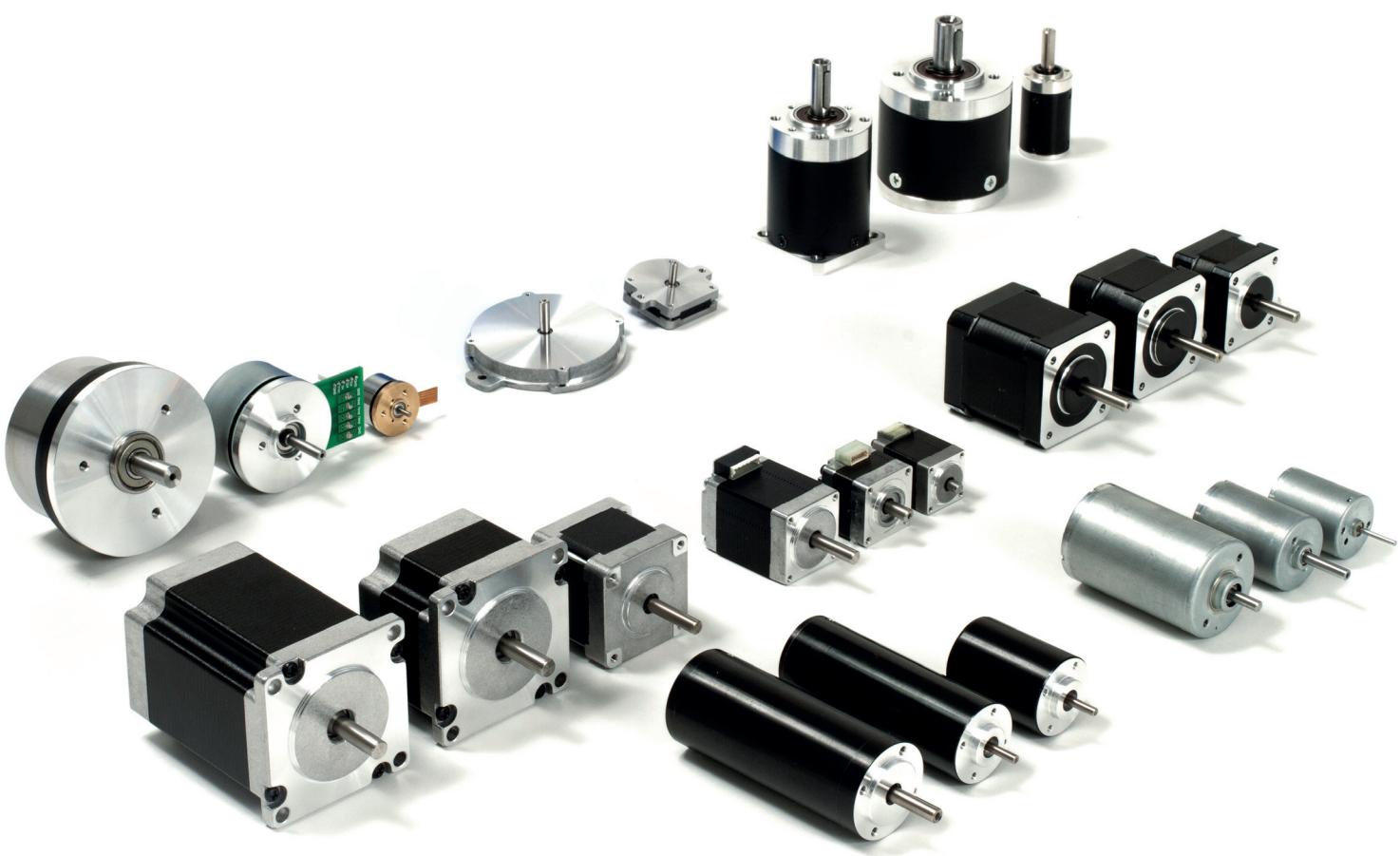
Fulling Motor



Hybrid Stepper Motors
Brushless Motors
Gearboxes

Fulling Motor
a DELTA LINE Company

lotax

Changzhou Fulling Motor Co., Ltd was established in year 2001 as a joint venture among Germany-Switzerland-China. We are a professional motors manufacturer in Changzhou City, China.
Our Company offers four major series of products: Hybrid stepper motors, DC brushless motors, Low Voltage Servo motors and motor drivers. Production capacity exceeds more than 5 million motors per year. Changzhou Fulling Motor Co., Ltd has also several joint venture Companies who are specialized in the production of AC Servo motors, PM stepper motors and DC gear motors.
Every year we sell nearly 5 million different motors to customers all over the world.
Our products are widely used in different fields like: industrial automation, robotics, textile industry, printing and medical equipment, logistics, communication, household and automotive sectors, etc. We export our motors to more than 30 countries such as Italy, Switzerland, Germany, UK, France, Japan and United States.

At the core of our development there is a professional engineering team including industrial experts in the fields of design and application engineering. We provide these talented individuals with access to advanced technology and cutting-edge equipment, ensuring the raise of high-quality products. Our Company has successfully achieved the quality management system certifications for ISO9001, IATF16949 and ISO14001, issued by the German TUV group.
All products are RoHS compliant and CE certified; some are UL approved. Fulling declares no 3TG residues in our products. No 3TG is intentionally used or added to the products or to the production process.

Fulling insists firstly in Quality, Innovation and Social Responsibility as the Company's main concept of development and continues to provide global customers with specialized control motor manufacturing and R&D services.

Quality

Fulling Motor provides 100% quality control during manufacturing process. This process encompasses quality check on each item after every single manufacturing process, starting from parts acceptance to the finished product. Every Fulling Motor's product undergoes reliability tests before it is released in the market.

Delivery

Fulling Motor's production system allows processing orders with little notice and in any quantity requested. Additionally, **Fulling Motor** uses a "one-by-one" process where one item can be manufactured as simply as one thousand items. A selection of **Fulling Motor's** standard products is available on stock for fast prototypes delivery.

Web

The **Fulling Motor's** website www.fullingmotor.eu is a valuable tool for design engineers to gather information. There you can find specifications on all our products; you can download PDF files or check the latest news.

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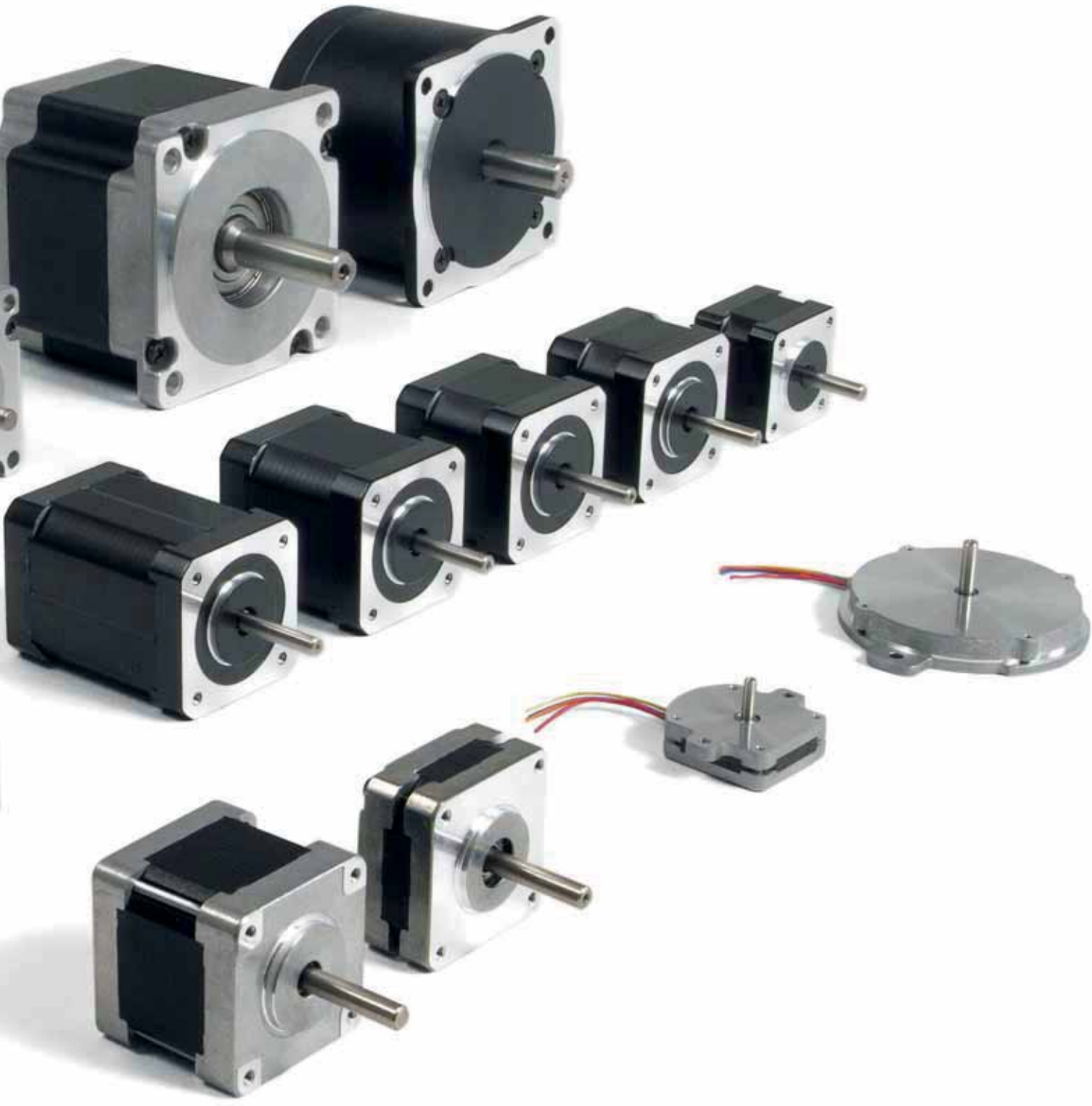
Stepper Motors



A stepper motor is an electromechanical device which converts electrical pulses into discrete mechanical movements. The shaft or spindle of a stepper motor rotates in discrete step increments when electrical command pulses are applied to it in the proper sequence. The motors rotation has several direct relationships to these applied input pulses.
The sequence of the applied pulses is directly related to the direction of motor shafts rotation. The speed of the motor shafts rotation is directly related to the frequency of the input pulses and the length of rotation is directly related to the number of input pulses applied.

Stepper Motor Advantages and Disadvantages

Advantages

1 The rotation angle of the motor is proportional to the input pulse.
2 The motor has full torque at standstill (if the windings are energized)
3 Precise positioning and repeatability of movement since good stepper motors have an accuracy of 3 - 5% of a step and this error is non cumulative from one step to the next.
4 Excellent response to starting/stopping/reversing.
5 Very reliable since there are no contact brushes in the motor. Therefore the life of the motor is simply dependant on the life of the bearing.
6 The motors response to digital input pulses provides open-loop control, making the motor simpler and less costly to control.
7 It is possible to achieve very low speed synchronous rotation with a load that is directly coupled to the shaft.
8 A wide range of rotational speeds can be realized as the speed is proportional to the frequency of the input pulses.

Disadvantages

1 Resonances can occur if not properly controlled.
2 Not easy to operate at extremely high speeds.

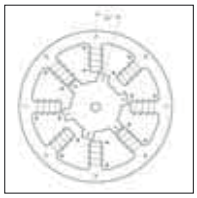
Open Loop Operation

One of the most significant advantages of a stepper motor is its ability to be accurately controlled in an open loop system. Open loop control means no feedback information about position is needed. This type of control eliminates the need for expensive sensing and feedback devices such as optical encoders. Your position is known simply by keeping track of the input step pulses.

Stepper motor type

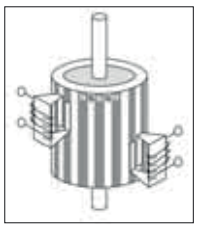
There are three basic stepper motor types. They are:

- Variable - reluctance
- Permanent-magnet
- Hybrid



Variable-reluctance (vr)

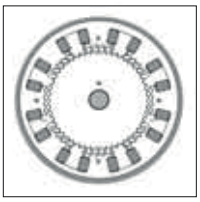
This type of stepper motor has been around for a long time. It is probably the easiest to understand from a structural point of view.
Figure 1 shows a cross section of a typical V.R. stepper motor.
This type of motor consists of a soft iron multi-toothed rotor and a wound stator.
When the stator windings are energized with DC current the poles become magnetized.
Rotation occurs when the rotor teeth are attracted to the energized stator poles.



Permanent magnet (pm)

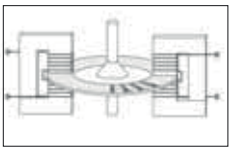
Often referred to as a "tin can" or "canstock" motor the permanent magnet step motor is a low cost and low resolution type motor with typical step angles of 7.5∞ to 15∞.
(48 - 24 steps/revolution) PM motors as the name implies have permanent magnets added to the motor structure. The rotor no longer has teeth as with the VR motor.Instead the rotor is magnetized with alternating north and south poles situated in a straight line parallel to the rotor shaft. These magnetized rotor poles provide an increased magnetic flux intensity and because
of this the PM motor exhibits improved torque characteristics when compared with the VR type.

Fig. 1 - Cross-section of a variable-reclutance (VR) motor.
Fig. 2 - Principle of a PM or Tin-Can stepper motor.



Hybrid (hb)

The hybrid stepper motor is more expensive than the PM stepper motor but provides better performance with respect to step resolution, torque and speed.
Typical step angles for the HB stepper motor range from 3.6∞ to 0.9∞ (100 - 400 steps per revolution).
The hybrid stepper motor combines the best features of both the PM and VR type stepper motors. The rotor is multi-toothed like the VR motor and contains an axially magnetized concentric magnet around its shaft.
The teeth on the rotor provide an even better path which helps guide the magnetic flux to preferred locations in the airgap. This further increases the detent, holding and dynamic torque characteristics of the motor when compared with both the VR and PM types.
The two most commonly used types of stepper motors are the permanent magnet and the hybrid types. If a designer is not sure which type will best fit his applications requirements he should first evaluate the PM type as it is normally several times less expensive. If not then the hybrid motor may be the right choice.



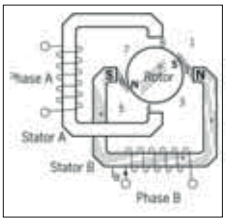
There also exist some special stepper motor designs. One is the disc magnet motor.
Here the rotor is designed as a disc with rare earth magnets, See fig. 4.
This motor type has some advantages such as very low inertia and a optimized magnetic flow path with no coupling between the two stator windings. These qualities are essential in some applications.

Size and power

In addition to being classified by their step angle stepper motors are also classified according to frame sizes which correspond to the diameter
of the body of the motor. For instance a size 11 stepper motor has a body diameter of approximately 1.1 inches. Likewise a size 23 stepper motor has a body diameter of 2.3 inches (58 mm), etc. The body length may however, vary from motor to motor within the same frame size classification. As a general rule the available torque output from a motor of a particular frame size will increase with increased body length. Power levels for IC-driven stepper motors typically range from below a watt for very small motors up to 10 - 20 watts for larger motors. The maximum power dissipation level or thermal limits of the motor are seldom clearly stated in the motor manufacturers data. To determine this we must apply the relationship P =V • I. For example, a size 23 step motor may be rated at 6V and 1A per phase. Therefore, with two phases energized the motor has a rated power dissipation of 12 watts. It is normal practice to rate a stepper motor at the power dissipation level where the motor case rises65∞C above the ambient in still air. Therefore, if the motor can be mounted to a heat-sink it is often possible to increase the allowable power dissipation level. This is important as the motor is designed to be and should be used at its maximum power dissipation,to be efficient from a size/output power/cost point of view.

When to Use a Stepper Motor

A stepper motor can be a good choice whenever controlled movement is required. They can be used to advantage in applications where you need to control rotation angle, speed, position and synchronism. Because of the inherent advantages listed previously, stepper motors have found their place in many different applications.Some of these include printers, plotters, scanners, high-end office equipment, hard disk drives, fax machines and many more.



The Rotating Magnetic Field

When a phase winding of a stepper motor is energized with current a magnetic flux is developed in the stator. The direction of this flux is determined by the "Right Hand Rule" which states:"If the coil is grasped in the right hand with the fingers pointing in the direction of the current in the winding (the thumb is extended at a 90∞ angle to the fingers), then the thumb will point in the direction of the magnetic field." Figure 5 shows the magnetic flux path developed when phase B is energized with winding current in the direction shown. The rotor then aligns itself so that the flux opposition is minimized. In this case the motor would rotate clockwise so that its south pole aligns with the north pole of the stator B at position 2 and its north pole aligns with the south pole of stator B at position 6. To get the motor to rotate we can now see that we must provide a sequence of energizing the stator windings in such a fashion that provides a rotating magnetic flux field which the rotor follows due to magnetic attraction.

Fig. 3 - Cross-section of a hybrid stepper motor.
Fig. 4 - Principle of a Disc Magnet motor developed by Portescap
Fig. 5 - Magnetic flux path through a two-pole stepper motor with a lag between the rotor and stator.

Torque Generation

The torque produced by a stepper motor depends on several factors.

- The step rate
- The drive current in the windings
- The drive design or type

In a stepper motor a torque is developed when the magnetic fluxes of the rotor and stator are displaced from each other.
The stator is made up of a high permeability magnetic material.
The presence of this high permeability material causes the magnetic flux to be confined for the most part to the paths defined by the stator structure in the same fashion that currents are confined to the conductors of an electronic circuit.
This serves to concentrate the flux at the stator poles.
The torque output produced by the motor is proportional to the intensity of the magnetic flux generated when the winding is energized.
The basic relationship which defines the intensity of the magnetic flux is defined by:

H = (N • i) / l where:
H = Magnetic field intensity
N = The number of winding turns
i = current
l = Magnetic flux path length

This relationship shows that the magnetic flux intensity and consequently the torque is proportional to the number of winding turns and the current and inversely proportional to the length of the magnetic flux path.
From this basic relationship one can see that the same frame size stepper motor could have very different torque output capabilities simply by changing the winding parameters.

Phases, Poles and Stepping Angles

Usually stepper motors have two phases, but three- and five-phase motors also exist. A bipolar motor with two phases has one winding/phase and a unipolar motor has one winding, with a center tap per phase. Sometimes the unipolar stepper motor is referred to as a "four-phase motor", even though it only has two phases. Motors that have two separate windings per phase also exist, these can be driven in either bipolar or unipolar mode.
A pole can be defined as one of the regions in a magnetized body where the magnetic flux density is concentrated. Both the rotor and the stator of a step motor have poles.
Figure 5 contains a simplified picture of a two-phase stepper motor having 2 poles (or 1 pole pairs) for each phase on the stator, and 2 poles (one pole pair) on the rotor. In reality several more poles are added to both the rotor and stator structure in order to increase the number of steps per revolution of the motor, or in other words to provide a smaller basic (full step) stepping angle. The permanent magnet stepper motor contains an equal number of rotor and stator pole pairs.
Typically the PM motor has 12 pole pairs. The stator has 12 pole pairs per phase. The hybrid type stepper motor has a rotor with teeth.
The rotor is split into two parts, separated by a permanent magnet, making half of the teeth south poles and half north poles.
The number of pole pairs is equal to the number of teeth on one of the rotor halves.
The stator of a hybrid motor also has teeth to build up a higher number of equivalent poles (smaller pole pitch, number of equivalent poles = 360/teeth pitch) compared to the main poles, on which the winding coils are wound.
Usually 4 main poles are used for 3.6 hybrids and 8 for 1.8- and 0.9-degree types. It is the relationship between the number of rotor poles and the equivalent stator poles, and the number the number of phases that determines the full-step angle of a stepper motor.

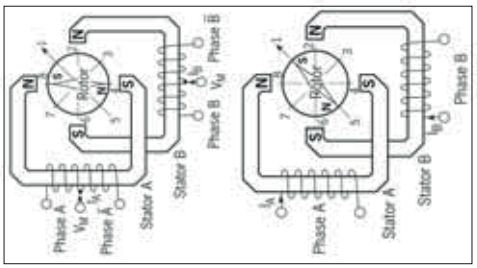
step angle = 360 / (NPh • Ph) = 360/N
NPh = Number of equivalent poles per phase = number of rotor poles
Ph = Number of phases
N = Total number of poles for all phases together

If the rotor and stator tooth pitch is unequal, a more-complicated relation-ship exists.

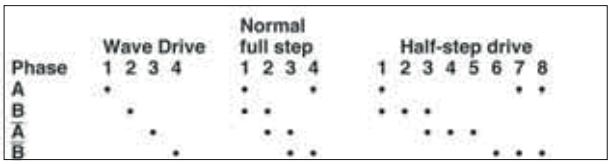
Stepping Modes

The following are the most common drive modes.

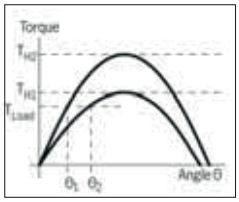
- Wave Drive (1 phase on)
- Full Step Drive (2 phases on)
- Half Step Drive (1 & 2 phases on)
- Microstepping (Continuously varying motor currents)



For the following discussions please refer to the figure 6.
In Wave Drive only one winding is energized at any given time. The stator is energized according to the sequence **A - B - A - B** and the rotor steps from position **8 - 2 - 4 - 6**.
For unipolar and bipolar wound motors with the same winding parameters this excitation mode would result in the same mechanical position. The disadvantage of this drive mode is that in the unipolar wound motor you are only using 25% and in the bipolar motor only 50% of the total motor winding at any given time. This means that you are not getting the maximum torque output from the motor. In Full Step Drive you are energizing two phases at any given time.



The stator is energized according to the sequence **AB - AB - AB - AB** and the rotor steps from position **1 - 3 - 5 - 7**.
Full step mode results in the same angular movement as 1 phase on drive but the mechanical position is offset by one half of a full step. The torque output of the unipolar wound motor is lower than the bipolar motor (for motors with the same winding parameters) since the unipolar motor uses only 50% of the available winding while the bipolar motor uses the entire winding. Half Step Drive combines both wave and full step (1&2 phases on) drive modes.
Every second step only one phase is energized and during the other steps one phase on each stator. The stator is energized according to the sequence **AB - B - AB - A - AB - B - AB - A** and the rotor steps from position **1 - 2 - 3 - 4 - 5 - 6 - 7 - 8**.
This results in angular movements that are half of those in 1 or 2 -phases- on drive modes. Half stepping can reduce a phenomena referred to as resonance which can be experienced in 1 or 2 -phases- on drive modes.
The excitation sequences for the above drive modes are summarized in Table 1.
In Microstepping Drive the currents in the windings are continuously varying to be able to break up one full step into many smaller discrete steps.



X = (Z / 2p) • sin(Ta / Th) where:
Z = Rotor tooth pitch
Ta = Load torque
Th = Motors rated holding torque
X = Displacement angle.

Therefore if you have a problem with the step angle error of the loaded motor at rest you can improve this by changing the "stiffness" of the motor. This is done by increasing the holding torque of the motor. We can see this effect shown in the figure 8. Increasing the holding torque for a constant load causes a shift in the lag angle from Q2 to Q1.

Step Position Error

The maximum positive or negative position error caused when the motor has rotated one step from the previous holding position.
Step position error = measured step angle - theoretical angle

Position Error

The motor is stepped N times from an initial position (N = 360∞/step angle) and the angle from the initial position is measured at each step position. If the angle from the initial position to the N-step position is QN and the error is DQN where: DQN = DQN - (step angle) • N.

The positional error is the difference of the maximum and minimum but is usually expressed with a ± sign.
That is: positional error = ±1.2 (DQMax - DQMin)

Fig. 6 - Unipolar and bipolar wound stepper motors
Fig. 7 - Torque vs. rotor angular position.
Fig. 8 - Torque vs. rotor angle position at different holding torque.
Fig. 9 - Positional accuracy of a stepper motor.
Table. 1 - Excitation sequences for different drives modes

Hysteresis Position Error
The values obtained from the measurement of positional errors in both directions.

Meccanical Parameters: Load, Friction, Inertia
The performance of a stepper motor system (driver and motor) is also highly dependent on the mechanical parameters of the load. The load is defined as what the motor drives. It is typically frictional, inertial or a combination of the two.
Friction is the resistance to motion due to the unevenness of surfaces which rub together. Friction is constant with velocity. A minimum torque level is required throughout the step in over to overcome this friction (at least equal to the friction). Increasing a frictional load lowers the top speed, lowers the acceleration and increases the positional error. The converse is true if the frictional load is lowered.Inertia is the resistance to changes in speed. A high inertial load requires a high inertial starting torque and the same would apply for braking. Increasing an inertial load will increase speed stability, increase the amount of time it takes to reach a desired speed and decrease the maximum self start pulse rate.
The converse is again true if the inertia is decreased. The rotor oscillations of a stepper motor will vary with the amount of friction and inertia load. Because of this relationship unwanted rotor oscillations can be reduced by mechanical damping means however it is more often simpler to reduce these unwanted oscillations by electrical damping methods such as switch from full step drive to half step drive.

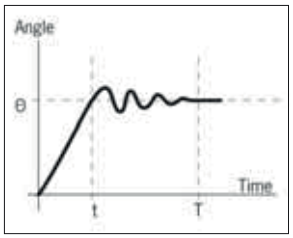
Holding Torque
The maximum torque produced by the motor at standstill.

Pull-In Curve
The pull-in curve defines a area refered to as the start stop region. This is the maximum frequency at which the motor can start/stop instantaneously, with a load applied, without loss of synchronism.

Maximum Start Rate
The maximum starting step frequency with no load applied.

Pull-Out Curve
The pull-out curve defines an area refered to as the slew region. It defines the maximum frequency at which the motor can operate without losing synchronism.
Since this region is outside the pull-in area the motor must ramped (accelerated or decelerated) into this region.

Single Step Response and Resonances
The single-step response character- istics of a stepper motor is shown in figure 11.
When one step pulse is applied to a stepper motor the rotor behaves in a manner as defined by the above curve. The step time t is the time it takes the motor shaft to rotate one step angle once
the first step pulse is applied. This step time is highly dependent on the ratio of torque to inertia (load) as well as the type of driver used.
Since the torque is a function of the displacement it follows that the acceleration will also be.
Therefore, when moving in large step increments a high torque is developed and consequently a high acceleration. This can cause over shots and ringing as shown. The settling time T is the time it
takes these oscillations or ringing to cease. In certain applications this phenomena can be undesirable. It is possible to reduce or eliminate this behaviour by microstepping the stepper motor.



Stepper motors can often exhibit a phenomena refered to as resonance at certain step rates. This can be seen as a sudden loss or drop in torque at certain speeds which can result in missed steps or loss of synchronism. It occurs when the input step pulse rate coincides with the natural oscillation frequency of the rotor. Often there is a resonance area around the 100 – 200 pps region and also one in the high step pulse rate region. The resonance phenomena of a stepper motor comes from its basic construction and therefore it is not possible to eliminate it completely. It is also dependent upon the load conditions. It can be reduced by driving the motor in half or microstepping modes.

Fig. 10 - Torque vs. speed characteristics of a stepper motor.

Codification

STEPPER MOTOR

42	SH	33	-	10	04	A	M	X	•	000

1 MOTOR SIZE (mm)

20, 25, 35, 39, 42, 57, 60, 63, 86, 110, ...

2 MOTOR TYPE (mm)

S = Hybrid Stepper SH = Stepper High Torque STC = Hyper Step

3 MOTOR LENGTH (mm)

23, 32, 40, 51, 36, 34, ...

4 WINDING CODE

RATEO CURRENT

5 NUMBER of WIRES

4, 6, 8

6 SHAFT CONFIGURATION

A = Single Shaft B = Double Shaft

6 STEP RATE

NULL = 200 step/rev M = 400 step/rev

7 CUSTOMIZATION

E = Encoder F = Flat K = Key Way

9 EXECUTION NUMBER

SPECIAL CONFIGURATION

Production Final Test

- Insulation resistance: 500VDC, 100Mohm
- Dielectric strength: 620VAC, 1 sec, 2mA
- Resistance/phase
- Inductance/phase
- Holding torque
- Detent torque
- Direction testing

Appearance Testing

- Output shaft
- Lead wires
- Mounting dimension (flange - screw - D-cut - etc)

Quality Control Additional Test

- Frequency vs torque curve
- No-load temperature rising

Running Test

- Max. running frequency at no load
- Smooth running
- Noise and vibration

Connection

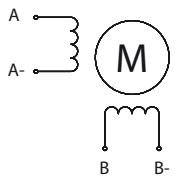
4 LEAD WIRES	A	A-	B	B-
Color Code 1	White	Red	Blue	Yellow
Color Code 2	Black	Green	Red	Blue
Color Code 3	Red	Blue	Orange	Yellow
Color Code 4	Red	White	Yellow	Green

3 PHASE WIRES	U	V	W
Color Code 1	Red	Yellow	Blue
Color Code 2	Red / Orange	White / Blue	Yellow / Green

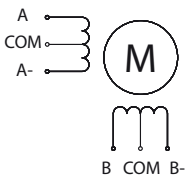
6 LEAD WIRES	A	A-	B	B-	Com A	Com B
Color Code 1	White	Red	Blue	Yellow	Black	Brown
Unipolar Motor	Black	Green	Red	Blue	Yellow	White

8 LEAD WIRES	A	A-	C	C-	B	B-	D	D-
Color Code 1	Blue / White	Blue	Red / White	Red	Green / White	Green	Black / White	Black
Color Code 2	Orange	Orange / White	Black / White	Black	Red	Red / White	Yellow / White	Yellow
Color Code 3	Red	Yellow	Blue	Black	White	Orange	Brown	Green

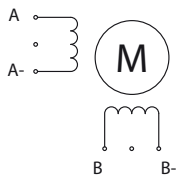
4 Leads
Bipolar connection



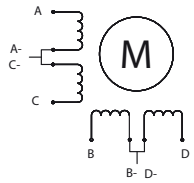
6 Leads
Unipolar connection



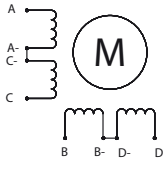
6 Leads
Series connection



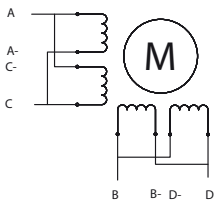
8 Leads
Unipolar connection



8 Leads
Serial connection



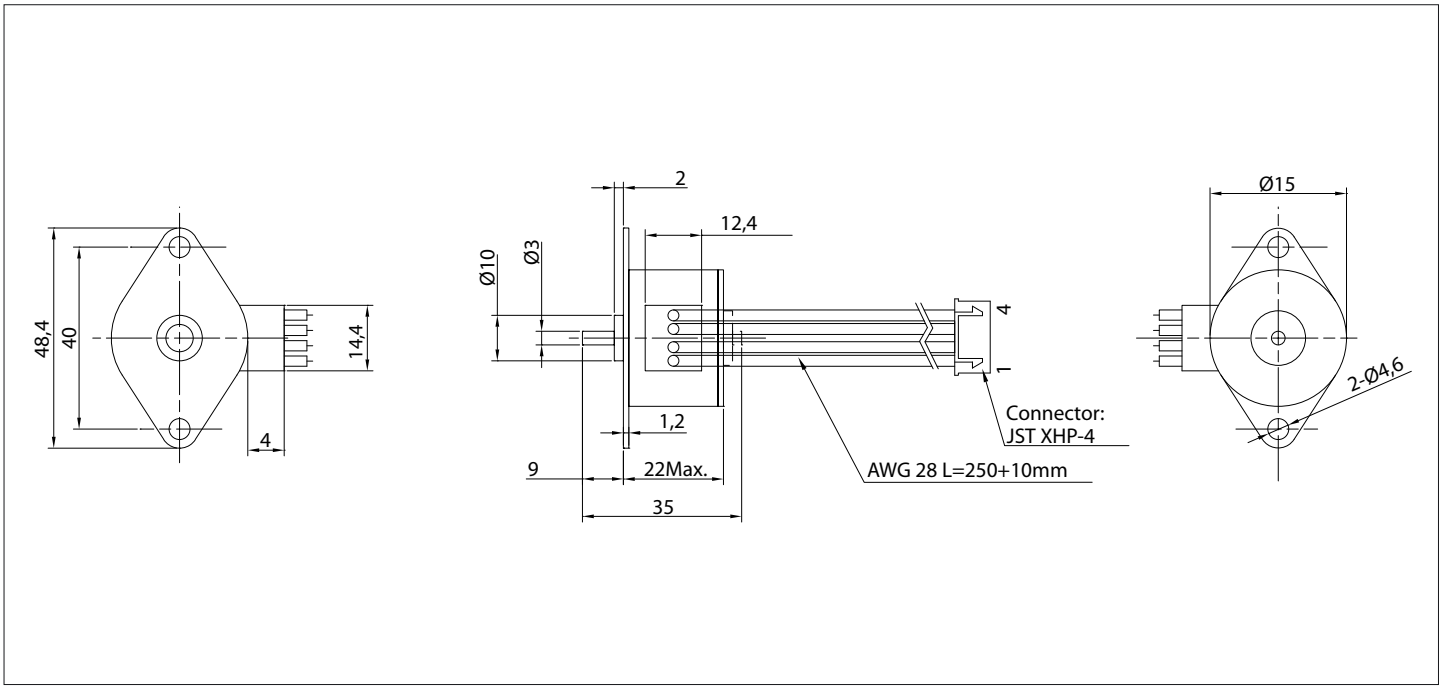
8 Leads
Parallel connection



PM Stepper Motor

Simple but efficient. Our range of permanent Stepper motors offers the ideal open loop control solution for many applications. Based on a simple 2-phase design, these motors offer a great balance of torque, speed and accuracy.

PM Stepper Motor 15PM12



SPECIFICATION

Model			15PM12-0244A	15PM12-0064A
1	Rated Voltage	V	12	12
2	Current/Phase	A	0,24	0,065
3	Resistance/Phase	Ω	50	190
4	Inductance/Phase	mH	9,5	37
5	Holding Torque	Nm	0,0035	0,0032
6	Rotor Inertia	g-cm^2	1,0x10^{-7}	1,0x10^{-7}
7	Weight	Kg	0,012	0,012
8	Number of leads		4	4

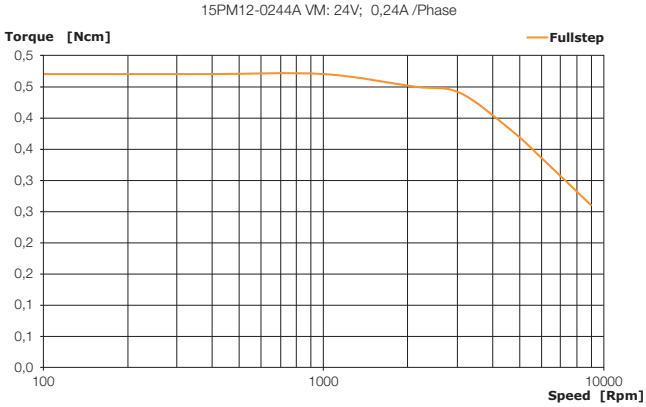
CHARACTERISTICS

Step Angle	18°
Step Angle Accuracy	± 8%
Insulation Class	E
Ambient Temperature	-20°C +50°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	2 N
Max Axial Force	1 N

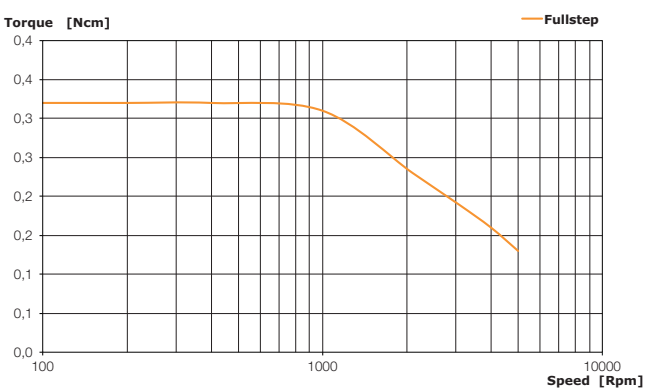
CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-

15PM12-0244A VM: 24V; 0,24A /Phase

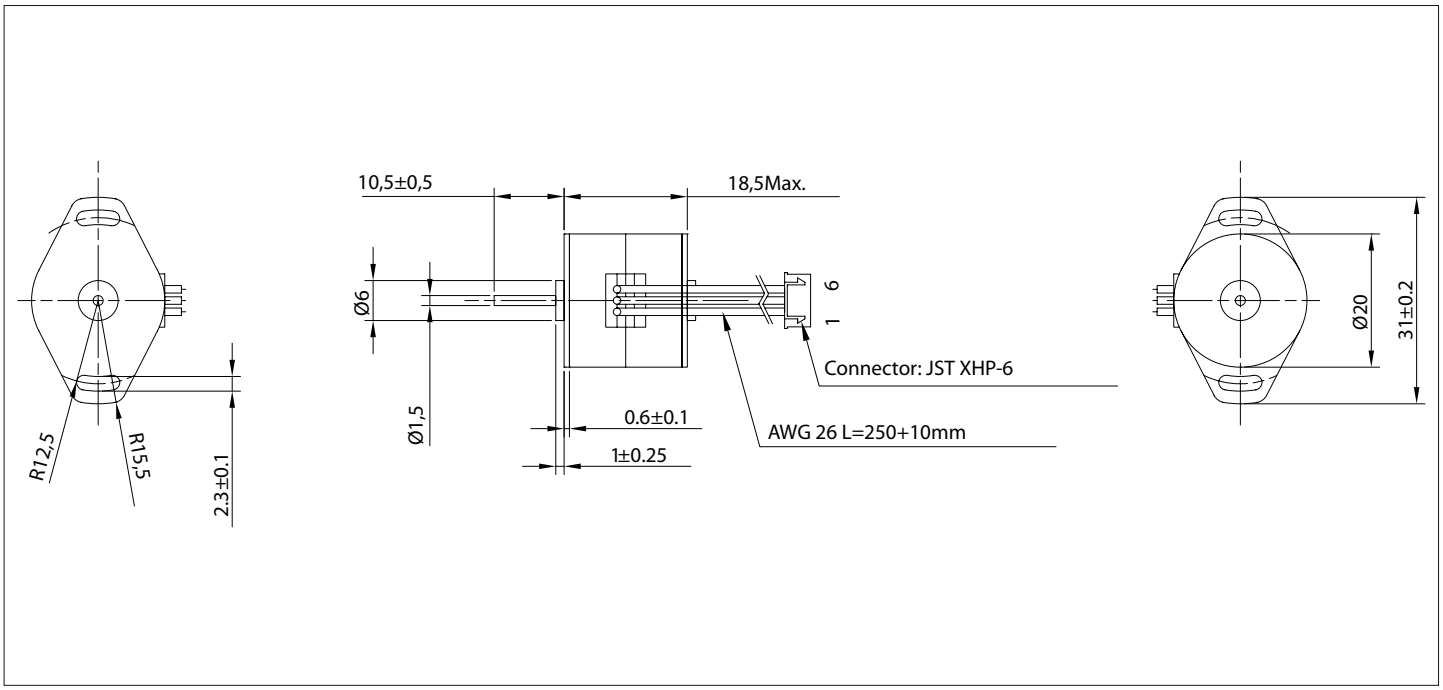


15PM12-0064A VM: 24V; 0,7A /Phase



May 2020 edition/ subject to change

PM Stepper Motor 20PM18



SPECIFICATION

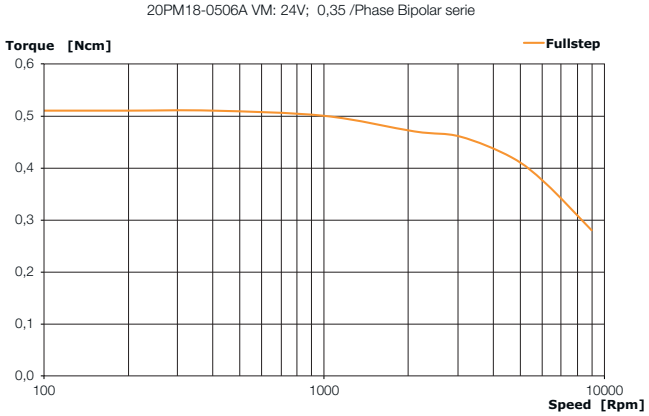
Model		20PM18-0506A
1 Rated Voltage	V	5
2 Current/Phase	A	0,5
3 Resistance/Phase	Ω	10
4 Inductance/Phase	mH	1,85
5 Holding Torque	Nm	0,005
6 Rotor Inertia	$Kg\text{-}m^2$	$1{,}0x10^{-7}$
7 Weight	Kg	0,026
8 Number of leads		6

CHARACTERISTICS

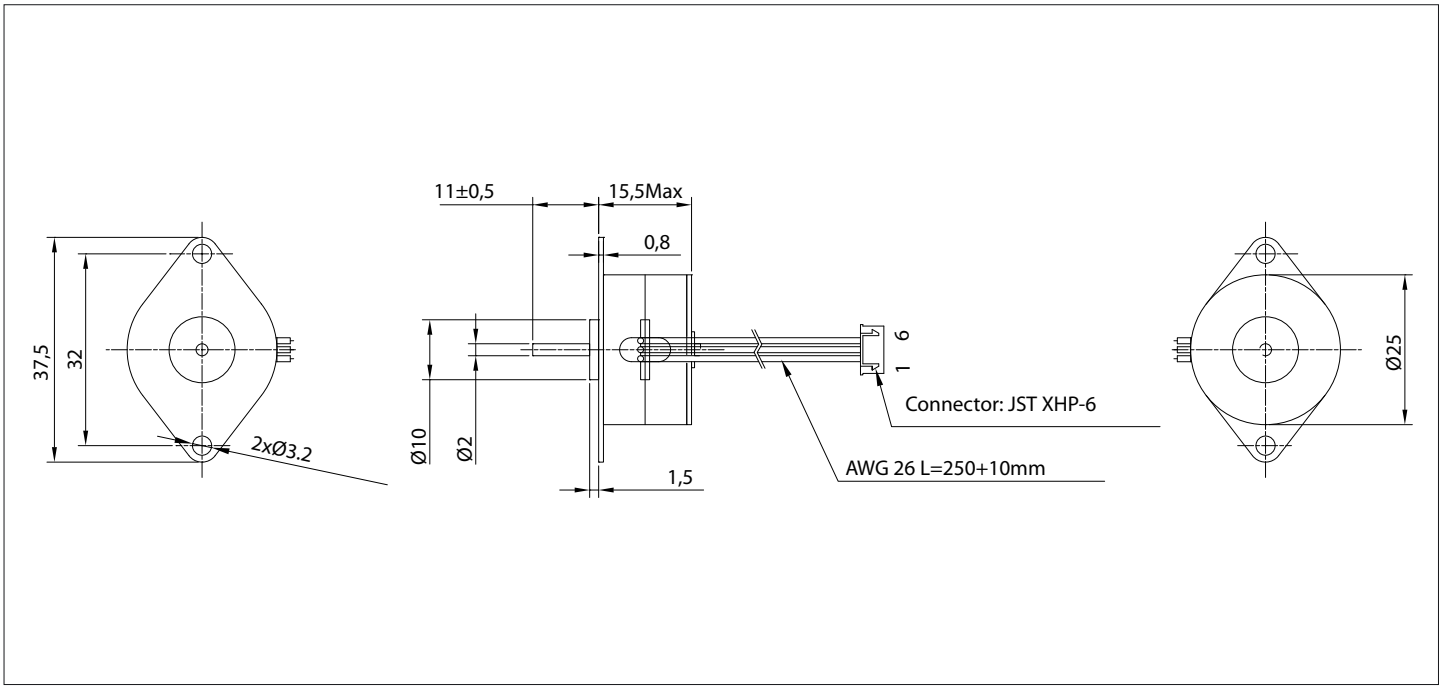
Step Angle	18°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	2 N
Max Axial Force	1 N

CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-
5	Black	UL1430 AWG30	Com Phase A
6	Brown	UL1430 AWG30	Com Phase A-



PM Stepper Motor 25PM15



SPECIFICATION

Model			25PM15-0436A	25PM15-0246A
1	Rated Voltage	V	5	12
2	Current/Phase	A	0,43	0,24
3	Resistance/Phase	Ω	11,5	50
4	Inductance/Phase	mH	2,3	3
5	Holding Torque	Nm	0,01	0,016
6	Rotor Inertia	Kg-m^2	1,0x10^{-7}	1,0x10^{-7}
7	Weight	Kg	0,036	0,036
8	Number of leads		6	6

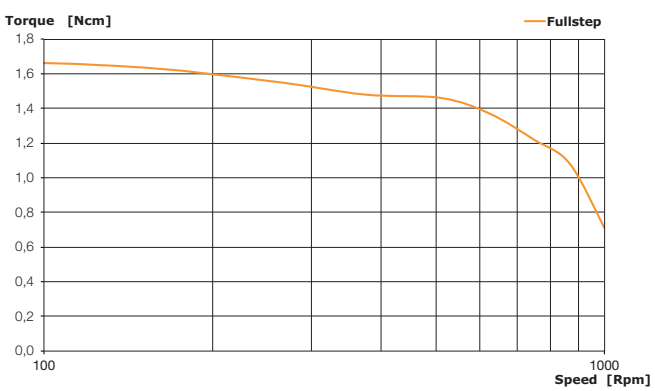
CHARACTERISTICS

Step Angle	7,5°
Step Angle Accuracy	± 8%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	3 N
Max Axial Force	1,5 N

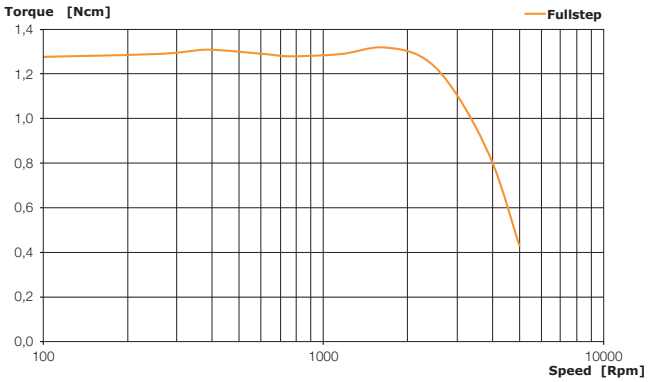
CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-
5	Black	UL1430 AWG30	Com Phase A
6	Brown	UL1430 AWG30	Com Phase B

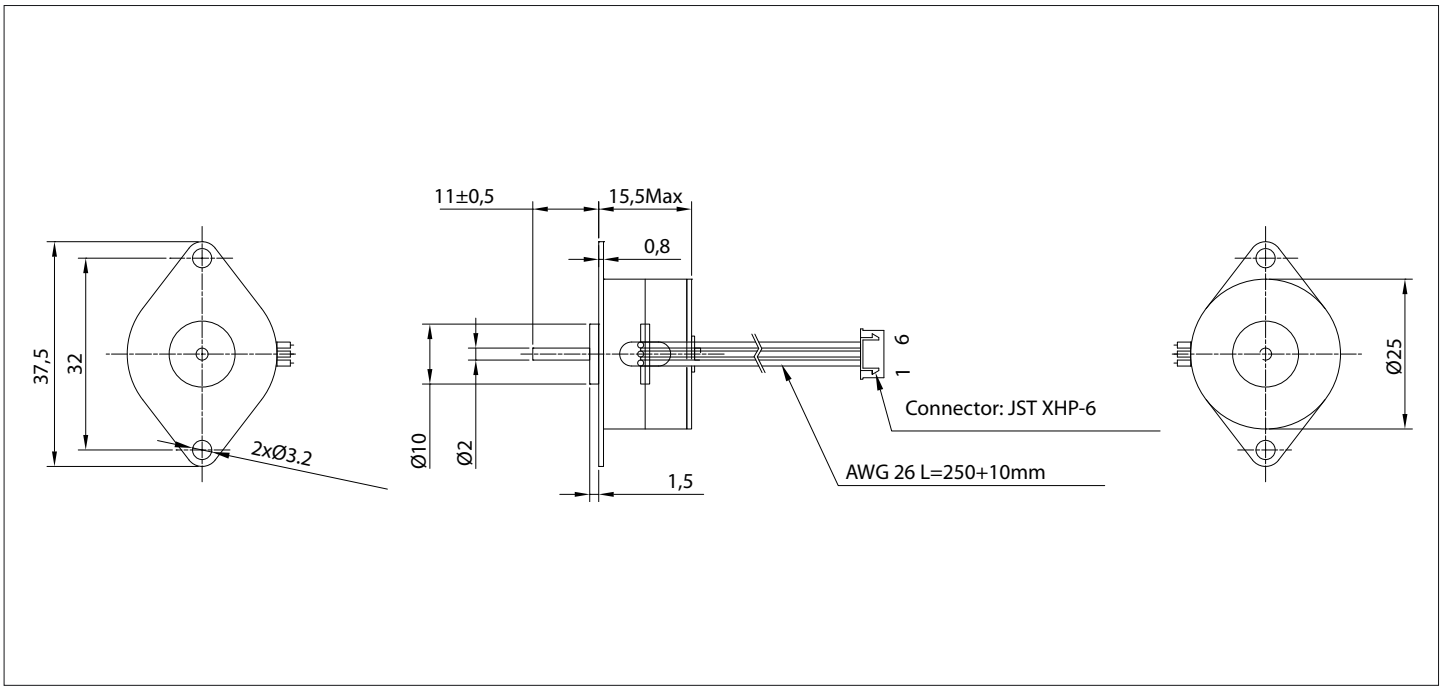
25PM15-0246A VM: 24V; 0,17 A/Phase Bipolar serie



25PM15-0436A VM: 24V; 0,35 A/Phase Bipolar serie



PM Stepper Motor 25PM15



SPECIFICATION

	Model		25PM15-0506A	25PM15-0764A
1	Rated Voltage	V	5	3,8
2	Current/Phase	A	0,5	0,76
3	Resistance/Phase	Ω	10	5
4	Inductance/Phase	mH	2	3
5	Holding Torque	Nm	0,014	0,01
6	Rotor Inertia	Kg-m^2	1,0x10^{-7}	1,0x10^{-7}
7	Weight	Kg	0,036	0,036
8	Number of leads		6	4

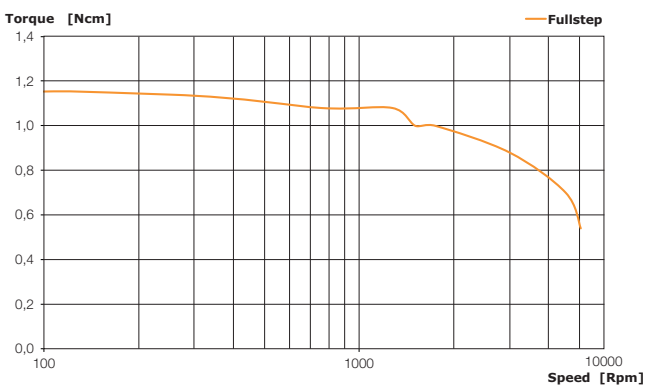
CHARACTERISTICS

Step Angle	7,5°
Step Angle Accuracy	± 8%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	3 N
Max Axial Force	1,5 N

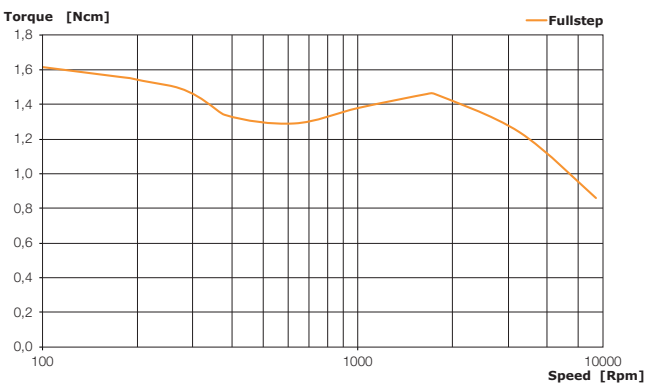
CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-
5	Black	UL1430 AWG30	Com Phase A
6	Brown	UL1430 AWG30	Com Phase B

25PM15-0506A VM: 24V; 0,34 A/Phase Bipolar serie

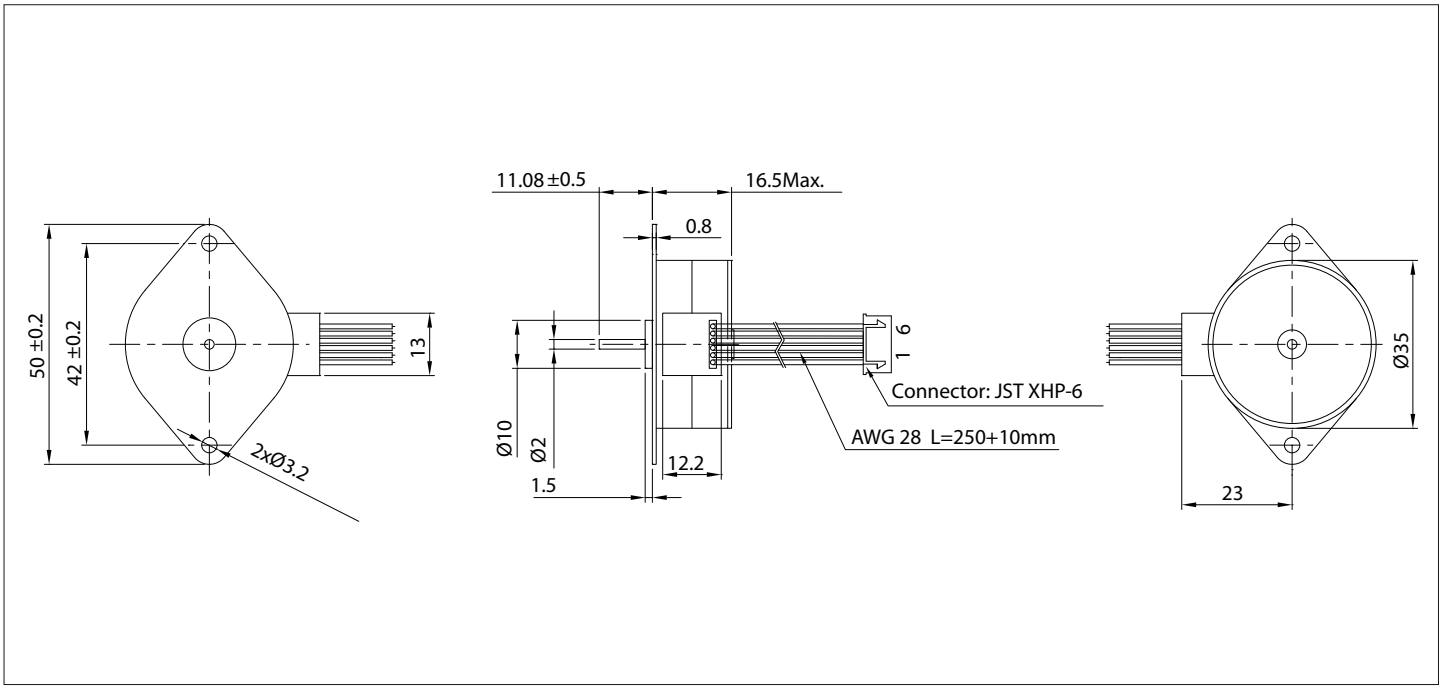


25PM15-0704A VM: 24V; 0,7 A/Phase Bipolar serie



PM STEPPER MOTOR

PM Stepper Motor 35PM16



SPECIFICATION

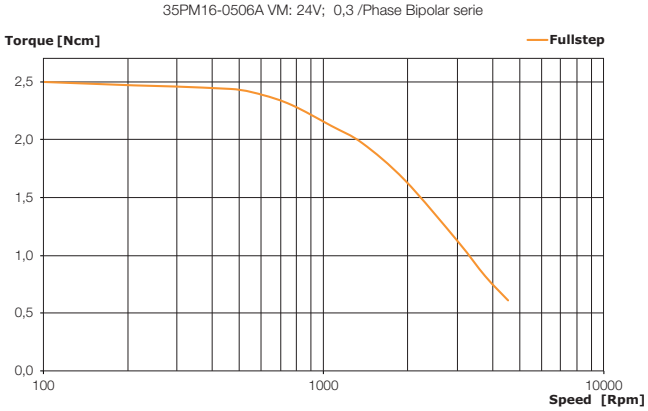
Model			35PM16-0506A
1	Rated Voltage	V	5
2	Current/Phase	A	0,5
3	Resistance/Phase	Ω	10
4	Inductance/Phase	mH	3,8
5	Holding Torque	Nm	0,04
6	Rotor Inertia	$Kg\text{-}m^2$	$5{,}0x10^{-7}$
7	Weight	Kg	0,09
8	Number of leads		6

CHARACTERISTICS

Step Angle	7,5°
Step Angle Accuracy	± 7%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	3 N
Max Axial Force	1,5 N

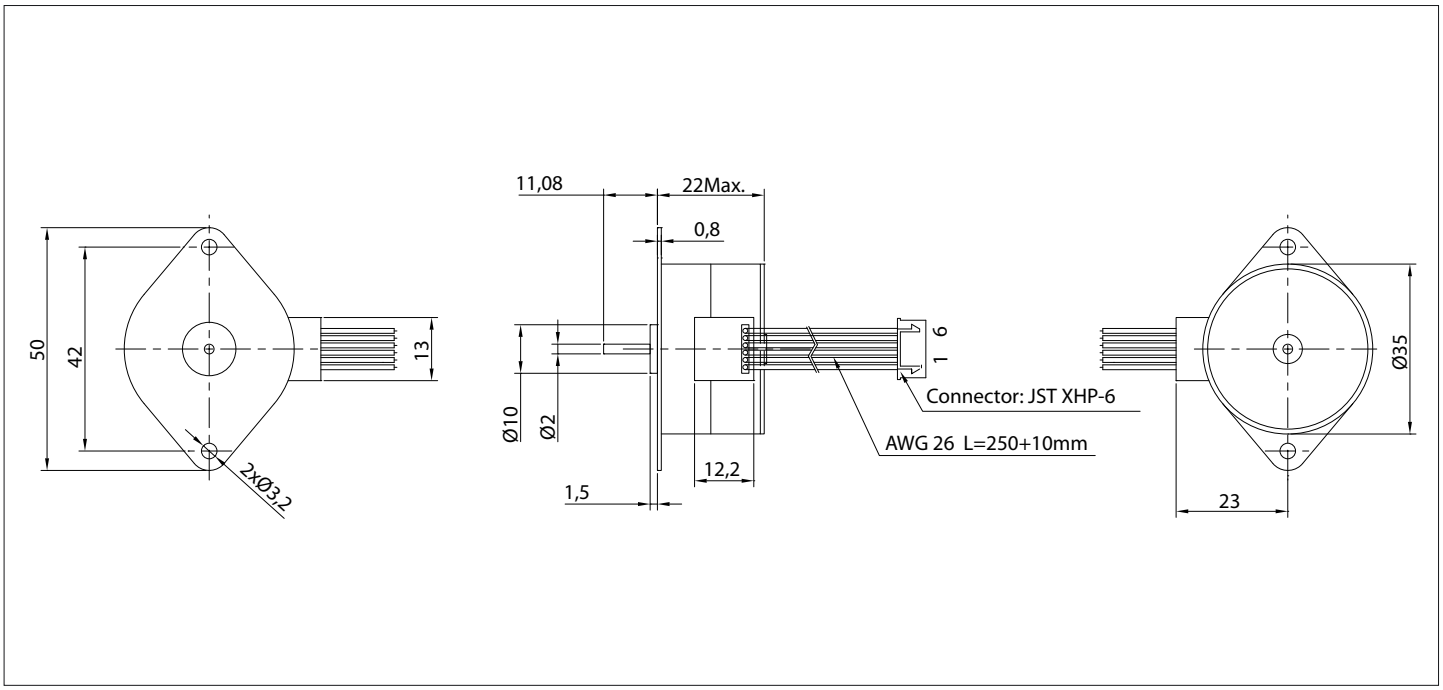
CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-
5	Black	UL1430 AWG30	Com Phase A
6	Brown	UL1430 AWG30	Com Phase B



PM STEPPER MOTOR

PM Stepper Motor 35PM22



SPECIFICATION

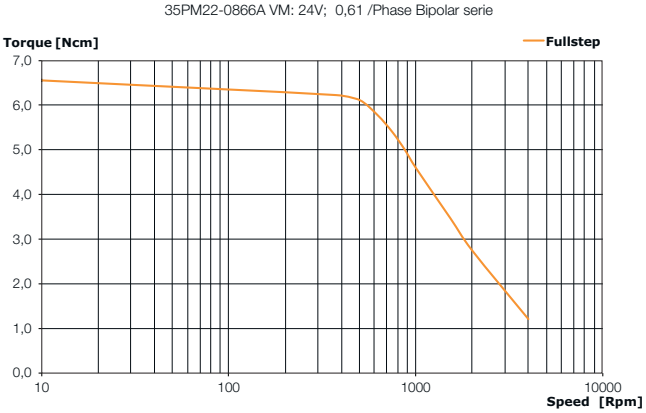
Model			35PM22-0866A
1	Rated Voltage	V	5
2	Current/Phase	A	0,86
3	Resistance/Phase	Ω	5,8
4	Inductance/Phase	mH	3,2
5	Holding Torque	Nm	0,055
6	Rotor Inertia	Kg-m^2	7,5x10^{-7}
7	Weight	Kg	0,09
8	Number of leads		6

CHARACTERISTICS

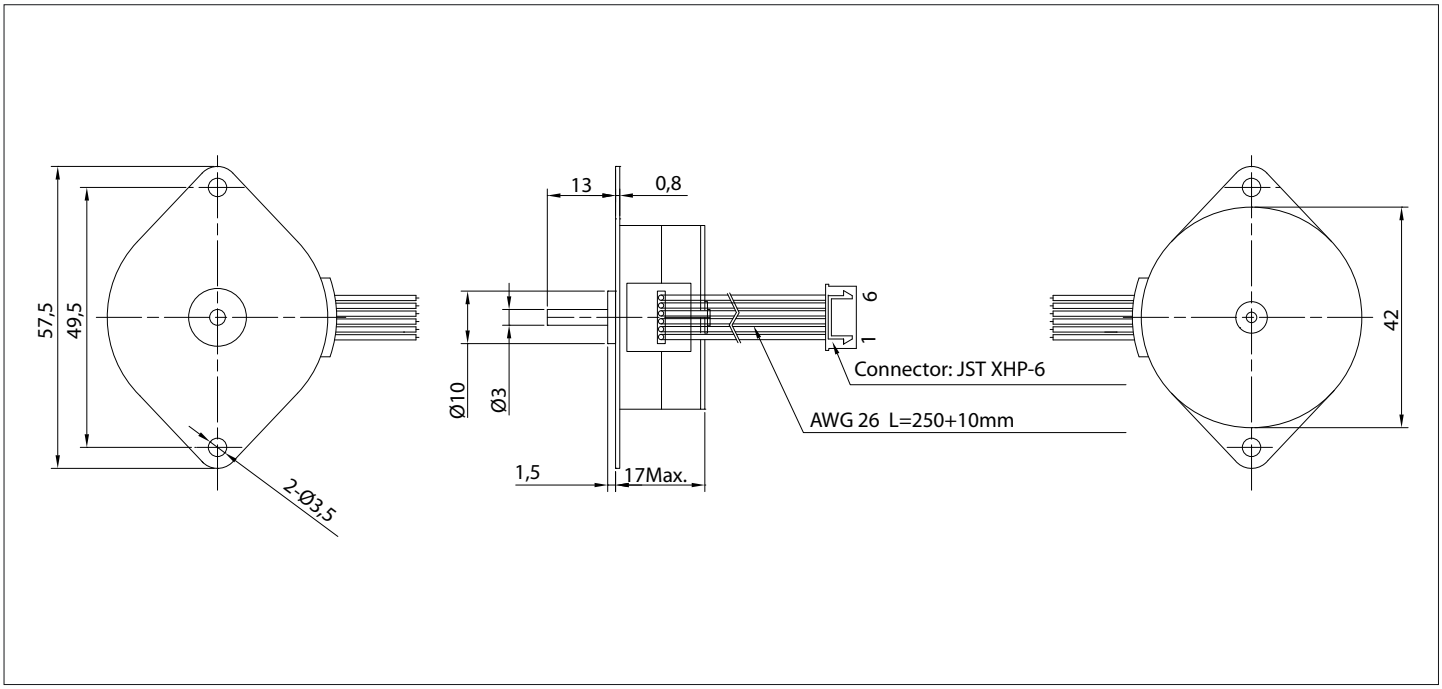
Step Angle	7,5°
Step Angle Accuracy	± 7%
Insulation Class	E
Ambient Temperature	-10°C +40°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	3 N
Max Axial Force	1,5 N

CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-
5	Black	UL1430 AWG30	Com Phase A
6	Brown	UL1430 AWG30	Com Phase B



PM Stepper Motor 42PM17



SPECIFICATION

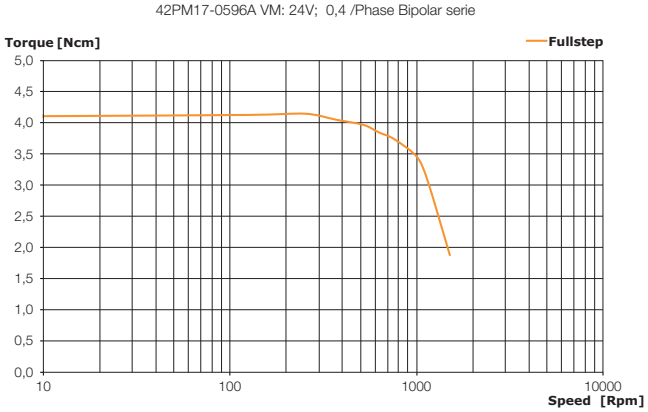
Model			42PM17-0596A
1	Rated Voltage	V	5
2	Current/Phase	A	0,59
3	Resistance/Phase	Ω	8,6
4	Inductance/Phase	mH	4,5
5	Holding Torque	Nm	0,05
6	Rotor Inertia	$Kg\text{-}m^2$	$9{,}6x10^{-7}$
7	Weight	Kg	0,11
8	Number of leads		6

CHARACTERISTICS

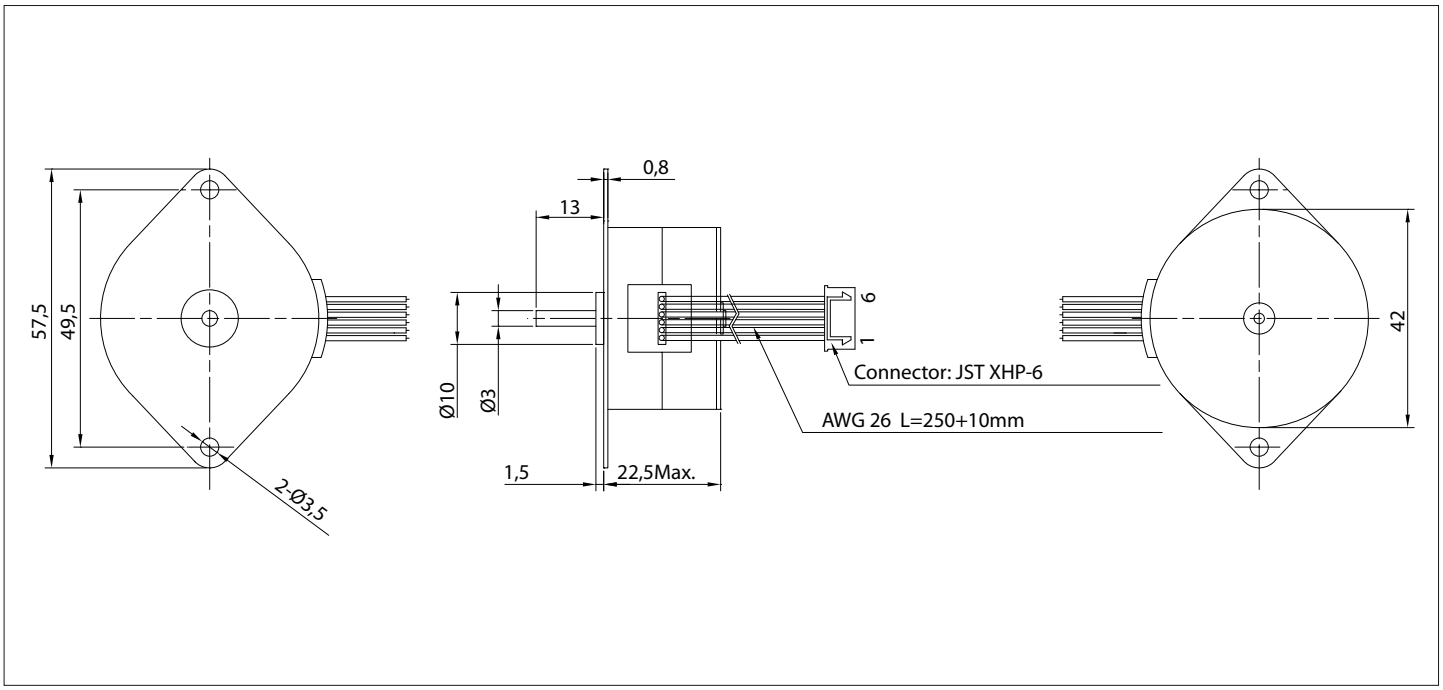
Step Angle	7,5°
Step Angle Accuracy	± 7%
Insulation Class	B
Ambient Temperature	-10°C +40°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	5 N
Max Axial Force	2 N

CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-
5	Black	UL1430 AWG30	Com Phase A
6	Brown	UL1430 AWG30	Com Phase B



PM Stepper Motor 42PM22



SPECIFICATION

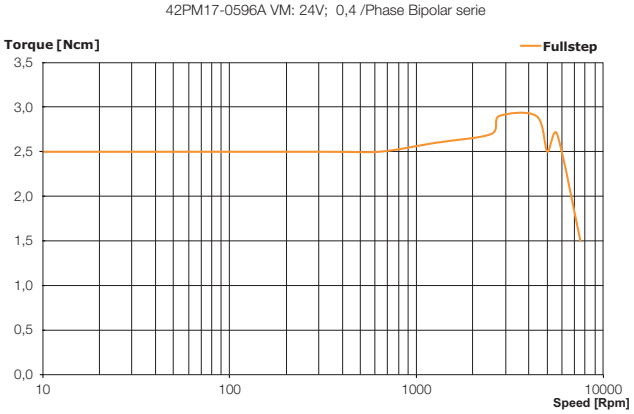
Model			42PM22-0806A
1	Rated Voltage	V	5
2	Current/Phase	A	0,8
3	Resistance/Phase	Ω	6,2
4	Inductance/Phase	mH	5,5
5	Holding Torque	Nm	0,06
6	Rotor Inertia	Kg-m^2	9,6x10^{-7}
7	Weight	Kg	0,13
8	Number of leads		6

CHARACTERISTICS

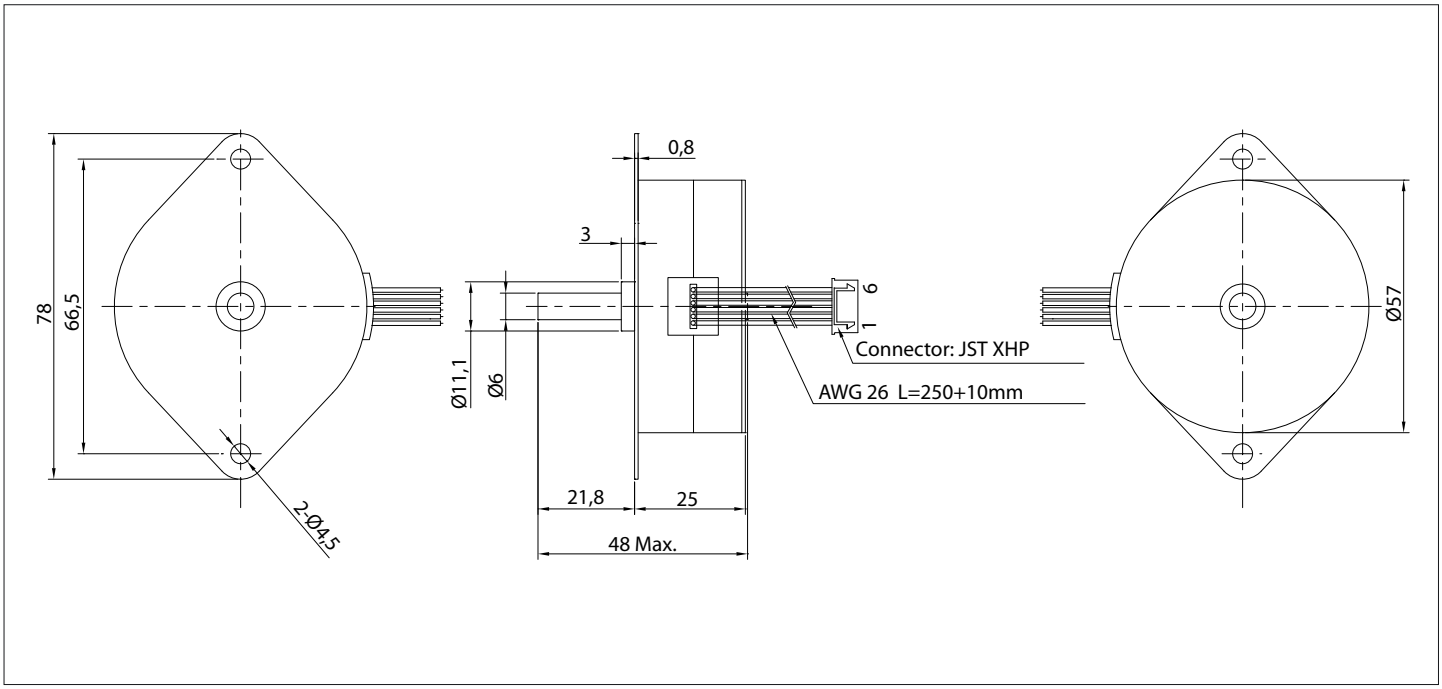
Step Angle	7,5°
Step Angle Accuracy	± 7%
Insulation Class	E
Ambient Temperature	-10°C +40°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min.500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	5 N
Max Axial Force	2 N

CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-
5	Black	UL1430 AWG30	Com Phase A
6	Brown	UL1430 AWG30	Com Phase B



PM Stepper Motor 57PM25



SPECIFICATION

Model			57PM25-0126A	57PM25-0624A
1	Rated Voltage	V	12	5,6
2	Current/Phase	A	0,12	0,625
3	Resistance/Phase	Ω	100	9
4	Inductance/Phase	mH	107	19,9
5	Holding Torque	Nm	0,15	0,12
6	Rotor Inertia	Kg-m^2	1,25x10^{-6}	1,25x10^{-6}
7	Weight	Kg	0,27	0,27
8	Number of leads		6	4

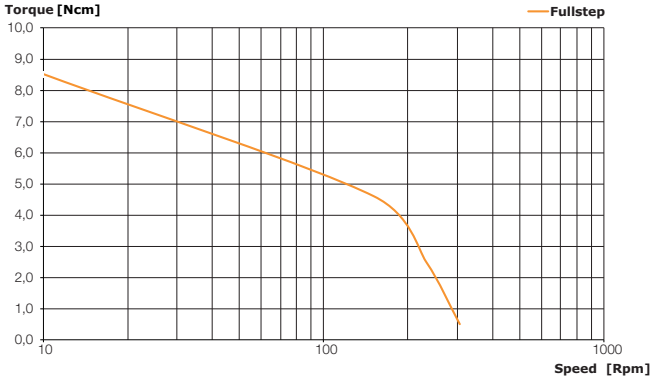
CHARACTERISTICS

Step Angle	7,5°
Step Angle Accuracy	± 8%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (Rated Current, 2 Phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (3 mm from front flange)	5 N
Max Axial Force	2 N

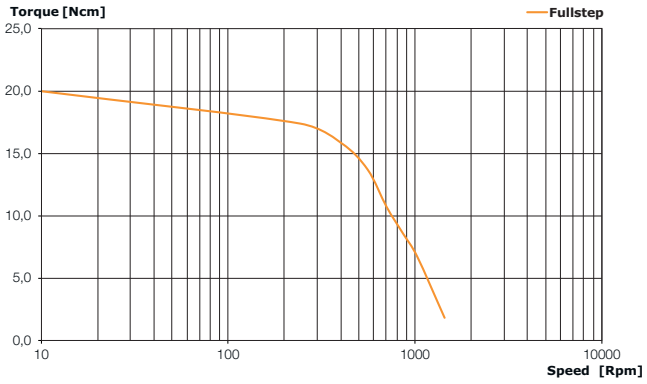
CONNECTION

Pin N°	Color	Gauge	Function
1	White	UL1430 AWG30	Phase A
2	Red	UL1430 AWG30	Phase A-
3	Blue	UL1430 AWG30	Phase B
4	Yellow	UL1430 AWG30	Phase B-
5	Black	UL1430 AWG30	Com Phase A
6	Brown	UL1430 AWG30	Com Phase B

57PM25-0126A VM: 24V; 0,9 /Phase Bipolar serie



57PM25-0624A VM: 24V; 0,6 /Phase Bipolar serie



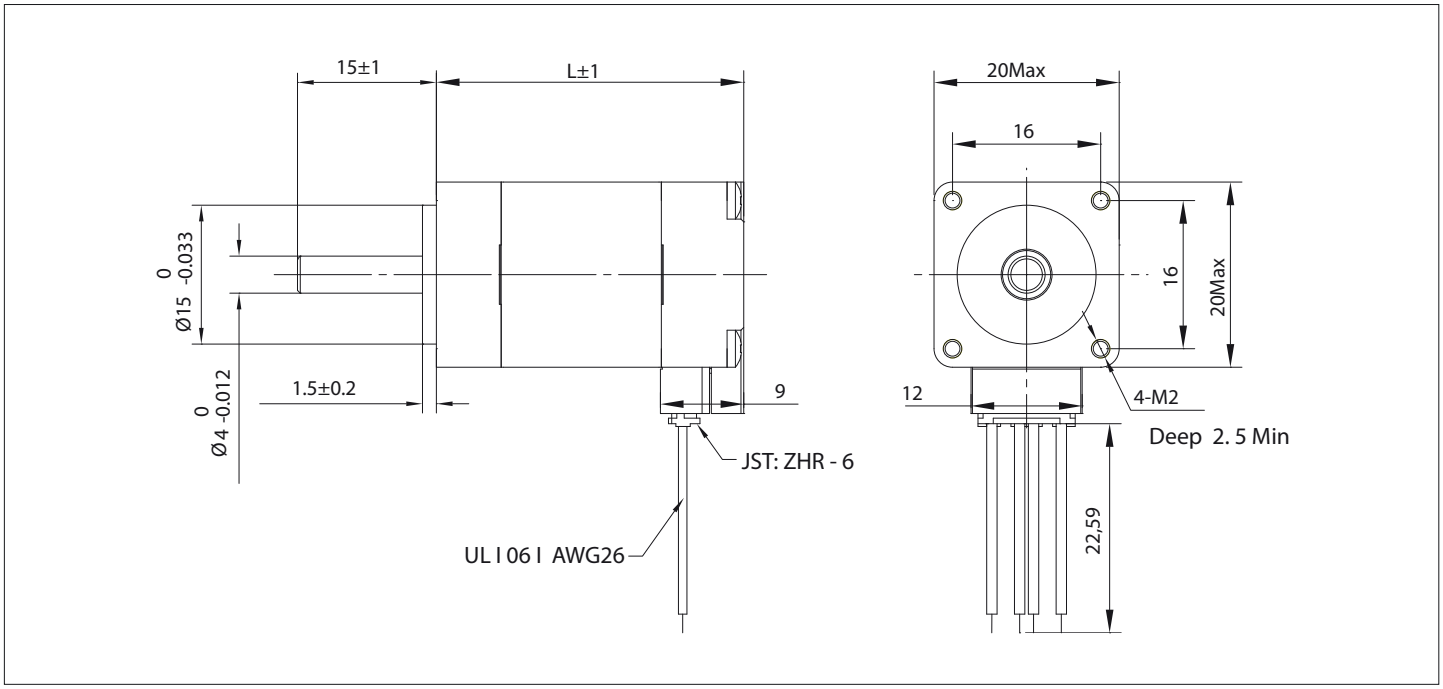
PM STEPPER MOTOR

May 2020 edition/ subject to change

Hybrid Stepper Motor

Where accuracy and torque the same thing. Our range of Hybrid Stepper motors, one of the largest in the industry, offer many variants to perfectly fit all applications requiring accurate and fast positioning. High torque, high accuracy, with 2 or 3-phase design, and highly customizable: there will be one version to fit your application needs.

Note/Notes



SPECIFICATION

	Model		20STC33-0604A	20STC40-0804A
1	Rated Voltage	V	3,84	4,32
2	Current/Phase	A	0,6	0,8
3	Resistance/Phase	Ω	6,4	5,6
4	Inductance/Phase	mH	2,6	2,3
5	Holding Torque	Nm	0,022	0,036
6	Rotor Inertia	g-cm^2	2	3,6
7	Weight	Kg	0,06	0,08
8	Number of leads		4	4
9	Length	mm	33	40

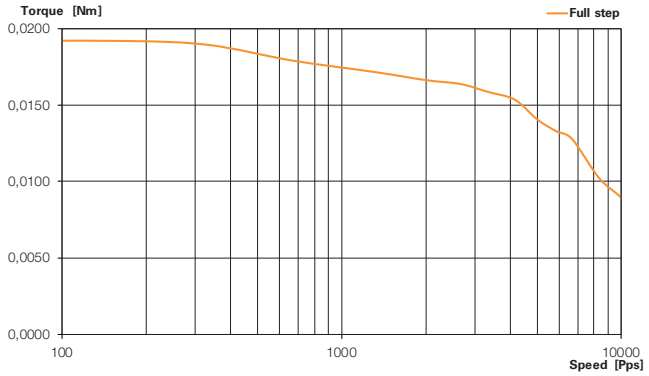
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	10 N
Max Axial Force	4 N

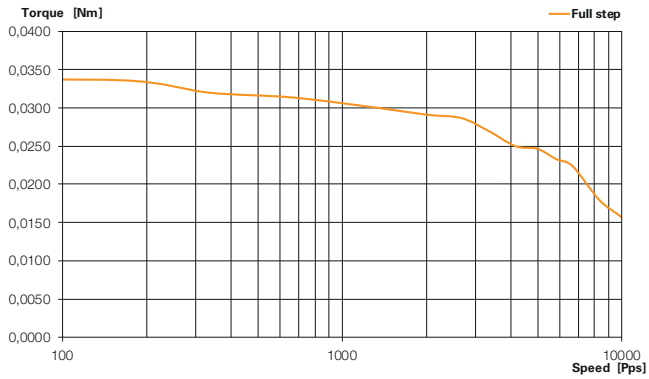
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-

20STC33-0604A VM: 24V; 0,6A /Phase Driver: SMD 103

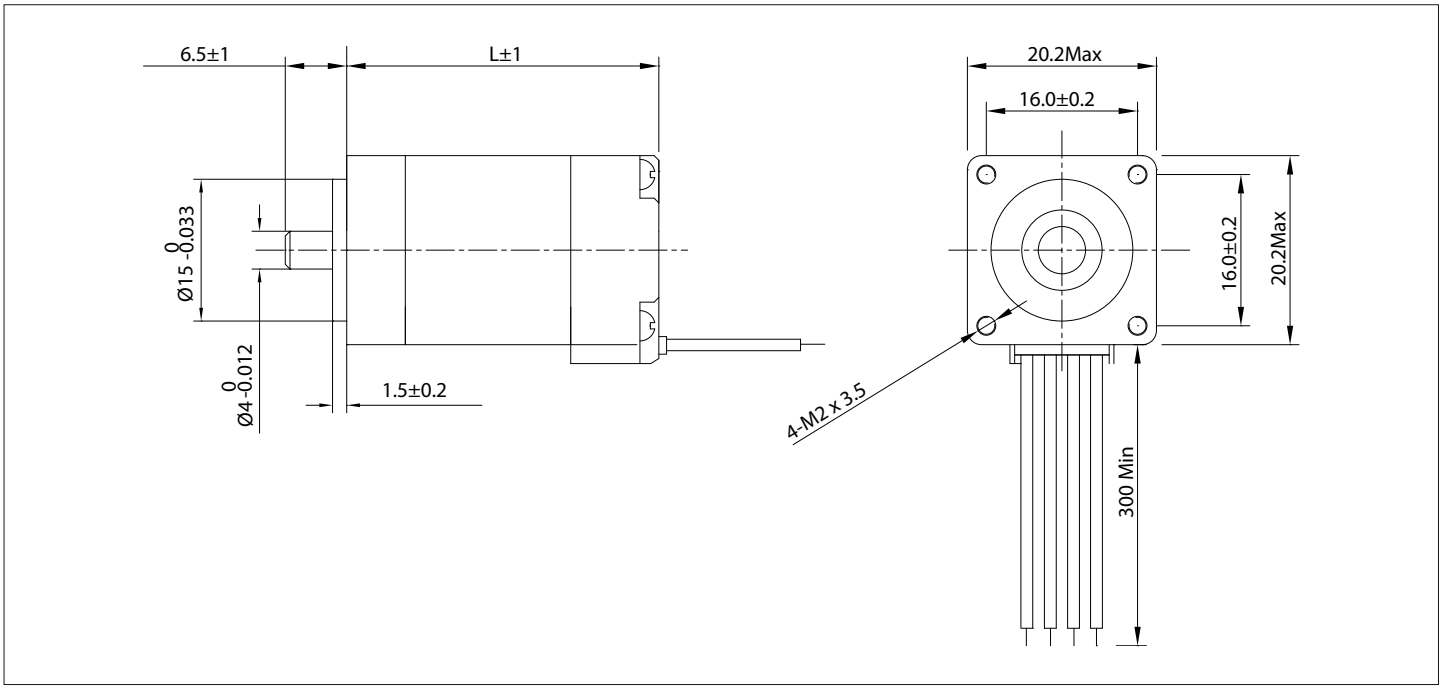


20STC40-0804A VM: 24V; 0,8A /Phase Driver: SMD 103



STEPPER MOTOR

Stepper Motor 20SH High Torque Hybrid



SPECIFICATION

Model			20SH33-0604A	20SH42-0804A
1	Rated Voltage	V	3,96	4,32
2	Current/Phase	A	0,6	0,8
3	Resistance/Phase	Ω	6,5	5,4
4	Inductance/Phase	mH	1,7	1,5
5	Holding Torque	Nm	0,0176	0,03
6	Rotor Inertia	g-cm^2	2	3,6
7	Weight	Kg	0,06	0,08
8	Number of leads		4	4
9	Length	mm	33	42

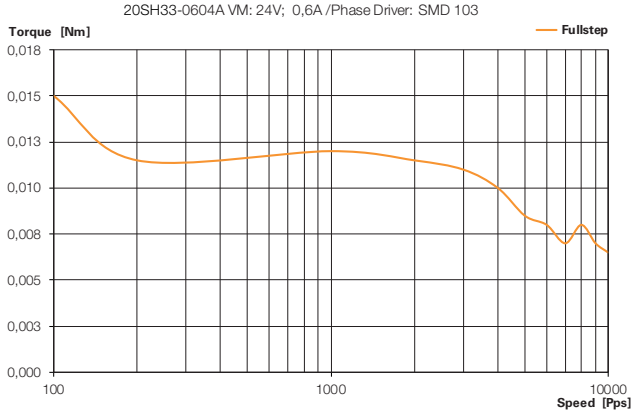
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	2 N

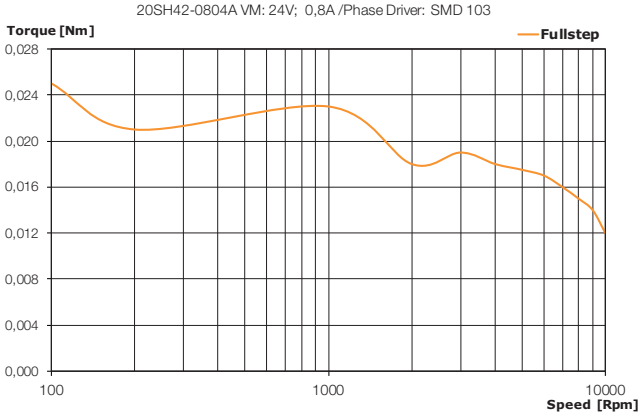
CONNECTION

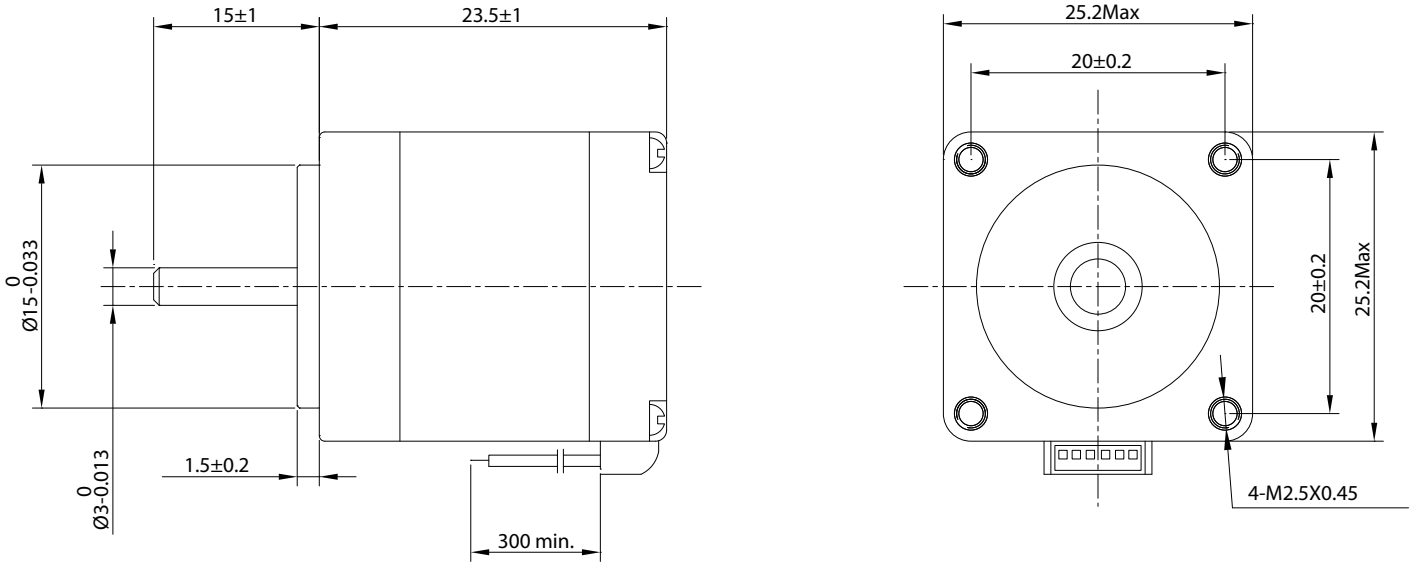
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG28	Phase A
2	Green	UL1061 AWG28	Phase A-
3	Red	UL1061 AWG28	Phase B
4	Blue	UL1061 AWG28	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG28	Com Phase A
6	White	UL1061 AWG28	Com Phase B

20SH33-0604A VM: 24V; 0,6A /Phase Driver: SMD 103



20SH42-0804A VM: 24V; 0,8A /Phase Driver: SMD 103





SPECIFICATION

Model		25SH23-0704A
1 Rated Voltage	V	3
2 Current/Phase	A	0,7
3 Resistance/Phase	Ω	4,3
4 Inductance/Phase	mH	2,4
5 Holding Torque	Nm	0,033
6 Rotor Inertia	g-cm^2	2
7 Weight	Kg	0,055
8 Number of leads		4
9 Length	mm	23

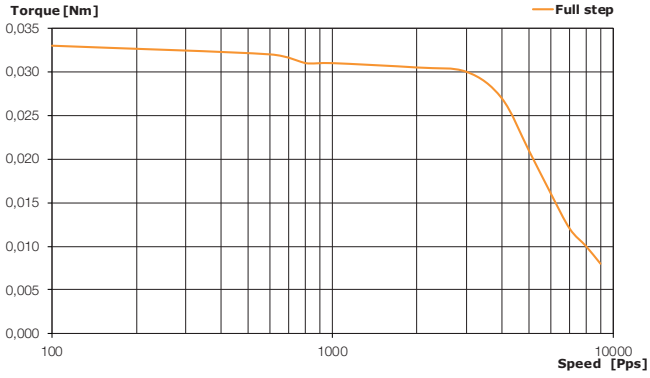
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	7 N

CONNECTION

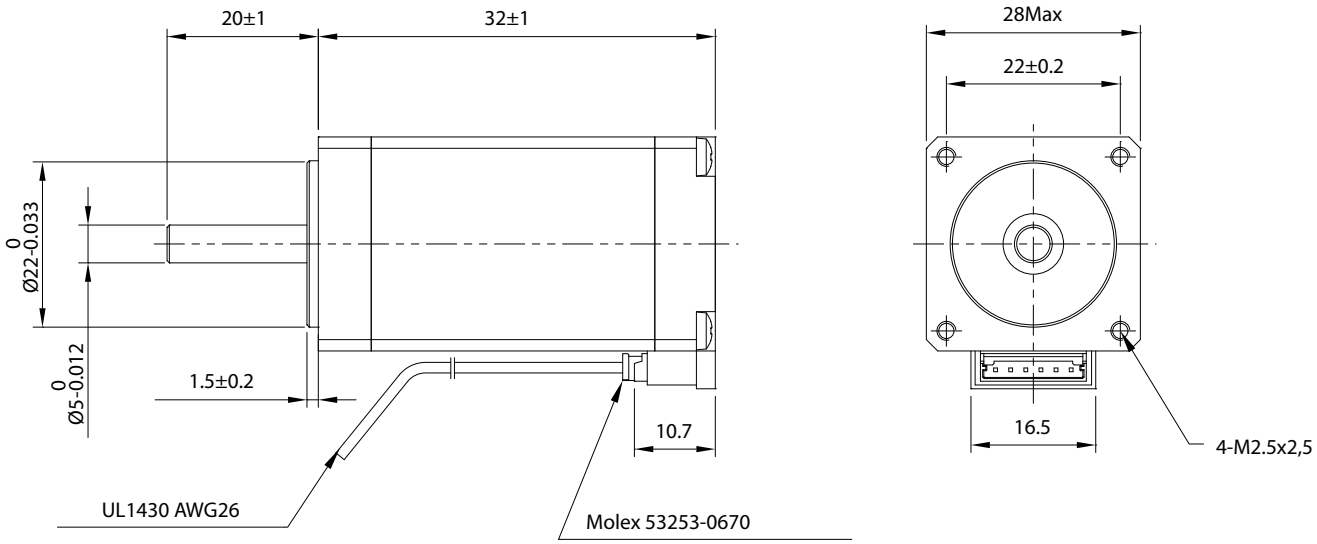
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-

25SH23-0704A VM: 24V; 0,7 A /Phase



STEPPER MOTOR

Stepper Motor 28STC32 High Torque Hybrid



SPECIFICATION

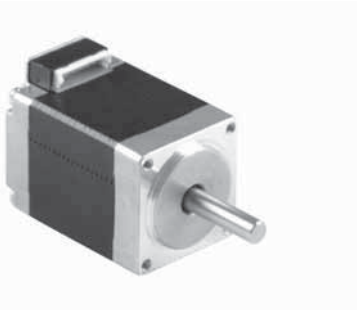
	Model		28STC32-0674A	28STC32-1504A
1	Rated Voltage	V	4,2	1,95
2	Current/Phase	A	0,67	1,5
3	Resistance/Phase	Ω	6,2	1,3
4	Inductance/Phase	mH	5,76	1
5	Holding Torque	Nm	0,08	0,08
6	Rotor Inertia	g-cm^2	9	9
7	Weight	Kg	0,11	0,11
8	Number of leads		4	4
9	Length	mm	32	32

CHARACTERISTICS

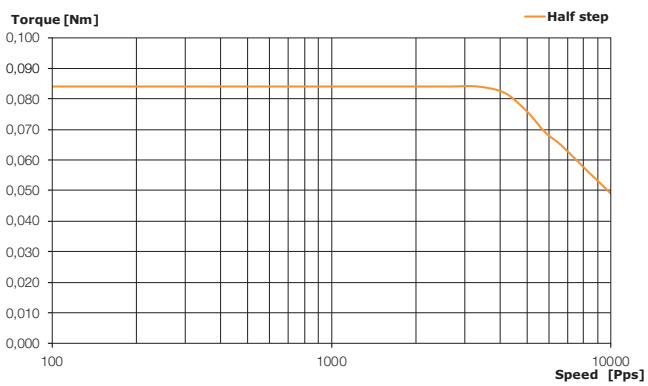
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	7 N

CONNECTION

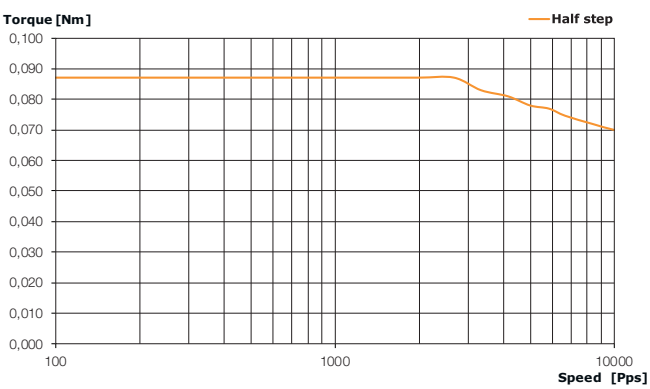
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG28	Phase A
2	Green	UL1061 AWG28	Phase A-
3	Red	UL1061 AWG28	Phase B
4	Blue	UL1061 AWG28	Phase B-

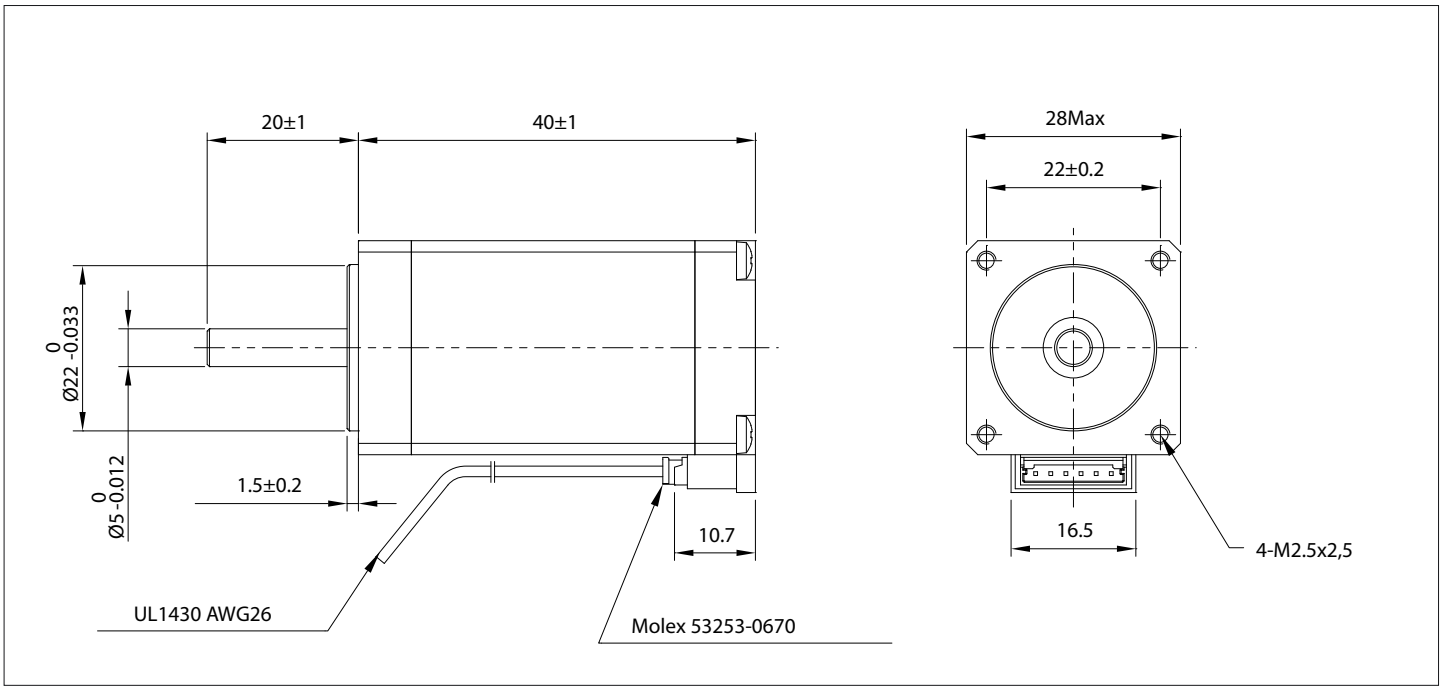


28STC32-0674A VM: 24V; 0,67A /Phase Driver: SMD 103



28STC32-1504A VM: 24V; 0,67A /Phase Driver: SMD 103





SPECIFICATION

	Model		28STC40-0674A	28STC40-1504A
1	Rated Voltage	V	4,9	2,2
2	Current/Phase	A	0,67	1,5
3	Resistance/Phase	Ω	7,3	1,45
4	Inductance/Phase	mH	6,52	1,25
5	Holding Torque	Nm	0,13	0,13
6	Rotor Inertia	g-cm^2	12	12
7	Weight	Kg	0,14	0,14
8	Number of leads		4	4
9	Length	mm	40	40

CHARACTERISTICS

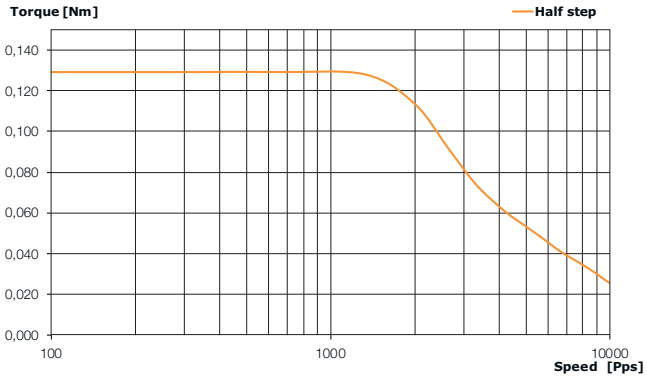
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	7 N

CONNECTION

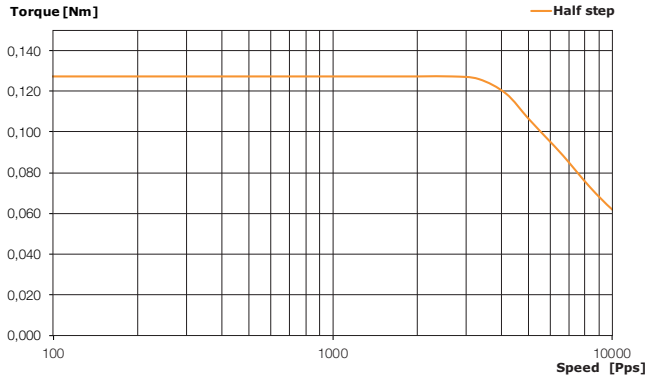
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG28	Phase A
2	Green	UL1061 AWG28	Phase A-
3	Red	UL1061 AWG28	Phase B
4	Blue	UL1061 AWG28	Phase B-

STEPPER MOTOR

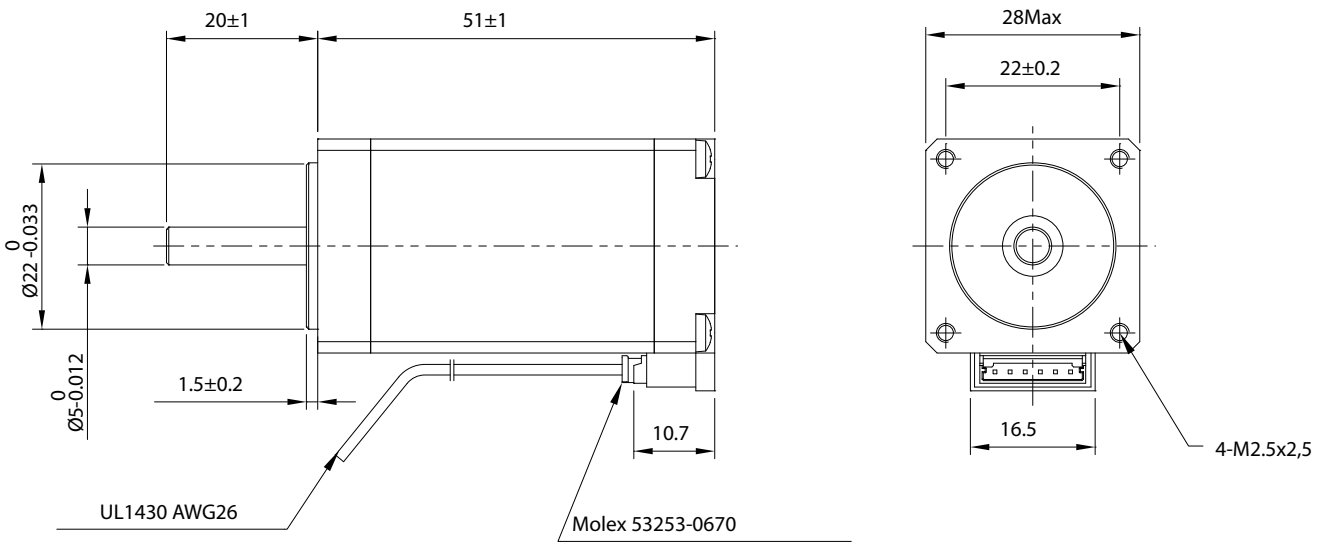
28STC40-0674A VM: 24V; 0,67A /Phase Driver: SMD 103



28STC40-1504A VM: 24V; 0,67A /Phase Driver: SMD 103



Stepper Motor 28STC51 High Torque Hybrid



SPECIFICATION

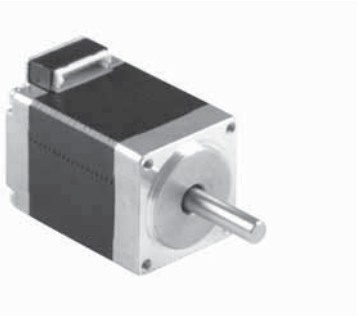
	Model		28STC51-0674A	28STC51-1504A
1	Rated Voltage	V	6,2	2,7
2	Current/Phase	A	0,67	1,5
3	Resistance/Phase	Ω	9,2	1,9
4	Inductance/Phase	mH	8,4	1,9
5	Holding Torque	Nm	0,18	0,18
6	Rotor Inertia	g-cm^2	18	18
7	Weight	Kg	0,2	0,2
8	Number of leads		4	4
9	Length	mm	51,5	51,5

CHARACTERISTICS

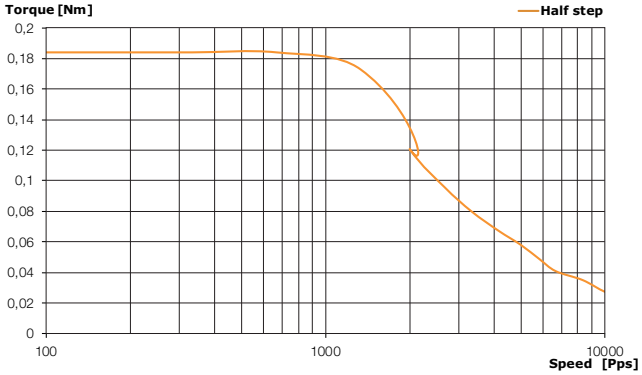
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	7 N

CONNECTION

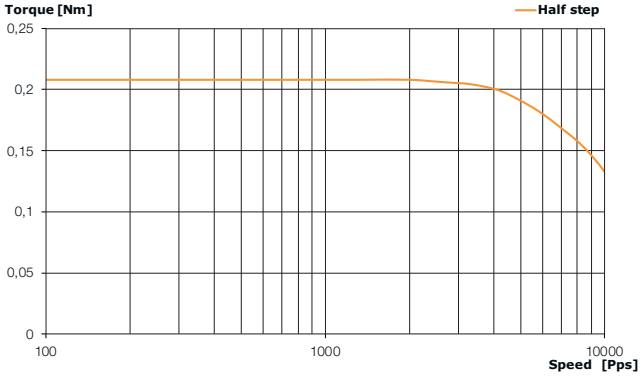
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG28	Phase A
2	Green	UL1061 AWG28	Phase A-
3	Red	UL1061 AWG28	Phase B
4	Blue	UL1061 AWG28	Phase B-

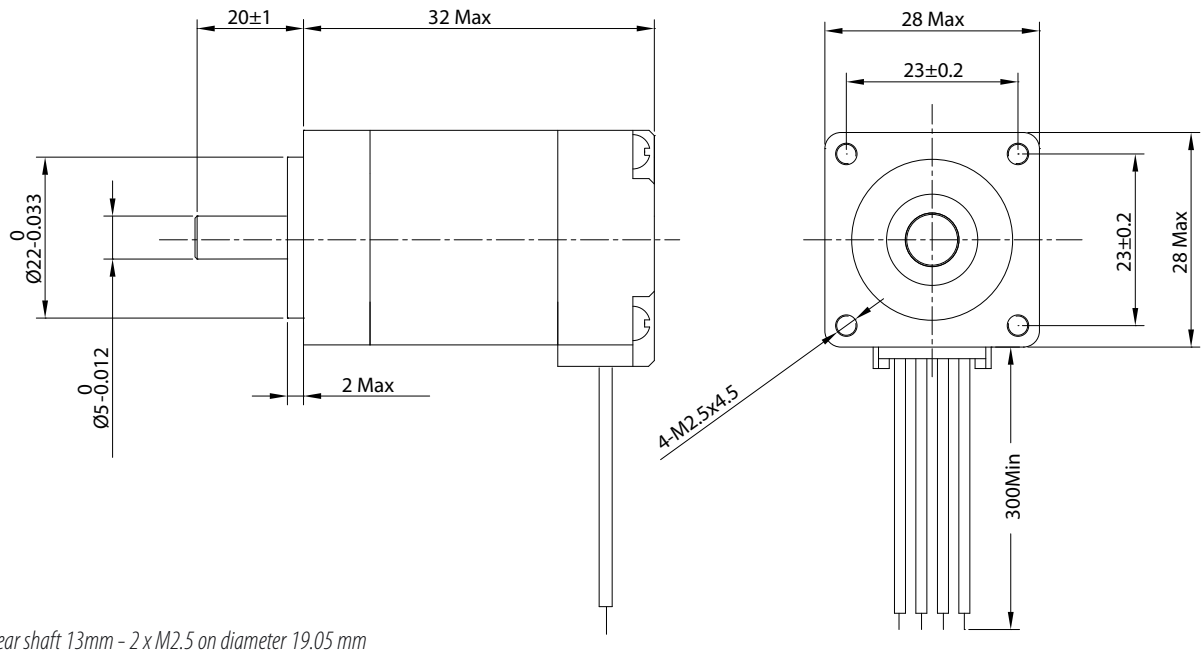


28STC51-0674A VM: 24V; 0,67A /Phase Driver: SMD 103



28STC51-1504A VM: 24V; 0,67A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		28SH32-0956A	28SH32-0674A
1	Rated Voltage	V	2,66	3,8
2	Current/Phase	A	0,95	0,67
3	Resistance/Phase	Ω	2,8	5,6
4	Inductance/Phase	mH	0,8	3,4
5	Holding Torque	Nm	0,043	0,06
6	Rotor Inertia	g-cm^2	9	9
7	Weight	Kg	0,11	0,11
8	Number of leads		6	4
9	Length	mm	32	32

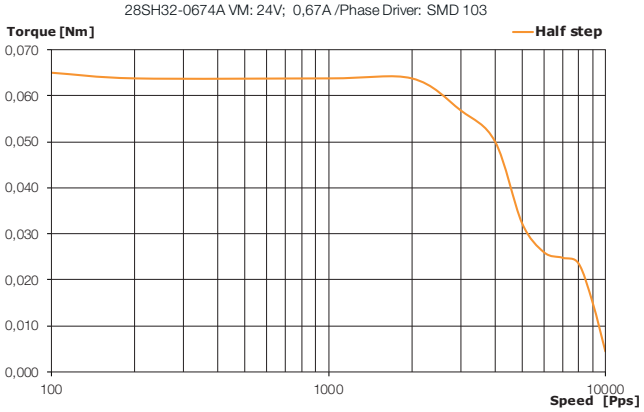
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

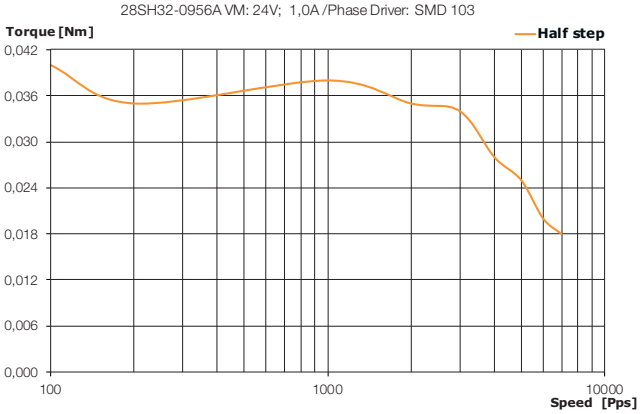
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

28SH32-0674A VM: 24V; 0,67A /Phase Driver: SMD 103

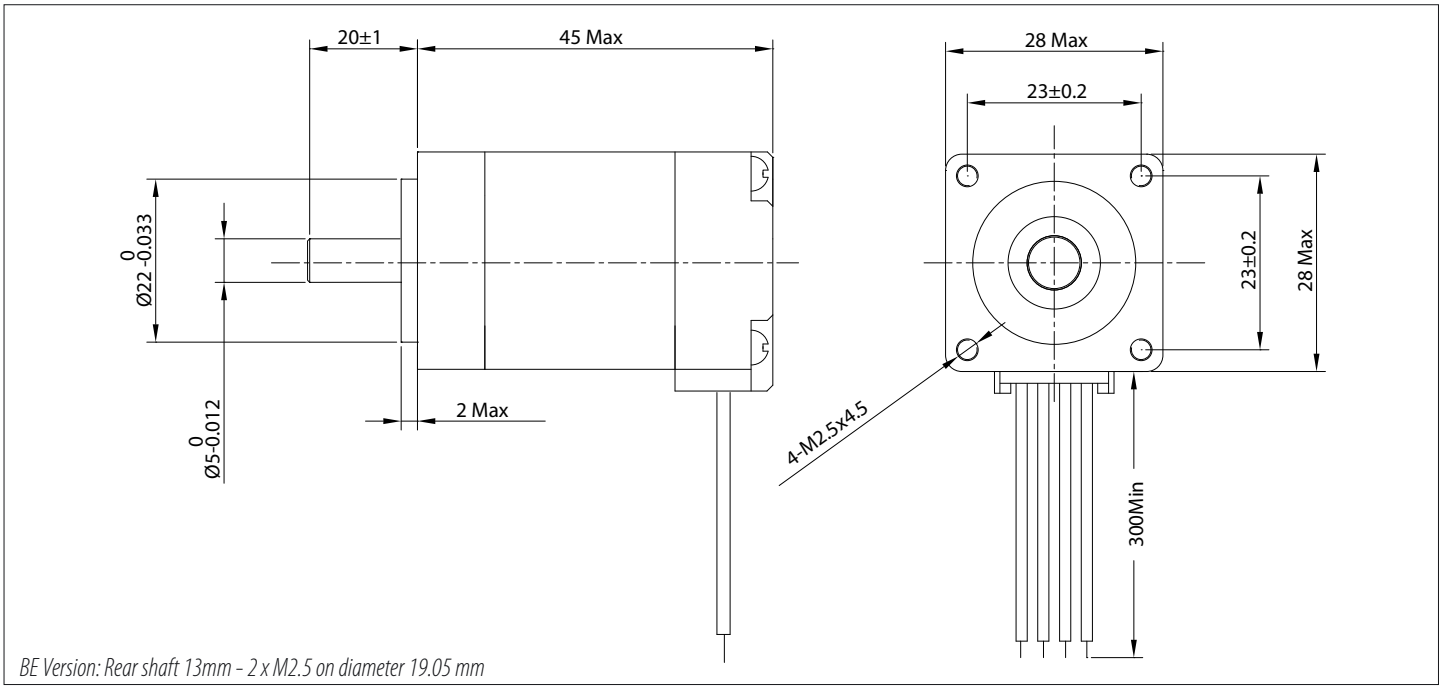


28SH32-0956A VM: 24V; 1,0A /Phase Driver: SMD 103



STEPPER MOTOR

Stepper Motor 28SH45 High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

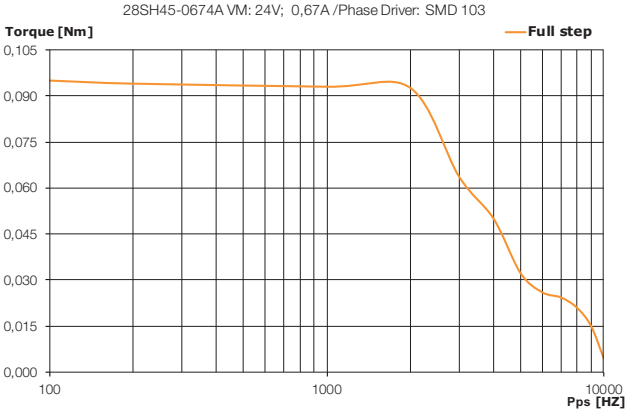
	Model		28SH45-0956A	28SH45-0674A
1	Rated Voltage	V	3,4	4,56
2	Current/Phase	A	0,95	0,67
3	Resistance/Phase	Ω	3,4	6,8
4	Inductance/Phase	mH	1,2	4,9
5	Holding Torque	Nm	0,075	0,095
6	Rotor Inertia	g-cm^2	12	12
7	Weight	Kg	0,14	0,14
8	Number of leads		6	4
9	Length	mm	45	45

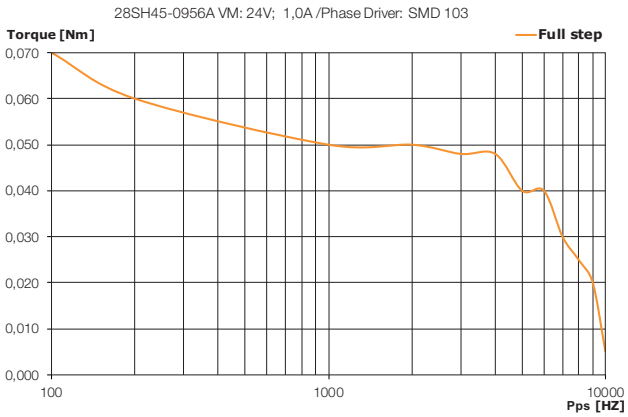
CHARACTERISTICS

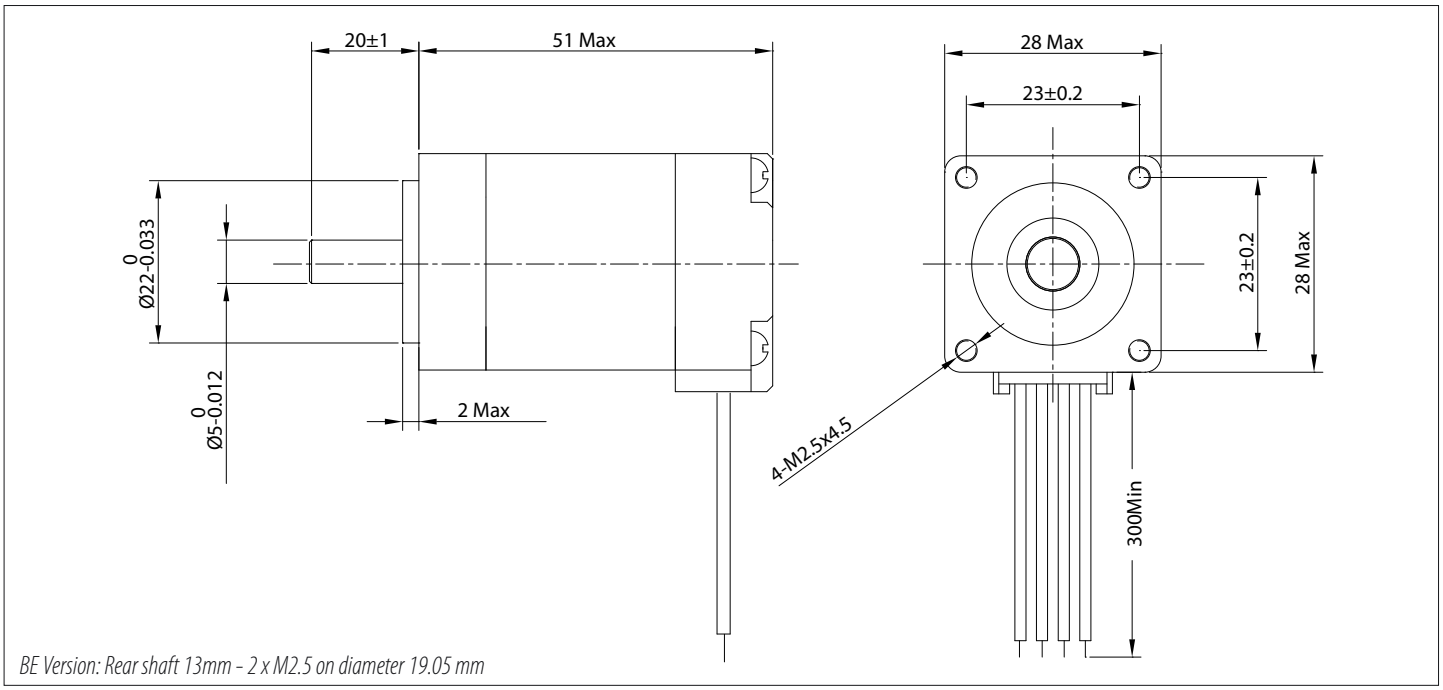
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B







BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

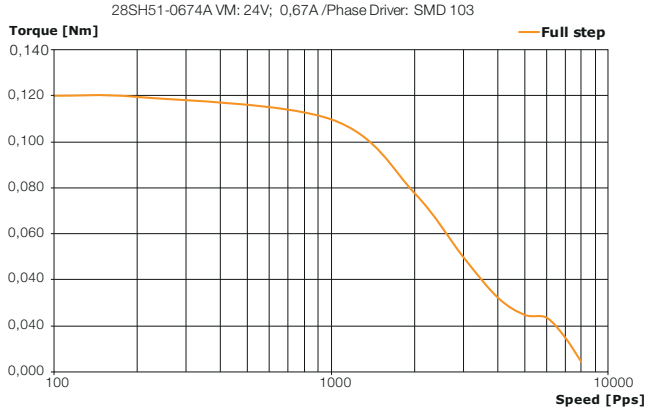
Model			28SH51-0956A	28SH51-0674A
1	Rated Voltage	V	4,4	6,2
2	Current/Phase	A	0,95	0,67
3	Resistance/Phase	Ω	4,6	9,2
4	Inductance/Phase	mH	1,8	7,2
5	Holding Torque	Nm	0,9	0,12
6	Rotor Inertia	g-cm^2	18	18
7	Weight	Kg	0,2	0,2
8	Number of leads		6	4
9	Length	mm	51	51

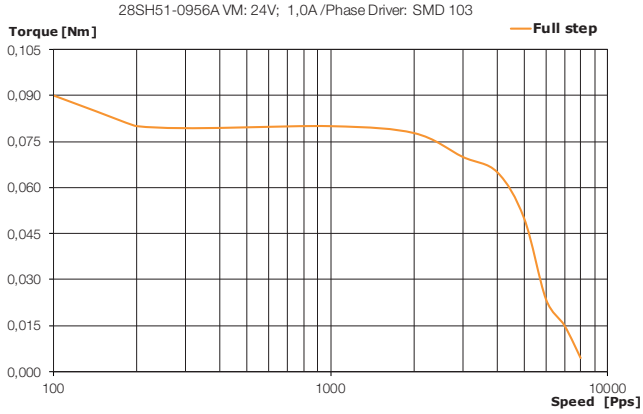
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

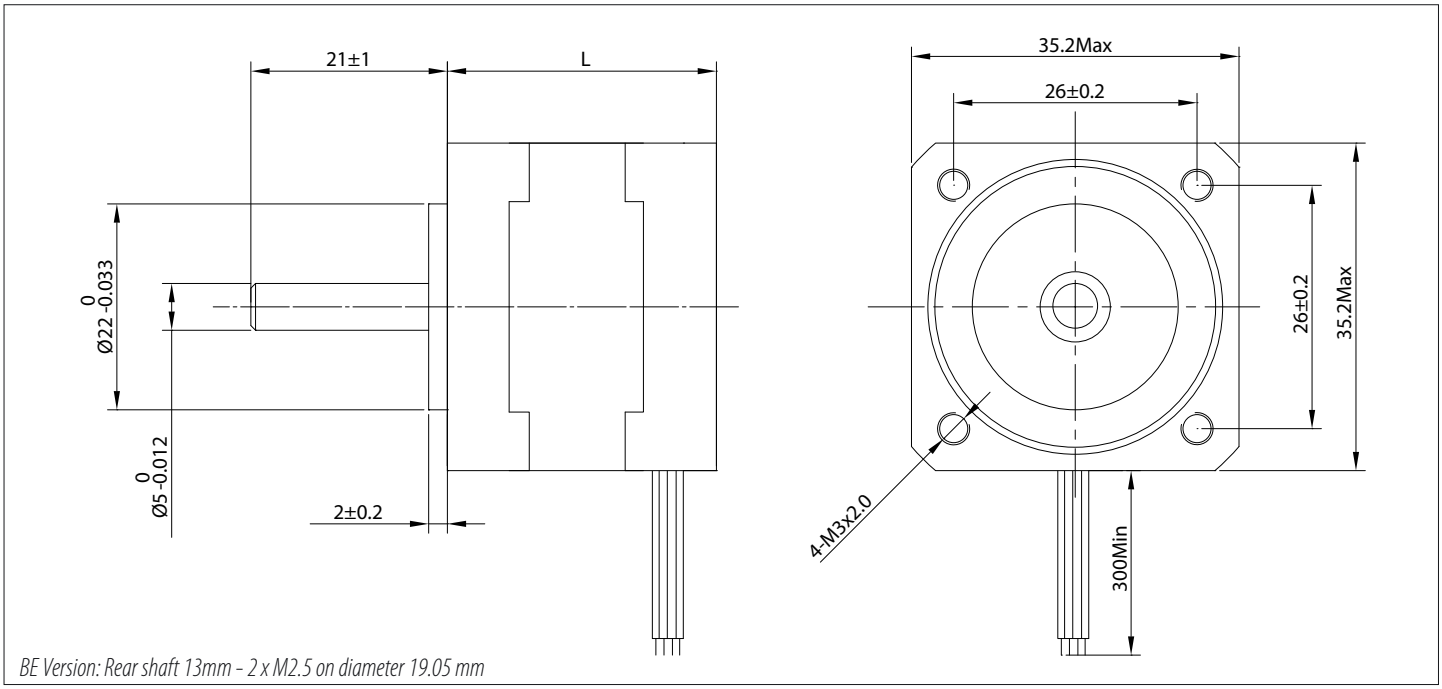
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B





Stepper Motor 35SH High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		35SH26-0284A	35SH28-0504A
1	Rated Voltage	V	7,4	10
2	Current/Phase	A	0,28	0,5
3	Resistance/Phase	Ω	26	20
4	Inductance/Phase	mH	27	14
5	Holding Torque	Nm	0,07	0,1
6	Rotor Inertia	g-cm^2	10	11
7	Detent Torque	g-cm	60	80
8	Weight	Kg	0,13	0,14
9	Number of leads		4	4
10	Length	mm	26	28

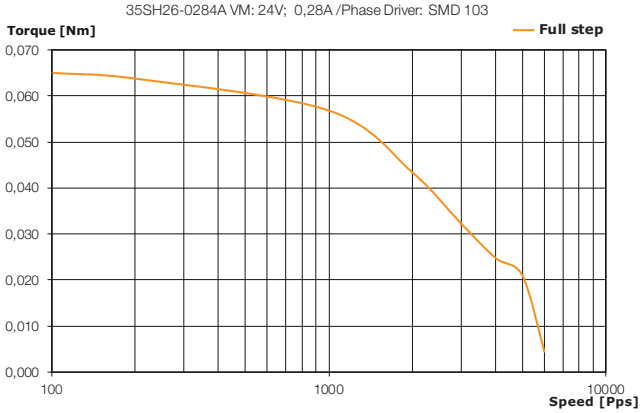
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

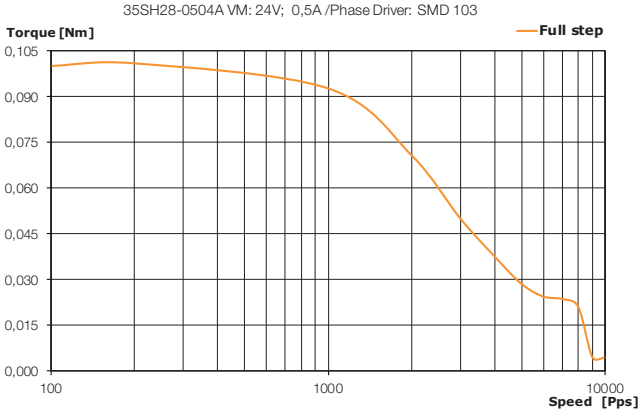
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

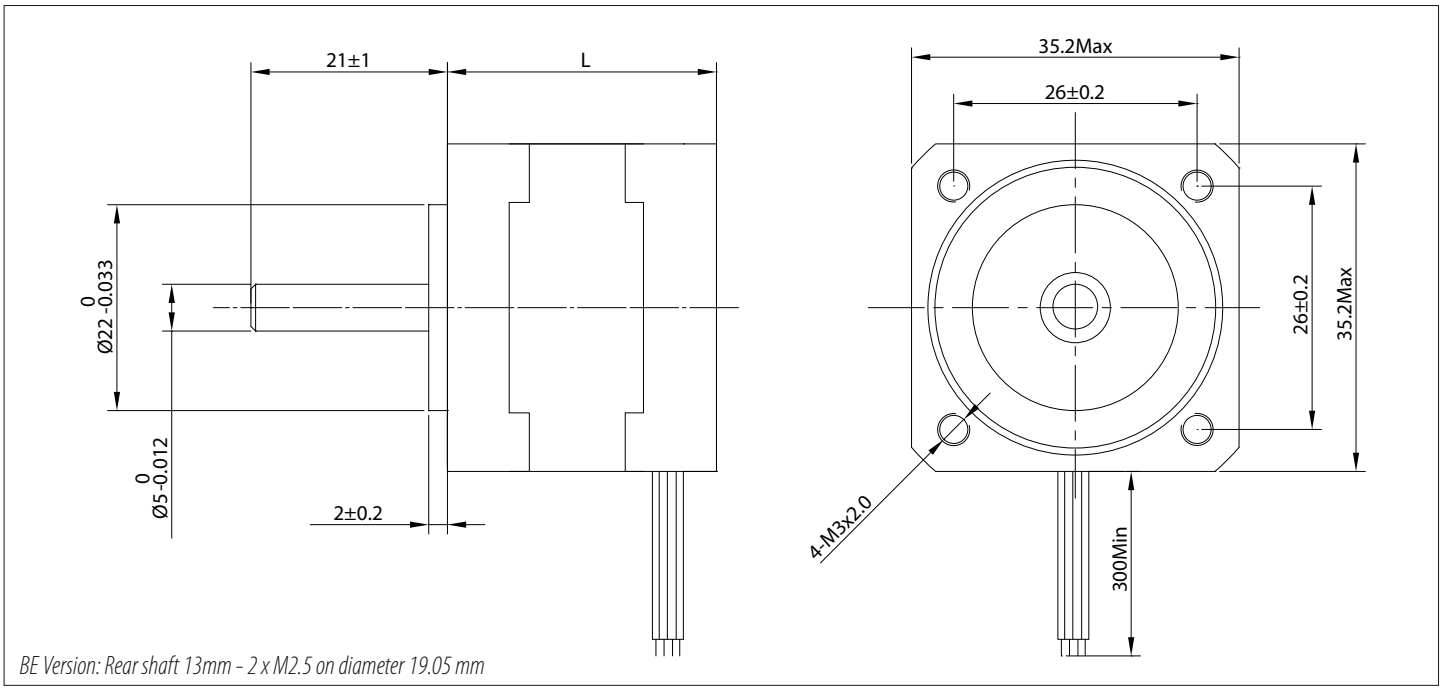
35SH26-0284A VM: 24V; 0,28A /Phase Driver: SMD 103



35SH28-0504A VM: 24V; 0,5A /Phase Driver: SMD 103



May 2020 edition/ subject to change



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

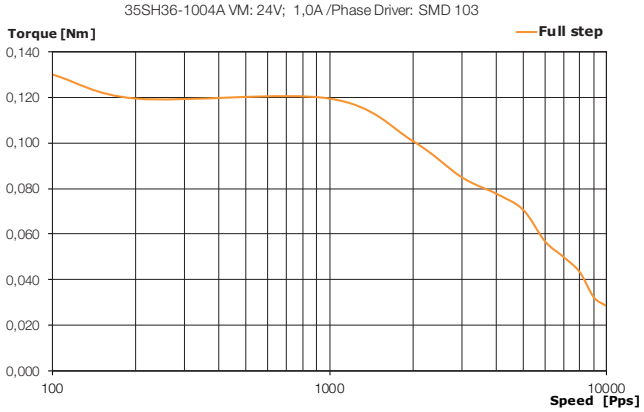
Model		35SH36-1004A
Rated Voltage	V	2,7
Current/Phase	A	1
Resistance/Phase	Ω	2,7
Inductance/Phase	mH	4,3
Holding Torque	Nm	0,14
Rotor Inertia	g-cm^2	14
Detent Torque	g-cm	100
Weight	Kg	0,18
Number of leads		4
Length	mm	36

CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

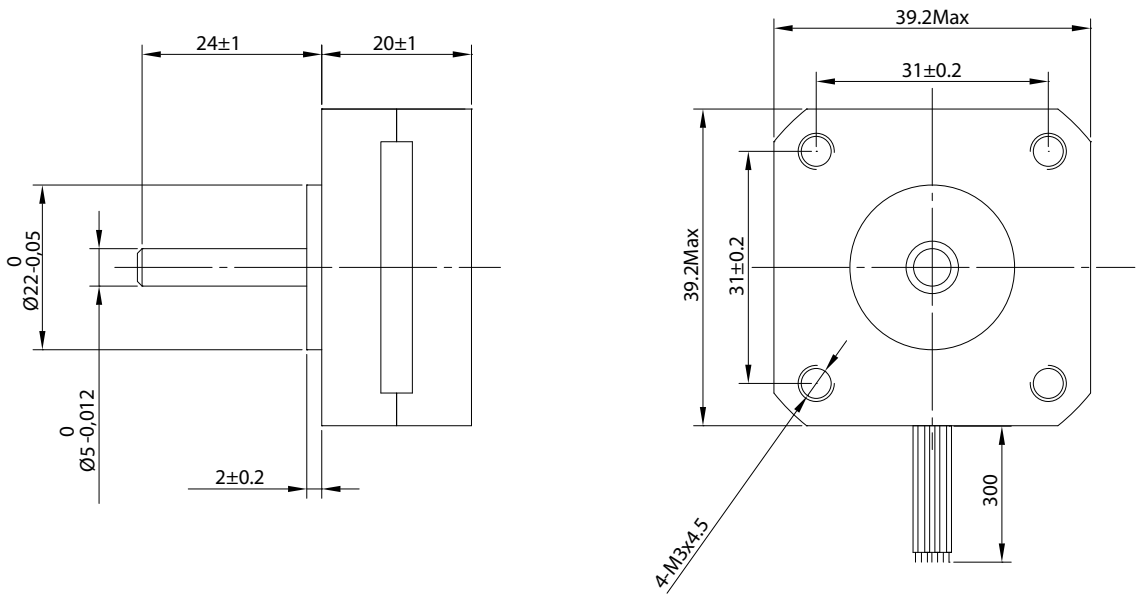
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B



STEPPER MOTOR

Stepper Motor 39SH20 High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

Model			39SH20-0404A	39SH20-0506A
1	Rated Voltage	V	2,64	6,5
2	Current/Phase	A	0,4	0,5
3	Resistance/Phase	Ω	6,6	13
4	Inductance/Phase	mH	6	6
5	Holding Torque	Nm	0,065	0,08
6	Rotor Inertia	g-cm^2	11	11
7	Detent Torque	g-cm	50	50
8	Weight	Kg	0,12	0,12
9	Number of leads		4	6
10	Length	mm	20	20

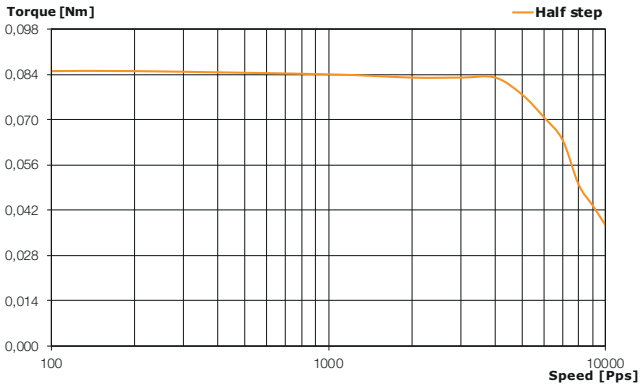
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm)
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

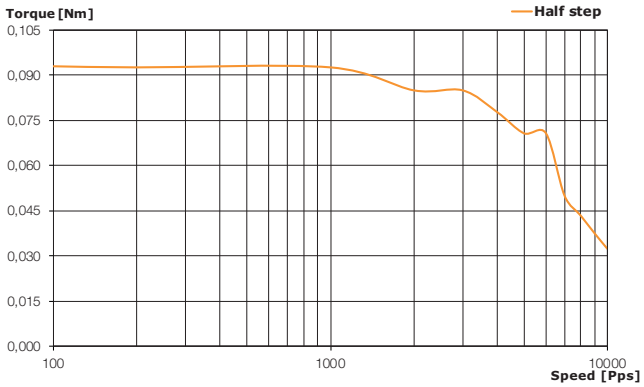
CONNECTION

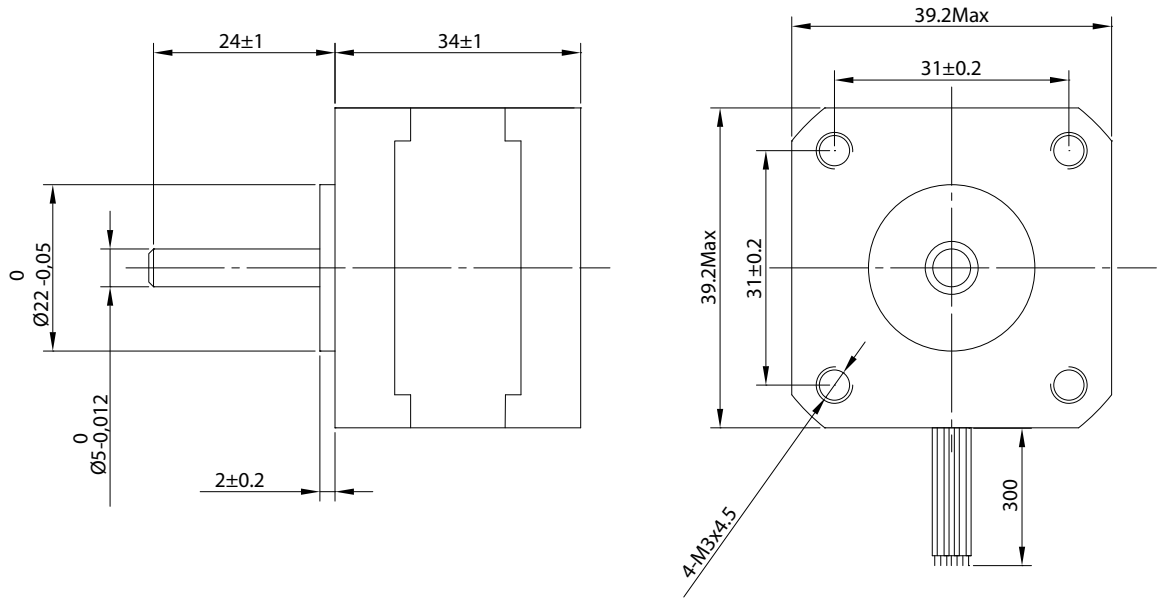
Lead N°	Color	Gauge	Function
1	Black	UL1430 AWG26	Phase A
2	Green	UL1430 AWG26	Phase A-
3	Red	UL1430 AWG26	Phase B
4	Blue	UL1430 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1430 AWG26	Com Phase A
6	White	UL1430 AWG26	Com Phase B

39SH20-0404A VM: 24V; 0,4A /Phase Driver: SMD 103



39SH20-0506A VM: 24V; 0,5A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

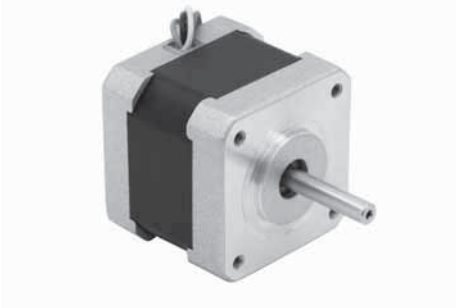
Model			39SH34-0306A	39SH34-0654A
1	Rated Voltage	V	12	4,55
2	Current/Phase	A	0,3	0,65
3	Resistance/Phase	Ω	40	7
4	Inductance/Phase	mH	20	9,3
5	Holding Torque	Nm	0,13	0,18
6	Rotor Inertia	g-cm^2	20	20
7	Detent Torque	g-cm	120	120
8	Weight	Kg	0,18	0,18
9	Number of leads		6	4
10	Length	mm	34	34

CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

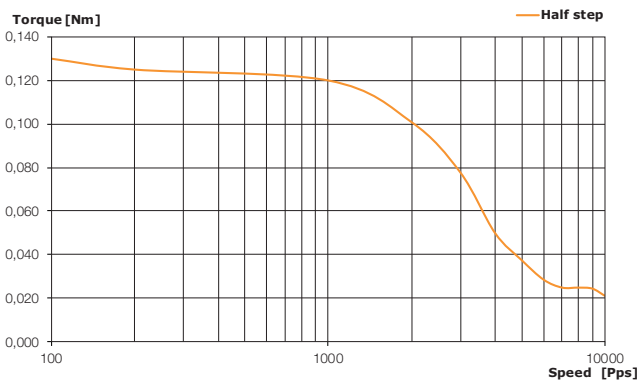
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1430 AWG26	Phase A
2	Green	UL1430 AWG26	Phase A-
3	Red	UL1430 AWG26	Phase B
4	Blue	UL1430 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1430 AWG26	Com Phase A
6	White	UL1430 AWG26	Com Phase B

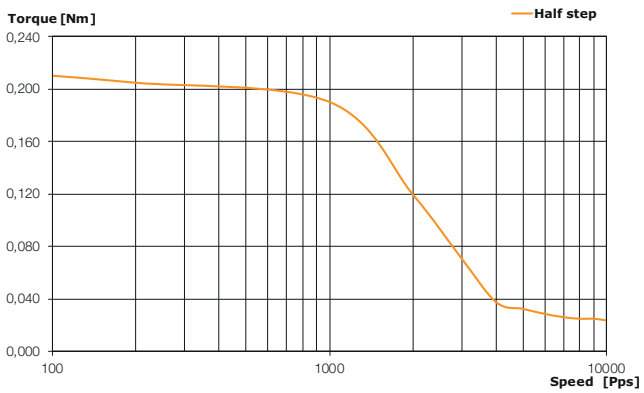


STEPPER MOTOR

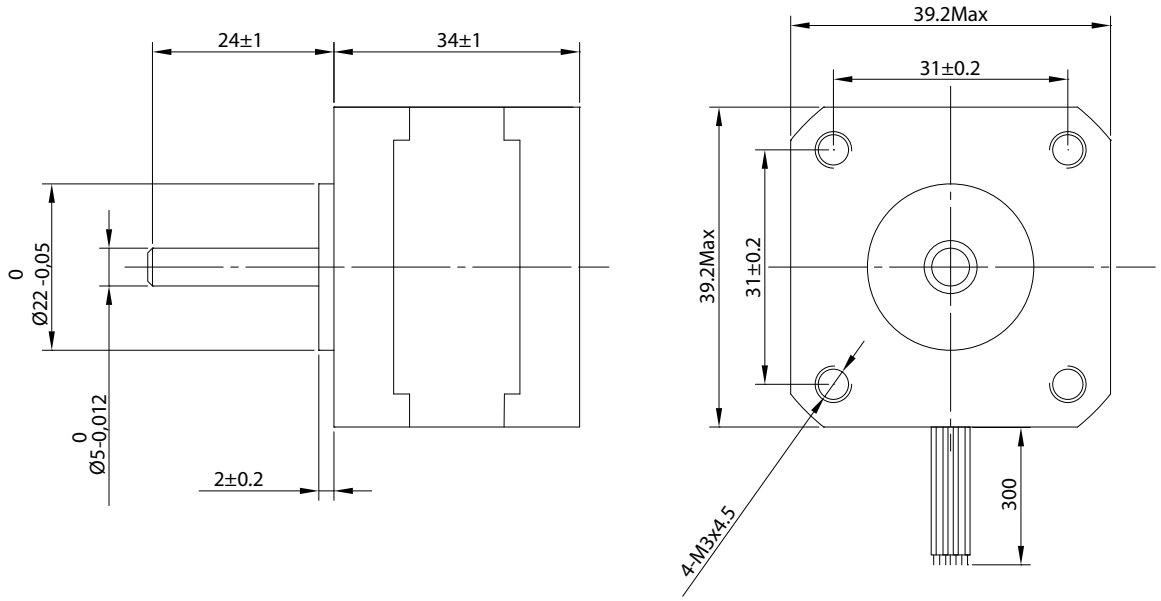
39SH34-0306A VM: 24V; 0,3A /Phase Driver: SMD 103



39SH34-0404A VM: 24V; 0,4A /Phase Driver: SMD 103



Stepper Motor 39SH34 High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

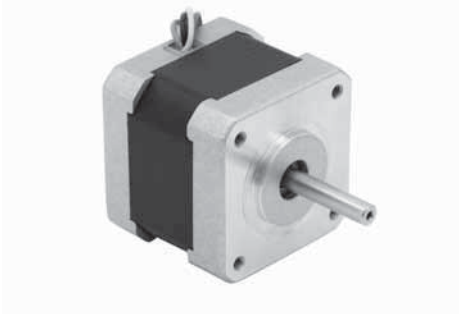
Model			39SH34-0404A	39SH34-0604A
1	Rated Voltage	V	12	9
2	Current/Phase	A	0,4	0,6
3	Resistance/Phase	Ω	30	15
4	Inductance/Phase	mH	43	16
5	Holding Torque	Nm	0,21	0,21
6	Rotor Inertia	g-cm^2	20	20
7	Detent Torque	g-cm	120	120
8	Weight	Kg	0,18	0,18
9	Number of leads		4	4
10	Length	mm	34	34

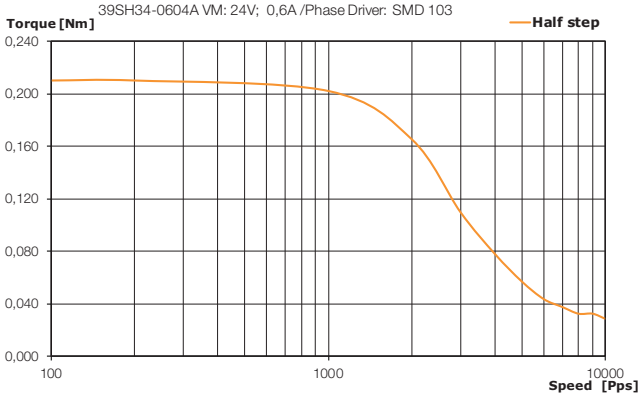
CHARACTERISTICS

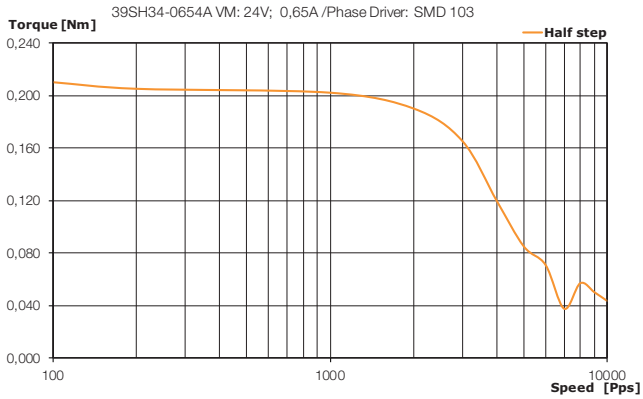
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

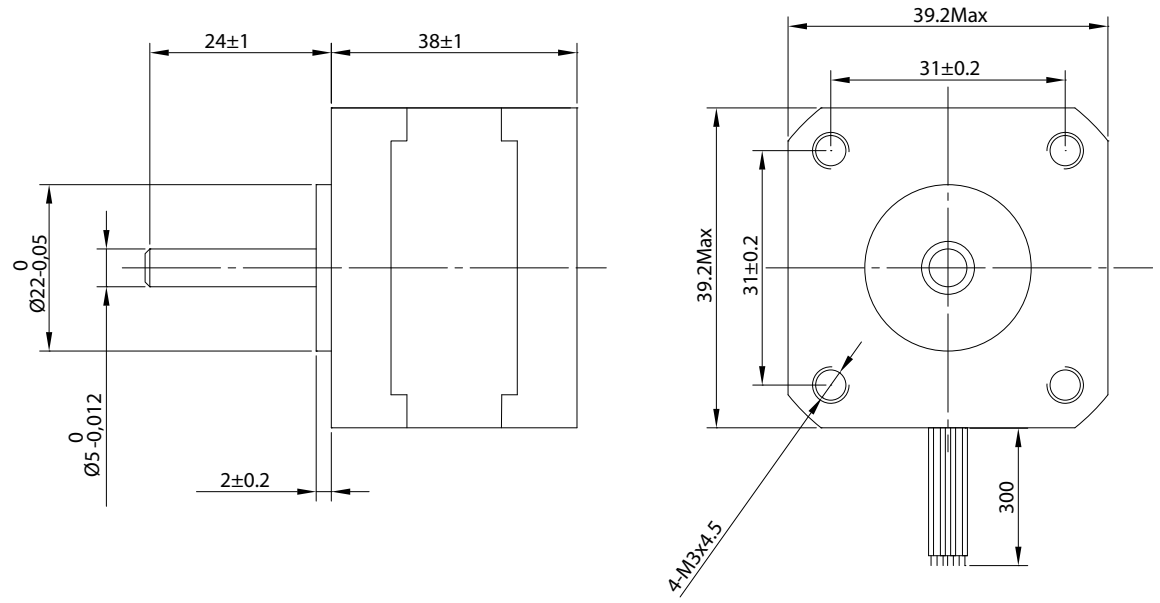
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1430 AWG26	Phase A
2	Green	UL1430 AWG26	Phase A-
3	Red	UL1430 AWG26	Phase B
4	Blue	UL1430 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1430 AWG26	Com Phase A
6	White	UL1430 AWG26	Com Phase B









BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

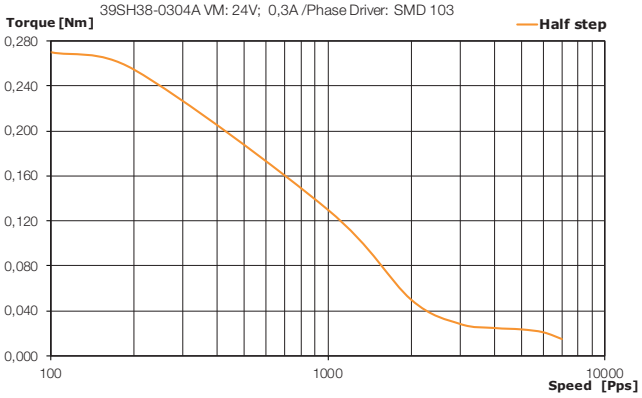
Model			39SH38-0806A	39SH38-0304A
1	Rated Voltage	V	6	12
2	Current/Phase	A	0,8	0,3
3	Resistance/Phase	Ω	7,5	40
4	Inductance/Phase	mH	8	100
5	Holding Torque	Nm	0,2	0,28
6	Rotor Inertia	g-cm^2	24	24
7	Detent Torque	g-cm	180	180
8	Weight	Kg	0,2	0,2
9	Number of leads		6	4
10	Length	mm	38	38

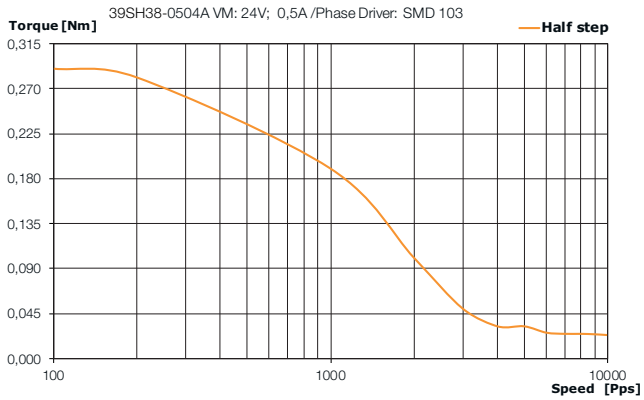
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

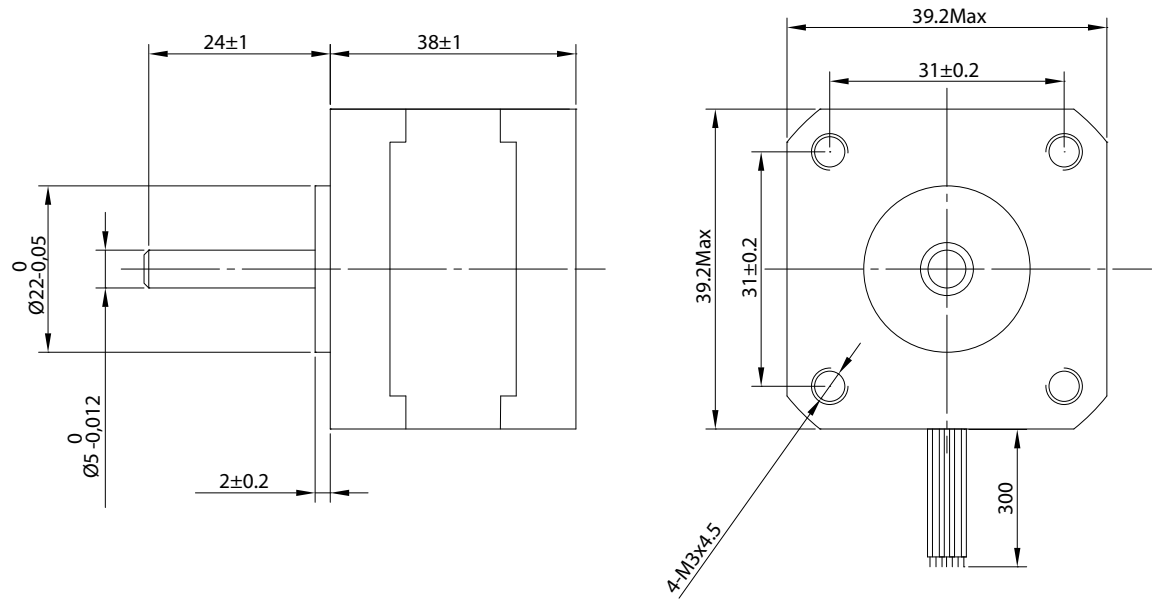
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1430 AWG26	Phase A
2	Green	UL1430 AWG26	Phase A-
3	Red	UL1430 AWG26	Phase B
4	Blue	UL1430 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1430 AWG26	Com Phase A
6	White	UL1430 AWG26	Com Phase B





Stepper Motor 39SH38 High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

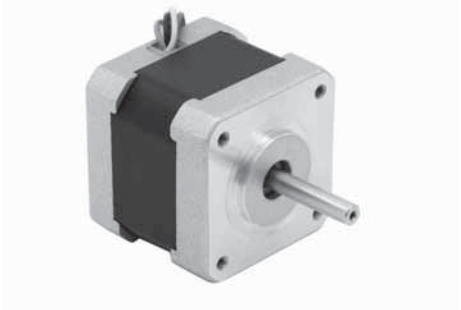
Model			39SH38-0504A
1	Rated Voltage	V	11
2	Current/Phase	A	0,5
3	Resistance/Phase	Ω	22
4	Inductance/Phase	mH	40
5	Holding Torque	Nm	0,29
6	Rotor Inertia	g-cm^2	24
7	Detent Torque	g-cm	180
8	Weight	Kg	0,2
9	Number of leads		4
10	Length	mm	38

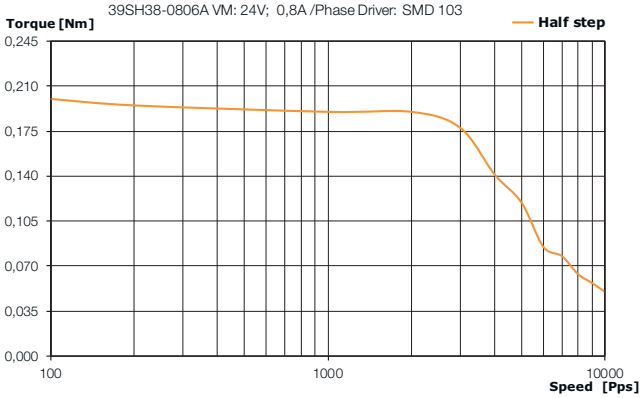
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

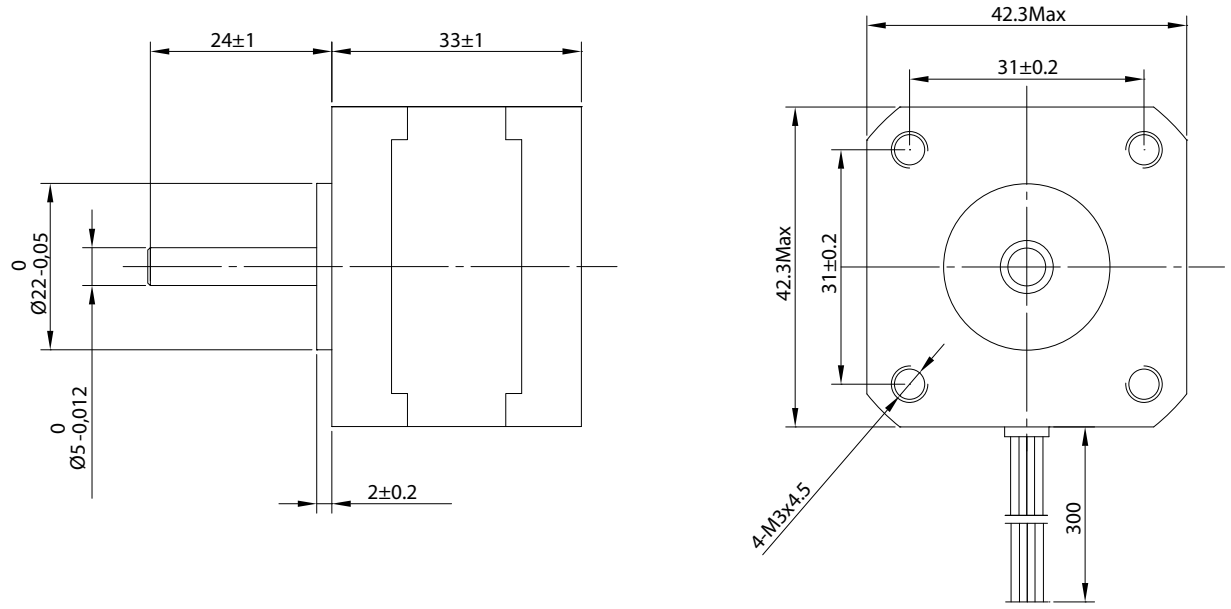
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1430 AWG26	Phase A
2	Green	UL1430 AWG26	Phase A-
3	Red	UL1430 AWG26	Phase B
4	Blue	UL1430 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1430 AWG26	Com Phase A
6	White	UL1430 AWG26	Com Phase B





STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

Model			42SH33-1A	42SH33-2A
1	Rated Voltage	V	4	9,6
2	Current/Phase	A	0,95	0,4
3	Resistance/Phase	Ω	4,2	24
4	Inductance/Phase	mH	2,5	15
5	Holding Torque	Nm	0,158	0,158
6	Rotor Inertia	g-cm^2	35	35
7	Detent Torque	g-cm	120	120
8	Weight	Kg	0,22	0,22
9	Number of leads		6	6
10	Length	mm	33,5	33,5

CHARACTERISTICS

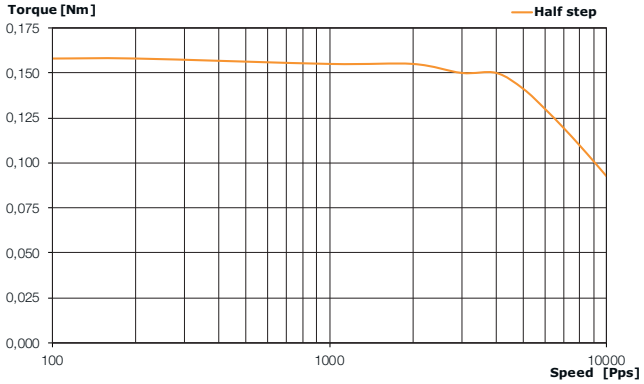
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

CONNECTION

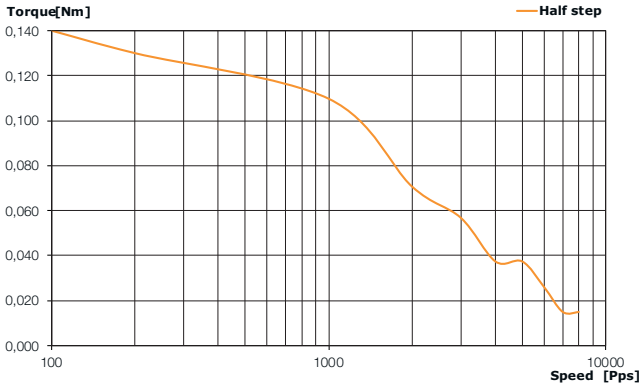
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

STEPPER MOTOR

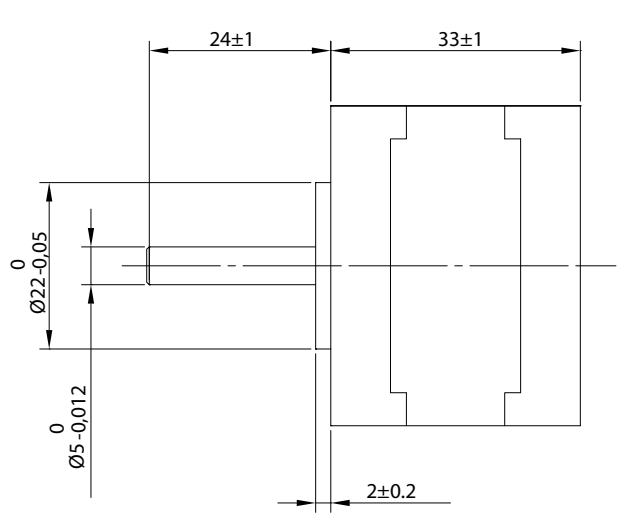
42SH33-1A VM: 24V; 0,95A /Phase Driver: SMD 103

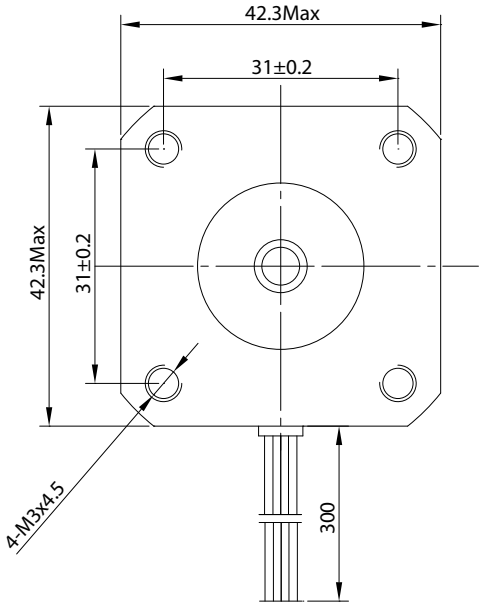


42SH33-2A VM: 24V; 0,4A /Phase Driver: SMD 103



Stepper Motor 42SH33 High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

Model			42SH33-3A	42SH33-4A
1	Rated Voltage	V	12	2,8
2	Current/Phase	A	0,31	1,33
3	Resistance/Phase	Ω	38,5	2,1
4	Inductance/Phase	mH	21	2,5
5	Holding Torque	Nm	0,158	0,22
6	Rotor Inertia	g-cm^2	35	35
7	Detent Torque	g-cm	120	120
8	Weight	Kg	0,22	0,22
9	Number of leads		6	4
10	Length	mm	33,5	33,5

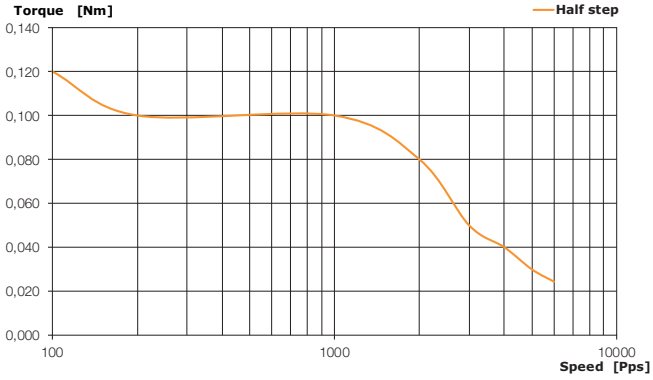
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm)
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

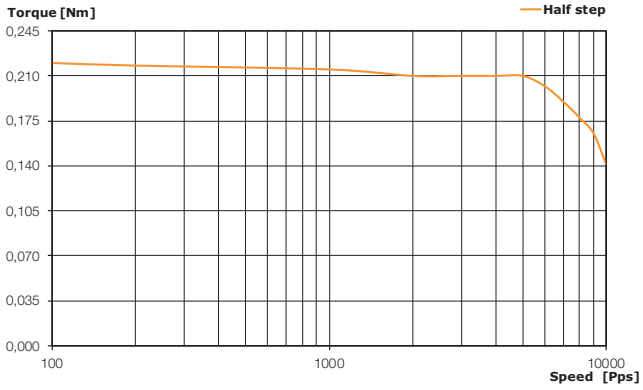
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

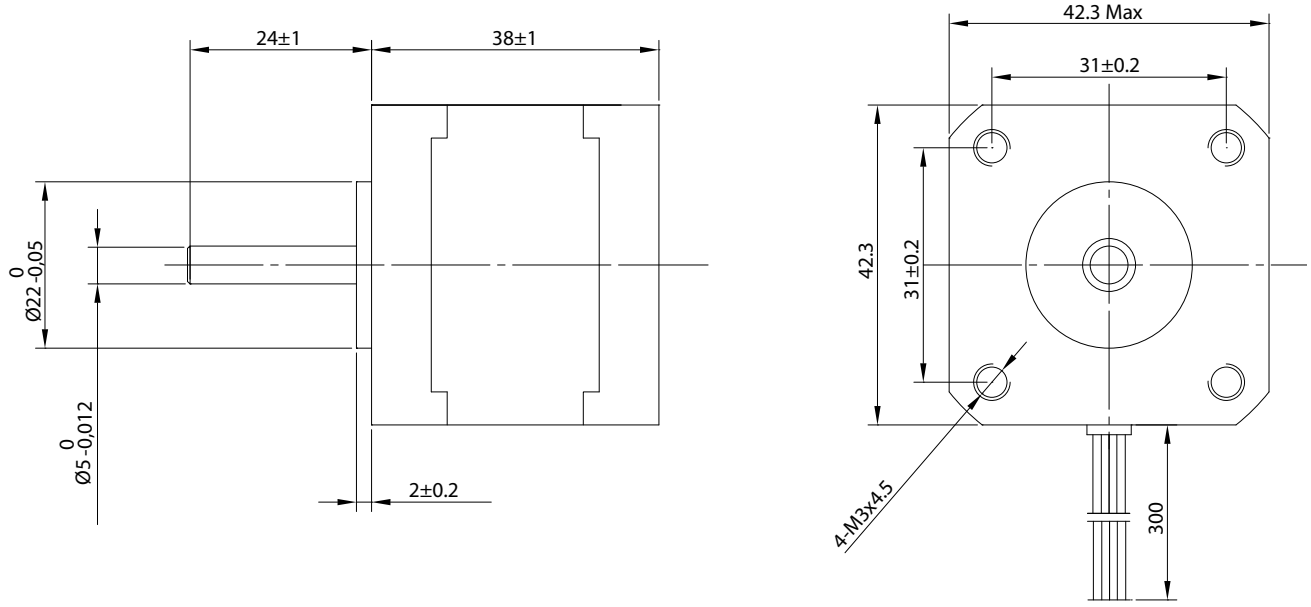
42SH33-3A- Bipolar Serie VM: 24V; 0,1A /Phase Driver: SMD 103



42SH33-4A VM: 24V; 1,3A /Phase Driver: SMD 103



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

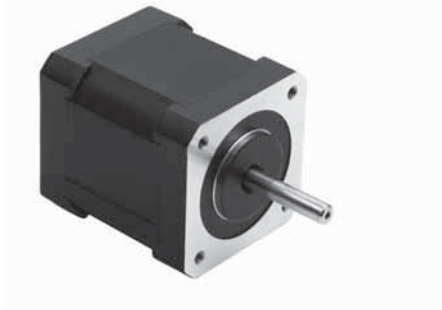
Model			42SH38-1A	42SH38-2A
1	Rated Voltage	V	4	6
2	Current/Phase	A	1,2	0,8
3	Resistance/Phase	Ω	3,3	7,5
4	Inductance/Phase	mH	3,2	6,7
5	Holding Torque	Nm	0,259	0,259
6	Rotor Inertia	g-cm^2	54	54
7	Detent Torque	g-cm	150	150
8	Weight	Kg	0,28	0,28
9	Number of leads		6	6
10	Length	mm	39,5	39,5

CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

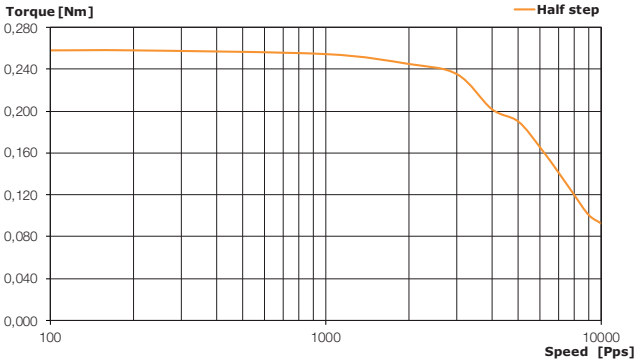
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

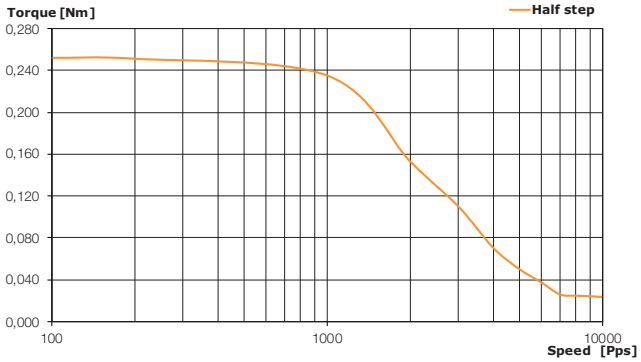


STEPPER MOTOR

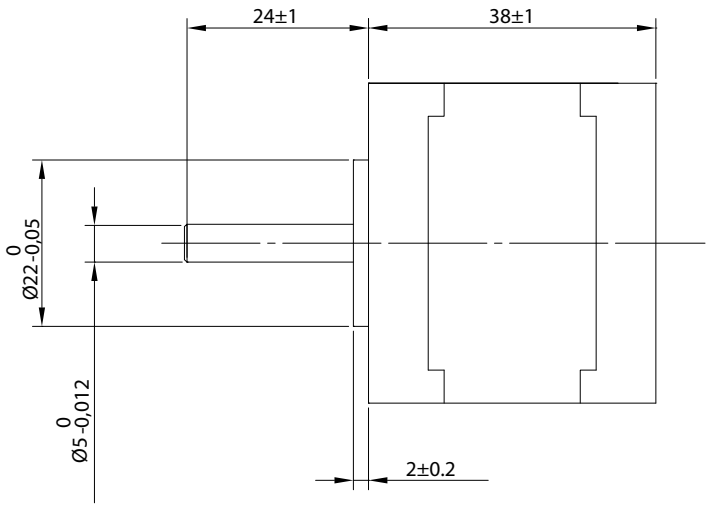
42SH38-1A VM: 24V; 1,2A /Phase Driver: SMD 103

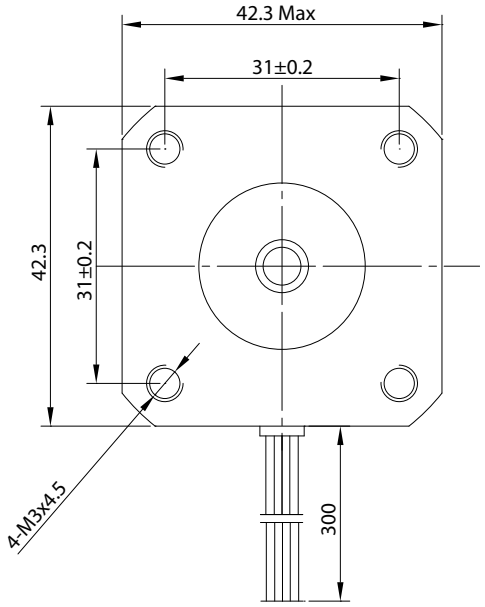


42SH38-2A VM: 24V; 0,8A /Phase Driver: SMD 103



Stepper Motor 42SH38 High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

Model			42SH38-3A	42SH38-4A
1	Rated Voltage	V	12	2,8
2	Current/Phase	A	0,4	1,68
3	Resistance/Phase	Ω	30	1,65
4	Inductance/Phase	mH	25	3,2
5	Holding Torque	Nm	0,259	0,36
6	Rotor Inertia	g-cm^2	54	54
7	Detent Torque	g-cm	150	150
8	Weight	Kg	0,28	0,28
9	Number of leads		6	4
10	Length	mm	39,5	39,5

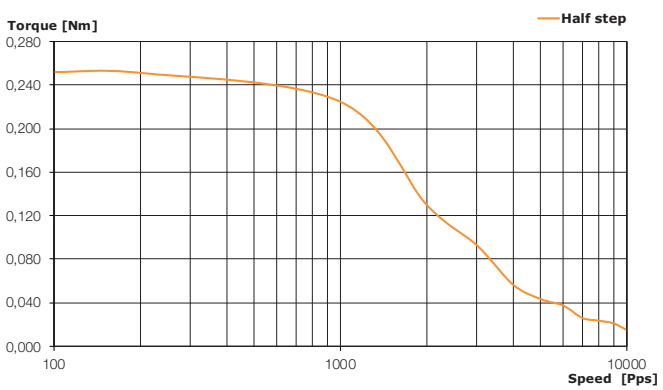
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm)
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

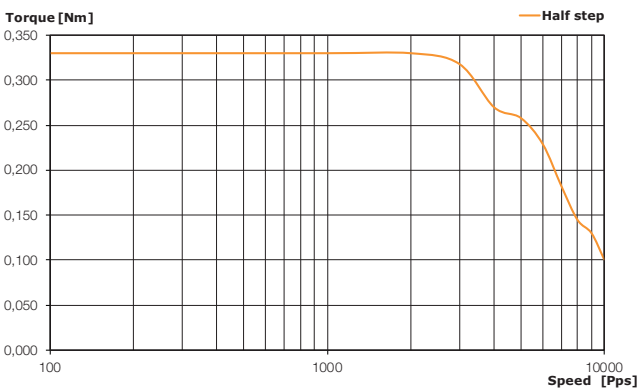
CONNECTION

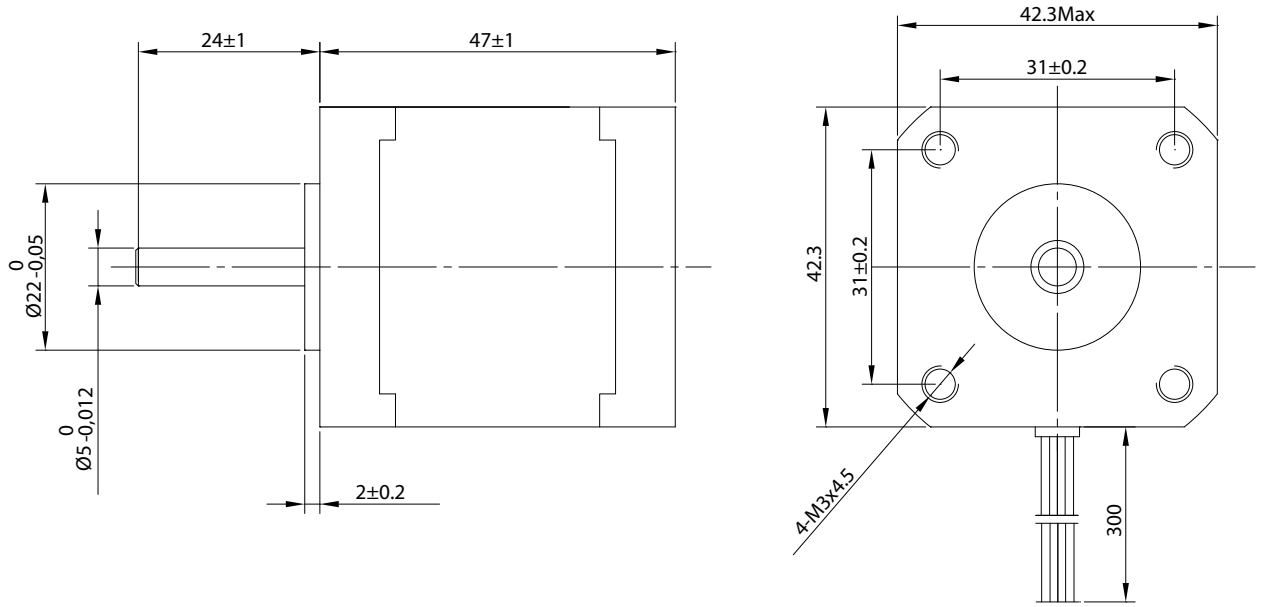
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

42SH38-3A VM: 24V; 0,4A /Phase Driver: SMD 103



42SH38-4A VM: 24V; 1,6A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

Model			42SH47-1A	42SH47-2A
1	Rated Voltage	V	4	6
2	Current/Phase	A	1,2	0,8
3	Resistance/Phase	Ω	3,3	7,5
4	Inductance/Phase	mH	2,8	6,3
5	Holding Torque	Nm	0,317	0,317
6	Rotor Inertia	g-cm^2	68	68
7	Detent Torque	g-cm	200	200
8	Weight	Kg	0,35	0,35
9	Number of leads		6	6
10	Length	mm	47,5	47,5

CHARACTERISTICS

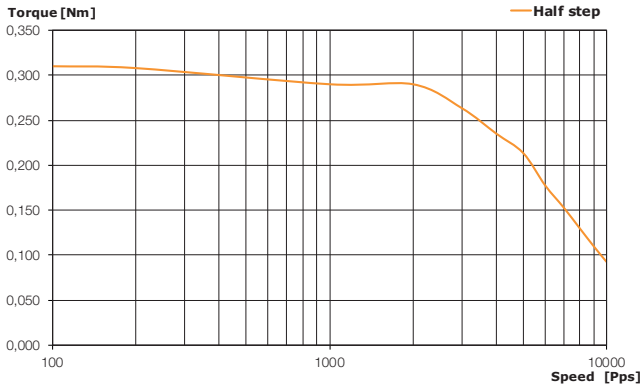
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

CONNECTION

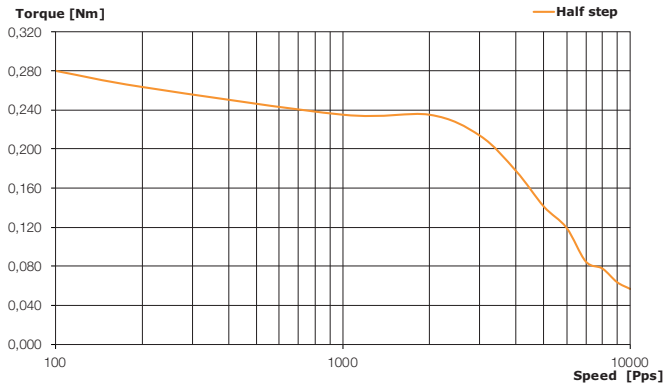
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

STEPPER MOTOR

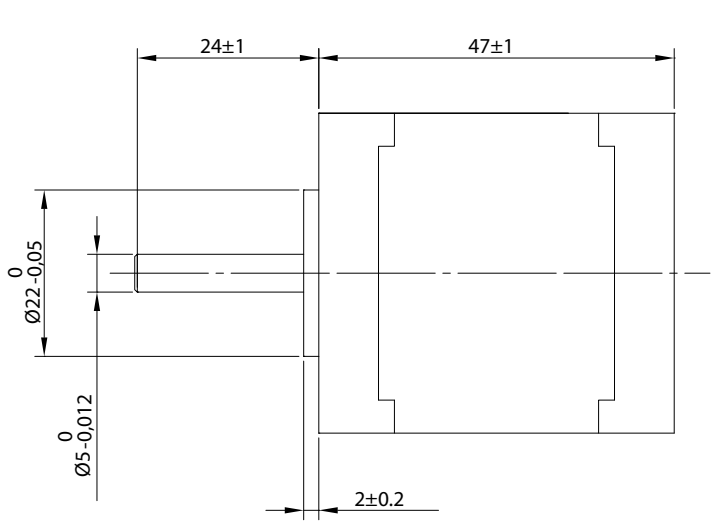
42SH47-1A VM: 24V; 1,2A /Phase Driver: SMD 103

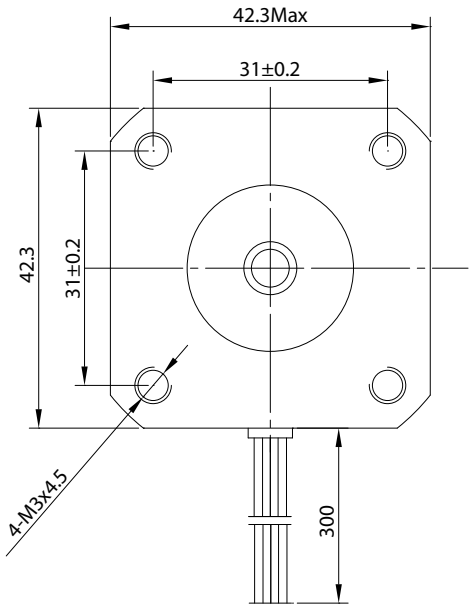


42SH47-2A VM: 24V; 0,8A /Phase Driver: SMD 103



Stepper Motor 42SH47 High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

Model			42SH47-3A	42SH47-4A
1	Rated Voltage	V	12	2,8
2	Current/Phase	A	0,4	1,68
3	Resistance/Phase	Ω	30	1,65
4	Inductance/Phase	mH	25	2,8
5	Holding Torque	Nm	0,317	0,44
6	Rotor Inertia	g-cm^2	68	68
7	Detent Torque	g-cm	200	200
8	Weight	Kg	0,35	0,35
9	Number of leads		6	4
10	Length	mm	47,5	47,5

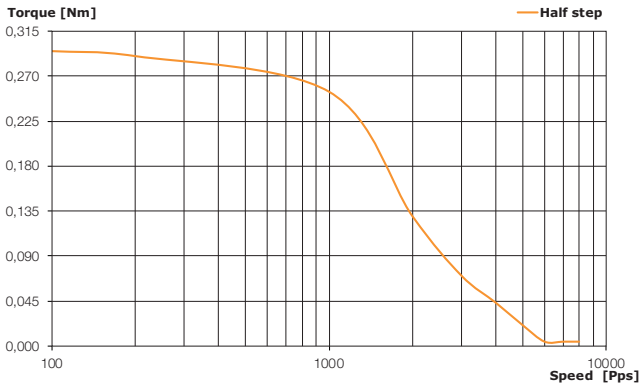
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

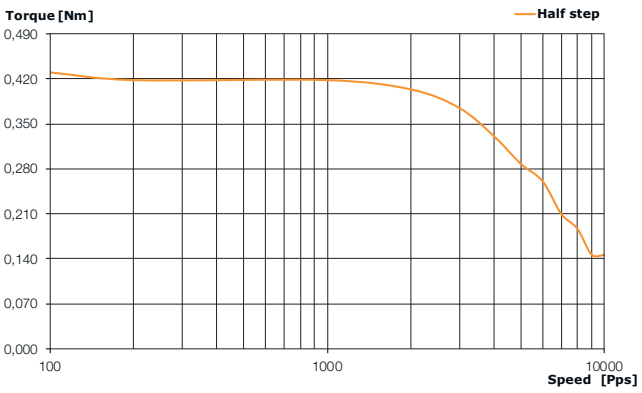
CONNECTION

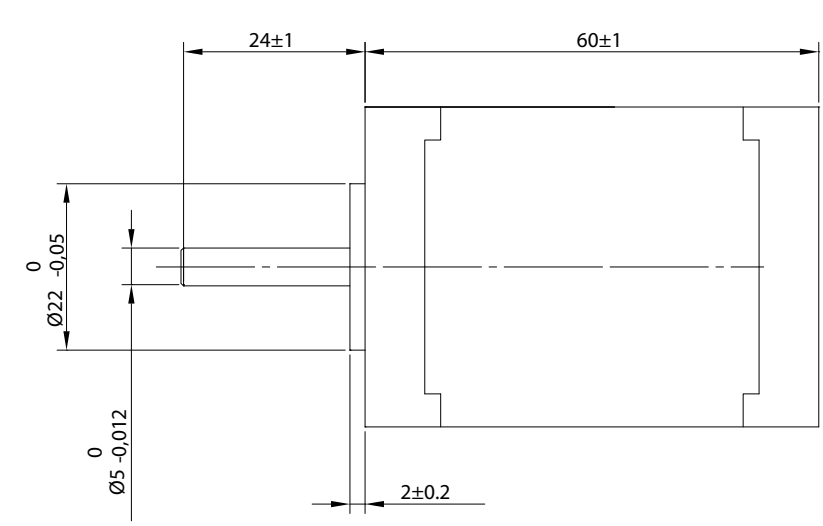
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

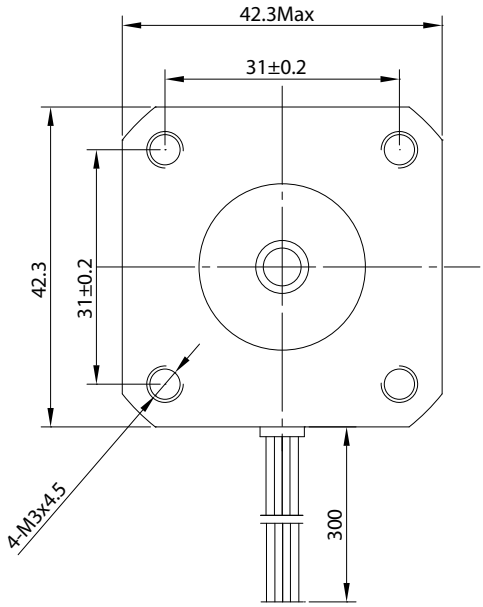
42SH47-3A VM: 24V; 0,4A /Phase Driver: SMD 103



42SH47-4A VM: 24V; 1,6A /Phase Driver: SMD 103







BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

Model			42SH60-1206A	42SH60-0854A
1	Rated Voltage	V	7,2	10,2
2	Current/Phase	A	1,2	0,85
3	Resistance/Phase	Ω	6	12
4	Inductance/Phase	mH	7	29
5	Holding Torque	Nm	0,65	0,8
6	Rotor Inertia	g-cm^2	102	102
7	Detent Torque	g-cm	280	280
8	Weight	Kg	0,5	0,5
9	Number of leads		6	4
10	Length	mm	60	60

CHARACTERISTICS

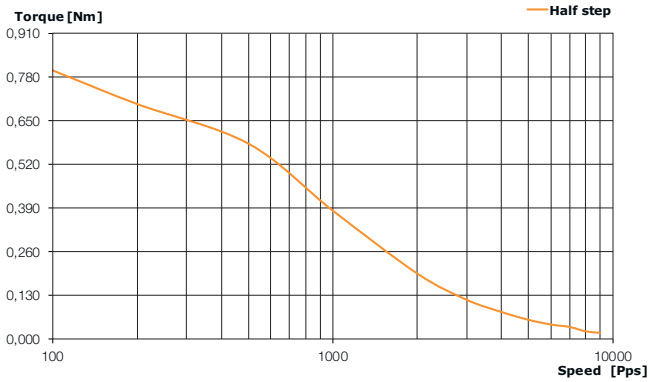
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

CONNECTION

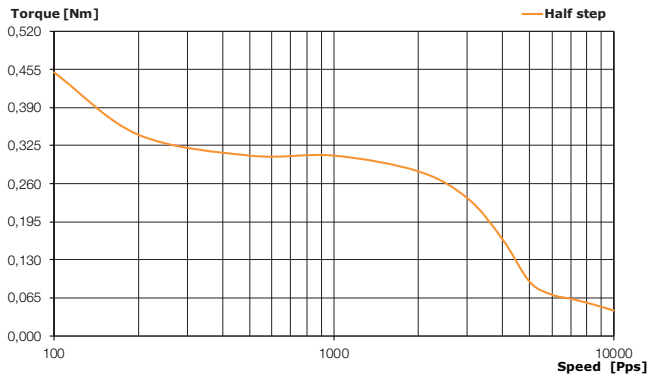
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

STEPPER MOTOR

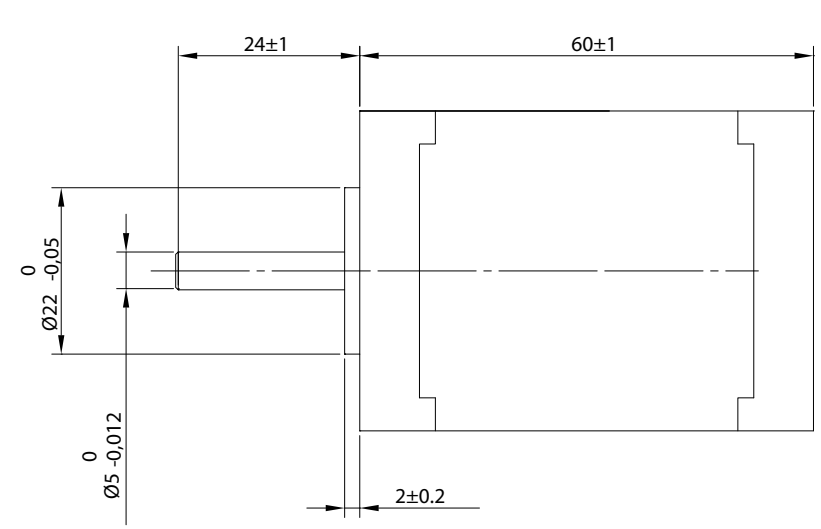
42SH60-0854A VM: 24V; 0.8A /Phase Driver: SMD 103

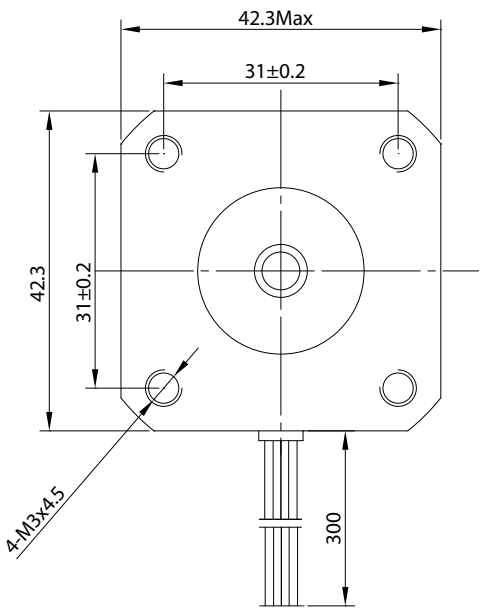


42SH60-1206A VM: 24V; 1.2A /Phase Driver: SMD 103



Stepper Motor 42SH60 High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

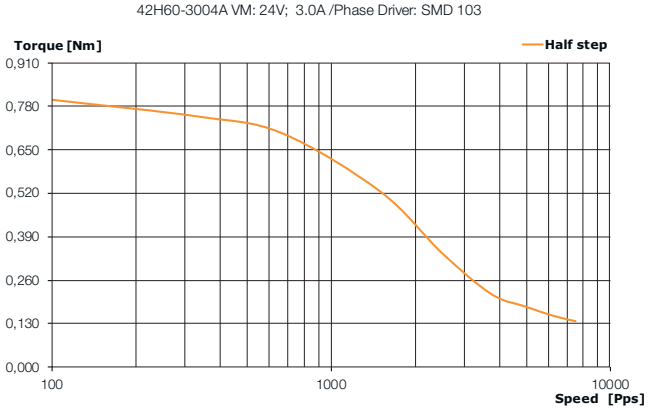
Model			42SH60-3004A
1	Rated Voltage	V	3,3
2	Current/Phase	A	3
3	Resistance/Phase	Ω	1,1
4	Inductance/Phase	mH	2,7
5	Holding Torque	Nm	0,8
6	Rotor Inertia	g-cm^2	102
7	Detent Torque	g-cm	280
8	Weight	Kg	0,5
9	Number of leads		4
10	Length	mm	60

CHARACTERISTICS

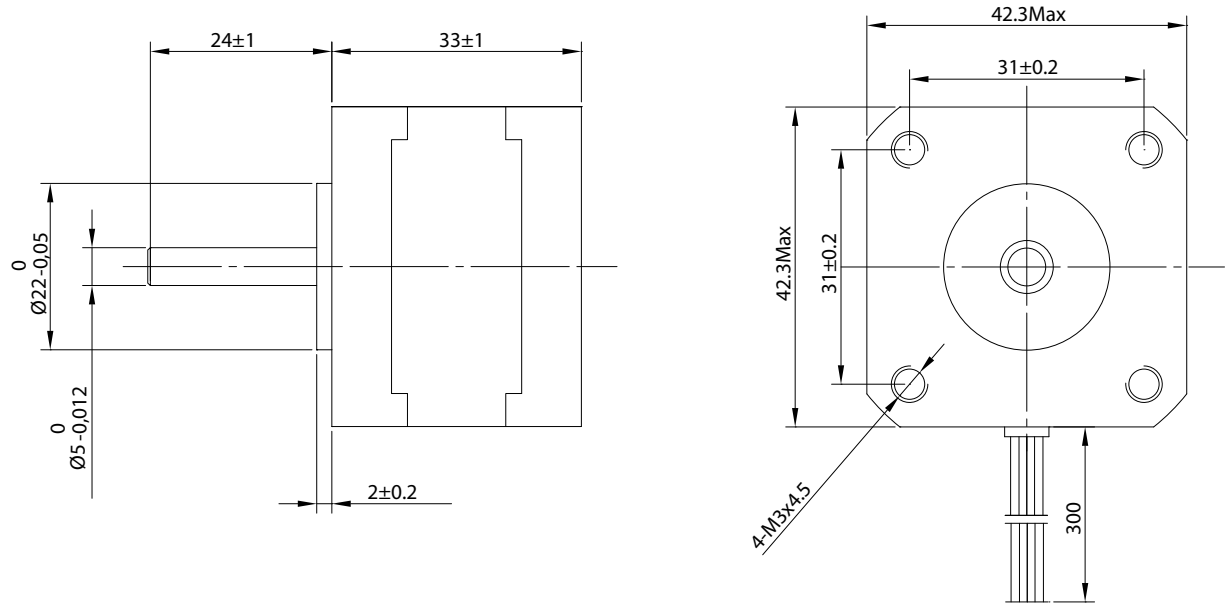
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

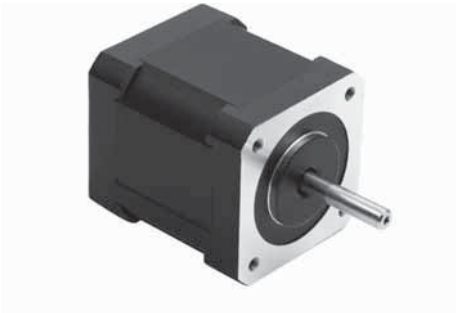
Model			42SH33-1AM	42SH33-2AM
1	Rated Voltage	V	4	6
2	Current/Phase	A	0,95	0,6
3	Resistance/Phase	Ω	4,2	10
4	Inductance/Phase	mH	4	11
5	Holding Torque	Nm	0,158	0,158
6	Rotor Inertia	g-cm^2	35	35
7	Detent Torque	g-cm	200	200
8	Weight	Kg	0,22	0,22
9	Number of leads		6	6
10	Length	mm	33,5	33,5

CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

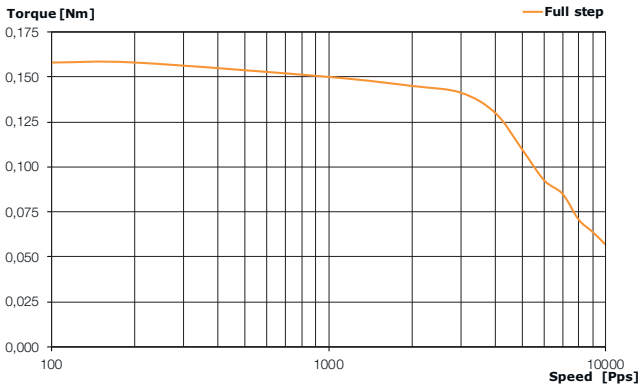
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

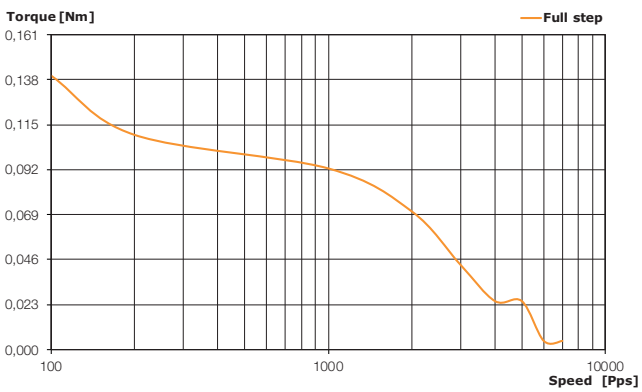


STEPPER MOTOR

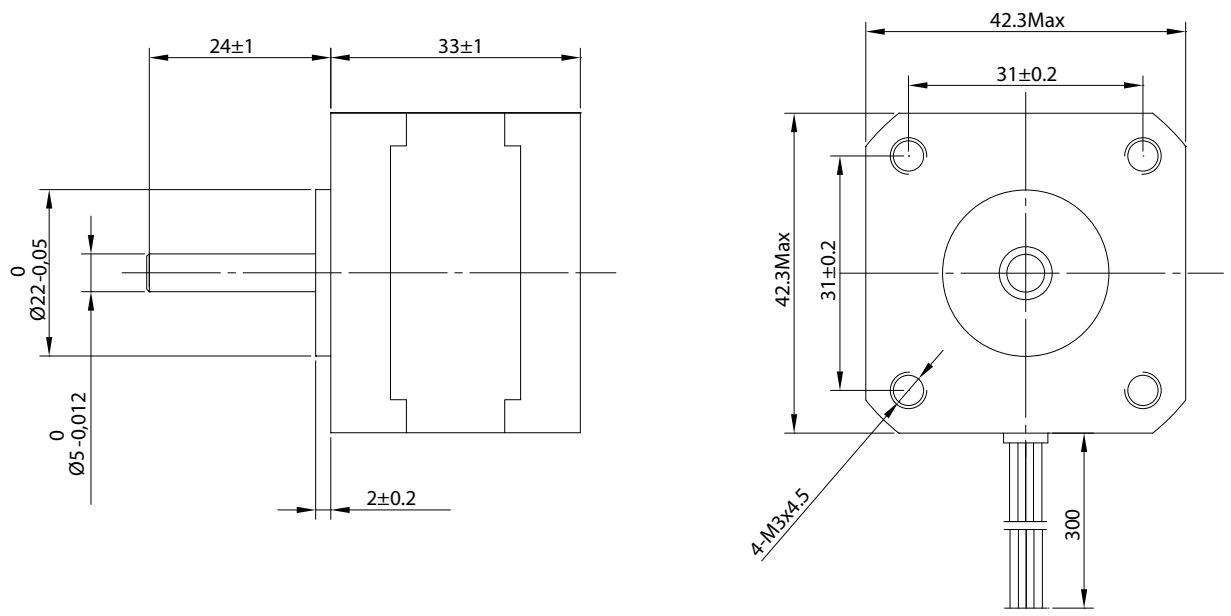
42SH33-1AM VM: 24V; 0,95A /Phase Driver: SMD 103



42SH33-2AM VM: 24V; 0,6A /Phase Driver: SMD 103



Stepper Motor 42SH33M High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

Model			42SH33-3AM	42SH33-4AM
1	Rated Voltage	V	12	2,8
2	Current/Phase	A	0,31	1,33
3	Resistance/Phase	Ω	38,5	2,1
4	Inductance/Phase	mH	33	4,2
5	Holding Torque	Nm	0,158	0,22
6	Rotor Inertia	g-cm^2	35	35
7	Detent Torque	g-cm	200	200
8	Weight	Kg	0,22	0,22
9	Number of leads		6	4
10	Length	mm	33,5	33,5

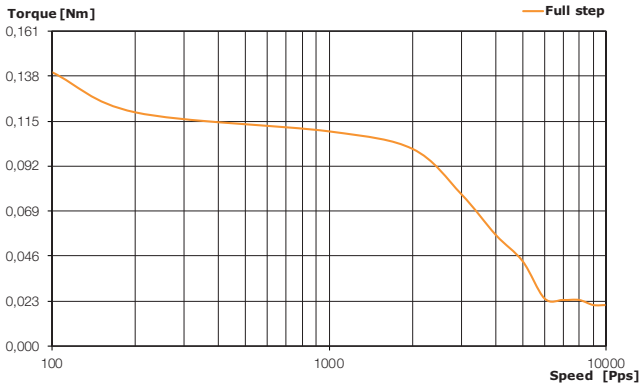
CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

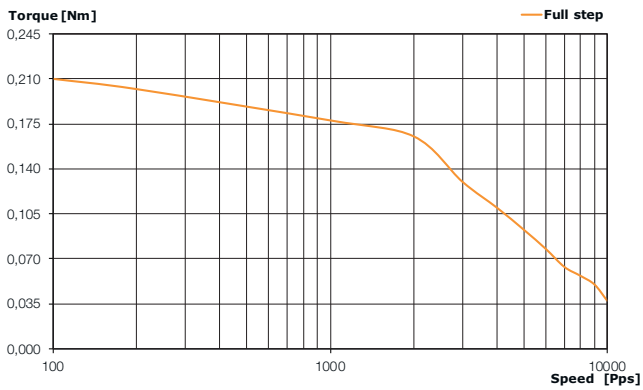
CONNECTION

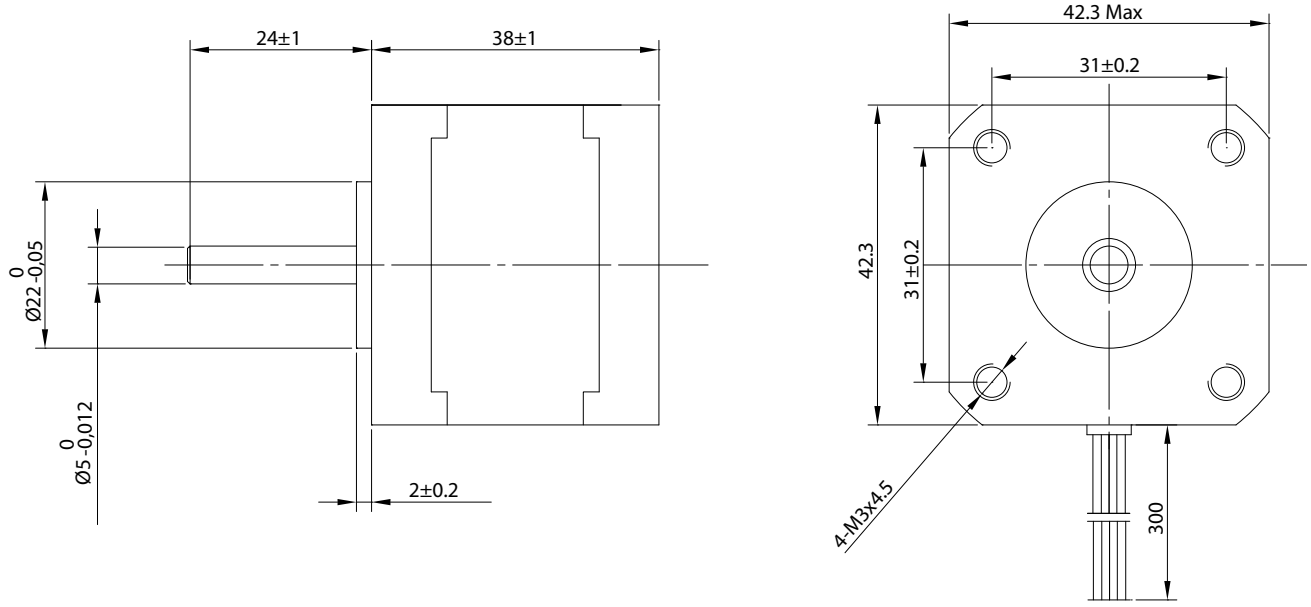
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

42SH33-3AM VM: 24V; 0,3A /Phase Driver: SMD 103



42SH33-4AM VM: 24V; 1,3A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

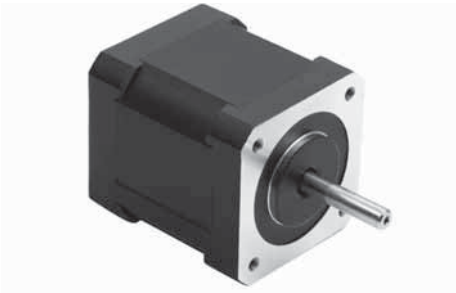
Model			42SH38-1AM	42SH38-2AM
1	Rated Voltage	V	4	6
2	Current/Phase	A	1,2	0,8
3	Resistance/Phase	Ω	3,3	7,5
4	Inductance/Phase	mH	4,1	8,3
5	Holding Torque	Nm	0,259	0,259
6	Rotor Inertia	g-cm^2	54	54
7	Detent Torque	g-cm	220	220
8	Weight	Kg	0,28	0,28
9	Number of leads		6	6
10	Length	mm	39,5	39,5

CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

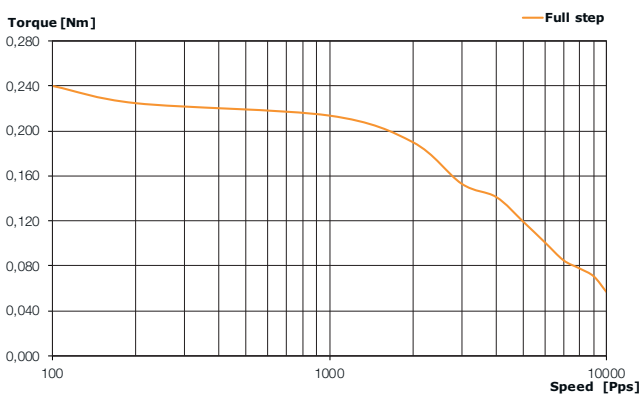
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B

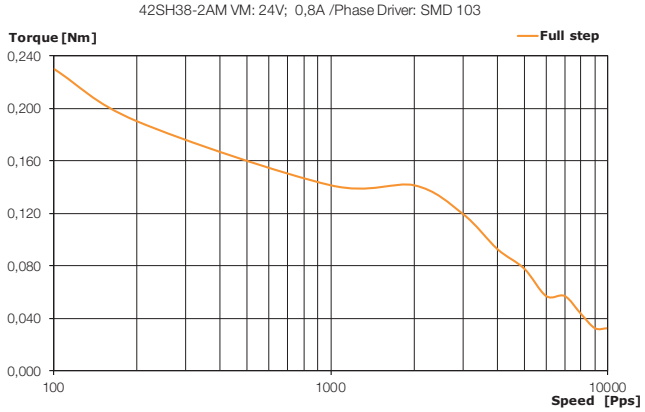


STEPPER MOTOR

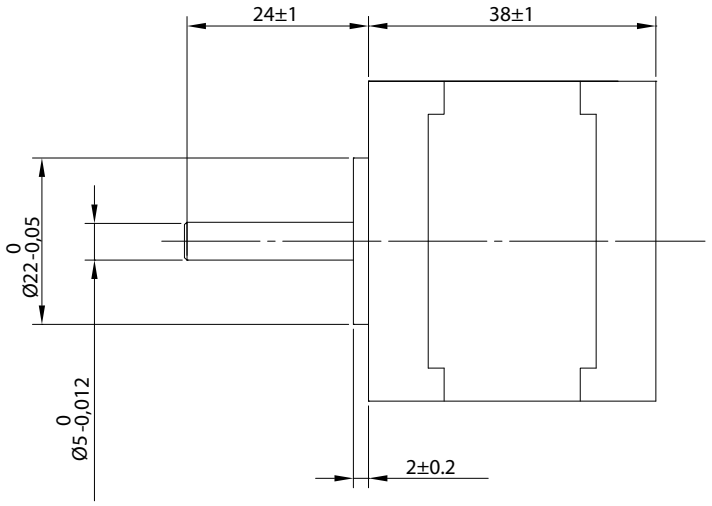
42SH38-1AM VM: 24V; 1,2A /Phase Driver: SMD 103

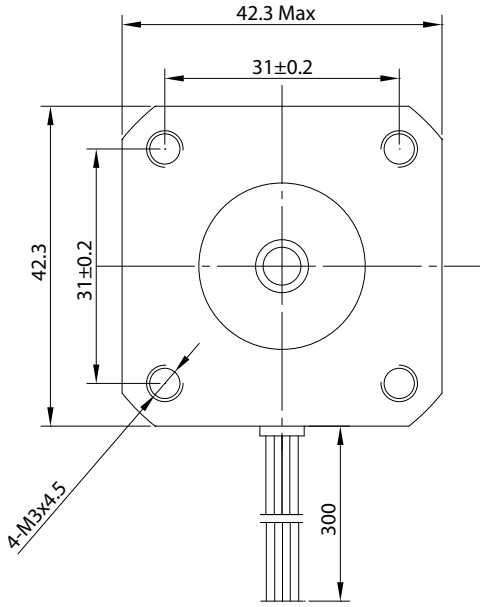


42SH38-2AM VM: 24V; 0,8A /Phase Driver: SMD 103



Stepper Motor 42SH38M High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

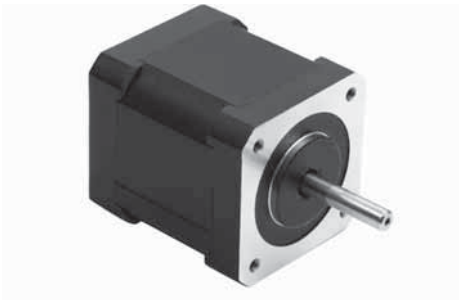
Model			42SH38-3AM	42SH38-4AM
1	Rated Voltage	V	12	2,8
2	Current/Phase	A	0,4	1,68
3	Resistance/Phase	Ω	30	1,65
4	Inductance/Phase	mH	30	4,1
5	Holding Torque	Nm	0,259	0,36
6	Rotor Inertia	g-cm^2	54	54
7	Detent Torque	g-cm	220	220
8	Weight	Kg	0,28	0,28
9	Number of leads		6	4
10	Length	mm	39,5	39,5

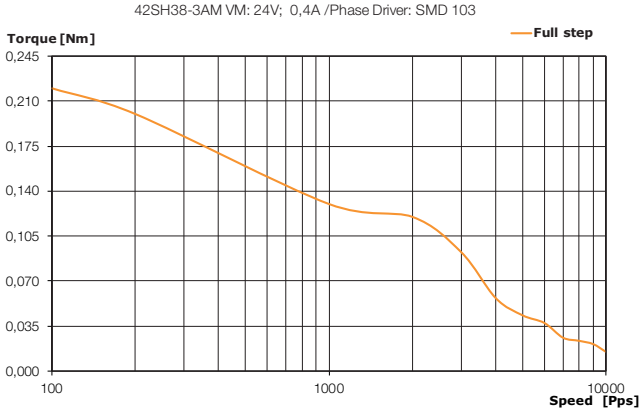
CHARACTERISTICS

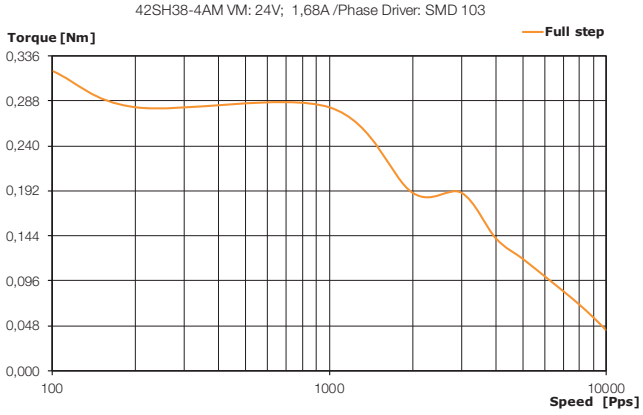
Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

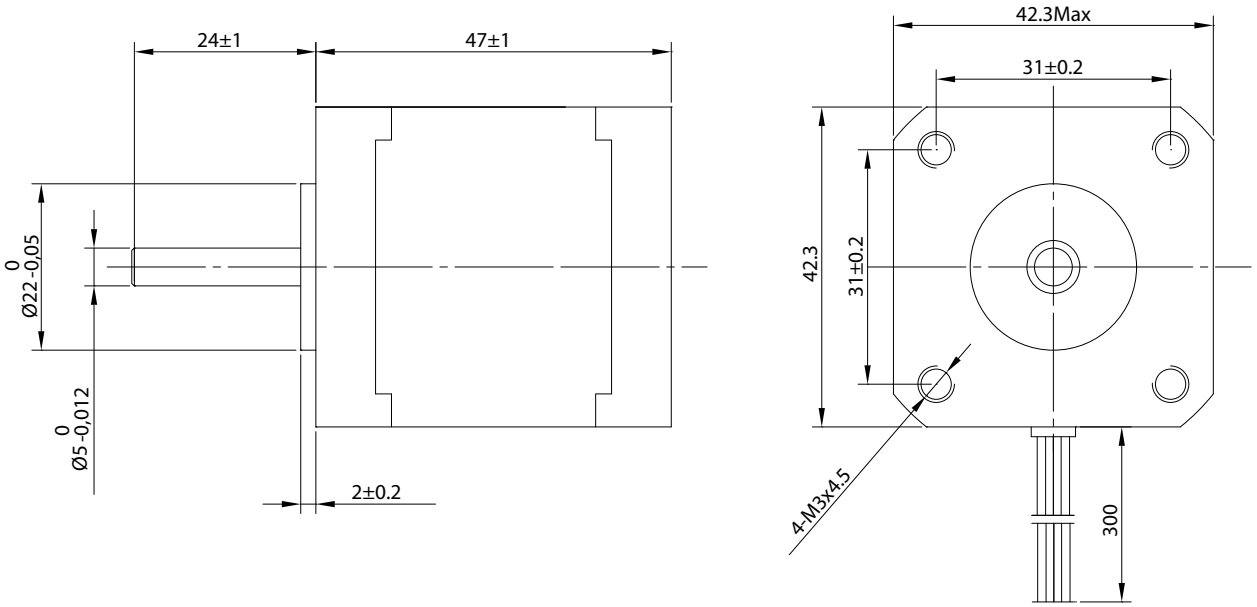
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B









BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

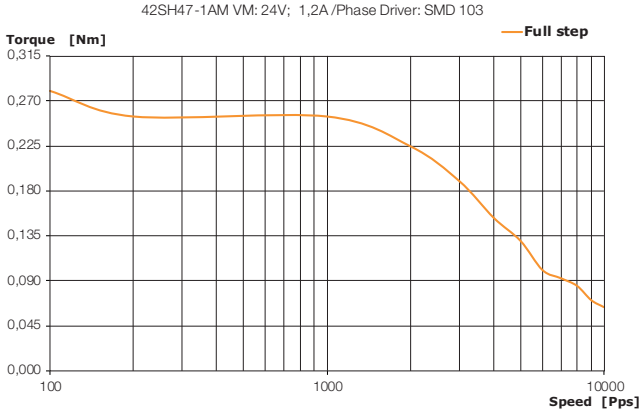
Model			42SH47-1AM	42SH47-2AM
1	Rated Voltage	V	4	6
2	Current/Phase	A	1,2	0,8
3	Resistance/Phase	Ω	3,3	7,5
4	Inductance/Phase	mH	2,8	6,3
5	Holding Torque	Nm	0,317	0,317
6	Rotor Inertia	g-cm^2	68	68
7	Detent Torque	g-cm	200	200
8	Weight	Kg	0,35	0,35
9	Number of leads		6	6
10	Length	mm	47,5	47,5

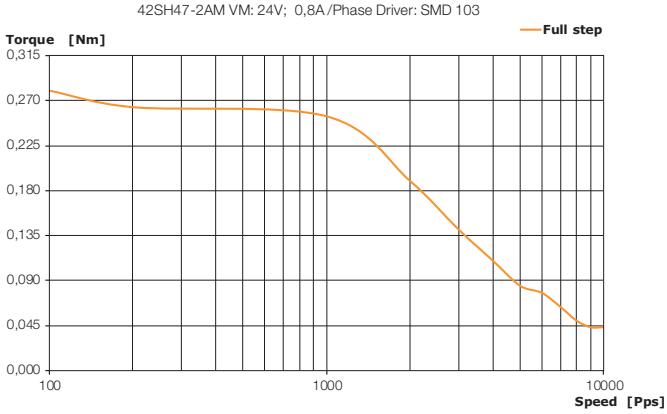
CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

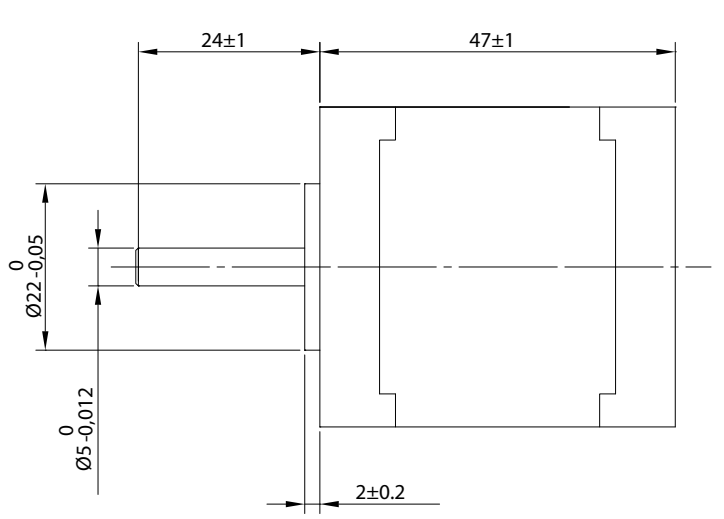
CONNECTION

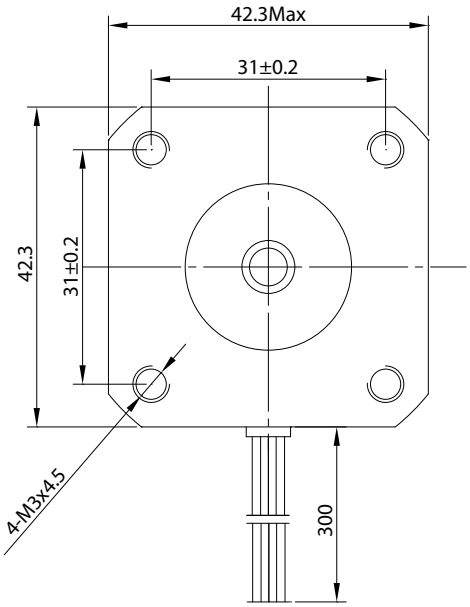
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B





Stepper Motor 42SH47M High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

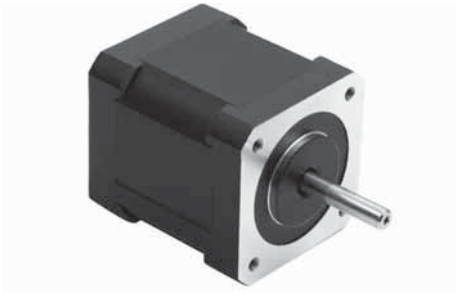
Model			42SH47-3AM	42SH47-4AM
1	Rated Voltage	V	12	2,8
2	Current/Phase	A	0,4	1,68
3	Resistance/Phase	Ω	30	1,65
4	Inductance/Phase	mH	25	2,8
5	Holding Torque	Nm	0,317	0,44
6	Rotor Inertia	g-cm^2	68	68
7	Detent Torque	g-cm	200	200
8	Weight	Kg	0,35	0,35
9	Number of leads		6	4
10	Length	mm	47,5	47,5

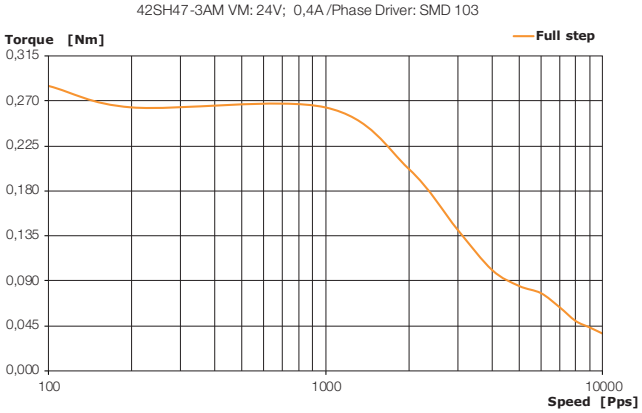
CHARACTERISTICS

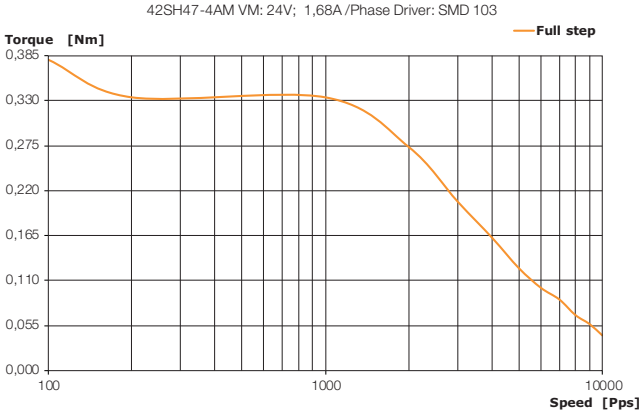
Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

CONNECTION

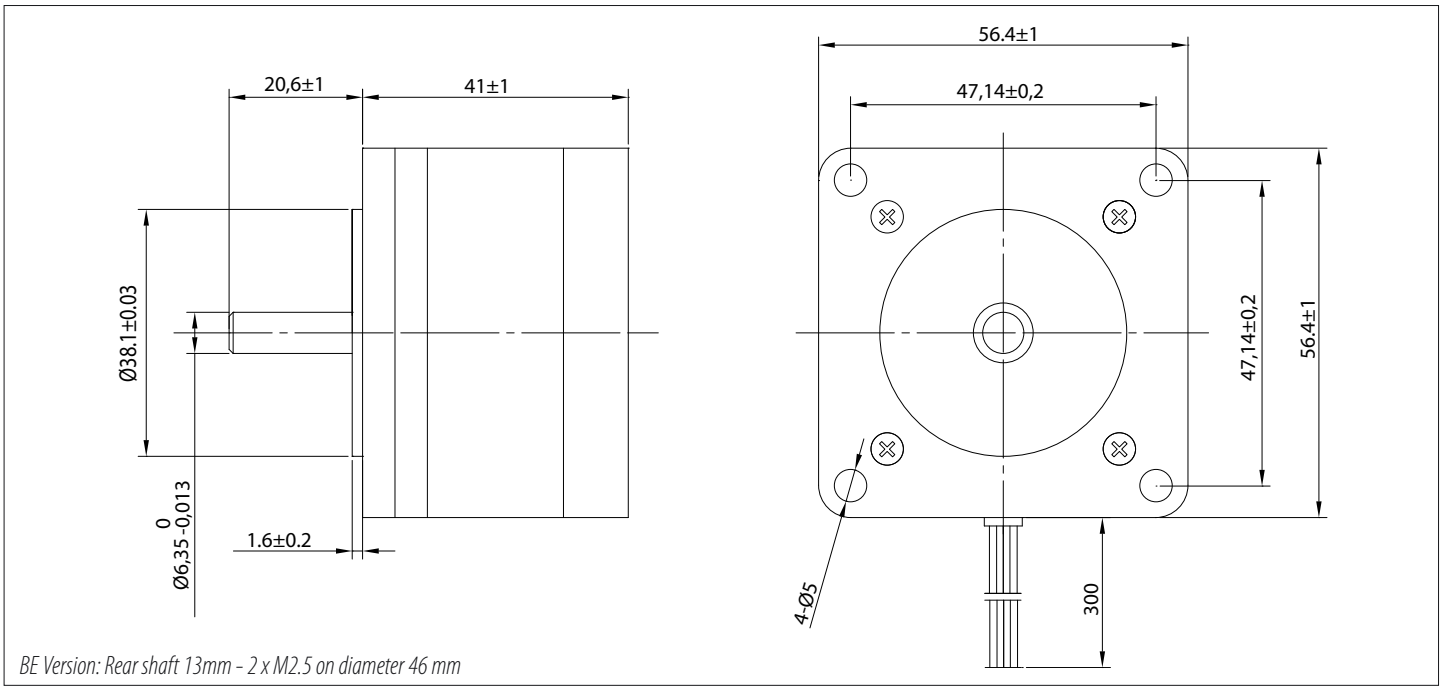
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG26	Phase A
2	Green	UL1061 AWG26	Phase A-
3	Red	UL1061 AWG26	Phase B
4	Blue	UL1061 AWG26	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG26	Com Phase A
6	White	UL1061 AWG26	Com Phase B







STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

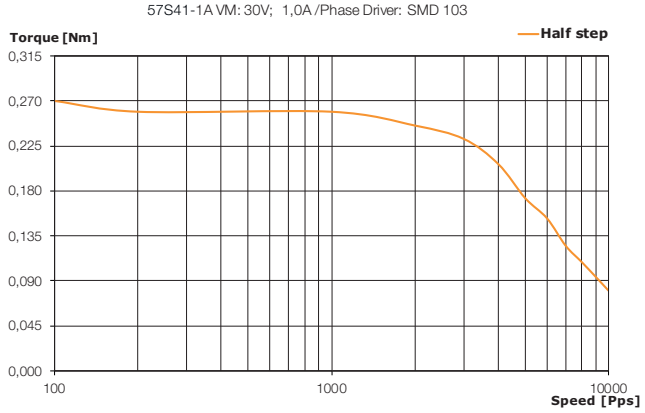
Model			57S41-1A	57S41-2A
1	Rated Voltage	V	4	12
2	Current/Phase	A	1,1	0,4
3	Resistance/Phase	Ω	3,6	30
4	Inductance/Phase	mH	4	30
5	Holding Torque	Nm	0,288	0,288
6	Rotor Inertia	g-cm^2	57	57
7	Detent Torque	Kg-cm	0,18	0,18
8	Weight	Kg	0,54	0,54
9	Number of leads		6	6
10	Length	mm	41	41

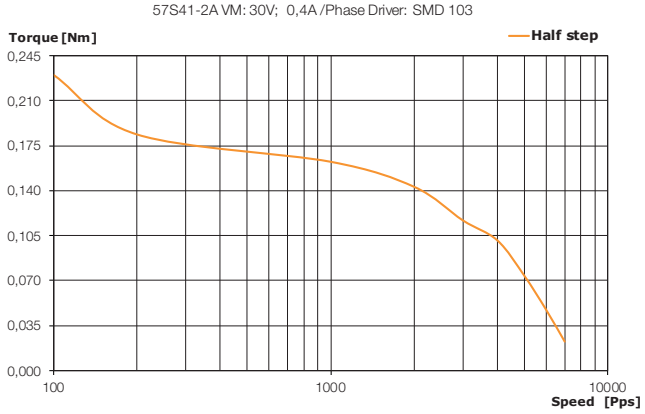
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	15 N

CONNECTION

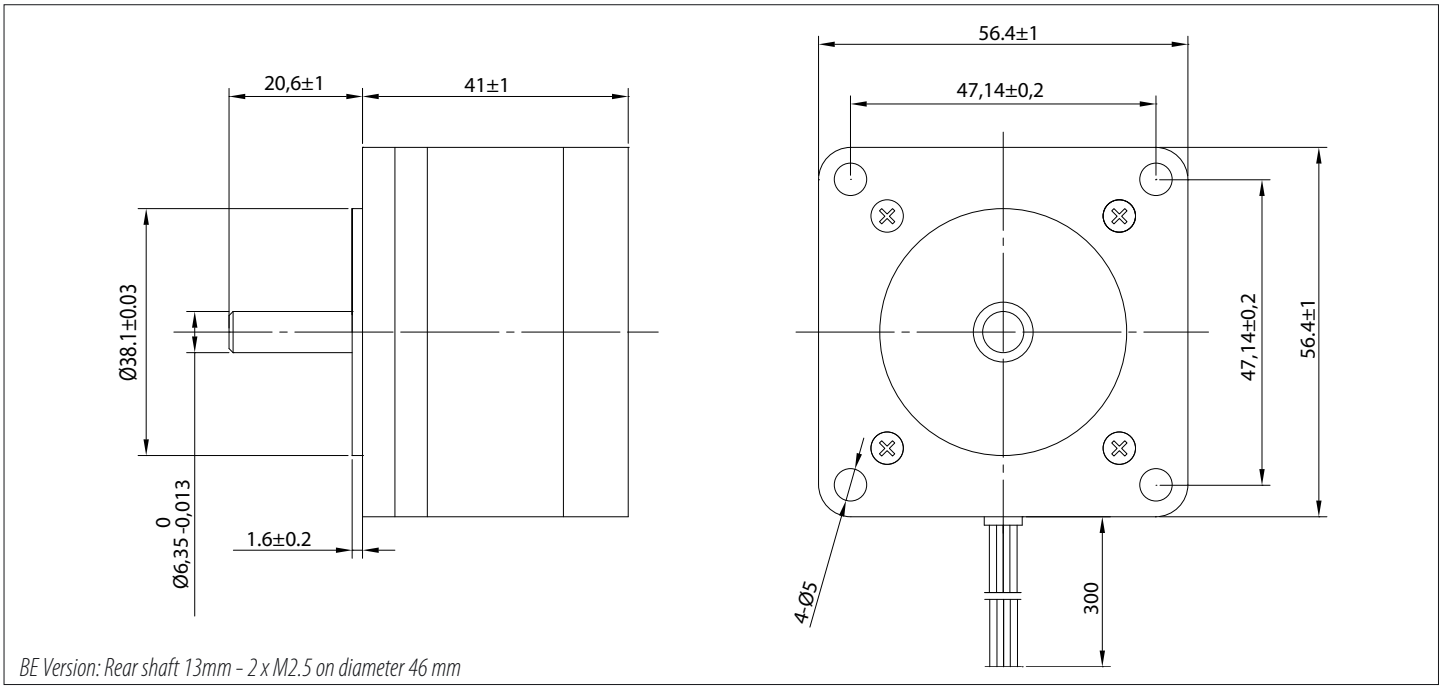
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B





STEPPER MOTOR

Stepper Motor 57S41 Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

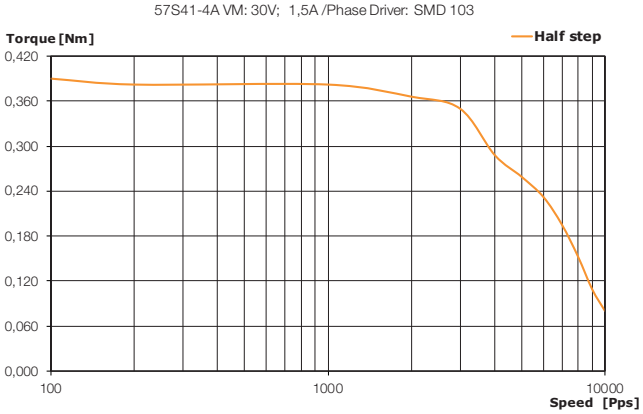
Model		57S41-4A
1 Rated Voltage	V	2,8
2 Current/Phase	A	1,56
3 Resistance/Phase	Ω	1,8
4 Inductance/Phase	mH	3,6
5 Holding Torque	Nm	0,4
6 Rotor Inertia	g-cm^2	57
7 Detent Torque	Kg-cm	0,18
8 Weight	Kg	0,54
9 Number of leads		4
10 Length	mm	41

CHARACTERISTICS

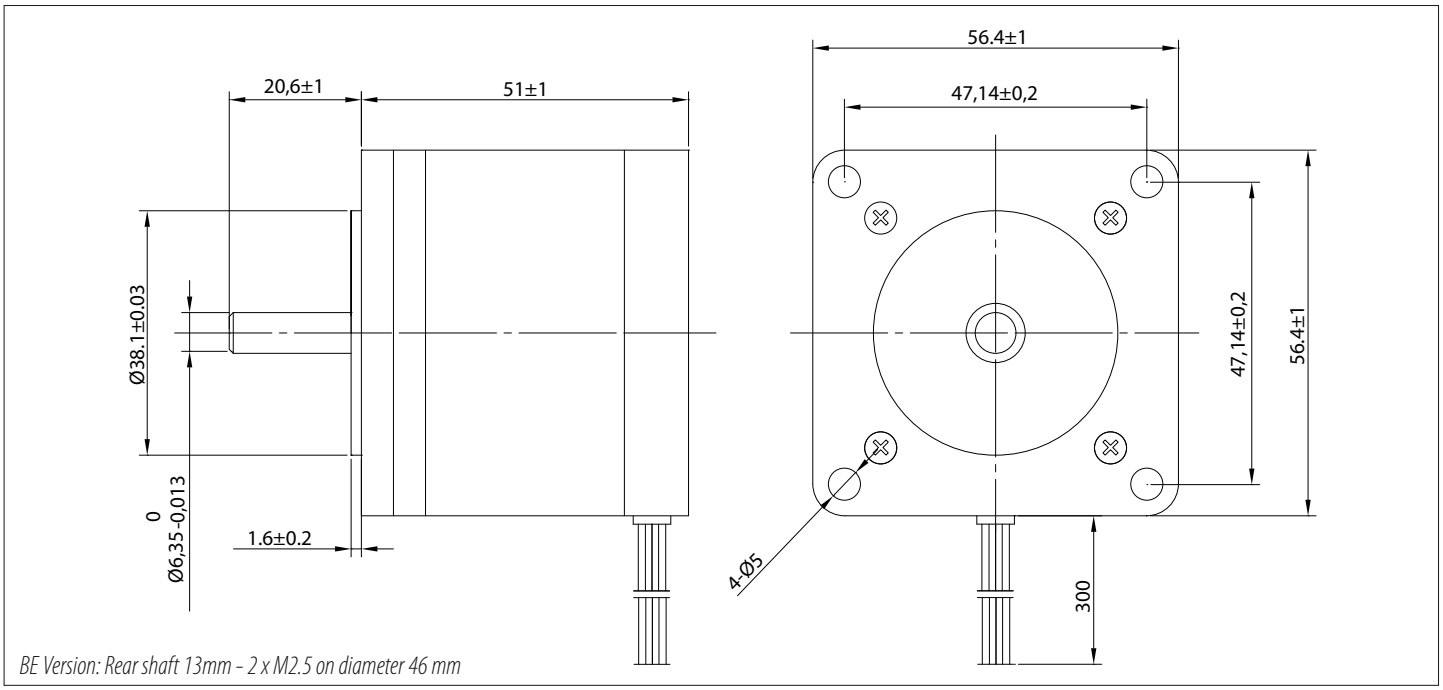
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

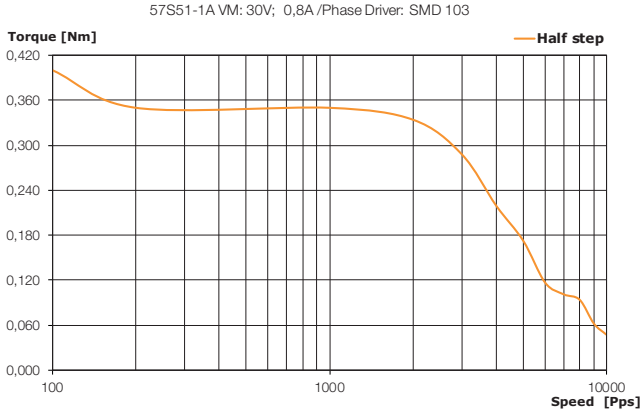
Model			57S51-1A	57S51-2A
1	Rated Voltage	V	6	12
2	Current/Phase	A	0,85	0,42
3	Resistance/Phase	Ω	7,1	29
4	Inductance/Phase	mH	9	36
5	Holding Torque	Nm	0,49	0,49
6	Rotor Inertia	g-cm^2	110	110
7	Detent Torque	Kg-cm	4	4
8	Weight	Kg	0,6	0,6
9	Number of leads		6	6
10	Length	mm	51	51

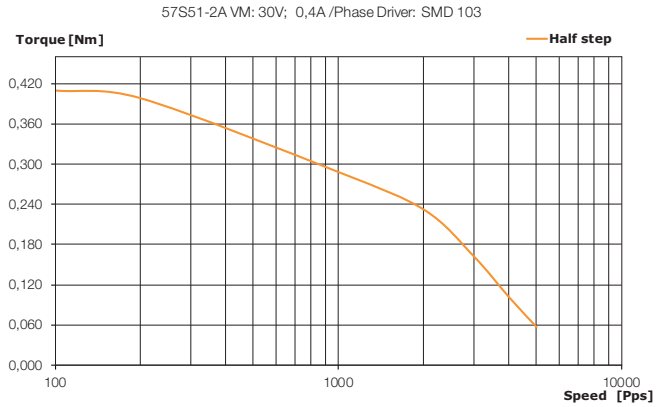
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

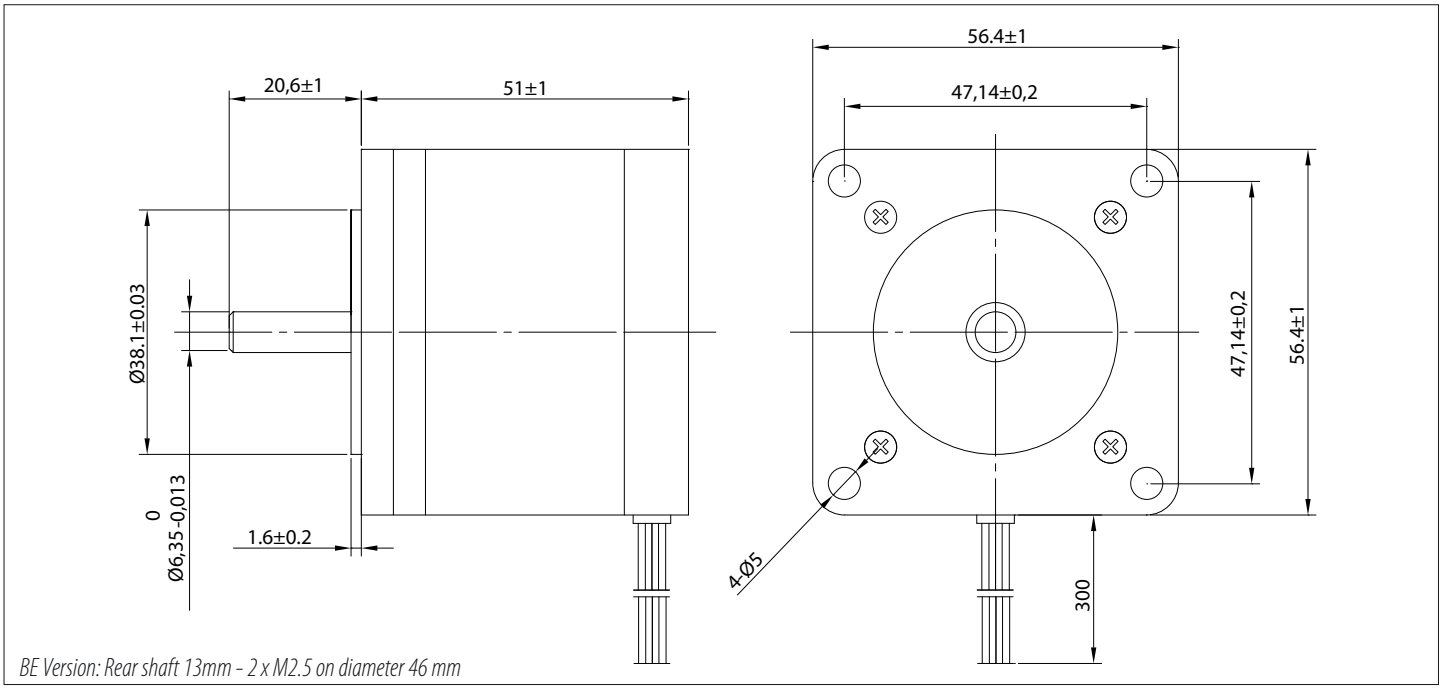
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B





Stepper Motor 57S51 Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57S51-4A
1	Rated Voltage	V	2,38
2	Current/Phase	A	2,8
3	Resistance/Phase	Ω	0,85
4	Inductance/Phase	mH	2,1
5	Holding Torque	Nm	0,69
6	Rotor Inertia	g-cm^2	110
7	Detent Torque	Kg-cm	4
8	Weight	Kg	0,6
9	Number of leads		4
10	Length	mm	51

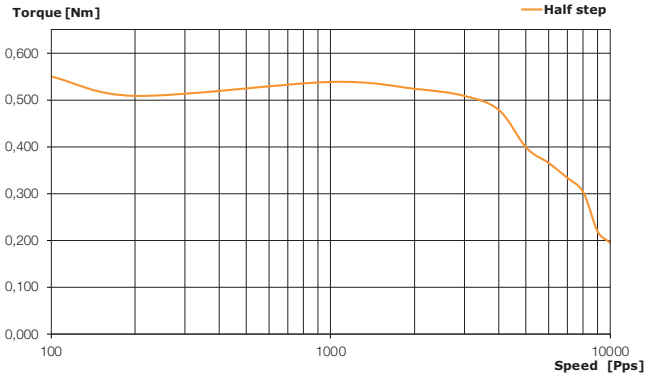
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm)
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

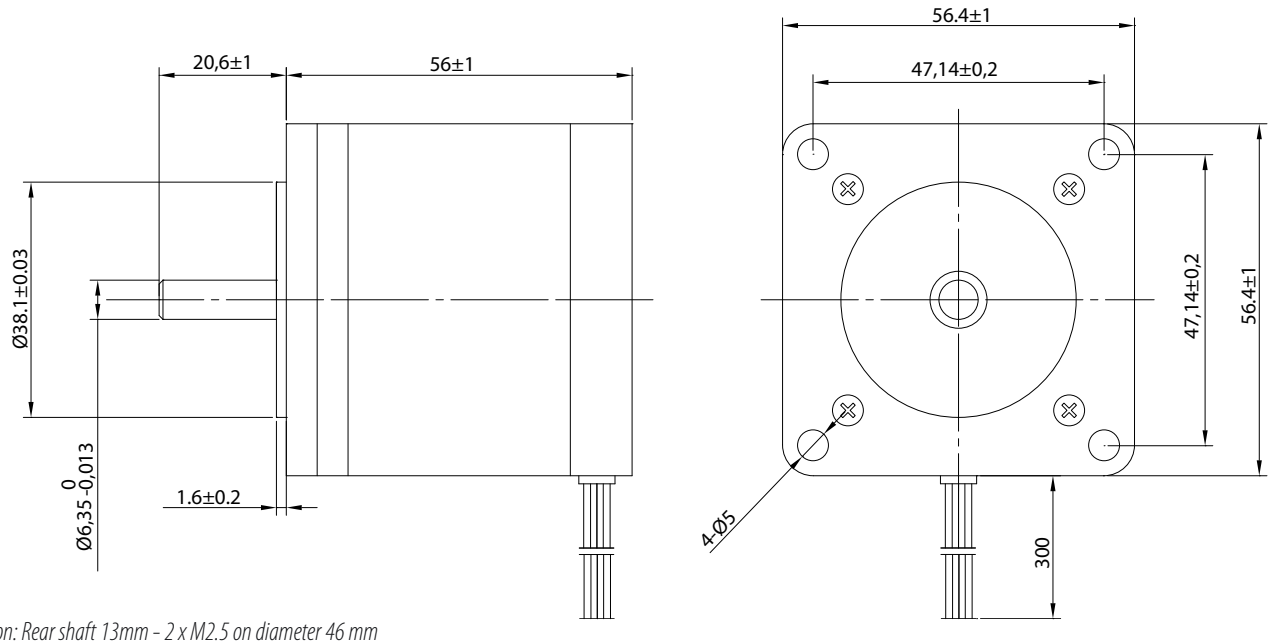
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57S51-4A VM: 30V; 2,8A /Phase Driver: SMD 103



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57S56-1A	57S56-2A
1	Rated Voltage	V	6	12
2	Current/Phase	A	1,2	0,6
3	Resistance/Phase	Ω	5	20
4	Inductance/Phase	mH	8	32
5	Holding Torque	Nm	0,605	0,605
6	Rotor Inertia	g-cm^2	135	135
7	Detent Torque	Kg-cm	0,42	0,42
8	Weight	Kg	0,65	0,65
9	Number of leads		6	6
10	Length	mm	56	56

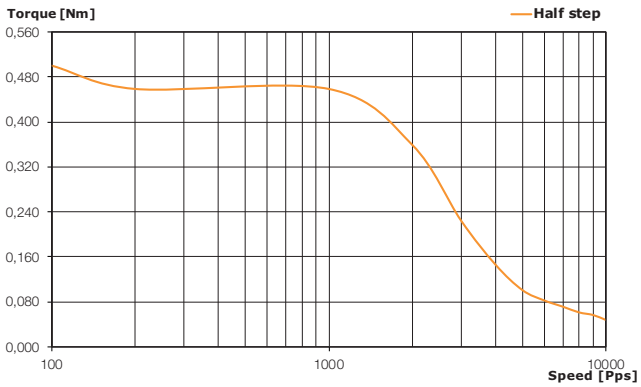
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

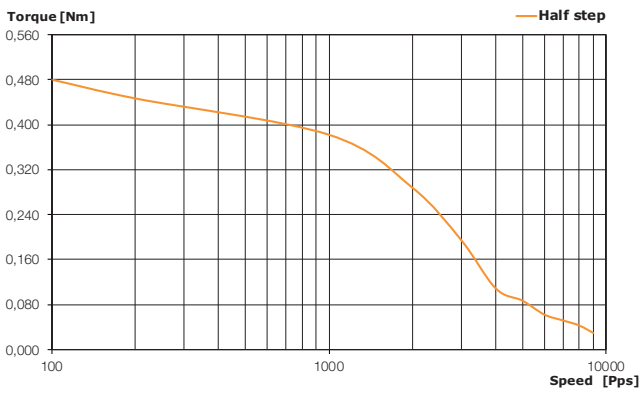
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

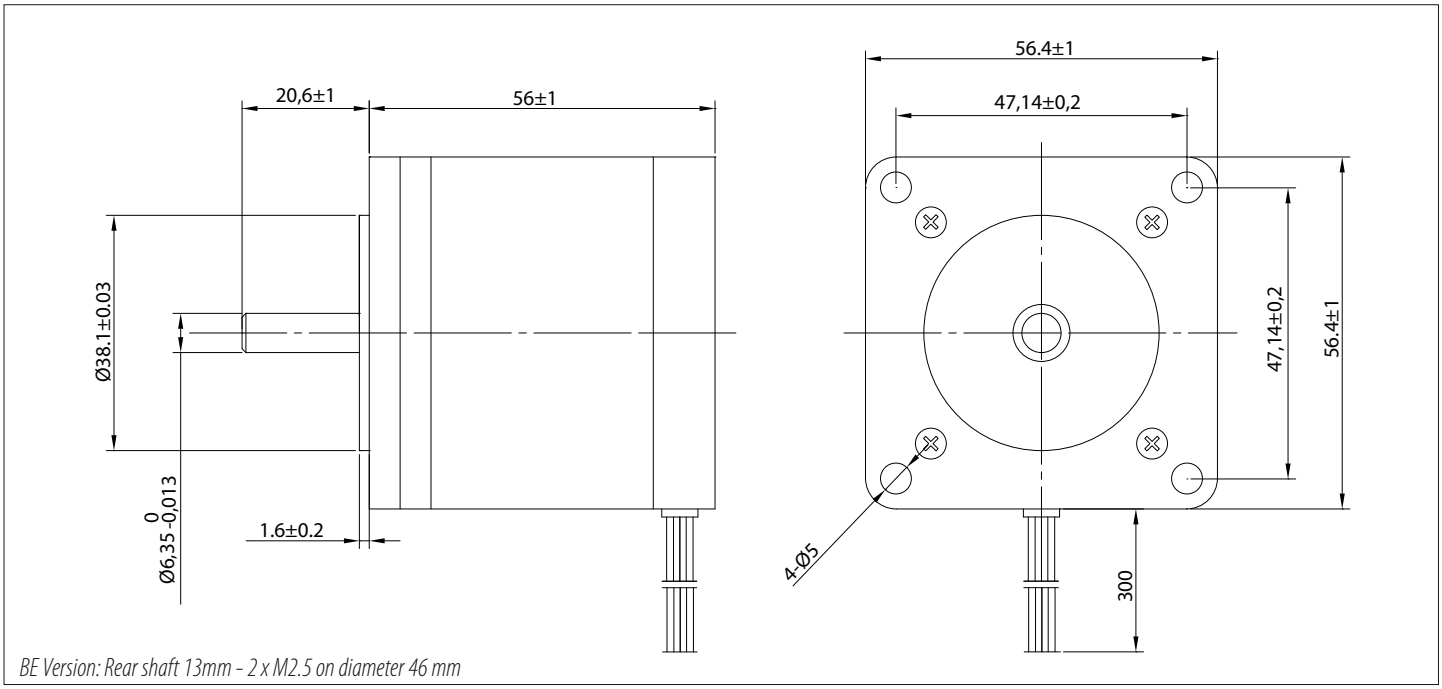
57S56-1A VM: 30V; 1,2A /Phase Driver: SMD 103



57S56-1A VM: 30V; 0,6A /Phase Driver: SMD 103



Stepper Motor 57S56 Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

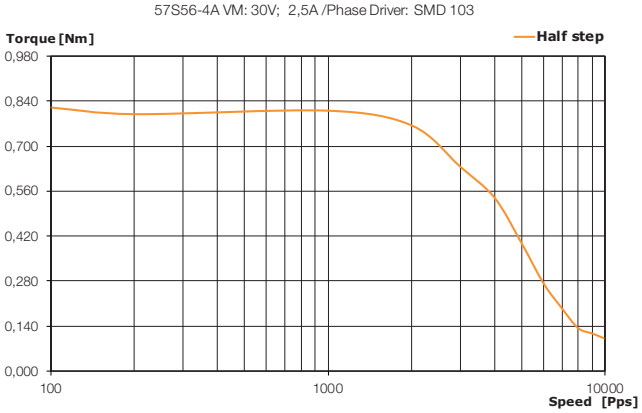
Model		57S56-4A
1 Rated Voltage	V	2,8
2 Current/Phase	A	2,5
3 Resistance/Phase	Ω	1,1
4 Inductance/Phase	mH	3,6
5 Holding Torque	Nm	0,84
6 Rotor Inertia	g-cm^2	135
7 Detent Torque	Kg-cm	0,42
8 Weight	Kg	0,65
9 Number of leads		4
10 Length	mm	56

CHARACTERISTICS

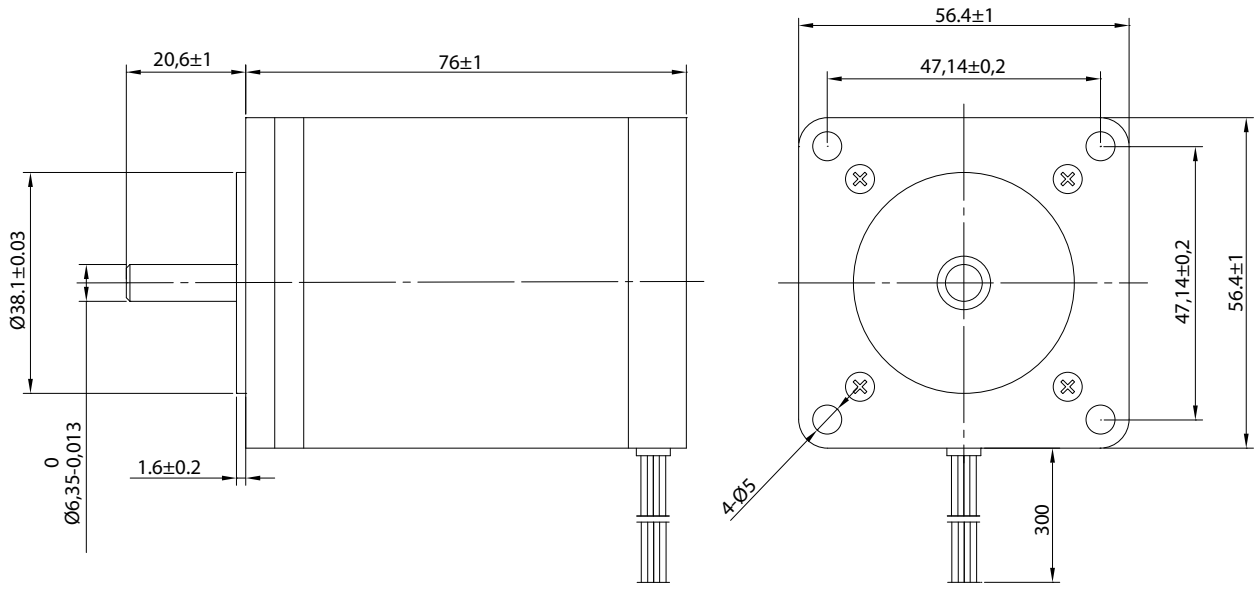
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57S76-1A	57S76-2A
1	Rated Voltage	V	5,4	12
2	Current/Phase	A	1,5	0,68
3	Resistance/Phase	Ω	3,6	17,7
4	Inductance/Phase	mH	6	30
5	Holding Torque	Nm	0,9	0,9
6	Rotor Inertia	g-cm^2	200	200
7	Detent Torque	Kg-cm	0,72	0,72
8	Weight	Kg	0,95	0,95
9	Number of leads		6	6
10	Length	mm	76	76

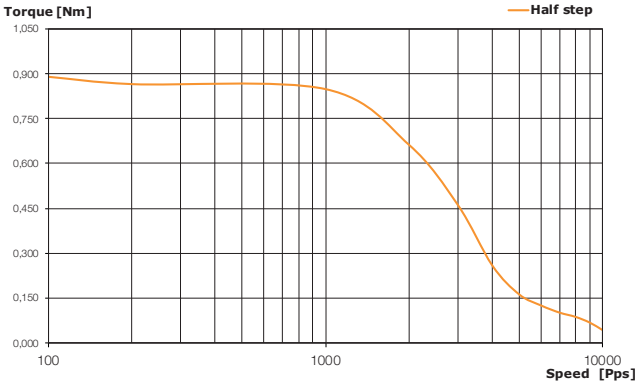
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

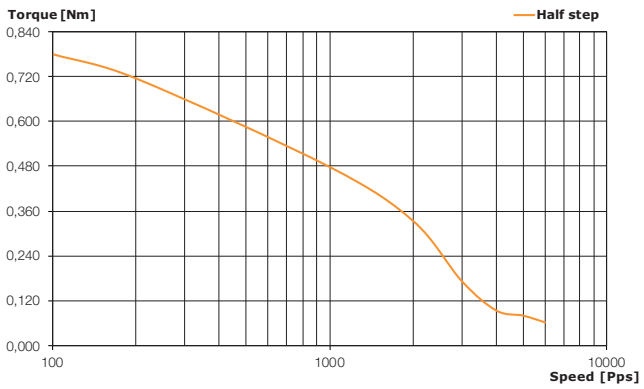
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

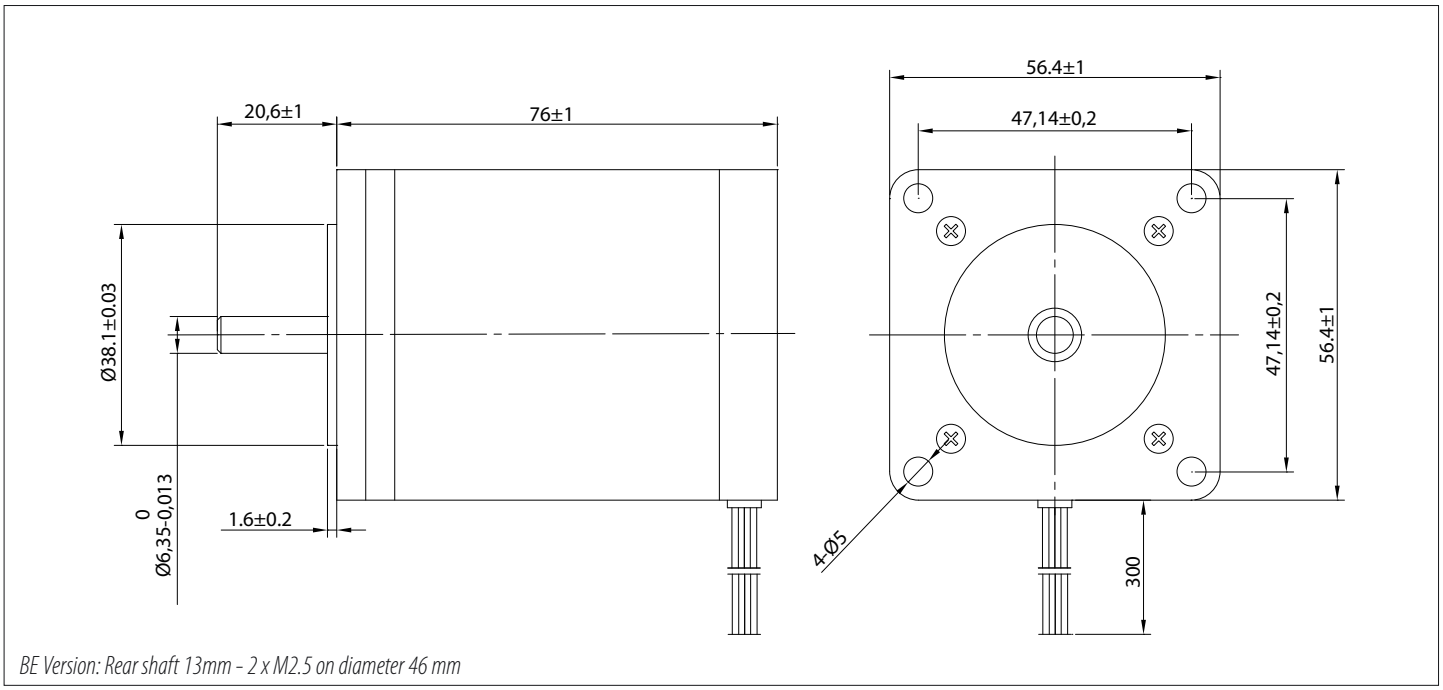
57S76-1A VM: 30V; 1,5A /Phase Driver: SMD 103



57S76-2A VM: 30V; 0,68A /Phase Driver: SMD 103



Stepper Motor 57S76 Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57S76-4A
1	Rated Voltage	V	2,7
2	Current/Phase	A	3,3
3	Resistance/Phase	Ω	0,85
4	Inductance/Phase	mH	3
5	Holding Torque	Nm	1,25
6	Rotor Inertia	g-cm^2	200
7	Detent Torque	Kg-cm	0,72
8	Weight	Kg	0,95
9	Number of leads		4
10	Length	mm	76

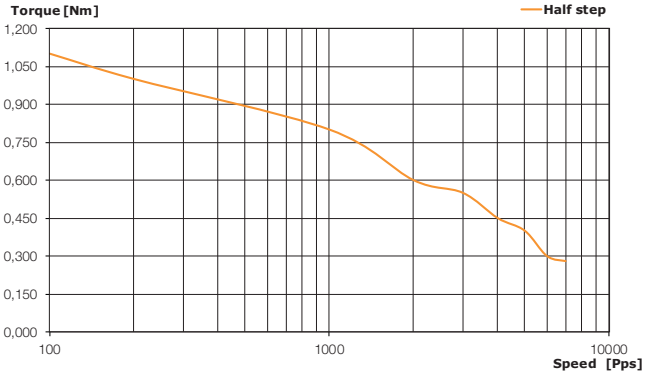
CHARACTERISTICS

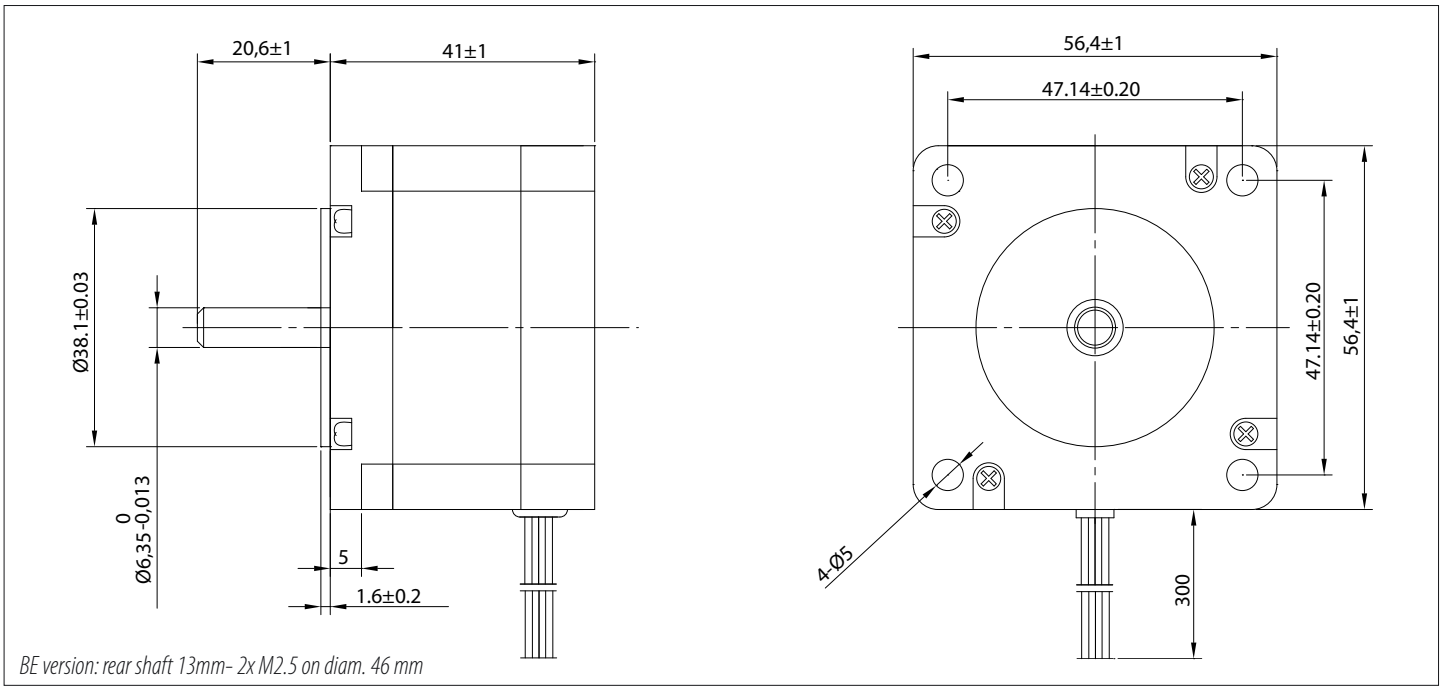
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57S76-4A VM: 30V; 3,0A /Phase Driver: SMD 103





BE version: rear shaft 13mm- 2x M2.5 on diam. 46 mm

SPECIFICATION

Model			57SH41-1A	57SH41-2A
1	Rated Voltage	V	5,7	2,8
2	Current/Phase	A	1	2
3	Resistance/Phase	Ω	5,7	1,4
4	Inductance/Phase	mH	5,4	1,4
5	Holding Torque	Nm	0,39	0,39
6	Rotor Inertia	g-cm^2	120	120
7	Detent Torque	Kg-cm	0,21	0,21
8	Weight	Kg	0,45	0,45
9	Number of leads		6	6
10	Length	mm	41	41

CHARACTERISTICS

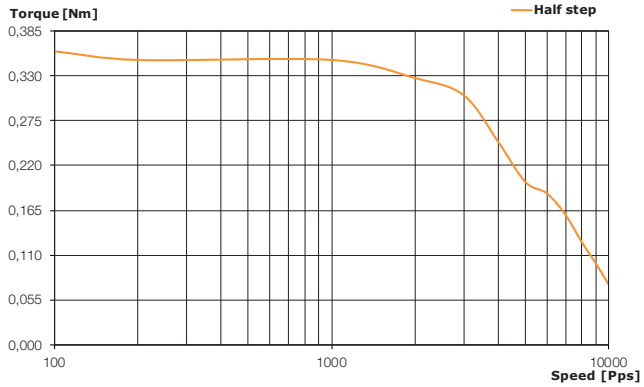
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

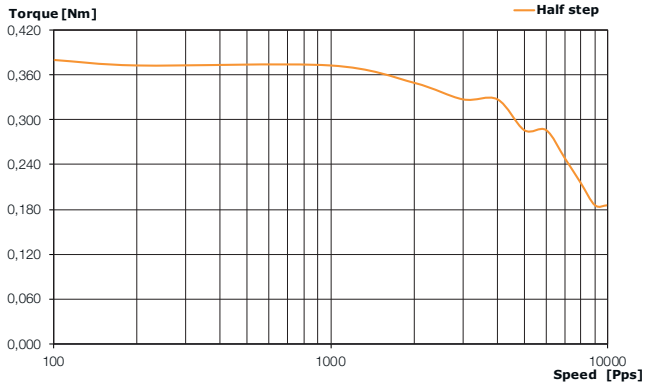
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

STEPPER MOTOR

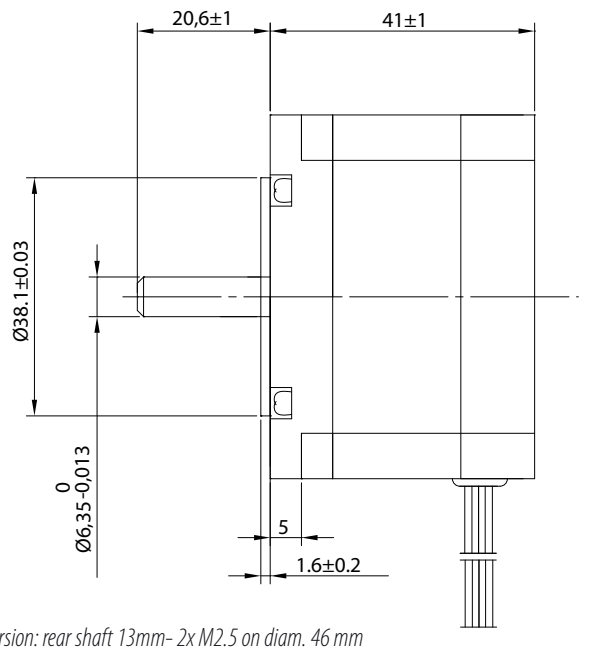
57SH41-1A VM: 30V; 1,0A /Phase Driver: SMD 103

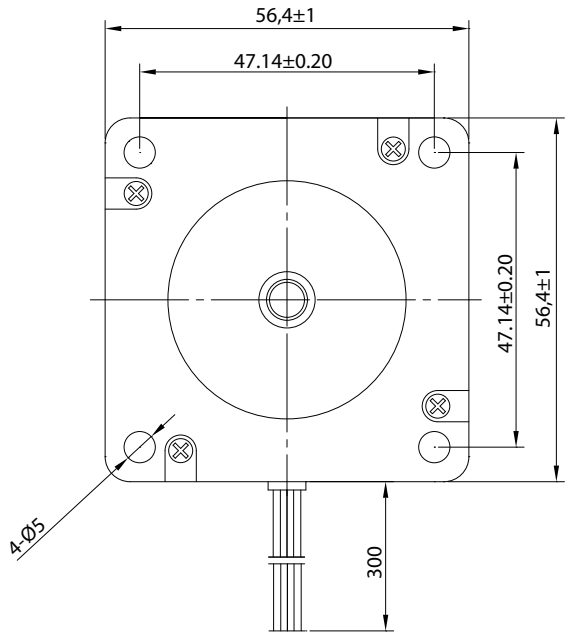


57SH41-2A VM: 30V; 2,0A /Phase Driver: SMD 103



Stepper Motor 57SH41 High Torque Hybrid





BE version: rear shaft 13mm- 2x M2.5 on diam. 46 mm

SPECIFICATION

Model			57SH41-3A	57SH41-4A
1	Rated Voltage	V	1,9	2
2	Current/Phase	A	3	2,8
3	Resistance/Phase	Ω	0,63	0,7
4	Inductance/Phase	mH	0,6	1,4
5	Holding Torque	Nm	0,39	0,55
6	Rotor Inertia	g-cm^2	120	120
7	Detent Torque	Kg-cm	0,21	0,21
8	Weight	Kg	0,45	0,45
9	Number of leads		6	4
10	Length	mm	41	41

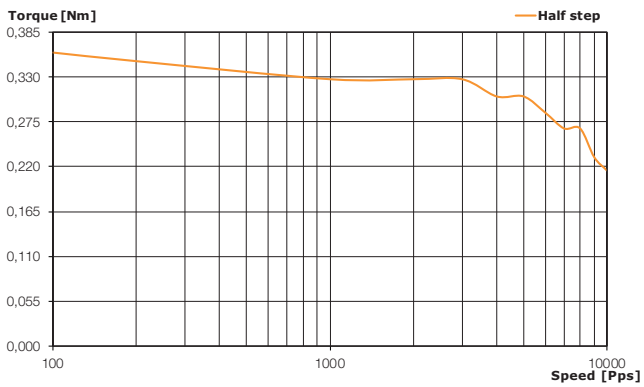
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

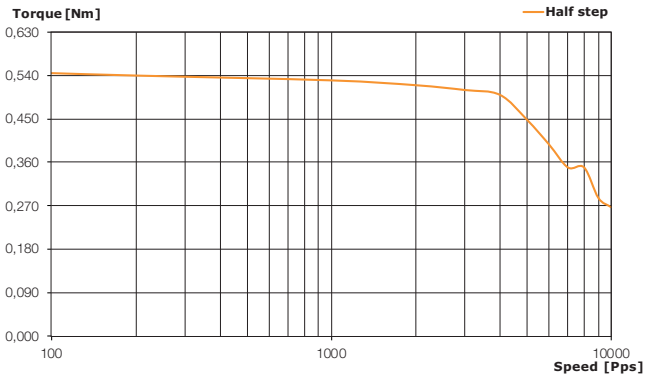
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57SH41-3A VM: 30V; 3,0A /Phase Driver: SMD 103

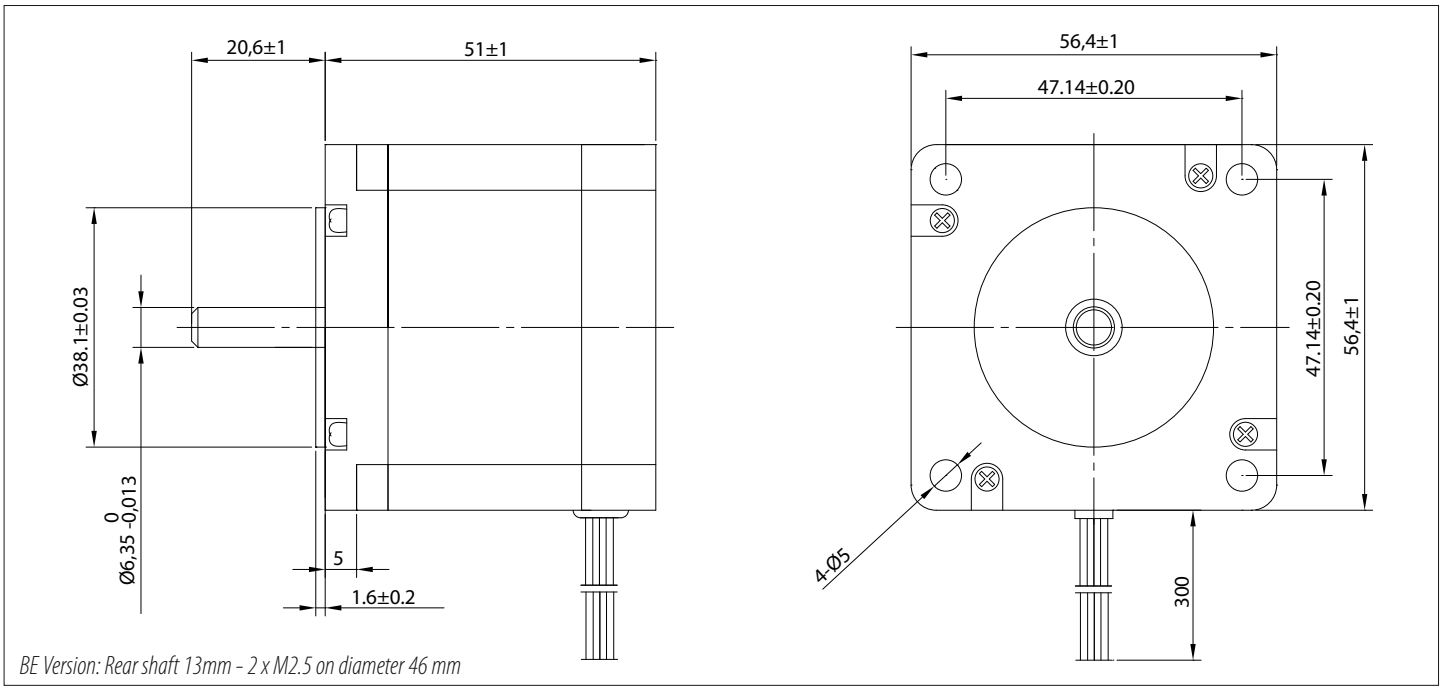


57SH41-4A VM: 30V; 2,8A /Phase Driver: SMD 103



STEPPER MOTOR

May 2020 edition/ subject to change



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH51-1A	57SH51-2A
1	Rated Voltage	V	6,6	3,3
2	Current/Phase	A	1	2
3	Resistance/Phase	Ω	6,6	1,65
4	Inductance/Phase	mH	8,2	2,2
5	Holding Torque	Nm	0,72	0,72
6	Rotor Inertia	g-cm^2	275	275
7	Detent Torque	Kg-cm	0,36	0,36
8	Weight	Kg	0,65	0,65
9	Number of leads		6	6
10	Length	mm	51	51

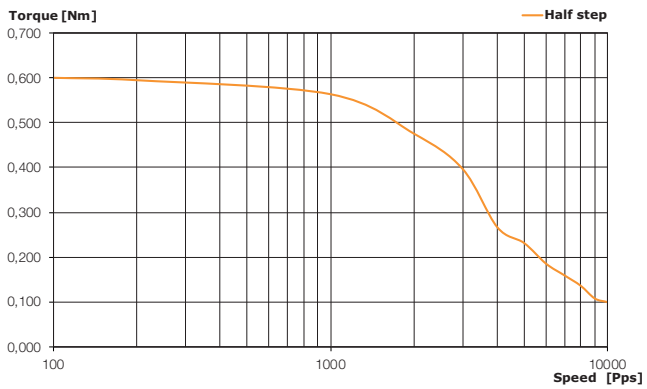
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

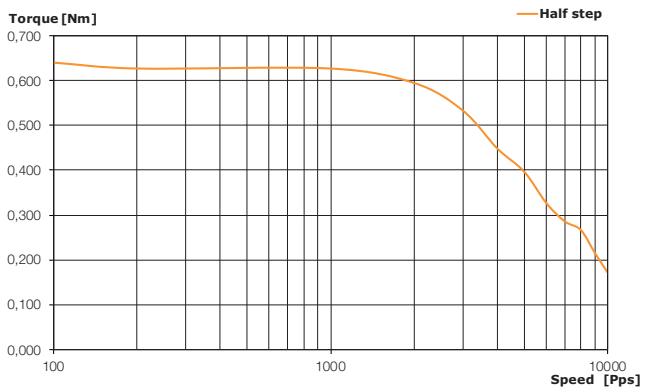
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

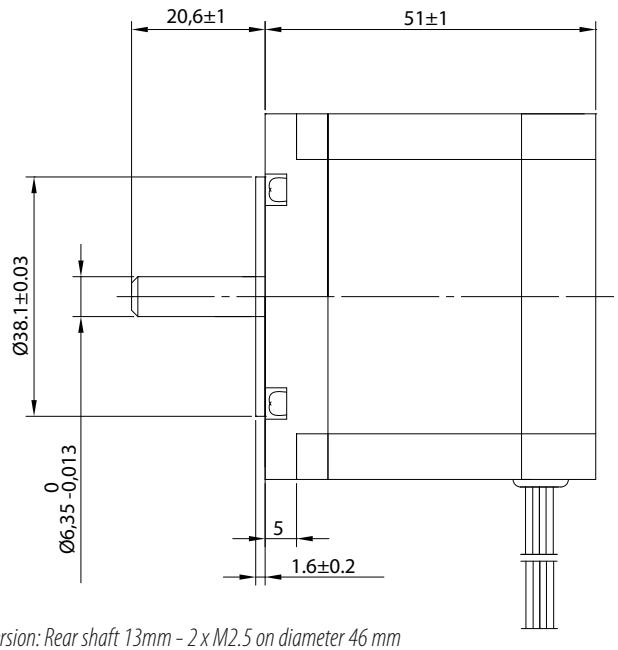
57SH51-1A VM: 30V; 1,0A /Phase Driver: SMD 103

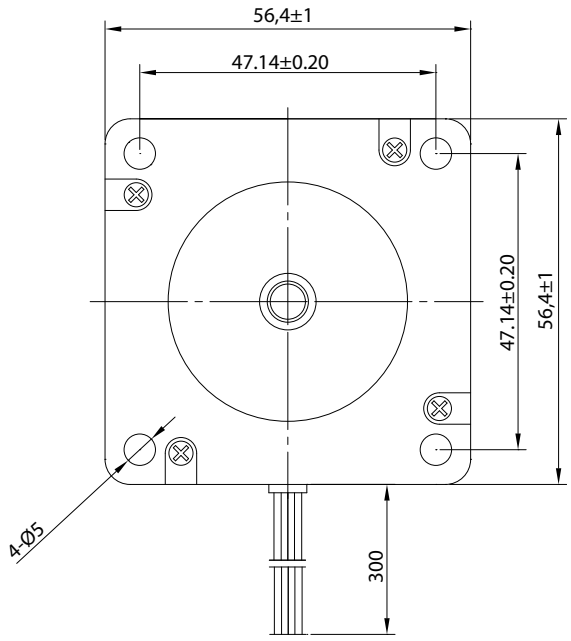


57SH51-2A VM: 30V; 2,0A /Phase Driver: SMD 103



Stepper Motor 57SH51 High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH51-3A	57SH51-4A
1	Rated Voltage	V	2,2	2,3
2	Current/Phase	A	3	2,8
3	Resistance/Phase	Ω	0,74	0,83
4	Inductance/Phase	mH	0,9	2,2
5	Holding Torque	Nm	0,72	1,01
6	Rotor Inertia	g-cm^2	275	275
7	Detent Torque	Kg-cm	0,36	0,36
8	Weight	Kg	0,65	0,65
9	Number of leads		6	4
10	Length	mm	51	51

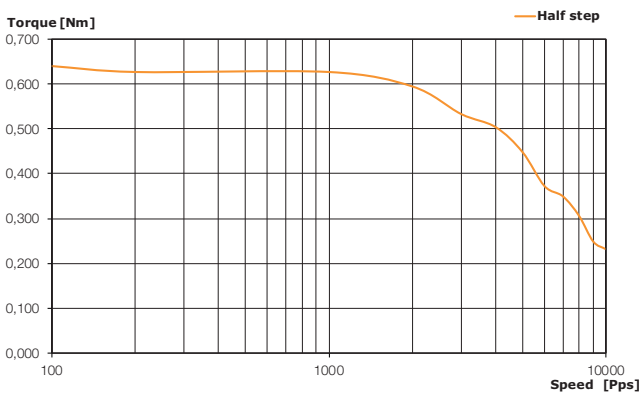
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

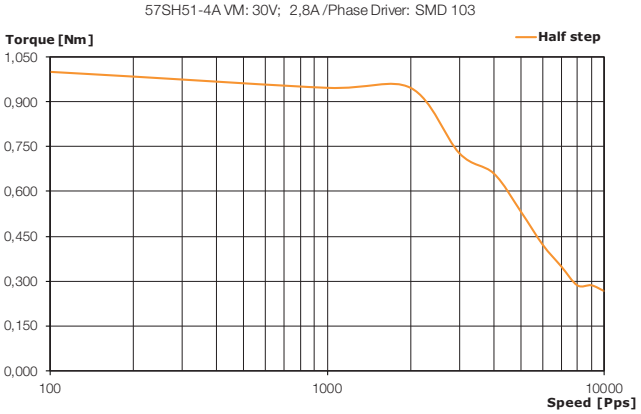
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

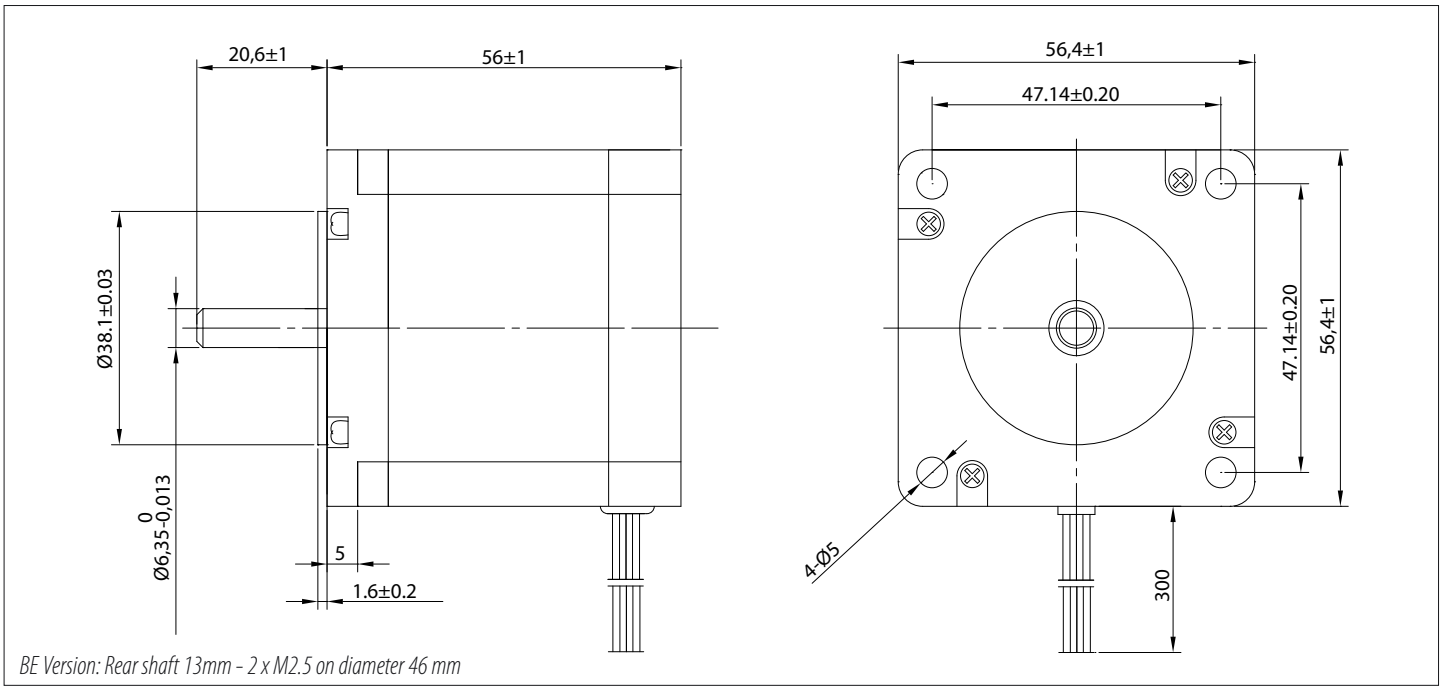
57SH51-3A VM: 30V; 3,0A /Phase Driver: SMD 103



57SH51-4A VM: 30V; 2,8A /Phase Driver: SMD 103



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH56-1A	57SH56-2A
1	Rated Voltage	V	7,4	3,6
2	Current/Phase	A	1	2
3	Resistance/Phase	Ω	7,4	1,8
4	Inductance/Phase	mH	10	2,5
5	Holding Torque	Nm	0,9	0,9
6	Rotor Inertia	g-cm^2	300	300
7	Detent Torque	Kg-cm	0,4	0,4
8	Weight	Kg	0,7	0,7
9	Number of leads		6	6
10	Length	mm	56	56

CHARACTERISTICS

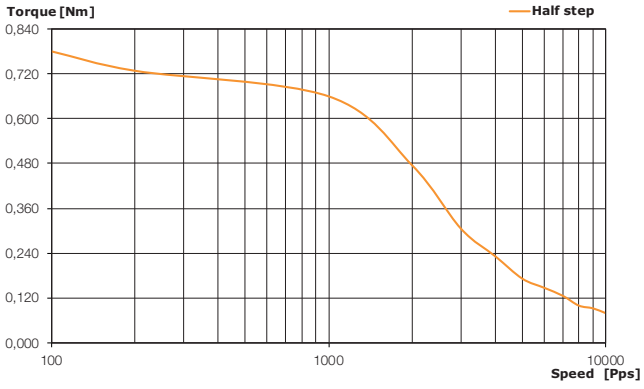
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

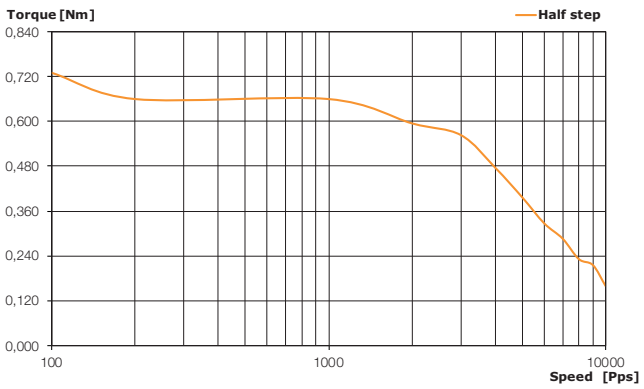
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

STEPPER MOTOR

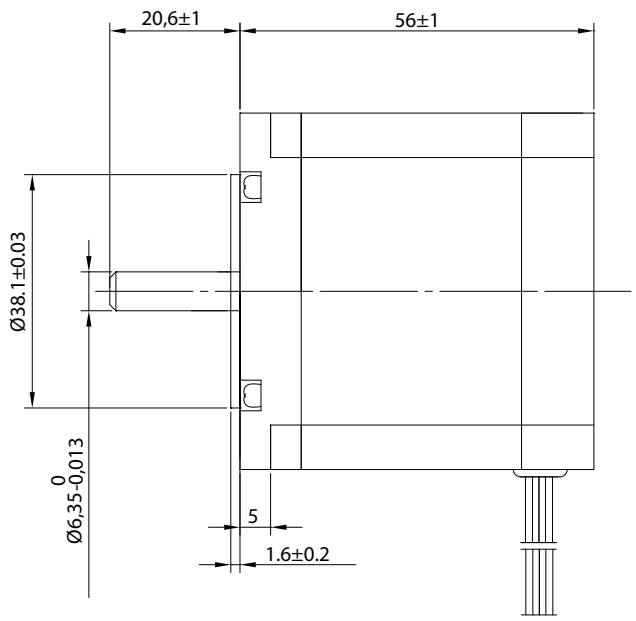
57SH56-1A VM: 30V; 1,0A /Phase Driver: SMD 103

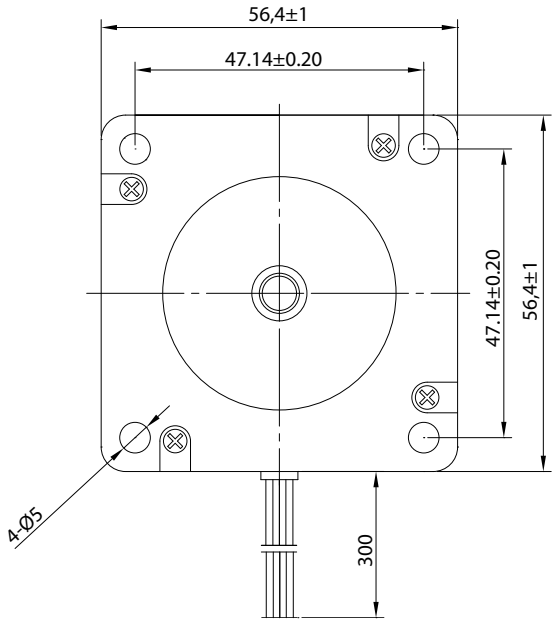


57SH56-2A VM: 30V; 2,0A /Phase Driver: SMD 103



Stepper Motor 57SH56 High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH56-3A	57SH56-4A
1	Rated Voltage	V	2,3	2,5
2	Current/Phase	A	3	2,8
3	Resistance/Phase	Ω	0,75	0,9
4	Inductance/Phase	mH	1,1	2,5
5	Holding Torque	Nm	0,9	1,26
6	Rotor Inertia	g-cm^2	300	300
7	Detent Torque	Kg-cm	0,4	0,4
8	Weight	Kg	0,7	0,7
9	Number of leads		6	4
10	Length	mm	56	56

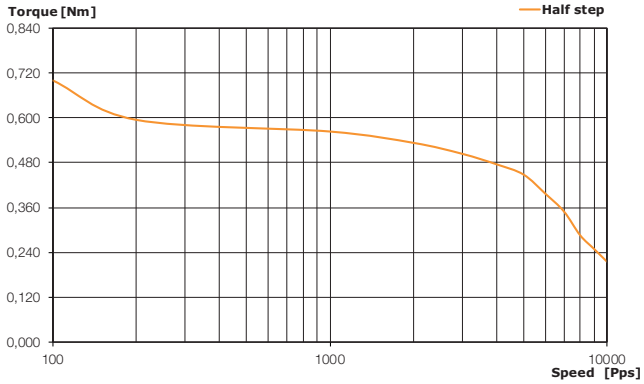
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

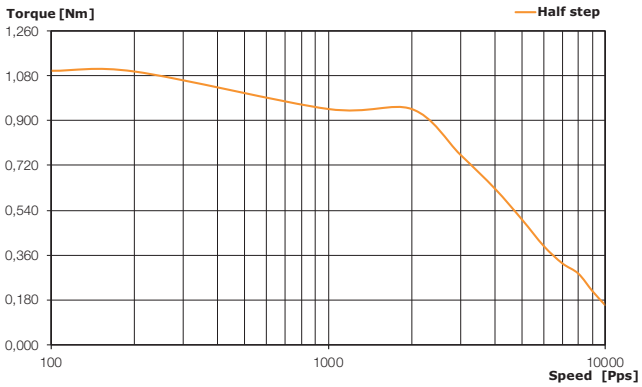
CONNECTION

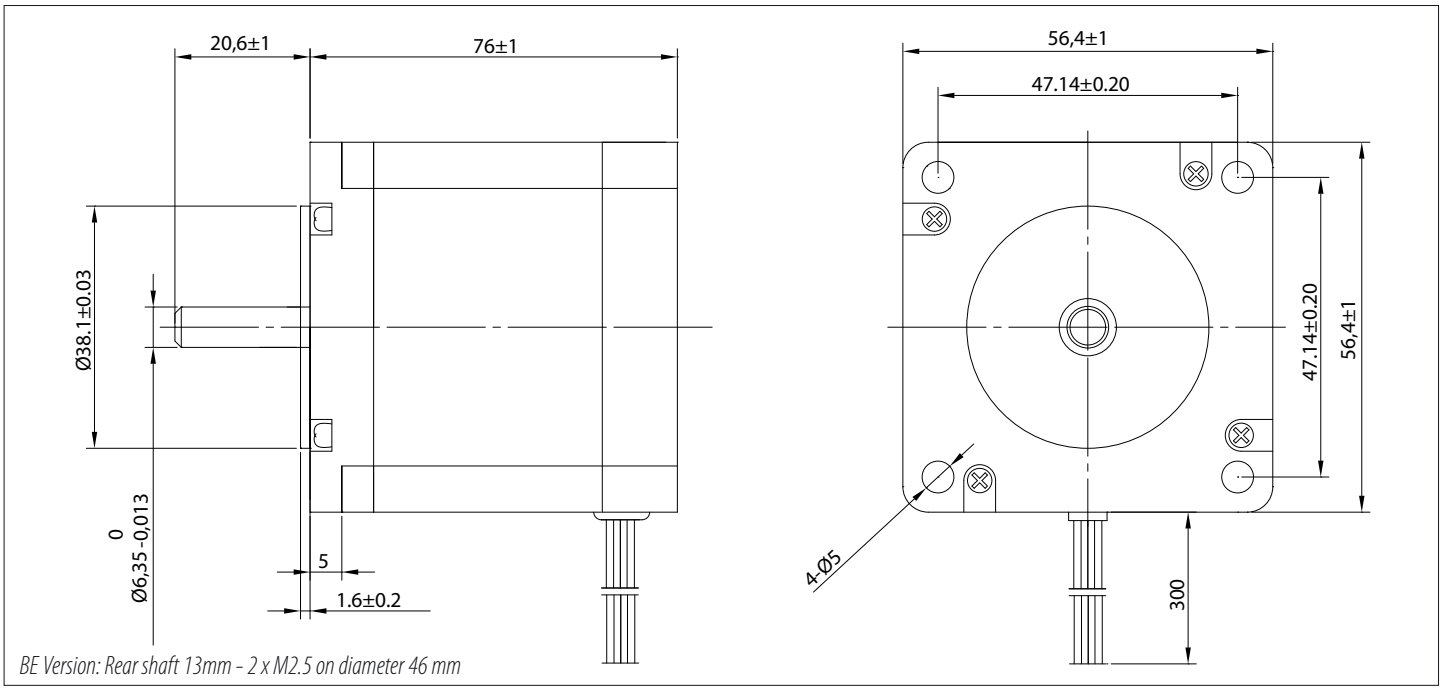
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57SH56-3A VM: 30V; 3,0A /Phase Driver: SMD 506



57SH56-4A VM: 30V; 2,8A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH76-1A	57SH76-2A
1	Rated Voltage	V	8,6	4,5
2	Current/Phase	A	1	2
3	Resistance/Phase	Ω	8,6	2,25
4	Inductance/Phase	mH	14	3,6
5	Holding Torque	Nm	1,35	1,35
6	Rotor Inertia	g-cm^2	480	480
7	Detent Torque	Kg-cm	0,68	0,68
8	Weight	Kg	1	1
9	Number of leads		6	6
10	Length	mm	76	76

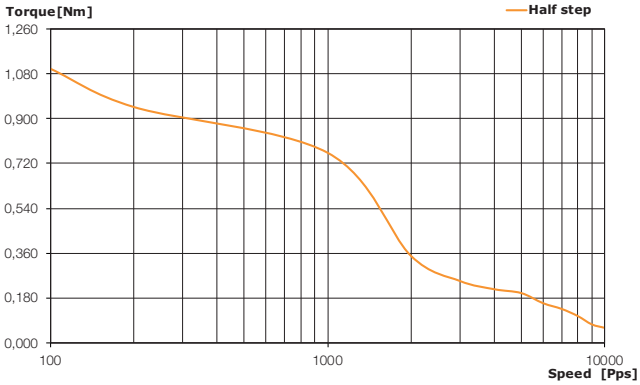
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

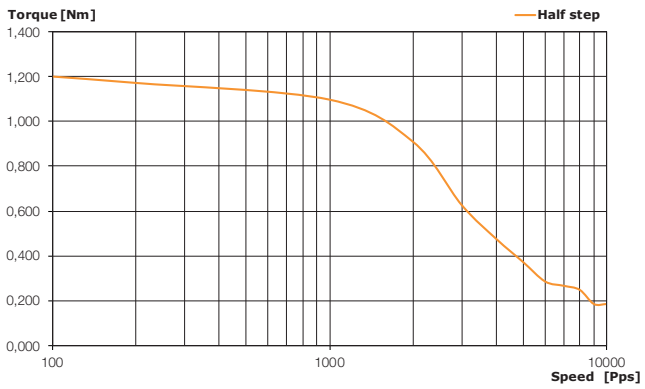
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

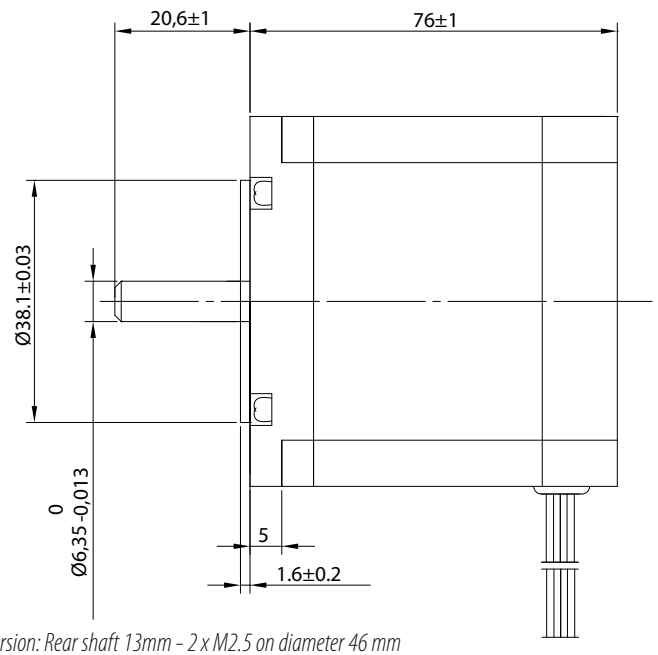
57SH76-1A VM: 30V; 1,0A /Phase Driver: SMD 103

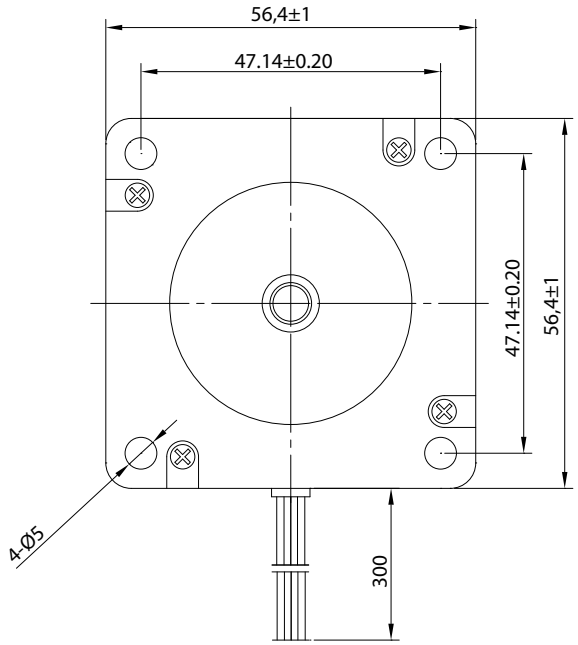


57SH76-2A VM: 30V; 2,0A /Phase Driver: SMD 103



Stepper Motor 57SH76 High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH76-3A	57SH76-4A
1	Rated Voltage	V	3	3,2
2	Current/Phase	A	3	2,8
3	Resistance/Phase	Ω	1	1,13
4	Inductance/Phase	mH	1,6	3,6
5	Holding Torque	Nm	1,35	1,89
6	Rotor Inertia	g-cm^2	480	480
7	Detent Torque	Kg-cm	0,68	0,68
8	Weight	Kg	1	1
9	Number of leads		6	4
10	Length	mm	76	76

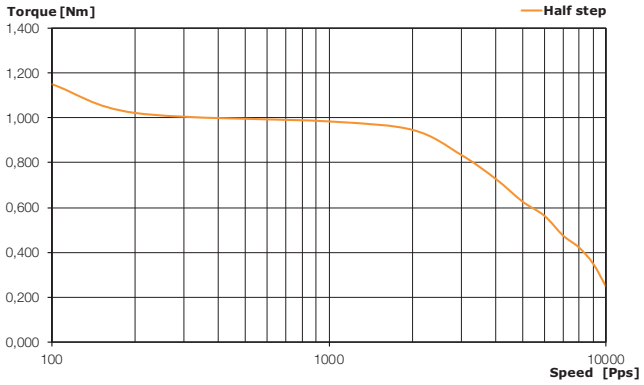
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

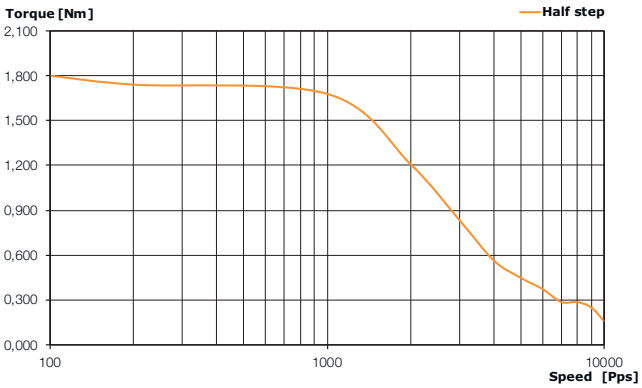
CONNECTION

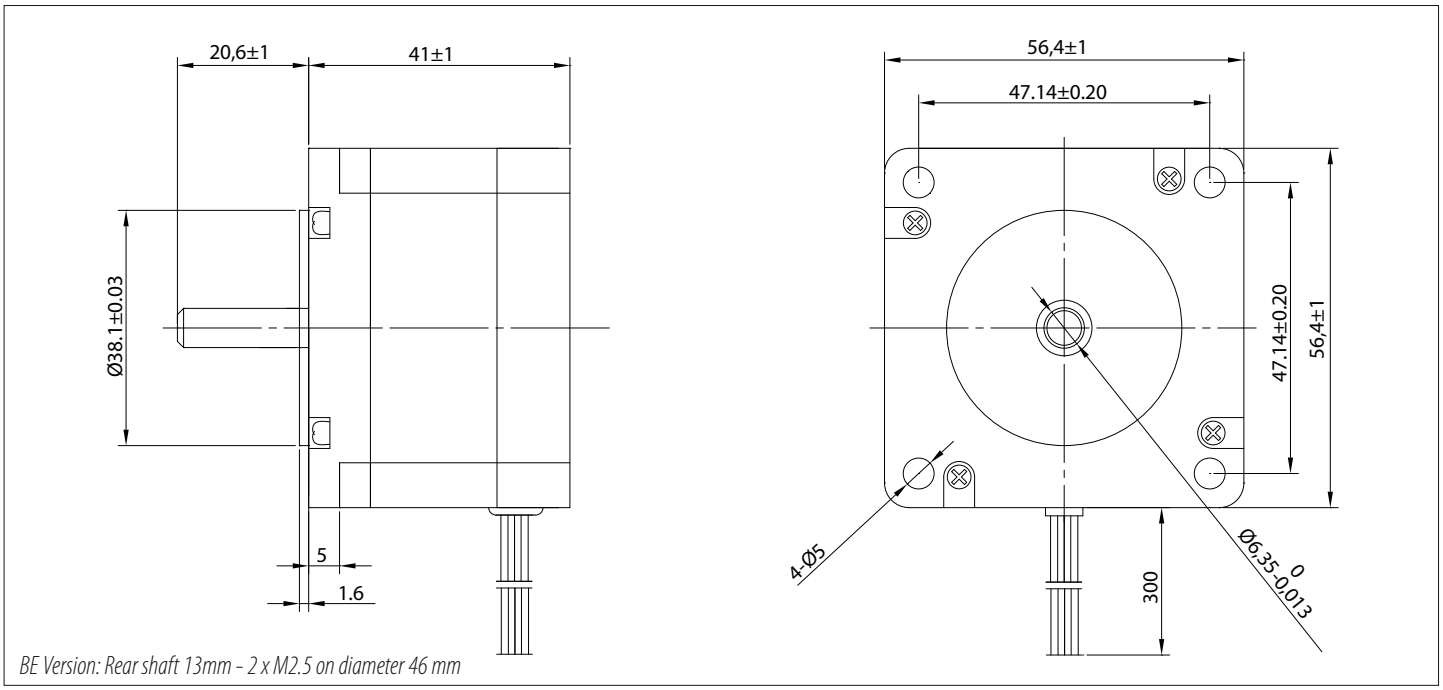
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57SH76-3A VM: 30V; 3,0A /Phase Driver: SMD 103



57SH76-4A VM: 30V; 2,8A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH41-1AM	57SH41-2AM
1	Rated Voltage	V	5,7	2,8
2	Current/Phase	A	1	2
3	Resistance/Phase	Ω	5,7	1,4
4	Inductance/Phase	mH	8	2,2
5	Holding Torque	Nm	0,39	0,39
6	Rotor Inertia	g-cm^2	120	120
7	Detent Torque	Kg-cm	0,21	0,21
8	Weight	Kg	0,45	0,45
9	Number of leads		6	6
10	Length	mm	41	41

CHARACTERISTICS

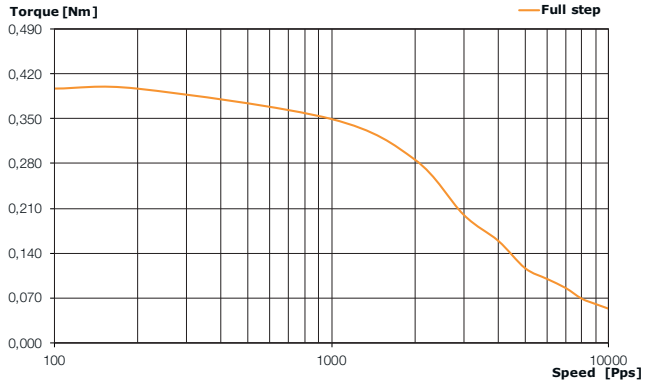
Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

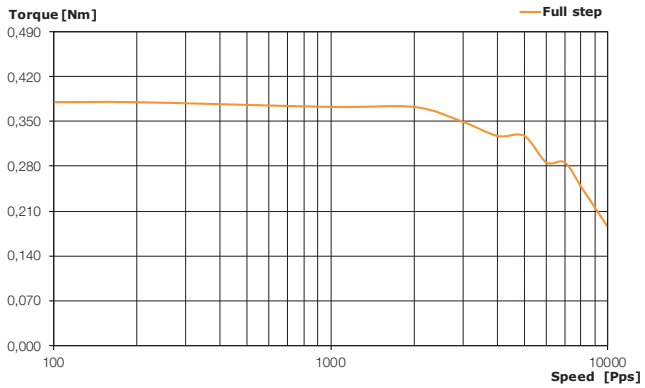
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

STEPPER MOTOR

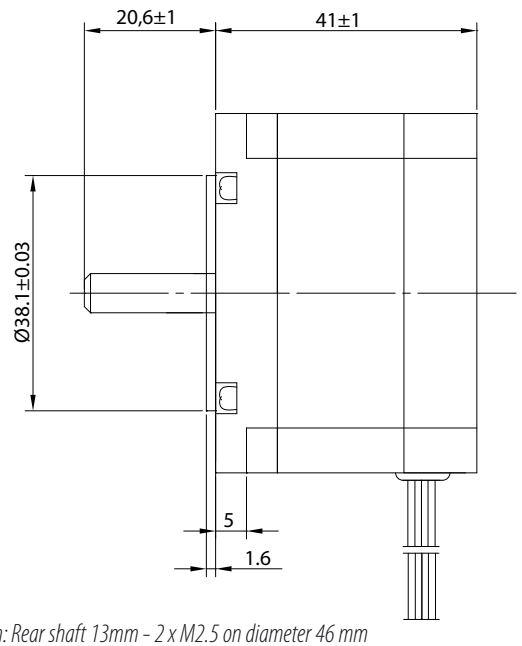
57SH41-1AM VM: 30V; 1,0A /Phase Driver: SMD 103

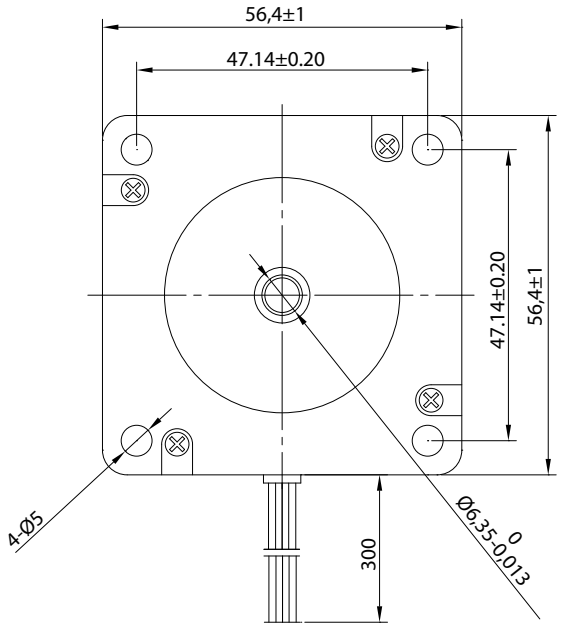


57SH41-2AM VM: 30V; 2,0A /Phase Driver: SMD 103



Stepper Motor 57SH41M High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH41-3AM	57SH41-4AM
1	Rated Voltage	V	1,9	2
2	Current/Phase	A	3	2,8
3	Resistance/Phase	Ω	0,63	0,7
4	Inductance/Phase	mH	1	2,2
5	Holding Torque	Nm	0,39	0,55
6	Rotor Inertia	g-cm^2	120	120
7	Detent Torque	Kg-cm	0,21	0,21
8	Weight	Kg	0,45	0,45
9	Number of leads		6	4
10	Length	mm	41	41

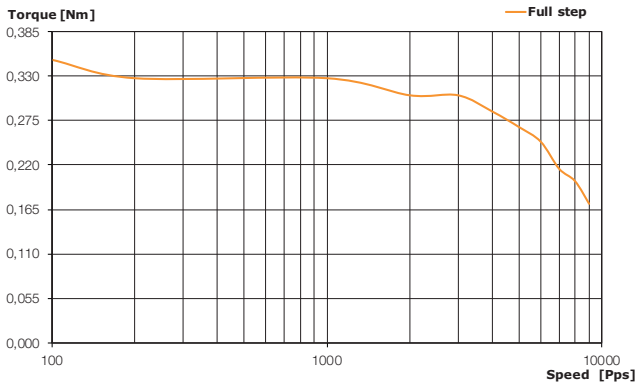
CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

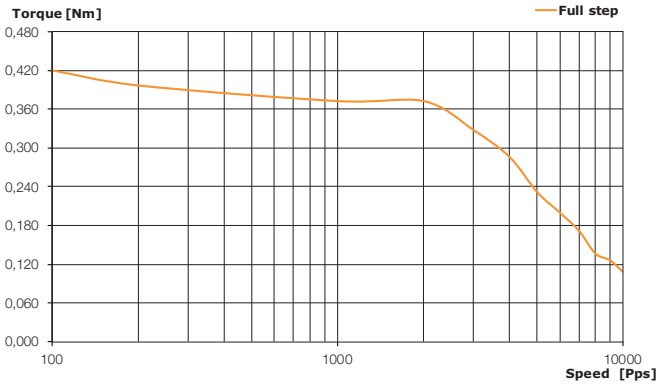
CONNECTION

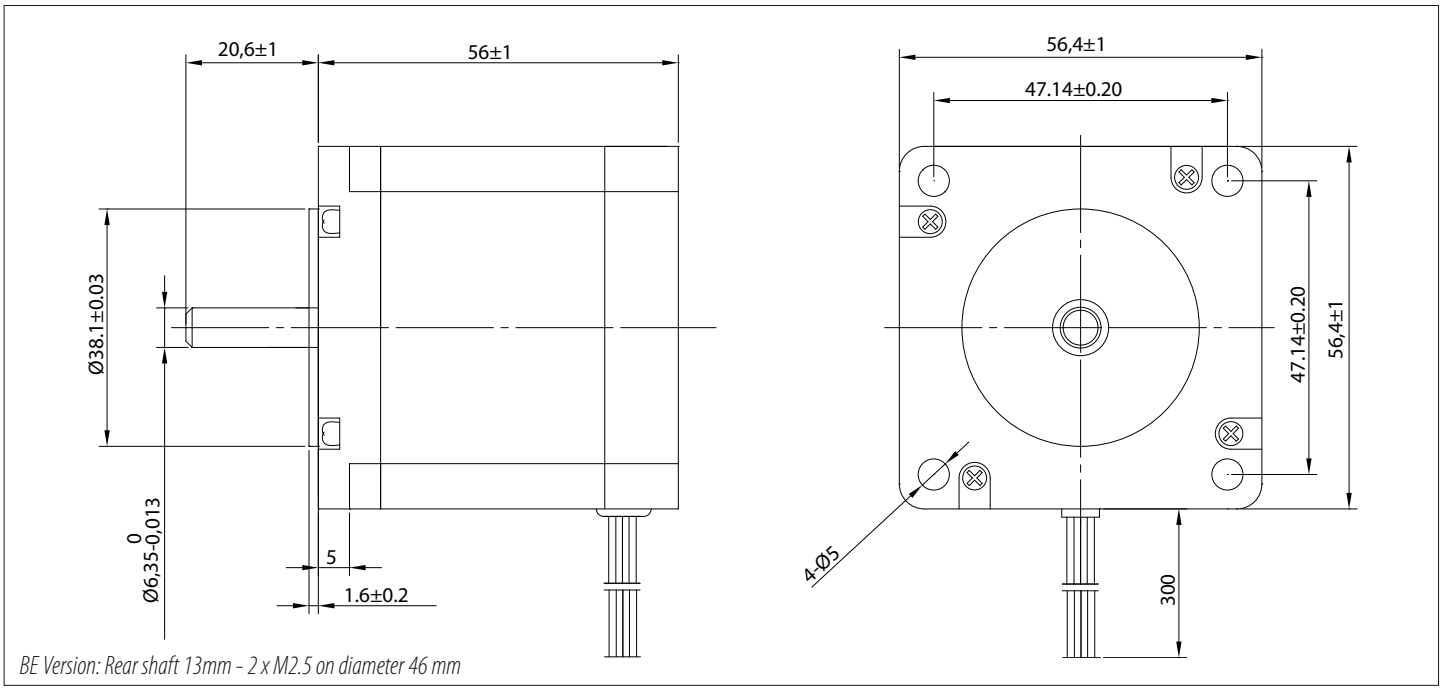
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57SH41-3AM VM: 30V; 3,0A /Phase Driver: SMD 103



57SH41-4AM VM: 30V; 2,8A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH56-1AM	57SH56-2AM
1	Rated Voltage	V	7,4	3,6
2	Current/Phase	A	1	2
3	Resistance/Phase	Ω	7,4	1,8
4	Inductance/Phase	mH	17,5	4,5
5	Holding Torque	Nm	0,9	0,9
6	Rotor Inertia	g-cm^2	300	300
7	Detent Torque	Kg-cm	0,4	0,4
8	Weight	Kg	0,7	0,7
9	Number of leads		6	6
10	Length	mm	56	56

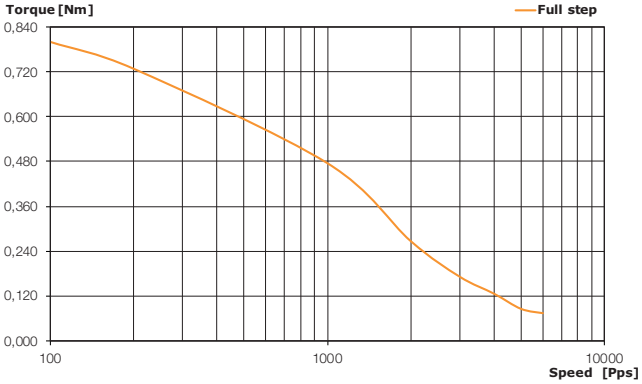
CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

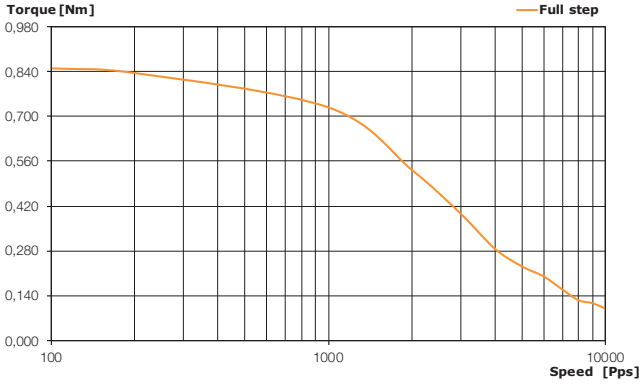
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57SH56-1AM VM: 30V; 1,0A /Phase Driver: SMD 103

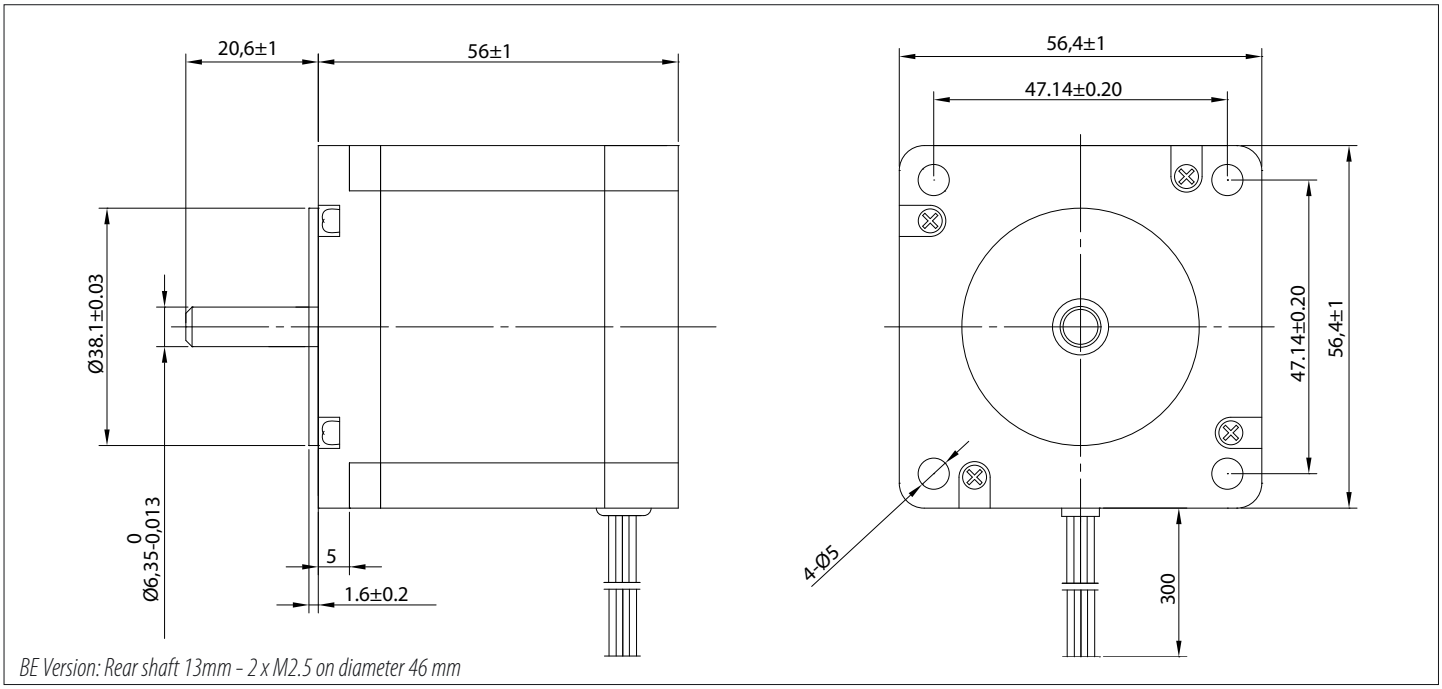


57SH56-2AM VM: 30V; 2,0A /Phase Driver: SMD 103



STEPPER MOTOR

Stepper Motor 57SH56M High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

	Model		57SH56-3AM	57SH56-4AM
1	Rated Voltage	V	2,3	2,5
2	Current/Phase	A	3	2,8
3	Resistance/Phase	Ω	0,75	0,9
4	Inductance/Phase	mH	1,9	4,5
5	Holding Torque	Nm	0,9	1,26
6	Rotor Inertia	g-cm^2	300	300
7	Detent Torque	Kg-cm	0,4	0,4
8	Weight	Kg	0,7	0,7
9	Number of leads		6	4
10	Length	mm	56	56

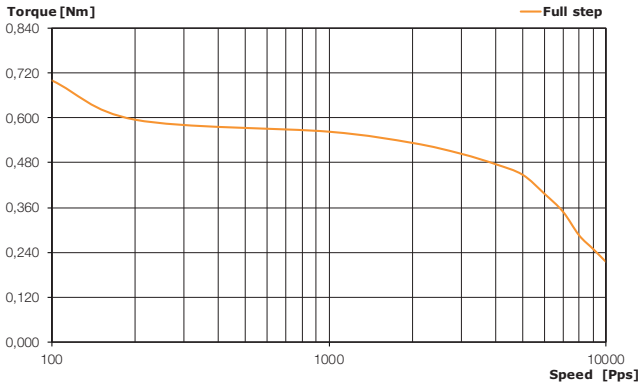
CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

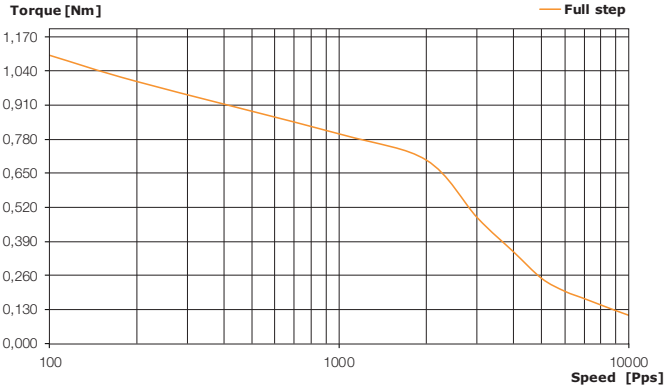
CONNECTION

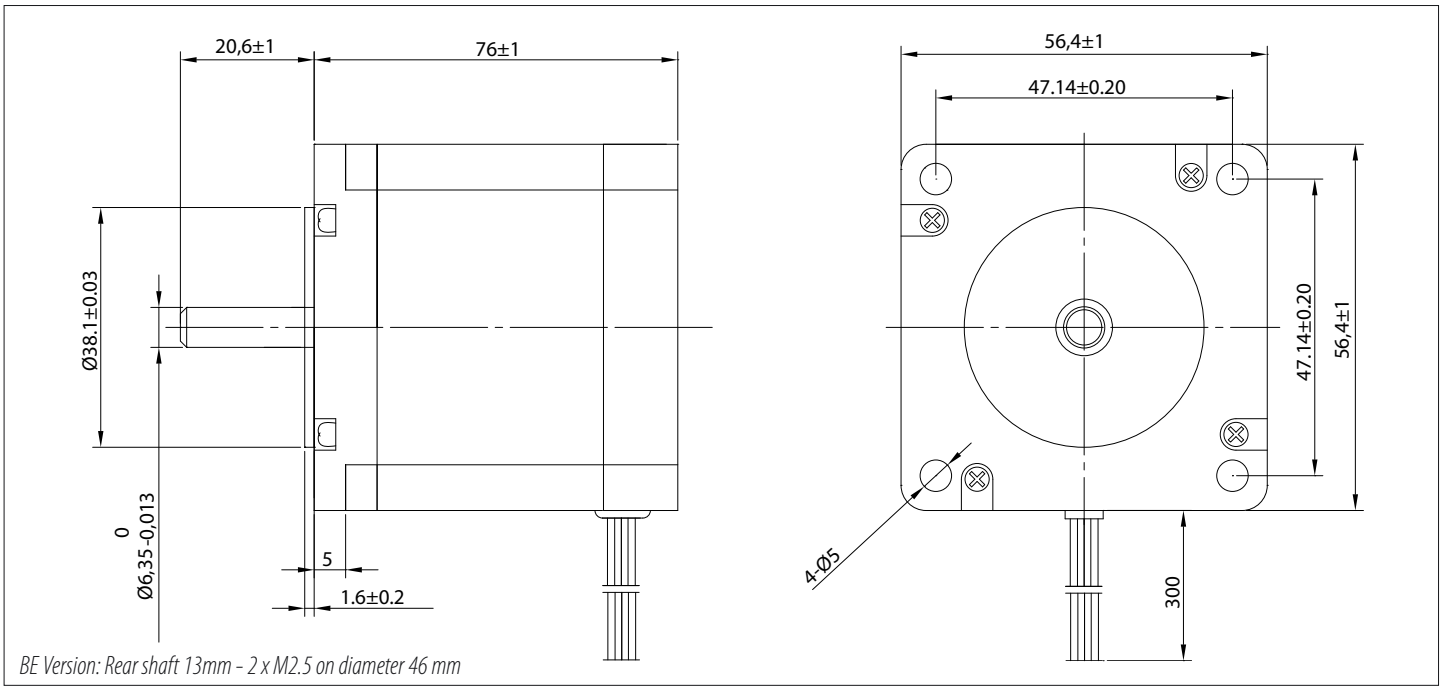
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57SH56-3AM VM: 30V; 3,0A /Phase Driver: SMD 103



57SH56-4AM VM: 30V; 2,8A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH76-1AM	57SH76-2AM
1	Rated Voltage	V	8,6	4,5
2	Current/Phase	A	1	2
3	Resistance/Phase	Ω	8,6	2,25
4	Inductance/Phase	mH	23	5,6
5	Holding Torque	Nm	1,35	1,35
6	Rotor Inertia	g-cm^2	480	480
7	Detent Torque	Kg-cm	0,68	0,68
8	Weight	Kg	1	1
9	Number of leads		6	6
10	Length	mm	76	76

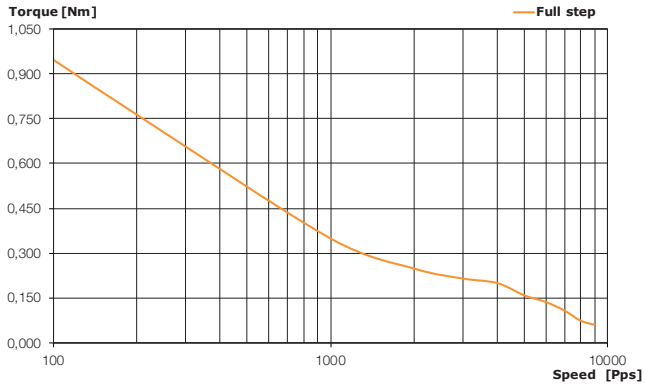
CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

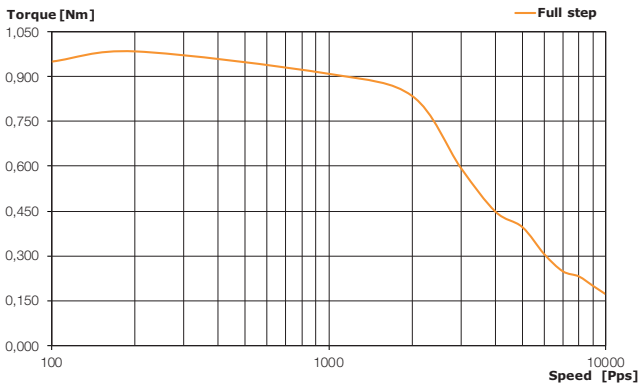
CONNECTION

Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57SH76-1AM VM: 30V; 1,0A /Phase Driver: SMD 103

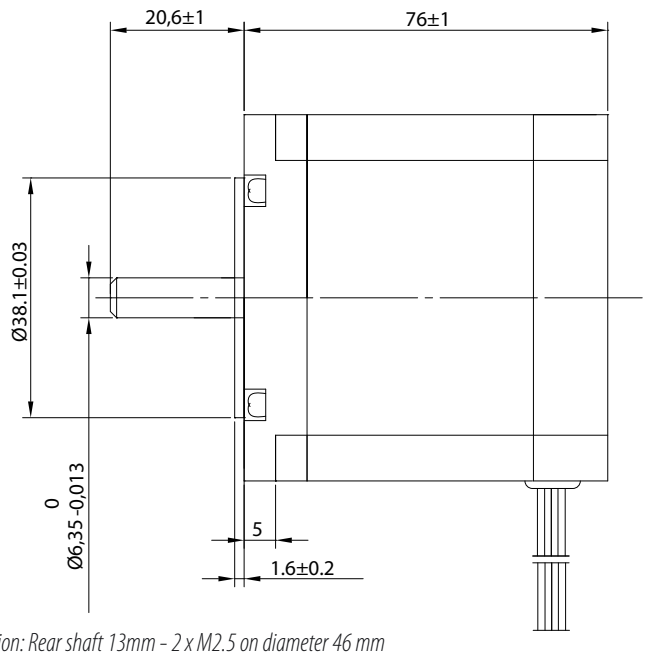


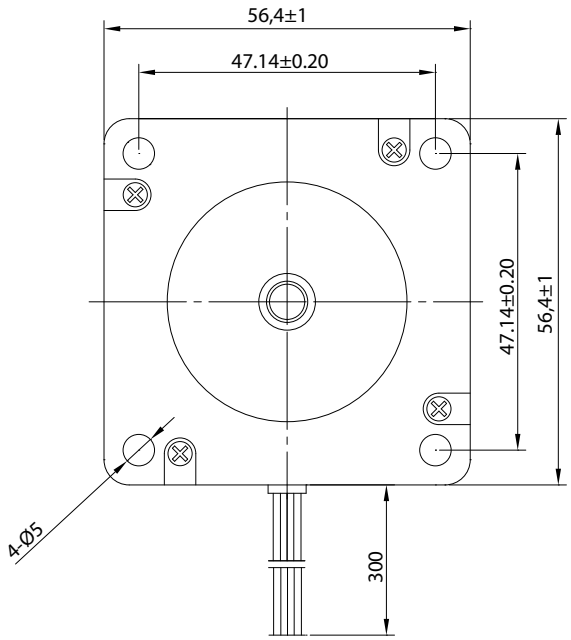
57SH76-2AM VM: 30V; 2,0A /Phase Driver: SMD 103



STEPPER MOTOR

Stepper Motor 57SH76M High Torque Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			57SH76-3AM	57SH76-4AM
1	Rated Voltage	V	3	3,2
2	Current/Phase	A	3	2,8
3	Resistance/Phase	Ω	1	1,13
4	Inductance/Phase	mH	2,6	5,6
5	Holding Torque	Nm	1,35	1,8
6	Rotor Inertia	g-cm^2	480	480
7	Detent Torque	Kg-cm	0,68	0,68
8	Weight	Kg	1	1
9	Number of leads		6	4
10	Length	mm	76	76

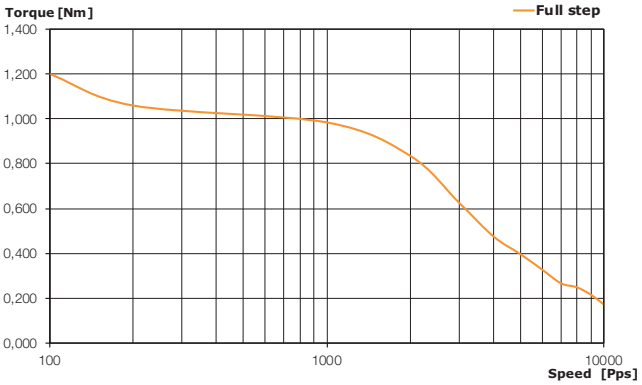
CHARACTERISTICS

Step Angle	0,9°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm)
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

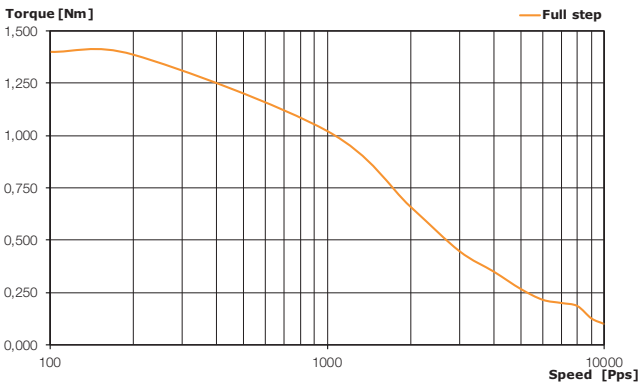
CONNECTION

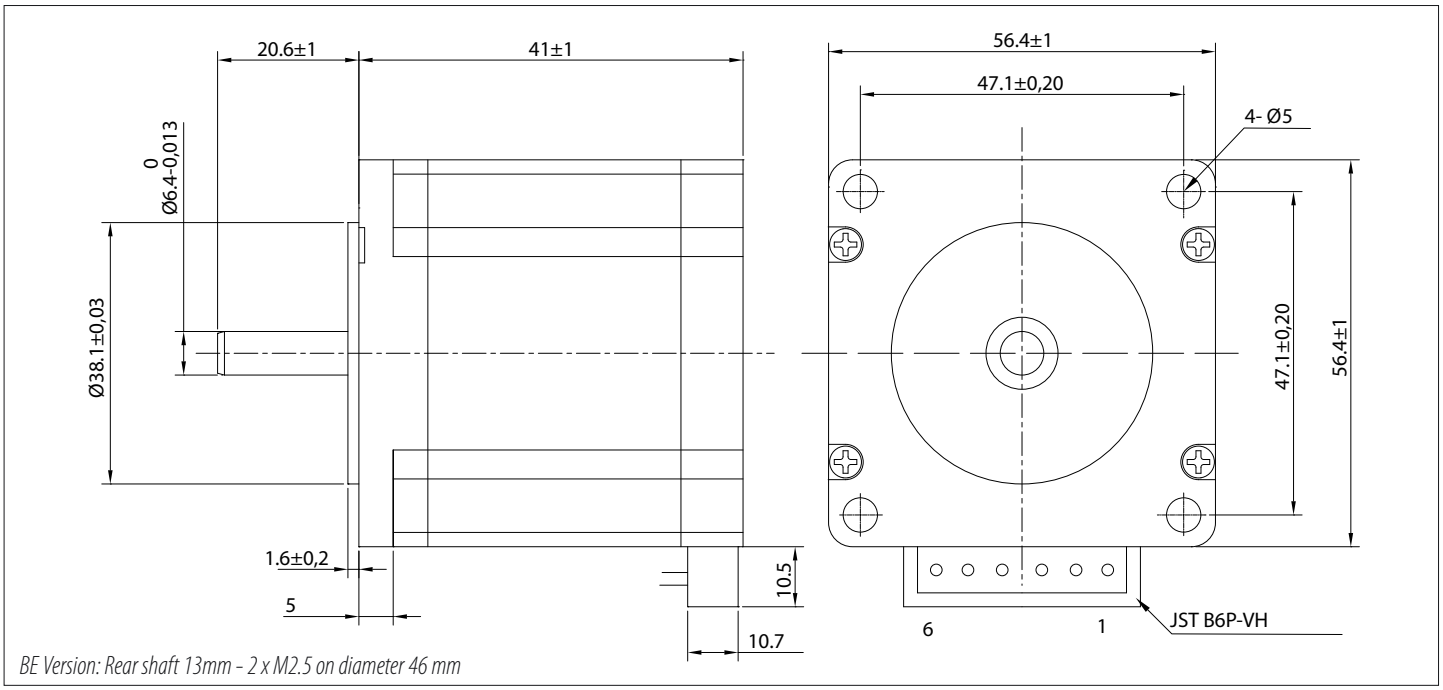
Lead N°	Color	Gauge	Function
1	Black	UL1061 AWG22	Phase A
2	Green	UL1061 AWG22	Phase A-
3	Red	UL1061 AWG22	Phase B
4	Blue	UL1061 AWG22	Phase B-
		UNIPOLAR MOTOR	
5	Yellow	UL1061 AWG22	Com Phase A
6	White	UL1061 AWG22	Com Phase B

57SH76-3AM VM: 30V; 3,0A /Phase Driver: SMD 103



57SH76-4AM VM: 30V; 2,8A /Phase Driver: SMD 103





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

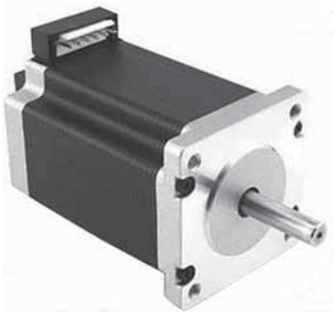
	Model		57STC41-2804AC	57STC41-4204AC
1	Rated Voltage	V	2,1	1,5
2	Current/Phase	A	2,8	4,2
3	Resistance/Phase	Ω	0,78	0,35
4	Inductance/Phase	mH	1,8	0,8
5	Holding Torque	Nm	0,6	0,6
6	Rotor Inertia	g-cm^2	120	120
7	Detent Torque	Kg-cm	0,21	0,21
8	Weight	Kg	0,45	0,45
9	Number of leads		4	4
10	Length	mm	41	41

CHARACTERISTICS

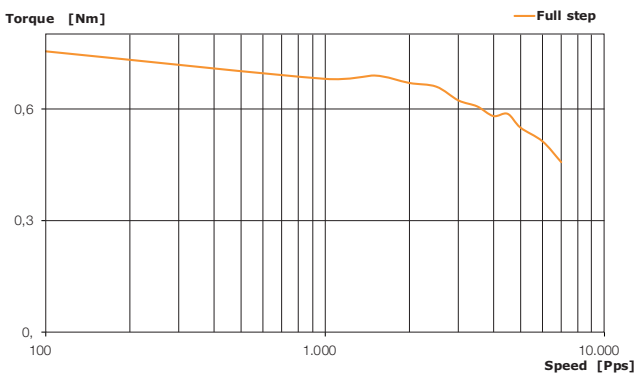
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	20 N
Max Axial Force	15 N

CONNECTION

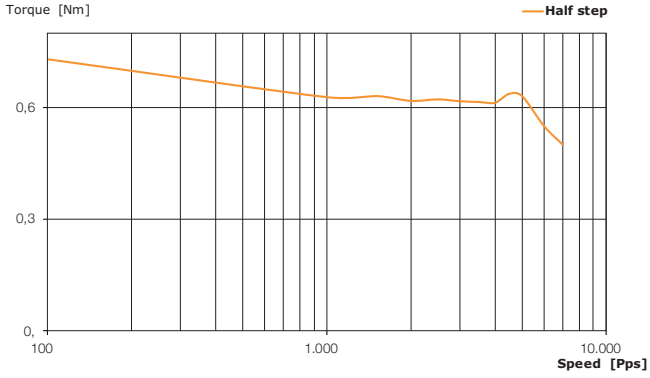
Lead N°	Color	Gauge	Function
1	Black	UL1430 AWG22	Phase A
2	Green	UL1430 AWG22	Phase A-
3	Red	UL1430 AWG22	Phase B
4	Blue	UL1430 AWG22	Phase B-



57STC41-2804AC VM: 24V; 2,8A /Phase Driver: SMD 103

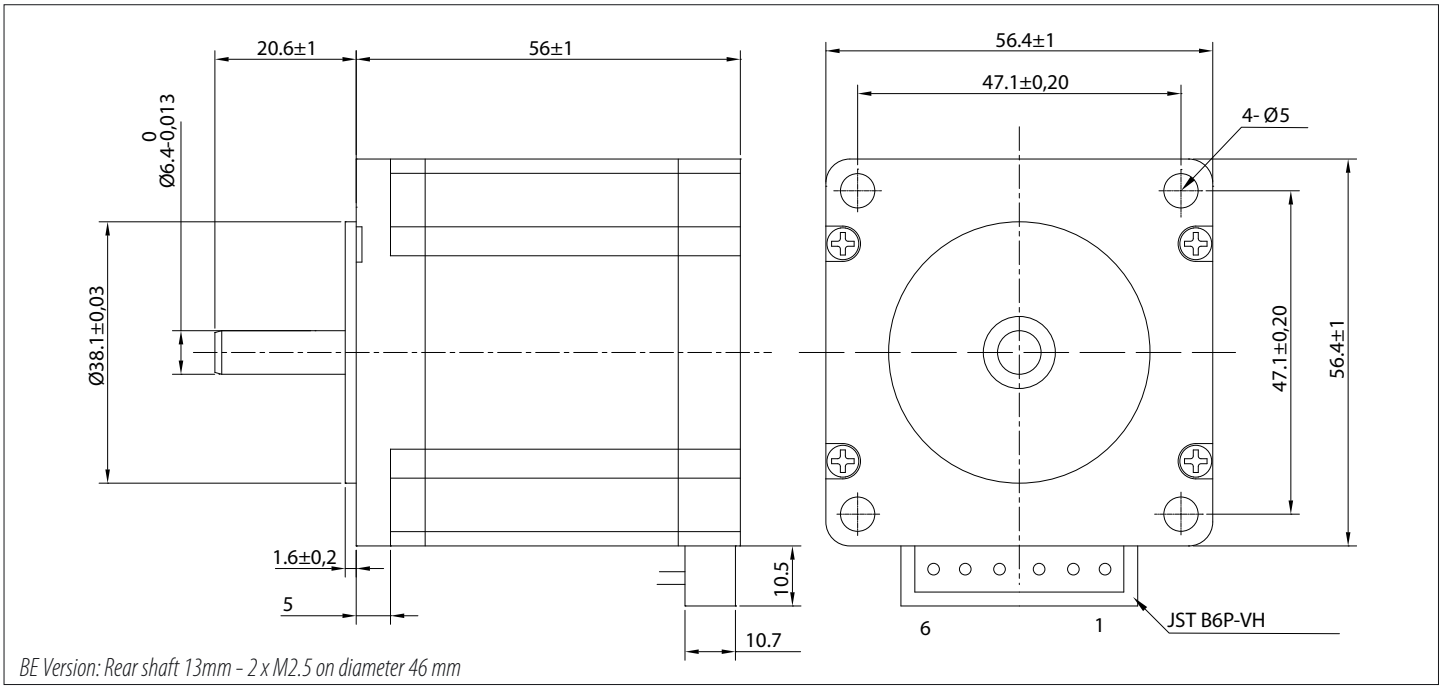


57STC41-4204AC VM: 24V; 4,2A /Phase Driver: SMD 103



STEPPER MOTOR

Stepper Motor 57STC56 Hyper Step



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

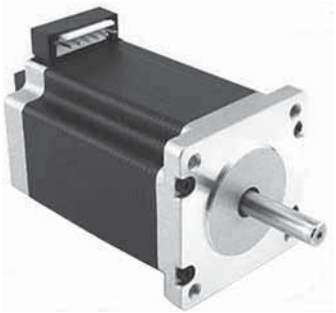
Model			57STC56-2804AC	57STC56-4204AC
1	Rated Voltage	V	2,8	2,1
2	Current/Phase	A	2,8	4,2
3	Resistance/Phase	Ω	1	0,5
4	Inductance/Phase	mH	3,2	1,6
5	Holding Torque	Nm	1,4	1,4
6	Rotor Inertia	g-cm^2	300	300
7	Detent Torque	Kg-cm	0,4	0,4
8	Weight	Kg	0,7	0,7
9	Number of leads		4	4
10	Length	mm	56	56

CHARACTERISTICS

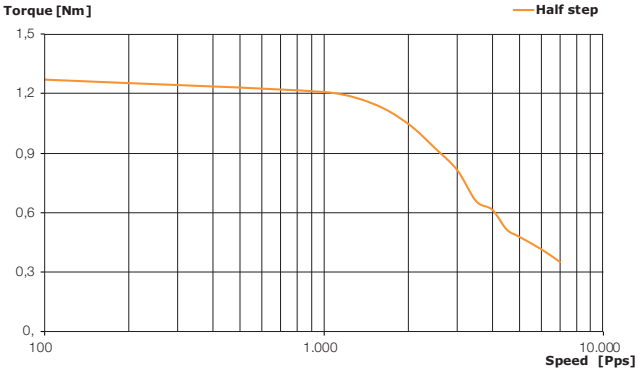
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	20 N
Max Axial Force	15 N

CONNECTION

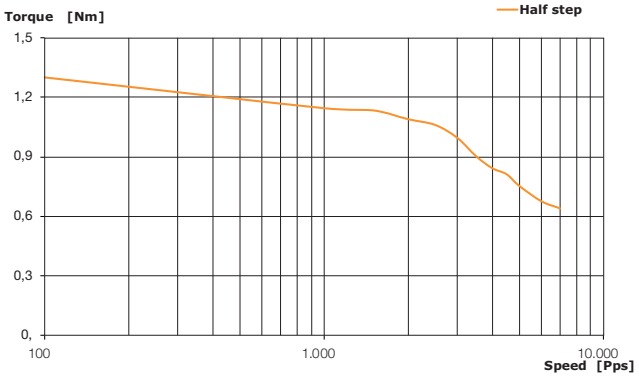
Lead N°	Color	Gauge	Function
1	Black	UL1430 AWG22	Phase A
2	Green	UL1430 AWG22	Phase A-
3	Red	UL1430 AWG22	Phase B
4	Blue	UL1430 AWG22	Phase B-



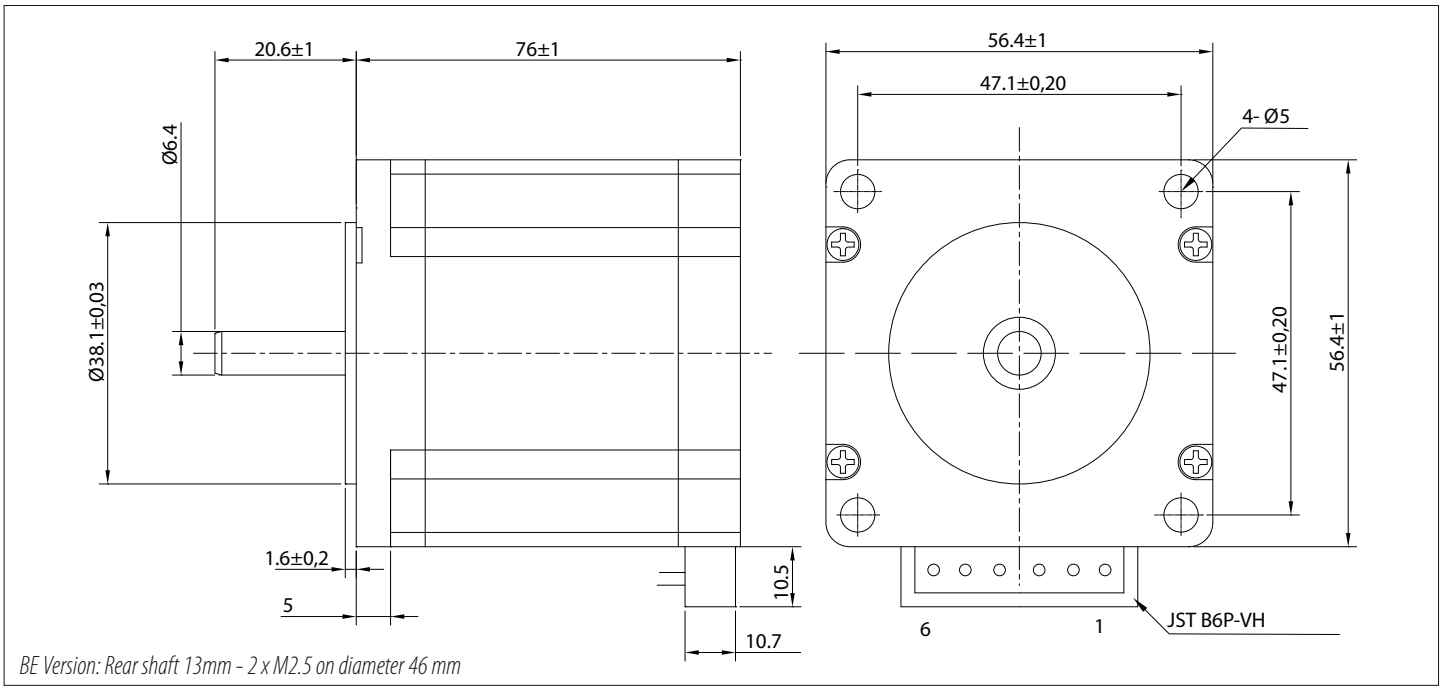
57STC56-2404AC VM: 24V; 2,4A /Phase Driver: SMD 103



57STC56-4204AC VM: 24V; 4,2A /Phase Driver: SMD 103



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

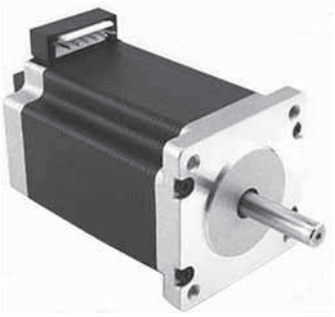
Model			57STC76-2804AC	57STC76-4204AC
1	Rated Voltage	V	3,6	2,3
2	Current/Phase	A	2,8	4,2
3	Resistance/Phase	Ω	1,3	0,55
4	Inductance/Phase	mH	5,3	2,1
5	Holding Torque	Nm	2,3	2,3
6	Rotor Inertia	g-cm^2	480	480
7	Detent Torque	Kg-cm	0,68	0,68
8	Weight	Kg	1,2	1,2
9	Number of leads		4	4
10	Length	mm	76	76

CHARACTERISTICS

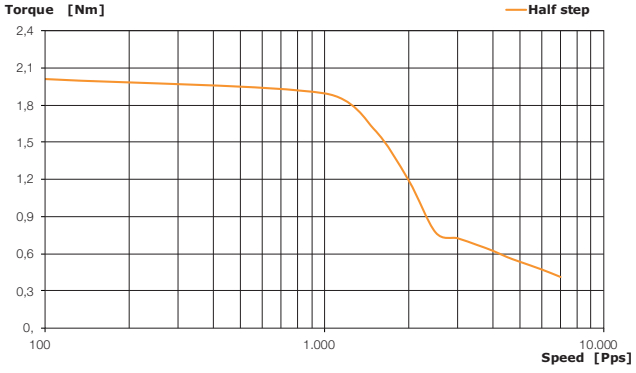
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	20 N
Max Axial Force	15 N

CONNECTION

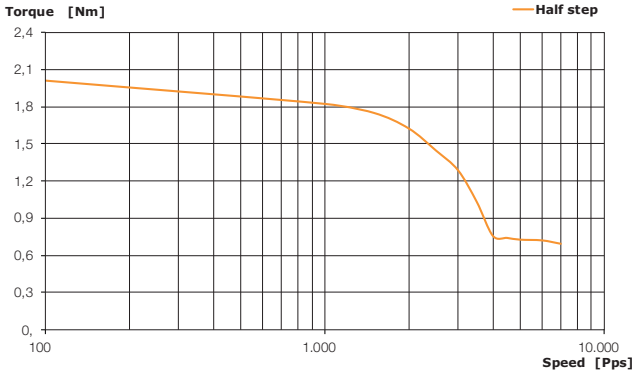
Lead N°	Color	Gauge	Function
1	Black	UL1430 AWG22	Phase A
2	Green	UL1430 AWG22	Phase A-
3	Red	UL1430 AWG22	Phase B
4	Blue	UL1430 AWG22	Phase B-



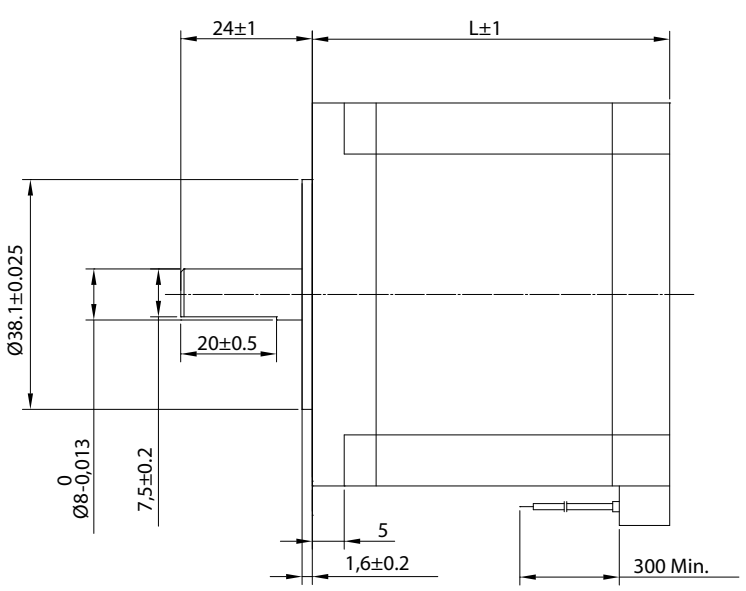
57STC76-2404AC VM: 24V; 2,4A /Phase Driver: SMD 103

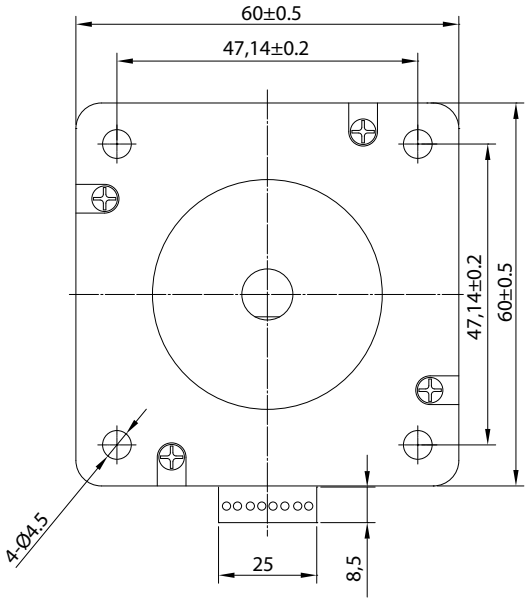


57STC76-4204AC VM: 24V; 4,2A /Phase Driver: SMD 103



Stepper Motor 60SH High Torque Hybrid





BE version: rear shaft 13mm- 2x M2.5 on diam. 46 mm

SPECIFICATION

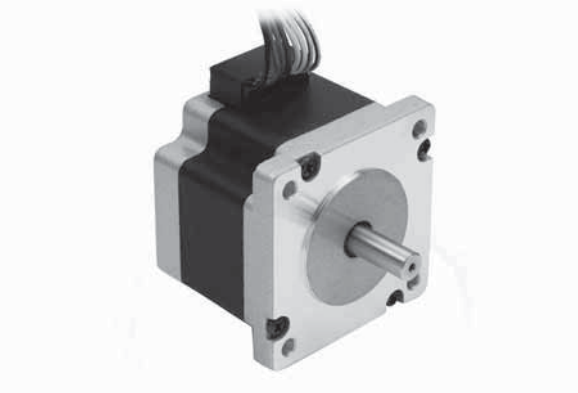
Model			60SH45-2008AF			60SH56-2008AF		
			UNIPOLAR	PARALLEL	SERIES	UNIPOLAR	PARALLEL	SERIES
1	Rated Voltage	V	3	2,1	4,2	3,6	2,52	5,04
2	Current/Phase	A	2	2,8	1,4	2	2,8	1,4
3	Resistance/Phase	Ω	1,5	0,75	3	1,8	0,9	3,6
4	Inductance/Phase	mH	2	2	8	3,6	3,6	14,4
5	Holding Torque	Nm	0,78	1,1	1,1	1,17	1,65	1,65
6	Rotor Inertia	g-cm^2		275			400	
7	Detent Torque	Kg-cm		0,5			0,7	
8	Weight	Kg		0,6			0,77	
9	Number of leads			8			8	
10	Length	mm		45			56	

CHARACTERISTICS

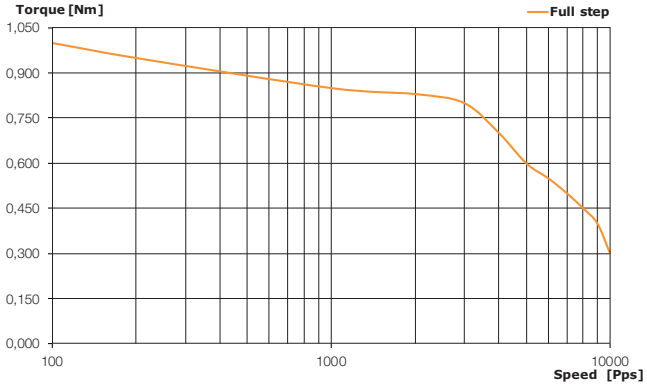
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

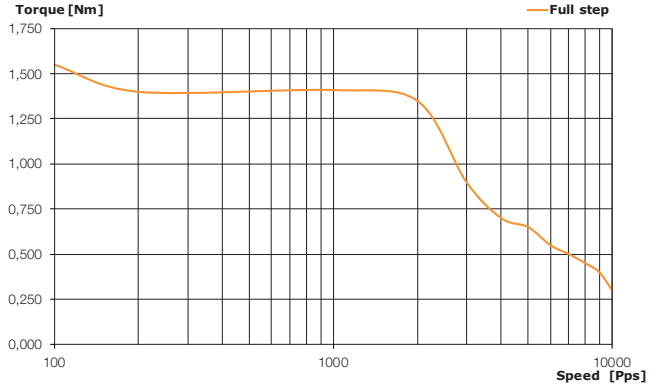
Pin N°	Color	Gauge	Function
1	Blue/White	UL1061 AWG22	Phase A
2	Blue	UL1061 AWG22	Phase A-
3	Red/White	UL1061 AWG22	Phase C-
4	Red	UL1061 AWG22	Phase C
5	Green/White	UL1061 AWG22	Phase B
6	Green	UL1061 AWG22	Phase B-
7	Black/White	UL1061 AWG22	Phase D-
8	Black	UL1061 AWG22	Phase D

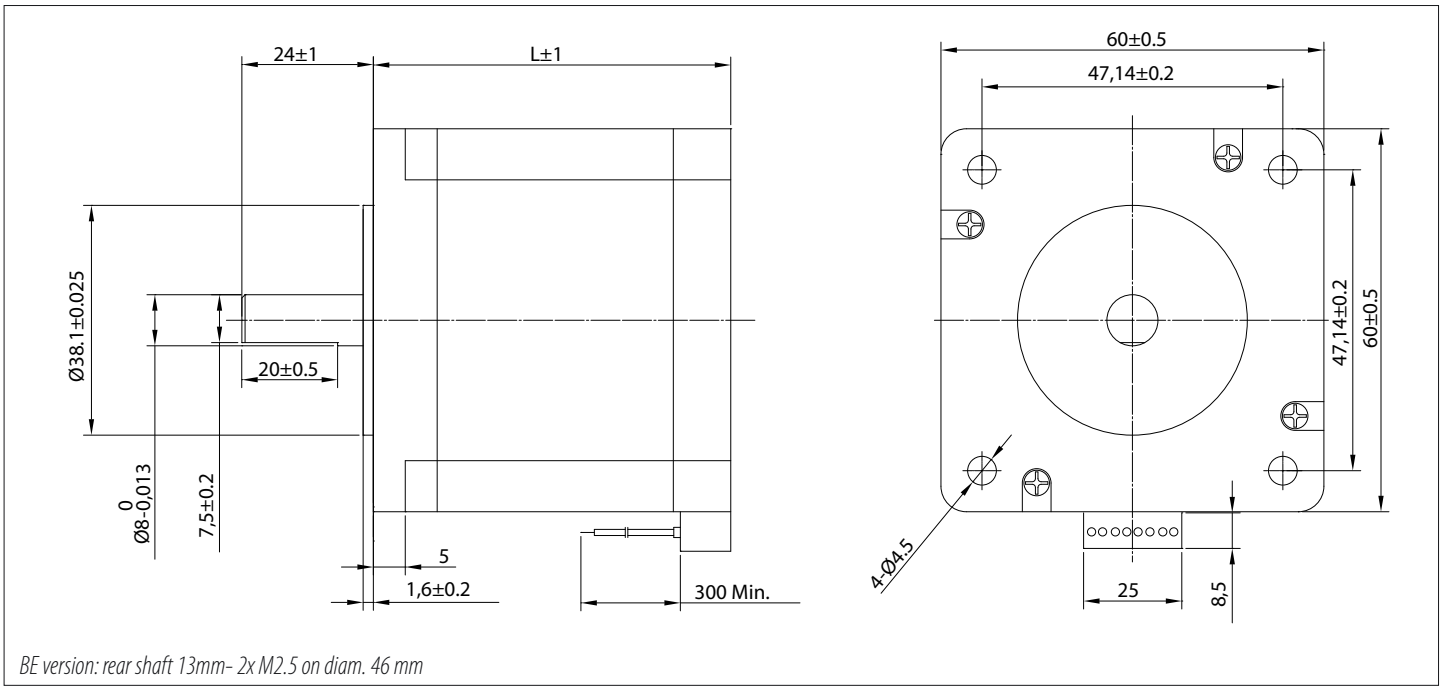


60SH45-2008A Bipolar parallel VM: 30V; 3,0A /Phase Driver: SMD 506



60SH56-2008A Bipolar parallel VM: 30V; 3,0A /Phase Driver: SMD 506





BE version: rear shaft 13mm- 2x M2.5 on diam. 46 mm

SPECIFICATION

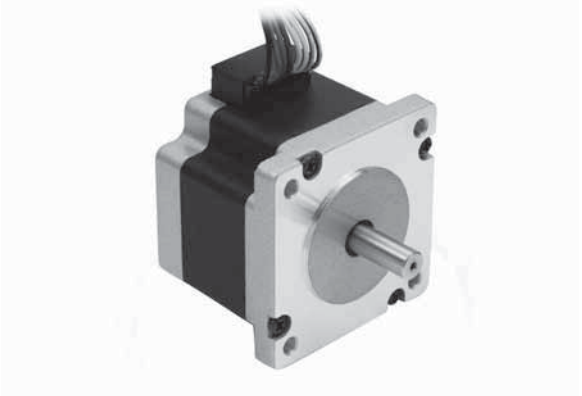
Model			60SH65-2008AF			60SH86-2008AF		
			UNIPOLAR	PARALLEL	SERIES	UNIPOLAR	PARALLEL	SERIES
1	Rated Voltage	V	4,8	3,36	6,72	6	4,17	8,4
2	Current/Phase	A	2	2,8	1,4	2	2,8	1,4
3	Resistance/Phase	Ω	2,4	1,2	4,8	3	1,5	6
4	Inductance/Phase	mH	4,6	4,6	18,4	6,8	6,8	27,2
5	Holding Torque	Nm	1,5	2,1	2,1	2,2	3,1	3,1
6	Rotor Inertia	g-cm^2		570			840	
7	Detent Torque	Kg-cm		0,9			1	
8	Weight	Kg		1,2			1,4	
9	Number of leads			8			8	
10	Length	mm		65			86	

CHARACTERISTICS

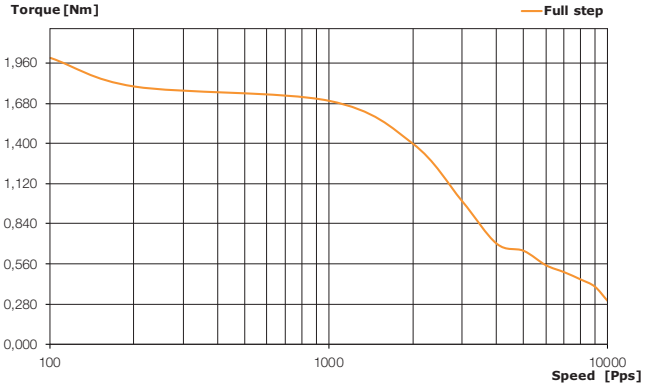
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

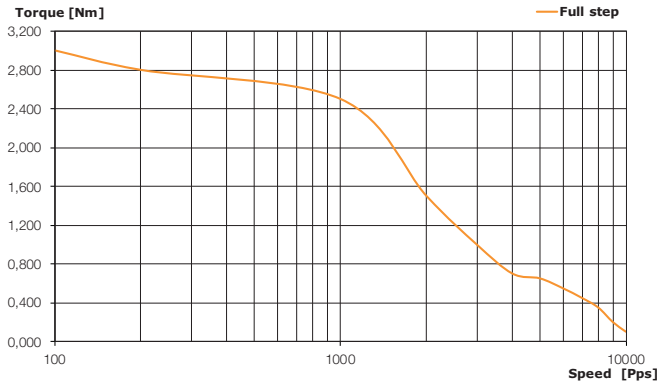
Pin N°	Color	Gauge	Function
1	Blue/White	UL1061 AWG22	Phase A
2	Blue	UL1061 AWG22	Phase A-
3	Red/White	UL1061 AWG22	Phase C-
4	Red	UL1061 AWG22	Phase C
5	Green/White	UL1061 AWG22	Phase B
6	Green	UL1061 AWG22	Phase B-
7	Black/White	UL1061 AWG22	Phase D-
8	Black	UL1061 AWG22	Phase D



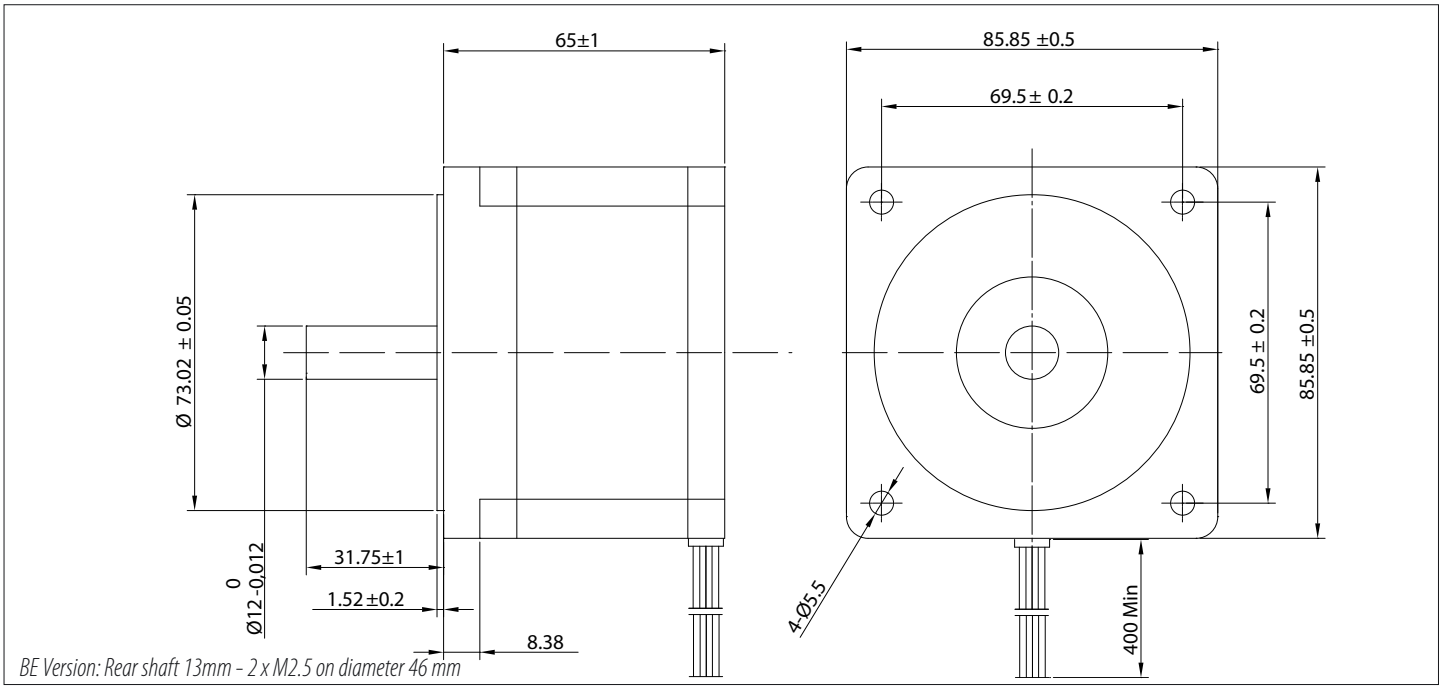
60SH65-2008A Bipolar parallel VM: 30V; 3,0A /Phase Driver: SMD 506



60SH86-2008A Bipolar parallel VM: 30V; 3,0A /Phase Driver: SMD 506



Stepper Motor 86SH65 High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			86SH65-4208A		
			UNIPOLAR	PARALLEL	SERIES
1	Rated Voltage	V	2,39	1,65	3,42
2	Current/Phase	A	4,2	5,9	3
3	Resistance/Phase	Ω	0,57	0,28	1,14
4	Inductance/Phase	mH	1,7	1,7	6,8
5	Holding Torque	Nm	2,6	3,4	3,4
6	Rotor Inertia	g-cm^2		1000	
7	Weight	Kg		1,7	
8	Number of leads			8	
9	Length	mm		65	

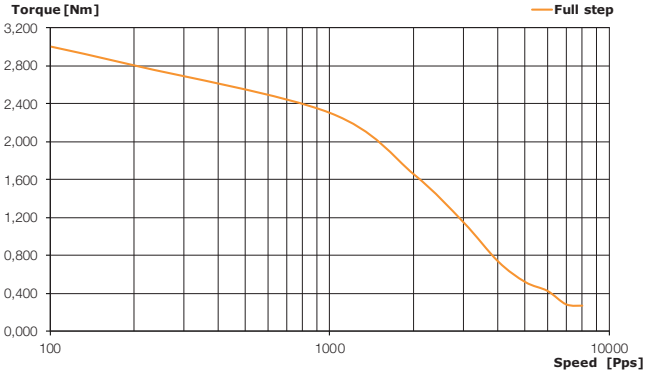
CHARACTERISTICS

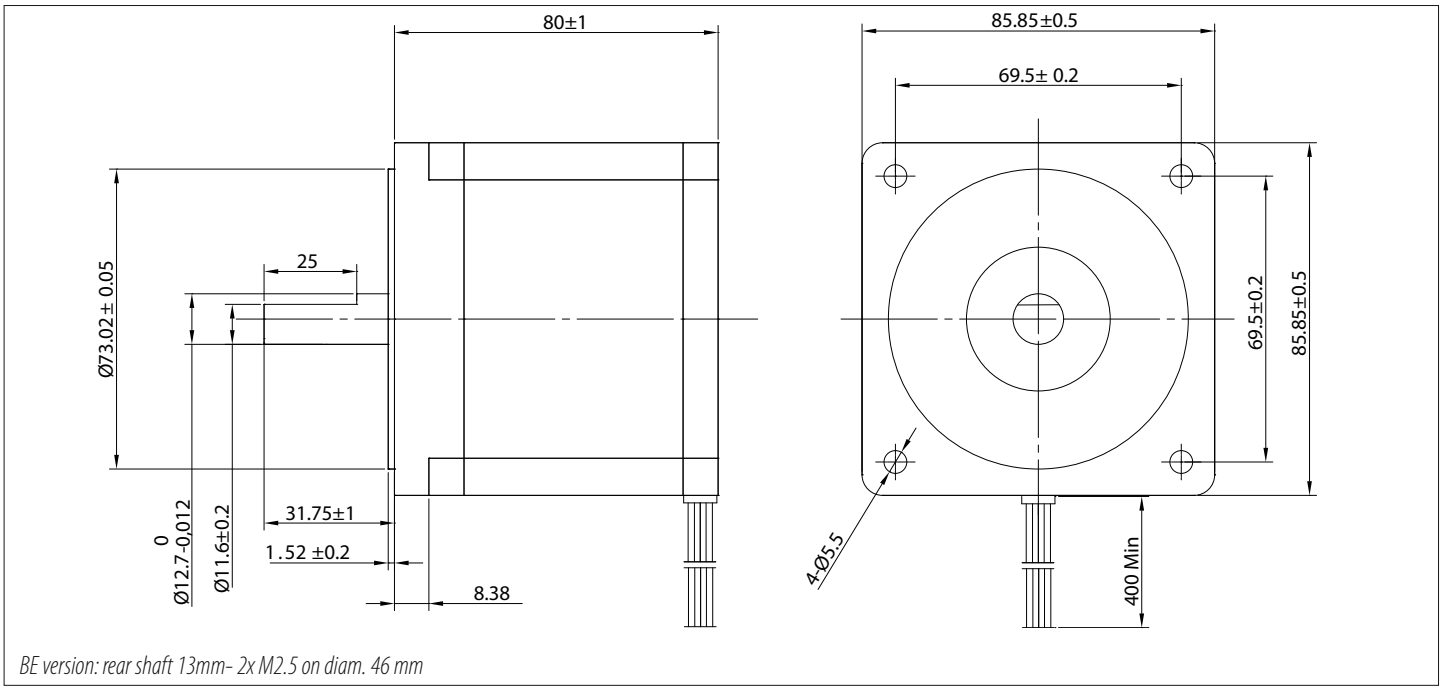
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	750 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220 N
Max Axial Force	60 N

CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG20	Phase A
2	Yellow	UL1061 AWG20	Phase A-
3	Blue	UL1061 AWG20	Phase C-
4	Black	UL1061 AWG20	Phase C
5	White	UL1061 AWG20	Phase B
6	Orange	UL1061 AWG20	Phase B-
7	Brown	UL1061 AWG20	Phase D-
8	Green	UL1061 AWG20	Phase D

86SH65-4208A Bipolar parallel VM: 48V; 6,0A /Phase Driver: SMD 506





BE version: rear shaft 13mm- 2x M2.5 on diam. 46 mm

SPECIFICATION

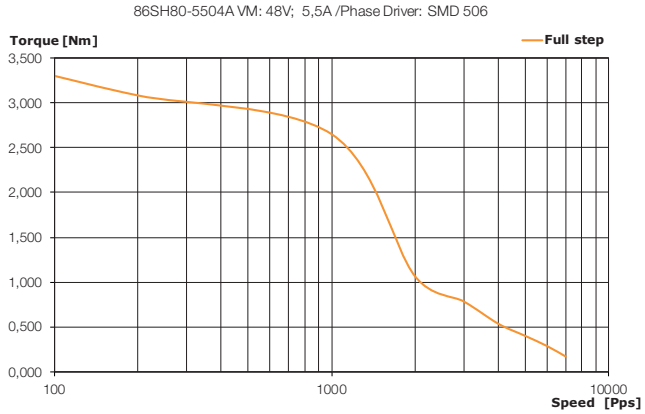
Model		86SH80-5504A
1 Rated Voltage	V	2,3
2 Current/Phase	A	5,5
3 Resistance/Phase	Ω	0,42
4 Inductance/Phase	mH	3,5
5 Holding Torque	Nm	4,6
6 Rotor Inertia	g-cm^2	1400
7 Detent Torque	Kg-cm	1,2
8 Weight	Kg	2,3
9 Number of leads		4
10 Length	mm	80

CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	750 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220 N
Max Axial Force	60 N

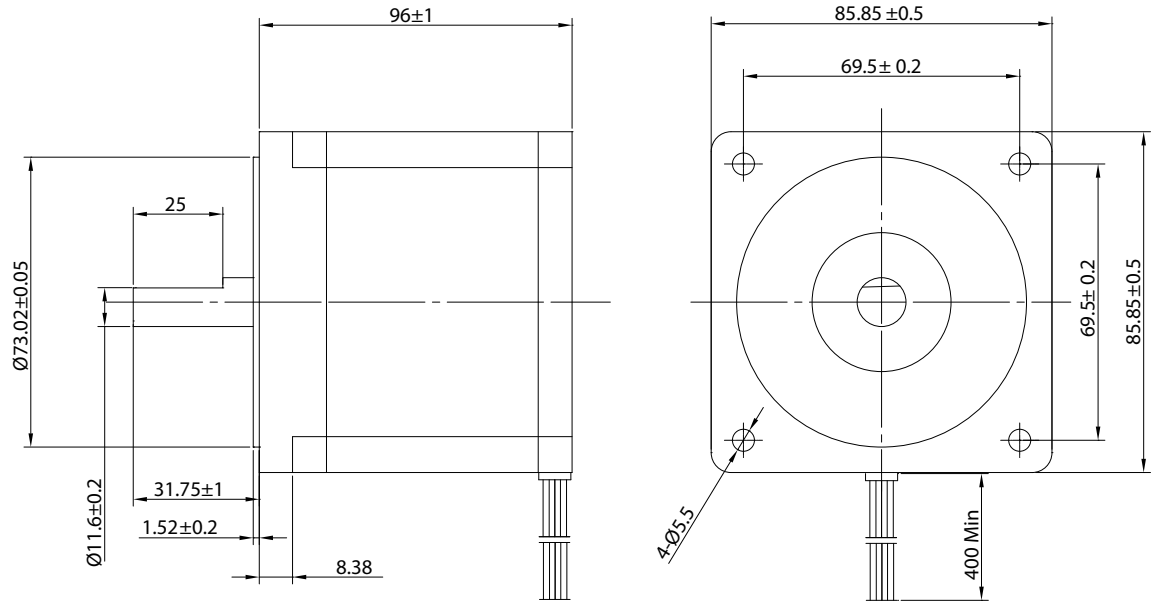
CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG20	Phase A
2	White	UL1061 AWG20	Phase A-
3	Yellow	UL1061 AWG20	Phase B
4	Green	UL1061 AWG20	Phase B-



STEPPER MOTOR

Stepper Motor 86SH96 High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model		86SH96-5504A
1 Rated Voltage	V	2,56
2 Current/Phase	A	5,5
3 Resistance/Phase	Ω	0,465
4 Inductance/Phase	mH	4,5
5 Holding Torque	Nm	7
6 Rotor Inertia	g-cm^2	2700
7 Detent Torque	Kg-cm	1,2
8 Weight	Kg	2,8
9 Number of leads		4
10 Length	mm	96

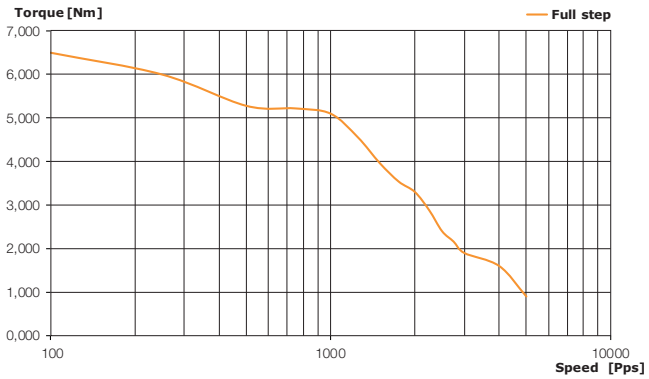
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	750 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220 N
Max Axial Force	60 N

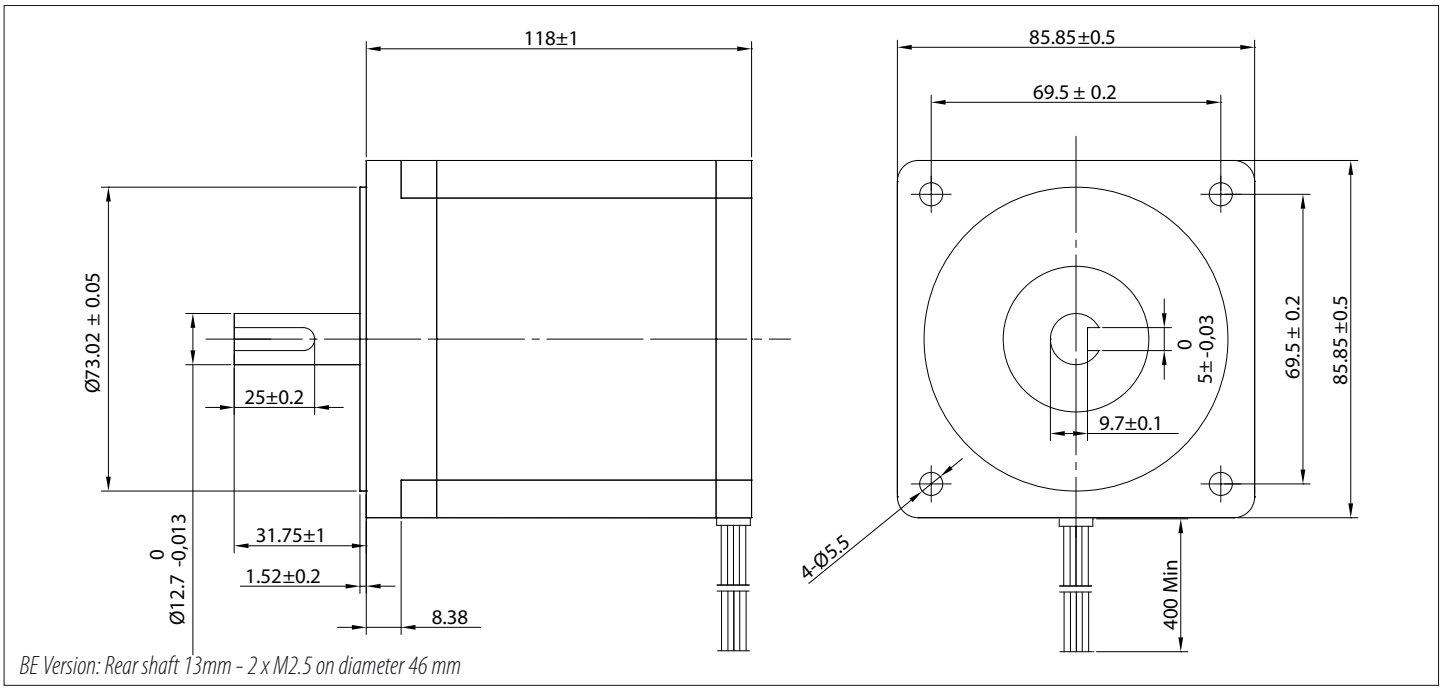
CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG20	Phase A
2	White	UL1061 AWG20	Phase A-
3	Yellow	UL1061 AWG20	Phase B
4	Green	UL1061 AWG20	Phase B-

86SH96-5504A VM: 48V; 5,5A /Phase Driver: SMD 506



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model		86SH118-6004A
1 Rated Voltage	V	2,7
2 Current/Phase	A	6
3 Resistance/Phase	Ω	0,45
4 Inductance/Phase	mH	5,1
5 Holding Torque	Nm	8,7
6 Rotor Inertia	g-cm^2	2700
7 Detent Torque	Kg-cm	2,4
8 Weight	Kg	3,8
9 Number of leads		4
10 Length	mm	118

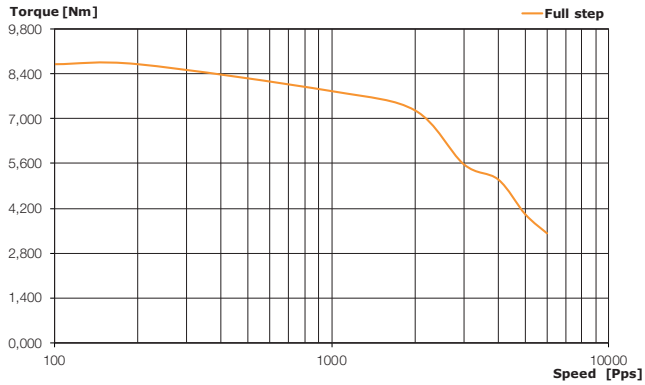
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	750 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220 N
Max Axial Force	60 N

CONNECTION

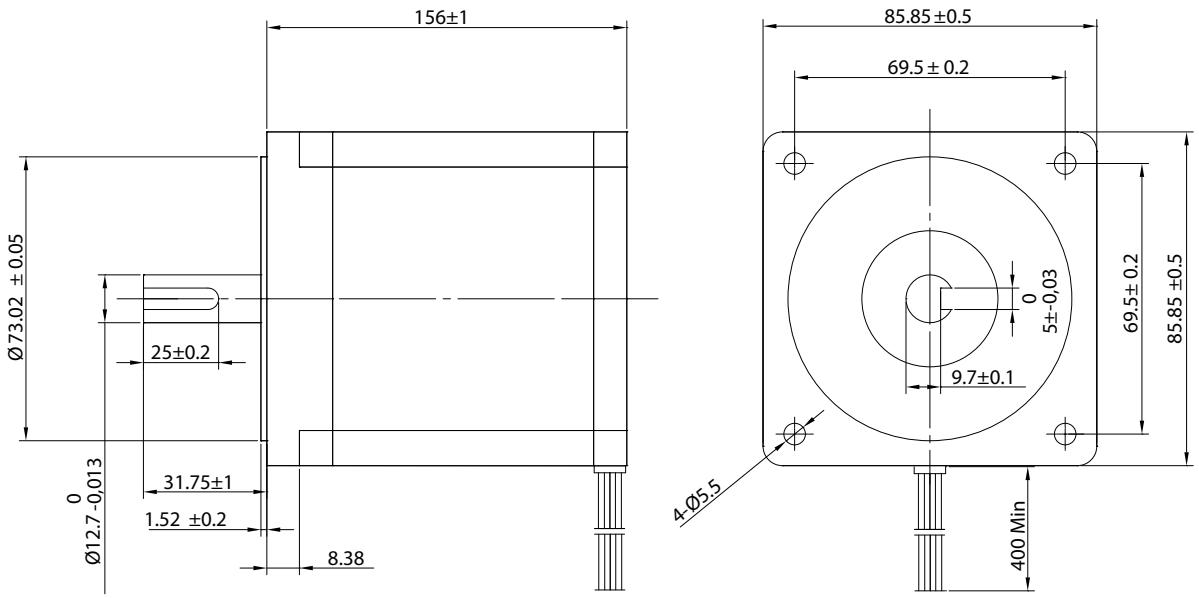
Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG20	Phase A
2	White	UL1061 AWG20	Phase A-
3	Yellow	UL1061 AWG20	Phase B
4	Green	UL1061 AWG20	Phase B-

86SH118-6004A VM: 100VAC; 6,0A /Phase Driver: SMD 506



STEPPER MOTOR

Stepper Motor 86SH156 High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model		86SH156-6204A
1 Rated Voltage	V	4,5
2 Current/Phase	A	6,2
3 Resistance/Phase	Ω	0,72
4 Inductance/Phase	mH	9
5 Holding Torque	Nm	12,1
6 Rotor Inertia	g-cm^2	4000
7 Detent Torque	Kg-cm	3,6
8 Weight	Kg	5,4
9 Number of leads		4
10 Length	mm	156

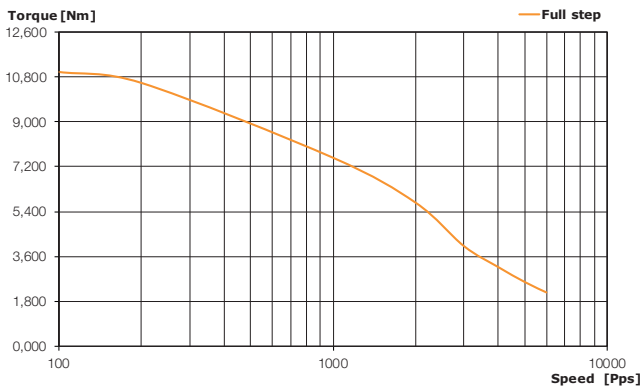
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	750 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220 N
Max Axial Force	60 N

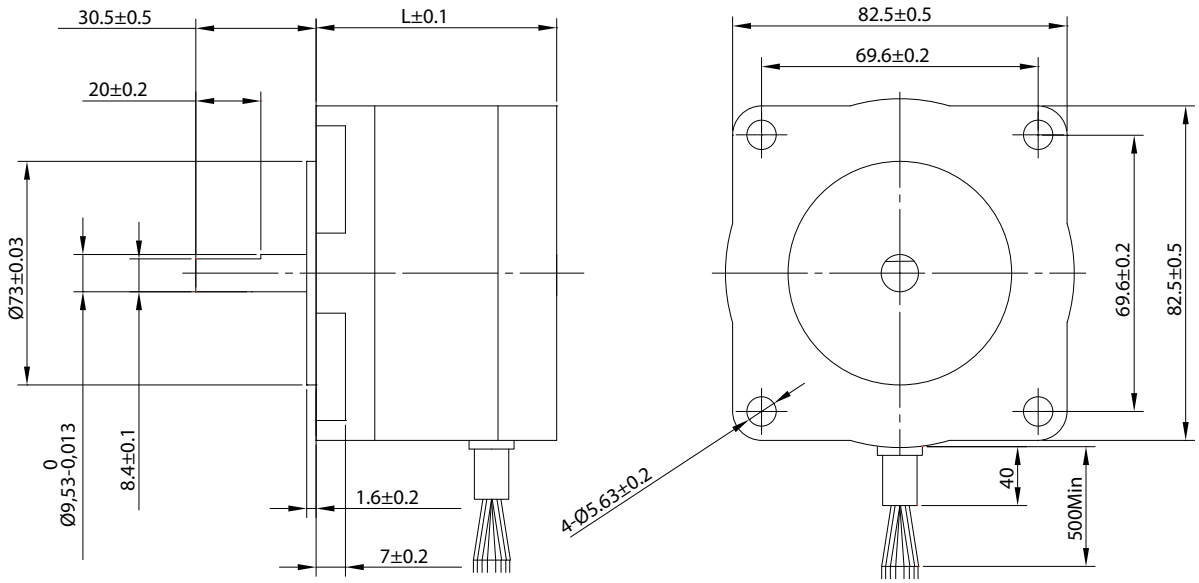
CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG20	Phase A
2	White	UL1061 AWG20	Phase A-
3	Yellow	UL1061 AWG20	Phase B
4	Green	UL1061 AWG20	Phase B-

86SH156-6204A VM: 100VAC; 6,0A /Phase Driver: SMD 506



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			86S67-2808A			86S94-2808A		
			UNIPOLAR	PARALLEL	SERIES	UNIPOLAR	PARALLEL	SERIES
1	Rated Voltage	V	3,64	2,54	5	4,76	2,54	6,6
2	Current/Phase	A	2,8	3,92	1,96	2,8	3,92	1,96
3	Resistance/Phase	Ω	1,3	0,65	2,6	1,7	0,85	3,4
4	Inductance/Phase	mH	5,1	5,1	20,4	7,7	7,7	30,8
5	Holding Torque	Nm	2,3	2,8	2,8	3,8	4,8	4,8
6	Rotor Inertia	g-cm^2		660			1200	
7	Detent Torque	Kg-cm		0,85			1,3	
8	Weight	Kg		1,6			2,4	
9	Number of leads			8			8	
10	Length	mm		67			94	

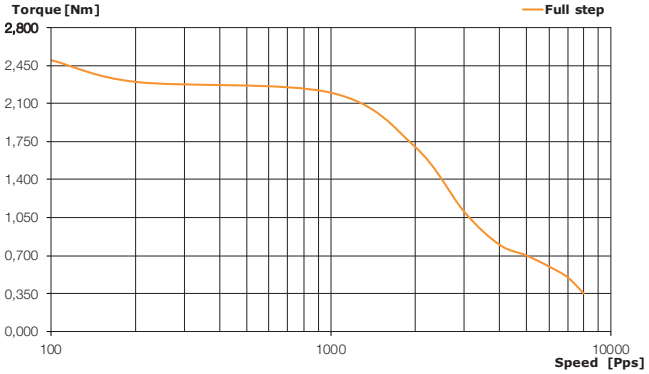
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 MMohm min. 500 VDC
Dielectric Strength	750 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220 N
Max Axial Force	60 N

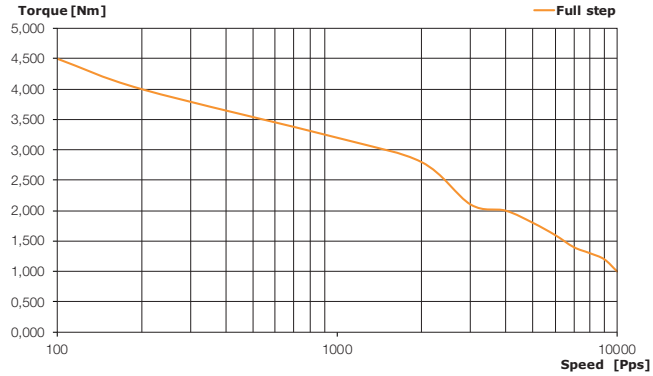
CONNECTION

Pin N°	Color	Gauge	Function
1	Orange	UL3266 AWG20	Phase A
2	Orange/White	UL3266 AWG20	Phase A-
3	Black/White	UL3266 AWG20	Phase C-
4	Black	UL3266 AWG20	Phase C
5	Red	UL3266 AWG20	Phase B
6	Red/White	UL3266 AWG20	Phase B-
7	Yellow/White	UL3266 AWG20	Phase D-
8	Yellow	UL3266 AWG20	Phase D

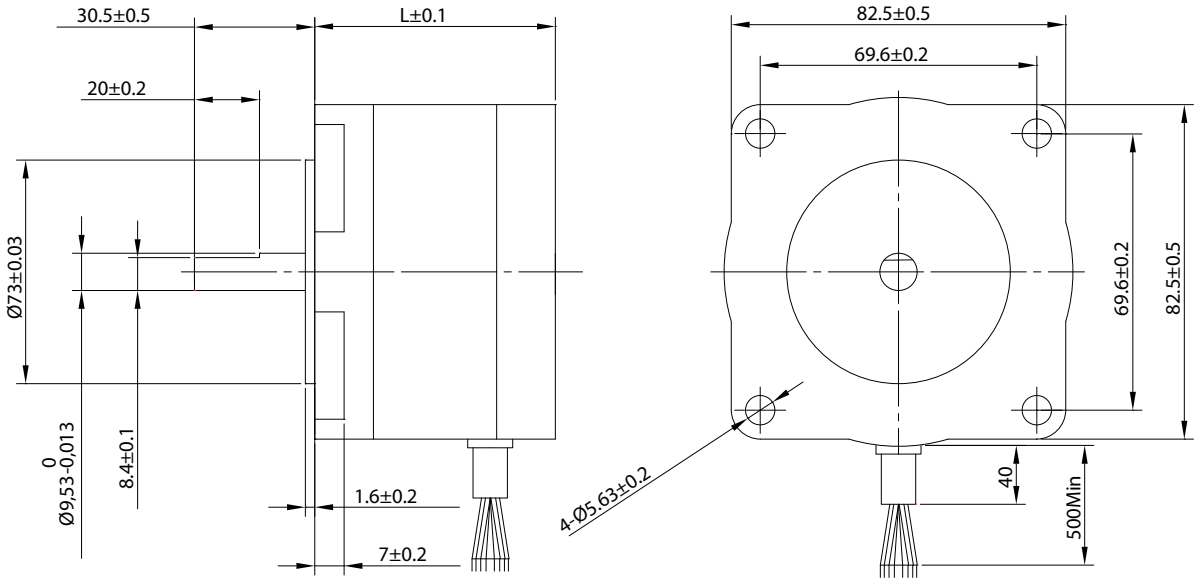
86S67-2808A Bipolar parallel VM: 60V; 4,0A /Phase Driver: SMD 506



86S94-2808A Bipolar parallel VM: 60V; 4,0A /Phase Driver: SMD 506



Stepper Motor 86S High Torque Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model			86S125-3508A		
			UNIPOLAR	PARALLEL	SERIES
1	Rated Voltage	V	4,97	3,47	6,95
2	Current/Phase	A	3,5	4,9	2,45
3	Resistance/Phase	Ω	1,42	0,71	2,84
4	Inductance/Phase	mH	7,9	7,9	31,6
5	Holding Torque	Nm	6,2	7,6	7,6
6	Rotor Inertia	g-cm^2		1800	
7	Detent Torque	Kg-cm		2,3	
8	Weight	Kg		3,6	
9	Number of leads			8	
10	Length	mm		125	

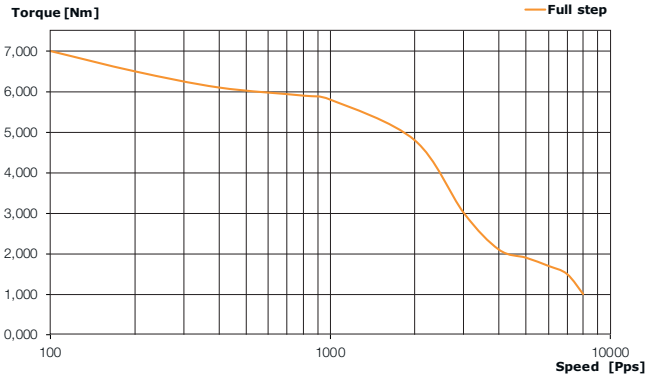
CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	750 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220 N
Max Axial Force	60 N

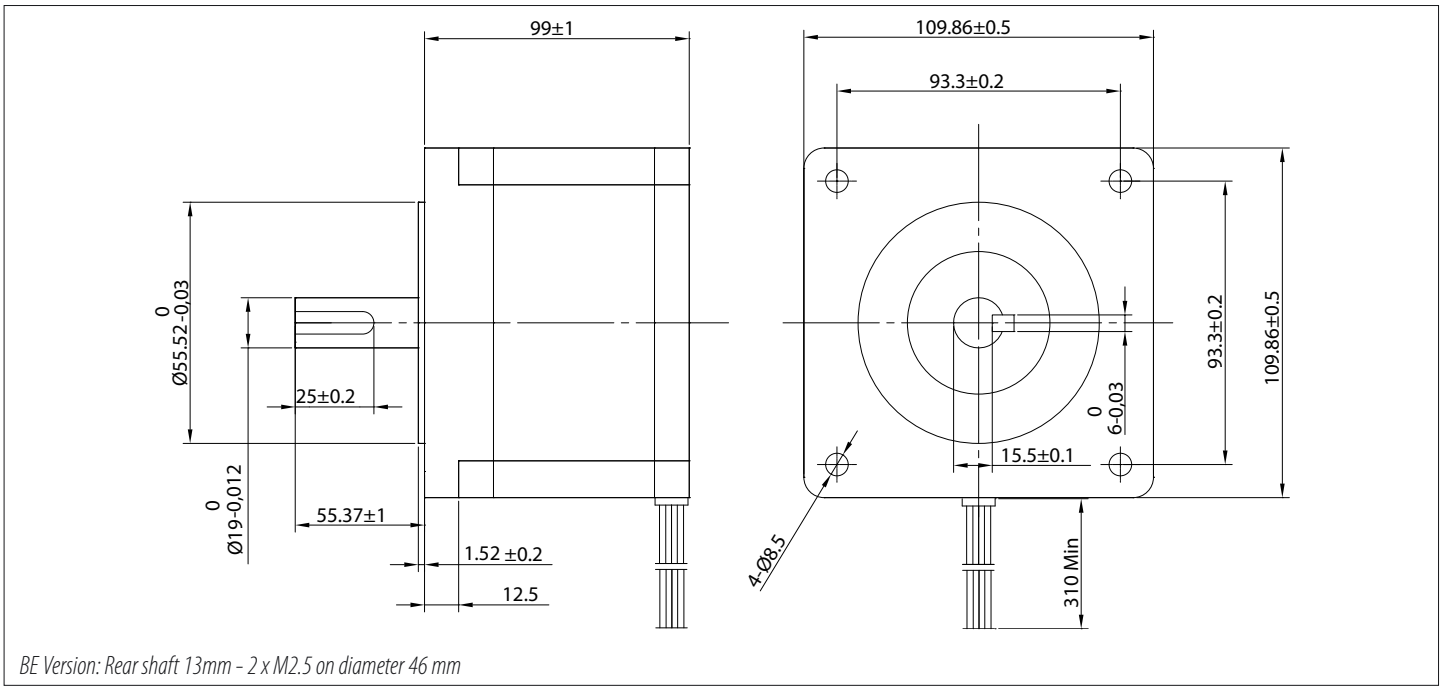
CONNECTION

Pin N°	Color	Gauge	Function
1	Orange	UL3266 AWG20	Phase A
2	Orange/White	UL3266 AWG20	Phase A-
3	Black/White	UL3266 AWG20	Phase C-
4	Black	UL3266 AWG20	Phase C
5	Red	UL3266 AWG20	Phase B
6	Red/White	UL3266 AWG20	Phase B-
7	Yellow/White	UL3266 AWG20	Phase D-
8	Yellow	UL3266 AWG20	Phase D

86S125-3508A Bipolar parallel VM: 120V; 5,0A /Phase Driver: SMD 506



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

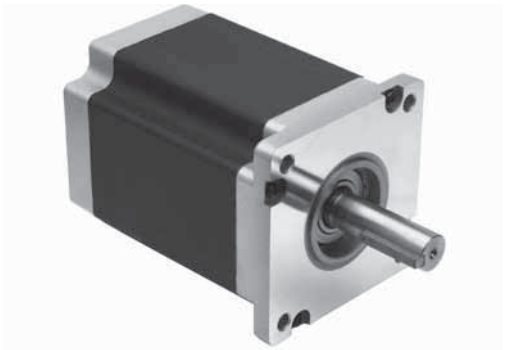
Model		110SH99-5504A
1 Rated Voltage	V	4,95
2 Current/Phase	A	5,5
3 Resistance/Phase	Ω	0,7
4 Inductance/Phase	mH	9,8
5 Holding Torque	Nm	11,2
6 Rotor Inertia	g-cm^2	5500
7 Detent Torque	Kg-cm	3
8 Weight	Kg	5
9 Number of leads		4
10 Length	mm	99

CHARACTERISTICS

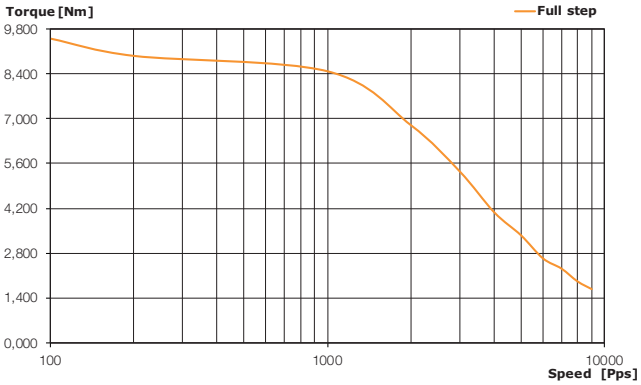
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	1500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	330 N
Max Axial Force	100 N

CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1430 AWG18	Phase A
2	White	UL1430 AWG18	Phase A-
3	Yellow	UL1430 AWG18	Phase B
4	Green	UL1430 AWG18	Phase B-

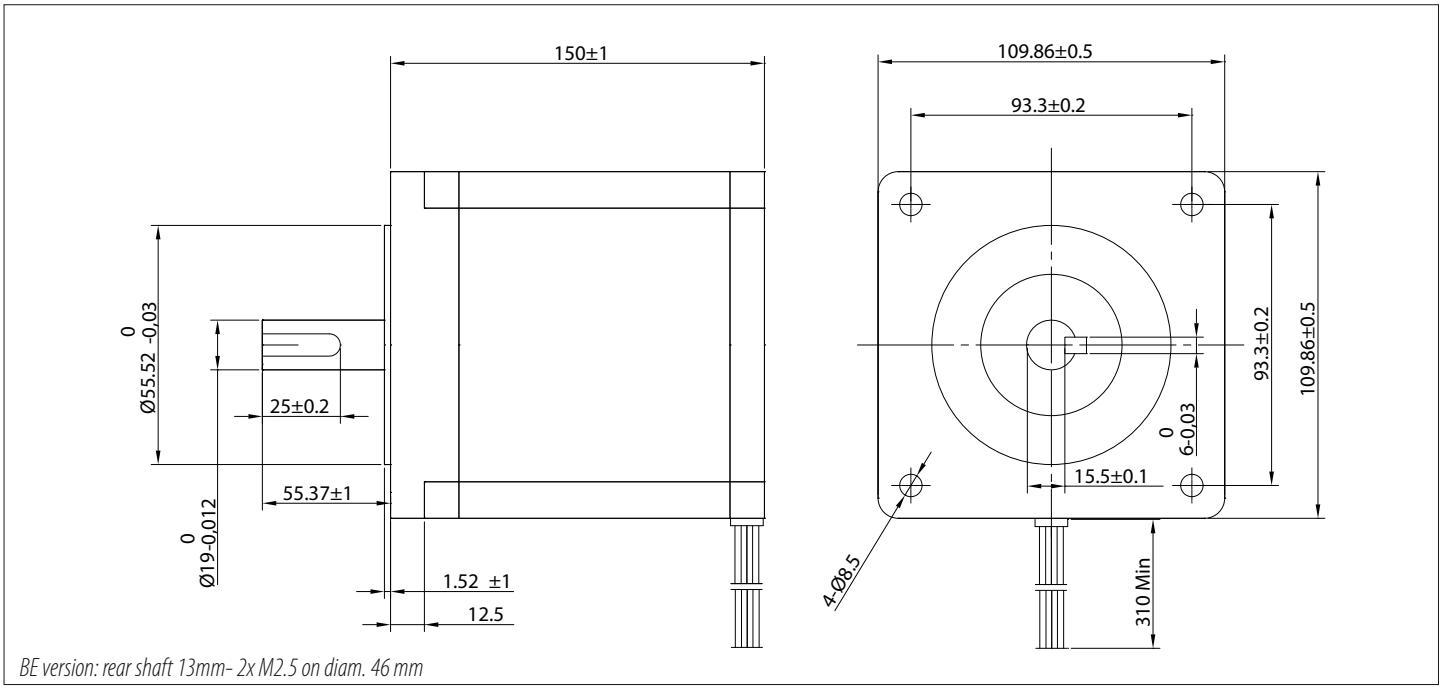


110SH99-5504A VM: 100VAC; 5,5A /Phase Driver: SMD 506



STEPPER MOTOR

Stepper Motor 110SH150 High Torque Hybrid



BE version: rear shaft 13mm- 2x M2.5 on diam. 46 mm

SPECIFICATION

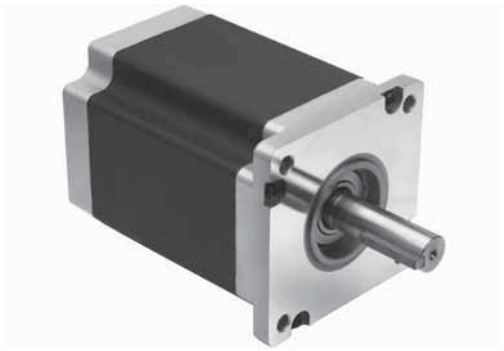
Model		110SH150-6504A
1 Rated Voltage	V	5,2
2 Current/Phase	A	6,5
3 Resistance/Phase	Ω	0,72
4 Inductance/Phase	mH	11,5
5 Holding Torque	Nm	21
6 Rotor Inertia	g-cm^2	10900
7 Detent Torque	Kg-cm	5,9
8 Weight	Kg	8,4
9 Number of leads		4
10 Length	mm	150

CHARACTERISTICS

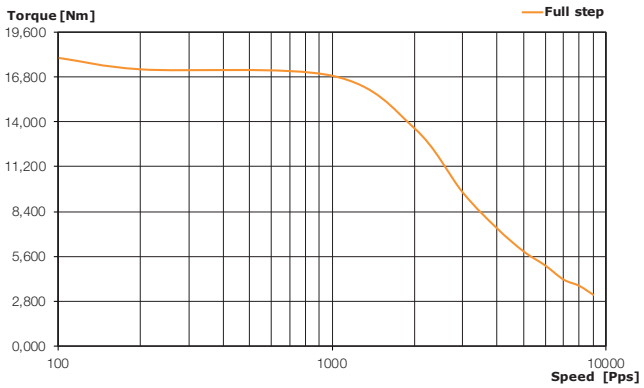
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	1500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	330 N
Max Axial Force	100 N

CONNECTION

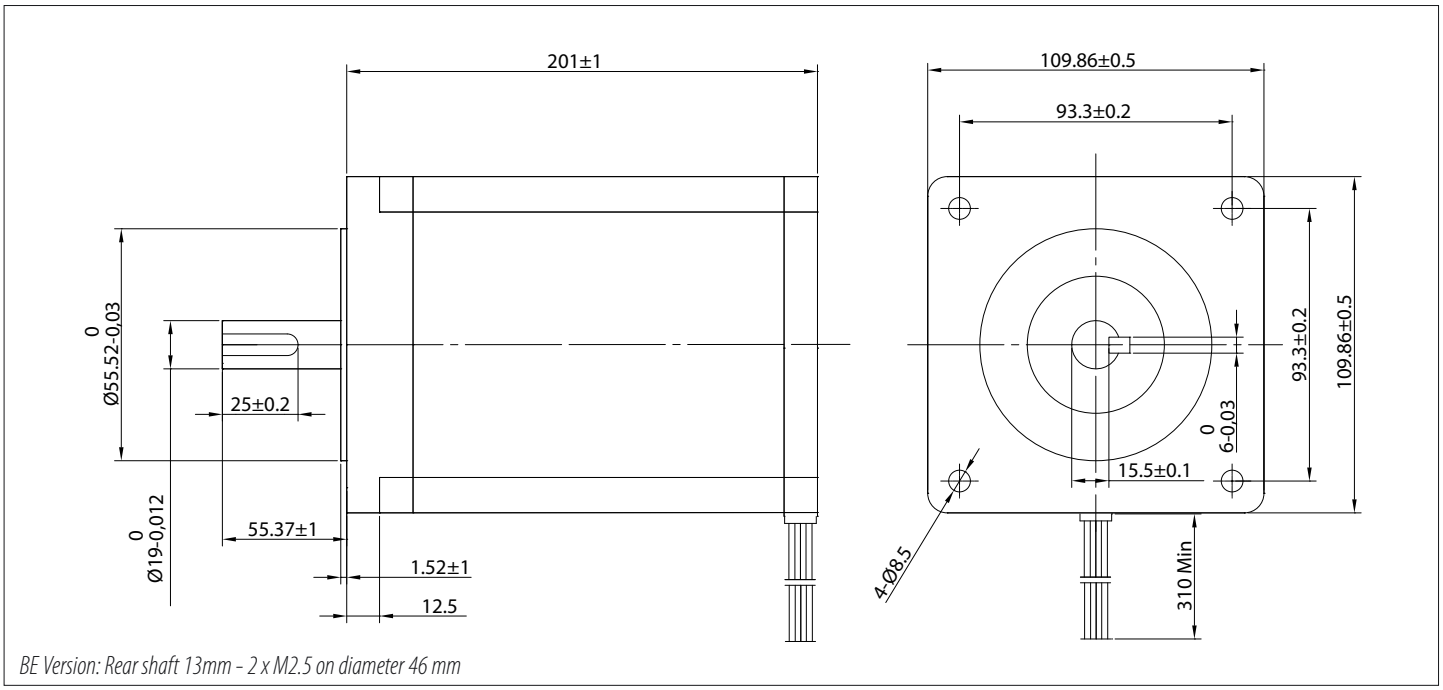
Pin N°	Color	Gauge	Function
1	Red	UL1430 AWG18	Phase A
2	White	UL1430 AWG18	Phase A-
3	Yellow	UL1430 AWG18	Phase B
4	Green	UL1430 AWG18	Phase B-



110SH150-6504A VM: 130VAC; 6,5A /Phase Driver: SMD 506



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

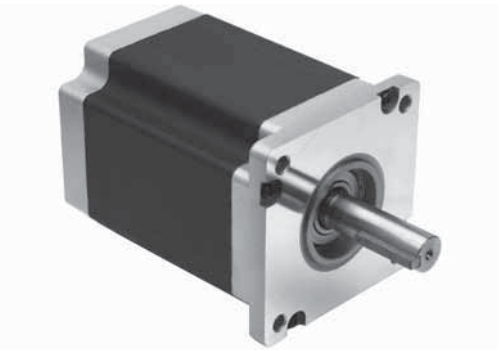
Model		110SH201-8004A
Rated Voltage	V	5,36
Current/Phase	A	8
Resistance/Phase	Ω	0,67
Inductance/Phase	mH	12
Holding Torque	Nm	28
Rotor Inertia	g-cm^2	16200
Detent Torque	Kg-cm	7,5
Weight	Kg	11,7
Number of leads		4
Length	mm	201

CHARACTERISTICS

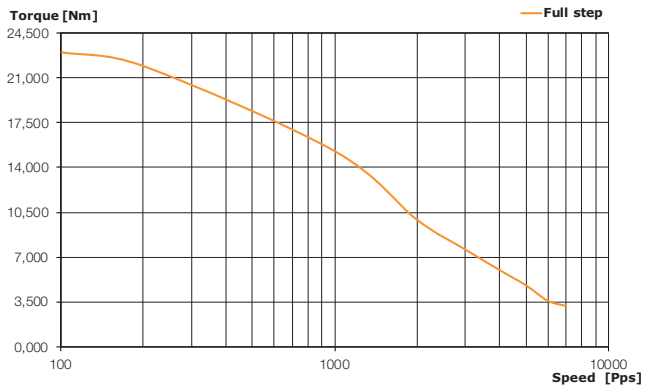
Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	1500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	330 N
Max Axial Force	100 N

CONNECTION

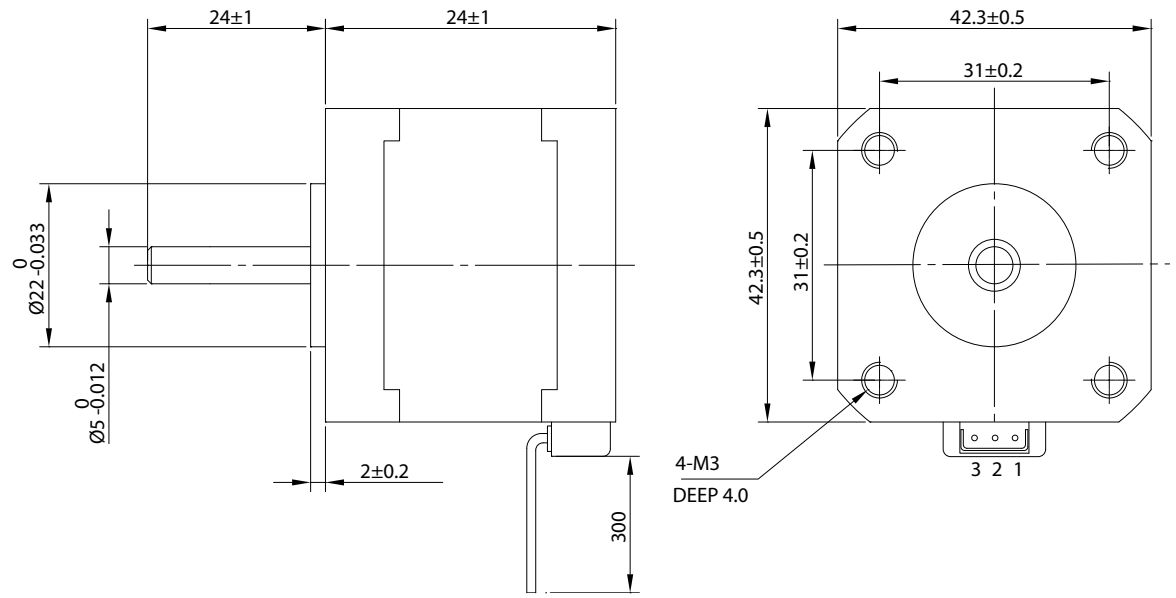
Pin N°	Color	Gauge	Function
1	Red	UL1430 AWG18	Phase A
2	White	UL1430 AWG18	Phase A-
3	Yellow	UL1430 AWG18	Phase B
4	Green	UL1430 AWG18	Phase B-



110SH201-8004A VM: 130VAC; 8,0A /Phase Driver: SMD 506H



Stepper Motor 423P24 3 Phase Hybrid



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

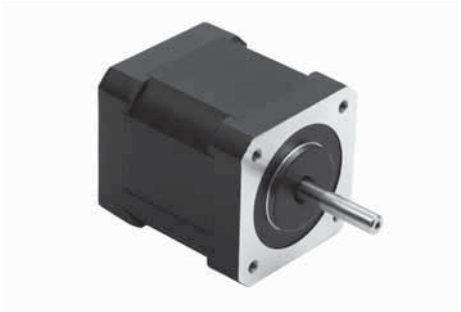
Model		423P24-0903A
1 Rated Voltage	V	5,58
2 Current/Phase	A	0,9
3 Resistance/Phase	Ω	6,2
4 Inductance/Phase	mH	3,2
5 Holding Torque	Nm	0,08
6 Rotor Inertia	g-cm^2	20
7 Weight	Kg	0,14
8 Number of leads		3
9 Length	mm	24

CHARACTERISTICS

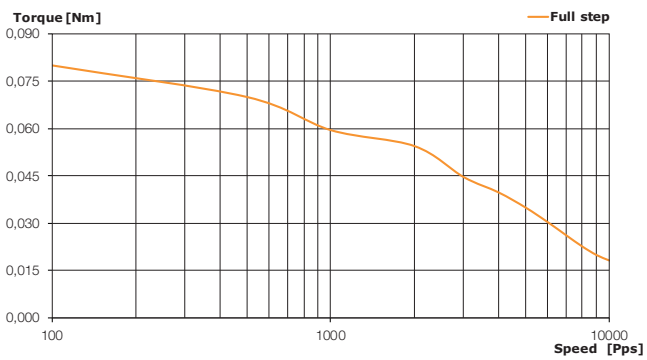
Step Angle	1,2°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

CONNECTION

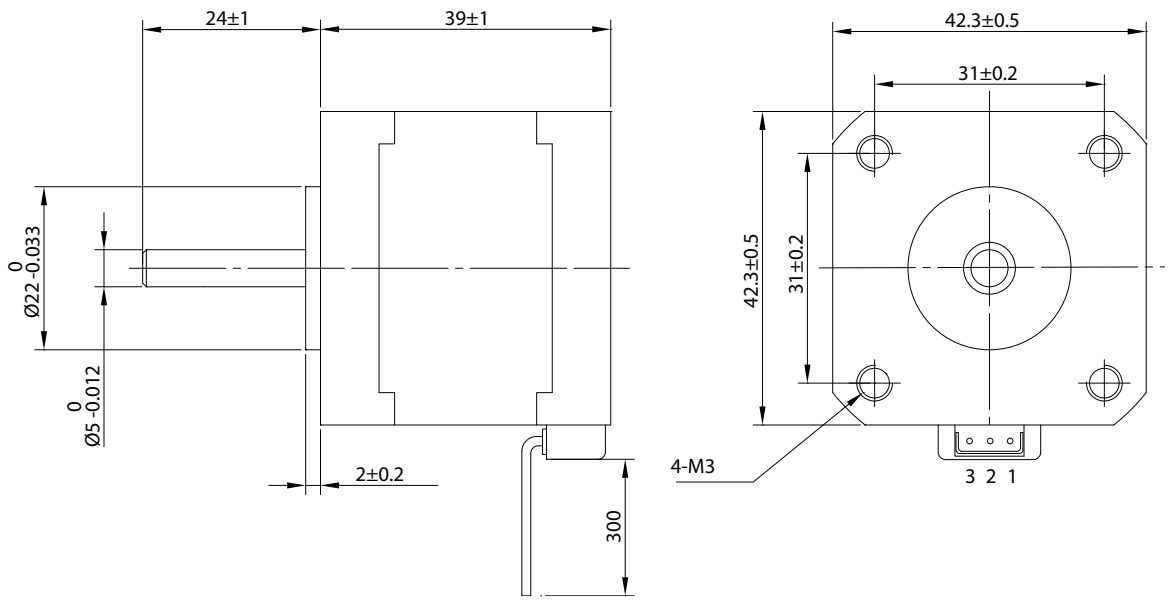
Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG26	Phase U
2	Yellow	UL1061 AWG26	Phase V
3	Blue	UL1061 AWG26	Phase W



423P24-0903A VM: 24V; 0,9A /Phase Driver: Q3HB64



STEPPER MOTOR



BE version: rear shaft 13mm- 2x M2.5 on diam. 19.05 mm

SPECIFICATION

Model		423P39-2403A
1 Rated Voltage	V	2,88
2 Current/Phase	A	2,4
3 Resistance/Phase	Ω	1,2
4 Inductance/Phase	mH	0,8
5 Holding Torque	Nm	0,2
6 Rotor Inertia	g-cm^2	54
7 Weight	Kg	0,28
8 Number of leads		3
9 Length	mm	39

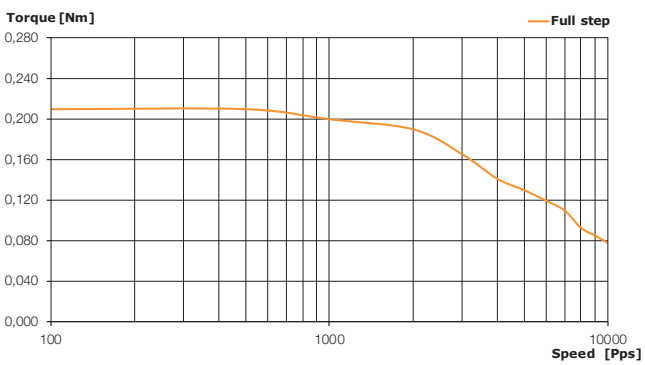
CHARACTERISTICS

Step Angle	1,2°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	28 N
Max Axial Force	10 N

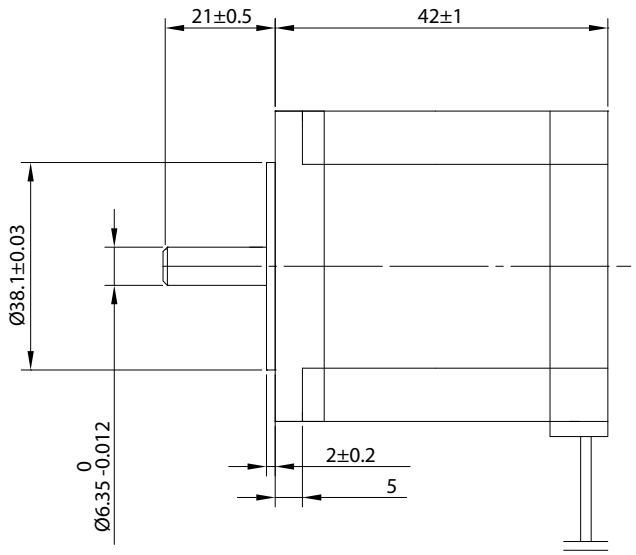
CONNECTION

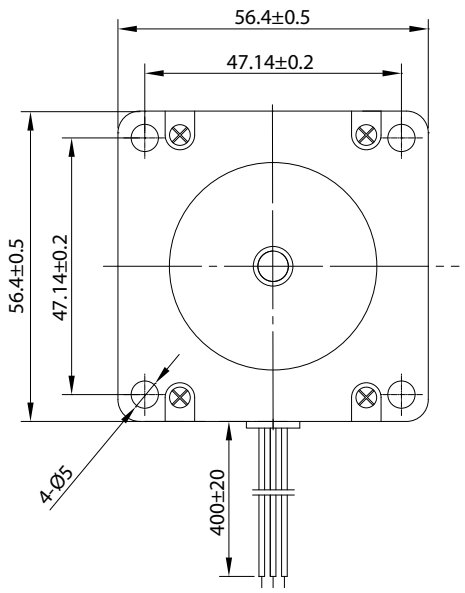
Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG26	Phase U
2	Yellow	UL1061 AWG26	Phase V
3	Blue	UL1061 AWG26	Phase W

423P39-2403A VM: 24V; 2,4A /Phase Driver: Q3HB64



Stepper Motor 573P42 3 Phase Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model		573P42
1 Rated Voltage	V	6,76
2 Current/Phase	A	5,2
3 Resistance/Phase	Ω	1,3
4 Inductance/Phase	mH	1,4
5 Holding Torque	Nm	0,45
6 Rotor Inertia	g-cm^2	110
7 Weight	Kg	0,45
8 Number of leads		6
9 Length	mm	42

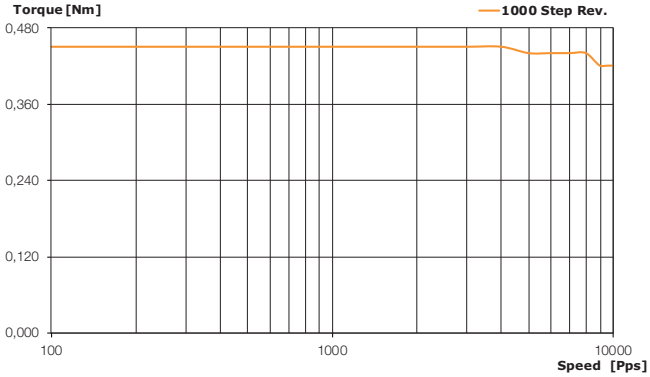
CHARACTERISTICS

Step Angle	1,2°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

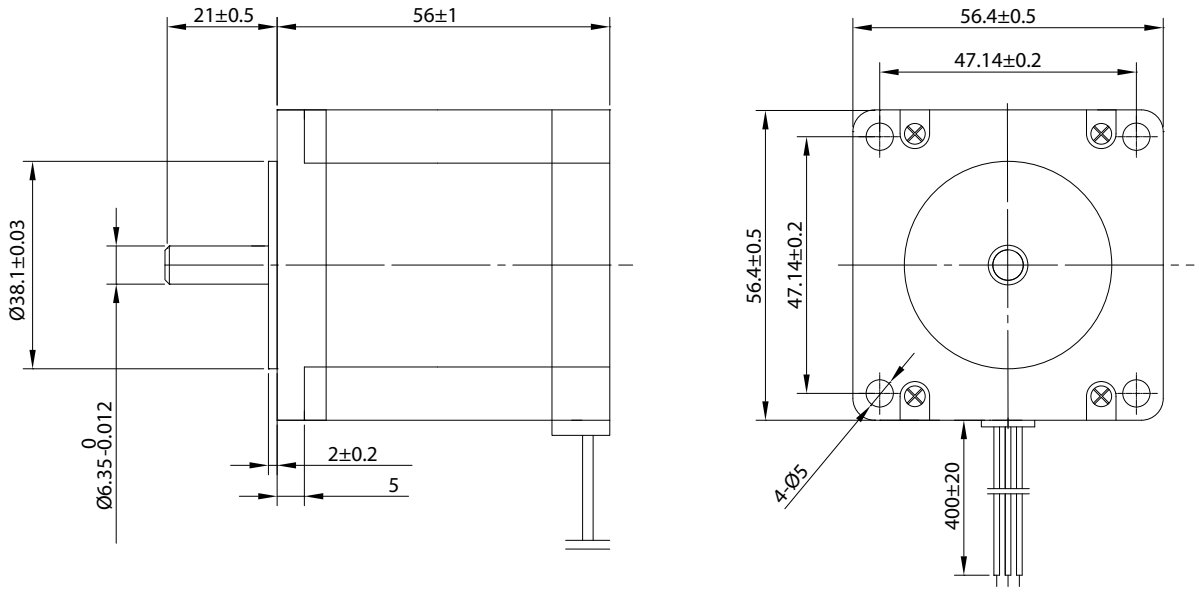
CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Phase U
2	Orange	UL1430 AWG26	Phase U
3	White	UL1430 AWG26	Phase V
4	Blue	UL1430 AWG26	Phase V
5	Yellow	UL1430 AWG26	Phase W
6	Green	UL1430 AWG26	Phase W

573P42 VM: 35V; 5,0A /Phase



STEPPER MOTOR



BE version: rear shaft 13mm- 2x M2.5 on diam. 46 mm

SPECIFICATION

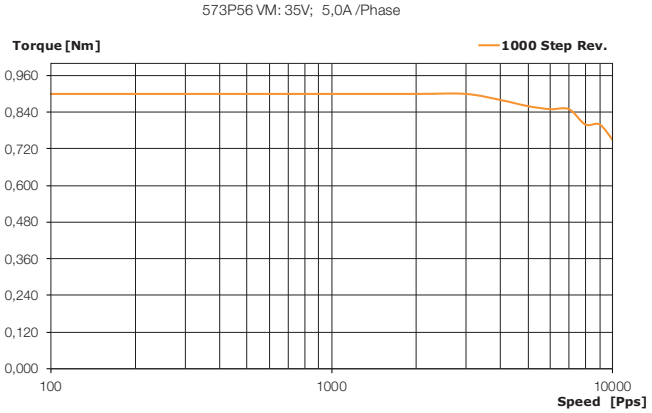
Model			573P56
1	Rated Voltage	V	4
2	Current/Phase	A	5,6
3	Resistance/Phase	Ω	0,7
4	Inductance/Phase	mH	1,7
5	Holding Torque	Nm	0,9
6	Rotor Inertia	g-cm^2	300
7	Weight	Kg	0,75
8	Number of leads		6
9	Length	mm	56

CHARACTERISTICS

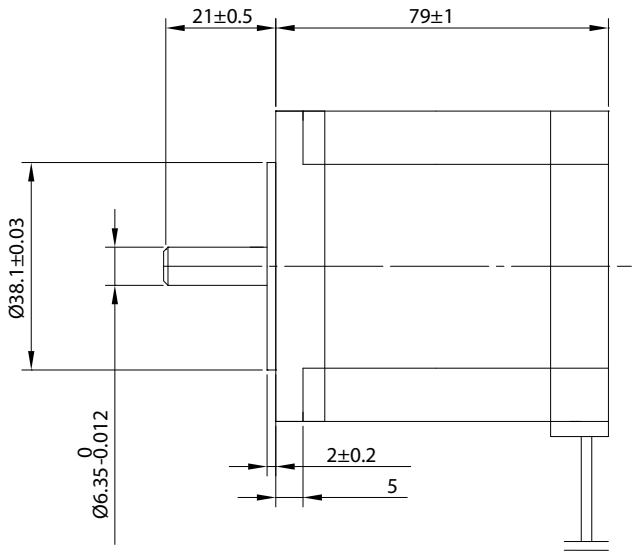
Step Angle	1,2°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

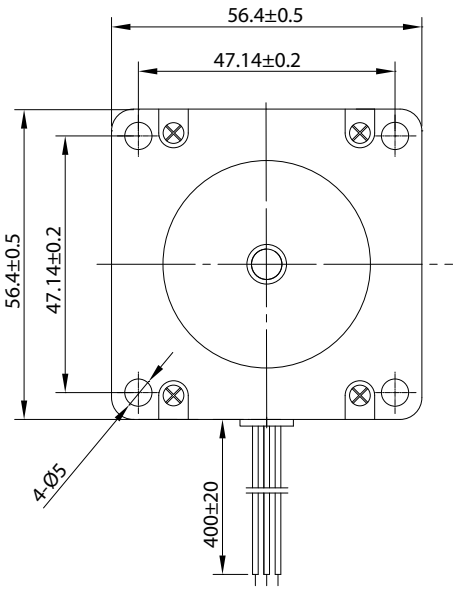
CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Phase U
2	Orange	UL1430 AWG26	Phase U
3	White	UL1430 AWG26	Phase V
4	Blue	UL1430 AWG26	Phase V
5	Yellow	UL1430 AWG26	Phase W
6	Green	UL1430 AWG26	Phase W



Stepper Motor 573P79 3 Phase Hybrid





BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

Model		573P79
1 Rated Voltage	V	6
2 Current/Phase	A	5,8
3 Resistance/Phase	Ω	1,05
4 Inductance/Phase	mH	2,4
5 Holding Torque	Nm	1,5
6 Rotor Inertia	g-cm^2	480
7 Weight	Kg	1,1
8 Number of leads		6
9 Length	mm	79

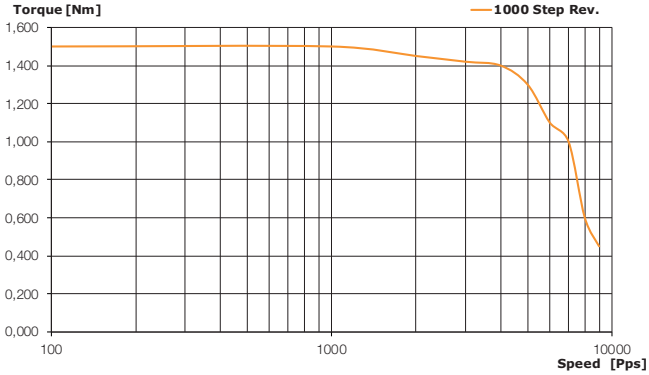
CHARACTERISTICS

Step Angle	1,2°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

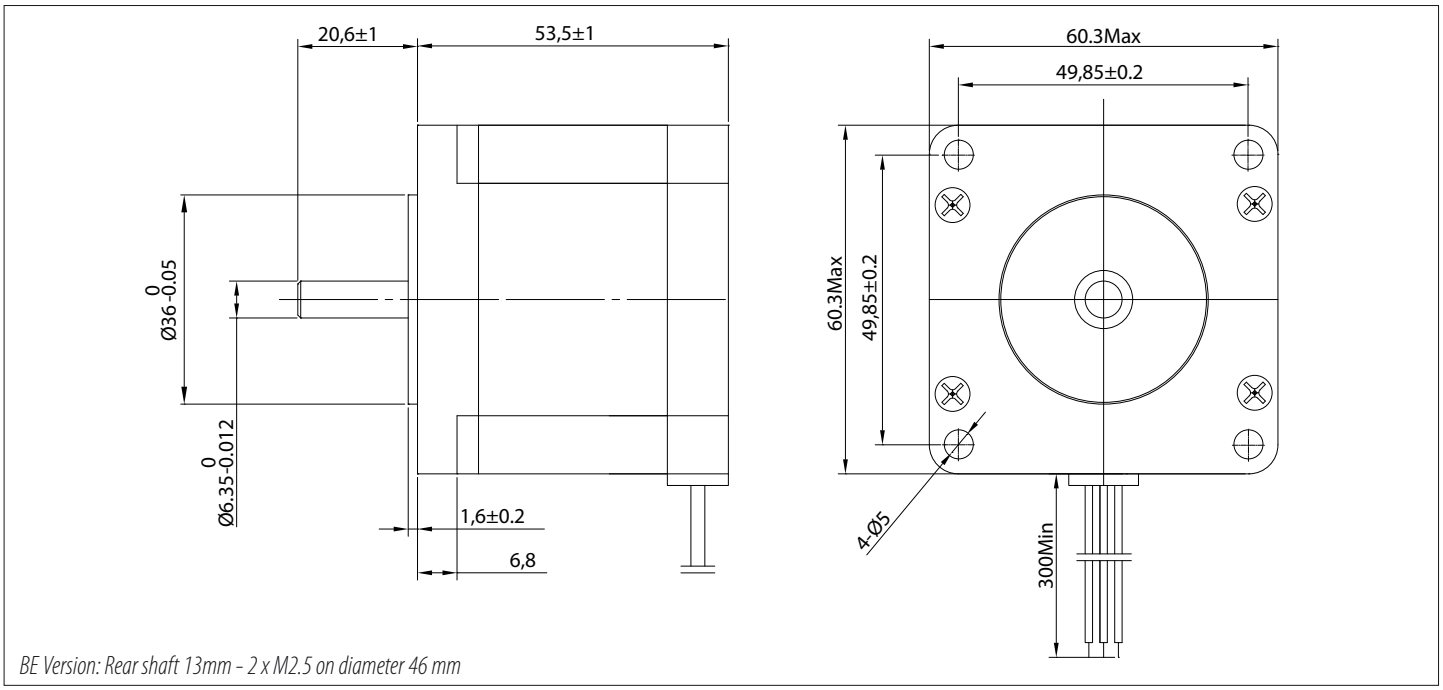
CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Phase U
2	Orange	UL1430 AWG26	Phase U
3	White	UL1430 AWG26	Phase V
4	Blue	UL1430 AWG26	Phase V
5	Yellow	UL1430 AWG26	Phase W
6	Green	UL1430 AWG26	Phase W

573P79 VM: 35V; 5,0A /Phase



STEPPER MOTOR



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

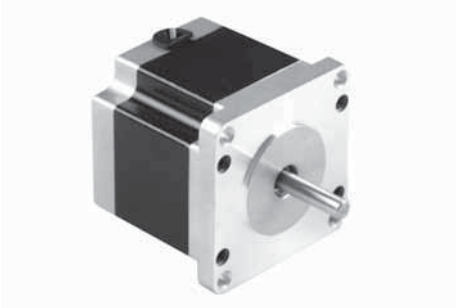
Model		603P53-1503
1 Rated Voltage	V	6,75
2 Current/Phase	A	1,5
3 Resistance/Phase	Ω	4,5
4 Inductance/Phase	mH	12
5 Holding Torque	Nm	0,9
6 Rotor Inertia	g-cm^2	260
7 Weight	Kg	0,8
8 Number of leads		3
9 Length	mm	53,5

CHARACTERISTICS

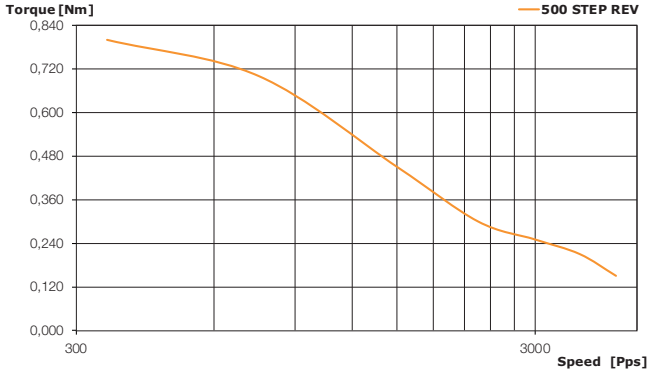
Step Angle	1,2°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC for one minute
Max Shaft Radial Play (450 g load)	0,02 mm
Max Shaft Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	75 N
Max Axial Force	15 N

CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG26	Phase U
2	Green	UL1061 AWG26	Phase V
3	white	UL1061 AWG26	Phase W



603P53 VM: 30V; 1,8A /Phase Chopper driver



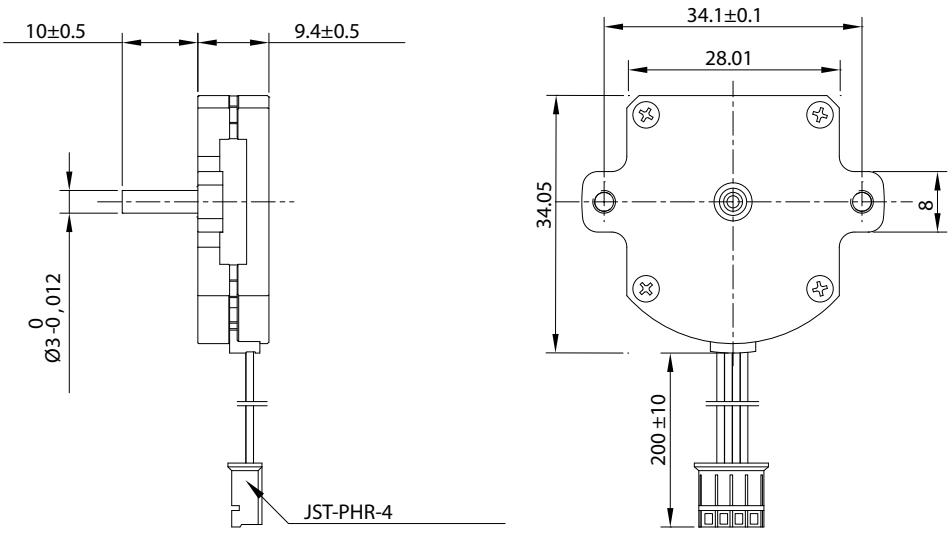
STEPPER MOTOR

Note/Notes

Flat Stepper motor

Ultra-flat and high-speed stepper motors. With speed up to 4300 rpm, our 2-phase flat stepper motors are ideal for applications where power and size are decisive. Specifically designed for semi-conductor applications, these unique Stepper motors are suitable for many other size-sensitive devices.

Stepper Flat 28S10



SPECIFICATION

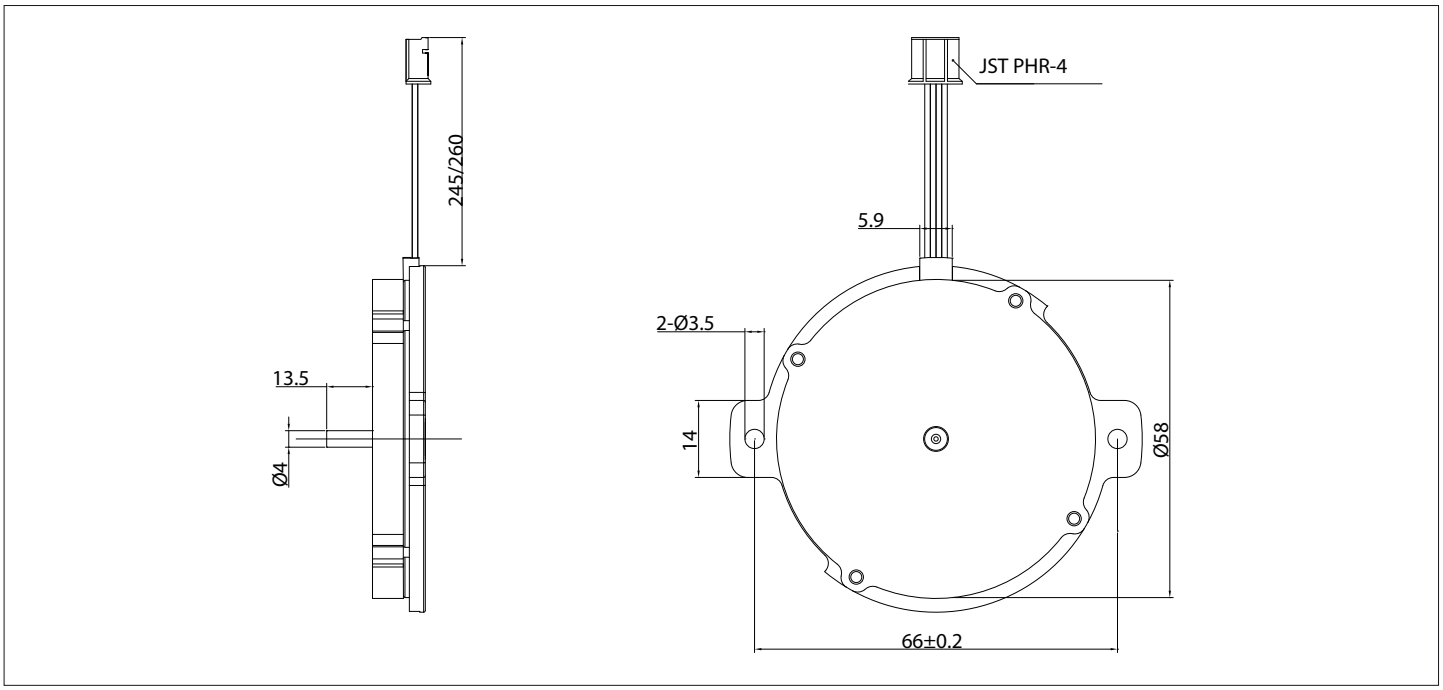
Model			28S10-0504
1	Rated Voltage	V	1,85
2	Current/Phase	A	0,5
3	Resistance/Phase	Ω	3,7
4	Inductance/Phase	mH	0,88
5	Holding Torque	Nm	0,0098
6	Rotor Inertia	g-cm^2	1,7
7	Weight	Kg	0,028
8	Number of leads		4
9	Length	mm	9,4

CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	B
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	500 VAC / 50Hz / 1 sec / 3 Ma
Max Shaft Radial Play (450 g load)	0,06 mm
Max Shaft Axial Play (450 g load)	0,04 mm
Max Radial Force (20 mm from front flange)	4.5 N
Max Axial Force	4.5 N

CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG26	Phase A
2	Blue	UL1061 AWG26	Phase A-
3	Orange	UL1061 AWG26	Phase B
4	Yellow	UL1061 AWG26	Phase B-



SPECIFICATION

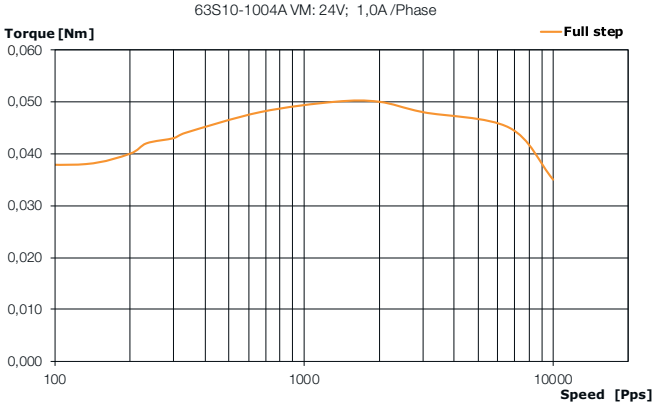
Model			63S10-1004A
1	Rated Voltage	V	3,8
2	Current/Phase	A	1
3	Resistance/Phase	Ω	3,8
4	Inductance/Phase	mH	2
5	Holding Torque	Nm	0,064
6	Rotor Inertia	g-cm^2	16
7	Weight	Kg	0,095
8	Number of leads		4
9	Length	mm	9,6

CHARACTERISTICS

Step Angle	1,8°
Step Angle Accuracy	± 5%
Insulation Class	E
Ambient Temperature	-20°C +50°C
Max Temp. Rise (rated current, 2 phase on)	80°C
Insulation Resistance	100 Mohm min. 500 VDC
Dielectric Strength	600 VAC for one minute
Max Shaft Radial Play (450 g load)	0,06 mm
Max Shaft Axial Play (450 g load)	0,05 mm
Max Radial Force (20 mm from front flange)	5 N
Max Axial Force	2 N

CONNECTION

Pin N°	Color	Gauge	Function
1	Red	UL1061 AWG26	Phase A
2	Blue	UL1061 AWG26	Phase A-
3	Orange	UL1061 AWG26	Phase B
4	Yellow	UL1061 AWG26	Phase B-



FLAT STEPPER MOTOR

Brushless Motors

If current is caused to flow in the armature conductors, torque is produced.
There is an application of a law of physics which is expressed as: F = KBli
Where:
F = force - K = a constant - B = air gap flux density - l = length of the conductor - i = current in a conductor

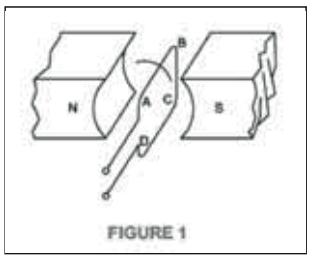


FIGURE 1

If more than one conductor is carrying the same current (multiple turns per coil), than F = KBliz
Where Z = number of conductors is series.In a motor the conductors rotate abput a central shaft (see figure 1). Than torque, T = FR, where R = radius at the air gap. So, T = KRBliz
Figure 1 shows the coil in the zero torque position. The maximum torque position is 90 electrical degrees from the position shown. As the conductors ratate from the maximum torque position, torque drops off in a sinusoidal fashion and becomes zero when the coil has moved 90 degrees.

A brush type motor has more than one coil. Each coil is angularly displaced from one another
so that when the torque from one coil has dropped off, current is automatically switched to another coil wich is properly located to produce maximum torque. The switching is accomplished mechanically with brushes and a commutator as shown in Figure 2

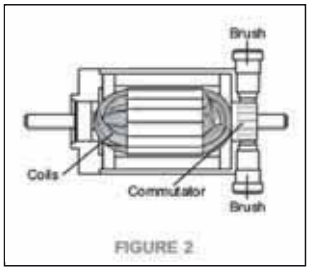


FIGURE 2

In a brushless motor, the position of the coils (phases) , with respect to the permanent magnet field, is sensed electronically and the current is switched, or commutated, to the appropriate pahases. The commutation is effected by means of transistor switches.
A brush type motor may be converted into a brushless motor by bringing out all the leads that are attached to the mechanical commutator and providing switches for each lead; however, this approach would involve a large number of switches.
Instead, a polyphase winding similar to that used in AC motors is utilized. In this design, the phases are commutated as a function of shaft position.

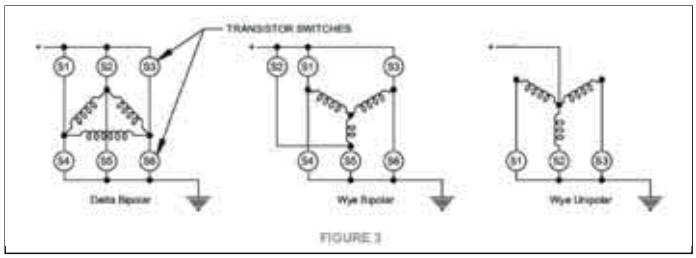
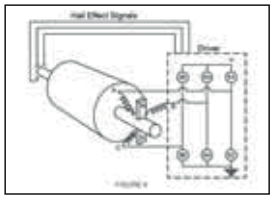
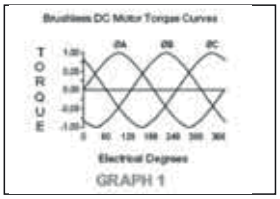


FIGURE 3

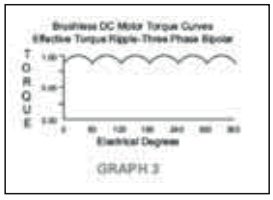
Two, three and four phase motor design are common.
DPM provide three phase design.
This configuration optimizes performance even though it requires more electronic components. Three types of three phase windings are available: Delta bipolar, wye unipolar and wye bipolar. These three winding configurations and their transistor orientation are shown in Figure 3

Figure 4 illustrates the sequential steps in the commutation of a three phase ,bi-polar system. Closing the transistors 1 and 4 will enable current to flow through phase A and B. The permanent magnet rotor will then align itself in a zero torque, preferred position. If 1 is opened and 5 closed, current will flow through phases B and C, the rotor will move 120 electrical degrees. (Note that the current through phase A is now flowing in the direction opposite the one at the start of this exercise.) Obviously, there must be some logic in the order and rate the transistor are switched. Hall Effect sensors are typically used in the logic scheme. Graph 1 may help illustrate how this works.5.

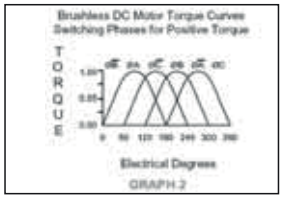




GRAPH 1



GRAPH 3



GRAPH 2

For istance, if one were to energize individual phases of a three phase brushless motor one would generate, as a function of electrical degrees of rotation, a torque curve as shown in Graph 1. Each phase would be 120 electrical degrees apart. (It should be noted that elelctrical degrees is simply mechanical degrees multiplied by the number of pole pairs of the motor). Now, imagine the rotor in Figure 4 resting in its zero torque position (i.e. the 180 electrical degree point of the Graph 1), with current flowing trough winding A. If the rotor is physically moved back from its rest position, torque will build up roughly sinusoidally and become peak at 90 electrical degrees. Since the objective is to have the motor run at its peak operating point, the position still another 30 degrees back from the peack torque point, or 60 degrees, is the point at which the winding must be switched on.

A sensor is located to trigger from a rotor magnet at this specific event. If the roor is allowed to turn back towards its original rest, or zero torque point, but the current is switched from winding A to winding B at 180 electrical degrees, the motor will operate on a new sine wave, or torque vs. angle, resulting in another point of peak performance. Again, a sensor is located in such a manner to mark this event. Similarly, the third sensor is set to trigger at 300 electrical degrees. These Hall Effect sensor setting, 120 electrical degrees apart from sensor to sensor, automatically sequence the switching of currents from one phase to another, at the appropriate time. Another important point to note from Graph 1 is the sign of the torque generated as a function of rotor position. If the currents in individual phases were switched at the proper electrical position, positive torque could always be generated, as illustrated in Graph 2. With the proper selection of phase energization (i.e. the proper commutation scheme) the resultant torque output of the motor is as illustrated in Graph 3. The successful commutation of the brushless motor is knowing the rotor position in electrical degrees and having the proper commutation scheme.

The nature of the application under consideration dictates what information is required to properly select a motor candidate. For example, operating at a fixed speed will have a different demand than operation under servo conditions. In general, three parameters will determine motor selection: 1 Peak torque requirement - 2 RMS torque requirement - 3 Speed of operation

PEAK TORQUE REQUIREMENT

Peak torque Tp is the sum of the torque due to acceleration of inertia, T_j, load, T_i, and friction T_f: $T_p=T_j+T_i+T_f$ Looking at the separate components, the torque due to inertia is the product of the load (including motor rotor) inertia and the load acceleration: $T_j=J*a$ (a = acceleration) The torque due to the load is defined by the configuration of the mechanical system coupled to the motor. The system also determines the amount of torque required to overcome the friction.

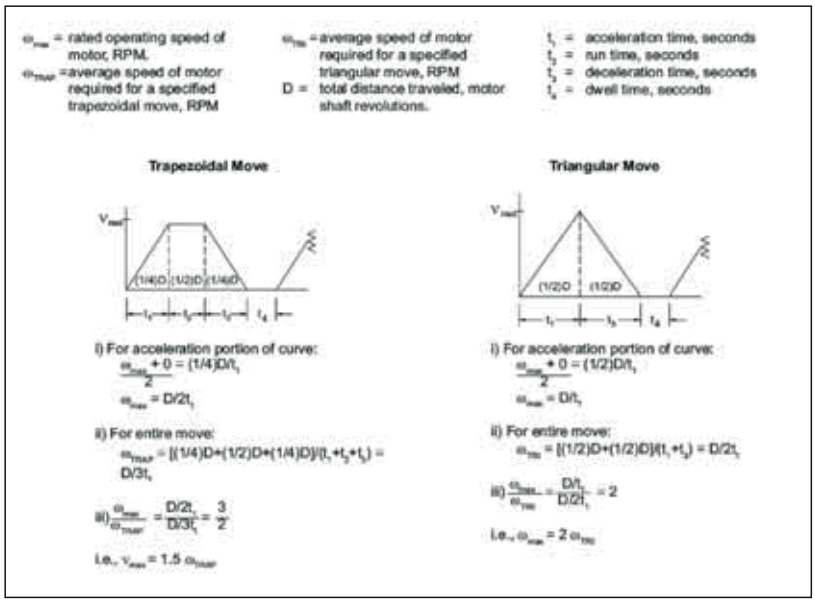
RMS TORQUE REQUIREMENT

Root-Mean-Square or RMS torque is a value used to approximate the average continuous torque requirement. It is a statistical approximation described by the following equation Where t_1 is the acceleration time, t_2 is the run time, t_3 is the deceleration time, and t_4 is the time in a move

$$T_{RMS} = \sqrt{\frac{T_P^2 t_1 + (T_L + T_F)^2 t_2 + (T_J - T_L - T_F)^2 t_3}{t_1 + t_2 + t_3 + t_4}}$$

SPEED OF OPERATION

Speed of operation is also dictated bythe configuration of the mechanical system that is coupled to the motor shaft, and by the type of move that is to be effected. For example, a single speed application would require a motor with rated speed equal to the average move speed. A point to point positioning application would require a motor with a rated speed higher than the average move speed.
(The higher speed would account for acceleration , deceleration and run times of the motion profile).
Figure 8A and 8B relate rated operating speed to average move speed for point to point positioning move profiles.



Codification

BRUSHLESS MOTOR

57	BLS	54	-IE	-	000

1 MOTOR SIZE (mm)

22, 24, 28, 32, 36, 42, 45, 57, 86, 110, ...

2 MOTOR TYPE (mm)

BL = Round BLS = Square BLW = Flat CBL = Price- Performance

3 MOTOR LENGTH (mm)

26, 30, 38, 45, 70 ....

4 ELECTRONIC

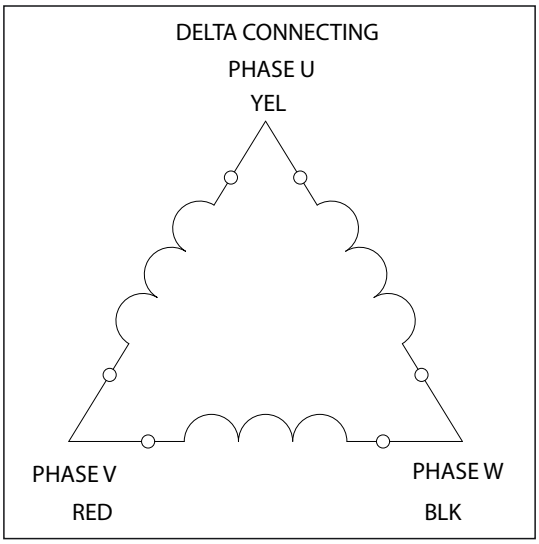
Null= Without Electronic -IE= With Integrated Electronic

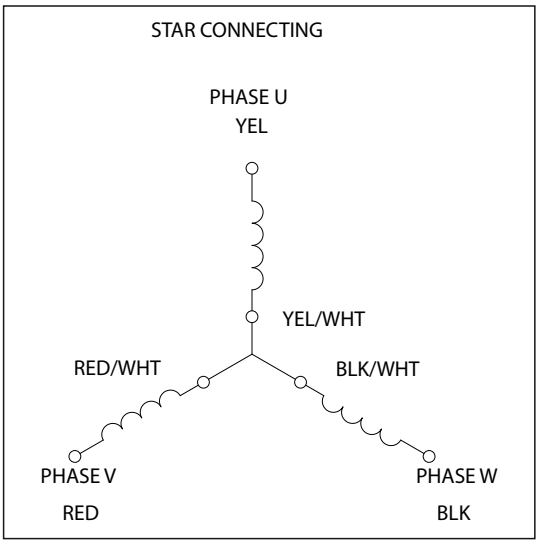
5 EXECUTION NUMBER

SPECIAL CONFIGURATION

Connection

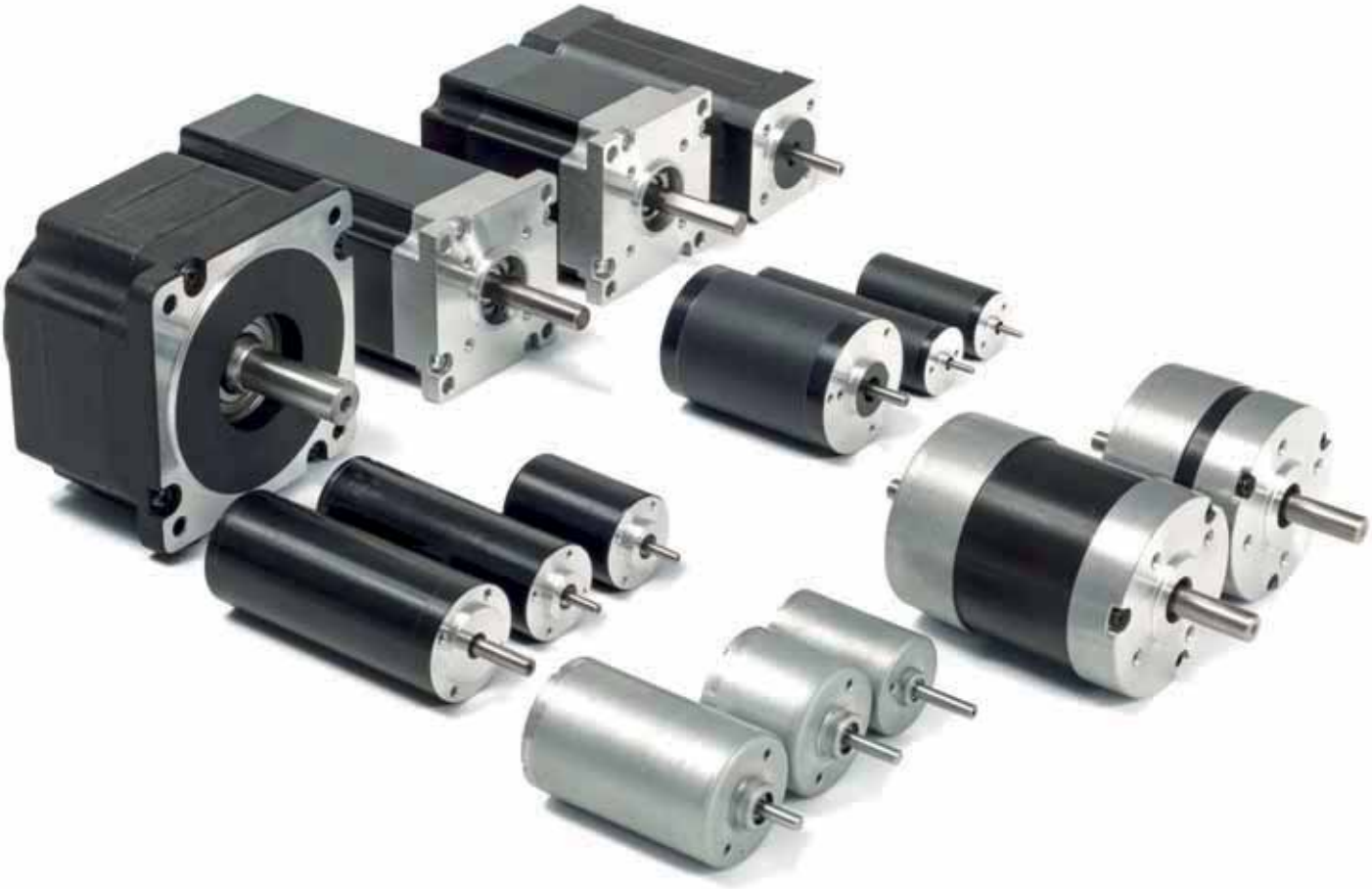
BLDC	Hall Sensor Connections					Winding Connections		
Connections	VCC Hall Sensor + 5 to 24 VDC	Hall A	Hall B	Hall C	Hall Sensor Ground	U	V	W
Color Code 1	Red	Blue	Green	White	Black	Yellow	Red	Black
Color Code 2	Yellow	Blue	Orange	Brown	White	Green	Red	Black



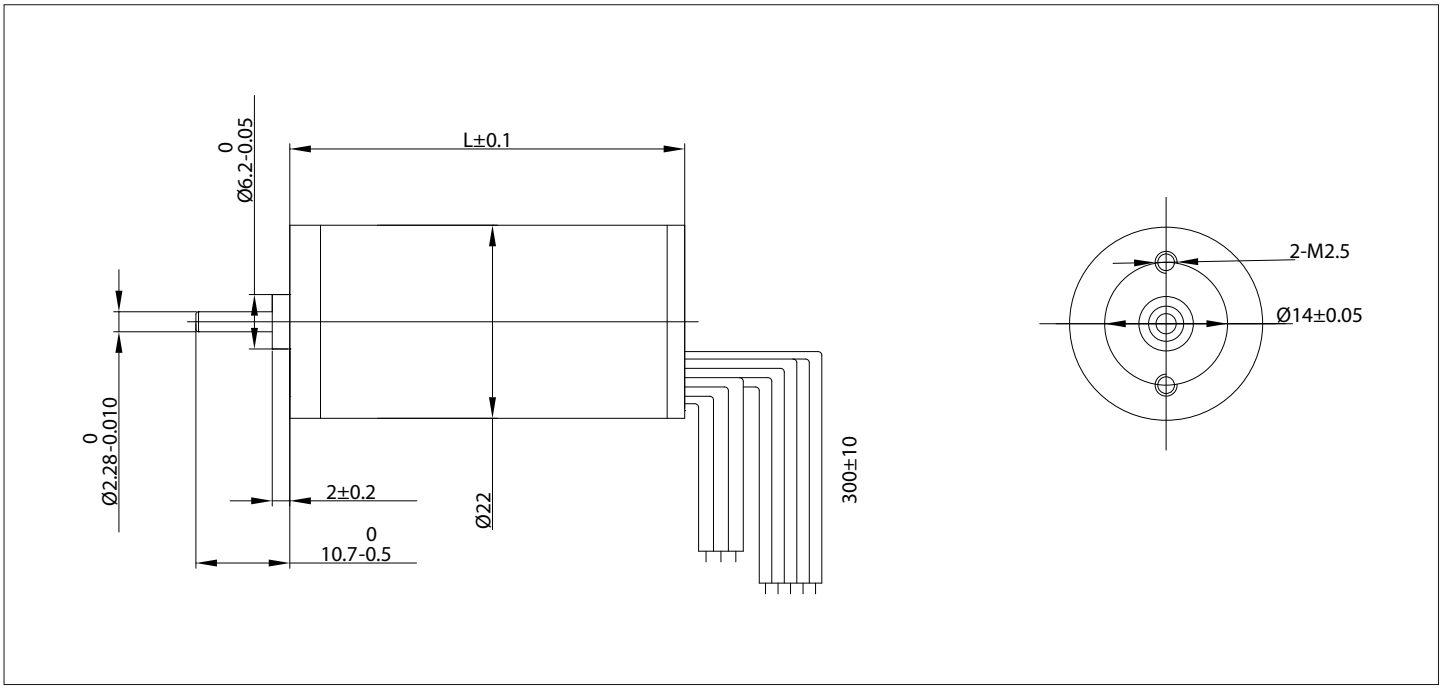


Brushless Motor

Reliability at first. Our Brushless motors, based on the Slotted design technology, are engineered to offer the highest performances without compromising on reliability. From 22mm to 86mm diameter, their multipolar design makes them the optimum choice for long life, high torque applications. They perfectly match with our range of planetary gearboxes, and offer many customization options.



Brushless Motor 22BL



SPECIFICATION

	Model		22BL45	22BL70
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4600	3800
5	Rated Torque	Nm	0,008	0,02
6	Max Peak Torque	Nm	0,024	0,06
7	Torque Constant	Nm/A	0,0302	0,0355
8	Line to Line Resistance	Ω	23	11,6
9	Line to Line inductance	mH	6,2	4,2
10	Max Peak Current	A	1,1	2
11	Rated Current	A	0,26	0,56
12	No-Load Current	mA	150	120
13	Length	mm	45	68
14	Rotor Inertia	g-cm^2	0,66	1,32
15	Weight	Kg	0,07	0,12

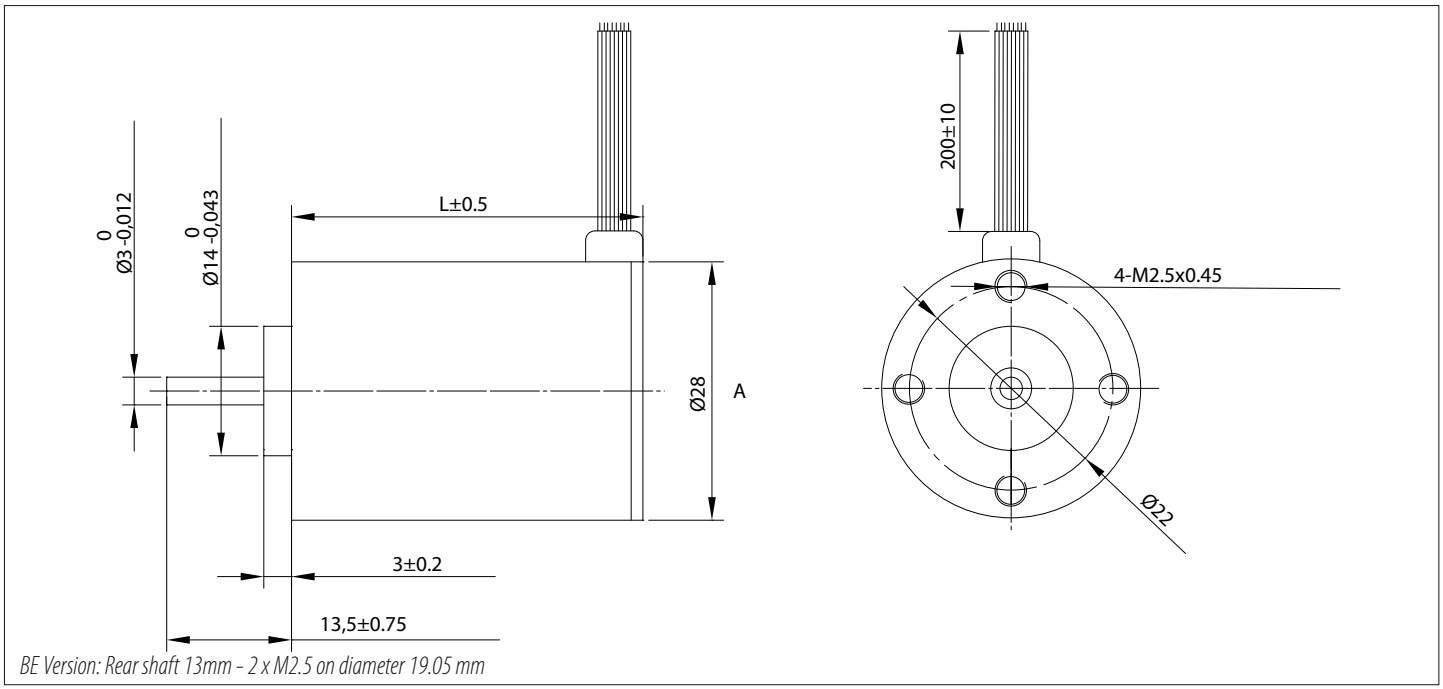
CONNECTION

Lead N°	Color	Gauge	Function
1	Yellow	UL1430 AWG28	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG28	Hall A
3	Orange	UL1430 AWG28	Hall B
4	Brown	UL1430 AWG28	Hall C
5	White	UL1430 AWG28	Hall Sensor Ground
6	Green	UL1430 AWG26	Phase U
7	Red	UL1430 AWG26	Phase V
8	Black	UL1430 AWG26	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	10N
Max Axial Force	2N
Dielectric Strength	360 VAC for one second
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 28BL



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		28BL26	28BL38	28BL77
1	N° of pole		4	4	4
2	N° of phase		3	3	3
3	Rated Voltage	V	15	24	24
4	Rated Speed	rpm	8000	3100	3100
5	Rated Torque	Nm	0,005	0,016	0,05
6	Max Peak Torque	Nm	0,015	0,048	0,15
7	Torque Constant	Nm/A	0,0143	0,024	0,05
8	Line to Line Resistance	Ω	8,2	20,5	4,67
9	Line to Line inductance	mH	2,3	7,4	2,2
10	Max Peak Current	A	1,3	2	3
11	Rated Current	A	0,35	0,67	1
12	No-Load Current	mA	200	200	150
13	Length	mm	26	38	77
14	Rotor Inertia	g-cm^2	2,35	3,69	10,98
15	Weight	Kg	0,06	0,082	0,28

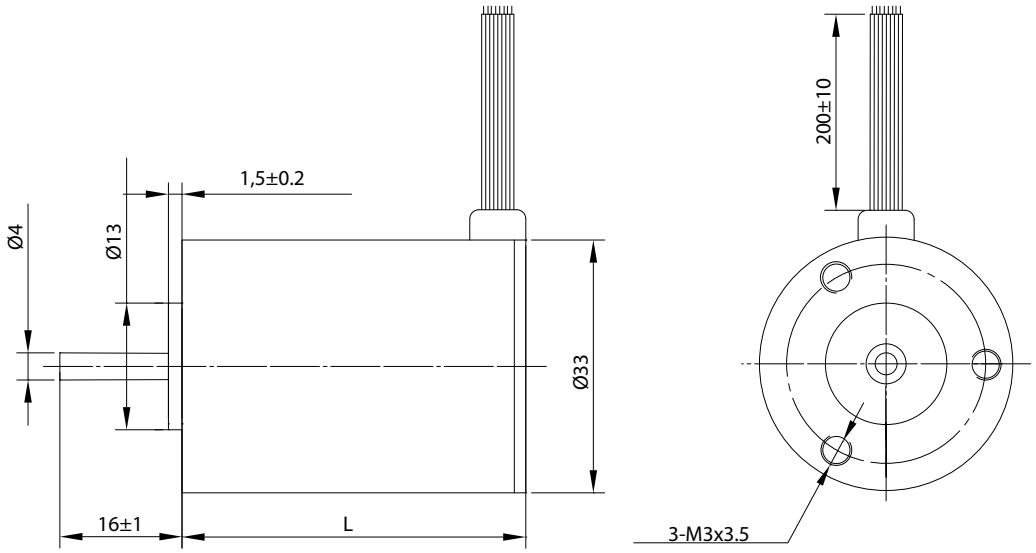
CONNECTION

Lead N°	Color	Gauge	Function
1	Yellow	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Orange	UL1430 AWG26	Hall B
4	Brown	UL1430 AWG26	Hall C
5	White	UL1430 AWG26	Hall Sensor Ground
6	Green	UL1430 AWG26	Phase U
7	Red	UL1430 AWG26	Phase V
8	Black	UL1430 AWG26	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	10N
Max Axial Force	2N
Dielectric Strength	360 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 33BL



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

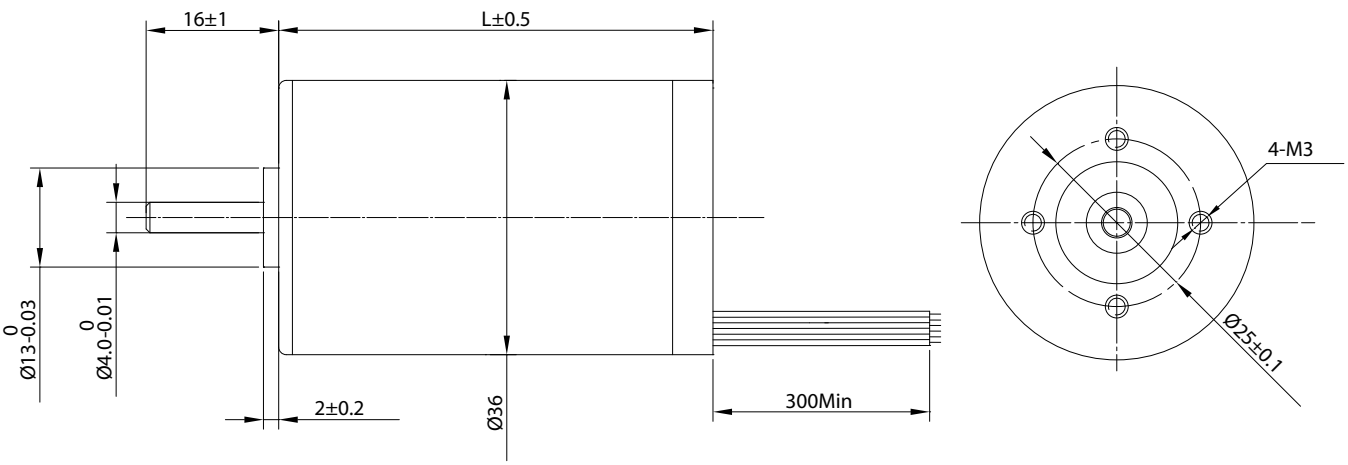
	Model		33BL38	33BL80
1	N° of pole		4	4
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	3000	7800
5	Rated Torque	Nm	0,022	0,05
6	Max Peak Torque	Nm	0,066	0,15
7	Torque Constant	Nm/A	0,046	0,023
8	Line to Line Resistance	Ω	14,2	0,86
9	Line to Line inductance	mH	7	0,55
10	Max Peak Current	A	1,45	4,8
11	Rated Current	A	0,48	2,17
12	No-Load Current	mA	100	450
13	Length	mm	38	80
14	Rotor Inertia	g-cm^2	7,95	23,55
15	Weight	Kg	0,085	0,2

CONNECTION

Lead N°	Color	Gauge	Function
1	Yellow	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Orange	UL1430 AWG26	Hall B
4	Brown	UL1430 AWG26	Hall C
5	White	UL1430 AWG26	Hall Sensor Ground
6	Green	UL1430 AWG22	Phase U
7	Red	UL1430 AWG22	Phase V
8	Black	UL1430 AWG22	Phase W

CHARACTERISTICS

Item	
Winding type	Star connection
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	10N
Max Axial Force	2N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		36RBL40	36RBL57
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4800	4500
5	Rated Torque	Nm	0,036	0,05
6	Max Peak Torque	Nm	0,1	0,15
7	Torque Constant	Nm/A	0,032	0,039
8	Line to Line Resistance	Ω	2,4	2
9	Line to Line inductance	mH	2,1	2
10	Max Peak Current	A	3,7	4,1
11	Rated Current	A	1,13	1,28
11	No-Load Current	mA	270	340
12	Length	mm	40	57
13	Rotor Inertia	g-cm^2	14	24
14	Weight	Kg	0,16	0,25

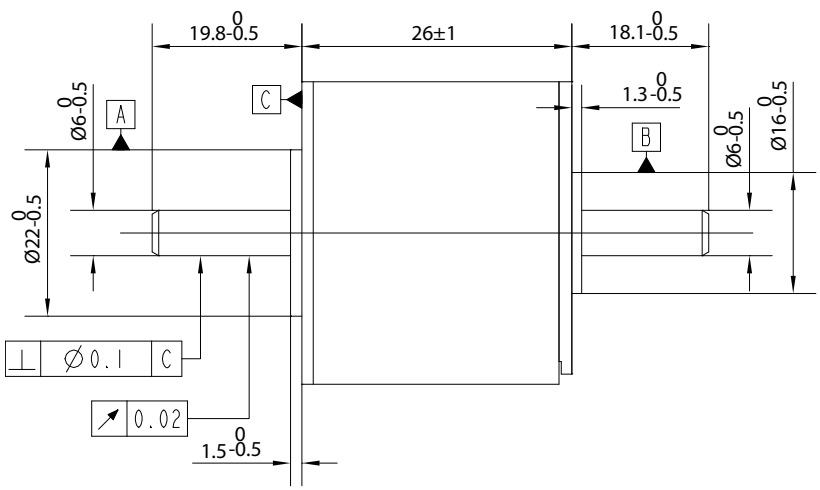
CONNECTION

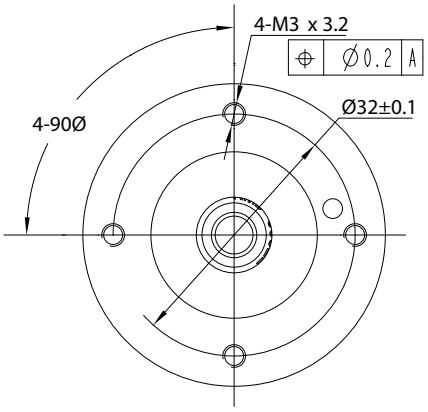
Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG22	Phase U
7	Red	UL1430 AWG22	Phase V
8	Black	UL1430 AWG22	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	15N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 40BL26





BE Version: Rear shaft 16.8mm: 3 - M2x2.4 on diameter 32 mm; 3 - M1.6x2.4 on diameter 28 mm

SPECIFICATION

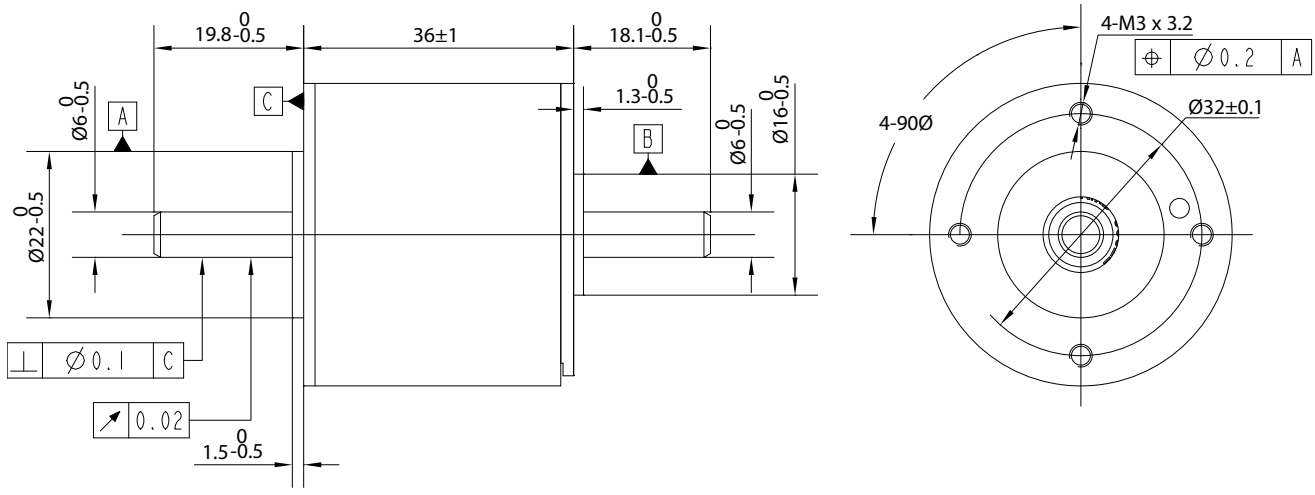
	Model		40BL26-12V	40BL26-24V
1	N° of pole		14	14
2	N° of phase		3	3
3	Rated Voltage	V	12	24
4	Rated Speed	rpm	9660	10300
5	Rated Torque	Nm	0,043	0,052
6	Max Peak Torque	Nm	0,12	0,16
7	Torque Constant	Nm/A	0,0085	0,017
8	Line to Line Resistance	Ω	0,28	0,50
9	Line to Line inductance	mH	0,11	0,39
10	Max Peak Current	A	13,4	9,35
11	Rated Current	A	5,06	3,06
12	No-Load Current	mA	522	285
13	Length	mm	26	26
14	Rotor Inertia	g-cm^2	10,5	10,5
15	Weight	Kg	0,17	0,17

CONNECTION

Pin N°	Connector	Function
1	UL1332 AWG26 MOLEX 430250600	Phase W
2	UL1332 AWG26 MOLEX 430250600	Phase V
3	UL1332 AWG26 MOLEX 430250600	Phase U
1	UL1332 AWG20 MOLEX 39012040	Hall A
2	UL1332 AWG20 MOLEX 39012040	Hall B
3	UL1332 AWG20 MOLEX 39012040	Hall C
4	UL1332 AWG20 MOLEX 39012040	Vcc Hall Sensor +5 to 24 Vdc
5	UL1332 AWG20 MOLEX 39012040	Hall Sensor Ground

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	F
Radial Play	Preloaded
Axial Play (9N load)	0,15 mm
Max Radial Force (5 mm from front flange)	15N
Max Axial Force	5N
Dielectric Strength	500 VAC for one second
Insulation Resistance	100 Mohm min. 500 VDC



BE Version: Rear shaft 16.8mm: 3 - M2x2.4 on diameter 32 mm; 3 - M1.6x2.4 on diameter 28 mm

SPECIFICATION

	Model		40BL36-18V	40BL36-36V
1	N° of pole		14	14
2	N° of phase		3	3
3	Rated Voltage	V	18	36
4	Rated Speed	rpm	8230	8740
5	Rated Torque	Nm	0,069	0,083
6	Max Peak Torque	Nm	0,21	0,25
7	Torque Constant	Nm/A	0,017	0,034
8	Line to Line Resistance	Ω	0,34	0,84
9	Line to Line inductance	mH	0,18	0,64
10	Max Peak Current	A	12,3	7,5
11	Rated Current	A	4,06	2,44
12	No-Load Current	mA	354	192
13	Length	mm	36	36
14	Rotor Inertia	g-cm^2	24,2	24,2
15	Weight	Kg	0,24	0,24

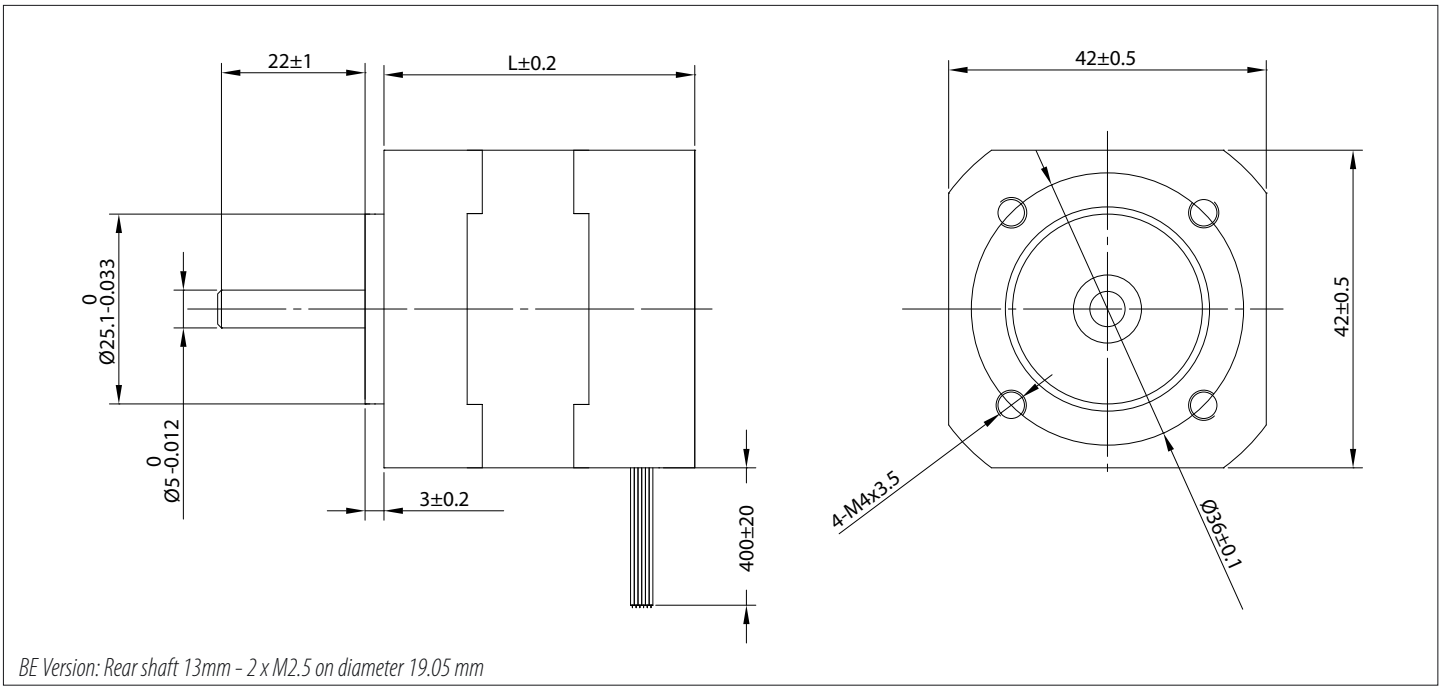
CONNECTION

Pin N°	Connector	Function
1	UL1332 AWG26 MOLEX 430250600	Phase W
2	UL1332 AWG26 MOLEX 430250600	Phase V
3	UL1332 AWG26 MOLEX 430250600	Phase U
1	UL1332 AWG20 MOLEX 39012040	Hall A
2	UL1332 AWG20 MOLEX 39012040	Hall B
3	UL1332 AWG20 MOLEX 39012040	Hall C
4	UL1332 AWG20 MOLEX 39012040	Vcc Hall Sensor +5 to 24 Vdc
5	UL1332 AWG20 MOLEX 39012040	Hall Sensor Ground

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	F
Radial Play	Preloaded
Axial Play (9N load)	0,15 mm
Max Radial Force (5 mm from front flange)	15N
Max Axial Force	5N
Dielectric Strength	500 VAC for one second
Insulation Resistance	100 Mohm min. 500 VDC

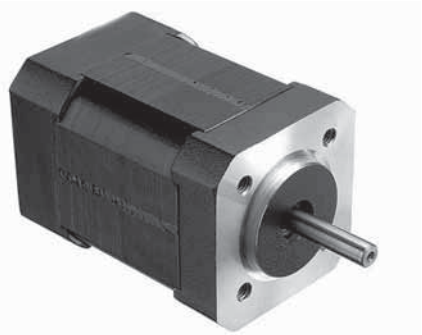
Brushless Motor 42BL



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		42BL41	42BL61
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4000	4000
5	Rated Torque	Nm	0,0625	0,125
6	Max Peak Torque	Nm	0,19	0,38
7	Torque Constant	Nm/A	0,035	0,036
8	Line to Line Resistance	Ω	1,5	0,8
9	Line to Line inductance	mH	2,1	1,2
10	Max Peak Current	A	6	10,8
11	Rated Current	A	1,79	3,47
12	No-Load Current	mA	200	240
13	Length	mm	41	61
14	Rotor Inertia	g-cm^2	24	48
15	Weight	Kg	0,3	0,45

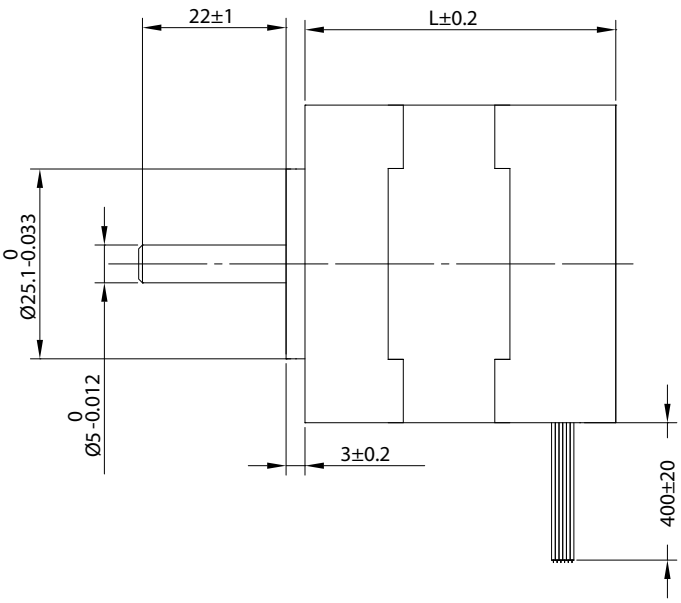


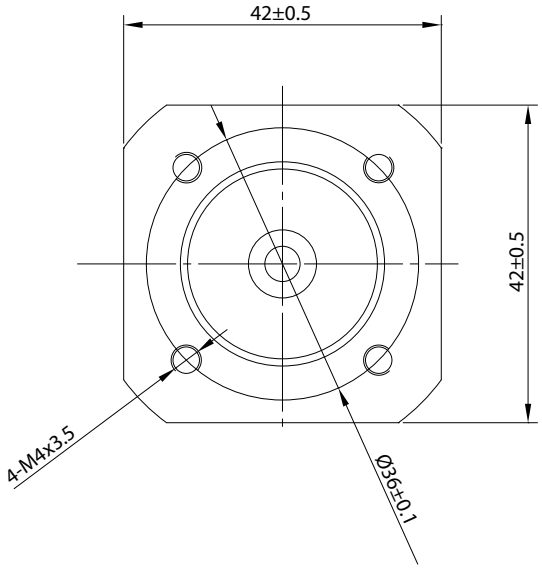
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

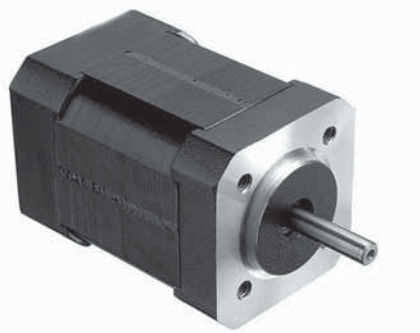




BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		42BL81	42BL100
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4000	4000
5	Rated Torque	Nm	0,185	0,25
6	Max Peak Torque	Nm	0,56	0,75
7	Torque Constant	Nm/A	0,036	0,036
8	Line to Line Resistance	Ω	0,43	0,3
9	Line to Line inductance	mH	0,71	0,5
10	Max Peak Current	A	15,5	21,7
11	Rated Current	A	5,14	6,94
12	No-Load Current	mA	400	450
13	Length	mm	81	100
14	Rotor Inertia	g-cm^2	72	96
15	Weight	Kg	0,65	0,8



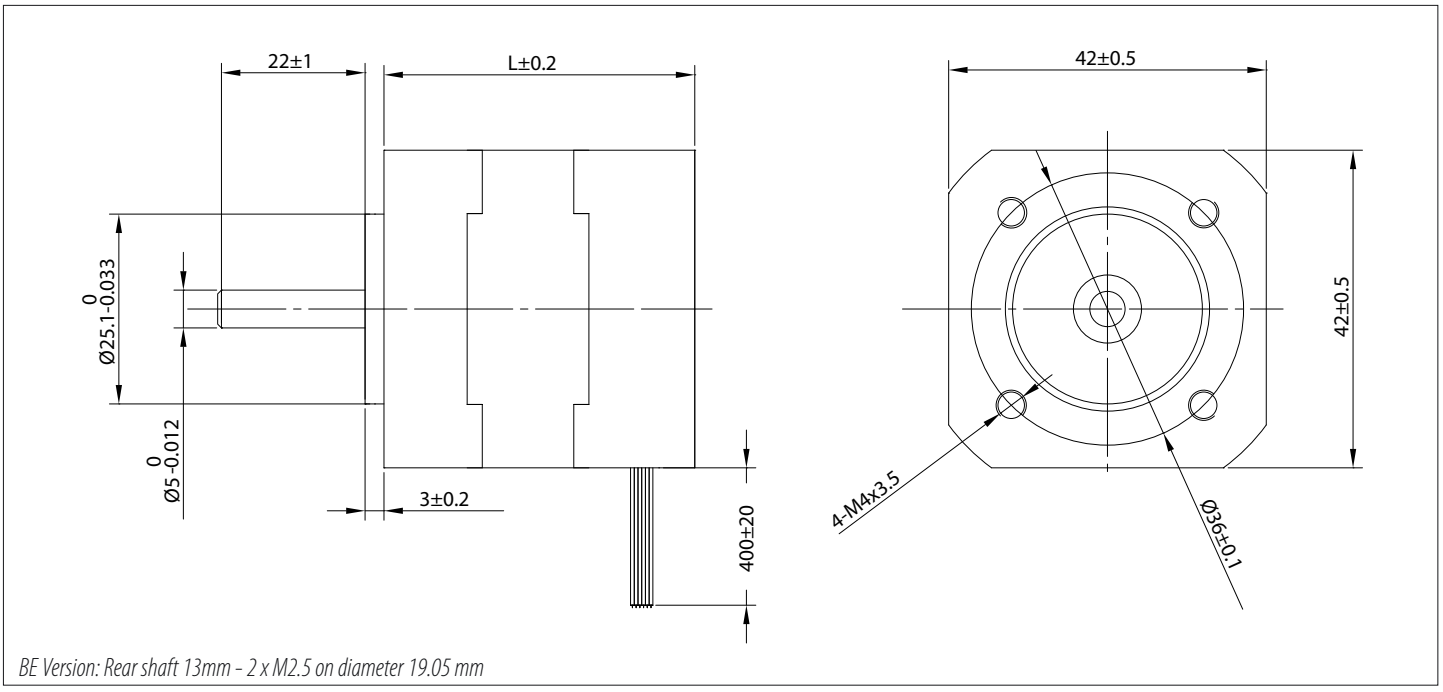
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

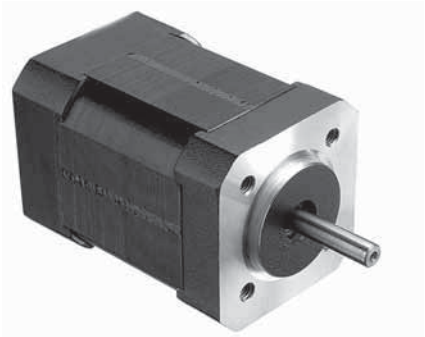
Brushless Motor 42BLA



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		42BLA01	42BLA02
1	N° of pole		10	10
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	0,07	0,16
6	Max Peak Torque	Nm	0,21	0,48
7	Torque Constant	Nm/A	0,055	0,059
8	Line to Line Resistance	Ω	2,6	1,1
9	Line to Line inductance	mH	1,83	0,96
10	Max Peak Current	A	4	8,3
11	Rated Current	A	1,27	2,71
12	No-Load Current	mA	220	450
13	Length	mm	40,3	60,3
14	Rotor Inertia	g-cm^2	48	101
15	Weight	Kg	0,26	0,45

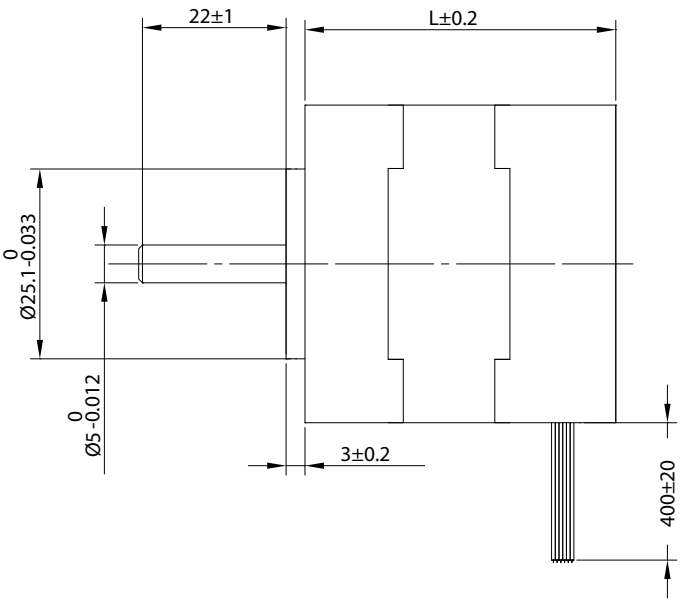


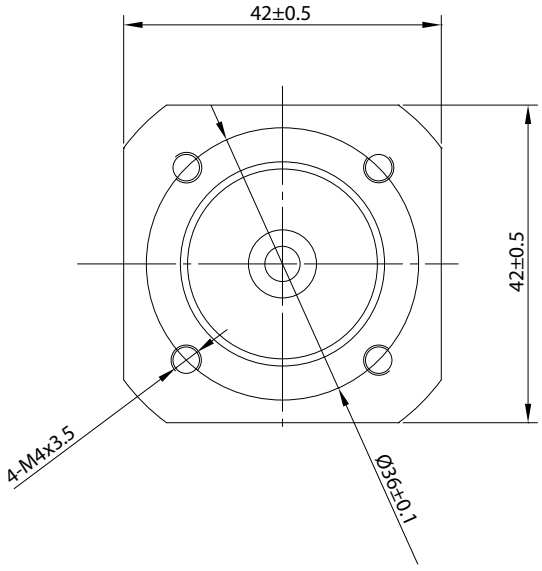
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

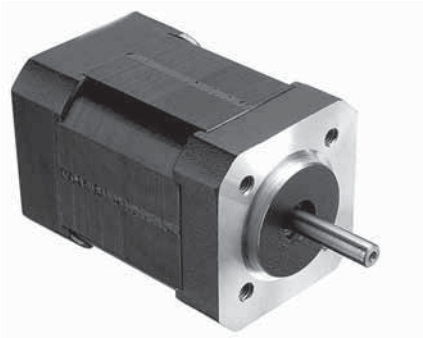




BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		42BLA03	42BLA04
1	N° of pole		10	10
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	0,26	0,36
6	Max Peak Torque	Nm	0,78	1,08
7	Torque Constant	Nm/A	0,058	0,057
8	Line to Line Resistance	Ω	0,7	0,48
9	Line to Line inductance	mH	0,58	0,44
10	Max Peak Current	A	13,5	19
11	Rated Current	A	4,48	6,32
12	No-Load Current	mA	430	490
13	Length	mm	80,3	100,3
14	Rotor Inertia	g-cm^2	154	207
15	Weight	Kg	0,65	0,85



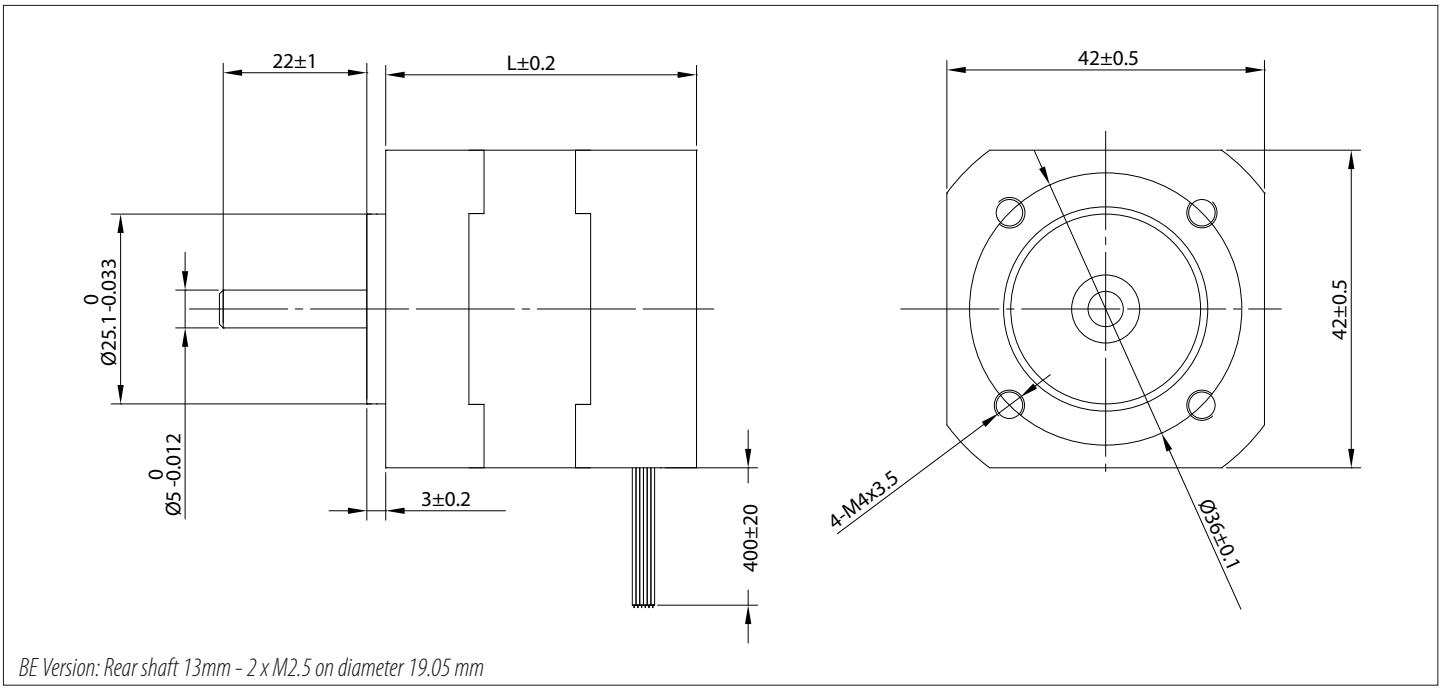
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

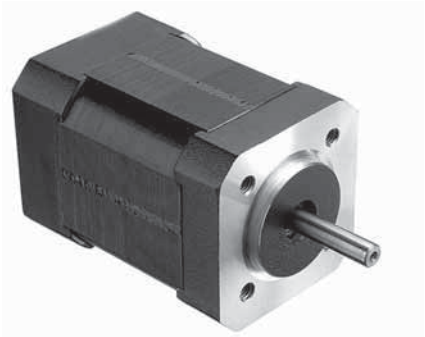
Brushless Motor 42BLB



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		42BLB01	42BLB02
1	N° of pole		6	6
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	0,064	0,17
6	Max Peak Torque	Nm	0,19	0,51
7	Torque Constant	Nm/A	0,057	0,058
8	Line to Line Resistance	Ω	3,6	1,05
9	Line to Line inductance	mH	1,8	0,75
10	Max Peak Current	A	3,5	9
11	Rated Current	A	1,12	2,93
12	No-Load Current	mA	160	270
13	Length	mm	40,3	60,3
14	Rotor Inertia	g-cm^2	80	100
15	Weight	Kg	0,4	0,6

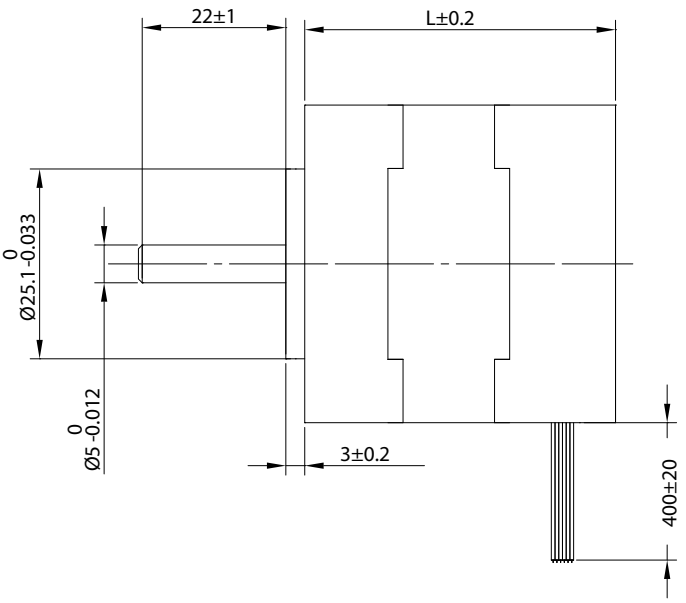


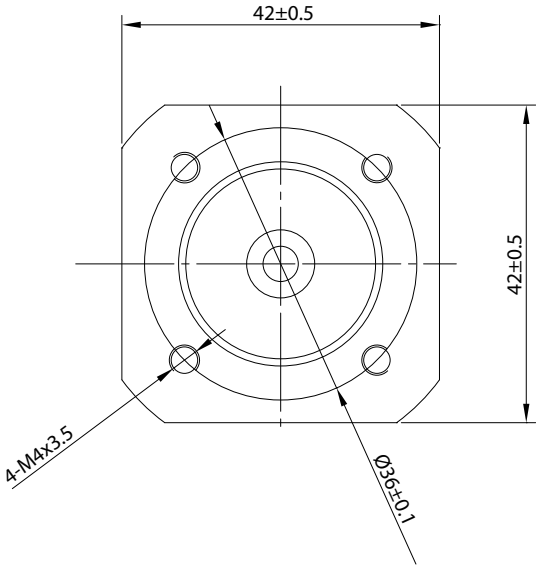
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

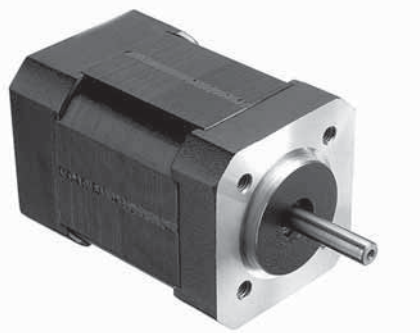




BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

	Model		42BLB03	42BLB04
1	N° of pole		6	6
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	0,3	0,43
6	Max Peak Torque	Nm	0,9	1,29
7	Torque Constant	Nm/A	0,062	0,062
8	Line to Line Resistance	Ω	0,54	0,4
9	Line to Line inductance	mH	0,45	0,3
10	Max Peak Current	A	14,5	20,8
11	Rated Current	A	4,84	6,94
12	No-Load Current	mA	330	450
13	Length	mm	80,3	100,3
14	Rotor Inertia	g-cm^2	120	140
15	Weight	Kg	0,8	1



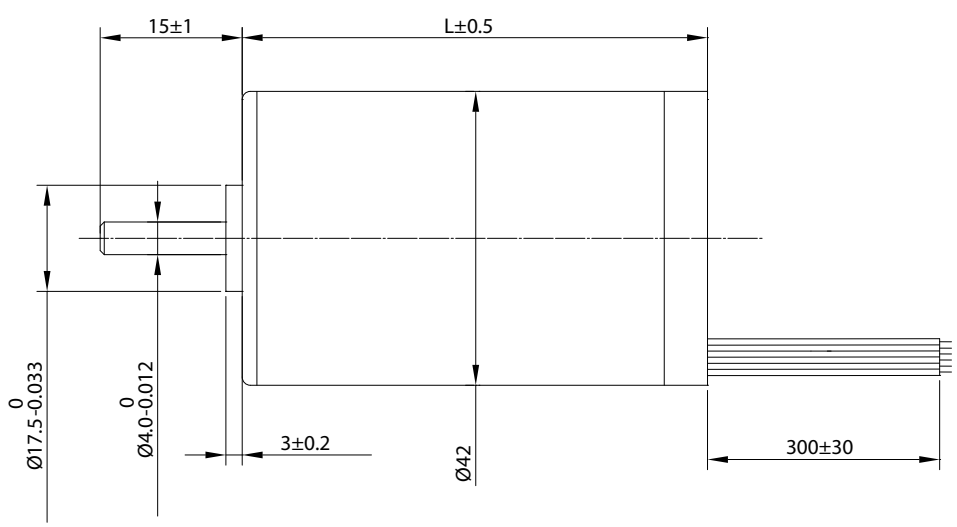
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 42RBL



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 19.05 mm

SPECIFICATION

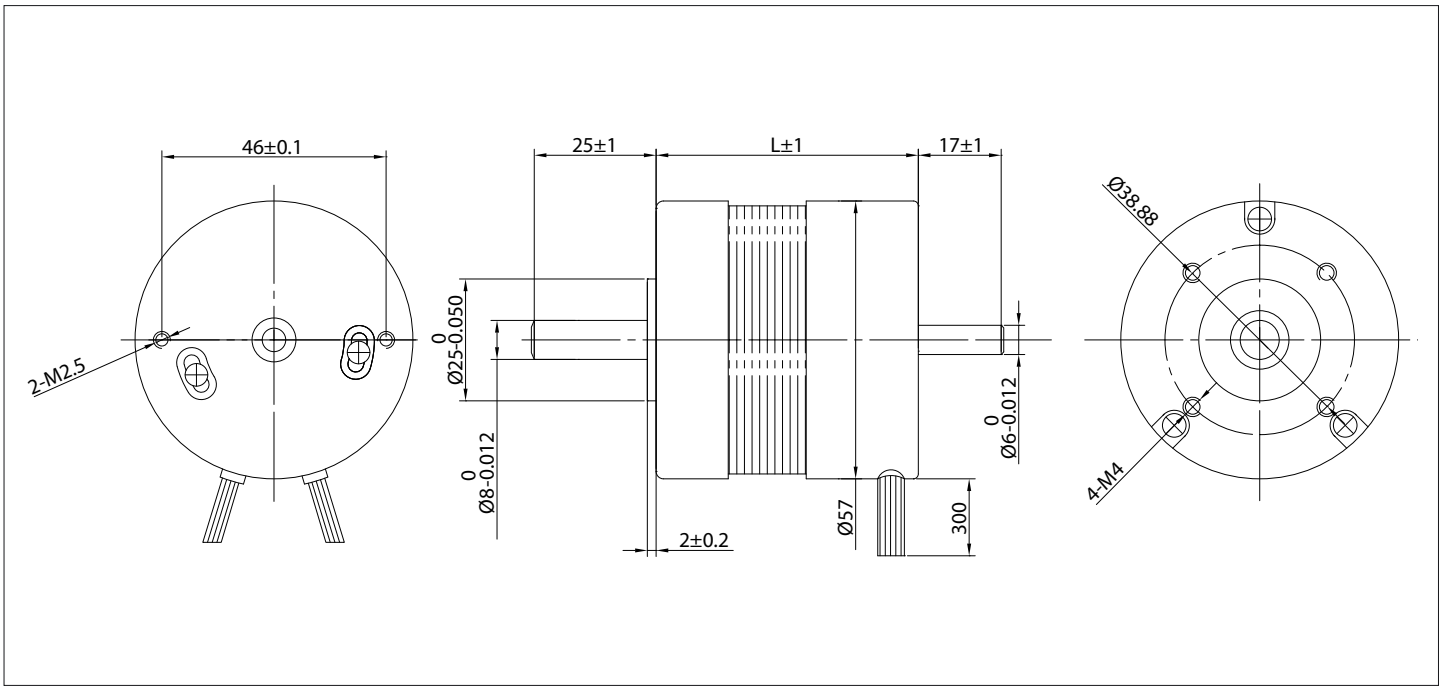
	Model		42RBL30	42RBL60	42RBL85
1	N° of pole		8	8	8
2	N° of phase		3	3	3
3	Rated Voltage	V	24	24	24
4	Rated Speed	rpm	4000	4000	4000
5	Rated Torque	Nm	0,02	0,06	0,15
6	Max Peak Torque	Nm	0,06	0,18	0,45
7	Torque Constant	Nm/A	0,039	0,038	0,036
8	Line to Line Resistance	Ω	5,9	1,6	0,71
9	Line to Line inductance	mH	5,1	1,94	0,86
10	Max Peak Current	A	1,7	4,4	11,4
11	Rated Current	A	0,51	1,58	4,17
12	No-Load Current	mA	160	230	280
13	Length	mm	30	60	85
14	Rotor Inertia	g-cm^2	15,6	33	84
15	Weight	Kg	0,25	0,4	0,7

CONNECTION

Lead N°	Color	Gauge	Function
1	Yellow	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Orange	UL1430 AWG26	Hall B
4	Brown	UL1430 AWG26	Hall C
5	White	UL1430 AWG26	Hall Sensor Ground
6	Green	UL1430 AWG22	Phase U
7	Red	UL1430 AWG22	Phase V
8	Black	UL1430 AWG22	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	15N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC



SPECIFICATION

	Model		57BL45	57BL54	57BL74
1	N° of pole		4	4	4
2	N° of phase		3	3	3
3	Rated Voltage	V	36	36	36
4	Rated Speed	rpm	4000	4000	4000
5	Rated Torque	Nm	0,055	0,11	0,22
6	Max Peak Torque	Nm	0,16	0,39	0,7
7	Torque Constant	Nm/A	0,052	0,061	0,06
8	Line to Line Resistance	Ω	4,1	1,5	0,58
9	Line to Line inductance	mH	10	4,4	2
10	Max Peak Current	A	3,5	6,8	12
11	Rated Current	A	1,06	1,80	3,67
12	No-Load Current	mA	240	300	400
13	Length	mm	43,6	53,6	73,6
14	Rotor Inertia	g-cm^2	30	75	119
15	Weight	Kg	0,33	0,44	0,72

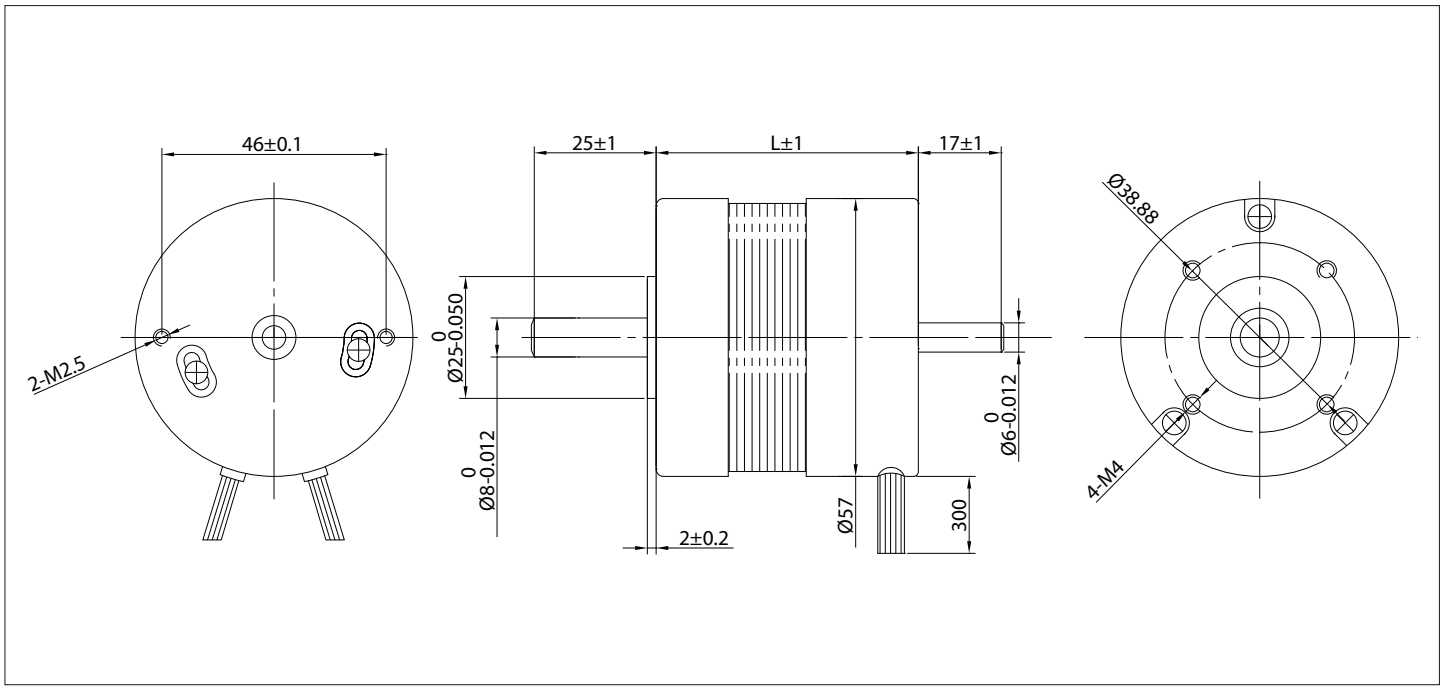
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (460 g load)	0,025 mm
Axial Play (4000 g load)	0,025 mm
Max Radial Force (10 mm from front flange)	75N
Max Axial Force	15N
Dielectric Strength	500 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 57BL



SPECIFICATION

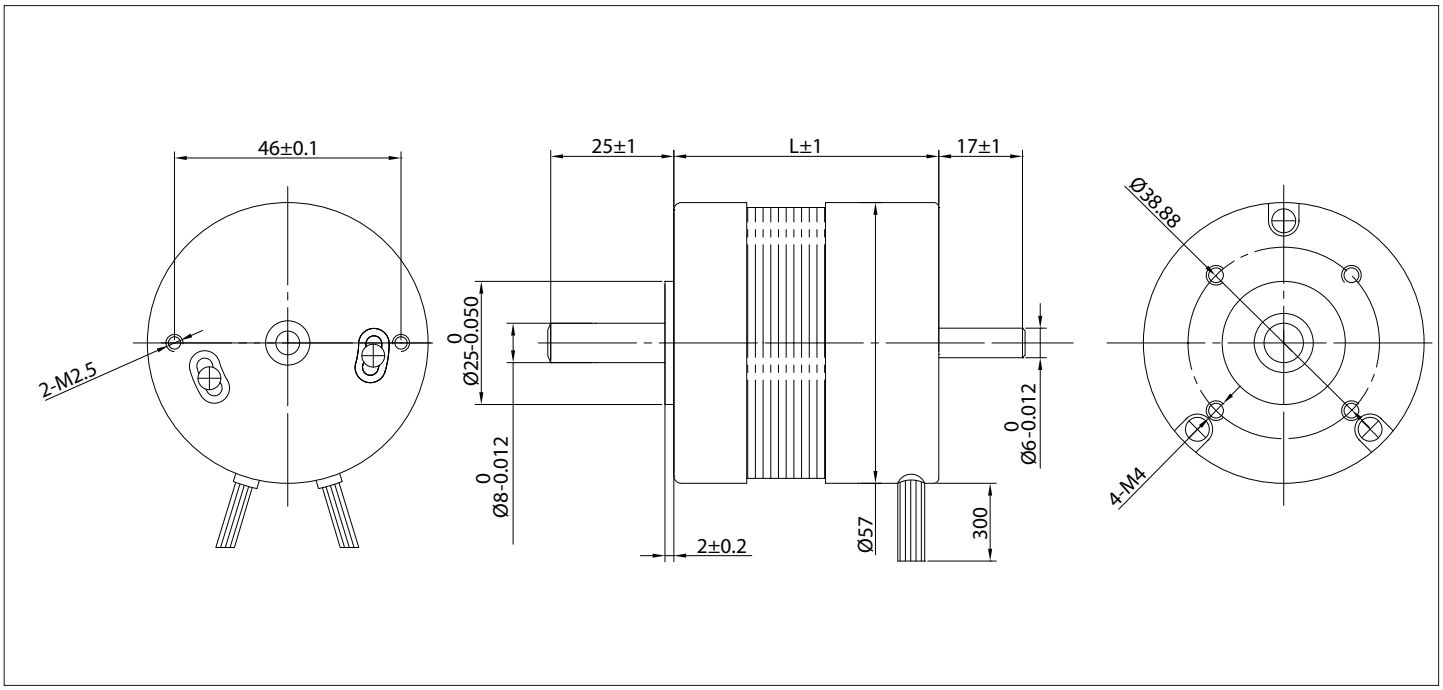
	Model		57BL94	57BL116
1	N° of pole		4	4
2	N° of phase		3	3
3	Rated Voltage	V	36	36
4	Rated Speed	rpm	4000	4000
5	Rated Torque	Nm	0,33	0,44
6	Max Peak Torque	Nm	1	1,27
7	Torque Constant	Nm/A	0,065	0,062
8	Line to Line Resistance	Ω	0,45	0,35
9	Line to Line inductance	mH	1,5	0,95
10	Max Peak Current	A	16	21
11	Rated Current	A	5,08	7,10
12	No-Load Current	mA	450	540
13	Length	mm	93,6	113,6
14	Rotor Inertia	g-cm^2	173	230
15	Weight	Kg	0,95	1,2

CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (460 g load)	0,025 mm
Axial Play (4000 g load)	0,025 mm
Max Radial Force (10 mm from front flange)	75N
Max Axial Force	15N
Dielectric Strength	500 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC



SPECIFICATION

	Model		57BLA01	57BLA02
1	N° of pole		6	6
2	N° of phase		3	3
3	Rated Voltage	V	36	36
4	Rated Speed	rpm	4000	4000
5	Rated Torque	Nm	0,2	0,4
6	Max Peak Torque	Nm	0,6	1,2
7	Torque Constant	Nm/A	0,07	0,07
8	Line to Line Resistance	Ω	0,95	0,4
9	Line to Line inductance	mH	1,2	0,55
10	Max Peak Current	A	8,6	16
11	Rated Current	A	2,86	5,71
12	No-Load Current	mA	350	400
13	Length	mm	53,6	73,6
14	Rotor Inertia	g-cm^2	275	375
15	Weight	Kg	0,52	0,75

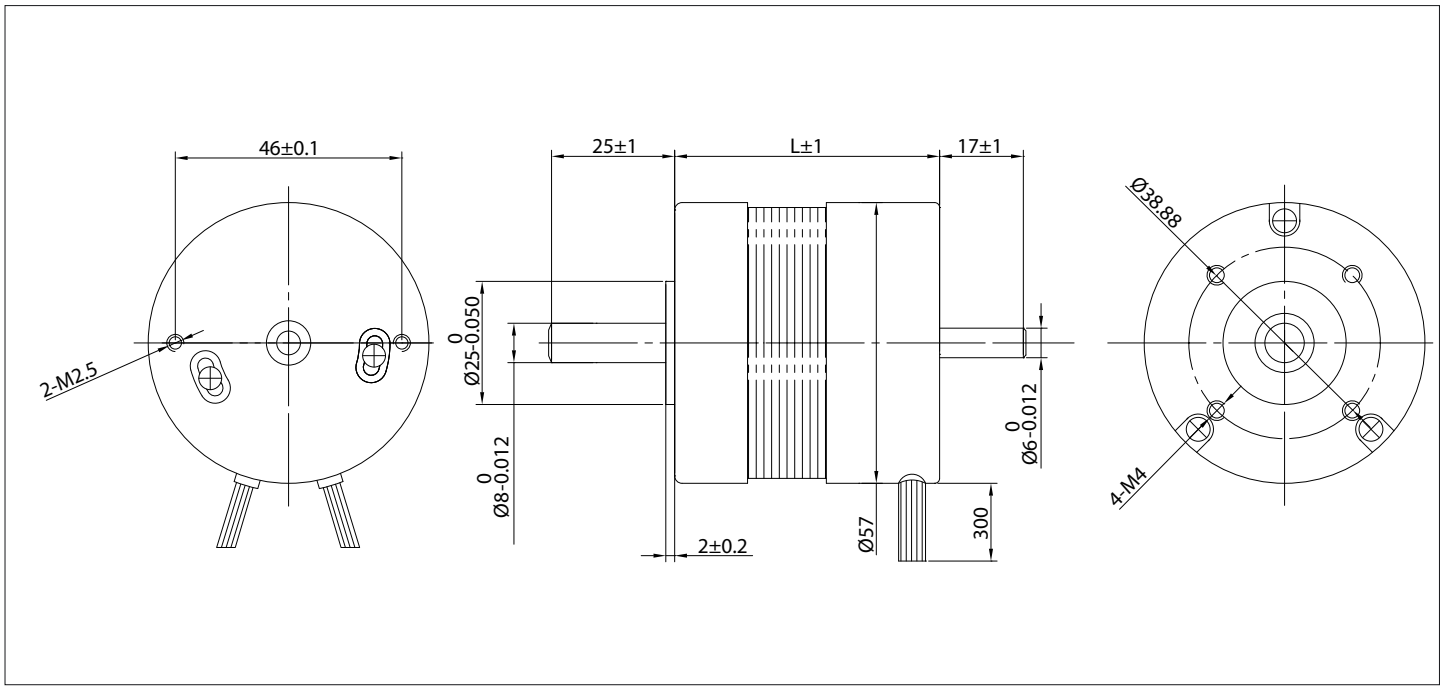
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	F
Radial Play (460 g load)	0,025 mm
Axial Play (4000 g load)	0,025 mm
Max Radial Force (20 mm from front flange)	115N
Max Axial Force	45N
Dielectric Strength	500 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 57BLA



SPECIFICATION

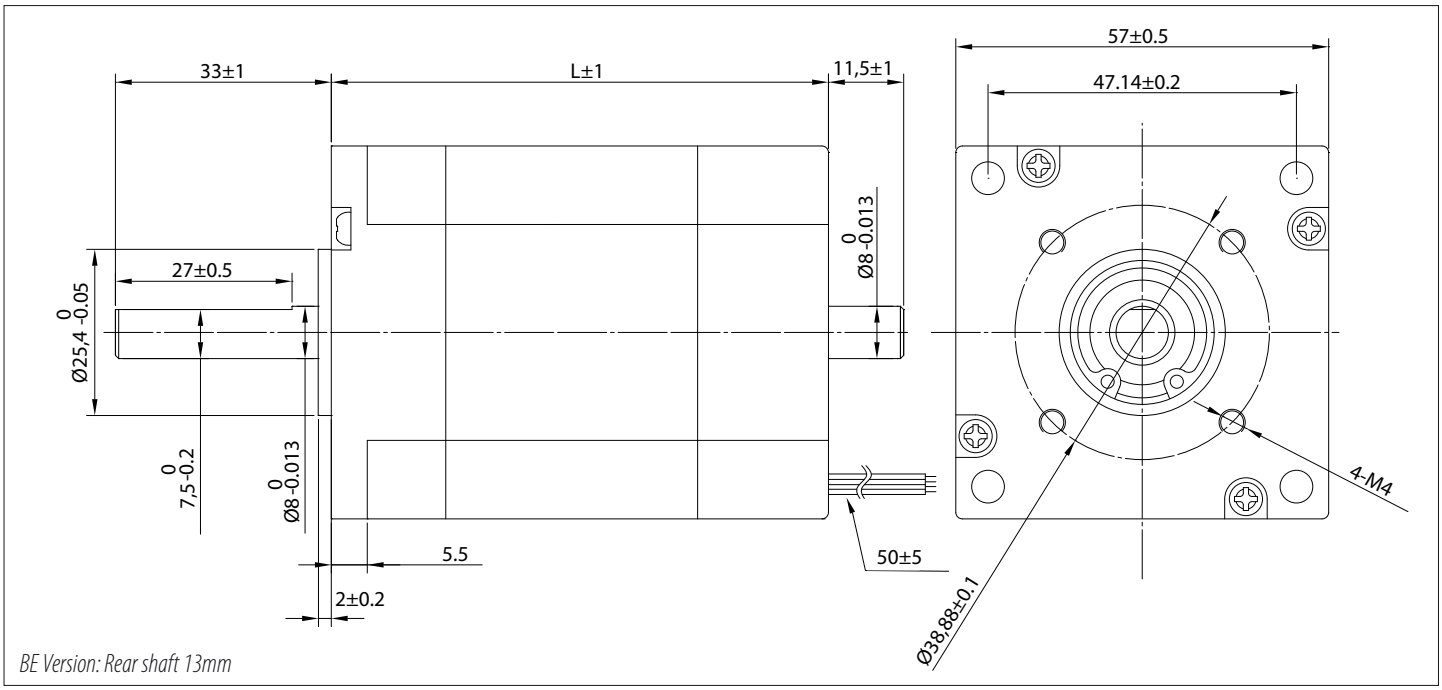
	Model		57BLA03	57BLA04
1	N° of pole		6	6
2	N° of phase		3	3
3	Rated Voltage	V	36	36
4	Rated Speed	rpm	4000	4000
5	Rated Torque	Nm	0,6	0,8
6	Max Peak Torque	Nm	1,8	2,4
7	Torque Constant	Nm/A	0,06	0,07
8	Line to Line Resistance	Ω	0,25	0,2
9	Line to Line inductance	mH	0,4	0,25
10	Max Peak Current	A	29	35
11	Rated Current	A	10	11,43
12	No-Load Current	mA	580	240
13	Length	mm	93,6	113,6
14	Rotor Inertia	g-cm^2	510	693
15	Weight	Kg	1	1,25

CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG20	Phase U
7	Red	UL1430 AWG20	Phase V
8	Black	UL1430 AWG20	Phase W

CHARACTERISTICS

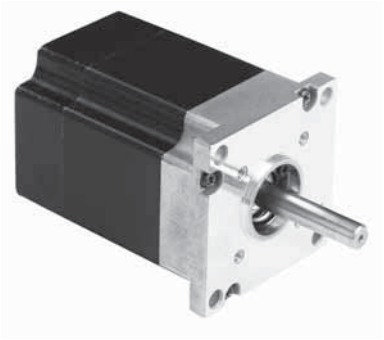
Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	F
Radial Play (460 g load)	0,025 mm
Axial Play (4000 g load)	0,025 mm
Max Radial Force (20 mm from front flange)	115N
Max Axial Force	45N
Dielectric Strength	500 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC



BE Version: Rear shaft 13mm

SPECIFICATION

	Model		57BLB40	57BLB60	57BLB80
1	N° of pole		8	8	8
2	N° of phase		3	3	3
3	Rated Voltage	V	36	36	36
4	Rated Speed	rpm	3000	3000	3000
5	Rated Torque	Nm	0,3	0,45	0,6
6	Max Peak Torque	Nm	0,9	1,35	1,8
7	Torque Constant	Nm/A	0,08	0,08	0,08
8	Line to Line Resistance	Ω	1,2	0,8	0,5
9	Line to Line inductance	mH	1,2	0,8	0,6
10	Max Peak Current	A	12,3	18,2	23,8
11	Rated Current	A	3,75	5,63	7,5
12	No-Load Current	mA	400	550	620
13	Length	mm	76	96	116
14	Rotor Inertia	g-cm^2	210	320	430
15	Weight	Kg	0,8	1	1,2



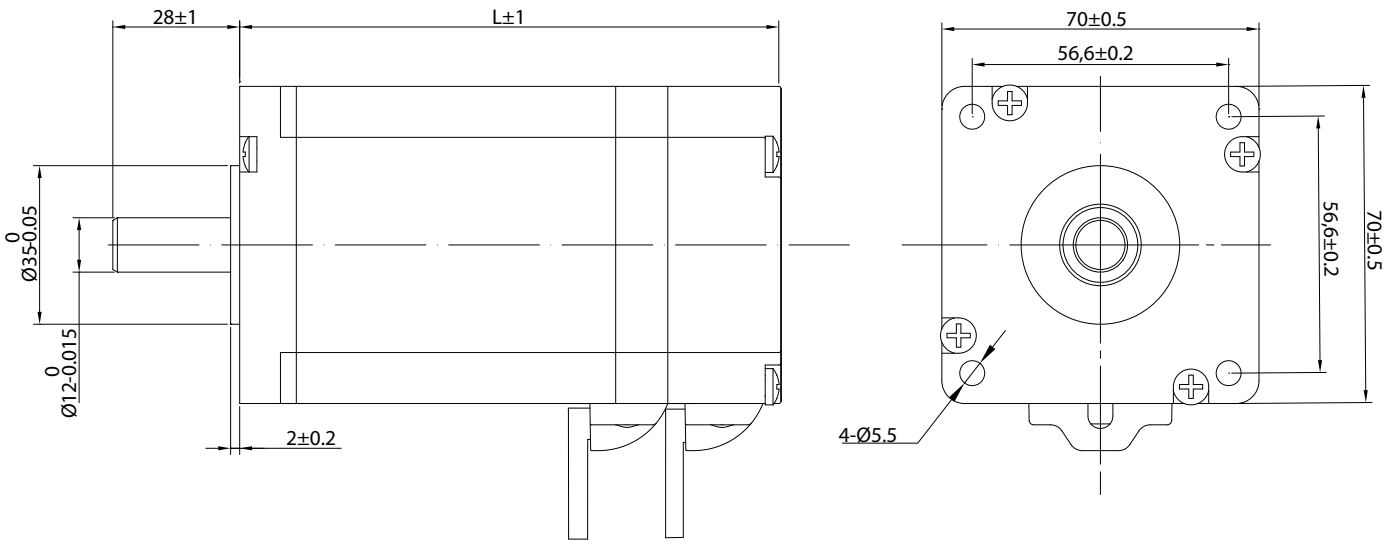
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL3265 AWG28	Vcc Hall Sensor +5 to +24 Vdc
2	Yellow	UL3265 AWG28	Hall A
3	Blue	UL3265 AWG28	Hall B
4	Purple	UL3265 AWG28	Hall C
5	Black	UL3265 AWG28	Hall Sensor Ground
6	Red	UL1430 AWG18	Phase U
7	Blue	UL1430 AWG18	Phase V
8	Black	UL1430 AWG18	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,025 mm
Axial Play (4000 g load)	0,025 mm
Max Radial Force (10 mm from front flange)	115N
Max Axial Force	45N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 70BLS



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

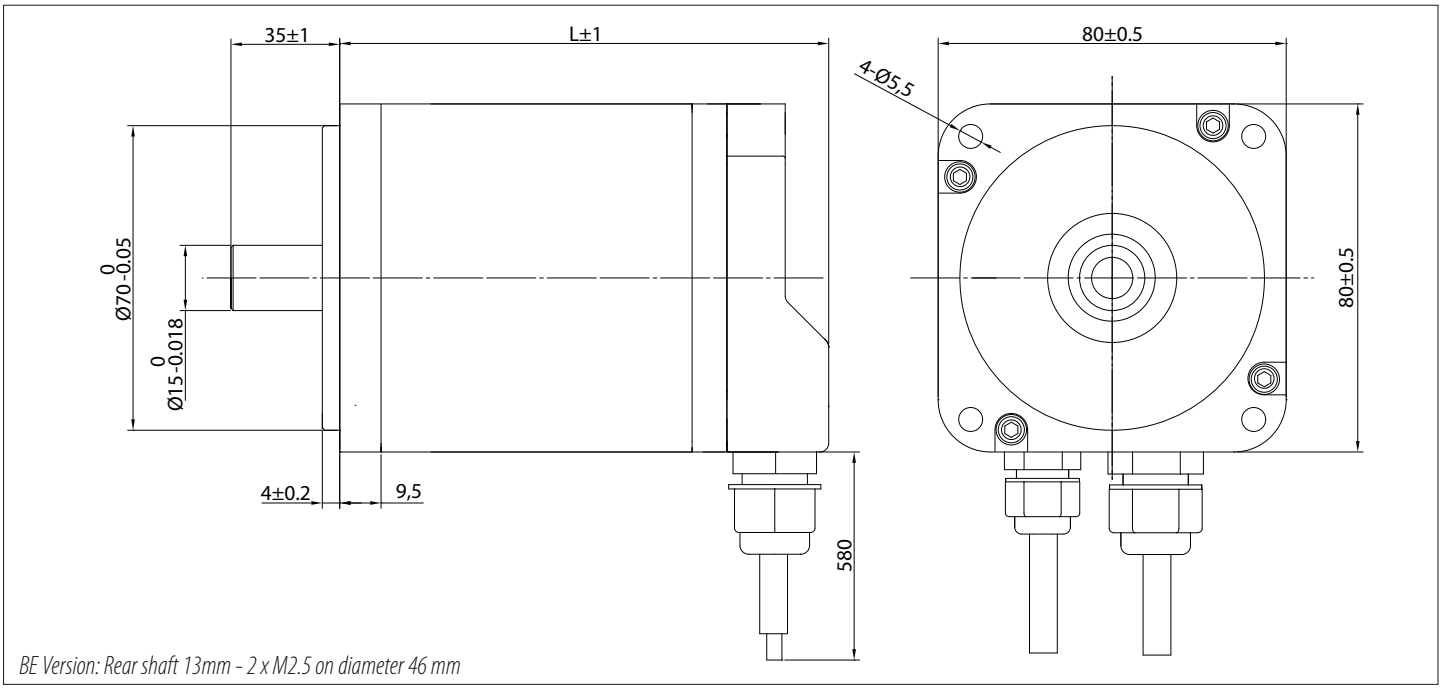
	Model		70BLS86	70BLS116	70BLS136
1	N° of pole		8	8	8
2	N° of phase		3	3	3
3	Rated Voltage	V	48	48	48
4	Rated Speed	rpm	3000	3000	3000
5	Rated Torque	Nm	0,5	1	1,5
6	Max Peak Torque	Nm	1,5	3	4,5
7	Torque Constant	Nm/A	0,12	0,12	0,12
8	Line to Line Resistance	Ω	0,60	0,30	0,22
9	Line to Line inductance	mH	1,40	0,70	0,55
10	Max Peak Current	A	13	26	38
11	Rated Current	A	4,17	8,33	12,50
12	No-Load Current	mA	600	600	600
13	Length	mm	86	116	136
14	Rotor Inertia	g-cm^2	200	400	600
15	Weight	Kg	1,3	2,1	2,9

CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL2464 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL2464 AWG26	Hall A
3	Green	UL2464 AWG26	Hall B
4	White	UL2464 AWG26	Hall C
5	Black	UL2464 AWG26	Hall Sensor Ground
6	Yellow	UL2464 AWG16	Phase U
7	Red	UL2464 AWG16	Phase V
8	Black	UL2464 AWG16	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	115N
Max Axial Force	45N
Dielectric Strength	600 VAC for one second
Insulation Resistance	100 Mohm min. 500 VDC



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

	Model		80BLS84	80BLS105
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	48	48
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	0,9	1,7
6	Max Peak Torque	Nm	2,5	5
7	Torque Constant	Nm/A	0,118	0,113
8	Line to Line Resistance	Ω	0,25	0,10
9	Line to Line inductance	mH	1,3	0,6
10	Max Peak Current	A	22	45
11	Rated Current	A	7,63	15,04
12	No-Load Current	mA	500	700
13	Length	mm	84	105
14	Rotor Inertia	g-cm^2	544	1020
15	Weight	Kg	1,6	2

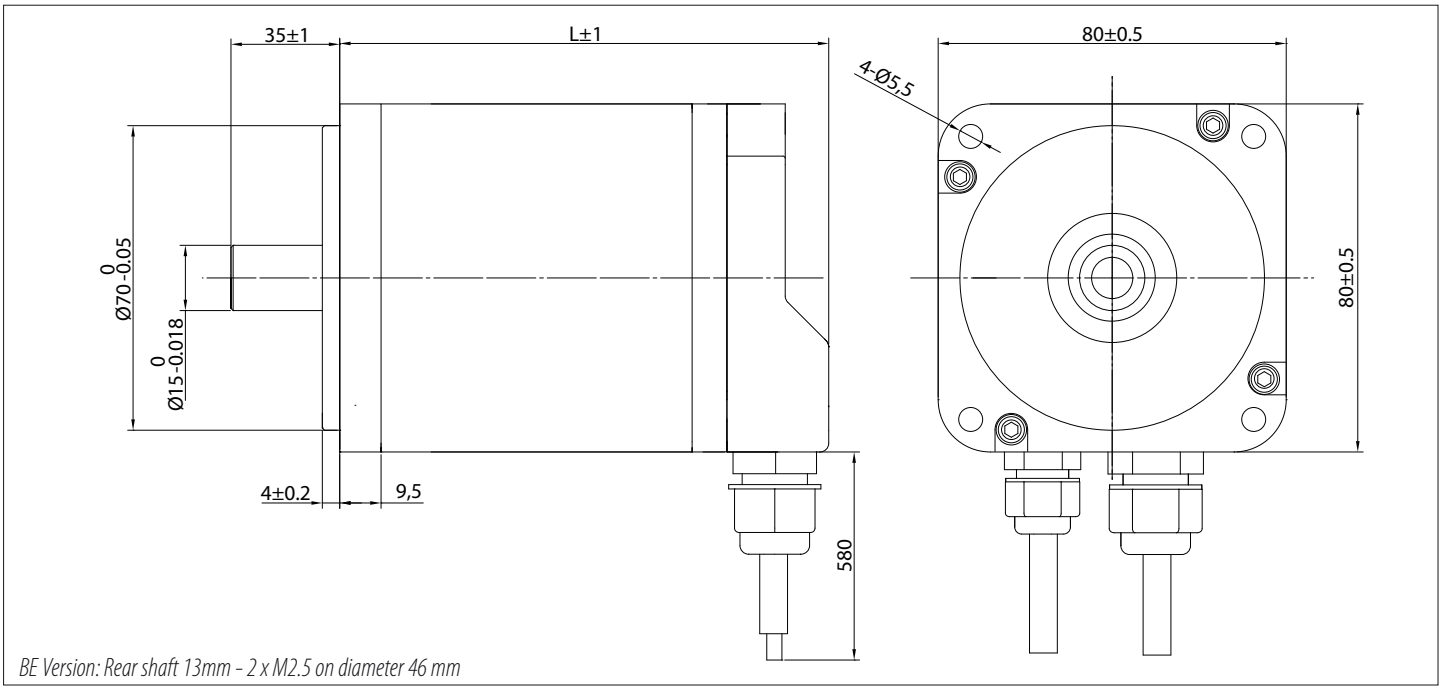
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1332 AWG22	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1332 AWG22	Hall A
3	Green	UL1332 AWG22	Hall B
4	White	UL1332 AWG22	Hall C
5	Black	UL1332 AWG22	Hall Sensor Ground
6	Yellow	UL3135 AWG14	Phase U
7	Red	UL3135 AWG14	Phase V
8	Black	UL3135 AWG14	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	F
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	115N
Max Axial Force	45N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 80BLS



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

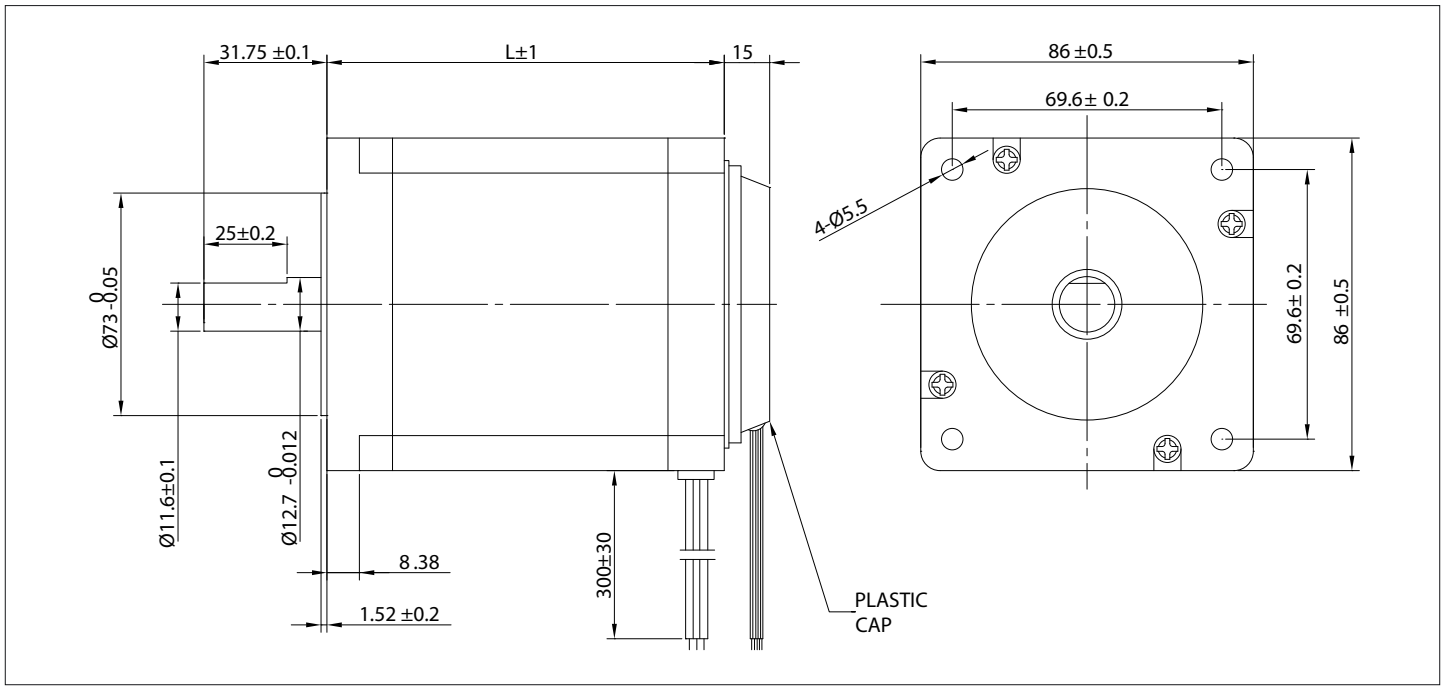
	Model		80BLS120	80BLS125
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	48	48
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	2,2	3
6	Max Peak Torque	Nm	6,5	8,5
7	Torque Constant	Nm/A	0,109	0,111
8	Line to Line Resistance	Ω	0,07	0,057
9	Line to Line inductance	mH	0,4	0,3
10	Max Peak Current	A	61	78
11	Rated Current	A	20,18	27,03
12	No-Load Current	mA	1000	1500
13	Length	mm	120	140
14	Rotor Inertia	g-cm^2	1360	1900
15	Weight	Kg	2,5	2,9

CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1332 AWG22	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1332 AWG22	Hall A
3	Green	UL1332 AWG22	Hall B
4	White	UL1332 AWG22	Hall C
5	Black	UL1332 AWG22	Hall Sensor Ground
6	Yellow	UL3135 AWG14	Phase U
7	Red	UL3135 AWG14	Phase V
8	Black	UL3135 AWG14	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	F
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	115N
Max Axial Force	45N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC



SPECIFICATION

	Model		86BLS58	86BLS71
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	48	48
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	0,35	0,7
6	Max Peak Torque	Nm	1,05	2,1
7	Torque Constant	Nm/A	0,116	0,124
8	Line to Line Resistance	Ω	0,90	0,34
9	Line to Line inductance	mH	2,60	1,00
10	Max Peak Current	A	9,5	20
11	Rated Current	A	3,02	5,65
12	No-Load Current	mA	540	800
13	Length	mm	58	71
14	Rotor Inertia	g-cm^2	400	800
15	Weight	Kg	1,6	2,12

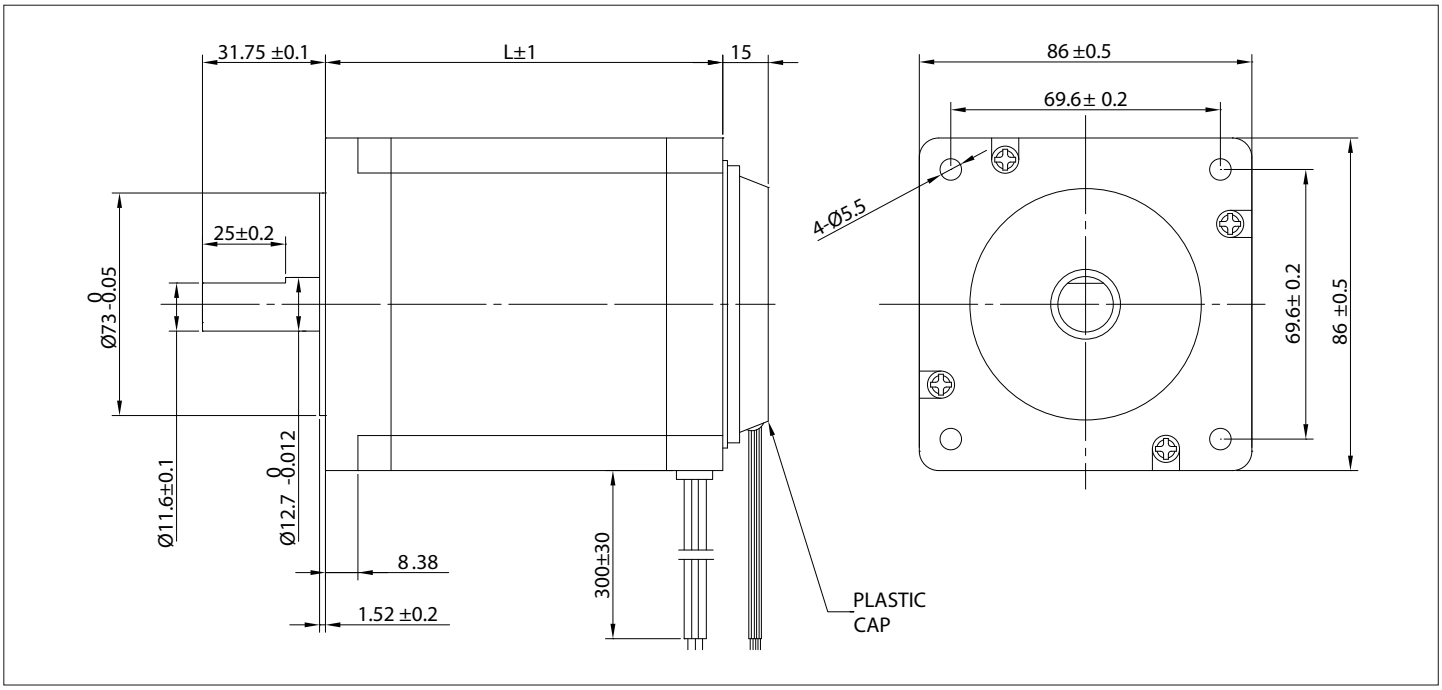
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1332 AWG22	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1332 AWG22	Hall A
3	Green	UL1332 AWG22	Hall B
4	White	UL1332 AWG22	Hall C
5	Black	UL1332 AWG22	Hall Sensor Ground
6	Yellow & Yellow/White	UL1332 AWG18	Phase U
7	Red & Red/White	UL1332 AWG18	Phase V
8	Black & Black/White	UL1332 AWG18	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220N
Max Axial Force	60N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 86BLS



SPECIFICATION

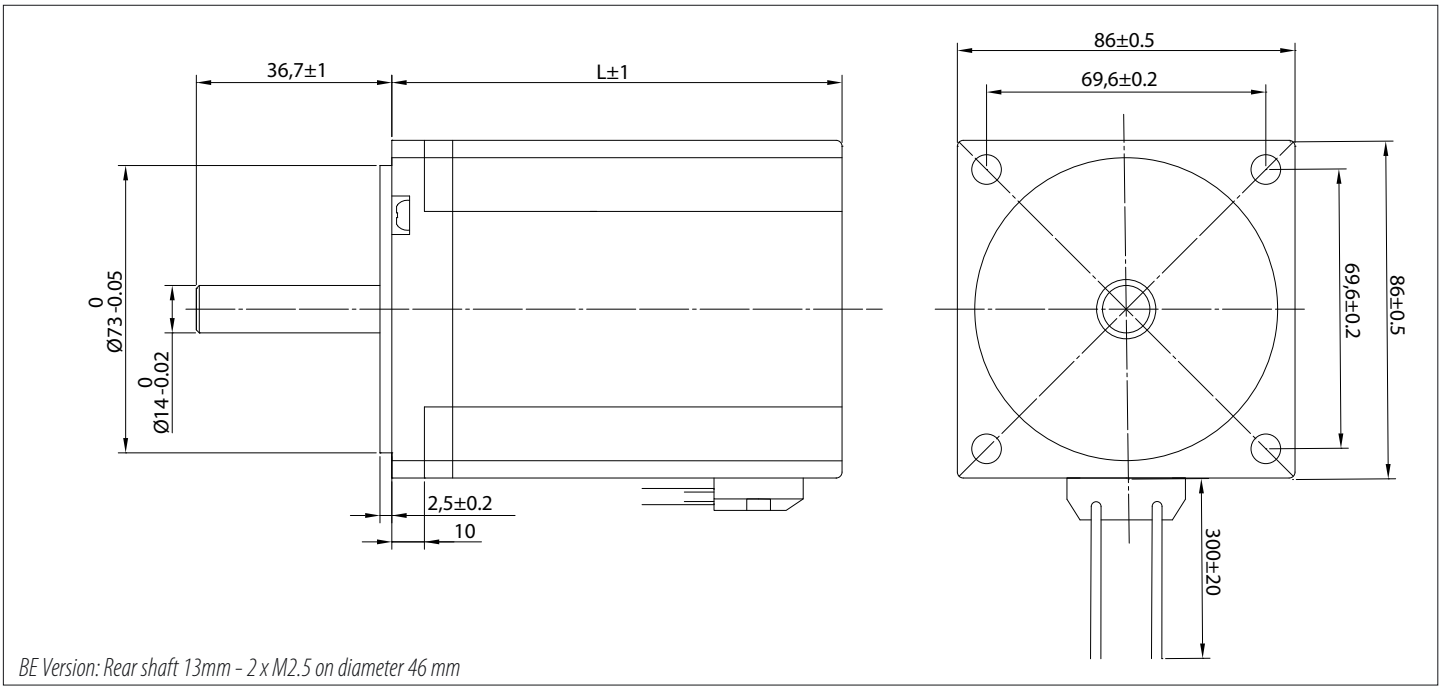
	Model		86BLS98	86BLS125
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	48	48
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	1,4	2,1
6	Max Peak Torque	Nm	4,2	6,3
7	Torque Constant	Nm/A	0,127	0,128
8	Line to Line Resistance	Ω	0,16	0,10
9	Line to Line inductance	mH	0,50	0,31
10	Max Peak Current	A	33	56
11	Rated Current	A	11,02	16,41
12	No-Load Current	mA	1450	1640
13	Length	mm	98	125
14	Rotor Inertia	g-cm^2	1600	2400
15	Weight	Kg	3,15	4,2

CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1332 AWG22	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1332 AWG22	Hall A
3	Green	UL1332 AWG22	Hall B
4	White	UL1332 AWG22	Hall C
5	Black	UL1332 AWG22	Hall Sensor Ground
6	Yellow & Yellow/White	UL1332 AWG18	Phase U
7	Red & Red/White	UL1332 AWG18	Phase V
8	Black & Black/White	UL1332 AWG18	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220N
Max Axial Force	60N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

	Model		86BLC64	86BLC77
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	48	48
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	0,4	0,8
6	Max Peak Torque	Nm	1,2	2,4
7	Torque Constant	Nm/A	0,122	0,149
8	Line to Line Resistance	Ω	1	0,34
9	Line to Line Inductance	mH	1,40	0,60
10	Max Peak Current	A	11	17,5
11	Rated Current	A	3,28	5,37
12	No-Load Current	mA	380	550
13	Length	mm	64	77
14	Rotor Inertia	g-cm^2	400	800
15	Weight	Kg	1,5	1,85

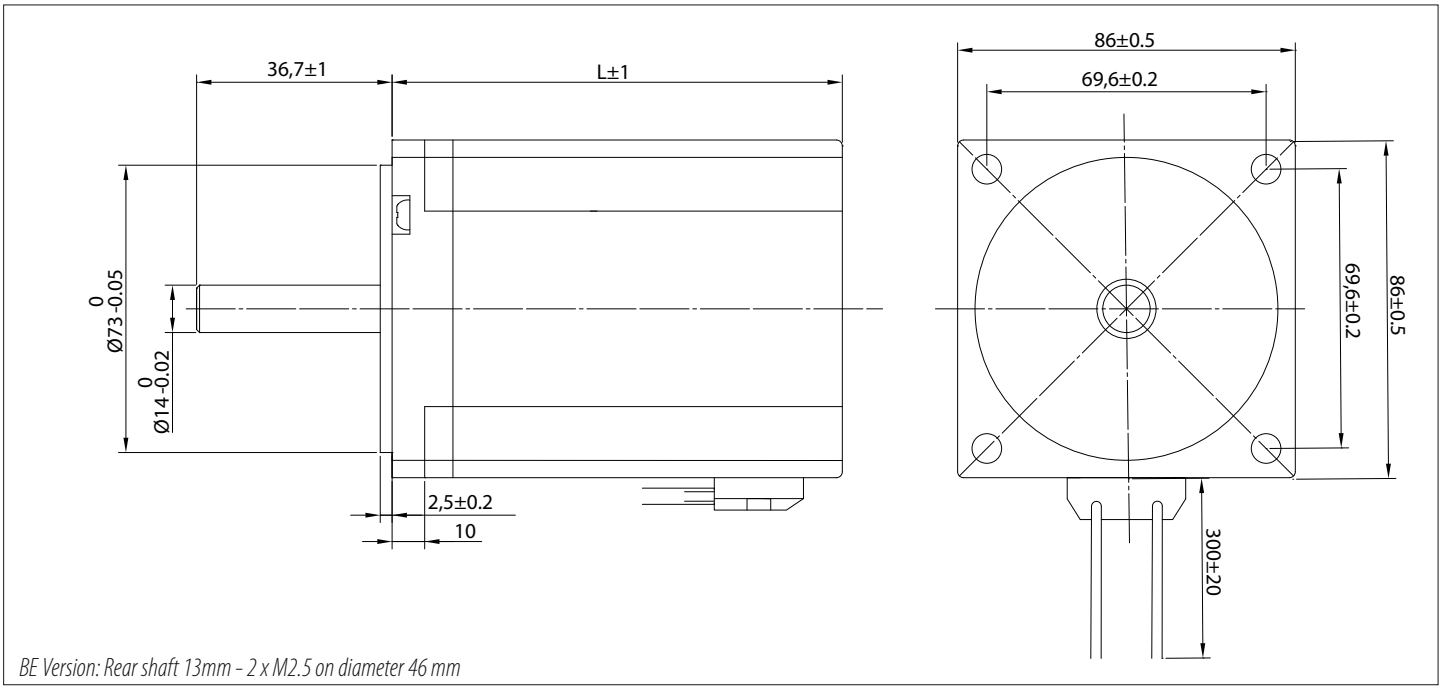
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1332 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1332 AWG26	Hall A
3	Green	UL1332 AWG26	Hall B
4	White	UL1332 AWG26	Hall C
5	Black	UL1332 AWG26	Hall Sensor Ground
6	Yellow	UL1332 AWG14	Phase U
7	Red	UL1332 AWG14	Phase V
8	Black	UL1332 AWG14	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (400 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220N 2
Max Axial Force	45N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor 86BLC



BE Version: Rear shaft 13mm - 2 x M2.5 on diameter 46 mm

SPECIFICATION

	Model		86BLC105	86BLC125
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	48	48
4	Rated Speed	rpm	3000	3000
5	Rated Torque	Nm	1,6	2,22
6	Max Peak Torque	Nm	4,8	6,66
7	Torque Constant	Nm/A	0,135	0,131
8	Line to Line Resistance	Ω	0,14	0,10
9	Line to Line inductance	mH	0,36	0,24
10	Max Peak Current	A	37	52
11	Rated Current	A	11,85	16,95
12	No-Load Current	mA	860	1200
13	Length	mm	105	125
14	Rotor Inertia	g-cm^2	1600	2400
15	Weight	Kg	2,7	4

CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1332 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1332 AWG26	Hall A
3	Green	UL1332 AWG26	Hall B
4	White	UL1332 AWG26	Hall C
5	Black	UL1332 AWG26	Hall Sensor Ground
6	Yellow	UL1332 AWG14	Phase U
7	Red	UL1332 AWG14	Phase V
8	Black	UL1332 AWG14	Phase W

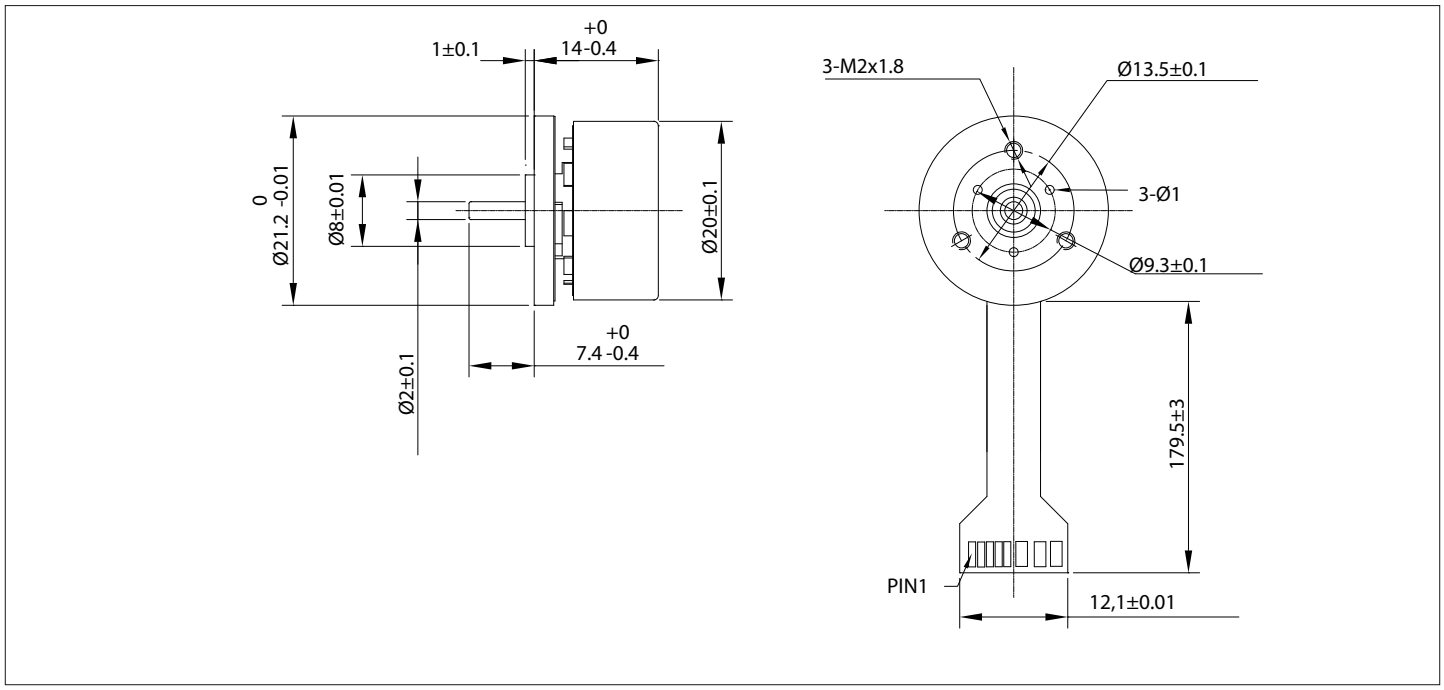
CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (400 g load)	0,08 mm
Max Radial Force (20 mm from front flange)	220N
Max Axial Force	45N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Flat Brushless motor

Miniaturization without any compromise on performance. Our Flat Brushless motors, with multipolar outer-rotor design, are perfectly suitable for applications where power density in the design selection criteria is requested. The BLW range will perfectly fit Healthcare and Robotics applications in direct drive or coupled to our wide range of gearboxes.

Brushless Flat 20BLW14



SPECIFICATION

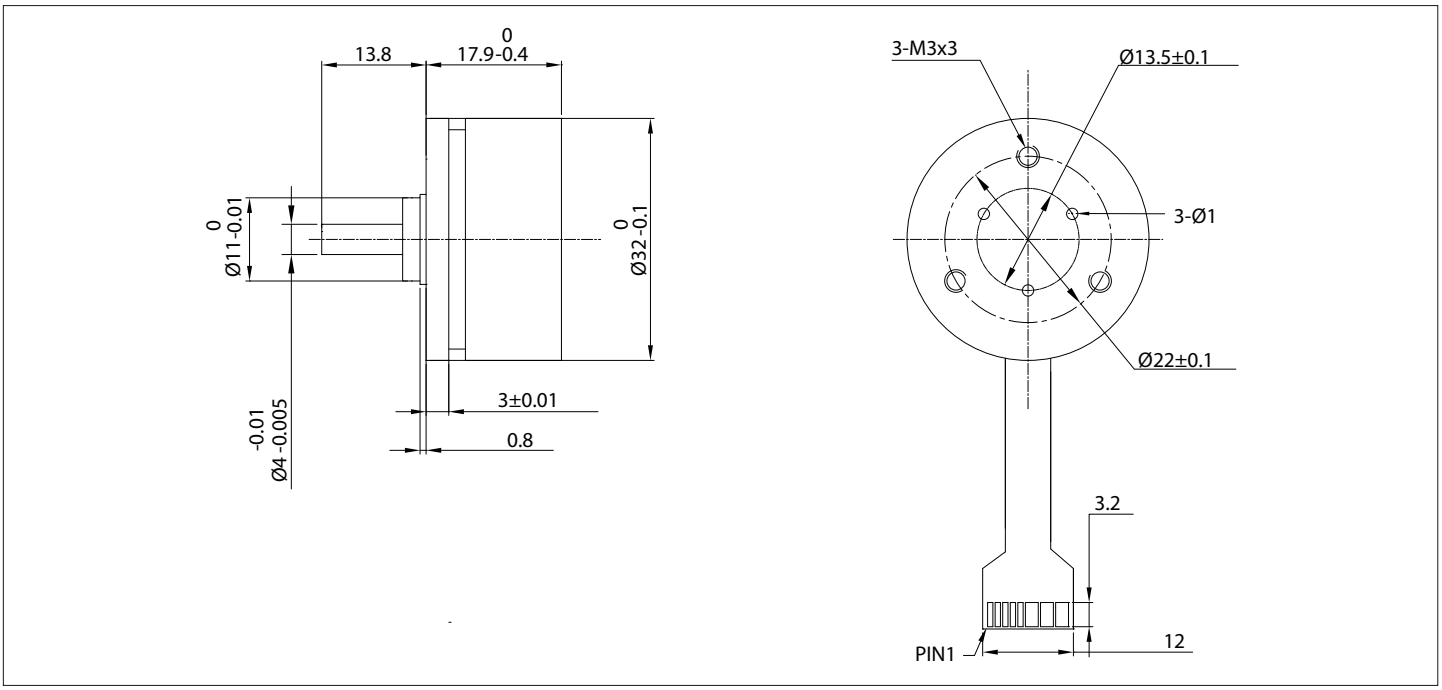
	Model		20BLW14-12V	20BLW14-24V
1	N° OF POLE		8	8
2	N° OF PHASE		3	3
3	RATED VOLTAGE	V	12	24
4	RATED SPEED	rpm	5170	5220
5	RATED TORQUE	Nm	0,0075	0,0077
6	MAX PEAK TORQUE	Nm	0,019	0,02
7	TORQUE CONSTANT	Nm/A	0,012	0,024
8	LINE TO LINE RESISTANCE	Ω	6,9	25,8
9	LINE TO LINE INDUCTANCE	mH	0,7	2,8
10	MAX PEAK CURRENT	A	1,62	0,85
11	RATED CURRENT	A	0,63	0,32
12	NO-LOAD CURRENT	mA	230	120
13	LENGTH	mm	14	14
14	ROTOR INERTIA	g-cm^2	5,1	5,1
15	WEIGHT	Kg	0,023	0,023

CONNECTION

Pin N°	Connector	Function
1	PFC CABLE	+ 5V DC
2	PFC CABLE	HALL C
3	PFC CABLE	HALL A
4	PFC CABLE	HALL B
5	PFC CABLE	GND
6	PFC CABLE	PHASE W
7	PFC CABLE	PHASE V
8	PFC CABLE	PHASE U

CHARACTERISTICS

Item	
HALL EFFECT ANGLE	120°
SHAFT RUN OUT	0,025 mm
INSULATION CLASS	B
RADIAL PLAY (450 g LOAD)	0,02 mm
AXIAL PLAY (450 g LOAD)	0,08 mm
MAX RADIAL FORCE (10 mm FROM FRONT FLANGE)	5N
MAX AXIAL FORCE	2N
DIELECTRIC STRENGTH	500 VDC FOR ONE MINUTE
INSULATION RESISTANCE	100 Mohm min. 500 VDC



SPECIFICATION

	Model		32BLW18-9V	32BLW18-12V
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	9	12
4	Rated Speed	rpm	2100	2800
5	Rated Torque	Nm	0,025	0,025
6	Max Peak Torque	Nm	0,075	0,075
7	Torque Constant	Nm/A	0,023	0,025
8	Line to Line Resistance	Ω	3	3
9	Line to Line inductance	mH	1,6	1,9
10	Max Peak Current	A	3,4	3,2
11	Rated Current	A	1,09	1
12	No-Load Current	mA	290	190
13	Length	mm	17,9	17,9
14	Rotor Inertia	g-cm^2	35	35
15	Weight	Kg	0,05	0,05

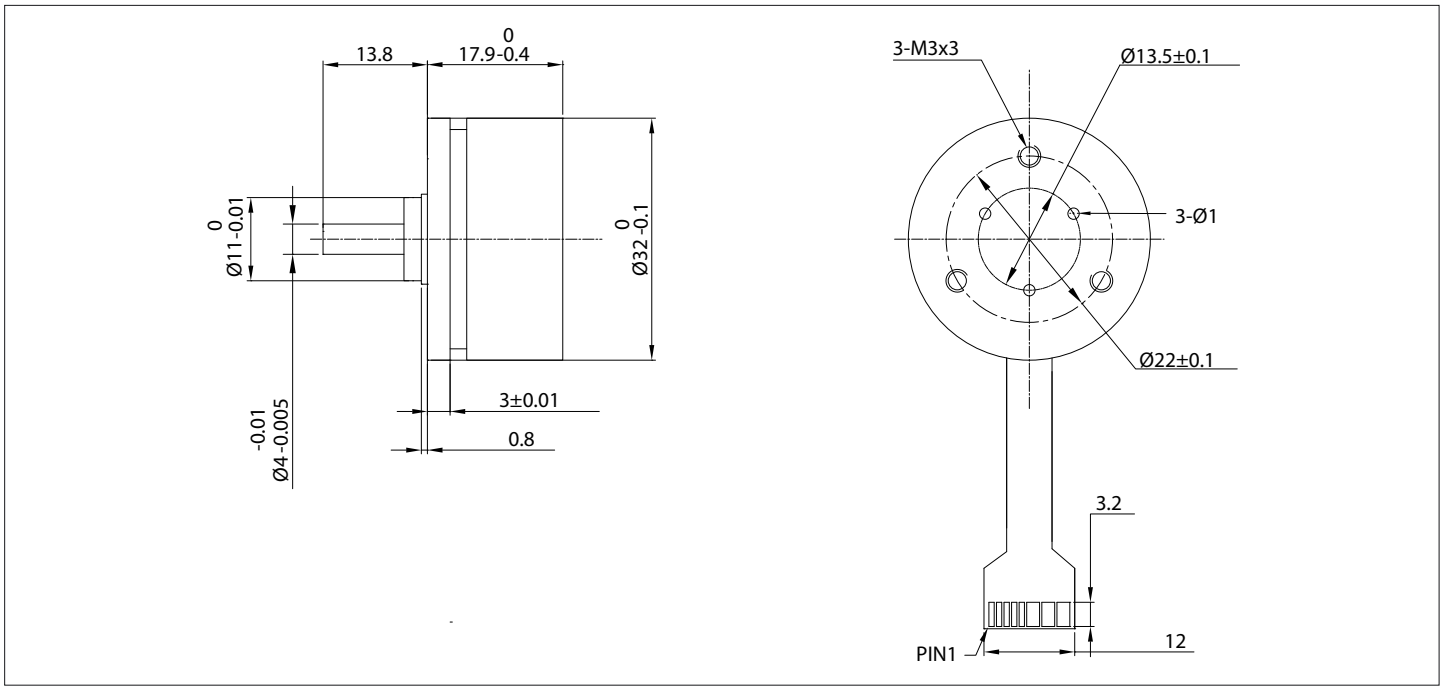
CONNECTION

Pin N°	Connector	Function
1	PFC CABLE	+ 5V DC
2	PFC CABLE	Hall C
3	PFC CABLE	Hall A
4	PFC CABLE	Hall B
5	PFC CABLE	GND
6	PFC CABLE	PHASE W
7	PFC CABLE	PHASE V
8	PFC CABLE	PHASE U

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,03 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,06 mm
Max Radial Force (10 mm from front flange)	14N
Max Axial Force	4N
Dielectric Strength	250 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Flat 32BLW18



SPECIFICATION

	Model		32BLW18-24V	32BLW18-48V
1	N° OF POLE		8	8
2	N° OF PHASE		3	3
3	RATED VOLTAGE	V	24	48
4	RATED SPEED	rpm	2760	2950
5	RATED TORQUE	Nm	0,026	0,025
6	MAX PEAK TORQUE	Nm	0,075	0,075
7	TORQUE CONSTANT	Nm/A	0,051	0,096
8	LINE TO LINE RESISTANCE	Ω	13	53
9	LINE TO LINE INDUCTANCE	mH	7,7	28
10	MAX PEAK CURRENT	A	1,7	0,97
11	RATED CURRENT	A	0,51	0,26
12	NO-LOAD CURRENT	mA	100	90
13	LENGTH	mm	17,9	17,9
14	ROTOR INERTIA	g-cm^2	35	35
15	WEIGHT	Kg	0,05	0,05

CONNECTION

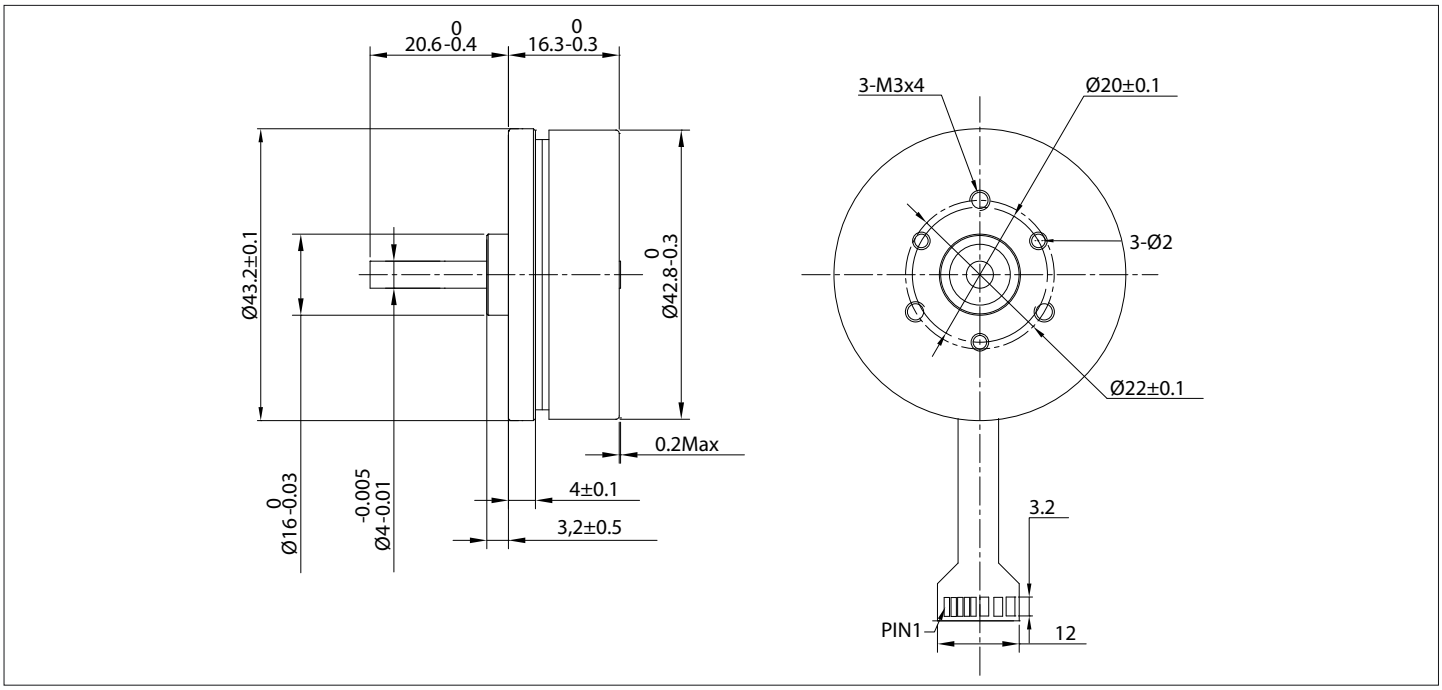
Pin N°	Connector	Function
1	PFC CABLE	+ 5V DC
2	PFC CABLE	HALL C
3	PFC CABLE	HALL A
4	PFC CABLE	HALL B
5	PFC CABLE	GND
6	PFC CABLE	PHASE W
7	PFC CABLE	PHASE V
8	PFC CABLE	PHASE U

CHARACTERISTICS

Item	
HALL EFFECT ANGLE	120°
SHAFT RUN OUT	0,03 mm
INSULATION CLASS	B
RADIAL PLAY (450 g LOAD)	0,02 mm
AXIAL PLAY (450 g LOAD)	0,06 mm
MAX RADIAL FORCE (10 mm FROM FRONT FLANGE)	14N
MAX AXIAL FORCE	4N
DIELECTRIC STRENGTH	250 VAC FOR ONE MINUTE
INSULATION RESISTANCE	100 Mohm min. 500 VDC

Brushless Flat 45BLW16

Flat Ribbon Cable



SPECIFICATION

	Model		45BLW16
1	N° OF POLE		16
2	N° OF PHASE		3
3	RATED VOLTAGE	V	12
4	RATED SPEED	rpm	2910
5	RATED TORQUE	Nm	0,055
6	MAX PEAK TORQUE	Nm	0,16
7	TORQUE CONSTANT	Nm/A	0,026
8	LINE TO LINE RESISTANCE	Ω	0,9
9	LINE TO LINE INDUCTANCE	mH	0,34
10	MAX PEAK CURRENT	A	6,3
11	RATED CURRENT	A	2,12
12	NO-LOAD CURRENT	mA	320
13	LENGTH	mm	16
14	ROTOR INERTIA	g-cm^2	92,5
15	WEIGHT	Kg	0,08

CONNECTION

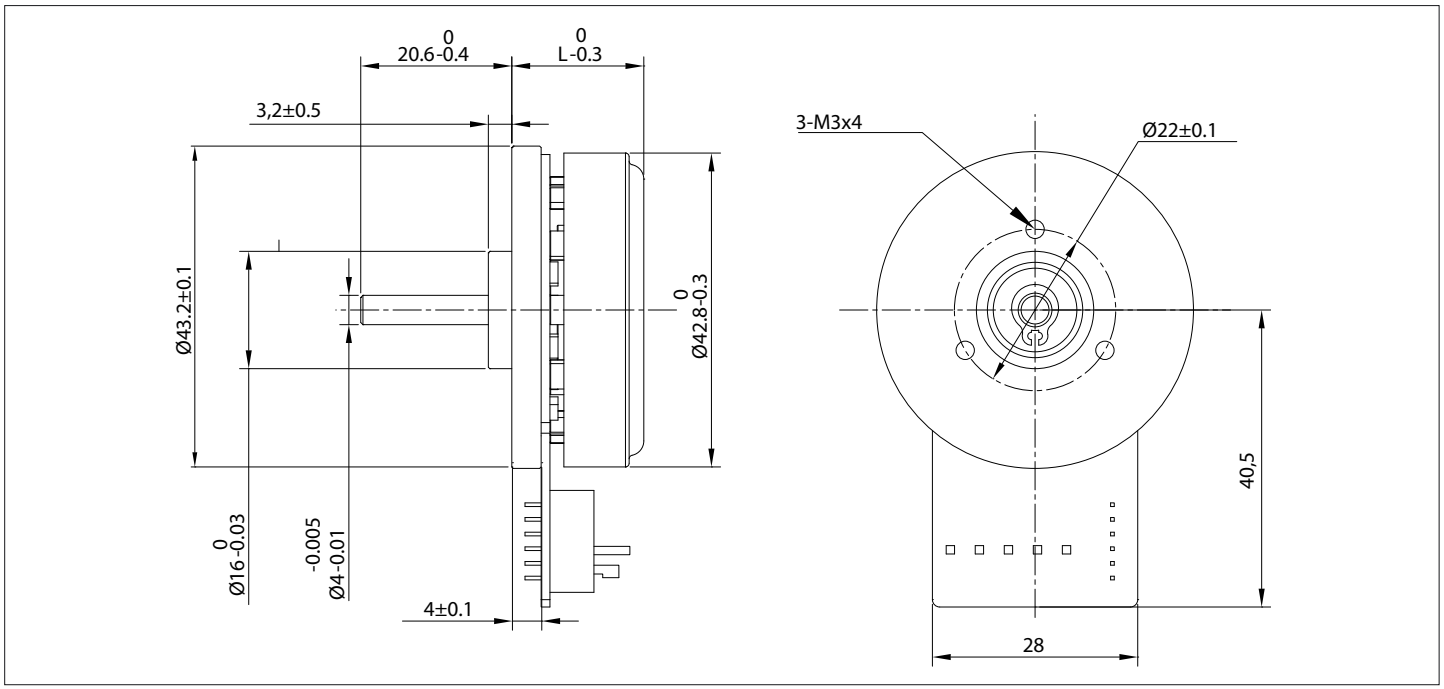
Pin N°	Connector	Function
1	PFC CABLE	4.5 - 24 V
2	PFC CABLE	HALL C
3	PFC CABLE	HALL A
4	PFC CABLE	HALL B
5	PFC CABLE	GND
6	PFC CABLE	PHASE W
7	PFC CABLE	PHASE V
8	PFC CABLE	PHASE U

CHARACTERISTICS

Item	
HALL EFFECT ANGLE	120°
SHAFT RUN OUT	0,03 mm
INSULATION CLASS	B
RADIAL PLAY (450 g LOAD)	0,02 mm
AXIAL PLAY (450 g LOAD)	0,14 mm
MAX RADIAL FORCE (10 mm FROM FRONT FLANGE)	28N
MAX AXIAL FORCE	10N
DIELECTRIC STRENGTH	500 VDC FOR ONE MINUTE
INSULATION RESISTANCE	100 Mohm min. 500 VDC

Brushless Flat 45BLW

Connector



SPECIFICATION

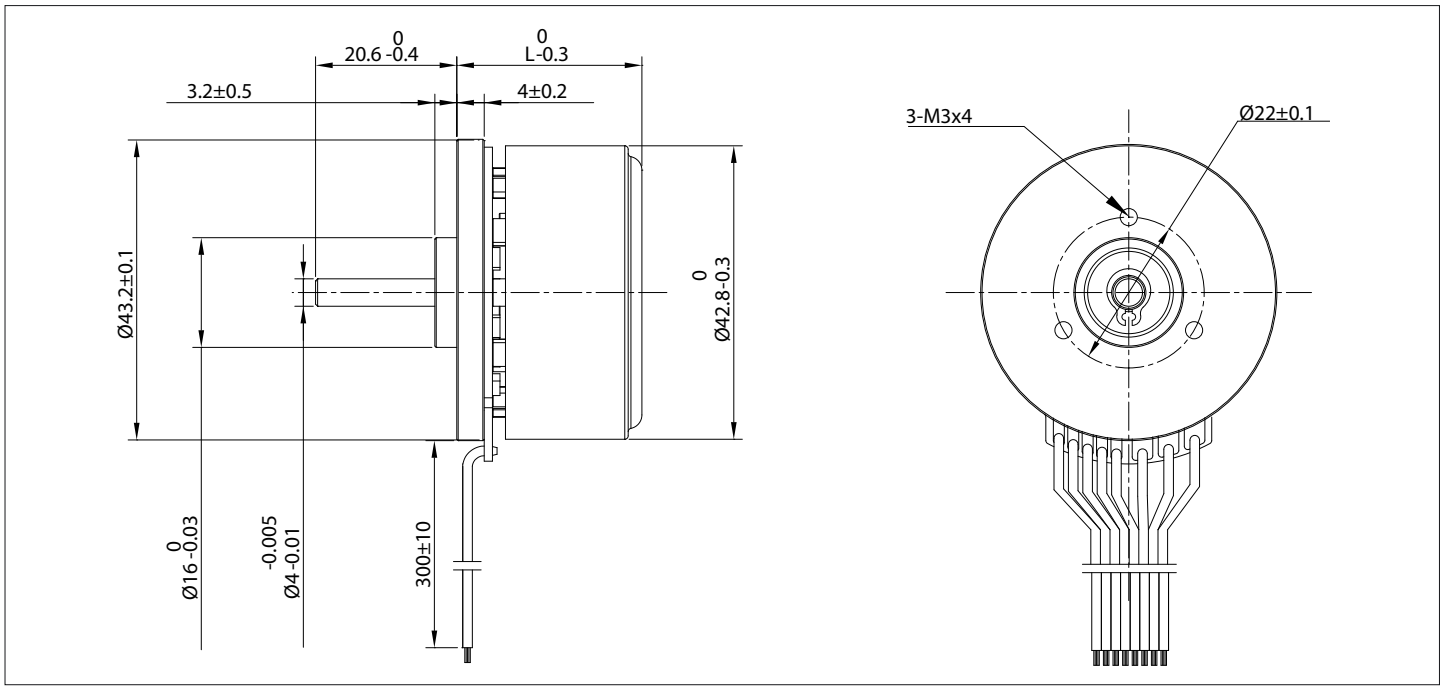
	Model		45BLW18	45BLW21	45BLW27
1	N° of pole		16	16	16
2	N° of phase		3	3	3
3	Rated Voltage	V	24	24	24
4	Rated Speed	rpm	5000	5260	4840
5	Rated Torque	Nm	0,05	0,084	0,13
6	Max Peak Torque	Nm	0,15	0,25	0,39
7	Torque Constant	Nm/A	0,031	0,033	0,037
8	Line to Line Resistance	Ω	1,83	0,8	0,61
9	Line to Line inductance	mH	0,59	0,33	0,27
10	Max Peak Current	A	4,8	7	10
11	Rated Current	A	1,61	2,55	3,51
12	No-Load Current	mA	250	390	430
13	Length	mm	18	21	27
14	Rotor Inertia	g-cm^2	100	135	180
15	Weight	Kg	0,08	0,12	0,15

CONNECTION

Pin N°	Connector	Function
1	JST B5P	GND
2	JST B5P	Phase W
3	JST B5P	Phase V
4	JST B5P	Phase U
5	JST B5P	GND
1	JST B6B	GND
2	JST B6B	+5V DC
3	JST B6B	Hall A
4	JST B6B	Hall B
5	JST B6B	Hall C
6	JST B6B	GND

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,03 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,14 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC



SPECIFICATION

	Model		45BLW18	45BLW21	45BLW27
1	N° of pole		16	16	16
2	N° of phase		3	3	3
3	Rated Voltage	V	24	24	24
4	Rated Speed	rpm	5000	5260	4840
5	Rated Torque	Nm	0,05	0,084	0,13
6	Max Peak Torque	Nm	0,15	0,25	0,39
7	Torque Constant	Nm/A	0,031	0,033	0,037
8	Line to Line Resistance	Ω	1,83	0,8	0,61
9	Line to Line inductance	mH	0,59	0,33	0,27
10	Max Peak Current	A	4,8	7	10
11	Rated Current	A	1,61	2,55	3,51
12	No-Load Current	mA	250	380	430
13	Length	mm	18	21	27
14	Rotor Inertia	g-cm^2	99	135	180
15	Weight	Kg	0,08	0,12	0,15

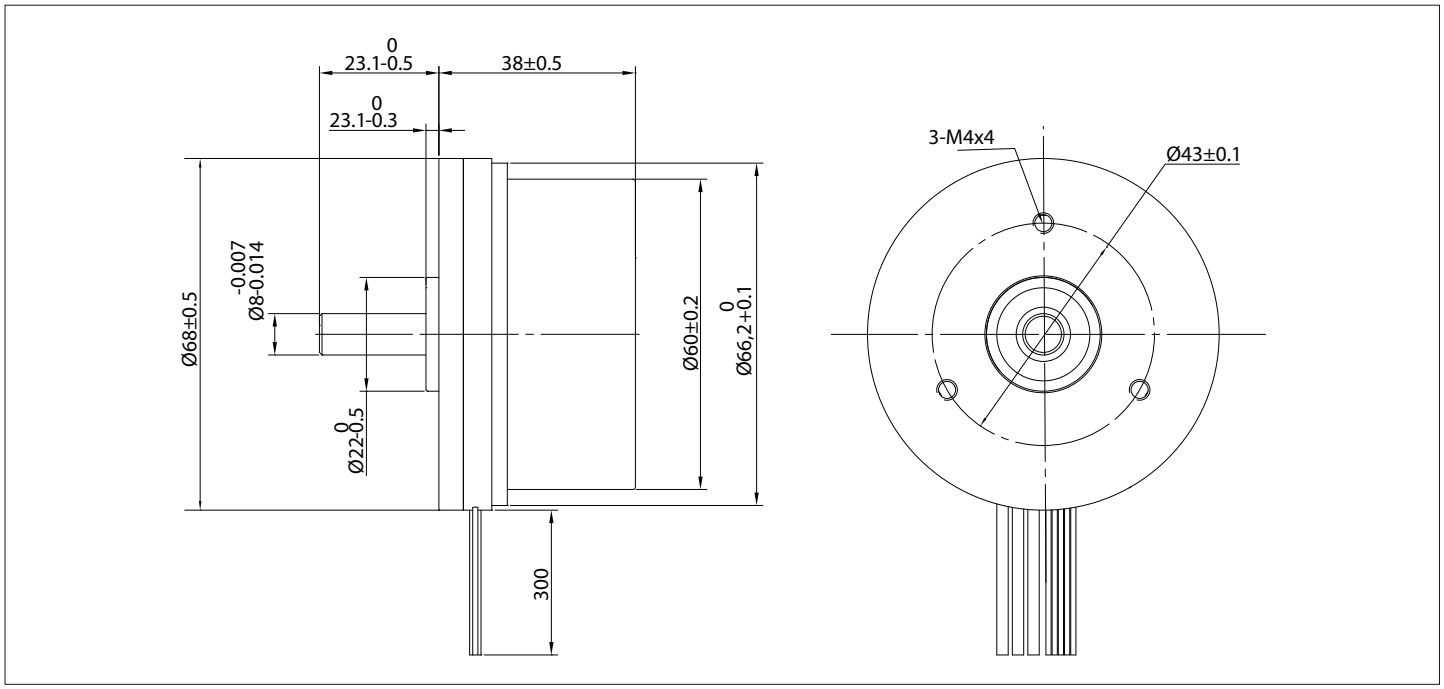
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG24	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG24	Hall A
3	Green	UL1430 AWG24	Hall B
4	White	UL1430 AWG24	Hall C
5	Black	UL1430 AWG24	Hall Sensor Ground
6	Grey	UL1430 AWG24	Phase U
7	Brown	UL1430 AWG24	Phase V
8	Yellow	UL1430 AWG24	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,03 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,14 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Flat 60BLW40



SPECIFICATION

	Model		60BLW40-24V	60BLW40-48V
1	N° of pole		14	14
2	N° of phase		3	3
3	Rated Voltage	V	24	48
4	Rated Speed	rpm	3700	3700
5	Rated Torque	Nm	0,3	0,3
6	Max Peak Torque	Nm	0,9	0,9
7	Torque Constant	Nm/A	0,05	0,1
8	Line to Line Resistance	Ω	0,3	1,1
9	Line to Line inductance	mH	0,3	1,4
10	Max Peak Current	A	18	9
11	Rated Current	A	6	3
12	No-Load Current	mA	800	400
13	Length	mm	42	42
14	Rotor Inertia	g-cm^2	1500	1500
15	Weight	Kg	0,5	0,5

CONNECTION

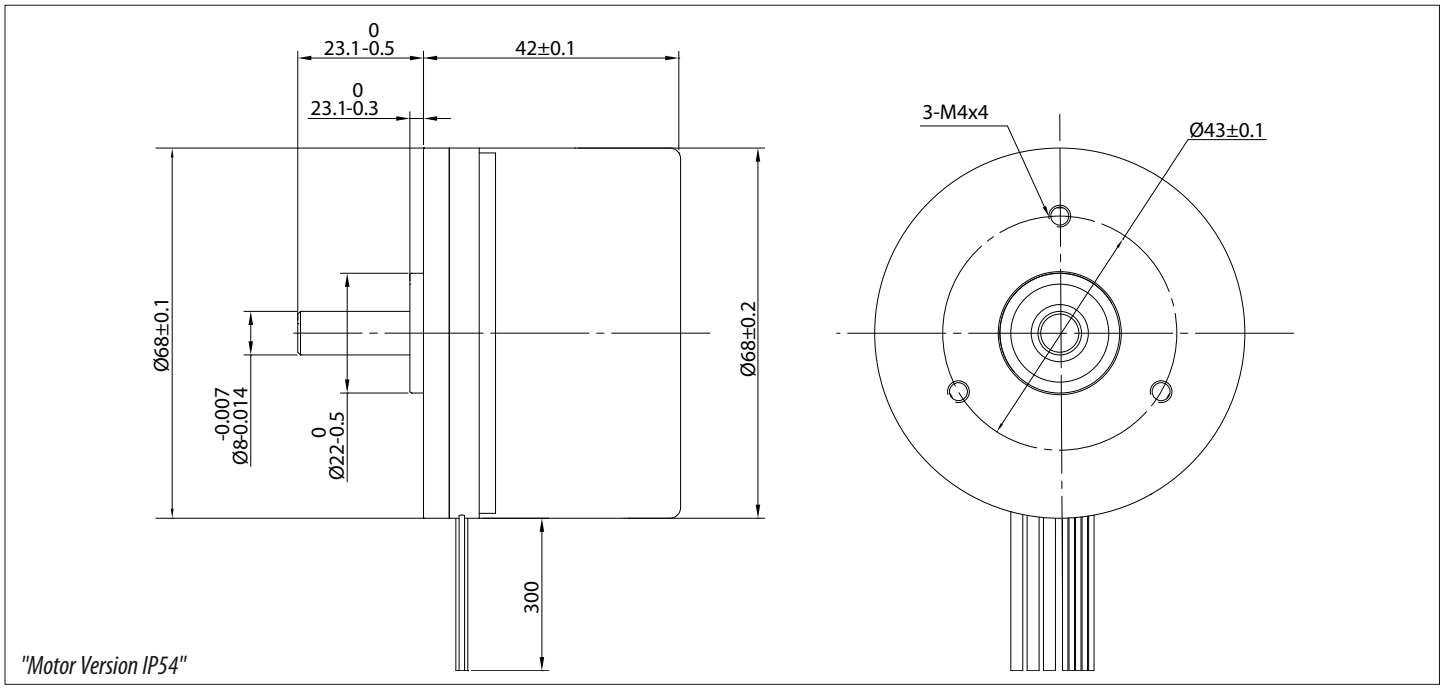
Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG18	Phase U
7	Red	UL1430 AWG18	Phase V
8	Black	UL1430 AWG18	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,14 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Flat 60BLW40

Version IP54



"Motor Version IP54"

SPECIFICATION

	Model		60BLW40-24V	60BLW40-48V
1	N° of pole		14	14
2	N° of phase		3	3
3	Rated Voltage	V	24	48
4	Rated Speed	rpm	3700	3700
5	Rated Torque	Nm	0,3	0,3
6	Max Peak Torque	Nm	0,9	0,9
7	Torque Constant	Nm/A	0,05	0,1
8	Line to Line Resistance	Ω	0,3	1,1
9	Line to Line inductance	mH	0,3	1,4
10	Max Peak Current	A	18	9
11	Rated Current	A	1,6	3
12	No-Load Current	mA	800	400
13	Length	mm	42	42
14	Rotor Inertia	g-cm^2	1500	1500
15	Weight	Kg	0,5	0,5

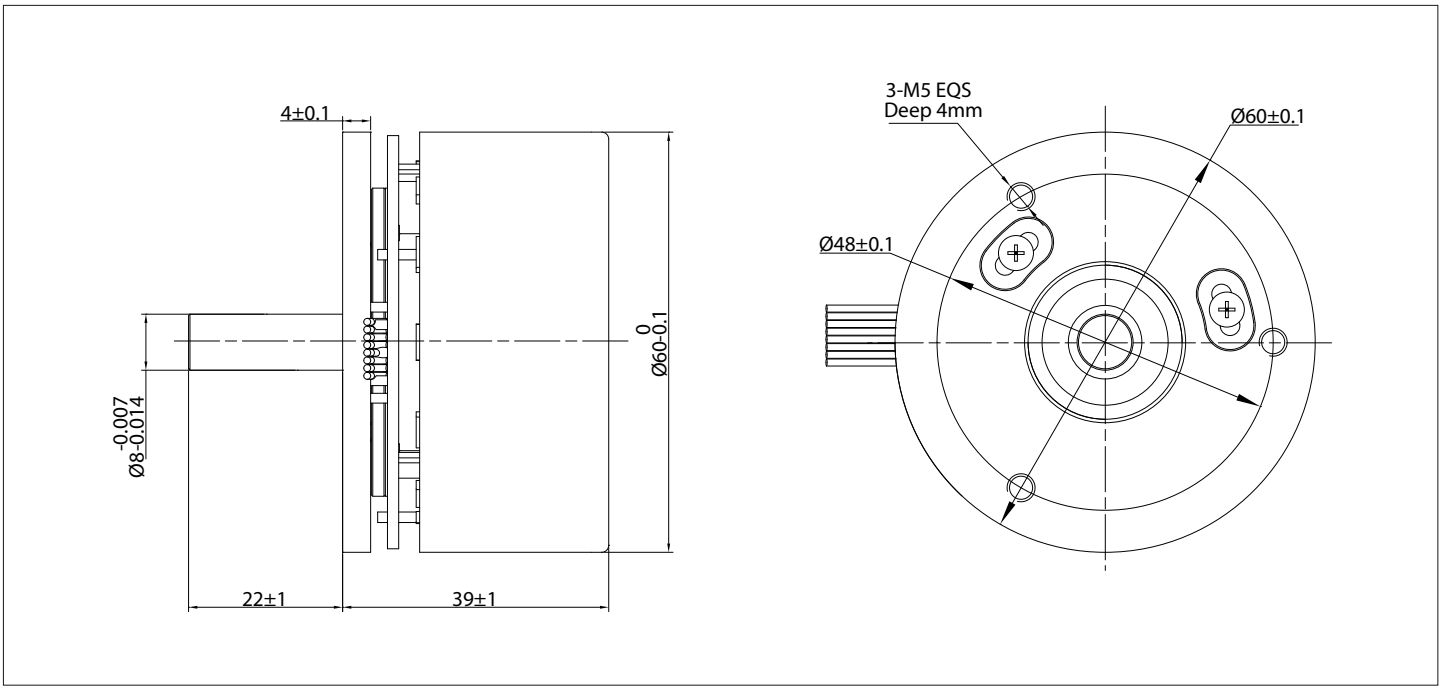
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1430 AWG18	Phase U
7	Red	UL1430 AWG18	Phase V
8	Black	UL1430 AWG18	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,14 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Flat 60BLWA38



SPECIFICATION

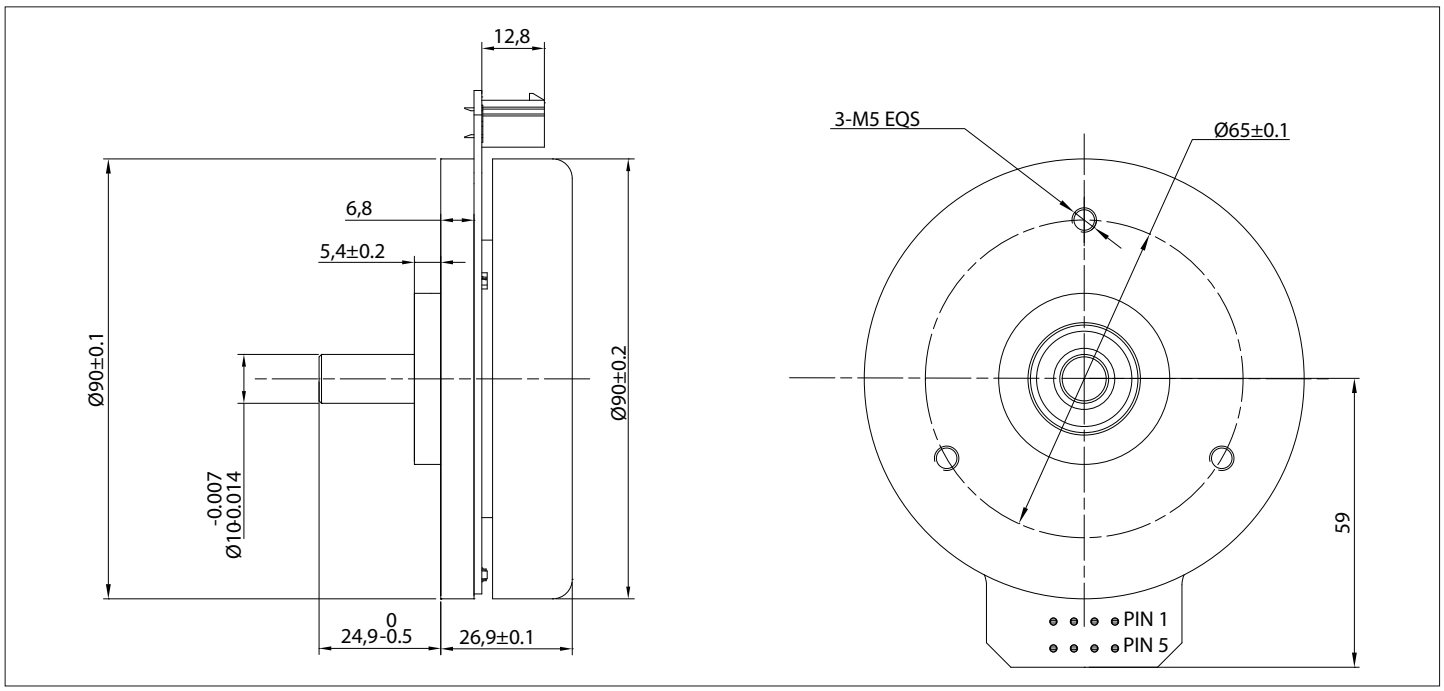
	Model		60BLWA38
1	N° of pole		14
2	N° of phase		3
3	Rated Voltage	V	48
4	Rated Speed	rpm	3400
5	Rated Torque	Nm	0,5
6	Max Peak Torque	Nm	1,5
7	Torque Constant	Nm/A	0,108
8	Line to Line Resistance	Ω	0,59
9	Line to Line inductance	mH	0,6
10	Max Peak Current	A	14
11	Rated Current	A	4,6
12	No-Load Current	mA	500
13	Length	mm	39
14	Rotor Inertia	g-cm^2	1100
15	Weight	Kg	0,5

CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1332 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1332 AWG26	Hall A
3	Green	UL1332 AWG26	Hall B
4	White	UL1332 AWG26	Hall C
5	Black	UL1332 AWG26	Hall Sensor Ground
6	Yellow	UL1007 AWG20	Phase U
7	Brown	UL1007 AWG20	Phase V
8	Orange	UL1007 AWG20	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	600 VDC for one second
Insulation Resistance	100 Mohm min. 500 VDC



SPECIFICATION

	Model		90BLW27-24V	90BLW27-36V
1	N° of pole		22	22
2	N° of phase		3	3
3	Rated Voltage	V	24	36
4	Rated Speed	rpm	2720	2510
5	Rated Torque	Nm	0,457	0,56
6	Max Peak Torque	Nm	1,8	1,8
7	Torque Constant	Nm/A	0,067	0,11
8	Line to Line Resistance	Ω	0,21	0,5
9	Line to Line inductance	mH	0,19	0,5
10	Max Peak Current	A	23	14,5
11	Rated Current	A	6,82	5,09
12	No-Load Current	mA	650	420
13	Length	mm	27	27
14	Rotor Inertia	g-cm^2	3000	3000
15	Weight	Kg	0,6	0,6

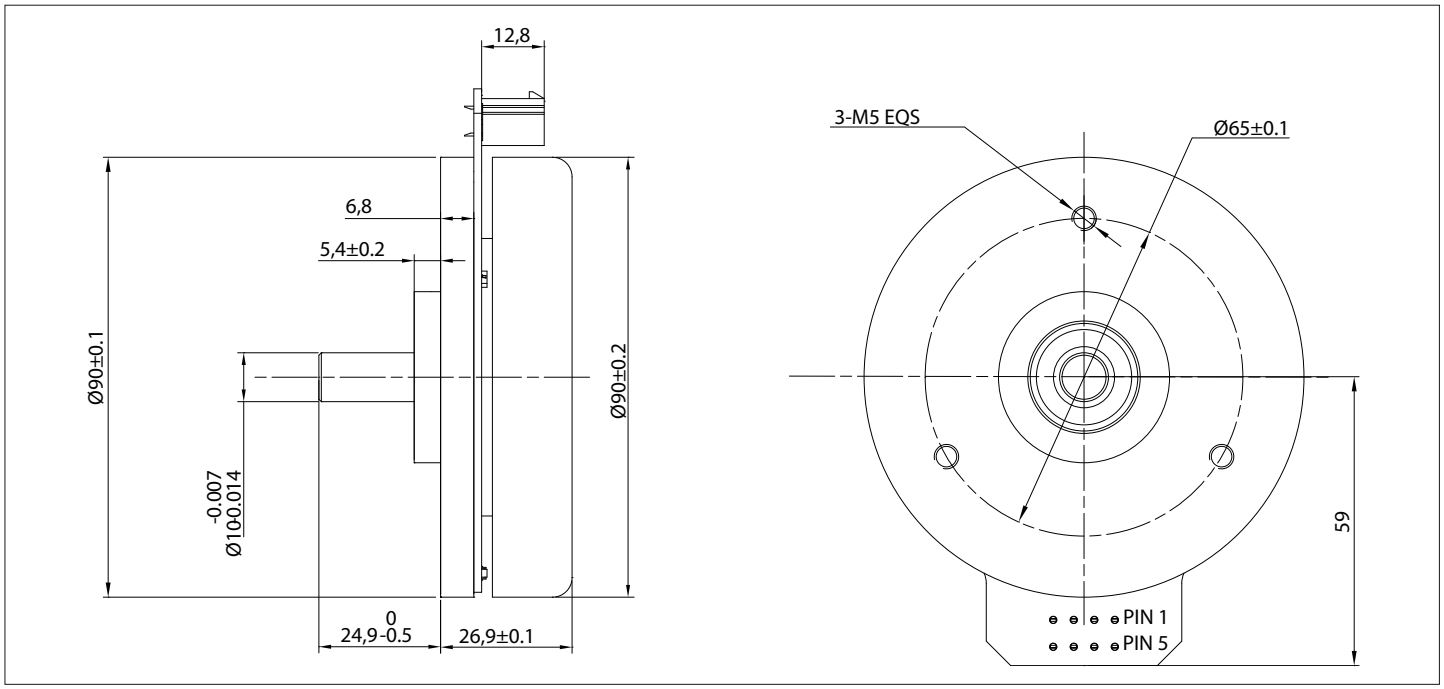
CONNECTION

Pin N°	Connector	Function
3	Mini-Fit Jr	Vcc Hall Sensor +5 - 24 V
1	Mini-Fit Jr	Hall A
2	Mini-Fit Jr	Hall B
5	Mini-Fit Jr	Hall C
6	Mini-Fit Jr	GND
7	Mini-Fit Jr	Phase W
8	Mini-Fit Jr	Phase V
4	Mini-Fit Jr	Phase U

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	110N
Max Axial Force	45N
Dielectric Strength	500 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Flat 90BLW27



SPECIFICATION

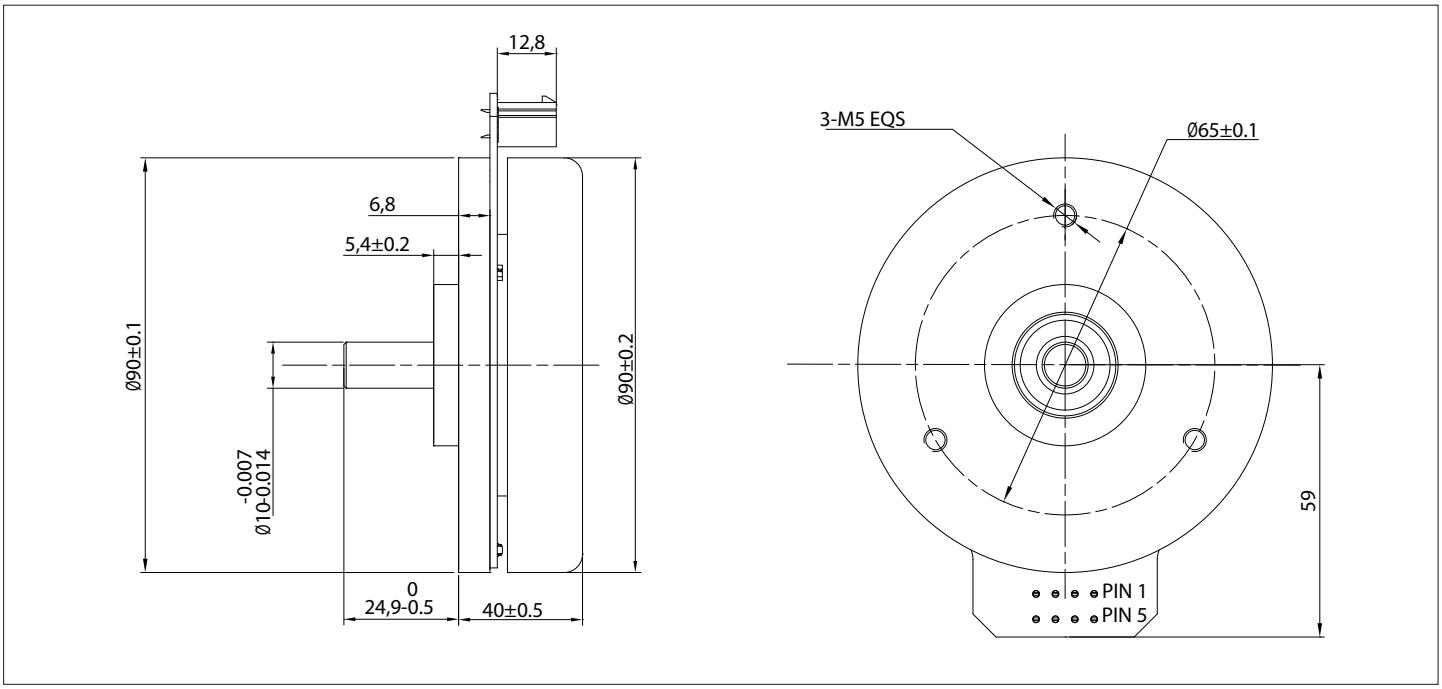
	Model		90BLW27-48V	90BLW27-60V
1	N° of pole		22	22
2	N° of phase		3	3
3	Rated Voltage	V	48	60
4	Rated Speed	rpm	1610	2200
5	Rated Torque	Nm	0,533	0,46
6	Max Peak Torque	Nm	1,8	1,8
7	Torque Constant	Nm/A	0,22	0,21
8	Line to Line Resistance	Ω	2,1	2
9	Line to Line inductance	mH	2	1,8
10	Max Peak Current	A	7,5	7,5
11	Rated Current	A	2,42	2,19
12	No-Load Current	mA	300	260
13	Length	mm	27	27
14	Rotor Inertia	g-cm^2	3000	3000
15	Weight	Kg	0,6	0,6

CONNECTION

Pin N°	Connector	Function
3	Mini-Fit Jr	Vcc Hall Sensor +5 - 24 V
1	Mini-Fit Jr	Hall A
2	Mini-Fit Jr	Hall B
5	Mini-Fit Jr	Hall C
6	Mini-Fit Jr	GND
7	Mini-Fit Jr	Phase W
8	Mini-Fit Jr	Phase V
4	Mini-Fit Jr	Phase U

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	110N
Max Axial Force	45N
Dielectric Strength	500 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC



SPECIFICATION

	Model		90BLW40-48V
1	N° of pole		22
2	N° of phase		3
3	Rated Voltage	V	48
4	Rated Speed	rpm	1670
5	Rated Torque	Nm	0,964
6	Max Peak Torque	Nm	3
7	Torque Constant	Nm/A	0,24
8	Line to Line Resistance	Ω	0,65
9	Line to Line inductance	mH	0,9
10	Max Peak Current	A	13
11	Rated Current	A	4
12	No-Load Current	mA	280
13	Length	mm	40
14	Rotor Inertia	g-cm^2	5000
15	Weight	Kg	1

CONNECTION

Pin N°	Connector	Function
3	Mini-Fit Jr	Vcc Hall Sensor +5 - 24 V
1	Mini-Fit Jr	Hall A
2	Mini-Fit Jr	Hall B
5	Mini-Fit Jr	Hall C
6	Mini-Fit Jr	GND
7	Mini-Fit Jr	Phase W
8	Mini-Fit Jr	Phase V
4	Mini-Fit Jr	Phase U

CHARACTERISTICS

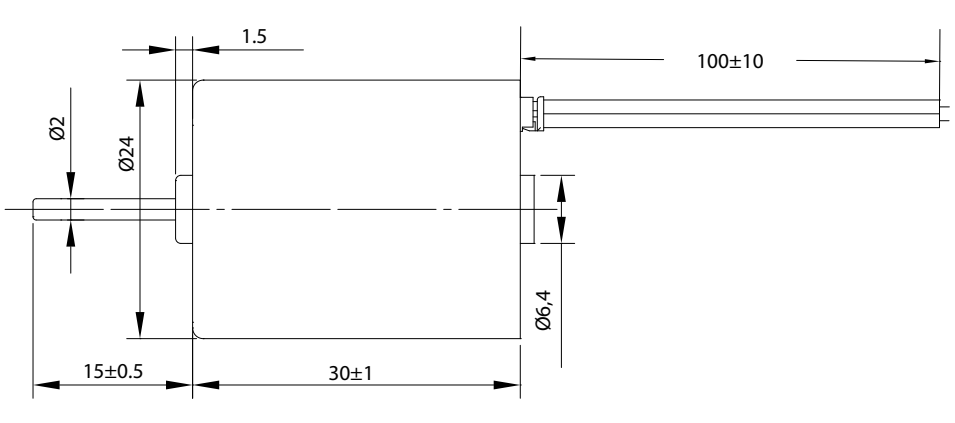
Item	
Hall Effect Angle	120°
Shaft Run Out	0,05 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	110N
Max Axial Force	45N
Dielectric Strength	500 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

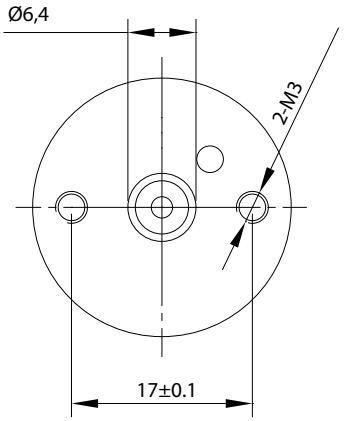
Note/Notes

Price-Performance Brushless motor

The union of performance and cost effectiveness. Engineered to be simple but powerful, the CBL range of Slotted Brushless motors is the ideal choice for high volume applications, when cost is not a matter but performance is a driver. Perfectly suited to many medical, robotics and industrial applications, the CBL range is available from 2,5 to 40 watts.

Brushless Price-Performance 24CBL30





Motor With Sleeve Bearings

SPECIFICATION

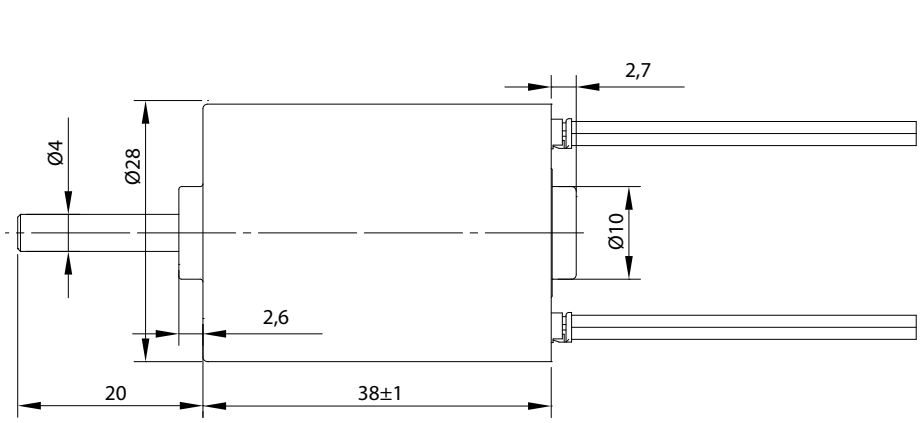
	Model		24CBL30
1	N° of pole		6
2	N° of phase		3
3	Rated Voltage	V	12
4	Rated Speed	rpm	4000
5	Rated Torque	Nm	0,006
6	Max Peak Torque	Nm	0,017
7	Torque Constant	Nm/A	0,02
8	Line to Line Resistance	Ω	7,3
9	Line to Line inductance	mH	1,7
10	No-Load Current	mA	190
11	Max Peak Current	A	0,9
12	Rated Current	A	0,3
13	Length	mm	30
14	Rotor Inertia	g-cm^2	2,3
15	Weight	Kg	0,1

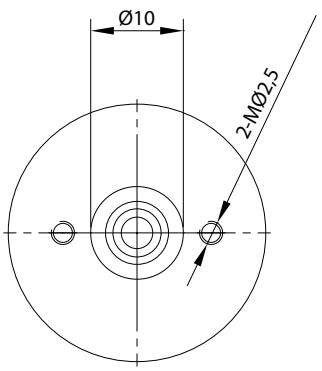
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG28	Vcc HallSensor +5 to +24 Vdc
2	Blue	UL1430 AWG28	Hall A
3	Green	UL1430 AWG28	Hall B
4	White	UL1430 AWG28	Hall C
5	Black	UL1430 AWG28	Hall Sensor Ground
6	Yellow	UL1430 AWG22	Phase U
7	Red	UL1430 AWG22	Phase V
8	Black	UL1430 AWG22	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,06 mm
Max Radial Force (10 mm from front flange)	4N
Max Axial Force	4N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC





SPECIFICATION

	Model		28CBL38
1	N° of pole		8
2	N° of phase		3
3	Rated Voltage	V	24
4	Rated Speed	rpm	4000
5	Rated Torque	Nm	0,028
6	Max Peak Torque	Nm	0,084
7	Torque Constant	Nm/A	0,047
8	Line to Line Resistance	Ω	5,69
9	Line to Line inductance	mH	2,48
10	No-Load Current	mA	130
11	Max Peak Current	A	2.3
12	Rated Current	A	0,60
13	Length	mm	38
14	Rotor Inertia	g-cm^2	5,8
15	Weight	Kg	0,1

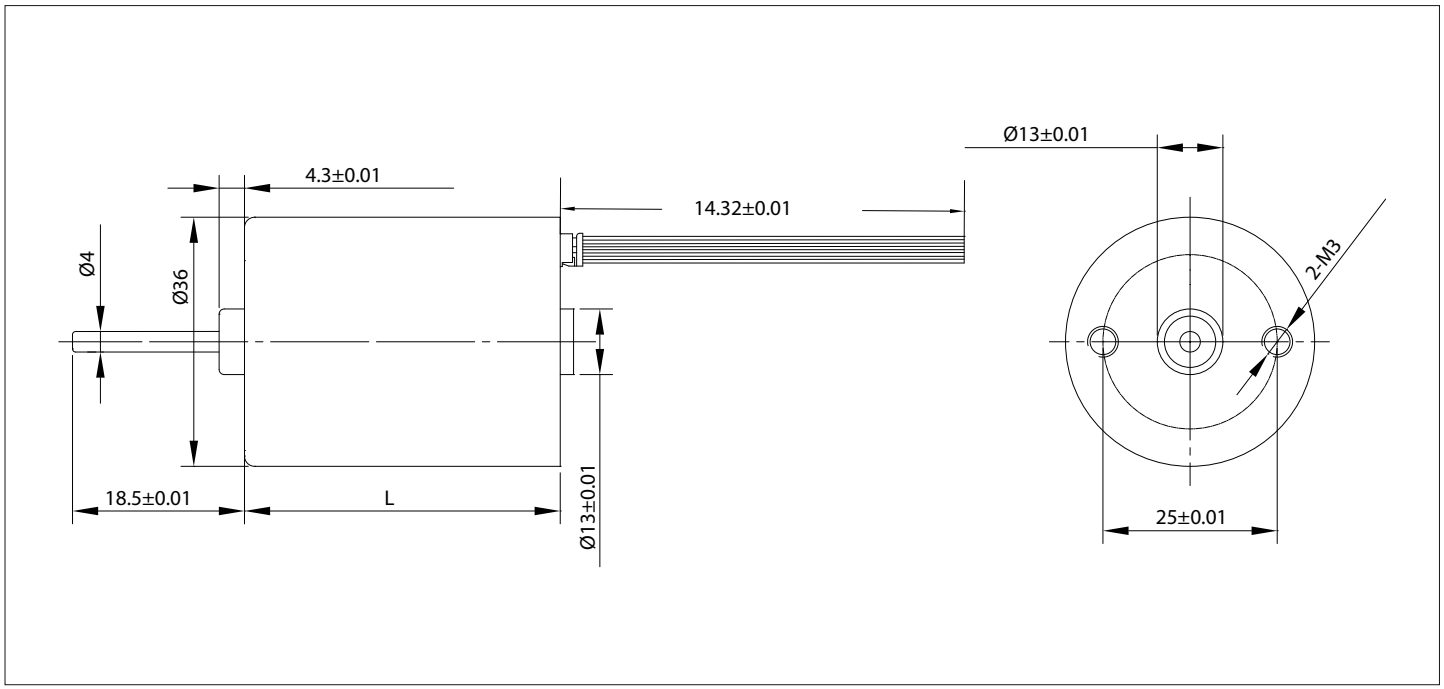
CONNECTION

Lead N°	Color	Gauge	Function
1	Yellow	UL1430 AWG28	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG28	Hall A
3	Orange	UL1430 AWG28	Hall B
4	Brown	UL1430 AWG28	Hall C
5	White	UL1430 AWG28	Hall Sensor Ground
6	Green	UL1430 AWG26	Phase U
7	Red	UL1430 AWG26	Phase V
8	Black	UL1430 AWG26	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,06 mm
Max Radial Force (10 mm from front flange)	4N
Max Axial Force	4N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Price-Performance 36CBL



SPECIFICATION

	Model		36CBL30	36CBL40
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4800	4800
5	Rated Torque	Nm	0,016	0,035
6	Max Peak Torque	Nm	0,05	0,11
7	Torque Constant	Nm/A	0,036	0,035
8	Line to Line Resistance	Ω	5,1	2
9	Line to Line inductance	mH	3,3	2
10	No-Load Current	mA	150	230
11	Max Peak Current	A	1,4	3
12	Rated Current	A	0,44	1
13	Length	mm	20	40
14	Rotor Inertia	g-cm^2	6	12
15	Weight	Kg	0,12	0,18

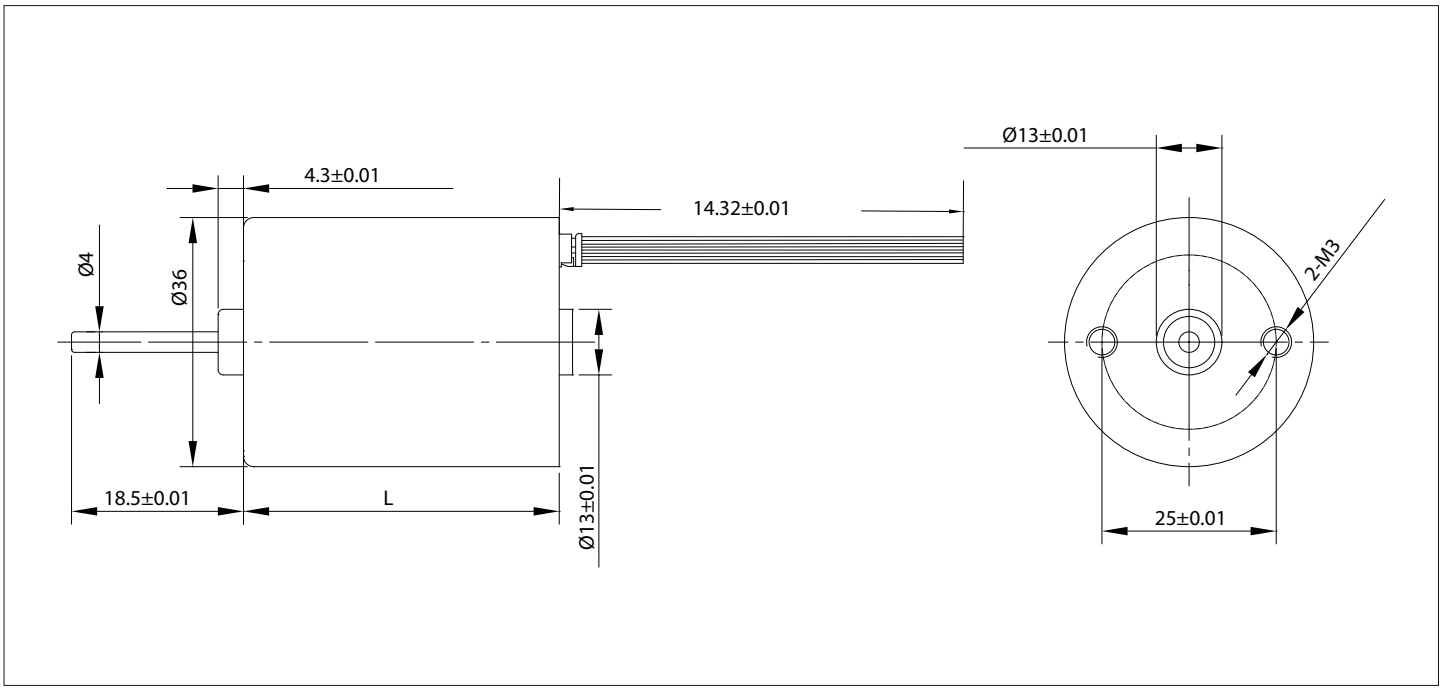
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1332 AWG24	Phase U
7	Brown	UL1332 AWG24	Phase V
8	Orange	UL1332 AWG24	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	15N
Max Axial Force	10N
Dielectric Strength	600 VCA for one second
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Price-Performance 36CBL



SPECIFICATION

	Model		36CBL57	36CBL60
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4500	4800
5	Rated Torque	Nm	0,07	0,08
6	Max Peak Torque	Nm	0,21	0,24
7	Torque Constant	Nm/A	0,037	0,035
8	Line to Line Resistance	Ω	1,1	0,9
9	Line to Line inductance	mH	1,2	1
10	No-Load Current	mA	270	220
11	Max Peak Current	A	5,3	6,5
12	Rated Current	A	1,89	2,29
13	Length	mm	57	60
14	Rotor Inertia	g-cm^2	27	30
15	Weight	Kg	0,25	0,3

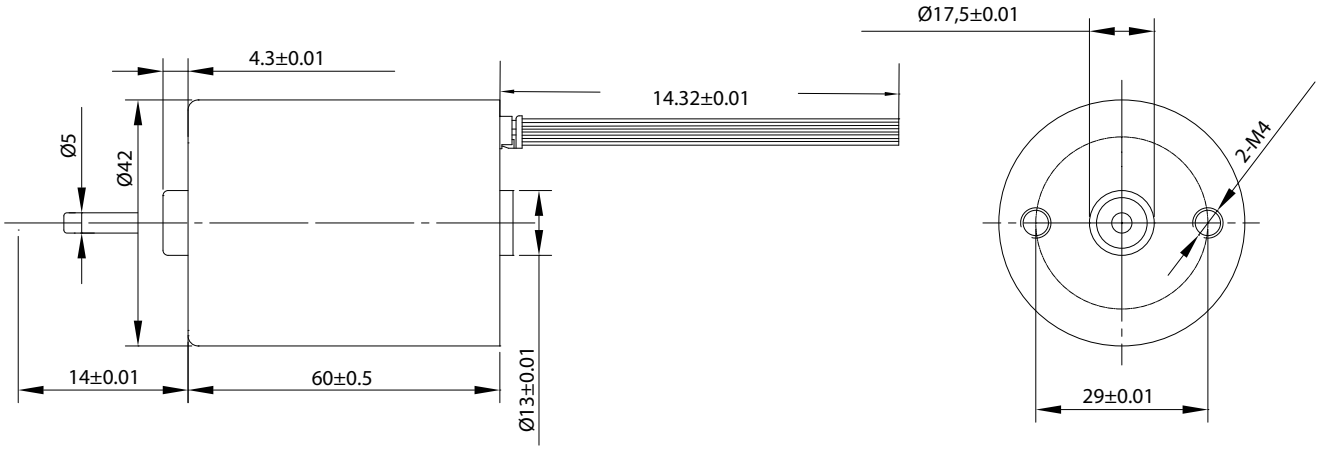
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1332 AWG24	Phase U
7	Brown	UL1332 AWG24	Phase V
8	Orange	UL1332 AWG24	Phase W

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	15N
Max Axial Force	10N
Dielectric Strength	600 VCA for one second
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Price-Performance 42CBL



SPECIFICATION

	Model		42CBL60
1	N° of pole		4
2	N° of phase		3
3	Rated Voltage	V	24
4	Rated Speed	rpm	5900
5	Rated Torque	Nm	0,068
6	Max Peak Torque	Nm	0,2
7	Torque Constant	Nm/A	0,032
8	Line to Line Resistance	Ω	0,66
9	Line to Line inductance	mH	0,63
10	No-Load Current	mA	430
11	Max Peak Current	A	6,6
12	Rated Current	A	2,13
13	Length	mm	60
14	Rotor Inertia	g-cm^2	44
15	Weight	Kg	0,35

CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG26	Vcc Hall Sensor +5 to +24 Vdc
2	Blue	UL1430 AWG26	Hall A
3	Green	UL1430 AWG26	Hall B
4	White	UL1430 AWG26	Hall C
5	Black	UL1430 AWG26	Hall Sensor Ground
6	Yellow	UL1332 AWG22	Phase U
7	Red	UL1332 AWG22	Phase V
8	Black	UL1332 AWG22	Phase W

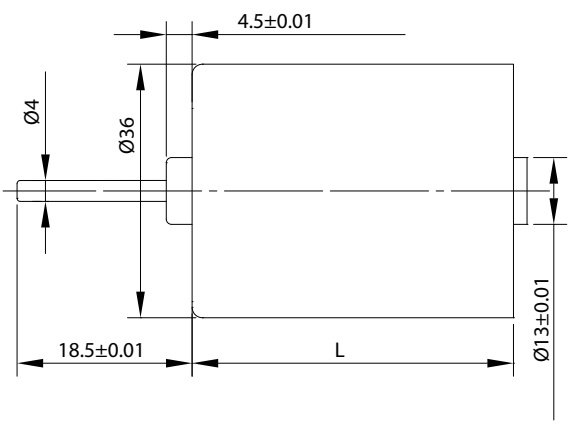
CHARACTERISTICS

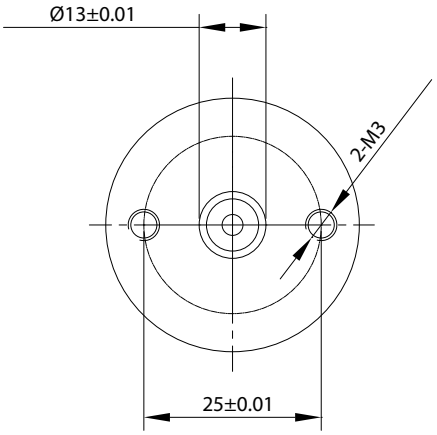
Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	15N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Motor with integrated electronic

Adding control simplicity to power. In many applications, the controllability of the Brushless motor is a key feature. This is why we designed a range of Brushless motors with integrated electronics to simplify the overall application drive and enable longer life by supporting the transition from Brushed DC to Brushless technology. Pumps and many other applications in Healthcare and Industrial segments will benefit from this technology.

Brushless Integrated Electronic 36CBL-IE





SPECIFICATION

	Model		36CBL30-IE	36CBL40-IE
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4800	4800
5	Rated Torque	Nm	0,016	0,035
6	Max Peak Torque	Nm	0,05	0,11
7	Torque Constant	Nm/A	0,034	0,037
8	Line to Line Resistance	Ω	7,8	2,7
9	Line to Line inductance	mH	5,5	2,6
10	Max Peak Current	A	1,4	3
11	Rated Current	A	0,47	0,95
12	No-Load Current	mA	120	230
13	Length	mm	30	40
14	Rotor Inertia	g-cm^2	6	12
15	Weight	Kg	0,12	0,18

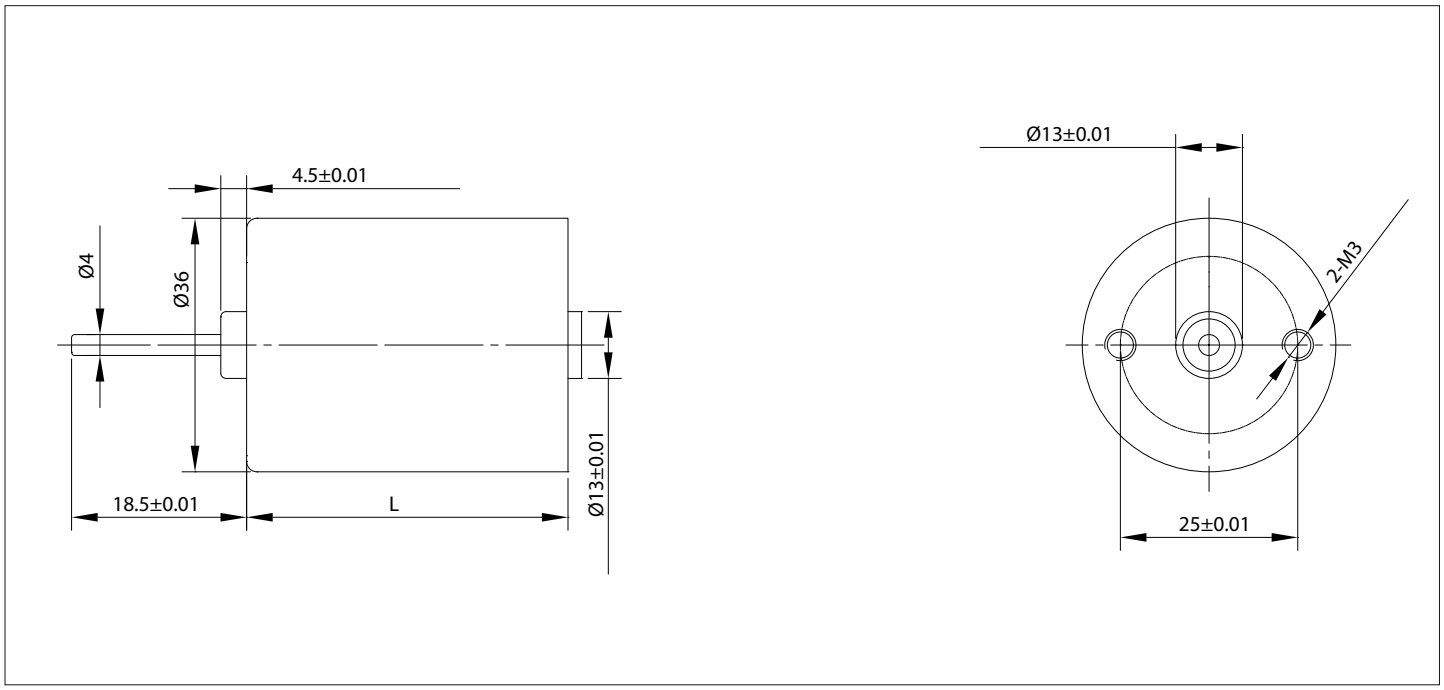
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG22	Vcc +24 Vdc
2	Black	UL1430 AWG22	GND
3	Green	UL1430 AWG26	CW/CCW Direction
4	White	UL1430 AWG26	PWM speed control
5	Blue	UL1430 AWG26	Brake
6	Yellow	UL1332 AWG22	Tacho out

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	15N
Max Axial Force	10N
Dielectric Strength	600 VAC for one second
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Integrated Electronic 36CBL-IE



SPECIFICATION

	Model		36CBL57-IE	36CBL60-IE
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4500	4800
5	Rated Torque	Nm	0,07	0,08
6	Max Peak Torque	Nm	0,21	0,24
7	Torque Constant	Nm/A	0,041	0,038
8	Line to Line Resistance	Ω	1,3	0,9
9	Line to Line inductance	mH	1,6	1,3
10	Max Peak Current	A	5,3	6,5
11	Rated Current	A	1,71	2,11
12	No-Load Current	mA	260	200
13	Length	mm	57	60
14	Rotor Inertia	g-cm^2	27	30
15	Weight	Kg	0,25	0,30

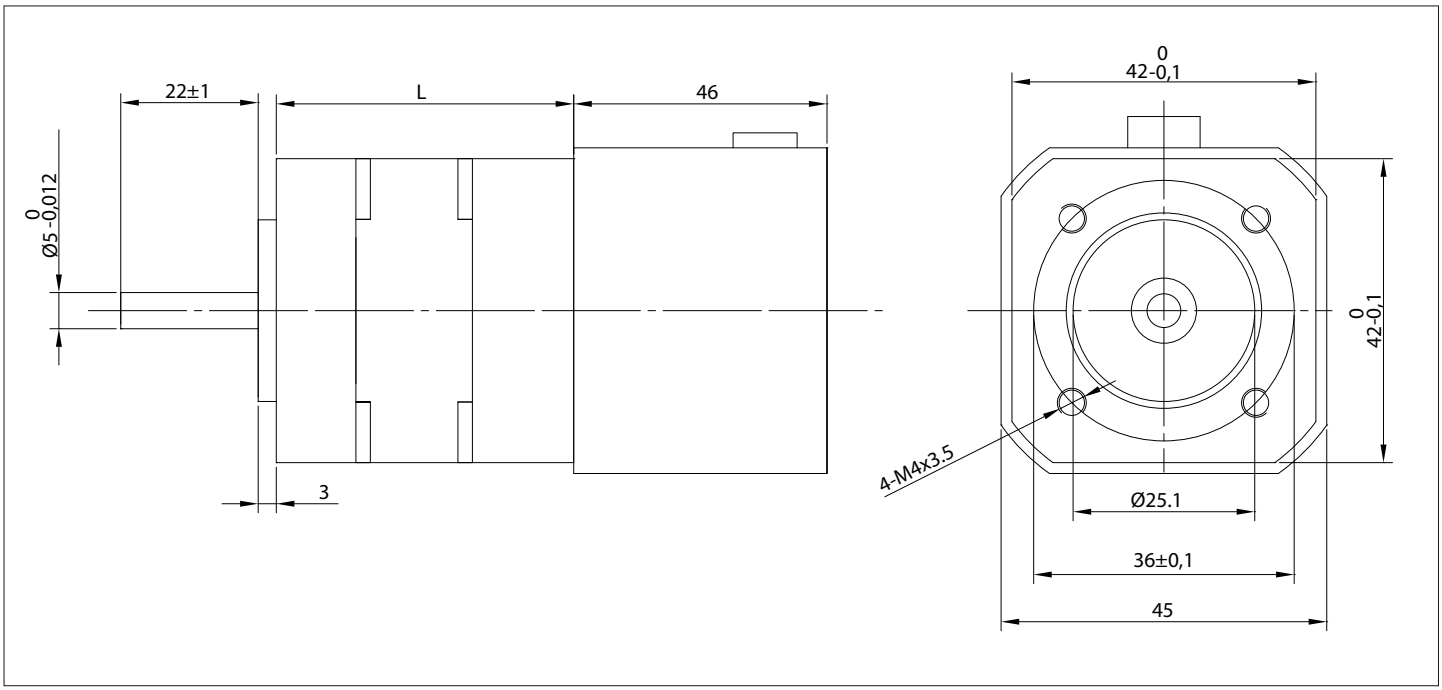
CONNECTION

Lead N°	Color	Gauge	Function
1	Red	UL1430 AWG22	Vcc +24 Vdc
2	Black	UL1430 AWG22	GND
3	Green	UL1430 AWG26	CW/CCW Direction
4	White	UL1430 AWG26	PWM speed control
5	Blue	UL1430 AWG26	Brake
6	Yellow	UL1332 AWG22	Tacho out

CHARACTERISTICS

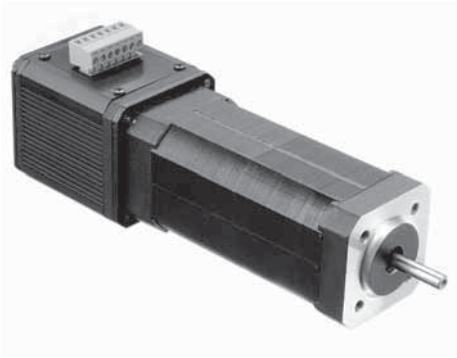
Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	15N
Max Axial Force	10N
Dielectric Strength	600 VAC for one second
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Integrated Electronic 42BL-IE



SPECIFICATION

	Model		42BL41-IE	42BL61-IE
1	N° of pole		8	8
2	N° of phase		3	3
3	Rated Voltage	V	24	24
4	Rated Speed	rpm	4000	4000
5	Rated Torque	Nm	0,0625	0,125
6	Max Peak Torque	Nm	0,19	0,37
7	Torque Constant	Nm/A	0,035	0,036
8	Line to Line Resistance	Ω	1,5	0,8
9	Line to Line inductance	mH	2,1	1,2
10	Max Peak Current	A	6	10,8
11	Rated Current	A	1,79	3,47
12	No-Load Current	mA	220	250
13	Length	mm	87	102
14	Rotor Inertia	g-cm^2	24	48
15	Weight	Kg	0,5	0,65

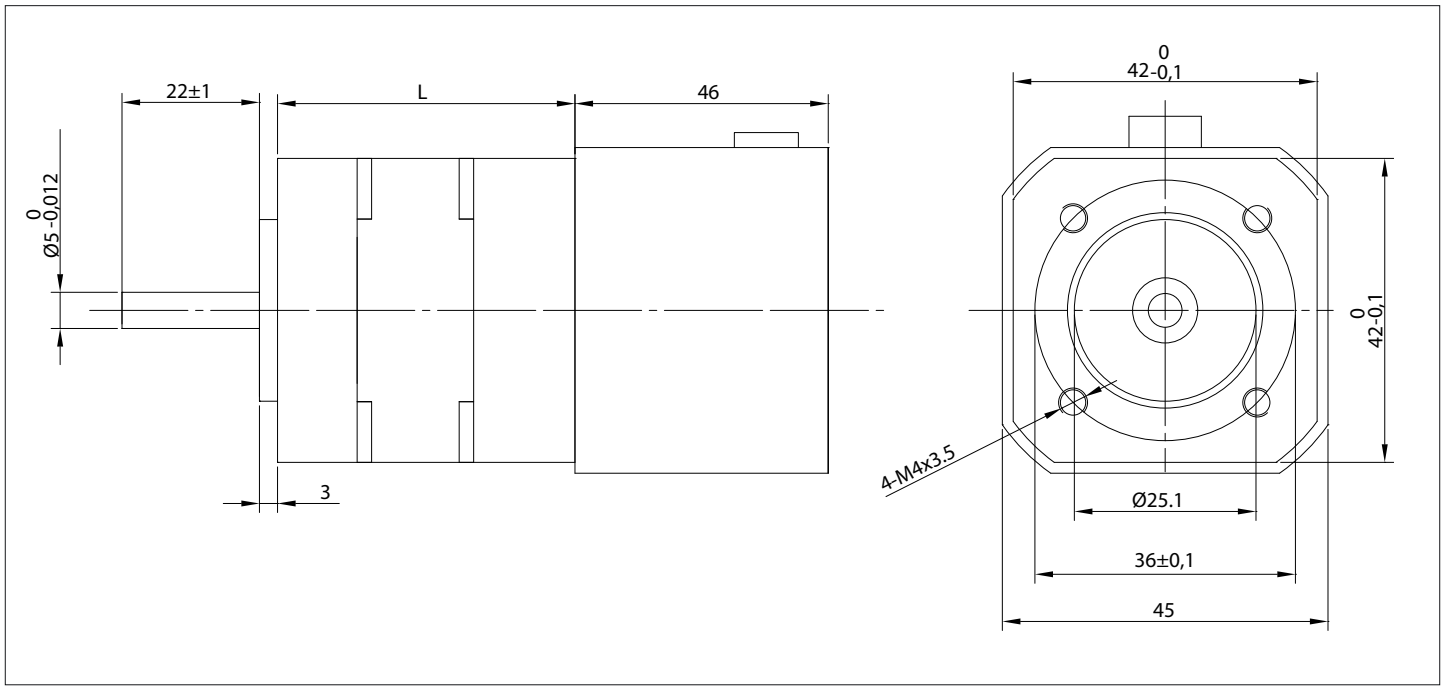


CONNECTION

Pin N°		Function
1	+5V	+5V voltage output
2	F/R	Rotation direction
3	SV	Reference speed Voltage 0/+5V
4	PG	Speed pulse output TTL.24 pulse/rev.
5	GND	common ground system
6	GND	common ground system
7	+Vp	DC power input +24Vdc

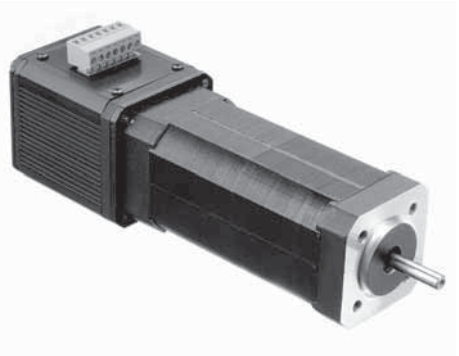
CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	28N
Max Axial Force	10N
Dielectric Strength	500 VDC for one second
Insulation Resistance	100 Mohm min. 500 VDC



SPECIFICATION

	Model		42BL81-IE	42BL100-IE
1	N° OF POLE		8	8
2	N° OF PHASE		3	3
3	RATED VOLTAGE	V	24	24
4	RATED SPEED	rpm	4000	4000
5	RATED TORQUE	Nm	0,185	0,25
6	MAX PEAK TORQUE	Nm	0,56	0,74
7	TORQUE CONSTANT	Nm/A	0,036	0,036
8	LINE TO LINE RESISTANCE	Ω	0,43	0,3
9	LINE TO LINE INDUCTANCE	mH	0,7	0,5
10	MAX PEAK CURRENT	A	15,5	21,7
11	RATED CURRENT	A	5,14	6,94
12	NO-LOAD CURRENT	mA	340	450
13	LENGTH	mm	127	146
14	ROTOR INERTIA	g-cm^2	72	96
15	WEIGHT	Kg	0,85	1



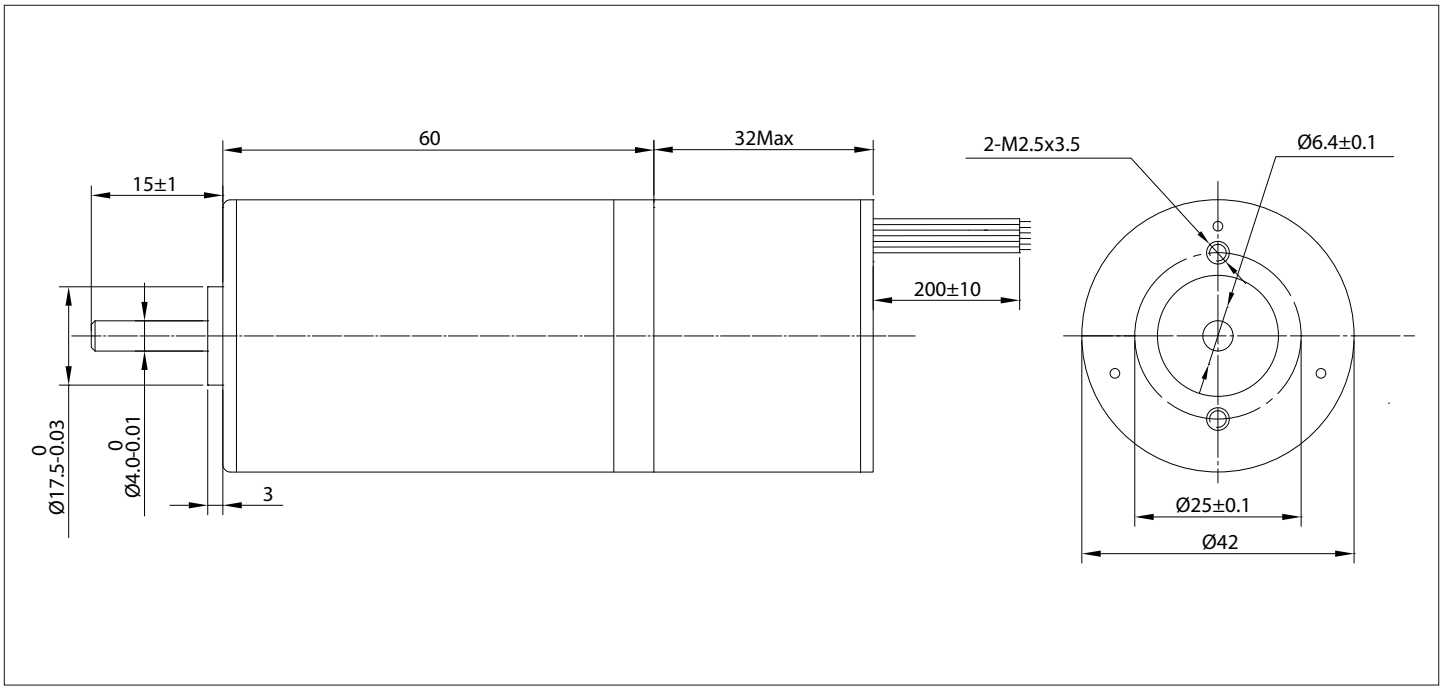
CONNECTION

Pin N°		Function
1	+5V	+5V VOLTAGE OUTPUT
2	F/R	ROTATION DIRECTION
3	SV	REFERENCE SPEED VOLTAGE 0/+5V
4	PG	SPEED PULSE OUTPUT TTL.24 PULSE/REV.
5	GND	COMMON GROUND SYSTEM
6	GND	COMMON GROUND SYSTEM
7	+VP	DC POWER INPUT +24VDC

CHARACTERISTICS

Item	
HALL EFFECT ANGLE	120°
SHAFT RUN OUT	0,025 mm
INSULATION CLASS	B
RADIAL PLAY (450 g LOAD)	0,02 mm
AXIAL PLAY (450 g LOAD)	0,08 mm
MAX RADIAL FORCE (10 mm FROM FRONT FLANGE)	28N
MAX AXIAL FORCE	10N
DIELECTRIC STRENGTH	500 VDC FOR ONE SECOND
INSULATION RESISTANCE	100 Mohm min. 500 VDC

Brushless Integrated Electronic 42RBL60-IE



SPECIFICATION

	Model		42RBL60-IE
1	N° of pole		8
2	N° of phase		3
3	Rated Voltage	V	24
4	Rated Speed	rpm	4000
5	Rated Torque	Nm	0,08
6	Max Peak Torque	Nm	0,19
7	Torque Constant	Nm/A	0,038
8	Line to Line Resistance	Ω	1,6
9	Line to Line inductance	mH	1,94
10	Max Peak Current	A	5
11	Rated Current	A	2,11
12	No-Load Current	mA	230
13	Length	mm	92
14	Rotor Inertia	g-cm^2	48
15	Weight	Kg	0,5

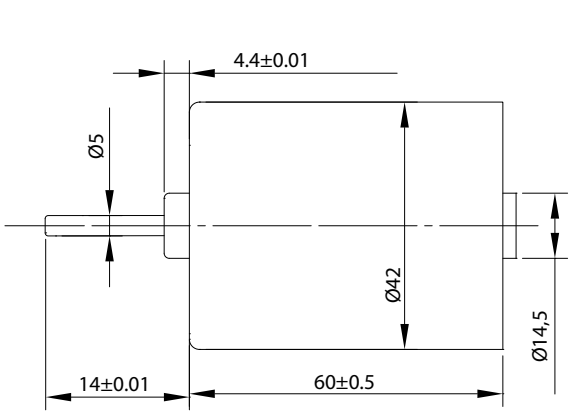
CONNECTION

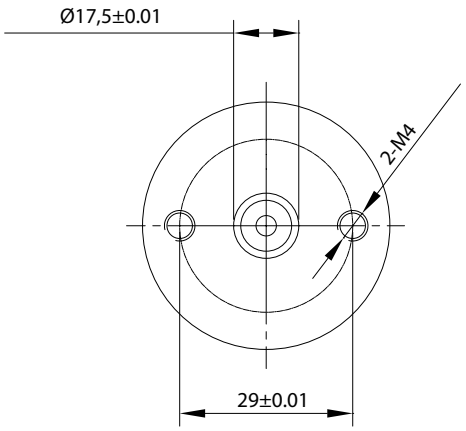
Lead N°	Color	Gauge	Function
1	Red	UL1007 AWG26	Vcc +
2	Black	UL1007 AWG26	Ground
3	White	UL1007 AWG26	Analog Speed 1,2V - 3V
4	Green	UL1007 AWG26	Direction

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (450 g load)	0,02 mm
Axial Play (450 g load)	0,08 mm
Max Radial Force (10 mm from front flange)	15N
Max Axial Force	10N
Dielectric Strength	500 VDC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Brushless Integrated Electronic 42CBL60-IE





SPECIFICATION

	Model		42CBL60-IE
1	N° OF POLE		4
2	N° OF PHASE		3
3	RATED VOLTAGE	V	24
4	RATED SPEED	rpm	5900
5	RATED TORQUE	Nm	0,068
6	MAX PEAK TORQUE	Nm	0,2
7	TORQUE CONSTANT	Nm/A	0,032
8	LINE TO LINE RESISTANCE	Ω	0,82
9	LINE TO LINE INDUCTANCE	mH	0,75
10	MAX PEAK CURRENT	A	6,6
11	RATED CURRENT	A	2,13
12	NO-LOAD CURRENT	mA	250
13	LENGTH	mm	60
14	ROTOR INERTIA	g-cm^2	44
15	WEIGHT	Kg	0,35

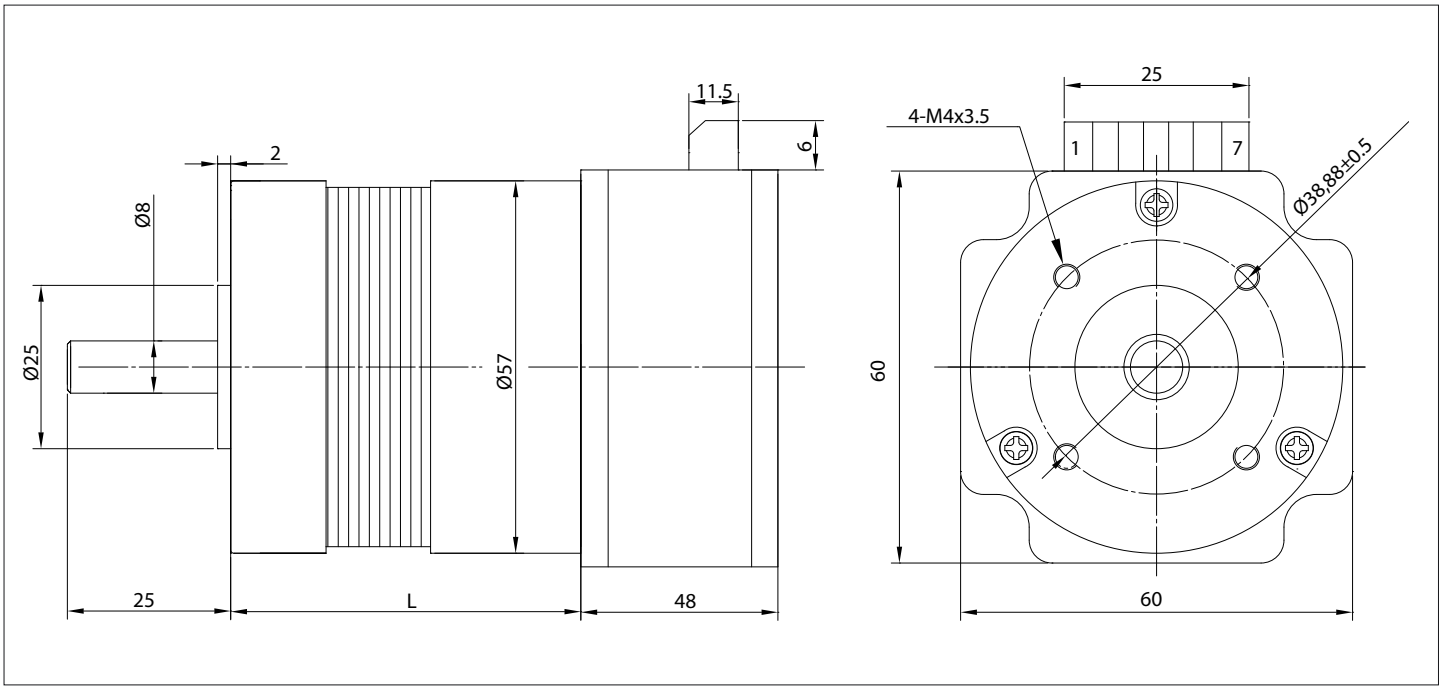
CONNECTION

Lead N°	Color	Gauge	Function
1	RED	UL1430 AWG22	VCC +24 VDC
2	BLACK	UL1430 AWG22	GND
3	GREEN	UL1430 AWG26	CW/CCW DIRECTION
4	WHITE	UL1430 AWG26	PWM SPEED CONTROL
5	BLUE	UL1430 AWG26	BRAKE
6	YELLOW	UL1332 AWG22	TACHO OUT

CHARACTERISTICS

Item	
HALL EFFECT ANGLE	120°
SHAFT RUN OUT	0,025 mm
INSULATION CLASS	B
RADIAL PLAY (450 g LOAD)	0,02 mm
AXIAL PLAY (450 g LOAD)	0,08 mm
MAX RADIAL FORCE (10 mm FROM FRONT FLANGE)	15N
MAX AXIAL FORCE	10N
DIELECTRIC STRENGTH	500 VDC FOR ONE MINUTE
INSULATION RESISTANCE	100 Mohm min. 500 VDC

Brushless Integrated Electronic 57BL-IE



SPECIFICATION

	Model		57BL54-IE	57BL74-IE	57BL94-IE
1	N° of pole		4	4	4
2	N° of phase		3	3	3
3	Rated Voltage	V	36	36	36
4	Rated Speed	rpm	4000	4000	4000
5	Rated Torque	Nm	0,11	0,22	0,33
6	Max Peak Torque	Nm	0,39	0,7	1
7	Torque Constant	Nm/A	0,061	0,06	0,065
8	Line to Line Resistance	Ω	1,5	0,58	0,45
9	Line to Line inductance	mH	4,4	2	1,5
10	Max Peak Current	A	6,8	12	16
11	Rated Current	A	1,80	3,67	5,08
12	No-Load Current	mA	300	400	450
13	Length	mm	102	122	133,5
14	Rotor Inertia	g-cm^2	75	119	173
15	Weight	Kg	0,44	0,72	0,95

CONNECTION

Pin N°		Function
1	+Vp	DC power input +36Vdc
2	GND	DC power input GND
3	GND	common ground system
4	PG	Speed pulse output TTL.6 pulse/rev.
5	SV	Reference speed Voltage 0/+5V
6	F/R	Rotation direction
7	+5V	+5V voltage output

CHARACTERISTICS

Item	
Hall Effect Angle	120°
Shaft Run Out	0,025 mm
Insulation Class	B
Radial Play (460 g load)	0,025 mm
Axial Play (4000 g load)	0,025 mm
Max Radial Force (10 mm from front flange)	75N
Max Axial Force	15N
Dielectric Strength	500 VAC for one minute
Insulation Resistance	100 Mohm min. 500 VDC

Note/Notes

Planetary Gearboxes

What is a planetary gearbox?

A planetary gearbox is a gearbox with the input shaft and the output shaft aligned. A planetary gearbox is used to transfer the largest torque in the most compact form (known as torque density).
The bicycle's acceleration hub is a great example of a planet-wheel mechanism: Have you ever wondered how you can get so much power and capabilities in such a little hub? For a three-speed hub, a one-stage planetary gear system is used, for a five-speed hub a 2-stage. Each planet gear system has a reduction state, a direct coupling and an acceleration mode.
In mathematical terms, the smallest reduction ratio is 3: 1, the largest is 10: 1. At a ratio of less than 3, the sun gear becomes too big against the planet gears. At a ratio greater than 10 the sun wheel becomes too small and the torque will drop. The ratios are usually absolute i.e. an integer number.
Whoever invented the planetary gearbox is not known, but was functionally described by Leonardo da Vinci in 1490 and has been used for centuries.

Why is it named a planetary gearbox?

The planetary gearbox got its name because of how the different gears move together. In a planetary gearbox we see a sun (solar) gear, satellite (ring) gear and two or more planet gears. Normally, the sun-gear is driven and thus move the planet gears locked in the planet carrier and form the output shaft. The satellite gears have a fixed position in relation to the outside world. This looks similar to our planetary solar system and that is where the name comes from. What helped was that ancient gear constructions were used extensively in astrology for mapping and following our celestial bodies. So it was not such a big step to make.
In practice, we often speak from the perspective of the use of planetary gearboxes for industrial automation. That is why we call the sun-gear the input shaft, the planet gears and carrier the output shaft and the satellite gear (or ring gear) the housing.

Grease or oil as lubricant in planetary gearbox

Even with how precisely the planetary gearbox is manufactured and assembled, there are always rolling or sliding surfaces inside. That's why each gearbox contains a lubricant – whether it's oil, grease or a synthetic gel – to ensure the gears function well and prevent wear. In addition, the lubricant often also provides cooling and reduces noise or vibration.

Features and Benefits:

High efficiency
Multiple ratios available
Standard NEMA mountings
Quick installation
Cost effective

Codification

GEARBOX

G	P	6	-	T	2	-	16	S	R	L	R	23

1 GEAR

2 GEAR TYPE

P = Planetary gear W = Worm gear

3 GEARBOX SIZE

22,28,36,42,56…

4 GEARBOX CONFIGURATION

T = High torque N = Low noise S = Slide bearings

5 NUMBER OF STAGES

1 -Stage 2 -Stages 3 -Stages

6 GEAR RATIO

4; 5; 7; 9; 16…

7 SUPPORT OF OUTPUT SHAFT

S = Standard ball bearings H = High load ball bearings P = High load planet carrier

8 FLANGE TYPE AT OUTPUT SIDE

S = Square flange for output shaft R = Round flange for output shaft

9 CONNECTION OF FIRST SUN GEAR

L = Located sun gear G = Glued sun gear C = Clamped sun gear D = Directly sun gear

10 FLANGE TYPE AT INPUT SIDE

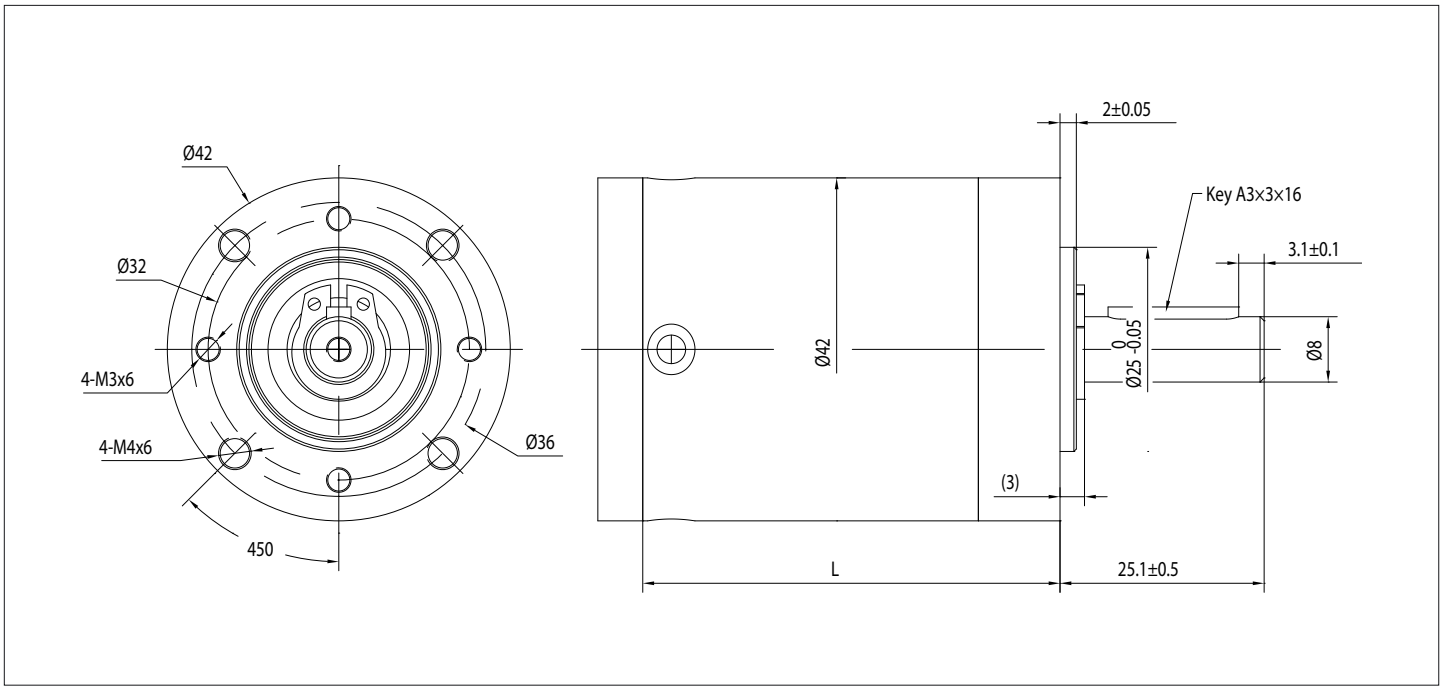
S = Square flange R = Round flange

11 NEMA SIZE

9; 11; 15; 23…

High-Performance Planetary Gearbox

Adding control simplicity to power. In many applications, the controllability of the Brushless motor is a key feature. This is why we designed a range of Brushless motors with integrated electronics to simplify the overall application drive and enable longer life by supporting the transition from Brushed DC to Brushless technology. Pumps and many other applications in Healthcare and Industrial segments will benefit from this technology.



SPECIFICATION

Technical data	Unit	GP42-S1-3.93	GP42-S1-4.27	GP42-S1-5.25	GP42-S1-6.00	GP42-S1-7.07
Number of stages		1-stage	1-stage	1-stage	1-stage	1-stage
Exact Ratio		3,931	4,269	5,250	6,000	7,071
Nominal output torque for L10h = 5,000 h	Nm	7,66	4,25	6,40	3,12	3,00
Max. output torque	Nm	15,32	8,50	12,80	6,24	6,00
Recommended input speed	rpm	3000	3000	3000	3000	3000
Max. input speed	rpm	8236	9187	11943	14050	17061
Efficiency	%	90%	90%	90%	90%	90%
Noise (n=3500 rpm, L = 1 m)	dB	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55
backlash with 2% of the rated torque	arcmin	≤ 60	≤ 60	≤ 60	≤ 60	≤ 60
Length	mm	42,70	42,70	42,70	42,70	42,70
Gearbox weight	kg	0,28	0,28	0,28	0,28	0,28

CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Operating Temperature	-15°C + 90° C
Max radial load (Center of shaft)	386 N
Max Axial Load	1641 N
Max press-fit force	320N
Protection class	IP54

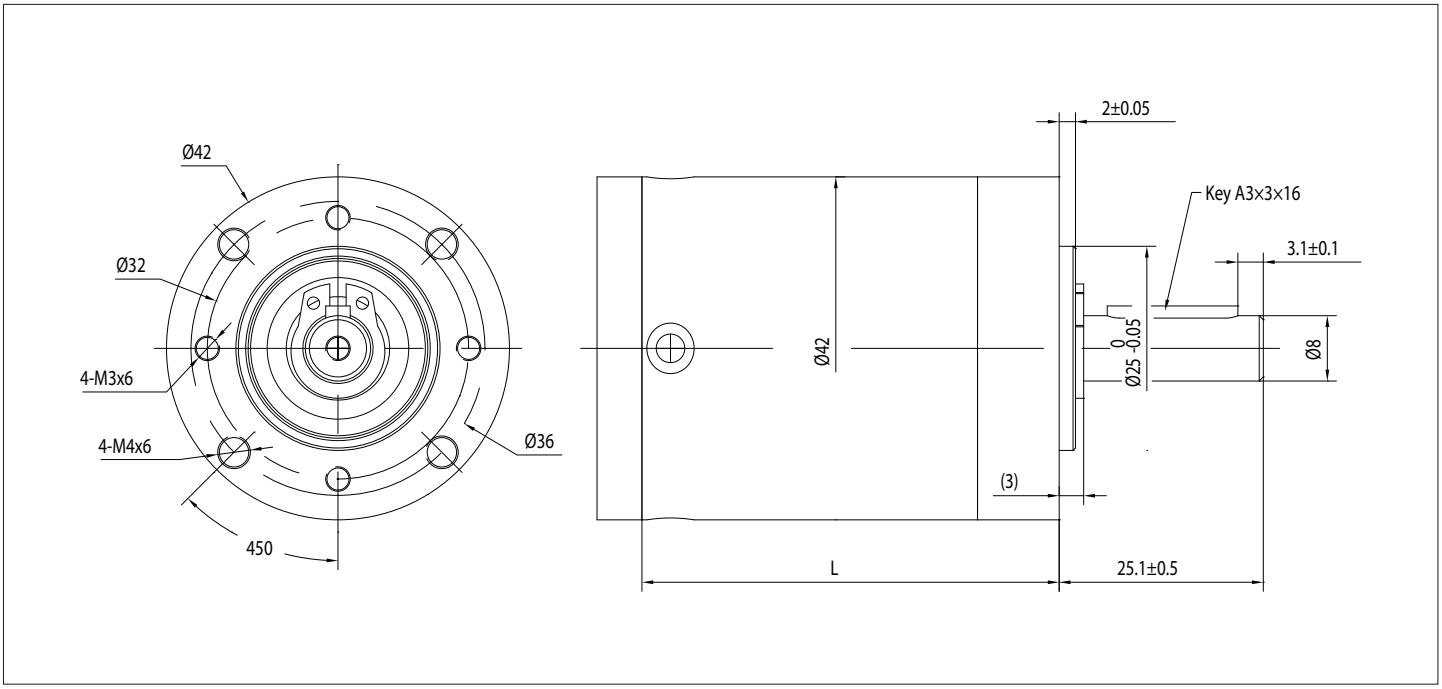
PRODUCT COMBINATION

- Brushless Motors
  - 45BLW
  - 42BL
  - 57BL
- Stepper Motors
  - 42SH

and other combination on request

SPECIAL SOLUTION

- high radial load
- low noise
- other ratios on request
- round flanges



SPECIFICATION

Technical data	Unit	GP42-S1-8.73	GP42-S2-15.45	GP42-S2-20.63	GP42-S2-25.61	GP42-S2-45.82
Number of stages		1-stage	2-stages	2-stages	2-stages	2-stages
Exact Ratio		8,727	15,453	20,630	25,610	45,818
Nominal output torque for L10h = 5,000 h	Nm	1,47	9,80	9,80	6,45	7,33
Max. output torque	Nm	2,94	19,12	19,61	12,90	14,66
Recommended input speed	rpm	3000	3000	3000	3000	3000
Max. input speed	rpm	18000	8236	11943	14050	18000
Efficiency	%	90%	85%	85%	85%	85%
Noise (n=3500 rpm, L = 1 m)	dB	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55
backlash with 2% of the rated torque	arcmin	≤ 60	≤ 60	≤ 60	≤ 60	≤ 60
Length	mm	42,70	56,60	56,60	56,60	56,60
Gearbox weight	kg	0,28	0,40	0,40	0,40	0,40

CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Operating Temperature	-15°C + 90° C
Max radial load (Center of shaft)	386 N
Max Axial Load	1641 N
Max press-fit force	320N
Protection class	IP54

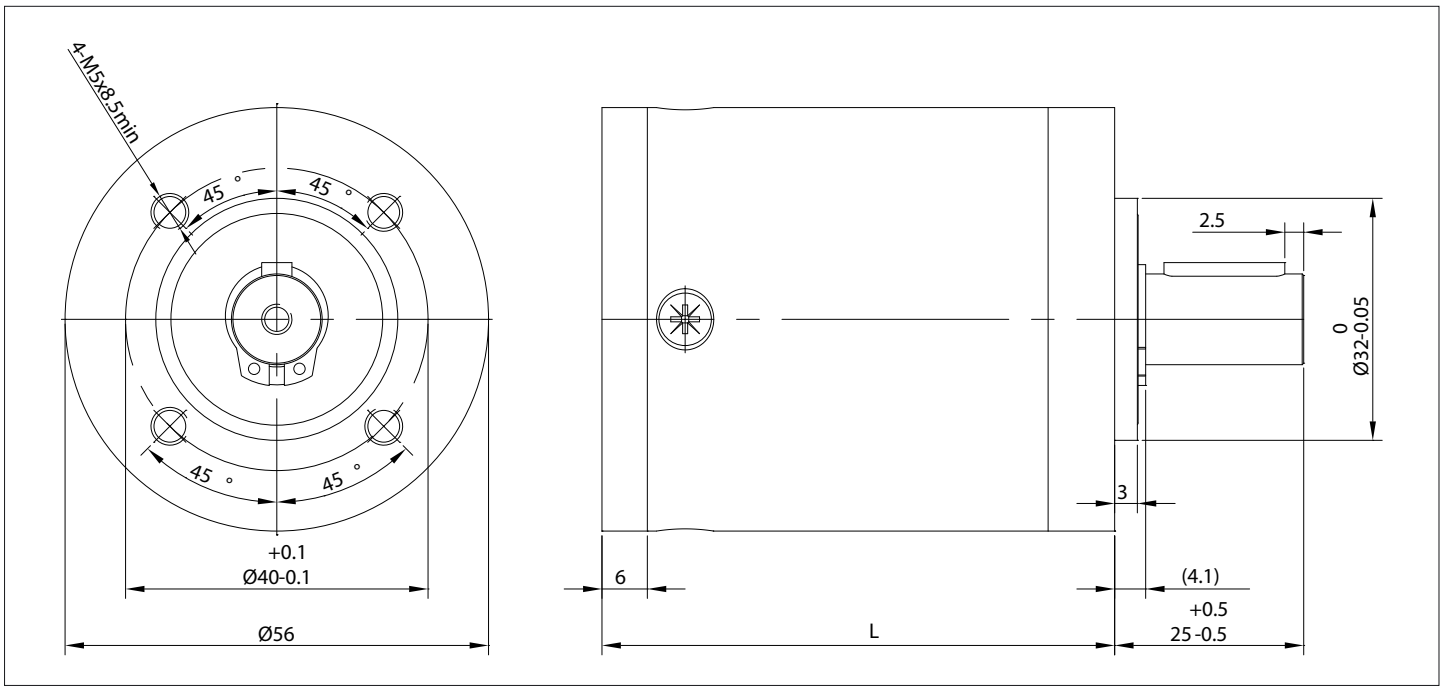
PRODUCT COMBINATION

- Brushless Motors
  - 45BLW
  - 42BL
  - 57BL
- Stepper Motors
  - 42SH

and other combination on request

SPECIAL SOLUTION

- high radial load
- low noise
- other ratios on request
- round flanges



SPECIFICATION

Technical data	Unit	GP56-S1-3.29	GP56-S1-3.93	GP56-S1-4.24	GP56-S1-5.08	GP56-S1-6.53	GP56-S1-7.71	GP56-S1-9.55
Number of stages		1-stage	1-stage	1-stage	1-stage	1-stage	1-stage	1-stage
Exact Ratio		3,293	3,938	4,241	5,087	6,529	7,714	9,546
Nominal output torque for L10h = 5,000 h	Nm	16,81	22,63	15,43	10,15	13,70	6,76	3,74
Max. output torque	Nm	33,62	45,26	30,86	20,30	27,40	13,52	7,48
Recommended input speed	rpm	3500	3500	3500	3500	3500	3500	3500
Max. input speed	rpm	4658	5971	6589	8307	8988	10919	13000
Efficiency	%	92	92	92	92	92	92	85
Noise (n=3500 rpm, L = 1 m)	dB	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55
backlash with 2% of the rated torque	arcmin	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30
Length	mm	50,60	50,60	50,60	50,60	50,60	50,60	50,60
Gearbox weight	kg	0,57	0,56	0,56	0,56	0,58	0,56	0,59

CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Operating Temperature	-15°C + 90° C
Max radial load (Center of shaft)	650 N
Max Axial Load	1641 N
Protection class	IP54

PRODUCT COMBINATION

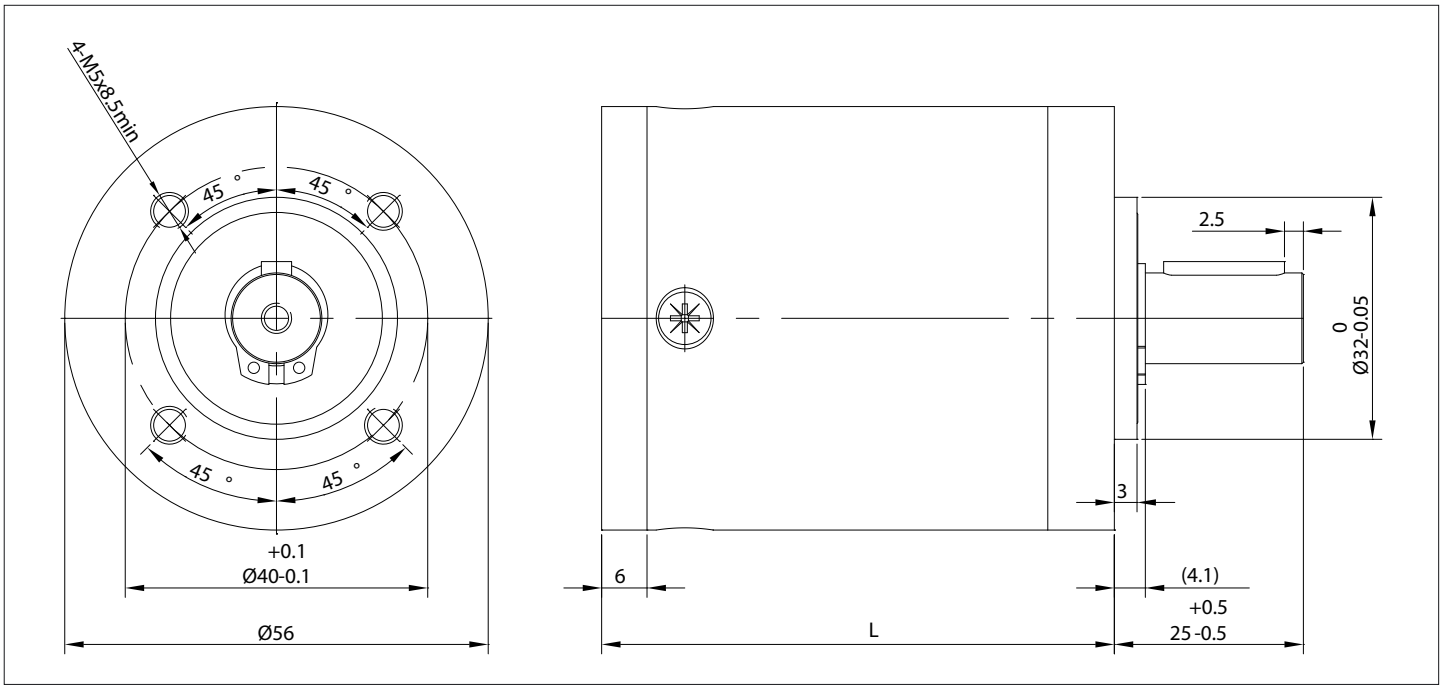
- Brushless Motors
  - 57BL
  - 57BLA
  - 57BLB
- Stepper Motors
  - 57SH

and other combination on request

SPECIAL SOLUTION

- high radial load
- low noise
- other ratios on request
- round flanges

Gearboxes High-Performance GP56-S



SPECIFICATION

Technical data	Unit	GP56-S2-10.84	GP56-S2-15.51	GP56-S2-20.03	GP56-S2-25.71	GP56-S2-32.69	GP56-S2-42.63	GP56-S2-62.33
Number of stages		2-stages	2-stages	2-stages	2-stages	2-stages	2-stages	2-stages
Exact Ratio		10,842	15,504	20,030	25,710	32,718	42,633	62,326
Nominal output torque for L10h = 5,000 h	Nm	20,06	25,53	25,93	26,36	22,36	18,44	19,26
Max. output torque	Nm	40,12	51,06	51,86	52,72	44,72	36,88	38,52
Recommended input speed	rpm	3500	3500	3500	3500	3500	3500	3500
Max. input speed	rpm	4658	5968	8307	8992	10919	8992	13000
Efficiency	%	85	85	85	85	85	85	85
Noise (n=3500 rpm, L = 1 m)	dB	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55
backlash with 2% of the rated torque	arcmin	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30
Length	mm	67,80	67,80	67,80	67,80	67,80	67,80	67,80
Gearbox weight	kg	0,80	0,84	0,80	0,80	0,80	0,80	0,82

CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Operating Temperature	-15°C + 90° C
Max radial load (Center of shaft)	650 N
Max Axial Load	1641 N
Protection class	IP54

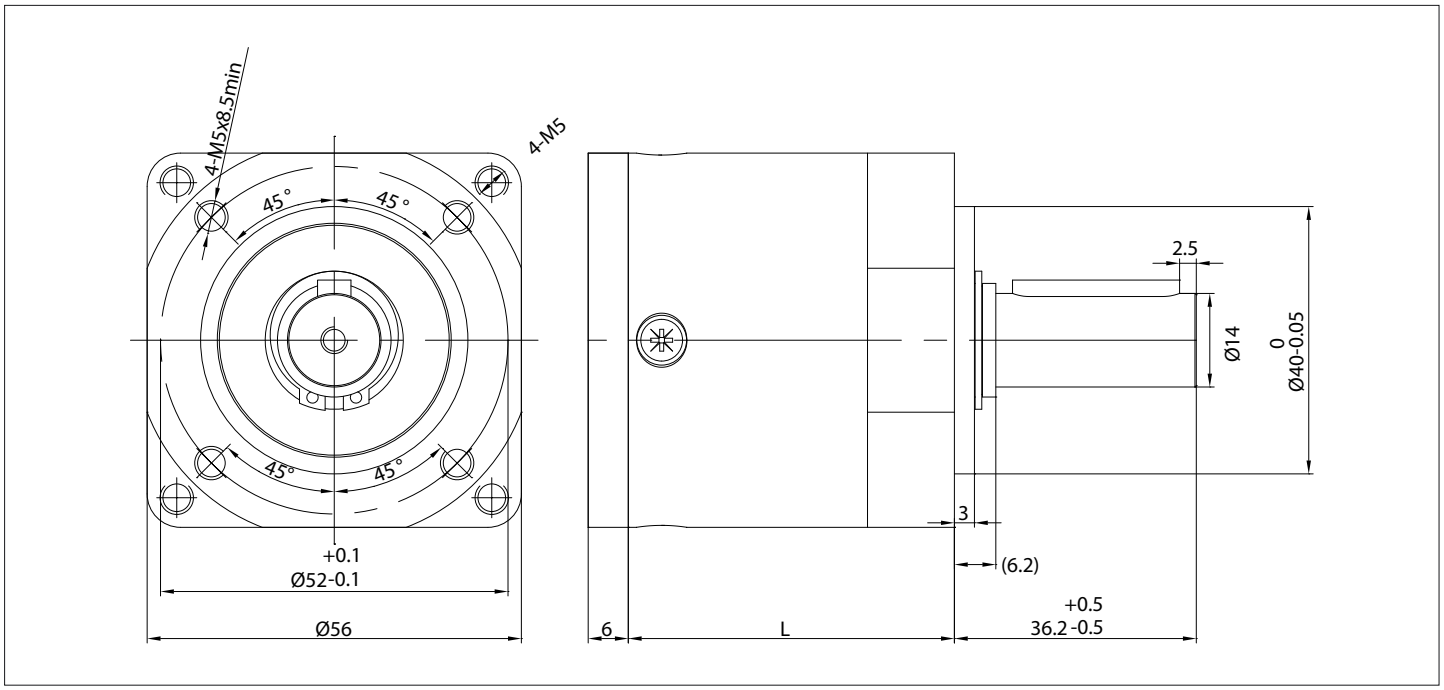
PRODUCT COMBINATION

- Brushless Motors
  - 57BL
  - 57BLA
  - 57BLB
- Stepper Motors
  - 57SH

and other combination on request

SPECIAL SOLUTION

- high radial load
- low noise
- other ratios on request
- round flanges



SPECIFICATION

Technical data	Unit	GP56-T1-3.29	GP56-T1-3.93	GP56-T1-4.24	GP56-T1-5.08	GP56-T1-6.53	GP56-T1-7.71	GP56-T1-9.55
Number of stages		1-stage	1-stage	1-stage	1-stage	1-stage	1-stage	1-stage
Exact Ratio		3,293	3,938	4,241	5,087	6,529	7,714	9,546
Nominal output torque for L10h = 5,000 h	Nm	16,81	22,63	15,43	10,15	13,70	6,76	3,74
Max. output torque	Nm	33,62	45,26	30,86	20,30	27,40	13,52	7,48
Recommended input speed	rpm	3500	3500	3500	3500	3500	3500	3500
Max. input speed	rpm	4658	5971	6589	8307	8988	10919	13000
Efficiency	%	92	92	92	93	92	92	85
Noise (n=3500 rpm, L = 1 m)	dB	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55
backlash with 2% of the rated torque	arcmin	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30
Length	mm	50,80	50,80	50,80	50,80	50,80	50,80	50,80
Gearbox weight	kg	0,56	0,56	0,56	0,56	0,56	0,56	0,56

CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Operating Temperature	-15°C + 90° C
Max radial load (Center of shaft)	711 N
Max Axial Load	1931 N
Max press-fit force	500N
Protection class	IP54

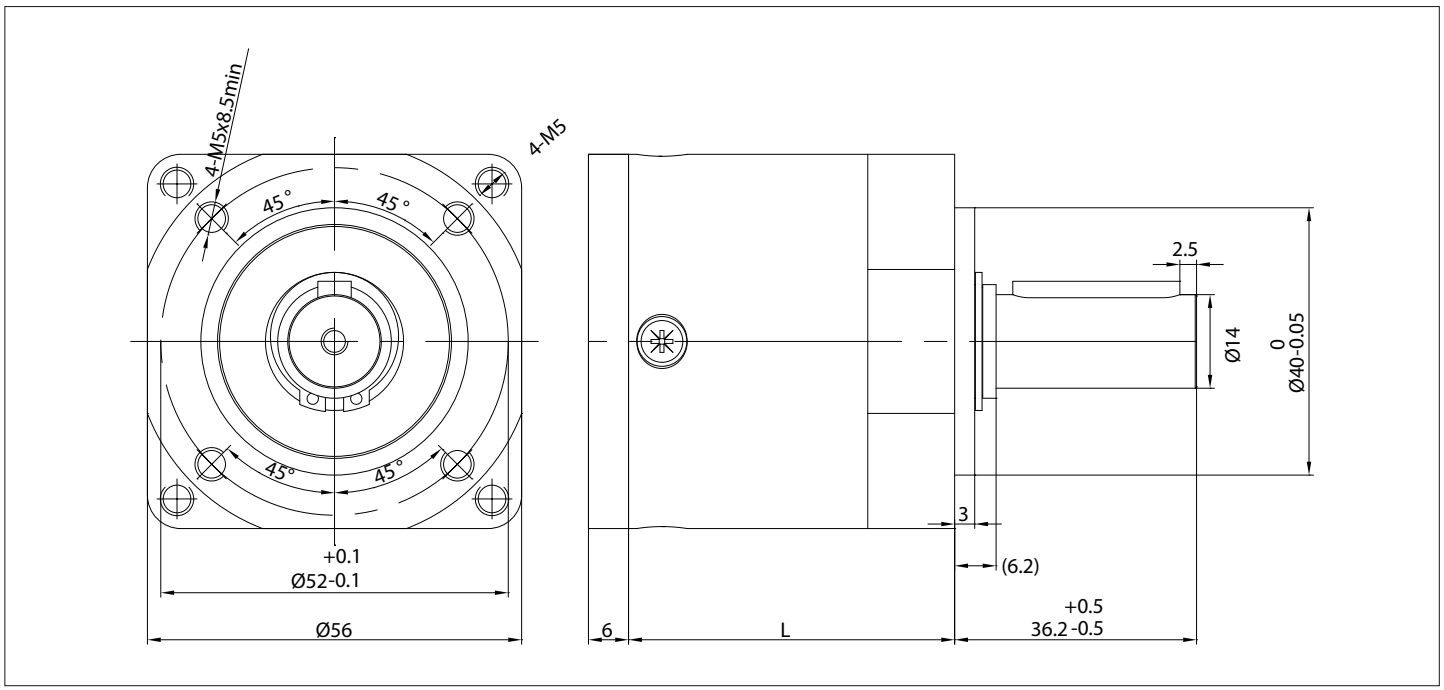
PRODUCT COMBINATION

- Brushless Motors
  - 57BL
  - 57BLA
  - 57BLB
- Stepper Motors
  - 57SH

and other combination on request

SPECIAL SOLUTION

- high radial load
- low noise
- other ratios on request
- round flanges



SPECIFICATION

Technical data	Unit	GP56-T2-10.84	GP56-T2-15.51	GP56-T2-20.03	GP56-T2-25.71	GP56-T2-32.69	GP56-T2-42.63	GP56-T2-62.33
Number of stages		2-stages	2-stages	2-stages	2-stages	2-stages	2-stages	2-stages
Exact Ratio		10,842	15,504	20,030	25,710	32,718	42,633	62,326
Nominal output torque for L10h = 5,000 h	Nm	20,06	25,53	25,93	26,36	22,36	18,44	19,26
Max. output torque	Nm	40,12	51,06	51,86	52,72	44,72	36,88	38,52
Recommended input speed	rpm	3500	3500	3500	3500	3500	3500	3500
Max. input speed	rpm	4658	5968	8307	8992	10919	8992	13000
Efficiency	%	85	85	85	85	85	85	85
Noise (n=3500 rpm, L = 1 m)	dB	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55	≤ 55
backlash with 2% of the rated torque	arcmin	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30
Length	mm	72	72	72	72	72	72	72
Gearbox weight	kg	0,80	0,80	0,80	0,80	0,80	0,80	0,80

CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Operating Temperature	-15°C + 90° C
Max radial load (Center of shaft)	711 N
Max Axial Load	1931 N
Max press-fit force	500N
Protection class	IP54

PRODUCT COMBINATION

- Brushless Motors
  - 57BL
  - 57BLA
  - 57BLB
- Stepper Motors
  - 57SH

and other combination on request

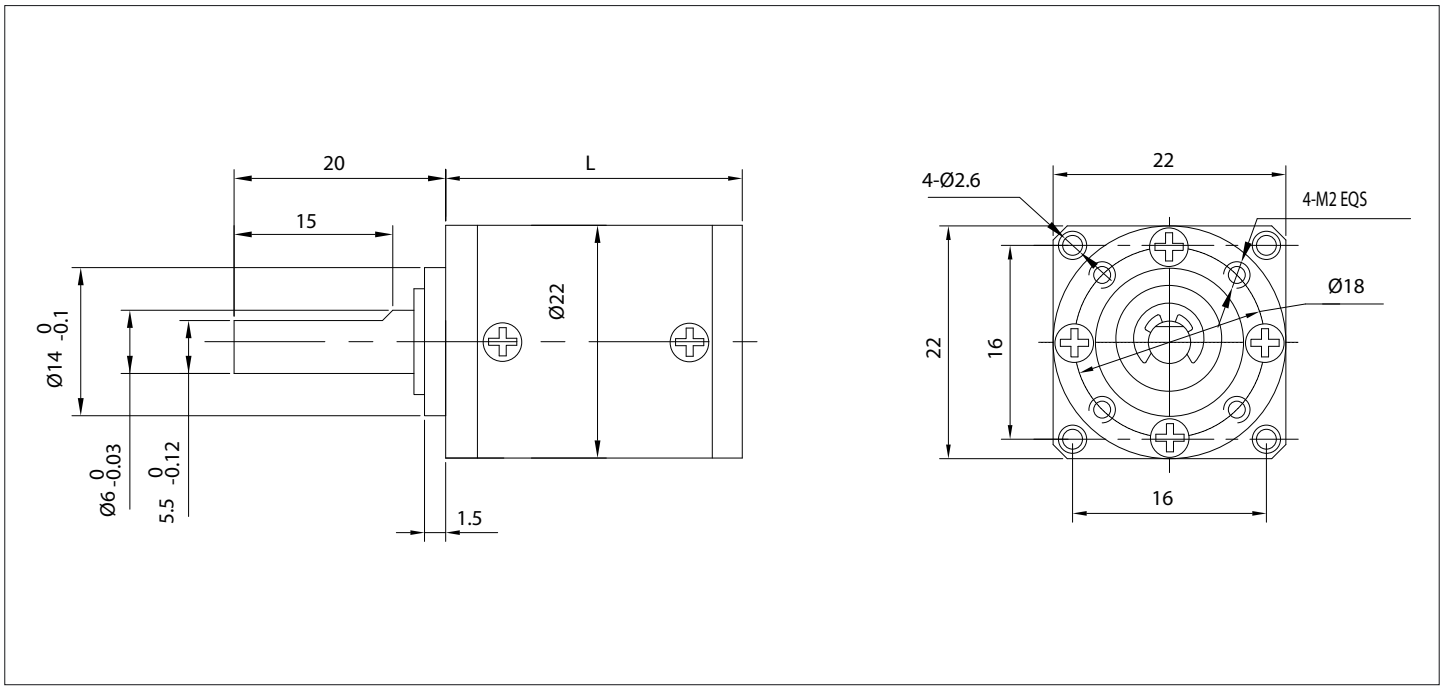
SPECIAL SOLUTION

- high radial load
- low noise
- other ratios on request
- round flanges

Price-performance planetary gearbox

The effective price-torque ratio. Engineered to drive effectiveness in many medical and industrial applications, our range of Price-Performance gearboxes matches our Stepper and Brushless portfolio. The planetary design enables to reach high torque and keep control over the cost of the motion solution.

Note/Notes



SPECIFICATION

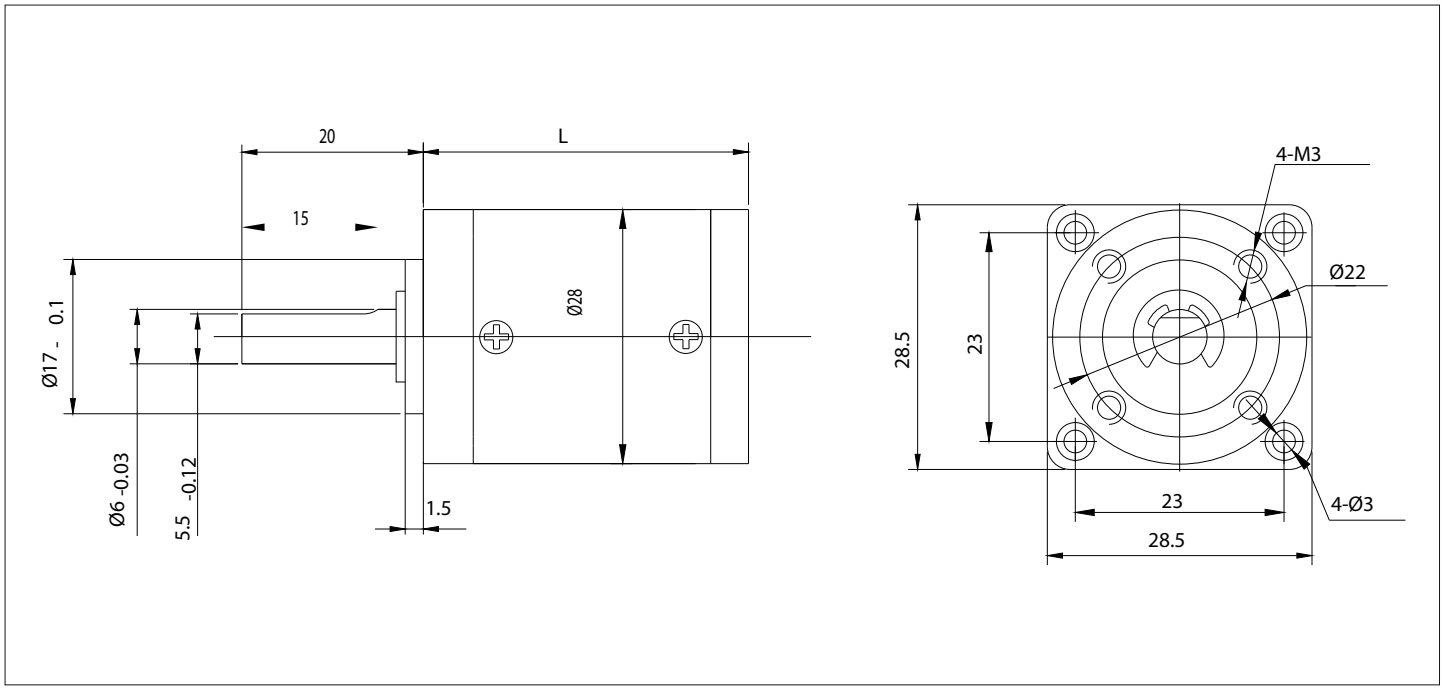
Number of Stages	Reduction ratio	Exact reduction ratio	Rated torque	Max momentary torque	Backlash at no-load	Efficiency	Length (mm)	Weight (g)
1-Stage	1/3.7 1/5.2	1/3.71 1/5.18	0.6 Nm	2.0 Nm	≤1.0°	90%	23.4±0.5	31
2-Stages	1/14 1/19 1/27	1/13.76 1/19.22 1/26.83	1.0 Nm	3.0 Nm	≤1.2°	81%	30.0±0.5	37
3-Stages	1/51 1/71 1/100 1/139	1/51.06 1/71.30 1/99.55 1/138.99	2.0 Nm	6.0 Nm	≤1.5°	73%	36.4±0.5	43

Pinion SPECIFICATION

Module	0.4	
No. of teeth	11	17
Pressure angle	20°	
Hole diameter	Ø2.5 (+0.02/+0.04)	
Reduction ratio	1/5.2 1/19 1/27 1/71 1/100 1/139	1/3.7 1/14 1/51

CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Max radial load	50N
Max arial load	30N
Radial play	<0,08
Axial play	<0,3
Shaft pres fit force max	60N
Operating ambient Humidity	20-80% RH
Operating Temperature	-20°C + 80° C



SPECIFICATION

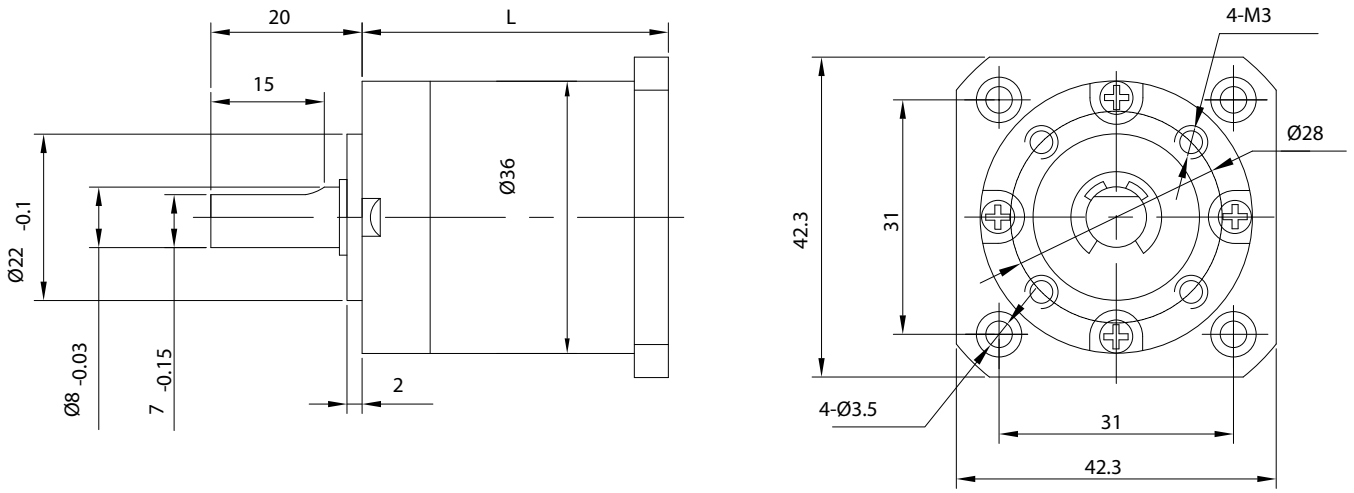
Number of Stages	Reduction ratio	Exact reduction ratio	Rated torque	Max momentary torque	Backlash at no-load	Efficiency	Length (mm)	Weight (g)
1-Stage	1/3.7 1/5.2	1/3.71 1/5.18	1.2 Nm	4.0 Nm	≤1.0°	90%	29.0±0.5	75
2-Stages	1/14 1/19 1/27	1/13.76 1/19.22 1/26.83	2.0 Nm	6.0 Nm	≤1.2°	81%	36.1±0.5	97
3-Stages	1/51 1/71 1/100 1/139	1/51.06 1/71.30 1/99.55 1/138.99	4.0 Nm	12.0 Nm	≤1.5°	73%	43.0±0.5	119

Pinion SPECIFICATION

Module	0.5	
No. of teeth	11	17
Pressure angle	20°	
Hole diameter	Ø3.5 (+0.008/+0.028)	
Reduction ratio	1/5.2 1/19 1/27 1/71 1/100 1/139	1/3.7 1/14 1/51

CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Max radial load	100N
Max arial load	50N
Radial play	<0,07
Axial play	<0,3
Shaft pres fit force max	100N
Operating ambient Humidity	20-80% RH
Operating Temperature	-20°C + 80° C



SPECIFICATION

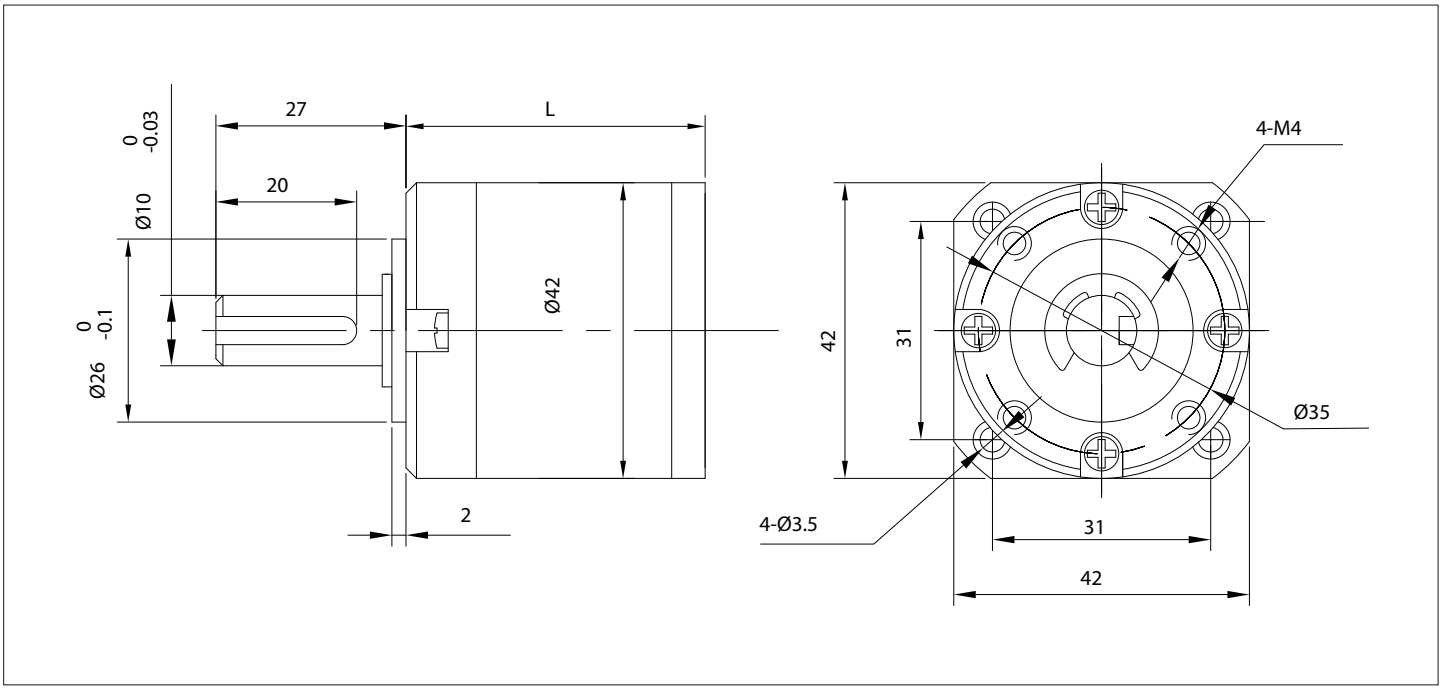
Number of Stages	Reduction ratio	Exact reduction ratio	Rated torque	Max momentary torque	Backlash at no-load	Efficiency	Length (mm)	Weight (g)
1-Stage	1/3.7 1/5.2	1/3.71 1/5.18	2.0 Nm	6.0 Nm	≤1.0°	90%	27.0±0.5	134
2-Stages	1/14 1/19 1/27	1/13.76 1/19.22 1/26.83	3.0 Nm	9.0 Nm	≤1.2°	81%	34.2±0.5	173
3-Stages	1/51 1/71 1/100 1/139	1/51.06 1/71.30 1/99.55 1/138.99	6.0 Nm	18.0 Nm	≤1.5°	73%	41.1±0.5	212

Pinion SPECIFICATION

Module	0.5	
No. of teeth	11	17
Pressure angle	20°	
Hole diameter	Ø3.5 (+0.008/+0.028)	
Reduction ratio	1/5.2 1/19 1/27 1/71 1/100 1/139	1/3.7 1/14 1/51

CHARACTERISTICS

Item	
Housing material	Metal - powder metal
Bearing output	Ball Bearings
Max radial load	100N
Max arial load	50N
Radial play	<0,07
Axial play	<0,3
Shaft pres fit force max	120N
Operating ambient Humidity	20-80% RH
Operating Temperature	-20°C + 80° C



SPECIFICATION

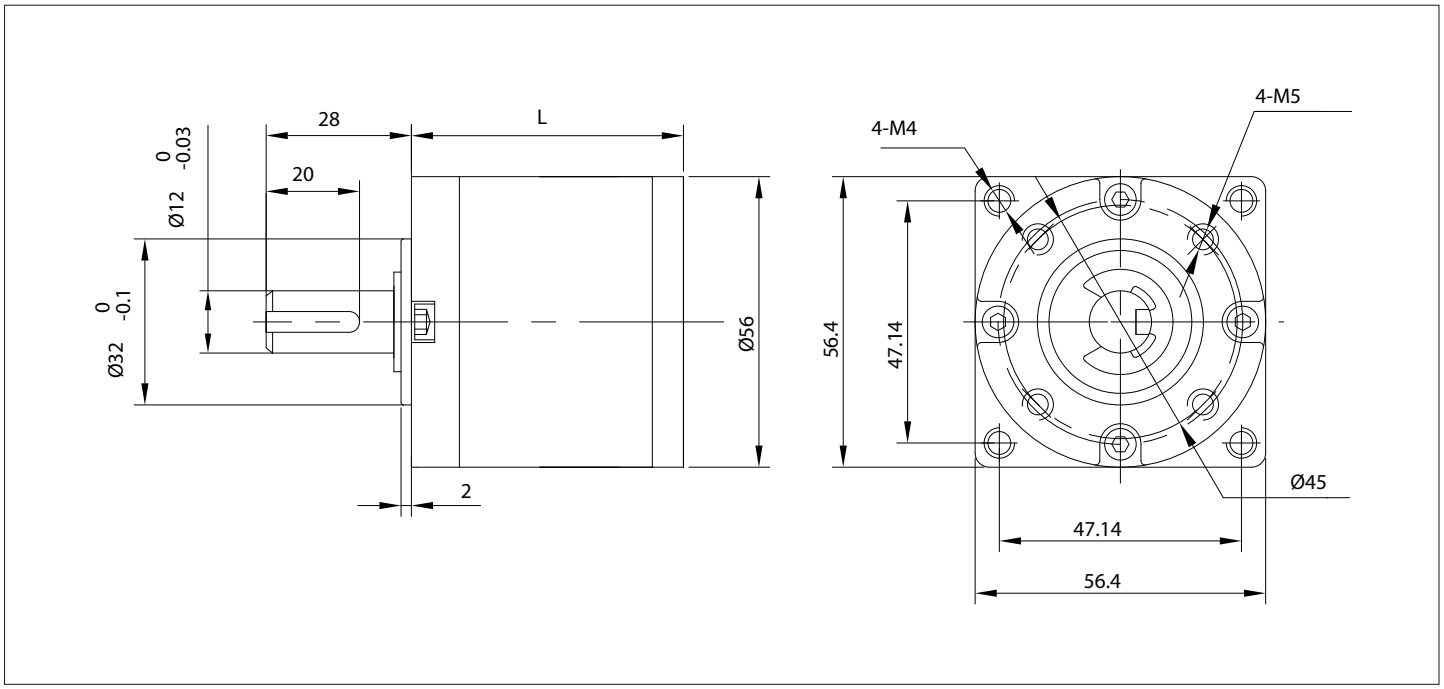
Number of Stages	Reduction ratio	Exact reduction ratio	Rated torque	Max momentary torque	Backlash at no-load	Efficiency	Length (mm)	Weight (g)
1-Stage	1/3.7 1/5.2	1/3.71 1/5.18	3.0 Nm	9.0 Nm	≤1.0°	90%	31.5±0.5	208
2-Stages	1/14 1/19 1/27	1/13.76 1/19.22 1/26.83	5.0 Nm	15.0 Nm	≤1.2°	81%	42.1±0.5	290
3-Stages	1/51 1/71 1/100 1/139	1/51.06 1/71.30 1/99.55 1/138.99	10.0 Nm	30.0 Nm	≤1.5°	73%	52.5±0.5	372

Pinion SPECIFICATION

Module	0.6	
No. of teeth	11	17
Pressure angle	20°	
Hole diameter	Ø4 (+0.008/+0.028)	
Reduction ratio	1/5.2 1/19 1/27 1/71 1/100 1/139	1/3.7 1/14 1/51

CHARACTERISTICS

Item	
Housing material	Metal - powder metal
Bearing output	Ball Bearings
Max radial load	200N
Max arial load	100N
Radial play	<0,06
Axial play	<0,3
Shaft pres fit force max	150N
Operating ambient Humidity	20-80% RH
Operating Temperature	-20°C + 80° C



SPECIFICATION

Number of Stages	Reduction ratio	Exact reduction ratio	Rated torque	Max momentary torque	Backlash at no-load	Efficiency	Length0 (mm)	Weight (g)
1-Stage	1/3.6 1/4.3	1/3.6 1/4.25	9.0 N.m	27.0 Nm	≤1.0°	90%	37.8±0.5	455
2-Stages	1/13 1/15 1/18 1/23	1/12.96 1/15.30 1/18.06 1/22.67	15.0 N.m	60.0 Nm	≤1.2°	81%	49.4±0.5	610
3-Stages	1/47 1/55 1/65 1/77	1/46.66 1/55.08 1/65.03 1/76.77	30.0 N.m	90.0 Nm	≤1.5°	73%	60.8±0.5	765

Pinion SPECIFICATION

Module	1.0	
No. of teeth	12	15
Pressure angle	20°	
Hole diameter	Ø6 (+0.018/0)	
Reduction ratio	1/4.3 1/15 1/18 1/55 1/65 1/77	1/3.6 1/13 1/547

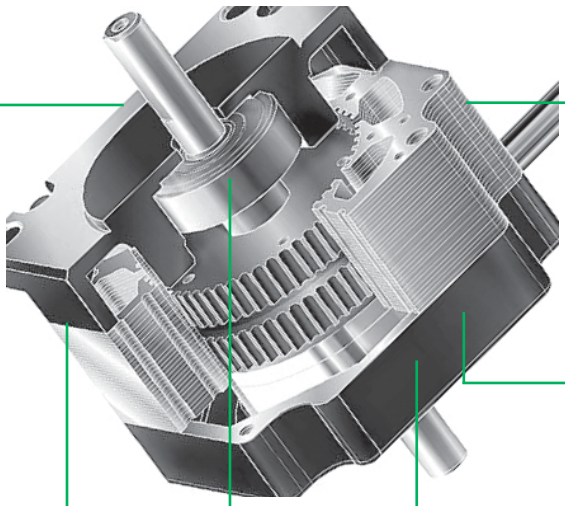
CHARACTERISTICS

Item	
Housing material	Metal
Bearing output	Ball Bearings
Max radial load	300N
Max arial load	200N
Radial play	<0,08
Axial play	<0,4
Shaft pres fit force max	300N
Operating ambient Humidity	20-80% RH
Operating Temperature	-20°C + 80° C

Custom Motors

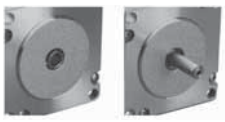
Take advantage of our Added Value

Cables & Connectors

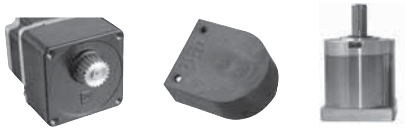


Ball bearings

Shaft



Encoders - Gearboxes



Winding

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