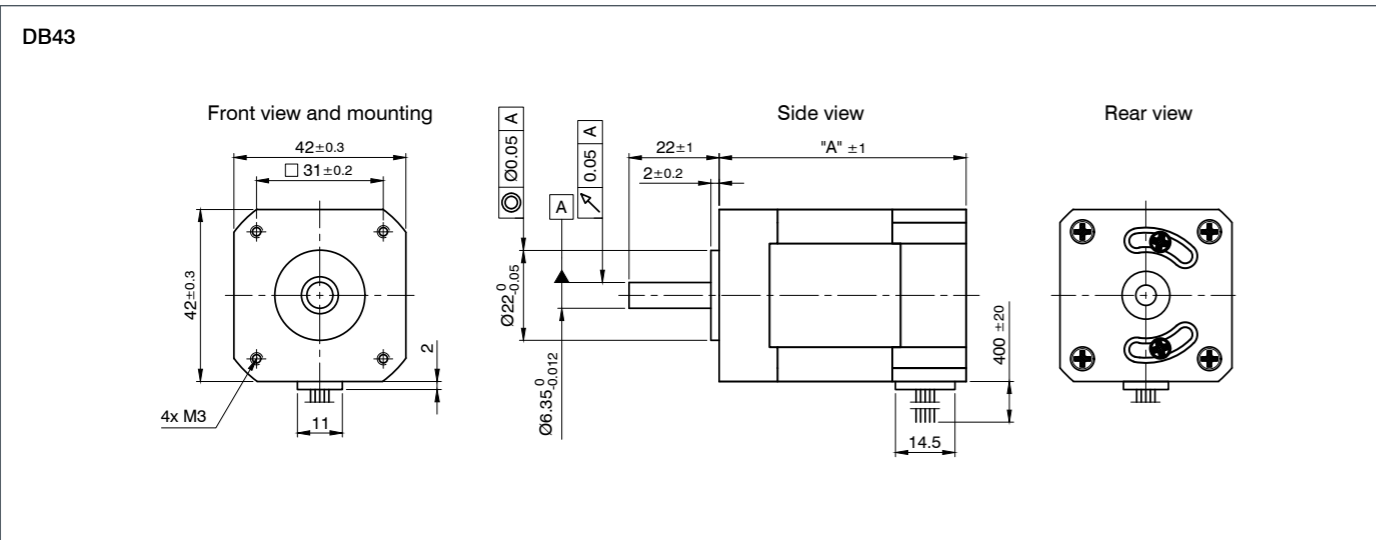
VERSIONS

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 gcm ²	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

DIMENSIONS (IN MM)





OPTIONS

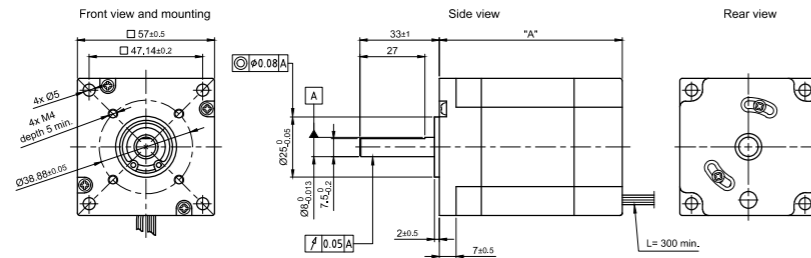


VERSIONS

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 gcm ²	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



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 gcm ²	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

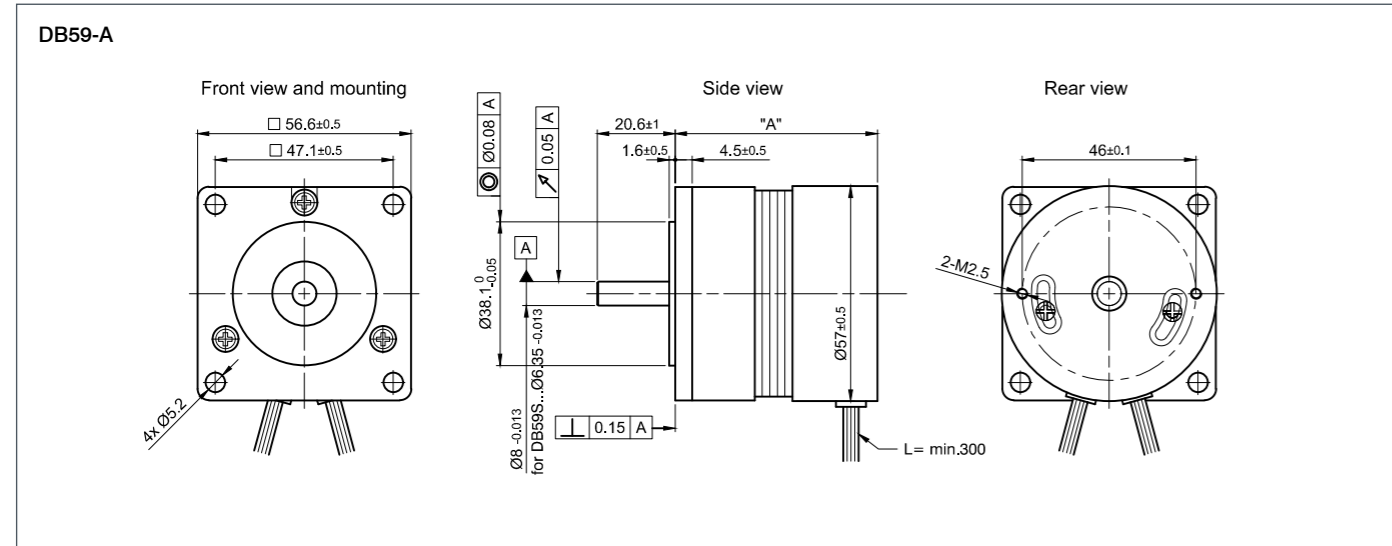
ORDER IDENTIFIER

DB59S024035-
 A = single shaft
 B* = double shaft end
 B3* = longer shaft end
 * Available for individual configuration with encoder or encoder and brake on our website

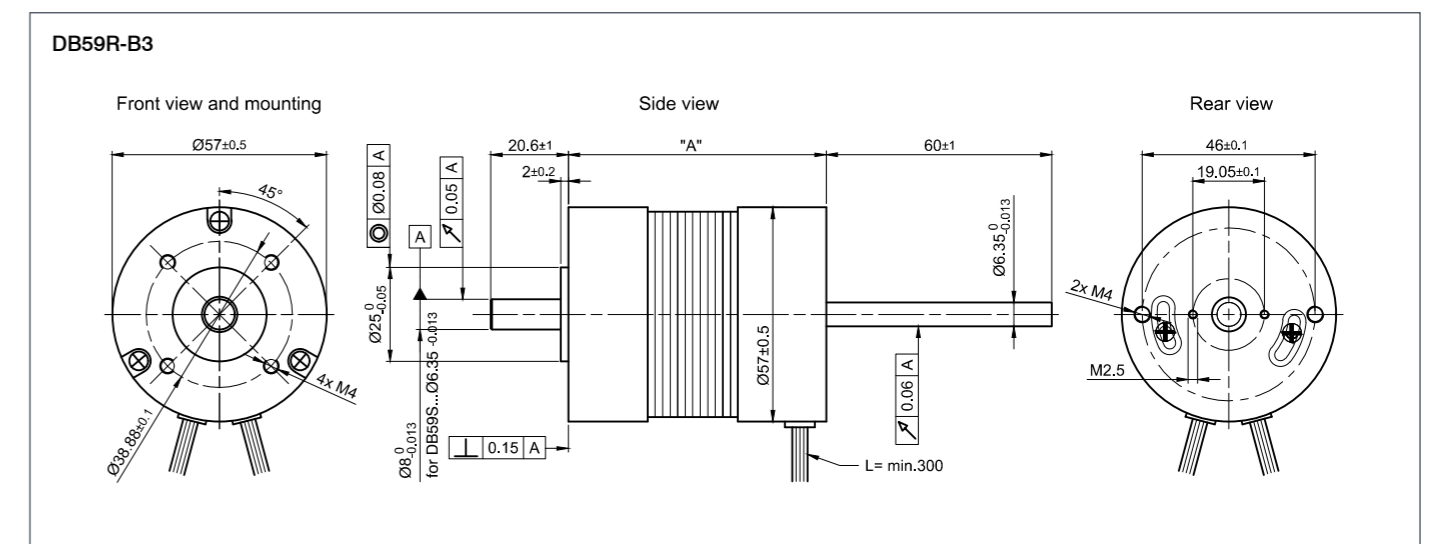
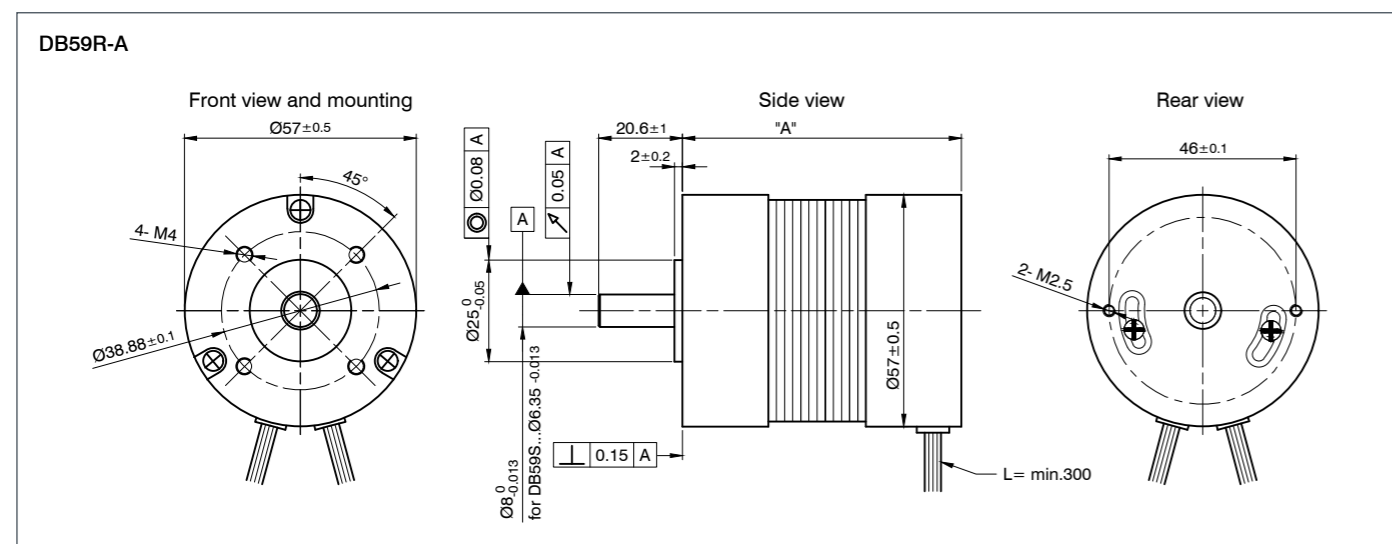
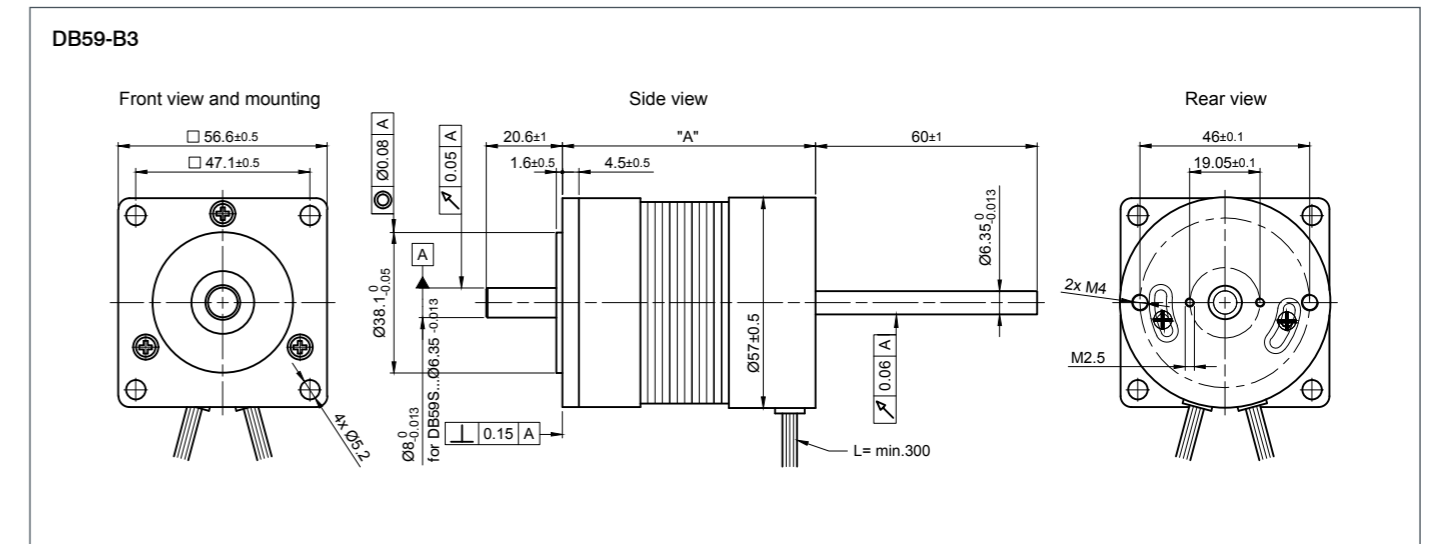
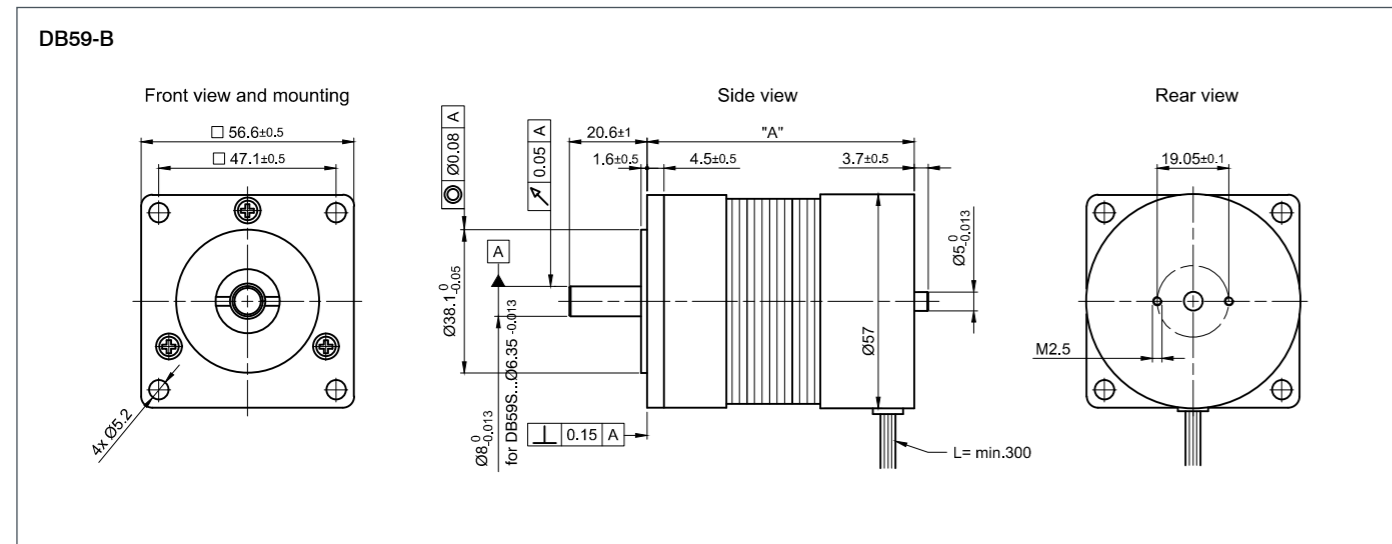
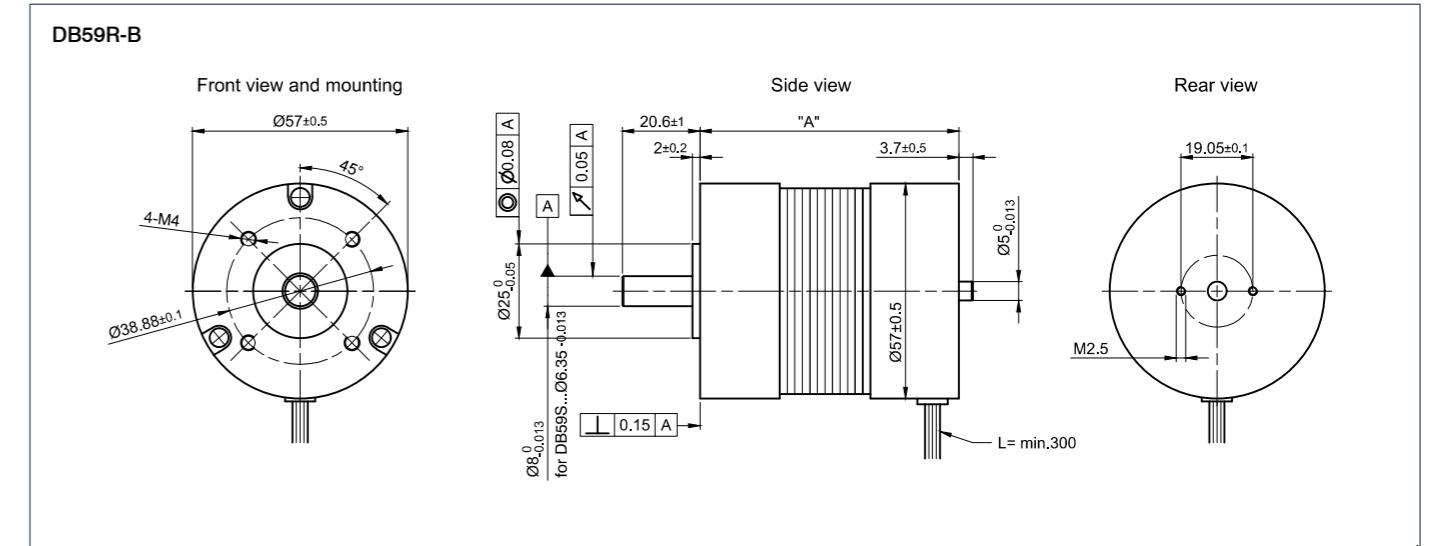
ACCESSORIES

ZD-DF56 Damper

DIMENSIONS (IN MM)



DIMENSIONS (IN MM)





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 gcm ²	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

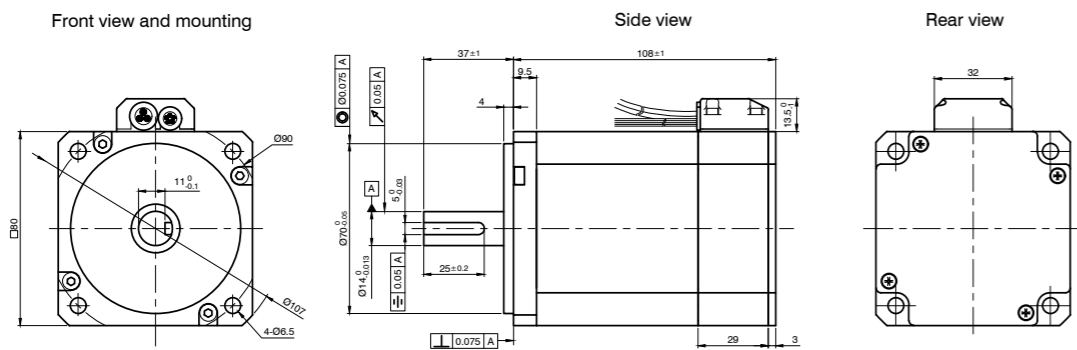
ORDER IDENTIFIER



DB80S048030-
 A = without encoder
 ENM05J = with incremental encoder

DIMENSIONS (IN MM)

DB80



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 gcm ²	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

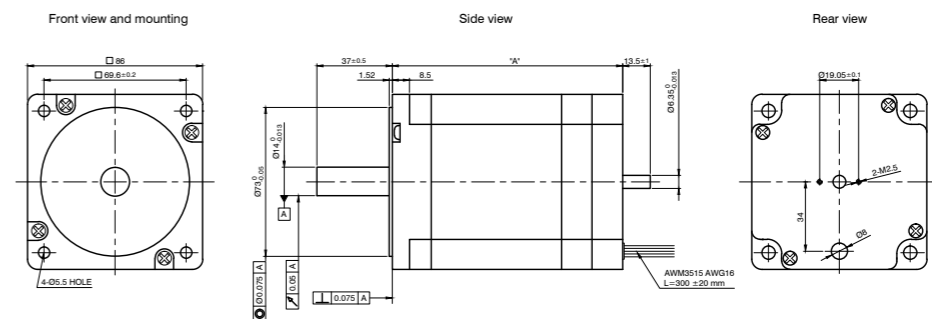
ACCESSORIES



ZD-D56 Damper

DIMENSIONS (IN MM)

DB87





OPTIONS



VERSIONS

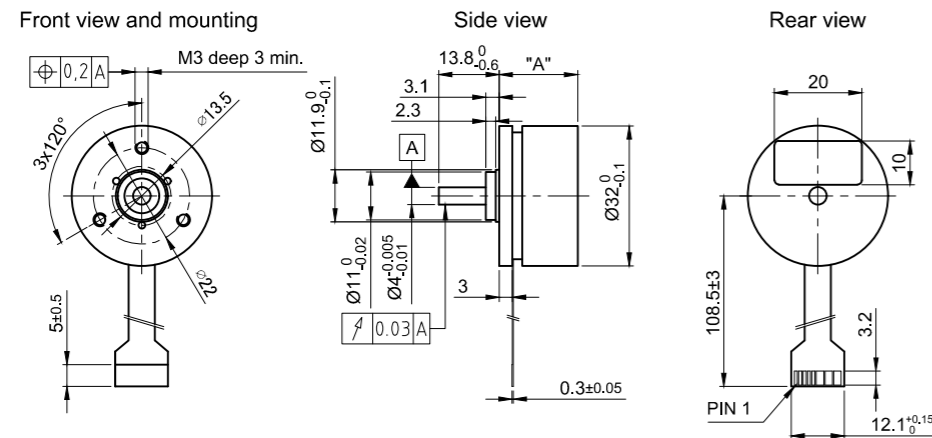
Type	Rated Power W	Rated Torque Ncm	Rated Current A	Peak Current A	Rated Voltage V	Rated Speed rpm	Torque Constant Ncm/A	Rotor Inertia gcm ²	Length „A“ mm	Weight kg
DF32M024027-A	7.4	2.55	0.5	1.5	24	2760	5.1	35	17.9	0.05

ACCESSORIES

ZIB-DF32 Adapter Board

DIMENSIONS (IN MM)

DF32-A



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 gcm ²	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

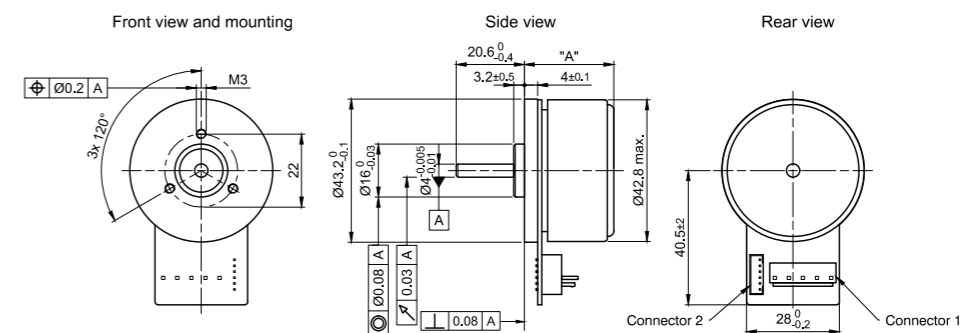
DF45S024050-
A = PCB connector
A2 = cable with connector

ACCESSORIES

ZK-JST-PHR-6-0.3M
Hall Cable DF45 0.3 m
ZK-JST-VHR-5N-0.3M
Motor Cable DF45 0.3 m

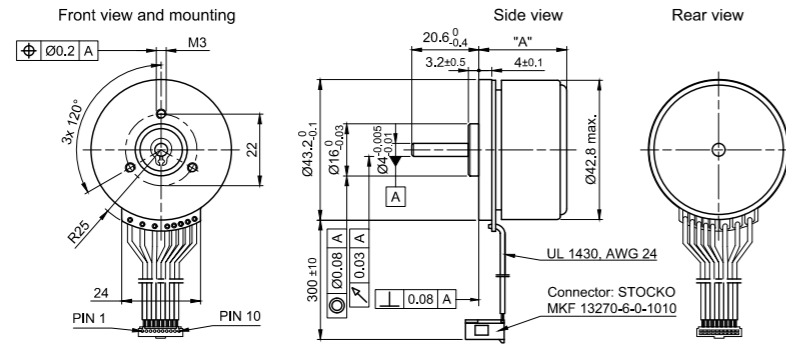
DIMENSIONS (IN MM)

DF45-A



DIMENSIONS (IN MM)

DF45-A2



BLDC MOTORS



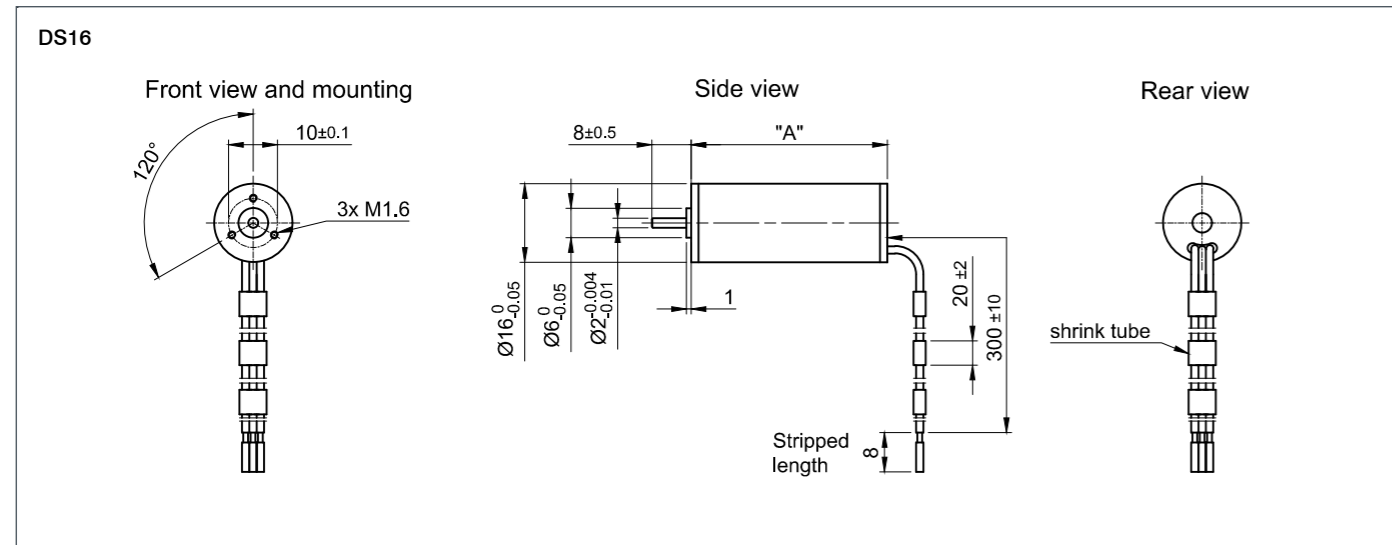
OPTIONS



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 gcm ²	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	56	0.065

DIMENSIONS (IN MM)



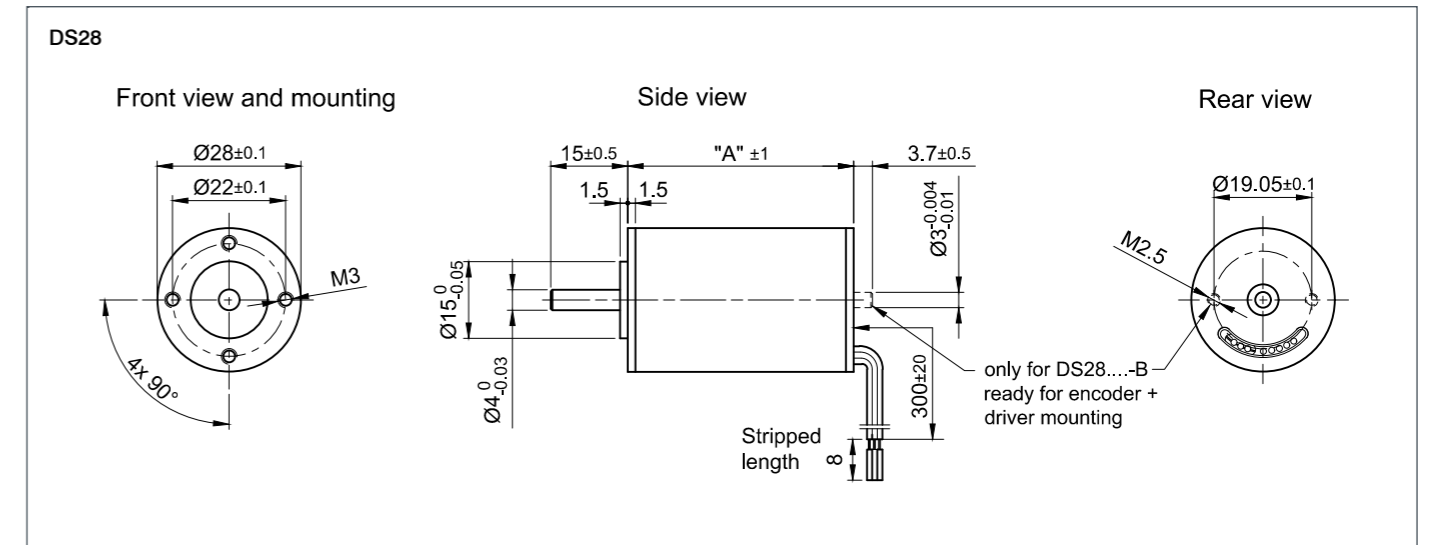
OPTIONS



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 gcm ²	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

DIMENSIONS (IN MM)



Lined area for notes.



ASB42

Brushless DC Motor with Protection Class IP65 - NEMA 17



OPTIONS



DESCRIPTION

NEMA 17 BLDC motor (42 mm) with protection class IP65 (except shaft output). With M16 and M12 connectors for power and encoder. For higher torques and a wider performance range Nanotec offers planetary gearboxes.

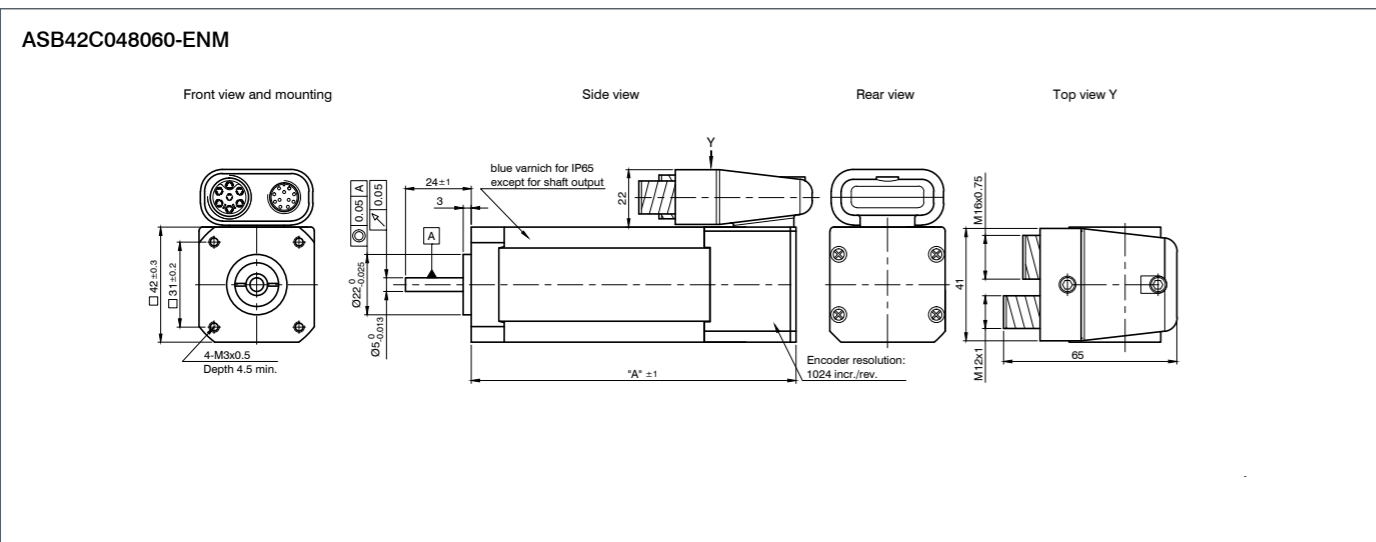
VERSIONS

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 gcm ²	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)



ASB87

Brushless DC Motor with Protection Class IP65 - NEMA 34



OPTIONS



DESCRIPTION

NEMA 34 BLDC motor (86 mm) with protection class IP65 (except shaft output). This motor requires no additional Hall sensors and is therefore extremely fail-safe. The reference signal is synchronous to the hall phase for even more exact positioning. For higher torques and a wider performance range Nanotec offers planetary gearboxes with an identical construction.

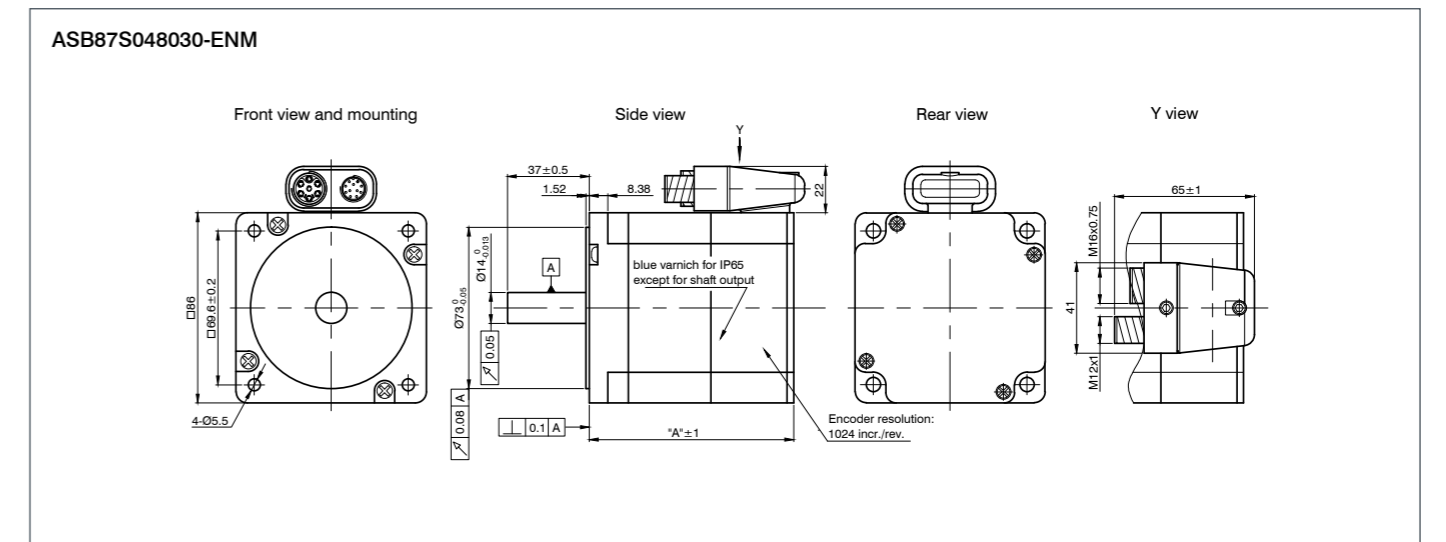
VERSIONS

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 gcm ²	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 2 m
- ZK-M12-12-2M-2-PADP Encoder Cable angled 2 m
- ZK-TW-7-2M Motor Cable straight 2 m

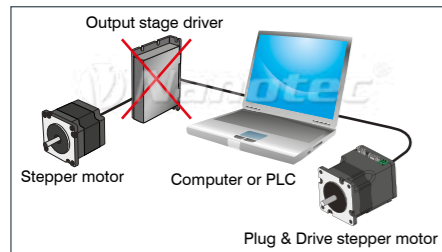
DIMENSIONS (IN MM)



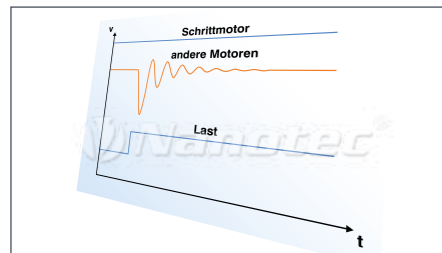
Lined area for notes.



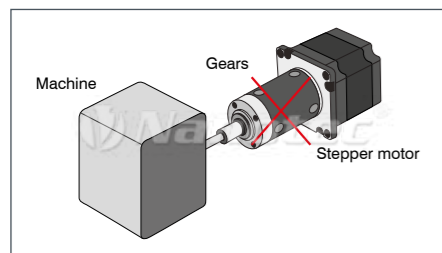
APPLICATION BENEFITS



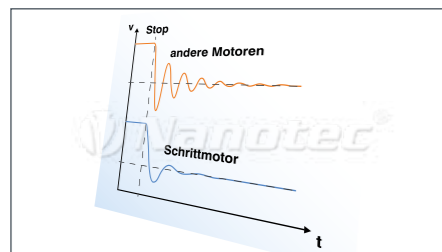
a) PC+PLC-capable (directly controllable via PC, PLC and microprocessor)
Brushless DC motors with integrated controller/drive have the highest productivity increase due to the use of PCs even at the lowest, decentralized machine level. Not only do these motors drastically reduce the development, wiring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



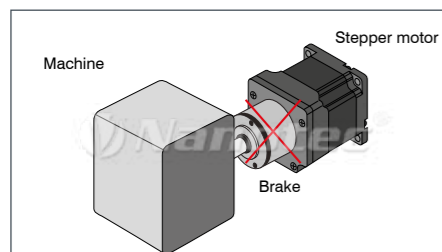
b) Turning speed stability
"No drop in speed when load changes" - the stepper motor meets this requirement like no other motor, without additional effort. Especially when using controllers for precise speed, synchronicity or ratios (such as for precise metering pumps), the stepper motor can achieve higher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



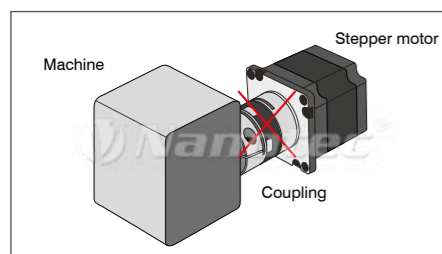
c) Direct drive
Stepper motors have their maximum torque in the lower speed range and the Nanotec micro stepper drivers still achieve concentricity properties of up to approx. 2 rpm. Other motors often need gears in order to fulfill speed and force requirements. Direct drives reduce system costs while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

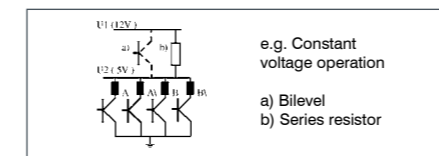


f) Avoiding damage to machines and injuries
The disadvantage of "falling out of step" when a motor is blocked, an issue that is sometimes brought up in connection with stepper motors, can actually be of advantage in some cases in view of increasingly stringent safety requirements. Slip and overload couplings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

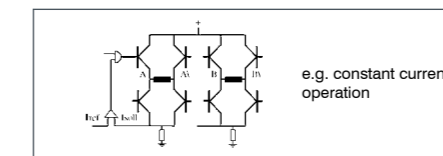
UNIPOLAR CONNECTION



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	+

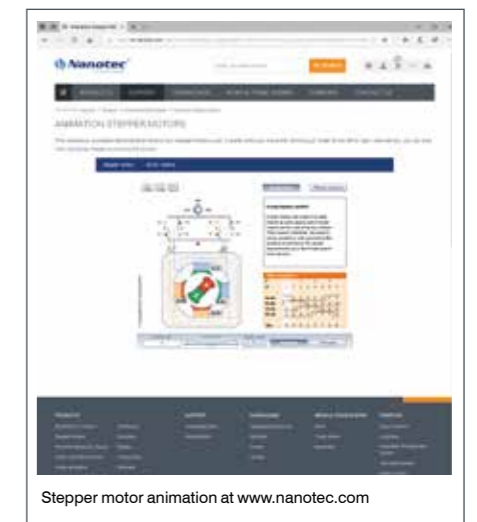
BIPOLAR SWITCHING SEQUENCES



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



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.

- 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.
- 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.
- 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.



OPTIONS



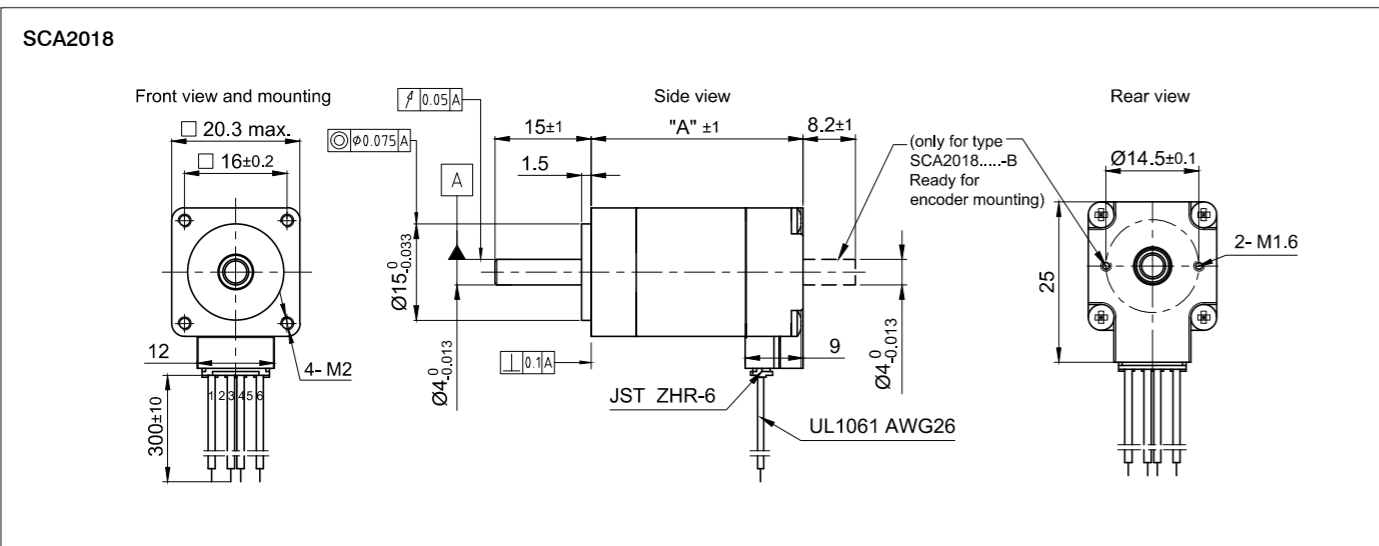
VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

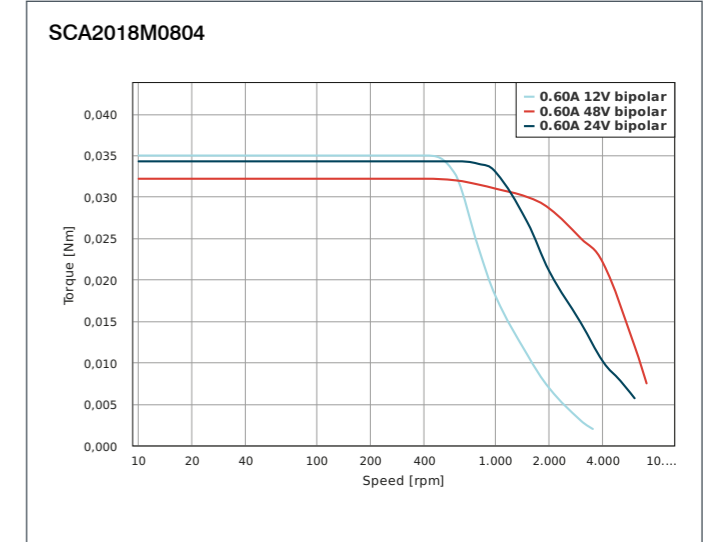
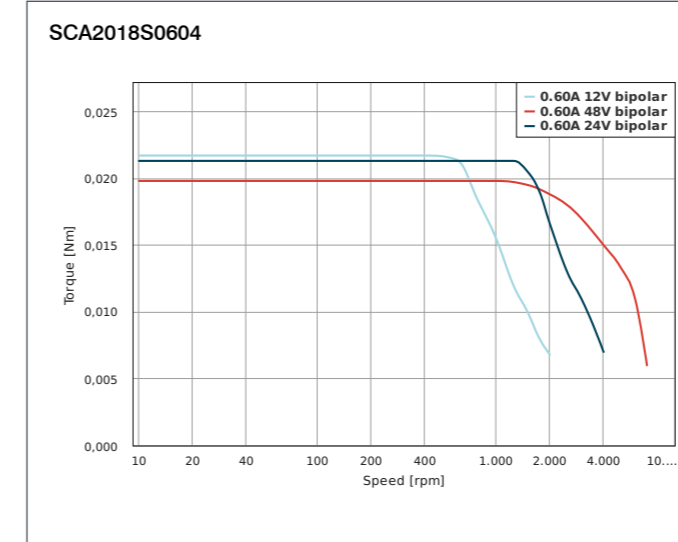
ORDER IDENTIFIER

SCA2018S0604-
 A = single shaft end
 B = double shaft end

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

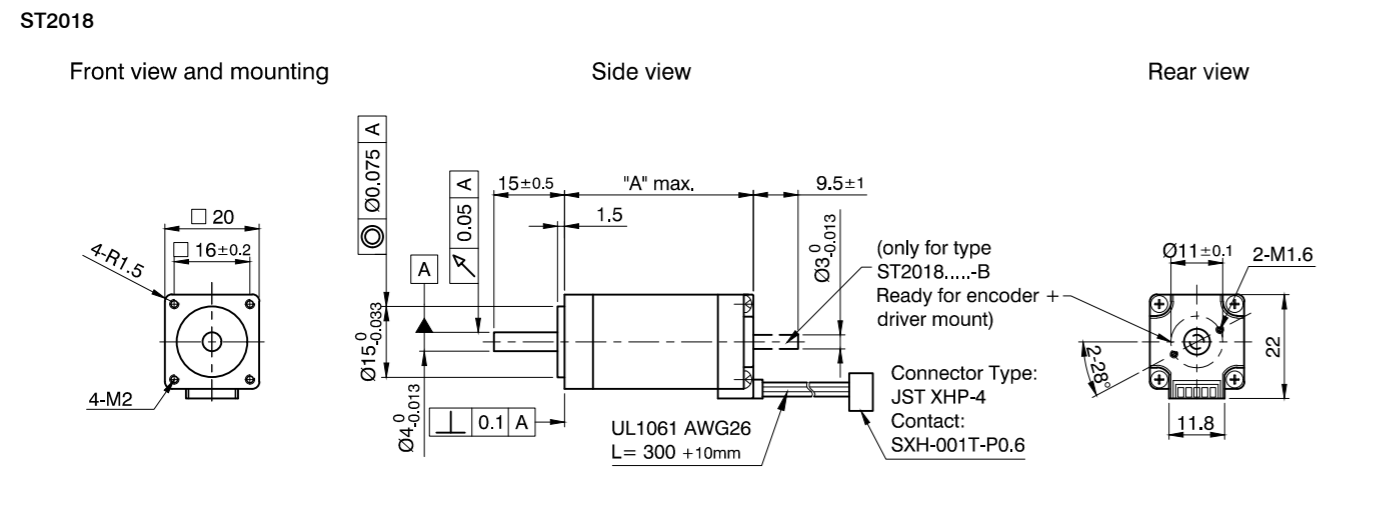
ORDER IDENTIFIER

ST2018S0604-
 A = single shaft end
 B = double shaft end

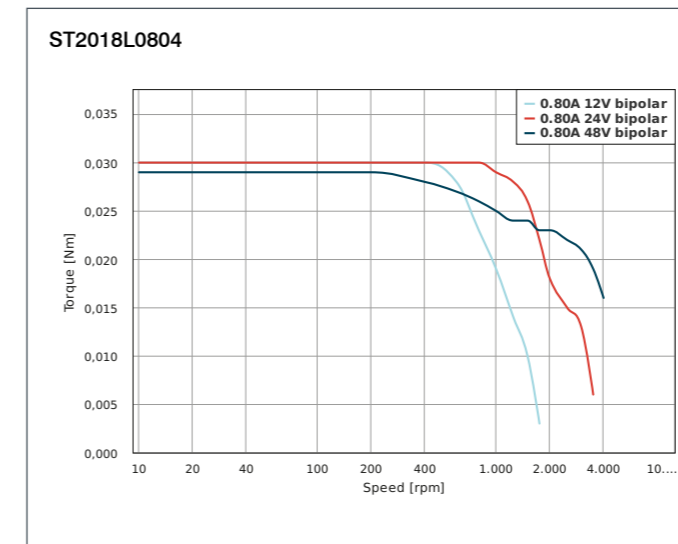
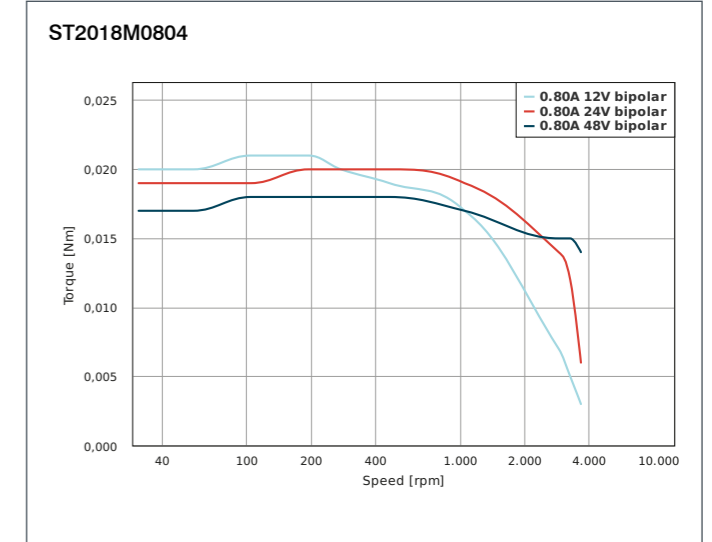
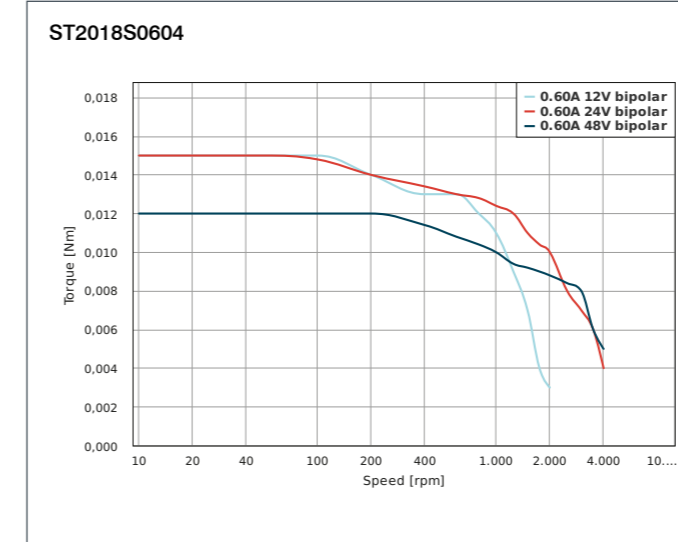
ACCESSORIES

ZK-JST-VL-4 Extension Cable 2m

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

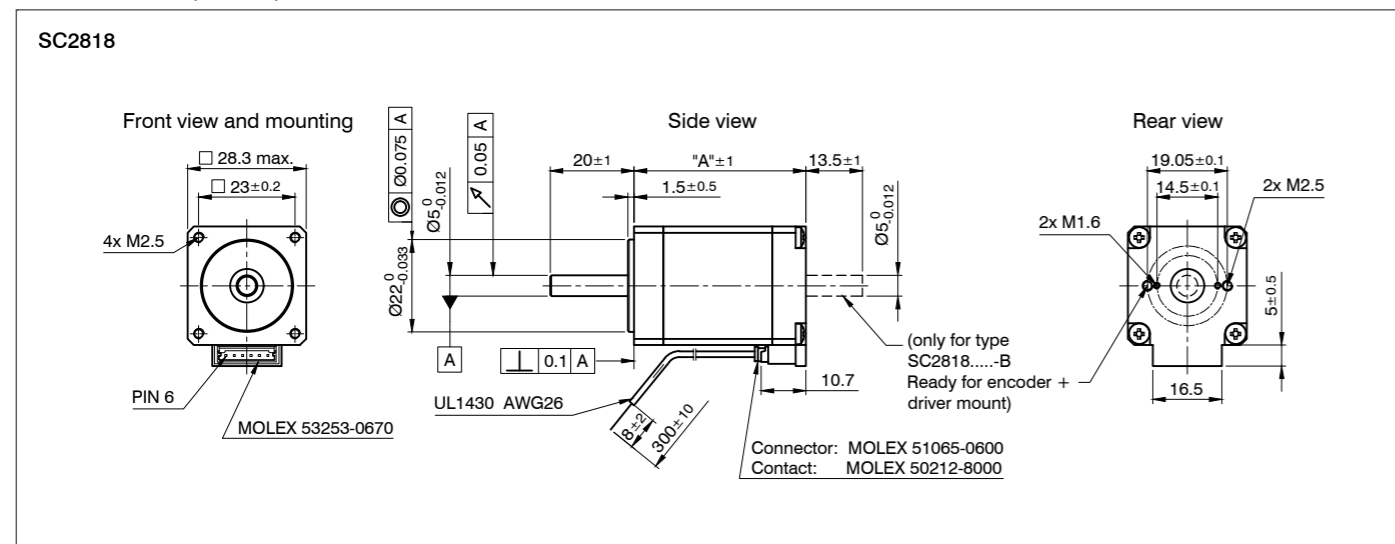
SC2818S0604-
A = single shaft end
B = double shaft end



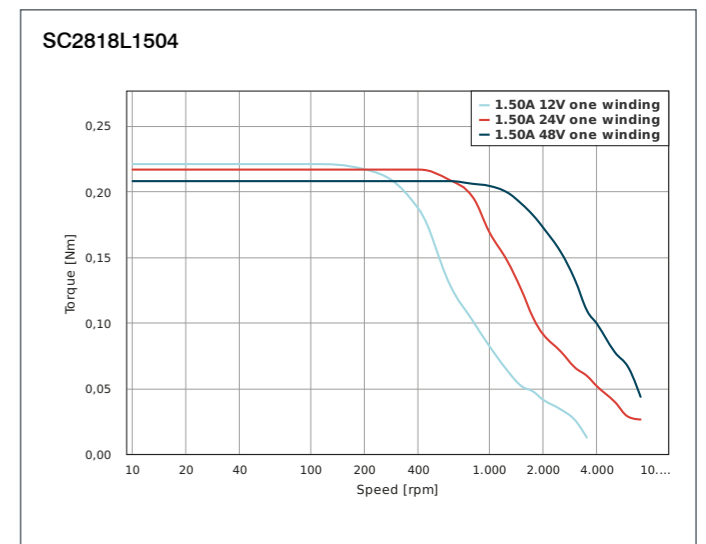
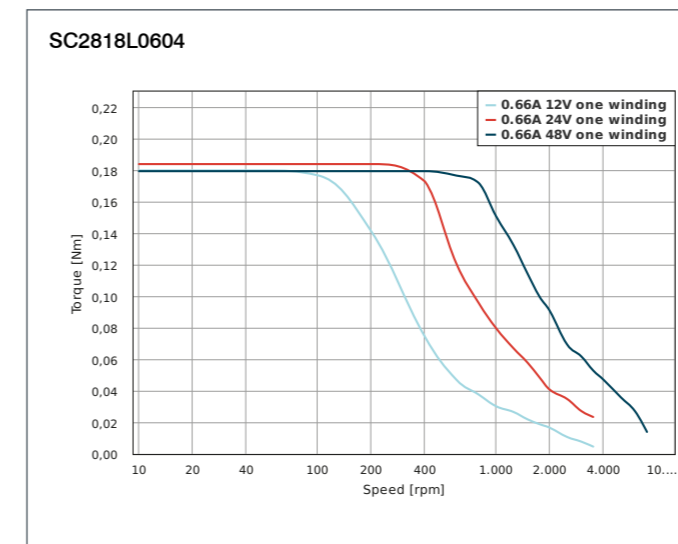
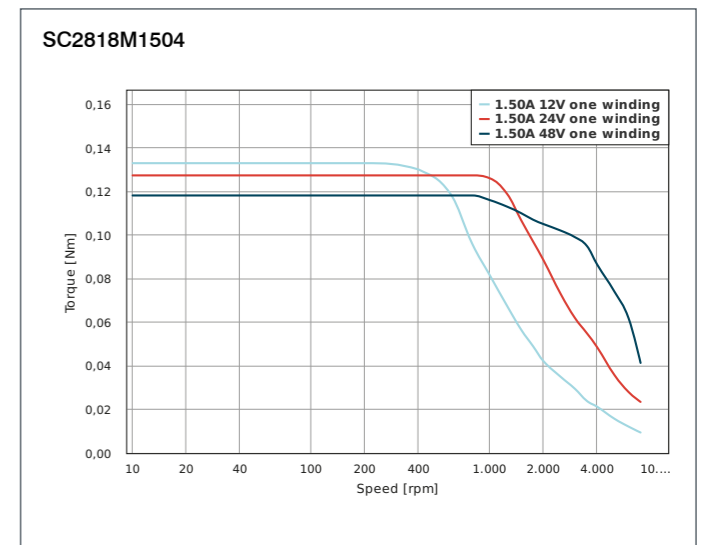
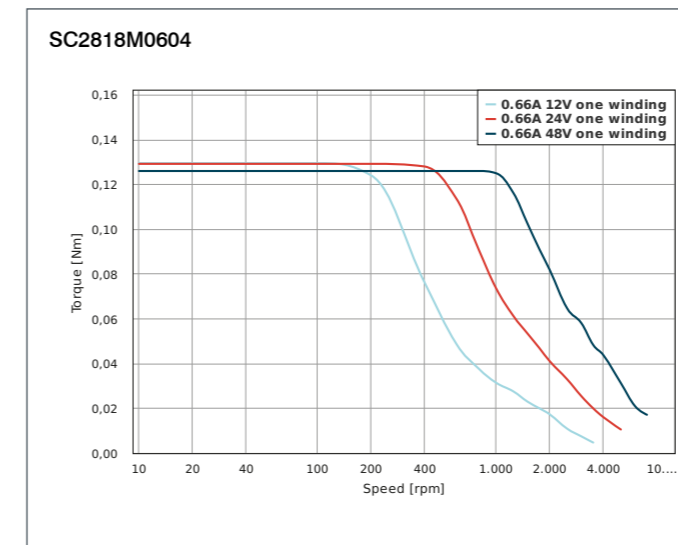
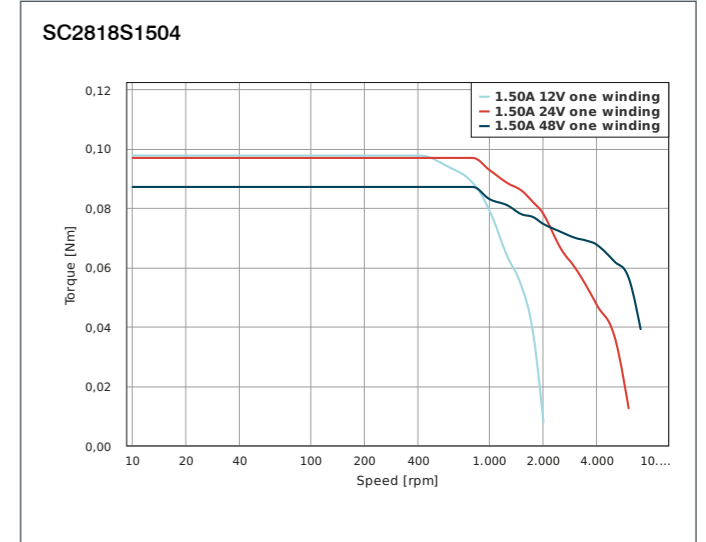
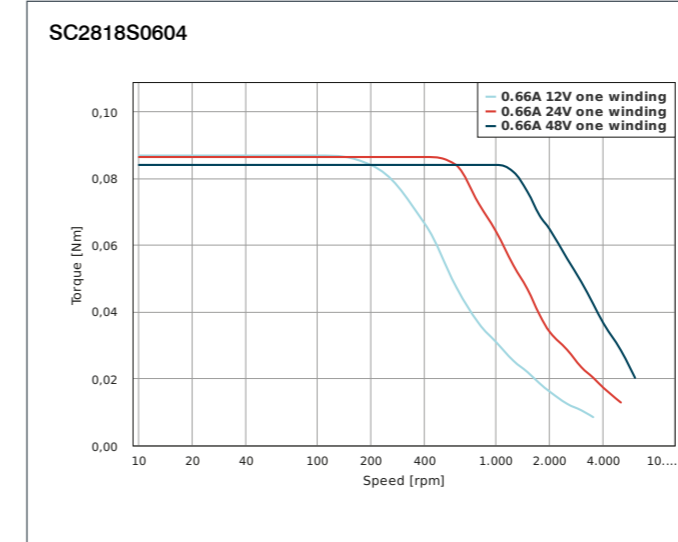
ACCESSORIES

ZD-D28 Damper

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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.

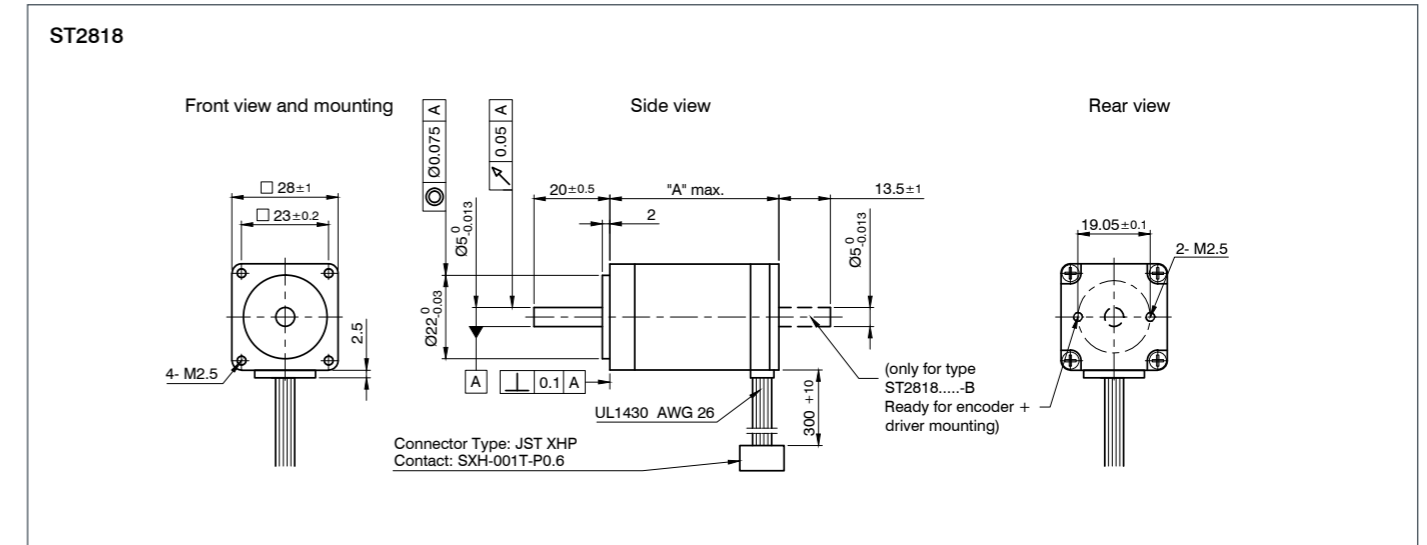
ORDER IDENTIFIER

ST2818S1006-
A = single shaft end
B = double shaft end

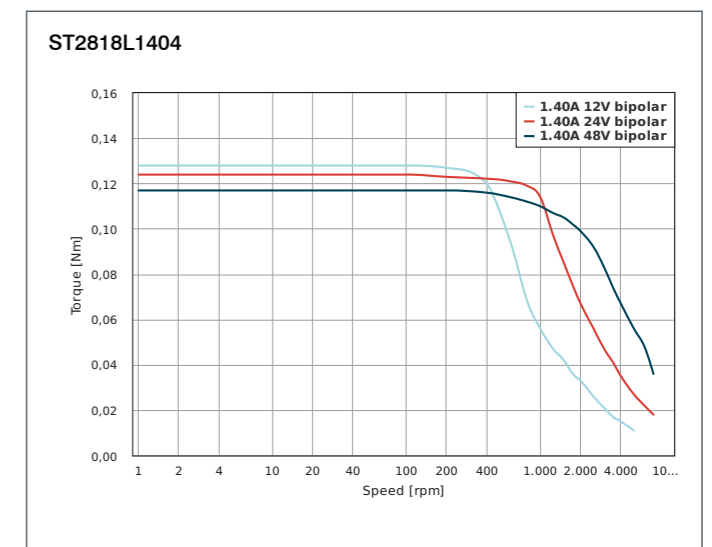
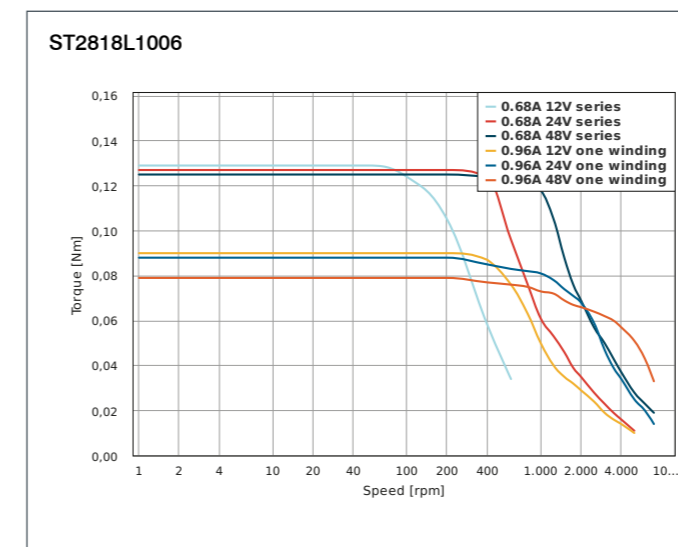
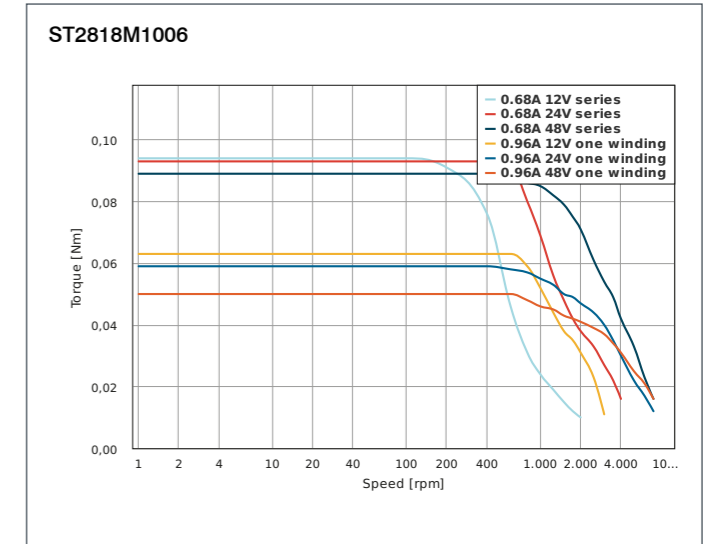
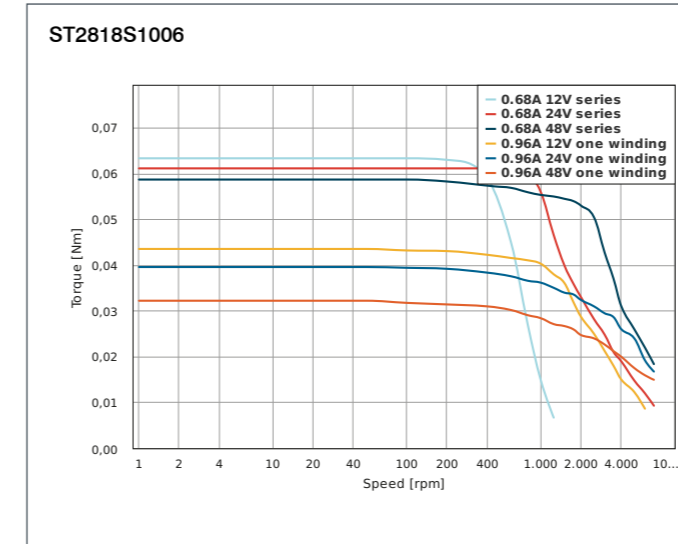
ACCESSORIES

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

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	Weight kg	Length „A“ mm
SC3518S1204	1.2	10	1.7	1.5	11	0.15	30
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

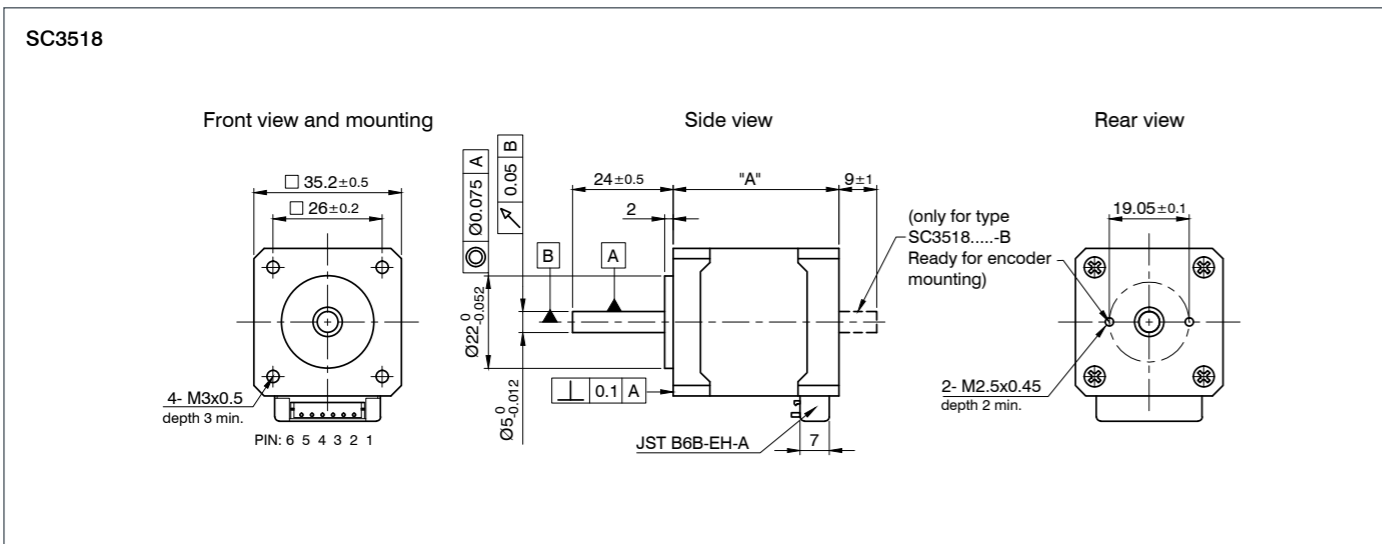
ORDER IDENTIFIER

SC3518S1204-
A = single shaft end
B = double shaft end

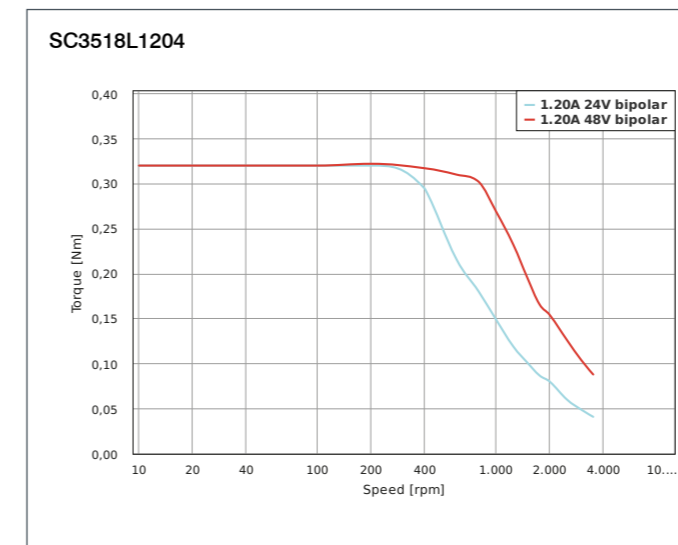
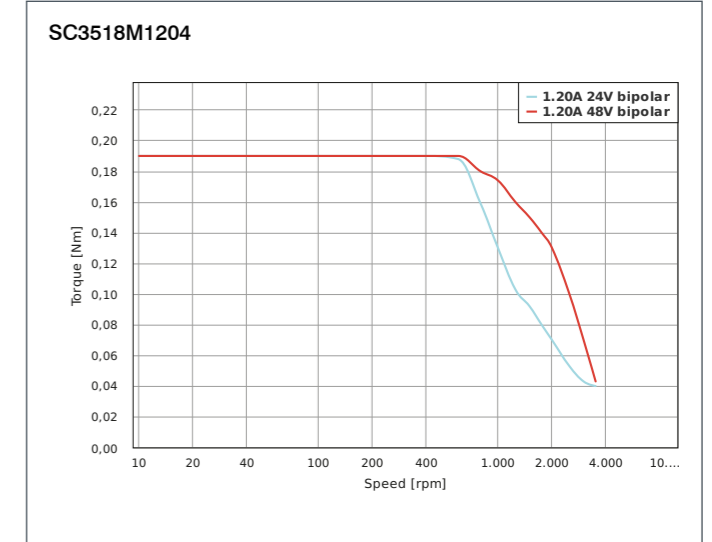
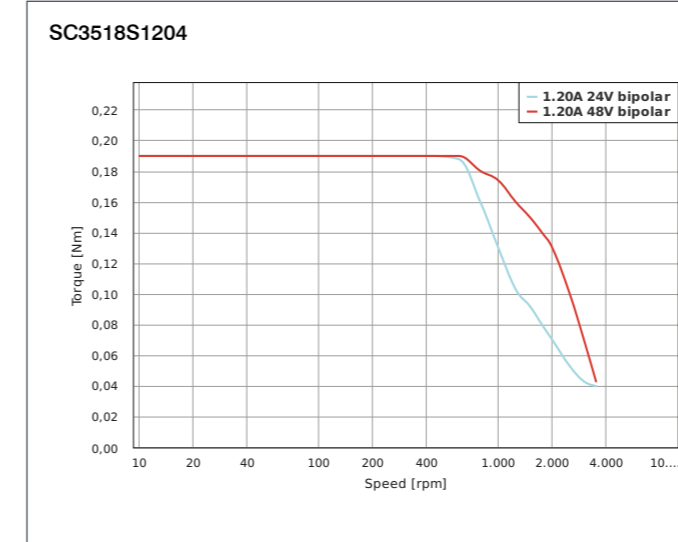
ACCESSORIES

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

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

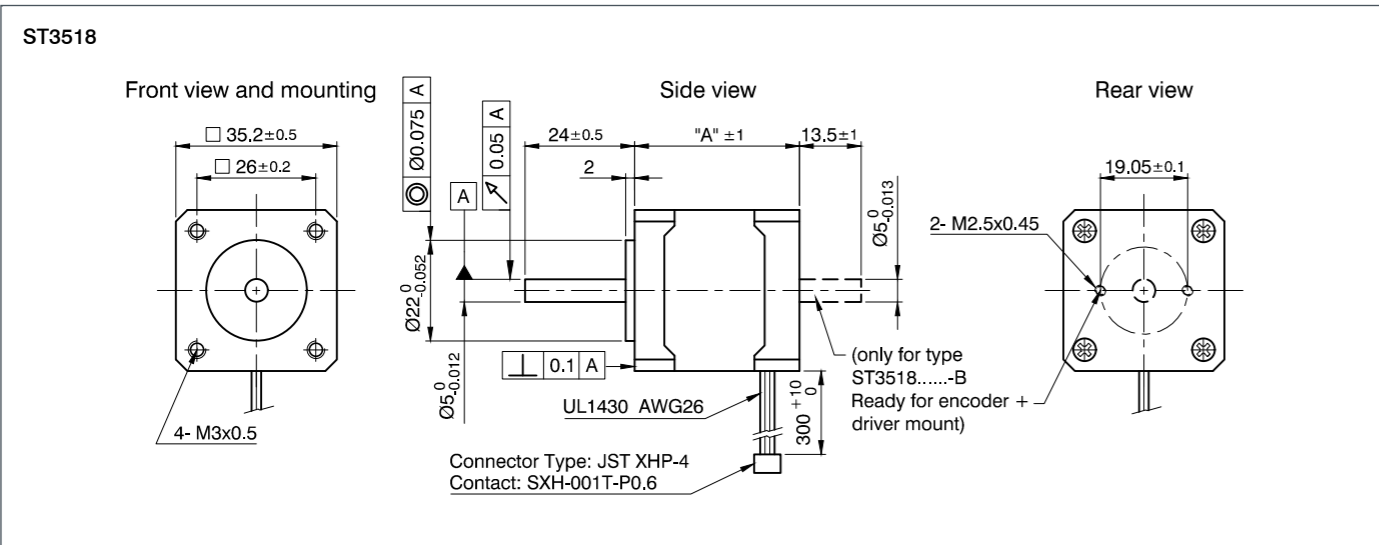
ST3518S0804-
 A = single shaft end
 B = double shaft end



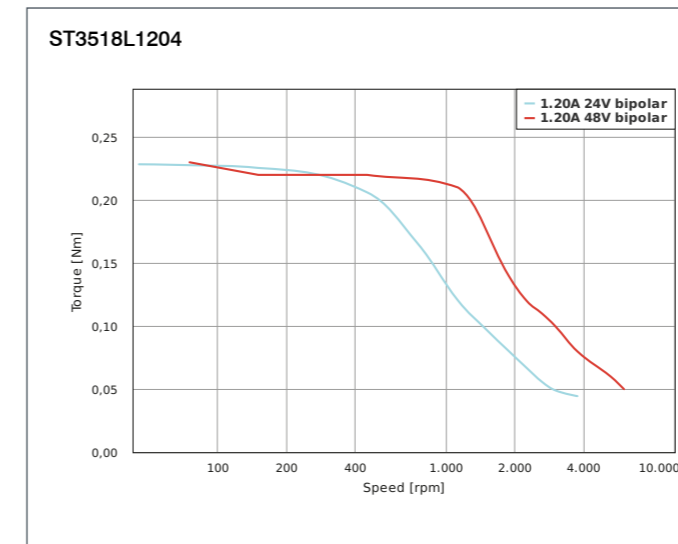
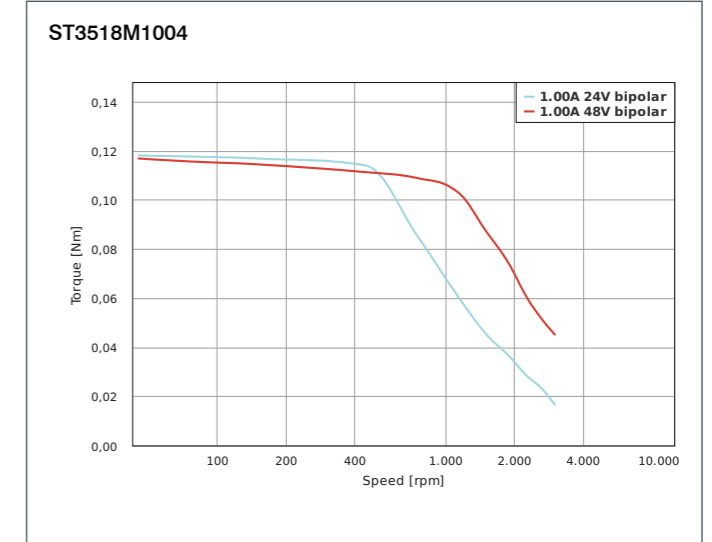
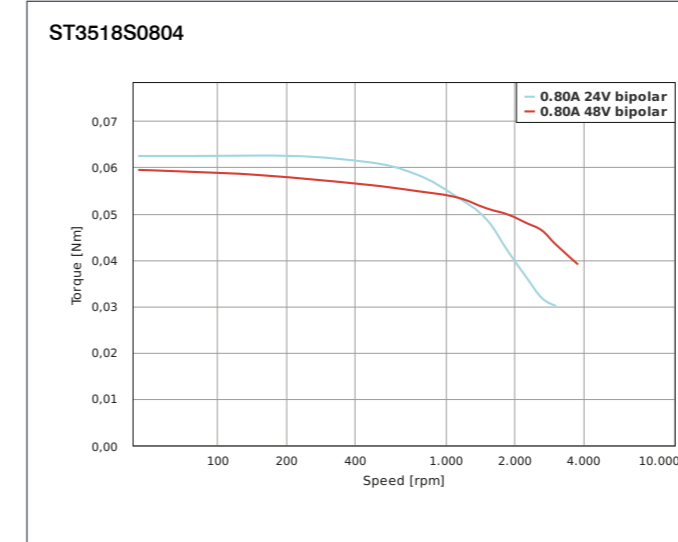
ACCESSORIES

ZK-JST-VL-4 Extension Cable 2m
ZD-D28 Damper

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	Weight kg	Length „A“ mm
SC4118L1804	1.8	50	1.75	3.3	82	0.34	50.5

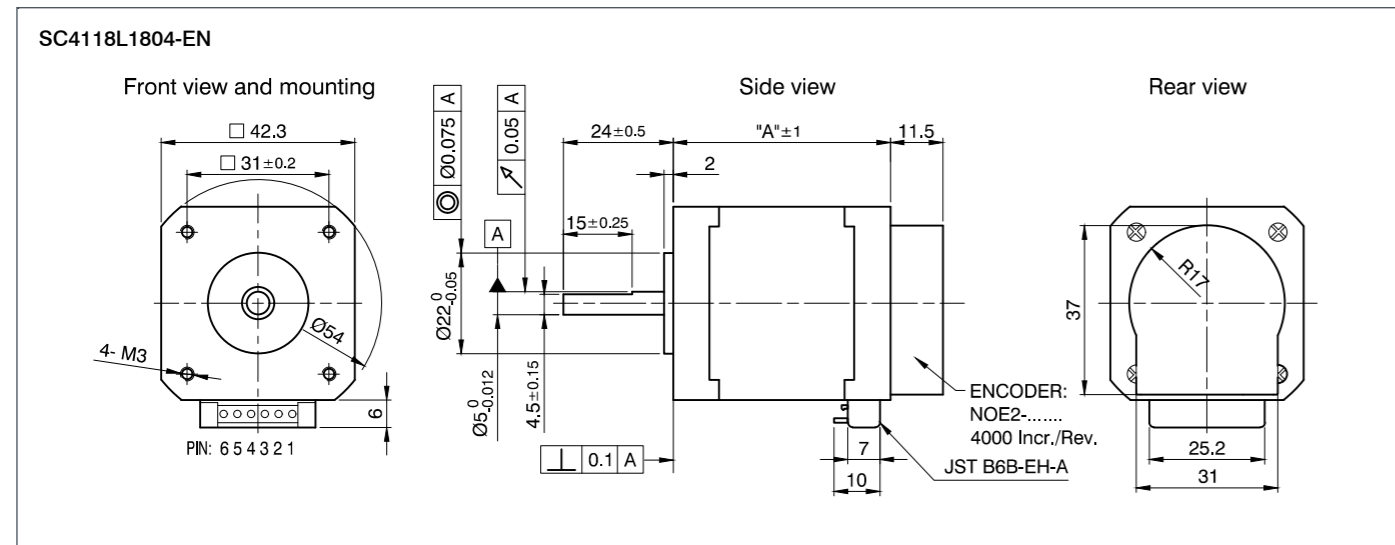
ORDER IDENTIFIER

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

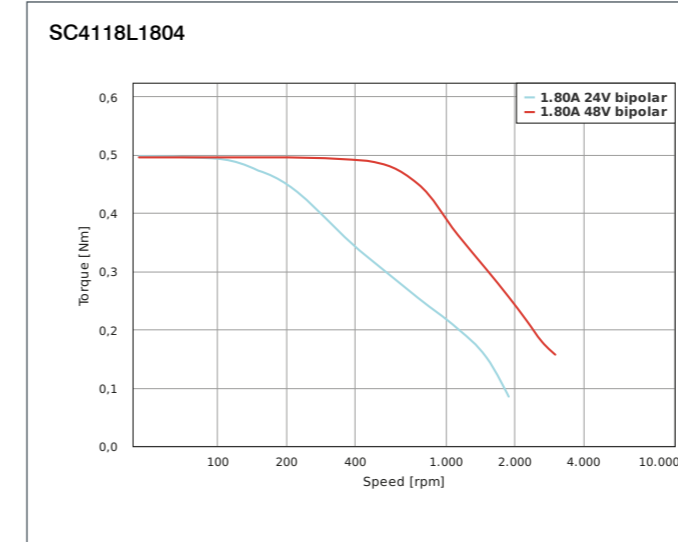
ACCESSORIES

ZK-JST-EHR-6-0.5M-S Motor Cable 0.5 m
ZK-NOE1-10-2000-S Encoder Cable NOE 2m
ZK-NOE1-10-500-S Encoder Cable NOE 0.5m

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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.

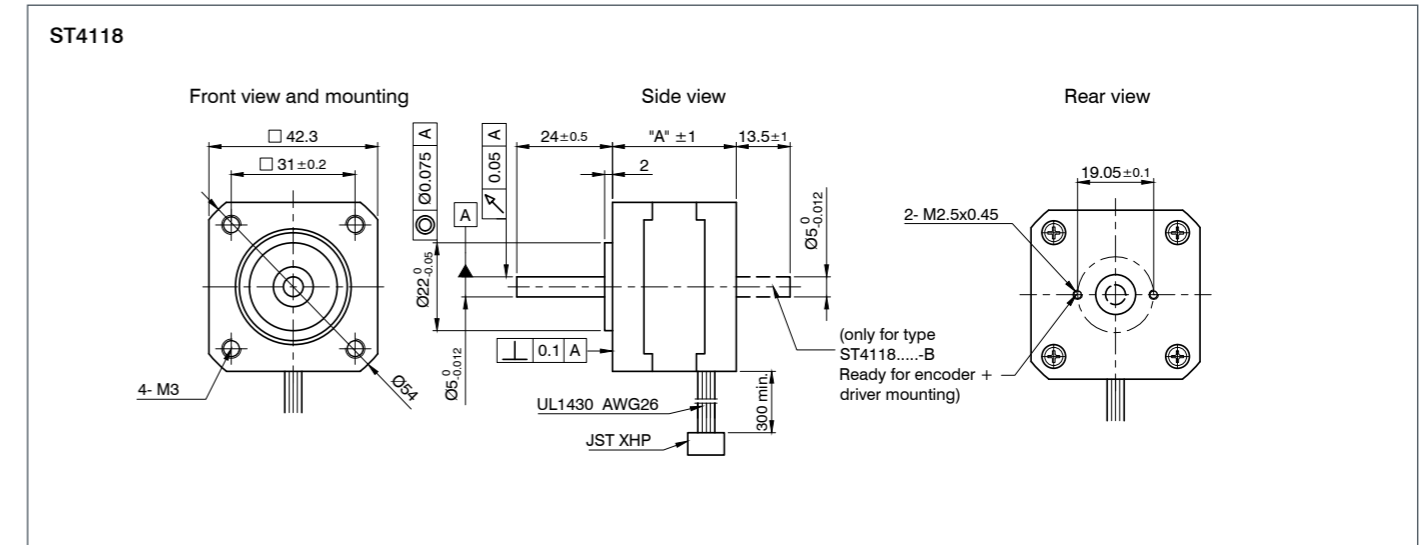
ORDER IDENTIFIER

ST4118X0404-
 A = single shaft end
 B = double shaft end

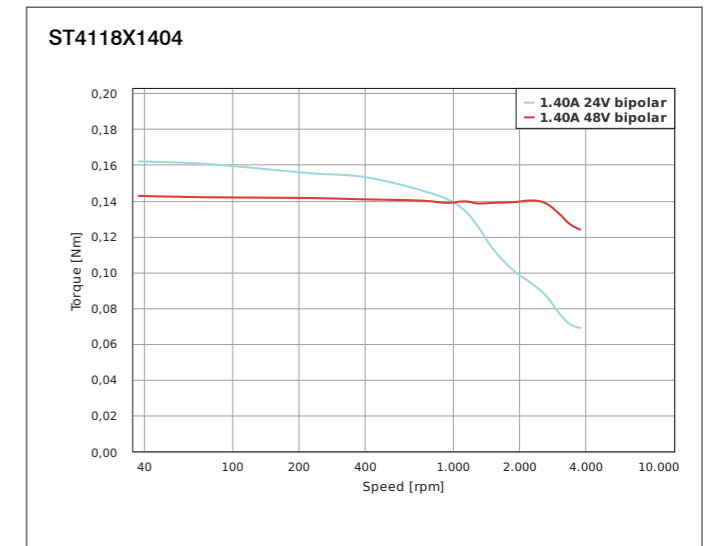
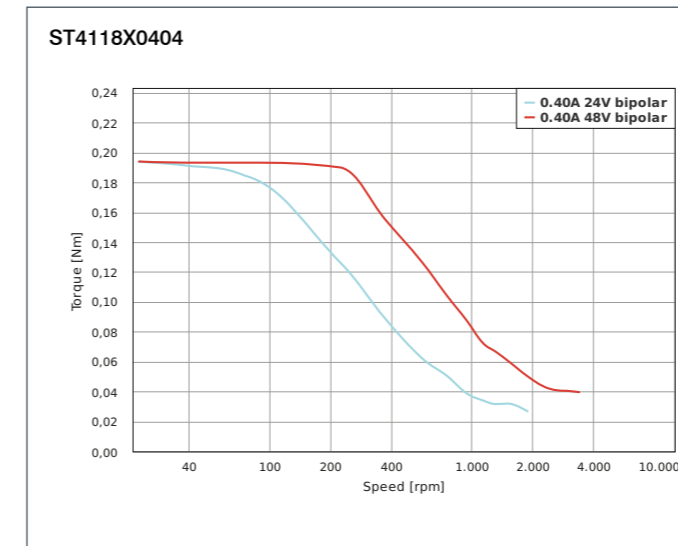
ACCESSORIES

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

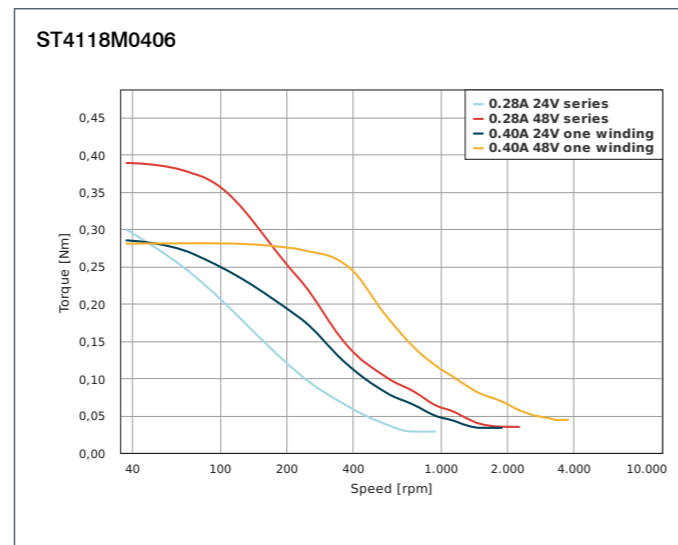
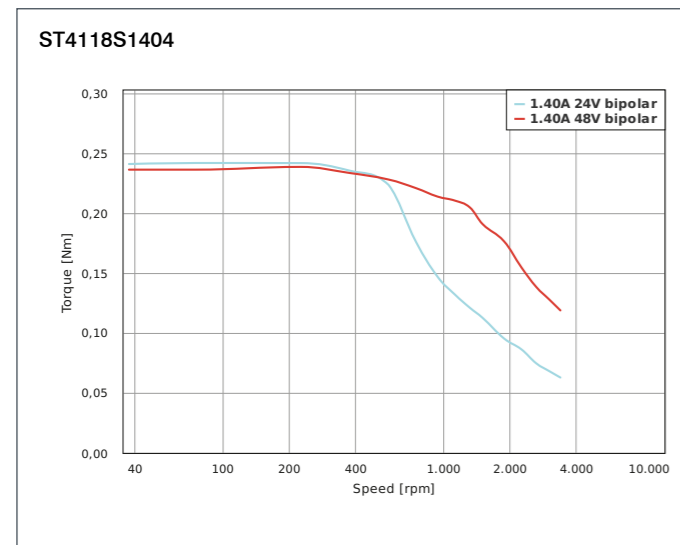
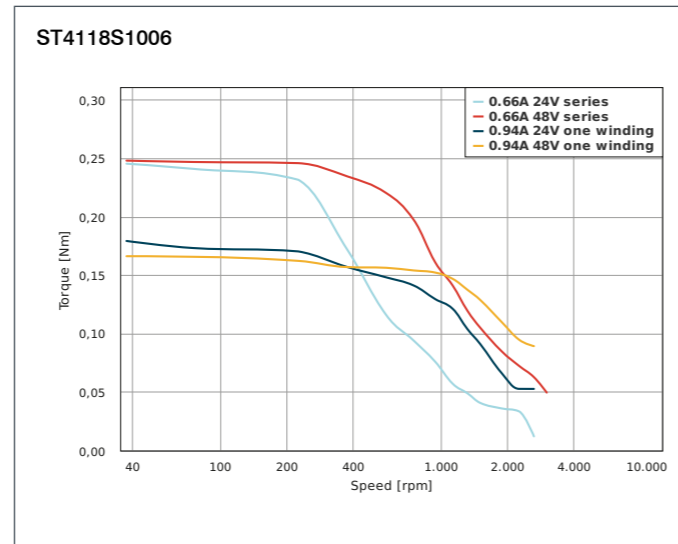
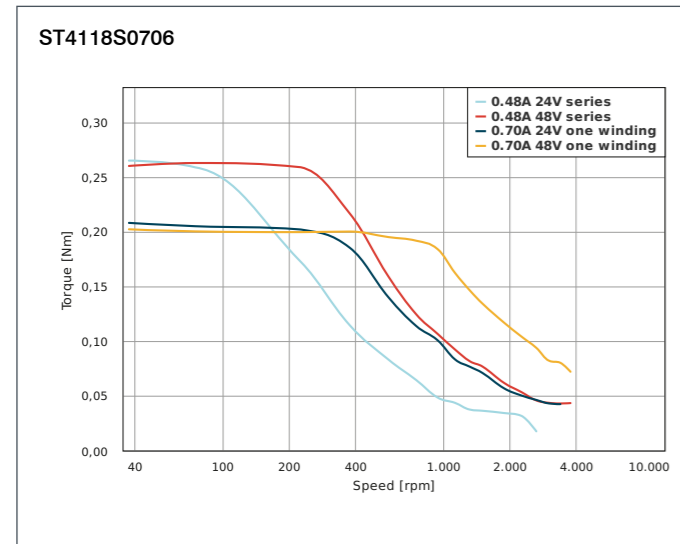
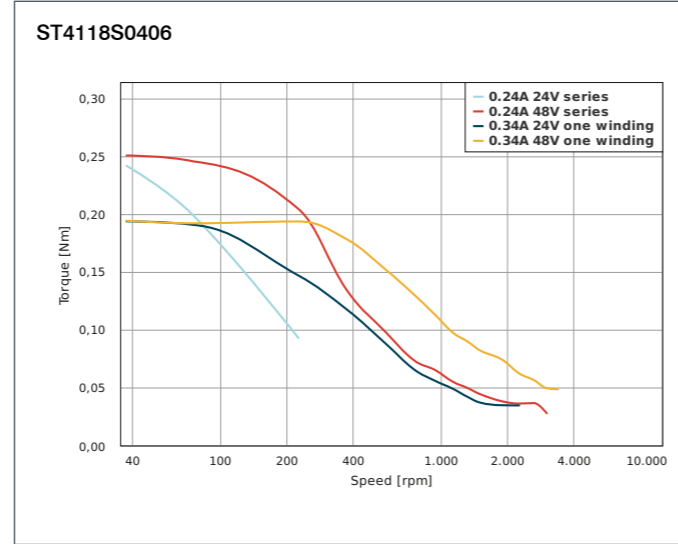
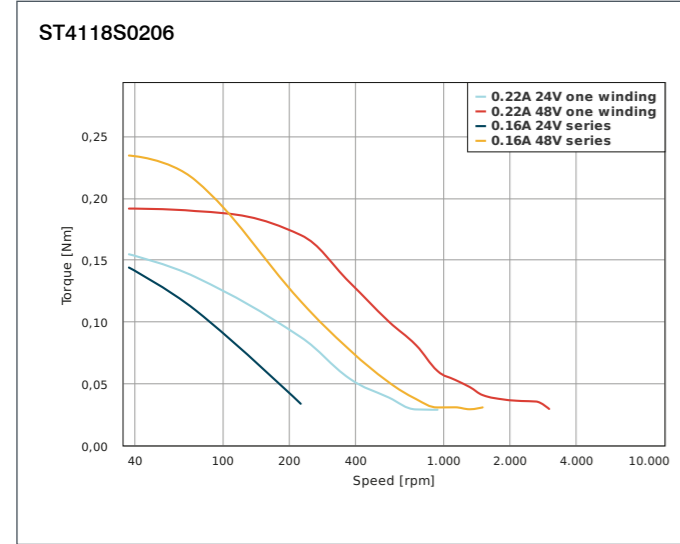
DIMENSIONS (IN MM)



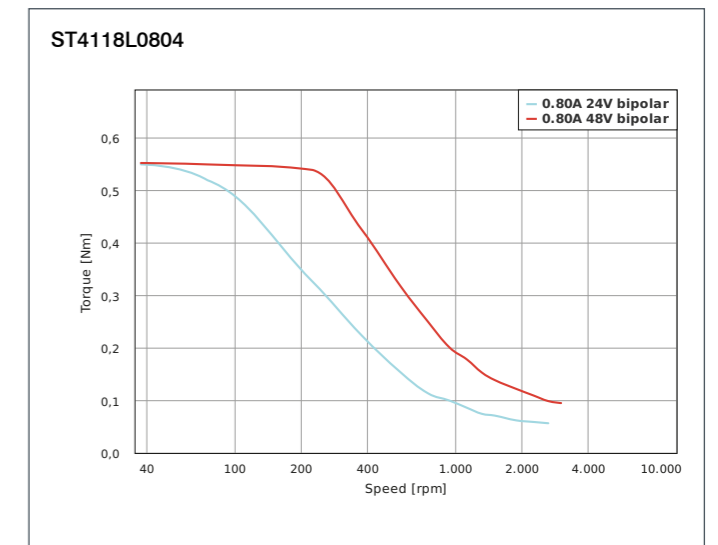
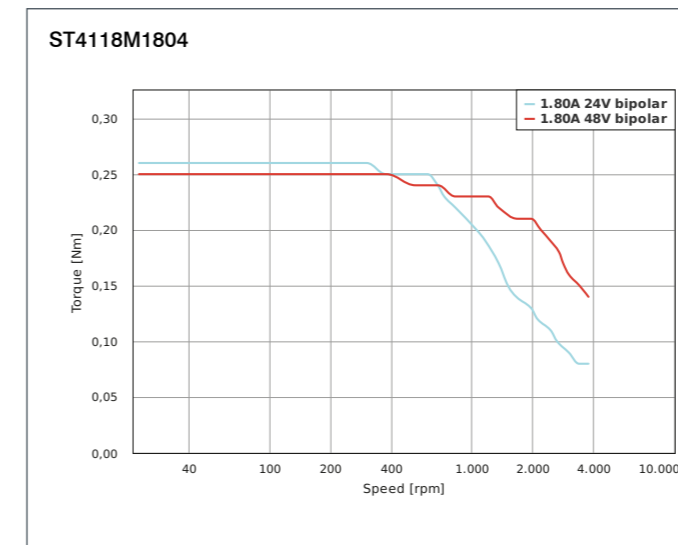
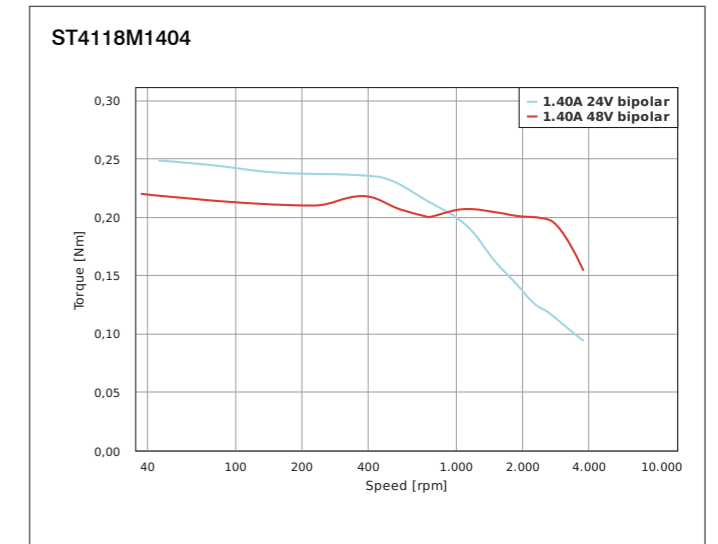
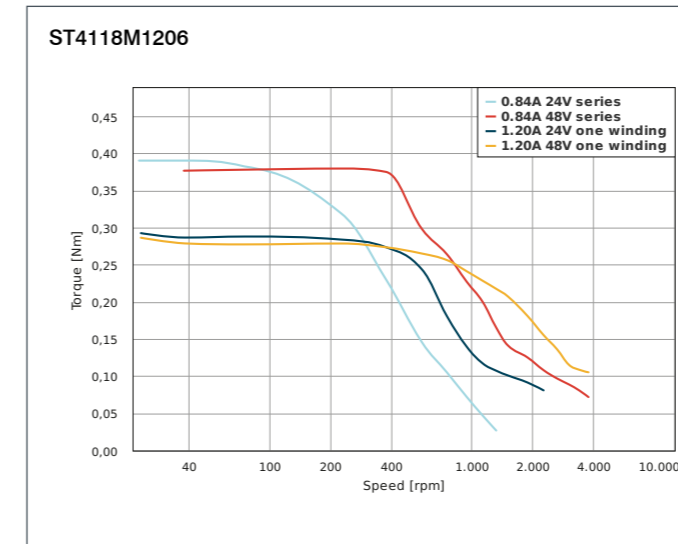
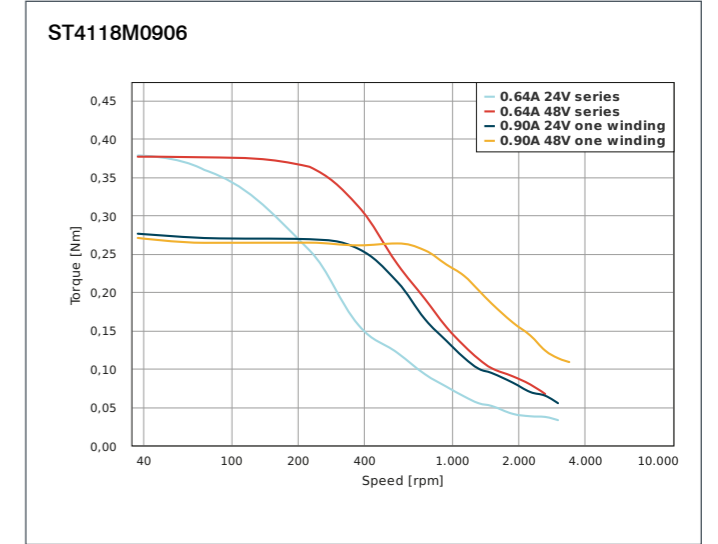
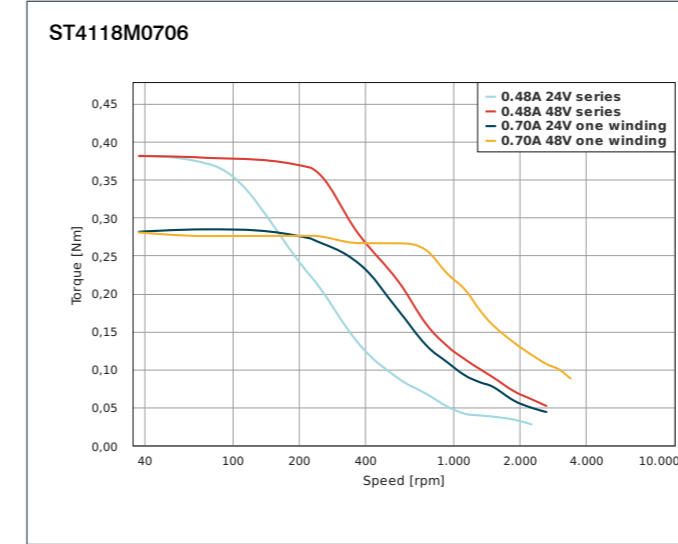
TORQUE CURVES



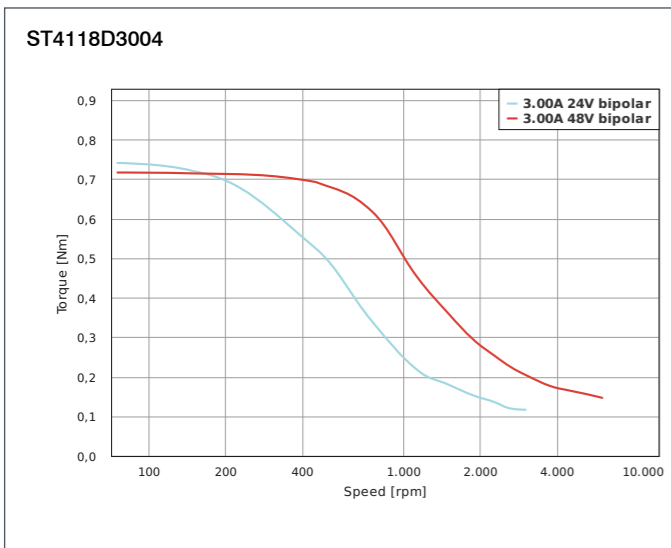
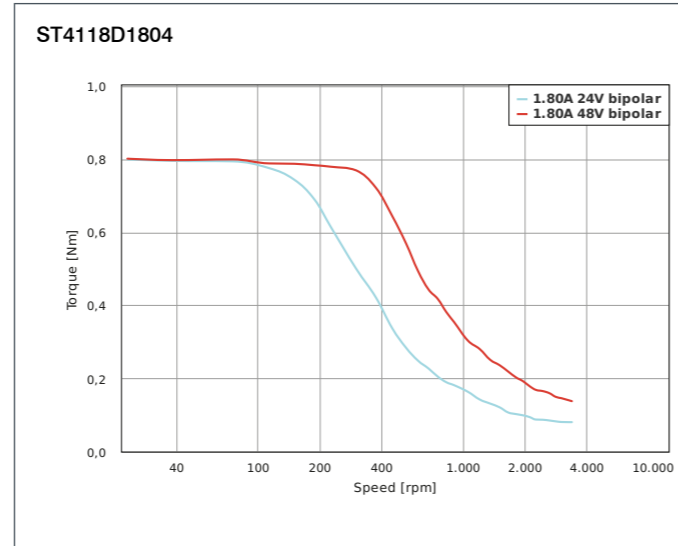
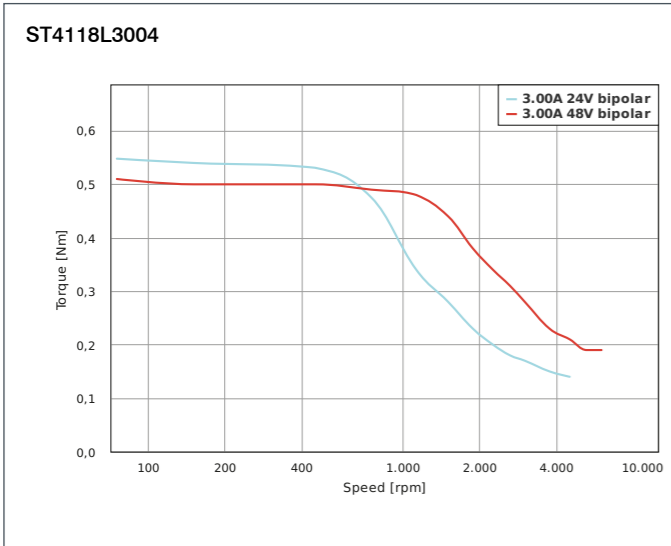
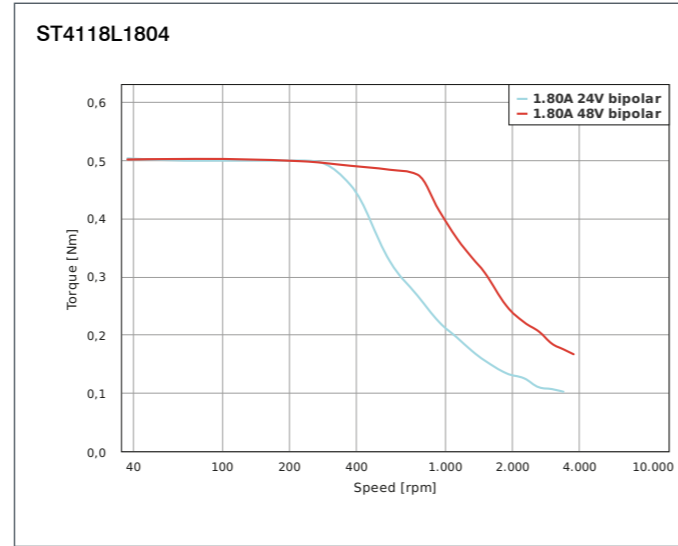
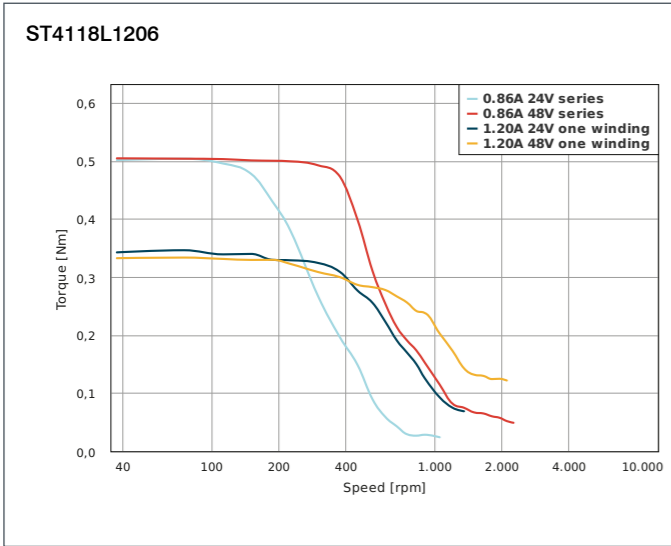
TORQUE CURVES



TORQUE CURVES



TORQUE CURVES



HYBRID STEPPER MOTORS



OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

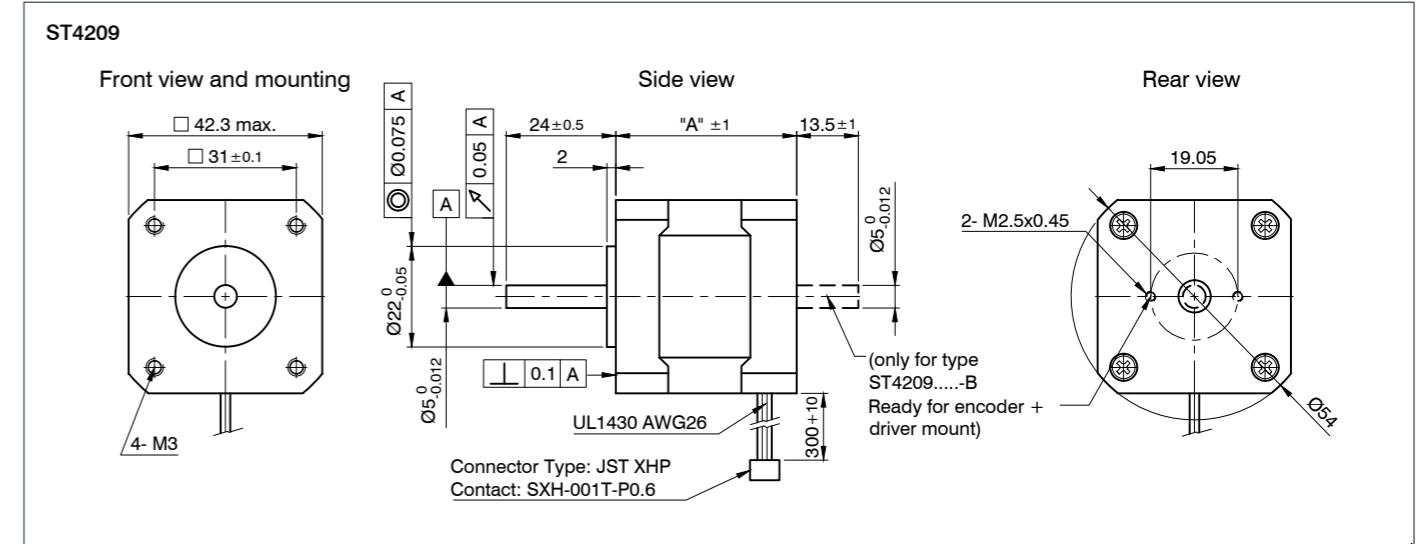
ST4209X1004-
 A = single shaft end
 B = double shaft end



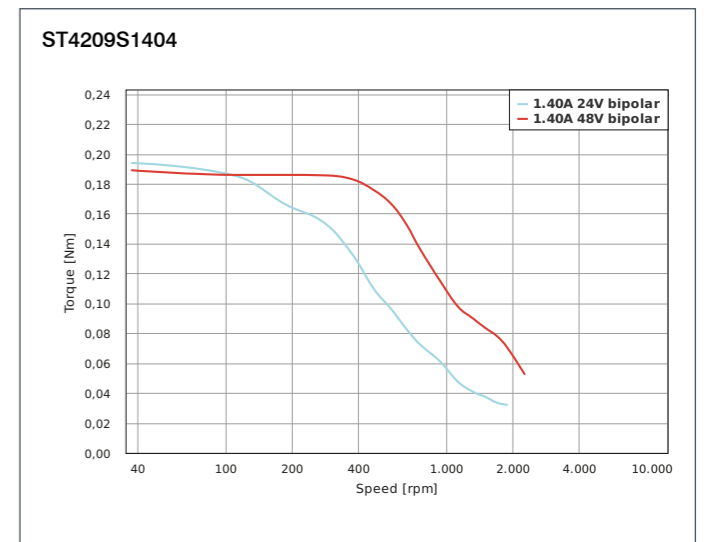
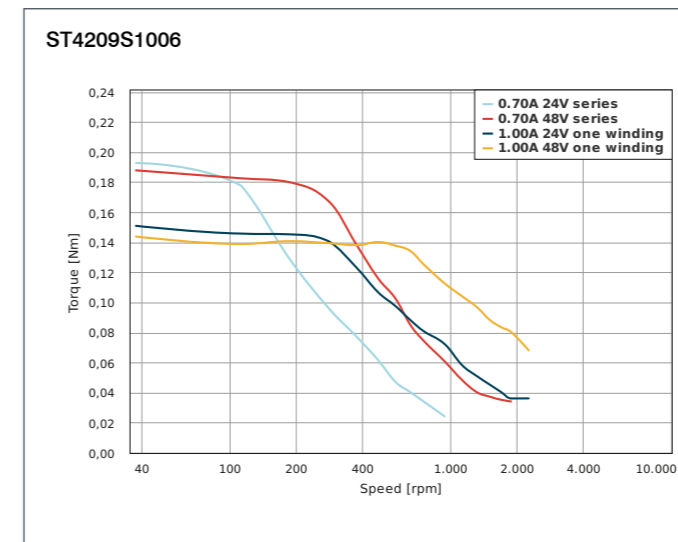
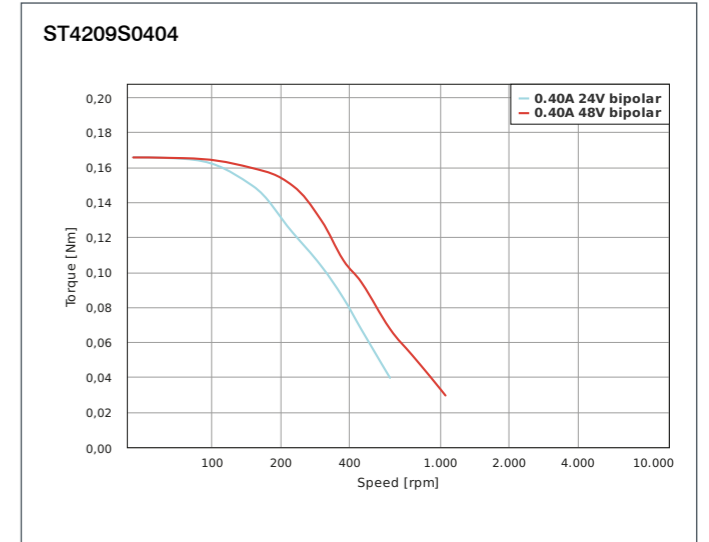
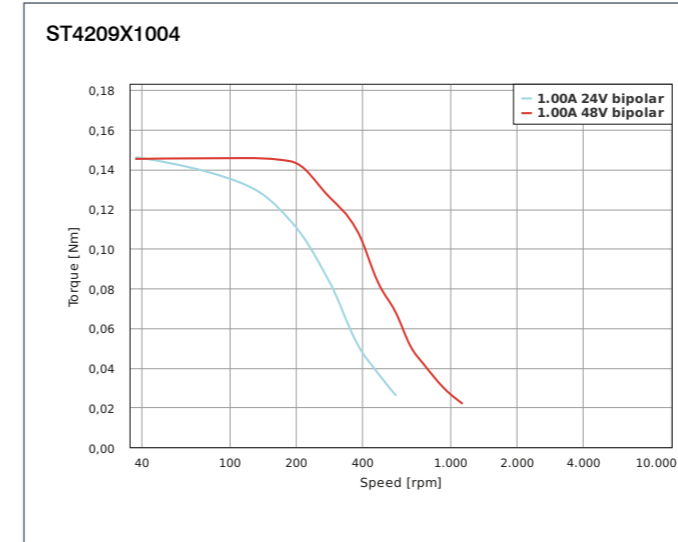
ACCESSORIES

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

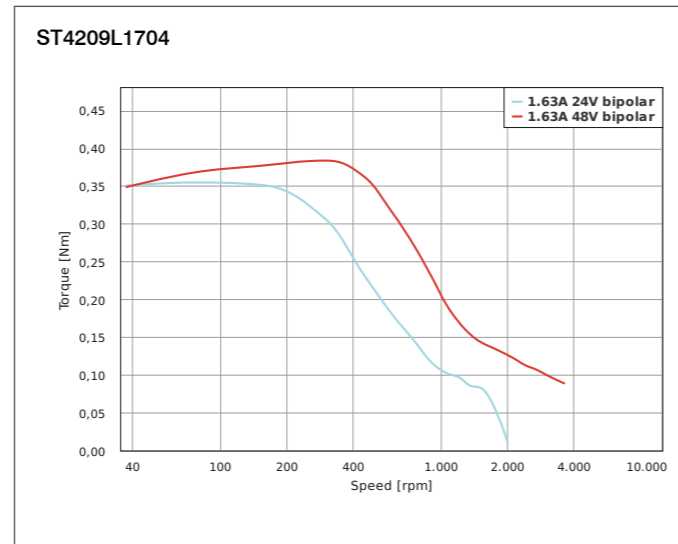
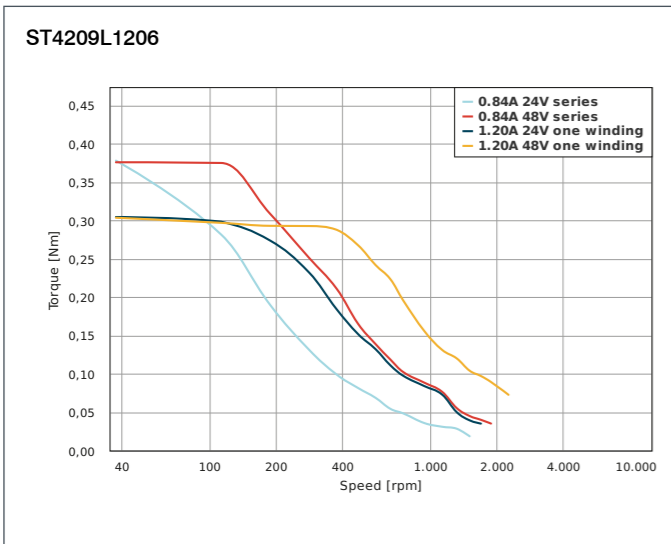
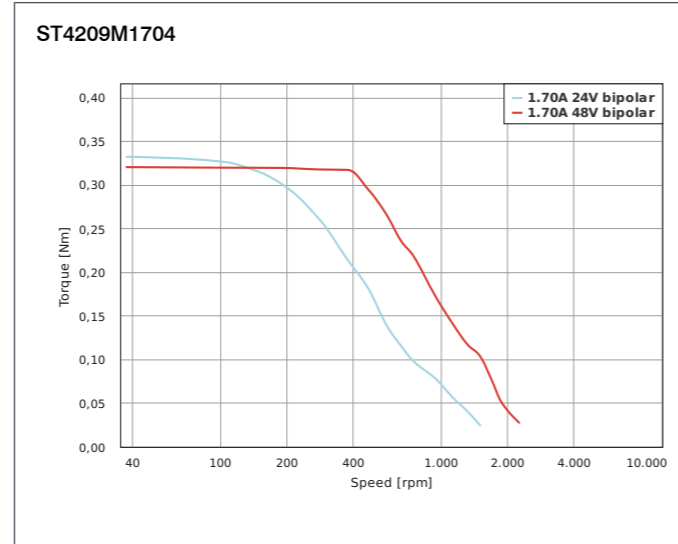
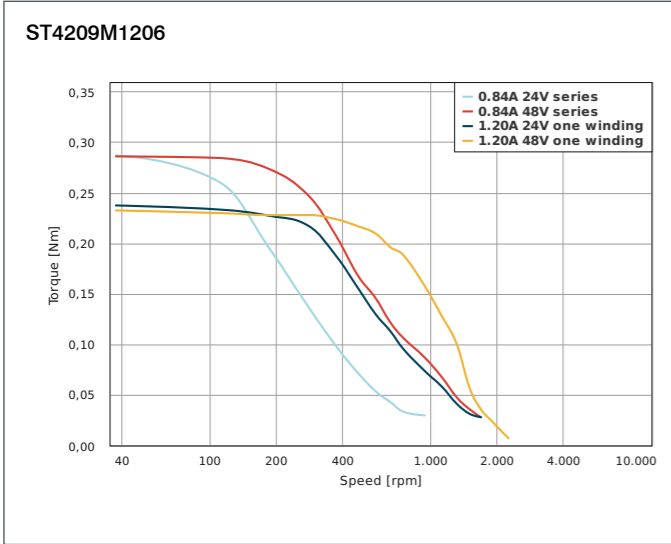
DIMENSIONS (IN MM)



TORQUE CURVES



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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.

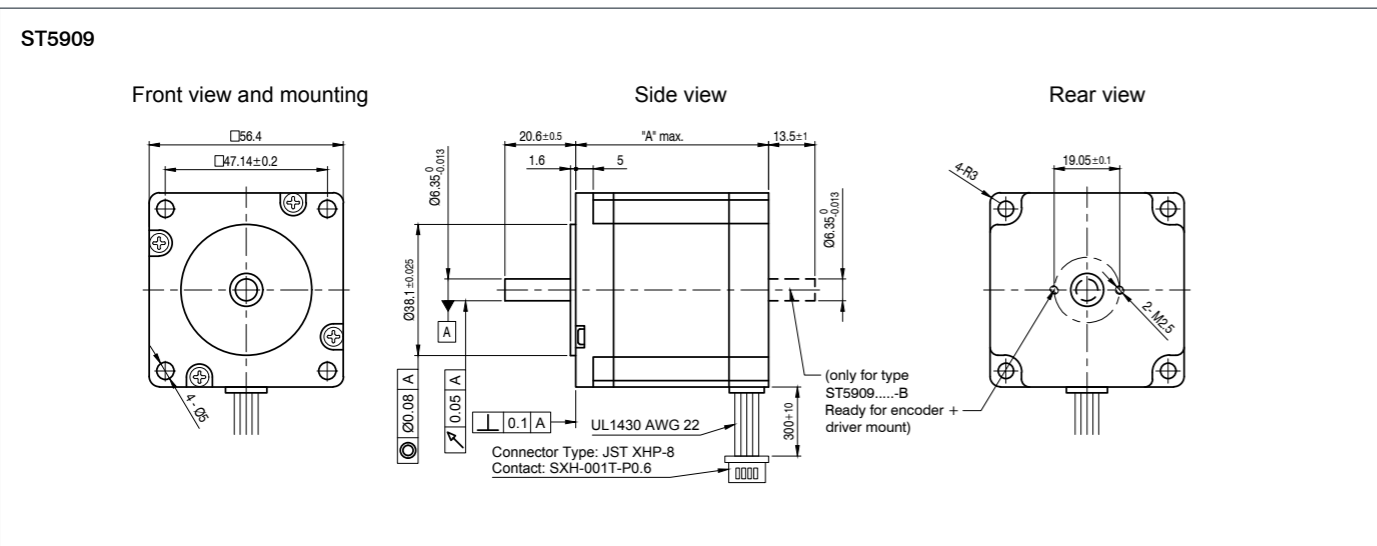
ORDER IDENTIFIER

ST5909X2508-
 A = single shaft end
 B = double shaft end

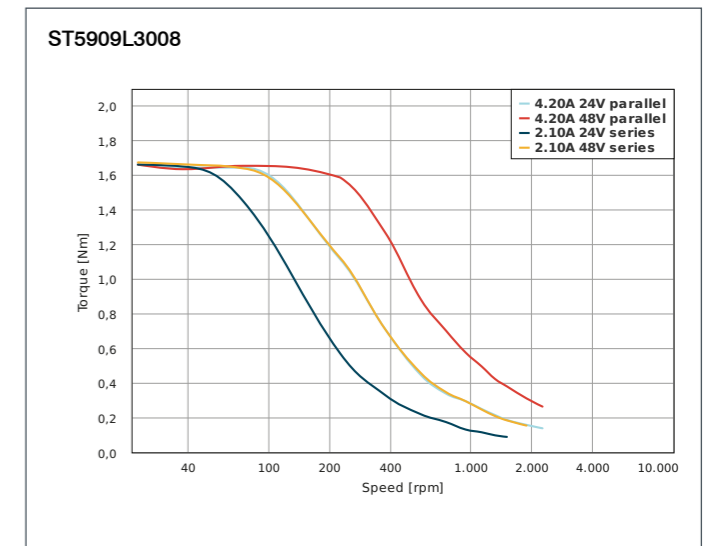
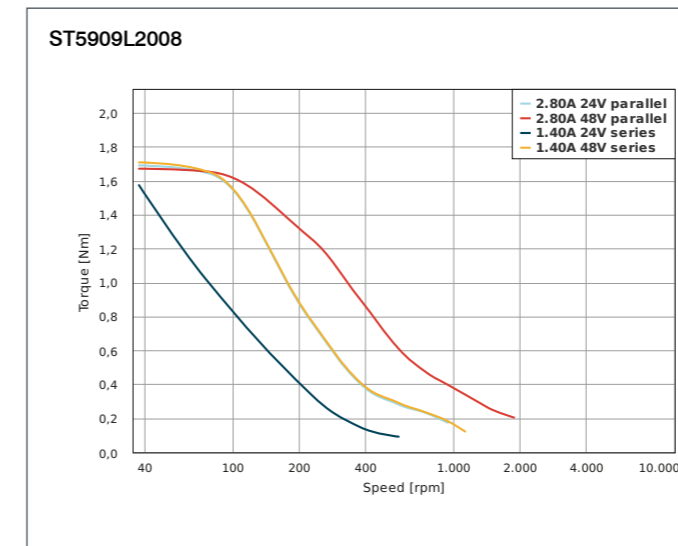
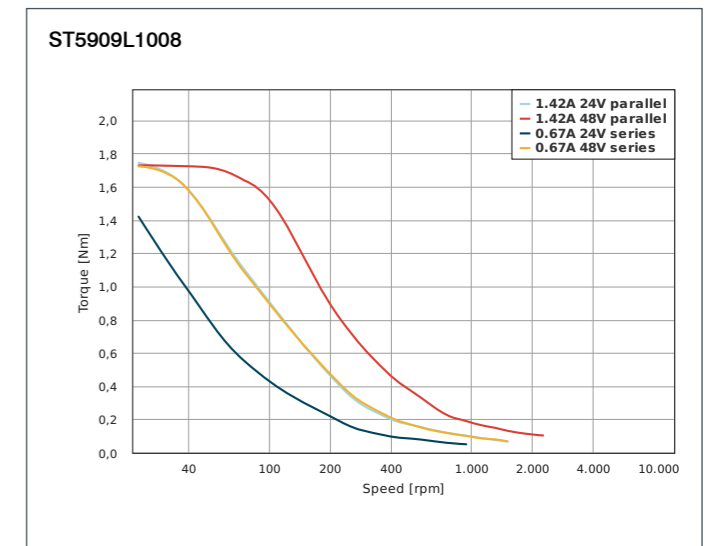
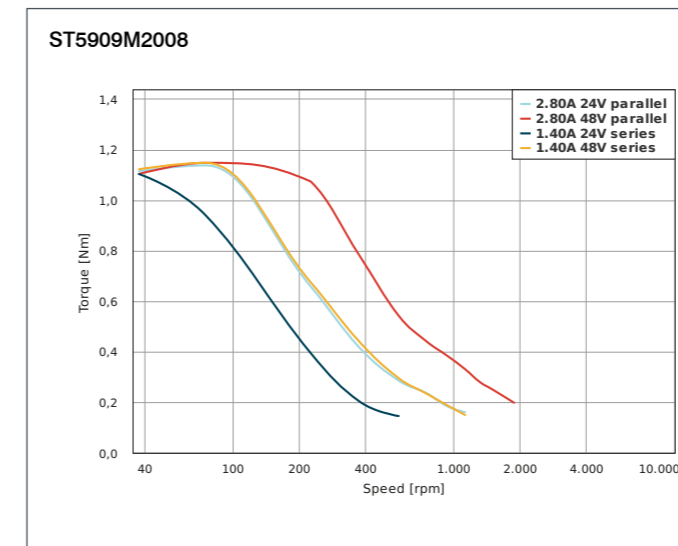
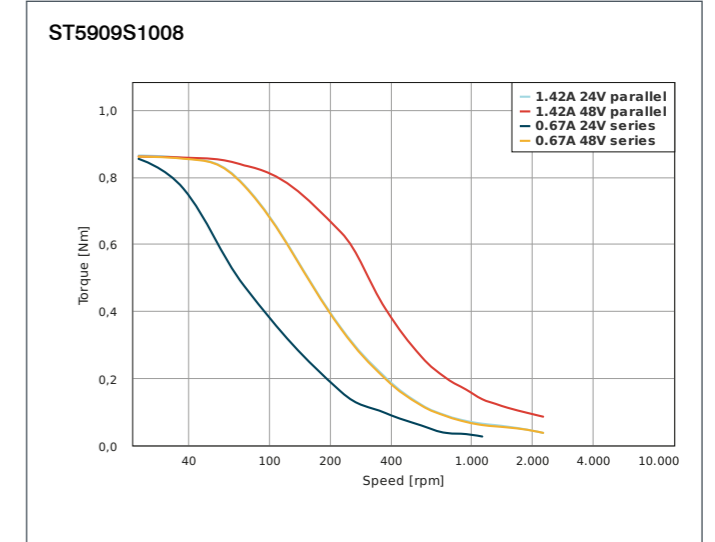
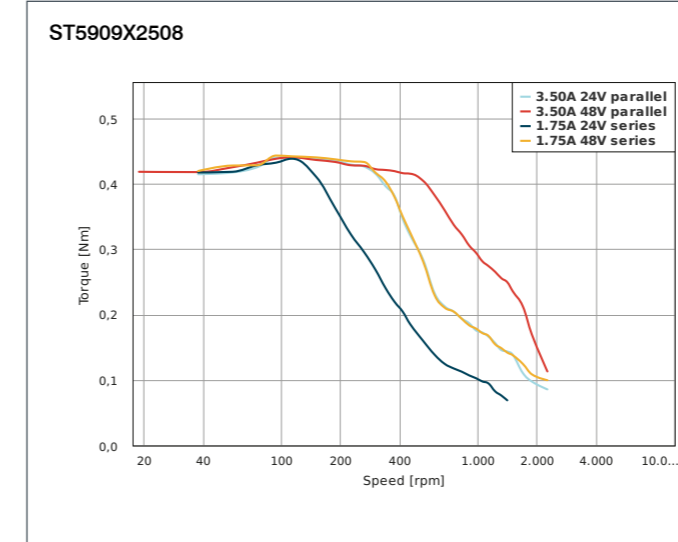
ACCESSORIES

ZD-D56 Damper
ZD-DF56 Damper

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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.

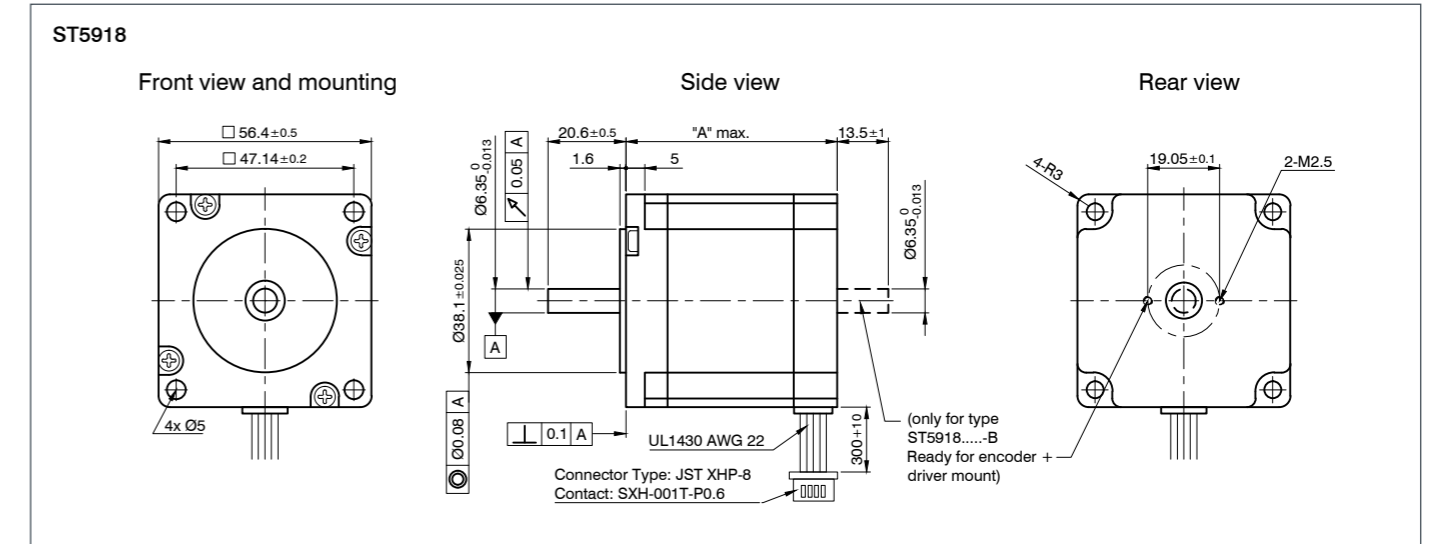
ORDER IDENTIFIER

ST5918X1008-
A = single shaft end
B = double shaft end

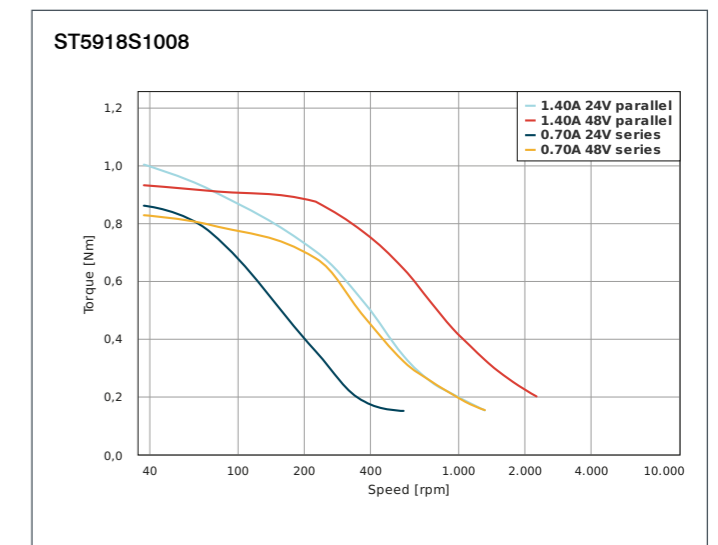
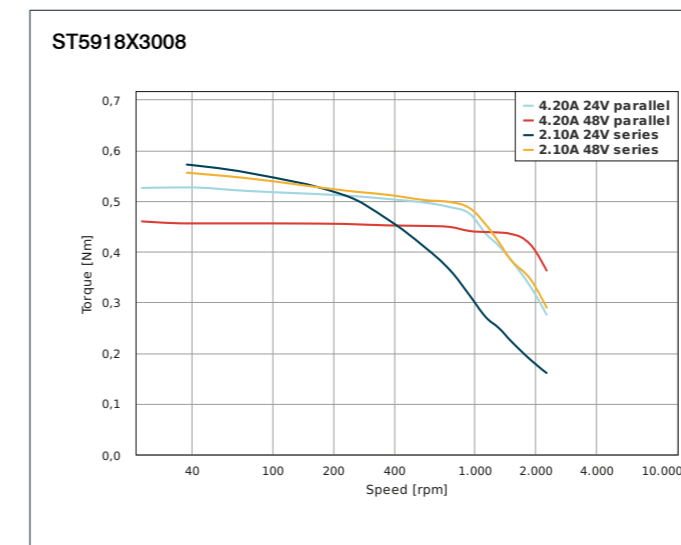
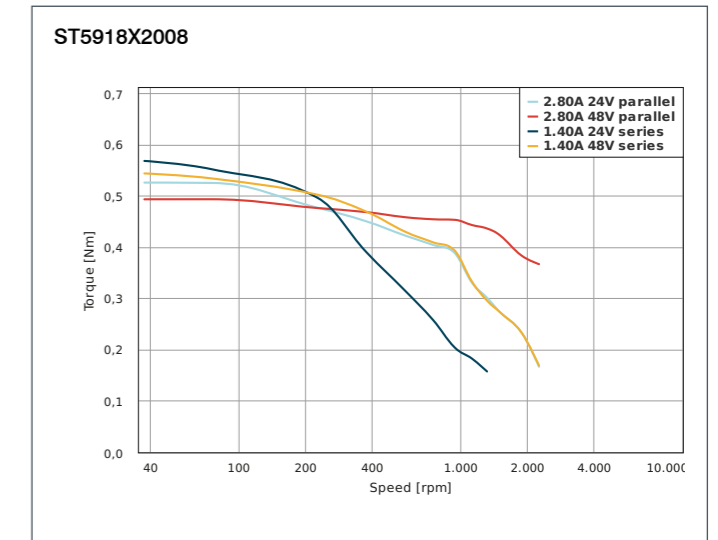
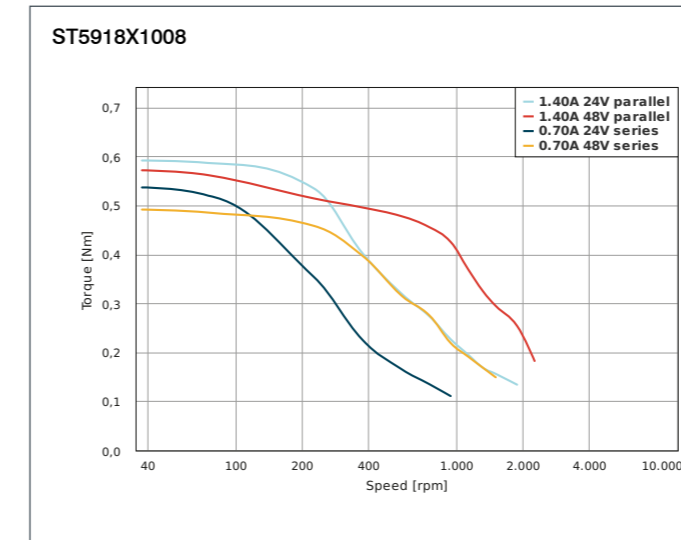
ACCESSORIES

ZD-D56 Damper
ZD-DF56 Damper

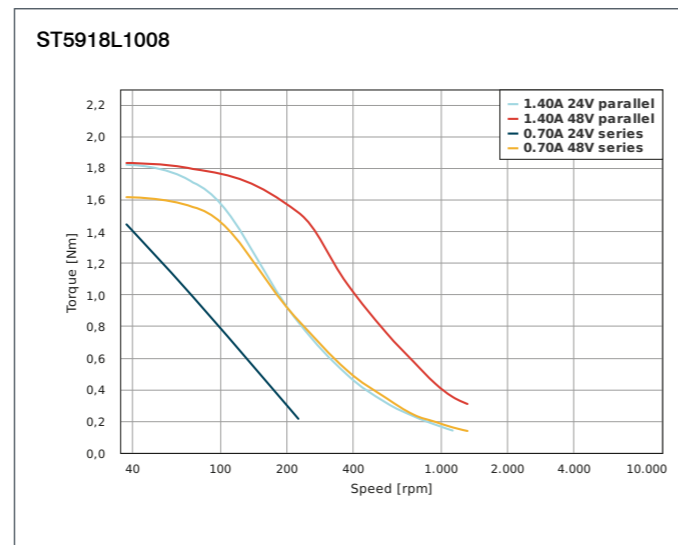
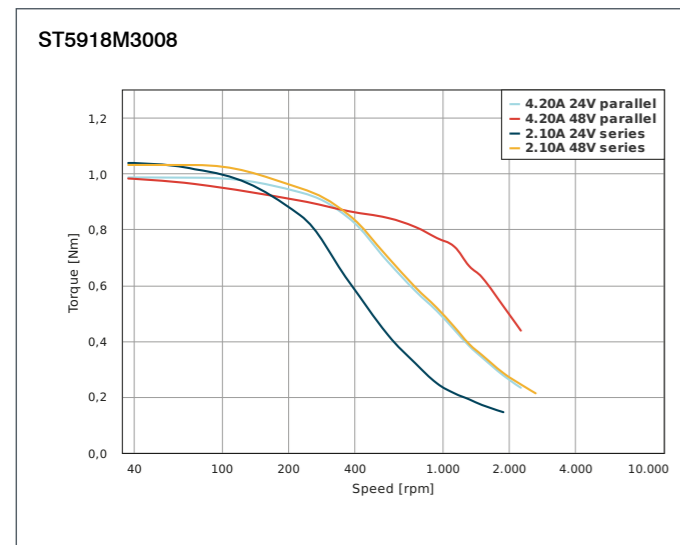
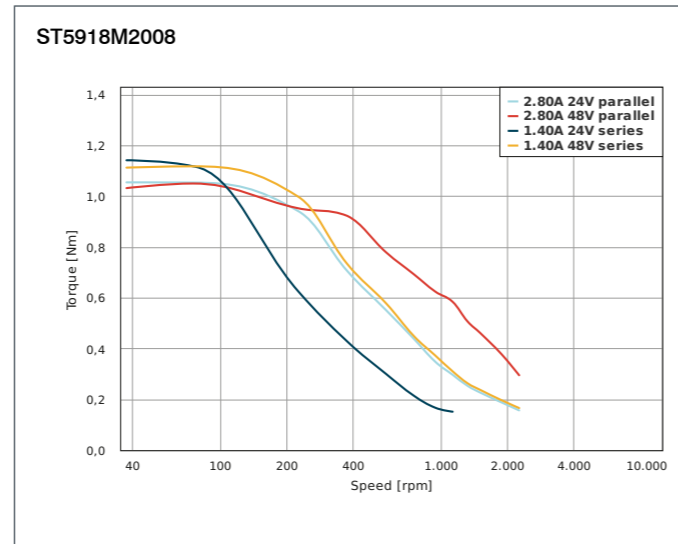
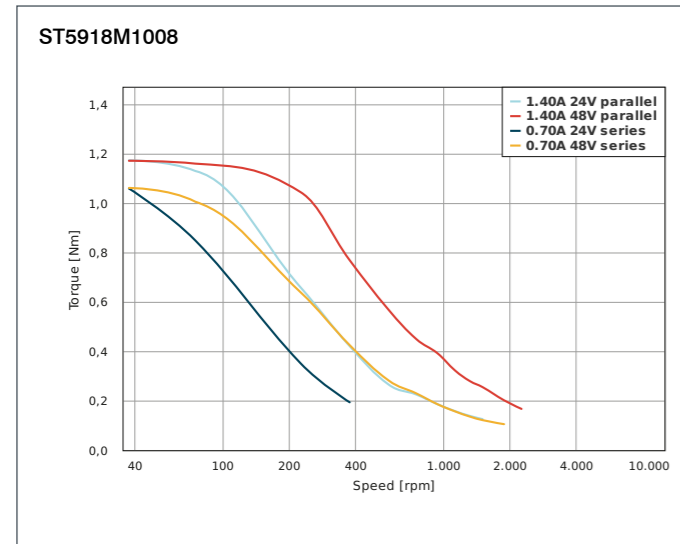
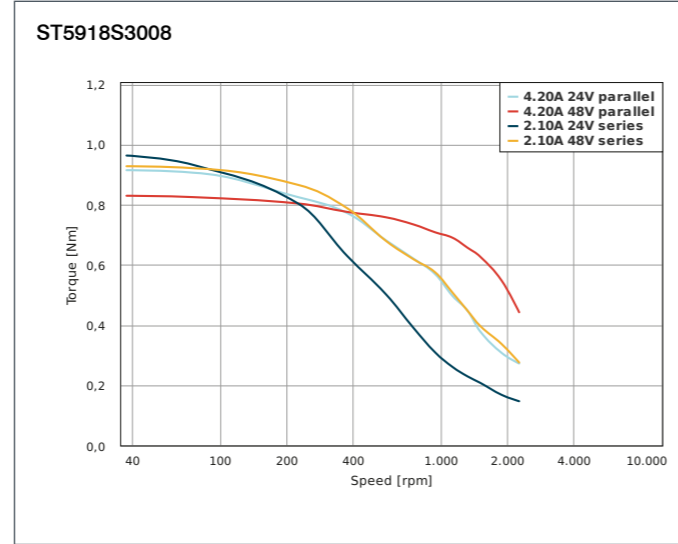
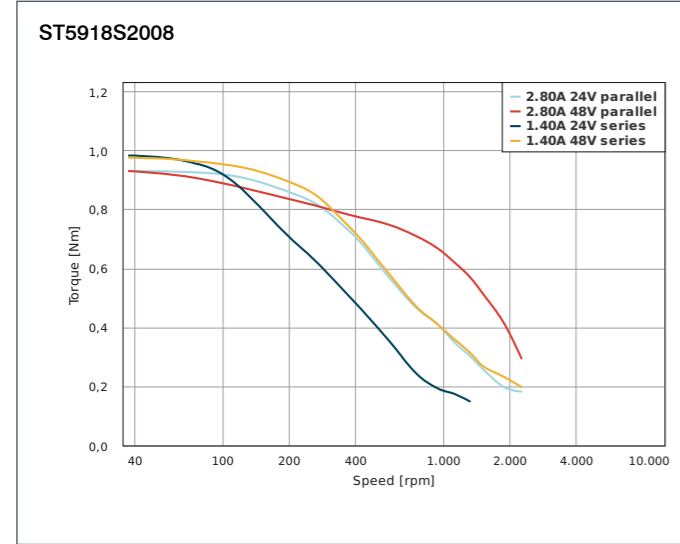
DIMENSIONS (IN MM)



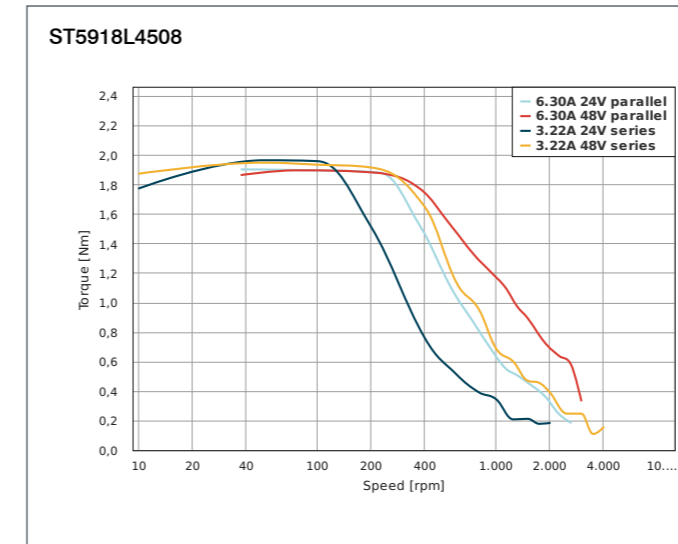
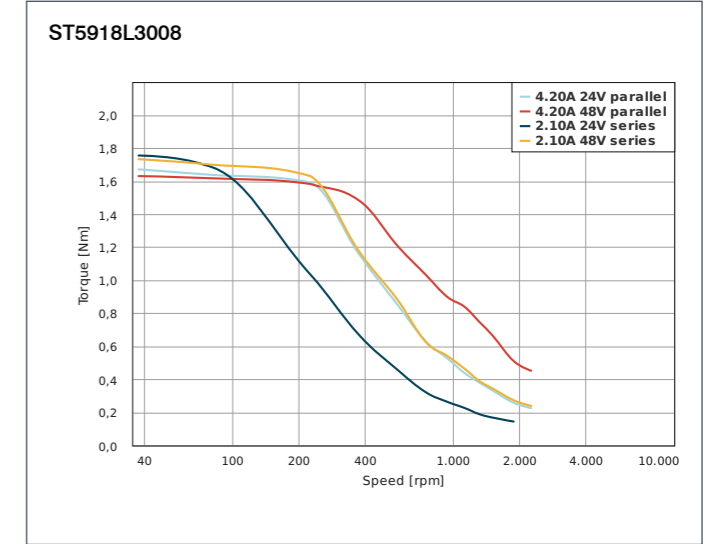
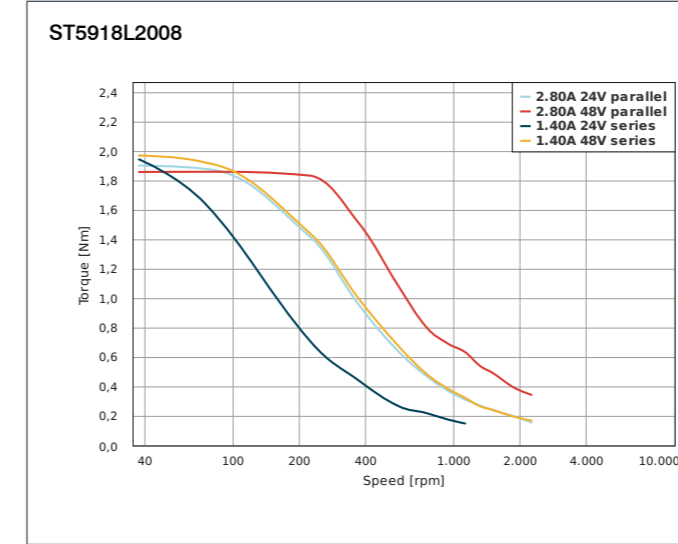
TORQUE CURVES



TORQUE CURVES



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	Weight kg	Length „A“ mm
SC6018L4204	4.2	354	0.65	3.2	840	1.4	88

ORDER IDENTIFIER

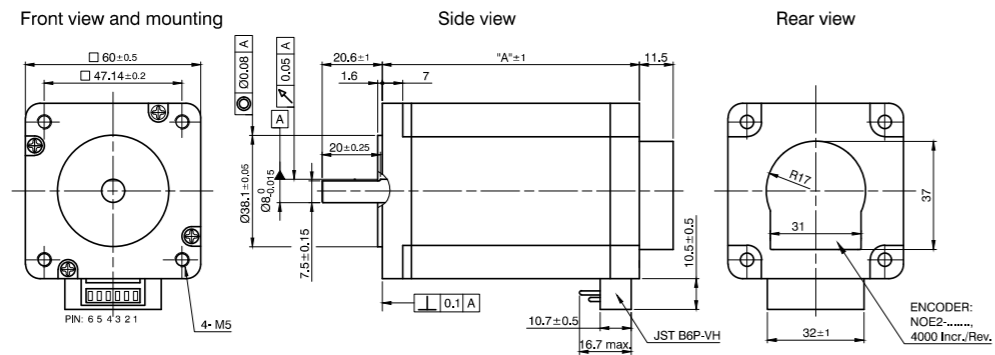
SC6018L4204-
 ENO05K = 5V encoder voltage
 ENO24K = 24V encoder voltage

ACCESSORIES

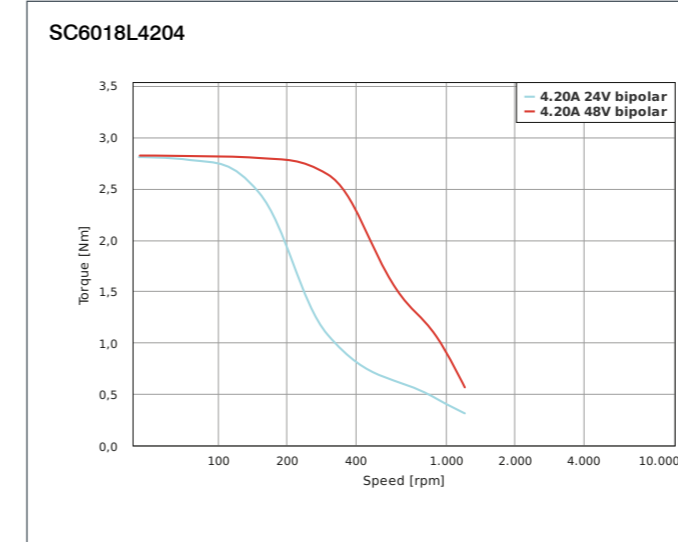
ZK-JST-VHR-6N-0.5M-S
 Motor Cable SC60 0.5 m
ZK-NOE1-10-2000-S
 Encoder Cable NOE 2m
ZK-NOE1-10-500-S
 Encoder Cable NOE 0.5m

DIMENSIONS (IN MM)

SC6018L4204-EN



TORQUE CURVES





OPTIONS



VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

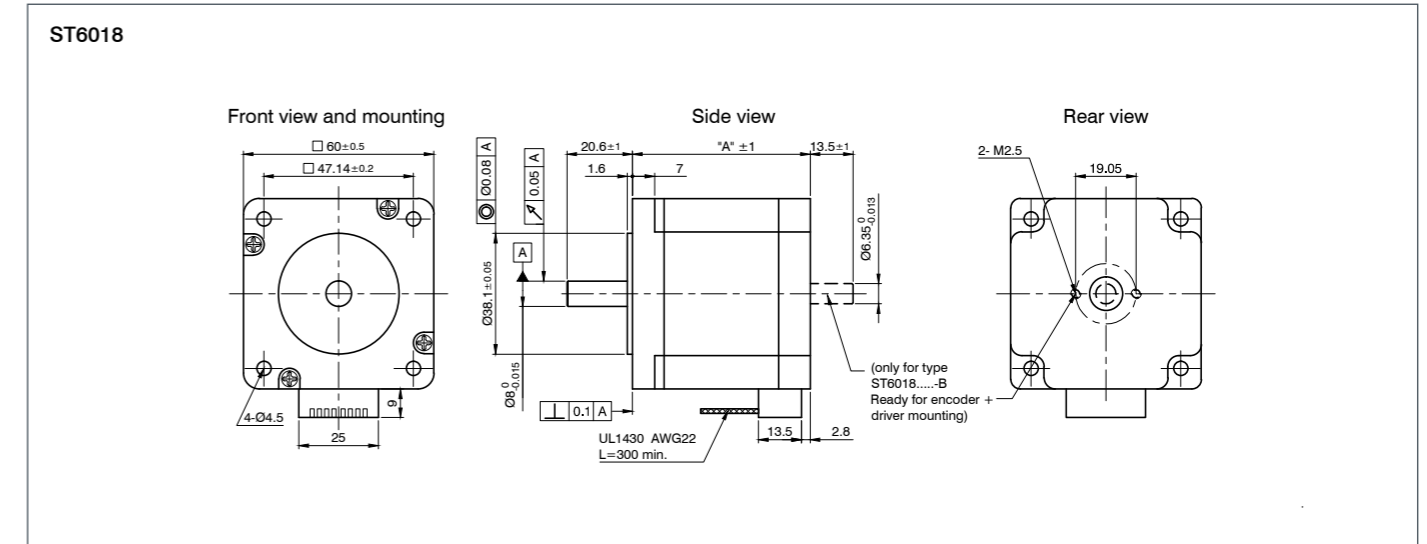
The current and holding torque values refer to bipolar serial wiring. The resistance and inductance values refer to unipolar wiring.

ORDER IDENTIFIER

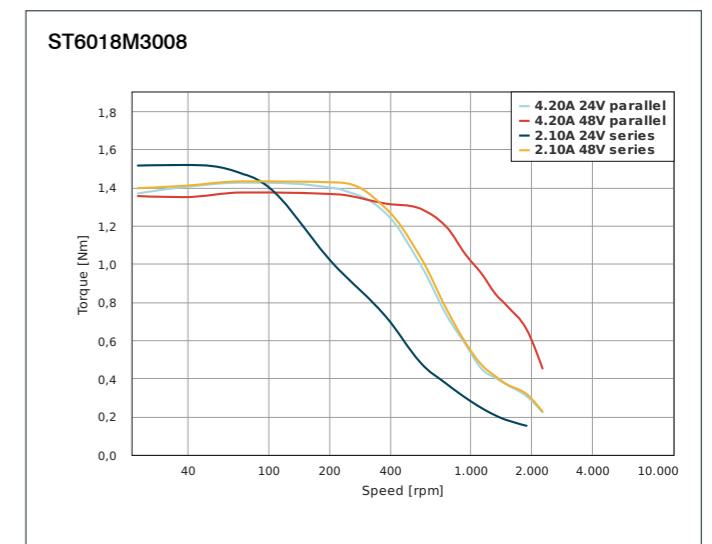
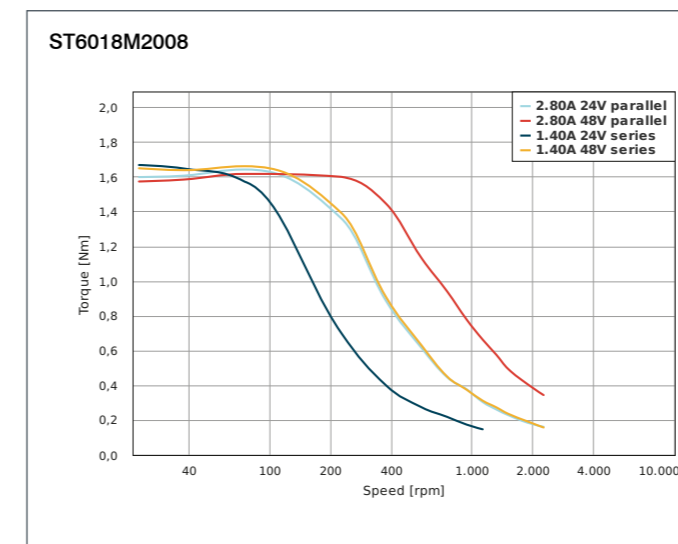
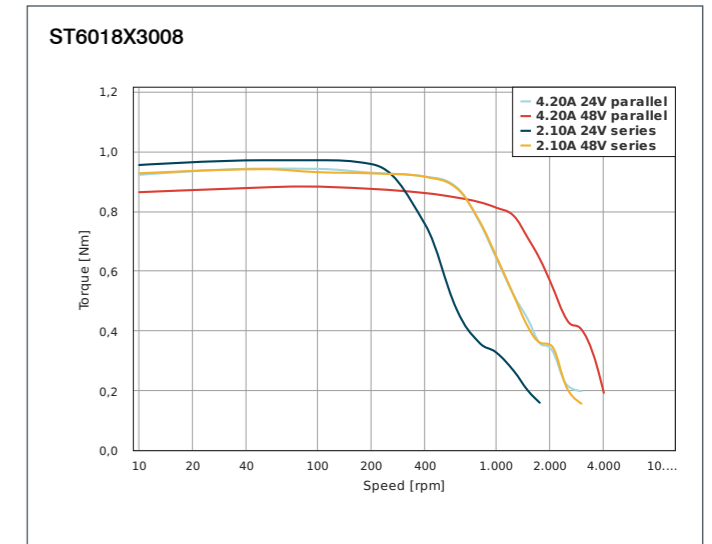
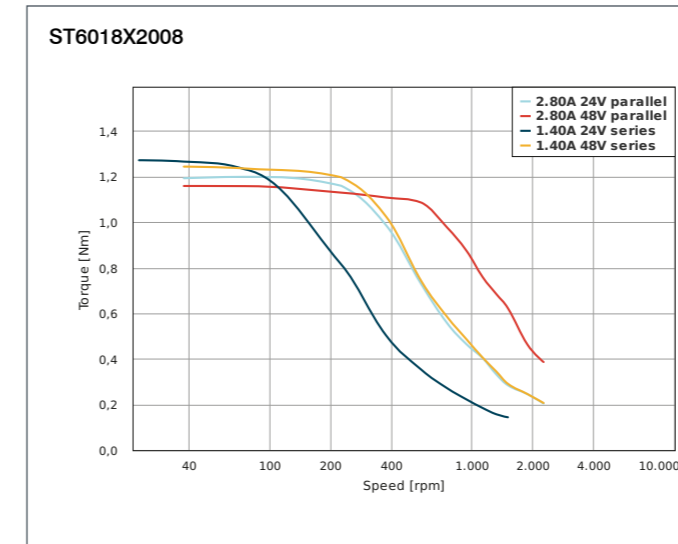


ST6018X2008-
 A = single shaft end
 B = double shaft end

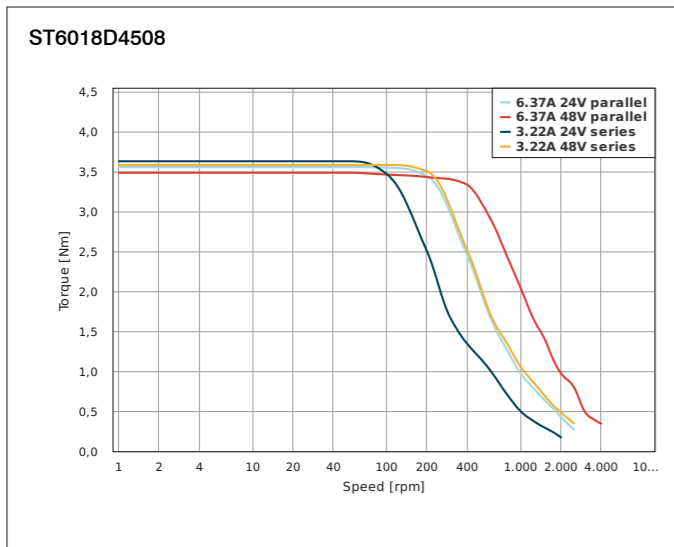
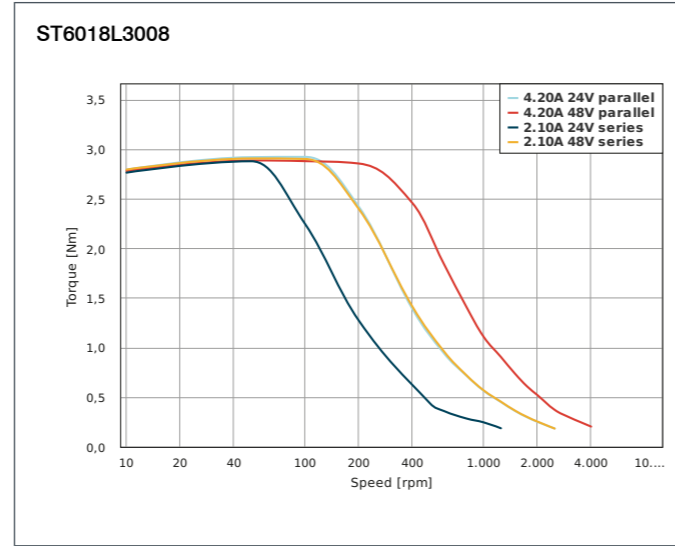
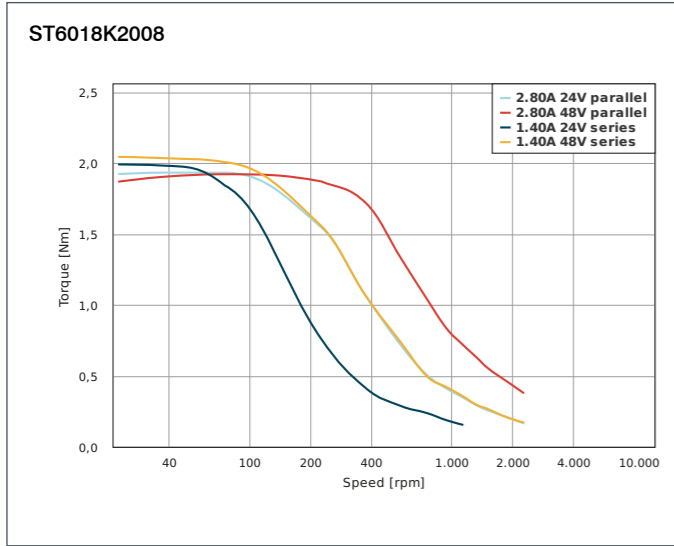
DIMENSIONS (IN MM)



TORQUE CURVES



TORQUE CURVES





OPTIONS



VERSIONS

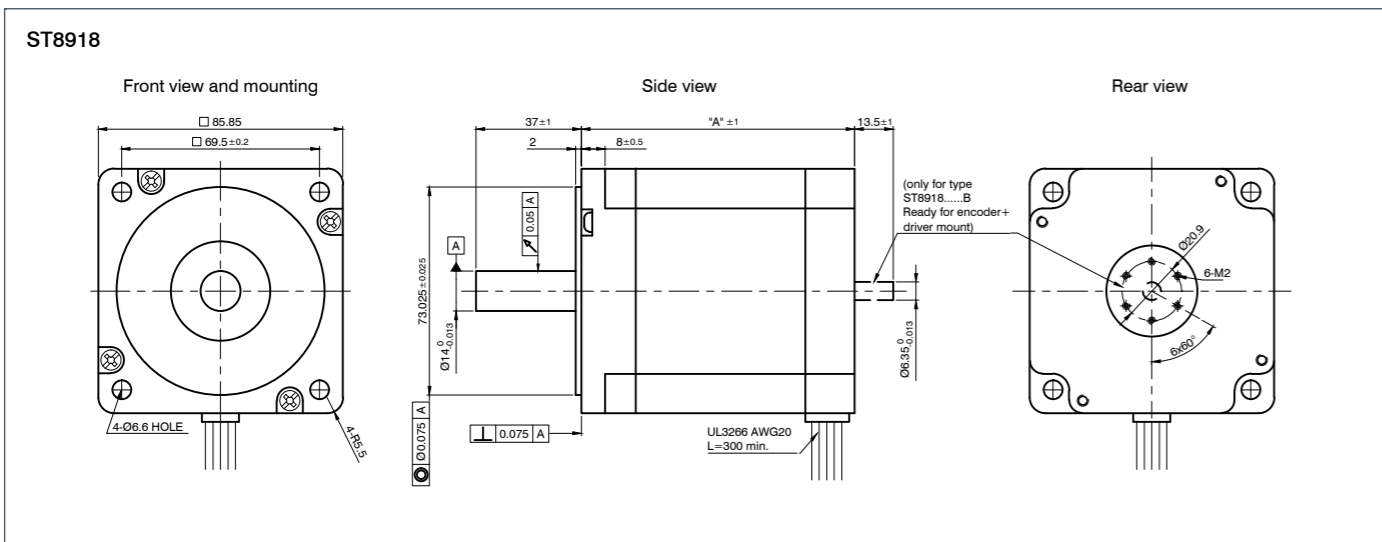
Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	Weight kg	Length „A“ mm
ST8918S4508	3.18	353.55	0.6	1.9	1000	1.7	65
ST8918M4508	3.18	593.97	0.66	3	1900	2.8	96
ST8918M6708	4.74	593.97	0.45	2.1	1900	2.8	96
ST8918L4508	3.18	933.38	1.1	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.

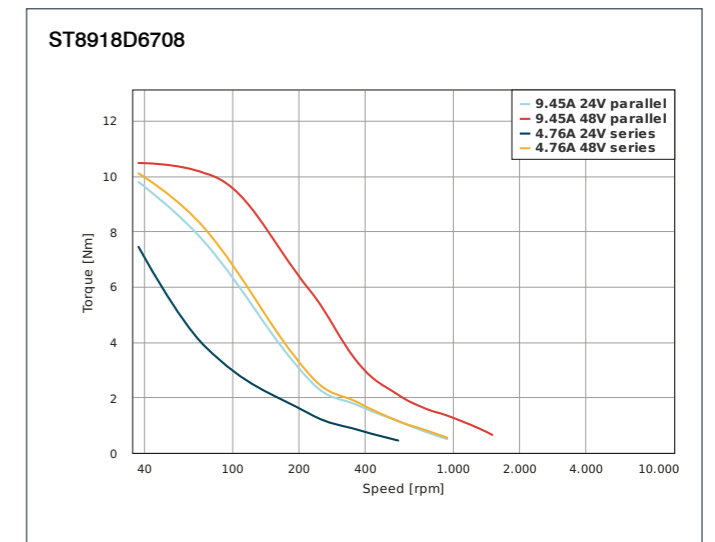
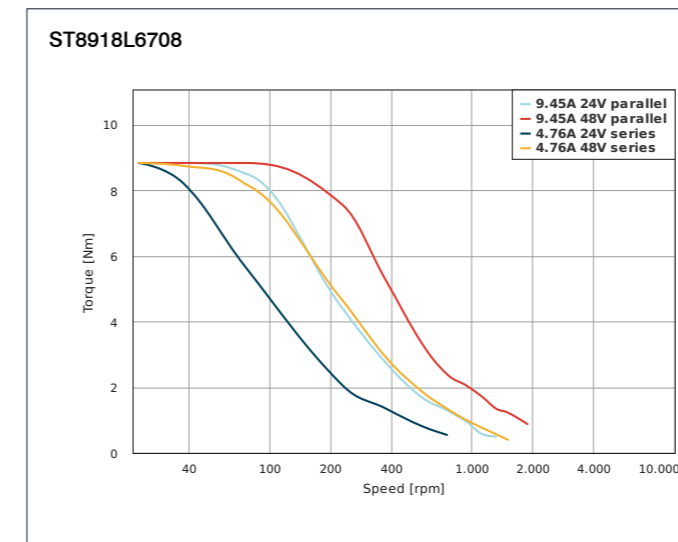
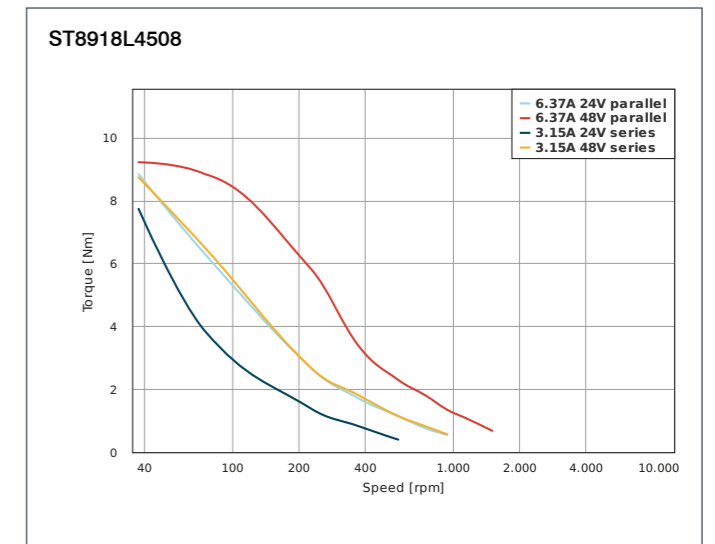
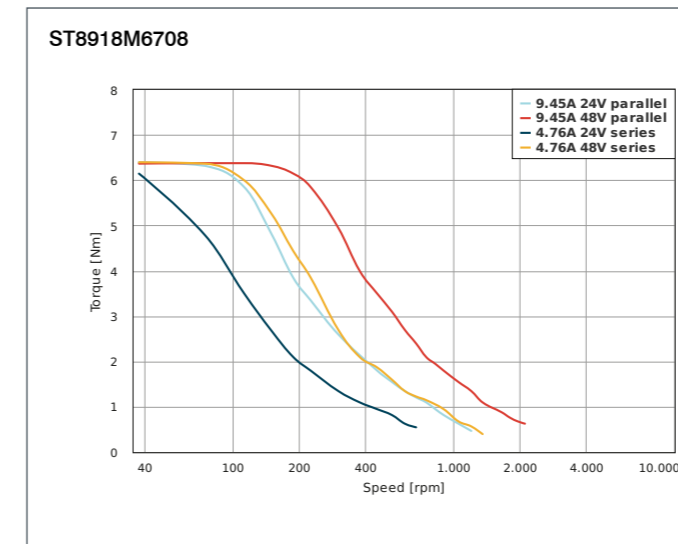
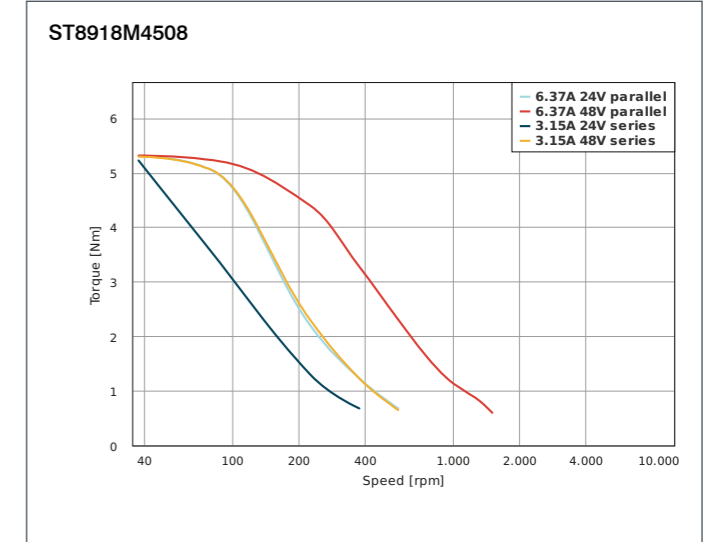
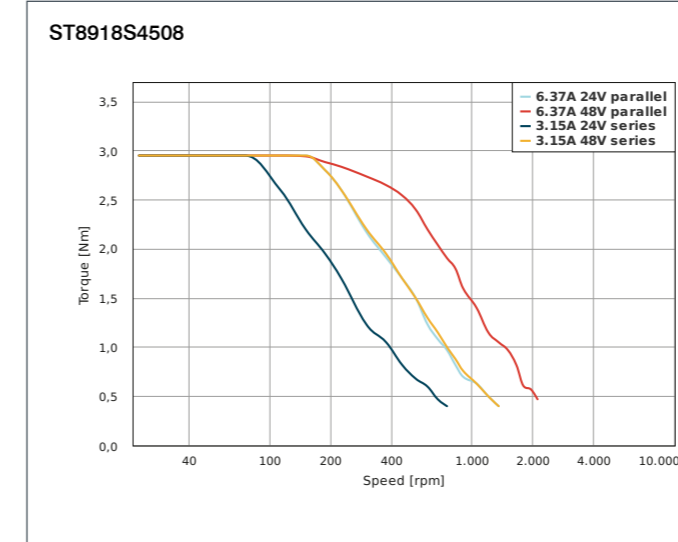
ORDER IDENTIFIER

ST8918S4508-
 A = single shaft end
 B = double shaft end

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



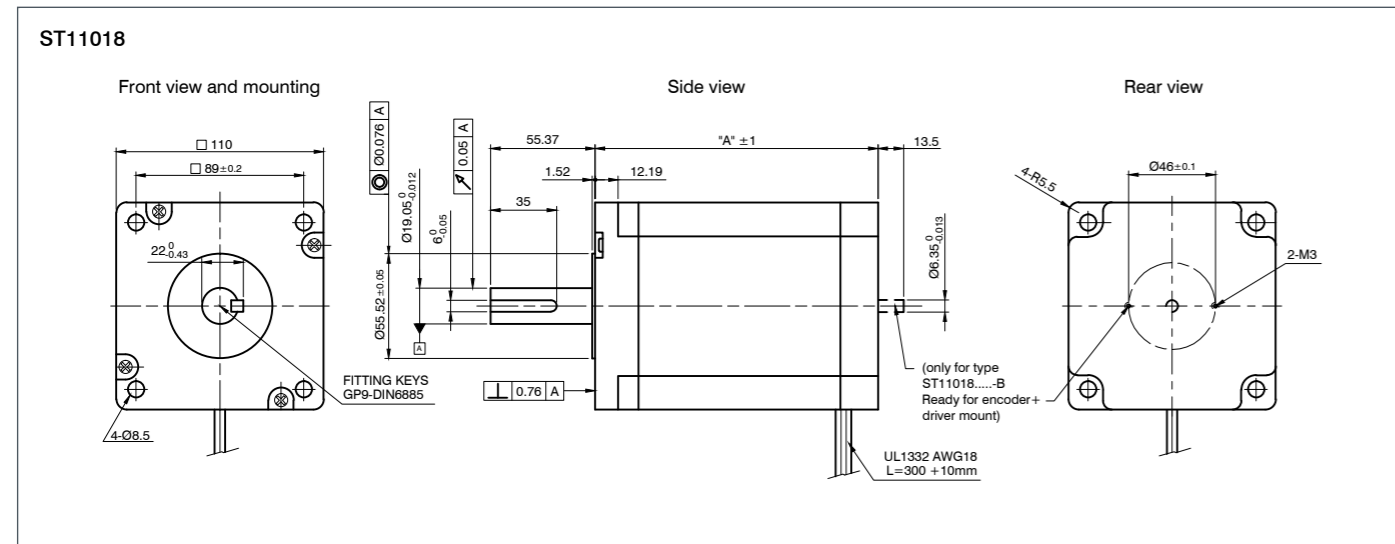
VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

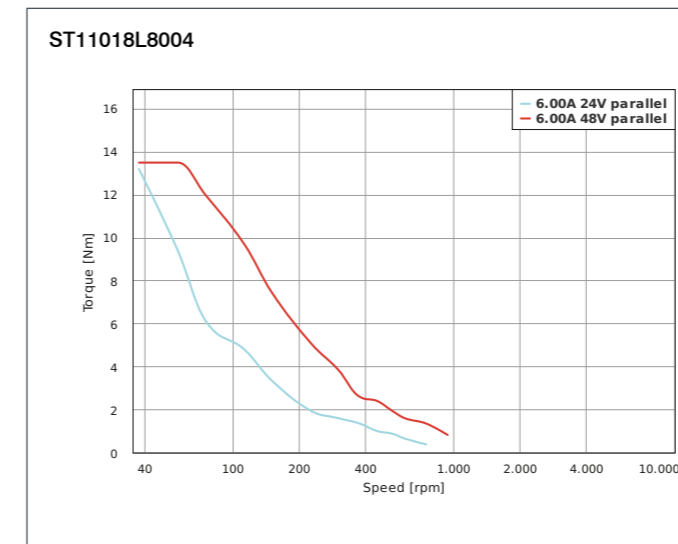
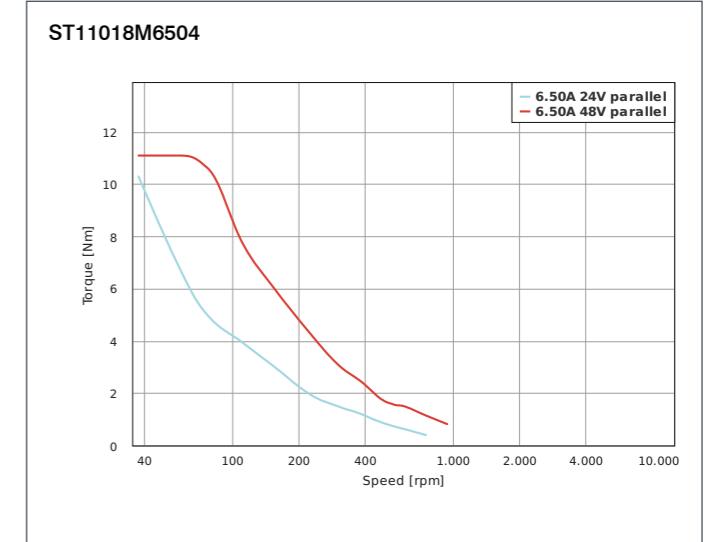
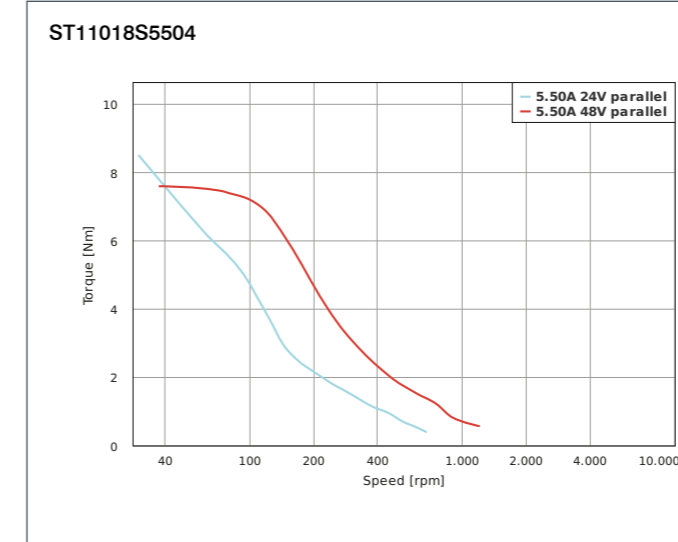
ORDER IDENTIFIER

ST11018S5504-
 A = single shaft end
 B = double shaft end

DIMENSIONS (IN MM)



TORQUE CURVES



Lined area for notes.





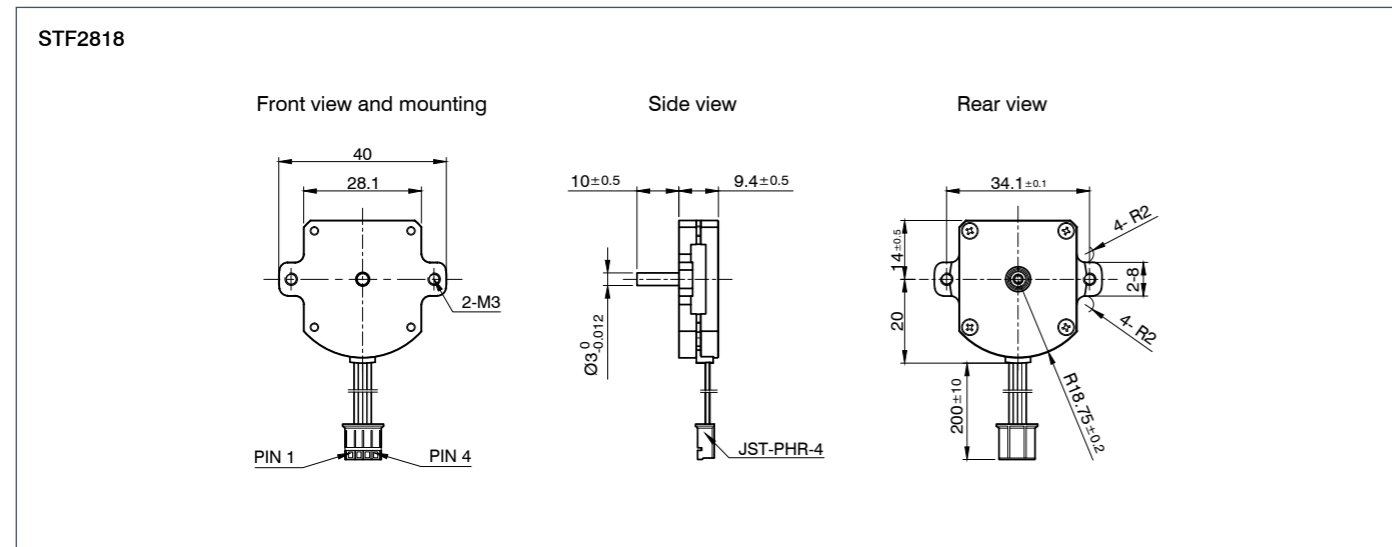
OPTIONS



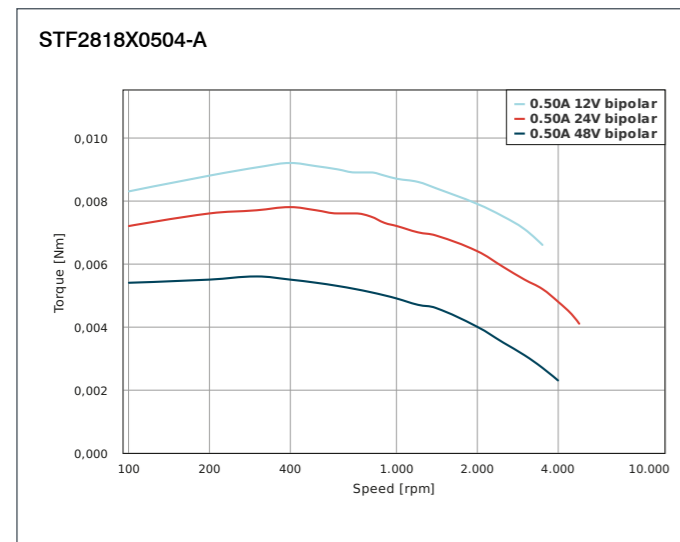
VERSIONS

Type	Size mm	Holding Torque Ncm	Current per Winding A	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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)



TORQUE CURVES



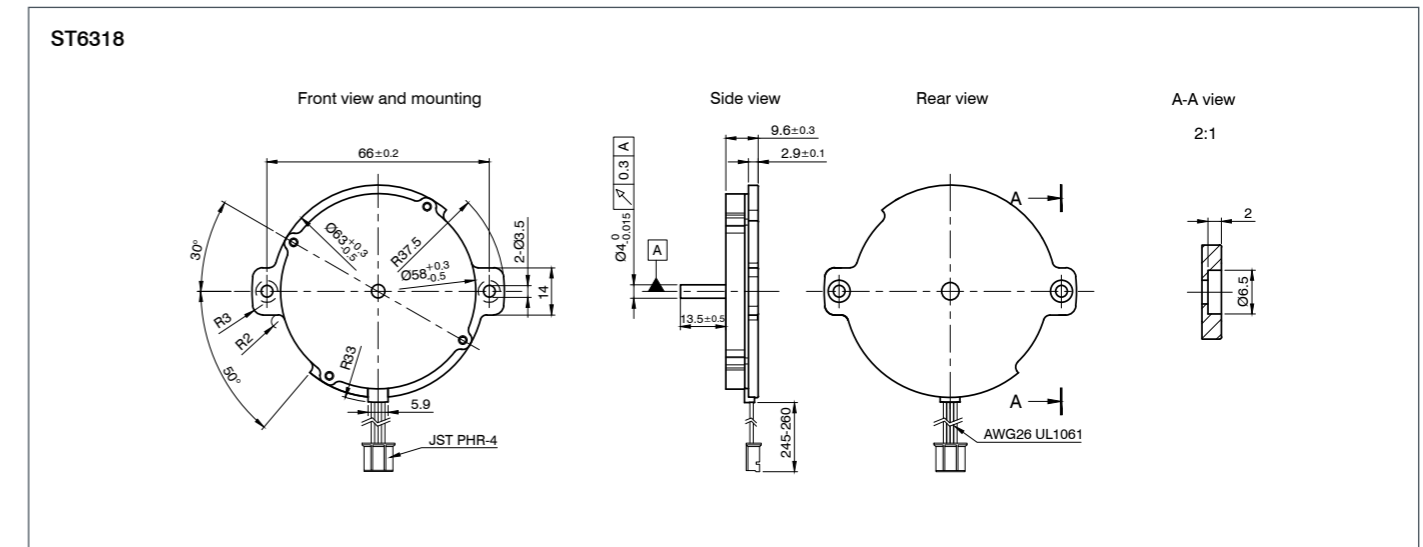
OPTIONS



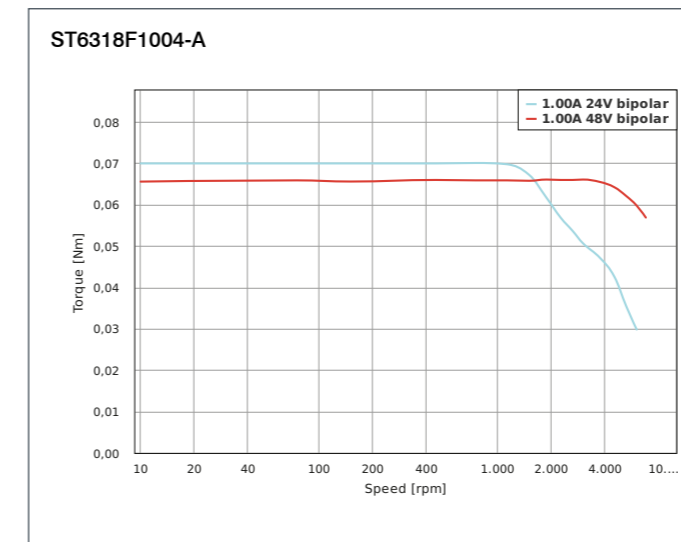
VERSIONS

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

DIMENSIONS (IN MM)



TORQUE CURVES



Lined area for notes with horizontal dotted lines.



ST4118

Stepper Motor with Hollow Shaft – NEMA 17



OPTIONS

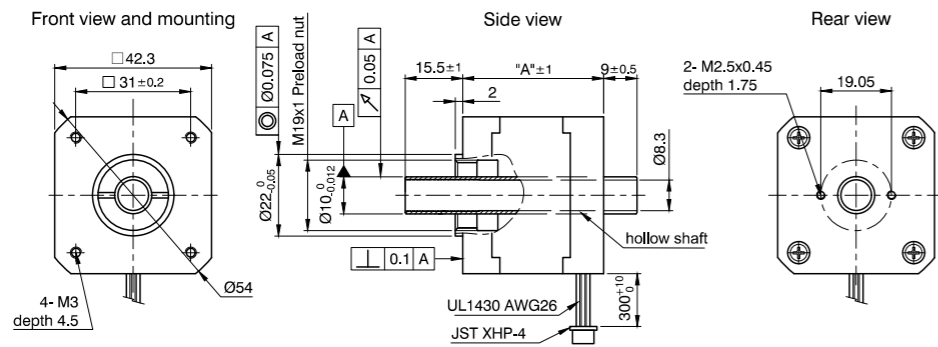


VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Rotor Inertia gcm ²	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

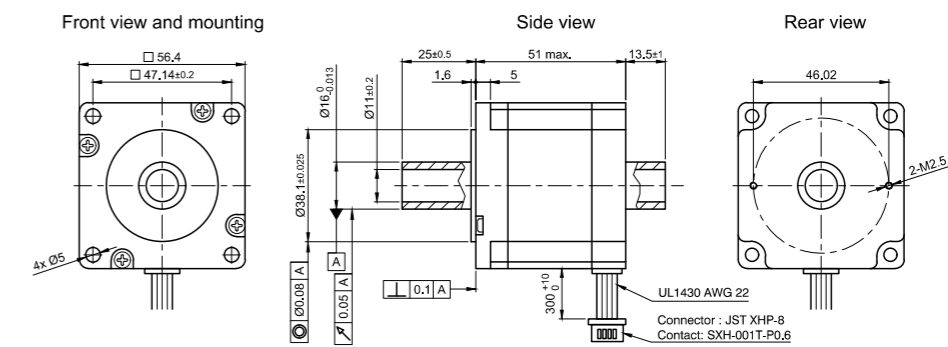


VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Rotor Inertia gcm ²	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

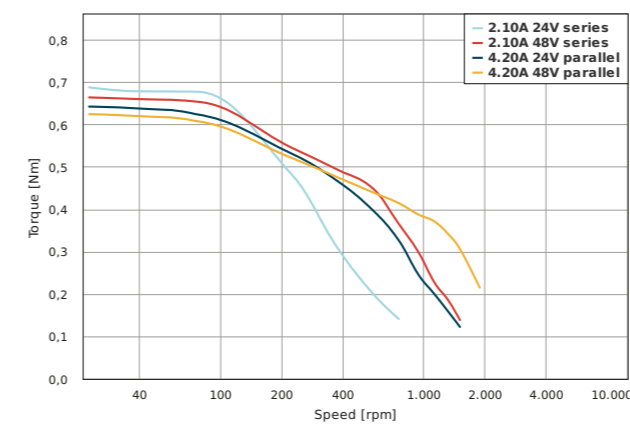
DIMENSIONS (IN MM)

ST5918S3008-L2



TORQUE CURVES

ST5918S3008-L2



Lined area for notes.





OPTIONS



DESCRIPTION

High-torque stepper motor in size NEMA 11 (28 mm), with protection class IP65 (except shaft outlet) and 1.8° step angle (full step). Identical flange size as the standard motor ST2818, therefore electrically and mechanically interchangeable. Available in two lengths.

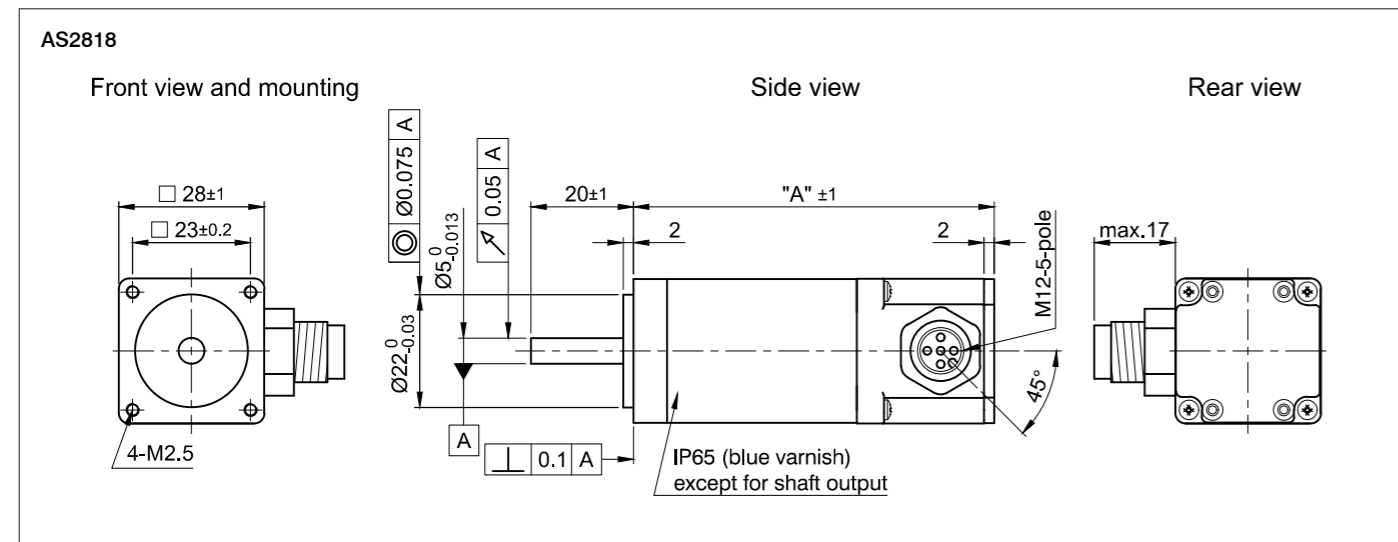
VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

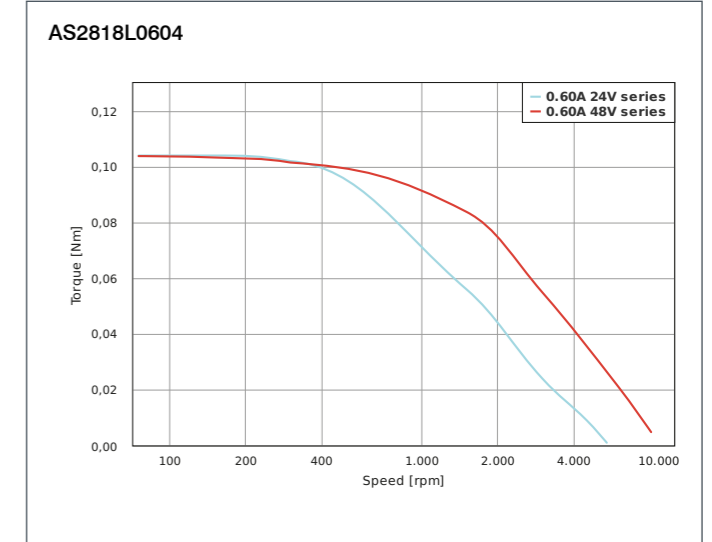
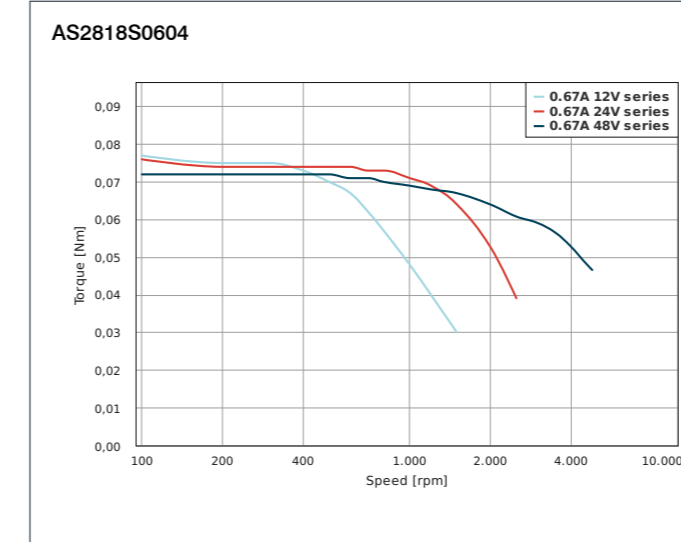
ACCESSORIES

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

DIMENSIONS (IN MM)



TORQUE CURVES





OPTIONS



DESCRIPTION

High-torque stepper motor with M12 connector in size NEMA 17 (42 mm), with protection class IP65 (except shaft outlet) and 1.8° step angle (full step). Identical flange size as the standard motor ST4118, therefore electrically and mechanically interchangeable. Available in a variety of versions.

VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Rotor Inertia gcm ²	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	✓	✓

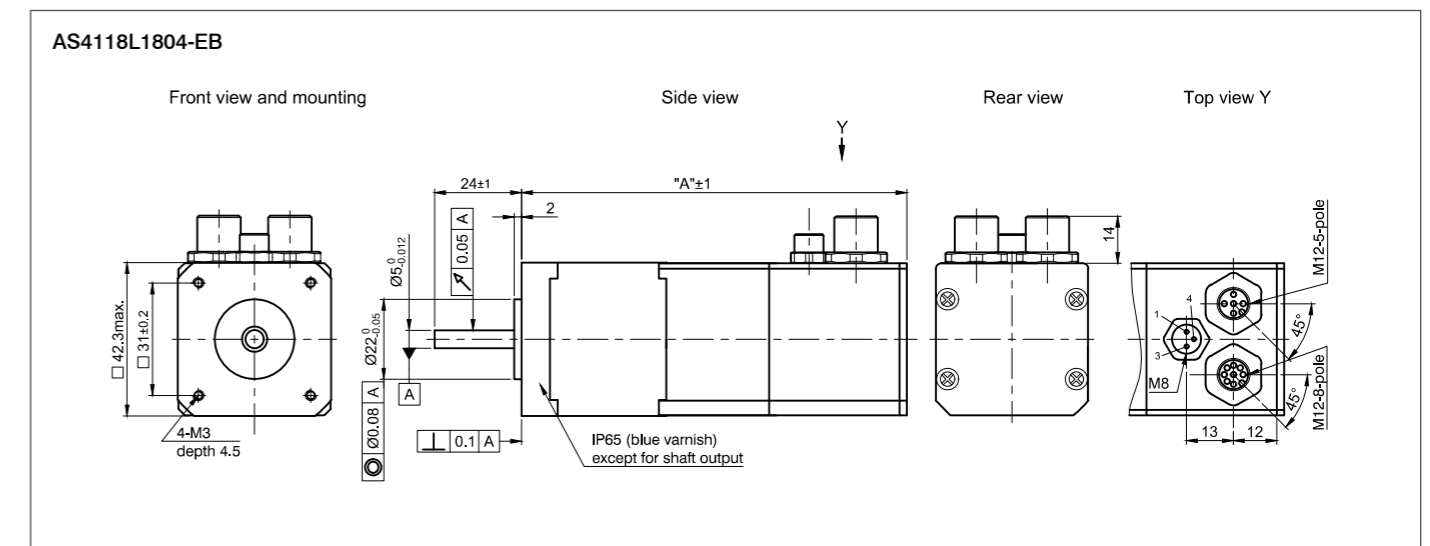
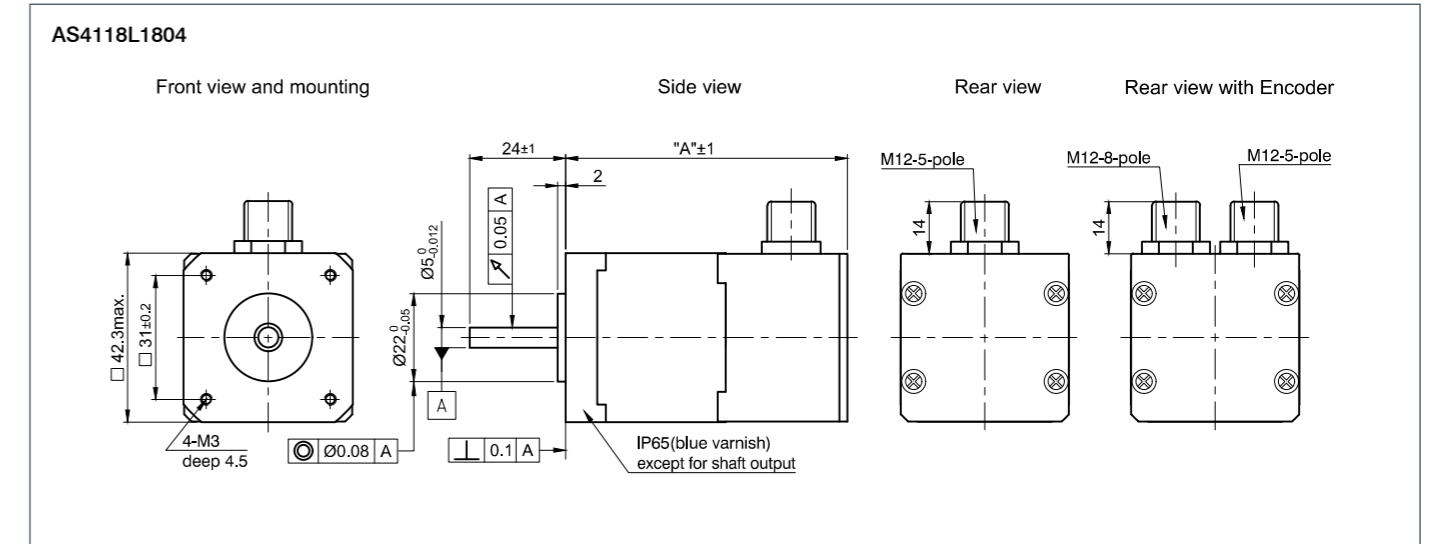
ORDER IDENTIFIER

AS4118L1804-
 E = with encoder
 EB = with encoder and brake
 ENM24 = with 24-V encoder

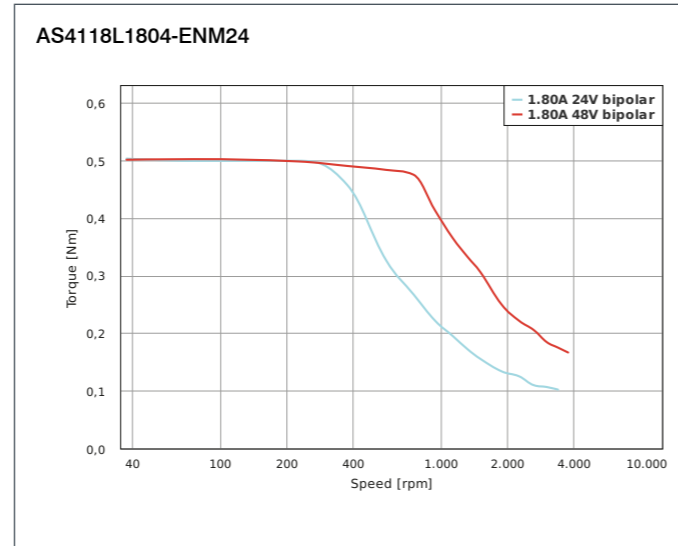
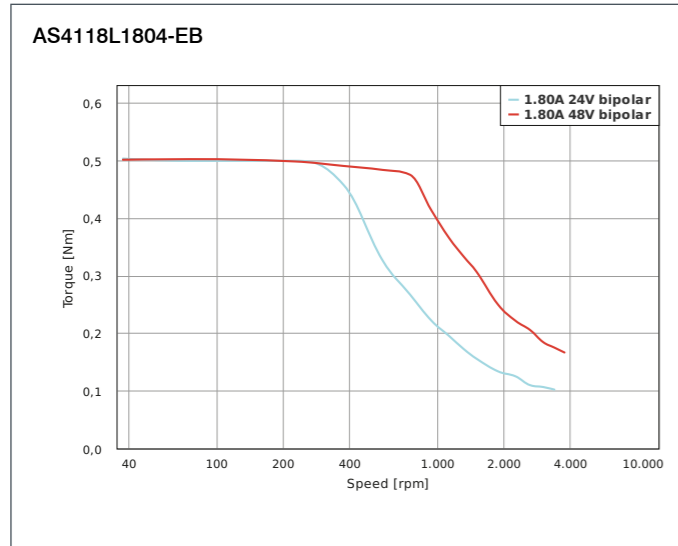
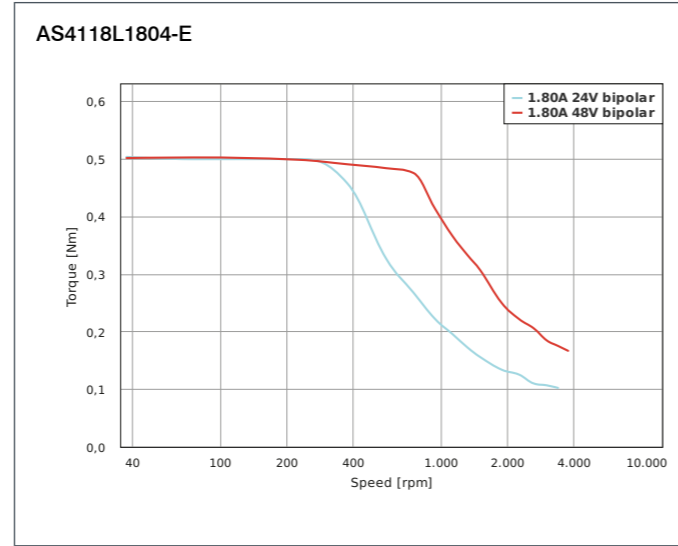
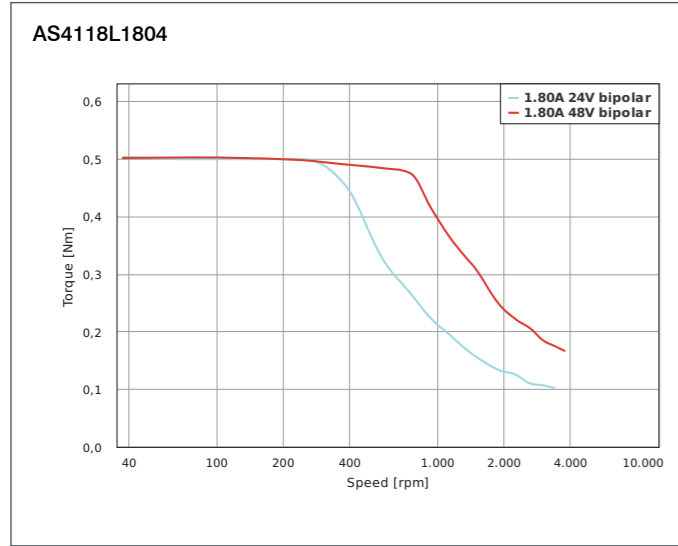
ACCESSORIES

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

DIMENSIONS (IN MM)



TORQUE CURVES



Notes section with horizontal lines for writing.



OPTIONS



DESCRIPTION

High-torque stepper motor with M12 connector in size NEMA 23 (56 mm), with protection class IP65 (except shaft outlet) and 1.8° step angle (full step). Identical flange size as the standard motor ST5918, therefore electrically and mechanically interchangeable. Available in a variety of versions.

VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Rotor Inertia gcm ²	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

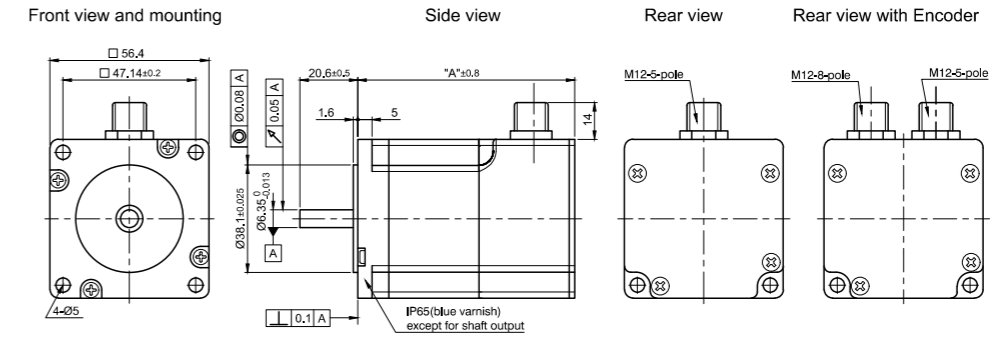
AS5918L4204-
 E = with encoder
 EB = with encoder and brake
 ENM24 = with 24-V encoder
 ENM24B = with 24-V encoder and brake

ACCESSORIES

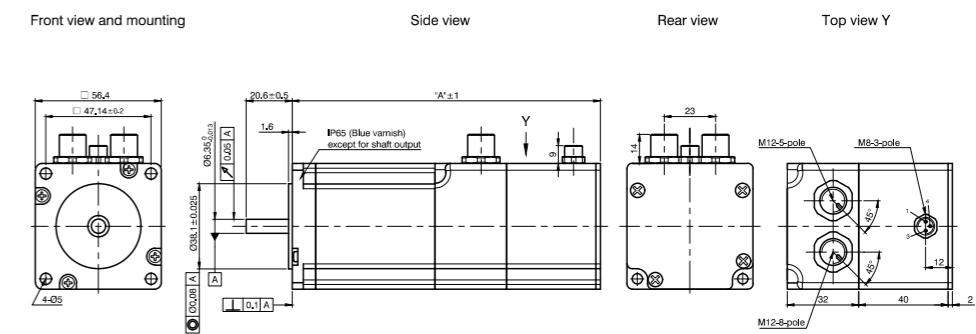
ZK-M8-3-2M-1-AFF
 Brake Cable straight 2 m
ZK-M12-5-2M-1-AFF
 Motor Cable straight 2 m
ZK-M12-5-2M-2-AFF
 Motor Cable angled 2 m
ZK-M12-5-5M-1-AFF
 Motor Cable straight 5 m
ZK-M12-5-5M-2-AFF
 Motor Cable angled 5 m
ZK-M12-8-2M-1-AFF
 Encoder Cable straight 2 m
ZK-M12-8-2M-2-AFF
 Encoder Cable angled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

DIMENSIONS (IN MM)

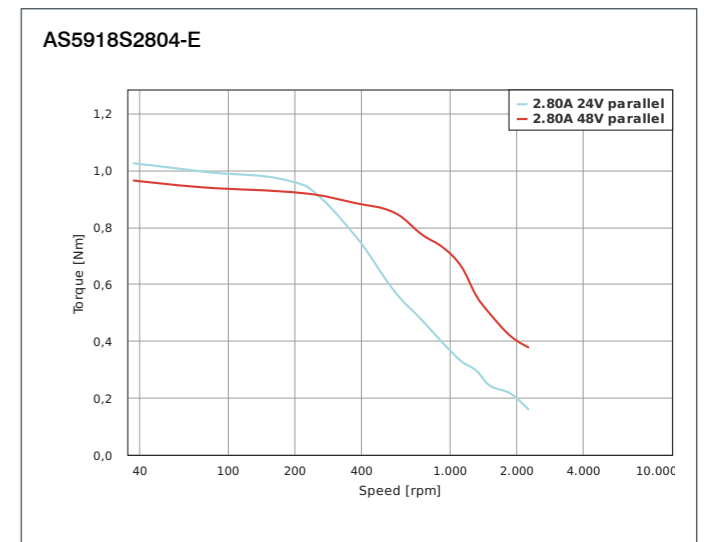
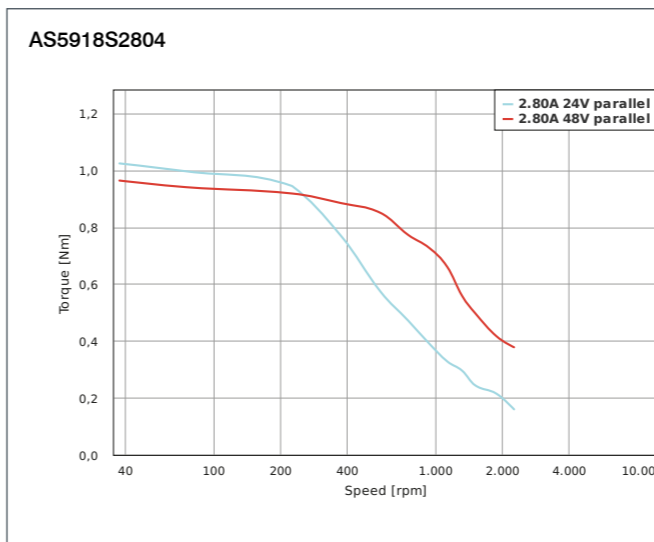
AS5918.../AS5918...-E/-ENM24



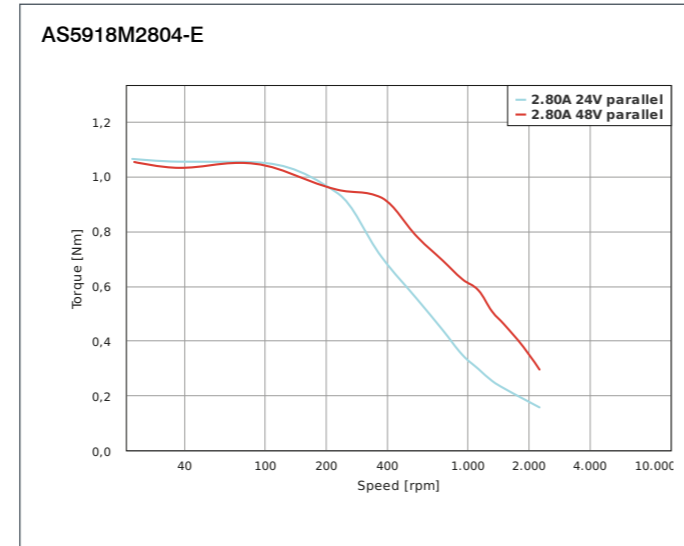
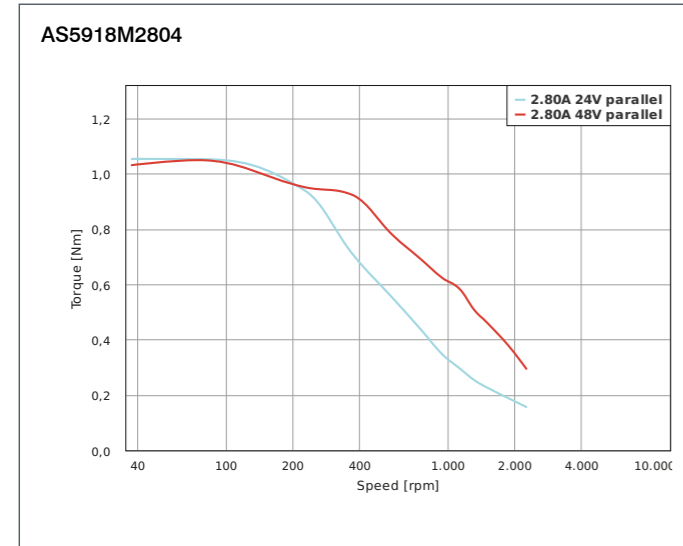
AS5918L...-EB/-ENM24B



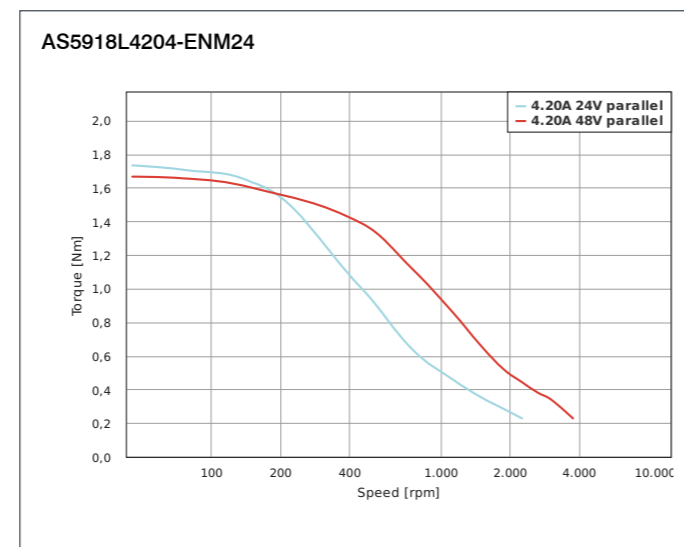
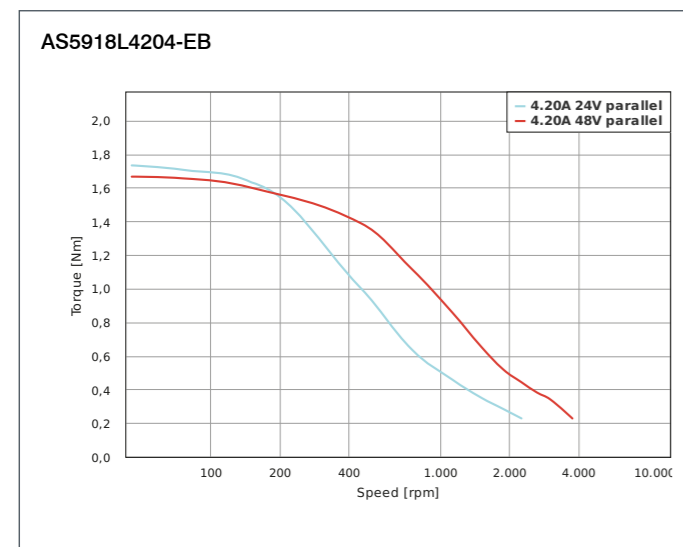
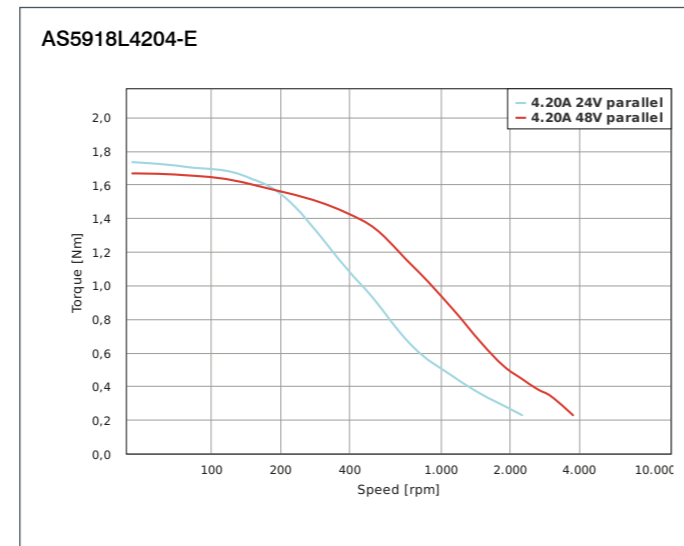
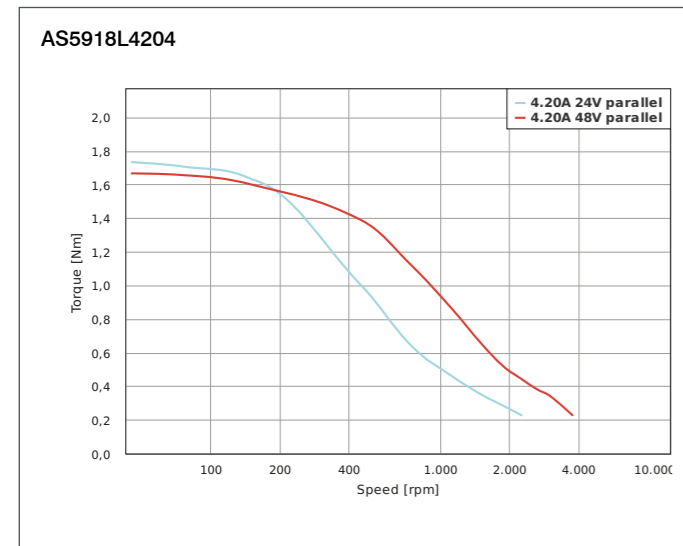
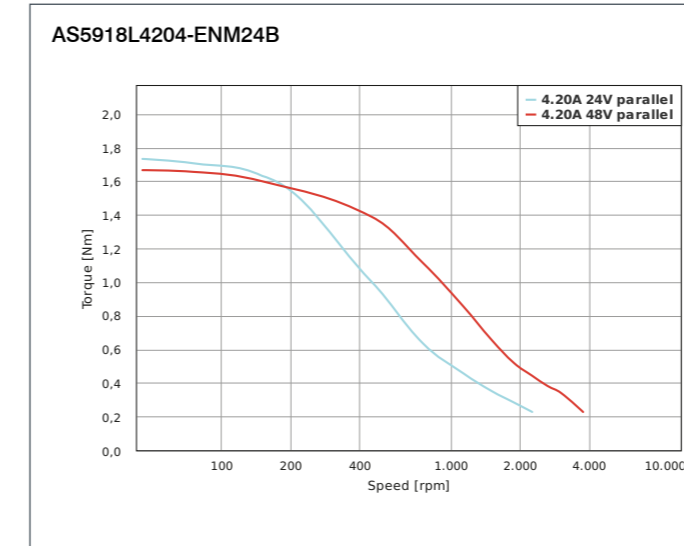
TORQUE CURVES



TORQUE CURVES



TORQUE CURVES





OPTIONS



DESCRIPTION

High-torque stepper motor with PG fitting in size NEMA 34 (89 mm), with protection class IP65 (except shaft outlet) and 1.8° step angle (full step). Identical flange size as the standard motor ST8918, therefore electrically and mechanically interchangeable. Available in a variety of versions.

VERSIONS

Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	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

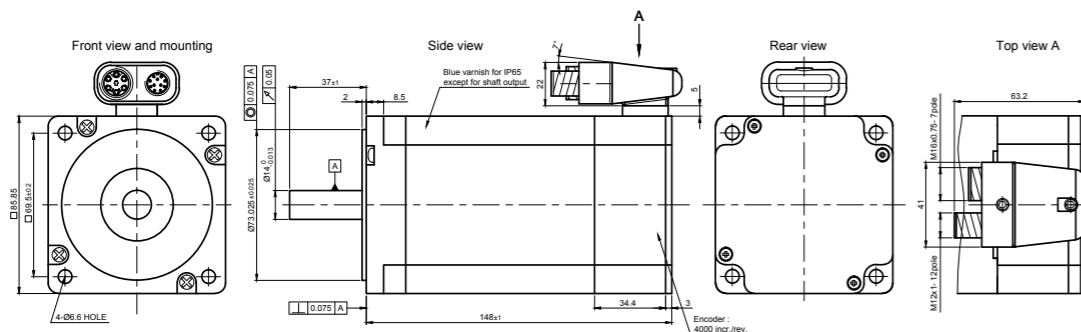
AS8918L9504-
E24 = with 24-V encoder
E24B = with 24-V encoder and brake

ACCESSORIES

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

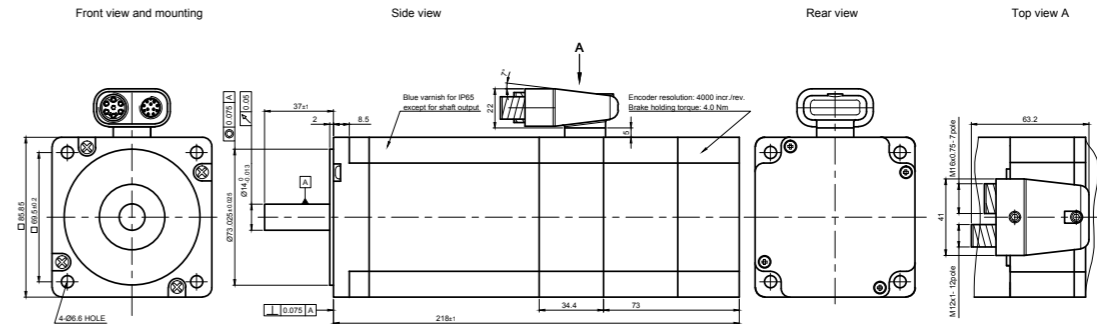
DIMENSIONS (IN MM)

AS8918L9504-E24



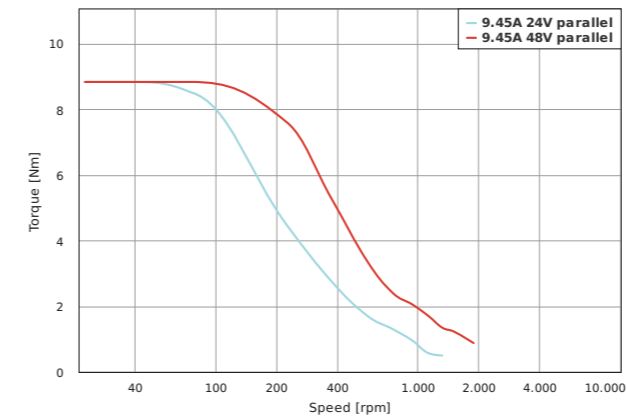
DIMENSIONS (IN MM)

AS8918L9504-E24B

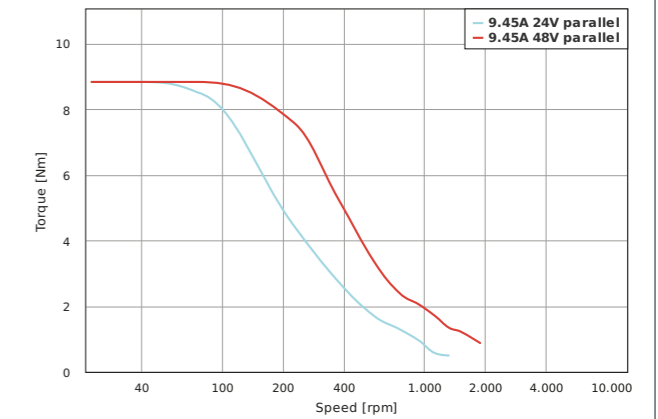


TORQUE CURVES

AS8918L9504-E24



AS8918L9504-E24B





OPTIONS



DESCRIPTION

High-torque stepper motor with PG fitting in size NEMA 34 (89 mm), with protection class IP65 (except shaft outlet) and 1.8° step angle (full step). Identical flange size as the standard motor ST8918, therefore electrically and mechanically interchangeable. Available in a variety of versions.

VERSIONS

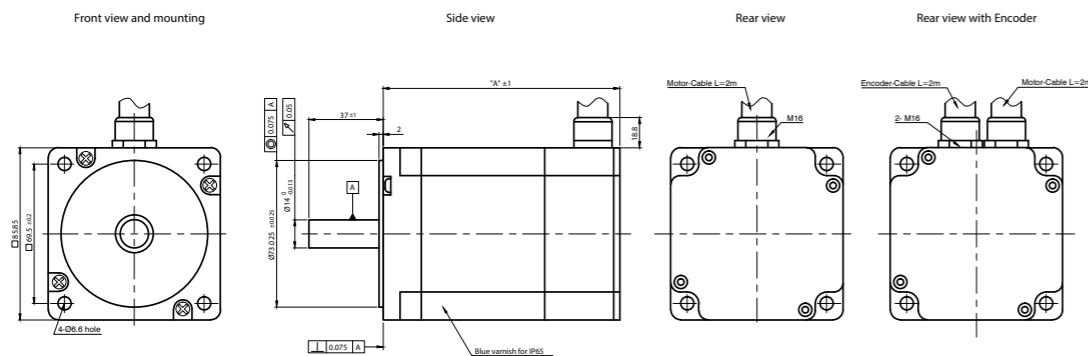
Type	Current per Winding A	Holding Torque Ncm	Resistance per Winding Ohm	Inductance per Winding mH	Rotor Inertia gcm ²	Weight kg	Length „A“ mm	Encoder
AP8918M6404	6.4	594	0.33	3	1900	3.4	118	-
AP8918M6404-E	6.4	594	0.33	3	1900	3.5	118	✓
AP8918L9504	9.5	933	0.26	2.7	3000	4.6	148	-
AP8918L9504-E	9.5	933	0.26	2.7	3000	4.7	148	✓

ORDER IDENTIFIER

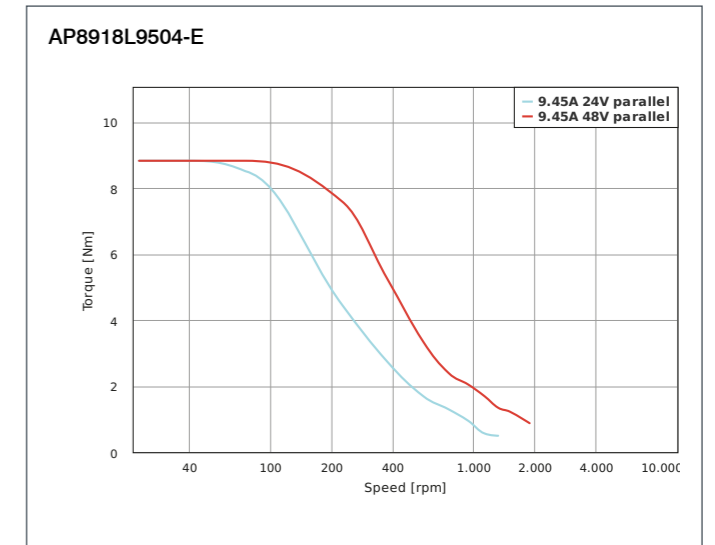
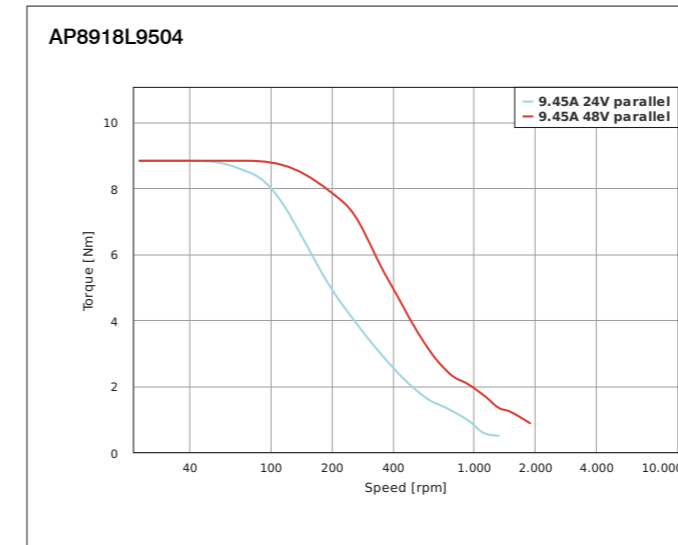
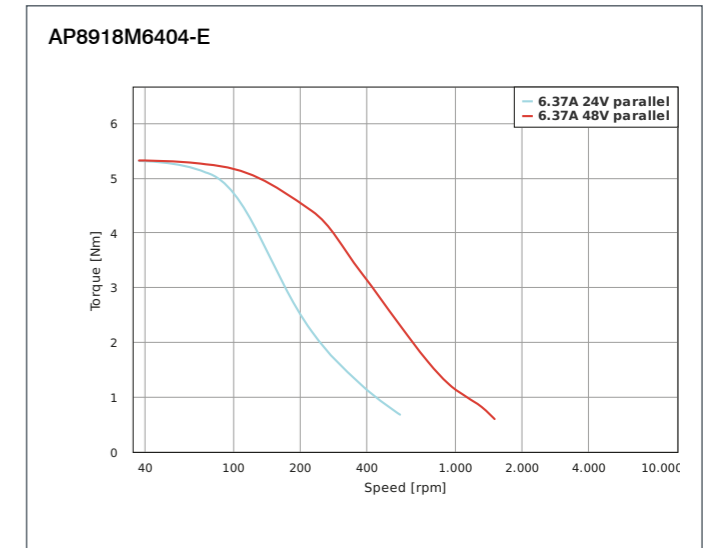
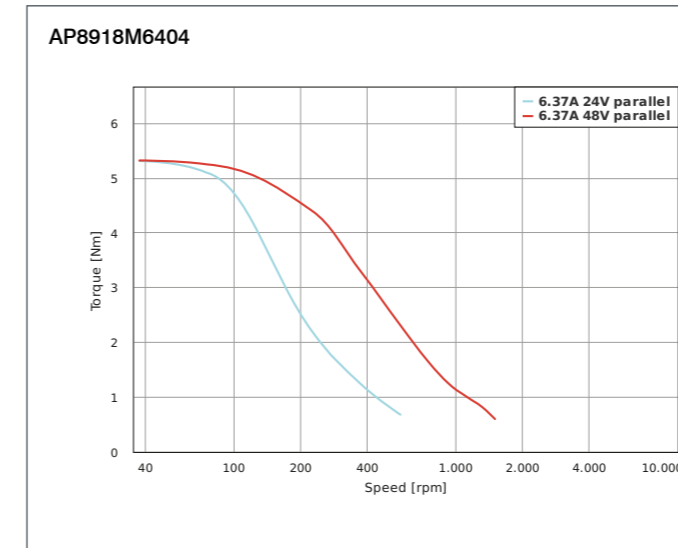
AP8918M6404-
E = with encoder

DIMENSIONS (IN MM)

AP8918



TORQUE CURVES



WHAT LINEAR ACTUATORS ARE AVAILABLE?

1. Linear actuator (non-captive)

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. Linear actuator with linear slide (captive)

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 (<math><5 \mu\text{m}</math>) 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.

PERFORMANCE CALCULATION FOR SELECTING LINEAR ACTUATORS

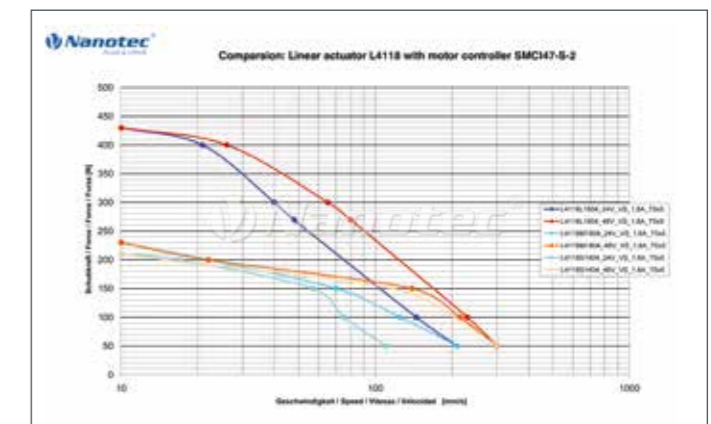
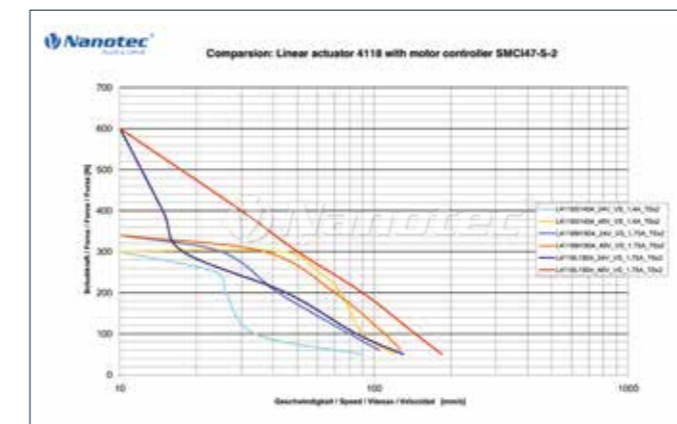
Resolutions, feed speeds and forces for stepper motors are calculated based on the screw pitch (p in mm), torque (M_d in Nm) and efficiency as follows:

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

The correct lead, pitch, 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.

CURVE COMPARISON

The curve comparison shows the differences that need to be taken into account when selecting a linear actuator. The graphics show a performance comparison using the L4118 linear actuator model with T5x5 and T6x2 threading.



CAUTION

Ensure that no radial forces are being applied to the screw and that the screw is running concentrically in relation to the motor shaft. The screw has to be prevented from rotating in order to achieve linear motion.

THREADED SCREWS AND NUTS

Please refer to pages 220 through 226 for matching screws and nuts.

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.



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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

ACCESSORIES

- ZST3,5-1-200-1 Lead Screw with Trapezoidal Thread
- ZST3,5-1-500 Lead Screw with Trapezoidal Thread
- NANOLUBE-50G Lubricant



CAUTION

The force and power ratings specified in the data sheets are based on a duty cycle of 10% to 20% and must be reduced for higher values. Moving against fixed end stops should be avoided.



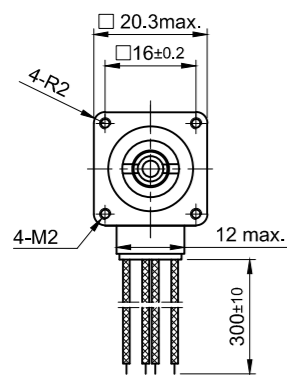
ORDER IDENTIFIER

- LA201S06- A... = single shaft end
- B... = double shaft end

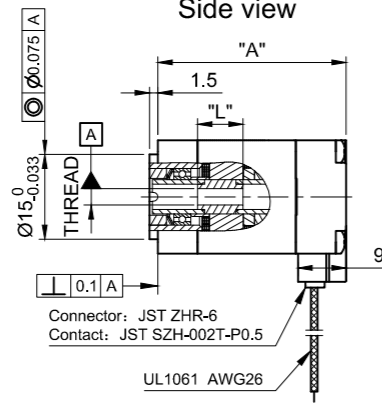
DIMENSIONS (IN MM)

LA20-A

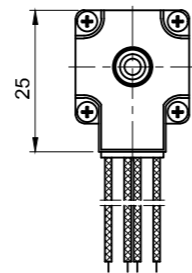
Front view and mounting



Side view



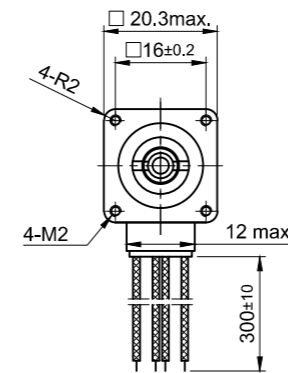
Rear view



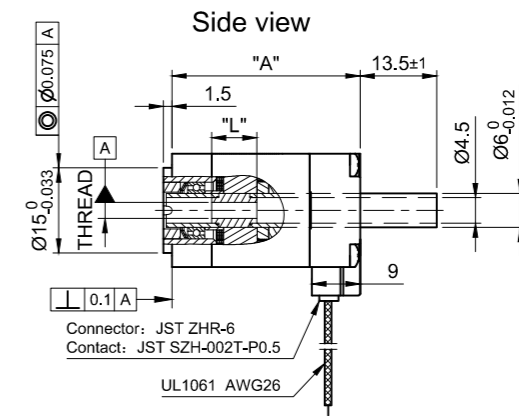
DIMENSIONS (IN MM)

LA20-B

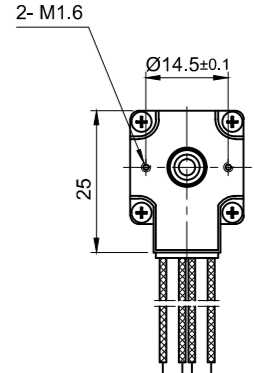
Front view and mounting



Side view

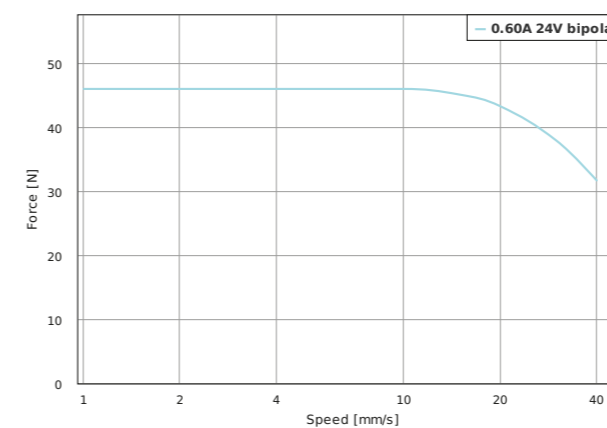


Rear view

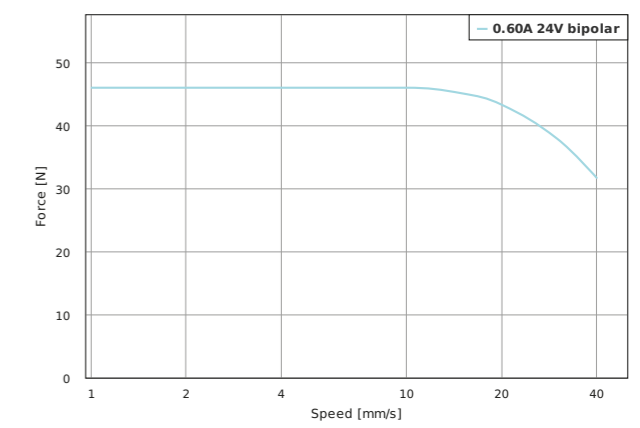


FORCE-VELOCITY CURVES

LA201S06-A-TDBA



LA201S06-B-TDBA





VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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-A-TDBA-038	46	40	0.6	5	6.4	2.6	3.5	1	33	38.1	0.15

ACCESSORIES

NANOLUBE-50G Lubricant

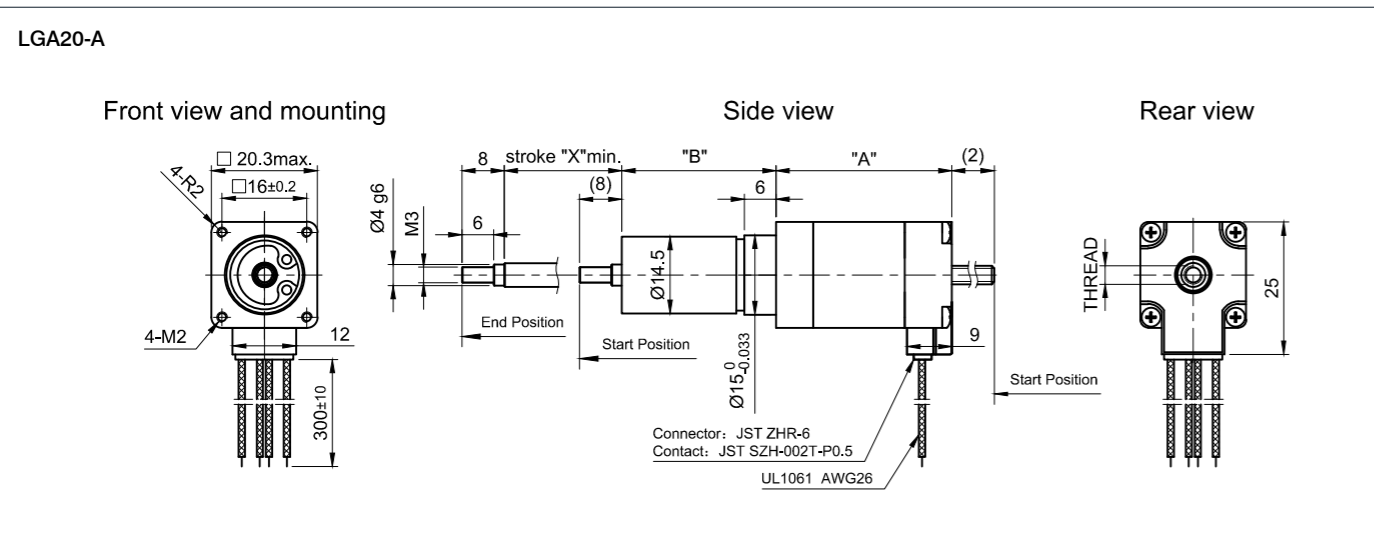


CAUTION

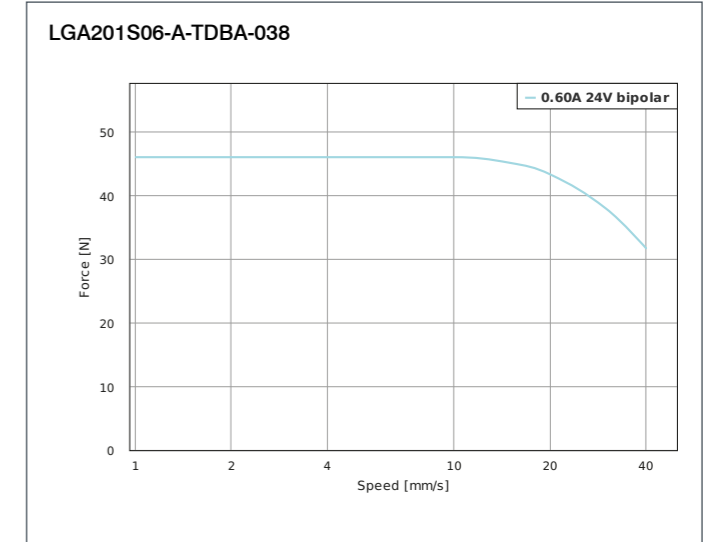
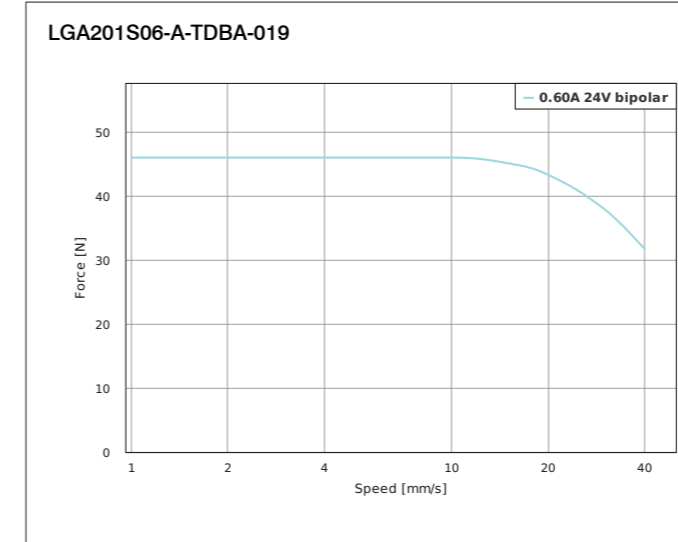


The force and power ratings specified in the data sheets are based on a duty cycle of 10% to 20% and must be reduced for higher values. Moving against fixed end stops should be avoided.

DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES





VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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

ACCESSORIES

- LSNUT-AAAA-TDBA Threaded Nut – POM
- LSNUT-ZERO3,5X1 Pre-Loaded Threaded Nut - PEEK
- NANOLUBE-50G Lubricant

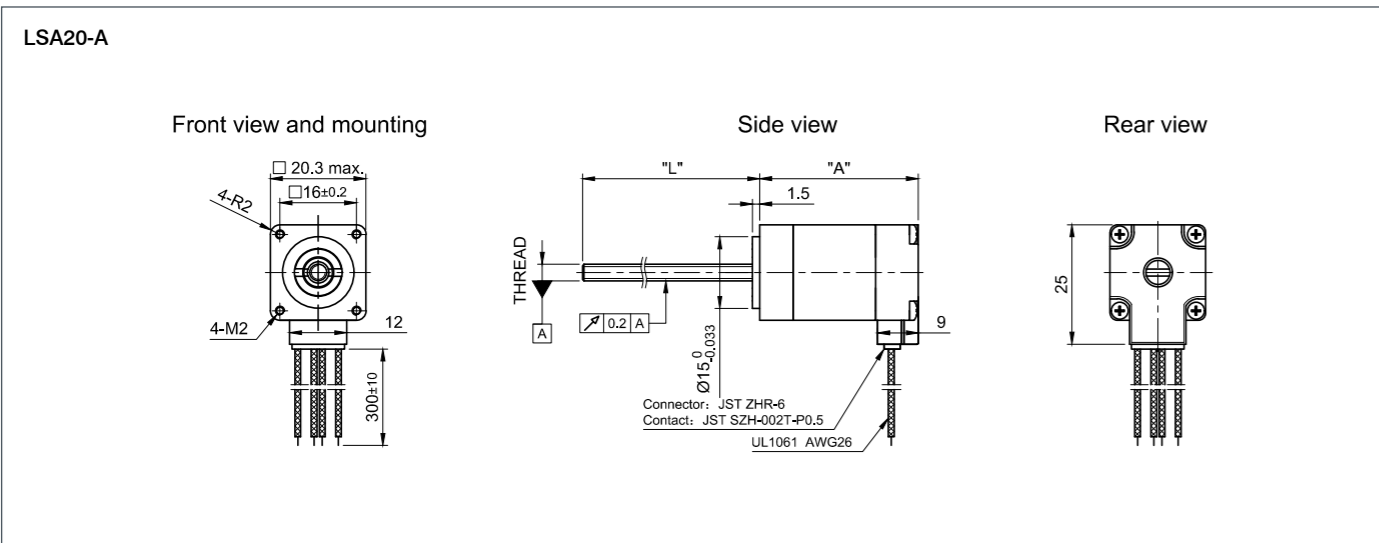


CAUTION

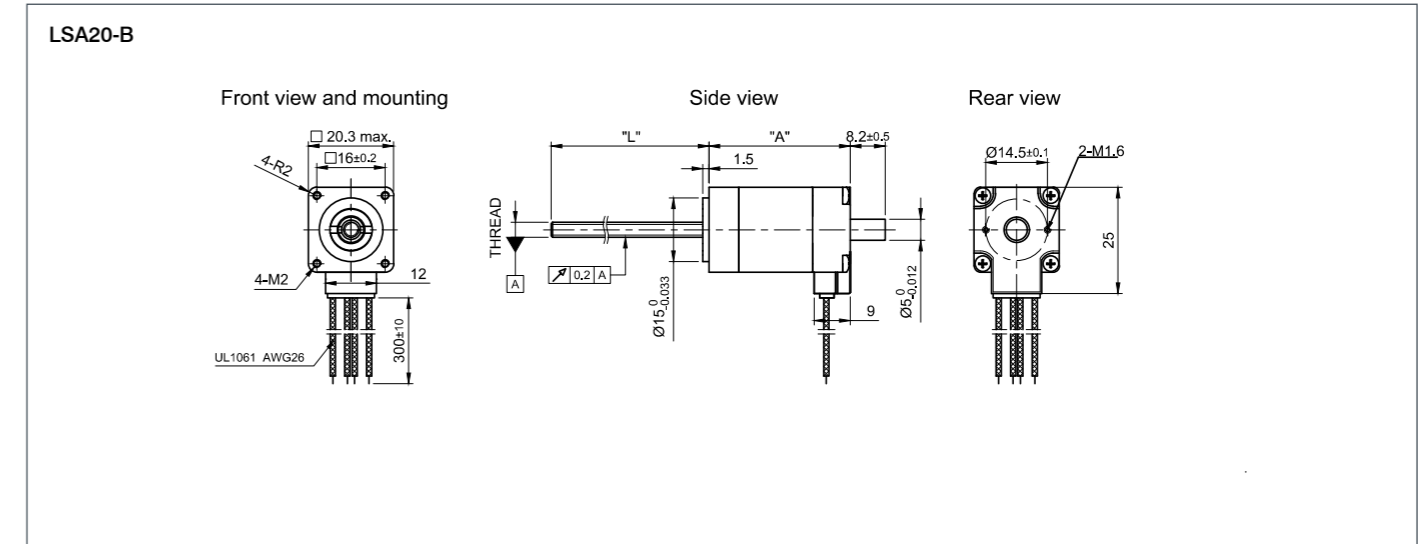


The force and power ratings specified in the data sheets are based on a duty cycle of 10% to 20% and must be reduced for higher values. Moving against fixed end stops should be avoided.

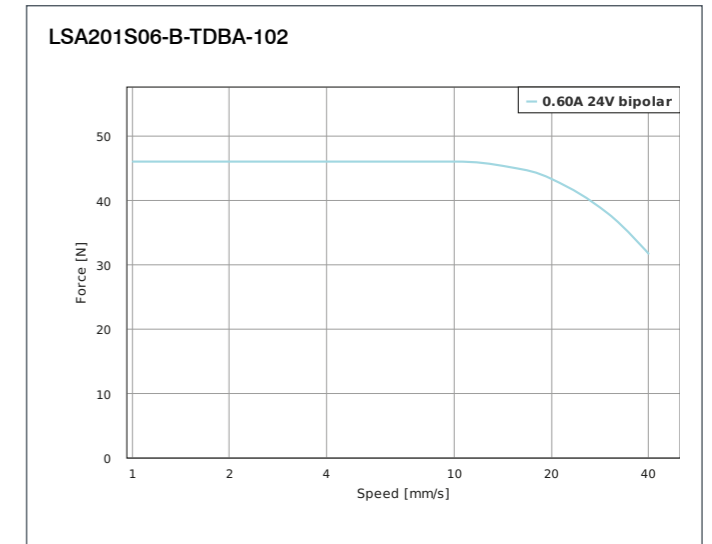
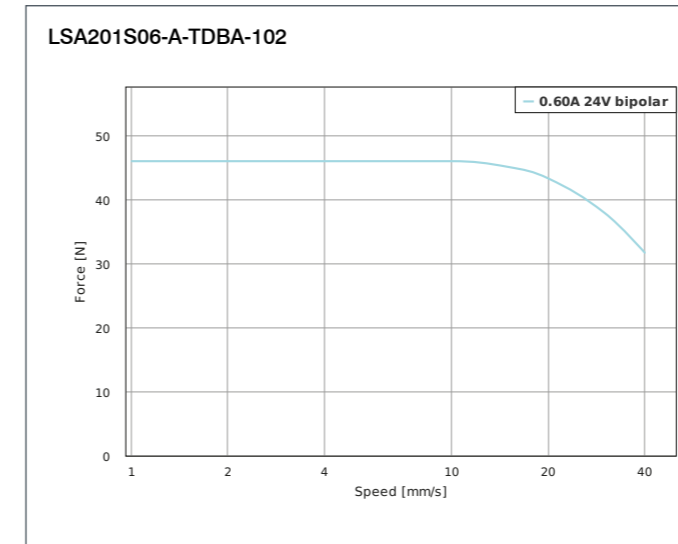
DIMENSIONS (IN MM)



DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES





OPTION



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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-THCA	93.4	35	1	10	2.7	2.5	5	2	33	15	0.11
LA281S10-B-THCA	93.4	35	1	10	2.7	2.5	5	2	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-UGAQ	210	19	1	3.175	2.7	2.5	4.76	0.635	33	15	0.11
LA281S10-B-UGAQ	210	19	1	3.175	2.7	2.5	4.76	0.635	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

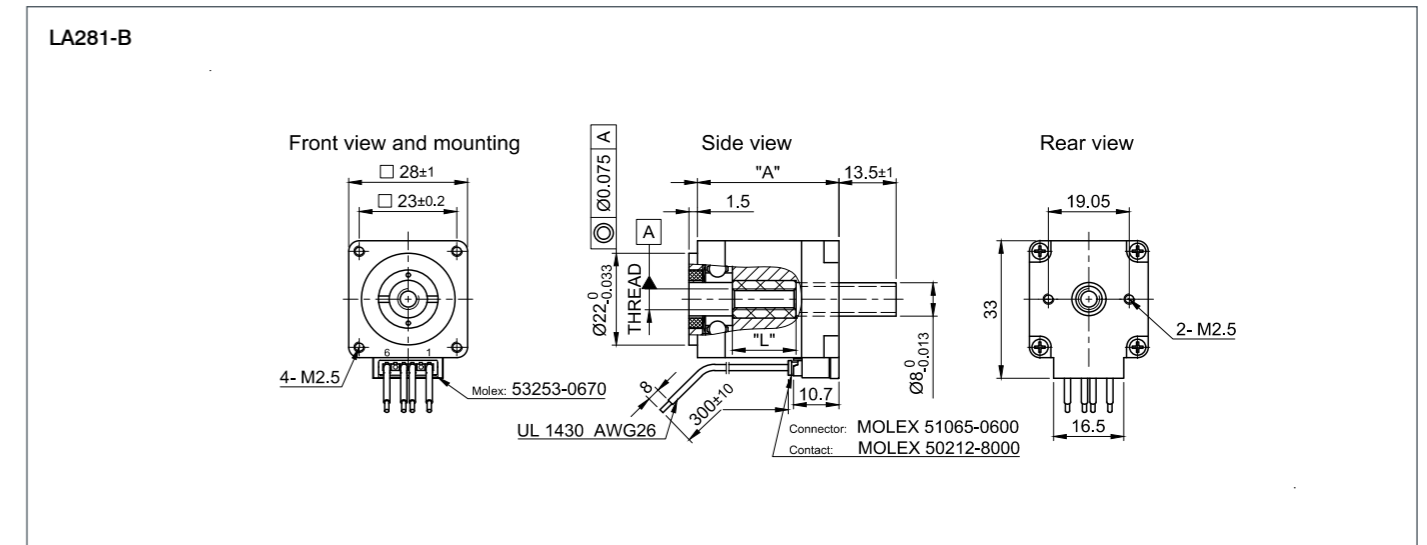
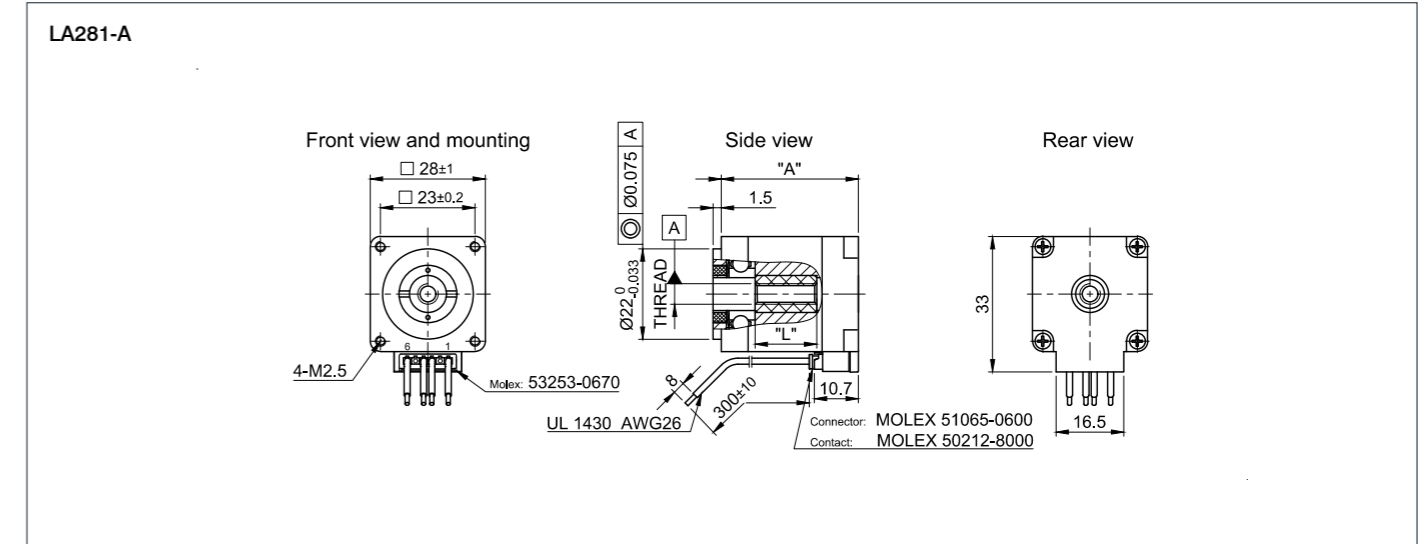
- SCREW-ABA-UGAQ-200**
Lead Screw with ACME Thread
- SCREW-ABA-UGAQ-300**
Lead Screw with ACME Thread
- SCREW-AAA-UGAQ-1000**
Lead Screw with ACME Thread
- SCREW-ABA-UGFC-200**
Lead Screw with ACME Thread
- SCREW-ABA-UGFC-300**
Lead Screw with ACME Thread
- SCREW-AAA-UGFC-1000**
Lead Screw with ACME Thread
- NANOLUBE-50G** Lubricant



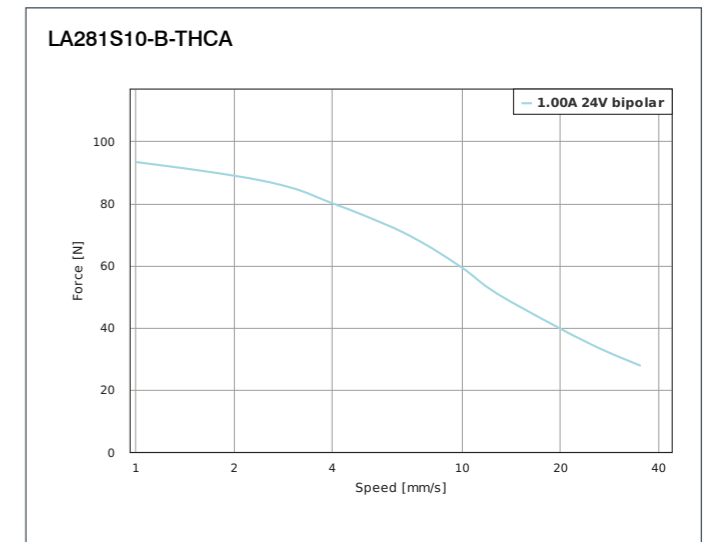
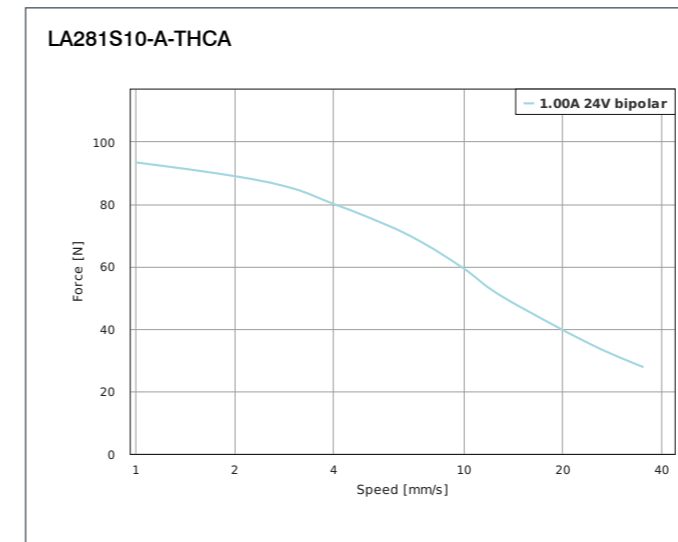
CAUTION

The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

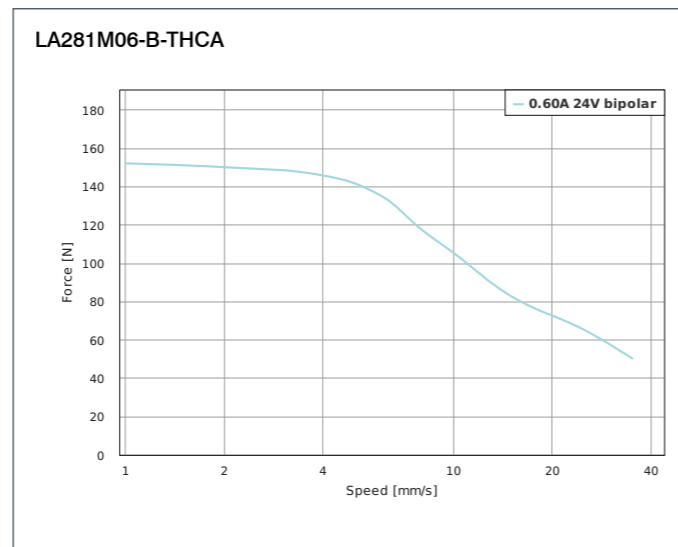
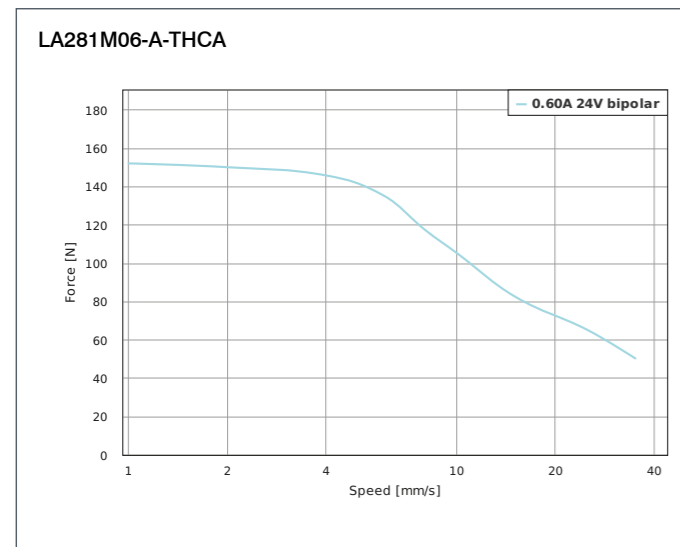
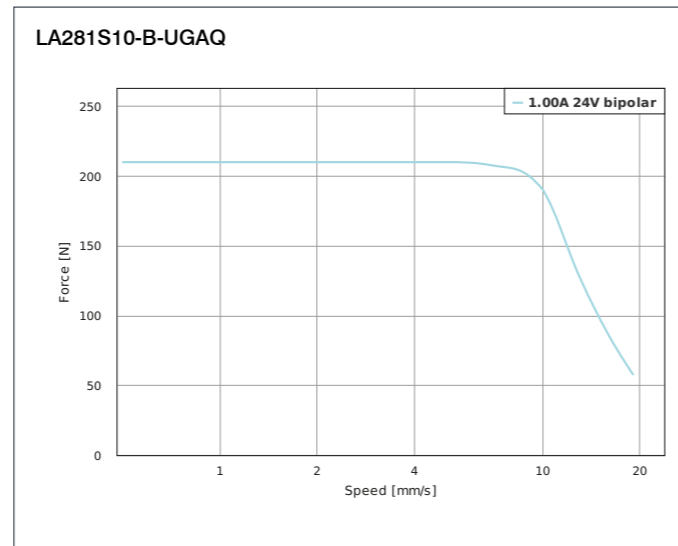
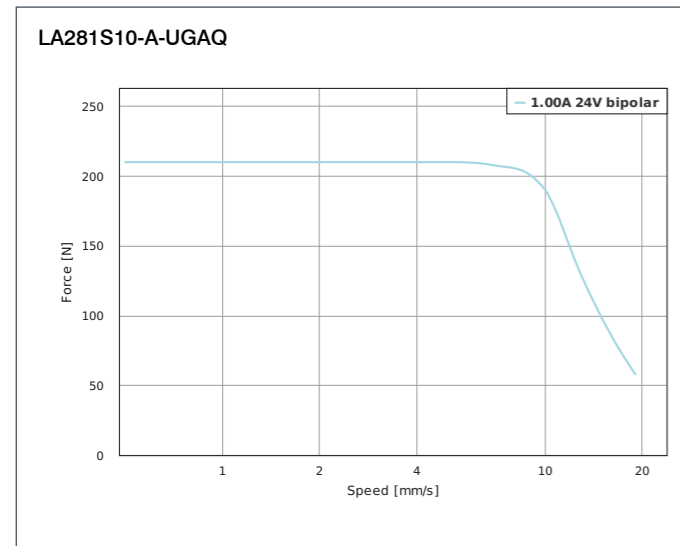
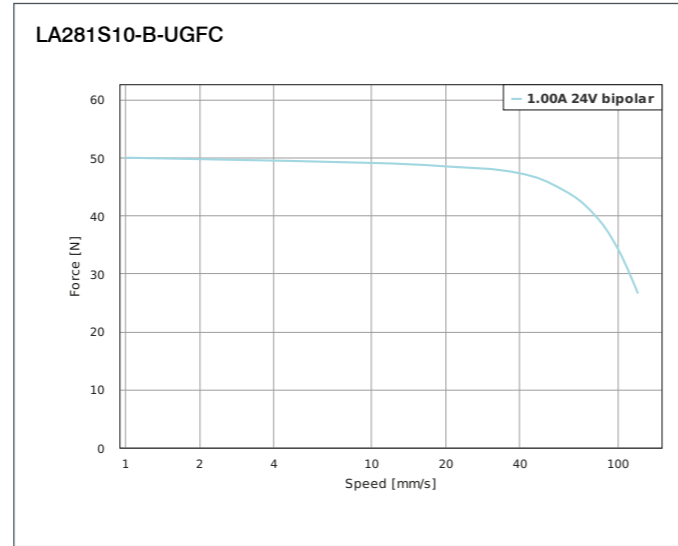
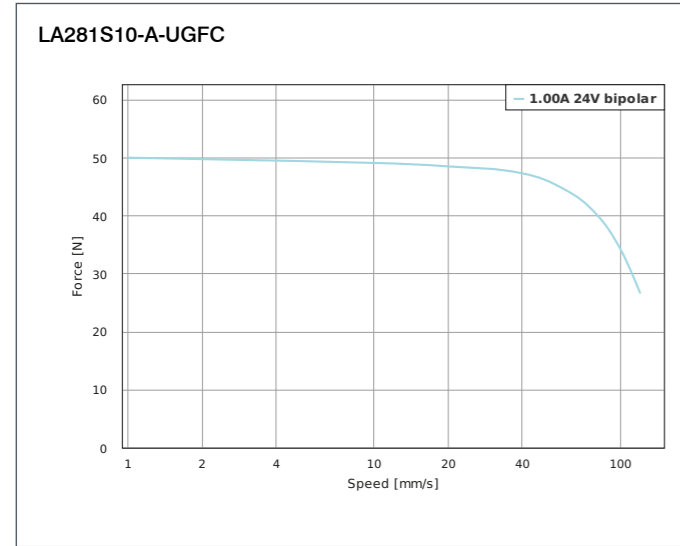
DIMENSIONS (IN MM)



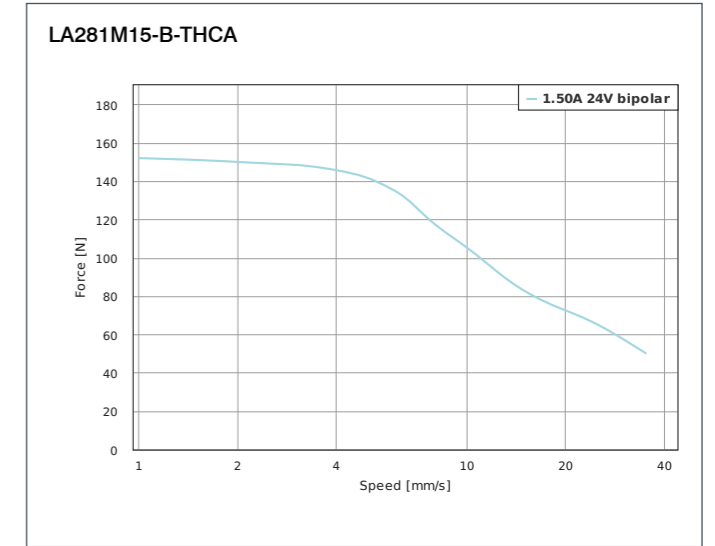
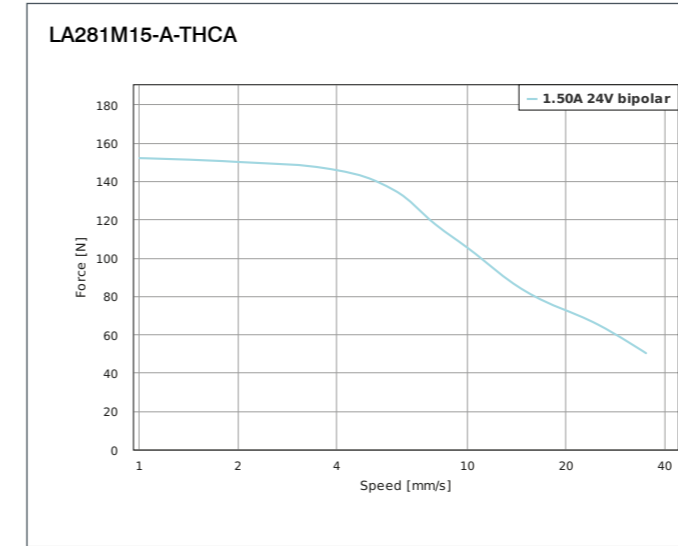
FORCE-VELOCITY CURVES



FORCE-VELOCITY CURVES



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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	3.175	2.7	2.5	4.76	0.635	33	19.05	0.14
LGA281S10-B-UGAQ-019	210	19	1	3.175	2.7	2.5	4.76	0.635	33	19.05	0.14
LGA281S10-A-UGAQ-038	210	19	1	3.175	2.7	2.5	4.76	0.635	33	38.1	0.15
LGA281S10-B-UGAQ-038	210	19	1	3.175	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	93.4	35	1	10	2.7	2.5	5	2	33	19.05	0.14
LGA281S10-B-THCA-019	93.4	35	1	10	2.7	2.5	5	2	33	19.5	0.14
LGA281S10-A-THCA-038	93.4	35	1	10	2.7	2.5	5	2	33	38.1	0.14
LGA281S10-B-THCA-038	93.4	35	1	10	2.7	2.5	5	2	33	38.1	0.14

ORDER IDENTIFIER

LGA281S10-
A-... = single shaft end
B-... = double shaft end



CAUTION

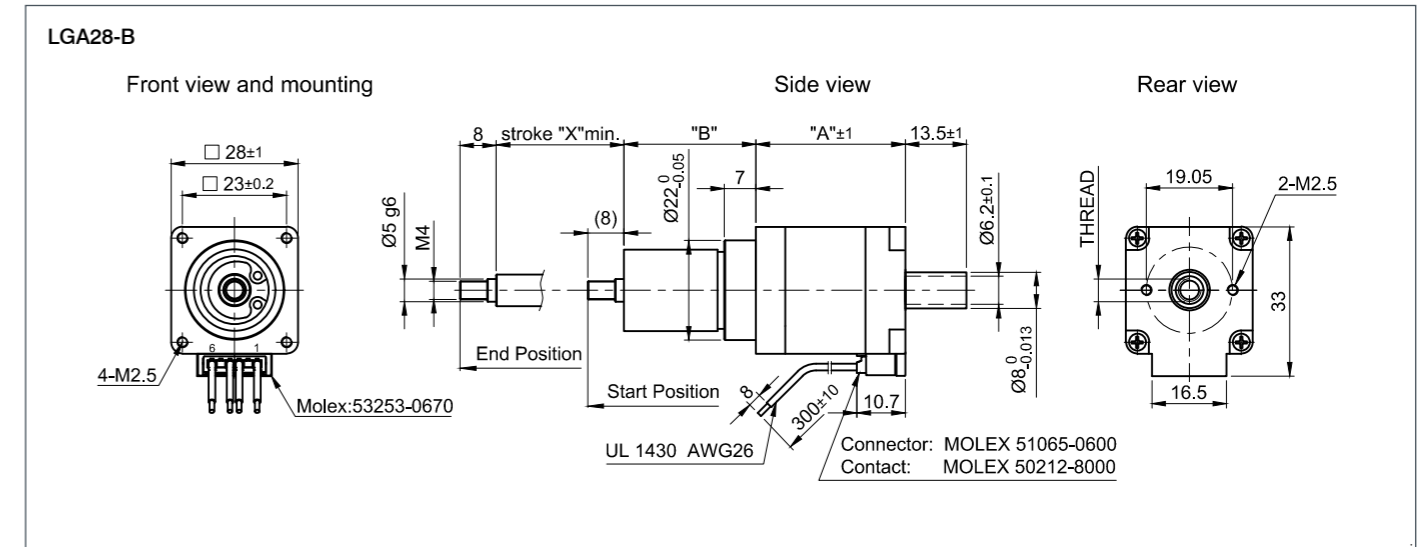
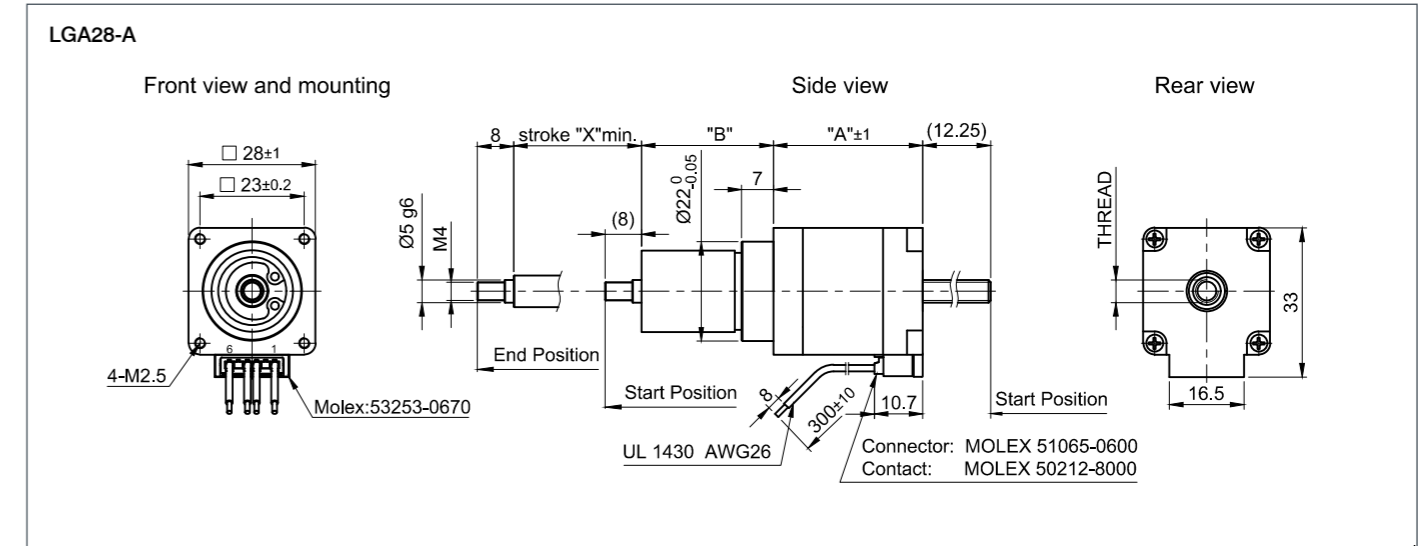
The force and power ratings specified in the data sheets are based on a duty cycle of 10% to 20% and must be reduced for higher values. Moving against fixed end stops should be avoided.



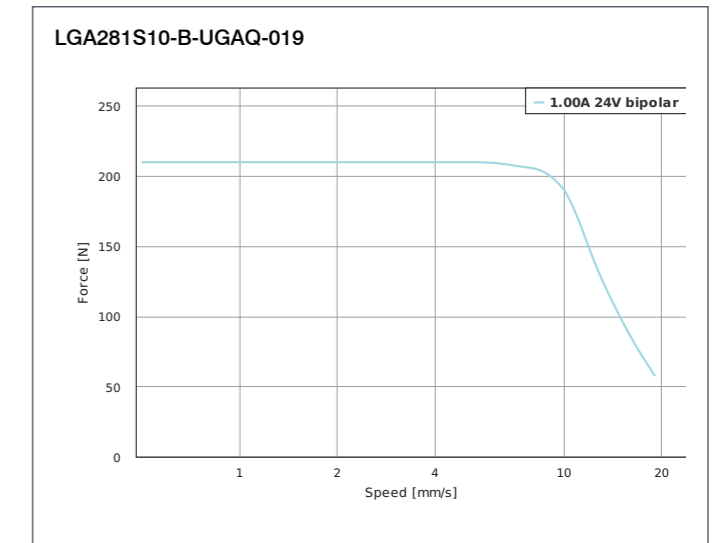
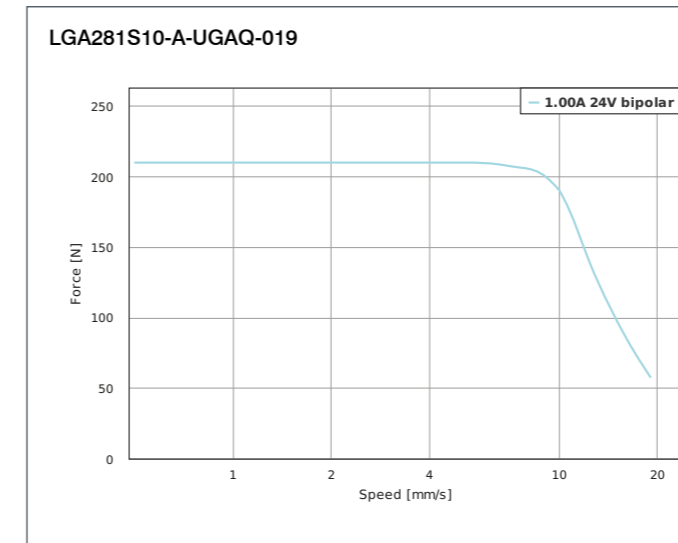
ACCESSORIES

NANOLUBE-50G Lubricant

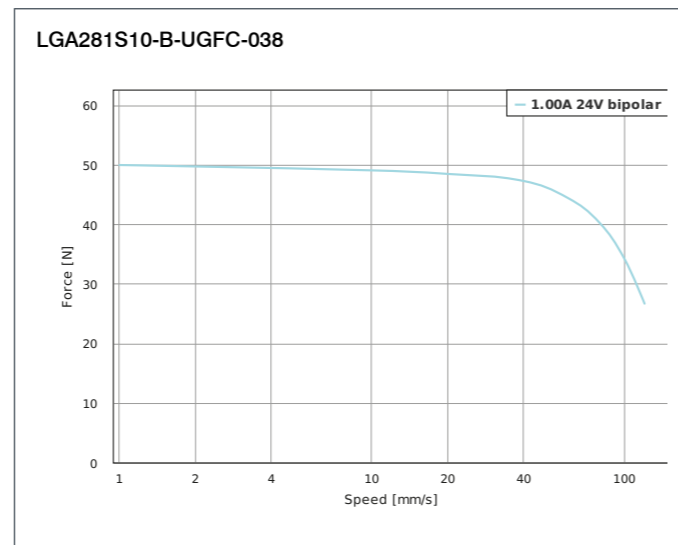
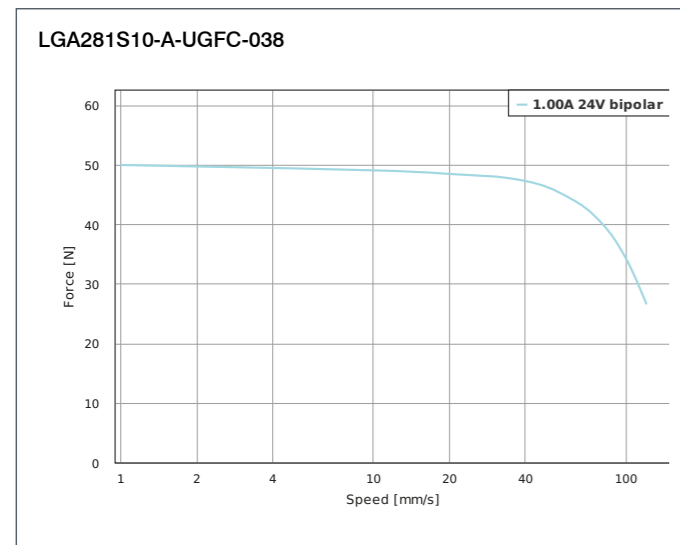
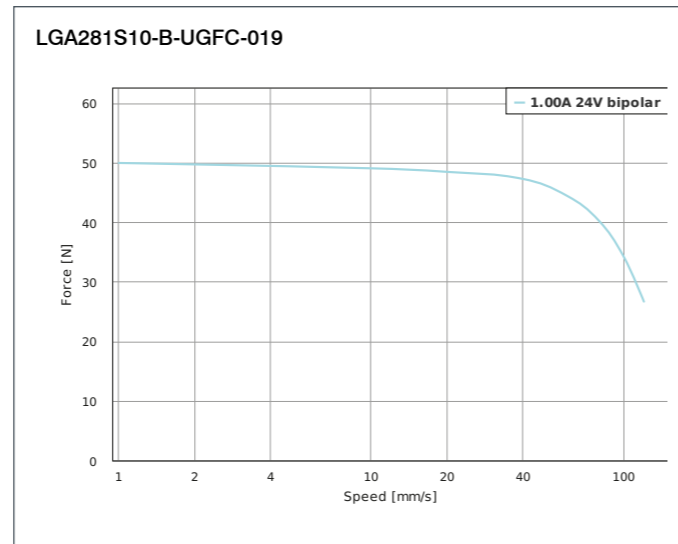
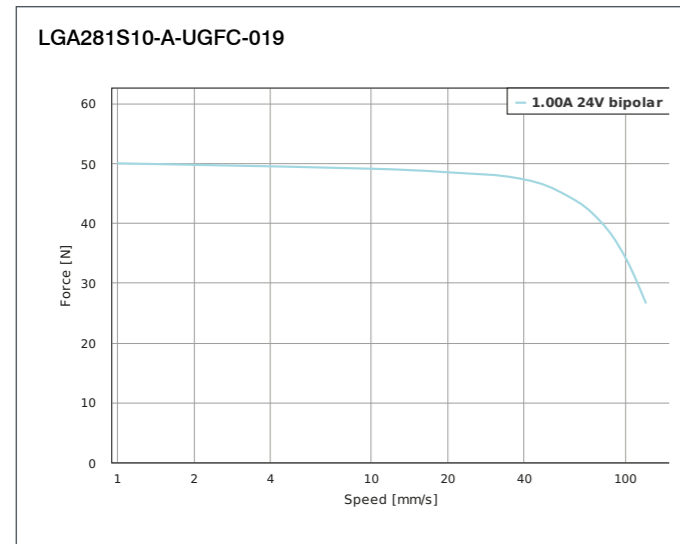
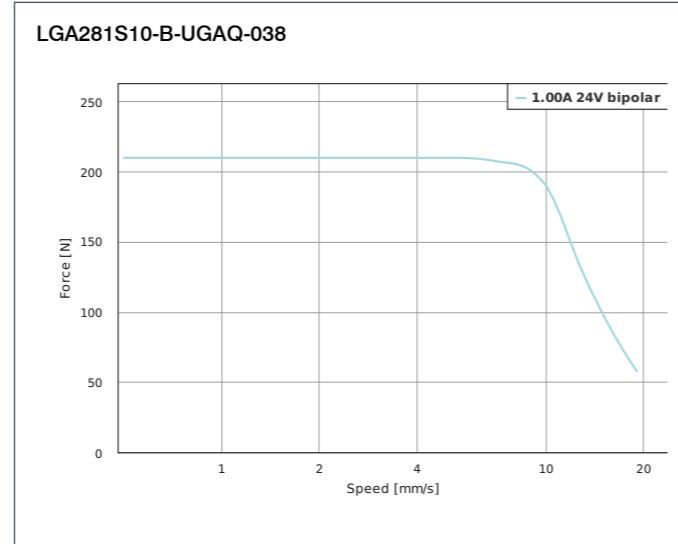
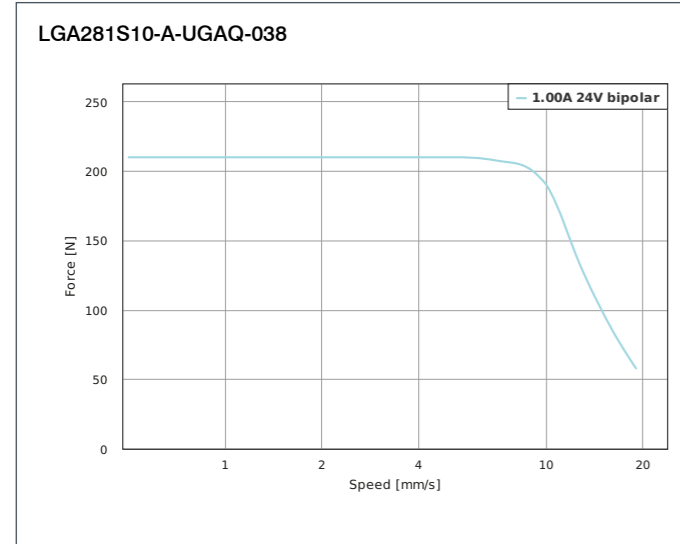
DIMENSIONS (IN MM)



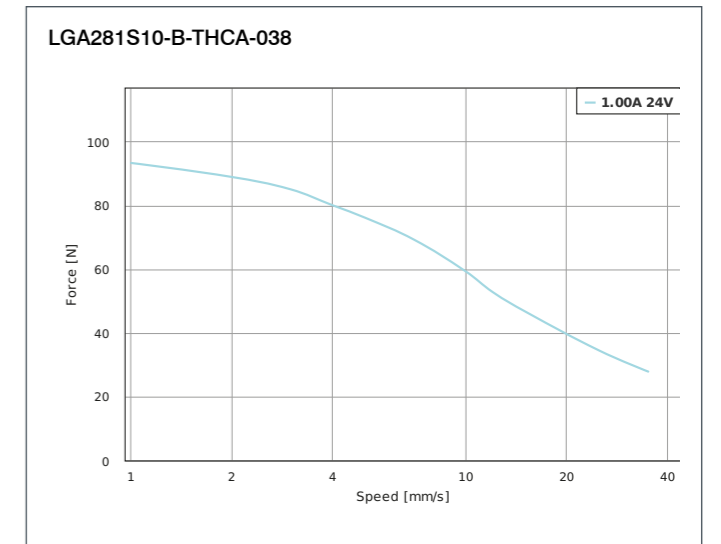
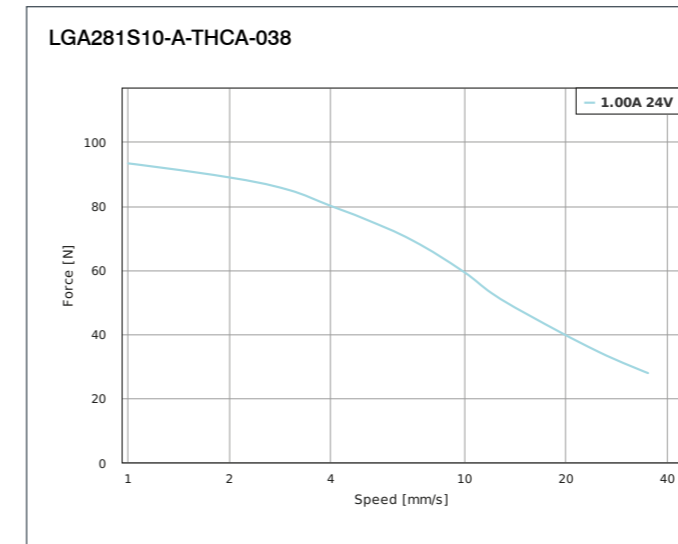
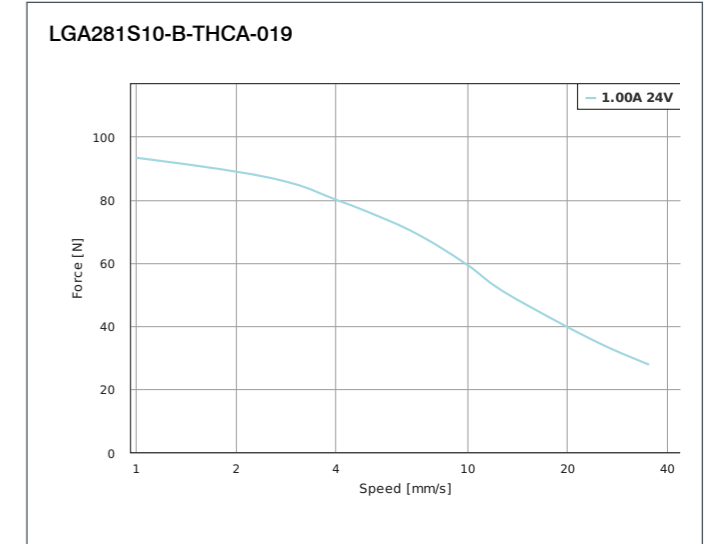
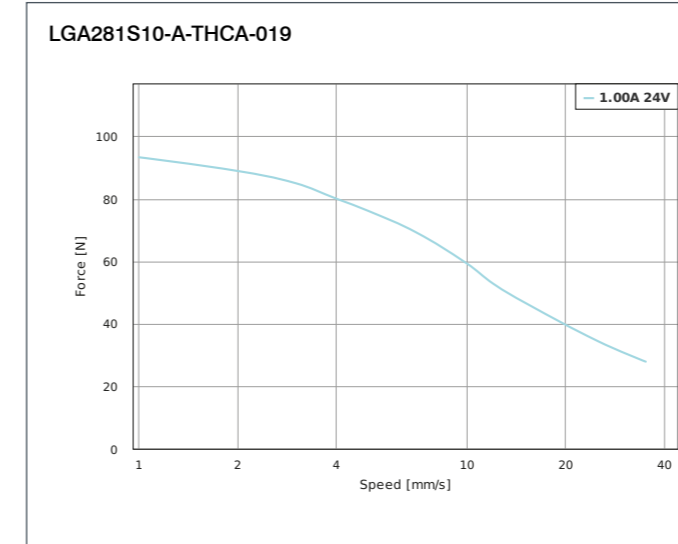
FORCE-VELOCITY CURVES



FORCE-VELOCITY CURVES



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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	3.175	2.7	2.5	4.76	0.635	33	152	0.13
LSA281S10-B-UGAQ-152	210	19	1	3.175	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	93.4	35	1	10	2.7	2.5	5	2	33	152	0.13
LSA281S10-B-THCA-152	93.4	35	1	10	2.7	2.5	5	2	33	152	0.13

ORDER IDENTIFIER

LSA281S10-
A... = single shaft end
B... = double shaft end

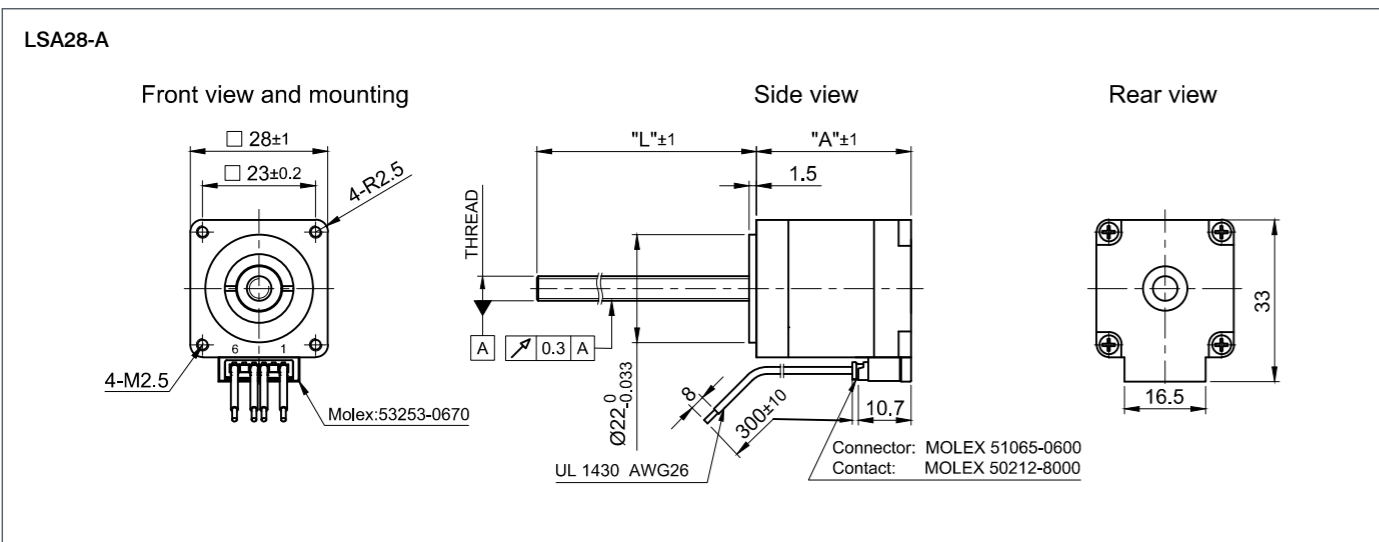
ACCESSORIES

LSNUT-AAAA-UGAQ Threaded Nut – POM
LSNUT-AAAA-UGFC Threaded Nut – POM
LSNUT-AAAA-THCA Threaded Nut – POM
NANOLUBE-50G Lubricant

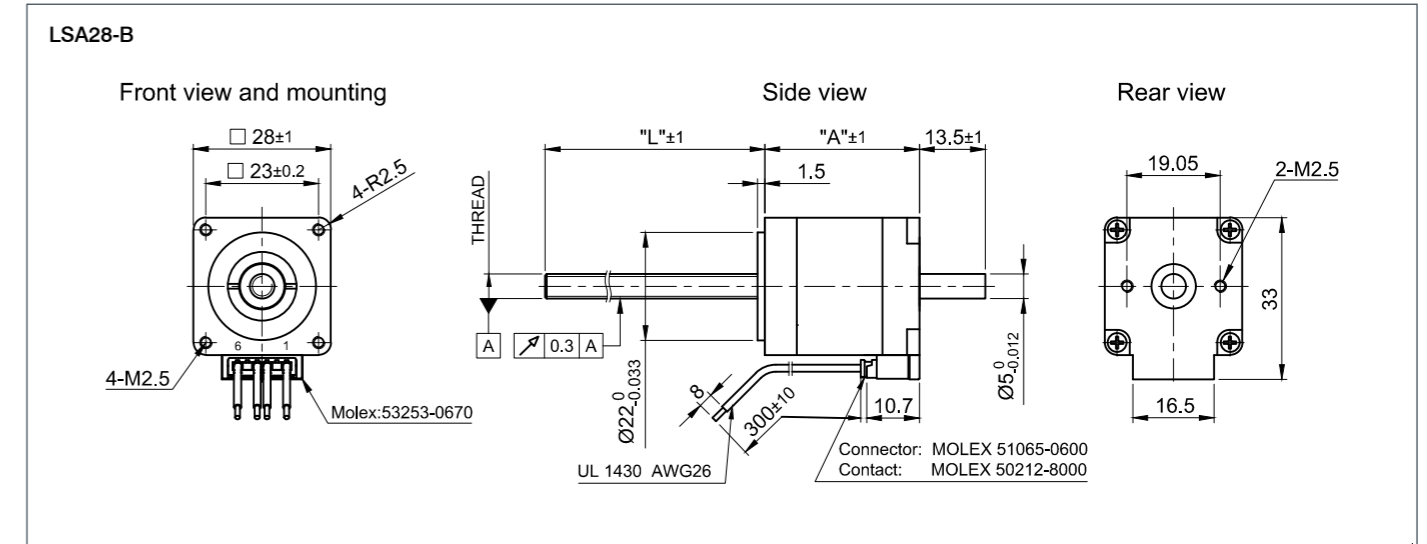
CAUTION

The force and power ratings specified in the data sheets are based on a duty cycle of 10% to 20% and must be reduced for higher values. Moving against fixed end stops should be avoided.

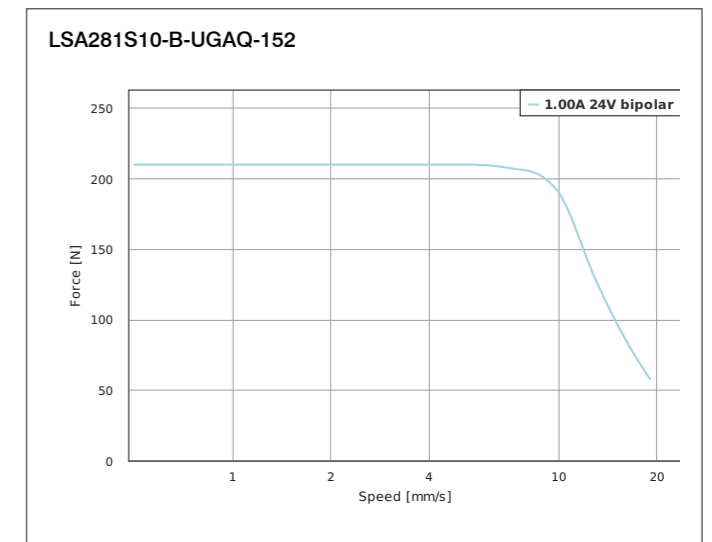
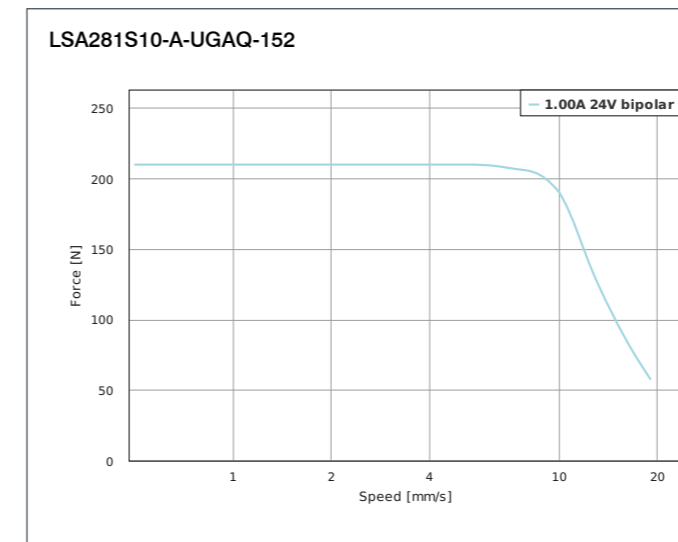
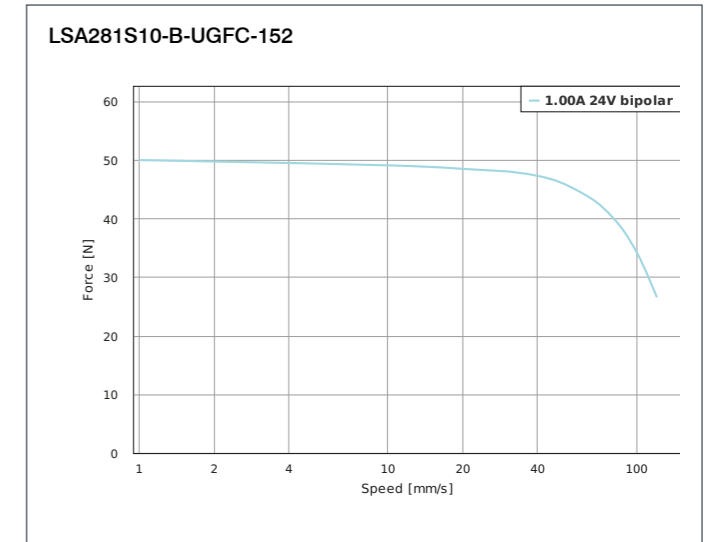
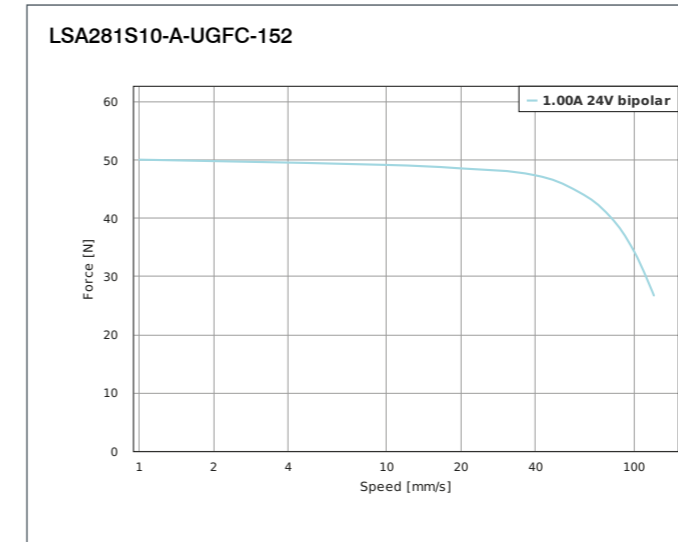
DIMENSIONS (IN MM)



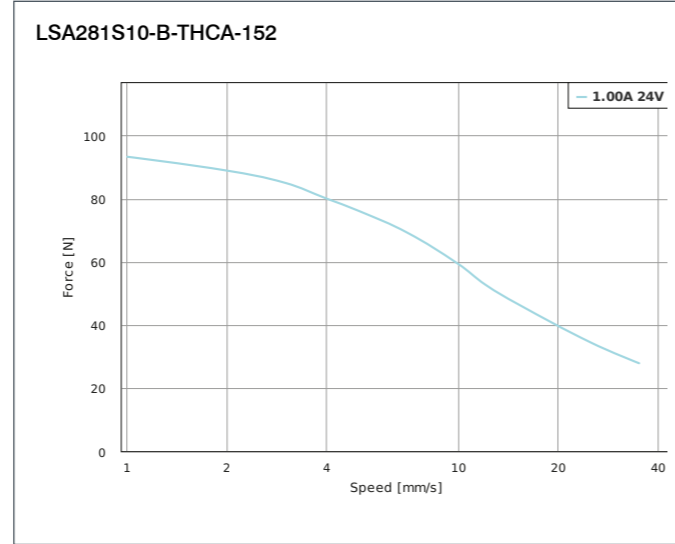
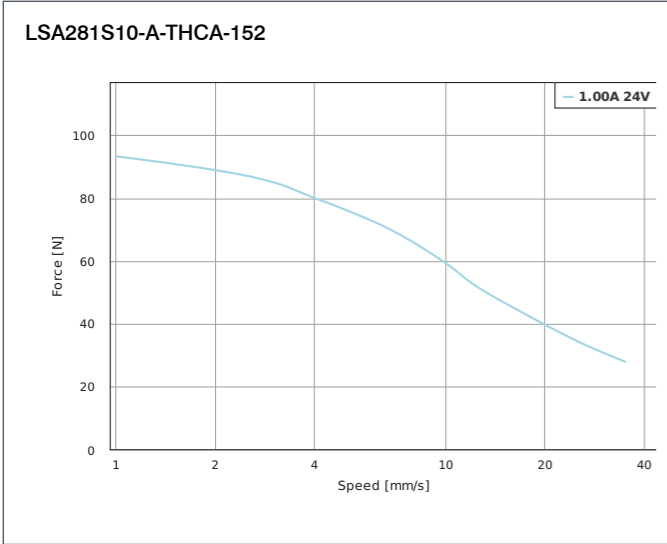
DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES



FORCE-VELOCITY CURVES



Notes section with horizontal lines for writing.



OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	Resistance per Winding Ohm	Inductance per Winding mH	Thread Diameter mm	Thread Lead mm	Length „A“ mm	Socket Length „L“ mm	Weight kg
L3518S1204-T6X1	240	22	1.2	5	1.85	2	6	1	34	20	0.15
L3518S1204-T6x2	160	36	1.2	10	1.85	2	6	2	34	20	0.15
L3518S1204-T5X5	85	200	1.2	25	1.85	2	5	5	34	20	0.15

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
- ZST5-5-200-1**
Lead Screw with Trapezoidal Thread
- ZST5-5-300-1**
Lead Screw with Trapezoidal Thread
- ZST5-5-1050**
Lead Screw with Trapezoidal Thread
- NANOLUBE-50G** Lubricant

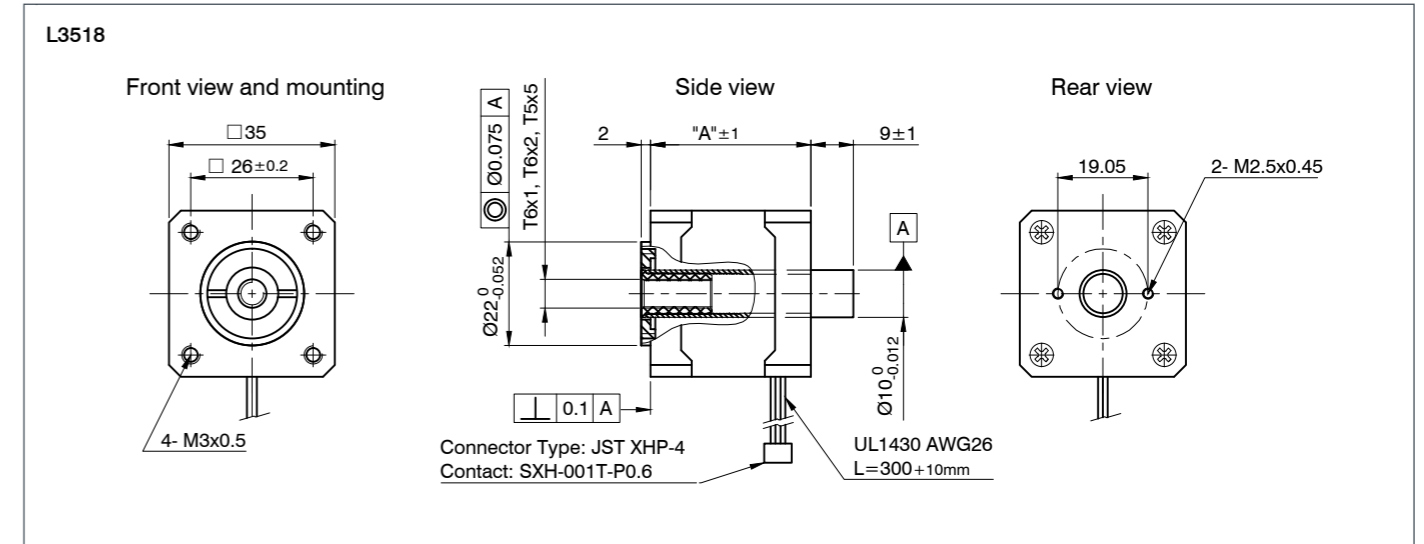


CAUTION

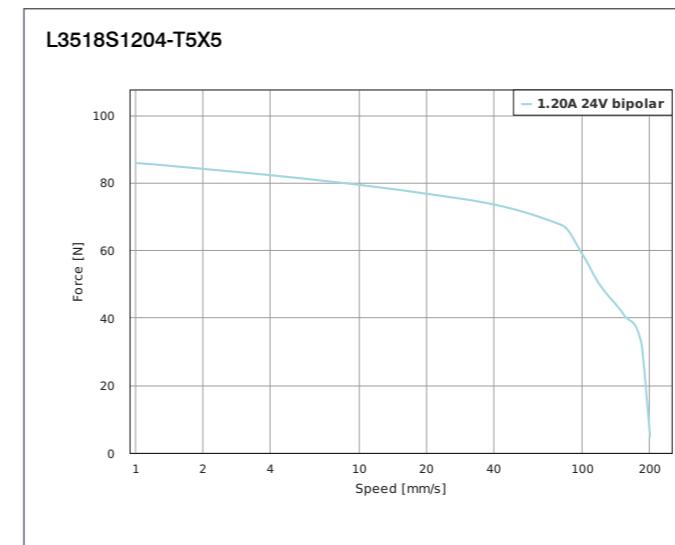
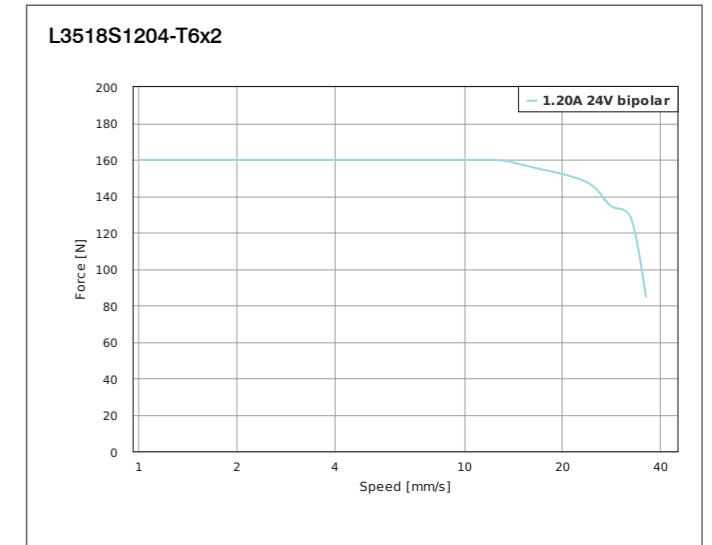
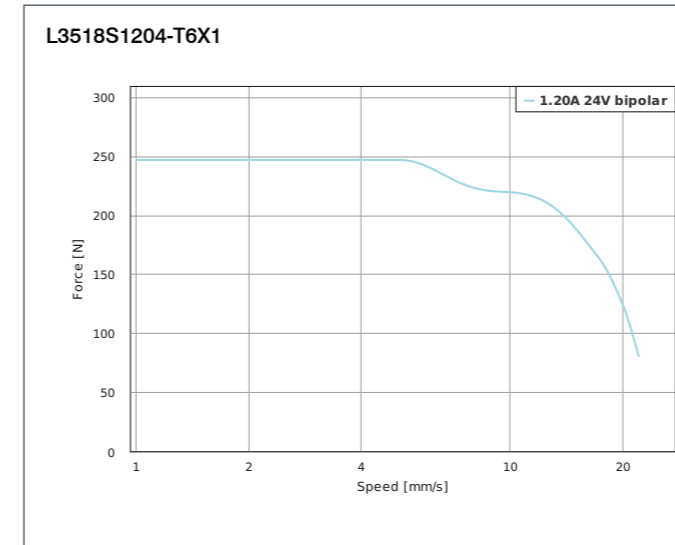
The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.



DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	Resistance per Winding Ohm	Thread Diameter mm	Thread Lead mm	Stroke Length „X“ mm	Housing Length „B“ mm	Length „A“ mm	Weight kg
L3518S1204-T6X1-A	240	22	1.2	5	1.85	6	1	25 - 50	43 - 68	34	0.24 - 0.28
L3518S1204-T6X2-A	160	36	1.2	10	1.85	6	2	25 - 50	43 - 68	34	0.24 - 0.28
L3518S1204-T5X5-A	85	200	1.2	25	1.85	5	5	25 - 50	43 - 68	34	0.24 - 0.28

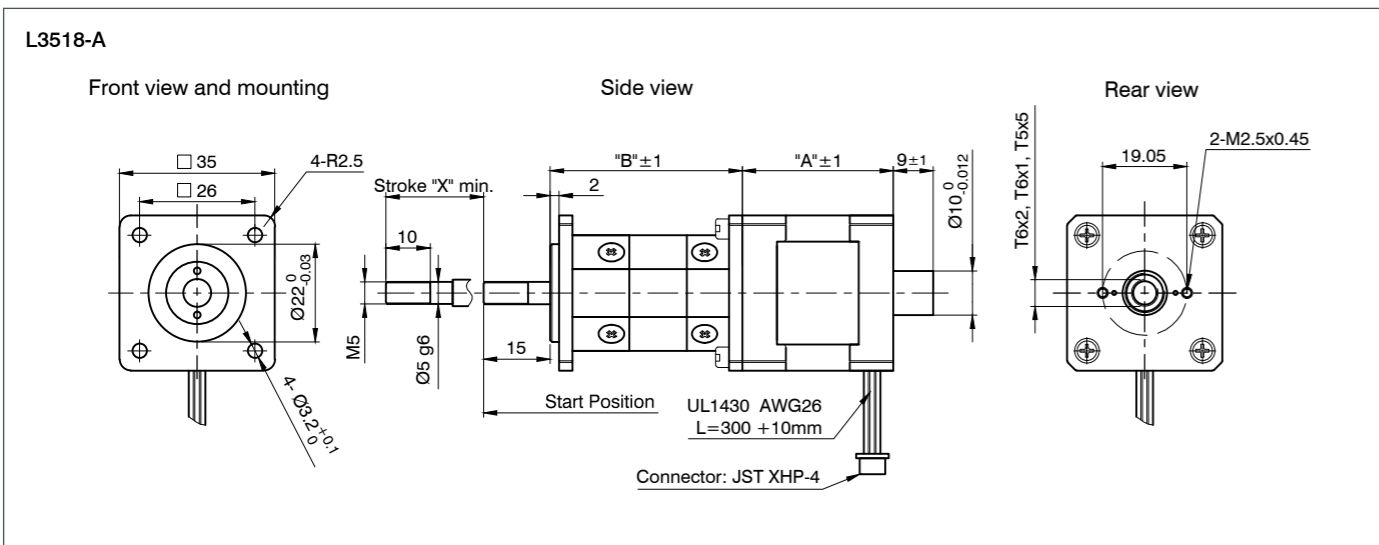
ORDER IDENTIFIER

L3518S1204-T5X5-
 A25 = 25 mm stroke length „X“
 A50 = 50 mm stroke length „X“

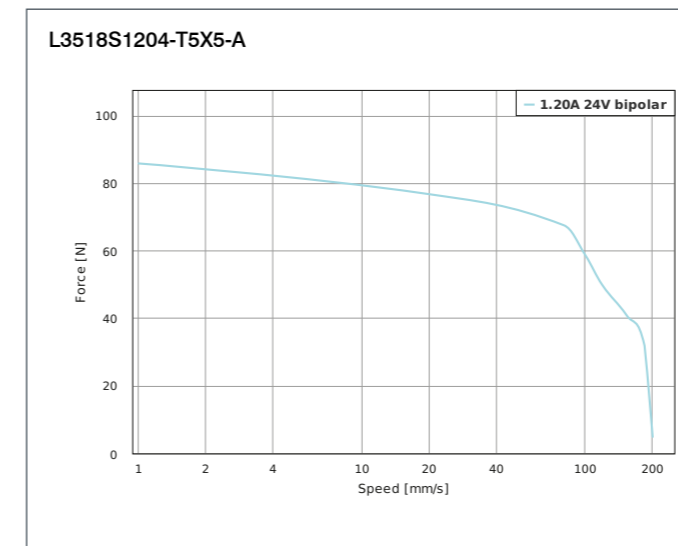
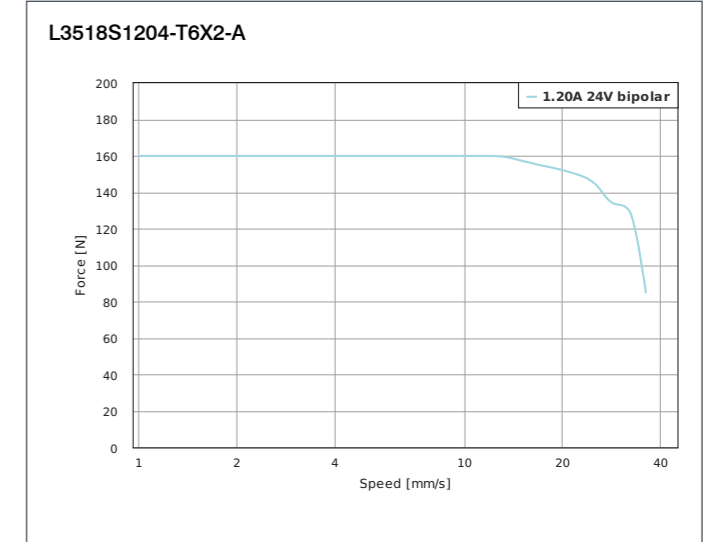
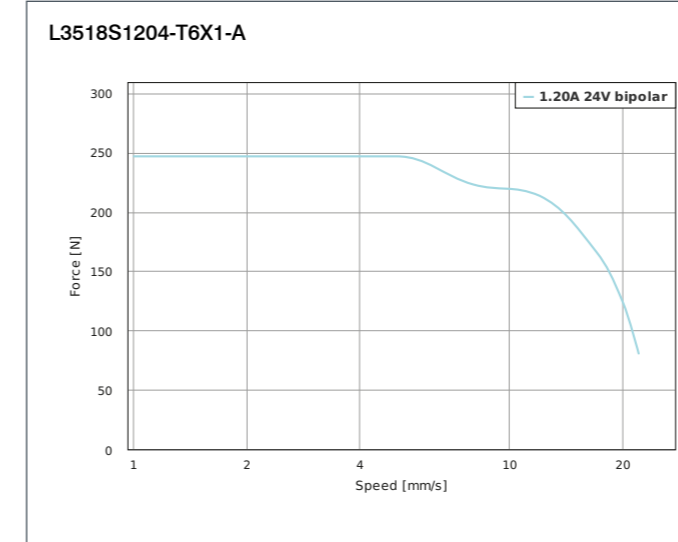
CAUTION

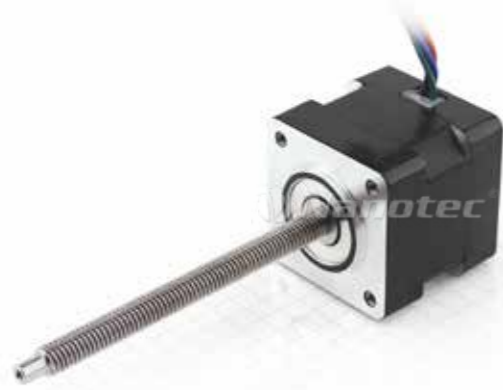
The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	Resistance per Winding Ohm	Inductance per Winding mH	Thread Diameter mm	Thread Lead mm	Length „A“ mm	Weight kg
LS3518S1204-T5X5-75	85	200	1.2	25	1.9	2.1	5	5	34	0.15
LS3518S1204-T6X1-75	240	22	1.2	5	1.9	2.1	6	1	34	0.15
LS3518S1204-T6X2-75	160	36	1.2	10	1.9	2.1	6	2	34	0.15

ACCESSORIES

- LSNUT-AAAE-TJBA** Threaded Nut - POM
- LSNUT-AAAE-TJCA** Threaded Nut - POM
- LSNUT-AEAE-TJBA** Pre-Loaded Threaded Nut - POM
- LSNUT-AEAE-TJCA** Pre-Loaded Threaded Nut - POM
- LSNUT-T5X5-F** Threaded Nut - PEEK
- LSNUT-ZERO5X5** Pre-Loaded Threaded Nut - PEEK

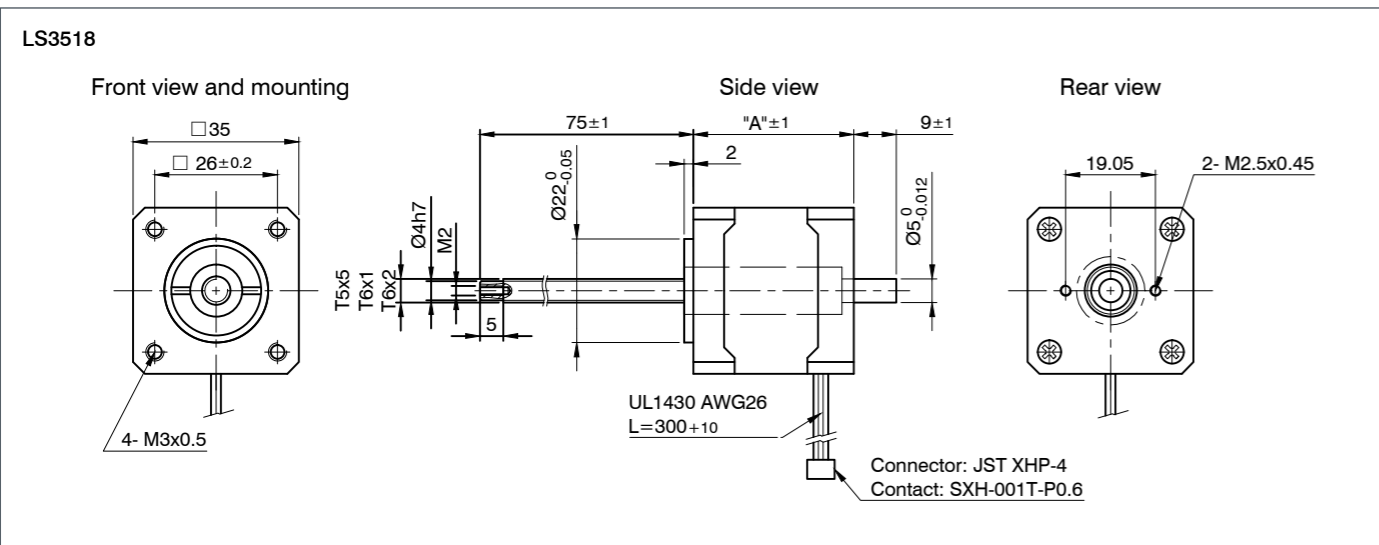


CAUTION

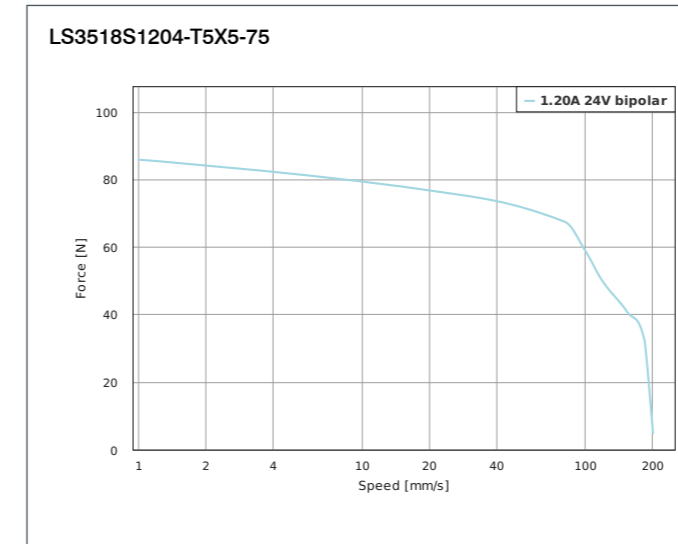
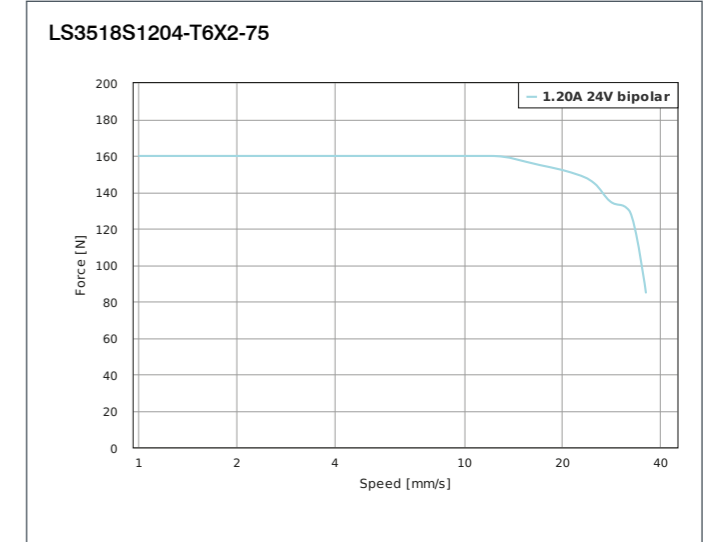
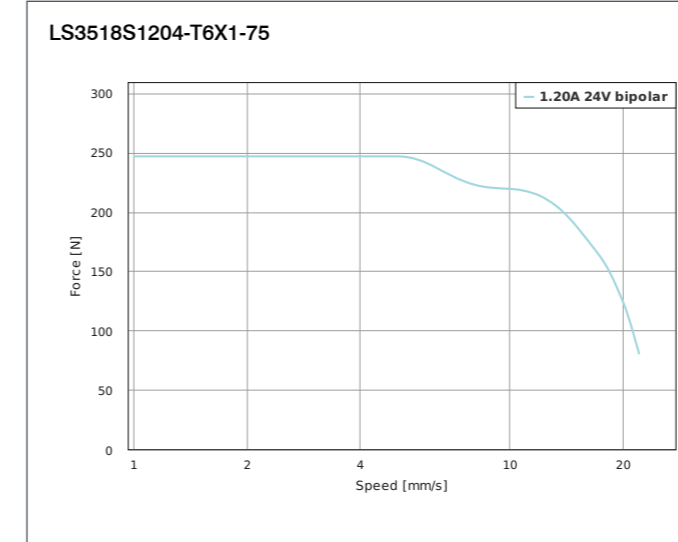


The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	Resistance per Winding Ohm	Inductance per Winding mH	Thread Diameter mm	Thread Lead mm	Length „A“ mm	Socket Length „L“ mm	Weight kg
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-A-UKGI	152	80	1.4	31.75	2	2.8	6.35	6.35	33.4	15	0.2
LA421S14-B-UKGI	152	80	1.4	31.75	2	2.8	6.35	6.35	33.4	15	0.2
LA421S14-B-TJCA	258.3	55	1.4	10	2	2.8	6	2	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	3.25	6	2	47.4	15	0.34
LA421L18-B-UKGI	275.1	80	1.8	31.75	1.75	3.4	6.35	6.35	47.4	15	0.34

ORDER IDENTIFIER

LA421S07-
 A-... = single shaft end
 B-... = double shaft end



ACCESSORIES

- 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-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 0.5 m
- NANOLUBE-50G** Lubricant

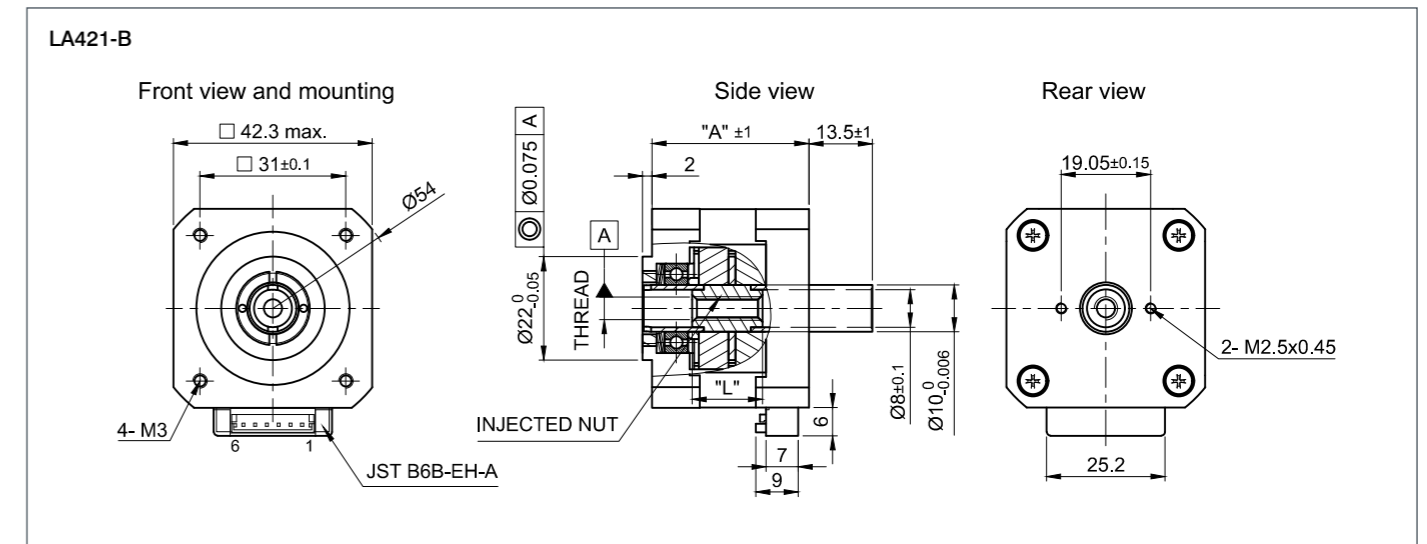
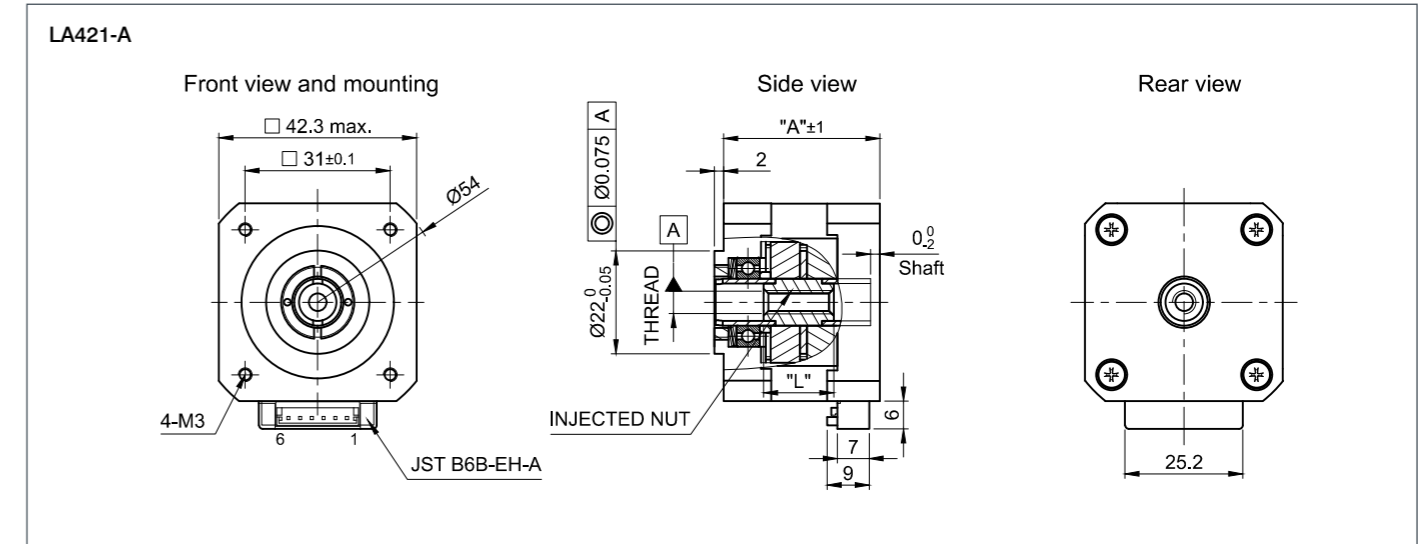


CAUTION

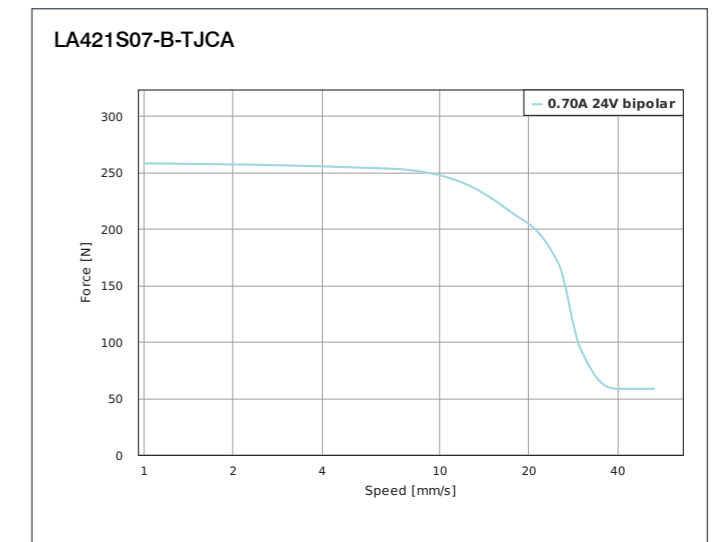
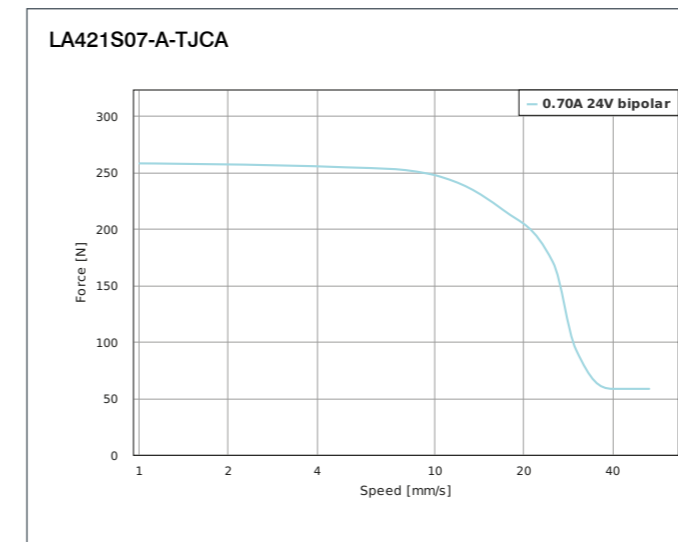


The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

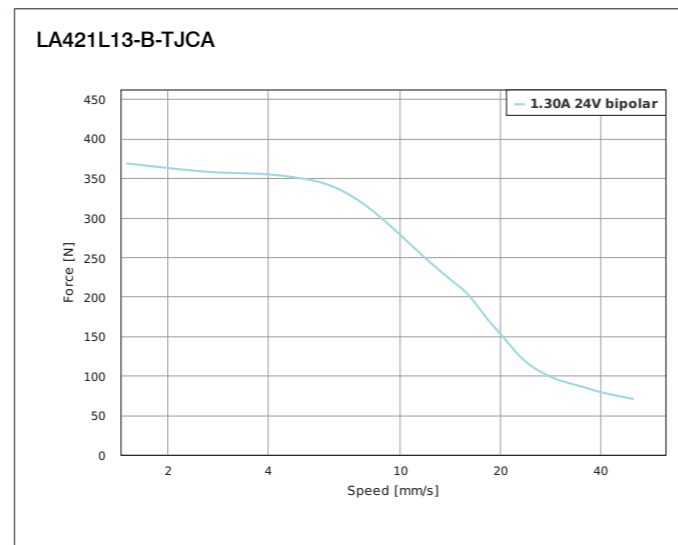
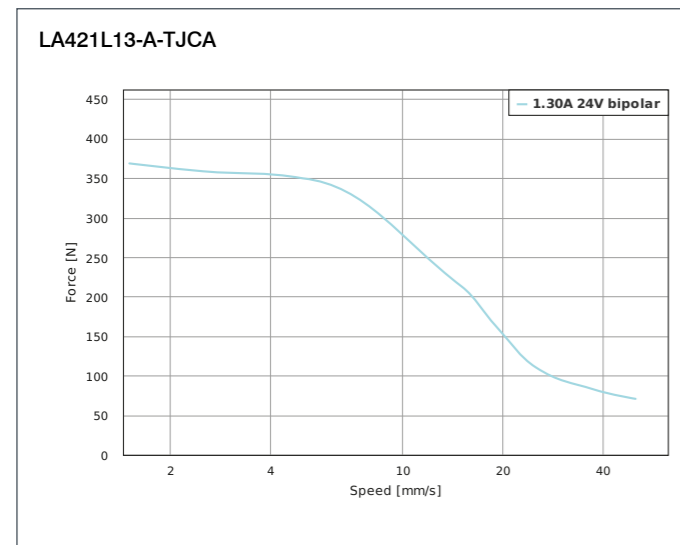
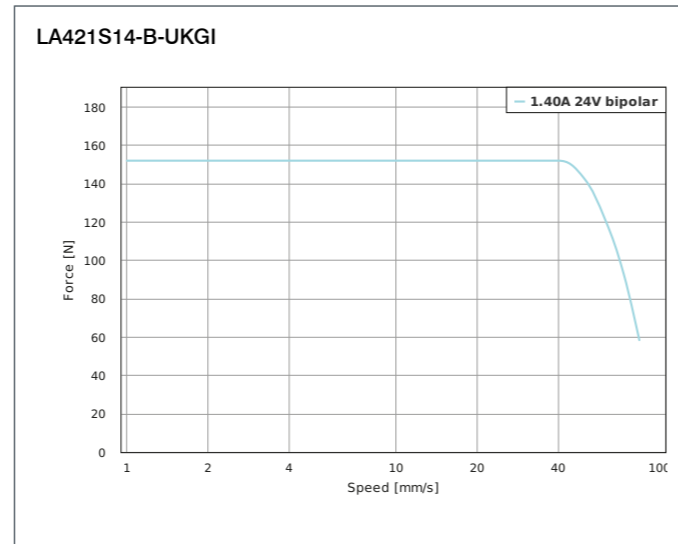
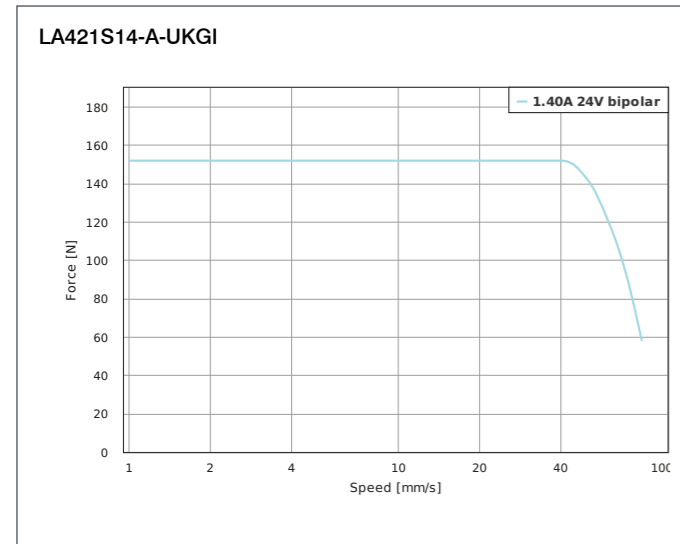
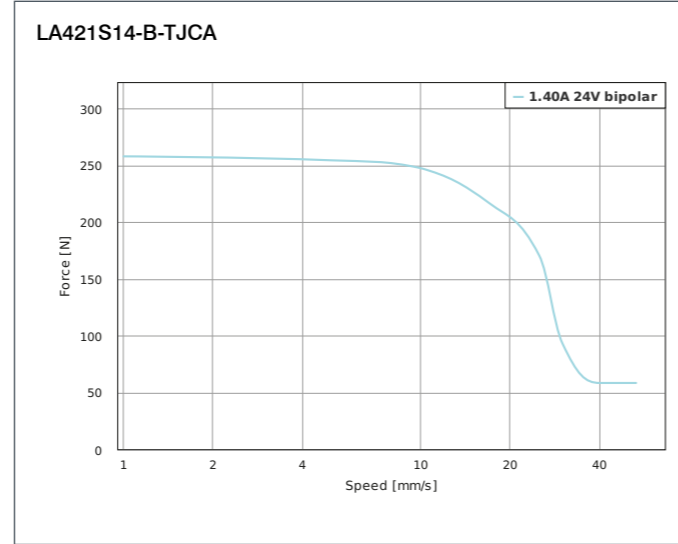
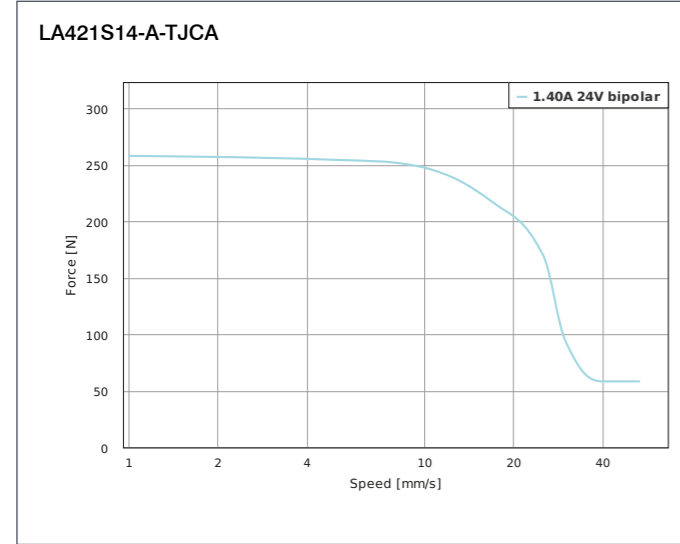
DIMENSIONS (IN MM)



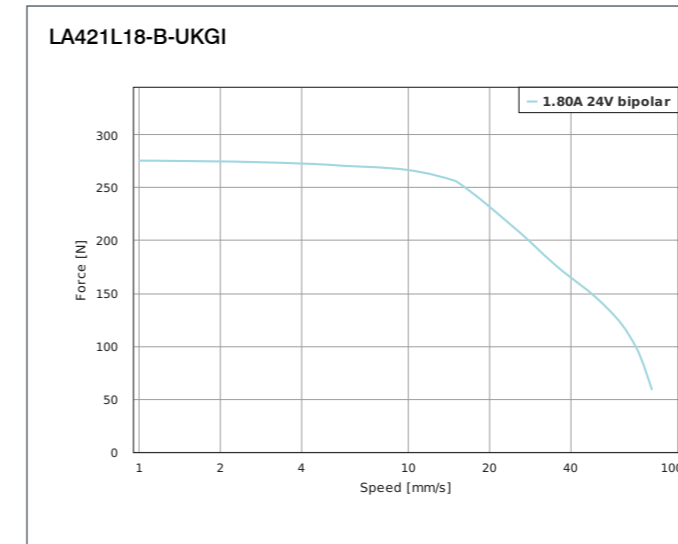
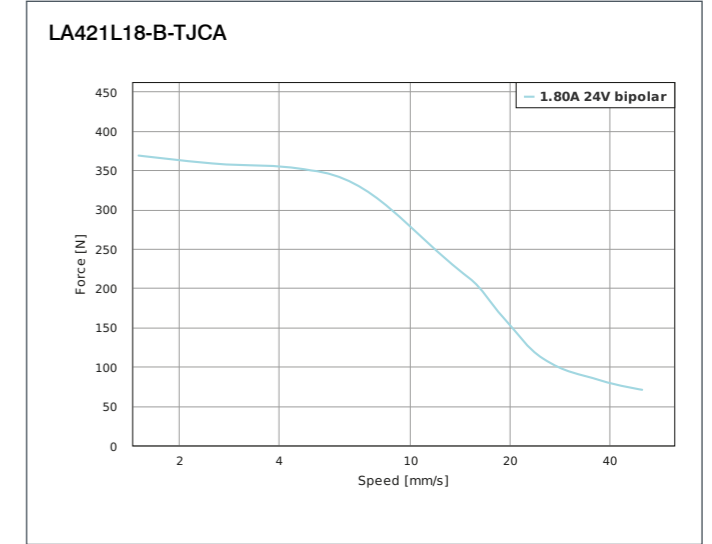
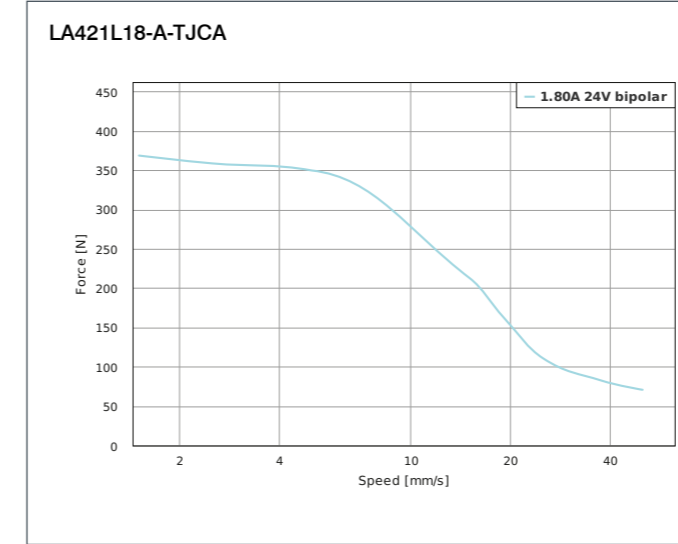
FORCE-VELOCITY CURVES



FORCE-VELOCITY CURVES



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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-UKGI-019	152	80	1.4	31.75	2	2.8	6.35	6.35	33.4	19.05	0.24
LGA421S14-B-UKGI-019	152	80	1.4	31.75	2	2.8	6.35	6.35	33.4	19.05	0.24
LGA421S14-A-UKGI-038	152	80	1.4	31.75	2	2.8	6.35	6.35	33.4	38.1	0.25
LGA421S14-B-UKGI-038	152	80	1.4	31.75	2	2.8	6.35	6.35	33.4	38.1	0.25
LGA421L18-B-UKGI-025	275	80	1.8	31.75	1.75	3.4	6.35	6.35	47.4	25.4	0.34
LGA421L18-B-UKGI-063	275	80	1.8	31.75	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 0.5 m

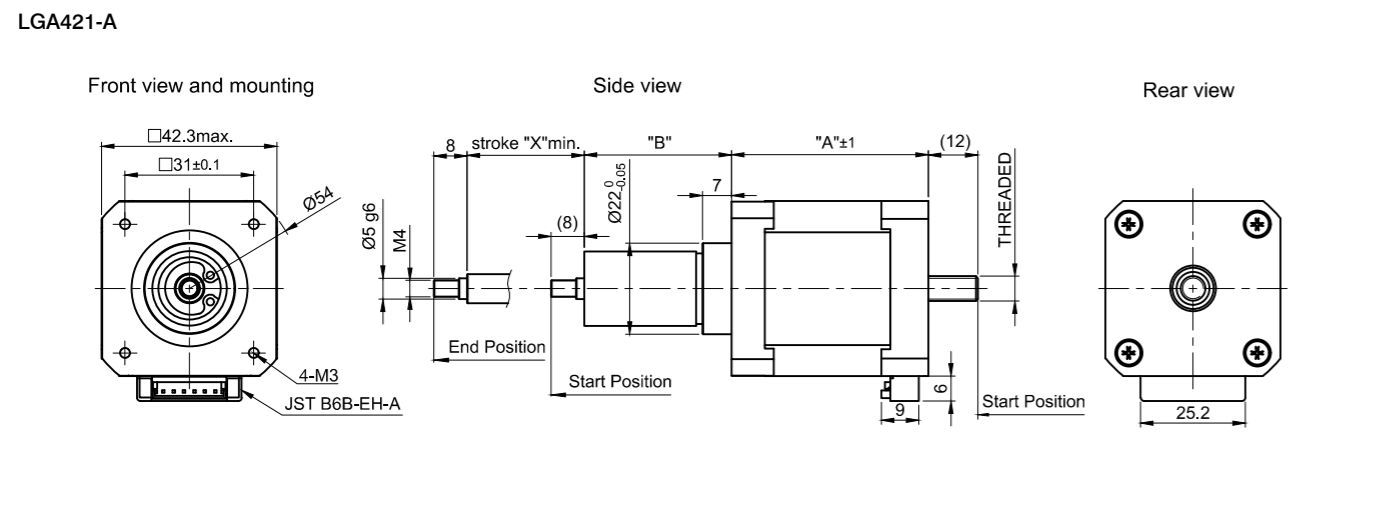


CAUTION

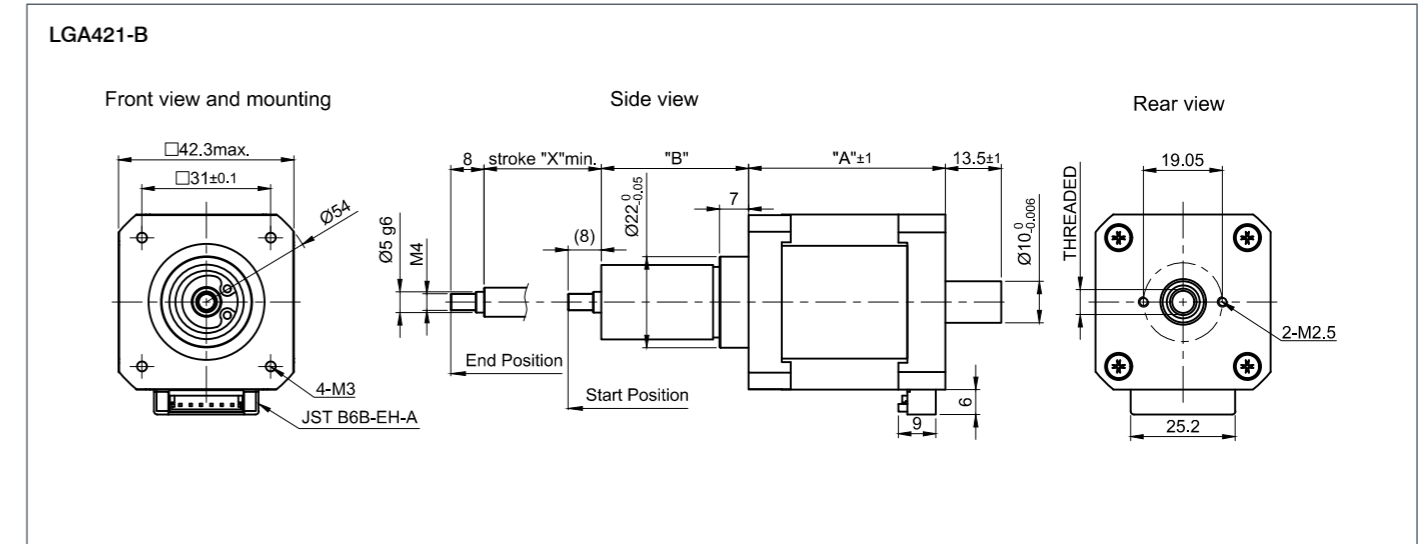


The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

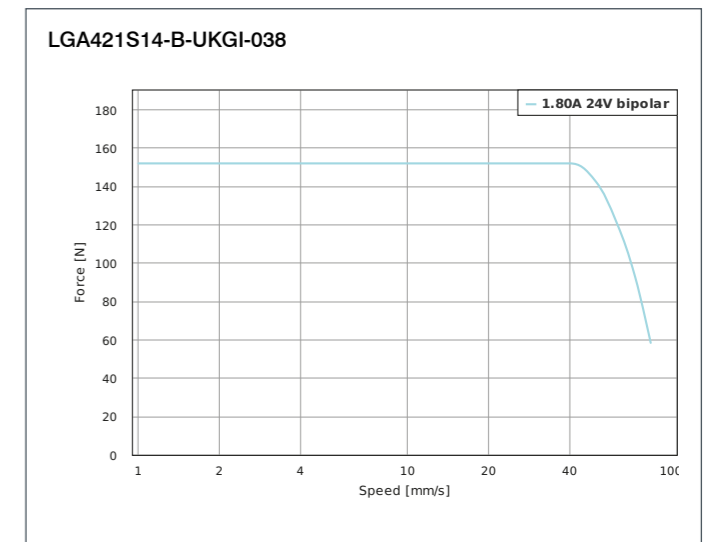
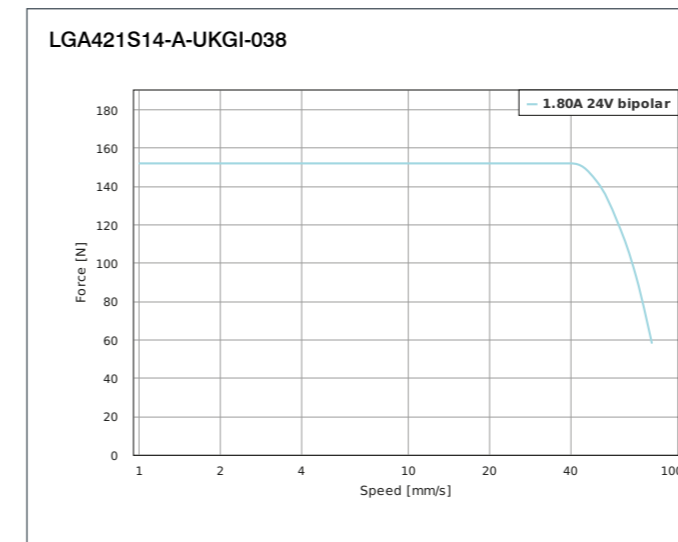
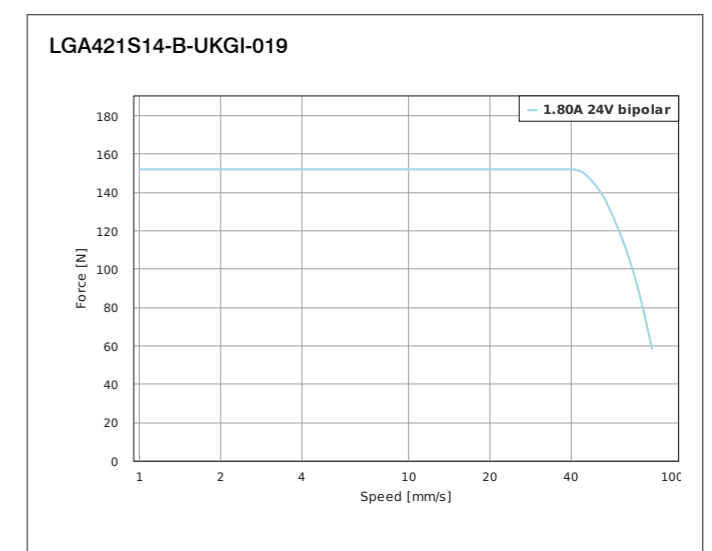
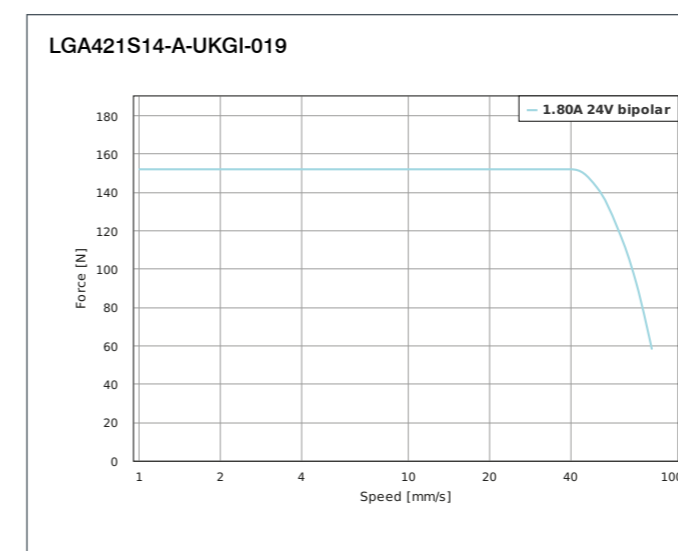
DIMENSIONS (IN MM)



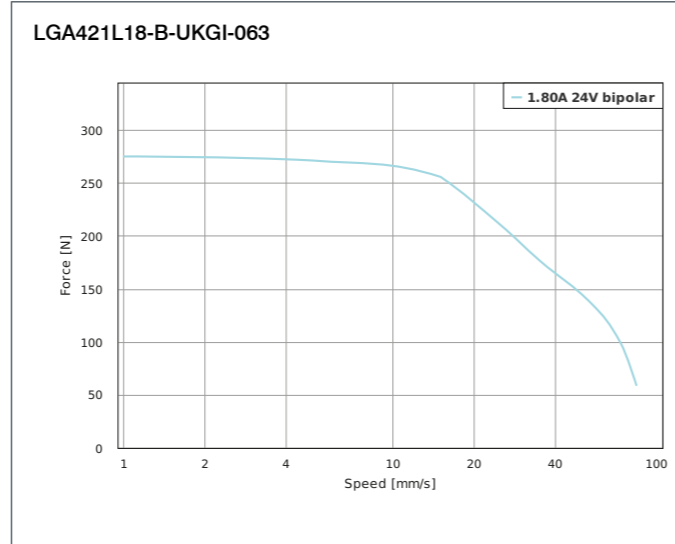
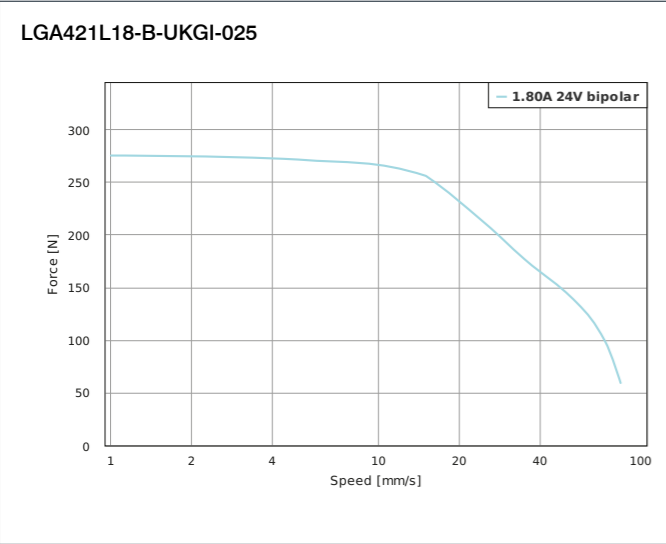
DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES



FORCE-VELOCITY CURVES



Notes section with horizontal lines for writing.



OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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-UKGI-152	152	80	1.4	31.75	2	2.8	6.35	6.35	152	33.4	0.26
LSA421S14-B-UKGI-152	152	80	1.4	31.75	2	2.8	6.35	6.35	152	33.4	0.26
LSA421L18-B-TJCA-152	369	50	1.8	10	1.75	3.25	6	2	152	47.4	0.4
LSA421L18-B-UKGI-152	275	80	1.8	31.75	1.75	3.4	6.35	6.35	152	47.4	0.4

ORDER IDENTIFIER

LSA421S14-
 A-... = single shaft end
 B-... = double shaft end

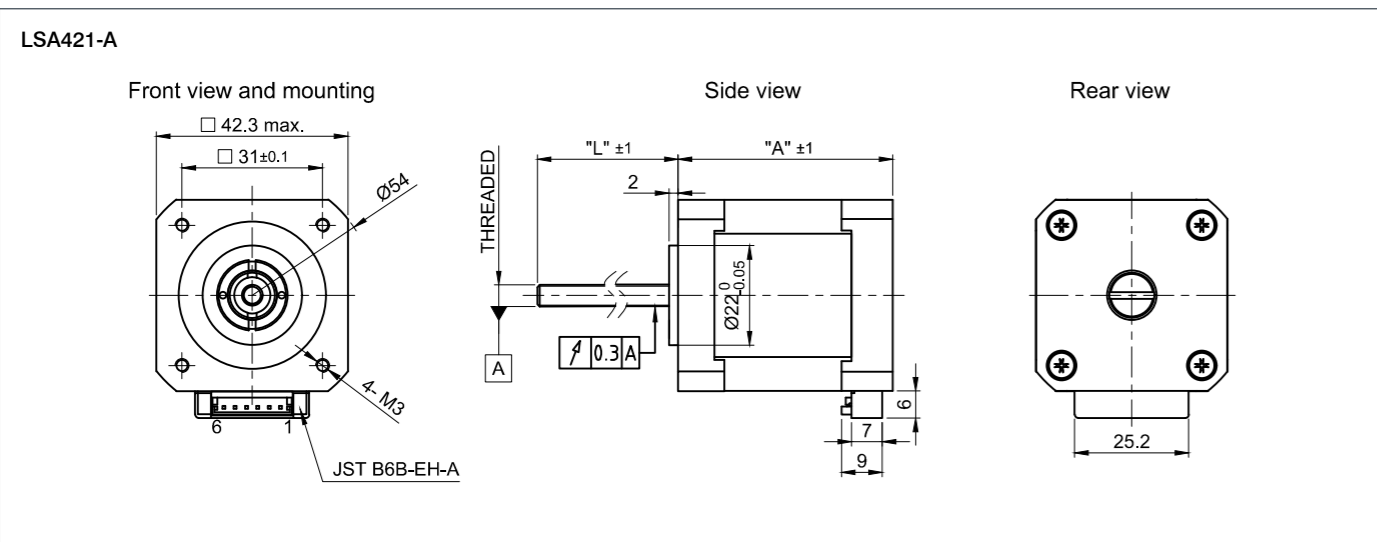
ACCESSORIES

LSNUT-AAAE-TJCA
 Threaded Nut – POM
LSNUT-AAAE-UKGI
 Threaded Nut – POM
LSNUT-AEAE-TJCA Pre-Loaded Threaded Nut - POM
LSNUT-AEAE-UKGI Pre-Loaded Threaded Nut - POM
ZK-JST-EHR-6-0.5M-S
 Motor Cable 0.5 m
NANOLUBE-50G Lubricant

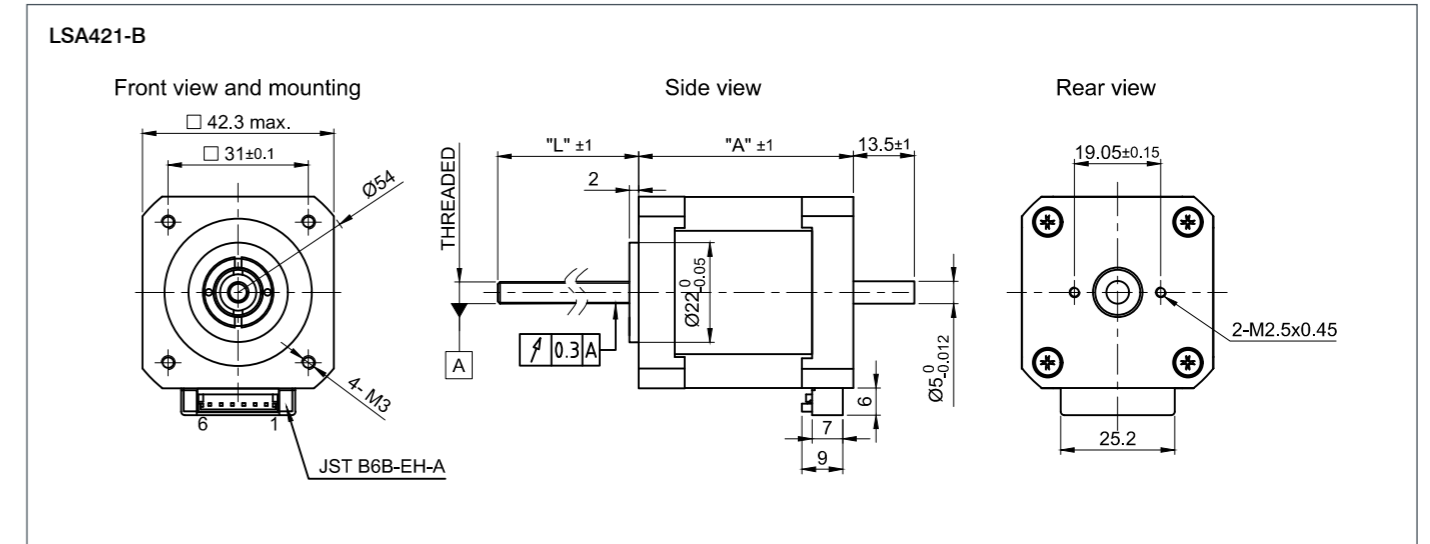
CAUTION

The force and power ratings specified in the data sheets are based on a duty cycle of 10% to 20% and must be reduced for higher values. Moving against fixed end stops should be avoided.

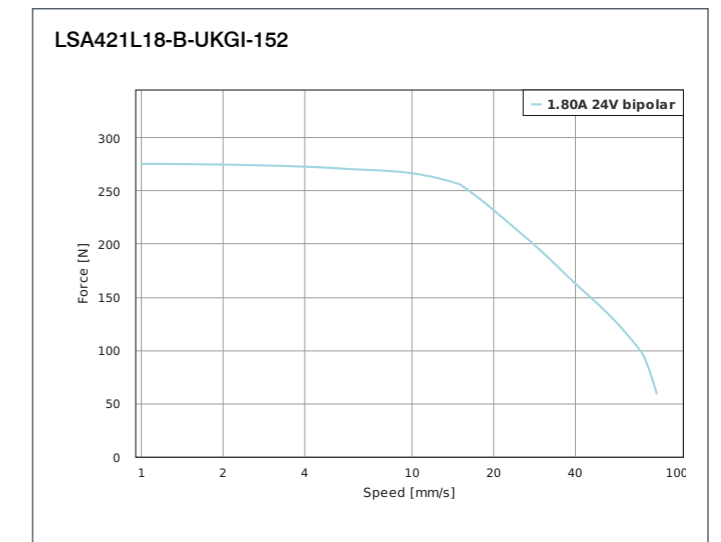
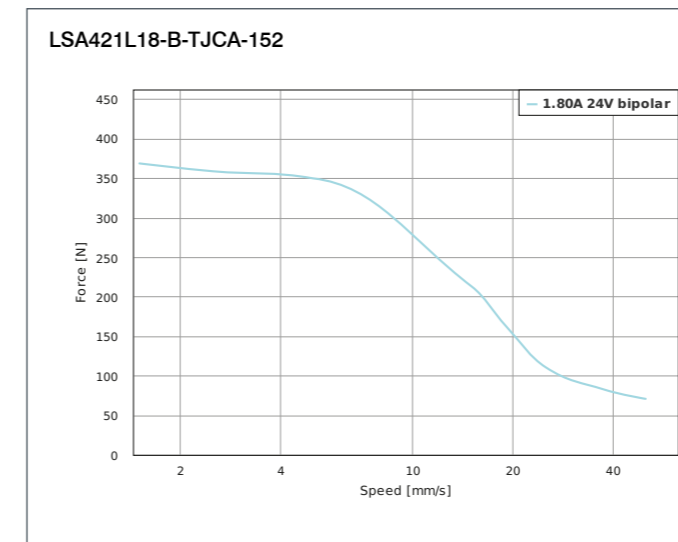
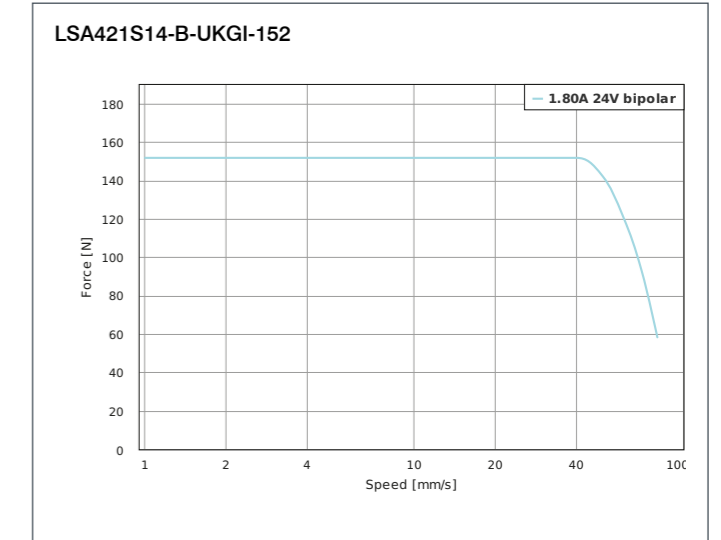
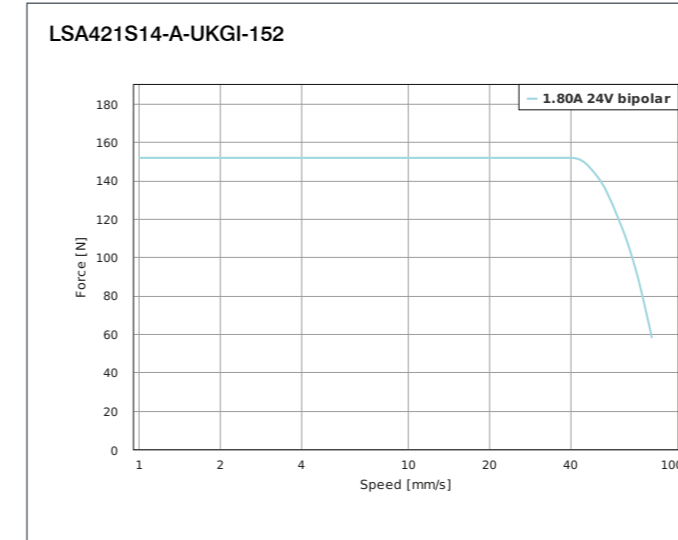
DIMENSIONS (IN MM)



DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	Resistance per Winding Ohm	Inductance per Winding mH	Thread Diameter mm	Thread Lead mm	Length „A“ mm	Socket Length „L“ mm	Weight kg
L5918S2008-T10X2	800	70	2	10	1.5	2.6	10	2	51	25	0.65
L5918S2008-T10X6	500	130	2	30	1.5	2.6	10	6	51	25	0.65
L5918L3008-T10X2	1000	80	3	10	1	2.2	10	2	76	25	1

ACCESSORIES

- ZST10-2-200-1**
Lead Screw with Trapezoidal Thread
- ZST10-2-300-1**
Lead Screw with Trapezoidal Thread
- ZST10-2-1050**
Lead Screw with Trapezoidal Thread
- ZST10-6-200-1**
Lead Screw with Trapezoidal Thread
- ZST10-6-300-1**
Lead Screw with Trapezoidal Thread
- ZST10-6-1000**
Lead Screw with Trapezoidal Thread
- NANOLUBE-50G** Lubricant

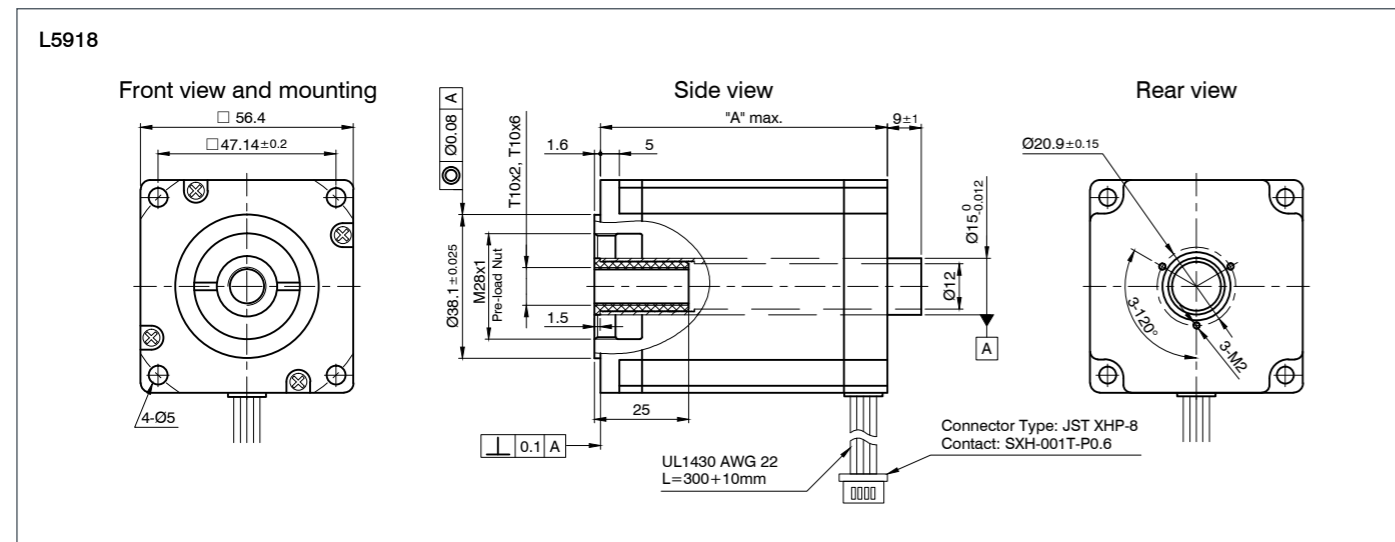


CAUTION

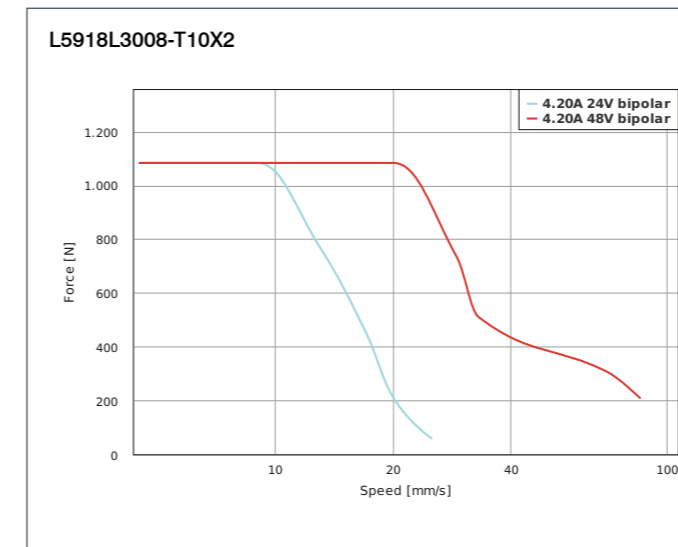
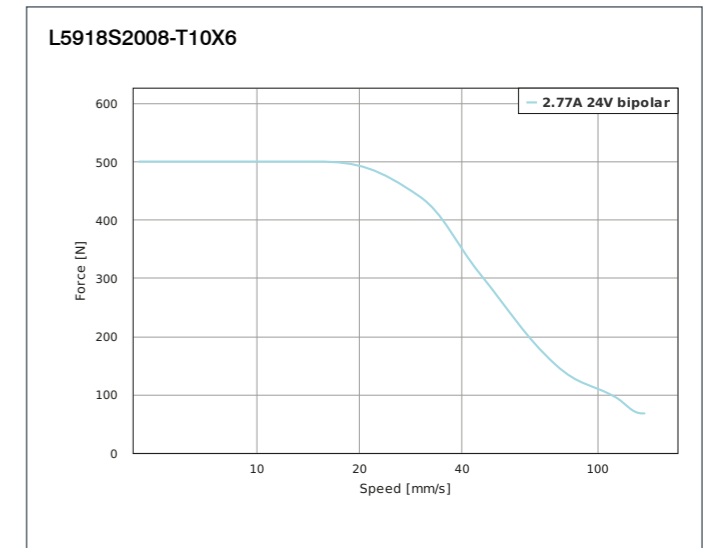
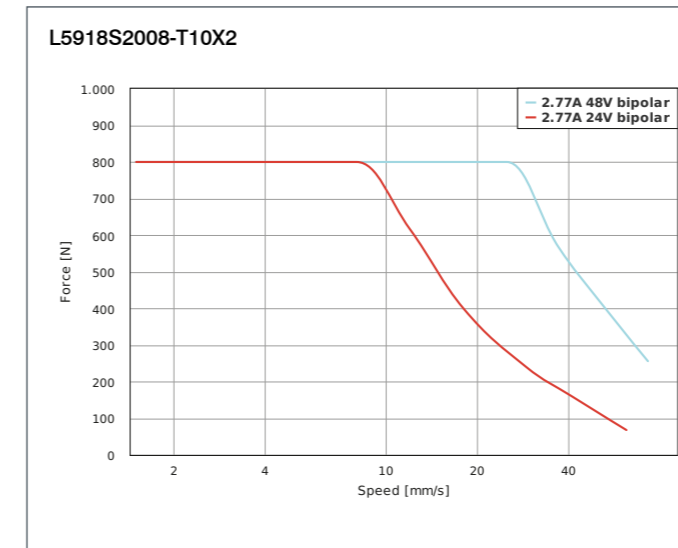


The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	Resistance per Winding Ohm	Thread Diameter mm	Thread Lead mm	Stroke Length „X“ mm	Housing Length „B“ mm	Length „A“ mm	Weight kg
L5918S2008-T10x2-A	800	70	2	10	1.5	10	2	25 - 50	47/72	51	0.8 - 0.85
L5918S2008-T10x6-A	500	130	2	30	1.5	10	6	25 - 50	47/72	51	0.8 - 0.85
L5918L3008-T10x2-A	1000	80	3	10	1	10	2	25 - 50	47/72	76	1.15 - 1.2

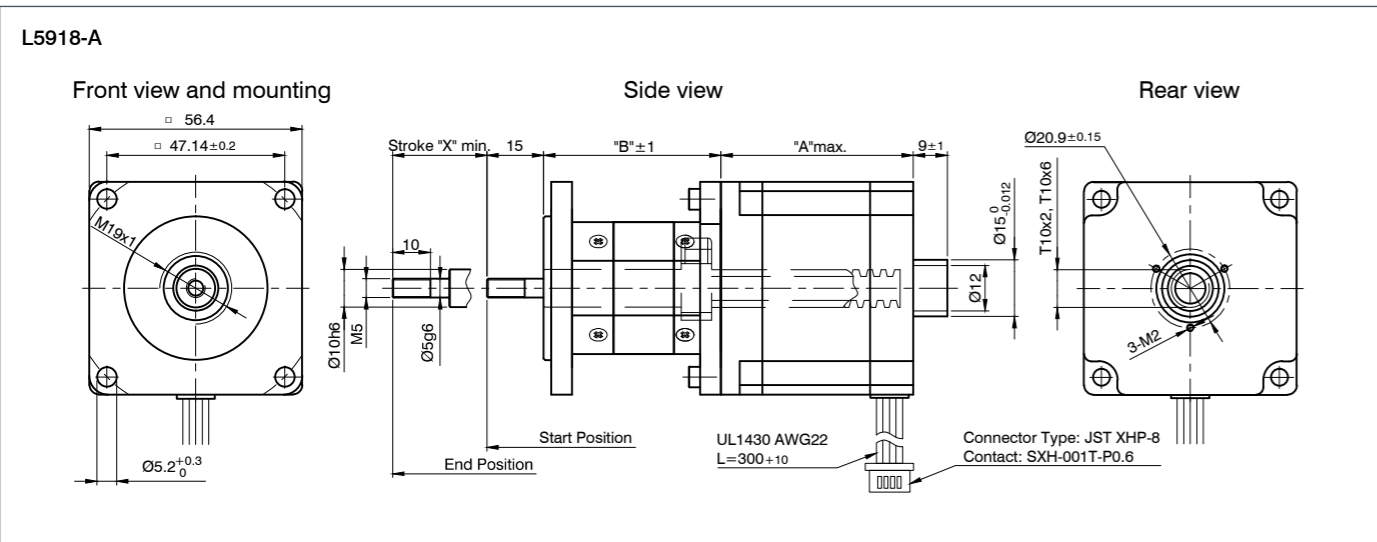
ORDER IDENTIFIER

L5918S2008-T10X2-
 A25 = 25 mm stroke length „X“
 A50 = 50 mm stroke length „X“

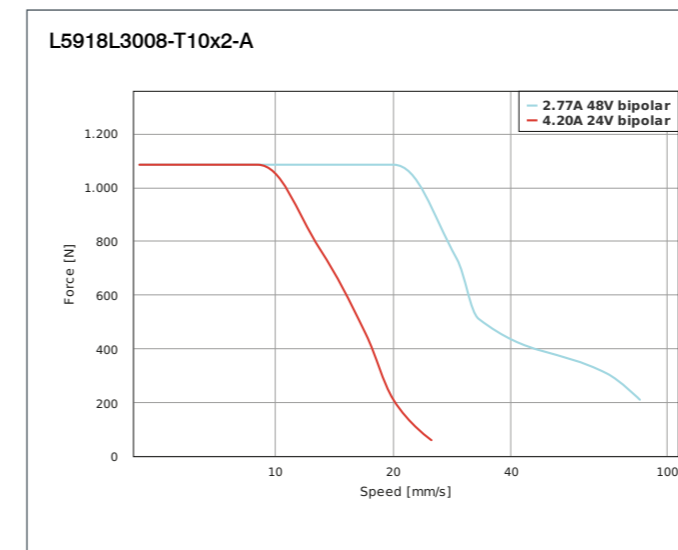
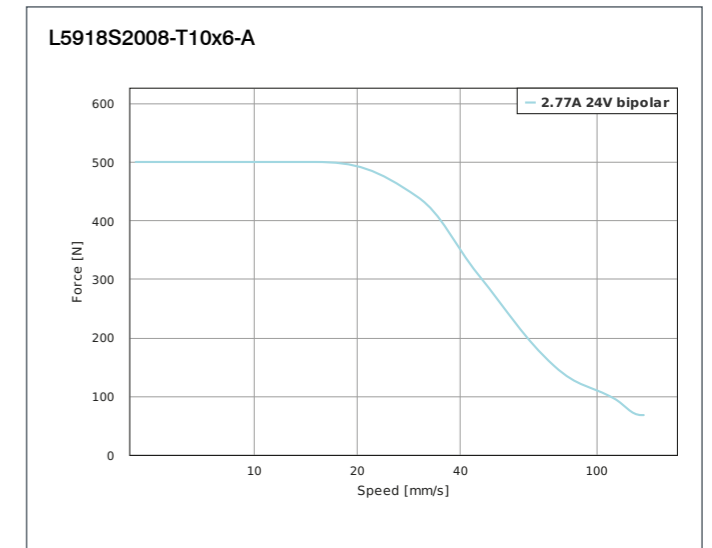
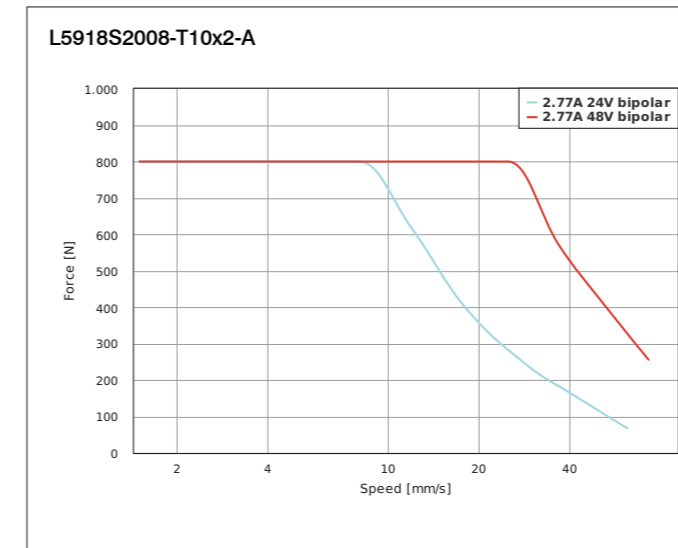
CAUTION

The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	Resistance per Winding Ohm	Thread Diameter mm	Thread Lead mm	Length „A“ mm	Weight kg
LS5918S2008-T10X2-75	800	70	2	10	1.5	10	2	51	0.85
LS5918S2008-T10X6-75	500	130	2	30	1.5	10	6	51	0.85

ACCESSORIES

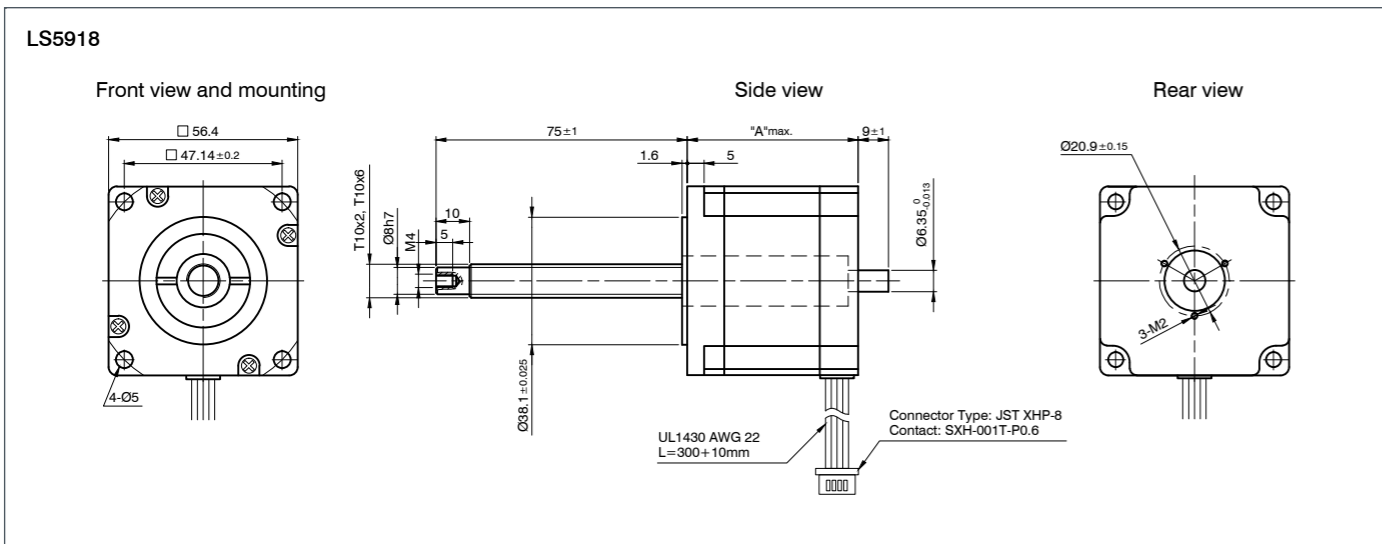
- LSNUT-T10X2-F Threaded Nut - PEEK
- LSNUT-T10X6-F Threaded Nut - PEEK



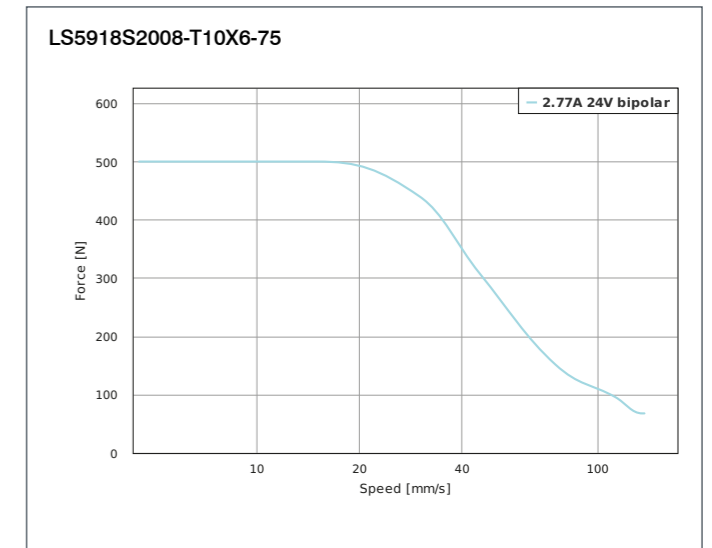
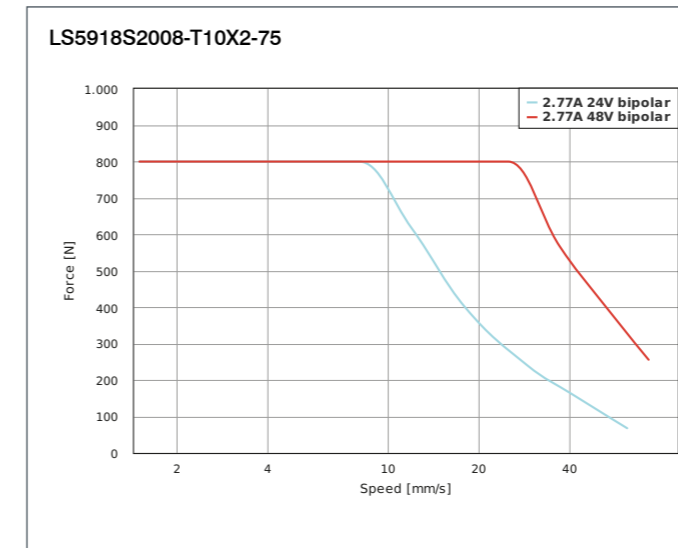
CAUTION

The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

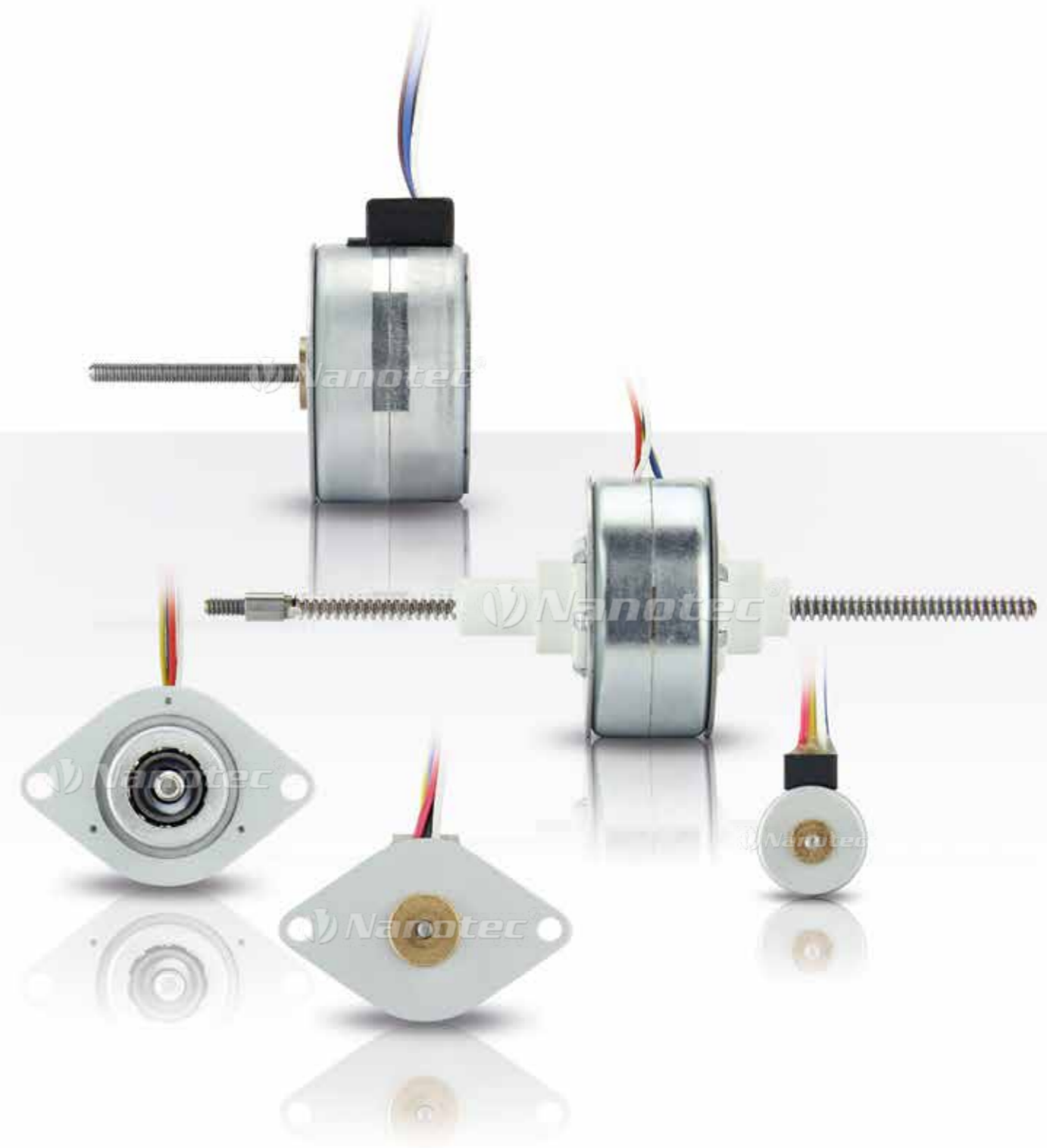
DIMENSIONS (IN MM)



FORCE-VELOCITY CURVES



Lined area for notes.





OPTIONS



VERSIONS

Type	Force N	Speed mm/s	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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

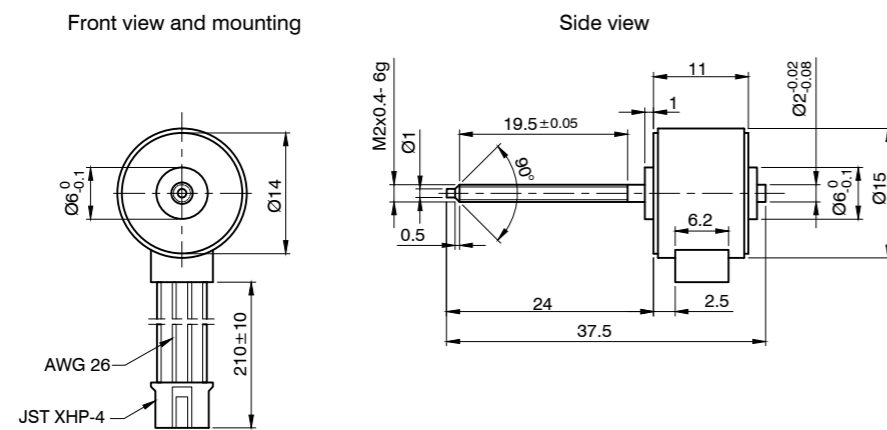
CAUTION



The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

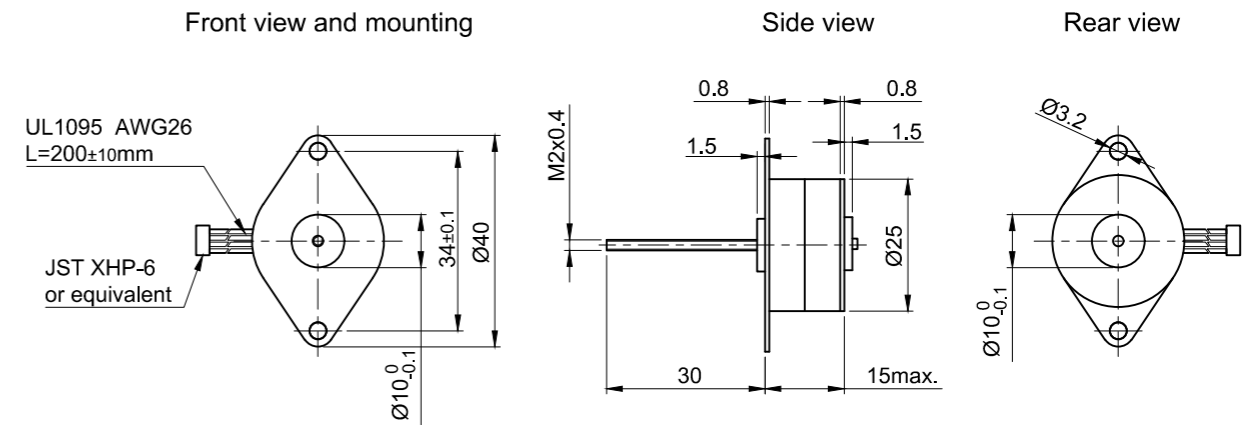
DIMENSIONS (IN MM)

LSP1518M0104

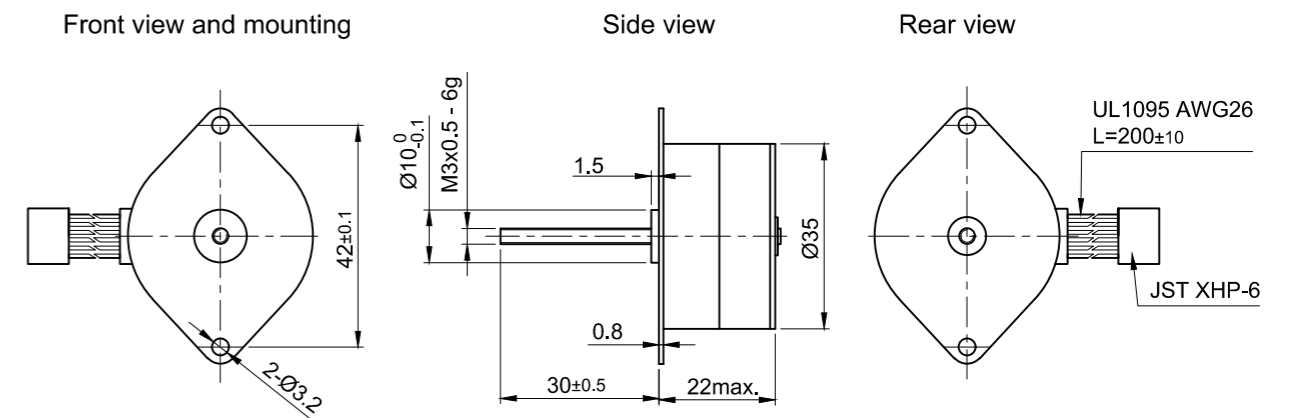


DIMENSIONS (IN MM)

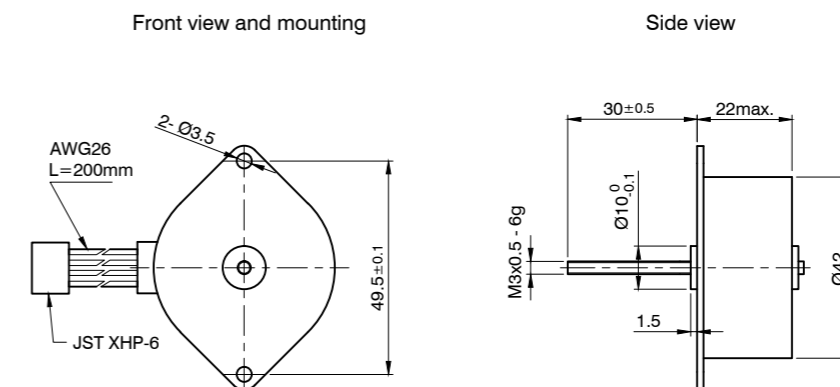
LSP2575M0506



LSP3575M0206



LSP4275M0206



OPTIONS



VERSIONS

Type	Force N	Current per Winding A	Resolution $\mu\text{m}/\text{step}$	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

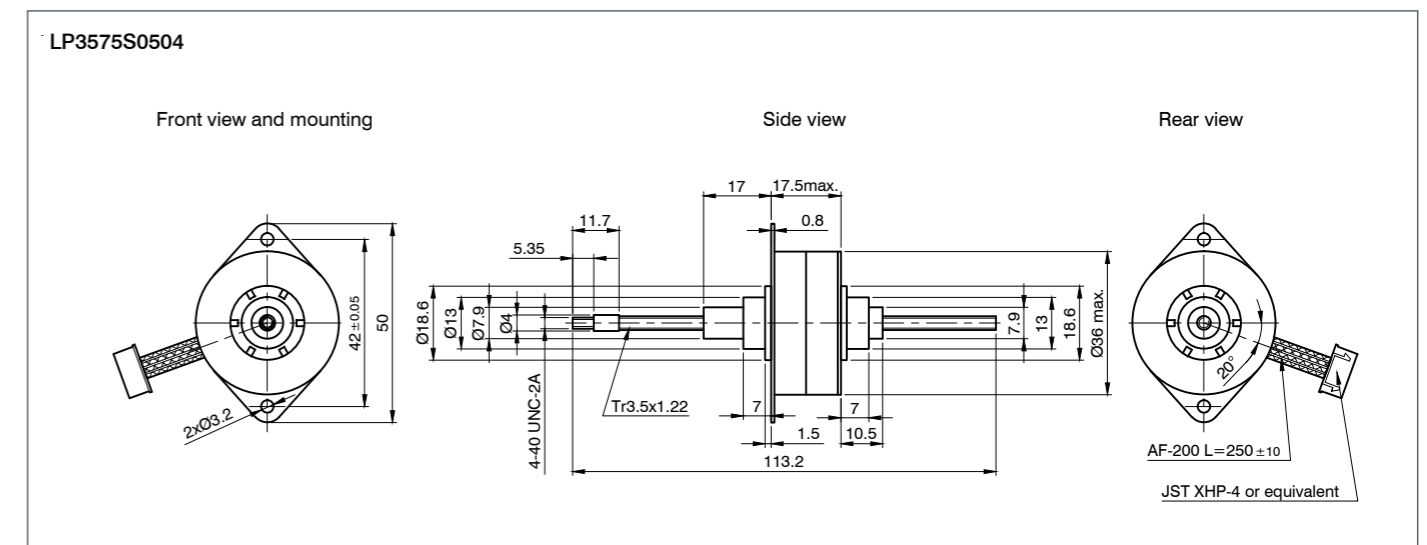
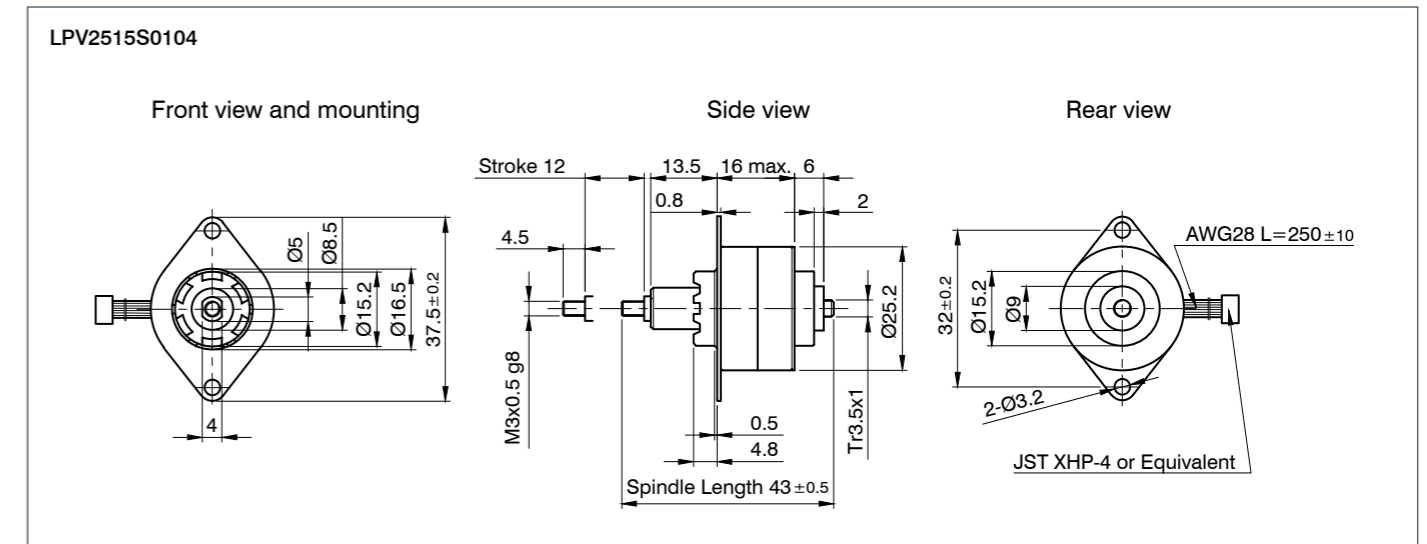
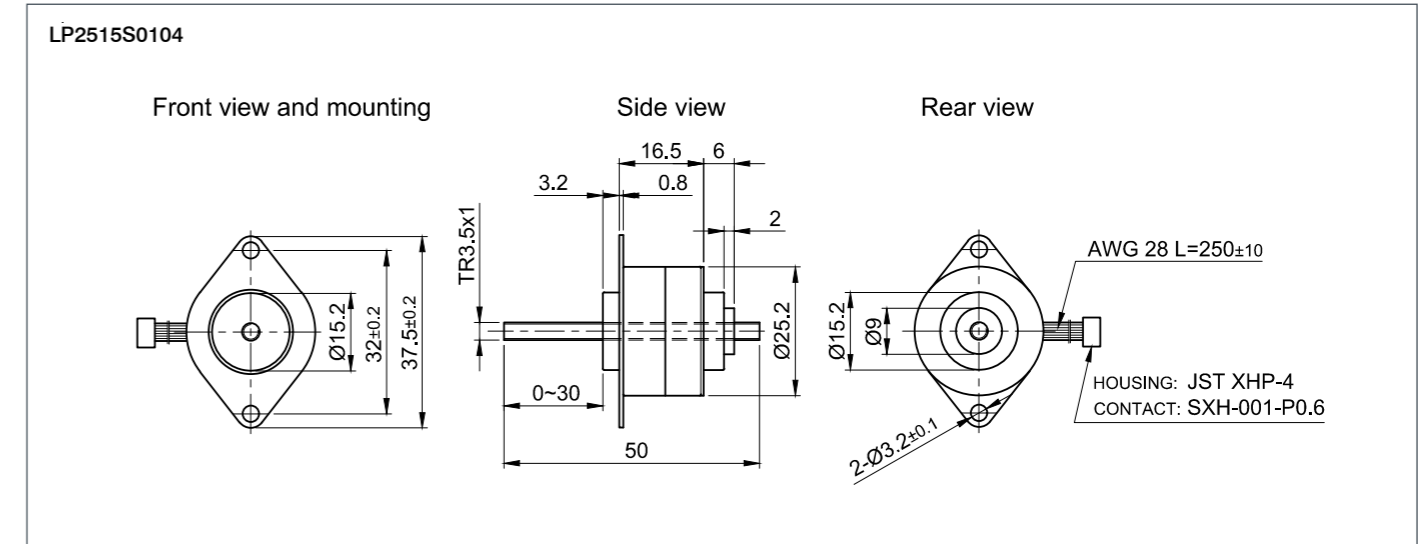
This linear actuator is available in a captive version (LPV2515S0104-TR3,5x1) and a non-captive version.

CAUTION



The force and output power ratings listed in the data sheets are based on a duty cycle of approx. 10% to 20% and must be reduced for higher values. Moving against fixed limit stops should be avoided.

DIMENSIONS (IN MM)



Lined area for notes.





ORDER IDENTIFIER

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

TECHNICAL DATA

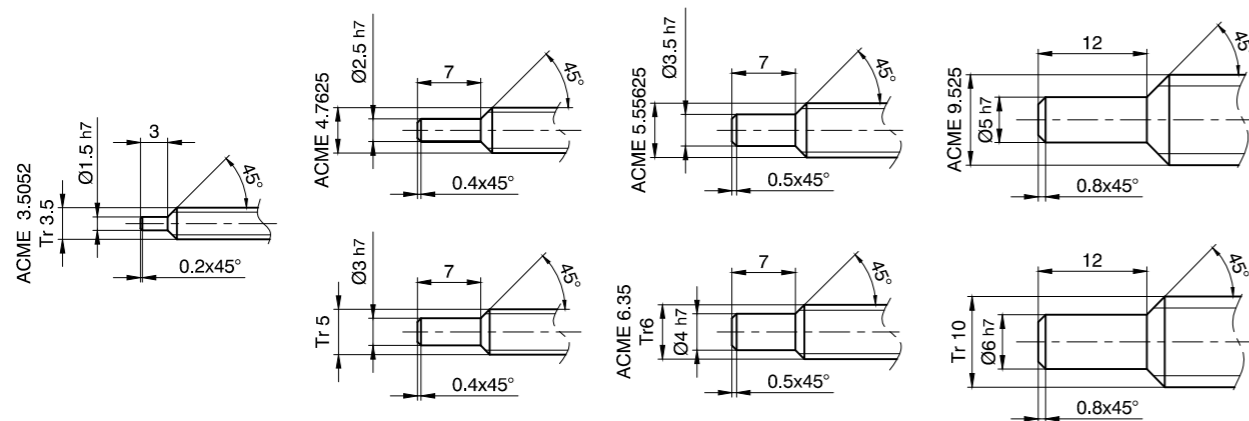
Screw Material	stainless (not resistant to acid and salt water)
Tensile Strength	760 N/mm ²
Thread Lead Delay	± 0.1/300 mm travel

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
SCREW-ABA-TJBA	6	4.465	1	LA.....TJBA	0.03	±0.05	1.4301	200 - 1000
SCREW-ABA-TJCA	6	4.444	2	LA...TJCA	0.03	±0.06	1.4301	200 - 1000
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	±0.5	1.4404	200 - 1000
ZST5-5	5	3.6	5	L.....T5x5	0.04	±0.7	1.4021	200 - 1050
ZST10-2	10	8.2	2	L.....T10x2	0.04	±0.07	1.4021	200 - 1050
ZST10-6	10	6.5	6	L.....T10x6	0.05	±0.09	1.4021	200 - 1000

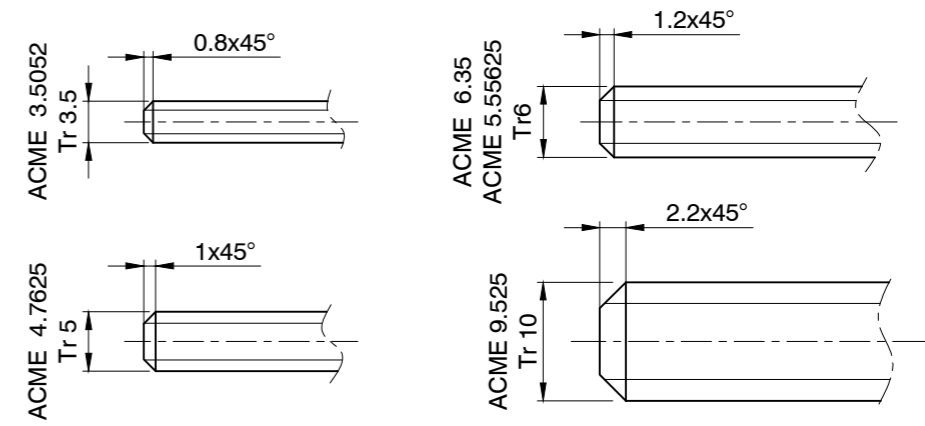
DIMENSIONS (IN MM)

SCREW-ABA-...

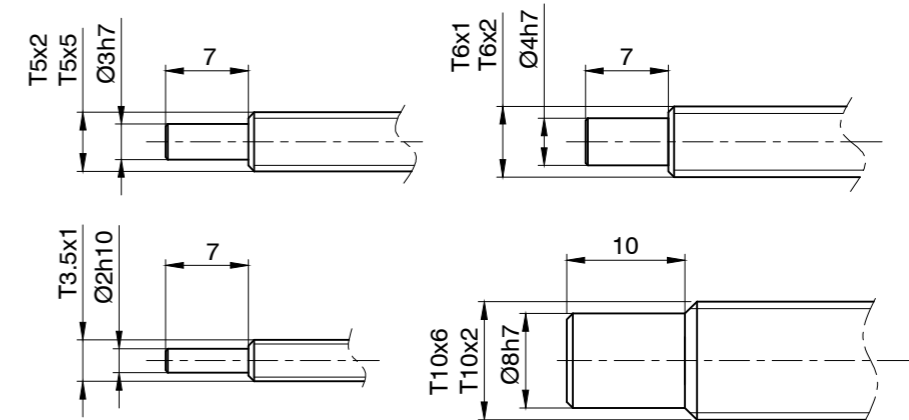


DIMENSIONS (IN MM)

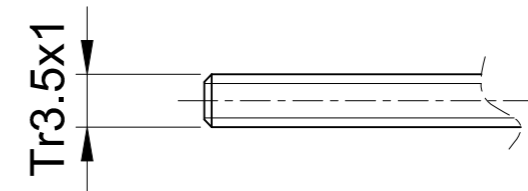
SCREW-AAA-...



ZST...

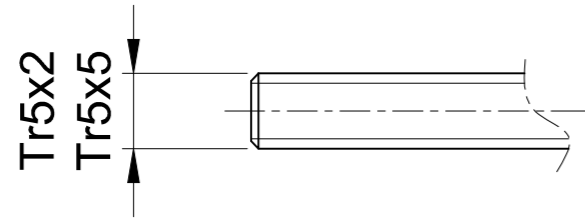


ZST3.5-1-500

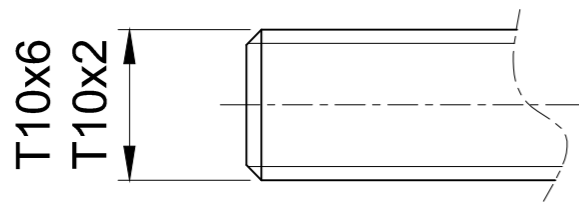


DIMENSIONS (IN MM)

ZST5-...-1000/1050



ZST10-...-1000/1050



ORDER IDENTIFIER

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

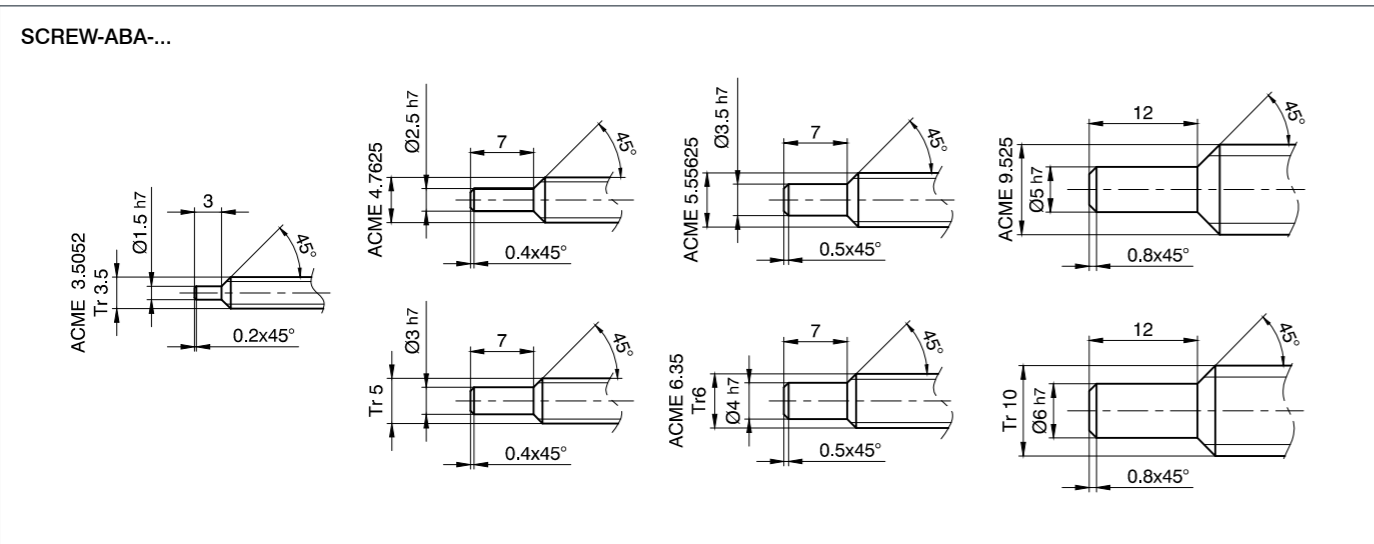
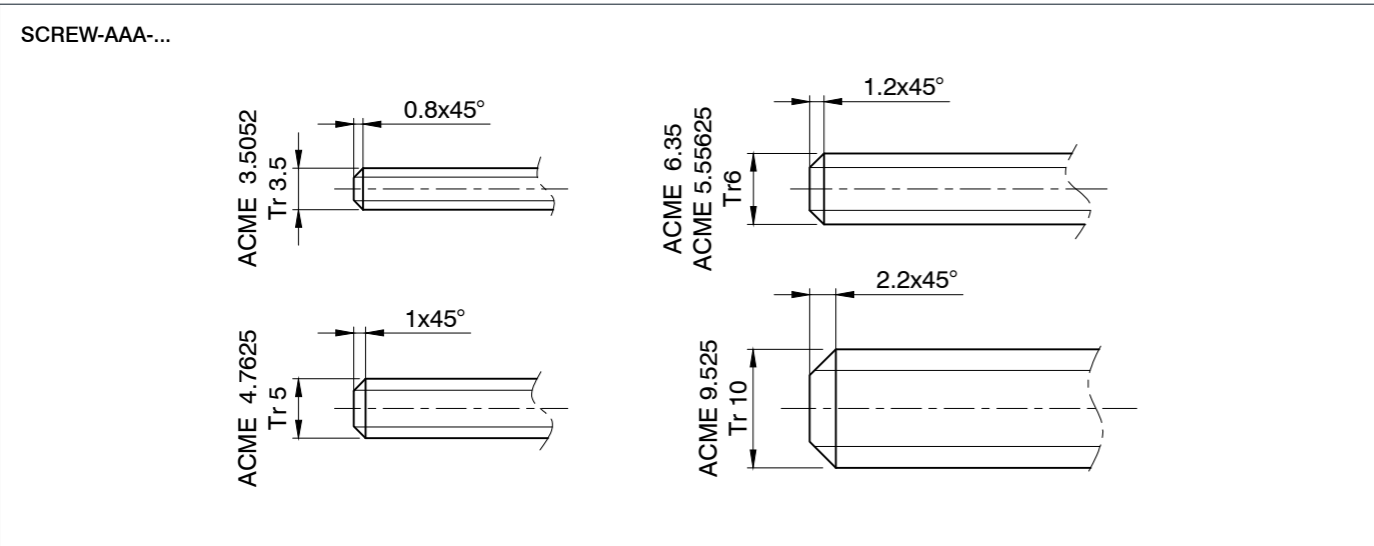
TECHNICAL DATA

Screw Material	stainless (not resistant to acid and salt water)
Tensile Strength	760 N/mm ²
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
SCREW-ABA-UGAQ-200	4.76	3.579	0.635	LA...-UGAQ	0.03	±0.06	1.4301	200
SCREW-ABA-UGAQ-300	4.76	3.579	0.635	LA...-UGAQ	0.03	±0.06	1.4301	300
SCREW-AAA-UGAQ-1000	4.76	3.579	0.635	LA...-UGAQ	0.03	±0.06	1.4301	1000
SCREW-ABA-UGFC-200	4.763	2.868	5.08	LA...-UGFC	0.04	±0.08	1.4301	200
SCREW-ABA-UGFC-300	4.763	2.868	5.08	LA...-UGFC	0.04	±0.08	1.4301	300
SCREW-AAA-UGFC-1000	4.763	2.868	5.08	LA...-UGFC	0.04	±0.08	1.4301	1000
SCREW-ABA-UIAP-200	5.56	4.402	0.6096	LA...-UIAP	0.04	±0.06	1.4301	200
SCREW-ABA-UIAP-300	5.56	4.402	0.61	LA...-UIAP	0.04	±0.06	1.4301	300
SCREW-AAA-UIAP-1000	5.56	4.402	0.6096	LA...-UIAP	0.04	±0.06	1.4301	1000
SCREW-ABA-UKAS-200	6.35	4.983	0.7938	LA...-UKAS	0.04	±0.07	1.4301	200
SCREW-ABA-UKAS-300	6.35	4.983	0.7938	LA...-UKAS	0.04	±0.07	1.4301	300
SCREW-AAA-UKAS-1000	6.35	4.983	0.7938	LA...-UKAS	0.04	±0.07	1.4301	1000
SCREW-ABA-UKBN-200	6.35	4.107	1.5875	LA...-UKBN	0.05	±0.08	1.4301	200
SCREW-ABA-UKBN-300	6.35	4.107	1.5875	LA...-UKBN	0.05	±0.08	1.4301	300
SCREW-AAA-UKBN-1000	6.35	4.107	1.5875	LA...-UKBN	0.05	±0.08	1.4301	1000
SCREW-ABA-UKDE-200	6.35	4.107	3.175	LA...-UKDE	0.05	±0.09	1.4301	200
SCREW-ABA-UKDE-300	6.35	4.107	3.175	LA...-UKDE	0.05	±0.09	1.4301	300
SCREW-AAA-UKDE-1000	6.35	4.107	3.175	LA...-UKDE	0.05	±0.09	1.4301	1000
SCREW-ABA-UKGI-200	6.35	4.107	6.35	LA...-UKGI	0.05	±0.09	1.4301	200
SCREW-ABA-UKGI-300	6.35	4.107	6.35	LA...-UKGI	0.05	±0.09	1.4301	300
SCREW-AAA-UKGI-1000	6.35	4.107	6.35	LA...-UKGI	0.05	±0.09	1.4301	1000

DIMENSIONS (IN MM)



ORDER IDENTIFIER

ZSM6-
200 = screw length
300 = screw length
1000 = screw length



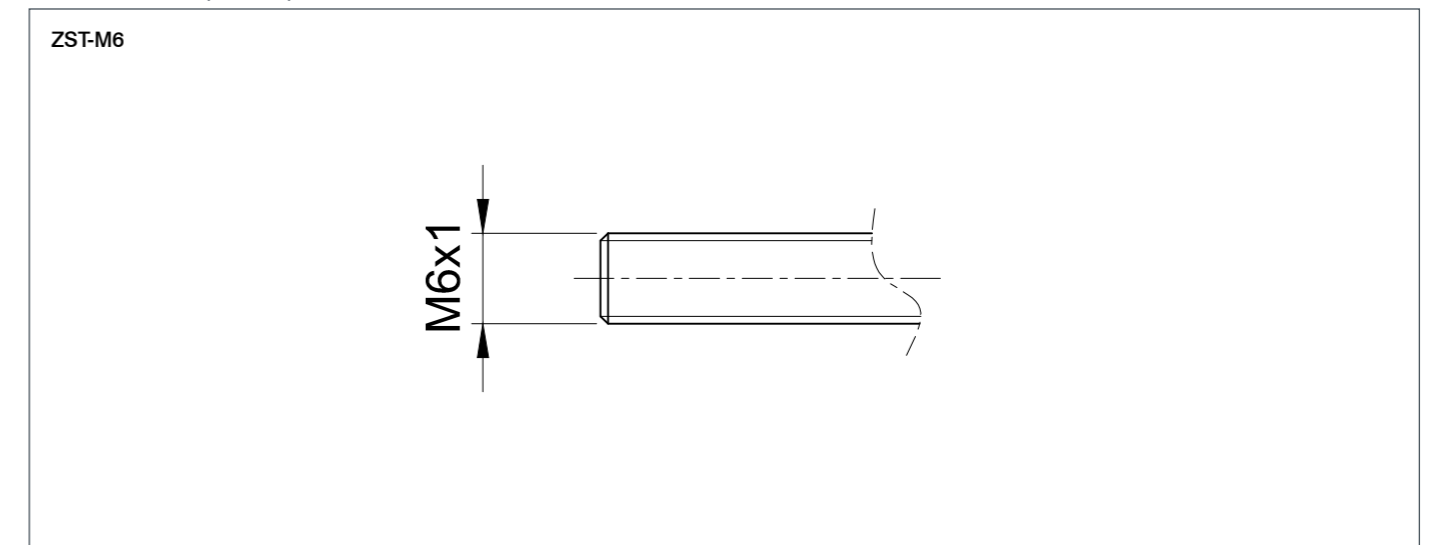
TECHNICAL DATA

Screw Material	stainless (not resistant to acid and salt water)
Tensile Strength	760 N/mm ²
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	End Machining	Material Number	Screw Length mm
ZSM6-1	6	5	1	L.....M6x1	0.03	±0.08	-	1.4401	200 - 1000

DIMENSIONS (IN MM)



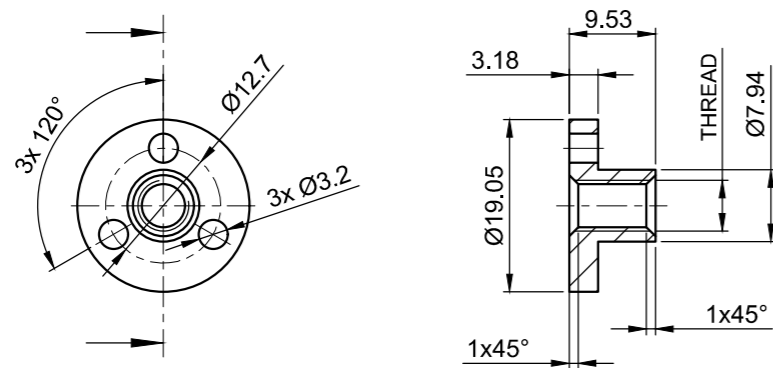


VERSIONS

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 Thread	3.5	1	1	LSA-...-TDBA	12.7	3.2
LSNUT-AAAA-UGAQ	UGAQ	ACME Thread	4.76	0.635	1	LSA-...-UGAQ	12.7	3.2
LSNUT-AAAA-UGFC	UGFC	ACME Thread	4.76	5.08	4	LSA-...-UGFC	12.7	3.2
LSNUT-AAAA-THCA	THCA	Trapezoidal Thread	5	2	1	LSA-...-THCA	12.7	3.2
LSNUT-AAAAE-UIAP	UIAP	ACME Thread	5.56	0.6096	1	LSA-...-UIAP	19.05	3.6
LSNUT-AAAAE-TJBA	TJBA	Trapezoidal Thread	6	1	1	LSA-...-TJBA	19.05	3.6
LSNUT-AAAAE-TJCA	TJCA	Trapezoidal Thread	6	2	2	LSA-...-TJCA	19.05	3.6
LSNUT-AAAAE-UKAS	UKAS	ACME Thread	6.35	0.794	1	LSA-...-UKAS	19.05	3.6
LSNUT-AAAAE-UKBN	UKBN	ACME Thread	6.35	1.588	1	LSA-...-UKBN	19.05	3.6
LSNUT-AAAAE-UKDE	UKDE	ACME Thread	6.35	3.175	2	LSA-...-UKDE	19.05	3.6
LSNUT-AAAAE-UKGI	UKGI	ACME Thread	6.35	6.35	4	LSA-...-UKGI	19.05	3.6

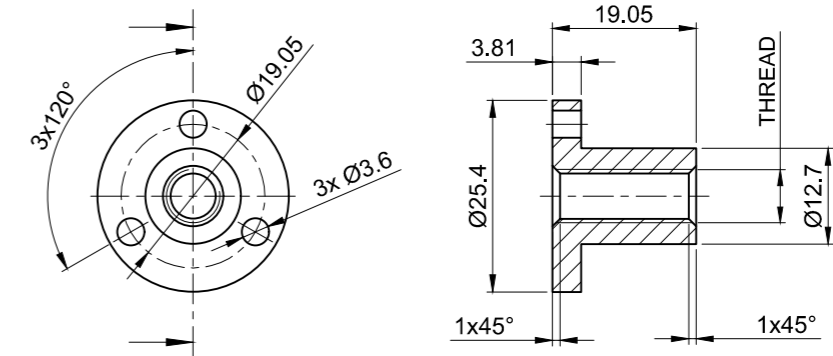
DIMENSIONS (IN MM)

LSNUT NEMA 8/11



DIMENSIONS (IN MM)

LSNUT NEMA 14/17

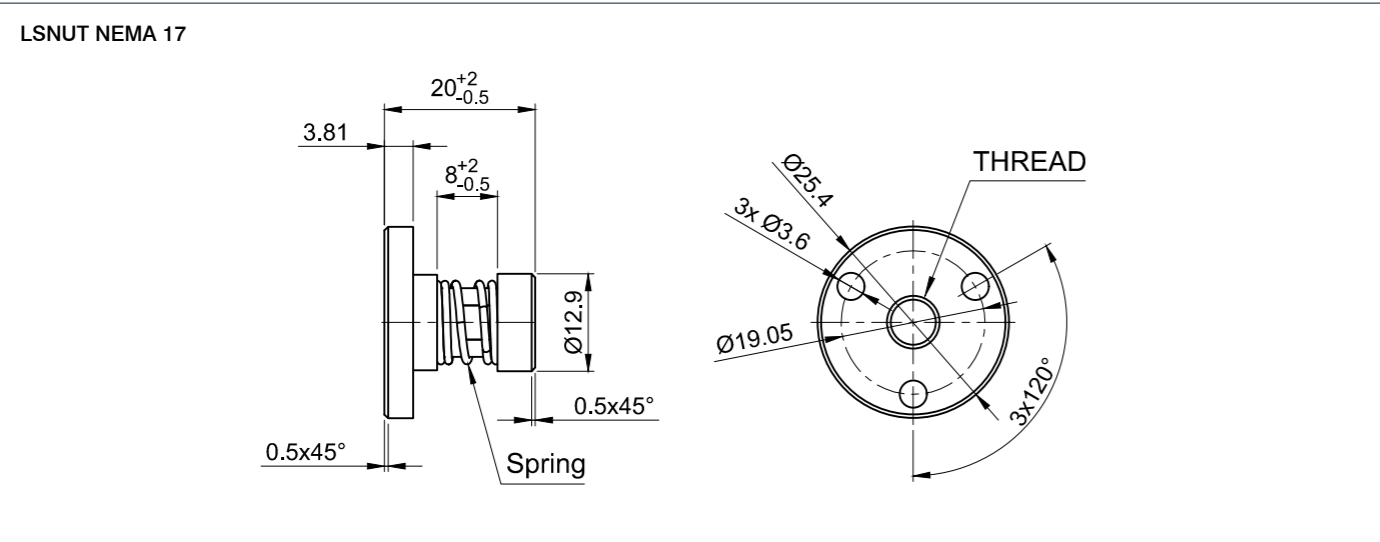




VERSIONS

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

DIMENSIONS (IN MM)

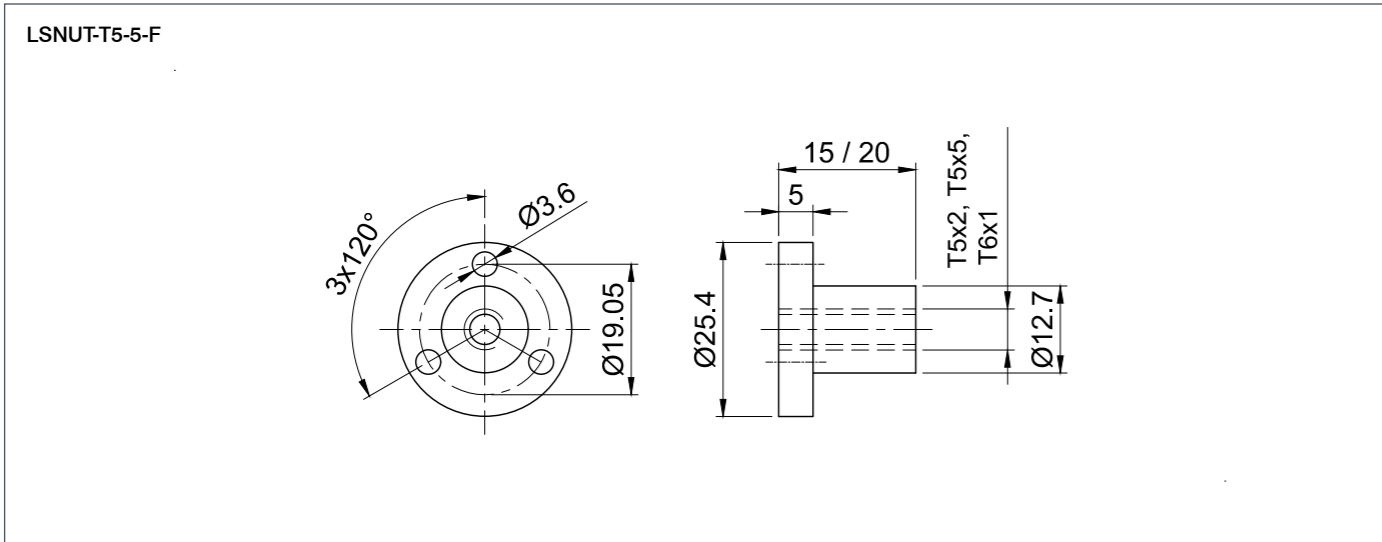




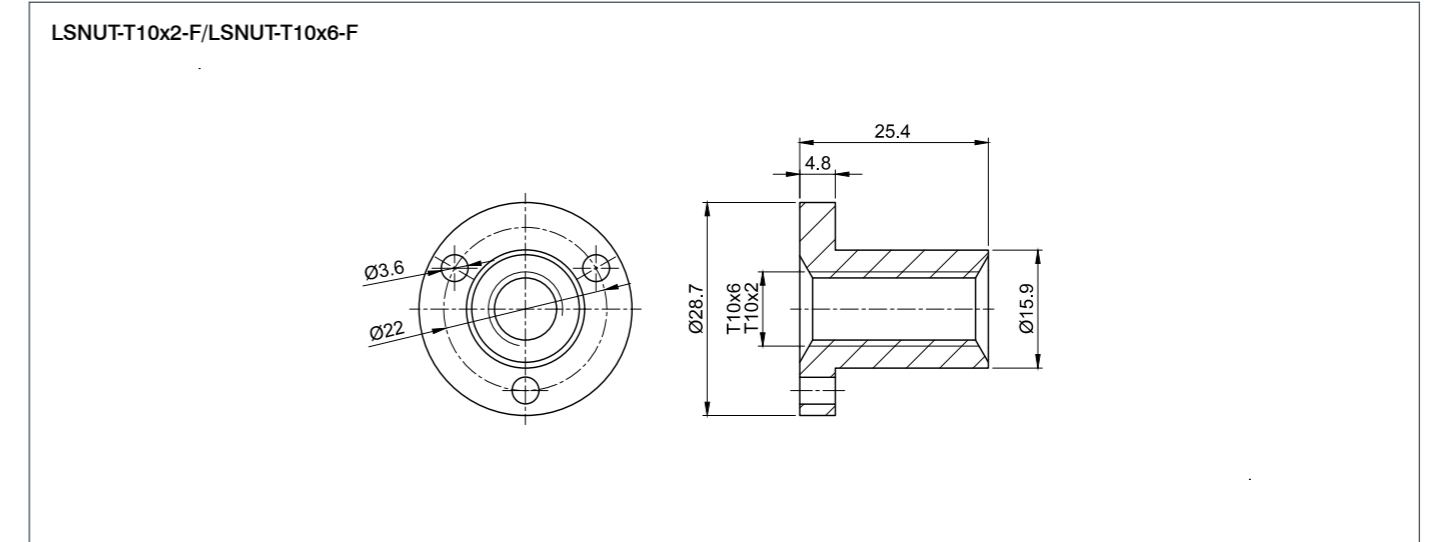
VERSIONS

Type	Thread Type	Thread Diameter mm	Thread Lead mm	Corresponding Motors
LSNUT-T5X5-F	Trapezoidal Thread	5	5	L.....-T5x5
LSNUT-T10X2-F	Trapezoidal Thread	10	2	L.....-T10x2
LSNUT-T10X6-F	Trapezoidal Thread	10	6	L.....-T10x6

DIMENSIONS (IN MM)



DIMENSIONS (IN MM)

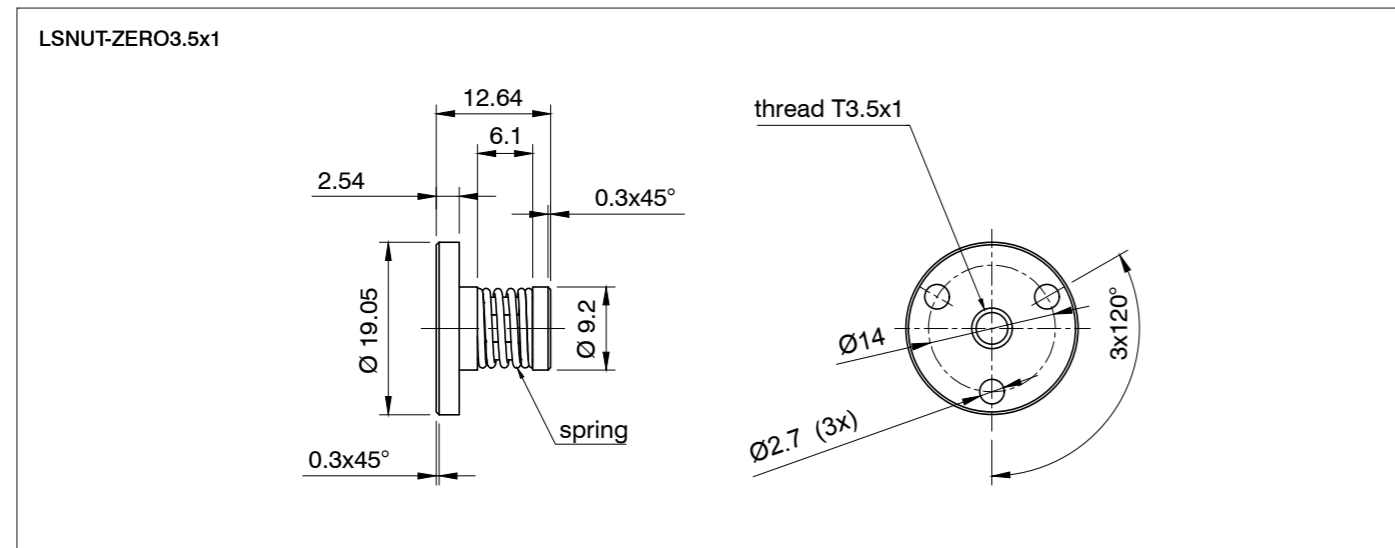




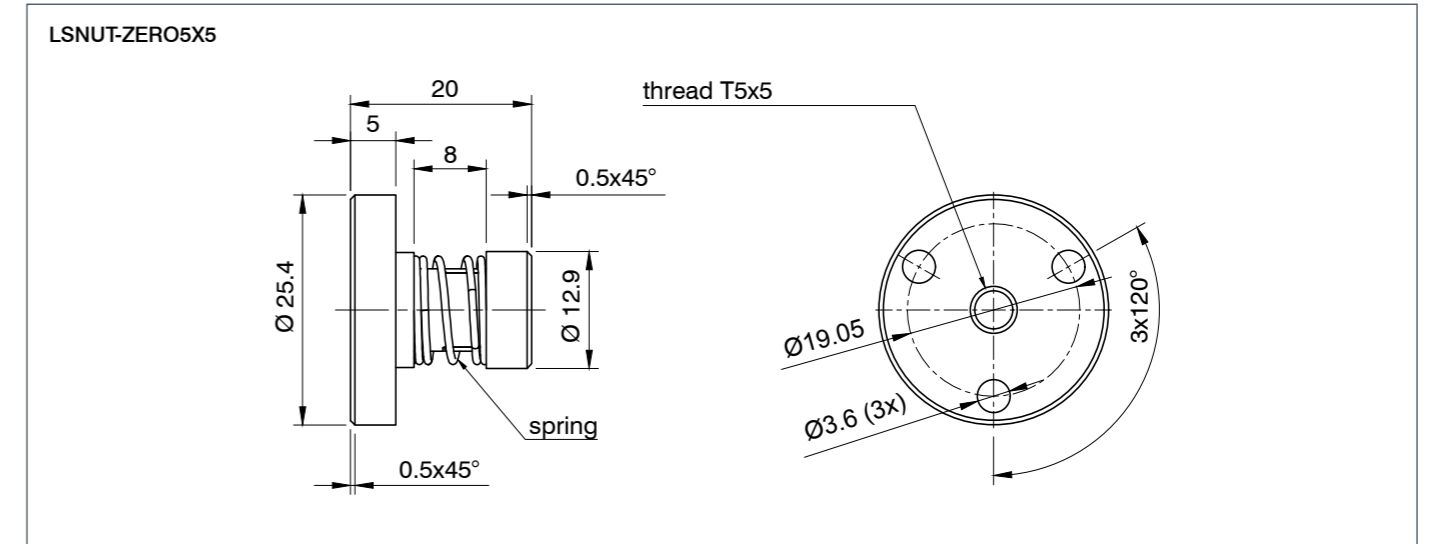
VERSIONS

Type	Thread Type	Thread Diameter mm	Thread Lead mm	Corresponding Motors
LSNUT-ZERO3.5X1	Trapezoidal Thread	3.5	1	L.....-T3.5x1
LSNUT-ZERO5X5	Trapezoidal Thread	5	5	L.....-T5x5

DIMENSIONS (IN MM)



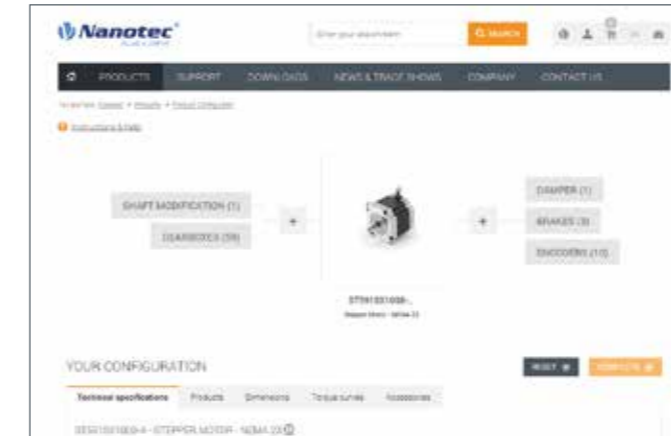
DIMENSIONS (IN MM)



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

- Broad product spectrum
- Rapid and easy selection
- Comprehensive documentation
- Direct ordering

Extensive product information is available directly on the Nanotec website for viewing and downloading. This includes product details such as technical drawings, 3D data, delivery times and parts lists. Find out more at www.nanotec.com



GEARBOXES	MOTORS	BRAKES	ENCODERS



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, I	12000
WEDL5541-B	✓	✓	incremental	1000	phase A, A, B, B, I, 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-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-SMC135
Encoder Cable WEDS 0.3m
ZK-WEDS-5-500
Encoder Cable WEDS 0.5m
ZK-WEDS-5-500-S
Encoder Cable WEDS 0.5m

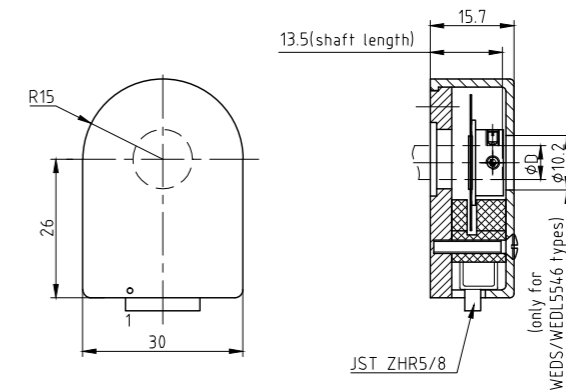


CAUTION

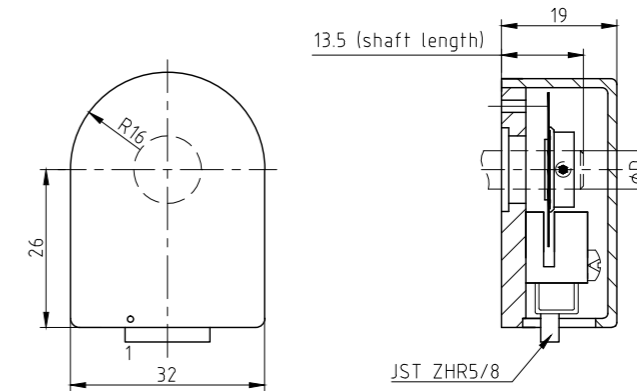
To be able to install the encoder yourself, you will need to order the additional mounting kit. Mounting kits are available on our website.

DIMENSIONS (IN MM)

WEDL-WEDS5541 (500 Ink.)



WEDL-WEDS5541 (1000 Ink.)





TECHNICAL DATA

Output Signals	phase A, A\, B, B\, I, I\
Current Consumption	72, max. 85 mA
Limit Frequency	360 kHz - 720 kHz
Limit Speed	8640 RPM - 10800 RPM
Max. Output Current per Channel	8 mA
Signal Level	low: 3.5 V, min. 2.0 V, high: 3.5 V, min. 2.0 V
Operating Temperature	-25 °C - 100 °C
Output Rise Time	50 ns
Output Fall Time	50 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

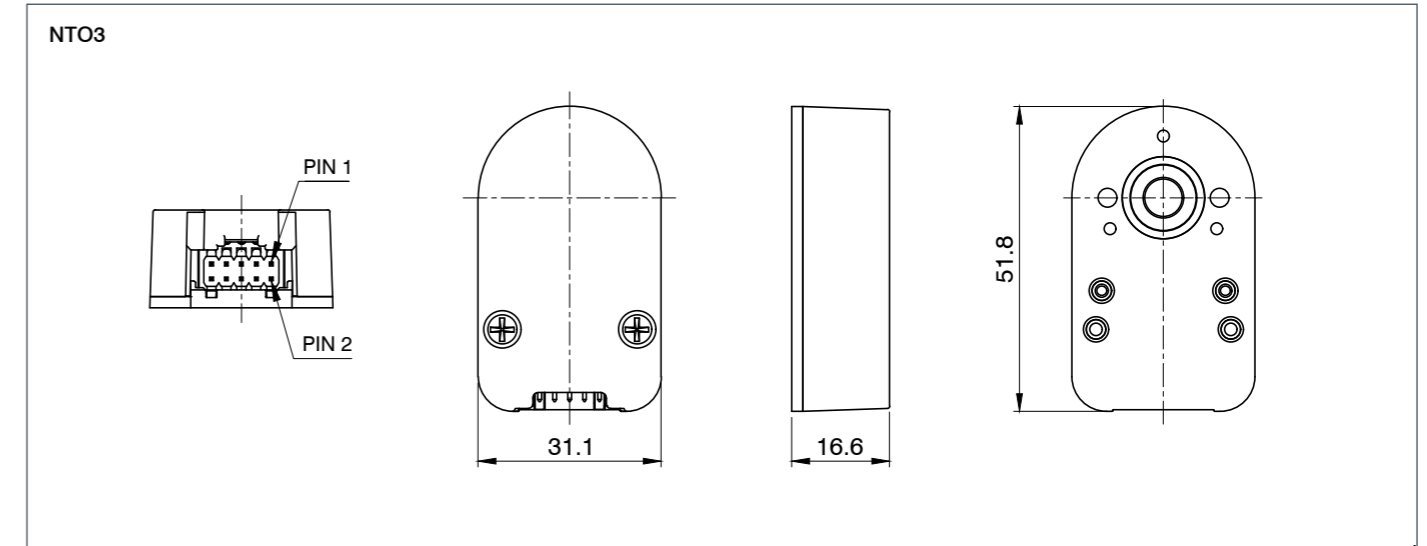


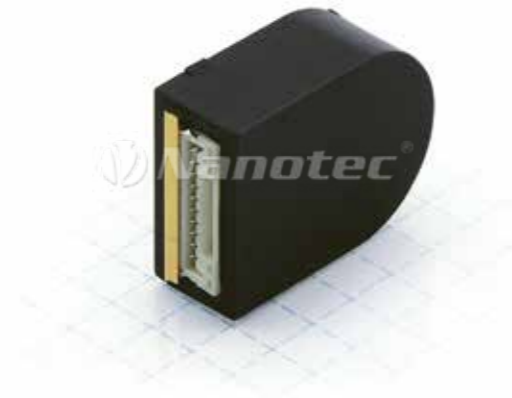
CAUTION



Please note that the encoder is only available in combination with a motor and must be mounted by Nanotec.

DIMENSIONS (IN MM)





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 (@V _{cc} =5 V, V _{out} =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

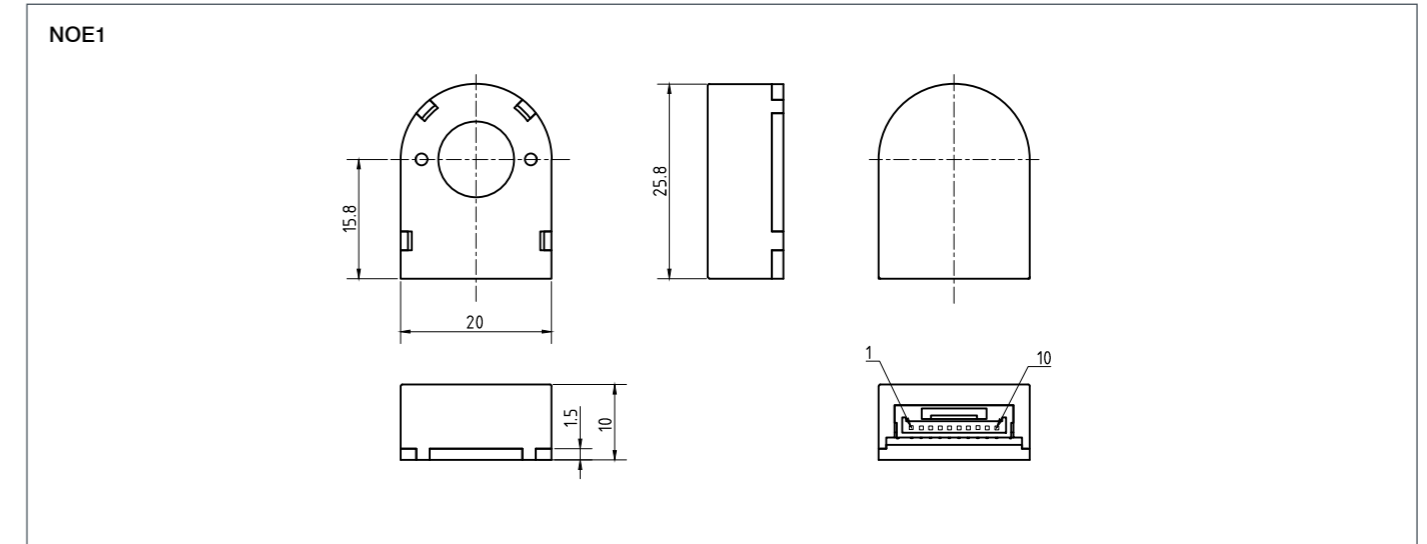
ACCESSORIES

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

CAUTION

Please note that the encoder is only available in combination with a motor and must be mounted by Nanotec.

DIMENSIONS (IN MM)





TECHNICAL DATA

Encoder Signal Type	incremental
Operating Voltage	5 V - 24 V
Output Signals	phase A, A\, B, B\, I, I\
Current Consumption	15 mA - 30 mA
Limit Speed	3600 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	5	60	Low: <2.0 V (@I_load=20 mA), High: 3 V (@I_load=20 mA)
NOE2-05-K	✓	✓	4000	5	240	Low: <2.0 V (@I_load=20 mA), High: 3 V (@I_load=20 mA)
NOE2-24-B	✓	✓	1000	24	60	Low: <2.0 V (@I_load=20 mA), High: VCC-0.2 V (@I_load=20 mA)
NOE2-24-K	✓	✓	4000	24	240	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

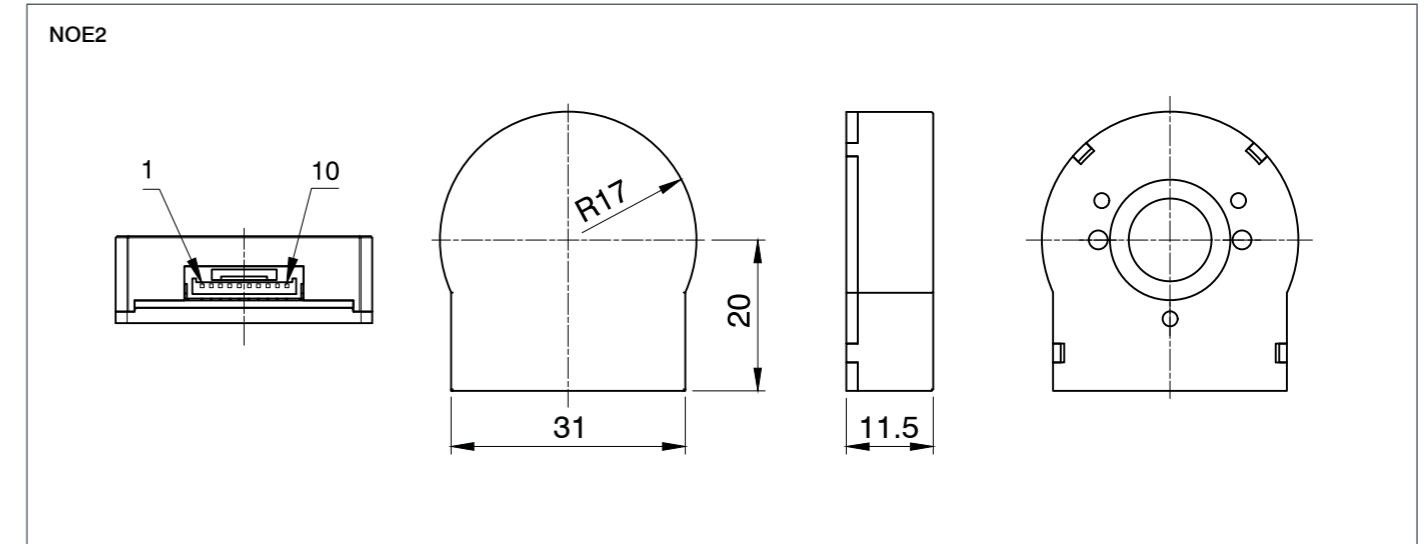


CAUTION



Please note that the encoder is only available in combination with a motor and must be mounted by Nanotec.

DIMENSIONS (IN MM)





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 (@V _{cc} =5 V, V _{out} =3 V), 90 mA (@V _{cc} =24 V, V _{out} =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	5-24	500
NME1-UVW-T14	✓	✓	incremental	1024	5-24	500

ORDER IDENTIFIER

NME1-UVW-T-
06 = 6.35 mm shaft diameter
14 = 5 mm shaft diameter



ACCESSORIES

ZK-NME1-13-500-S
Encoder Cable NME1 0.5m

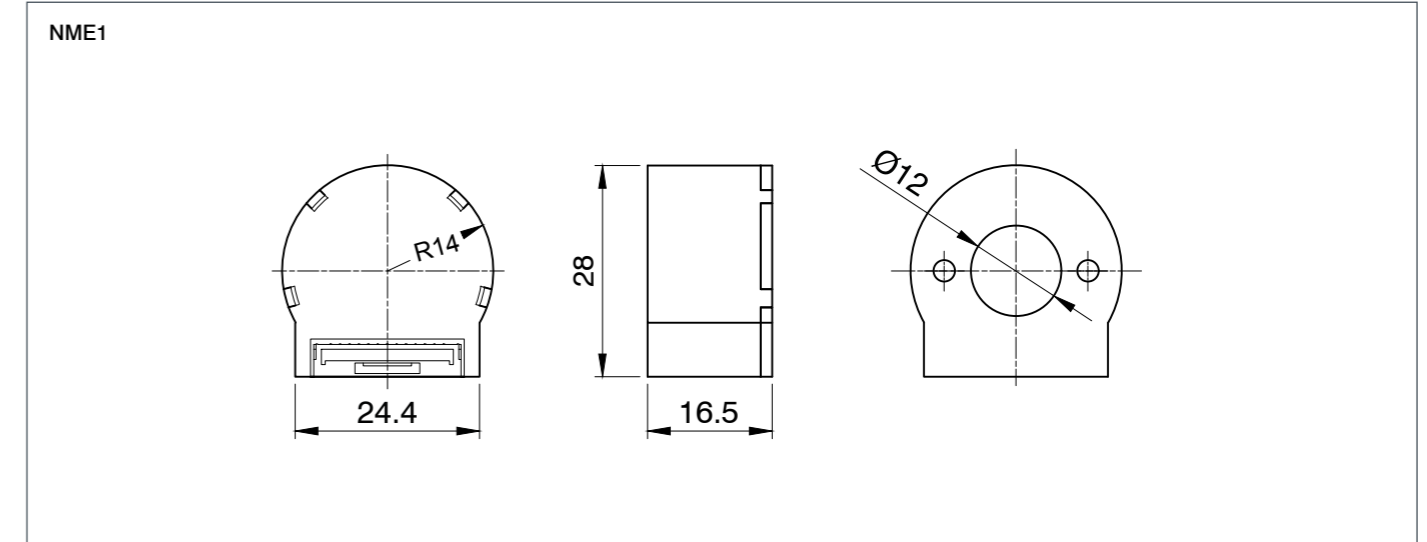


CAUTION



Please note that the encoder is only available in combination with a motor and must be mounted by Nanotec.

DIMENSIONS (IN MM)





TECHNICAL DATA

IP Protection (Except Shaft Output)	IP54
Service Life*	10000
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 mm ²	Admissible Axial Shaft Load N	Admissible Radial Shaft Load N	Length „L“ mm	Weight kg
GP56-S1-3-SR	3	17.5	24.7	4658	29	92	8.5	1302	516	44.6	0.57
GP56-S1-7-SR	7	12.1	26.1	8988	34	92	3.7	1302	516	44.6	0.58
GP56-S1-10-SR	10	3.6	38.2	13000	35	91	3.2	1302	516	44.6	0.59
GP56-S2-11-SR	11	19.2	32.9	4658	31	89	8.4	1302	516	61.8	0.8
GP56-S2-16-SR	16	24.6	39.4	5968	32	89	6.2	1302	516	61.8	0.84
GP56-S2-62-SR	62	18.3	26.1	13000	33	86	3.1	1302	516	61.8	0.82
GP56-T1-3-HR	3	17.5	24.7	4658	29	95	9.6	1532	564	48.8	0.67
GP56-T1-7-HR	7	12.1	26.1	8988	34	95	4	1532	564	48.8	0.67
GP56-T1-10-HR	10	3.6	38.2	13000	35	94	3.3	1532	564	48.8	0.68
GP56-T2-11-HR	11	19.2	32.9	4658	31	94	8.4	1532	564	66	0.89
GP56-T2-16-HR	16	24.6	39.4	5968	32	94	6.3	1532	564	66	0.93
GP56-T2-62-HR	62	18.3	26.1	13000	33	92	3.2	1532	564	66	0.91

ORDER IDENTIFIER

GP56-
 Sx-... = with standard bearing
 Tx-... = with reinforced bearing

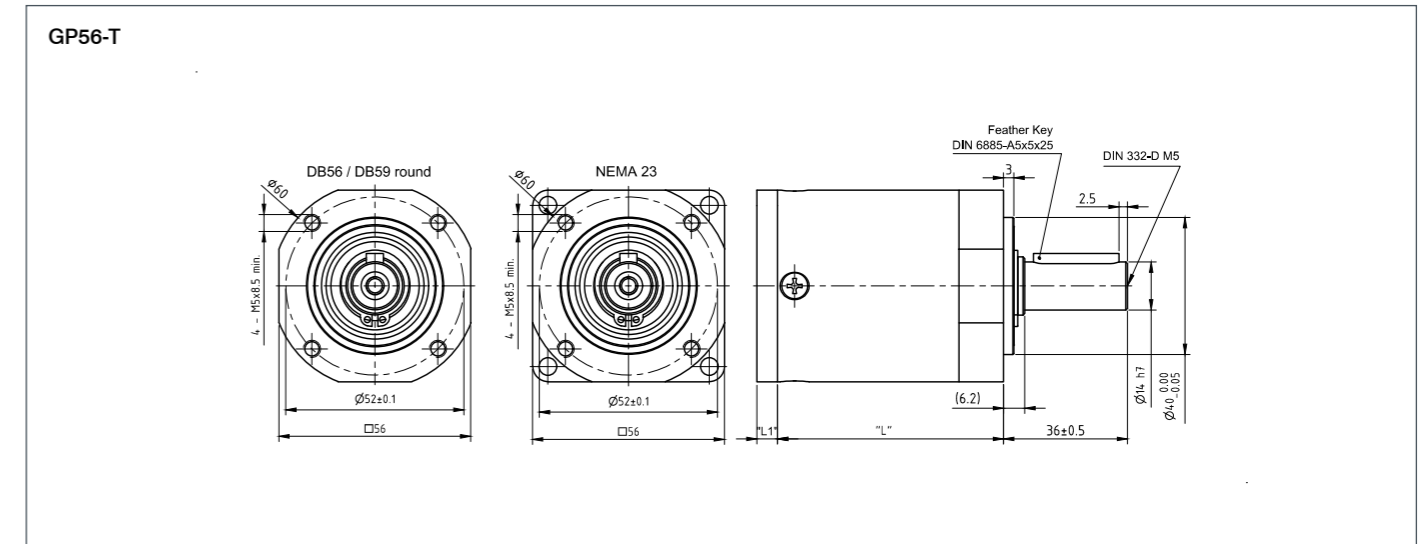
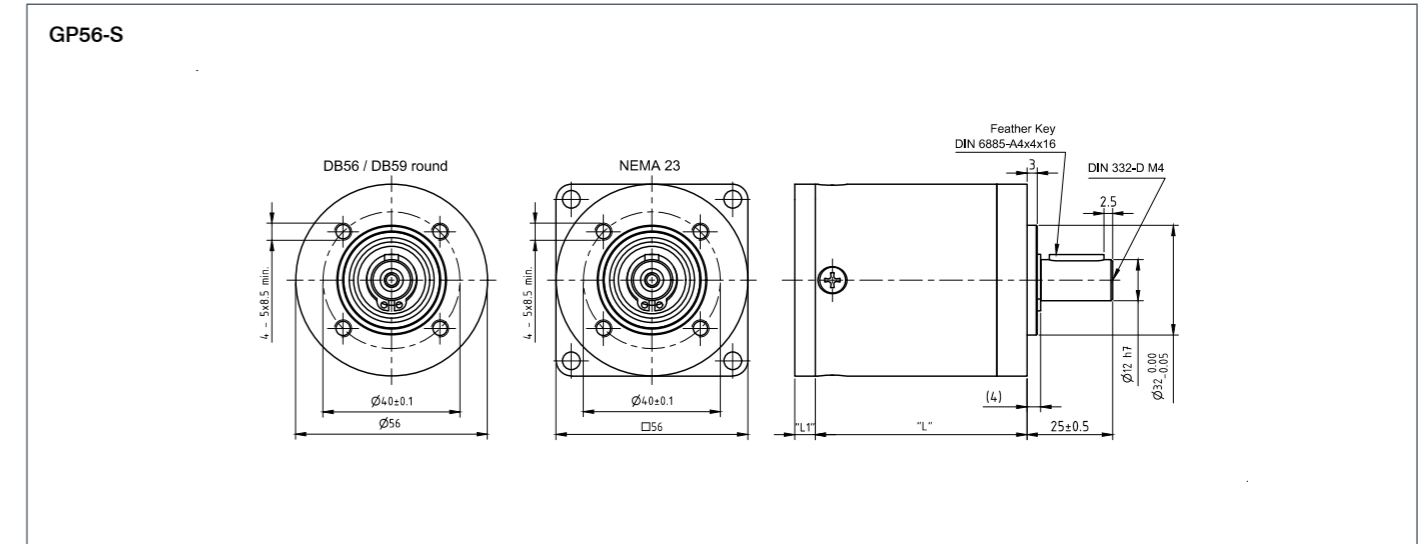


WARNHINWEIS



Please note that the GP gearboxes are only available together with a motor.

DIMENSIONS (IN MM)





CAUTION



Please note that the GPLE22 gearboxes are only available together with a motor.

TECHNICAL DATA

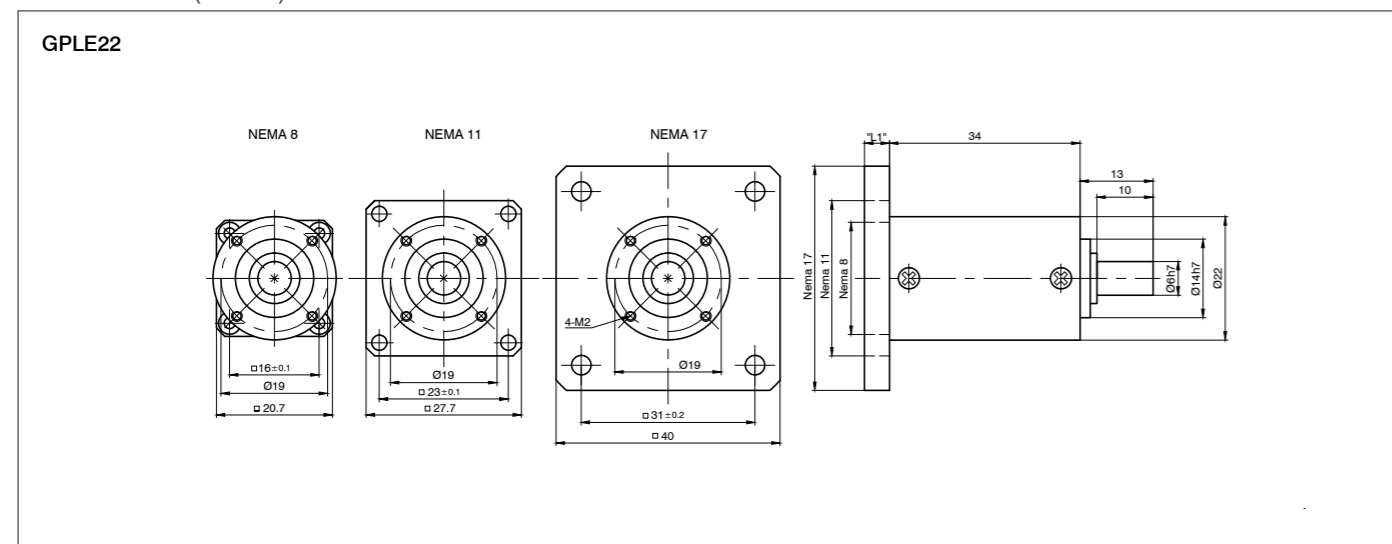
IP Protection (Except Shaft Output)	IP43
Service Life*	10000
For Motor Size	NEMA 8, NEMA 11, NEMA 17
Operating Temperature	-25 to +90 °C
Admissible Axial Shaft Load	20 N
Admissible Radial Shaft Load	20 N
Max. Input Speed	4500 rpm

*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 mm ²	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)





ORDER IDENTIFIER

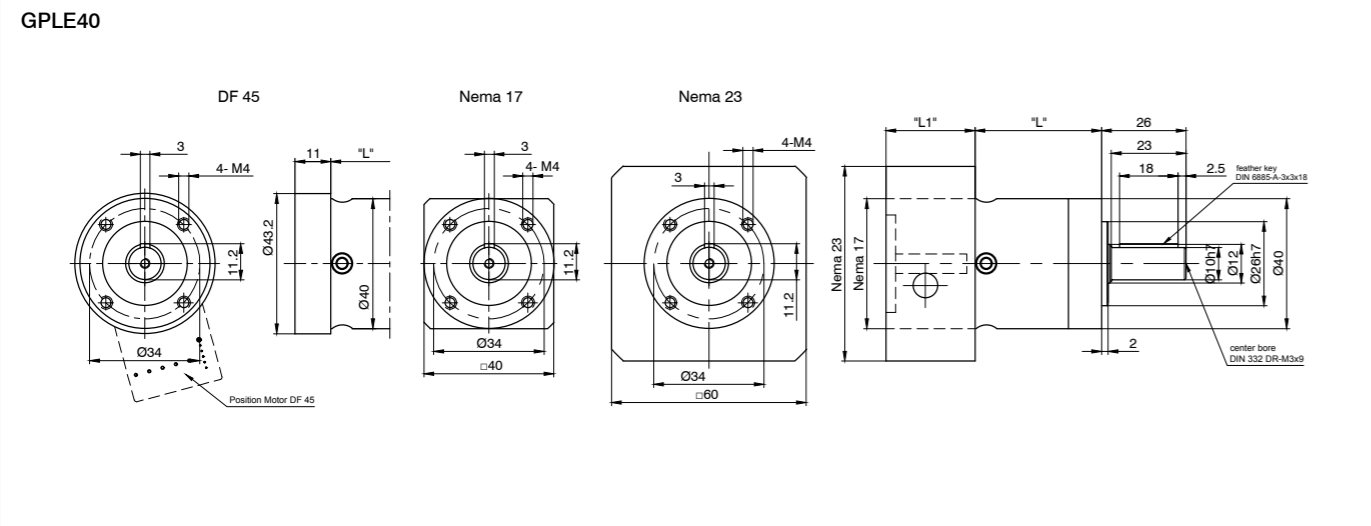
GPLE40-1S-3
= for NEMA 17 motors
-F56 = for NEMA 23, 24 motors

TECHNICAL DATA

IP Protection (Except Shaft Output)	IP54
Service Life*	30000
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.

DIMENSIONS (IN MM)



VERSIONS

Type	Reduction Ratio	Rated Output Torque Nm	Max. Output Torque Nm	Efficiency %	Max. Backlash (arc minutes)	Moment of Inertia kg mm ²	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	1.9	64.5	24.5 - 27.5	0.55
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.

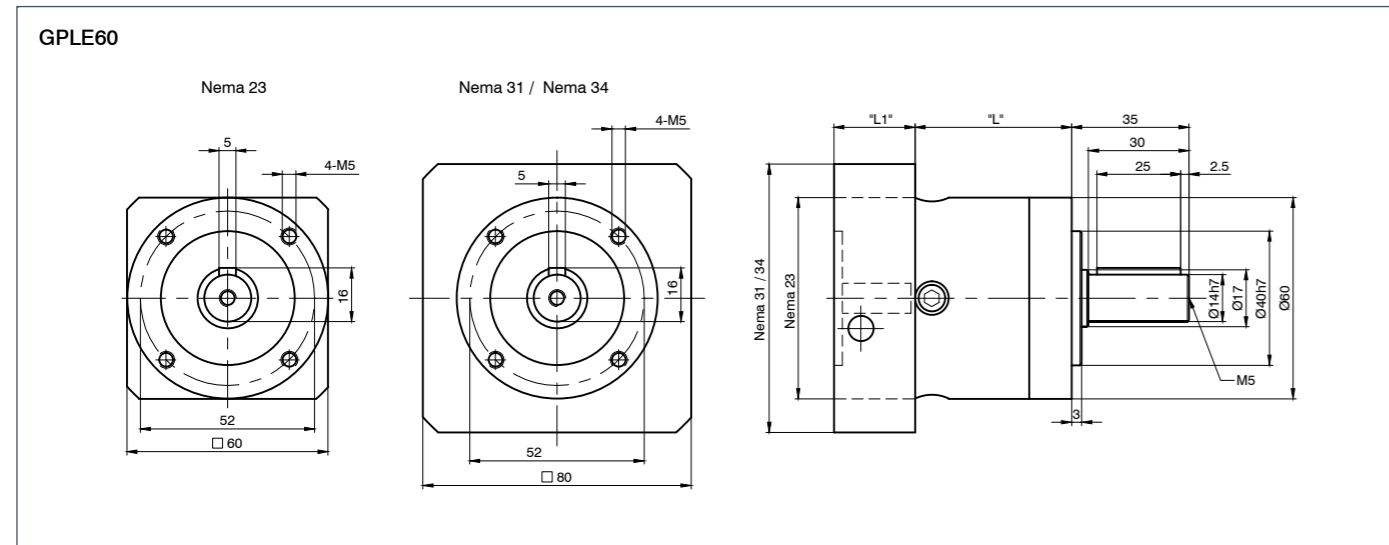


TECHNICAL DATA

IP Protection (Except Shaft Output)	IP54
Service Life*	30000
For Motor Size	NEMA 23, NEMA 24, NEMA 34
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.

DIMENSIONS (IN MM)



ORDER IDENTIFIER

GPLE60-1S-3
= for NEMA 23, 24 motors
-F87 = for NEMA 34 motors



ACCESSORIES

MK-DH-8-11-GPLE Spacer Sleeve



VERSIONS

Type	Reduction Ratio	Rated Output Torque Nm	Max. Output Torque Nm	Efficiency %	Max. Backlash ' (arc minutes)	Moment of Inertia kg mm ²	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
GPLE60-3S-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

GPLE80-1S-3-F87
= for NEMA 34 motors

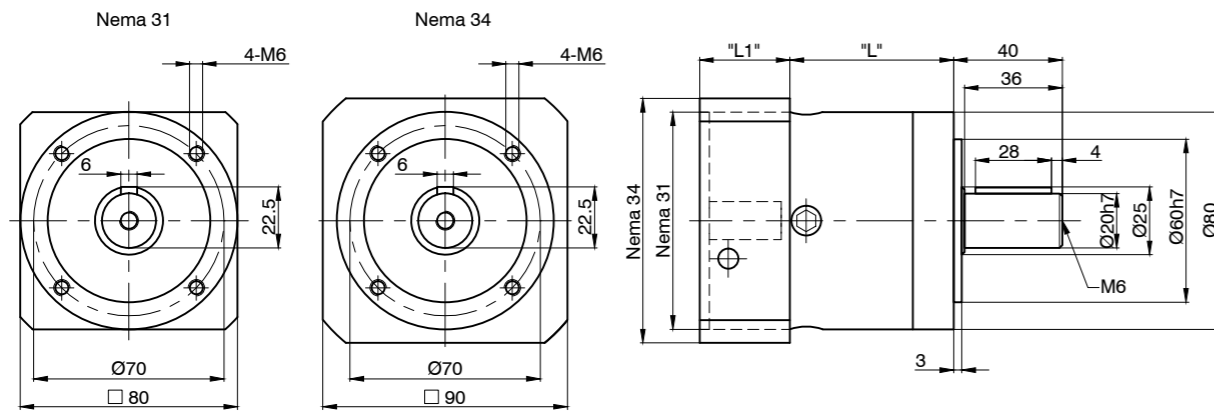
TECHNICAL DATA

IP Protection (Except Shaft Output)	IP54
Service Life*	30000
For Motor Size	NEMA 34
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.

DIMENSIONS (IN MM)

GPLE80



VERSIONS

Type	Reduction Ratio	Rated Output Torque Nm	Max. Output Torque Nm	Efficiency %	Max. Backlash (arc minutes)	Moment of Inertia kg mm ²	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
GPLE80-3S-120	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

GPLEP50

Precision Planetary Gearbox



ACCESSORIES

MK-DH-6,35-8 Spacer Sleeve

TECHNICAL DATA

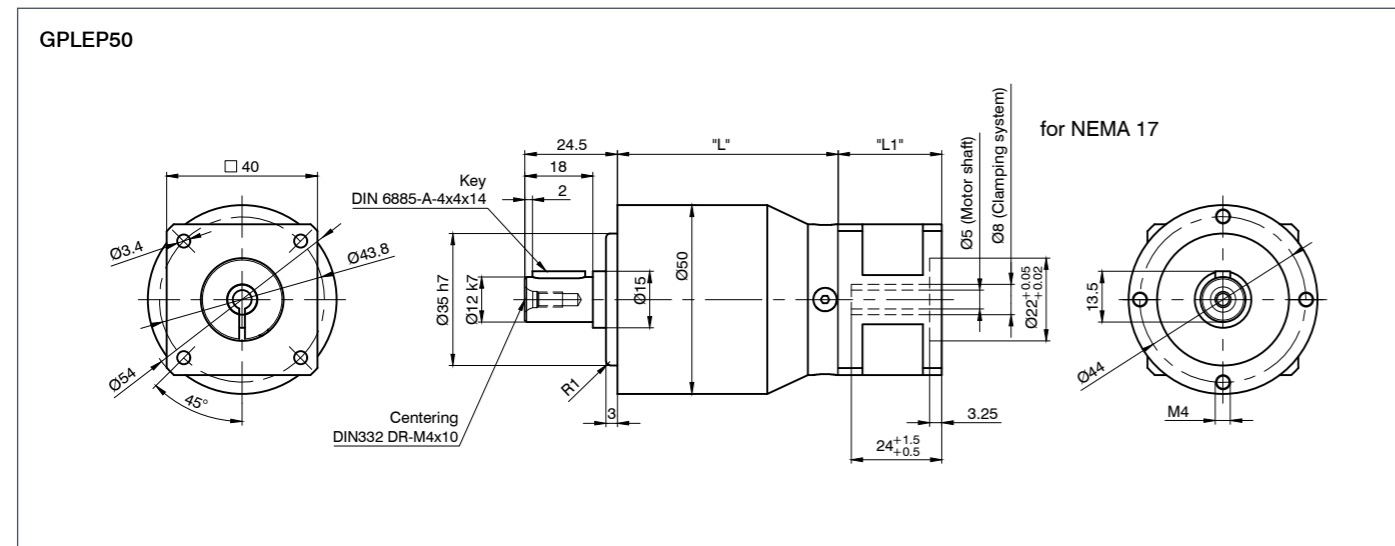
IP Protection (Except Shaft Output)	IP54
Service Life*	30000
For Motor Size	NEMA 17
Operating Temperature	-25 to +90 °C
Admissible Axial Shaft Load	800 N
Admissible Radial Shaft Load	700 N
Max. Input Speed	18000 rpm

*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 mm ²	Length „L“ mm	Flange Length L1 mm	Weight kg
GPLEP50-1S-5	5	13	21	97	15	≤3	46	24	0.7
GPLEP50-1S-10	10	5	8	97	15	≤1.5	46	24	0.7
GPLEP50-2S-25	25	13	21	95	19	≤1.8	48.5	24	0.8

DIMENSIONS (IN MM)



GPLEP70

Precision Planetary Gearbox



ACCESSORIES

MK-DH-8-11-GPLE Spacer Sleeve

TECHNICAL DATA

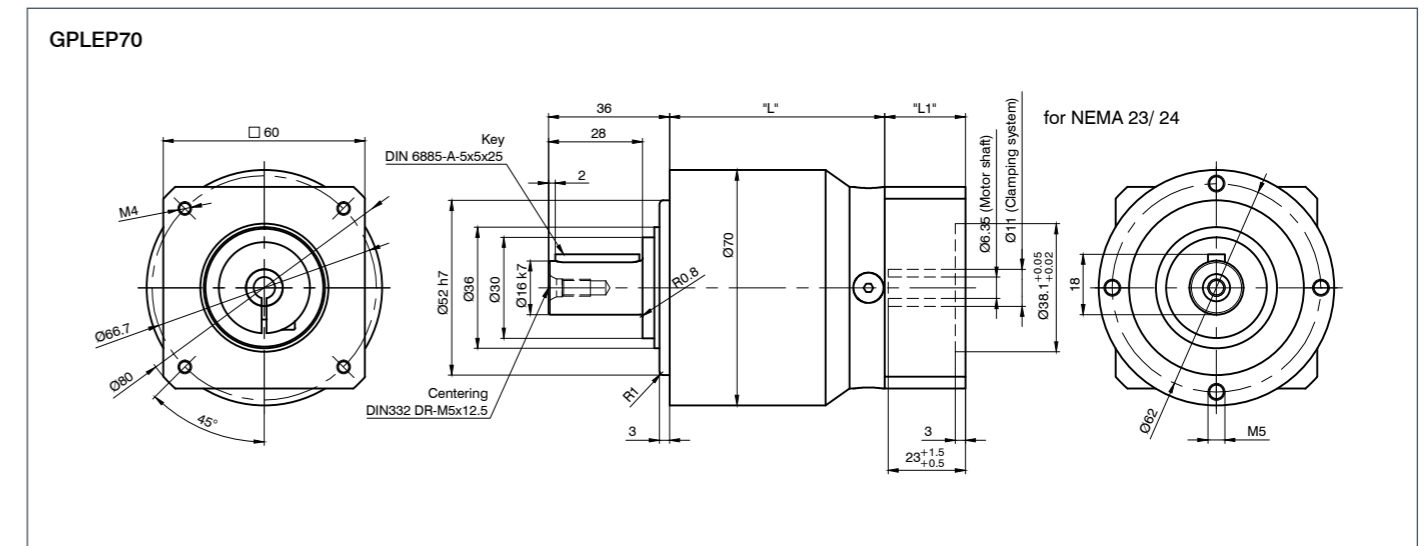
IP Protection (Except Shaft Output)	IP54
Service Life*	30000
For Motor Size	NEMA 23, NEMA 24
Operating Temperature	-25 to +90 °C
Admissible Axial Shaft Load	1000 N
Admissible Radial Shaft Load	900 N
Max. Input Speed	13000 rpm

*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 mm ²	Length „L“ mm	Flange Length L1 mm	Weight kg
GPLEP70-1S-5	5	30	48	97	10	≤17.4	51	23	1.5
GPLEP70-1S-10	10	15	24	97	10	≤17.4	51	23	1.5
GPLEP70-2S-25	25	30	48	95	12	≤12.6	64	23	1.8

DIMENSIONS (IN MM)



GPLEP90

Precision Planetary Gearbox



TECHNICAL DATA

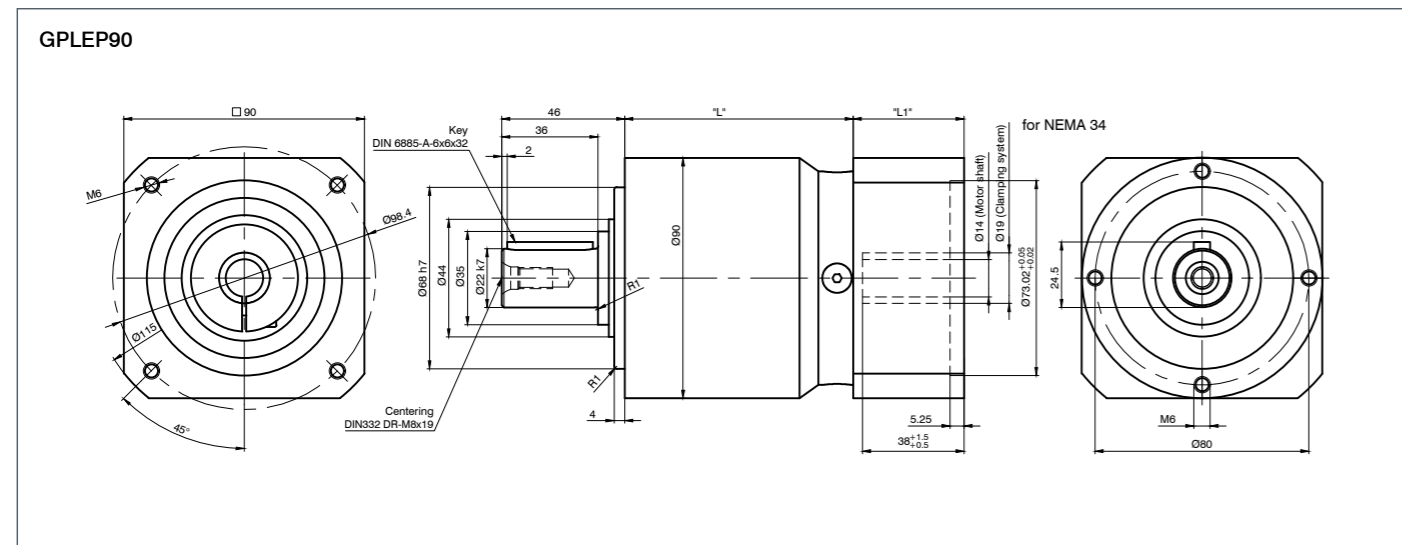
IP Protection (Except Shaft Output)	IP54
Service Life*	30000
For Motor Size	NEMA 34
Operating Temperature	-25 to +90 °C
Admissible Axial Shaft Load	1500 N
Admissible Radial Shaft Load	1700 N
Service Life*	7000 rpm

*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 mm ²	Length „L“ mm	Flange Length L1 mm	Weight kg
GPLEP90-1S-5	5	82	131	97	7	≤78.9	67.5	38	3.1
GPLEP90-1S-10	10	38	61	97	7	≤78.9	67.5	38	3.1
GPLEP90-2S-25	25	82	131	95	9	≤62.6	85.5	38	3.8

DIMENSIONS (IN MM)



GPLEF64

Flange Gearbox



ACCESSORIES

MK-DH-8-11-GPLE Spacer Sleeve

TECHNICAL DATA

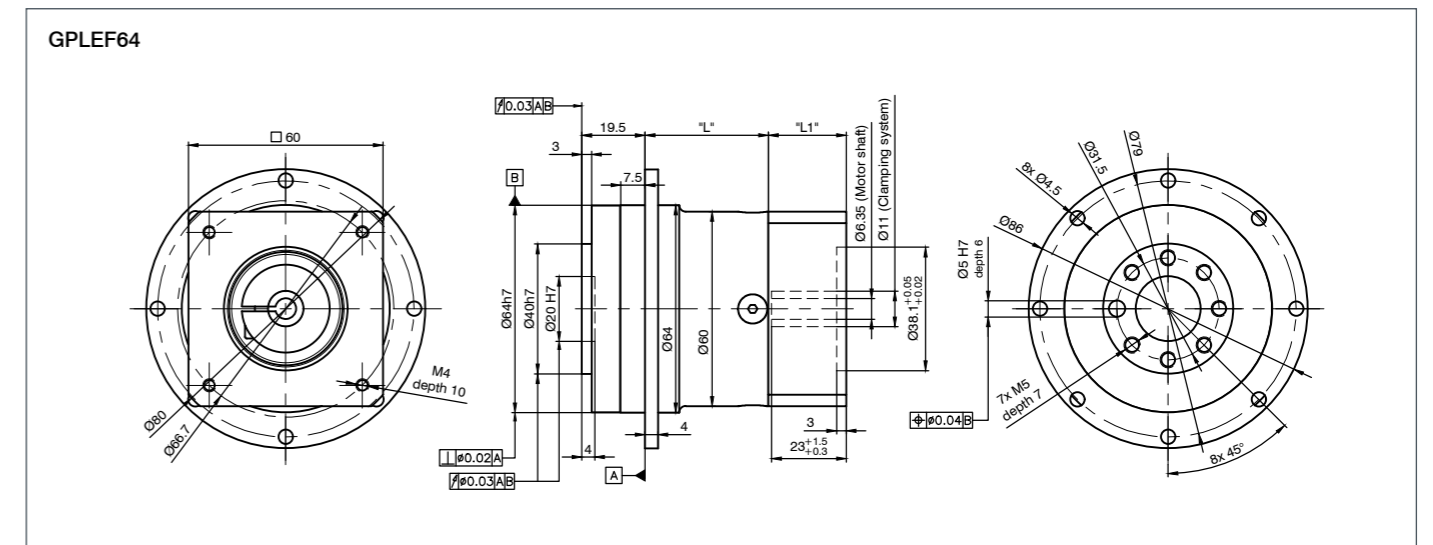
IP Protection (Except Shaft Output)	IP54
Service Life*	30000
For Motor Size	NEMA 23, NEMA 24
Operating Temperature	-25 to +90 °C
Admissible Axial Shaft Load	1200 N
Admissible Radial Shaft Load	500 N
Max. Input Speed	13000 rpm

*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 mm ²	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)





CAUTION



Please note that the GPLK42 gearboxes are only available together with a motor.

TECHNICAL DATA

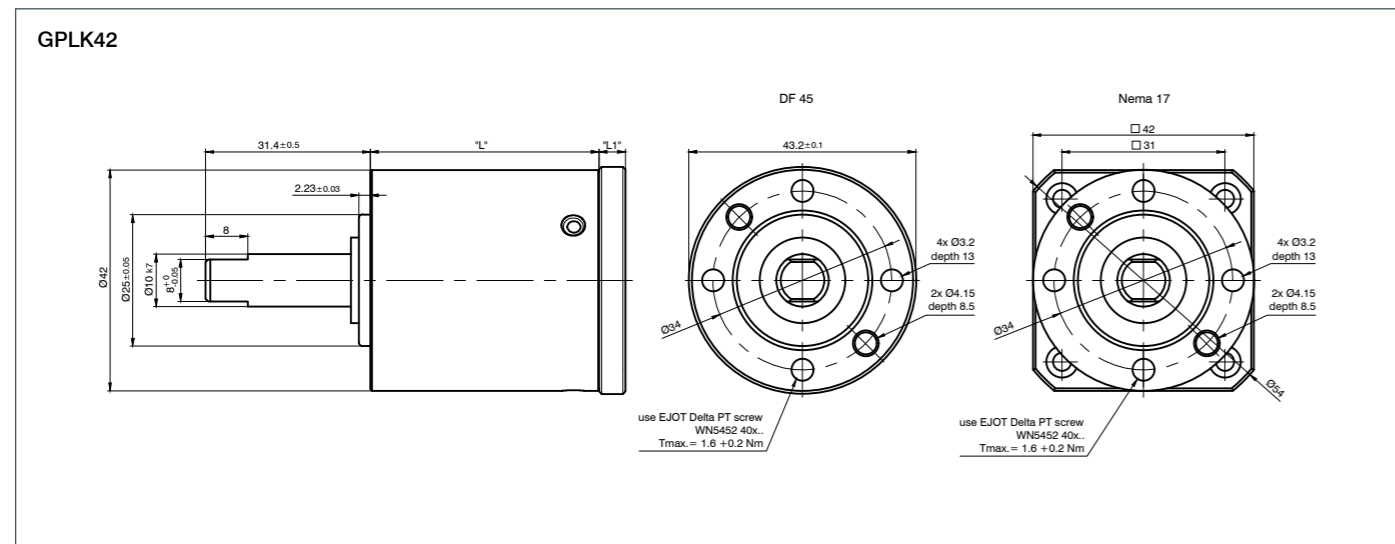
Service Life*	5000
For Motor Size	NEMA 17
Operating Temperature	-15 to +65 °C
Admissible Axial Shaft Load	40 N
Admissible Radial Shaft Load	40 N
Max. Input Speed	5000 rpm

*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	Axial Play mm	Weight kg
GPLK42-4,3	4.25	4	8	75	90	43.5	5	< 0.2	0.145
GPLK42-23	22.66	6	12	70	90	59.3	5	< 0.2	0.175
GPLK42-56	56.25	5	10	70	90	59.3	5	< 0.2	0.175

DIMENSIONS (IN MM)



CAUTION



Please note that the GPLL gearboxes are only available together with a motor.

TECHNICAL DATA

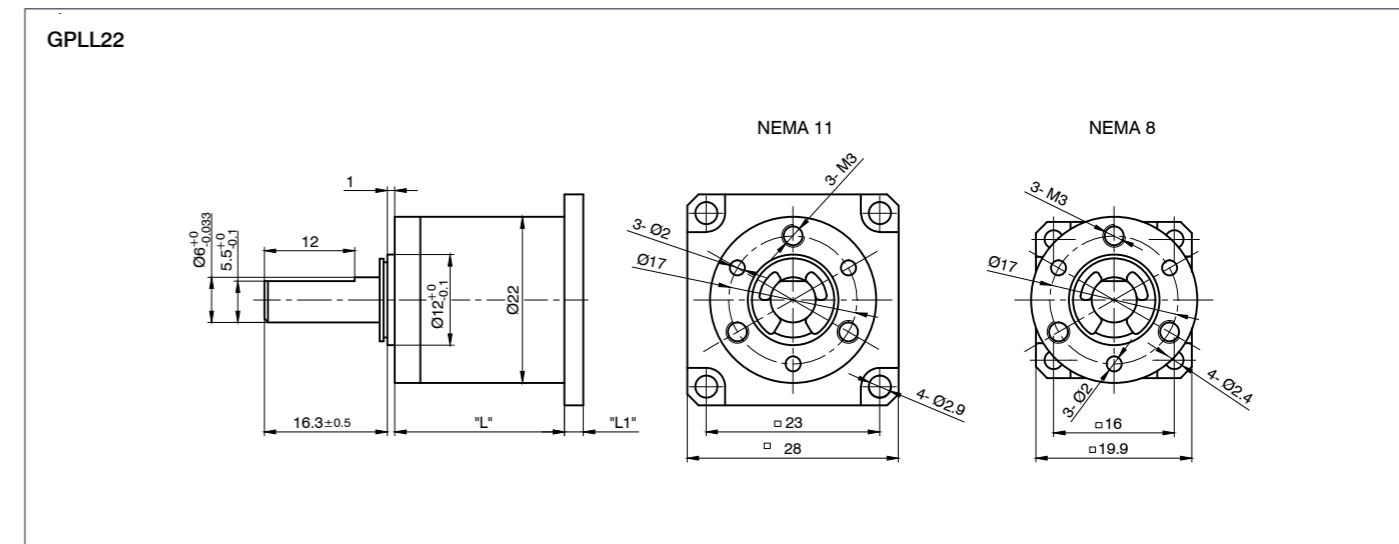
Service Life*	1000
For Motor Size	NEMA 8, NEMA 11
Operating Temperature	-10 to +80 °C
Admissible Axial Shaft Load	7 N
Admissible Radial Shaft Load	10 N
Max. Input Speed	9000 rpm

*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)





CAUTION



Please note that the GPLL gearboxes are only available together with a motor.

TECHNICAL DATA

Service Life*	1000
For Motor Size	NEMA 17
Operating Temperature	-10 to +80 °C
Admissible Axial Shaft Load	30 N
Admissible Radial Shaft Load	50 N
Max. Input Speed	9000 rpm

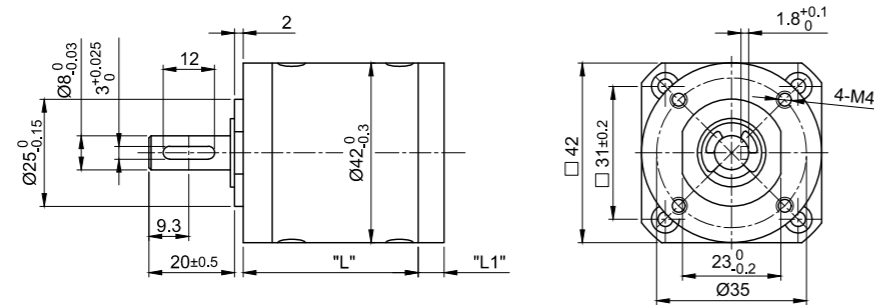
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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
GPLL40-4	4	0.5	1.5	80	180	27.5	5	0.191
GPLL40-14	14	1	3	70	180	34.2	5	0.193
GPLL40-49	49	1.8	5.4	60	180	40.9	5	0.233

DIMENSIONS (IN MM)

GPLL40



CAUTION



Please note that the GPLL gearboxes are only available together with a motor.

TECHNICAL DATA

Service Life*	1000
For Motor Size	NEMA 23, NEMA 24, NEMA 34
Operating Temperature	-10 to +80 °C
Admissible Axial Shaft Load	100 N
Admissible Radial Shaft Load	200 N
Max. Input Speed	9000 rpm

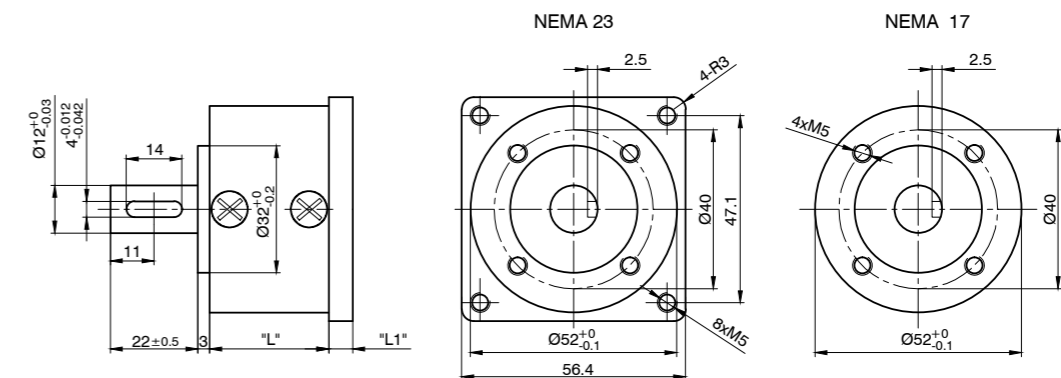
*The estimated service life is an approximate value based on the listed nominal torques and an ambient temperature of 30 °C. There are no data available for differing conditions as the environmental factors and operating conditions may vary greatly.

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
GPLL52-4	4.33	1	3	80	180	47	6	0.475
GPLL52-15	15.16	3	9	70	180	62.5	6	0.66
GPLL52-53	53.08	10	30	60	180	78	6	0.85
GPLL52-100	100.28	10	30	60	180	78	6	0.85

DIMENSIONS (IN MM)

GPLL52





BESCHREIBUNG

Worm gearboxes of the GSGE60 series can be mounted on any stepper motor size 56 x 56 mm (NEMA 23) and on stepper motors of the ST6018 series. They are pre-lubricated at the factory with a high-quality synthetic long-life lubricant and are maintenance free. Due to their high backlash (appr. 1-2 °), worm gearboxes are not suitable for positioning applications.

ACCESSORIES

Double Shaft for GSGE60
Cover for GSGE60



CAUTION



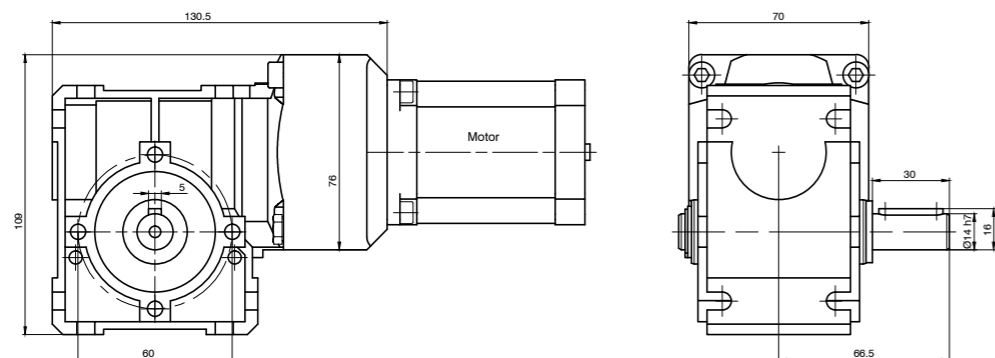
Please note that the GSGE60 gearboxes are only available together with a motor.

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

DIMENSIONS (IN MM)

GSGE60



DESCRIPTION

The worm gearboxes of the GSGE80 series can be mounted on any stepper motor size 86x86 mm (NEMA 34). They are pre-lubricated at the factory with a high-quality synthetic long-life lubricant and are maintenance free. Due to their high backlash (appr. 1-2 °), worm gearboxes are not suitable for positioning applications.

ACCESSORIES

Double Shaft for GSGE80
Cover for GSGE80



CAUTION



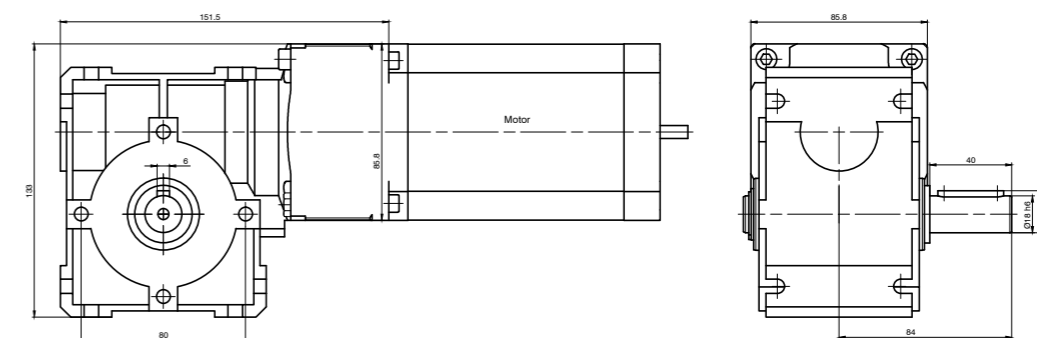
Please note that the GSGE80 gearboxes are only available together with a motor.

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

DIMENSIONS (IN MM)

GSGE80





CAUTION



Do not slow down the motor directly with the brake! In our standard configuration, the brake should only be used as a holding brake. If bought in combination with a motor, the brake must be mounted by Nanotec.

TECHNICAL DATA

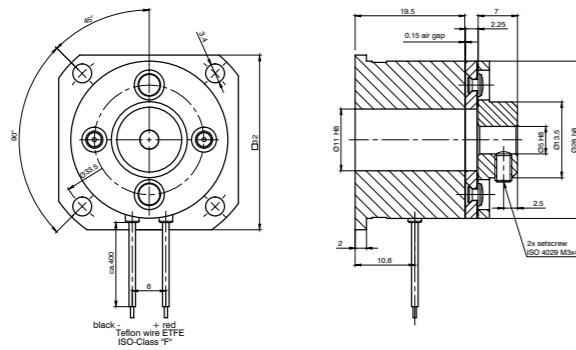
Operating Voltage	24 VDC
Hub	borehole ... H8 with 2 grub screws AM3x4
Fastening	with 4 M3 screws
Connection	leads L=400 mm

VERSIONS

Type	Rated Power W	Holding Torque Ncm	Moment of Inertia kg mm ²	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

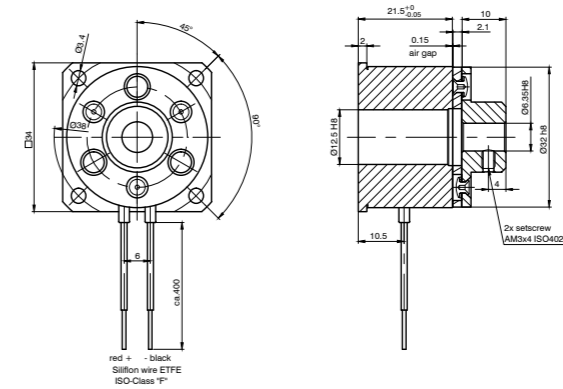
DIMENSIONS (IN MM)

BKE-0.4-5.0



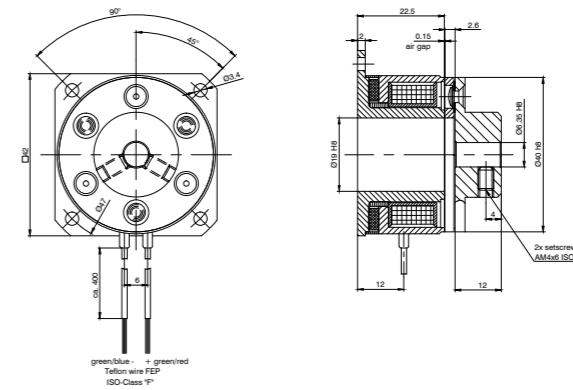
DIMENSIONS (IN MM)

BKE-1.0-6.35



DIMENSIONS (IN MM)

BKE-2.0-6.35





CAUTION

Do not slow down the motor directly with the brake! In our standard configuration, the brake should only be used as a holding brake. If bought in combination with a motor, the brake must be mounted by Nanotec.

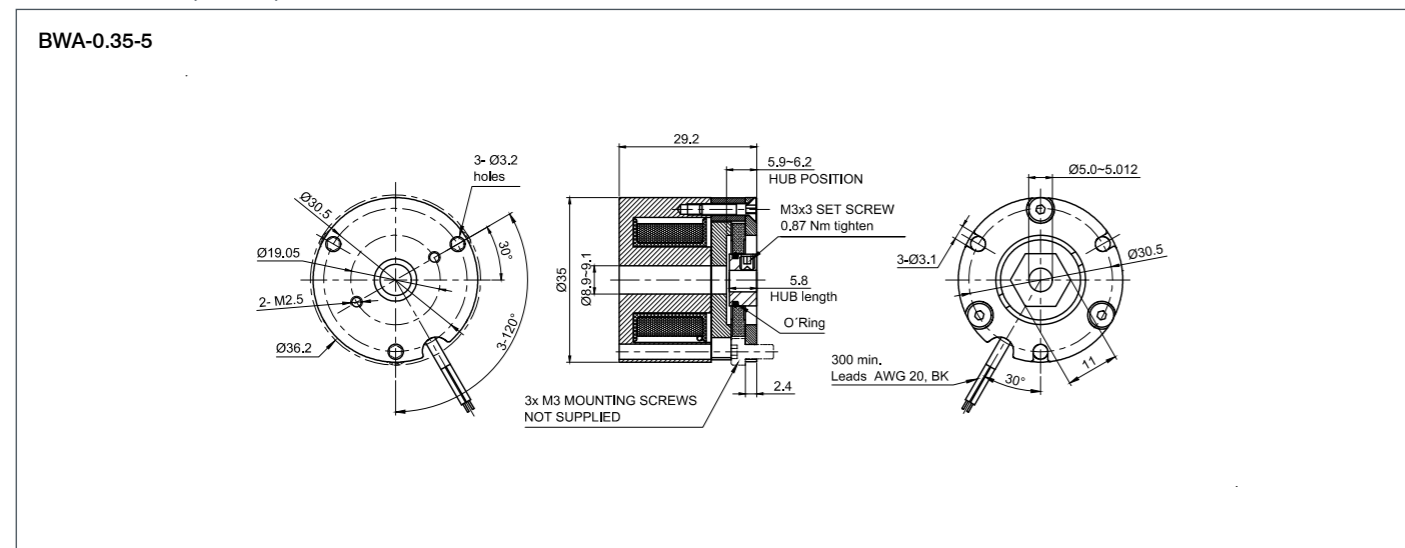
TECHNICAL DATA

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

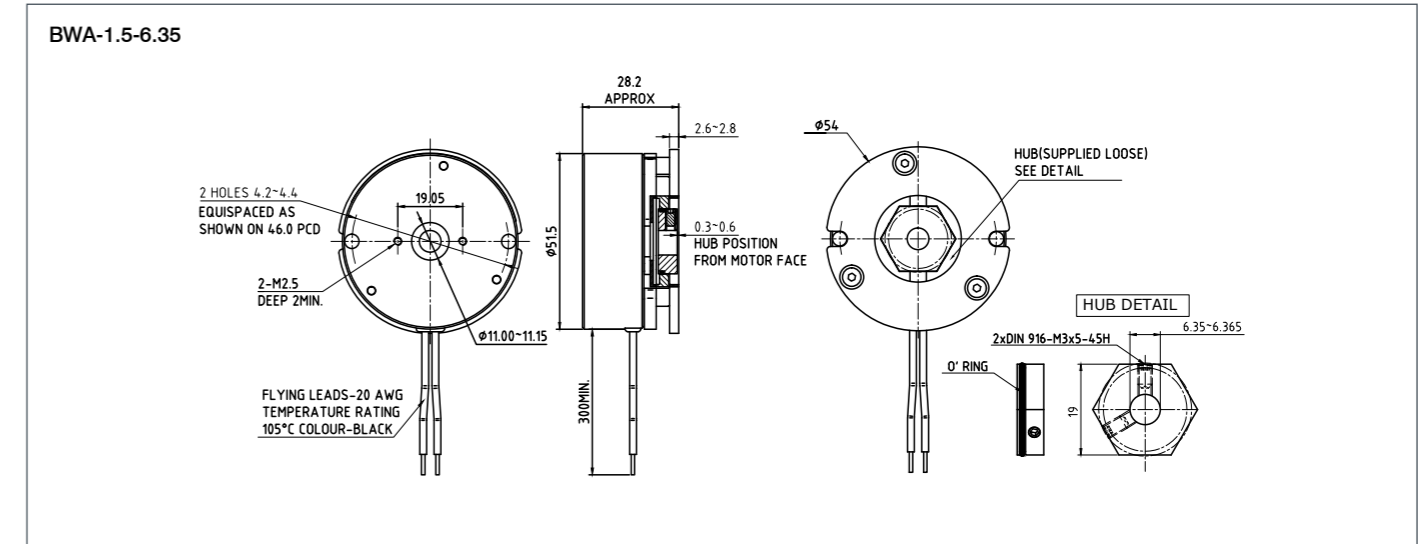
VERSIONS

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)



DIMENSIONS (IN MM)



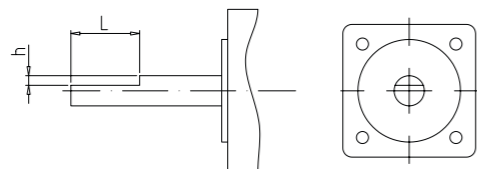
Lined area for notes.



CUSTOM MACHINING

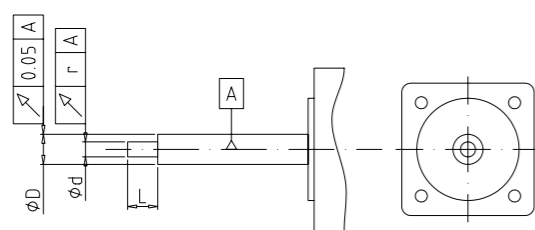
Nanotec also supplies shafts with customer-specific designs for all motors of the ST and DB series as well as IP motors. The tolerances specified below are standard for large order quantities. Please note that these cannot always be adhered to when post-machining motor shafts in small numbers. In addition, when a shaft is subsequently machined, a minimum distance of 3 mm must always be maintained to the surface of the centering flange. Please refer to our website for possible tolerances.

D-CUT



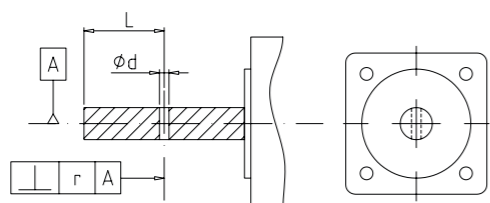
In addition to D-cut, 90° and triangular flattening, we also produce shafts with flat surfaces for setting screws, relief grooves for lock rings and threaded blind holes according to customer specifications. The shaft is flattened to enable simple and form-fitting fixation and to effectively prevent the load from rotating.

MACHINED SHAFT/THINNER SHAFT



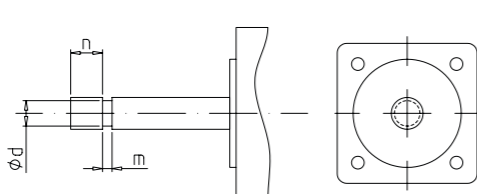
Machined shafts are used primarily to attach transmission elements with smaller bore diameters directly onto the motor shaft. Additional machining is possible even if for small quantities.

SIDE-DRILLED HOLE



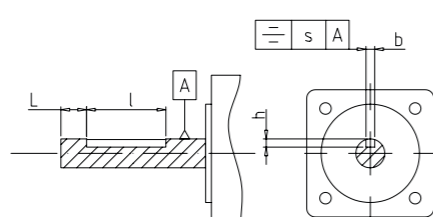
Side-drilled holes can be used to securely attach clamping pins in order to meet the high directional and load change requirements of transmission elements.

GROOVE



Shaft grooves on motors are used for comfortably attaching safety disks that axially fix timing pulleys, spur gears, etc.

KEYWAY



Systems that are subject to high load and directional changes benefit from shafts with keyways that provide reliable rotation protection.

ACCESSORIES/GEAR WHEELS

TIMING PULLEY



Nanotec supplies synchronous pulleys in metric and imperial dimensions, with and without a hub or tapered adapter sleeve, and with a variety of tooth profiles, forms and pitches.

SHAFT WITH METRIC THREAD



Shafts with a metric thread are an ideal solution for rotating elements and linear low-speed positioning drives.

TOOTHED SHAFT



Motors with toothed shafts are used for easy mounting on existing gears, etc.

CLAMPING BOLT



Clamping bolts provide secure clamping with a relatively large displacement path and high clamping force. When space is restricted, they can also be used for automatic adjustment.

BRASS OR STEEL INPUT PINION



Motors with a pinion on the motor shaft are used for mounting on existing gears.

WORM GEARS



Motors with a mounted worm gear can be installed at a 90° angle to the load and thus provide a large reduction ratio in a very limited space. Their efficiency is between 30 and 70%, depending on the reduction ratio.

MODIFICATIONS IN QUANTITY

Nanotec offers machining for all motors of the ST and DB series as well as motors with protection class and brushless DC motors with integrated controller. Depending on the complexity of the machining a minimum order quantity between 100 and 1000 pcs is required.

LARGER SHAFT



Larger or thicker shafts are primarily used for high radial forces.

SPECIAL SHAFT FORMS



With square or hexagonal shafts, systems can be easily and quickly adapted to various tools and other equipment during manual or motorized adjustments.

HOLLOW SHAFT



Hollow shafts make it possible to pass cables, hoses, screws and laser beams through them.

TIMING BELT



Shafts with timing belts are very smooth running while exhibiting low belt tension and low bearing load.



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, SMC133	1.5
ZK-VHR-3-500	CL4-E-2 (Power)	0.5
ZK-VHR-4-500	CL4-E-2 (Motor)	0.5
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



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, NME1	0.5	✓	Adapter Cable
ZK-NME1-13-500-S	NME1	0.5	✓	Free Cable Ends
ZK-NOE-10-500-S-PADP	C5-E, N5, NME1	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-NT03-10-500-S	NT03	0.5	✓	Free Cable Ends
ZK-NT03-10-500-PADP	C5-E, N5, NT03	0.5	✓	Adapter Cable
ZK-NT03-10-1000-S	NT03	1	✓	Free Cable Ends
ZK-NT03-10-1000-PADP	C5-E, N5, NT03	1	✓	Adapter Cable
ZK-PADP-12-500-S	C5-E, N5	0.5	✓	Free Cable Ends
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



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	✓



VERSIONS

Type	Number of Poles	Cable Length m	Connector Type	Shielding	Suitable for
ZK-M12-5-2M-1-AFF	5	2	Straight	✓	AS28, AS41, AS59, PD4-E, PD4-EB
ZK-M12-5-2M-2-AFF	5	2	Angled	✓	AS28, AS41, AS59, PD2-N-IP, PD4-N-IP
ZK-M12-5-5M-1-AFF	5	5	Straight	✓	AS28, AS41, AS59
ZK-M12-5-5M-2-AFF	5	5	Angled	✓	AS28, AS41, AS59, PD2-N-IP, PD4-N-IP
ZK-M12-8-2M-1-AFF	8	2	Straight	✓	AS41, AS59
ZK-M12-8-2M-2-AFF	8	2	Angled	✓	AS41, AS59
ZK-M12-8-5M-1-AFF	8	5	Straight	✓	AS41, AS59
ZK-M12-8-5M-2-AFF	8	5	Angled	✓	AS41, AS59
ZK-M12-12-2M-1-AFF	12	2	Straight	✓	AS89, ASB42, ASB87, PD4-E, PD4-EB
ZK-M12-5-2M-1-B-S	5	2	Straight	✓	PD4-E, PD4-EB
ZK-M12-5-2M-1-A-S-M	5	2	Straight	✓	PD4-E, PD4-EB
ZK-M12-4-2M-1-D-RJ45	4	2	Straight	✓	PD4-E, PD4-EB
ZK-M12-8-2M-2-PADP	8	2	Angled	✓	AS41, AS59
ZK-M12-12-2M-2-PADP	12	2	Angled	✓	ASB42, ASB87
ZK-M12M-M8F-5-200-S	5	0.2	Straight	✓	PD2-C-IP, PD2-CB-IP, PD4-E, PD4-EB
ZK-M12M-M12F-5-500-S	5	5	Straight	✓	PD4-E, PD4-EB
ZK-M12-17-1M-2-S-FIN	17	1.5	Angled	✓	PD2-N-IP, PD4-N-IP



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



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



DESCRIPTION

The D28, D40 and D56 dampers can be mounted on all stepper motors with a double shaft (size 28-59 mm). Apart from the improved settling time, system resonance is suppressed and vibration and motor noise in the lower speed range are greatly reduced.

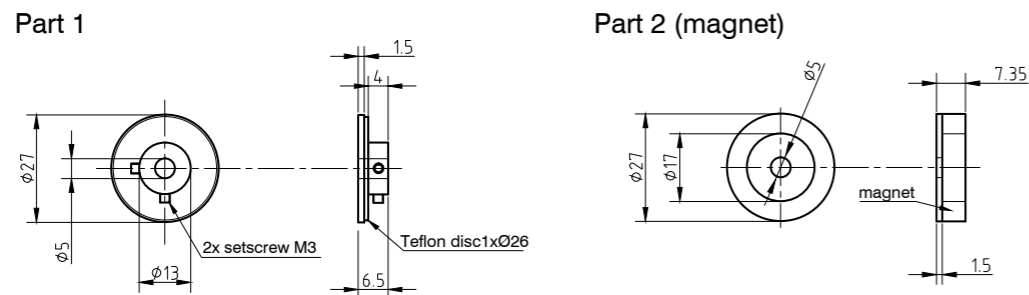
In case of device-specific resonance and noise problems, putting the motor into operation is made considerably easier by using a damper.

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

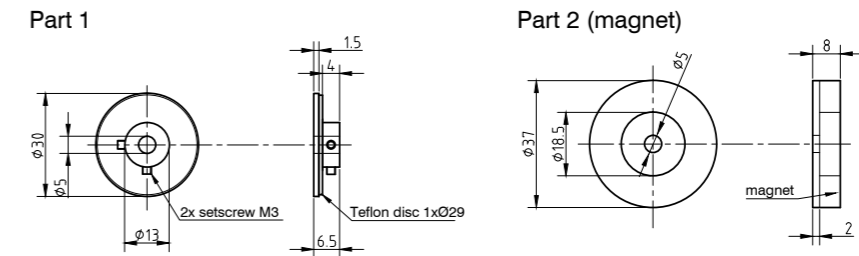
DIMENSIONS (IN MM)

ZD-D28

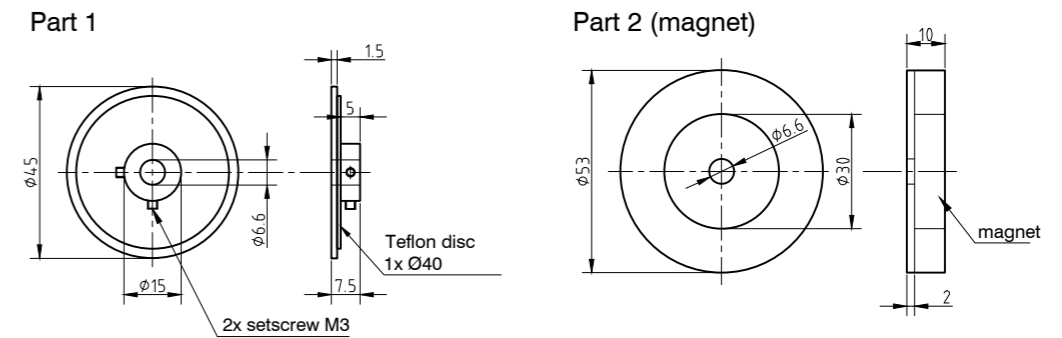


DIMENSIONS (IN MM)

ZD-D40



ZD-D56





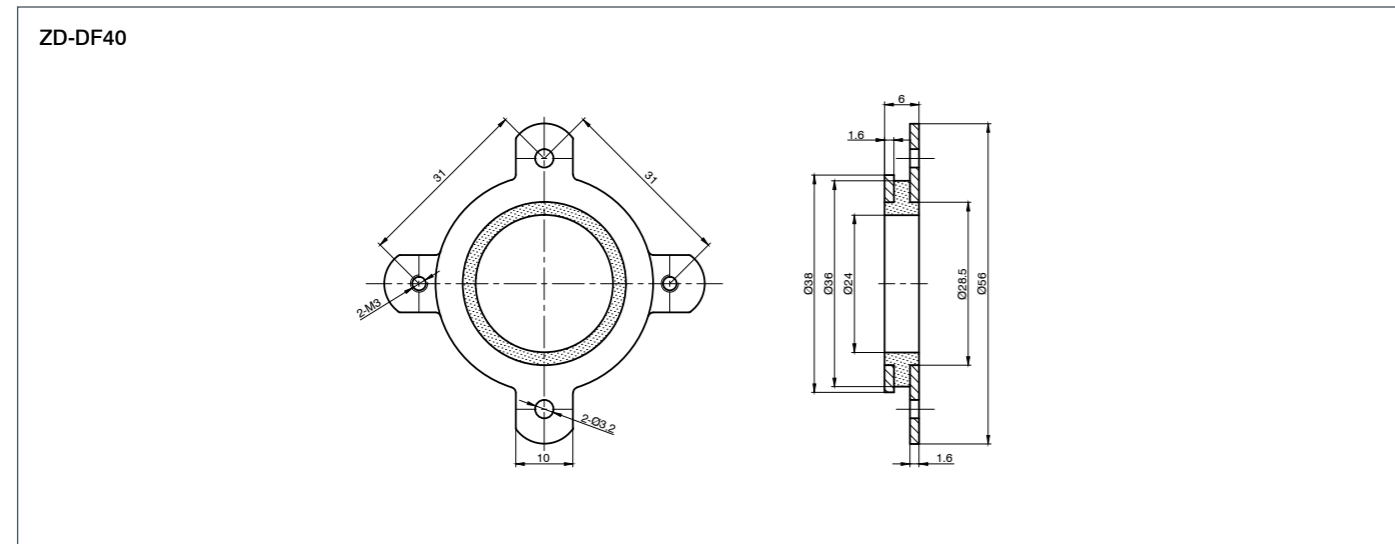
DESCRIPTION

Between the two flange rings, the ZD-DF damper has a layer of vulcanized-on rubber for suppressing body-borne sound, which can be reduced by approx. 3-10 dB(A), depending on the frequency. Owing to the different sound velocity of steel/air/rubber (5000/331/50 m/s) as well as its damping oscillation tendency, the ZD-DF... damper provides a low-cost noise damping solution.

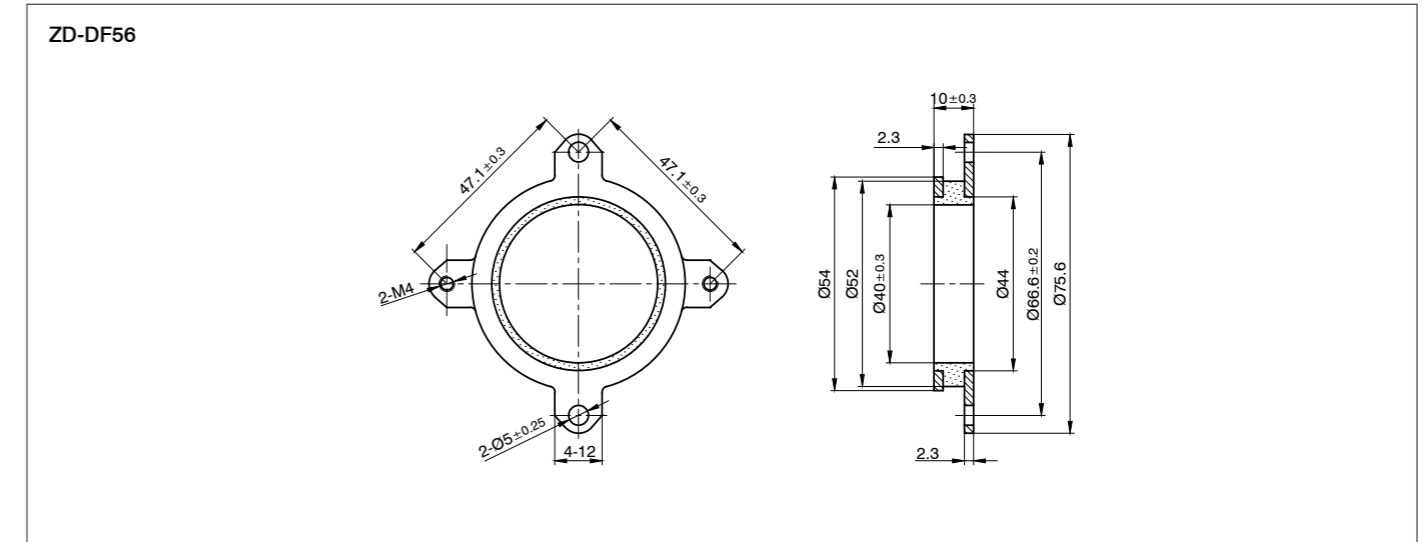
VERSIONS

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

DIMENSIONS (IN MM)



DIMENSIONS (IN MM)



Charging Capacitor

for Controllers/Drives and Motors with Integrated Controllers



DESCRIPTION

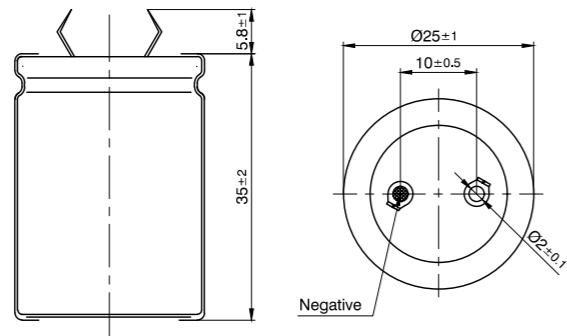
The capacitor Z-K4700/50 is designed for a phase current below 5 A, whereas the Z-K10000/100 capacitor is designed for phase currents above 5 A.

VERSIONS

Type	Capacity μF	Lead mm	Capacitance Tolerance	Temperature Range $^{\circ}\text{C}$	Max. Operating Voltage V	Dimensions
Z-K4700/50	4700	10	$\pm 20\%$	-40 - 85	50	Cylindrical Aluminum Cup, $\varnothing 25$ mm, 35 mm Length
Z-K10000/100	10000	20	$\pm 20\%$	-40 - 85	100	Cylindrical Aluminum Cup, $\varnothing 40$ mm, 95 mm Length

DIMENSIONS (IN MM)

Z-K4700-50



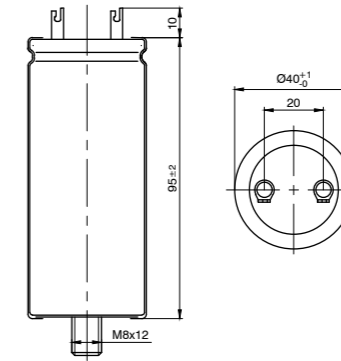
Charging Capacitor

For Controllers/Drives and Motors with Integrated Controllers



DIMENSIONS (IN MM)

Z-K10000-100





VERSIONS

Type	Type	Max. Operating Voltage V	Dimensions
EB-Brake	PWM Controller for Brakes	24	25.4 x 12.5 mm
EB-CAN-ADAPTER	Add-on Board for CANopen	24	40 x 68 mm
ZIB-DF32	Add-on Board for DF32 Motor	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



VERSIONS

Type	Description	Pin Configuration
ZCJST-XHP	Connector Socket Housing	2 - 8
ZCJST-SXH	JST Crimp Contacts for ZCJST-XHP	
ZCJST-NR	Insulation Displacement Termination for AWG24 (XHP)	4 - 8
ZC2SL	Pin Strip RM 2.54 mm	4 - 8
ZCPHOFK-MC0,5	Clip-on Plug	2 - 12
ZCPHOFK-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 Configuration
 3 = 3 Pin Configuration
 4 = 4 Pin Configuration
 5 = 5 Pin Configuration
 6 = 6 Pin Configuration
 8 = 8 Pin Configuration

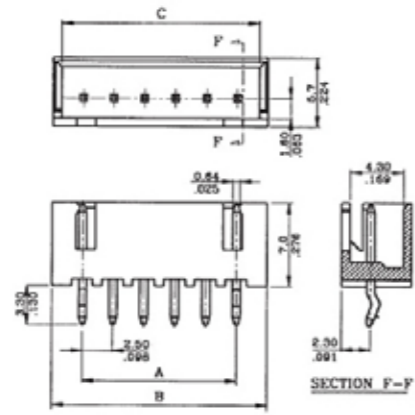
CAUTION



For mounting the connector, please use a crimping tool, e.g. JST WC-110.

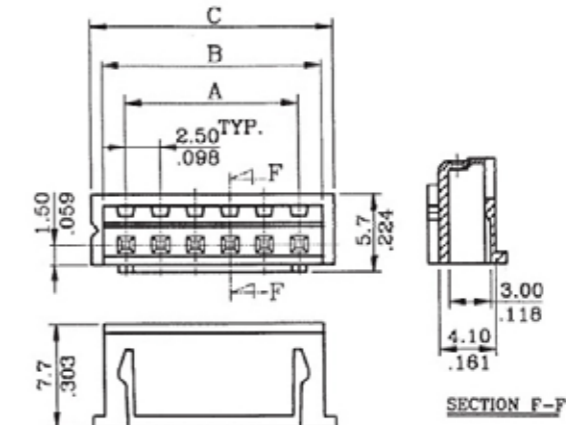
DIMENSIONS (IN MM)

ZC2-

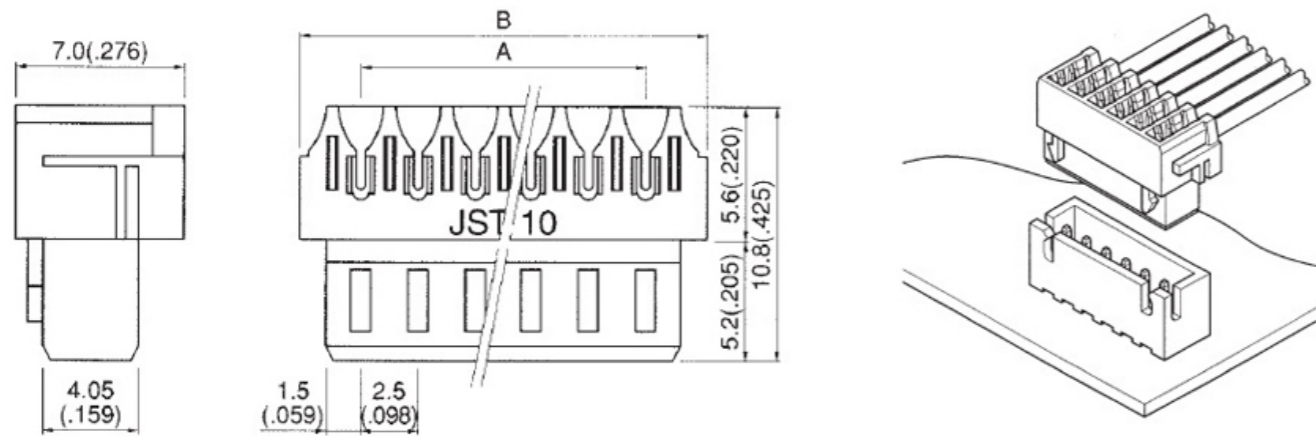


DIMENSIONS (IN MM)

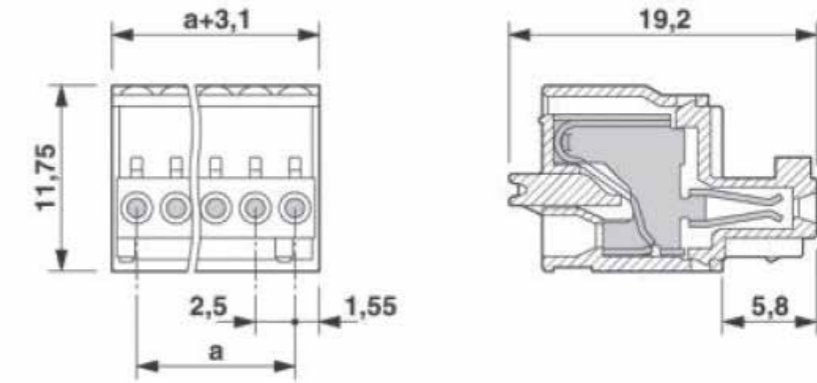
ZCJST-XHP



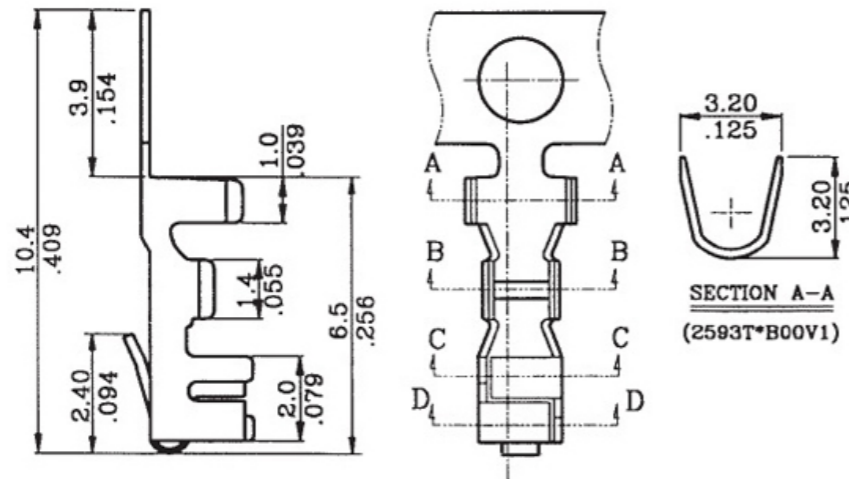
ZCJST



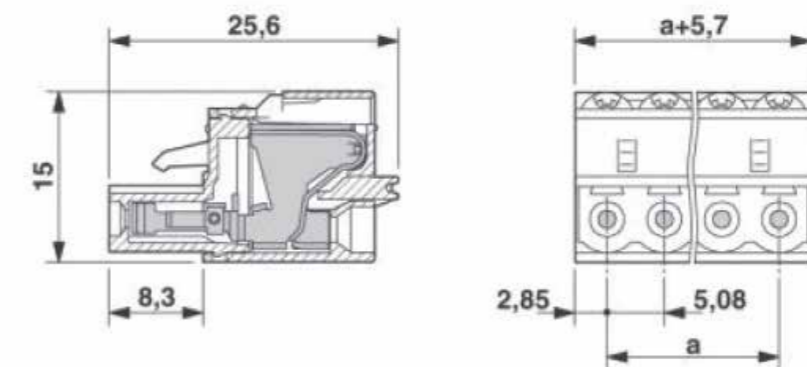
ZCPHOFK-MC0.5



ZCJST-SXH



ZCPHOFK-2.5HC





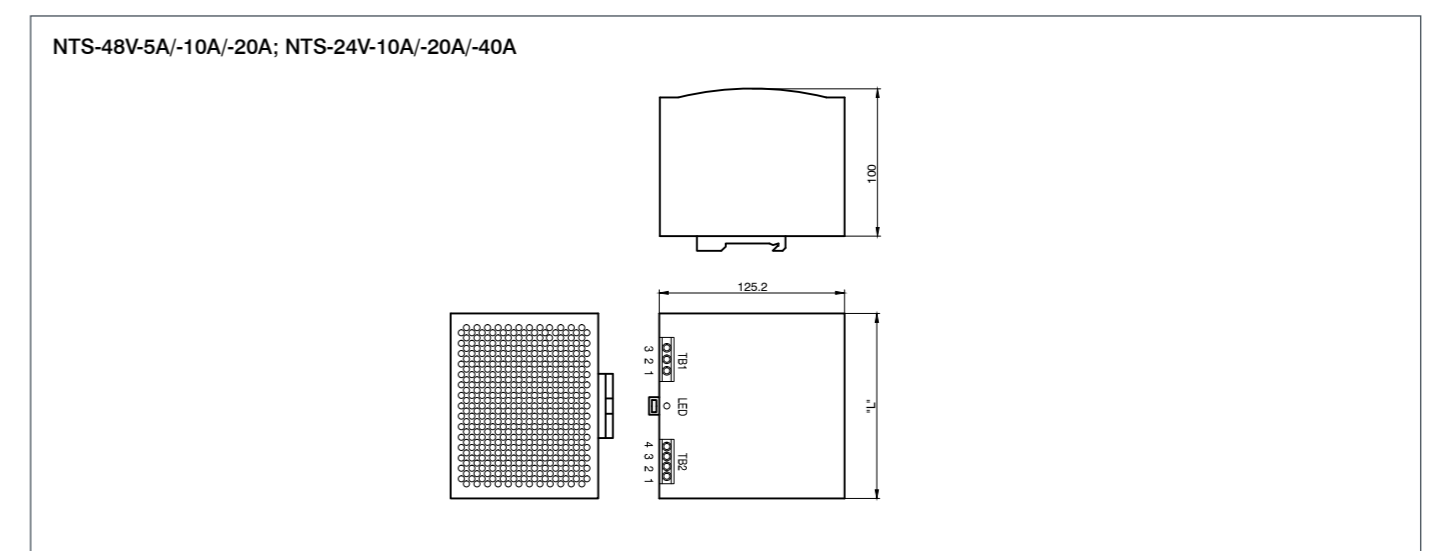
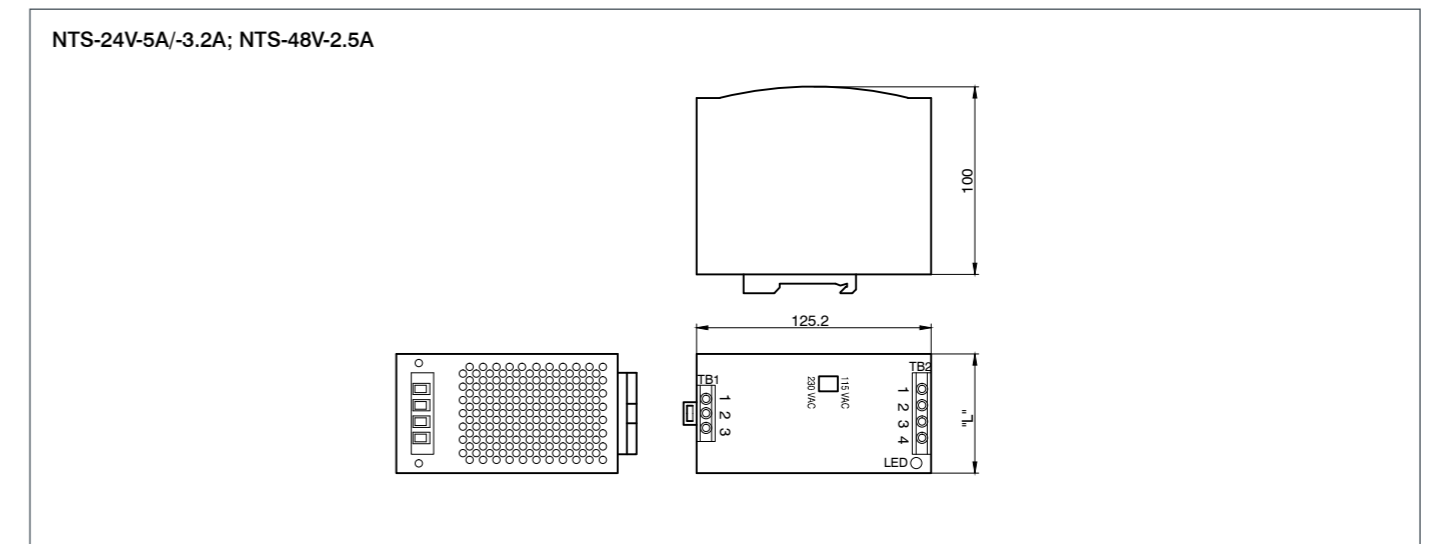
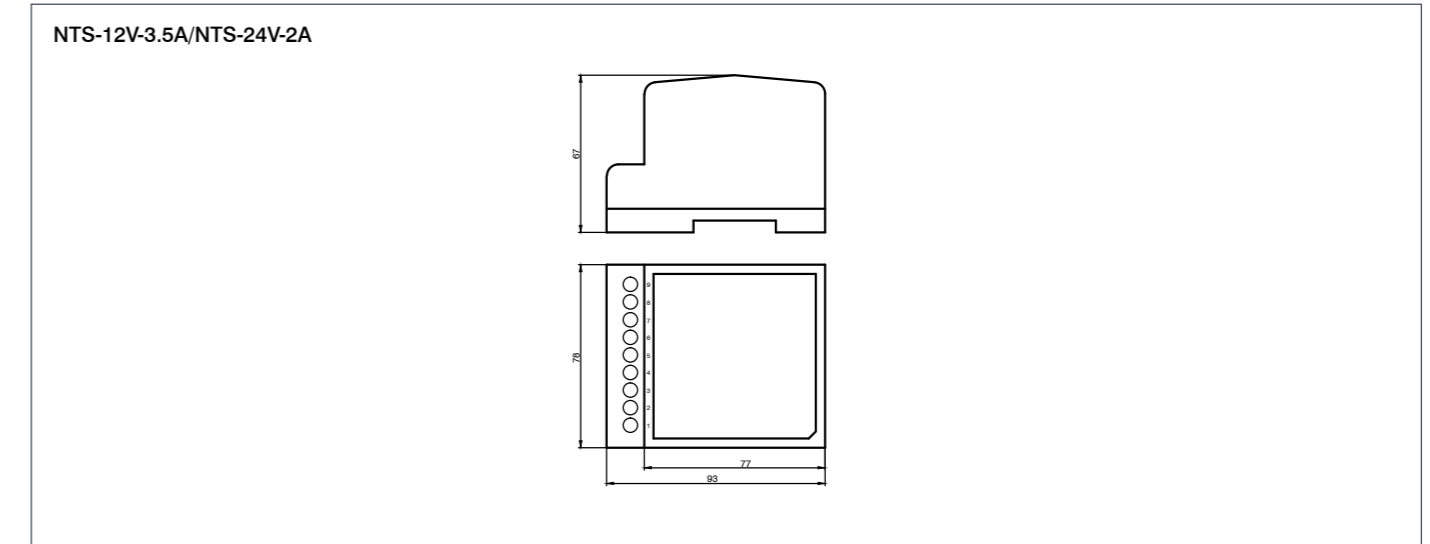
TECHNICAL DATA

Safety	soft start
Certifications	CE/UL/TÜV
Type of Connection	screw clamps
Fastening Type	DIN carrying rail TS-35/7.5 or 15
Protective Circuit	overload/overvoltage protection, short-circuit proof, over temperature

VERSIONS

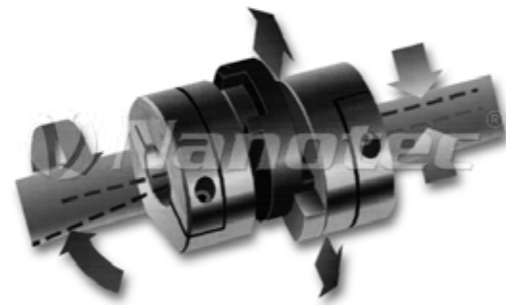
Type	Input Voltage	Output Voltage V	Output Current A	Power Output W	Input Current (Cold Start) A	Length „L“ mm	Weight kg
NTS-12V-3,5A	85...264VAC 120...370VDC	12	3.5	42	56 / 230 VAC	93	0.31
NTS-24V-2A	85...264VAC 120...370VDC	24	2	48	56 / 230 VAC	93	0.31
NTS-24V-3,2A	85...264VAC 120...370VDC	24	3.2	76.8	40 / 230 VAC	55.5	0.6
NTS-24V-5A	88...132/176...264VAC 248...370VDC	24	5	120	40 / 230 VAC	65.5	0.79
NTS-24V-10A	85...264VAC 120...370VDC	24	10	240	45 / 230 VAC	125.5	1.2
NTS-24V-20A	90...132/180...264 VAC 254...370 VAC	24	20	480	40 / 230 VAC	227	2.6
NTS-24V-40A	340...550VAC 3ph.	24	40	960	50	276	3.3
NTS-48V-2,5A	88...132/176...264VAC 248...370VDC	48	2.5	120	40 / 230 VAC	65.5	0.79
NTS-48V-5A	85...264VAC 120...370VDC	48	5	240	45 / 230 VAC	125.5	1.2
NTS-48V-10A	180...264 VAC 250...370 VDC	48	10	480	40 / 230 VAC	227	2.6
NTS-48V-20A	340...550VAC 3ph.	48	20	960	50	276	3.3

DIMENSIONS (IN MM)



Shaft Coupling

for Brushless DC and Stepper Motors



TECHNICAL DATA

Material	hub of aluminum alloy 2014 T6, Nylon 11 (colorless)
Tapped Blind Hole	length of the parallel borehole ± 0.2 , boreholes end with 118° bevel
Impact Torque	1.7 Nm - 17 Nm
Max. Compensation, Angle at 3000 rpm	0.5°
Max. Compensation, Radial at 3000 rpm	0.2 mm
Max. Compensation, Axial at 3000 rpm	0.1 mm - 0.15 mm

ORDER IDENTIFIER

ZW-234-19-
 20 = with 5 mm hub bore
 24 = with 6.35 mm hub bore
 99 = without
ZW-234-25-
 24 = with 6.35 mm hub bore
 28 = with 8 mm hub bore
 99 = without
ZW-234-41-
 38 = with 14 mm hub bore
 99 = with 6 mm hub bore

With a min. order of 50 pcs, custom specific boreholes are possible!

CAUTION

Couplings in sizes 19 and 25 mm are also available without hub hole for installation by the customer. Size 41 mm couplings have a min. hole of 6 mm. Please order two couplings and one transmission disc.



Shaft Coupling

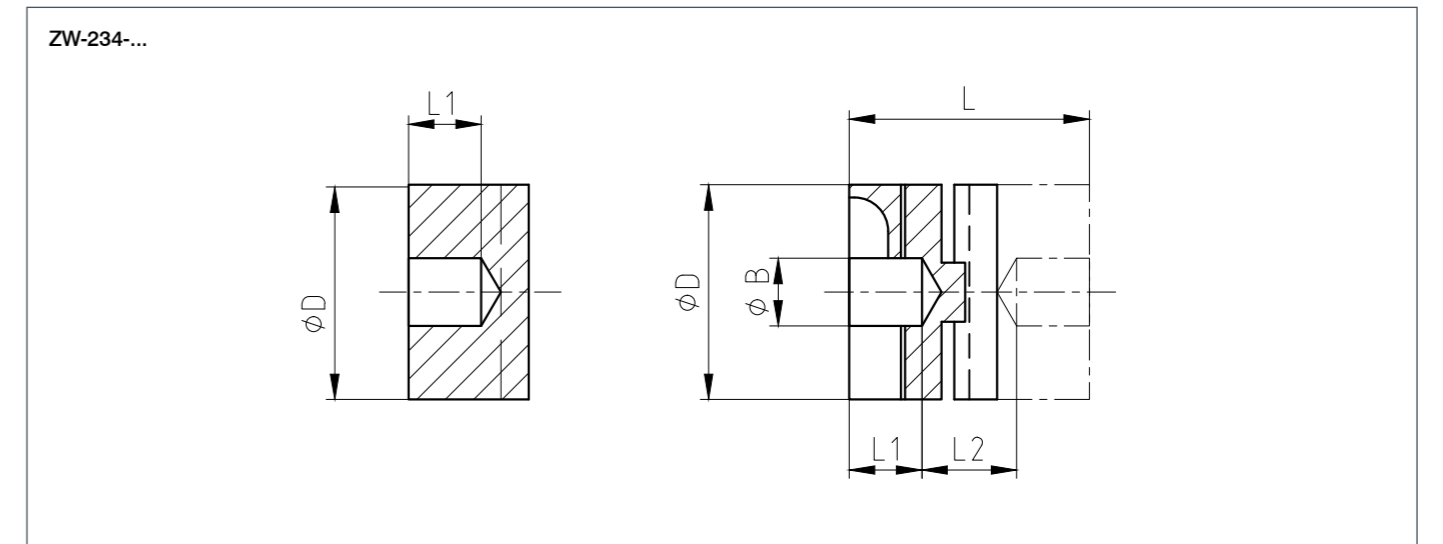
For Brushless DC and Stepper Motors



VERSIONS

Type	Description	L mm	Flange Length L1 mm	L2 mm	Ø B (max.) mm	Mass Moment of Inertia $\text{kgm}^2 \times 10^{-6}$	Impact Torque Nm	Torsional Stiffness Nm/rad	Static Break Torque Nm	Fixing Screw
ZW-234-19	Shaft Coupling	22	6.3	9.4	8	67	1.7	115	10	M2.5
ZW-234-19-0	Transmission Disc									
ZW-234-25	Shaft Coupling	28.4	8.6	11.2	12	252	4	205	13	M3
ZW-234-25-0	Transmission Disc									
ZW-234-41	Shaft Coupling	50.8	16.7	17.4	20	3327	17	1200	57	M4
ZW-234-41-0	Transmission Disc									

DIMENSIONS (IN MM)



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