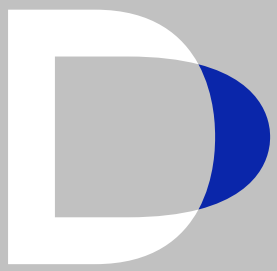
2021/2022
Product
Catalogue



Delta Line

Moving together

Stepper

Permanent Magnet Stepper

p.265

Flat Hybrid Stepper

p.353

Hybrid Stepper S series

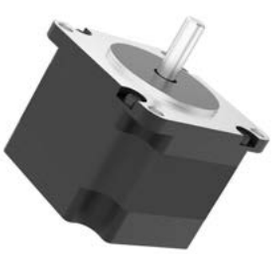
p.277

Hybrid Stepper SH series

p.287

Hybrid Stepper STC series

p.327



3-Phase Hybrid Stepper

p.337

Hollow Shaft Stepper

p.345 - NEW

Hybrid Stepper with Encoder

p.357

IP65 Hybrid Stepper

p.373

Stepper Motors

* Holding Torque

Term	
Rated voltage	Voltage necessary to reach the nominal current per phase.
Current/Phase	The current supplied to the motor phases that will not exceed, at an ambient temperature of 20°C, the thermal limits of the motor.
Resistance/Phase	Winding resistance per phase. Tolerance +/- 12%, steady state.
Inductance/Phase	Winding inductance per phase measured at 1kHz.
Holding Torque	The torque generated by the motor at nominal current.
Rotor Inertia	Is the mass moment of inertia of the rotor, based on the axis of rotation.
Detent Torque	The torque required to rotate a non-energized step motor.
Number of leads	Number of lead wires available to connect the motor.
Length	Total motor length.
Weight	Total motor mass.
Step angle	Number of angular degrees the motor moves per full-step
Step angle accuracy	The percentage position error per full step, at no load and nominal current. This error is not cumulative between steps.
Insulation class	The electrical insulation system for wires and other wire-wound electrical components is divided into different classes by temperature and temperature rise. The electrical insulation system is sometimes referred to as insulation class or thermal classification.
Ambient temperature	Temperatures at which the motor can operate.
Max. Temp. Rise (rated current 2 phase on)	Maximum temperature rise for the motor at rated voltage and two phases
Max. shaft radial play	The shaft displacement perpendicular to the shaft due to a side force applied perpendicular to the shaft axis.
Max. shaft axial play	Axial shaft displacement occurring during a reversal of an axial force on the shaft.
Max. Radial force	Maximum force that can be applied to the shaft in the radial direction (any direction perpendicular to the motor shaft axis).
Max. Axial force	Maximum force that can be applied to the shaft in the axial direction (in the same axis as or parallel to the motor shaft axis).
Dielectric strength	A dielectric test (also known as hipot or high potential test) is performed on all motors under 500V phases to the housing and during 5 seconds after voltage ramp up. Maximum allowed leakage is 1mA
Insulation resistance	The measurement of insulation resistance is carried out by means of a megohmmeter – high resistance range ohmmeter. DC voltage is applied between the windings and the ground of the motor.

Glossary

Product families

- Permanent Magnet Stepper motors
- Hybrid Stepper motors
- 3-Phase Hybrid Stepper motors
- Hollow Shaft Stepper motors
- Flat Hybrid Stepper motors
- Stepper motors with Encoder
- IP65 Hybrid 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. 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.

Main advantages	
1	The rotation angle of the motor is proportional to the input pulse.
2	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.
3	Excellent response to starting/stopping/reversing.
4	Very reliable since there are no contact brushes in the motor. Therefore the life of the motor is simply dependent on the life of the bearing.
5	A wide range of rotational speeds can be realized as the speed is proportional to the frequency of the input pulses.

Often referred to as “tin can” or “can stack” motor the permanent magnet step motor is a low cost and low resolution type motor. PM motors have permanent magnets added to the motor structure. The rotor no longer has teeth, instead the rotor is magnetized with alternating north and south poles situated in a straight line parallel to the rotor shaft. These motors offer good torque at lower speed.

Permanent Magnets stepper motors

The hybrid stepper motor is more expensive than the PM stepper motor but provides better performance with respect to step resolution, torque and speed. This motor combines the best features of both the PM and Variable Reluctance stepper motors. The rotor is multi-toothed 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 air gap. This further increases the detent, holding and dynamic torque characteristics of the motor when compared with both the VR and PM types.

Hybrid Stepper motors (2-Phase)

3-Phase technology in hybrid stepper motor is used mainly where ultra-low vibration and very low noise levels are required. The drive circuit of these motors is simplified because it is driven with a star wiring connection. The use of three phases inherently helps to reduce torque ripple and smooth motor performance. An example of an ideal application is in performance lighting, where quick movement and quiet operation are required.

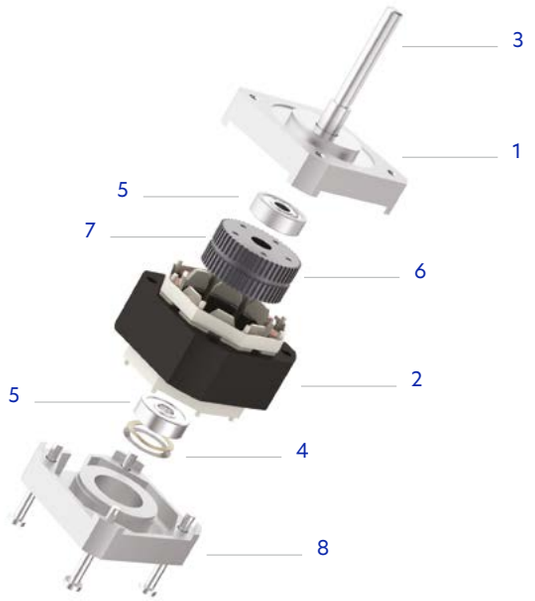
3-Phase Hybrid Stepper motors

Our Hybrid stepper motors are also available equipped with an optical incremental encoder to increase the motion precision. Thanks to the encoder, the drive knows the position (or the speed) of the motor in real time and can perform adjustments to align the real condition with the condition requested by the system. The presence of an encoder is highly recommended when is critical to know the status of the motor (both position and speed) in every instant.

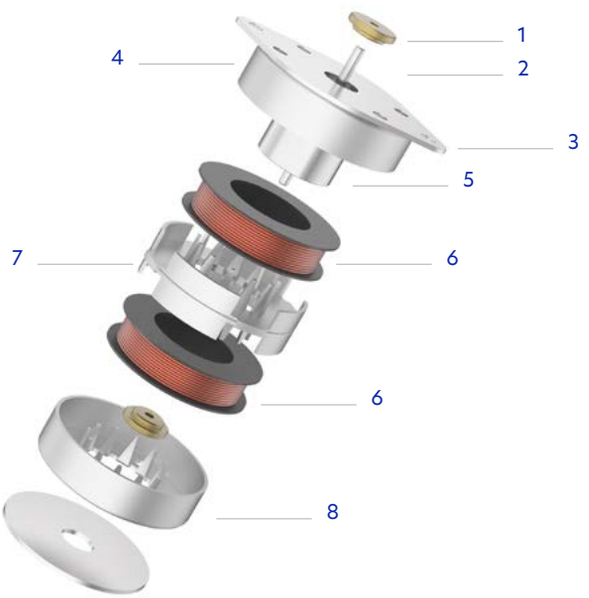
Stepper motors with integrated Encoder

Technical introduction

Composition Hybrid Stepper	
1	Front Endbell
2	Stator & Coils
3	Shaft
4	Washer
5	Ball bearings
6	Rotor cup
7	Magnet
8	Rear Endbell



Composition PM Stepper	
1	Sleeve bearing
2	Shaft
3	Front flange
4	Front cover/stator
5	Rotor
6	Windings
7	Inner stator
8	Rear cover/stator



Stepper motors

Flat Hybrid

Advantages at a glance
Very compact size
High torque
Great power to volume ratio

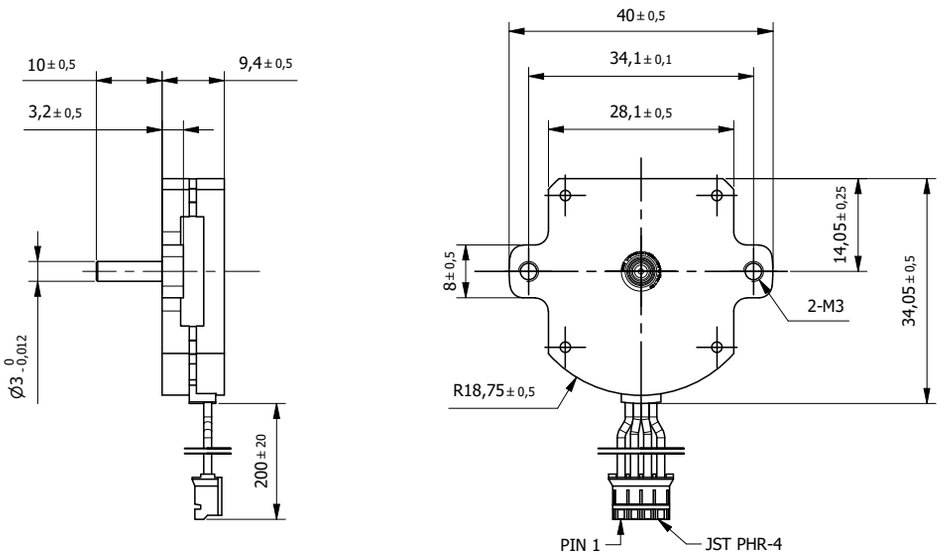
Flat Hybrid Stepper motors	Torque* (Nm)	
28S10	0,010	354
63S10	0,064	355

Our flat high-torque stepper motors offer maximum functionality in a very compact package. 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.

* Holding Torque

Flat Hybrid Stepper Motor 28S10

□ 28mm



Specification			
	Model		...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	0,01
6	Rotor Inertia	gcm2	1,7
7	n° of Leads		4
8	Length (L)	mm	9,4
9	Weight	Kg	0,028

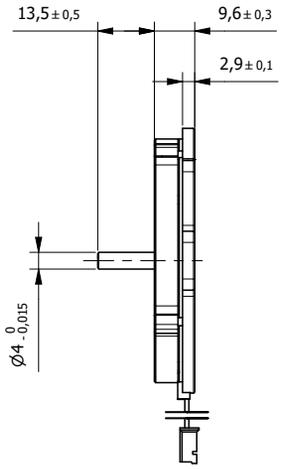
Characteristics	
Item	
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP30
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (at 4N)	0,02mm
Max. Shaft Axial play (at 4N)	0,08mm
Max. Radial Force (5mm from front flange)	10N
Max Axial Force	2N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

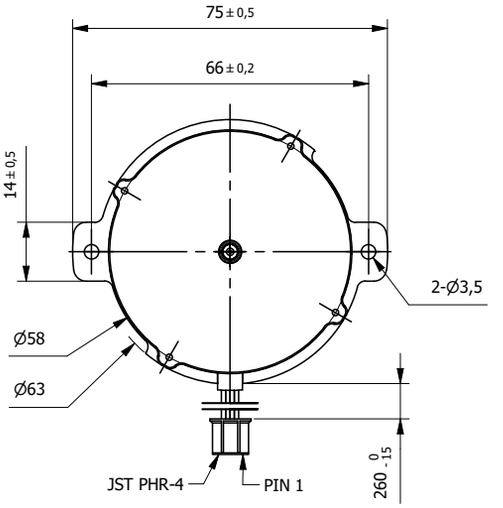
Standard Combination
Drive
Aries
Libra
Orion
Aquarius
* other options on request

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

Flat Hybrid Stepper Motor 63S10

Ø 63mm





Specification			
	Model		...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	gcm2	16
7	n° of Leads		4
8	Length (L)	mm	9,6
9	Weight	Kg	0,095

Characteristics	
Item	
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	E
Protection Class	IP30
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (at 4N)	0,02mm
Max. Shaft Axial play (at 4N)	0,08mm
Max. Radial Force (5mm from front flange)	10N
Max Axial Force	2N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

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Connection			
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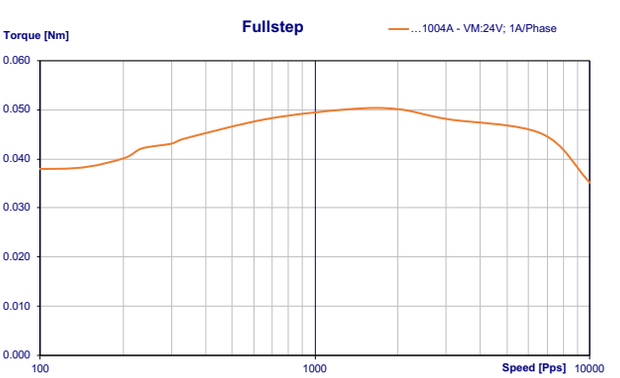

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