

PRODUCT CATALOGUE

Perfect customized Slotless BLDC motors,
gearheads, encoders, controllers

Silent, Reliable, Efficient, Powerful



We Specialize in Motor and control technology



We provide

worldwide, Perfectly engineered miniature Brushless motors, Gearheads, encoders variety of possible combinations, and offer flexible customized services which suit your needs.

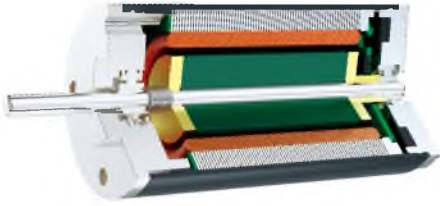
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We are Vishan

Since 2012,Vishan has started to develop and produce the miniature motors and precision motion control technologies for performance-critical applications which could save,improve and enhance lives.

Our products including Slotless and Slotted Brushless DC motors,Gearheads,Encoders and controllers for the industrial automation,power tools,medical technology and robotics place. We provide the best products and custom engineering services from customized small volumes to series production to ensure a perfect fit for your applications.

OUR PRODUCTS OVERVIEW



Brushless DC motor Slotless Winding

Brushless DC motors are electronically commutated, the size is from $\phi 6-50\text{mm}$, with up to 300W

Main Characteristics

- No cogging torque
- Very long lifetime
- Well control properties
- Speed up to 60,000rpm

Product lines

- EC SERIES Basic product range
- ECD series Electronics integrated
- ECH Series Provide high speed performance



Brushless DC motor Slotless Winding-4Pole

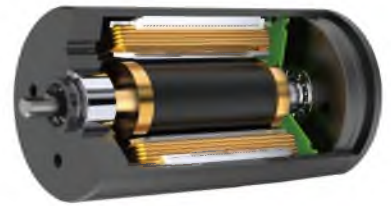
The innovative 4-pole magnet and winding design can greatly increase the power density of the motor, with sizes from $\phi 22\text{mm}$ to 30mm with up to 200W

Main Characteristics

- Ultra high power density
- Ultra High efficiency
- High reliability
- Low noise
- No Cogging
- Low inductance

Product lines

- EC-4pole 22 series
- EC-4pole 28 series
- EC-4pole 30 series



Brushless DC motor Slotted Winding

The slotted structure design concentrates the magnetic field, improving efficiency and torque density, allowing the motor to achieve greater output in a smaller volume.

Main Characteristics

- Cost effective
- Large starting torque
- Low noise
- Good heat dissipation
- Long operational lifetime
- Customizable

Product lines

- BL SERIES: Basic product range
- BD series: Electronics integrated
- BF Series: External rotor structure & Electronics integrated
- ECI Series: Multipole internal rotor design



Planetary gearbox

Through the high-precision planetary gearbox design and flexible gear material, internal structure and grease customization, it can meet the design requirements of the non-pass to the greatest extent, with dimensions ranging from $\varnothing 8\text{mm}$ to 42mm and maximum torque up to 20Nm

Product lines

Planetary gearhead
Screws planetary gearhead



Encoder

The encoder range covers magnetic encoders, optical encoders, and is available in multiturn or singleturn absolute solutions in sizes from $\varnothing 8\text{ mm}$ to 24 mm

Product lines

Magnetic encoders
Optical encoders
High position accuracy, repeatability and high signal quality.
Multifarious function customization



Controllers

Based on the hardware and software solutions of our own drive team, we can provide motor control solutions for motors with hallsensors, without Hallsensors, and servo motors. It is mainly suitable for working voltages ranging from 4.5VDC to 52VDC , with a maximum current up to 30A .

Product lines:

For motor with hallsensor
For motor without hallsensor
Motion control

We continue to innovate to create high precision and performance in the field of micro-kinematics, based on a series of standard products, through in-depth communication, to understand your specific needs and provide professional, flexible customization and fast sample delivery services for specific applications.

Glance of product line

Brushless DC Motors-Slotless



EC Series

2Pole winding Technology
φ6mm-50mm
Maximum power up to 260W
Max. speed up to 30,000rpm



ECD Series

2Pole winding Technology
Electronics integrated
φ12mm-36mm
Maximum rated current up to 3A
Max. speed up to 30,000rpm



ECH Series

2Pole winding Technology
High speed design
φ13mm-22mm
Max. speed up to 60,000rpm



EC-4Pole Series

4Pole winding Technology
φ22mm-30mm
Maximum power up to 200W
Max. speed up to 20,000rpm

Brushless DC Motors-Slotted



BL Series

Inner running structure
φ16mm-36mm
Maximum power up to 30W
Max. speed up to 20,000rpm



BD Series

Inner running structure
Electronics integrated
φ16mm-42mm
Maximum rated current up to 3A
Max. speed up to 15,000rpm



BF Series

External rotor structure
Electronics integrated
φ32mm-68mm
Max. speed up to 12,000rpm
Maximum rated current up to 3A



ECI Series

Multipole internal rotor design
φ40mm-58mm
Maximum power up to 120W
Max. speed up to 10,000rpm

Planetary gearhead Series



PG Series

High precision transmission structure
φ6mm-40mm
Maximum torque up to 20Nm



GS Series

Ball screws available
φ16mm-30mm
Highly efficient
Not self-locking

Vishan Encoders



Magnetic encoders

φ8mm-24mm
Incremental encoders
Single turn absolute encoders
Multiturn absolute encoders



Optical encoders

φ22mm-28mm
Maximum 4096PPR
High accuracy

Vishan controllers



Speed Controller

Suitable for motor with hallsensor
or without hallsensor



Motion Controller

Support incremental encoder and
linear Hall Support RS485 MODBUS-
RTU protocol Position, speed, current,
three closed-loop control Set the
parameters of the upper computer

How we delivery our flexible service

we hope to understand your actual needs, whether it is electrical performance indicators, dimensions, use environment or working methods.

In order to find the most suitable single product or combination solution flexibility in our product system, we can also provide complete development and customization services according to specific indicators, and we can provide samples and follow-up mass production efficiency. We will always think from the customer's point of view.

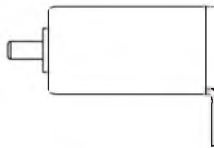
Basic products :

We have materials in stock for standard products in order to make fast delivery.



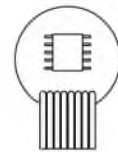
Gear

Planetary Gearhead
Screw Drive



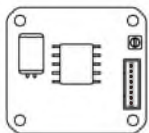
Motor

Brushless DC Motors-Slotless
Brushless DC Motors-Slotted



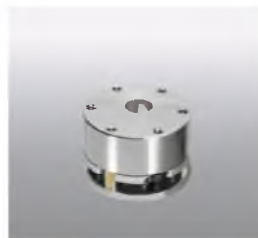
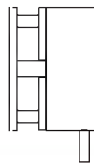
Encoder

Incremental encoders
Absolute encoders
Optical encoders



Controllers

Speed Control
Motion Control



Brake

φ 22mm-37mm
24VDC



Ledwire&connector

JST, Molex connectors
PVC, Teflon, Silicone wires

Product Modifications

Based on our standard products, customized parts are available



Shaft
Diameter
Length
D-Cut
Steps



Bearing
Ball bearing
Stainless steel ball bearing
Grease



Coil
Operate voltage
Rated speed
Temperature range



Gearhead
Dimensions
Shaft
Grease
Materials

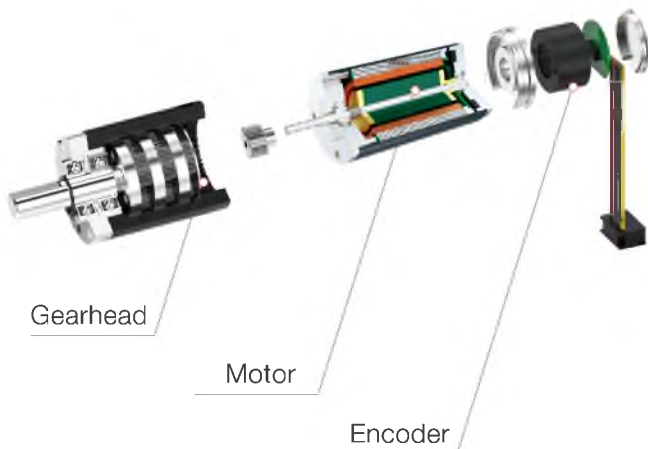


Front/back covers
Flange
Screw holes
Special require



Leadwire
Terminals JST/MOLES/TE
Cables PVC/PTFE/SILICON
Color

We prepare the materials for the standard products and regularly update the stock in order to provide a fast delivery service in case of urgent delivery deadlines. Vishan look forward for your consultation.

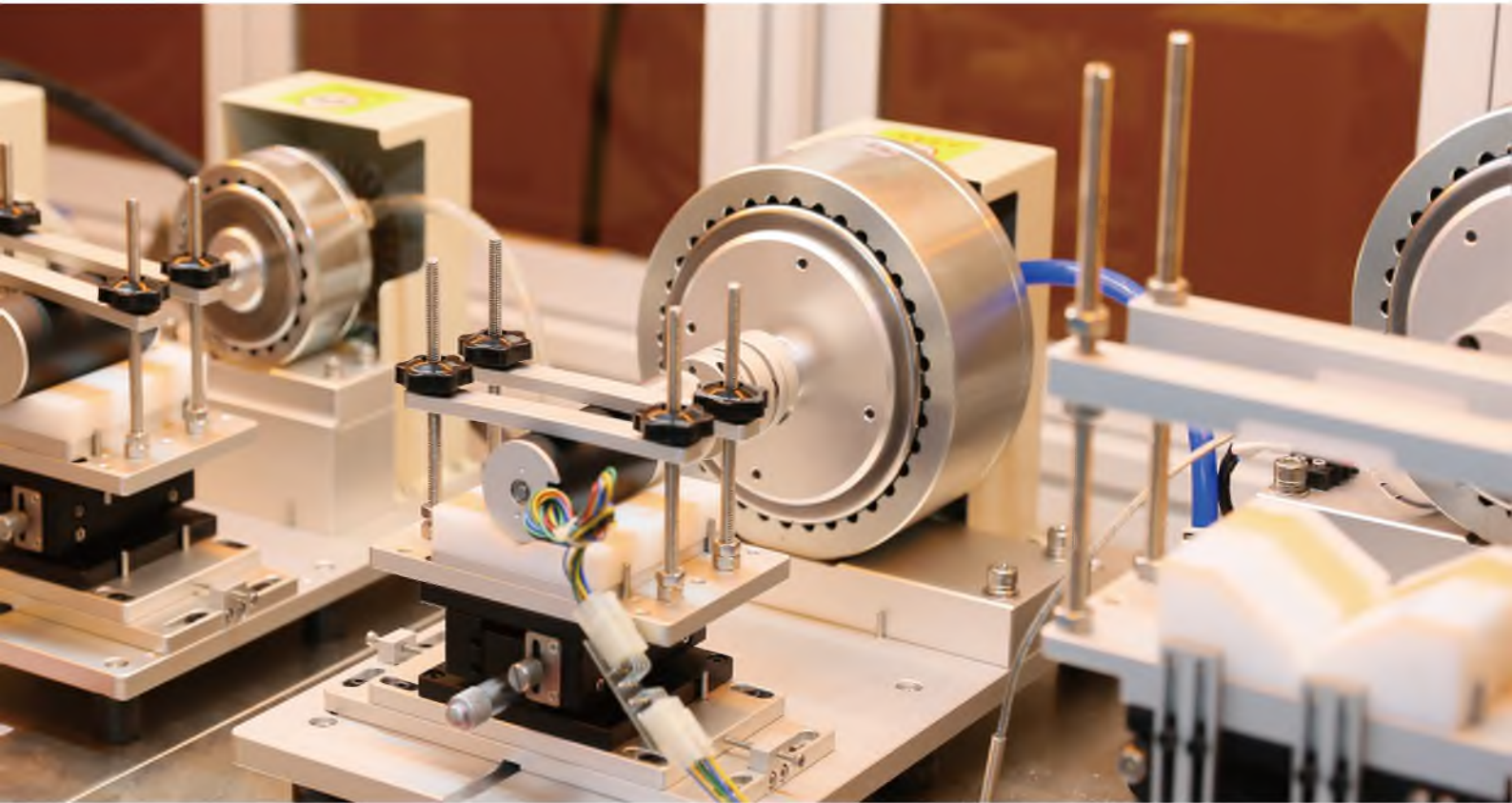


With just a few simple questions, we are able to output a complete customized solution:

- operate voltage
- Rated speed
- Rated torque
- Target dimensions
- Working: Continuous/Intermittent

Especially for applications with gearboxes, we try to reduce the motor output speed and adjust the gears and grease inside the gearbox to achieve the best performance for your application

Quantity without the contemptuous



Vishan adheres the concept of quality-first, we with meticulous attention to every aspect of production.

We understand that exceptional quality stems from rigorous management and a relentless pursuit of excellence. Therefore, we have established stringent standards and protocols throughout the production process to ensure that every product is crafted to perfection.

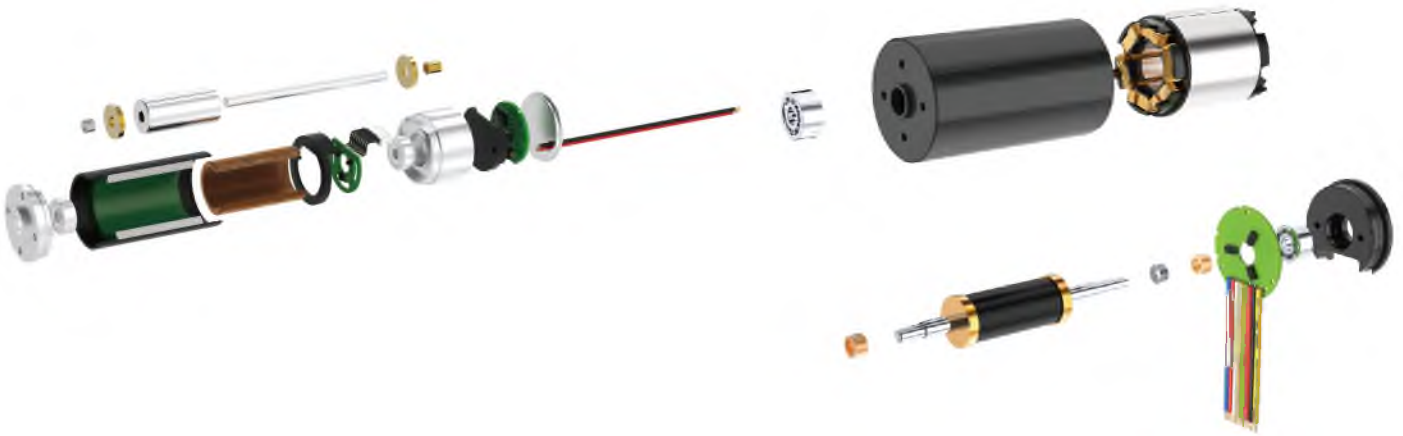


We rely on

customized production and testing equipment to ensure the best performance and quality requirements for our products in R&D and production as well as in testing engineering



Choose the right technology for your application



	Slotless Brushless DC motor	Slotted Brushless DC motor
Coil	Self-supporting cylindrical coils Advantages: No cogging torque Low Iron Loss High efficiency Linear torque/speed ratio	Self-supporting cylindrical coils Advantages: No cogging torque Low Iron Loss High efficiency Linear torque/speed ratio
Permanent magnet	Neodymium iron boron Samarium Cobalt Advantages: Torque/current is proportional Speed/Voltage is proportional Linear torque/speed ratio	Neodymium iron boron Advantages: Torque/current is proportional Speed/Voltage is proportional Linear torque/speed ratio
Brushless Design	There is no brush wear or arcing Advantages: Long life time Lower EMI Electronics integrated option	There is no brush wear or arcing Advantages: Long life time Lower EMI Electronics integrated option

With ultra-high precision, efficiency and reliability, our motors deliver the power density needed for top performance in a compact package. There are two kinds of designs: slotted and slotless Brushless DC motors, both are suitable configuration is selected for different industry applications.

Typical application

Power tools



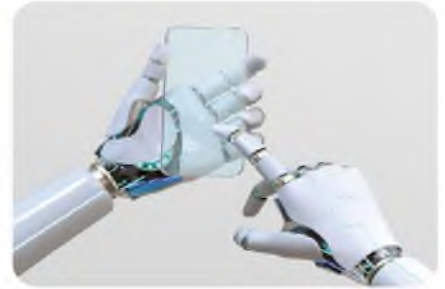
Electric screw drivers
Electric Scissors
Meat Slicer

Medical&Lab



Dental devices
Surgical equipment
Ventilators
Chemical Analysis

Robotics



Electric Grippers
Humanoid robots
Service robotis
Exoskeleton

Industrial



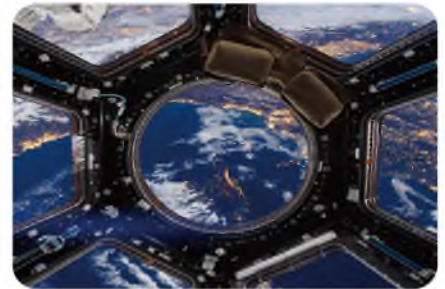
Screw valves
Mini pump
Instrumentation
Machinery equipment

Optical instruments



Automatic focus
Microscopes

Aerospace



Radar systems
Seat and display adjustments
Angle control systems

Consumer Applications



Tattoo Machines
Permanent make-up
Micron needles

Power Seat



High speed train seat

Slotless

Brushless DC motors



Contents

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ECD SERIES	2Pole winding Technology Electronics integrated	P. 53-67
ECH SERIES	2Pole winding Technology High speed design	P. 69-77

SLOTLESS BLDC MOTOR

EC Series

2 Pole winding technology

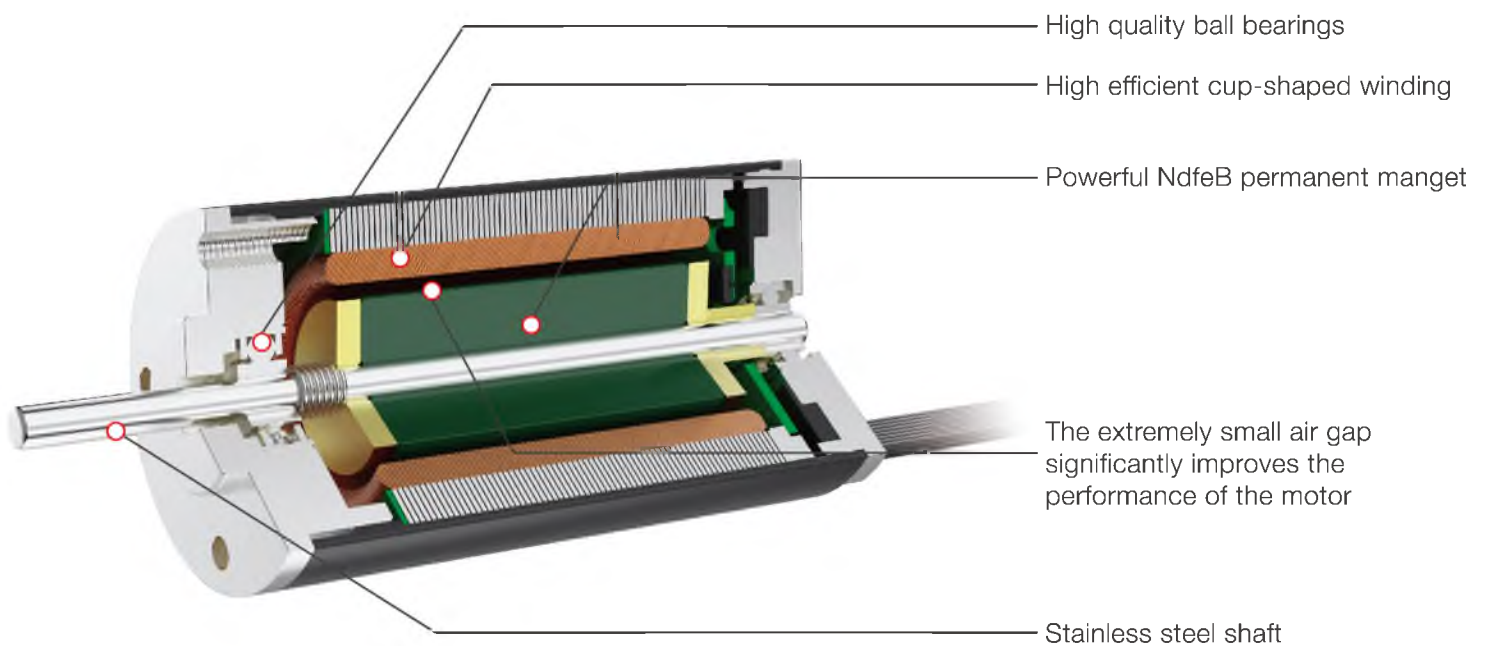
Model	Dimension (mm)	Nominal Troque (mNm)	Nominal Speed (rpm)	Page
EC0615	Φ6x15	0.3	25000	15
EC0818	Φ8x18	0.8	25000	16
EC1025	Φ10x25	1.5	35000	17
EC1220	Φ12x20	1.5	16000	18
EC1220	Φ12x30	3	20000	19
EC1333	Φ13x33	3.7	21000	20
EC1348	Φ13x48	4.5	25000	21
EC1630	Φ16x30	3.5	20000	22
EC1636	Φ16x36	6	12000	23
EC2040	Φ20x40	10	16000	24
EC2232	Φ22x32	6	10000	25
EC2240	Φ22x40	12	14000	26
EC2248	Φ22x48	18	12000	27
EC2260	Φ22x60	28	14000	28
EC2446	Φ24.5x46	18	12000	29
EC2453	Φ24.5x53	20	14000	30
EC2845	Φ28x45	18	12000	31
EC2854	Φ28x54	35	10000	32
EC2864	Φ28x64	50	10000	33
EC3242	Φ32x42	25	8000	34
EC3260	Φ32x60	50	10000	35
EC3270	Φ32x70	70	8000	36
EC3660	Φ36x60	82	7000	37
EC3670	Φ36x70	120	5000	38
EC4058	Φ40x58	85	7000	39
EC4070	Φ40x70	130	7000	40
EC4088	Φ40x88	200	7000	41
EC5088	Φ50x88	280	7000	42



EC SERIES

2Pole Slotless winding technology

The benefits of this new technology are torque and high-speed when compared to same sizing. The lack of cogging, a reduced ripple torque, a linear correlation between speed and torque, low inertia bring performance to greater level in terms of power, dynamics by means of reduced weights and reduced dimensions.

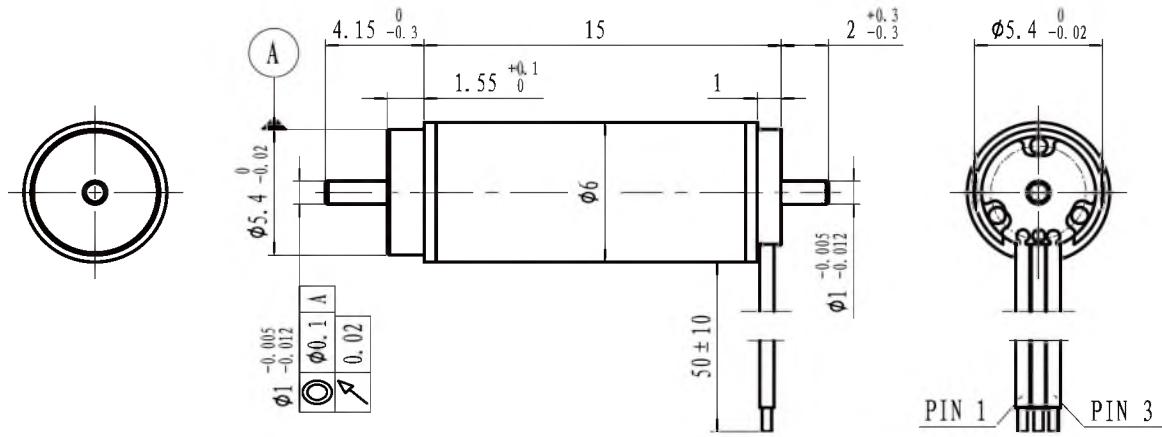


Basic Data:

Diameter: $\phi 6\text{mm}-50\text{mm}$
Maximum Length: 88mm
Operate Voltage: 6V-48VDC
Maximum Power output: 260W
Maximum Permissible speed: 30,000rpm
Operate temperature: $-30^{\circ}\text{C}-+80^{\circ}\text{C}$

Typical features:

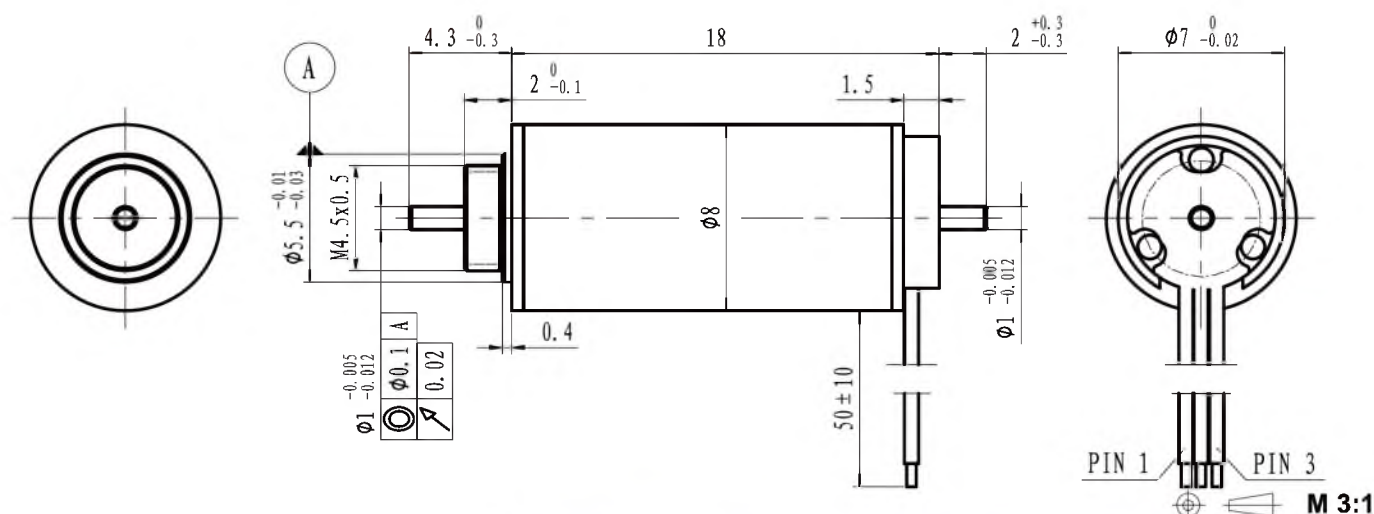
High power density
High efficiency
High reliability
Low noise
No Cogging
Low inductance
Good heat dissipation
Long operational lifetime



M 3:1

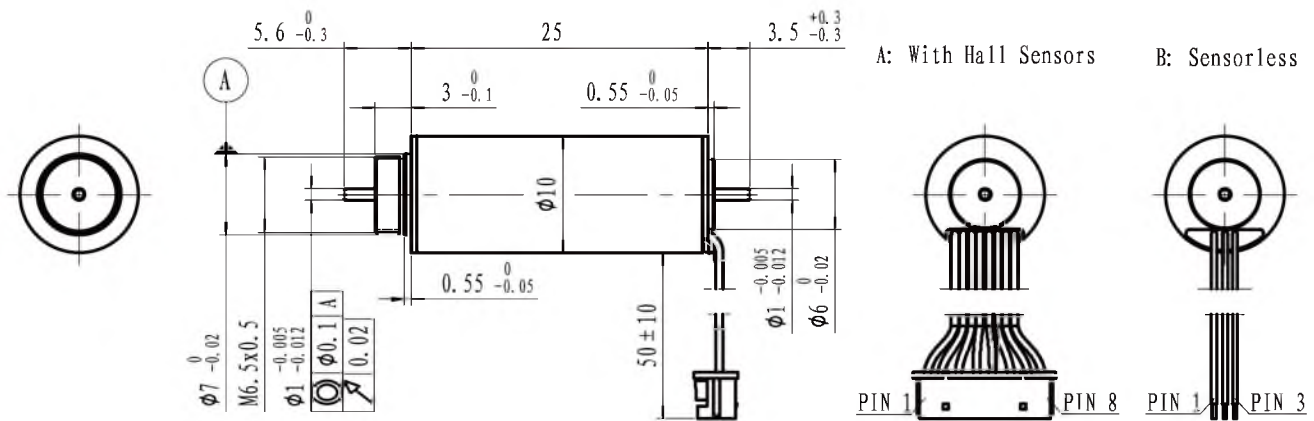
Sensorless		EC0615L-...	0645	1245						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	6	12						
2	No load speed	rpm	45931	45633						
3	No load current	mA	80	53						
4	Nominal speed	rpm	26901	25005						
5	Nominal torque	mNm	0.3	0.3						
6	Nominal current	A	0.35	0.19						
7	Stall torque	mNm	0.72	0.66						
8	Stall current	A	0.73	0.36						
9	Max. efficiency	%	44.8	38.1						
10	Terminal resistance	Ω	8.2	33.1						
11	Terminal inductance	mH	0.048	0.195						
12	Torque constant	mNm/A	1.11	2.14						
13	Speed constant	rpm/V	8595	4454						
14	Speed/torque gradient	rpm/mNm	63434	68759						
15	Mechanical time constant	ms	5.3	5.8						
16	Rotor inertia	gcm ²	0.008	0.008						
17	Thermal resistance housing-ambient	90 K/W								
18	Thermal resistance winding-housing	17.6 K/W								
19	Thermal time constant winding	1.1 s								
20	Thermal time constant motor	136 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+125°C								
23	Max. permissible speed	80000 rpm								
24	Axial play at axial load	<0.15 N 0 mm >0.15 N max. 0.1 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	0.1 N								
27	Max. force for press fits (static)	10 N								
28	Max. radial loading, 2mm from flange	2 N								
29	Number of pole pairs	1								
30	Number of phases	3								
31	Weight of motor	2.6 g								
Operating Range										
EC0615 Power [W] The diagram based on ambient temperature of 25 °C Speed [rpm] Torque [mNm] n-T Curve at Nominal Voltage Continuous operating range Continuous operating range with Reduced R_{th2} 50%										

Connection		Configuration
Conection PVC Pin 1 Motor winding MA AWG32 yellow Pin 2 Motor winding MB AWG32 green Pin 3 Motor winding MC AWG32 blue		Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard flange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE



Sensorless		EC0818L-...	0635	1235						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	6	12						
2	No load speed	rpm	35118	34760						
3	No load current	mA	110	80						
4	Nominal speed	rpm	24754	24125						
5	Nominal torque	mNm	0.8	0.8						
6	Nominal current	A	0.63	0.35						
7	Stall torque	mNm	2.71	2.61						
8	Stall current	A	1.88	0.95						
9	Max. efficiency	%	57.4	50.3						
10	Terminal resistance	Ω	3.2	12.68						
11	Terminal inductance	mH	0.033	0.131						
12	Torque constant	mNm/A	1.54	3.02						
13	Speed constant	rpm/V	6218	3164						
14	Speed/torque gradient	rpm/mNm	12955	13294						
15	Mechanical time constant	ms	4.3	4.5						
16	Rotor inertia	gcm ²	0.032	0.032						
17	Thermal resistance housing-ambient	54.0 K/W	Operating Range EC0818 The diagram based on ambient temperature of 25 °C Power [W] 2 2.75 3.5 4.25 Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage Speed [rpm] Torque [mNm]							
18	Thermal resistance winding-housing	20.0 K/W								
19	Thermal time constant winding	3.3 s								
20	Thermal time constant motor	175.9 s								
21	Ambient temperature	-30...+100 °C								
22	Max. permissible winding temperature	+125 °C								
23	Max. permissible speed	50000 rpm								
24	Axial play at axial load	<0.3 N 0 mm								
		>0.3 N max. 0.1 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	0.2 N								
27	Max. force for press fits (static)	10 N								
	(static, shaft supported)	100 N								
28	Max. radial loading, 2mm from flange	2 N								
29	Number of pole pairs	1								
30	Number of phases	3								
31	Weight of motor	5.4 g								

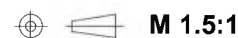
Connection				Configuration
Conection		PVC		Performance: Customized in the continuous operating range
Pin 1	Motor winding MA	AWG32	yellow	Ball bearing: Preload
Pin 2	Motor winding MB	AWG32	green	Flange: Standard frange front&back/customize the frange
Pin 3	Motor winding MC	AWG32	blue	Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
				Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
				Connector: JST/MOLEX/TE



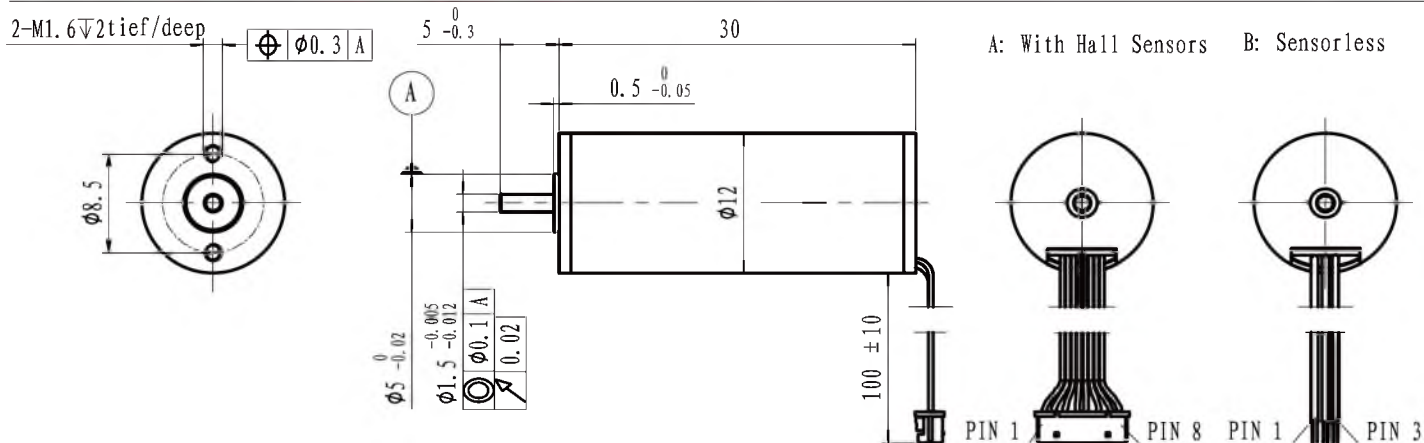
M 1.5:1

	Sensorless	EC1025L-...	0640	1240						
	With hall sensor	EC1025S-...								
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	6	12						
2	No load speed	rpm	40183	40617						
3	No load current	mA	163	92						
4	Nominal speed	rpm	34447	35001						
5	Nominal torque	mNm	1.5	1.5						
6	Nominal current	A	1.24	0.64						
7	Stall torque	mNm	10.51	10.85						
8	Stall current	A	7.69	4.03						
9	Max. efficiency	%	73.0	72.1						
10	Terminal resistance	Ω	0.78	2.98						
11	Terminal inductance	mH	0.014	0.056						
12	Torque constant	mNm/A	1.40	2.76						
13	Speed constant	rpm/V	6842	3464						
14	Speed/torque gradient	rpm/mNm	3824	3744						
15	Mechanical time constant	ms	3.1	3.0						
16	Rotor inertia	gcm ²	0.077	0.077						
17	Thermal resistance housing-ambient	42.3 K/W								
18	Thermal resistance winding-housing	5.9 K/W								
19	Thermal time constant winding	2 s								
20	Thermal time constant motor	292 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+125°C								
23	Max. permissible speed	50000 rpm								
24	Axial play at axial load	<0.3 N 0 mm >0.3 N max. 0.1 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	0.2 N								
27	Max. force for press fits (static)	10 N								
28	Max. radial loading, 2mm from flange	2 N								
29	Number of pole pairs	1								
30	Number of phases	3								
31	Weight of motor	9.2 g								
Operating Range										
EC1025 Power [W] The diagram based on ambient temperature of 25 °C Speed [rpm] Torque [mNm] n-T Curve at Nominal Voltage Continuous operating range Continuous operating range with Reduced R_{th2} 50%										

Connection	Configuration
Connection A (Sensor) Pin 1 Vhall 3-18 VDC Pin 2 Hall sensor HA Pin 3 Hall sensor HB Pin 4 Hall sensor HC Pin 5 GND Pin 6 Motor winding MA Pin 7 Motor winding MB Pin 8 Motor winding MC Connector MX 1.25-8Y	Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
Connection B (Sensorless) Pin 1 Motor winding MA Pin 2 Motor winding MB Pin 3 Motor winding MC	



Connection			Configuration
Conection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
Pin 1	Vhall 3-18 VDC	PTFE AWG30 red	
Pin 2	Hall sensor HA	AWG30 yellow	
Pin 3	Hall sensor HB	AWG30 green	
Pin 4	Hall sensor HC	AWG30 blue	
Pin 5	GND	AWG30 black	
Pin 6	Motor winding MA	AWG30 yellow	
Pin 7	Motor winding MB	AWG30 green	
Pin 8	Motor winding MC	AWG30 blue	
Conector MX 1.25-8Y			
Conection B (Sensorless)			
Pin 1	Motor winding MA	PVC AWG30 yellow	
Pin 2	Motor winding MB	AWG30 green	
Pin 3	Motor winding MC	AWG30 blue	



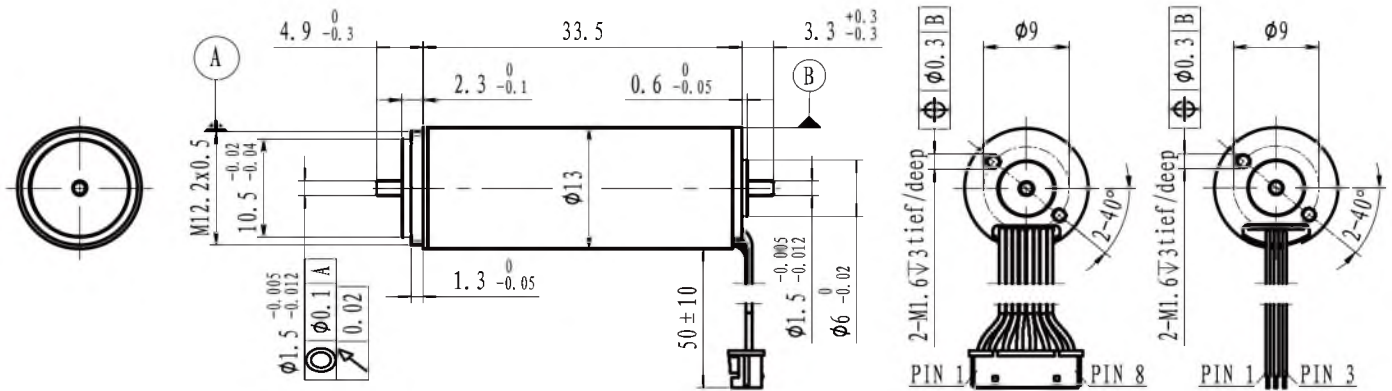
M 1.5:1

	Sensorless	EC1230L-...	0625	0925	1225				
	With hall sensor	EC1230S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		6	9	12				
2 No load speed	rpm		25310	25100	24930				
3 No load current	mA		122	90	72				
4 Nominal speed	rpm		20689	20565	20449				
5 Nominal torque	mNm		3	3	3				
6 Nominal current	A		1.47	0.98	0.74				
7 Stall torque	mNm		16.43	16.61	16.69				
8 Stall current	A		7.50	5.03	3.77				
9 Max. efficiency	%		76.1	75.0	74.3				
10 Terminal resistance	Ω		0.8	1.79	3.18				
11 Terminal inductance	mH		0.02	0.04	0.08				
12 Torque constant	mNm/A		2.23	3.36	4.51				
13 Speed constant	rpm/V		4288	2840	2118				
14 Speed/torque gradient	rpm/mNm		1540	1512	1494				
15 Mechanical time constant	ms		5.2	5.1	5.0				
16 Rotor inertia	gcm ²		0.32	0.32	0.32				
17 Thermal resistance housing-ambient	28.4 K/W	Operating Range							
18 Thermal resistance winding-housing	7.1 K/W	EC1230 Power [W] The diagram based on ambient temperature of 25 °C Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage Speed [rpm] Torque [mNm]							
19 Thermal time constant winding	4 s								
20 Thermal time constant motor	240 s								
21 Ambient temprature	-30...+100°C								
22 Max. permissible winding temperature	+125°C								
23 Max. permissible speed	50000 rpm								
24 Axial play at axial load	<0.8 N 0 mm >0.8 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	0.3 N								
27 Max. force for press fits (static)	11 N								
28 Max. radial loading, 5mm from flange	200 N								
29 Number of pole pairs	1								
30 Number of phases	3								
31 Weight of motor	16.3 g								

Connection	Configuration
Conection A (Sensor) Pin 1 Vhall 3-18 VDC Pin 2 Hall sensor HA Pin 3 Hall sensor HB Pin 4 Hall sensor HC Pin 5 GND Pin 6 Motor winding MA Pin 7 Motor winding MB Pin 8 Motor winding MC Conector MX 1.25-8Y	Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
Conection B (Sensorless) Pin 1 Motor winding MA Pin 2 Motor winding MB Pin 3 Motor winding MC	

A: With Hall Sensors

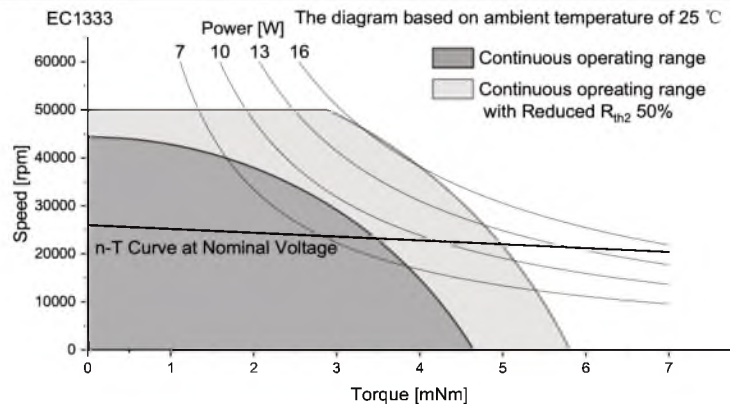
B: Sensorless



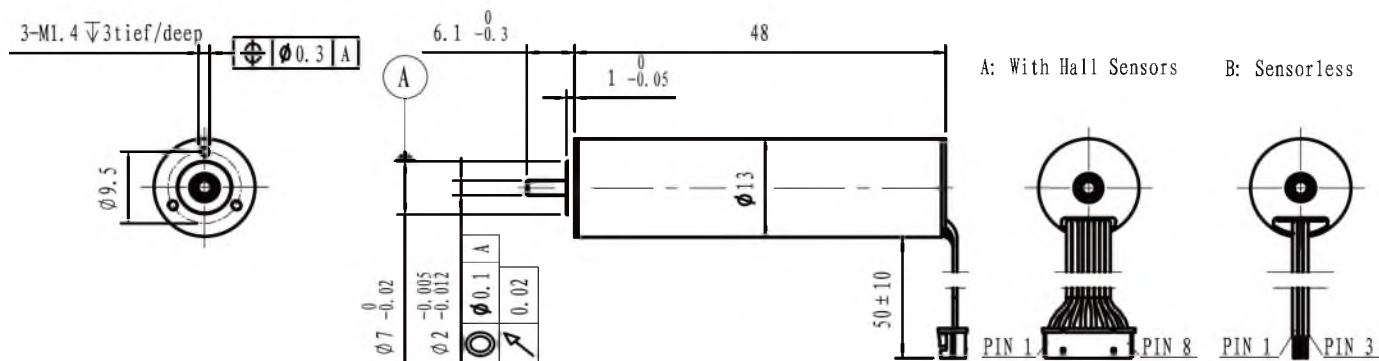
M 1.2:1

	Sensorless	EC1333L-...	0624	1224	2424						
	With hall sensor	EC1333S-...									
Motor data											
Values at nominal voltage											
1	Nominal voltage	V	6	12	24						
2	No load speed	rpm	24011	24430	24821						
3	No load current	mA	270	160	100						
4	Nominal speed	rpm	21236	21695	22040						
5	Nominal torque	mNm	3.7	3.7	3.7						
6	Nominal current	A	1.85	0.97	0.51						
7	Stall torque	mNm	32.02	33.05	33.02						
8	Stall current	A	13.95	7.36	3.77						
9	Max. efficiency	%	74.1	72.7	70.1						
10	Terminal resistance	Ω	0.43	1.63	6.36						
11	Terminal inductance	mH	0.014	0.055	0.208						
12	Torque constant	mNm/A	2.34	4.59	8.99						
13	Speed constant	rpm/V	4081	2081	1062						
14	Speed/torque gradient	rpm/mNm	750	739	752						
15	Mechanical time constant	ms	2.8	2.8	2.8						
16	Rotor inertia	gcm ²	0.36	0.36	0.36						
17	Thermal resistance housing-ambient	27.5 K/W									
18	Thermal resistance winding-housing	10.7 K/W									
19	Thermal time constant winding	8.2 s									
20	Thermal time constant motor	275 s									
21	Ambient temprature	-30...+100°C									
22	Max. permissible winding temperature	+125°C									
23	Max. permissible speed	50000 rpm									
24	Axial play at axial load	<0.8 N 0 mm >0.8 N max. 0.3 mm									
25	Radial play	preloaded									
26	Max. axial load (dynamic)	0.3 N									
27	Max. force for press fits (static)	11 N									
28	Max. radial loading, 5mm from flange	200 N									
29	Number of pole pairs	3									
30	Number of phases	3									
31	Weight of motor	26.9 g									

Operating Range

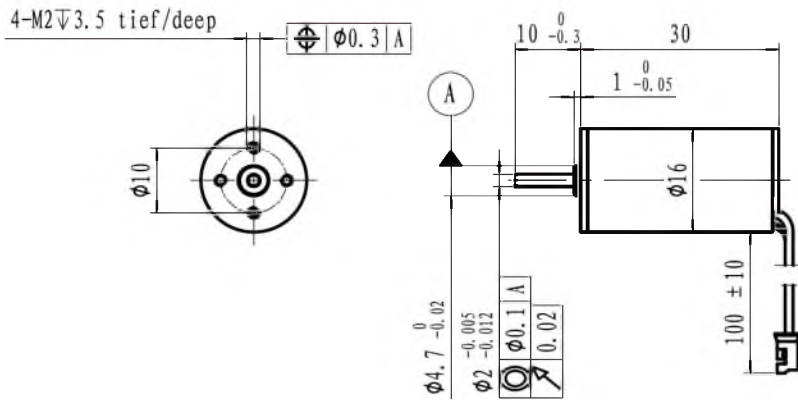


Connection			Configuration	
Conection A (Sensor)			Performance: Customized in the continuous operating range	
Pin 1	Vhall 3-18 VDC	PTFE	Ball bearing: Preload	
Pin 2	Hall sensor HA	AWG30	Flange: Standard frange front&back/customize the frange	
Pin 3	Hall sensor HB	AWG30	Shaft: Length/Diameter/Cut face/double shaft/hollow shaft	
Pin 4	Hall sensor HC	AWG30	Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length	
Pin 5	GND	AWG30	Connector: JST/MOLEX/TE	
Pin 6	Motor winding MA	AWG30		
Pin 7	Motor winding MB	AWG30		
Pin 8	Motor winding MC	AWG30		
Conector				
MX 1.25-8Y				
Conection B (Sensorless)				
Pin 1	Motor winding MA	PVC		
Pin 2	Motor winding MB	AWG28		
Pin 3	Motor winding MC	AWG28		



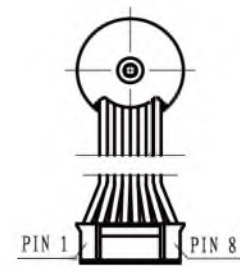
		Sensorless	EC1348L-...	0630	1230	2430					
		With hall sensor	EC1348S-...								
Motor data											
Values at nominal voltage											
1	Nominal voltage	V		6	12	24					
2	No load speed	rpm		30138	30255	30088					
3	No load current	mA		240	135	67					
4	Nominal speed	rpm		25858	26308	26201					
5	Nominal torque	mNm		4.5	4.5	4.5					
6	Nominal current	A		2.64	1.34	0.67					
7	Stall torque	mNm		31.68	34.49	34.83					
8	Stall current	A		17.14	9.38	4.71					
9	Max. efficiency	%		77.7	77.4	77.6					
10	Terminal resistance	Ω		0.35	1.28	5.1					
11	Terminal inductance	mH		0.012	0.048	0.189					
12	Torque constant	mNm/A		1.87	3.73	7.51					
13	Speed constant	rpm/V		5094	2558	1272					
14	Speed/torque gradient	rpm/mNm		951	877	864					
15	Mechanical time constant	ms		4.1	3.8	3.7					
16	Rotor inertia	gcm ²		0.41	0.41	0.41					
17	Thermal resistance housing-ambient	23.5 K/W	Operating Range								
18	Thermal resistance winding-housing	5.6 K/W	EC1348 The diagram based on ambient temperature of 25 °C Power [W] 10 15 20 25 Speed [rpm] 60000 50000 40000 30000 20000 10000 0 Torque [mNm] 0 1 2 3 4 5 6 7 8 9 Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage								
19	Thermal time constant winding	6.7 s									
20	Thermal time constant motor	362 s									
21	Ambient temprature	-30...+100°C									
22	Max. permissible winding temperature	+125°C									
23	Max. permissible speed	50000 rpm									
24	Axial play at axial load	<0.8 N 0 mm >0.8 N max. 0.3 mm									
25	Radial play	preloaded									
26	Max. axial load (dynamic)	0.3 N									
27	Max. force for press fits (static)	11 N									
	(static, shaft supported)	200 N									
28	Max. radial loading, 5mm from flange	4.3 N									
29	Number of pole pairs	1									
30	Number of phases	3									
31	Weight of motor	34.0 g									

Connection			Configuration
Conection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
Pin 1	Vhall 3-18 VDC	PTFE	
Pin 2	Hall sensor HA	AWG30 red	
Pin 3	Hall sensor HB	AWG30 Yellow	
Pin 4	Hall sensor HC	AWG30 Green	
Pin 5	GND	AWG30 blue	
Pin 6	Motor winding MA	AWG30 black	
Pin 7	Motor winding MB	AWG30 Yellow	
Pin 8	Motor winding MC	AWG30 Green	
Conector			
MX 1.25-8Y			
Conection B (Sensorless)			
Pin 1	Motor winding MA	PVC AWG28 yellow	
Pin 2	Motor winding MB	AWG28 green	
Pin 3	Motor winding MC	AWG28 blue	



A: With Hall Sensors

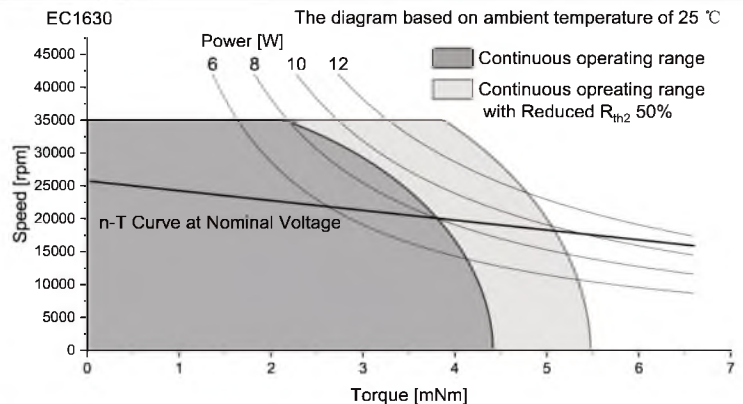
B: Sensorless



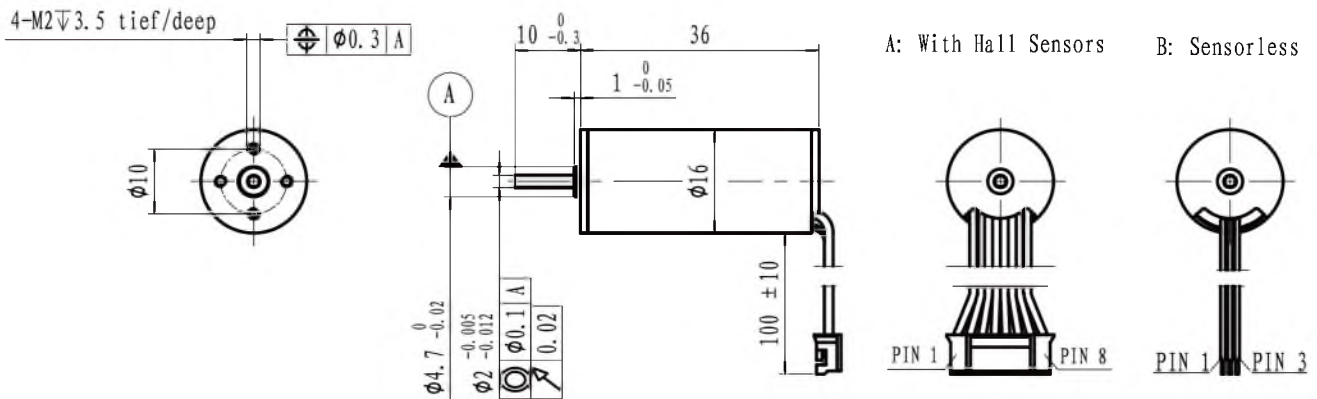
M 1:1.2

	Sensorless	EC1630L-...	1223	1823	2423				
	With hall sensor	EC1630S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		12	18	24				
2 No load speed	rpm		23220	23511	23760				
3 No load current	mA		210	150	100				
4 Nominal speed	rpm		19138	19506	19203				
5 Nominal torque	mNm		3.5	3.5	3.5				
6 Nominal current	A		0.95	0.65	0.48				
7 Stall torque	mNm		19.91	20.55	18.25				
8 Stall current	A		4.44	3.10	2.09				
9 Max. efficiency	%		61.3	60.9	61.0				
10 Terminal resistance	Ω		2.7	5.8	11.5				
11 Terminal inductance	mH		0.08	0.17	0.33				
12 Torque constant	mNm/A		4.70	6.96	9.18				
13 Speed constant	rpm/V		2031	1373	1040				
14 Speed/torque gradient	rpm/mNm		1166	1144	1302				
15 Mechanical time constant	ms		5.9	5.8	6.5				
16 Rotor inertia	gcm ²		0.48	0.48	0.48				
17 Thermal resistance housing-ambient	20.0 K/W								
18 Thermal resistance winding-housing	8.8 K/W								
19 Thermal time constant winding	8 s								
20 Thermal time constant motor	236 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	35000 rpm								
24 Axial play at axial load	<1.8 N 0 mm >1.8 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	1.3 N								
27 Max. force for press fits (static)	15 N								
28 Max. radial loading, 5mm from flange	350 N								
29 Number of pole pairs	1								
30 Number of phases	3								
31 Weight of motor	25 g								

Operating Range



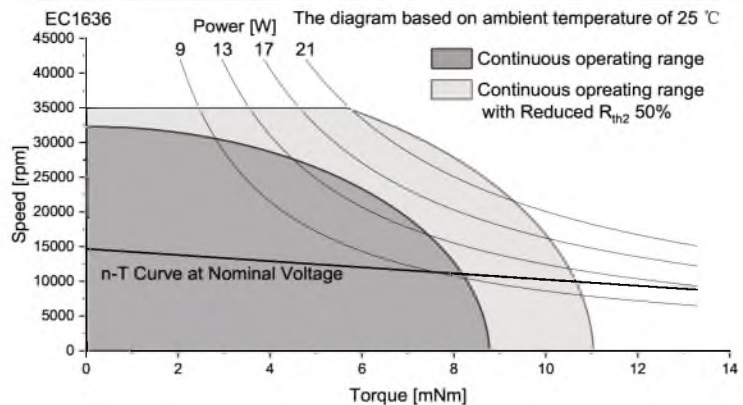
Connection			Configuration	
Connection A (Sensor)			Performance: Customized in the continuous operating range	
Pin 1	Vhall 3-18 VDC	PTFE	Ball bearing: Preload	
Pin 2	Hall sensor HA	AWG30	Flange: Standard flange front&back/customize the flange	
Pin 3	Hall sensor HB	AWG30	Shaft: Length/Diameter/Cut face/double shaft/hollow shaft	
Pin 4	Hall sensor HC	AWG30	Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length	
Pin 5	GND	AWG30	Connector: JST/MOLEX/TE	
Pin 6	Motor winding MA	AWG30		
Pin 7	Motor winding MB	AWG30		
Pin 8	Motor winding MC	AWG30		
Conector				
JST PH2.0-8Y				
Connection B (Sensorless)				
Pin 1	Motor winding MA	PVC		
Pin 2	Motor winding MB	AWG26		
Pin 3	Motor winding MC	AWG26		



M 1:1.2

	Sensorless	EC1636L-...	0614	0914	1214	2414				
	With hall sensor	EC1636S-...								
Motor data										
Values at nominal voltage										
1 Nominal voltage	V		6	9	12	24				
2 No load speed	rpm		13835	14533	14460	14688				
3 No load current	mA		150	110	70	50				
4 Nominal speed	rpm		11412	11930	11615	12028				
5 Nominal torque	mNm		6	6	6	6				
6 Nominal current	A		1.62	1.14	0.84	0.44				
7 Stall torque	mNm		34.27	33.50	30.49	33.13				
8 Stall current	A		8.57	5.88	3.99	2.22				
9 Max. efficiency	%		75.3	74.5	75.3	72.3				
10 Terminal resistance	Ω		0.7	1.53	3.01	10.8				
11 Terminal inductance	mH		0.04	0.08	0.15	0.81				
12 Torque constant	mNm/A		4.07	5.80	7.79	15.25				
13 Speed constant	rpm/V		2347	1646	1227	626				
14 Speed/torque gradient	rpm/mNm		404	434	474	443				
15 Mechanical time constant	ms		2.6	2.8	3.1	2.9				
16 Rotor inertia	gcm ²		0.62	0.62	0.62	0.62				
17 Thermal resistance housing-ambient	17.1 K/W									
18 Thermal resistance winding-housing	5.3 K/W									
19 Thermal time constant winding	6 s									
20 Thermal time constant motor	252 s									
21 Ambient temprature	-30...+100°C									
22 Max. permissible winding temperature	+150°C									
23 Max. permissible speed	35000 rpm									
24 Axial play at axial load	<1.8 N 0 mm >1.8 N max. 0.3 mm									
25 Radial play	preloaded									
26 Max. axial load (dynamic)	1.3 N									
27 Max. force for press fits (static)	15 N									
28 Max. radial loading, 5mm from flange	350 N									
29 Number of pole pairs	1									
30 Number of phases	3									
31 Weight of motor	32 g									

Operating Range



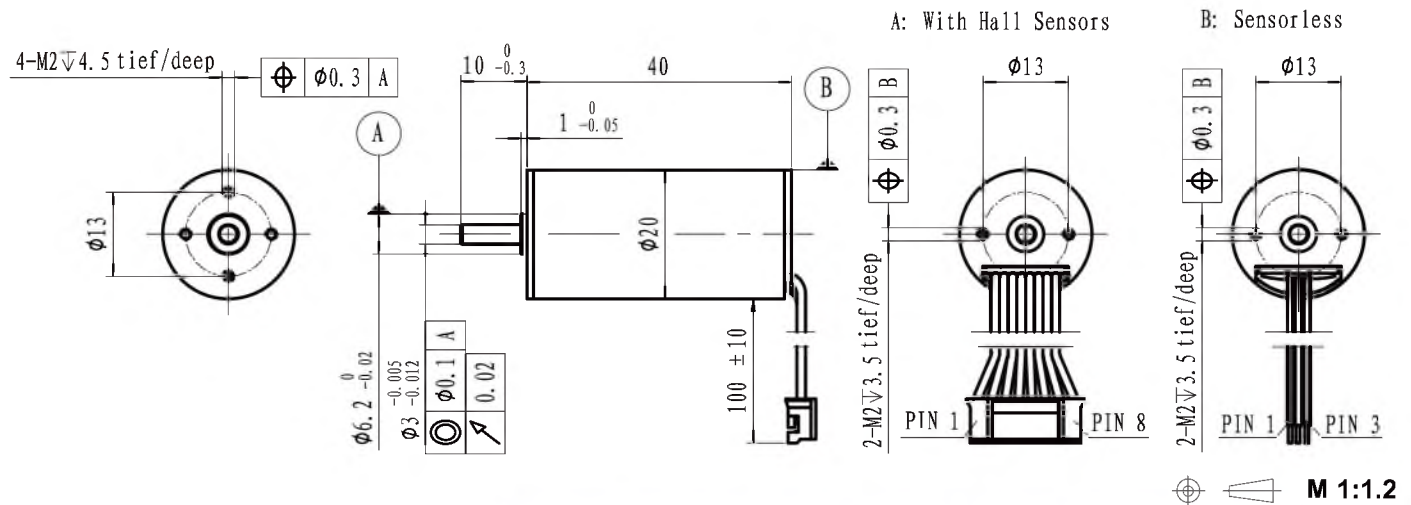
Connection

Conection A (Sensor)		PTFE
Pin 1 Vhall 3-18 VDC	AWG30	black
Pin 2 Hall sensor HA	AWG30	black
Pin 3 Hall sensor HB	AWG30	black
Pin 4 Hall sensor HC	AWG30	black
Pin 5 GND	AWG30	black
Pin 6 Motor winding MA	AWG30	black
Pin 7 Motor winding MB	AWG30	black
Pin 8 Motor winding MC	AWG30	black
Conector		
JST PH2.0-8Y		

Conection B (Sensorless)		PVC
Pin 1 Motor winding MA	AWG26	yellow
Pin 2 Motor winding MB	AWG26	green
Pin 3 Motor winding MC	AWG26	blue

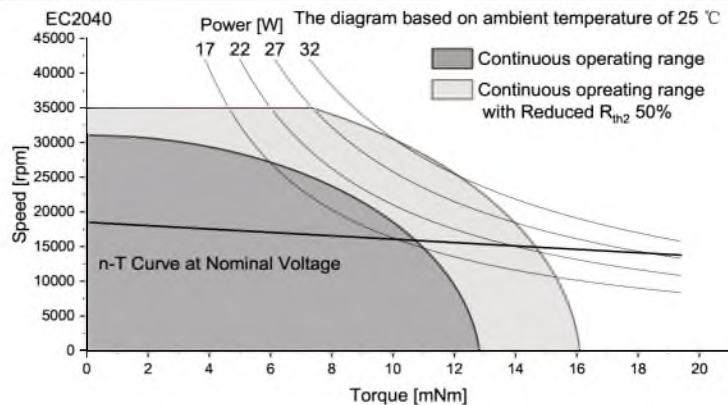
Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



	Sensorless	EC2040L-...	1218	1818	2418	3618				
	With hall sensor	EC2040S-...								
Motor data										
Values at nominal voltage										
1 Nominal voltage	V		12	18	24	36				
2 No load speed	rpm		17780	18360	18500	18880				
3 No load current	mA		149	137	105	83				
4 Nominal speed	rpm		15083	16171	16042	16164				
5 Nominal torque	mNm		10	10	10	10				
6 Nominal current	A		1.72	1.22	0.93	0.64				
7 Stall torque	mNm		65.93	83.87	75.25	69.52				
8 Stall current	A		10.53	9.23	6.28	3.98				
9 Max. efficiency	%		77.6	77.1	75.8	73.2				
10 Terminal resistance	Ω		1.14	1.95	3.82	9.04				
11 Terminal inductance	mH		0.08	0.17	0.3	0.62				
12 Torque constant	mNm/A		6.35	9.22	12.18	17.83				
13 Speed constant	rpm/V		1503	1035	784	536				
14 Speed/torque gradient	rpm/mNm		270	219	246	272				
15 Mechanical time constant	ms		6.5	5.3	5.9	6.5				
16 Rotor inertia	gcm ²		2.3	2.3	2.3	2.3				
17 Thermal resistance housing-ambient	13.8 K/W									
18 Thermal resistance winding-housing	4.3 K/W									
19 Thermal time constant winding	8 s									
20 Thermal time constant motor	366 s									
21 Ambient temperature	-30...+100°C									
22 Max. permissible winding temperature	+150°C									
23 Max. permissible speed	35000 rpm									
24 Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm									
25 Radial play	preloaded									
26 Max. axial load (dynamic)	3.5 N									
27 Max. force for press fits (static)	44 N									
28 Max. radial loading, 5mm from flange	1200 N									
29 Number of pole pairs	1									
30 Number of phases	3									
31 Weight of motor	56 g									

Operating Range



Connection

Connection A (Sensor)		PVC	
Pin 1 Vhall 3-18 VDC	AWG26	black	
Pin 2 Hall sensor HA	AWG26	black	
Pin 3 Hall sensor HB	AWG26	black	
Pin 4 Hall sensor HC	AWG26	black	
Pin 5 GND	AWG26	black	
Pin 6 Motor winding MA	AWG26	black	
Pin 7 Motor winding MB	AWG26	black	
Pin 8 Motor winding MC	AWG26	black	
Connector			
JST PH2.0-8P			
Connection B (Sensorless)		PVC	
Pin 1 Motor winding MA	AWG26	yellow	
Pin 2 Motor winding MB	AWG26	green	
Pin 3 Motor winding MC	AWG26	blue	

Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard flange front&back/customize the flange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

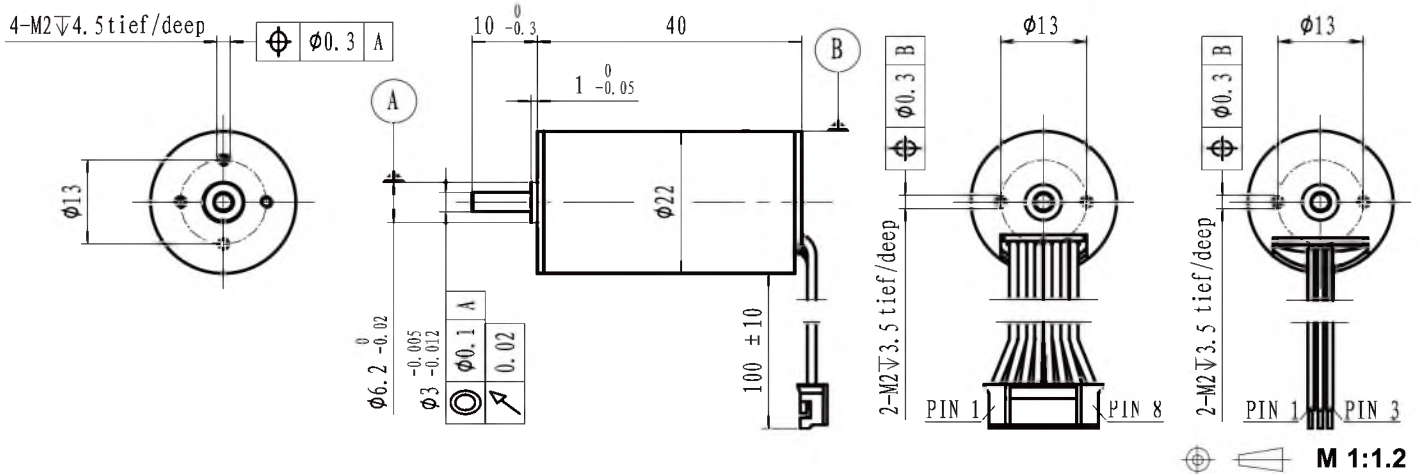


The diagram is a performance chart for the EC2232 motor. The vertical axis represents Speed in rpm, ranging from 0 to 45,000. The horizontal axis represents Torque in mNm, ranging from 0 to 14. Four power curves are shown, labeled 8, 12, 16, and 20 [W]. The chart is divided into two shaded regions: a dark grey region for the 'Continuous operating range' and a light grey region for the 'Continuous operating range with Reduced R_{th2} 50%'. A solid line represents the 'n-T Curve at Nominal Voltage'.

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard flange front&back/customize the flange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

A: With Hall Sensors

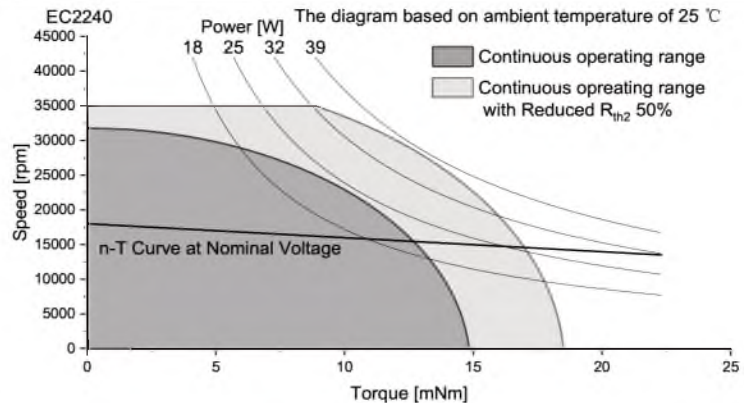
B: Sensorless



M 1:1.2

	Sensorless	EC2240L-...	1216	2416	3016	3616			
	With hall sensor	EC2240S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		12	24	30	36			
2 No load speed	rpm		16748	16768	16713	16679			
3 No load current	mA		183	115	87	73			
4 Nominal speed	rpm		14354	14337	14360	14128			
5 Nominal torque	mNm		12	12	12	12			
6 Nominal current	A		1.96	1.01	0.80	0.67			
7 Stall torque	mNm		83.94	82.76	85.25	78.47			
8 Stall current	A		12.63	6.28	5.15	3.95			
9 Max. efficiency	%		77.4	74.8	75.7	74.7			
10 Terminal resistance	Ω		0.95	3.82	5.83	9.11			
11 Terminal inductance	mH		0.07	0.28	0.44	0.64			
12 Torque constant	mNm/A		6.74	13.42	16.85	20.23			
13 Speed constant	rpm/V		1416	712	567	472			
14 Speed/torque gradient	rpm/mNm		200	203	196	213			
15 Mechanical time constant	ms		4.8	4.9	4.7	5.1			
16 Rotor inertia	gcm ²		2.3	2.3	2.3	2.3			
17 Thermal resistance housing-ambient	12.7 K/W								
18 Thermal resistance winding-housing	5.0 K/W								
19 Thermal time constant winding	12 s								
20 Thermal time constant motor	420 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	35000 rpm								
24 Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	3.5 N								
27 Max. force for press fits (static)	44 N								
28 Max. radial loading, 5mm from flange	1200 N								
29 Number of pole pairs	1								
30 Number of phases	3								
31 Weight of motor	64 g								

Operating Range



Connection

Connection A (Sensor)		PVC
Pin 1 Vhall 3-18 VDC	AWG26	black
Pin 2 Hall sensor HA	AWG26	black
Pin 3 Hall sensor HB	AWG26	black
Pin 4 Hall sensor HC	AWG26	black
Pin 5 GND	AWG26	black
Pin 6 Motor winding MA	AWG26	black
Pin 7 Motor winding MB	AWG26	black
Pin 8 Motor winding MC	AWG26	black
Connector		
JST PH2.0-8P		

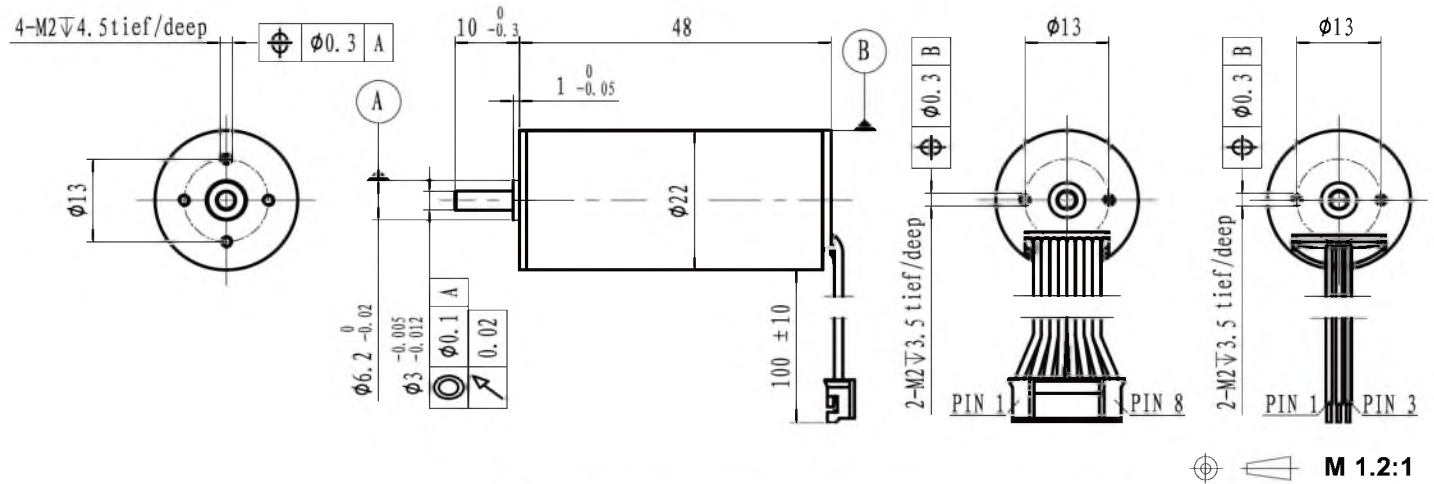
Connection B (Sensorless)		PVC
Pin 1 Motor winding MA	AWG26	yellow
Pin 2 Motor winding MB	AWG26	green
Pin 3 Motor winding MC	AWG26	blue

Configuration

Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

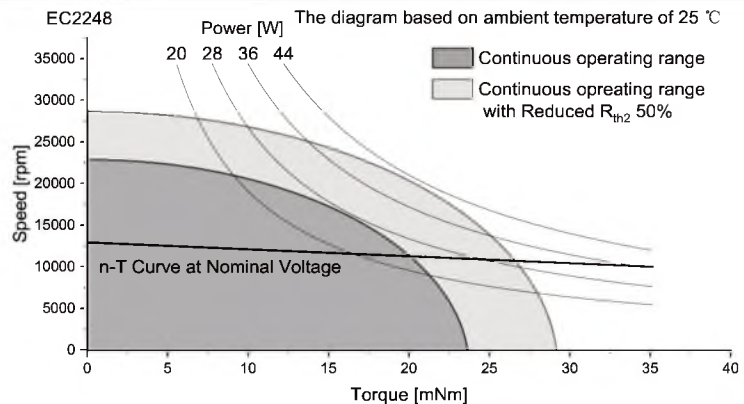
A: With Hall Sensors

B: Sensorless



	Sensorless	EC2248L-...	1213	2413	3613	4813			
	With hall sensor	EC2248S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		12	24	36	48			
2 No load speed	rpm		13004	12930	13390	13641			
3 No load current	mA		179	102	82	69			
4 Nominal speed	rpm		11422	11413	11749	12159			
5 Nominal torque	mNm		18	18	18	18			
6 Nominal current	A		2.24	1.13	0.79	0.61			
7 Stall torque	mNm		147.93	153.38	146.84	165.71			
8 Stall current	A		17.14	8.86	5.88	5.07			
9 Max. efficiency	%		80.6	79.7	77.8	78.0			
10 Terminal resistance	Ω		0.7	2.71	6.12	9.47			
11 Terminal inductance	mH		0.07	0.28	0.58	0.97			
12 Torque constant	mNm/A		8.72	17.52	25.32	33.14			
13 Speed constant	rpm/V		1095	545	377	288			
14 Speed/torque gradient	rpm/mNm		88	84	91	82			
15 Mechanical time constant	ms		2.9	2.7	3.0	2.7			
16 Rotor inertia	gcm ²		3.1	3.1	3.1	3.1			
17 Thermal resistance housing-ambient	11.8 K/W								
18 Thermal resistance winding-housing	4.7 K/W								
19 Thermal time constant winding	21 s								
20 Thermal time constant motor	504 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	30000 rpm								
24 Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	3.5 N								
27 Max. force for press fits (static)	44 N								
28 Max. radial loading, 5mm from flange	1200 N								
29 Number of pole pairs	1								
30 Number of phases	3								
31 Weight of motor	85 g								

Operating Range



Connection

Conection A (Sensor)

Pin 1 Vhall 3-18 VDC	PVC	
Pin 2 Hall sensor HA	AWG26	black
Pin 3 Hall sensor HB	AWG26	black
Pin 4 Hall sensor HC	AWG26	black
Pin 5 GND	AWG26	black
Pin 6 Motor winding MA	AWG26	black
Pin 7 Motor winding MB	AWG26	black
Pin 8 Motor winding MC	AWG26	black
Connector		
JST PH2.0-8P		

Conection B (Sensorless)

Pin 1 Motor winding MA	PVC	
Pin 2 Motor winding MB	AWG26	yellow
Pin 3 Motor winding MC	AWG26	green
	AWG26	blue

Configuration

Performance: Customized in the continuous operating range

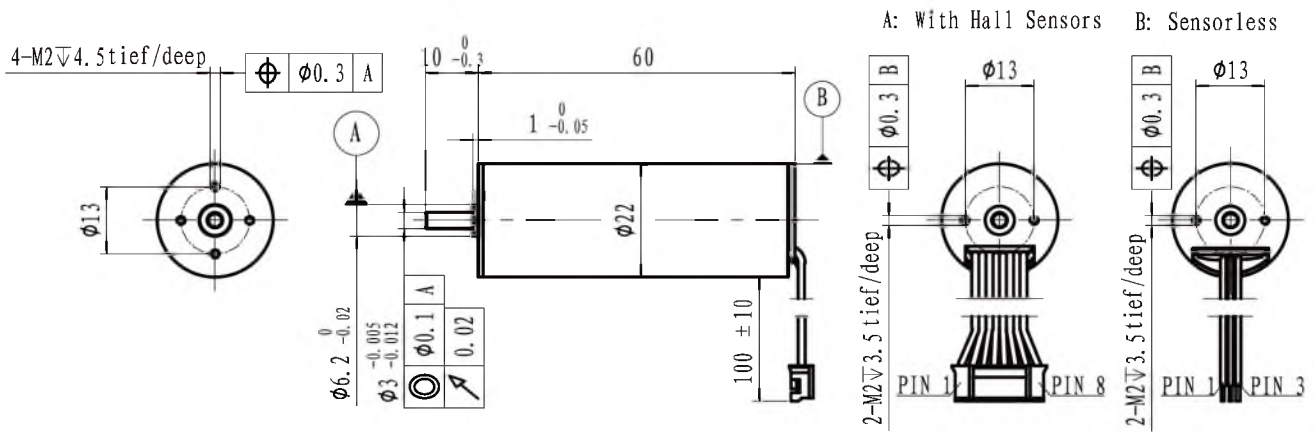
Ball bearing: Preload

Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length

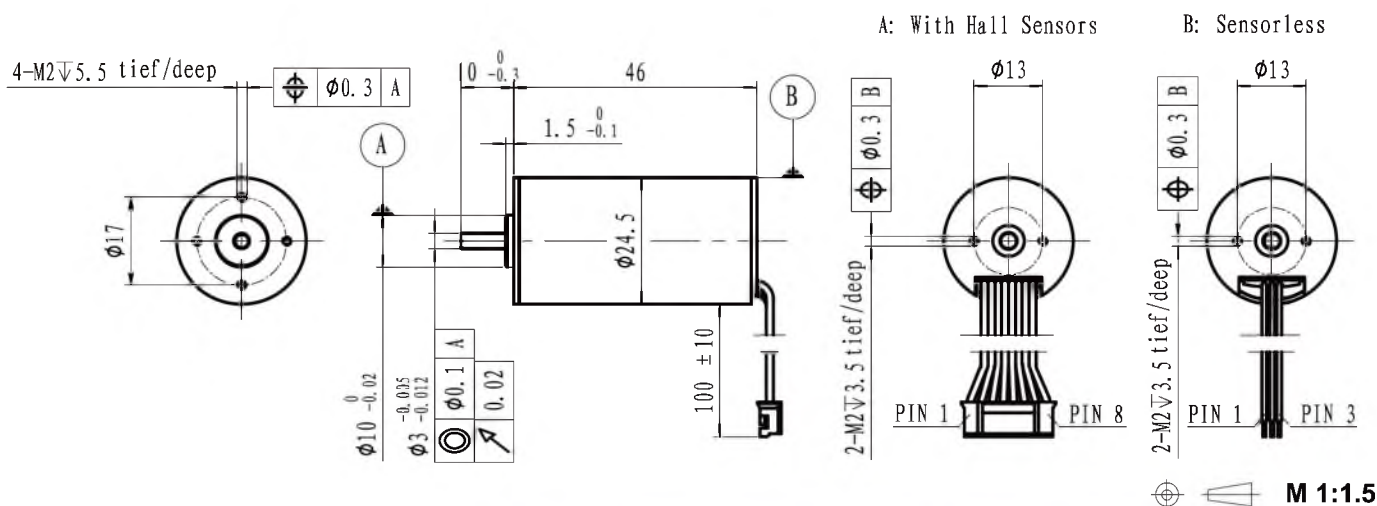
Connector: JST/MOLEX/TE



M 1:1.5

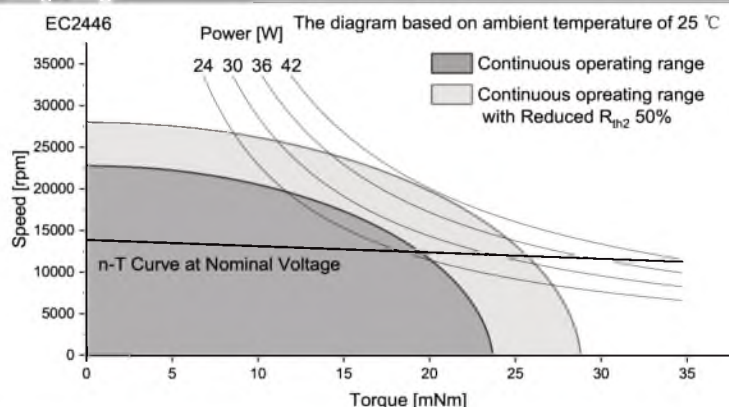
	Sensorless	EC2260L-...	1213	2413	3613	4813			
	With hall sensor	EC2260S-...							
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24	36	48			
2	No load speed	rpm	16360	16086	16030	16200			
3	No load current	mA	440	230	170	110			
4	Nominal speed	rpm	14517	14441	14364	14530			
5	Nominal torque	mNm	28	28	28	28			
6	Nominal current	A	4.49	2.22	1.49	1.11			
7	Stall torque	mNm	248.58	273.76	269.48	271.54			
8	Stall current	A	36.36	19.67	12.90	9.82			
9	Max. efficiency	%	79.2	79.5	78.4	79.9			
10	Terminal resistance	Ω	0.33	1.22	2.79	4.89			
11	Terminal inductance	mH	0.03	0.13	0.3	0.52			
12	Torque constant	mNm/A	6.92	14.08	21.16	27.98			
13	Speed constant	rpm/V	1380	678	451	341			
14	Speed/torque gradient	rpm/mNm	66	59	59	60			
15	Mechanical time constant	ms	2.1	1.9	1.9	1.9			
16	Rotor inertia	gcm ²	3.1	3.1	3.1	3.1			
17	Thermal resistance housing-ambient	7.6 K/W							
18	Thermal resistance winding-housing	4.6 K/W							
19	Thermal time constant winding	29 s							
20	Thermal time constant motor	533 s							
21	Ambient temprature	-30...+100°C							
22	Max. permissible winding temperature	+150°C							
23	Max. permissible speed	30000 rpm							
24	Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	3.5 N							
27	Max. force for press fits (static)	44 N							
28	Max. radial loading, 5mm from flange	1200 N							
29	Number of pole pairs	1							
30	Number of phases	3							
31	Weight of motor	122 g							
Operating Range									
EC2260 Power [W] The diagram based on ambient temperature of 25 °C 40 50 60 70 Speed [rpm] Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage Torque [mNm]									

Connection			Configuration	
Conection A (Sensor)			Performance: Customized in the continuous operating range	
Pin 1	Vhall 3-18 VDC	PVC	Ball bearing: Preload	
Pin 2	Hall sensor HA	AWG26 black	Flange: Standard frange front&back/customize the frange	
Pin 3	Hall sensor HB	AWG26 black	Shaft: Length/Diameter/Cut face/double shaft/hollow shaft	
Pin 4	Hall sensor HC	AWG26 black	Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length	
Pin 5	GND	AWG26 black	Connector: JST/MOLEX/TE	
Pin 6	Motor winding MA	AWG26 black		
Pin 7	Motor winding MB	AWG26 black		
Pin 8	Motor winding MC	AWG26 black		
Conector				
JST PH2.0-8P				
Conection B (Sensorless)				
Pin 1	Motor winding MA	PVC yellow		
Pin 2	Motor winding MB	AWG26 green		
Pin 3	Motor winding MC	AWG26 blue		



	Sensorless	EC2446L-...	1214	2414	3614	4814				
	With hall sensor	EC2446S-...								
Motor data										
Values at nominal voltage										
1 Nominal voltage	V		12	24	36	48				
2 No load speed	rpm		14150	13872	13920	13870				
3 No load current	mA		249	124	106	79				
4 Nominal speed	rpm		12675	12487	12662	12446				
5 Nominal torque	mNm		18	18	18	18				
6 Nominal current	A		2.50	1.23	0.84	0.63				
7 Stall torque	mNm		172.68	180.35	199.18	175.28				
8 Stall current	A		21.82	11.16	8.28	5.46				
9 Max. efficiency	%		79.8	80.0	78.6	77.4				
10 Terminal resistance	Ω		0.55	2.15	4.35	8.79				
11 Terminal inductance	mH		0.07	0.29	0.62	1.14				
12 Torque constant	mNm/A		8.01	16.34	24.38	32.57				
13 Speed constant	rpm/V		1193	584	392	293				
14 Speed/torque gradient	rpm/mNm		82	77	70	79				
15 Mechanical time constant	ms		3.6	3.4	3.1	3.5				
16 Rotor inertia	gcm ²		4.2	4.2	4.2	4.2				
17 Thermal resistance housing-ambient	11.6 K/W									
18 Thermal resistance winding-housing	5.6 K/W									
19 Thermal time constant winding	30 s									
20 Thermal time constant motor	557 s									
21 Ambient temperature	-30...+100°C									
22 Max. permissible winding temperature	+150°C									
23 Max. permissible speed	30000 rpm									
24 Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm									
25 Radial play	preloaded									
26 Max. axial load (dynamic)	3.5 N									
27 Max. force for press fits (static)	44 N									
28 Max. radial loading, 5mm from flange	1200 N									
29 Number of pole pairs	1									
30 Number of phases	3									
31 Weight of motor	92 g									

Operating Range

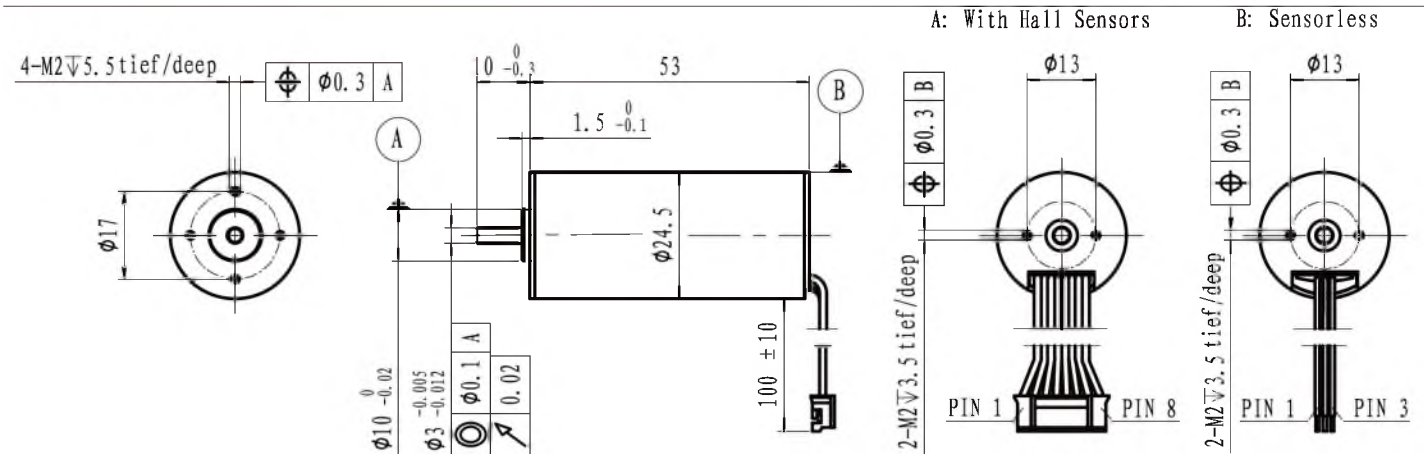


Connection

Connection A (Sensor)			PVC
Pin 1	Vhall 3-18 VDC	AWG26	black
Pin 2	Hall sensor HA	AWG26	black
Pin 3	Hall sensor HB	AWG26	black
Pin 4	Hall sensor HC	AWG26	black
Pin 5	GND	AWG26	black
Pin 6	Motor winding MA	AWG26	black
Pin 7	Motor winding MB	AWG26	black
Pin 8	Motor winding MC	AWG26	black
Connector			JST PH2.0-8P
Connection B (Sensorless)			PVC
Pin 1	Motor winding MA	AWG26	yellow
Pin 2	Motor winding MB	AWG26	green
Pin 3	Motor winding MC	AWG26	blue

Configuration

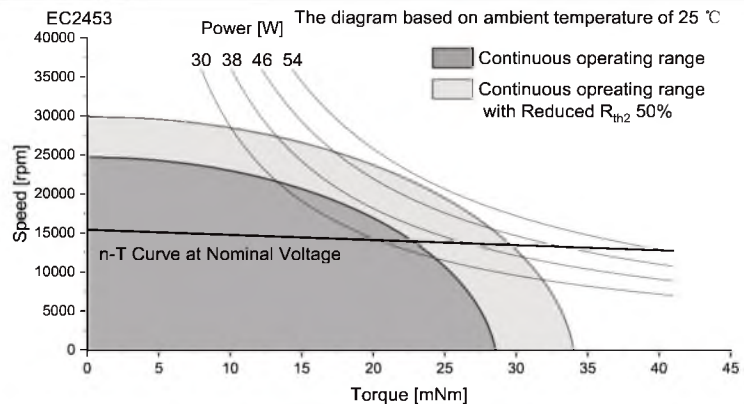
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard flange front&back/customize the flange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



M 1:1.5

	Sensorless	EC2453L-...	1215	2415	3615	4815				
	With hall sensor	EC2453S-...								
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24	36	48				
2	No load speed	rpm	15083	15398	15202	15310				
3	No load current	mA	308	156	115	94				
4	Nominal speed	rpm	13938	14347	14211	14263				
5	Nominal torque	mNm	20	20	20	20				
6	Nominal current	A	2.96	1.51	1.01	0.77				
7	Stall torque	mNm	263.48	293.05	306.73	292.55				
8	Stall current	A	35.29	20.00	13.79	9.96				
9	Max. efficiency	%	82.2	83.1	82.6	81.5				
10	Terminal resistance	Ω	0.34	1.2	2.61	4.82				
11	Terminal inductance	mH	0.05	0.19	0.44	0.76				
12	Torque constant	mNm/A	7.53	14.77	22.43	29.66				
13	Speed constant	rpm/V	1268	647	426	322				
14	Speed/torque gradient	rpm/mNm	57	53	50	52				
15	Mechanical time constant	ms	2.5	2.3	2.2	2.3				
16	Rotor inertia	gcm ²	4.2	4.2	4.2	4.2				
17	Thermal resistance housing-ambient	10.2 K/W								
18	Thermal resistance winding-housing	6.4 K/W								
19	Thermal time constant winding	36 s								
20	Thermal time constant motor	555 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	30000 rpm								
24	Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	3.5 N								
27	Max. force for press fits (static)	44 N								
28	Max. radial loading, 5mm from flange	1200 N								
29	Number of pole pairs	1								
30	Number of phases	3								
31	Weight of motor	110 g								

Operating Range



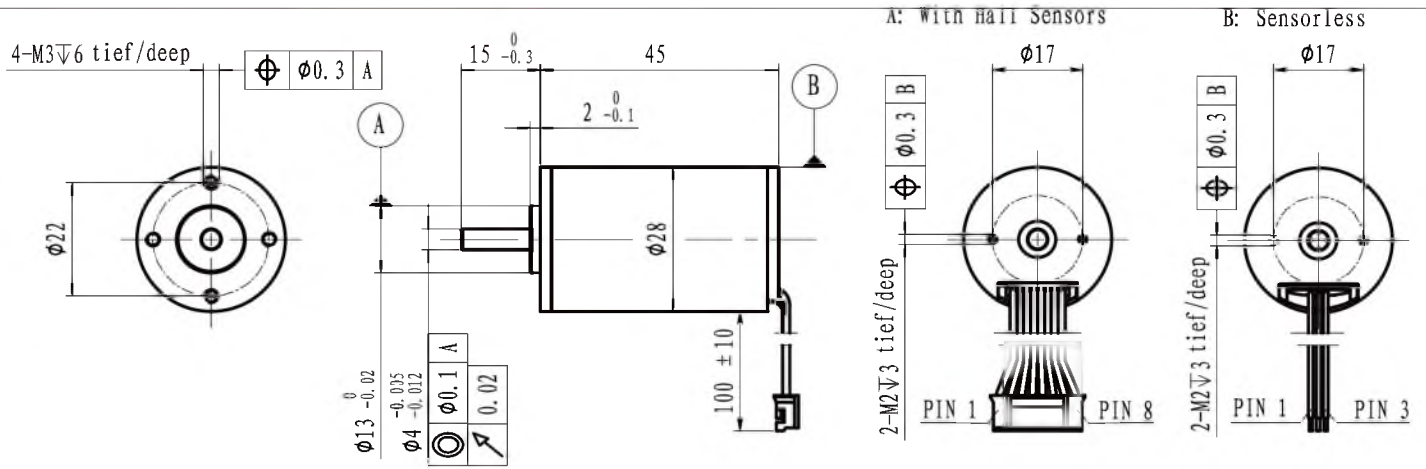
Connection

Conection A (Sensor)		PVC	
Pin 1	Vhall 3-18 VDC	AWG26	black
Pin 2	Hall sensor HA	AWG26	black
Pin 3	Hall sensor HB	AWG26	black
Pin 4	Hall sensor HC	AWG26	black
Pin 5	GND	AWG26	black
Pin 6	Motor winding MA	AWG26	black
Pin 7	Motor winding MB	AWG26	black
Pin 8	Motor winding MC	AWG26	black
Conector			
JST PH2.0-8P			

Conection B (Sensorless)		PVC	
Pin 1	Motor winding MA	AWG26	yellow
Pin 2	Motor winding MB	AWG26	green
Pin 3	Motor winding MC	AWG26	blue

Configuration

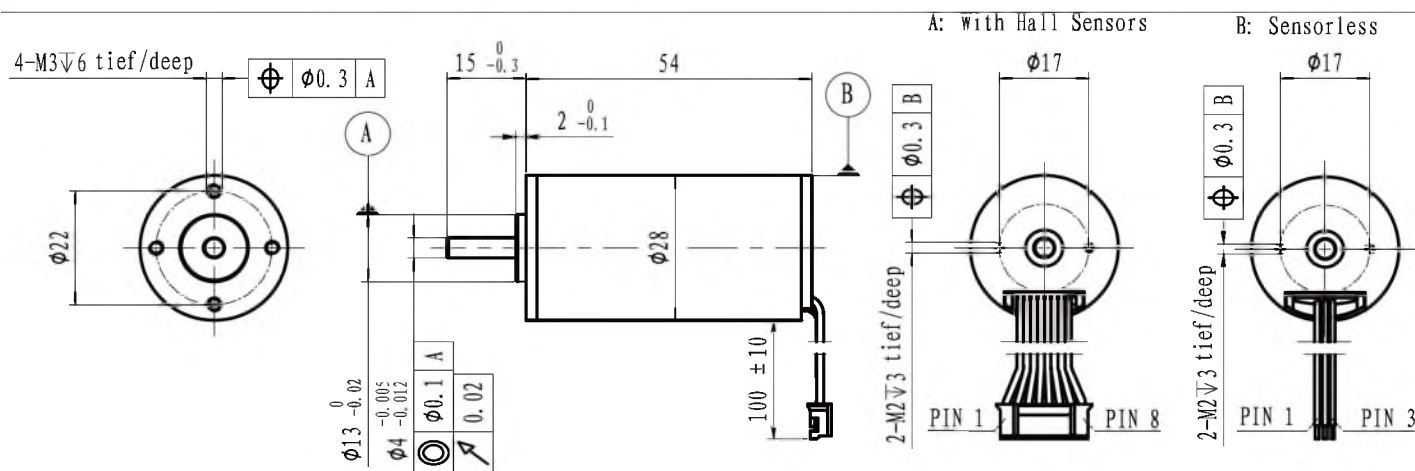
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



M 1:1.5

	Sensorless	EC2845L-...	1213	2413	3613	4813				
	With hall sensor	EC2845S-...								
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24	36	48				
2	No load speed	rpm	13737	13756	13783	13400				
3	No load current	mA	202	128	84	79				
4	Nominal speed	rpm	12225	12342	12432	11903				
5	Nominal torque	mNm	18	18	18	18				
6	Nominal current	A	2.38	1.22	0.81	0.61				
7	Stall torque	mNm	163.48	175.07	183.68	161.16				
8	Stall current	A	20.00	10.76	7.53	4.87				
9	Max. efficiency	%	80.9	79.4	80.0	76.1				
10	Terminal resistance	Ω	0.6	2.23	4.78	9.86				
11	Terminal inductance	mH	0.08	0.34	0.73	1.47				
12	Torque constant	mNm/A	8.26	16.46	24.66	33.65				
13	Speed constant	rpm/V	1156	580	387	284				
14	Speed/torque gradient	rpm/mNm	84	79	75	83				
15	Mechanical time constant	ms	4.6	4.3	4.1	4.5				
16	Rotor inertia	gcm ²	5.2	5.2	5.2	5.2				
17	Thermal resistance housing-ambient	9.6 K/W								
18	Thermal resistance winding-housing	6.3 K/W								
19	Thermal time constant winding	37 s								
20	Thermal time constant motor	584 s								
21	Ambient temprature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	25000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
28	Max. radial loading, 5mm from flange	25 N								
29	Number of pole pairs	1								
30	Number of phases	3								
31	Weight of motor	120 g								
Operating Range										
EC2845 Power [W] The diagram based on ambient temperature of 25 °C 20 25 30 35 Speed [rpm] Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage Torque [mNm]										

Connection			Configuration	
Conection A (Sensor)			Performance: Customized in the continuous operating range	
Pin 1	Vhall 3-18 VDC	AWG26 black	Ball bearing: Preload	
Pin 2	Hall sensor HA	AWG26 black	Flange: Standard frange front&back/customize the frange	
Pin 3	Hall sensor HB	AWG26 black	Shaft: Length/Diameter/Cut face/double shaft/hollow shaft	
Pin 4	Hall sensor HC	AWG26 black	Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length	
Pin 5	GND	AWG26 black	Connector: JST/MOLEX/TE	
Pin 6	Motor winding MA	AWG26 black		
Pin 7	Motor winding MB	AWG26 black		
Pin 8	Motor winding MC	AWG26 black		
Conector				
JST PH2.0-8P				
Conection B (Sensorless)				
Pin 1	Motor winding MA	AWG26 yellow		
Pin 2	Motor winding MB	AWG26 green		
Pin 3	Motor winding MC	AWG26 blue		



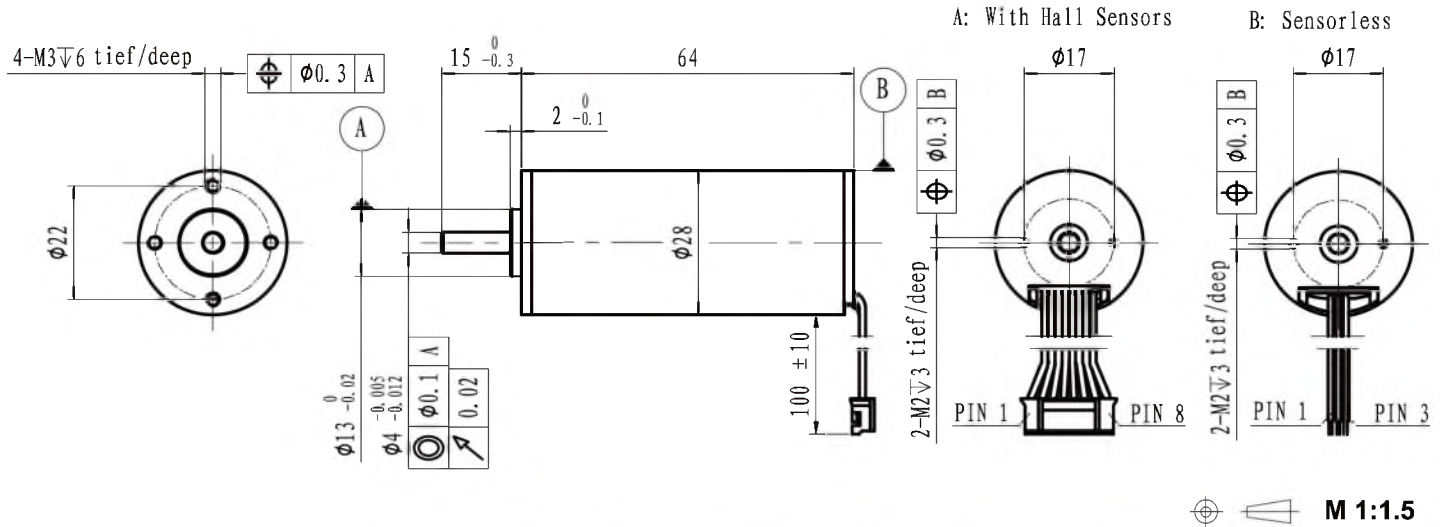
M 1:1.5

		Sensorless	EC2854L-...	1212	2412	3612	4812				
		With hall sensor	EC2854S-...								
Motor data											
Values at nominal voltage											
1	Nominal voltage	V		12	24	36	48				
2	No load speed	rpm		12039	12238	12100	12066				
3	No load current	mA		410	190	125	90				
4	Nominal speed	rpm		10716	10874	10961	10693				
5	Nominal torque	mNm		35	35	35	35				
6	Nominal current	A		4.13	2.08	1.37	1.02				
7	Stall torque	mNm		318.59	313.96	371.75	307.58				
8	Stall current	A		34.29	17.14	13.33	8.28				
9	Max. efficiency	%		79.3	80.1	81.6	80.2				
10	Terminal resistance	Ω		0.35	1.4	2.7	5.8				
11	Terminal inductance	mH		0.16	0.61	1.41	2.56				
12	Torque constant	mNm/A		9.40	18.52	28.14	37.58				
13	Speed constant	rpm/V		1015	516	339	254				
14	Speed/torque gradient	rpm/mNm		38	39	33	39				
15	Mechanical time constant	ms		3.4	3.5	2.9	3.5				
16	Rotor inertia	gcm ²		8.5	8.5	8.5	8.5				
17	Thermal resistance housing-ambient	7.1 K/W									
18	Thermal resistance winding-housing	5 K/W									
19	Thermal time constant winding	51 s									
20	Thermal time constant motor	552 s									
21	Ambient temperature	-30...+100°C									
22	Max. permissible winding temperature	+150°C									
23	Max. permissible speed	25000 rpm									
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm									
25	Radial play	preloaded									
26	Max. axial load (dynamic)	7.5 N									
27	Max. force for press fits (static)	100 N									
	(static, shaft supported)	2000 N									
28	Max. radial loading, 5mm from flange	25 N									
29	Number of pole pairs	1									
30	Number of phases	3									
31	Weight of motor	156 g									

Operating Range

The diagram shows the operating range for the EC2854 motor. The y-axis represents Speed in rpm, ranging from 0 to 30,000. The x-axis represents Torque in mNm, ranging from 0 to 55. A horizontal line at approximately 12,000 rpm is labeled 'n-T Curve at Nominal Voltage'. Several curves are plotted, labeled with power values: 45, 54, 63, and 72 W. The area under the 45 W curve is shaded dark grey and labeled 'Continuous operating range'. The area between the 45 W and 72 W curves is shaded light grey and labeled 'Continuous operating range with Reduced R_{th2} 50%'. A legend on the right side of the diagram confirms these labels.

Connection			Configuration
Connection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
Pin 1	Vhall 3-18 VDC	AWG26 black	
Pin 2	Hall sensor HA	AWG26 black	
Pin 3	Hall sensor HB	AWG26 black	
Pin 4	Hall sensor HC	AWG26 black	
Pin 5	GND	AWG26 black	
Pin 6	Motor winding MA	AWG26 black	
Pin 7	Motor winding MB	AWG26 black	
Pin 8	Motor winding MC	AWG26 black	
Conector JST PH2.0-8P			
Connection B (Sensorless)			
Pin 1	Motor winding MA	AWG26 yellow	
Pin 2	Motor winding MB	AWG26 green	
Pin 3	Motor winding MC	AWG26 blue	

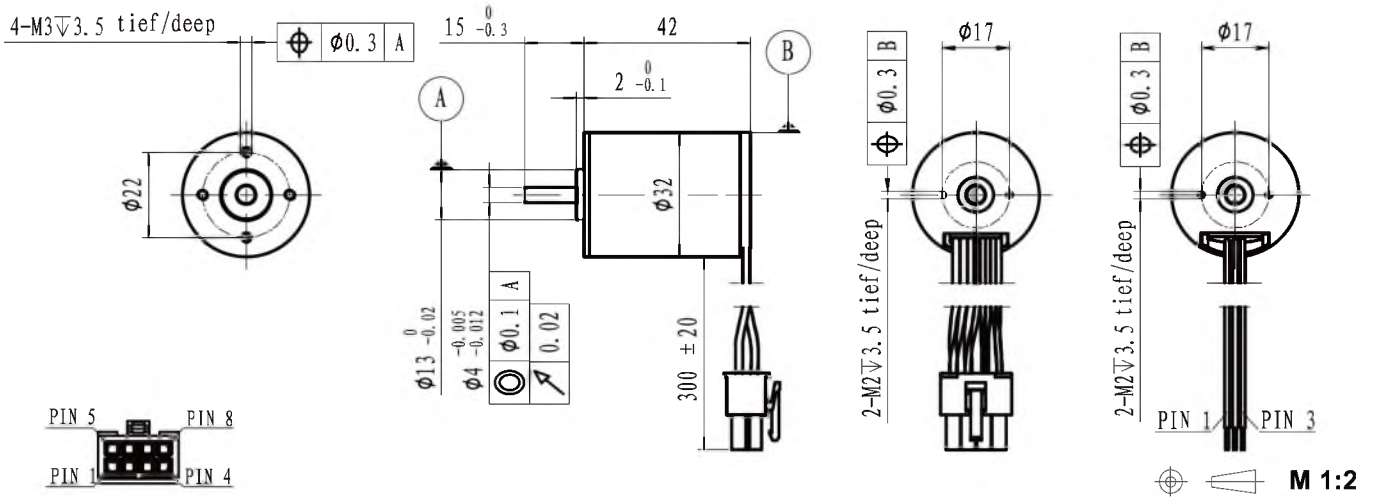


		Sensorless	EC2864L-...	1212	2412	3612	4812				
		With hall sensor	EC2864S-...								
Motor data											
Values at nominal voltage											
1	Nominal voltage	V		12	24	36	48				
2	No load speed	rpm		12210	12100	12021	12305				
3	No load current	mA		460	240	170	120				
4	Nominal speed	rpm		10828	10853	10843	11008				
5	Nominal torque	mNm		50	50	50	50				
6	Nominal current	A		5.84	2.90	1.93	1.47				
7	Stall torque	mNm		441.89	485.06	510.28	474.35				
8	Stall current	A		48.00	26.09	18.18	12.97				
9	Max. efficiency	%		81.4	81.7	81.6	81.7				
10	Terminal resistance	Ω		0.25	0.92	1.98	3.7				
11	Terminal inductance	mH		0.11	0.46	0.46	0.96				
12	Torque constant	mNm/A		9.30	18.77	28.33	36.91				
13	Speed constant	rpm/V		1027	509	337	259				
14	Speed/torque gradient	rpm/mNm		28	25	24	26				
15	Mechanical time constant	ms		2.8	2.5	2.4	2.6				
16	Rotor inertia	gcm ²		9.6	9.6	9.6	9.6				
17	Thermal resistance housing-ambient	5.5 K/W									
18	Thermal resistance winding-housing	4 K/W									
19	Thermal time constant winding	56 s									
20	Thermal time constant motor	521 s									
21	Ambient temprature	-30...+100°C									
22	Max. permissible winding temperature	+150°C									
23	Max. permissible speed	25000 rpm									
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm									
25	Radial play	preloaded									
26	Max. axial load (dynamic)	7.5 N									
27	Max. force for press fits (static)	100 N									
28	Max. radial loading, 5mm from flange	2000 N									
29	Number of pole pairs	1									
30	Number of phases	3									
31	Weight of motor	195 g									
Operating Range											
EC2864				The diagram based on ambient temperature of 25 °C							

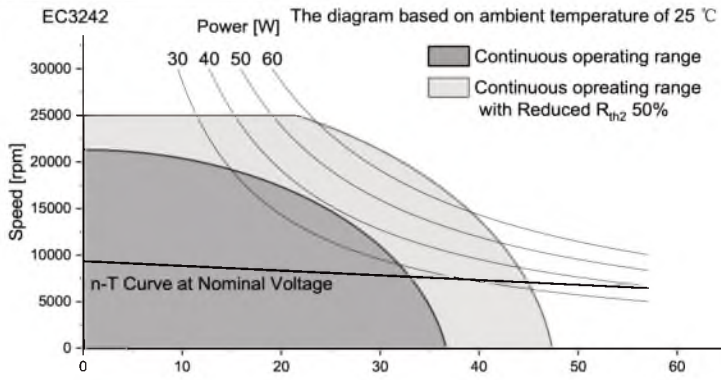
Connection				Configuration	
Conection A (Sensor)				Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE	
Pin 1	Vhall 3-18 VDC	PVC	black		
Pin 2	Hall sensor HA	AWG26	black		
Pin 3	Hall sensor HB	AWG26	black		
Pin 4	Hall sensor HC	AWG26	black		
Pin 5	GND	AWG26	black		
Pin 6	Motor winding MA	AWG26	black		
Pin 7	Motor winding MB	AWG26	black		
Pin 8	Motor winding MC	AWG26	black		
Conector					
JST PH2.0-8P					
Conection B (Sensorless)					
Pin 1	Motor winding MA	PVC	yellow		
Pin 2	Motor winding MB	AWG26	green		
Pin 3	Motor winding MC	AWG26	blue		

A: With Hall Sensors

B: Sensorless



		Sensorless	EC3242L-...		1209	2409	3609	4809				
		With hall sensor	EC3242S-...									
Motor data												
Values at nominal voltage												
1	Nominal voltage	V		12	24	36	48					
2	No load speed	rpm		9319	9516	9269	9389					
3	No load current	mA		380	210	120	90					
4	Nominal speed	rpm		8198	8364	8219	8120					
5	Nominal torque	mNm		25	25	25	25					
6	Nominal current	A		2.46	1.27	0.81	0.61					
7	Stall torque	mNm		207.75	206.49	220.60	184.98					
8	Stall current	A		17.65	8.99	6.19	3.97					
9	Max. efficiency	%		72.8	71.8	74.1	72.1					
10	Terminal resistance	Ω		0.68	2.67	5.82	12.1					
11	Terminal inductance	mH		0.11	0.4	0.98	1.79					
12	Torque constant	mNm/A		12.03	23.52	36.37	47.71					
13	Speed constant	rpm/V		794	406	263	200					
14	Speed/torque gradient	rpm/mNm		45	46	42	51					
15	Mechanical time constant	ms		4.4	4.5	4.1	5.0					
16	Rotor inertia	gcm ²		9.4	9.4	9.4	9.4					
17	Thermal resistance housing-ambient	8.8 K/W										
18	Thermal resistance winding-housing	2.7 K/W										
19	Thermal time constant winding	23.5 s										
20	Thermal time constant motor	560 s										
21	Ambient temperature	-30...+100°C										
22	Max. permissible winding temperature	+150°C										
23	Max. permissible speed	25000 rpm										
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm										
25	Radial play	preloaded										
26	Max. axial load (dynamic)	7.5 N										
27	Max. force for press fits (static)	100 N										
	(static, shaft supported)	2700 N										
28	Max. radial loading, 5mm from flange	25 N										
29	Number of pole pairs	1										
30	Number of phases	3										
31	Weight of motor	147 g										

Operating Range												
EC3242												
The diagram based on ambient temperature of 25 °C												
												

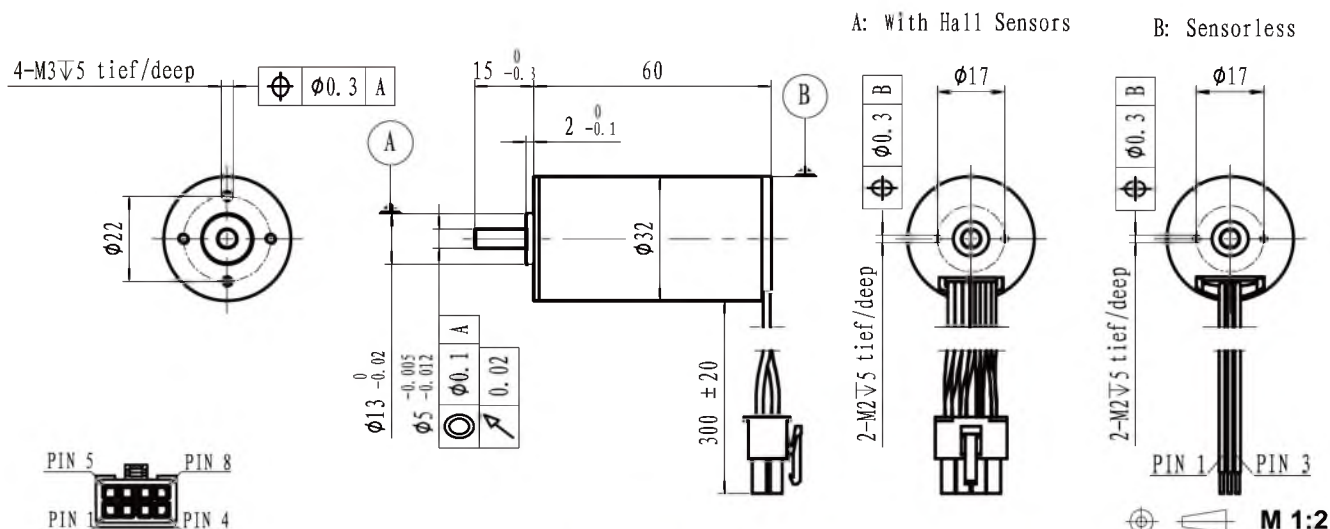
Connection

Conection A (Sensor)		PTFE
Pin 1	Motor winding MB	AWG20 Green
Pin 2	Vhall 3-18 VDC	AWG26 Red
Pin 3	Hall sensor HA	AWG26 Yellow
Pin 4	Hall sensor HC	AWG26 Blue
Pin 5	Motor winding MA	AWG20 Yellow
Pin 6	Motor winding MC	AWG20 Blue
Pin 7	GND	AWG26 Black
Pin 8	Hall sensor HB	AWG26 Green
Conector		
Molex5557-8P		

Conection B (Sensorless)		PTFE
Pin 1	Motor winding MA	AWG20 Yellow
Pin 2	Motor winding MB	AWG20 Green
Pin 3	Motor winding MC	AWG20 Blue

Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



Sensorless		EC3260L-...	1211	2411	3611	4811				
With hall sensor		EC3260S-...								
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24	36	48				
2	No load speed	rpm	10845	11038	10937	11125				
3	No load current	mA	430	190	130	90				
4	Nominal speed	rpm	9889	10027	9931	10087				
5	Nominal torque	mNm	50	50	50	50				
6	Nominal current	A	5.20	2.62	1.73	1.31				
7	Stall torque	mNm	567.29	545.82	543.84	535.92				
8	Stall current	A	54.55	26.67	17.56	13.19				
9	Max. efficiency	%	83.0	83.8	83.5	84.2				
10	Terminal resistance	Ω	0.22	0.9	2.05	3.64				
11	Terminal inductance	mH	0.08	0.32	0.9	1.22				
12	Torque constant	mNm/A	10.48	20.62	31.20	40.92				
13	Speed constant	rpm/V	911	463	306	233				
14	Speed/torque gradient	rpm/mNm	19	20	20	21				
15	Mechanical time constant	ms	3.1	3.3	3.3	3.4				
16	Rotor inertia	gcm ²	15.5	15.5	15.5	15.5				
17	Thermal resistance housing-ambient	6 K/W								
18	Thermal resistance winding-housing	3.2 K/W								
19	Thermal time constant winding	36 s								
20	Thermal time constant motor	626 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	25000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
	(static, shaft supported)	2700 N								
28	Max. radial loading, 5mm from flange	25 N								
29	Number of pole pairs	1								
30	Number of phases	3								
31	Weight of motor	217 g								

Operating Range

EC3260

The diagram based on ambient temperature of 25 °C

Power [W] 60 80 100 120

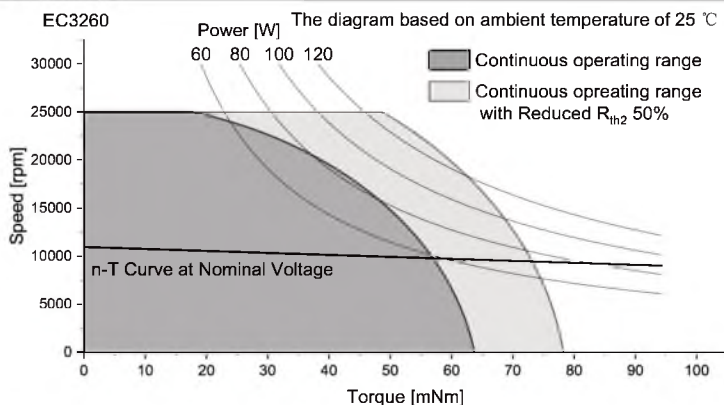
Speed [rpm] 30000 25000 20000 15000 10000 5000 0

Torque [mNm] 0 10 20 30 40 50 60 70 80 90 100

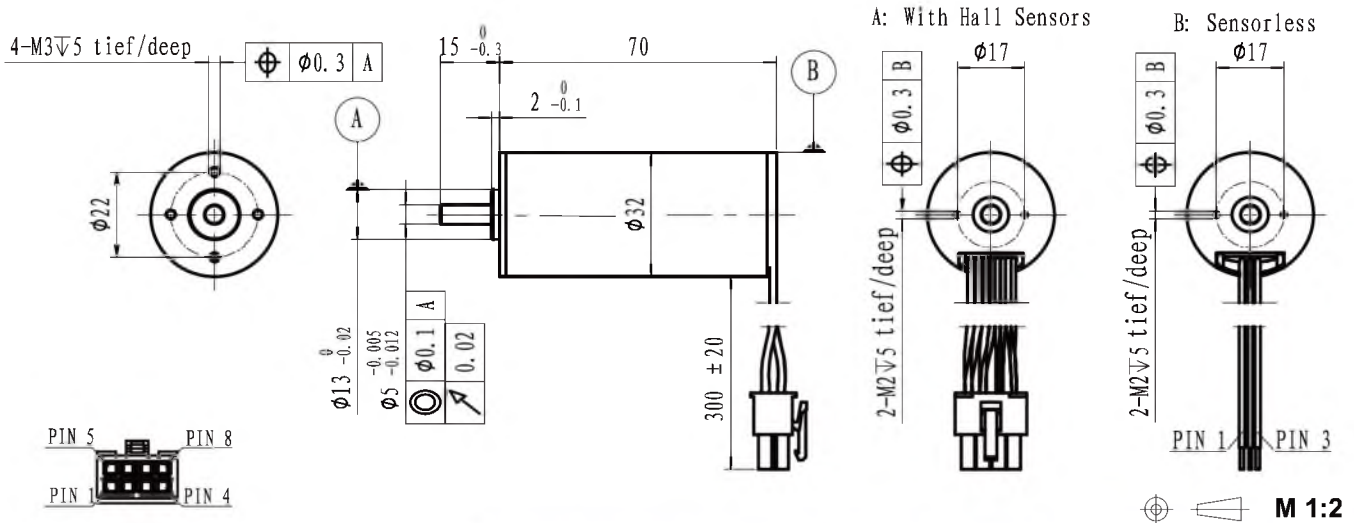
Continuous operating range

Continuous operating range with Reduced R_{th2} 50%

n-T Curve at Nominal Voltage

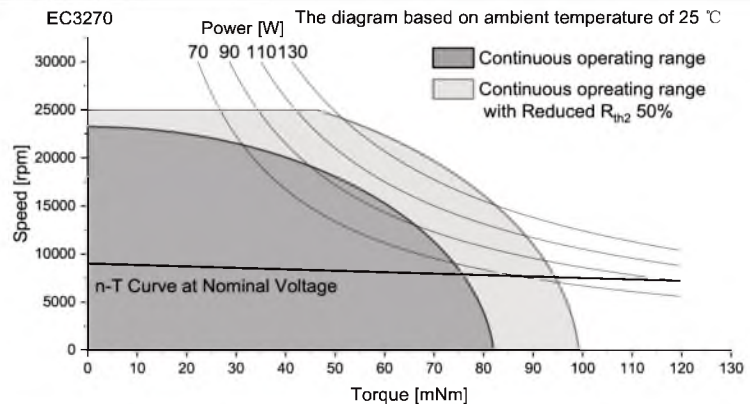


Connection			Configuration
Conection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
Pin 1	Motor winding MB	PTFE AWG20 Green	
Pin 2	Vhall 3-18 VDC	AWG26 Red	
Pin 3	Hall sensor HA	AWG26 Yellow	
Pin 4	Hall sensor HC	AWG26 Blue	
Pin 5	Motor winding MA	AWG20 Yellow	
Pin 6	Motor winding MC	AWG20 Blue	
Pin 7	GND	AWG26 Black	
Pin 8	Hall sensor HB	AWG26 Green	
Conector Mollex5557-8P			
Conection B (Sensorless)			
Pin 1	Motor winding MA	PTFE AWG20 Yellow	
Pin 2	Motor winding MB	AWG20 Green	
Pin 3	Motor winding MC	AWG20 Blue	



	Sensorless	EC3270L-...	1209	2409	3609	4809			
	With hall sensor	EC3270S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		12	24	36	48			
2 No load speed	rpm		8998	9055	9252	9080			
3 No load current	mA		450	180	100	90			
4 Nominal speed	rpm		7991	7963	8129	8077			
5 Nominal torque	mNm		70	70	70	70			
6 Nominal current	A		6.00	2.97	2.00	1.49			
7 Stall torque	mNm		625.35	580.67	576.72	633.67			
8 Stall current	A		50.00	23.30	15.72	12.73			
9 Max. efficiency	%		81.9	83.2	84.7	83.9			
10 Terminal resistance	Ω		0.24	1.03	2.29	3.77			
11 Terminal inductance	mH		0.09	0.35	0.75	1.33			
12 Torque constant	mNm/A		12.62	25.11	36.92	50.12			
13 Speed constant	rpm/V		757	380	259	191			
14 Speed/torque gradient	rpm/mNm		14	16	16	14			
15 Mechanical time constant	ms		2.8	3.0	3.1	2.8			
16 Rotor inertia	gcm ²		18.5	18.5	18.5	18.5			
17 Thermal resistance housing-ambient	4.7 K/W								
18 Thermal resistance winding-housing	2.9 K/W								
19 Thermal time constant winding	38 s								
20 Thermal time constant motor	568 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	25000 rpm								
24 Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	7.5 N								
27 Max. force for press fits (static)	100 N								
28 Max. radial loading, 5mm from flange	2700 N								
29 Number of pole pairs	1								
30 Number of phases	3								
31 Weight of motor	256 g								

Operating Range



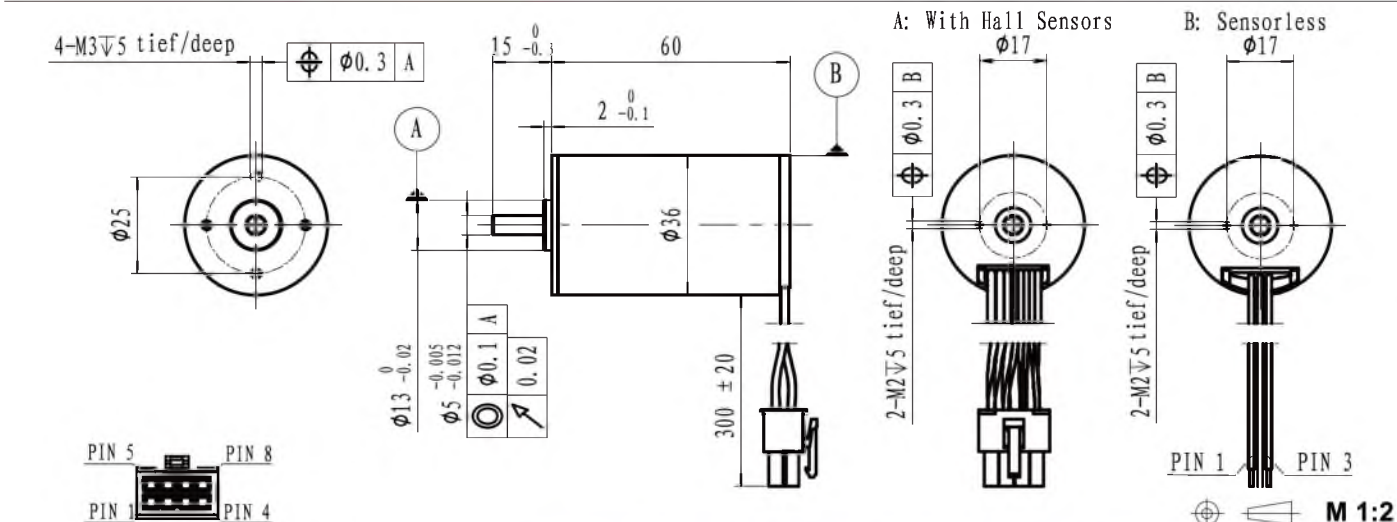
Connection

Connection A (Sensor)		PTFE
Pin 1 Motor winding MB	AWG20	Green
Pin 2 Vhall 3-18 VDC	AWG26	Red
Pin 3 Hall sensor HA	AWG26	Yellow
Pin 4 Hall sensor HC	AWG26	Blue
Pin 5 Motor winding MA	AWG20	Yellow
Pin 6 Motor winding MC	AWG20	Blue
Pin 7 GND	AWG26	Black
Pin 8 Hall sensor HB	AWG26	Green
Connector		
Molex5557-8P		

Connection B (Sensorless)		PTFE
Pin 1 Motor winding MA	AWG20	Yellow
Pin 2 Motor winding MB	AWG20	Green
Pin 3 Motor winding MC	AWG20	Blue

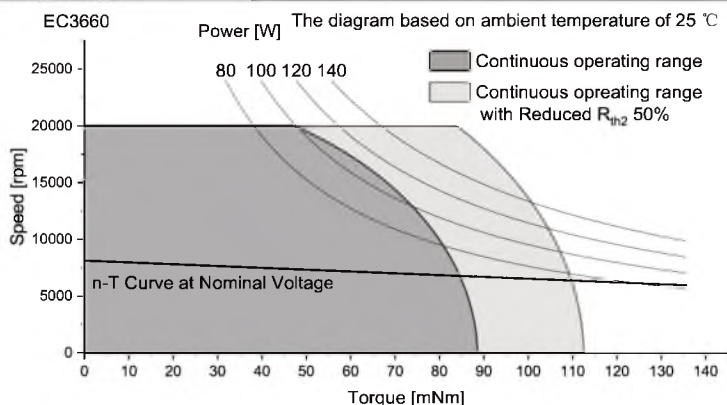
Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard flange front&back/customize the flange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



	Sensorless	EC3660L-...	1208	2408	3608	4808			
	With hall sensor	EC3660S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		12	24	36	48			
2 No load speed	rpm		8050	8140	8014	8083			
3 No load current	mA		288	148	101	84			
4 Nominal speed	rpm		6794	6784	6804	6766			
5 Nominal torque	mNm		82	82	82	82			
6 Nominal current	A		6.09	3.08	2.03	1.54			
7 Stall torque	mNm		525.64	492.24	542.90	503.13			
8 Stall current	A		37.50	17.78	12.86	9.04			
9 Max. efficiency	%		83.2	82.6	83.1	81.6			
10 Terminal resistance	Ω		0.32	1.35	2.8	5.31			
11 Terminal inductance	mH		0.09	0.38	0.88	1.6			
12 Torque constant	mNm/A		14.13	27.92	42.56	56.18			
13 Speed constant	rpm/V		676	342	224	170			
14 Speed/torque gradient	rpm/mNm		15	17	15	16			
15 Mechanical time constant	ms		3.1	3.4	3.0	3.3			
16 Rotor inertia	gcm ²		19.5	19.5	19.5	19.5			
17 Thermal resistance housing-ambient	4.4 K/W								
18 Thermal resistance winding-housing	1.3 K/W								
19 Thermal time constant winding	15 s								
20 Thermal time constant motor	582 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	20000 rpm								
24 Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	7.5 N								
27 Max. force for press fits (static)	100 N								
28 Max. radial loading, 5mm from flange	2700 N								
29 Number of pole pairs	1								
30 Number of phases	3								
31 Weight of motor	272 g								

Operating Range



Connection

Connection A (Sensor)

Pin 1	Motor winding MB	PTFE	Green
Pin 2	Vhall 3-18 VDC	AWG26	Red
Pin 3	Hall sensor HA	AWG26	Yellow
Pin 4	Hall sensor HC	AWG26	Blue
Pin 5	Motor winding MA	AWG20	Yellow
Pin 6	Motor winding MC	AWG20	Blue
Pin 7	GND	AWG26	Black
Pin 8	Hall sensor HB	AWG26	Green

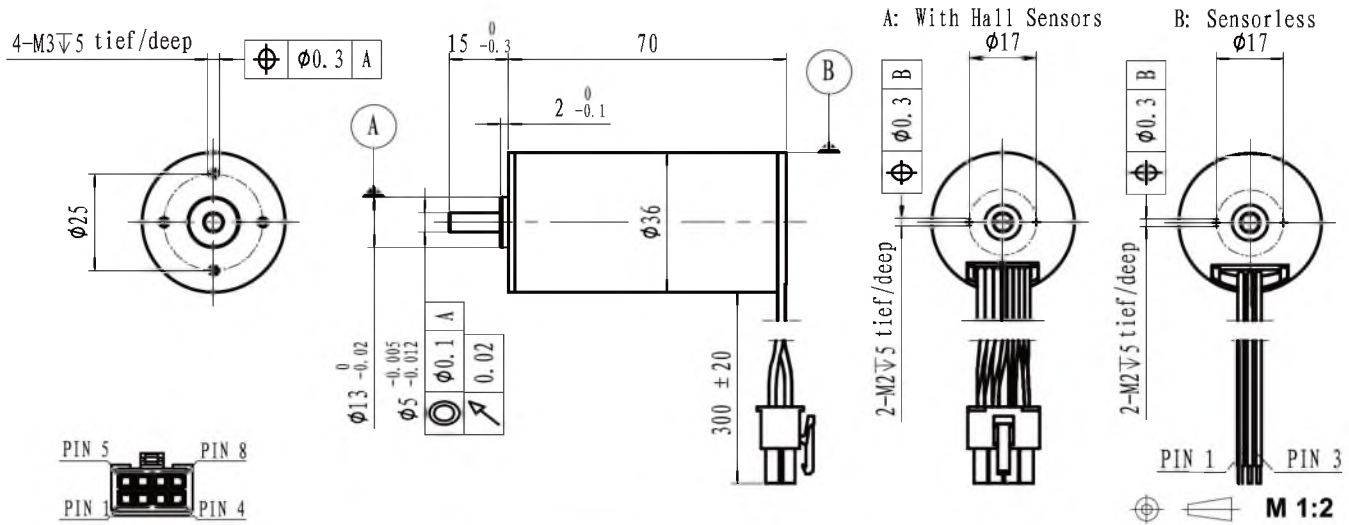
Connector
Molex5557-8P

Connection B (Sensorless)

Pin 1	Motor winding MA	PTFE	Yellow
Pin 2	Motor winding MB	AWG20	Green
Pin 3	Motor winding MC	AWG20	Blue

Configuration

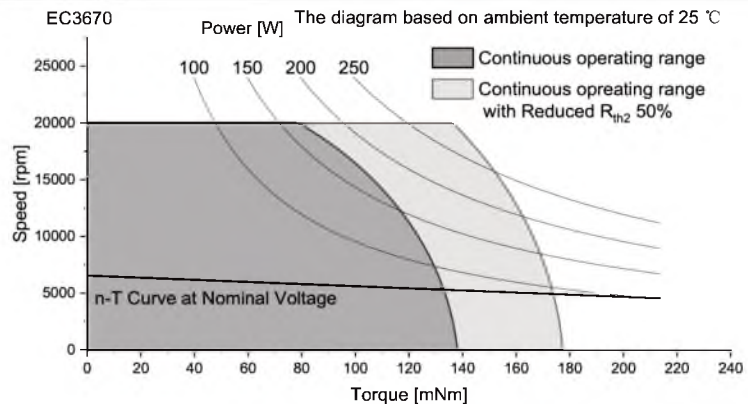
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



		Sensorless	EC3670L-...							
		With hall sensor	EC3670S-...	1208	2408	3608	4808			
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24	36	48				
2	No load speed	rpm	6578	6555	6675	6545				
3	No load current	mA	293	137	101	78				
4	Nominal speed	rpm	5312	5395	5455	5401				
5	Nominal torque	mNm	120	120	120	120				
6	Nominal current	A	7.24	3.59	2.45	1.81				
7	Stall torque	mNm	623.30	678.25	656.57	686.54				
8	Stall current	A	36.36	19.67	12.95	9.96				
9	Max. efficiency	%	82.9	84.0	83.1	83.1				
10	Terminal resistance	Ω	0.33	1.22	2.78	4.82				
11	Terminal inductance	mH	0.09	0.38	0.85	1.52				
12	Torque constant	mNm/A	17.28	34.72	51.10	69.48				
13	Speed constant	rpm/V	553	275	187	137				
14	Speed/torque gradient	rpm/mNm	11	10	10	10				
15	Mechanical time constant	ms	2.4	2.2	2.3	2.1				
16	Rotor inertia	gcm²	21.5	21.5	21.5	21.5				
17	Thermal resistance housing-ambient	3.5 K/W								
18	Thermal resistance winding-housing	0.9 K/W								
19	Thermal time constant winding	14.3 s								
20	Thermal time constant motor	558 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	20000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
	(static, shaft supported)	2700 N								
28	Max. radial loading, 5mm from flange	25 N								
29	Number of pole pairs	1								
30	Number of phases	3								
31	Weight of motor	331 g								

		Operating Range	
		The diagram based on ambient temperature of 25 °C	
		EC3670	
		Power [W]	
		100 150 200 250	
		Continuous operating range	
		Continuous operating range with Reduced R _{th2} 50%	
		Speed [rpm]	
		25000	
		20000	
		15000	
		10000	
		5000	
		0	
		n-T Curve at Nominal Voltage	
		Torque [mNm]	
		0 20 40 60 80 100 120 140 160 180 200 220 240	

Operating Range



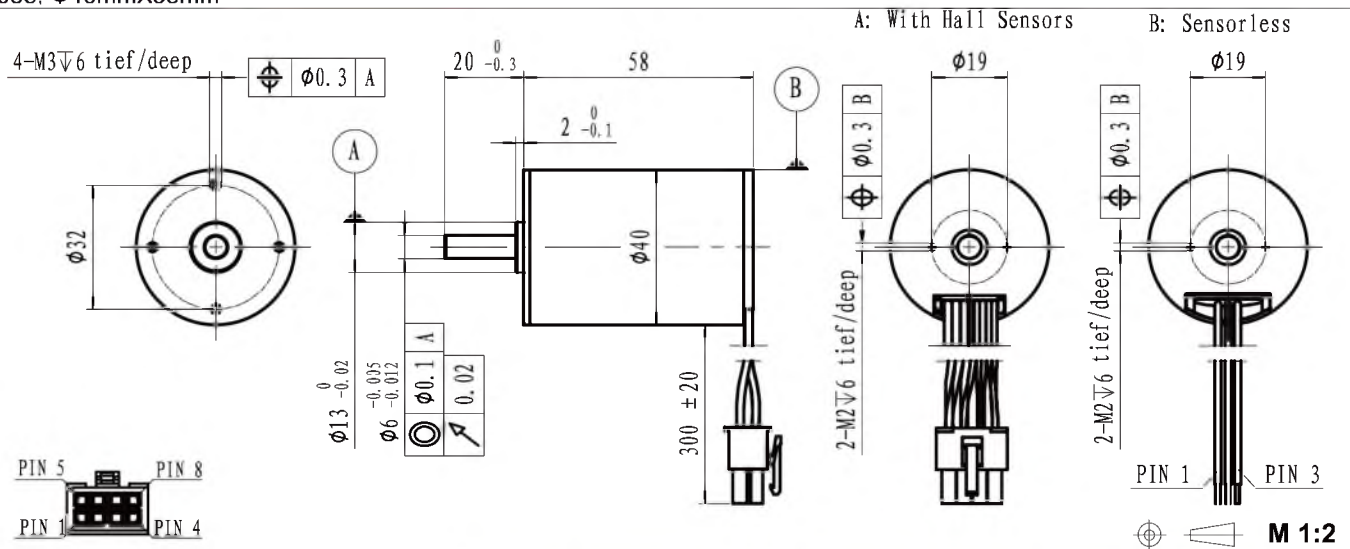
Connection

Conection A (Sensor)		PTFE
Pin 1	Motor winding MB	AWG20 Green
Pin 2	Vhall 3-18 VDC	AWG26 Red
Pin 3	Hall sensor HA	AWG26 Yellow
Pin 4	Hall sensor HC	AWG26 Blue
Pin 5	Motor winding MA	AWG20 Yellow
Pin 6	Motor winding MC	AWG20 Blue
Pin 7	GND	AWG26 Black
Pin 8	Hall sensor HB	AWG26 Green
Connector		Molex5557-8P

Conection B (Sensorless)		PTFE
Pin 1	Motor winding MA	AWG20 Yellow
Pin 2	Motor winding MB	AWG20 Green
Pin 3	Motor winding MC	AWG20 Blue

Configuration

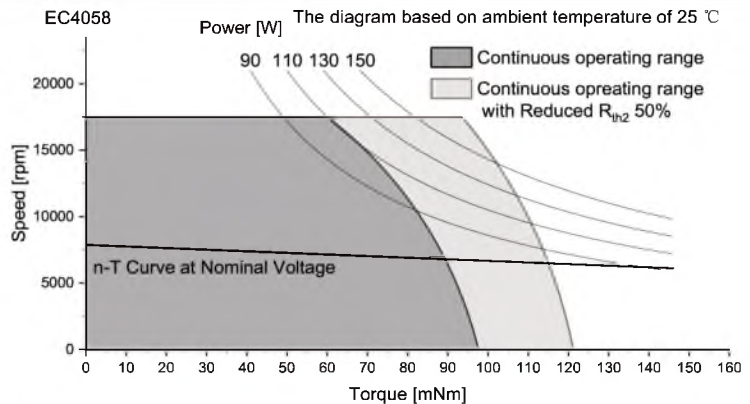
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard flange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



		Sensorless	EC4058L-...		1208	2408	3608	4808				
		With hall sensor	EC4058S-...									
Motor data												
Values at nominal voltage												
1	Nominal voltage	V		12	24	36	48					
2	No load speed	rpm		7958	7890	7962	8001					
3	No load current	mA		480	200	170	110					
4	Nominal speed	rpm		7000	6912	6943	6986					
5	Nominal torque	mNm		85	85	85	85					
6	Nominal current	A		6.44	3.15	2.16	1.61					
7	Stall torque	mNm		706.22	685.56	664.16	669.80					
8	Stall current	A		50.00	24.00	15.72	11.91					
9	Max. efficiency	%		81.4	82.6	80.3	81.7					
10	Terminal resistance	Ω		0.24	1	2.29	4.03					
11	Terminal inductance	mH		0.11	0.46	0.97	1.67					
12	Torque constant	mNm/A		14.26	28.81	42.71	56.76					
13	Speed constant	rpm/V		670	332	224	168					
14	Speed/torque gradient	rpm/mNm		11	12	12	12					
15	Mechanical time constant	ms		4.7	3.6	3.7	3.7					
16	Rotor inertia	gcm ²		39.6	29.6	29.6	29.6					
17	Thermal resistance housing-ambient	4.7 K/W										
18	Thermal resistance winding-housing	2.2 K/W										
19	Thermal time constant winding	35 s										
20	Thermal time constant motor	777 s										
21	Ambient temperature	-30...+100°C										
22	Max. permissible winding temperature	+150°C										
23	Max. permissible speed	17500 rpm										
24	Axial play at axial load	<10N 0 mm >10N max. 0.3 mm										
25	Radial play	preloaded										
26	Max. axial load (dynamic)	9 N										
27	Max. force for press fits (static)	170 N										
	(static, shaft supported)	4500 N										
28	Max. radial loading, 5mm from flange	80 N										
29	Number of pole pairs	1										
30	Number of phases	3										
31	Weight of motor	338 g										

		Operating Range																		
		EC4058	The diagram based on ambient temperature of 25 °C																	
		Power [W]																		
		20000	90 110 130 150																	
		15000	Continuous operating range																	
		10000	Continuous operating range with Reduced R _{th2} 50%																	
		5000	n-T Curve at Nominal Voltage																	
		0																		
			0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	
			Torque [mNm]																	

Operating Range



Connection

Connection A (Sensor)		PTFE	
Pin 1	Motor winding MB	AWG20	Green
Pin 2	Vhall 3-18 VDC	AWG26	Red
Pin 3	Hall sensor HA	AWG26	Yellow
Pin 4	Hall sensor HC	AWG26	Blue
Pin 5	Motor winding MA	AWG20	Yellow
Pin 6	Motor winding MC	AWG20	Blue
Pin 7	GND	AWG26	Black
Pin 8	Hall sensor HB	AWG26	Green
Connector			
Molex5557-8P			

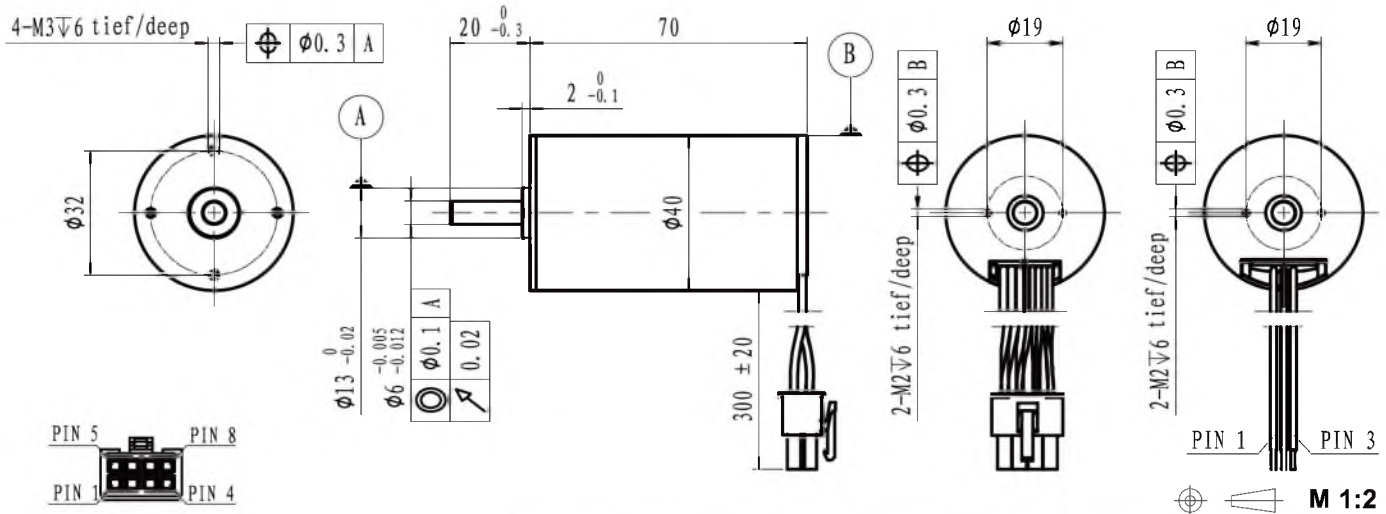
Connection B (Sensorless)		PTFE	
Pin 1	Motor winding MA	AWG20	Yellow
Pin 2	Motor winding MB	AWG20	Green
Pin 3	Motor winding MC	AWG20	Blue

Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

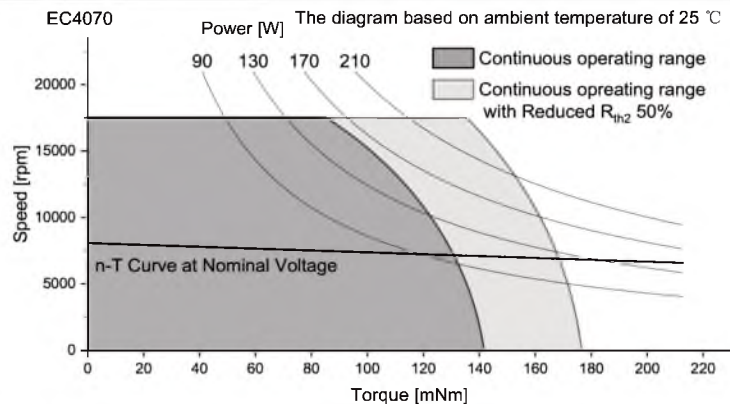
A: With Hall Sensors

B: Sensorless



		Sensorless	EC4070L-...	1208	2408	3608	4808				
		With hall sensor	EC4070S-...								
Motor data											
Values at nominal voltage											
1	Nominal voltage	V		12	24	36	48				
2	No load speed	rpm		6154	8102	8113	8061				
3	No load current	mA		264	200	190	130				
4	Nominal speed	rpm		5066	7304	7266	7238				
5	Nominal torque	mNm		130	130	130	130				
6	Nominal current	A		7.29	4.82	3.28	2.43				
7	Stall torque	mNm		735.0	1319.9	1244.6	1272.7				
8	Stall current	A		40.00	47.06	29.75	22.64				
9	Max. efficiency	%		84.4	87.4	84.7	85.4				
10	Terminal resistance	Ω		0.3	0.51	1.21	2.12				
11	Terminal inductance	mH		0.11	0.3	0.66	1.2				
12	Torque constant	mNm/A		18.50	28.17	42.10	56.54				
13	Speed constant	rpm/V		516	339	227	169				
14	Speed/torque gradient	rpm/mNm		8	6	7	6				
15	Mechanical time constant	ms		3.5	2.5	2.7	2.6				
16	Rotor inertia	gcm ²		39.4	39.4	39.4	39.4				
17	Thermal resistance housing-ambient	3.8 K/W									
18	Thermal resistance winding-housing	1.5 K/W									
19	Thermal time constant winding	33 s									
20	Thermal time constant motor	775 s									
21	Ambient temperature	-30...+100°C									
22	Max. permissible winding temperature	+150°C									
23	Max. permissible speed	17500 rpm									
24	Axial play at axial load	<10N 0 mm >10N max. 0.3 mm									
25	Radial play	preloaded									
26	Max. axial load (dynamic)	9 N									
27	Max. force for press fits (static)	170 N									
28	Max. radial loading, 5mm from flange	4500 N									
29	Number of pole pairs	1									
30	Number of phases	3									
31	Weight of motor	415 g									

Operating Range



Connection

Conection A (Sensor)		PTFE
Pin 1	Motor winding MB	AWG20 Green
Pin 2	Vhall 3-18 VDC	AWG26 Red
Pin 3	Hall sensor HA	AWG26 Yellow
Pin 4	Hall sensor HC	AWG26 Blue
Pin 5	Motor winding MA	AWG20 Yellow
Pin 6	Motor winding MC	AWG20 Blue
Pin 7	GND	AWG26 Black
Pin 8	Hall sensor HB	AWG26 Green
Conector		Molex5557-8P

Conection B (Sensorless)		PTFE
Pin 1	Motor winding MA	AWG20 Yellow
Pin 2	Motor winding MB	AWG20 Green
Pin 3	Motor winding MC	AWG20 Blue

Configuration

Performance: Customized in the continuous operating range

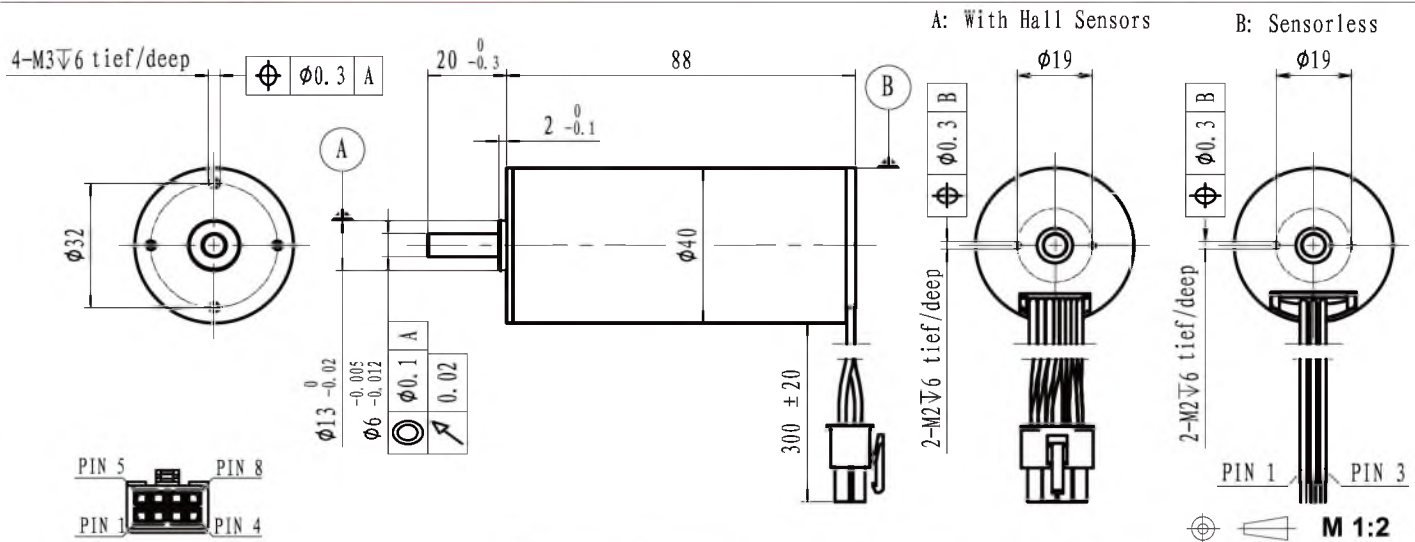
Ball bearing: Preload

Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length

Connector: JST/MOLEX/TE



		Sensorless	EC4088L-...	EC4088S-...	2408	3608	4808						
		With hall sensor											
Motor data													
Values at nominal voltage													
1	Nominal voltage	V			24	36	48						
2	No load speed	rpm			7921	8032	8081						
3	No load current	mA			440	290	200						
4	Nominal speed	rpm			7299	7379	7452						
5	Nominal torque	mNm			200	200	200						
6	Nominal current	A			7.39	4.99	3.74						
7	Stall torque	mNm			2546.5	2460.4	2570.3						
8	Stall current	A			88.89	58.06	45.71						
9	Max. efficiency	%			86.4	86.4	87.2						
10	Terminal resistance	Ω			0.27	0.62	1.05						
11	Terminal inductance	mH			0.18	0.38	0.78						
12	Torque constant	mNm/A			28.79	42.59	56.47						
13	Speed constant	rpm/V			332	224	169						
14	Speed/torque gradient	rpm/mNm			3	3	3						
15	Mechanical time constant	ms			1.8	1.8	1.8						
16	Rotor inertia	gcm ²			54.1	54.1	54.1						
17	Thermal resistance housing-ambient	3.0 K/W											
18	Thermal resistance winding-housing	0.6 K/W											
19	Thermal time constant winding	48 s											
20	Thermal time constant motor	996 s											
21	Ambient temperature	-30...+100°C											
22	Max. permissible winding temperature	+150°C											
23	Max. permissible speed	17500 rpm											
24	Axial play at axial load	<10N 0 mm >10N max. 0.3 mm											
25	Radial play	preloaded											
26	Max. axial load (dynamic)	9 N											
27	Max. force for press fits (static)	170 N											
28	Max. radial loading, 5mm from flange	4500 N											
29	Number of pole pairs	1											
30	Number of phases	3											
31	Weight of motor	571 g											
Operating Range													
EC4088 Power [W] The diagram based on ambient temperature of 25 °C Speed [rpm] Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage Torque [mNm]													

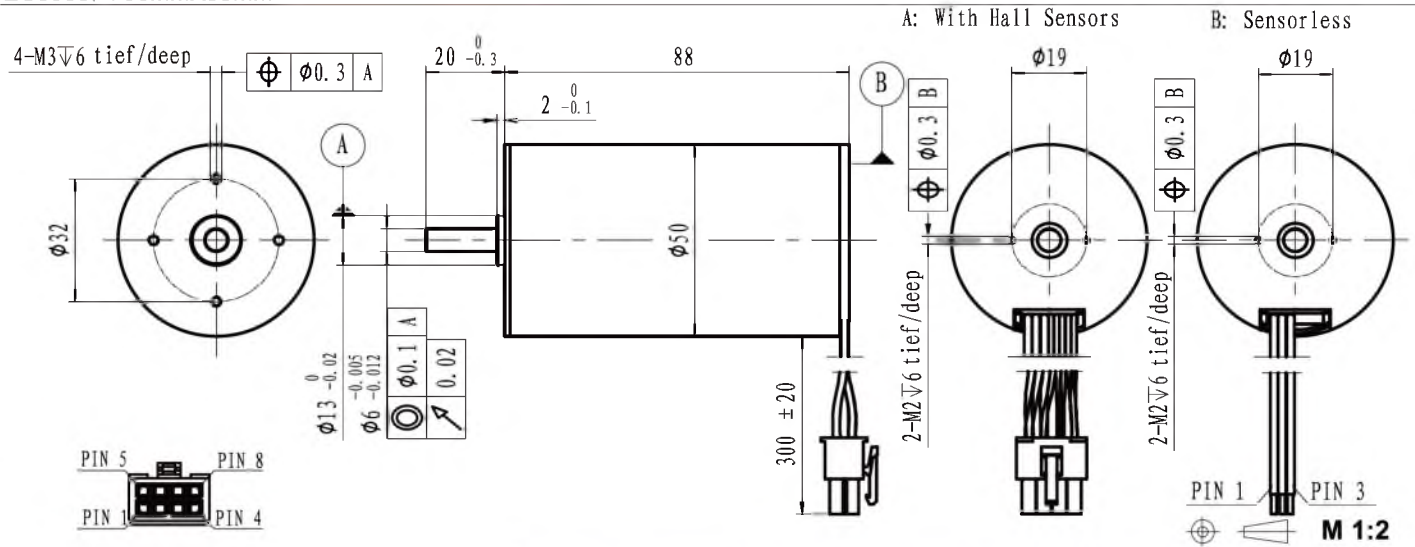
Connection

Conection A (Sensor)			
Pin 1	Motor winding MB	AWG20	Green
Pin 2	Vhall 3-18 VDC	AWG26	Red
Pin 3	Hall sensor HA	AWG26	Yellow
Pin 4	Hall sensor HC	AWG26	Blue
Pin 5	Motor winding MA	AWG20	Yellow
Pin 6	Motor winding MC	AWG20	Blue
Pin 7	GND	AWG26	Black
Pin 8	Hall sensor HB	AWG26	Green
Conector			
Molex5557-8P			

Conection B (Sensorless)			
Pin 1	Motor winding MA	AWG20	Yellow
Pin 2	Motor winding MB	AWG20	Green
Pin 3	Motor winding MC	AWG20	Blue

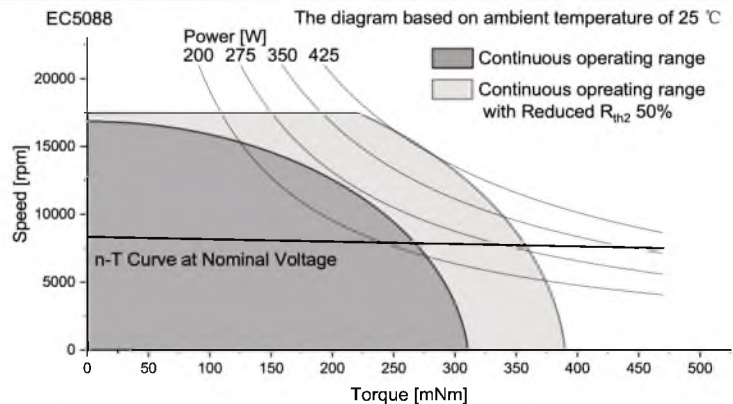
Configuration

Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE



		Sensorless	EC5088L-...	EC5088S-...	2408	3608	4808						
		With hall sensor											
Motor data													
Values at nominal voltage													
1	Nominal voltage	V			24	36	48						
2	No load speed	rpm			8345	8175	8352						
3	No load current	mA			680	290	200						
4	Nominal speed	rpm			7845	7673	7844						
5	Nominal torque	mNm			280	280	280						
6	Nominal current	A			10.92	6.97	5.31						
7	Stall torque	mNm			4670.8	4563.1	4599.6						
8	Stall current	A			171.43	109.09	84.21						
9	Max. efficiency	%			87.8	90.0	90.5						
10	Terminal resistance	Ω			0.14	0.33	0.57						
11	Terminal inductance	mH			0.041	0.092	0.184						
12	Torque constant	mNm/A			27.35	41.94	54.75						
13	Speed constant	rpm/V			349	228	174						
14	Speed/torque gradient	rpm/mNm			2	2	2						
15	Mechanical time constant	ms			2.6	2.6	2.7						
16	Rotor inertia	gcm ²			140	140	140						
17	Thermal resistance housing-ambient	2.7 K/W											
18	Thermal resistance winding-housing	1.1 K/W											
19	Thermal time constant winding	48 s											
20	Thermal time constant motor	1100 s											
21	Ambient temperature	-30...+100°C											
22	Max. permissible winding temperature	+125°C											
23	Max. permissible speed	17500 rpm											
24	Axial play at axial load	<10N 0 mm >10N max. 0.3 mm											
25	Radial play	preloaded											
26	Max. axial load (dynamic)	9 N											
27	Max. force for press fits (static)	170 N											
	(static, shaft supported)	4500 N											
28	Max. radial loading, 5mm from flange	80 N											
29	Number of pole pairs	1											
30	Number of phases	3											
31	Weight of motor	928 g											

Operating Range



Connection

Conection A (Sensor)		PTFE	
Pin 1	Motor winding MB	AWG20	Green
Pin 2	Vhall 3-18 VDC	AWG26	Red
Pin 3	Hall sensor HA	AWG26	Yellow
Pin 4	Hall sensor HC	AWG26	Blue
Pin 5	Motor winding MA	AWG20	Yellow
Pin 6	Motor winding MC	AWG20	Blue
Pin 7	GND	AWG26	Black
Pin 8	Hall sensor HB	AWG26	Green
Conector			
Molex5557-8P			

Conection B (Sensorless)		PTFE	
Pin 1	Motor winding MA	AWG20	Yellow
Pin 2	Motor winding MB	AWG20	Green
Pin 3	Motor winding MC	AWG20	Blue

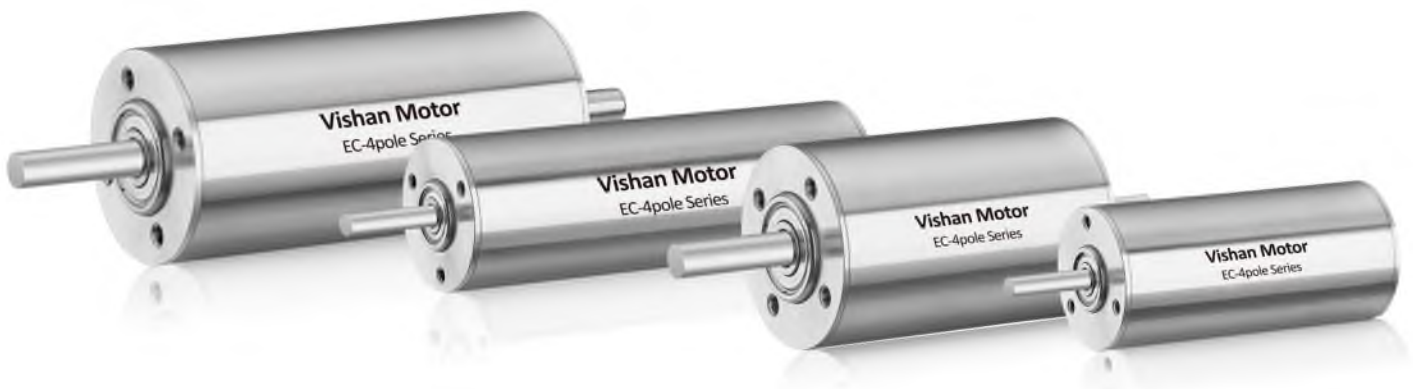
Configuration

Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

EC-4Pole Series

4 Pole winding technology

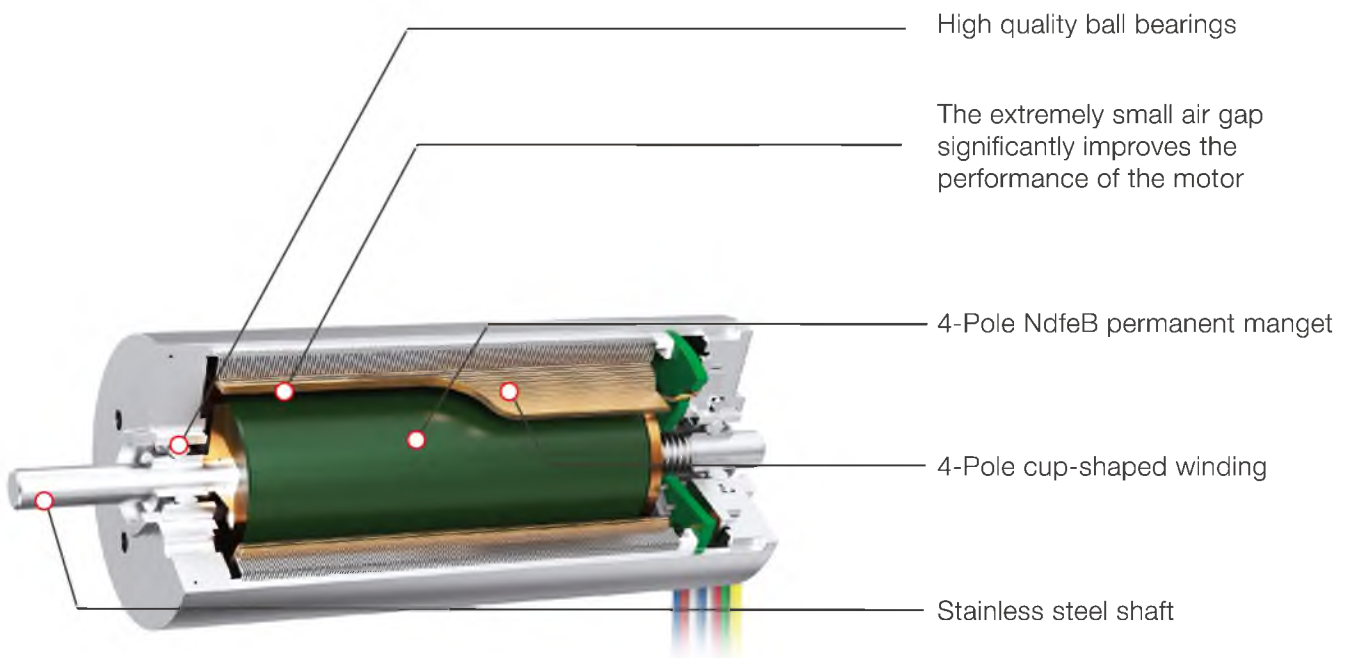
Model	Dimension (mm)	Nominal Troque (mNm)	Nominal Speed (rpm)	Page
EC4P2232	Φ22x32	13.5	15000	45
EC4P2250	Φ22x50	28	15000	46
EC4P2262	Φ22x62	55	10000	47
EC4P2899	Φ28x99	110	4000	48
EC4P3047	Φ30x47	48	11000	49
EC4P3064	Φ30x64	80	12000	50
EC4P3099	Φ30x99	130	6500	51



EC-4Pole Series

4 Pole winding technology

Thanks to the latest 4-Pole winding technology and 4-pole magnets, our 4-Pole series offers extremely high advantages in terms of volume and weight per unit power ratio. The cogging-free design ensures that torque fluctuations are minimized at low speed torque control. The stainless steel body design ensures adequate heat dissipation and excellent structural strength.



Basic Data:

Diameter: $\phi 22\text{mm}-36\text{mm}$
Maximum Length: 99mm
Operate Voltage: 24V-48VDC
Maximum Power output: 300W
Maximum Permissible speed: 25,000rpm
Operate temperature: $-30^{\circ}\text{C}-+80^{\circ}\text{C}$

Typical features:

Ultra high power density
Ultra High efficiency
High reliability
Low noise
No Cogging
Low inductance
Good heat dissipation
Long operational lifetime



17	Thermal resistance housing-ambient	18.0 K/W
18	Thermal resistance winding-housing	7.8 K/W
19	Thermal time constant winding	17.6 s
20	Thermal time constant motor	735 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	25000 rpm
24	Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	3.5 N
27	Max. force for press fits (static)	44 N
	(static, shaft supported)	1200 N
28	Max. radial loading, 5mm from flange	15 N
29	Number of pole pairs	2
30	Number of phases	3
31	Weight of motor	77.2 g

Operating Range

EC4P2232

The diagram based on ambient temperature of 25 °C

Power [W] 20 27.5 35 42.5

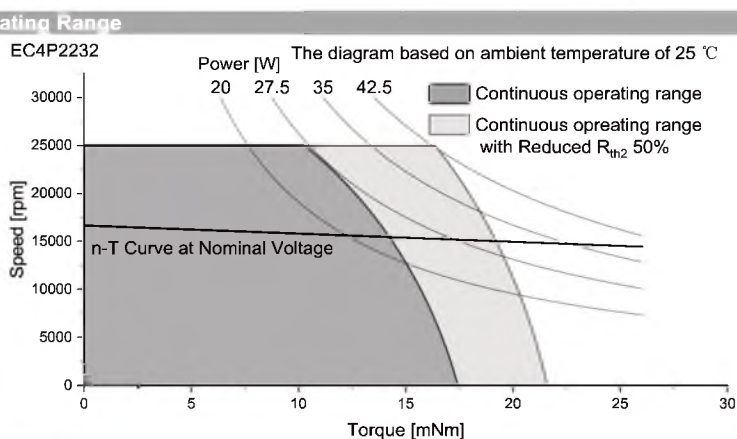
Continuous operating range

Continuous operating range with Reduced R_{th2} 50%

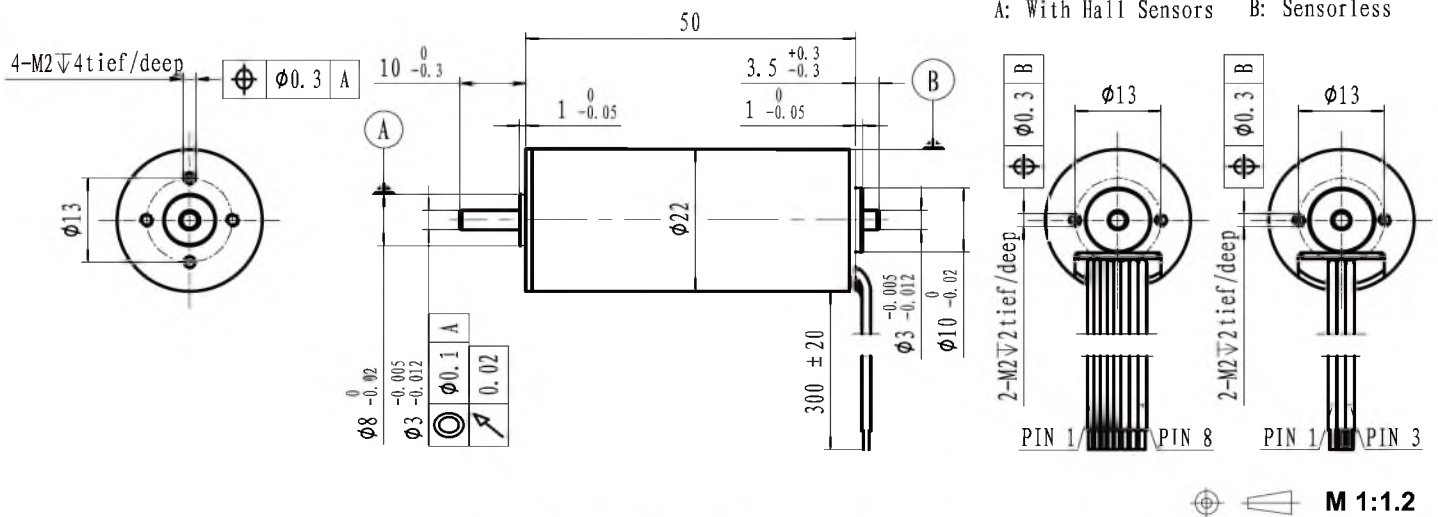
n-T Curve at Nominal Voltage

Speed [rpm]

Torque [mNm]

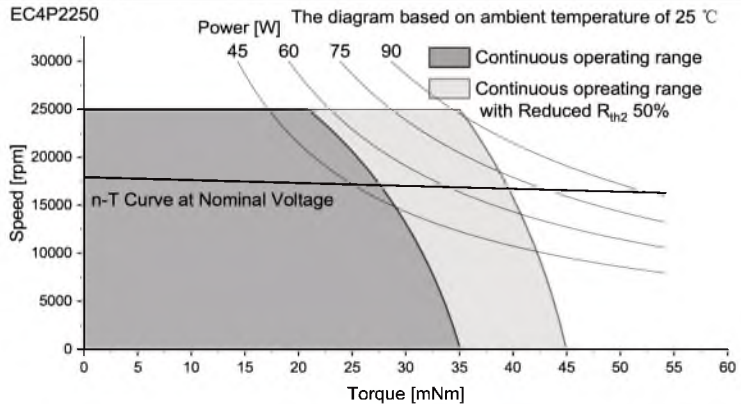


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	Sensorless With hall sensor	EC4P2250L-... EC4P2250S-...	2416	3616	4816					
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	24	36	48					
2	No load speed	rpm	16240	16133	16311					
3	No load current	mA	250	170	110					
4	Nominal speed	rpm	15493	15279	15621					
5	Nominal torque	mNm	28	28	28					
6	Nominal current	A	2.25	1.49	1.11					
7	Stall torque	mNm	608.8	529.2	661.6					
8	Stall current	A	43.64	25.17	23.76					
9	Max. efficiency	%	85.4	84.2	86.9					
10	Terminal resistance	Ω	0.55	1.43	2.02					
11	Terminal inductance	mH	0.05	0.12	0.19					
12	Torque constant	mNm/A	14.03	21.16	27.97					
13	Speed constant	rpm/V	681	451	341					
14	Speed/torque gradient	rpm/mNm	27	30	25					
15	Mechanical time constant	ms	1.7	1.9	1.5					
16	Rotor inertia	gcm ²	5.98	5.98	5.98					
17	Thermal resistance housing-ambient	12.7 K/W								
18	Thermal resistance winding-housing	3.5 K/W								
19	Thermal time constant winding	8 s								
20	Thermal time constant motor	780 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	25000 rpm								
24	Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	3.5 N								
27	Max. force for press fits (static)	44 N								
28	Max. radial loading, 5mm from flange	1200 N								
29	Number of pole pairs	2								
30	Number of phases	3								
31	Weight of motor	119 g								

Operating Range



Connection

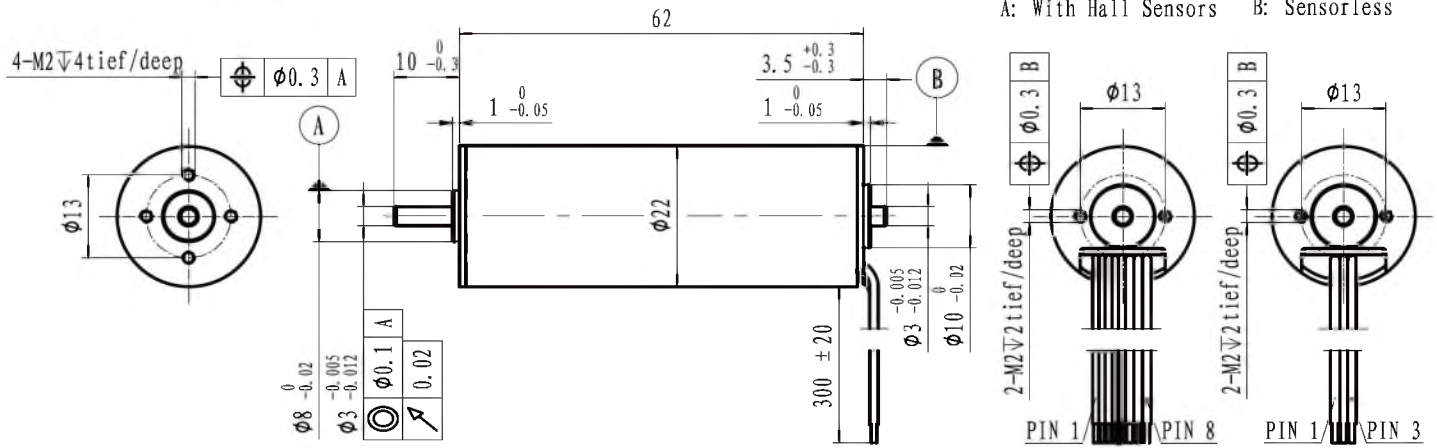
Connection A (Sensor)		PTFE
Pin 1 Vhall 3-18 VDC	AWG26	Red
Pin 2 Hall sensor HA	AWG26	Yellow
Pin 3 Hall sensor HB	AWG26	Blue
Pin 4 Hall sensor HC	AWG26	Green
Pin 5 GND	AWG26	black
Pin 6 Motor winding MA	AWG20	Yellow
Pin 7 Motor winding MB	AWG20	Blue
Pin 8 Motor winding MC	AWG20	Green

Connection B (Sensorless)		PTFE
Pin 1 Motor winding MA	AWG20	yellow
Pin 2 Motor winding MB	AWG20	green
Pin 3 Motor winding MC	AWG20	blue

Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard flange front&back/customize the flange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

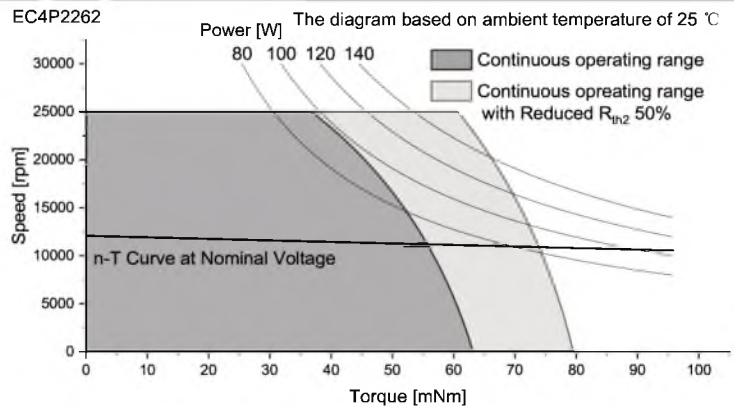
A: With Hall Sensors B: Sensorless



M 1:1.5

	Sensorless	EC4P2262L-...	2412	3612	4812				
	With hall sensor	EC4P2262S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		24	36	48				
2 No load speed	rpm		11705	12100	11795				
3 No load current	mA		180	135	80				
4 Nominal speed	rpm		10834	11299	10971				
5 Nominal torque	mNm		55	55	55				
6 Nominal current	A		3.00	2.08	1.50				
7 Stall torque	mNm		738.9	830.7	787.6				
8 Stall current	A		38.10	29.51	20.43				
9 Max. efficiency	%		86.7	86.9	87.9				
10 Terminal resistance	Ω		0.63	1.22	2.35				
11 Terminal inductance	mH		0.06	0.12	0.24				
12 Torque constant	mNm/A		19.49	28.28	38.71				
13 Speed constant	rpm/V		490	338	247				
14 Speed/torque gradient	rpm/mNm		16	15	15				
15 Mechanical time constant	ms		1.4	1.3	1.3				
16 Rotor inertia	gcm ²		8.43	8.43	8.43				
17 Thermal resistance housing-ambient	7.8 K/W								
18 Thermal resistance winding-housing	2.8 K/W								
19 Thermal time constant winding	17 s								
20 Thermal time constant motor	612 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	25000 rpm								
24 Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	3.5 N								
27 Max. force for press fits (static)	44 N								
(static, shaft supported)	1200 N								
28 Max. radial loading, 5mm from flange	15 N								
29 Number of pole pairs	2								
30 Number of phases	3								
31 Weight of motor	151 g								

Operating Range



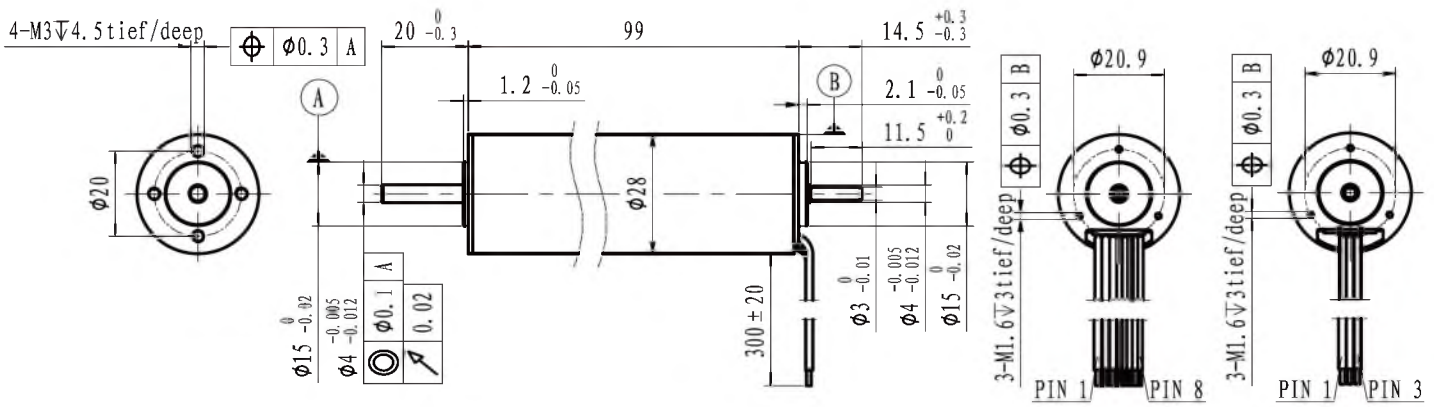
Connection

Connection A (Sensor)		PTFE	
Pin 1 Vhall 3-18 VDC	AWG26	Red	
Pin 2 Hall sensor HA	AWG26	Yellow	
Pin 3 Hall sensor HB	AWG26	Blue	
Pin 4 Hall sensor HC	AWG26	Green	
Pin 5 GND	AWG26	black	
Pin 6 Motor winding MA	AWG20	Yellow	
Pin 7 Motor winding MB	AWG20	Blue	
Pin 8 Motor winding MC	AWG20	Green	

Connection B (Sensorless)		PTFE	
Pin 1 Motor winding MA	AWG20	yellow	
Pin 2 Motor winding MB	AWG20	green	
Pin 3 Motor winding MC	AWG20	blue	

Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



M 1:1.8

	Sensorless	EC4P2899L-...		2404	3604	4804				
	With hall sensor	EC4P2899S-...								
Motor data										
Values at nominal voltage										
1	Nominal voltage	V		24	36	48				
2	No load speed	rpm		4589	4533	4501				
3	No load current	mA		150	110	70				
4	Nominal speed	rpm		4111	4051	4027				
5	Nominal torque	mNm		110	110	110				
6	Nominal current	A		2.37	1.57	1.16				
7	Stall torque	mNm		1055.3	1033.4	1043.8				
8	Stall current	A		21.43	13.85	10.39				
9	Max. efficiency	%		84.0	83.0	84.3				
10	Terminal resistance	Ω		1.12	2.6	4.62				
11	Terminal inductance	mH		0.15	0.34	0.6				
12	Torque constant	mNm/A		49.59	75.24	101.15				
13	Speed constant	rpm/V		193	127	94				
14	Speed/torque gradient	rpm/mNm		4	4	4				
15	Mechanical time constant	ms		1.4	1.4	1.4				
16	Rotor inertia	gcm^2		30.1	30.1	30.1				
17	Thermal resistance housing-ambient	6.6 K/W	Operating Range EC4P2899 The diagram based on ambient temperature of 25 °C ■ Continuous operating range □ Continuous operating range with Reduced Rth2 50%							
18	Thermal resistance winding-housing	2.5 K/W								
19	Thermal time constant winding	33 s								
20	Thermal time constant motor	1370 s								
21	Ambient temperature	-30...+100°C	 n-T Curve at Nominal Voltage Torque [mNm]							
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	12000 rpm								
24	Axial play at axial load	<8 N >8 N	0 mm max. 0.3 mm							
25	Radial play	preloaded								
26	Max. axial load (dynamic)		7.5 N							
27	Max. force for press fits (static)		100 N							
	(static, shaft supported)		2000 N							
28	Max. radial loading, 5mm from flange		25 N							
29	Number of pole pairs		1							
30	Number of phases		3							
31	Weight of motor		389 g							

Connection

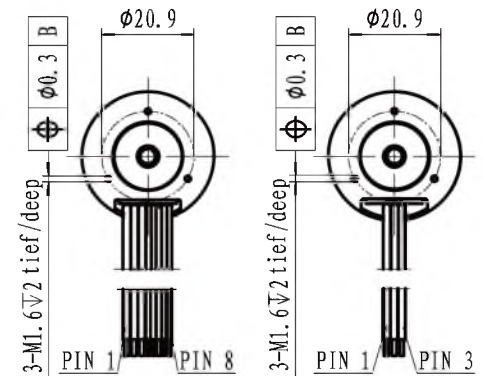
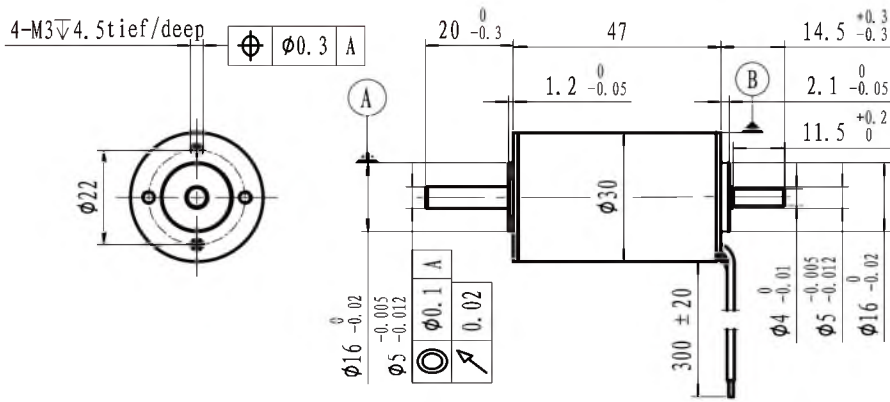
Connection A (Sensor)		PTFE	
Pin 1	Motor winding MA	AWG20	yellow
Pin 2	Motor winding MB	AWG20	green
Pin 3	Motor winding MC	AWG20	blue
Pin 4	Vhall 3-18 VDC	AWG26	red
Pin 5	GND	AWG26	black
Pin 6	Hall sensor HA	AWG26	white
Pin 7	Hall sensor HB	AWG26	orange
Pin 8	Hall sensor HC	AWG26	gray

Connection B (Sensorless)		PVC	
Pin 1	Motor winding MA	AWG20	yellow
Pin 2	Motor winding MB	AWG20	green
Pin 3	Motor winding MC	AWG20	blue

Configuration

Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

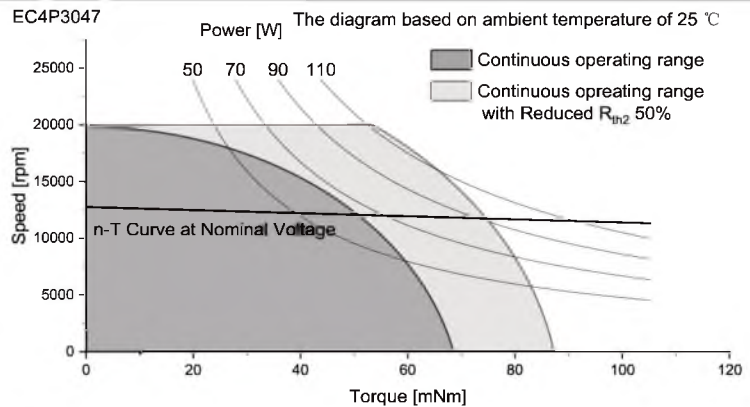
A: With Hall Sensors B: Sensorless



M 1:1.8

	Sensorless	EC4P3047L-...	2412	3612	4812				
	With hall sensor	EC4P3047S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		24	36	48				
2 No load speed	rpm		11890	12600	12338				
3 No load current	mA		330	249	170				
4 Nominal speed	rpm		11239	11868	11661				
5 Nominal torque	mNm		48	48	48				
6 Nominal current	A		2.84	2.02	1.47				
7 Stall torque	mNm		876.95	825.97	874.60				
8 Stall current	A		46.15	30.77	23.88				
9 Max. efficiency	%		83.8	82.8	83.8				
10 Terminal resistance	Ω		0.52	1.17	2.01				
11 Terminal inductance	mH		0.056	0.098	0.23				
12 Torque constant	mNm/A		19.14	27.06	36.89				
13 Speed constant	rpm/V		499	353	259				
14 Speed/torque gradient	rpm/mNm		14	15	14				
15 Mechanical time constant	ms		3.1	3.5	3.2				
16 Rotor inertia	gcm ²		21.9	21.9	21.9				
17 Thermal resistance housing-ambient	9.5 K/W								
18 Thermal resistance winding-housing	2.8 K/W								
19 Thermal time constant winding	17 s								
20 Thermal time constant motor	903 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	20000 rpm								
24 Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	7.5 N								
27 Max. force for press fits (static)	100 N								
(static, shaft supported)	2700 N								
28 Max. radial loading, 5mm from flange	25 N								
29 Number of pole pairs	2								
30 Number of phases	3								
31 Weight of motor	207 g								

Operating Range



Connection

Conection A (Sensor)		PTFE	
Pin 1	Motor winding MA	AWG20	yellow
Pin 2	Motor winding MB	AWG20	green
Pin 3	Motor winding MC	AWG20	blue
Pin 4	Vhall 3-18 VDC	AWG26	red
Pin 5	GND	AWG26	black
Pin 6	Hall sensor HA	AWG26	white
Pin 7	Hall sensor HB	AWG26	orange
Pin 8	Hall sensor HC	AWG26	gray

Conection B (Sensorless)		PVC	
Pin 1	Motor winding MA	AWG20	yellow
Pin 2	Motor winding MB	AWG20	green
Pin 3	Motor winding MC	AWG20	blue

Configuration

Performance: Customized in the continuous operating range

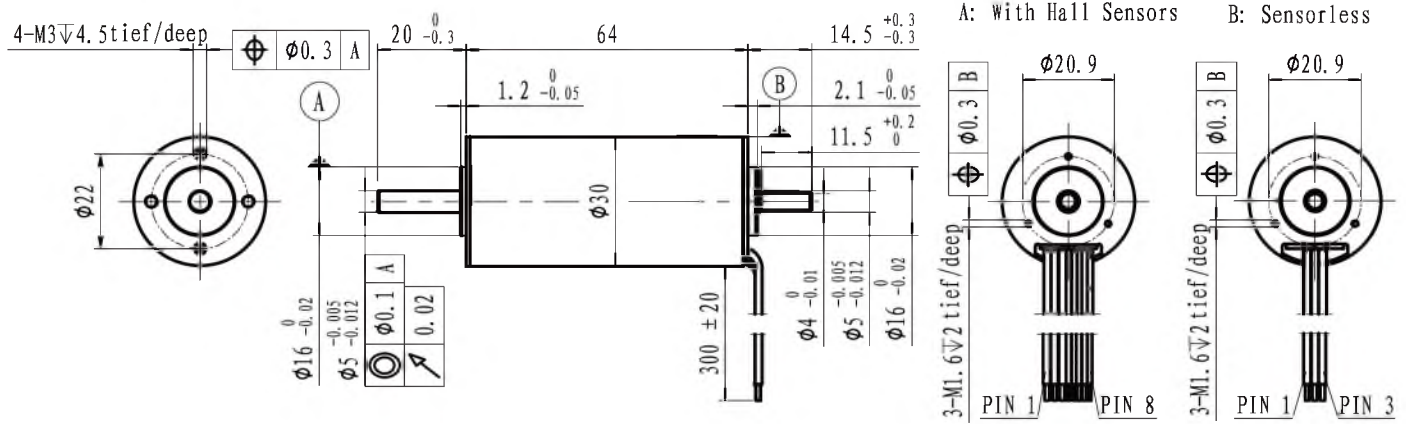
Ball bearing: Preload

Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

Leadwire: PVC/Silicon/Teflon/U/L No/Dimension/length

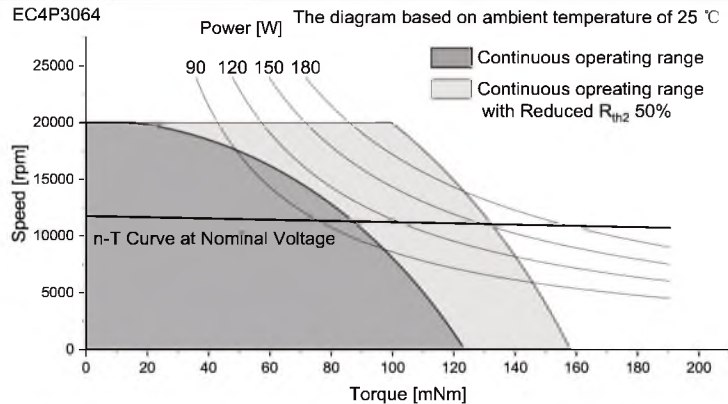
Connector: JST/MOLEX/TE



M 1:1.8

		Sensorless EC4P3064L-...	With hall sensor EC4P3064S-...	2412	3612	4812				
Motor data										
Values at nominal voltage										
1	Nominal voltage	V		24	36	48				
2	No load speed	rpm		12119	12376	12413				
3	No load current	mA		520	280	210				
4	Nominal speed	rpm		11716	11984	12032				
5	Nominal torque	mNm		80	80	80				
6	Nominal current	A		4.77	3.17	2.38				
7	Stall torque	mNm		2407.46	2522.52	2606.50				
8	Stall current	A		128.34	91.37	71.01				
9	Max. efficiency	%		87.7	89.2	89.4				
10	Terminal resistance	Ω		0.19	0.39	0.68				
11	Terminal inductance	mH		0.026	0.061	0.101				
12	Torque constant	mNm/A		18.83	27.69	36.82				
13	Speed constant	rpm/V		507	345	259				
14	Speed/torque gradient	rpm/mNm		5	5	5				
15	Mechanical time constant	ms		1.8	1.7	1.7				
16	Rotor inertia	gcm ²		33.8	33.8	33.8				
17	Thermal resistance housing-ambient	7.5 K/W								
18	Thermal resistance winding-housing	2.1 K/W								
19	Thermal time constant winding	26 s								
20	Thermal time constant motor	1100 s								
21	Ambient temprature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	20000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
28	Max. radial loading, 5mm from flange	2700 N								
29	Number of pole pairs	2								
30	Number of phases	3								
31	Weight of motor	286 g								

Operating Range



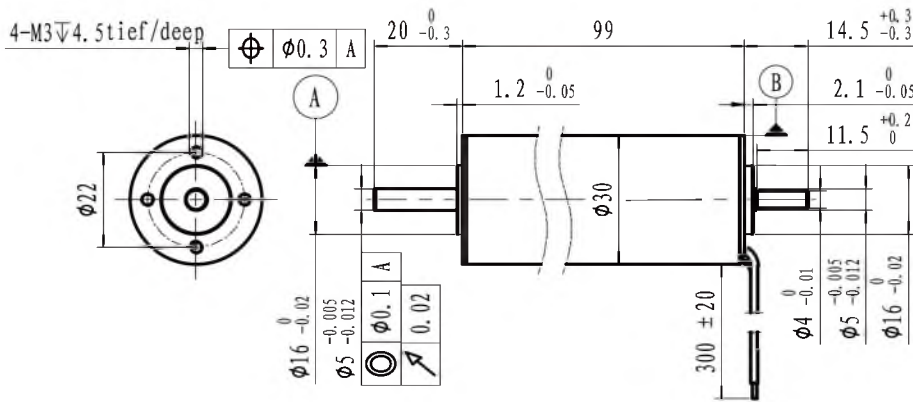
Connection

Conection A (Sensor)		PTFE	
Pin 1	Motor winding MA	AWG20	yellow
Pin 2	Motor winding MB	AWG20	green
Pin 3	Motor winding MC	AWG20	blue
Pin 4	Vhall 3-18 VDC	AWG26	red
Pin 5	GND	AWG26	black
Pin 6	Hall sensor HA	AWG26	white
Pin 7	Hall sensor HB	AWG26	orange
Pin 8	Hall sensor HC	AWG26	gray

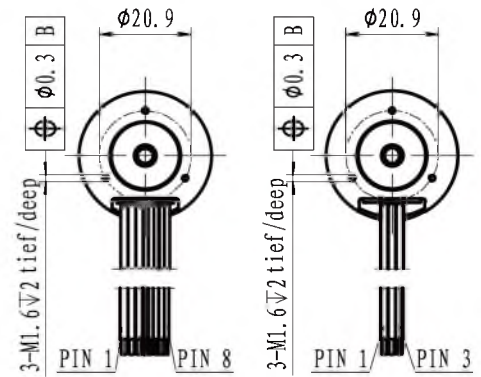
Conection B (Sensorless)		PVC	
Pin 1	Motor winding MA	AWG20	yellow
Pin 2	Motor winding MB	AWG20	green
Pin 3	Motor winding MC	AWG20	blue

Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



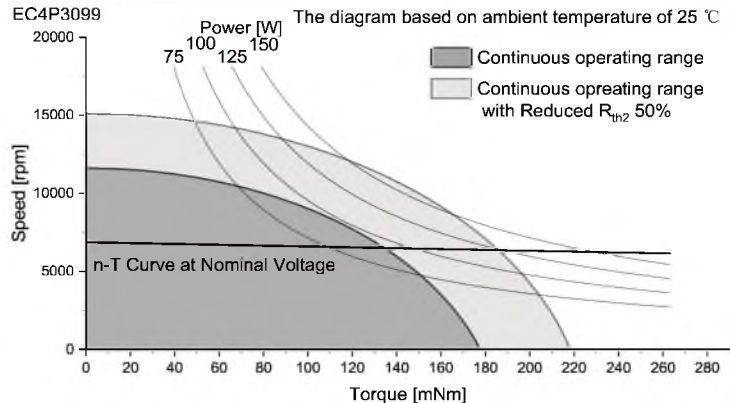
A: With Hall Sensors B: Sensorless



M 1:1.8

		Sensorless	EC4P3099L-...	2407	3607	4807				
		With hall sensor	EC4P3099S-...							
Motor data										
Values at nominal voltage										
1	Nominal voltage	V		24	36	48				
2	No load speed	rpm		6812	6983	7064				
3	No load current	mA		330	240	140				
4	Nominal speed	rpm		6458	6600	6690				
5	Nominal torque	mNm		130	130	130				
6	Nominal current	A		4.21	2.89	2.15				
7	Stall torque	mNm		2501.15	2371.41	2453.77				
8	Stall current	A		75.00	48.65	38.10				
9	Max. efficiency	%		87.2	86.4	88.2				
10	Terminal resistance	Ω		0.32	0.74	1.26				
11	Terminal inductance	mH		0.048	0.113	0.182				
12	Torque constant	mNm/A		33.50	48.99	64.65				
13	Speed constant	rpm/V		285	195	148				
14	Speed/torque gradient	rpm/mNm		3	3	3				
15	Mechanical time constant	ms		1.6	1.7	1.7				
16	Rotor inertia	gcm ²		54.8	54.8	54.8				
17	Thermal resistance housing-ambient	5.6 K/W								
18	Thermal resistance winding-housing	2.7 K/W								
19	Thermal time constant winding	42 s								
20	Thermal time constant motor	1275 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	20000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
	(static, shaft supported)	2700 N								
28	Max. radial loading, 5mm from flange	25 N								
29	Number of pole pairs	2								
30	Number of phases	3								
31	Weight of motor	432 g								

Operating Range



Connection

Connection A (Sensor)		PTFE	
Pin 1	Motor winding MA	AWG20	yellow
Pin 2	Motor winding MB	AWG20	green
Pin 3	Motor winding MC	AWG20	blue
Pin 4	Vhall 3-18 VDC	AWG26	red
Pin 5	GND	AWG26	black
Pin 6	Hall sensor HA	AWG26	white
Pin 7	Hall sensor HB	AWG26	orange
Pin 8	Hall sensor HC	AWG26	gray

Connection B (Sensorless)		PVC	
Pin 1	Motor winding MA	AWG20	yellow
Pin 2	Motor winding MB	AWG20	green
Pin 3	Motor winding MC	AWG20	blue

Configuration

Performance: Customized in the continuous operating range

Ball bearing: Preload

Flange: Standard frange front&back/customize the frange

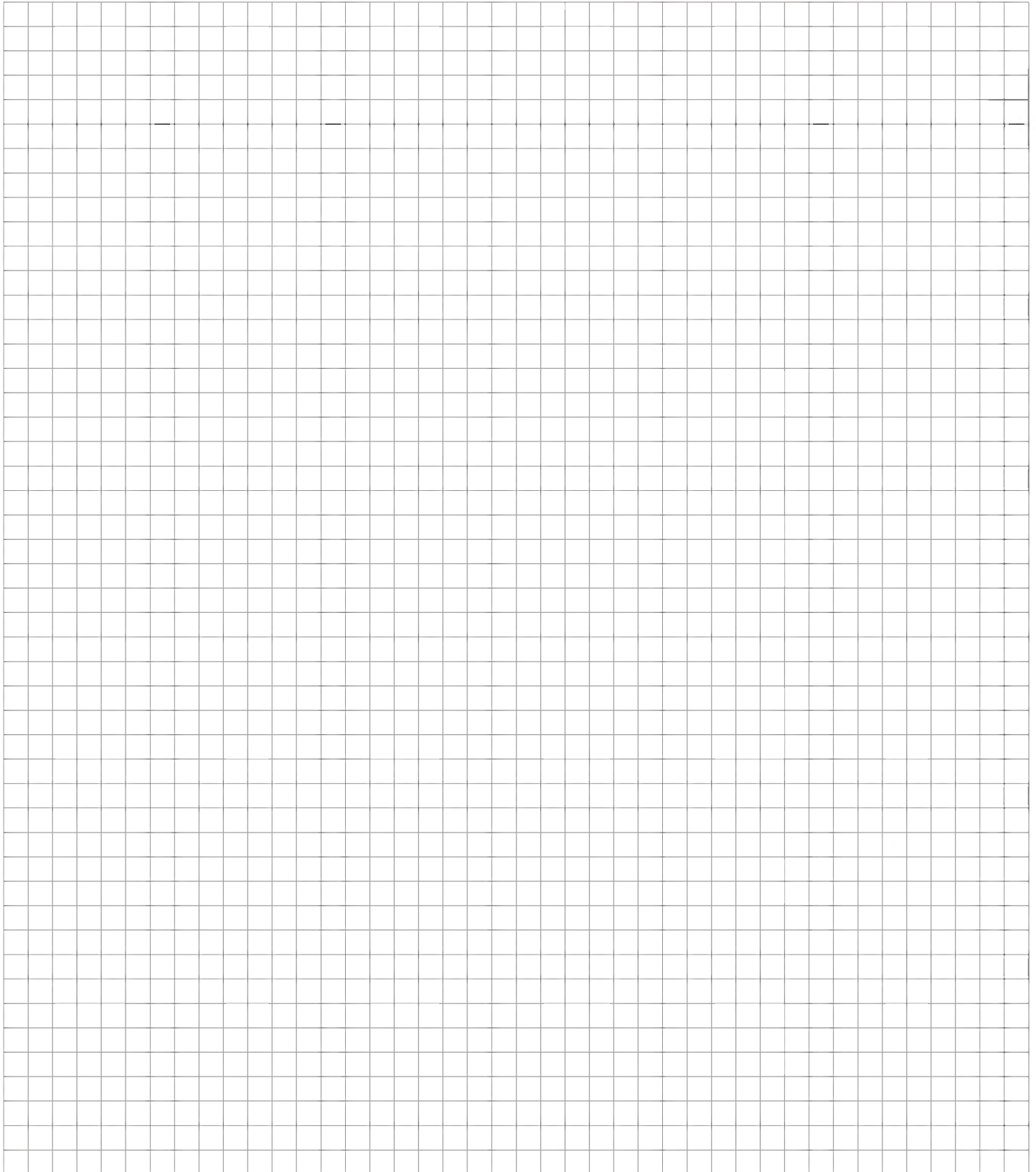
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length

Connector: JST/MOLEX/TE

Subject: _____

Date: _____



ECD Series

Electronics integrated

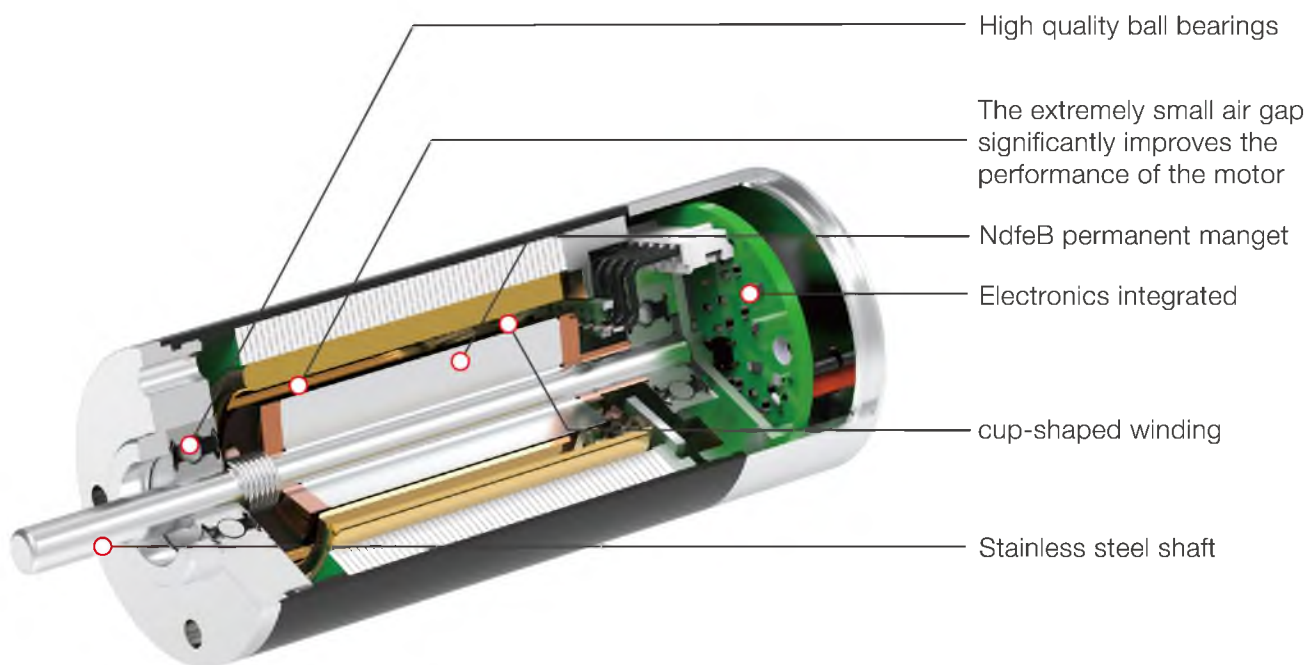
Model	Dimension (mm)	Nominal Troque (mNm)	Nominal Speed (rpm)	Page
ECD1228	Φ12x28	0.5	25000	56
ECD1629	Φ16x29	2	10000	57
ECD1638	Φ16x38	1.5	15000	58
ECD2238	Φ22x38	6	15000	59
ECD2246	Φ22x46	8	12000	60
ECD2452	Φ24.5x52	14	6000	61
ECD2459	Φ24.5x59	20	6000	62
ECD2854	Φ28x54	18	5000	63
ECD2863	Φ28x63	25	3000	64
ECD3270	Φ32x70	40	6000	65
ECD3673	Φ36x73	50	3000	66
ECD3683	Φ36x83	75	3000	67



ECD Series

Electronics integrated

We creatively integrate the brushless motor drive system into the motor and can provide functional customization, the minimum outer diameter can be 12mm, especially suitable for space-limited speed control occasions, users do not need to consider additional motor control, bringing the most convenient use.



Basic Data:

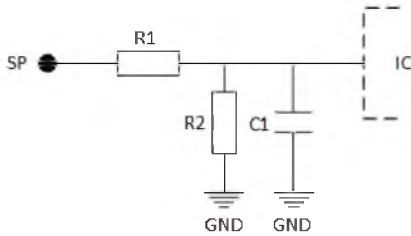
Diameter: ϕ 12mm-36mm
 Maximum Continuous current: 3A
 Operate Voltage: 4.5V-26VDC
 Maximum Power output: 50W
 Maximum Permissible speed: 30,000rpm
 Operate temperature: -30°C-+80°C

Typical features:

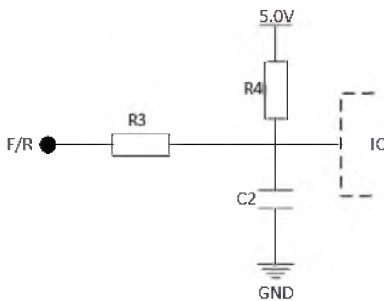
Electronics integrated
 High power density
 High efficiency
 Low noise
 Low inductance
 Good heat dissipation

I/O Schematics

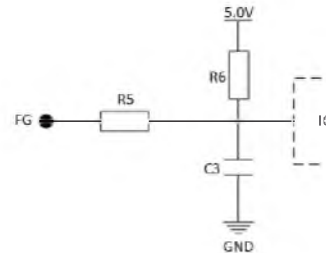
Speed command input



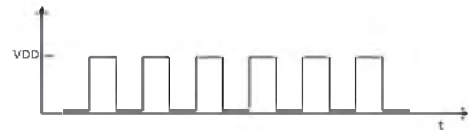
Direction command input



Speed output



Speed output signal



Electrical Connections

Version

Description

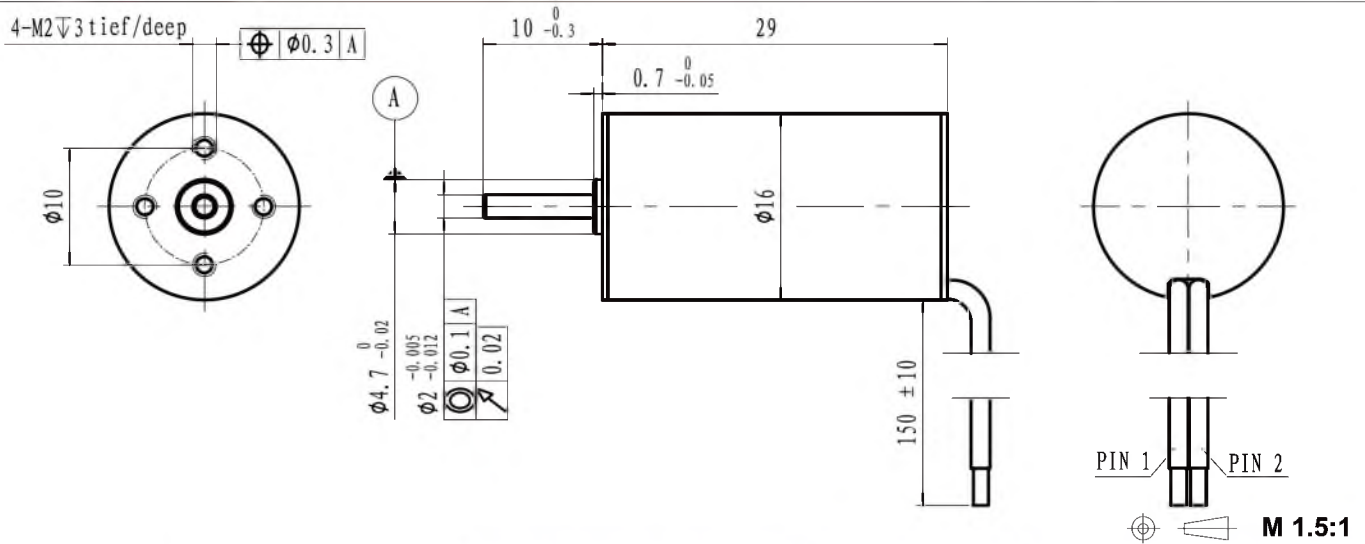
5-Wire

- 1 Power supply
- 2 GND
- 3 Speed command input(SP)
- 4 Direction command input(F/R)
- 5 Speed signal output (FG)

ECD12 and ECD16, because these two models use integrated chips.

The built-in series product interface is configured up to five wires, with three function pins, namely speed control SP (compatible with analog voltage and PWM duty cycle control, PWM frequency range of 10KHz -35KHz, 5V TTL level), forward and reverse control F/R (CCW operation by default, CW operation by connecting ground), speed feedback output FG (one pulse per turn). If you need enable and brake functions, you need to replace the two functions among three function pins above.

Please note that the standard products in the catalog are two-wire, only power and ground wires



Sensorless ECD1629L-...		0612	1212						
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	6	12					
2	No load speed	rpm	12150	12035					
3	No load current	mA	130	80					
4	Nominal speed	rpm	9534	9561					
5	Nominal torque	mNm	2	2					
6	Nominal current	A	0.58	0.31					
7	Stall torque	mNm	9.29	9.73					
8	Stall current	A	2.22	1.18					
9	Max. efficiency	%	57.5	54.6					
10	Supply voltage +Vcc	V	4.5..7	8..13					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	4.44	8.87					
13	Speed constant	rpm/V	2151	1076					
14	Speed/torque gradient	rpm/mNm	1308	1237					
15	Mechanical time constant	ms	6.4	6.1					
16	Rotor inertia	gcm ²	0.47	0.47					
17	Thermal resistance housing-ambient	20.2 K/W							
18	Thermal resistance winding-housing	6.6 K/W							
19	Thermal time constant winding	8 s							
20	Thermal time constant motor	216 s							
21	Ambient temperature	-30...+100°C							
22	Max. permissible winding temperature	+150°C							
23	Max. permissible speed	35000 rpm							
24	Axial play at axial load	<1.8 N 0 mm >1.8 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	1.3 N							
27	Max. force for press fits (static)	15 N							
28	Max. radial loading, 5mm from flange	350 N							
29	Number of pole pairs	1							
30	Number of phases	3							
31	Weight of motor	21 g							
Operating Range									
ECD1629 The diagram based on ambient temperature of 25 °C Power [W] Speed [rpm] Torque [mNm] n-T Curve at Nominal Voltage Continuous operating range Continuous operating range with Reduced R_{th2} 50%									

Controller features

Sensorless, Open loop, $I_{max} < 0.5A$
 Overload protection, Stall protection
 Max. temperature of electronics +105°C

Connection

Conection

Pin 1	+VCC	PTFE	red
Pin 2	GND	AWG24	black

Caution:

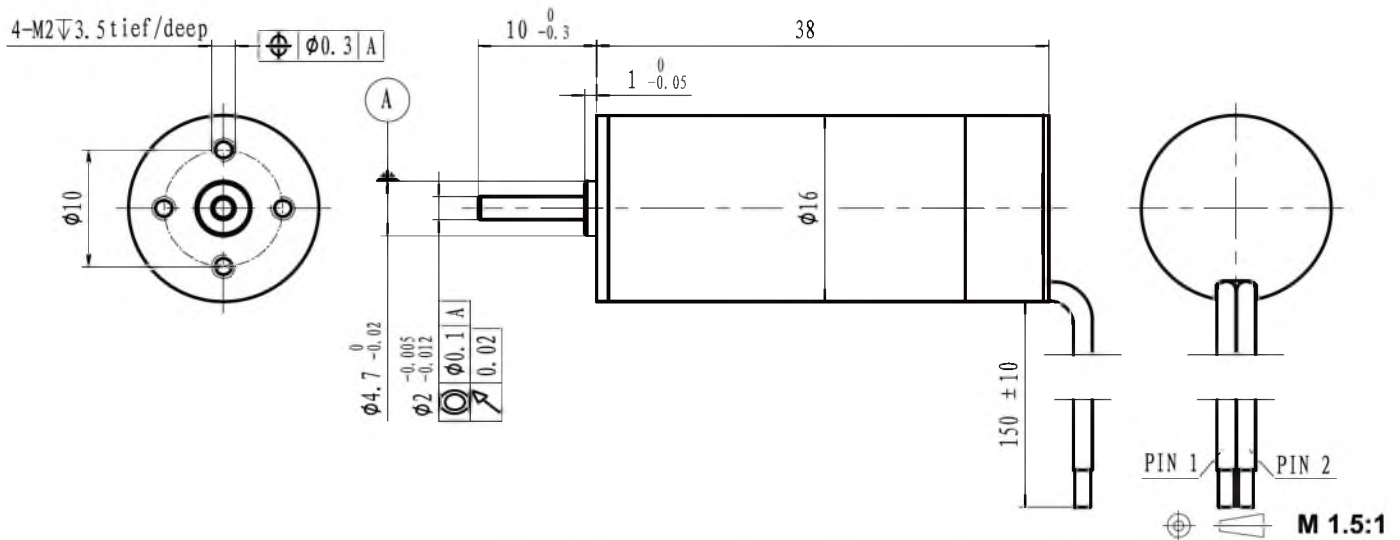
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:

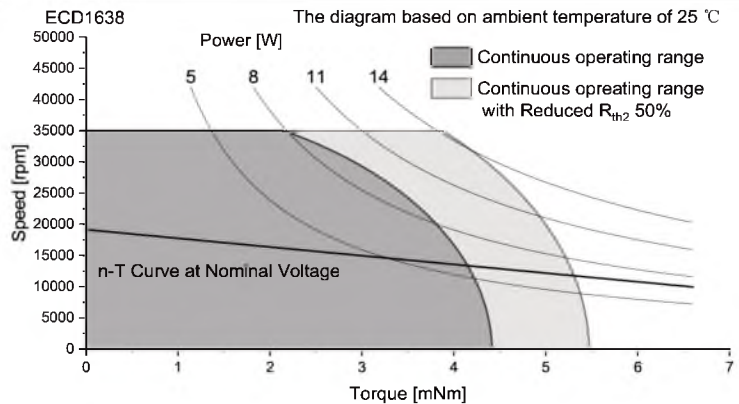
Please contact our sales engineers



	Sensorless	ECD1638L-...	0617	1217					
Motor data									
Values at nominal voltage									
1 Nominal voltage	V		6	12					
2 No load speed	rpm		17310	17664					
3 No load current	mA		190	100					
4 Nominal speed	rpm		15037	15284					
5 Nominal torque	mNm		1.5	1.5					
6 Nominal current	A		0.67	0.34					
7 Stall torque	mNm		11.42	11.13					
8 Stall current	A		3.82	1.91					
9 Max. efficiency	%		60.4	59.5					
10 Supply voltage +Vcc	V		4.5..7	8..13					
11 Direction of rotation			CW	CW					
12 Torque constant	mNm/A		3.15	6.15					
13 Speed constant	rpm/V		3036	1553					
14 Speed/torque gradient	rpm/mNm		1515	1587					
15 Mechanical time constant	ms		6.3	6.6					
16 Rotor inertia	gcm ²		0.4	0.4					

17 Thermal resistance housing-ambient	20.2 K/W
18 Thermal resistance winding-housing	8.7 K/W
19 Thermal time constant winding	7 s
20 Thermal time constant motor	238 s
21 Ambient temperature	-30...+100°C
22 Max. permissible winding temperature	+150°C
23 Max. permissible speed	35000 rpm
24 Axial play at axial load <1.8 N	0 mm
>1.8 N	max. 0.3 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	1.3 N
27 Max. force for press fits (static)	15 N
(static, shaft supported)	350 N
28 Max. radial loading, 5mm from flange	5 N
29 Number of pole pairs	1
30 Number of phases	3
31 Weight of motor	27 g

Operating Range



Controller features	
Sensorless, Open loop, $I_{max} < 0.5A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection	PTFE
Pin 1 +VCC	AWG24 red
Pin 2 GND	AWG24 black

Caution:

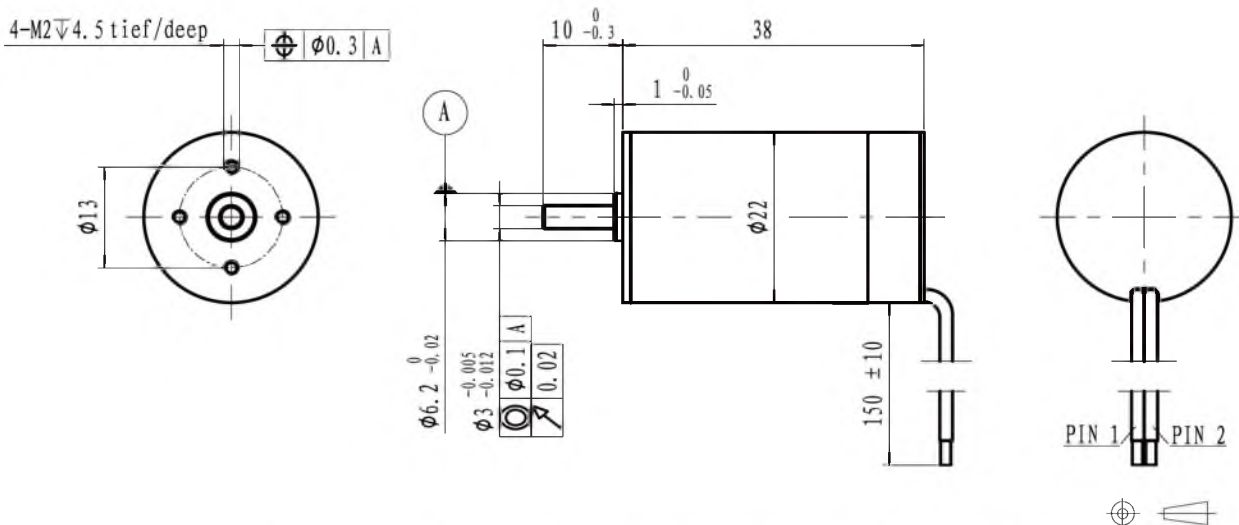
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:

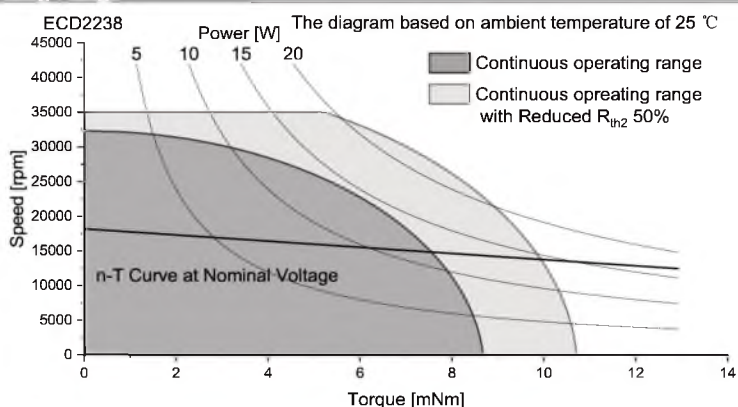
Please contact our sales engineers



With hall sensor		ECD2238S-...		1218	2418						
Motor data											
Values at nominal voltage											
1	Nominal voltage	V		12	24						
2	No load speed	rpm		17445	17721						
3	No load current	mA		220	110						
4	Nominal speed	rpm		15172	15134						
5	Nominal torque	mNm		6	6						
6	Nominal current	A		1.16	0.59						
7	Stall torque	mNm		46.05	41.10						
8	Stall current	A		7.44	3.39						
9	Max. efficiency	%		68.6	67.2						
10	Supply voltage +Vcc	V		10..28	10.28						
11	Direction of rotation			CW	CW						
12	Torque constant	mNm/A		6.37	12.51						
13	Speed constant	rpm/V		1498	763						
14	Speed/torque gradient	rpm/mNm		379	431						
15	Mechanical time constant	ms		6.0	6.8						
16	Rotor inertia	gcm ²		1.5	1.5						

17	Thermal resistance housing-ambient	15.2 K/W
18	Thermal resistance winding-housing	6.0 K/W
19	Thermal time constant winding	11 s
20	Thermal time constant motor	383 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	35000 rpm
24	Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	3.5 N
27	Max. force for press fits (static)	44 N
28	Max. radial loading, 5mm from flange	1200 N
29	Number of pole pairs	1
30	Number of phases	3
31	Weight of motor	63 g

Operating Range



Controller features	
Sensor, Open loop, I _{max} < 1.5A	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection	PTFE
Pin 1 +VCC	AWG24 red
Pin 2 GND	AWG24 black

Caution:

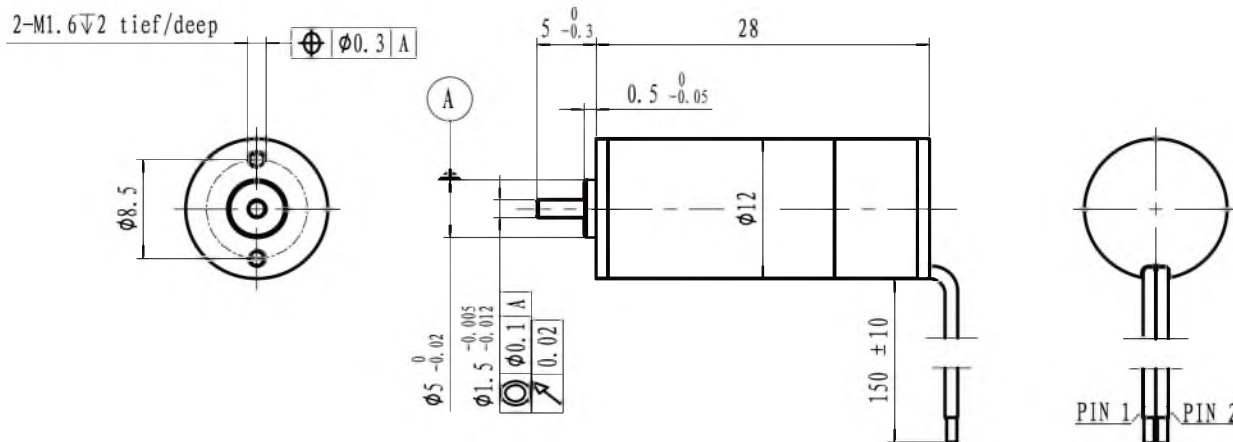
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

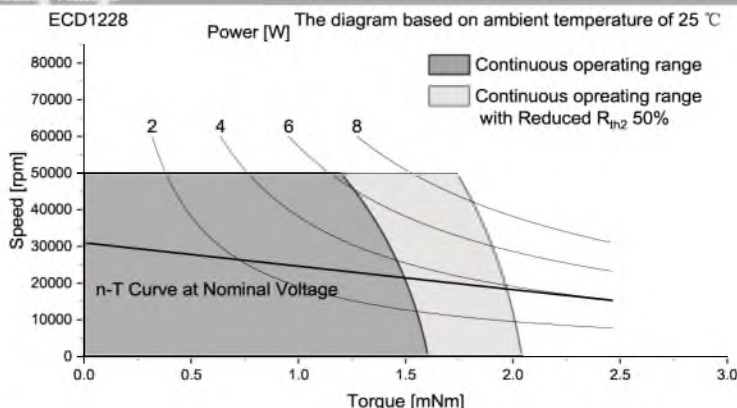
More:

Please contact our sales engineers



M 1.5:1

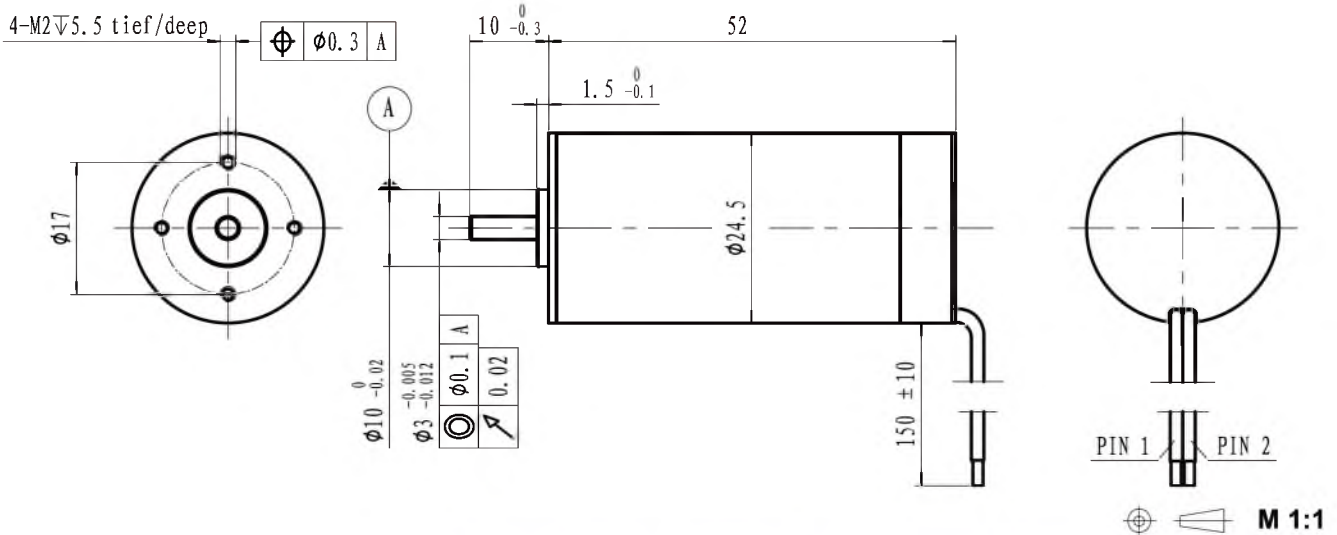
	Sensorless	ECD1228L-...	0631						
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	6						
2	No load speed	rpm	31000						
3	No load current	mA	140						
4	Nominal speed	rpm	27755						
5	Nominal torque	mNm	0.5						
6	Nominal current	A	0.42						
7	Stall torque	mNm	4.78						
8	Stall current	A	2.86						
9	Max. efficiency	%	60.6						
10	Supply voltage +Vcc	V	4.5..7						
11	Direction of rotation		CW						
12	Torque constant	mNm/A	1.76						
13	Speed constant	rpm/V	5433						
14	Speed/torque gradient	rpm/mNm	6491						
15	Mechanical time constant	ms	11.6						
16	Rotor inertia	gcm ²	0.17						
17	Thermal resistance housing-ambient	38.3 K/W		Operating Range					
18	Thermal resistance winding-housing	9.6 K/W		ECD1228 Power [W] The diagram based on ambient temperature of 25 °C Continuous operating range Continuous operating range with Reduced R_{th2} 50%					
19	Thermal time constant winding	5 s							
20	Thermal time constant motor	196 s							
21	Ambient temperature	-30...+100°C							
22	Max. permissible winding temperature	+125°C							
23	Max. permissible speed	50000 rpm							
24	Axial play at axial load	<0.8 N 0 mm >0.8 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	0.3							
27	Max. force for press fits (static)	11N							
	(static, shaft supported)	200 N							
28	Max. radial loading, 5mm from flange	4.3 N							
29	Number of pole pairs	1							
30	Number of phases	3							
31	Weight of motor	12.2 g							



Controller features				Configuration			
Sensor, Open loop, I _{max} < 0.5A				Function: On&Off/Direction/Speed control/Brake Speed closed&open-loop Control/Speed feedback			
Overload protection, Stall protection							
Max. temperature of electronics +105℃				Performance: Customized in the continuous operating range			
Connection				Ball bearing: Preload			
Conection				Flange: Standard frange front&back/customize the frange			
Pin 1	+VCC	PTFE		Shaft: Length/Diameter/Cut face			
Pin 2	GND	AWG24	red	Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length			
		AWG24	black	Connector: JST/MOLEX/TE			

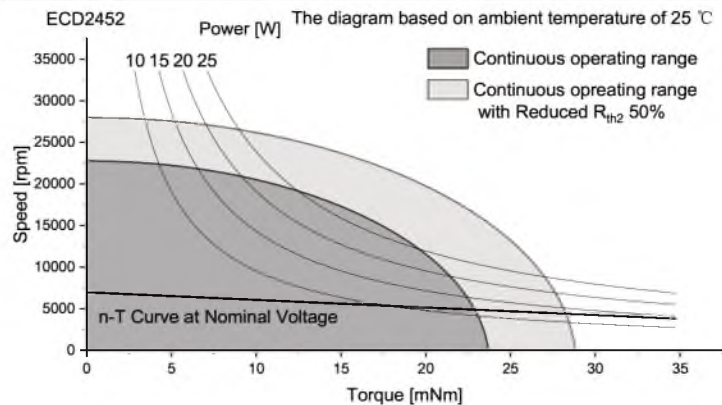
Caution:
Incorrect lead connection will damage the controller!

More:
Please contact our sales engineers

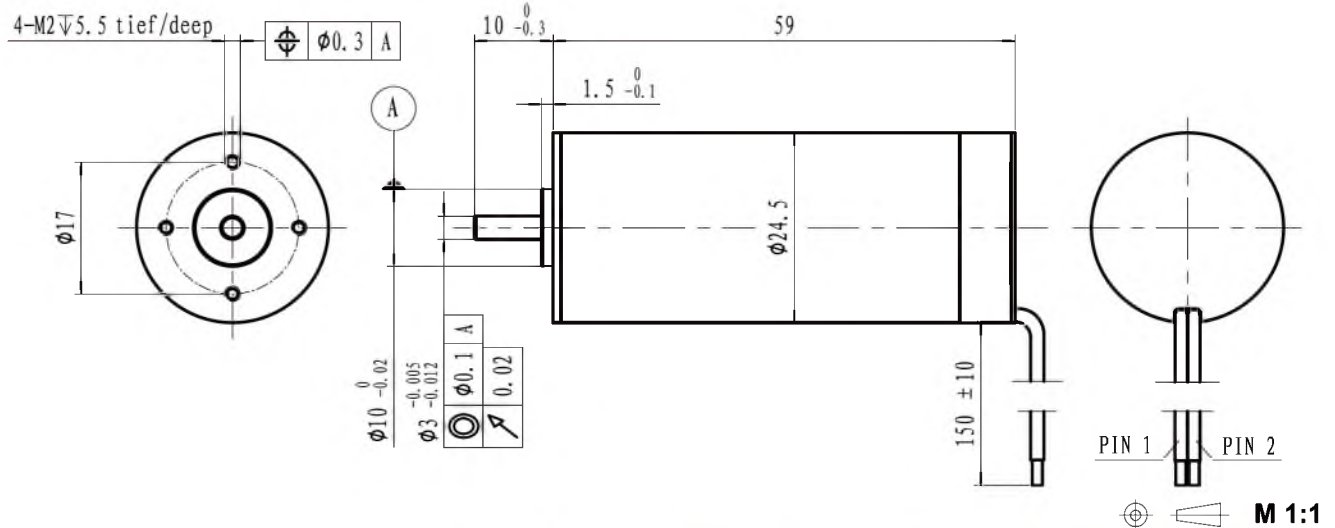


With hall sensor		ECD2452S-...	1207	2407					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	6904	6980					
3	No load current	mA	103	70					
4	Nominal speed	rpm	5821	5832					
5	Nominal torque	mNm	14	14					
6	Nominal current	A	0.96	0.51					
7	Stall torque	mNm	89.25	85.11					
8	Stall current	A	5.58	2.73					
9	Max. efficiency	%	74.7	70.5					
10	Supply voltage +Vcc	V	10..28	8..13					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	16.29	31.99					
13	Speed constant	rpm/V	586	298					
14	Speed/torque gradient	rpm/mNm	77	82					
15	Mechanical time constant	ms	3.4	3.6					
16	Rotor inertia	gcm ²	4.2	4.2					
17	Thermal resistance housing-ambient	11.6 K/W							
18	Thermal resistance winding-housing	5.6 K/W							
19	Thermal time constant winding	30 s							
20	Thermal time constant motor	557 s							
21	Ambient temperature	-30...+100°C							
22	Max. permissible winding temperature	+150°C							
23	Max. permissible speed	30000 rpm							
24	Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	3.5 N							
27	Max. force for press fits (static)	44 N							
28	Max. radial loading, 5mm from flange	1200 N							
29	Number of pole pairs	1							
30	Number of phases	3							
31	Weight of motor	112 g							

Operating Range



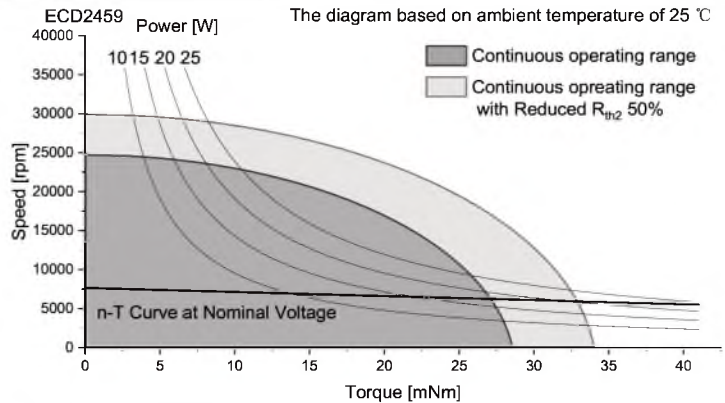
Controller features		Configuration	
Sensor, Open loop, $I_{max} < 1.5A$		Function: On&Off/Direction/Speed control/Brake	
Overload protection, Stall protection		Speed closed&open-loop Control/Speed feedback	
Max. temperature of electronics	+105°C	Performance: Customized in the continuous operating range	
Connection		Ball bearing: Preload	
Conection		Flange: Standard frange front&back/customize the frange	
Pin 1 +VCC	PTFE	Shaft: Length/Diameter/Cut face	
Pin 2 GND	AWG24 red	Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length	
	AWG24 black	Connector: JST/MOLEX/TE	
Caution:		More:	
Incorrect lead connection will damage the controller!		Please contact our sales engineers	



With hall sensor		ECD2459S-...	1207	2407						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	7699	7655						
3	No load current	mA	118	73						
4	Nominal speed	rpm	6640	6597						
5	Nominal torque	mNm	20	20						
6	Nominal current	A	1.48	0.75						
7	Stall torque	mNm	145.35	144.73						
8	Stall current	A	10.00	4.98						
9	Max. efficiency	%	79.5	77.2						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	14.71	29.50						
13	Speed constant	rpm/V	649	324						
14	Speed/torque gradient	rpm/mNm	53	53						
15	Mechanical time constant	ms	3.3	3.3						
16	Rotor inertia	gcm ²	5.9	5.9						

17	Thermal resistance housing-ambient	10.2 K/W
18	Thermal resistance winding-housing	6.4 K/W
19	Thermal time constant winding	36 s
20	Thermal time constant motor	555 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	30000 rpm
24	Axial play at axial load	<4 N 0 mm
		>4 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	3.5 N
27	Max. force for press fits (static)	44 N
	(static, shaft supported)	1200 N
28	Max. radial loading, 5mm from flange	15 N
29	Number of pole pairs	1
30	Number of phases	3
31	Weight of motor	130 g

Operating Range



Controller features

Sensor, Open loop, $I_{max} < 1.5A$
Overload protection, Stall protection
Max. temperature of electronics

Connection

Conection	PTFE
Pin 1 +VCC	AWG24 red
Pin 2 GND	AWG24 black

Caution:

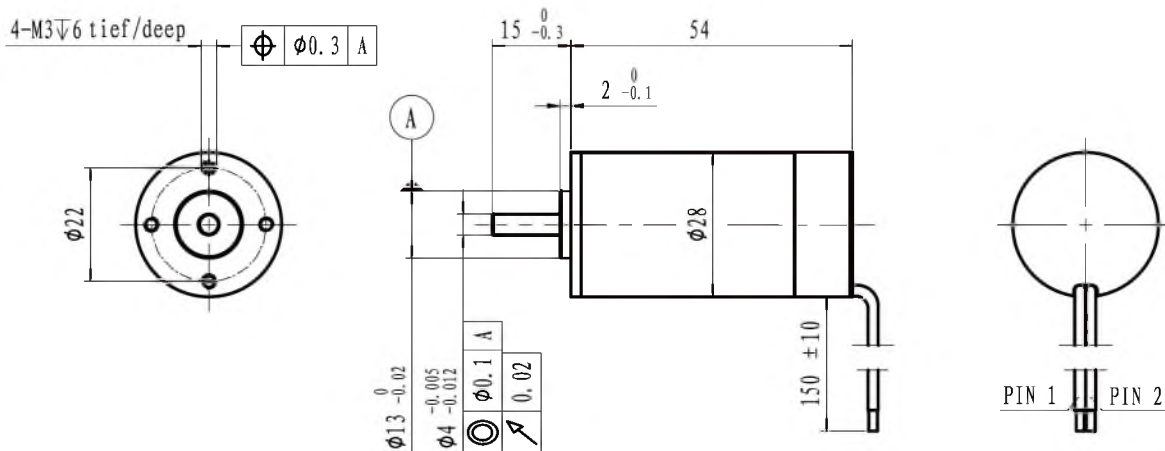
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:

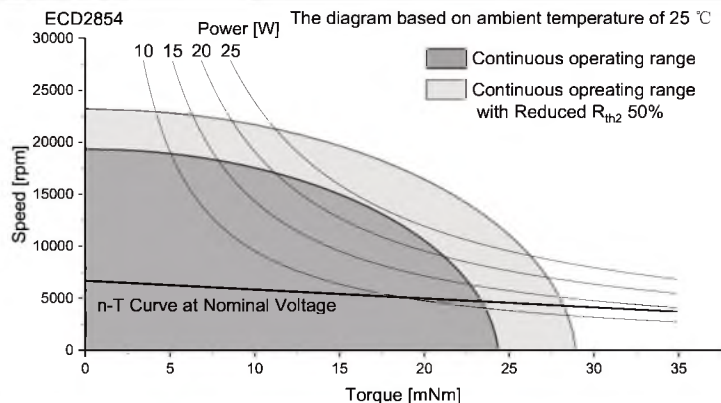
Please contact our sales engineers



M 1:1.5

With hall sensor		ECD2854S-...	1206	2406					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	6878	6700					
3	No load current	mA	121	76					
4	Nominal speed	rpm	5433	5157					
5	Nominal torque	mNm	18	18					
6	Nominal current	A	1.23	0.62					
7	Stall torque	mNm	85.67	78.14					
8	Stall current	A	5.38	2.43					
9	Max. efficiency	%	72.3	67.8					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	16.29	33.14					
13	Speed constant	rpm/V	586	288					
14	Speed/torque gradient	rpm/mNm	80	86					
15	Mechanical time constant	ms	4.4	4.7					
16	Rotor inertia	gcm ²	5.2	5.2					
17	Thermal resistance housing-ambient	9.6 K/W							
18	Thermal resistance winding-housing	6.3 K/W							
19	Thermal time constant winding	37 s							
20	Thermal time constant motor	584 s							
21	Ambient temperature	-30...+100°C							
22	Max. permissible winding temperature	+150°C							
23	Max. permissible speed	25000 rpm							
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	7.5 N							
27	Max. force for press fits (static)	100 N							
28	Max. radial loading, 5mm from flange	2000 N							
29	Number of pole pairs	1							
30	Number of phases	3							
31	Weight of motor	153 g							

Operating Range



Controller features

Sensor, Open loop, $I_{max} < 1.8A$
 Overload protection, Stall protection
 Max. temperature of electronics +105°C

Connection

Conection
 Pin 1 +VCC PTFE
 Pin 2 GND AWG20 red
 black

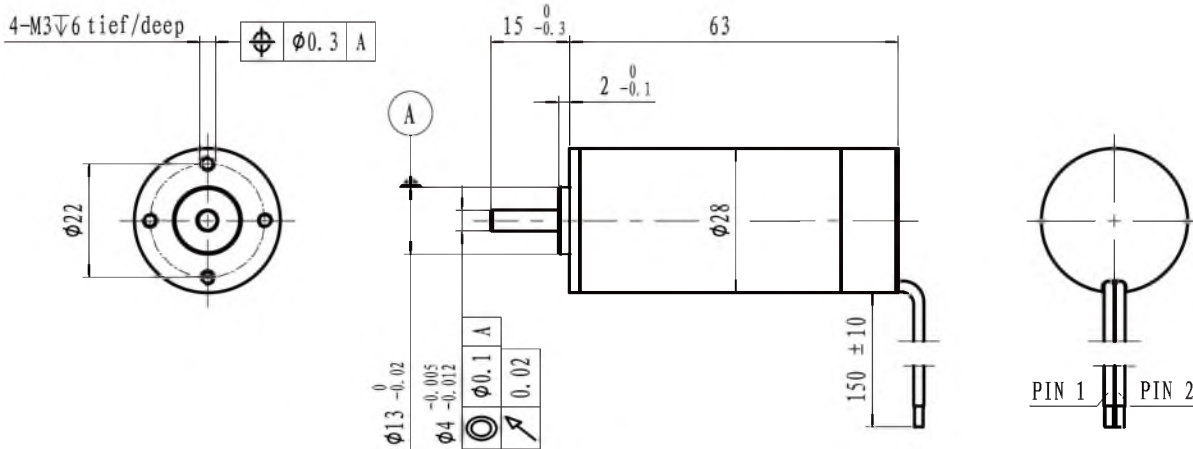
Caution:

Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:
 Please contact our sales engineers

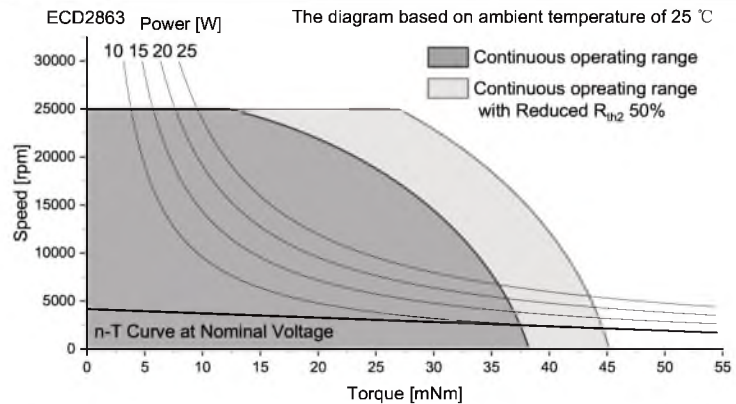


M 1:1.5

With hall sensor		ECD2863S-...	1204	2404						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	4168	4163						
3	No load current	mA	70	60						
4	Nominal speed	rpm	3264	3033						
5	Nominal torque	mNm	25	25						
6	Nominal current	A	0.99	0.53						
7	Stall torque	mNm	115.29	92.11						
8	Stall current	A	4.33	1.79						
9	Max. efficiency	%	76.2	66.7						
10	Supply voltage +Vcc	V	4.5..7	8..13						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	27.05	53.21						
13	Speed constant	rpm/V	353	179						
14	Speed/torque gradient	rpm/mNm	36	45						
15	Mechanical time constant	ms	3.2	4.0						
16	Rotor inertia	gcm ²	8.5	8.5						

17	Thermal resistance housing-ambient	7.1 K/W
18	Thermal resistance winding-housing	5 K/W
19	Thermal time constant winding	51 s
20	Thermal time constant motor	552 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	25000 rpm
24	Axial play at axial load	<8 N 0 mm
		>8 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
	(static, shaft supported)	2000 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	1
30	Number of phases	3
31	Weight of motor	188 g

Operating Range



Controller features	
Sensor, Open loop, $I_{max} < 1.8\text{A}$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection	PTFE
Pin 1 +VCC	AWG20 red
Pin 2 GND	AWG20 black

Caution:

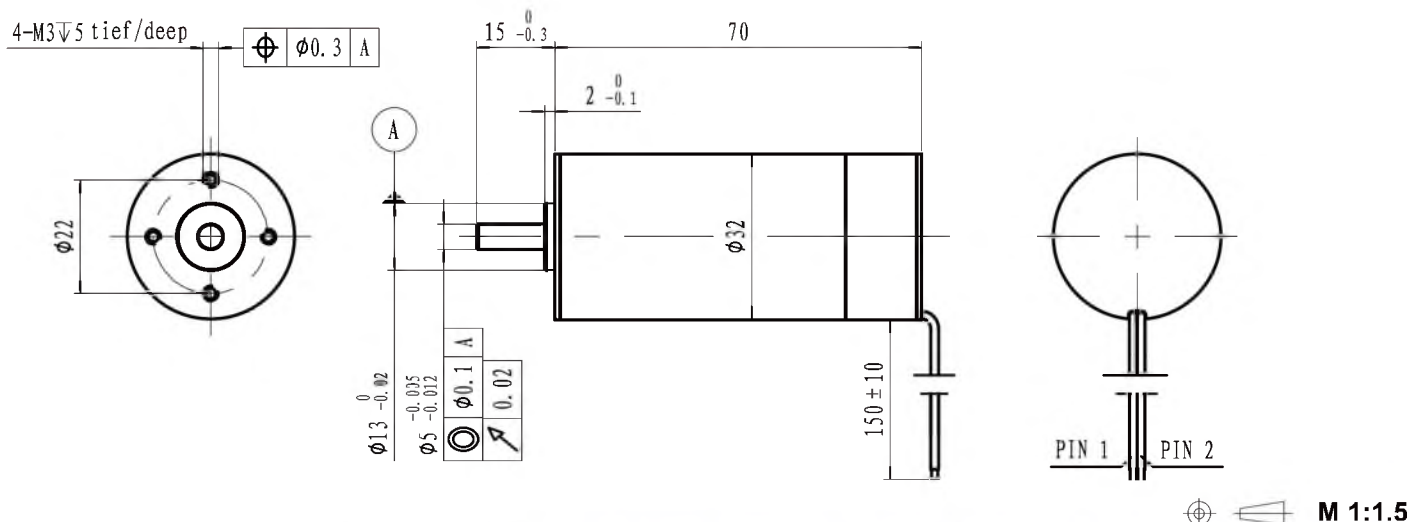
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:

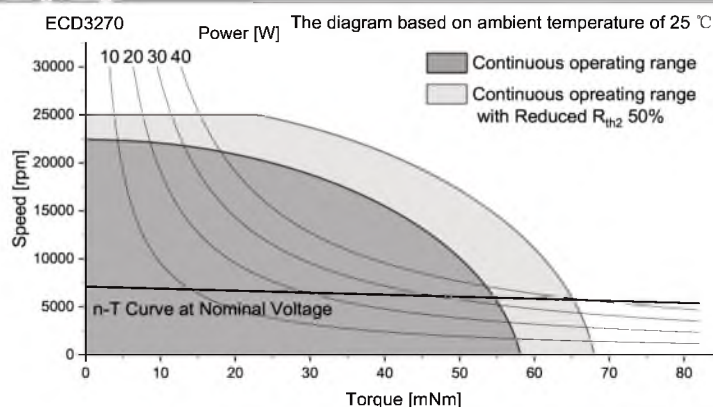
Please contact our sales engineers



With hall sensor		ECD3270S-...	1207	2407					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	7200	7100					
3	No load current	mA	194	110					
4	Nominal speed	rpm	6277	6243					
5	Nominal torque	mNm	40	40					
6	Nominal current	A	2.73	1.36					
7	Stall torque	mNm	312.16	331.23					
8	Stall current	A	20.00	10.48					
9	Max. efficiency	%	81.3	80.6					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	15.76	31.94					
13	Speed constant	rpm/V	606	299					
14	Speed/torque gradient	rpm/mNm	23	21					
15	Mechanical time constant	ms	3.7	3.5					
16	Rotor inertia	gcm^2	15.5	15.5					

17	Thermal resistance housing-ambient	5 K/W
18	Thermal resistance winding-housing	4 K/W
19	Thermal time constant winding	52 s
20	Thermal time constant motor	540 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	25000 rpm
24	Axial play at axial load	0 mm
	<8 N	max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
	(static, shaft supported)	2700 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	1
30	Number of phases	3
31	Weight of motor	255 g

Operating Range



Controller features	
Sensor, Open loop, $I_{max} < 2.2A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

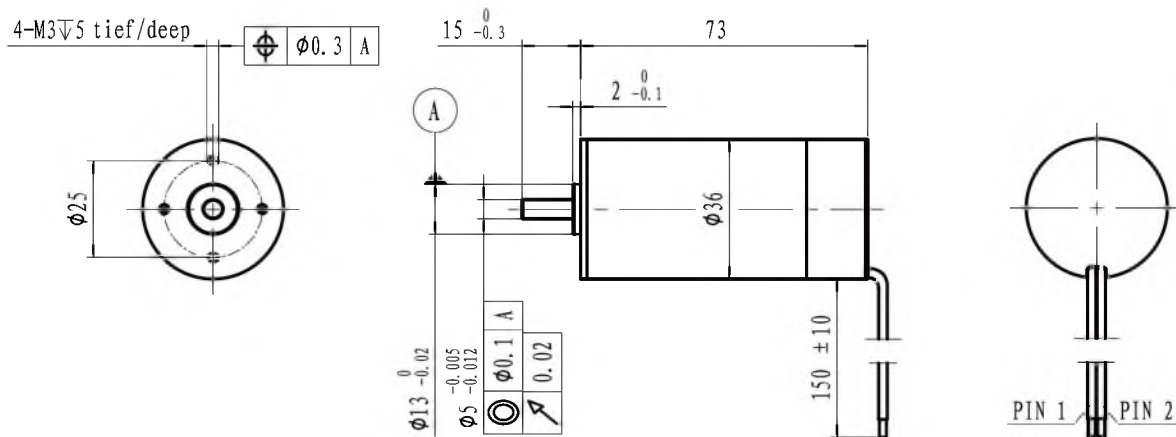
Conection

Conection		PTFE	
Pin 1	+VCC	AWG20	red
Pin 2	GND	AWG20	black

Caution:

Caution:
Incorrect lead connection will damage the controller!

More:
Please contact our sales engineers



M 1:2

With hall sensor		ECD3673S-...	1204	2404							
Motor data											
Values at nominal voltage											
1	Nominal voltage	V	12	24							
2	No load speed	rpm	4070	4042							
3	No load current	mA	148	84							
4	Nominal speed	rpm	3229	3223							
5	Nominal torque	mNm	50	50							
6	Nominal current	A	1.95	0.98							
7	Stall torque	mNm	242.00	246.84							
8	Stall current	A	8.89	4.52							
9	Max. efficiency	%	75.9	74.6							
10	Supply voltage +Vcc	V	10..28	10..28							
11	Direction of rotation		CW	CW							
12	Torque constant	mNm/A	27.69	55.65							
13	Speed constant	rpm/V	345	172							
14	Speed/torque gradient	rpm/mNm	17	16							
15	Mechanical time constant	ms	3.4	3.3							
16	Rotor inertia	gcm ²	19.5	19.5							
17	Thermal resistance housing-ambient	4.9 K/W	Operating Range								
18	Thermal resistance winding-housing	1.6 K/W	ECD3673 Power [W] The diagram based on ambient temperature of 25 °C 15 30 45 60 Continuous operating range Continuous operating range with Reduced R_{th2} 50% Speed [rpm] 25000 20000 15000 10000 5000 0 Torque [mNm] 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 n-T Curve at Nominal Voltage								
19	Thermal time constant winding	45 s									
20	Thermal time constant motor	630 s									
21	Ambient temperature	-30...+100°C									
22	Max. permissible winding temperature	+150°C									
23	Max. permissible speed	20000 rpm	Function: On&Off/Direction/Speed control/Brake Speed closed&open-loop Control/Speed feedback Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm									
25	Radial play	preloaded									
26	Max. axial load (dynamic)	7.5 N									
27	Max. force for press fits (static)	100 N									
	(static, shaft supported)	2700 N									
28	Max. radial loading, 5mm from flange	25 N									
29	Number of pole pairs	1	Configuration								
30	Number of phases	3									
31	Weight of motor	317 g									

Controller features	
Sensor, Open loop, $I_{max} < 4A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection	PTFE
Pin 1 +VCC	AWG20 red
Pin 2 GND	AWG20 black

Caution:

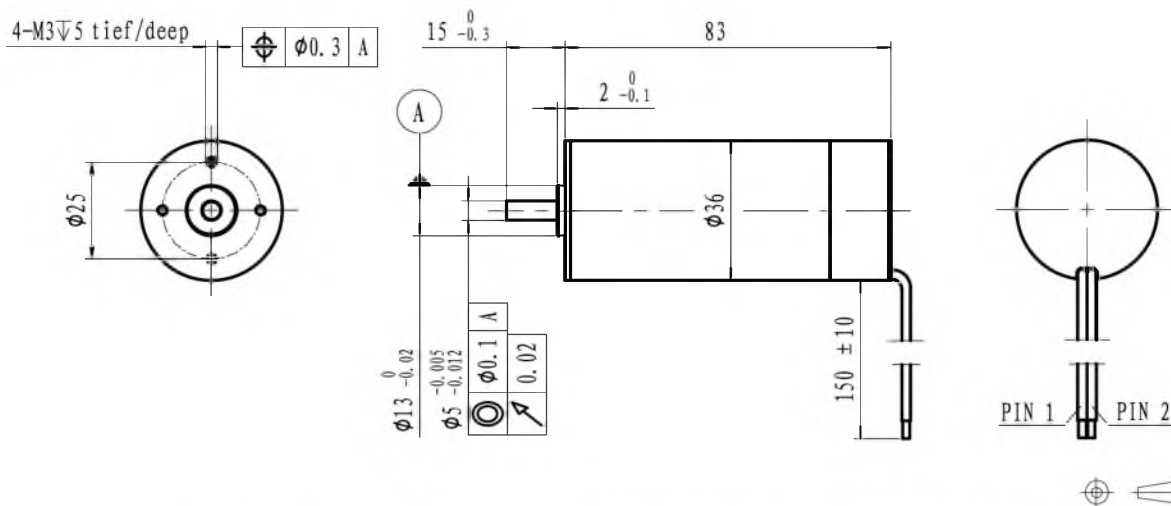
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

More:

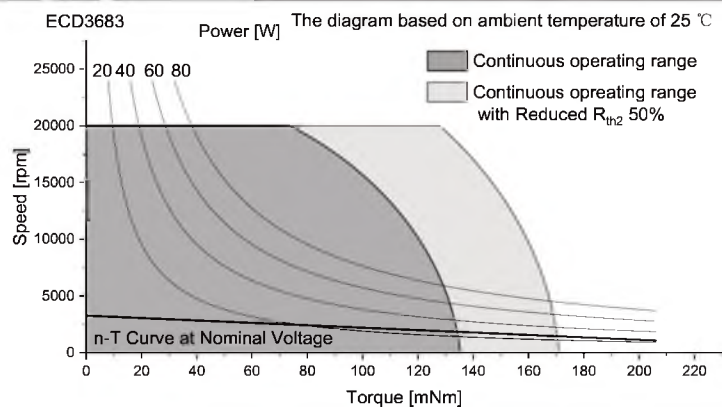
Please contact our sales engineers



With hall sensor		ECD3683S-...	1203	2403						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	3278	3273						
3	No load current	mA	137	78						
4	Nominal speed	rpm	2543	2546						
5	Nominal torque	mNm	75	75						
6	Nominal current	A	2.31	1.17						
7	Stall torque	mNm	334.34	337.82						
8	Stall current	A	9.84	4.98						
9	Max. efficiency	%	77.8	76.5						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	34.47	68.93						
13	Speed constant	rpm/V	277	139						
14	Speed/torque gradient	rpm/mNm	10	10						
15	Mechanical time constant	ms	2.2	2.2						
16	Rotor inertia	gcm ²	21.5	21.5						

17	Thermal resistance housing-ambient	5 K/W
18	Thermal resistance winding-housing	2.3 K/W
19	Thermal time constant winding	46 s
20	Thermal time constant motor	816 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	20000 rpm
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
27	(static, shaft supported)	2700 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	1
30	Number of phases	3
31	Weight of motor	366 g

Operating Range



Controller features	
Sensor, Open loop, I _{max} < 4A	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection	PTFE
Pin 1 +VCC	AWG20 red
Pin 2 GND	AWG20 black

Caution:

Incorrect lead connection will damage the controller!

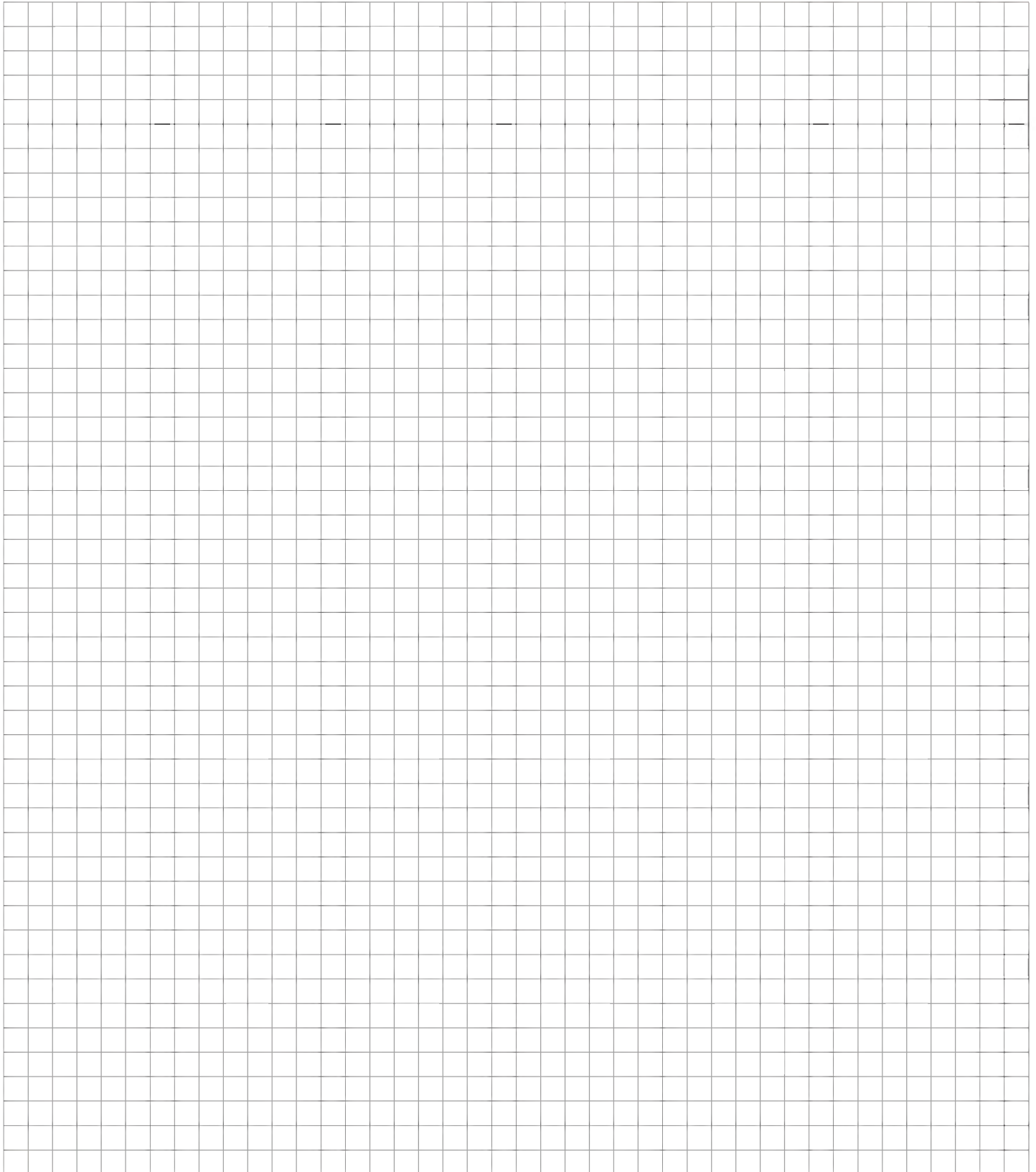
Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

More:
Please contact our sales engineers

Subject: _____

Date: _____



ECH Series

High speed winding

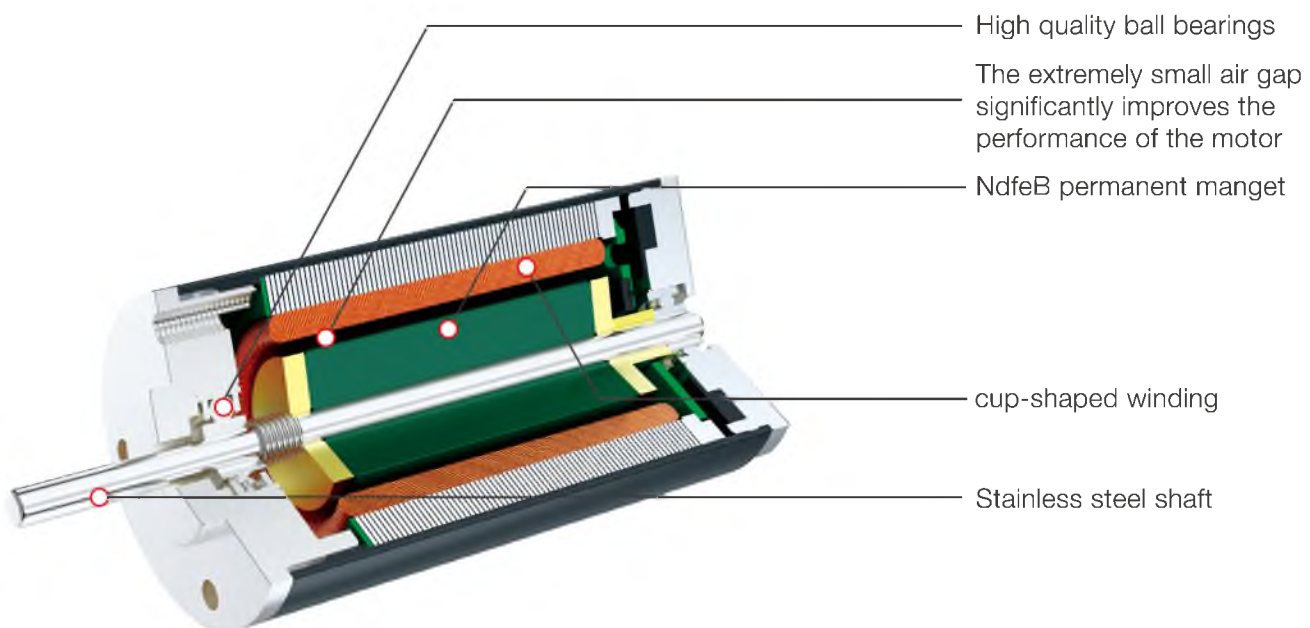
Model	Dimension (mm)	Nominal Troque (mNm)	Nominal Speed (rpm)	Page
ECH1636	Φ16x36	5	35000	71
ECH1644	Φ16x44	7.5	25000	72
ECH1656	Φ16x56	6	40000	73
ECH2040	Φ20x40	6.5	35000	74
ECH2053	Φ20x53	10	45000	75
ECH2057	Φ20x57	12.5	45000	76
ECH2260	Φ22x60	15	35000	77



ECH Series

High speed winding

The high-speed coreless motor, with its unique ironless design and light weight rotor, excels in high rotational speed and low inertia. It enables rapid start, stop, and reversal, offering exceptional dynamic responsiveness. By minimizing eddy current and core losses, this motor achieves higher efficiency, especially at high speeds. Its low noise and vibration characteristics make it particularly suitable for applications requiring high stability.

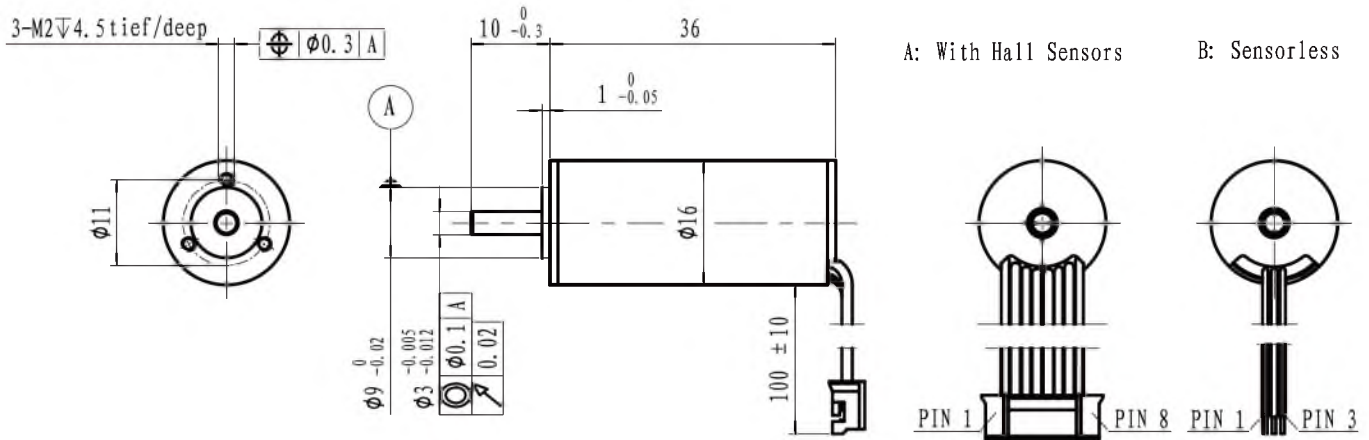


Basic Data:

Diameter: $\phi 13\text{mm}-22\text{mm}$
Maximum Length: 60mm
Operate Voltage: 12V-48VDC
Maximum Permissible speed: 60,000rpm
Operate temperature: $-30^{\circ}\text{C}-+80^{\circ}\text{C}$

Typical features:

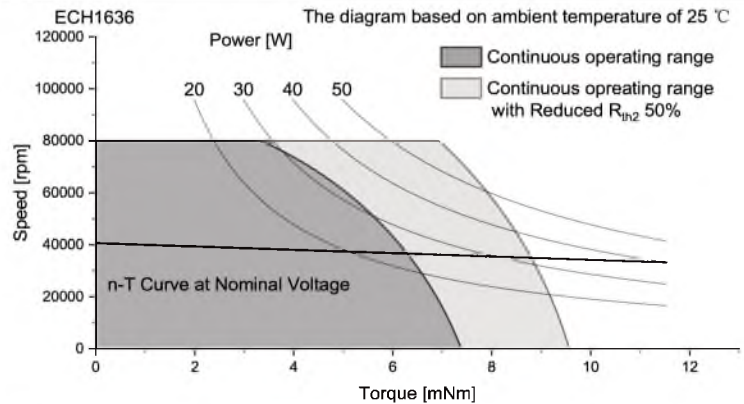
High efficiency
High Speed
Low noise
No Cogging
Low inductance
Good heat dissipation
Long operational lifetime



M 1:1

	Sensorless	ECH1636L-...	2440	3040	3640				
	With hall sensor	ECH1636S-...							
Motor data									
Values at nominal voltage									
1 Nominal voltage	V	24	30	36					
2 No load speed	rpm	40273	40225	40760					
3 No load current	mA	90	77	72					
4 Nominal speed	rpm	37067	36958	37406					
5 Nominal torque	mNm	5	5	5					
6 Nominal current	A	0.98	0.79	0.67					
7 Stall torque	mNm	62.80	61.56	60.76					
8 Stall current	A	11.21	8.80	7.35					
9 Max. efficiency	%	82.9	82.2	81.2					
10 Terminal resistance	Ω	2.14	3.41	4.9					
11 Terminal inductance	mH	0.11	0.17	0.33					
12 Torque constant	mNm/A	5.65	7.06	8.35					
13 Speed constant	rpm/V	1692	1353	1143					
14 Speed/torque gradient	rpm/mNm	641	653	671					
15 Mechanical time constant	ms	3.7	3.8	3.9					
16 Rotor inertia	gcm ²	0.55	0.55	0.55					
17 Thermal resistance housing-ambient	18.6 K/W								
18 Thermal resistance winding-housing	3.44 K/W								
19 Thermal time constant winding	6 s								
20 Thermal time constant motor	298 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	80000 rpm								
24 Axial play at axial load <3 N	0 mm								
>3 N	max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	2.5 N								
27 Max. force for press fits (static)	44 N								
(static, shaft supported)	1200 N								
28 Max. radial loading, 5mm from flange	11 N								
29 Number of pole pairs	1								
30 Number of phases	3								
31 Weight of motor	32 g								

Operating Range



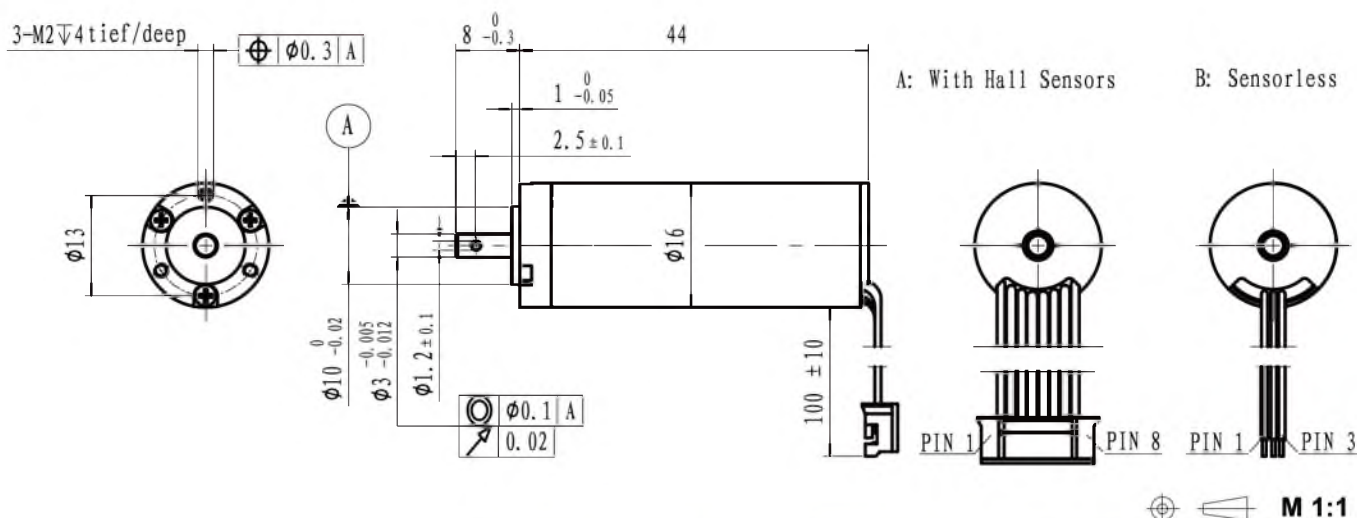
Connection

Connection A (Sensor)		PVC	
Pin 1 Vhall 3-18 VDC	AWG26	black	
Pin 2 Hall sensor HA	AWG26	black	
Pin 3 Hall sensor HB	AWG26	black	
Pin 4 Hall sensor HC	AWG26	black	
Pin 5 GND	AWG26	black	
Pin 6 Motor winding MA	AWG26	black	
Pin 7 Motor winding MB	AWG26	black	
Pin 8 Motor winding MC	AWG26	black	
Connector		JST PH2.0-8P	

Connection B (Sensorless)		PVC	
Pin 1 Motor winding MA	AWG26	yellow	
Pin 2 Motor winding MB	AWG26	green	
Pin 3 Motor winding MC	AWG26	blue	

Configuration

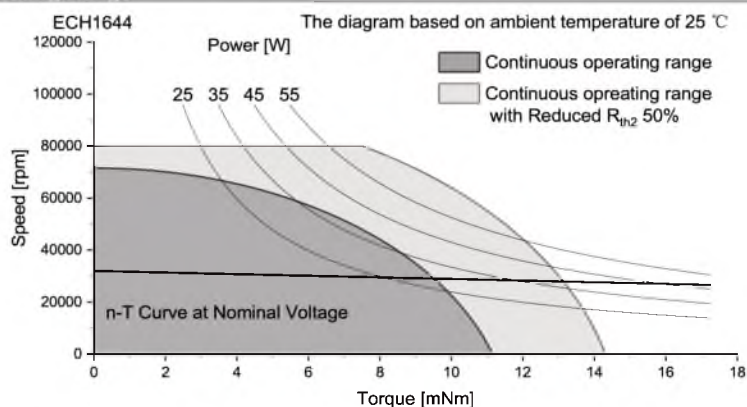
Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE



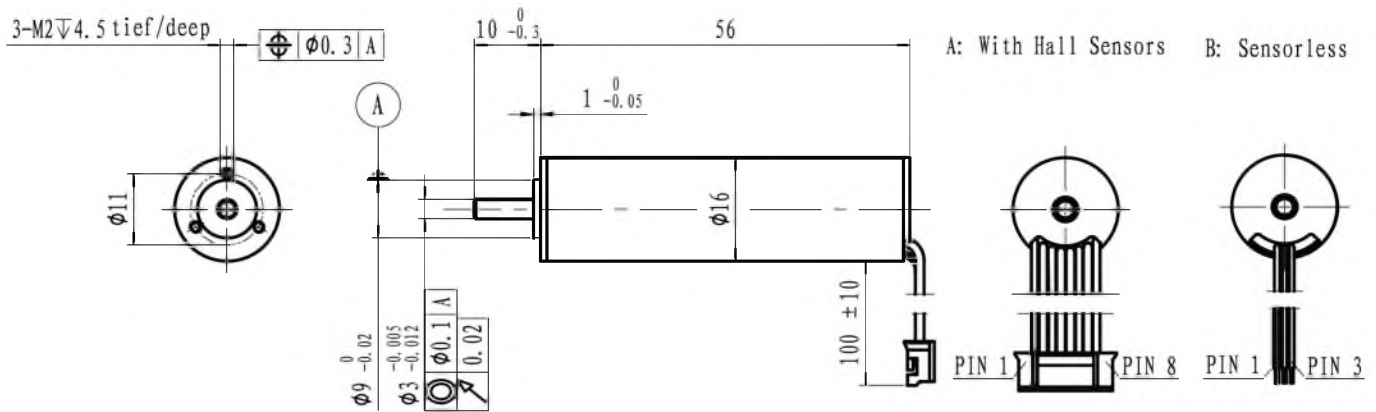
		Sensorless	ECH1644L-...						
		With hall sensor	ECH1644S-...	2430	3040	3640			
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	24	30	36				
2	No load speed	rpm	30580	30900	30160				
3	No load current	mA	95	80	76				
4	Nominal speed	rpm	28134	28403	27632				
5	Nominal torque	mNm	7.5	7.5	7.5				
6	Nominal current	A	1.10	0.90	0.74				
7	Stall torque	mNm	93.75	92.81	89.46				
8	Stall current	A	12.70	10.17	8.00				
9	Max. efficiency	%	83.4	83.0	81.5				
10	Terminal resistance	Ω	1.89	2.95	4.5				
11	Terminal inductance	mH	0.12	0.19	0.28				
12	Torque constant	mNm/A	7.44	9.20	11.29				
13	Speed constant	rpm/V	1284	1038	846				
14	Speed/torque gradient	rpm/mNm	326	333	337				
15	Mechanical time constant	ms	2.8	2.9	2.9				
16	Rotor inertia	gcm^2	0.82	0.82	0.82				

17	Thermal resistance housing-ambient	16.2 K/W
18	Thermal resistance winding-housing	3.5 K/W
19	Thermal time constant winding	4 s
20	Thermal time constant motor	339 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	80000 rpm
24	Axial play at axial load <3 N	0 mm
	>3 N	max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	2.5 N
27	Max. force for press fits (static) (static, shaft supported)	44 N 1200 N
28	Max. radial loading, 5mm from flange	11 N
29	Number of pole pairs	1
30	Number of phases	3
31	Weight of motor	43g

Operating Range



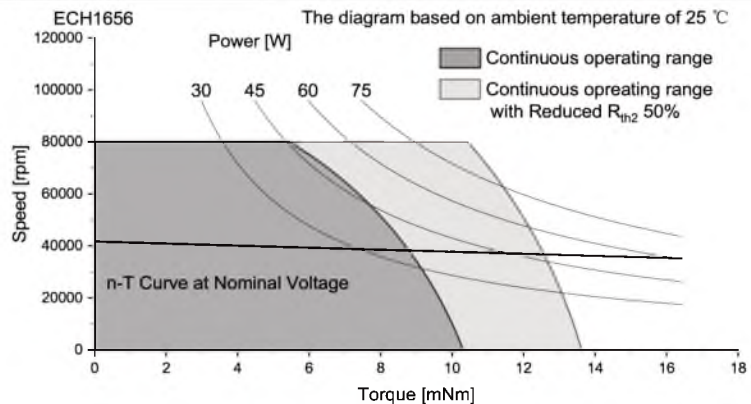
Connection			Configuration
Connection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
	PVC		
Pin 1	Vhall 3-18 VDC	AWG26 black	
Pin 2	Hall sensor HA	AWG26 black	
Pin 3	Hall sensor HB	AWG26 black	
Pin 4	Hall sensor HC	AWG26 black	
Pin 5	GND	AWG26 black	
Pin 6	Motor winding MA	AWG26 black	
Pin 7	Motor winding MB	AWG26 black	
Pin 8	Motor winding MC	AWG26 black	
Conector			
JST PH2.0-8P			
Conection B (Sensorless)			
	PVC		
Pin 1	Motor winding MA	AWG26 yellow	
Pin 2	Motor winding MB	AWG26 green	
Pin 3	Motor winding MC	AWG26 blue	



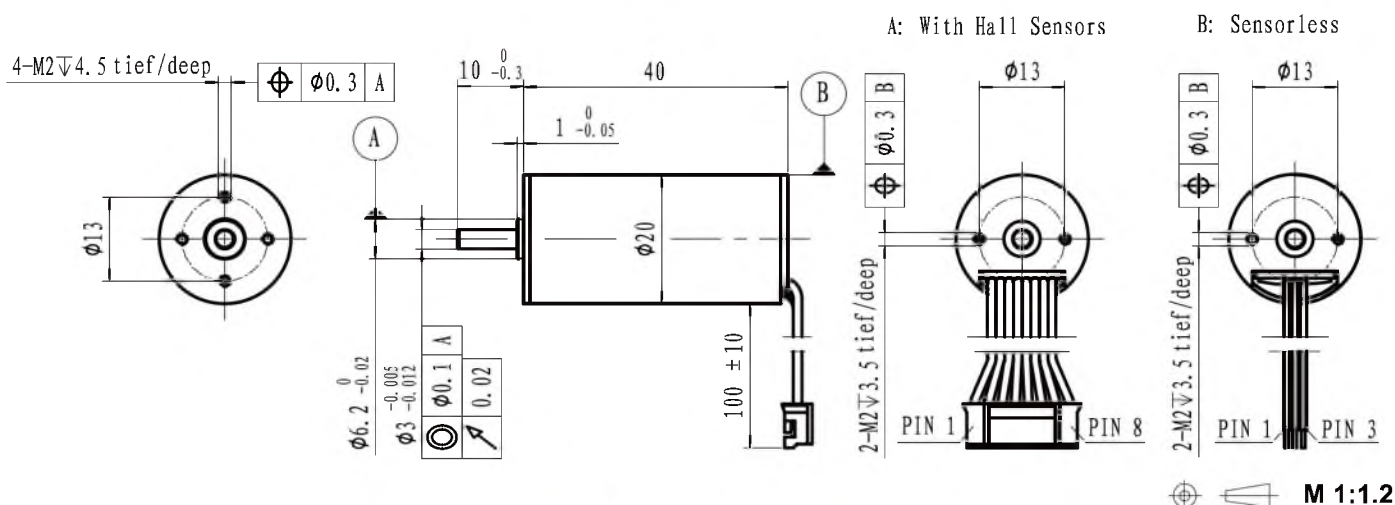
M 1:2

	Sensorless	ECH1656L-...	2440	3040	3640					
	With hall sensor	ECH1656S-...								
Motor data										
Values at nominal voltage										
1 Nominal voltage	V		24	30	36					
2 No load speed	rpm		41670	40775	41311					
3 No load current	mA		103	89	79					
4 Nominal speed	rpm		39238	38438	38898					
5 Nominal torque	mNm		6	6	6					
6 Nominal current	A		1.20	0.95	0.80					
7 Stall torque	mNm		102.81	104.67	102.71					
8 Stall current	A		18.90	15.08	12.50					
9 Max. efficiency	%		85.8	85.2	84.7					
10 Terminal resistance	Ω		1.27	1.99	2.88					
11 Terminal inductance	mH		0.09	0.14	0.2					
12 Torque constant	mNm/A		5.47	6.98	8.27					
13 Speed constant	rpm/V		1746	1367	1155					
14 Speed/torque gradient	rpm/mNm		405	390	402					
15 Mechanical time constant	ms		2.6	2.5	2.6					
16 Rotor inertia	gcm ²		0.61	0.61	0.61					
17 Thermal resistance housing-ambient	16.2 K/W									
18 Thermal resistance winding-housing	1.9 K/W									
19 Thermal time constant winding	5 s									
20 Thermal time constant motor	397 s									
21 Ambient temperature	-30...+100°C									
22 Max. permissible winding temperature	+150°C									
23 Max. permissible speed	80000 rpm									
24 Axial play at axial load	<3 N 0 mm >3 N max. 0.3 mm									
25 Radial play	preloaded									
26 Max. axial load (dynamic)	2.5 N									
27 Max. force for press fits (static)	44 N									
28 Max. radial loading, 5mm from flange	1200 N									
29 Number of pole pairs	1									
30 Number of phases	3									
31 Weight of motor	50 g									

Operating Range



Connection				Configuration	
Conection A (Sensor)				Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE	
Pin 1	Vhall 3-18 VDC	PVC			
Pin 2	Hall sensor HA	AWG26	black		
Pin 3	Hall sensor HB	AWG26	black		
Pin 4	Hall sensor HC	AWG26	black		
Pin 5	GND	AWG26	black		
Pin 6	Motor winding MA	AWG26	black		
Pin 7	Motor winding MB	AWG26	black		
Pin 8	Motor winding MC	AWG26	black		
Conector					
JST PH2.0-8P					
Conection B (Sensorless)					
Pin 1	Motor winding MA	PVC	yellow		
Pin 2	Motor winding MB	AWG26	green		
Pin 3	Motor winding MC	AWG26	blue		



Sensorless		EC2040L-...	2440	3040	3640				
With hall sensor		EC2040S-...							
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	24	30	36				
2	No load speed	rpm	41392	40700	40020				
3	No load current	mA	69	60	55				
4	Nominal speed	rpm	37502	36777	36049				
5	Nominal torque	mNm	6.3	6.3	6.3				
6	Nominal current	A	1.21	0.96	0.79				
7	Stall torque	mNm	67.04	65.35	63.48				
8	Stall current	A	12.24	9.40	7.50				
9	Max. efficiency	%	85.6	84.7	83.6				
10	Terminal resistance	Ω	1.96	3.19	4.8				
11	Terminal inductance	mH	0.21	0.47	0.47				
12	Torque constant	mNm/A	5.51	6.99	8.53				
13	Speed constant	rpm/V	1734	1365	1120				
14	Speed/torque gradient	rpm/mNm	617	623	630				
15	Mechanical time constant	ms	4.5	4.5	4.6				
16	Rotor inertia	gcm ²	0.69	0.69	0.69				
17	Thermal resistance housing-ambient	18.7 K/W							
18	Thermal resistance winding-housing	1.9 K/W							
19	Thermal time constant winding	5 s							
20	Thermal time constant motor	397 s							
21	Ambient temperature	-30...+100°C							
22	Max. permissible winding temperature	+150°C							
23	Max. permissible speed	80000 rpm							
24	Axial play at axial load	<3 N 0 mm >3 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	2.5 N							
27	Max. force for press fits (static)	44 N							
	(static, shaft supported)	1200 N							
28	Max. radial loading, 5mm from flange	11 N							
29	Number of pole pairs	1							
30	Number of phases	3							
31	Weight of motor	53 g							

Operating Range

The diagram based on ambient temperature of 25 °C

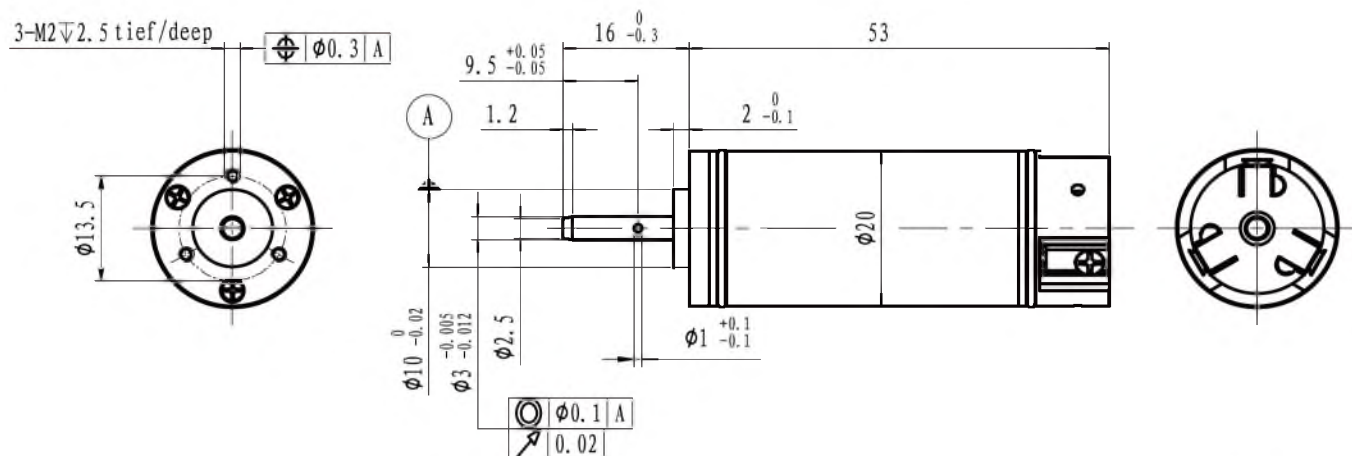
Power [W]: 25, 35, 45, 55

Continuous operating range

Continuous operating range with Reduced R_{th2} 50%

n-T Curve at Nominal Voltage

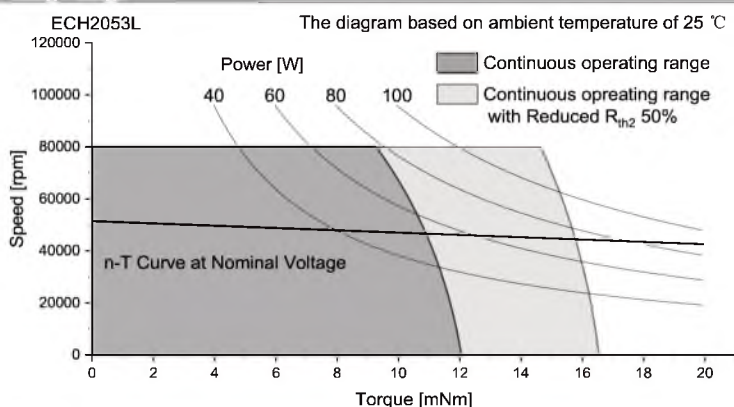
Connection			Configuration
Conection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
	PVC		
Pin 1	Vhall 3-18 VDC	AWG26 black	
Pin 2	Hall sensor HA	AWG26 black	
Pin 3	Hall sensor HB	AWG26 black	
Pin 4	Hall sensor HC	AWG26 black	
Pin 5	GND	AWG26 black	
Pin 6	Motor winding MA	AWG26 black	
Pin 7	Motor winding MB	AWG26 black	
Pin 8	Motor winding MC	AWG26 black	
Conector			
JST PH2.0-8P			
Conection B (Sensorless)			
	PVC		
Pin 1	Motor winding MA	AWG26 yellow	
Pin 2	Motor winding MB	AWG26 green	
Pin 3	Motor winding MC	AWG26 blue	



M 1:1

Sensorless EC2053L-...		1850	2450	3650	4850				
Motor data									
Values at nominal voltage									
1 Nominal voltage	V	18	24	36	48				
2 No load speed	rpm	50202	50832	51448	50700				
3 No load current	mA	136	107	81	68				
4 Nominal speed	rpm	45684	46379	46936	46188				
5 Nominal torque	mNm	10	10	10	10				
6 Nominal current	A	3.07	2.33	1.58	1.18				
7 Stall torque	mNm	111.13	114.15	114.02	112.37				
8 Stall current	A	32.73	25.53	17.22	12.57				
9 Max. efficiency	%	87.5	87.5	86.8	85.8				
10 Terminal resistance	Ω	0.55	0.94	2.09	3.82				
11 Terminal inductance	mH	0.06	0.1	0.23	0.38				
12 Torque constant	mNm/A	3.41	4.49	6.65	8.99				
13 Speed constant	rpm/V	2801	2127	1436	1062				
14 Speed/torque gradient	rpm/mNm	452	445	451	451				
15 Mechanical time constant	ms	3.9	3.9	3.9	3.9				
16 Rotor inertia	gcm ²	0.83	0.83	0.83	0.83				
17 Thermal resistance housing-ambient	11.8 K/W								
18 Thermal resistance winding-housing	0.8 K/W								
19 Thermal time constant winding	2 s								
20 Thermal time constant motor	386 s								
21 Ambient temperature	-30...+100°C								
22 Max. permissible winding temperature	+150°C								
23 Max. permissible speed	80000 rpm								
24 Axial play at axial load	<3 N 0 mm >3 N max. 0.3 mm								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	2.5 N								
27 Max. force for press fits (static)	44 N								
27 Max. force for press fits (static)	1200 N								
28 Max. radial loading, 5mm from flange	11 N								
29 Number of pole pairs	1								
30 Number of phases	3								
31 Weight of motor	63 g								

Operating Range



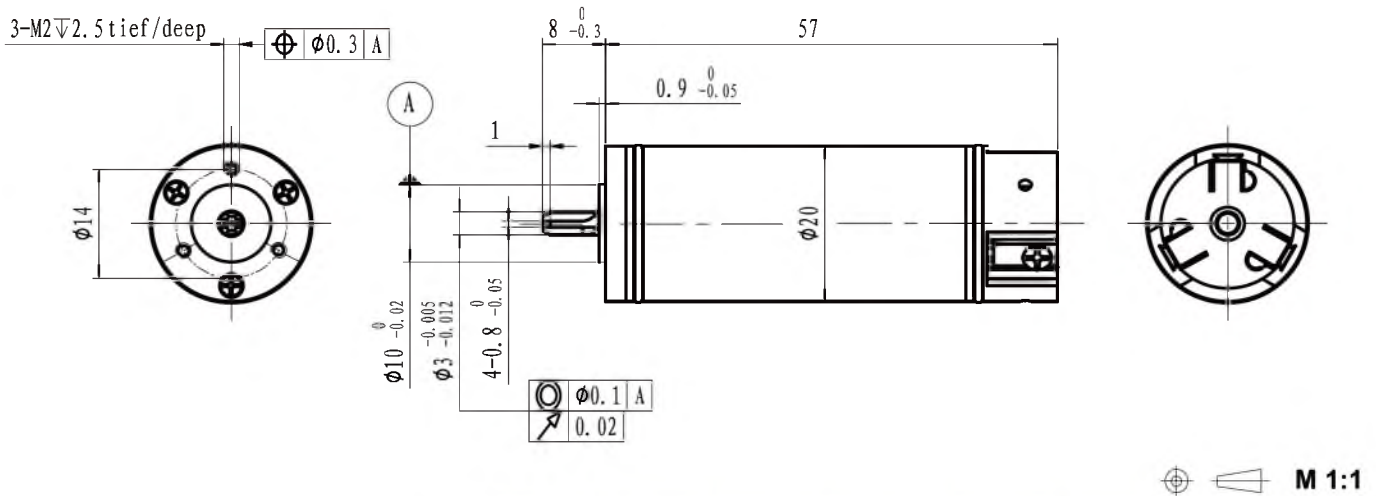
Connection

Conection

specical connector
please contact sales engineer

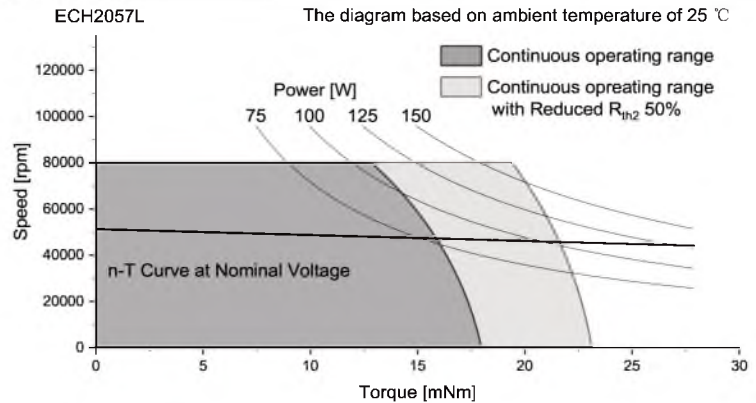
Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



Sensorless		EC2057L-...	1850	2450	3650	4850			
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	18	24	36	48			
2	No load speed	rpm	50202	50832	51286	50700			
3	No load current	mA	210	158	113	94			
4	Nominal speed	rpm	46263	46714	47334	46436			
5	Nominal torque	mNm	15	15	15	15			
6	Nominal current	A	4.61	3.50	2.36	1.76			
7	Stall torque	mNm	191.16	185.14	194.68	178.37			
8	Stall current	A	56.25	41.38	29.27	19.92			
9	Max. efficiency	%	88.2	88.0	88.0	86.7			
10	Terminal resistance	Ω	0.32	0.58	1.23	2.41			
11	Terminal inductance	mH	0.04	0.06	0.14	0.25			
12	Torque constant	mNm/A	3.41	4.49	6.68	9.00			
13	Speed constant	rpm/V	2799	2126	1430	1061			
14	Speed/torque gradient	rpm/mNm	263	275	263	284			
15	Mechanical time constant	ms	2.5	2.6	2.5	2.7			
16	Rotor inertia	gcm ²	0.91	0.91	0.91	0.91			

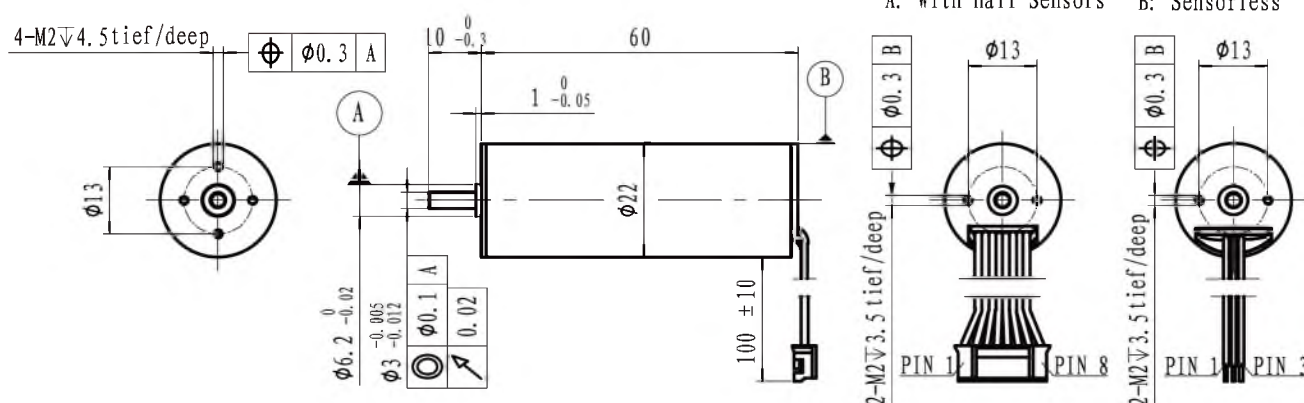
17	Thermal resistance housing-ambient	7.6 K/W
18	Thermal resistance winding-housing	1.6 K/W
19	Thermal time constant winding	5 s
20	Thermal time constant motor	410 s
21	Ambient temprature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	80000 rpm
24	Axial play at axial load	<3 N 0 mm
		>3 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	2.5 N
27	Max. force for press fits (static)	44 N
	(static, shaft supported)	1200 N
28	Max. radial loading, 5mm from flange	11 N
29	Number of pole pairs	1
30	Number of phases	3
31	Weight of motor	69 g

Operating Range**Connection****Conection**

specical connector
please contact sales engineer

Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



 **M 1:1.5**

		Sensorless	EC2260L-...	EC2260S-...	2440	3640					
		With hall sensor									
Motor data											
Values at nominal voltage											
1	Nominal voltage	V	24	36							
2	No load speed	rpm	41423	40020							
3	No load current	mA	100	65							
4	Nominal speed	rpm	36276	35320							
5	Nominal torque	mNm	15	15							
6	Nominal current	A	2.82	1.82							
7	Stall torque	mNm	120.72	127.74							
8	Stall current	A	22.02	15.00							
9	Max. efficiency	%	87.0	87.3							
10	Terminal resistance	Ω	1.09	2.4							
11	Terminal inductance	mH	0.17	0.39							
12	Torque constant	mNm/A	5.51	8.55							
13	Speed constant	rpm/V	1734	1117							
14	Speed/torque gradient	rpm/mNm	343	313							
15	Mechanical time constant	ms	2.6	2.3							
16	Rotor inertia	gcm ²	0.71	0.71							
17	Thermal resistance housing-ambient	9.6 K/W									
18	Thermal resistance winding-housing	2.5 K/W									
19	Thermal time constant winding	14 s									
20	Thermal time constant motor	448 s									
21	Ambient temperature	-30...+100°C									
22	Max. permissible winding temperature	+150°C									
23	Max. permissible speed	80000 rpm									
24	Axial play at axial load	<3 N 0 mm >3 N max. 0.3 mm									
25	Radial play	preloaded									
26	Max. axial load (dynamic)	2.5 N									
27	Max. force for press fits (static)	44 N									
	(static, shaft supported)	1200 N									
28	Max. radial loading, 5mm from flange	11 N									
29	Number of pole pairs	1									
30	Number of phases	3									
31	Weight of motor	92 g									

Operating Range

ECH2260

The diagram based on ambient temperature of 25 °C

Power [W]: 50, 65, 80, 95

Speed [rpm]: 0, 20000, 40000, 60000, 80000, 100000

Torque [mNm]: 0, 5, 10, 15, 20, 25

Continuous operating range

Continuous operating range with Reduced R_{th2} 50%

n-T Curve at Nominal Voltage

23 Thermal resistance housing-ambient 9.6 K/W

24 Thermal resistance winding-housing 2.5 K/W

25 Thermal time constant winding 14 s

26 Thermal time constant motor 448 s

27 Ambient temperature -30...+100°C

28 Max. permissible winding temperature +150°C

29 Max. permissible speed 80000 rpm

30 Axial play at axial load <3 N 0 mm
>3 N max. 0.3 mm

31 Radial play preloaded

32 Max. axial load (dynamic) 2.5 N

33 Max. force for press fits (static) 44 N

34 (static, shaft supported) 1200 N

35 Max. radial loading, 5mm from flange 11 N

36 Number of pole pairs 1

37 Number of phases 3

38 Weight of motor 92 g

Connection			Configuration
Conection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
Pin 1	Vhall 3-18 VDC	AWG26 black	
Pin 2	Hall sensor HA	AWG26 black	
Pin 3	Hall sensor HB	AWG26 black	
Pin 4	Hall sensor HC	AWG26 black	
Pin 5	GND	AWG26 black	
Pin 6	Motor winding MA	AWG26 black	
Pin 7	Motor winding MB	AWG26 black	
Pin 8	Motor winding MC	AWG26 black	
Conector JST PH2.0-8P			
Conection B (Sensorless)			
Pin 1	Motor winding MA	AWG26 yellow	
Pin 2	Motor winding MB	AWG26 green	
Pin 3	Motor winding MC	AWG26 blue	

Slotted

Brushless DC motors



Contents

BL SERIES	Inner running structure	P. 79-84
BD SERIES	Electronics integrated	P. 85-100
BF SERIES	Outer running structure	P. 101-109
ECI SERIES	Multipole internal rotor design	P. 111-115

SLOTTED BLDC MOTOR

BL Series

Inner running structure

Model	Dimension (mm)	Nominal Troque (mNm)	Nominal Speed (rpm)	Page
BL1632	Φ16x32	7	8000	81
BL2240	Φ22x40	12	9000	82
BL2847	Φ28x47	20	12000	83
BL3657	Φ36x57	40	12000	84

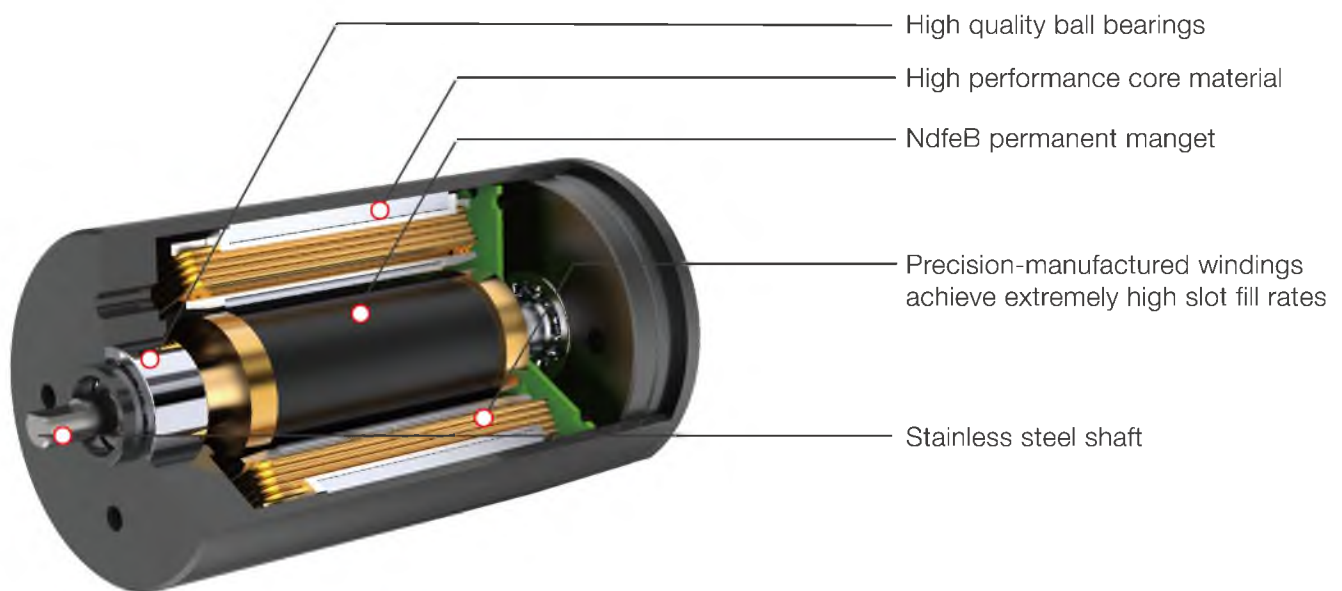


In fact, based on the technology of slotted brushless DC motors, we can provide a completely customized service for different applications and requirements, which can be a completely new product design or a replacement of the original model.

SLOTTED BLDC MOTOR

BL Series

The slotted structure design concentrates the magnetic field, improving efficiency and torque density, allowing the motor to achieve greater output in a smaller volume. The structure is rugged and able to withstand high mechanical stress, making it suitable for operation in harsh environments. Good heat dissipation is another advantage, and the slotted structure can effectively dissipate heat, reduce the risk of overheating, and improve the reliability of the motor. In addition, this motor is very precise in speed control, which is suitable for applications that require high-precision control.

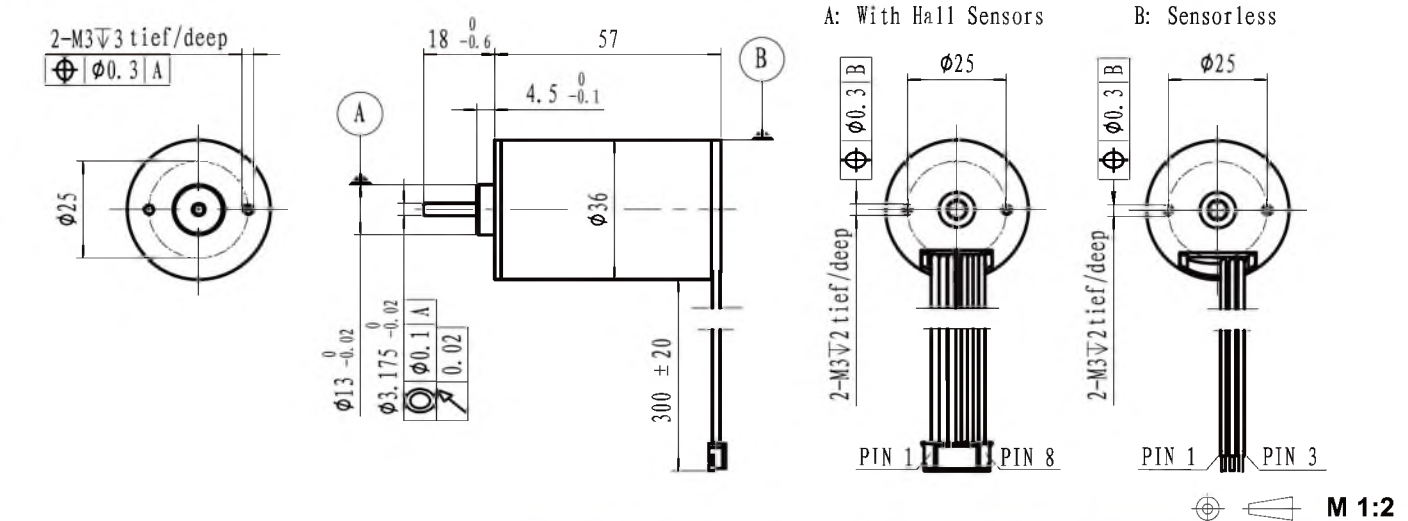


Basic Data:

Diameter: ϕ 16mm-36mm
Maximum Length: 57mm
Operate Voltage: 12V-48VDC
Maximum Permissible speed: 20,000rpm
Operate temperature: -30°C-+80°C

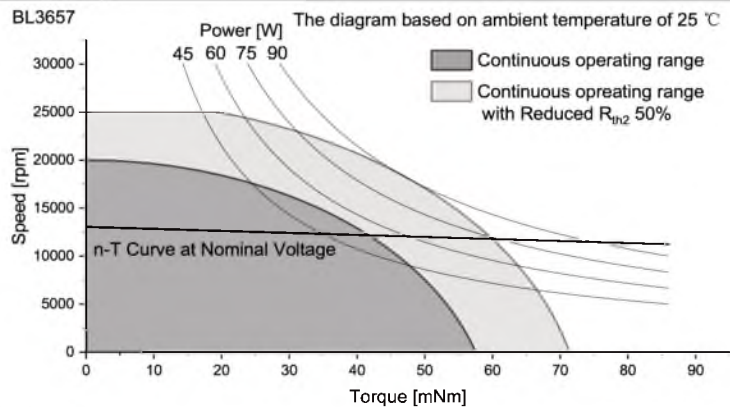
Typical features:

Cost effective
Large starting torque
Low noise
Good heat dissipation
Long operational lifetime
Customizable



	Sensorless	BL3657L-...	2413	3613					
	With hall sensor	BL3657S-...							
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	24	36					
2	No load speed	rpm	13150	13022					
3	No load current	mA	265	190					
4	Nominal speed	rpm	12230	12170					
5	Nominal torque	mNm	40	40					
6	Nominal current	A	2.58	1.72					
7	Stall torque	mNm	571.75	611.17					
8	Stall current	A	33.33	23.53					
9	Max. efficiency	%	83.0	82.8					
10	Terminal resistance	Ω	0.72	1.53					
11	Terminal inductance	mH	0.48	1.05					
12	Torque constant	mNm/A	17.29	26.19					
13	Speed constant	rpm/V	552	365					
14	Speed/torque gradient	rpm/mNm	23	21					
15	Mechanical time constant	ms	4.6	4.2					
16	Rotor inertia	gcm ²	19	19					
17	Thermal resistance housing-ambient	8 K/W							
18	Thermal resistance winding-housing	3.4 K/W							
19	Thermal time constant winding	26 s							
20	Thermal time constant motor	864 s							
21	Ambient temperature	-30...+100°C							
22	Max. permissible winding temperature	+150°C							
23	Max. permissible speed	25000 rpm							
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	7.5 N							
27	Max. force for press fits (static)	100 N							
28	Max. radial loading, 5mm from flange	2700 N							
29	Number of pole pairs	2							
30	Number of phases	3							
31	Weight of motor	223 g							

Operating Range



Connection

Connection A (Sensor)			PVC
Pin 1	Vhall 3-18 VDC	AWG26	black
Pin 2	Hall sensor HA	AWG26	black
Pin 3	Hall sensor HB	AWG26	black
Pin 4	Hall sensor HC	AWG26	black
Pin 5	GND	AWG26	black
Pin 6	Motor winding MA	AWG26	black
Pin 7	Motor winding MB	AWG26	black
Pin 8	Motor winding MC	AWG26	black
Connector			JST PH2.0-8P

Connection B (Sensorless)			PVC
Pin 1	Motor winding MA	AWG26	yellow
Pin 2	Motor winding MB	AWG26	green
Pin 3	Motor winding MC	AWG26	blue

Configuration

Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard flange front&back/customize the flange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

BD Series

Electronics integrated

Model	Dimension (mm)	Nominal Troque (mNm)	Nominal Speed (rpm)	Page
BD1621	Φ16x21	1.5	5000	88
BD1632	Φ16x32	2.5	5000	89
BD2232	Φ22x32	4	5000	90
BD2438	Φ24x38	10	3000	91
BD2448	Φ24x48	15	2500	92
BD2854	Φ28x54	25	3000	93
BD3238	Φ32x38	30	3000	94
BD3248	Φ32x48	40	3000	95
BD3260	Φ32x60	45	3000	96
BD3650	Φ36x50	50	3000	97
BD3670	Φ36x70	60	3000	98
BD4270	Φ42x70	80	3000	99
BD4290	Φ42x90	100	3000	100



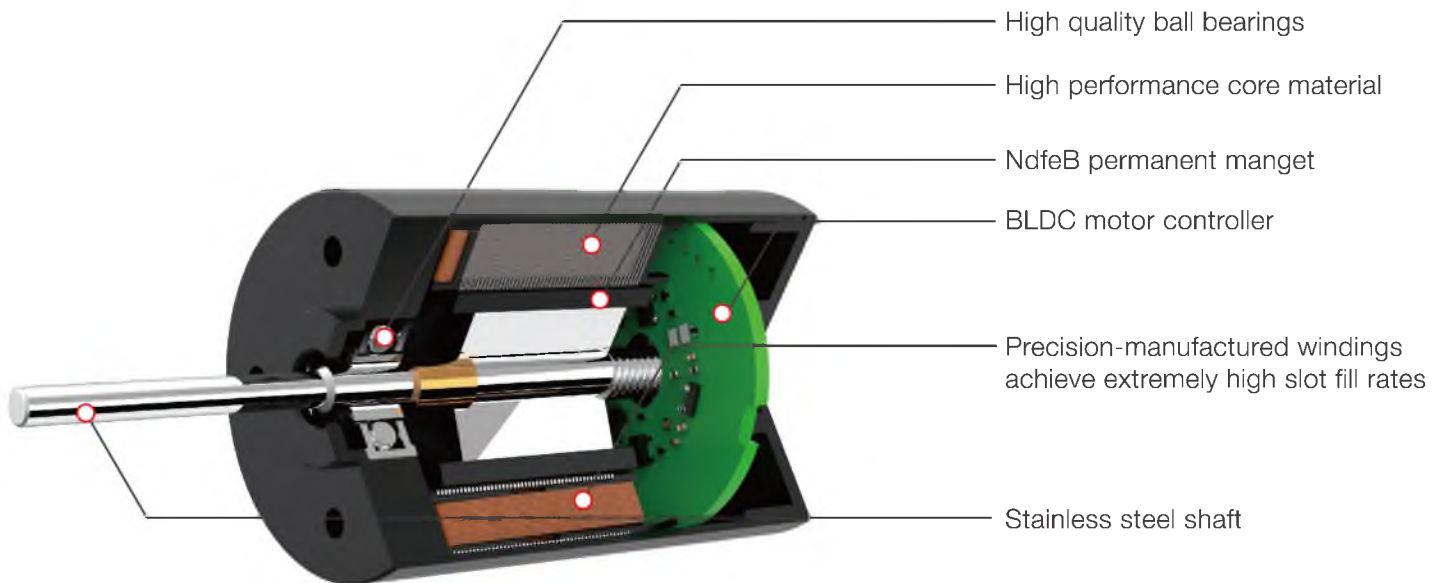
SLOTTED BLDC MOTOR

BD Series

Electronics integrated

With the integrated controller, the series simplifies system design, reduces external wiring and components, and makes the overall structure more compact. Second, the integrated design reduces points of failure and improves the reliability and durability of the system. Because the controller is seamlessly matched to the motor, the integrated solution also optimizes motor performance, provides more precise control, and improves efficiency and dynamic response.

In addition, the integrated motor takes up less space, reducing installation complexity and cost. At the same time, the simplified installation and maintenance process also reduces operating time and maintenance costs.



Basic Data:

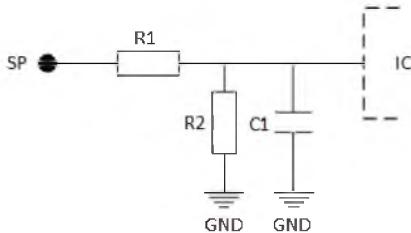
Diameter: $\phi 16\text{mm}-42\text{mm}$
Maximum Length: 90mm
Operate Voltage: 4.5V-24VDC
Maximum Permissible speed: 10,000rpm
Operate temperature: $-30^{\circ}\text{C}-+80^{\circ}\text{C}$

Typical features:

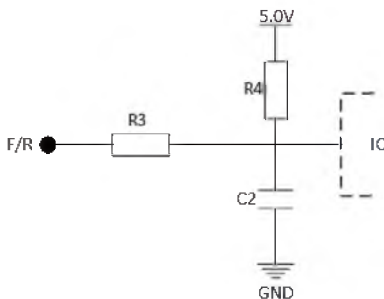
Electronics integrated
Cost effective
Large starting torque
Low noise
Good heat dissipation
Long operational lifetime
Customizable

I/O Schematics

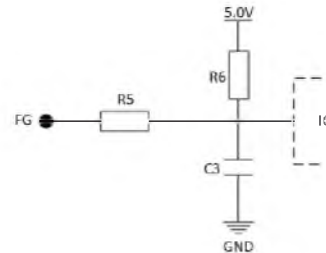
Speed command input



Direction command input



Speed output



Speed output signal



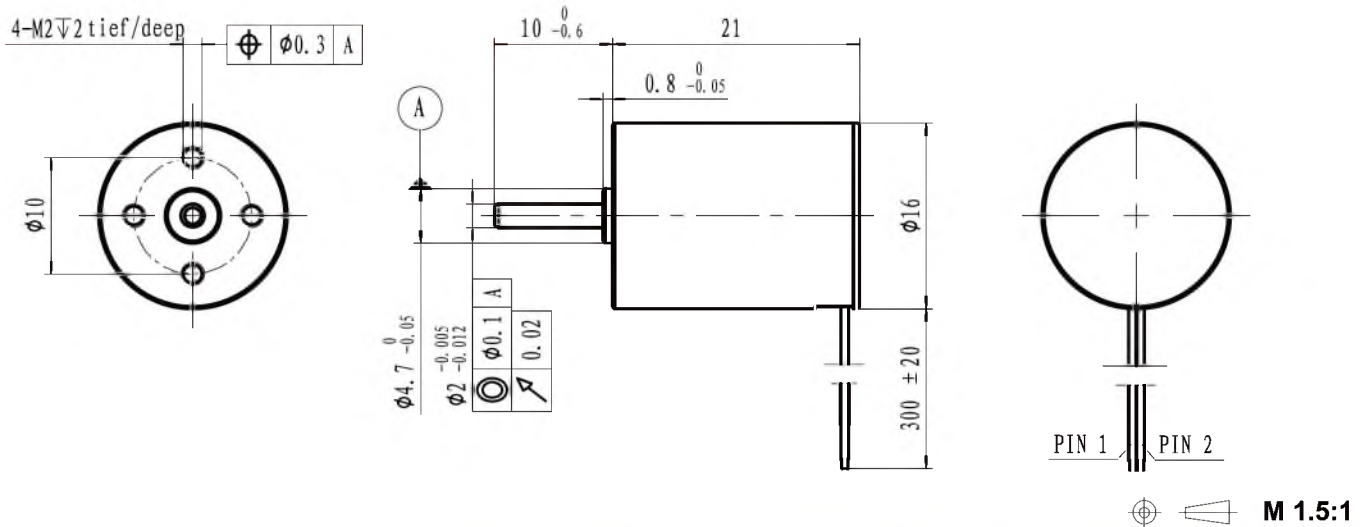
Electrical Connections

Version	Description
5-Wire	1 Power supply
	2 GND
	3 Speed command input(SP)
	4 Direction command input(F/R)
	5 Speed signal output (FG)

ECD12 and ECD16, because these two models use integrated chips.

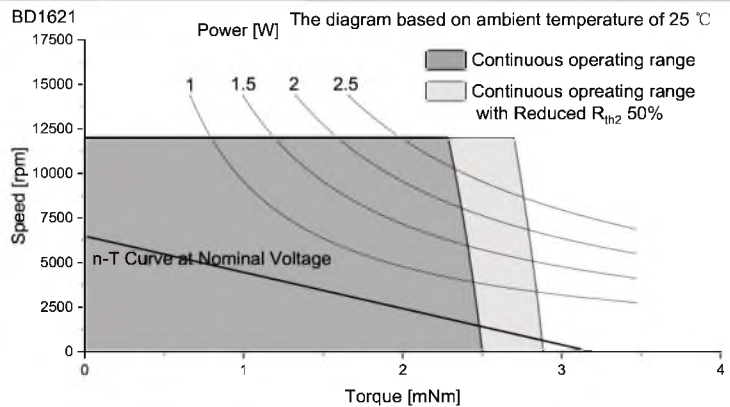
The built-in series product interface is configured up to five wires, with three function pins, namely speed control SP (compatible with analog voltage and PWM duty cycle control, PWM frequency range of 10KHz -35KHz, 5V TTL level), forward and reverse control F/R (CCW operation by default, CW operation by connecting ground), speed feedback output FG (one pulse per turn). If you need enable and brake functions, you need to replace the two functions among three function pins above.

Please note that the standard products in the catalog are two-wire, only power and ground wires



	Sensorless	BD1621L-...	0308	0606						
Motor data										
Values at nominal voltage										
1 Nominal voltage	V		3	6						
2 No load speed	rpm		8492	6500						
3 No load current	mA		100	50						
4 Nominal speed	rpm		5267	3483						
5 Nominal torque	mNm		1.5	1.5						
6 Nominal current	A		0.58	0.24						
7 Stall torque	mNm		3.95	3.23						
8 Stall current	A		1.36	0.46						
9 Max. efficiency	%		53.2	45.0						
10 Supply voltage +Vcc	V		2.7..5	4.5..7						
11 Direction of rotation			CW	CW						
12 Torque constant	mNm/A		3.13	7.86						
13 Speed constant	rpm/V		3055	1215						
14 Speed/torque gradient	rpm/mNm		2150	2012						
15 Mechanical time constant	ms		4.5	4.2						
16 Rotor inertia	gcm ²		0.2	0.2						

17 Thermal resistance housing-ambient	25.7 K/W
18 Thermal resistance winding-housing	18.7 K/W
19 Thermal time constant winding	11 s
20 Thermal time constant motor	288 s
21 Ambient temperature	-30...+100°C
22 Max. permissible winding temperature	+150°C
23 Max. permissible speed	12000 rpm
24 Axial play at axial load	<1.8 N 0 mm
	>1.8 N max. 0.3 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	1.3 N
27 Max. force for press fits (static)	15 N
(static, shaft supported)	350 N
28 Max. radial loading, 5mm from flange	5 N
29 Number of pole pairs	2
30 Number of phases	3
31 Weight of motor	14.7 g

Operating Range**Controller features**

Sensorless, Open loop, $I_{max} < 0.5A$
Overload protection, Stall protection
Max. temperature of electronics

Connection

Conection	PVC
Pin 1 +VCC	AWG28 red
Pin 2 GND	AWG28 black

Caution:

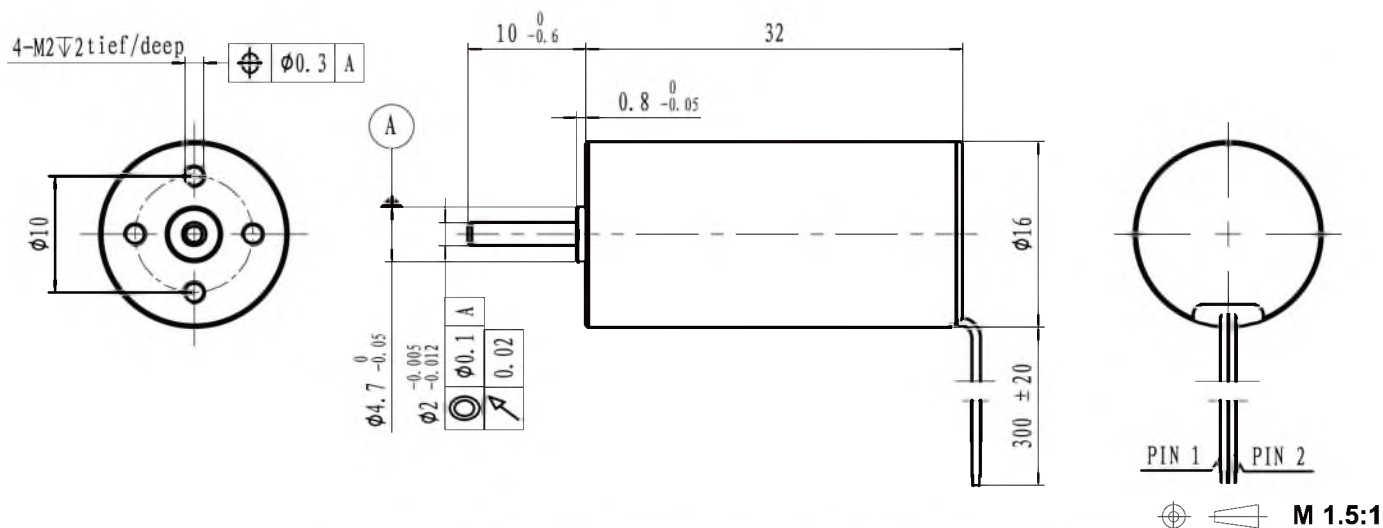
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

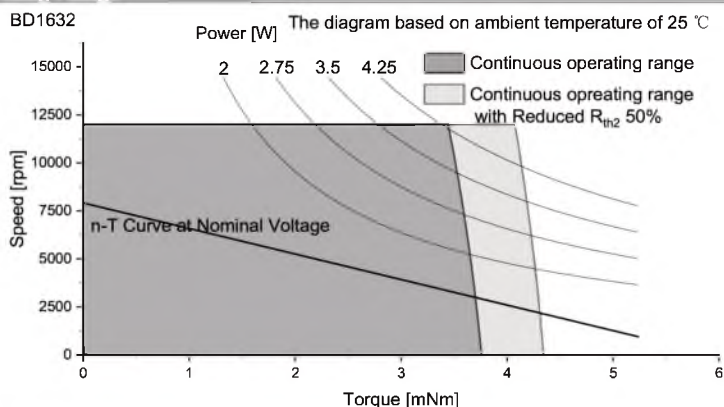
More:

Please contact our sales engineers



Sensorless		BD1632L-...	0608	1208						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	6	12						
2	No load speed	rpm	8032	8055						
3	No load current	mA	80	40						
4	Nominal speed	rpm	5046	4865						
5	Nominal torque	mNm	2.5	2.5						
6	Nominal current	A	0.46	0.23						
7	Stall torque	mNm	6.72	6.31						
8	Stall current	A	1.10	0.52						
9	Max. efficiency	%	53.3	52.2						
10	Supply voltage +Vcc	V	4.5..7	8..13						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	6.61	13.13						
13	Speed constant	rpm/V	1444	727						
14	Speed/torque gradient	rpm/mNm	1194	1276						
15	Mechanical time constant	ms	4.6	4.9						
16	Rotor inertia	gcm ²	0.37	0.37						
17	Thermal resistance housing-ambient	17.6 K/W								
18	Thermal resistance winding-housing	17.5 K/W								
19	Thermal time constant winding	11.4 s								
20	Thermal time constant motor	301 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	12000 rpm								
24	Axial play at axial load	<1.8 N 0 mm >1.8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	1.3 N								
27	Max. force for press fits (static)	15 N								
28	Max. radial loading, 5mm from flange	350 N								
29	Number of pole pairs	2								
30	Number of phases	3								
31	Weight of motor	23 g								

Operating Range



Controller features

Sensorless, Open loop, $I_{max} < 0.5A$
Overload protection, Stall protection
Max. temperature of electronics +105°C

Connection

Conection	PVC
Pin 1 +VCC	AWG28 red
Pin 2 GND	AWG28 black

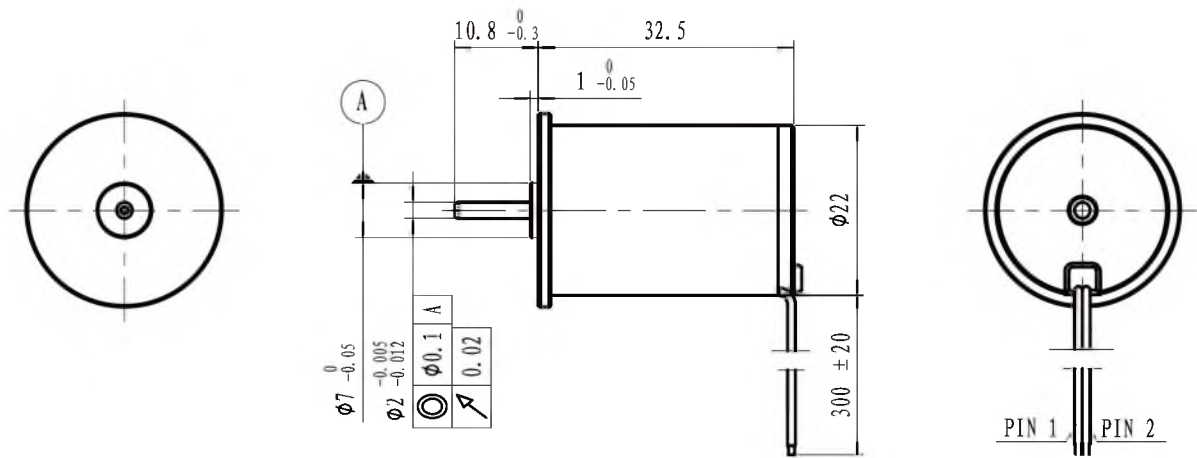
Caution:

Incorrect lead connection will damage the controller!

Configuration

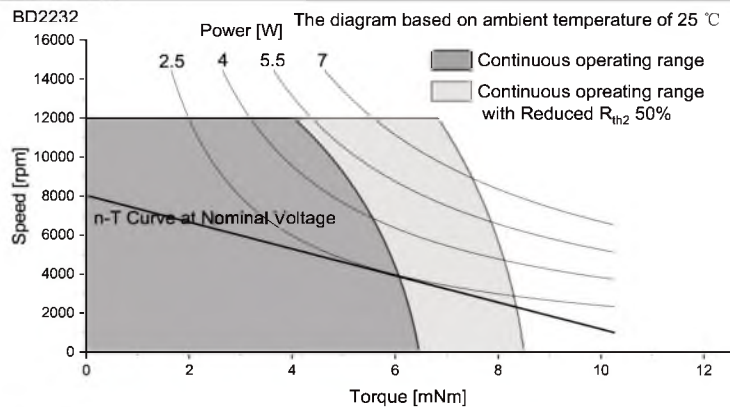
Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

More:
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With hall sensor		BD2232S-...	0608	1208						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	6	12						
2	No load speed	rpm	8024	7882						
3	No load current	mA	90	60						
4	Nominal speed	rpm	5288	4998						
5	Nominal torque	mNm	4	4						
6	Nominal current	A	0.68	0.36						
7	Stall torque	mNm	11.73	10.93						
8	Stall current	A	1.82	0.87						
9	Max. efficiency	%	60.5	54.3						
10	Supply voltage +Vcc	V	10..28	10.28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	6.79	13.53						
13	Speed constant	rpm/V	1407	706						
14	Speed/torque gradient	rpm/mNm	684	721						
15	Mechanical time constant	ms	15.0	15.9						
16	Rotor inertia	gcm ²	2.1	2.1						

17	Thermal resistance housing-ambient	15.2 K/W
18	Thermal resistance winding-housing	6.0 K/W
19	Thermal time constant winding	11 s
20	Thermal time constant motor	383 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	12000 rpm
24	Axial play at axial load	<4 N 0 mm
		>4 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	3.5 N
27	Max. force for press fits (static)	44 N
	(static, shaft supported)	1200 N
28	Max. radial loading, 5mm from flange	15 N
29	Number of pole pairs	2
30	Number of phases	3
31	Weight of motor	34 g

Operating Range**Controller features**

Sensor, Open loop, $I_{max} < 1.5A$
Overload protection, Stall protection
Max. temperature of electronics

Connection

Conection	PVC
Pin 1 +VCC	AWG28 red
Pin 2 GND	AWG28 black

Caution:

Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback

Performance: Customized in the continuous operating range

Ball bearing: Preload

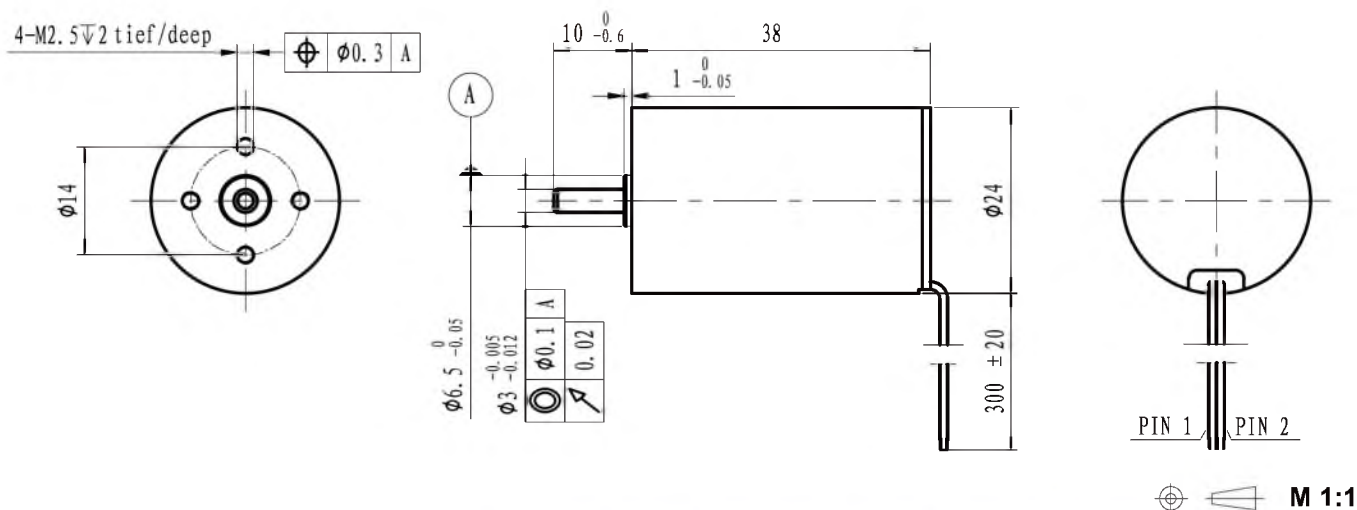
Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face

Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length

Connector: JST/MOLEX/TE

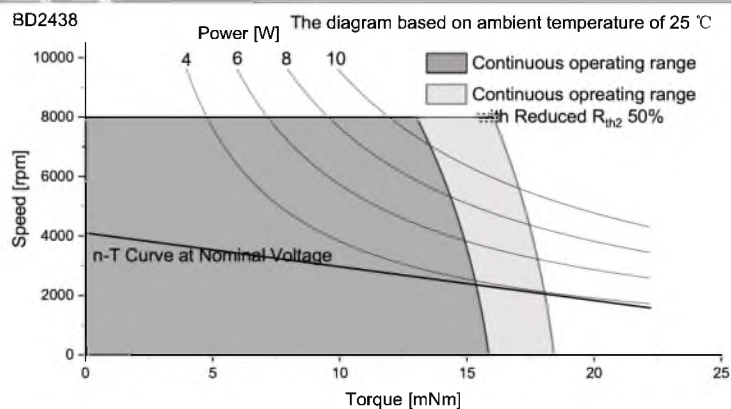
More:
Please contact our sales engineers



With hall sensor		BD2438S-...	1204	2404						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	4045	4101						
3	No load current	mA	90	50						
4	Nominal speed	rpm	2907	2913						
5	Nominal torque	mNm	10	10						
6	Nominal current	A	0.47	0.24						
7	Stall torque	mNm	35.53	34.52						
8	Stall current	A	1.43	0.71						
9	Max. efficiency	%	56.1	54.1						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	26.54	51.97						
13	Speed constant	rpm/V	360	184						
14	Speed/torque gradient	rpm/mNm	114	119						
15	Mechanical time constant	ms	3.4	3.5						
16	Rotor inertia	gcm ²	2.85	2.85						

17	Thermal resistance housing-ambient	10.2 K/W
18	Thermal resistance winding-housing	6.4 K/W
19	Thermal time constant winding	36 s
20	Thermal time constant motor	555 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load	<4 N 0 mm >4 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	3.5 N
27	Max. force for press fits (static)	44 N
27	(static, shaft supported)	1200 N
28	Max. radial loading, 5mm from flange	15 N
29	Number of pole pairs	3
30	Number of phases	3
31	Weight of motor	57 g

Operating Range



Controller features

Sensor, Open loop, $I_{max} < 1.5A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection	PVC
Pin 1 +VCC	AWG24 red
Pin 2 GND	AWG24 black

Caution:

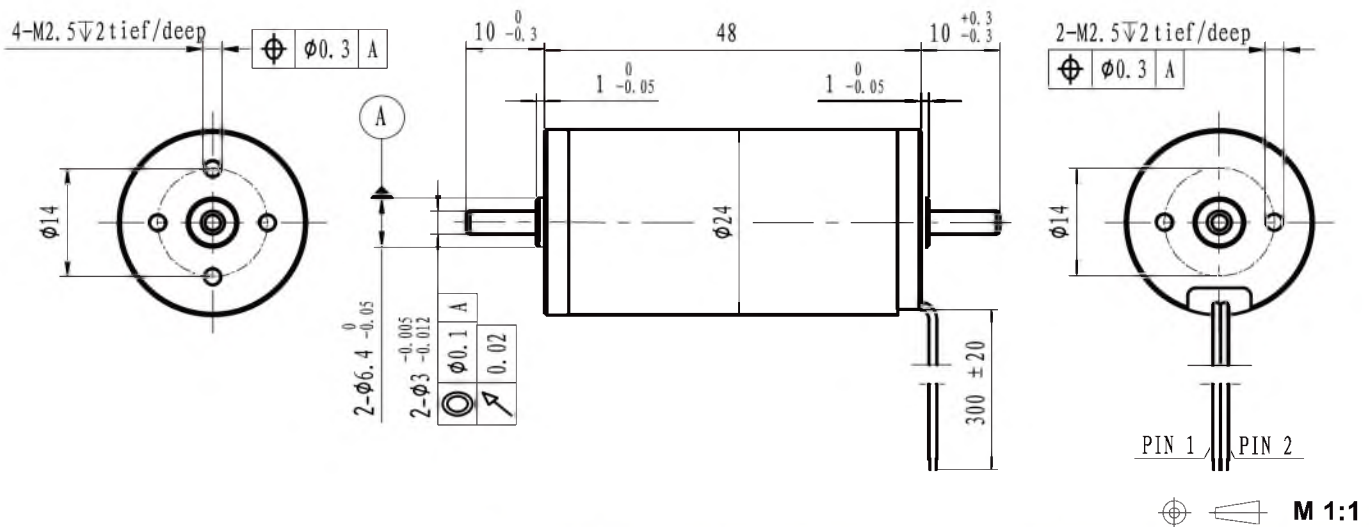
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

More:

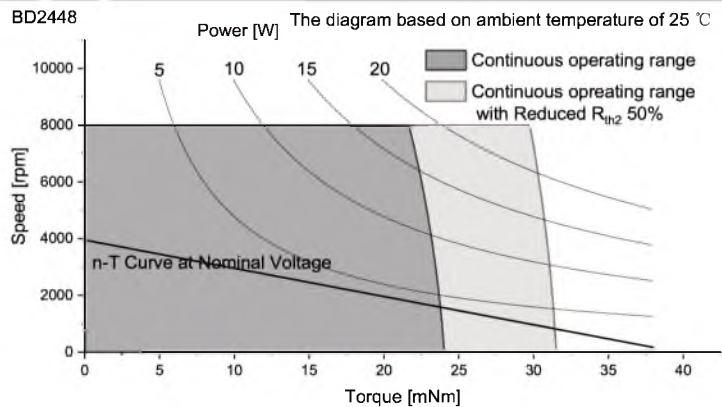
Please contact our sales engineers



With hall sensor			BD2448S-...	1204	2404					
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	3916	4011						
3	No load current	mA	90	50						
4	Nominal speed	rpm	2404	2399						
5	Nominal torque	mNm	15	15						
6	Nominal current	A	0.64	0.33						
7	Stall torque	mNm	38.86	37.33						
8	Stall current	A	1.50	0.75						
9	Max. efficiency	%	57.0	55.0						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	27.51	53.33						
13	Speed constant	rpm/V	347	179						
14	Speed/torque gradient	rpm/mNm	101	107						
15	Mechanical time constant	ms	3.8	4.0						
16	Rotor inertia	gcm^2	3.57	3.57						

17	Thermal resistance housing-ambient	10.2 K/W
18	Thermal resistance winding-housing	6.4 K/W
19	Thermal time constant winding	36 s
20	Thermal time constant motor	555 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load	<4 N 0 mm
		>4 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	3.5 N
27	Max. force for press fits (static)	44 N
	(static, shaft supported)	1200 N
28	Max. radial loading, 5mm from flange	15 N
29	Number of pole pairs	3
30	Number of phases	3
31	Weight of motor	94 g

Operating Range



Controller features	
Sensor, Open loop, $I_{max} < 1.5A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

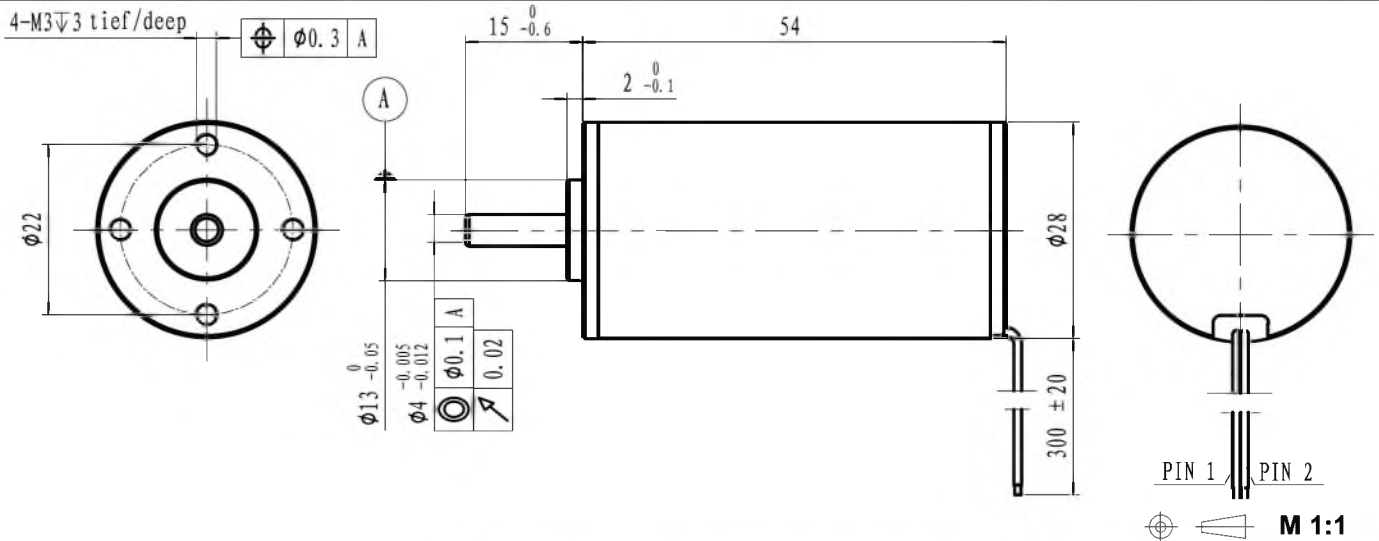
Connection

Conection		PVC	
Pin 1	+VCC	AWG24	red
Pin 2	GND	AWG24	black

Caution:

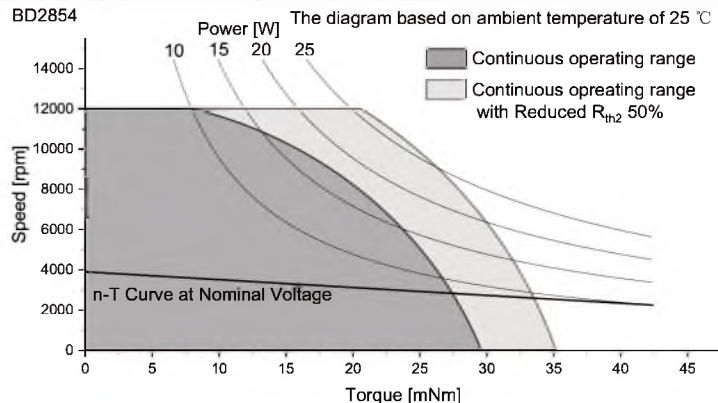
Caution:
Incorrect lead connection will damage the controller!

More:
Please contact our sales engineers



With hall sensor		BD2854S-...	1204	2404					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	3950	4011					
3	No load current	mA	110	70					
4	Nominal speed	rpm	2964	3218					
5	Nominal torque	mNm	25	25					
6	Nominal current	A	1.00	0.52					
7	Stall torque	mNm	100.17	126.43					
8	Stall current	A	3.67	2.35					
9	Max. efficiency	%	68.4	68.5					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	28.14	55.44					
13	Speed constant	rpm/V	339	172					
14	Speed/torque gradient	rpm/mNm	39	32					
15	Mechanical time constant	ms	2.6	2.1					
16	Rotor inertia	gcm ²	6.4	6.4					
17	Thermal resistance housing-ambient	11.2 K/W							
18	Thermal resistance winding-housing	8 K/W							
19	Thermal time constant winding	29 s							
20	Thermal time constant motor	1211 s							
21	Ambient temperature	-30...+100°C							
22	Max. permissible winding temperature	+150°C							
23	Max. permissible speed	12000 rpm							
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	7.5 N							
27	Max. force for press fits (static)	100 N							
	(static, shaft supported)	2000 N							
28	Max. radial loading, 5mm from flange	25 N							
29	Number of pole pairs	3							
30	Number of phases	3							
31	Weight of motor	156 g							

Operating Range



Controller features

Sensor, Open loop, $I_{max} < 1.8A$
 Overload protection, Stall protection
 Max. temperature of electronics +105°C

Connection

Conection
 Pin 1 +VCC PVC
 Pin 2 GND AWG22 red
 AWG22 black

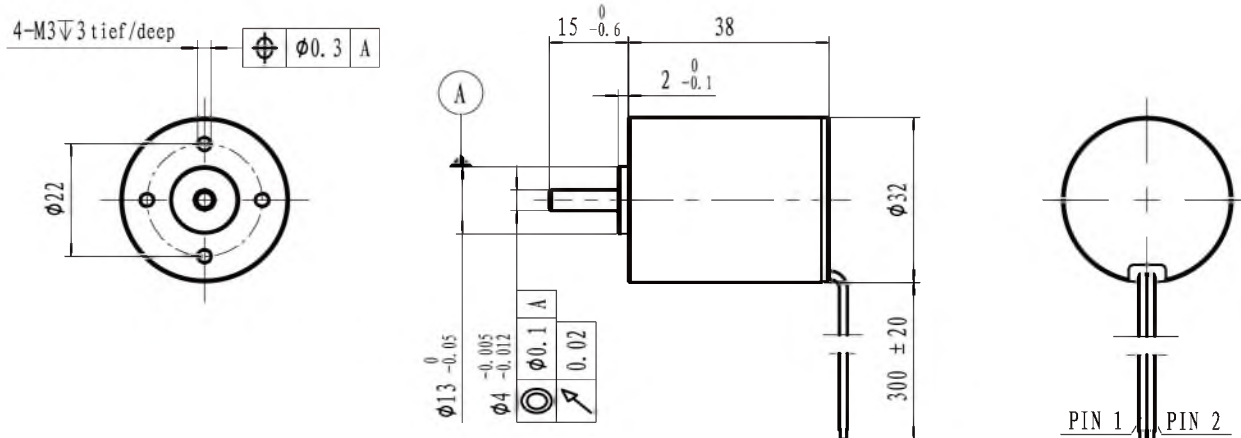
Caution:

Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:
 Please contact our sales engineers

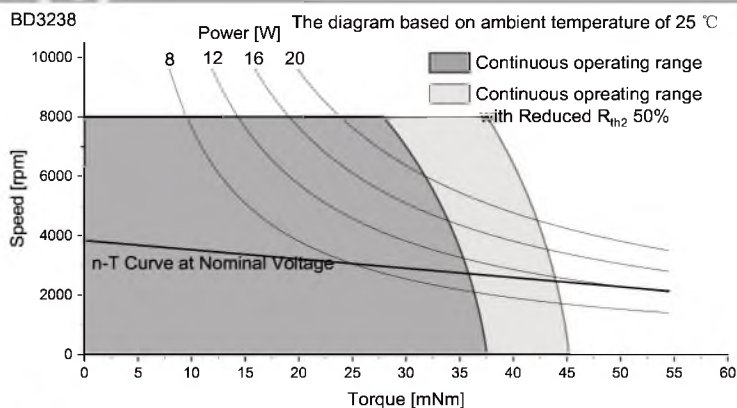


M 1:1.5

		With hall sensor	BD3238S-...	1204	2404					
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	3981	3998						
3	No load current	mA	140	90						
4	Nominal speed	rpm	2925	2969						
5	Nominal torque	mNm	30	30						
6	Nominal current	A	1.22	0.64						
7	Stall torque	mNm	113.06	116.59						
8	Stall current	A	4.20	2.21						
9	Max. efficiency	%	66.8	63.7						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	27.83	54.99						
13	Speed constant	rpm/V	343	174						
14	Speed/torque gradient	rpm/mNm	35	34						
15	Mechanical time constant	ms	4.6	4.5						
16	Rotor inertia	gcm^2	12.5	12.5						

17	Thermal resistance housing-ambient	9.3 K/W
18	Thermal resistance winding-housing	5.7 K/W
19	Thermal time constant winding	15 s
20	Thermal time constant motor	432 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load <8 N	0 mm
	>8 N	max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
	(static, shaft supported)	2700 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	7
30	Number of phases	3
31	Weight of motor	101 g

Operating Range



Controller features

Sensor, Open loop, $I_{max} < 2.2A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection		PVC	
Pin 1	+VCC	AWG22	red
Pin 2	GND	AWG22	black

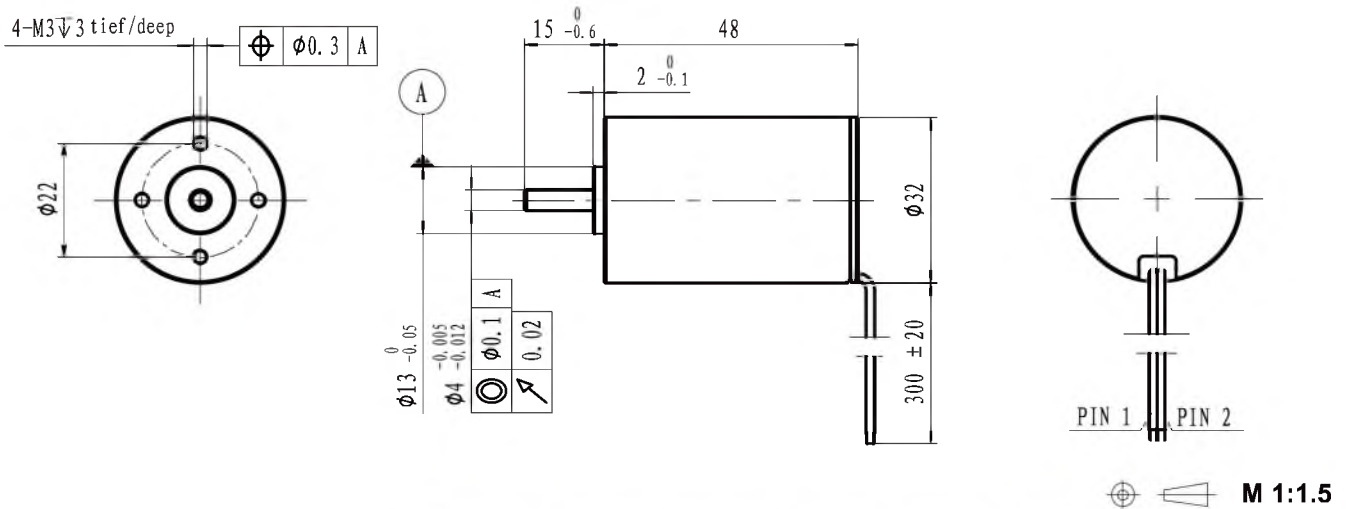
Caution:

Caution:
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

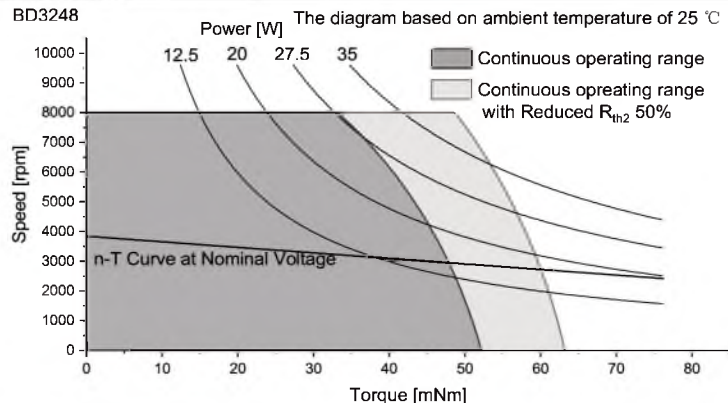
More:
Please contact our sales engineers



With hall sensor		BD3248S-...	1204	2404						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	3950	3978						
3	No load current	mA	180	110						
4	Nominal speed	rpm	3170	3299						
5	Nominal torque	mNm	40	40						
6	Nominal current	A	1.59	0.82						
7	Stall torque	mNm	202.61	234.27						
8	Stall current	A	7.34	4.28						
9	Max. efficiency	%	71.1	70.5						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	28.30	56.13						
13	Speed constant	rpm/V	337	170						
14	Speed/torque gradient	rpm/mNm	19	17						
15	Mechanical time constant	ms	3.2	2.8						
16	Rotor inertia	gcm ²	15.5	15.5						
17	Thermal resistance housing-ambient	8.2 K/W								
18	Thermal resistance winding-housing	4.7 K/W								
19	Thermal time constant winding	17 s								
20	Thermal time constant motor	484 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	8000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
28	Max. radial loading, 5mm from flange	2700 N								
29	Number of pole pairs	7								
30	Number of phases	3								
31	Weight of motor	113 g								

Operating Range

BD3248



Controller features

Sensor, Open loop, $I_{max} < 2.2A$
 Overload protection, Stall protection
 Max. temperature of electronics +105°C

Connection

Conection

Pin 1	+VCC	PVC
Pin 2	GND	AWG22 red
		AWG22 black

Caution:

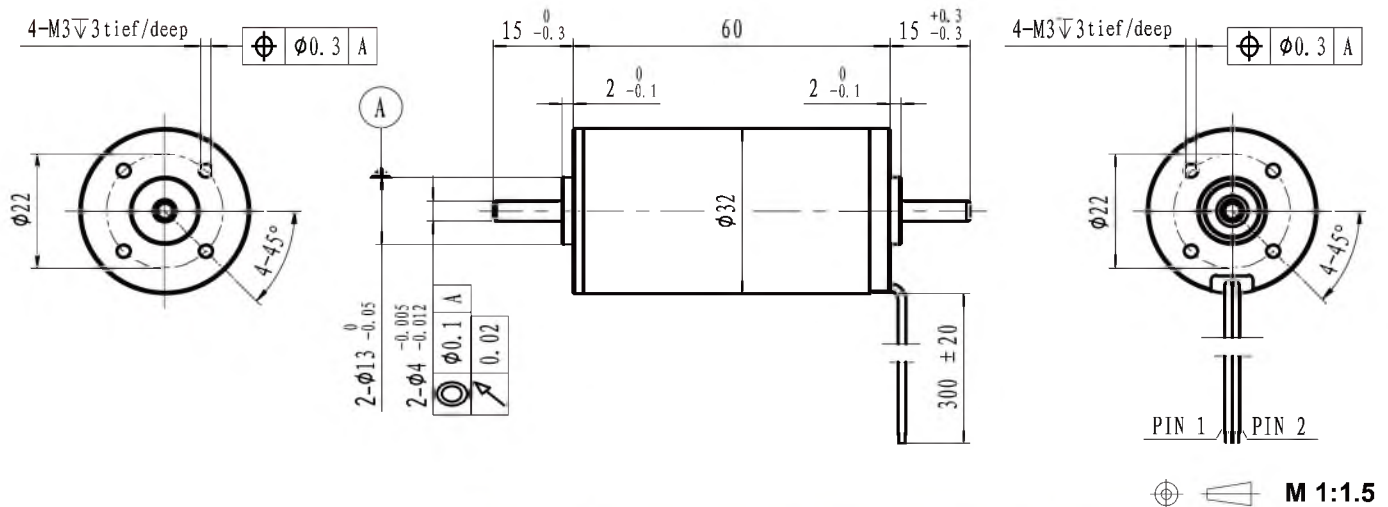
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:

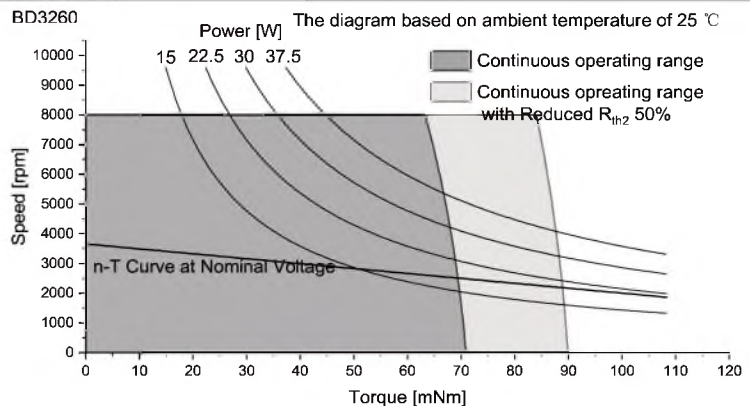
Please contact our sales engineers



			1204	2404					
With hall sensor			BD3260S-...						
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	3650	3597					
3	No load current	mA	190	100					
4	Nominal speed	rpm	2914	3001					
5	Nominal torque	mNm	45	45					
6	Nominal current	A	1.66	0.82					
7	Stall torque	mNm	223.24	271.47					
8	Stall current	A	7.49	4.46					
9	Max. efficiency	%	70.7	72.3					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	30.60	62.29					
13	Speed constant	rpm/V	312	153					
14	Speed/torque gradient	rpm/mNm	16	13					
15	Mechanical time constant	ms	3.2	2.6					
16	Rotor inertia	gcm^2	18.6	18.6					

17	Thermal resistance housing-ambient	6.0 K/W
18	Thermal resistance winding-housing	1.9 K/W
19	Thermal time constant winding	19 s
20	Thermal time constant motor	435 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load <8 N	0 mm
	>8 N	max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
	(static, shaft supported)	2700 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	7
30	Number of phases	3
31	Weight of motor	150 g

Operating Range



Controller features	
Sensor, Open loop, $I_{max} < 2.2A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection		PVC	
Pin 1	+VCC	AWG22	red
Pin 2	GND	AWG22	black

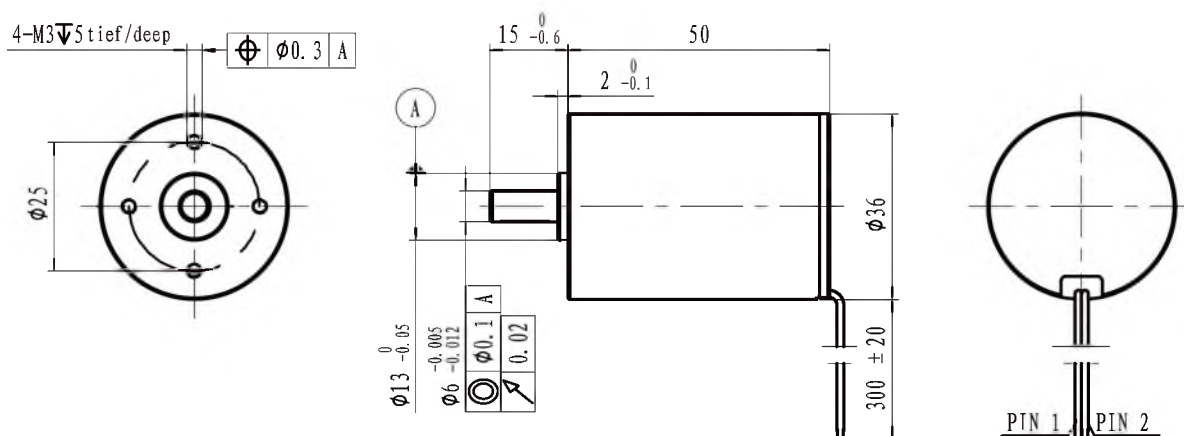
Caution:

Caution:
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

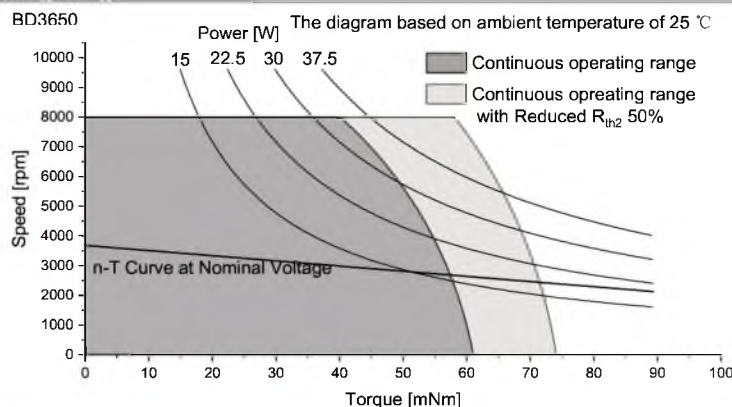
More:
Please contact our sales engineers



M 1:1.5

With hall sensor		BD3650S-...	1204	2404						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	3621	3650						
3	No load current	mA	180	100						
4	Nominal speed	rpm	2864	3039						
5	Nominal torque	mNm	50	50						
6	Nominal current	A	1.80	0.91						
7	Stall torque	mNm	239.07	298.92						
8	Stall current	A	7.91	4.96						
9	Max. efficiency	%	72.1	73.6						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	30.93	61.52						
13	Speed constant	rpm/V	309	155						
14	Speed/torque gradient	rpm/mNm	15	12						
15	Mechanical time constant	ms	4.6	3.7						
16	Rotor inertia	gcm ²	29.2	29.2						
17	Thermal resistance housing-ambient	6.5 K/W								
18	Thermal resistance winding-housing	3.6 K/W								
19	Thermal time constant winding	45 s								
20	Thermal time constant motor	630 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	8000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
28	Max. radial loading, 5mm from flange	2700 N								
29	Number of pole pairs	6								
30	Number of phases	3								
31	Weight of motor	150 g								

Operating Range



Controller features

Sensor, Open loop, $I_{max} < 4A$
 Overload protection, Stall protection
 Max. temperature of electronics +105°C

Connection

Conection

Pin 1	+VCC	PVC	red
Pin 2	GND	AWG20	black

Caution:

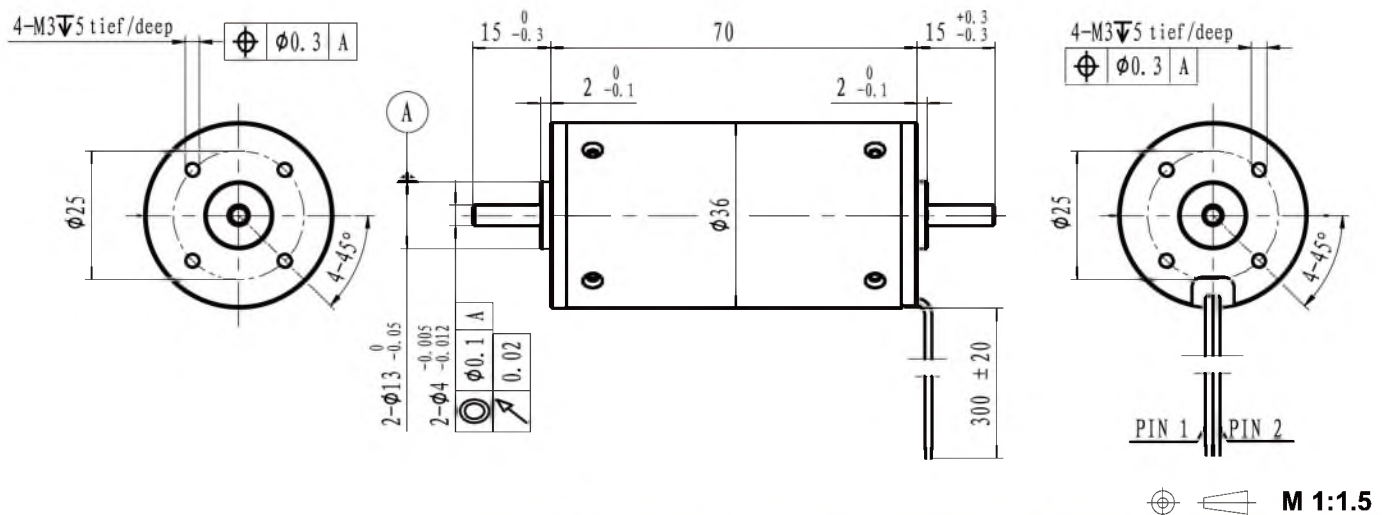
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:

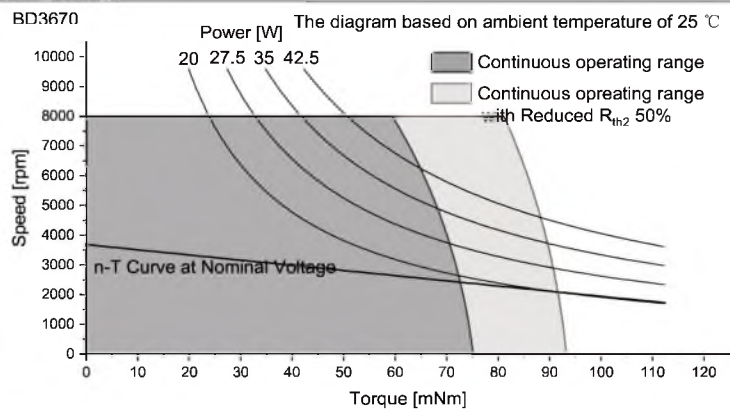
Please contact our sales engineers



With hall sensor			BD3670S-...	1204	2404					
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	3700	3611						
3	No load current	mA	180	100						
4	Nominal speed	rpm	2751	2894						
5	Nominal torque	mNm	60	60						
6	Nominal current	A	2.16	1.06						
7	Stall torque	mNm	233.97	302.15						
8	Stall current	A	7.91	4.96						
9	Max. efficiency	%	72.1	73.6						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	30.27	62.19						
13	Speed constant	rpm/V	316	154						
14	Speed/torque gradient	rpm/mNm	16	12						
15	Mechanical time constant	ms	5.5	4.2						
16	Rotor inertia	gcm^2	33.2	33.2						

17	Thermal resistance housing-ambient	4.7 K/W
18	Thermal resistance winding-housing	2 K/W
19	Thermal time constant winding	46 s
20	Thermal time constant motor	816 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load <8 N	0 mm
	>8 N	max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
	(static, shaft supported)	2700 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	6
30	Number of phases	3
31	Weight of motor	196 g

Operating Range



Controller features	
Sensor, Open loop, $I_{max} < 4A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

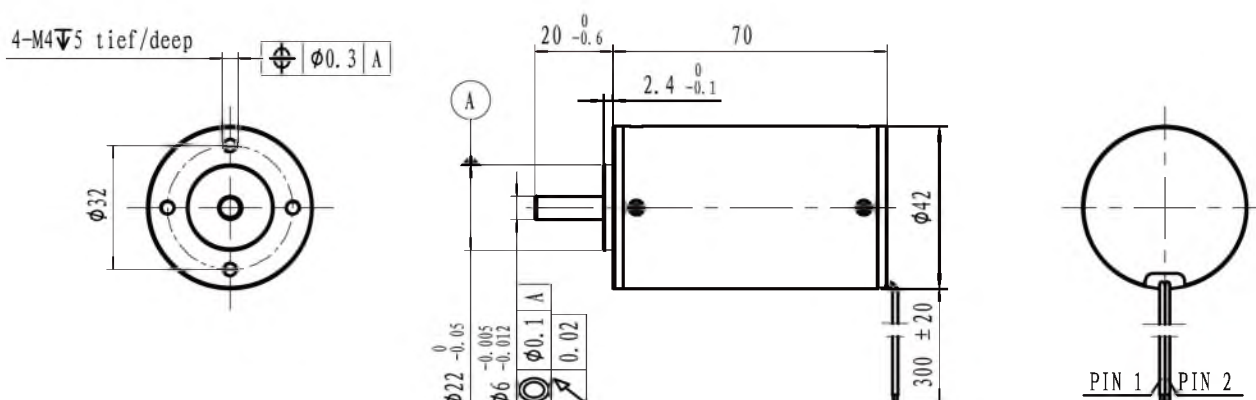
Connection

Conection		PVC	
Pin 1	+VCC	AWG20	red
Pin 2	GND	AWG20	black

Caution:

Caution:
Incorrect lead connection will damage the controller!

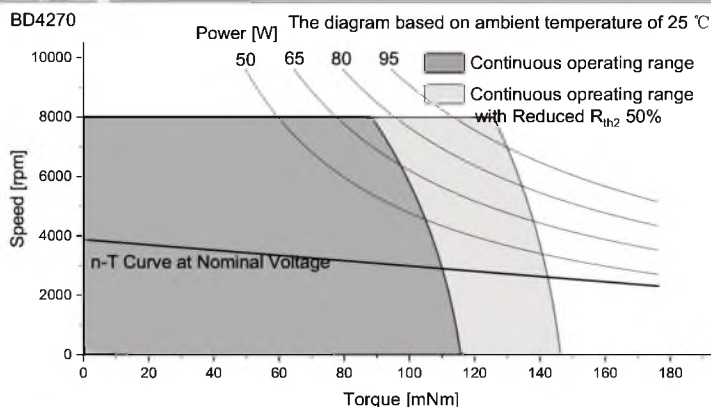
More:
Please contact our sales engineers



M 1:2

With hall sensor		BD4270S-...	1204	2404						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	3878	3912						
3	No load current	mA	260	180						
4	Nominal speed	rpm	3154	3550						
5	Nominal torque	mNm	80	80						
6	Nominal current	A	3.02	1.56						
7	Stall torque	mNm	428.23	863.89						
8	Stall current	A	15.01	15.10						
9	Max. efficiency	%	75.4	79.4						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	29.04	57.89						
13	Speed constant	rpm/V	329	165						
14	Speed/torque gradient	rpm/mNm	9	5						
15	Mechanical time constant	ms	3.7	1.9						
16	Rotor inertia	gcm ²	39.3	39.3						
17	Thermal resistance housing-ambient	1.2 K/W								
18	Thermal resistance winding-housing	1.4 K/W								
19	Thermal time constant winding	12 s								
20	Thermal time constant motor	623 s								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	8000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
28	Max. radial loading, 5mm from flange	2700 N								
29	Number of pole pairs	3								
30	Number of phases	3								
31	Weight of motor	313 g								

Operation Range



Controller features

Sensor, Open loop, $I_{max} < 4A$
 Overload protection, Stall protection
 Max. temperature of electronics +105°C

Connection

Conection

Pin 1	+VCC	PTFE	red
Pin 2	GND	AWG20	black

Caution:

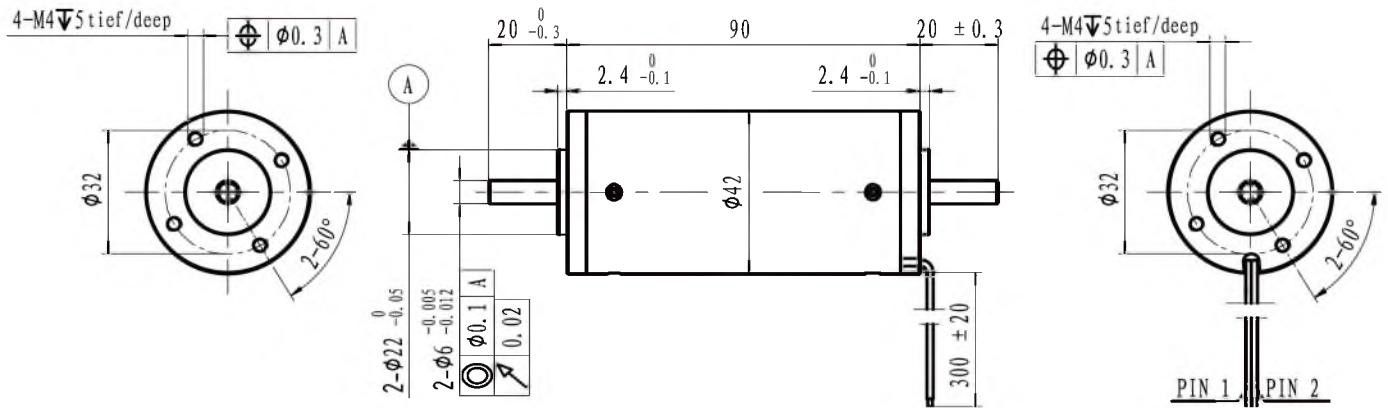
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:

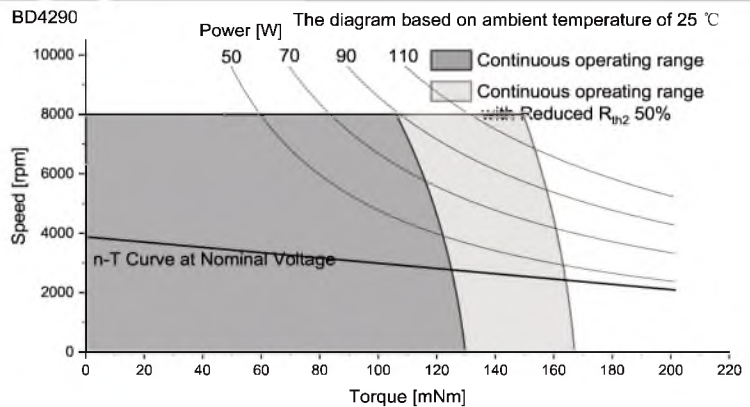
Please contact our sales engineers



M 1:2

With hall sensor		BD4290S-...	1204	2404						
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	3920	3980						
3	No load current	mA	260	180						
4	Nominal speed	rpm	3087	3522						
5	Nominal torque	mNm	100	100						
6	Nominal current	A	3.74	1.94						
7	Stall torque	mNm	470.78	889.29						
8	Stall current	A	16.62	15.45						
9	Max. efficiency	%	76.5	79.6						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	28.78	56.91						
13	Speed constant	rpm/V	332	168						
14	Speed/torque gradient	rpm/mNm	8	5						
15	Mechanical time constant	ms	3.9	2.2						
16	Rotor inertia	gcm ²	45.1	45.1						
17	Thermal resistance housing-ambient	3.5 K/W								
18	Thermal resistance winding-housing	0.9 K/W								
19	Thermal time constant winding	14 s								
20	Thermal time constant motor	690								
21	Ambient temperature	-30...+100°C								
22	Max. permissible winding temperature	+150°C								
23	Max. permissible speed	8000 rpm								
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	7.5 N								
27	Max. force for press fits (static)	100 N								
	(static, shaft supported)	2700 N								
28	Max. radial loading, 5mm from flange	25 N								
29	Number of pole pairs	1								
30	Number of phases	3								
31	Weight of motor	366 g								

Operating Range



Controller features

Sensor, Open loop, $I_{max} < 4A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection	PTFE	
Pin 1 +VCC	AWG20	red
Pin 2 GND	AWG20	black

Caution:

Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

More:

Please contact our sales engineers

SLOTTED BLDC MOTOR

BF Series

External rotor structure
Electronics integrated

Model	Dimension (mm)	Nominal Troque (mNm)	Nominal Speed (rpm)	Page
BF3242	Φ32x42	32	3500	104
BF4253	Φ42x53	70	3500	105
BF5031	Φ50x31	30	3500	106
BF5032	Φ50x32	40	5500	107
BF5434	Φ54x34	90	3500	108
BF6862	Φ68x62	200	2500	109



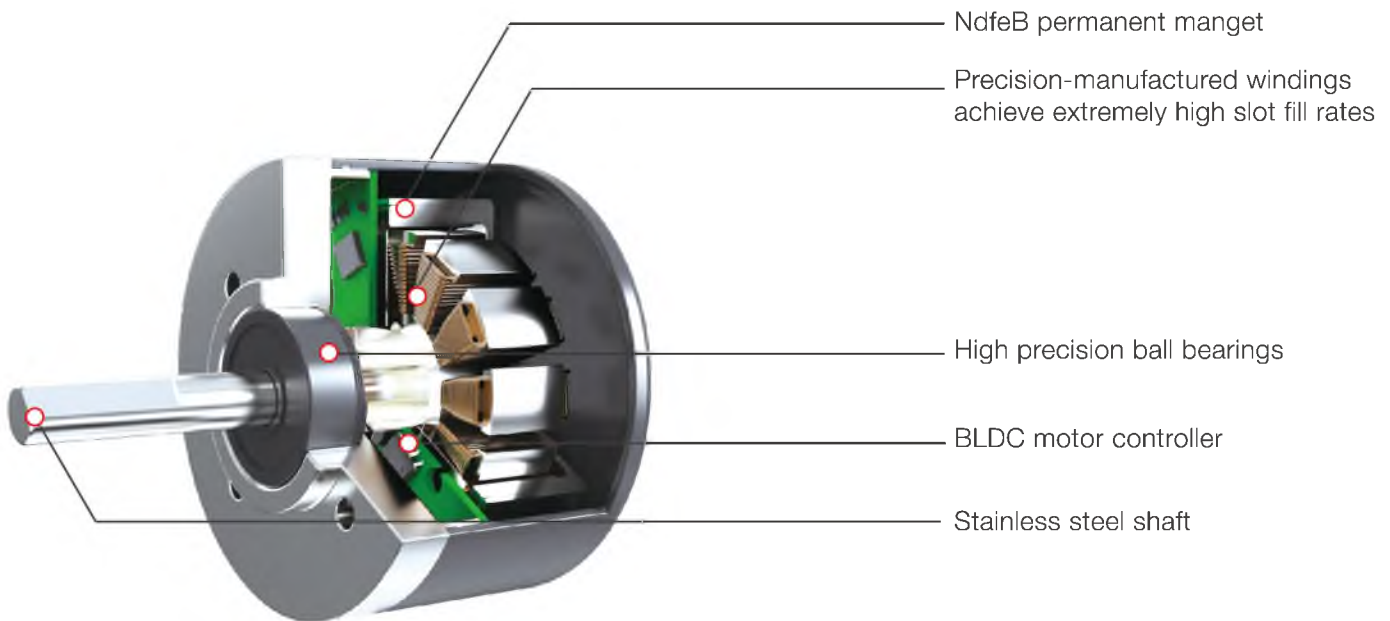
SLOTTED BLDC MOTOR

BF Series

External rotor structure & Electronics integrated

Thanks to the outrunner design, this series has the characteristics of high torque, good stability and compact structure. Its design allows for a larger rotor diameter that produces higher torque while the rotor mass is distributed externally, running smoothly with low vibration and noise. The external rotor is directly exposed to the environment, which helps dissipate heat and improves the durability and reliability of the motor.

Another feature of the series is the integrated controller, which simplifies system design, reduces external wiring and components, and makes the overall structure more compact. Maintenance process also reduces operating time and maintenance costs.



Basic Data:

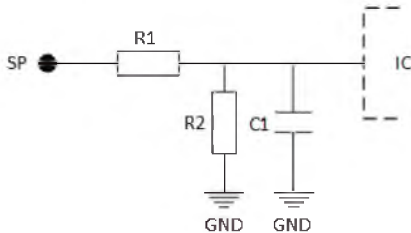
Diameter: $\phi 32\text{mm}-68\text{mm}$
Maximum Length: 72mm
Operate Voltage: 4.5V-24VDC
Maximum Permissible speed: 10,000rpm
Operate temperature: $-30^{\circ}\text{C}-+80^{\circ}\text{C}$

Typical features:

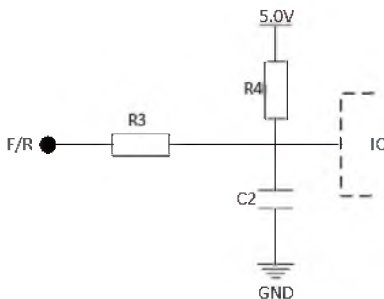
Electronics integrated
Cost effective
Large starting torque
Low noise
Good heat dissipation
Long operational lifetime
Customizable

I/O Schematics

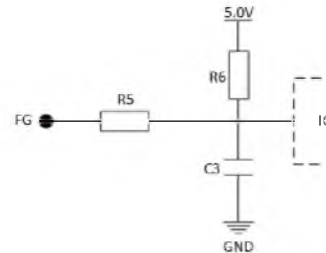
Speed command input



Direction command input



Speed output



Speed output signal



Electrical Connections

Version

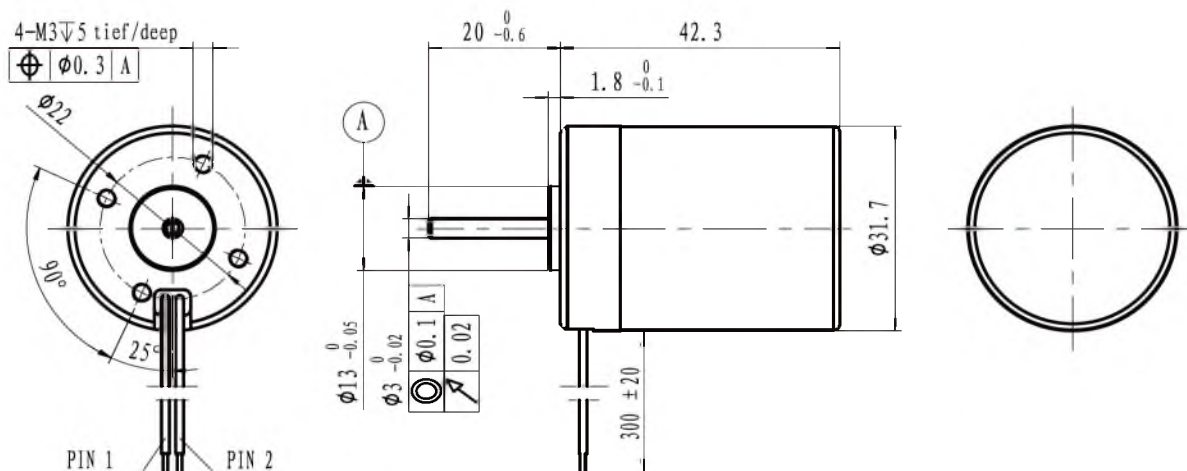
Description

5-Wire

- 1 Power supply
- 2 GND
- 3 Speed command input(SP)
- 4 Direction command input(F/R)
- 5 Speed signal output (FG)

ECD12 and ECD16, because these two models use integrated chips. The built-in series product interface is configured up to five wires, with three function pins, namely speed control SP(compatible with analog voltage PWM duty cycle control, PWM frequency range of 10KHZ-35KHZ, 5V TTL level), forward and reverse control F/R(CCW operation by connecting ground),speed feedback output FG (one pulse perturn). If you need enable and brake functions, you need to replace the two functions among three function pins above.

Please note that the standard products in the catalog are two-wire,only power and ground wires

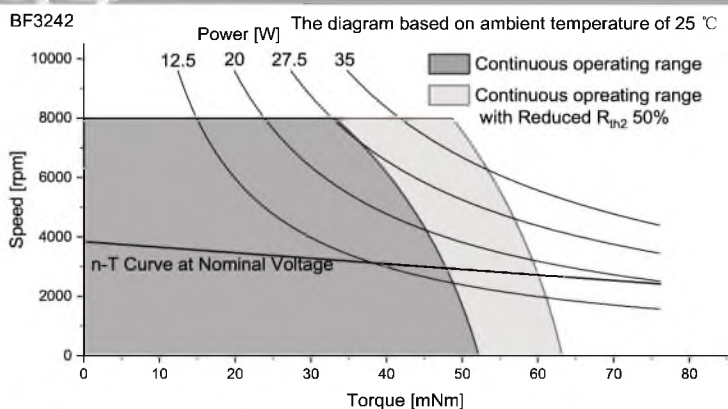


M 1:1.2

With hall sensor		BF3242S-...	1204	2404					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	4090	4064					
3	No load current	mA	140	80					
4	Nominal speed	rpm	3560	3569					
5	Nominal torque	mNm	32	32					
6	Nominal current	A	1.30	0.66					
7	Stall torque	mNm	246.92	262.83					
8	Stall current	A	9.09	4.82					
9	Max. efficiency	%	76.7	75.9					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	27.59	55.46					
13	Speed constant	rpm/V	346	172					
14	Speed/torque gradient	rpm/mNm	17	15					
15	Mechanical time constant	ms	12.6	11.8					
16	Rotor inertia	gcm^2	72.7	72.7					

17	Thermal resistance housing-ambient	13 K/W
18	Thermal resistance winding-housing	5 K/W
19	Thermal time constant winding	32 s
20	Thermal time constant motor	540 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load	0 mm
	<8 N	max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
	(static, shaft supported)	2700 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	8
30	Number of phases	3
31	Weight of motor	120 g

Operating Range



Controller features	
Sensor, Open loop, $I_{max} < 2.2A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

Connection

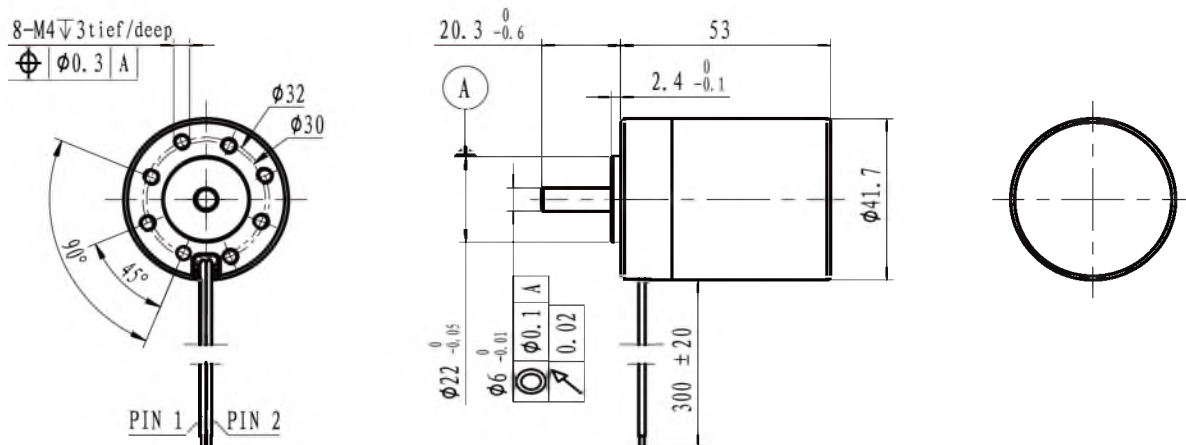
Conection		PVC	
Pin 1	+VCC	AWG20	red
Pin 2	GND	AWG20	black

Caution:

Caution:
Incorrect lead connection will damage the controller!

More:

Please contact our sales engineers



M 1:2

With hall sensor		BF4253S-...	1204	2404					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	4023	4017					
3	No load current	mA	350	200					
4	Nominal speed	rpm	3616	3610					
5	Nominal torque	mNm	70	70					
6	Nominal current	A	2.84	1.45					
7	Stall torque	mNm	692.30	690.53					
8	Stall current	A	25.00	12.50					
9	Max. efficiency	%	77.7	76.3					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	28.09	56.14					
13	Speed constant	rpm/V	340	170					
14	Speed/torque gradient	rpm/mNm	6	6					
15	Mechanical time constant	ms	8.9	8.9					
16	Rotor inertia	gcm ²	146.4	146.4					
17	Thermal resistance housing-ambient	5.0 K/W							
18	Thermal resistance winding-housing	3.6 K/W							
19	Thermal time constant winding	17 s							
20	Thermal time constant motor	630 s							
21	Ambient temperature	-30...+100°C							
22	Max. permissible winding temperature	+150°C							
23	Max. permissible speed	8000 rpm							
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm							
25	Radial play	preloaded							
26	Max. axial load (dynamic)	7.5 N							
27	Max. force for press fits (static)	100 N							
	(static, shaft supported)	2700 N							
28	Max. radial loading, 5mm from flange	25 N							
29	Number of pole pairs	7							
30	Number of phases	3							
31	Weight of motor	215 g							
Operating Range									
BF4253									
The diagram based on ambient temperature of 25 °C Power [W] 40 55 70 85 Continuous operating range Continuous operating range with Reduced R _{th2} 50% n-T Curve at Nominal Voltage Speed [rpm] 10000 8000 6000 4000 2000 0 Torque [mNm] 0 20 40 60 80 100 120 140 160 180									

Controller features

Sensor, Open loop, I_{max} < 4A
 Overload protection, Stall protection
 Max. temperature of electronics +105°C

Connection

Conection
 Pin 1 +VCC PVC
 Pin 2 GND AWG20 red
 AWG20 black

Caution:

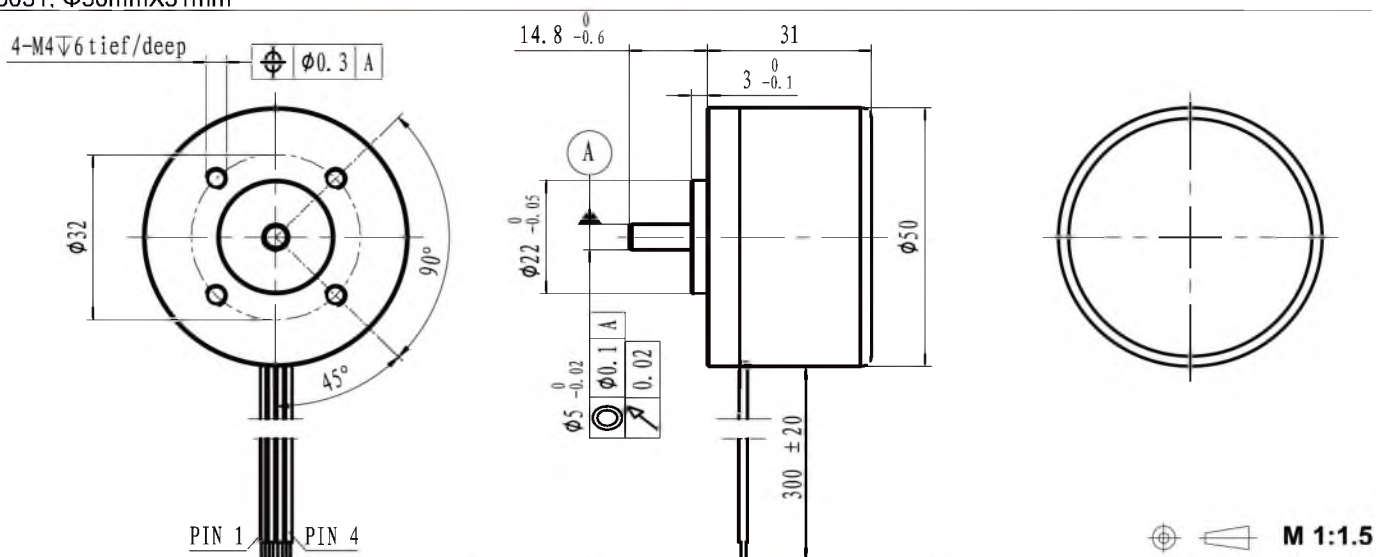
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

More:

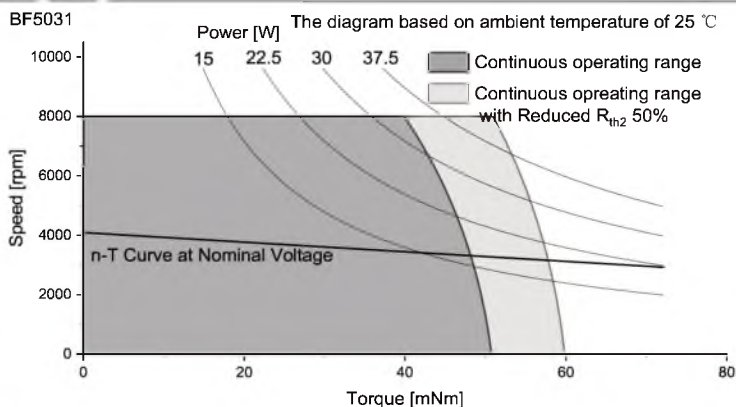
Please contact our sales engineers



		With hall sensor	BF5031S-...	1204	2404					
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	12	24						
2	No load speed	rpm	4038	4021						
3	No load current	mA	170	90						
4	Nominal speed	rpm	3747	3521						
5	Nominal torque	mNm	30	30						
6	Nominal current	A	1.24	0.63						
7	Stall torque	mNm	416.08	241.30						
8	Stall current	A	15.00	4.41						
9	Max. efficiency	%	79.8	73.5						
10	Supply voltage +Vcc	V	10..28	10..28						
11	Direction of rotation		CW	CW						
12	Torque constant	mNm/A	28.06	55.83						
13	Speed constant	rpm/V	340	171						
14	Speed/torque gradient	rpm/mNm	10	17						
15	Mechanical time constant	ms	8.8	15.2						
16	Rotor inertia	gcm^2	87	87						

17	Thermal resistance housing-ambient	8.9 K/W
18	Thermal resistance winding-housing	6.9 K/W
19	Thermal time constant winding	22.5 s
20	Thermal time constant motor	508 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load <8 N	0 mm
	>8 N	max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
	(static, shaft supported)	2700 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	5
30	Number of phases	3
31	Weight of motor	108 g

Operating Range



Controller features

Sensor, Open loop, $I_{max} < 4A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection		PVC	
Pin 1	+VCC	AWG24	red
Pin 2	GND	AWG24	black
Pin 1	SP	AWG24	blue
Pin 2	FG	AWG24	yellow

Caution:

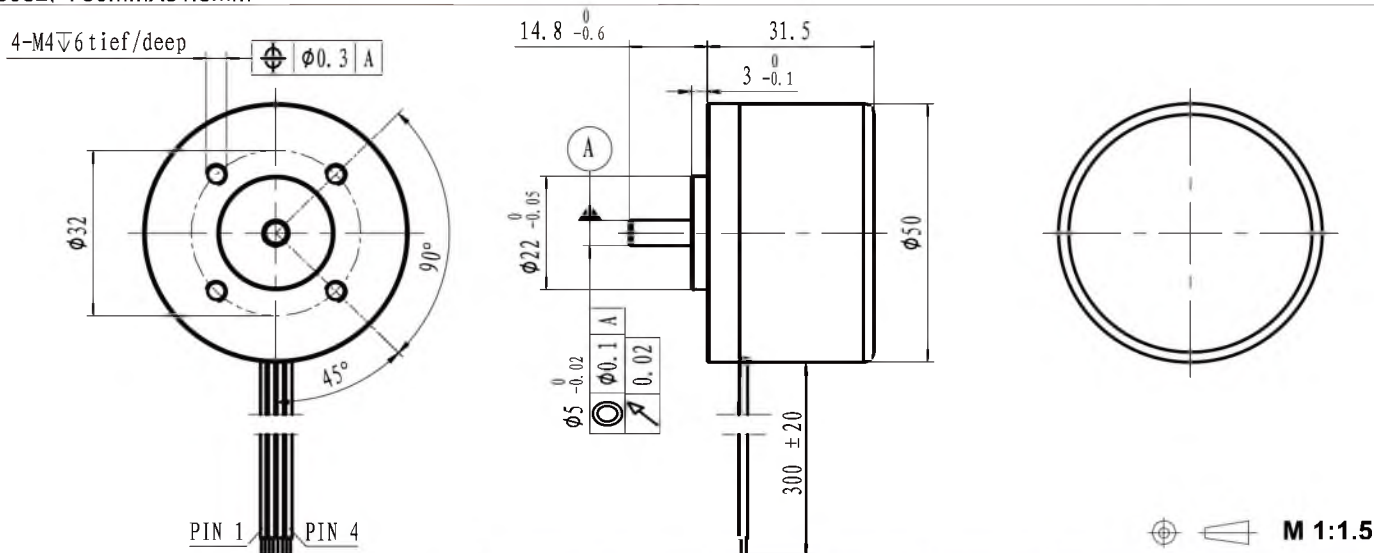
Caution:
Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

More:

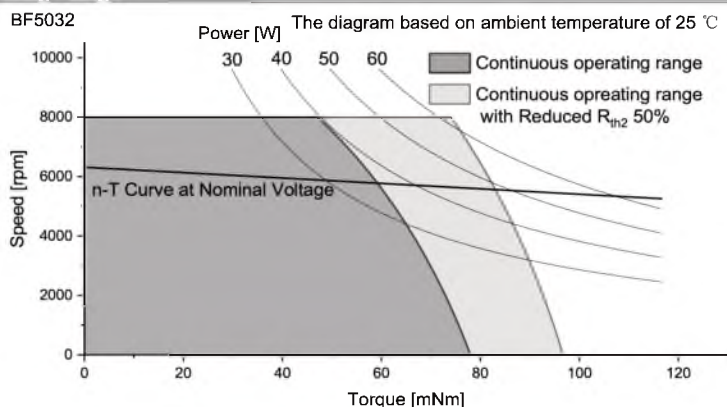
Please contact our sales engineers



With hall sensor		BF5032S-...	1204	2406					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	5998	6070					
3	No load current	mA	400	220					
4	Nominal speed	rpm	5678	5794					
5	Nominal torque	mNm	40	40					
6	Nominal current	A	2.51	1.29					
7	Stall torque	mNm	748.99	880.65					
8	Stall current	A	40.00	23.76					
9	Max. efficiency	%	81.0	81.7					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	18.91	37.41					
13	Speed constant	rpm/V	505	255					
14	Speed/torque gradient	rpm/mNm	8	7					
15	Mechanical time constant	ms	8.0	6.9					
16	Rotor inertia	gcm ²	95	95					

17	Thermal resistance housing-ambient	8.3 K/W
18	Thermal resistance winding-housing	3.6 K/W
19	Thermal time constant winding	15 s
20	Thermal time constant motor	675 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
28	Max. radial loading, 5mm from flange	2700 N
29	Number of pole pairs	5
30	Number of phases	3
31	Weight of motor	175 g

Operating Range



Controller features	
Sensor, Open loop, $I_{max} < 4A$	
Overload protection, Stall protection	
Max. temperature of electronics	+105°C

Connection

Conection	PVC
Pin 1 +VCC	AWG24 red
Pin 2 GND	AWG24 black
Pin 1 SP	AWG24 blue
Pin 2 FG	AWG24 yellow

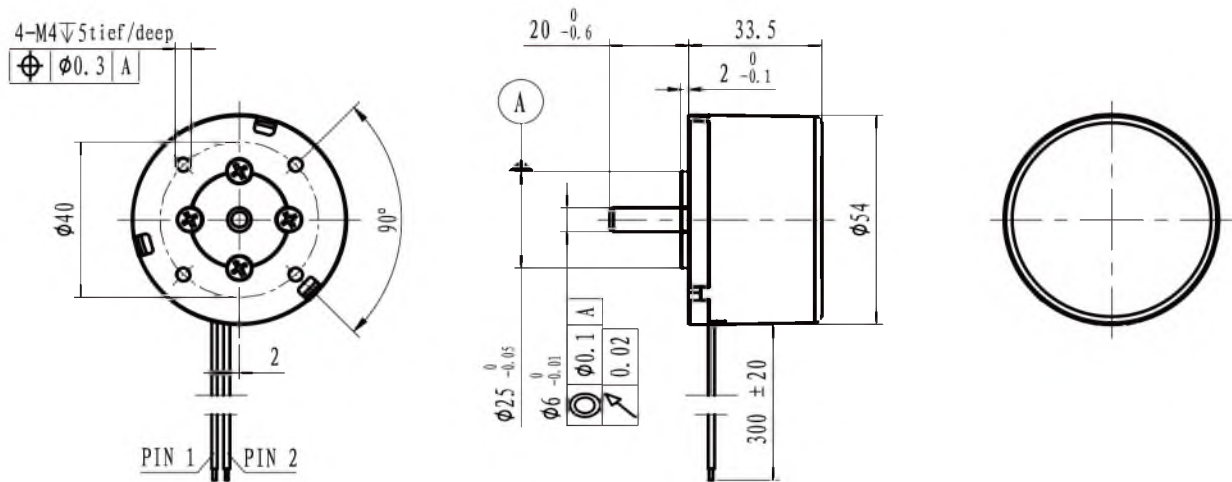
Caution:

Incorrect lead connection will damage the controller!

Configuration

Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE

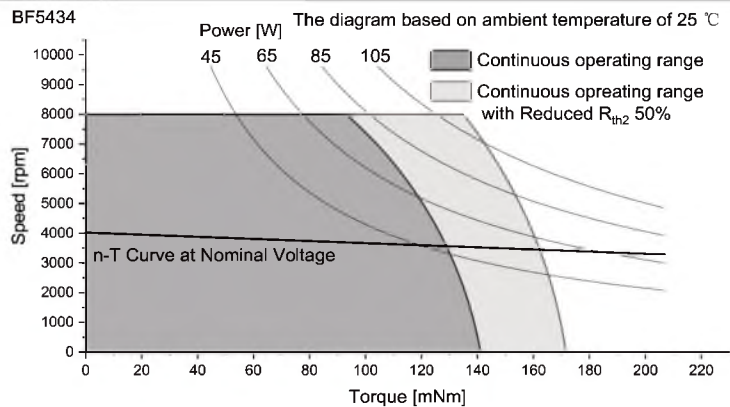
More:
Please contact our sales engineers



M 1:2

With hall sensor		BF5434S-...	1204	2404					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24					
2	No load speed	rpm	4015	4042					
3	No load current	mA	230	150					
4	Nominal speed	rpm	3716	3774					
5	Nominal torque	mNm	90	90					
6	Nominal current	A	3.40	1.75					
7	Stall torque	mNm	1210.09	1357.60					
8	Stall current	A	42.86	24.24					
9	Max. efficiency	%	85.9	84.9					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	28.39	56.35					
13	Speed constant	rpm/V	336	169					
14	Speed/torque gradient	rpm/mNm	3	3					
15	Mechanical time constant	ms	7.2	6.5					
16	Rotor inertia	gcm ²	208	208					

17	Thermal resistance housing-ambient	6.1 K/W
18	Thermal resistance winding-housing	3.3 K/W
19	Thermal time constant winding	24 s
20	Thermal time constant motor	565 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	8000 rpm
24	Axial play at axial load	<8 N 0 mm >8 N max. 0.3 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7.5 N
27	Max. force for press fits (static)	100 N
	(static, shaft supported)	2700 N
28	Max. radial loading, 5mm from flange	25 N
29	Number of pole pairs	5
30	Number of phases	3
31	Weight of motor	220 g

Operating Range**Controller features**

Sensor, Open loop, $I_{max} < 5A$
Overload protection, Stall protection
Max. temperature of electronics

Configuration

Function: On&Off/Direction/Speed control/Brake
 Speed closed&open-loop Control/Speed feedback
 Performance: Customized in the continuous operating range
 Ball bearing: Preload
 Flange: Standard frange front&back/customize the frange
 Shaft: Length/Diameter/Cut face
 Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
 Connector: JST/MOLEX/TE

Connection

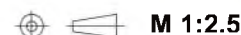
Conection	PVC
Pin 1 +VCC	AWG20 red
Pin 2 GND	AWG20 black

Caution:

Incorrect lead connection will damage the controller!

More:

Please contact our sales engineers

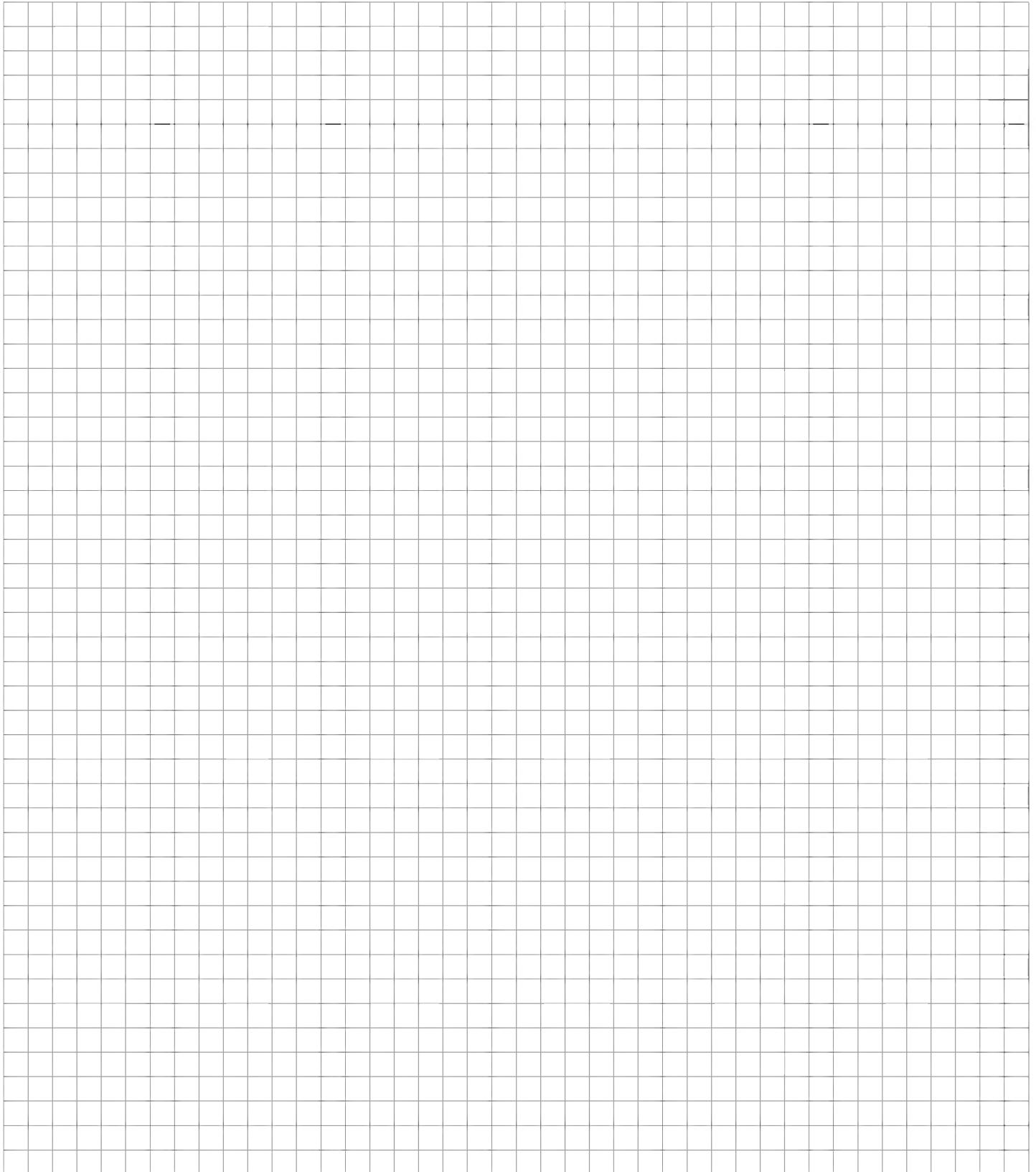


Controller features				Configuration			
Sensor, Open loop, I _{max} < 8A				Function: On&Off/Direction/Speed control/Brake Speed closed&open-loop Control/Speed feedback			
Overload protection, Stall protection							
Max. temperature of electronics +105°C				Performance: Customized in the continuous operating range			
Connection				Ball bearing: Preload			
Conection				Flange: Standard frange front&back/customize the frange			
Pin 1 +VCC				Shaft: Length/Diameter/Cut face			
Pin 2 GND				Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length			
PVC				Connector: JST/MOLEX/TE			
AWG20							
red							
AWG20							
black							

More:
Please contact our sales engineers

Subject: _____

Date: _____



SLOTTED BLDC MOTOR

ECI Series

Multipole internal rotor design

Model	Dimension (mm)	Nominal Troque (mNm)	Nominal Speed (rpm)	Page
ECi4036	Φ40x36	55	9000	113
ECi4056	Φ40x56	175	3500	114
ECi5640	Φ56x40	210	3500	115

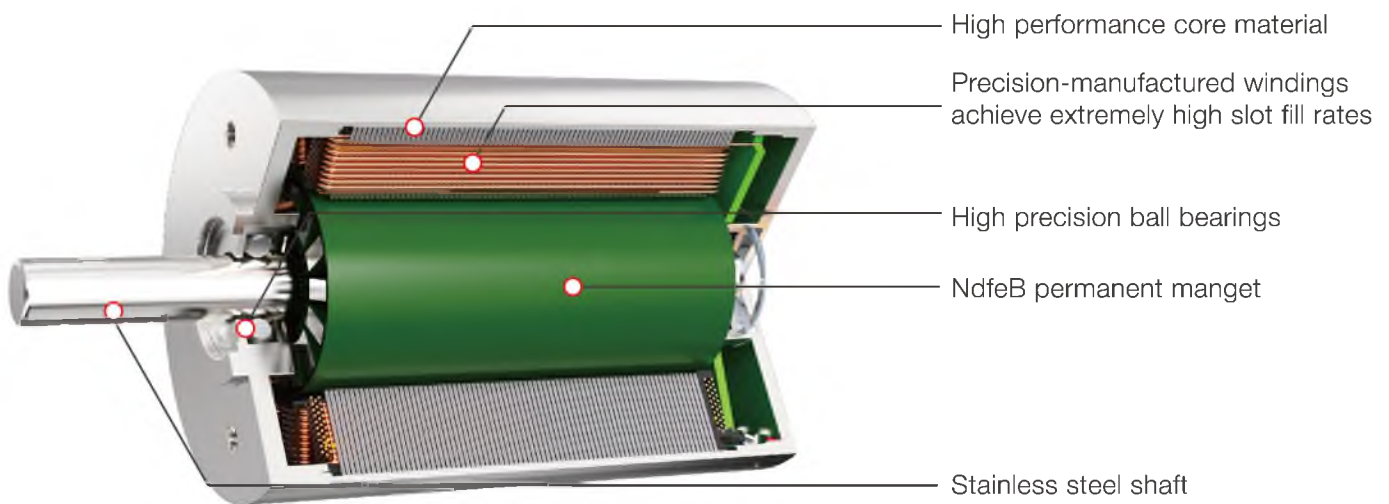


SLOTTED BLDC MOTOR

ECI Series

Multipole internal rotor design

By increasing the number of poles, this series can have the characteristics of high torque output, low speed and high efficiency without increasing the size of the motor, and because the electromagnetic force distribution of the motor is more uniform, the torque ripple and vibration are reduced, and the motor can provide higher torque and efficiency at lower speeds, while reducing torque ripple, so that the motor runs more smoothly



Basic Data:

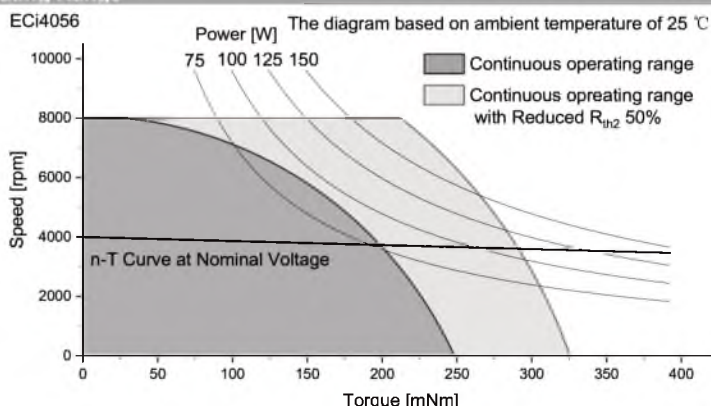
Diameter: $\phi 40\text{mm}-58\text{mm}$
Maximum Length: 56mm
Operate Voltage: 12V-48VDC
Maximum Permissible speed: 10,000rpm
Operate temperature: $-30^{\circ}\text{C}-+80^{\circ}\text{C}$

Typical features:

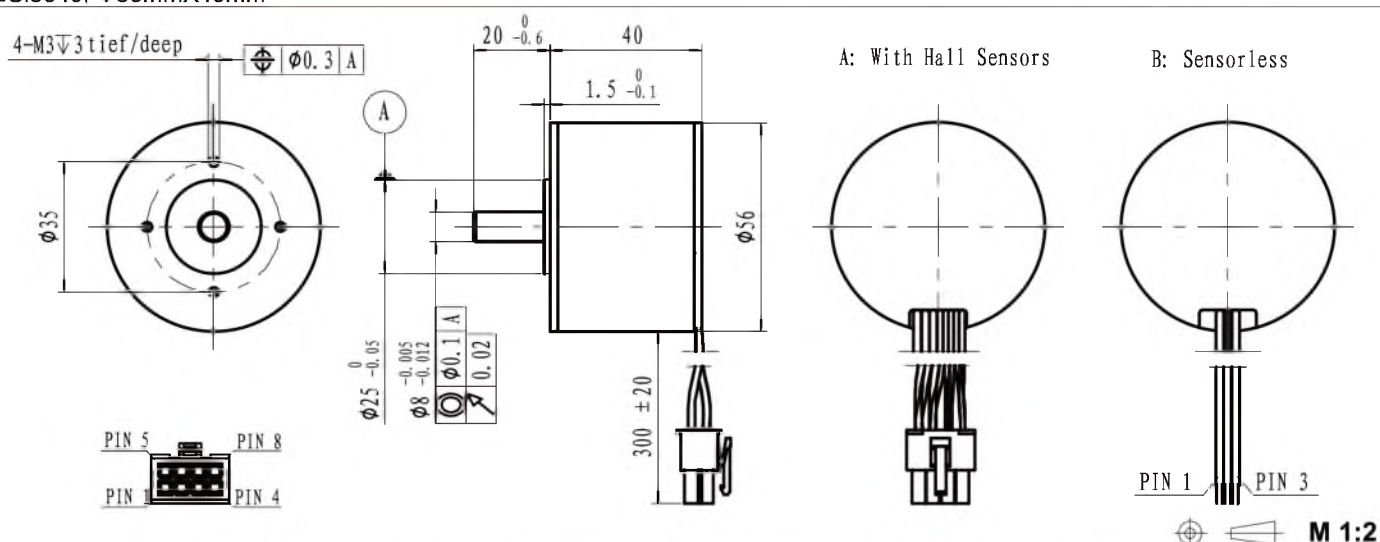
High torque density
Large starting torque
Low noise
Good heat dissipation
Long operational lifetime
Customizable



Operating Range



Configuration

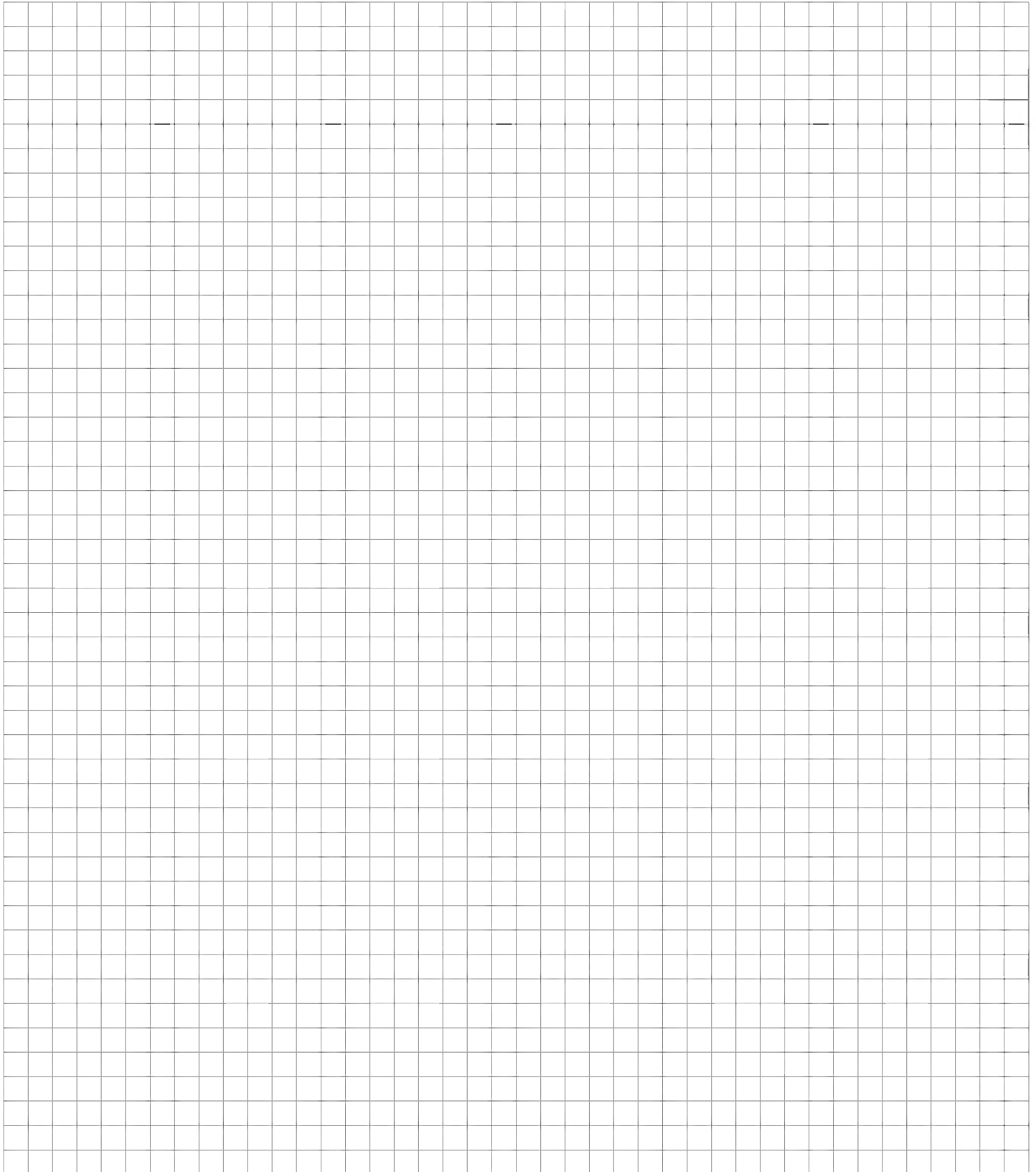


Sensorless		ECi5640L-...	2404	4804						
With hall sensor		ECi5640S-...								
Motor data										
Values at nominal voltage										
1	Nominal voltage	V	24	48						
2	No load speed	rpm	4065	4012						
3	No load current	mA	310	150						
4	Nominal speed	rpm	3694	3582						
5	Nominal torque	mNm	210	210						
6	Nominal current	A	4.06	2.00						
7	Stall torque	mNm	2298.12	1960.03						
8	Stall current	A	41.38	17.45						
9	Max. efficiency	%	83.4	82.3						
10	Terminal resistance	Ω	0.58	2.75						
11	Terminal inductance	mH	0.29	1.3						
12	Torque constant	mNm/A	55.96	113.27						
13	Speed constant	rpm/V	171	84						
14	Speed/torque gradient	rpm/mNm	2	2						
15	Mechanical time constant	ms	3.2	3.7						
16	Rotor inertia	gcm ²	173.2	173.2						
17	Thermal resistance housing-ambient	15.2 K/W	Operating Range							
18	Thermal resistance winding-housing	6.0 K/W	ECi5640							
19	Thermal time constant winding	11 s	The diagram based on ambient temperature of 25 °C							
20	Thermal time constant motor	383 s								
21	Ambient temperature	-30...+100 °C	Continuous operating range Continuous operating range with Reduced R_{th2} 50%							
22	Max. permissible winding temperature	+150 °C								
23	Max. permissible speed	8000 rpm								
24	Axial play at axial load	<10N 0 mm >10N max. 0.3 mm								
25	Radial play	preloaded								
26	Max. axial load (dynamic)	9 N								
27	Max. force for press fits (static)	170 N								
	(static, shaft supported)	4500 N								
28	Max. radial loading, 5mm from flange	80 N								
29	Number of pole pairs	7								
30	Number of phases	3								
31	Weight of motor	320 g								

Connection			Configuration
Connection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE
Pin 1	Motor winding MB	PTFE AWG20 Green	
Pin 2	Vhall 3-18 VDC	AWG26 Red	
Pin 3	Hall sensor HA	AWG26 Yellow	
Pin 4	Hall sensor HC	AWG26 Blue	
Pin 5	Motor winding MA	AWG20 Yellow	
Pin 6	Motor winding MC	AWG20 Blue	
Pin 7	GND	AWG26 Black	
Pin 8	Hall sensor HB	AWG26 Green	
Conector Molex5557-8P			
Connection B (Sensorless)			
Pin 1	Motor winding MA	PTFE AWG20 Yellow	
Pin 2	Motor winding MB	AWG20 Green	
Pin 3	Motor winding MC	AWG20 Blue	

Subject: _____

Date: _____



Planetary gearhead

Screw gearhead

Model	Dimension (mm)	Nominal Troque (mNm)	Page
PG08	Φ8	0.01-0.1	118
PG10	Φ10	0.03-0.3	119
PG12	Φ12	0.1-0.2	120
PG13	Φ13	0.18-0.36	121
PG16	Φ16	0.42-0.9	122
PG22	Φ22	0.72-1.45	123
PG28	Φ28	1.55-3.1	124
PG32	Φ32	2.34-4.65	125
PG36	Φ36	3.24-6.48	126
PG42	Φ42	6.5-13	127

Model	Dimension (mm)	Type	Page
GS16	Φ16	ball screw	128
GS22	Φ22	ball screw	129
GS30	Φ30	ball screw	130

Our high-precision planetary reduction gearbox can provide comprehensive customization of external dimensions, internal grease and gear materials, and achieve the best overall performance by adjusting the motor input speed

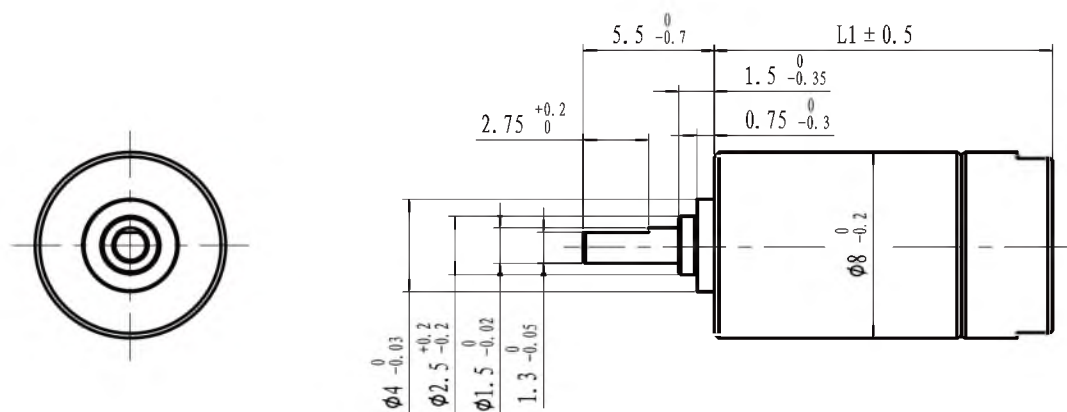


Basic Data:

Diameter: $\varnothing$ 8mm-42mm
Maximum Continuous torque: 25Nm
Maximum Permissible speed: 50,000rpm
Operate temperature: -30°C-+80°C

Modular platform:

EC Series	BL Series
EC- 4Pole series	BD Series
ECD Series	BF Series
ECH Series	ECl Series



PG08

Gearhead Data

1 Housing material		Steel				
2 Geartrain material		Steel				
3 Bearing type on output shaft		Ball bearing				
4 Max. radial load (4.5mm from flange)	N	8				
5 Max. axial load	N	5				
6 Radial play of shaft	mm	0.08				
7 Thrust play of shaft	mm	0.1				
8 Backlash at no load	°	3				
9 Max. continuous speed	rpm	22000				
10 Operating temperature range	°C	-30...+100				
11 Number of stages		1	2	3	4	5
12 Max continuous torque	Nm	0.01	0.02	0.06	0.08	0.1
13 Max. intermittent torque	Nm	0.015	0.03	0.09	0.12	0.15
14 Max. efficiency	%	80	64	51	41	33
15 Gearhead length L1	mm	9.2	11.7	14.2	16.7	19.2
16 Ratio	X:1	4.64	21.5	99.6	462	2141

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

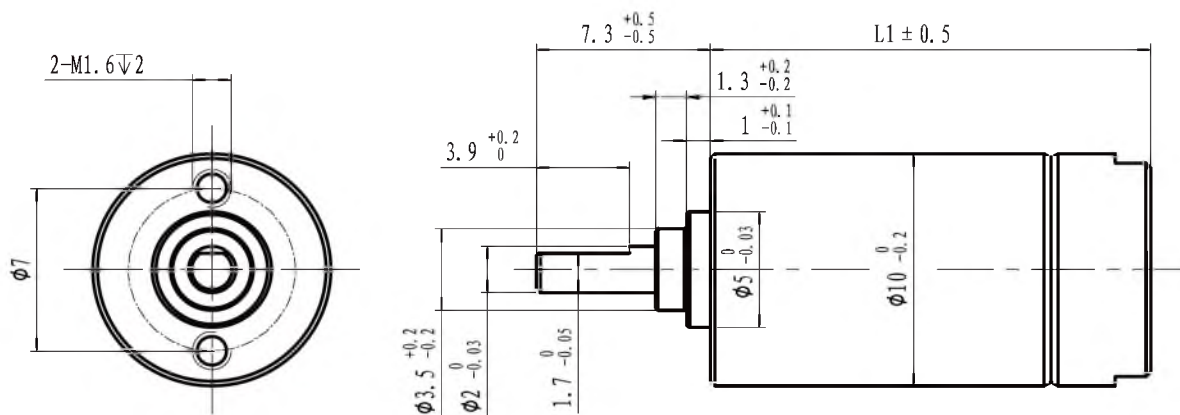
Flange: Standard flange front&back/customize the flange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer



M 3:1

PG08

Gearhead Data

1 Housing material		Steel				
2 Geartrain material		Steel				
3 Bearing type on output shaft		Ball bearing				
4 Max. radial load (5mm from flange)	N	10				
5 Max. axial load	N	5				
6 Radial play of shaft	mm	0.08				
7 Thrust play of shaft	mm	0.1				
8 Backlash at no load	°	3				
9 Max. continuous speed	rpm	30000				
10 Operating temperature range	°C	-30...+100				
11 Number of stages		1	2	3	4	5
12 Max continuous torque	Nm	0.03	0.05	0.1	0.2	0.3
13 Max. intermittent torque	Nm	0.045	0.08	0.15	0.3	0.45
14 Max. efficiency	%	85	72	61	52	44
15 Gearhead length L1	mm	11.5	15	18.5	22	25.5
16 Ratio	X:1	4	16	64	256	1024

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

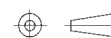
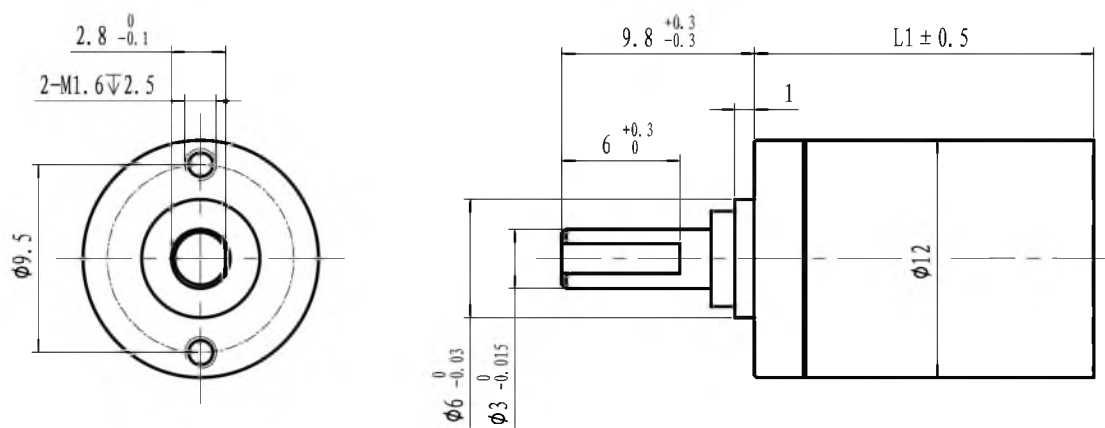
Flange: Standard flange front&back/customize the flange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer



M 2.5:1

PG12

Gearhead Data

1 Housing material		Steel				
2 Geartrain material		Steel				
3 Bearing type on output shaft		Ball bearing				
4 Max. radial load (10mm from flange)	N	5				
5 Max. axial load	N	5				
6 Radial play of shaft	mm	0.1				
7 Thrust play of shaft	mm	0.2				
8 Backlash at no load	°	3				
9 Max. continuous speed	rpm	42000				
10 Operating temperature range	°C	-30...+100				
11 Number of stages		1	2	3	4	5
12 Max continuous torque	Nm	0.1	0.2	0.2	0.2	0.2
13 Max. intermittent torque	Nm	0.15	0.25	0.25	0.25	0.25
14 Max. efficiency	%	90	81	73	65	59
15 Gearhead length L1	mm	15.1	17.9	20.7	23.5	26.3
16 Ratio	X:1	3.47, 3.94	12.07, 13.68 15.5, 18.17	41.92, 47.51 55.69, 53.86 63.13 61.05 71.56, 83.88	145.6, 165.04 187.08, 219.29 248.56, 281.75 291.36 330.26	505.8,

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

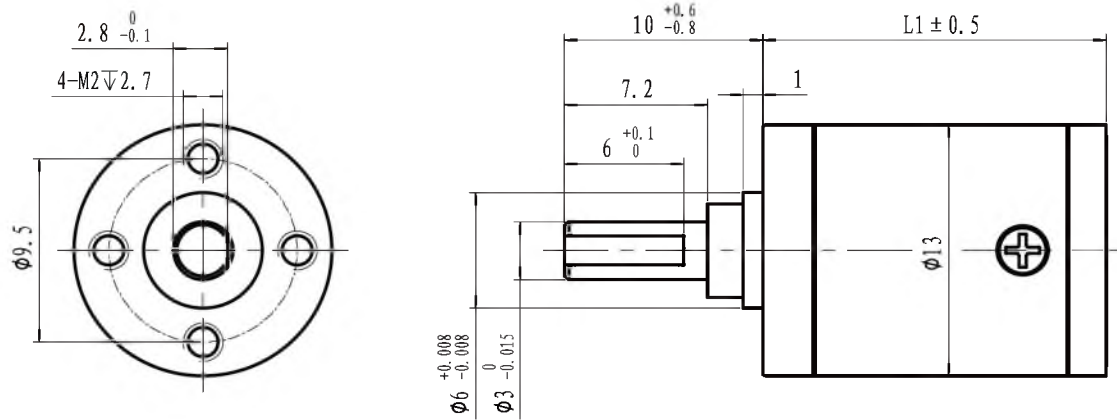
Flange: Standard flange front&back/customize the flange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer


M 2.5:1

PG12

Gearhead Data

1 Housing material		Steel				
2 Geartrain material		Steel				
3 Bearing type on output shaft		Ball bearing				
4 Max. radial load (10mm from flange)	N	5				
5 Max. axial load	N	5				
6 Radial play of shaft	mm	0.04				
7 Thrust play of shaft	mm	0.4				
8 Backlash at no load	°	2				
9 Max. continuous speed	rpm	42000				
10 Operating temperature range	°C	-30...+100				
11 Number of stages		1	2	3	4	5
12 Max continuous torque	Nm	0.18	0.24	0.3	0.36	0.36
13 Max. intermittent torque	Nm	0.54	0.72	0.9	1.08	1.08
14 Max. efficiency	%	93	86	80	75	70
15 Gearhead length L1	mm	16.1	19.6	23.1	26.6	30.1
16 Ratio	X:1	3.6, 4.9	13, 17.6 24	46.7, 63.5 86.4, 117.6	168, 228.6 311.2, 423.5 576.5	604.7, 823, 1120.2, 1524.7, 2075.3, 2824.8

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

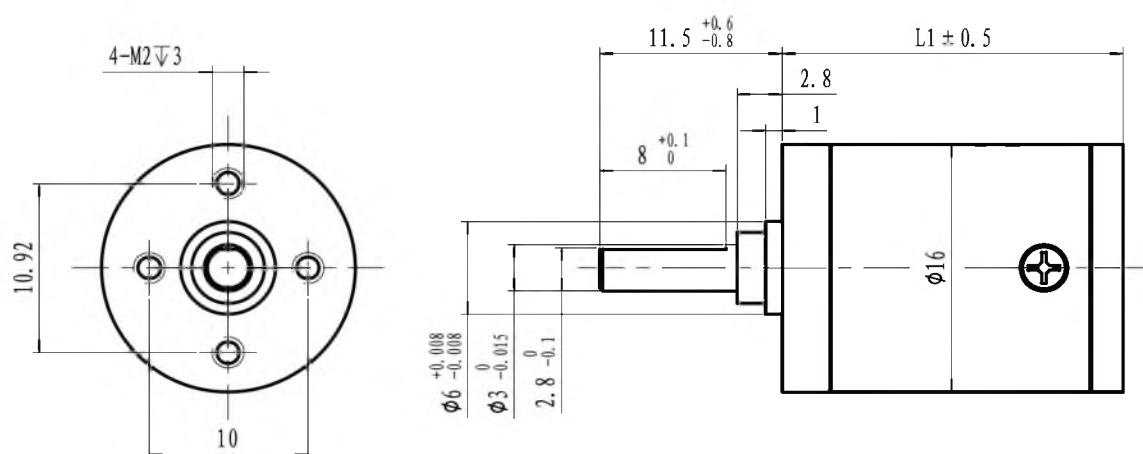
Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer



PG16

Gearhead Data

1 Housing material		Steel				
2 Geartrain material		Steel				
3 Bearing type on output shaft		Ball bearing				
4 Max. radial load (10mm from flange)	N	15.6				
5 Max. axial load	N	4.9				
6 Radial play of shaft	mm	0.04				
7 Thrust play of shaft	mm	0.4				
8 Backlash at no load	°	2				
9 Max. continuous speed	rpm	42000				
10 Operating temperature range	°C	-30...+100				
11 Number of stages		1	2	3	4	5
12 Max continuous torque	Nm	0.42	0.6	0.75	0.9	0.9
13 Max. intermittent torque	Nm	0.84	1.2	1.5	1.8	1.8
14 Max. efficiency	%	90	83	77	72	67
15 Gearhead length L1	mm	17.9	21.8	25.7	29.6	33.5
16 Ratio	X:1	3.7, 4.4, 5.4, 6.5	14.5, 16.4, 19.2, 23.7, 28.5, 35.1 42.3,	48.2, 54.5, 61.7, 67.1, 75.9, 80.8, 88.8, 94.5, 103.8, 109.3 125, 131 154, 185.3	204, 228, 251.8, 274.6, 294.4, 313.3 333, 354.4, 389.3, 400.8 455.2, 493.6, 547.9, 560.6 674.8, 690.4	738, 850.3, 944.2, 1023.5, 1136.6, 1232 1328.9, 1447.2, 1502.9, 1636.7, 1757, 1851 1996, 2164, 2402, 2530, 3027, 3644,

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

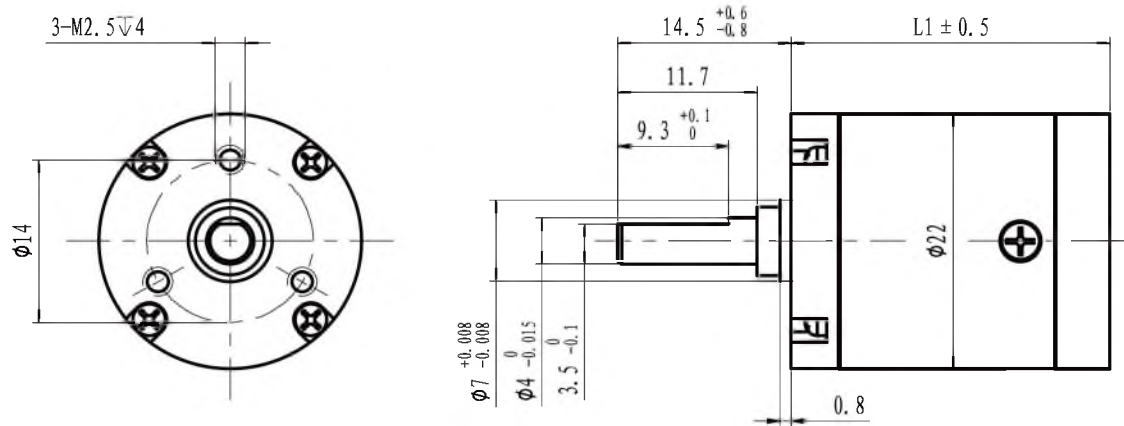
Flange: Standard flange front&back/customize the flange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer


M 1.2:1

PG22

Gearhead Data

1 Housing material		Steel				
2 Geartrain material		Steel				
3 Bearing type on output shaft		Ball bearing				
4 Max. radial load (10mm from flange)	N	15.6				
5 Max. axial load	N	4.9				
6 Radial play of shaft	mm	0.04				
7 Thrust play of shaft	mm	0.4				
8 Backlash at no load	°	2				
9 Max. continuous speed	rpm	42000				
10 Operating temperature range	°C	-30...+100				
11 Number of stages		1	2	3	4	5
12 Max continuous torque	Nm	0.72	0.96	1.2	1.45	1.45
13 Max. intermittent torque	Nm	1.44	1.92	2.4	2.9	2.9
14 Max. efficiency	%	90	83	77	72	72
15 Gearhead length L1	mm	22.6	27.6	32.7	37.7	42.8
16 Ratio	X:1	3.7, 4.4, 5.4, 6.5	14.5, 16.4, 19.2, 23.7, 28.5, 35.1, 42.3	48.2, 54.5, 61.7, 67.1, 75.9, 80.8, 88.8, 94.5, 103.8, 109.3, 125, 131, 154, 185.3	204, 228, 251.8, 274.6, 294.4, 313.3, 333, 354.4, 389.3, 400.8, 455.2, 493.6, 547.9, 560.6, 674.8, 690.4	738, 850.3, 944.2, 1023.5, 1136.6, 1232, 1328.9, 1447.2, 1502.9, 1636.7, 1757, 1851, 1996, 2164, 2402, 2530, 3027, 3644

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

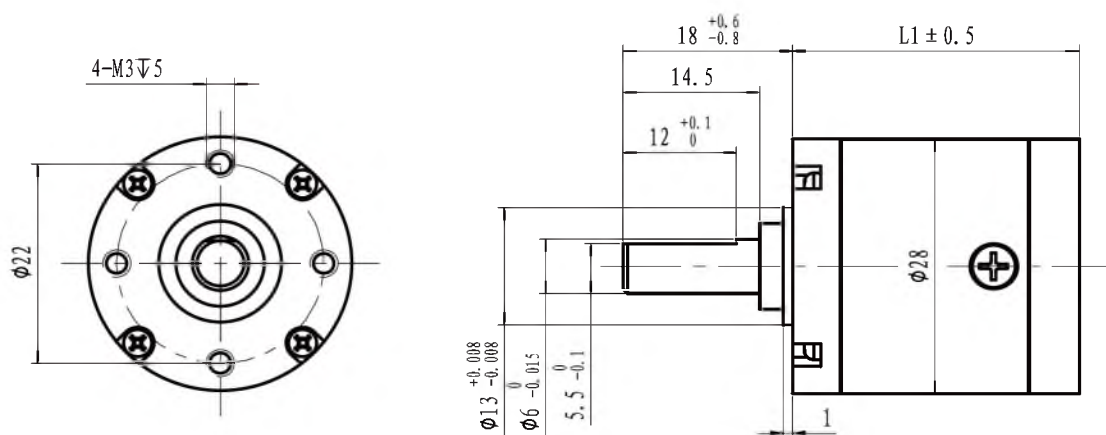
Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer



PG28

Gearhead Data

1 Housing material		Steel			
2 Geartrain material		Steel			
3 Bearing type on output shaft		Ball bearing			
4 Max. radial load (10mm from flange)	N	58.8			
5 Max. axial load	N	29.4			
6 Radial play of shaft	mm	0.04			
7 Thrust play of shaft	mm	0.4			
8 Backlash at no load	°	2			
9 Max. continuous speed	rpm	36000			
10 Operating temperature range	°C	-30...+100			
11 Number of stages		1	2	3	4
12 Max continuous torque	Nm	1.55	2.1	2.6	3.1
13 Max. intermittent torque	Nm	3.1	4.2	5.2	6.2
14 Max. efficiency	%	90	83	77	72
15 Gearhead length L1	mm	28.4	34.7	41	47.3
16 Ratio	X:1	4.4, 5.2, 6.7, 8.3	15.1, 16.9, 18, 20.1, 23.1, 25.6 27.6, 29.3, 31.8, 35, 43.5, 55.2,	61.7, 68.7, 77.1, 87.6, 100.6, 109, 120, 125, 129, 134.1 139.8, 144.7 149.1, 154 166.8, 183.8 211.7, 243 264.5, 290	335.9, 385.5, 411.4, 494.8, 528, 630, 677.6, 705.8 759.7, 860.4 964.7, 1069 1158, 1276, 1523, 1755, 2014, 3051 3792, 4713

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

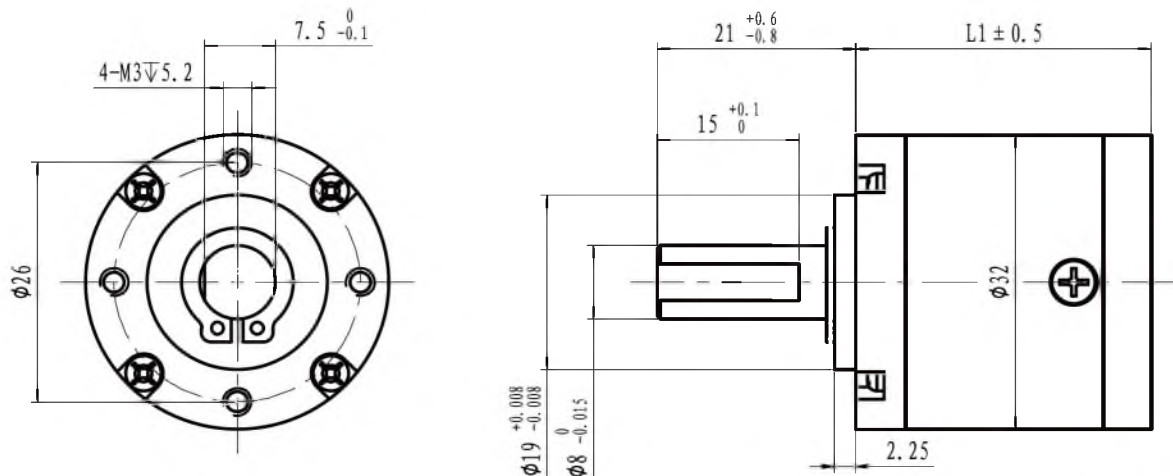
Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer



PG32

Gearhead Data

1 Housing material		Steel			
2 Geartrain material		Steel			
3 Bearing type on output shaft		Ball bearing			
4 Max. radial load (10mm from flange)	N	98			
5 Max. axial load	N	58.8			
6 Radial play of shaft	mm	0.04			
7 Thrust play of shaft	mm	0.4			
8 Backlash at no load	°	2			
9 Max. continuous speed	rpm	36000			
10 Operating temperature range	°C	-30...+100			
11 Number of stages		1	2	3	4
12 Max continuous torque	Nm	2.34	3.1	3.88	4.65
13 Max. intermittent torque	Nm	4.68	6.2	7.76	9.3
14 Max. efficiency	%	90	83	77	72
15 Gearhead length L1	mm	31.2	38.7	46.2	53.7
16 Ratio	X:1	4.4, 5.2, 6.7, 8.3	15.1, 16.9, 18, 20.1, 23.1, 25.6, 27.6, 29.3, 31.8, 35, 43.5, 55.2,	61.7, 68.7, 77.1, 87.6, 100.6, 109, 120, 125, 129, 134.1, 139.8, 144.7, 149.1, 154, 166.8, 183.8, 211.7, 243, 264.5, 290	335.9, 385.5, 411.4, 494.8, 528, 630, 677.6, 705.8, 759.7, 860.4, 964.7, 1069, 1158, 1276, 1523, 1755, 2014, 3051, 3792, 4713

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

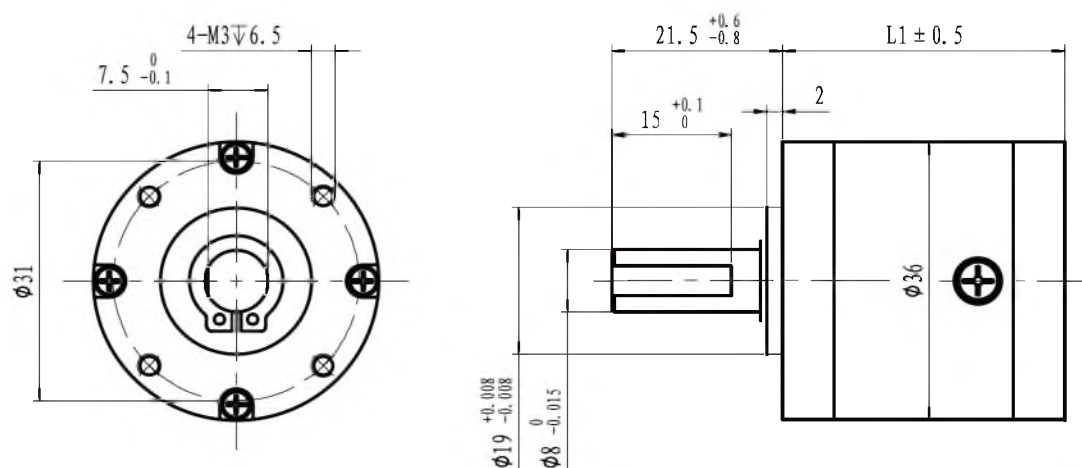
Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer



PG36

Gearhead Data

1 Housing material		Steel			
2 Geartrain material		Steel			
3 Bearing type on output shaft		Ball bearing			
4 Max. radial load (10mm from flange)	N	98			
5 Max. axial load	N	58.8			
6 Radial play of shaft	mm	0.04			
7 Thrust play of shaft	mm	0.4			
8 Backlash at no load	°	2			
9 Max. continuous speed	rpm	30000			
10 Operating temperature range	°C	-30...+100			
11 Number of stages		1	2	3	4
12 Max continuous torque	Nm	3.24	4.32	5.4	6.48
13 Max. intermittent torque	Nm	6.48	8.64	10.8	13
14 Max. efficiency	%	90	83	77	72
15 Gearhead length L1	mm	35.6	44.2	52.8	61.4
16 Ratio	X:1	4.3, 5.1, 6.3, 7.6	14.7, 16.3, 18.6, 19.2, 21.9, 23.9, 25.8, 27.2, 28.9, 32, 38.7, 39.7, 48, 58.1	65.6, 74.6, 81.4, 90.5, 98.5, 109, 112.1, 124.6, 123, 141.8, 150.4, 162.4, 171.2, 182, 196.5, 220.3, 243.9, 250.7	277.4, 302.6, 335.8, 351, 382.2, 413.2, 459.3, 500.1, 537.4, 583.5, 620.6, 686.9, 744.7, 824.4, 869, 924.2, 1006, 1388, 1680, 3380

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

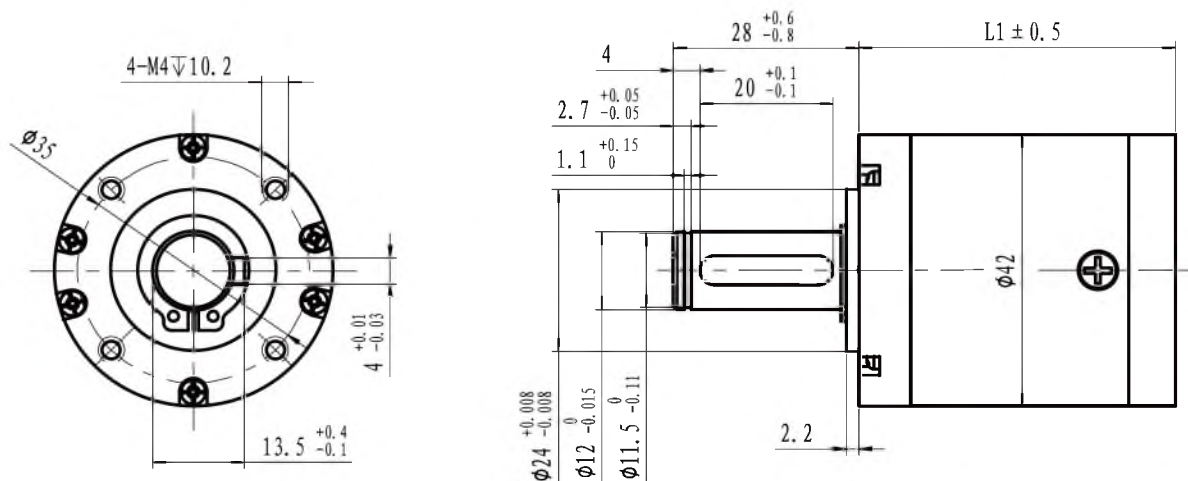
Flange: Standard flange front&back/customize the flange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer


M 1:1.2

PG42

Gearhead Data

1 Housing material		Steel			
2 Geartrain material		Steel			
3 Bearing type on output shaft		Ball bearing			
4 Max. radial load (10mm from flange)	N	196			
5 Max. axial load	N	98			
6 Radial play of shaft	mm	0.04			
7 Thrust play of shaft	mm	0.4			
8 Backlash at no load	°	2			
9 Max. continuous speed	rpm	30000			
10 Operating temperature range	°C	-30...+100			
11 Number of stages		1	2	3	4
12 Max continuous torque	Nm	6.5	8.6	10.8	13
13 Max. intermittent torque	Nm	13	17.2	21.6	26
14 Max. efficiency	%	90	83	77	72
15 Gearhead length L1	mm	43.8	54.6	65.4	76
16 Ratio	X:1	4.3, 5.1, 6.3, 7.6	14.7, 16.3, 18.6, 19.2, 21.9, 23.9, 25.8, 27.2, 28.9, 32, 38.7, 39.7, 48, 58.1	65.6, 74.6, 81.4, 90.5, 98.5, 109, 112.1, 124.6, 123, 141.8, 150.4, 162.4, 171.2, 182, 196.5, 220.3 243.9, 250.7	277.4, 302.6, 335.8, 351, 382.2, 413.2, 459.3, 500.1, 537.4, 583.5, 620.6, 686.9, 744.7, 824.4, 869, 924.2 1006, 1388, 1680, 3380

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

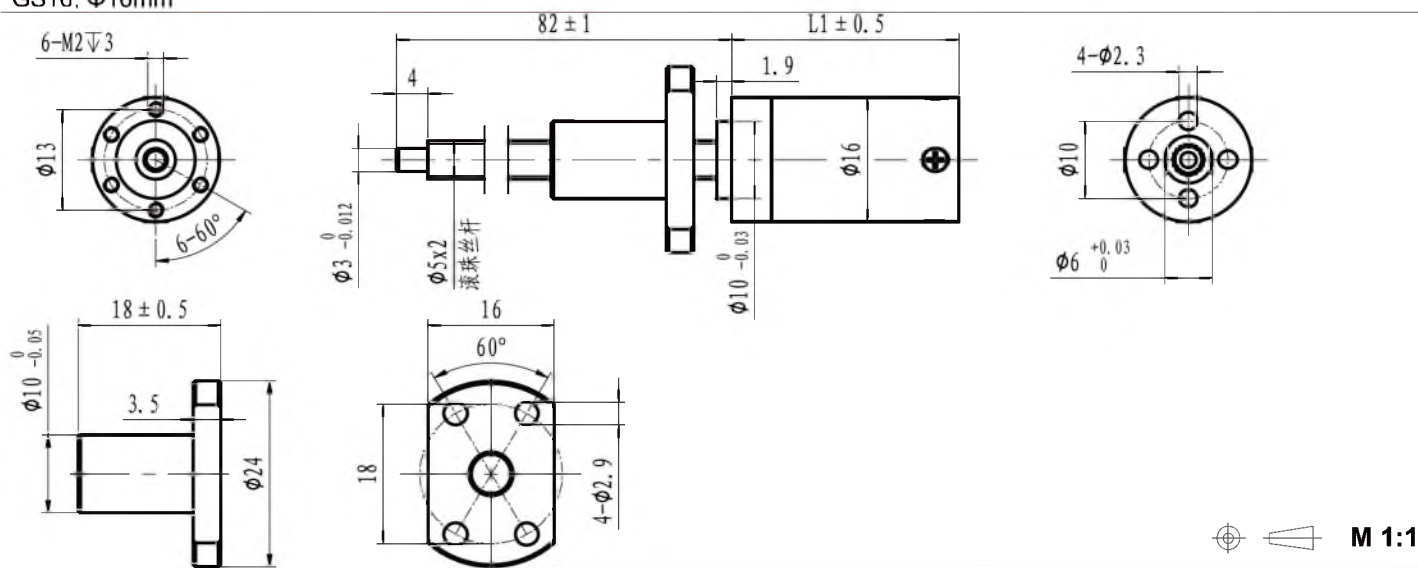
Flange: Standard flange front&back/customize the flange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer

GS16, $\Phi 16\text{mm}$ 

GS16

Gearhead Data

1 Housing material		Steel			
2 Geartrain material		Steel			
3 Bearing type on output shaft		Ball bearing			
4 Max. radial load (5mm from flange)	N	60			
5 Max. axial load	N	400			
6 Radial play of shaft	mm	0.04			
7 Axial play	mm	preloaded			
8 Max. continuous speed	rpm	12000			
9 Operating temperature range	°C	-20..+100			
10 Number of stages		1	2	3	4
11 Max. continuous feed force	N	60	110	200	280
12 Max. intermittent feed force	N	120	220	400	400
13 Max. efficiency	%	80	72	63	55
14 Backlash at no load	°	1.5	2	2	2.2
15 Mechanical positioning accuracy	mm	0.045	0.045	0.05	0.05
16 Gearhead length L1	mm	22.7	28.7	33	37.3
17 Ratio	X:1	3.55, 3.95 5.31	13, 14 16, 19 21, 26 28, 35	45, 50 55, 62 67, 74 83, 92 100, 103 111, 124 138, 150 172, 186 231	158, 176 196, 218 237, 243 263, 293 326, 354 365, 394 406, 439 490, 530 546, 590 610, 659 679, 734 794, 820 987, 1135 1227

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

Flange: Standard flange front&back/customize the flange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer



GS22

Gearhead Data

1	Housing material				Steel	
2	Geartrain material				Steel	
3	Bearing type on output shaft				Ball bearing	
4	Max. radial load (10mm from flange)	N			100	
5	Max. axial load	N			600	
6	Radial play of shaft	mm			0.04	
7	Axial play	mm			preloaded	
8	Max. continuous speed	rpm			8000	
9	Operating temperature range	°C			-20...+100	
10	Number of stages		1	2	3	4
11	Max. continuous feed force	N	110	200	290	400
12	Max. intermittent feed force	N	220	400	500	550
13	Max. efficiency	%	80	72	63	55
14	B backlash at no load	°	1	1.2	1.6	1.6
15	Mechanical positioning accuracy	mm	0.04	0.04	0.045	0.045
16	Gearhead length L1	mm	31.5	38.5	43	47.5
17	Ratio	X:1	3.7, 4.3	12, 14 16, 18 19, 22 25, 29	40, 45 47, 51 52, 59 61, 63 68, 71 73, 79 82, 93 95, 100 107, 115 124, 130 169	150, 168 173, 186 194, 209 218, 225 235, 242 252, 264 272, 292 305, 315 328, 337 344, 353 369, 380 397, 409 426, 480 493, 516 531, 556 596, 626 642, 672 777, 837 1012, 1140

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

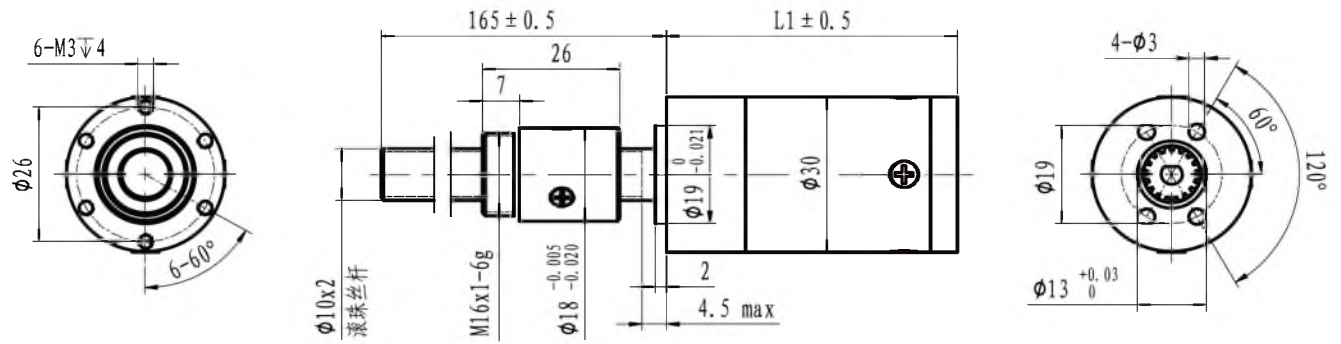
Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer



GS30

Gearhead Data

1 Housing material		Steel			
2 Geartrain material		Steel			
3 Bearing type on output shaft		Ball bearing			
4 Max. radial load (10mm from flange)	N	100			
5 Max. axial load	N	600			
6 Radial play of shaft	mm	0.04			
7 Axial play	mm	preloaded			
8 Max. continuous speed	rpm	8000			
9 Operating temperature range	°C	-20..+100			
10 Number of stages		1	2	3	4
11 Max. continuous feed force	N	500	1000	1500	2000
12 Max. intermittent feed force	N	1000	2000	2500	2700
13 Max. efficiency	%	80	72	63	55
14 Backlash at no load	°	0.8	1	1	1.5
15 Mechanical positioning accuracy	mm	0.045	0.045	0.055	0.055
16 Gearhead length L1	mm	45.5	55	61.7	68.4
17 Ratio	X:1	3.11, 3.71	10, 12	45, 50	30, 36
		4.8	14, 15	55, 62	43, 46
			18, 21	67, 74	51, 55
			23, 28	83, 92	66, 72
				100, 103	79, 86
				111, 124	103, 111
				138, 150	123, 132
				172, 186	159, 173
				231	190, 206
					223, 246
					266, 295
					318, 381
					412, 456
					492, 531
					589, 636
					706, 762

Configuration

Pinion: Metal/Plastic

Ball bearing: Preload

Flange: Standard frange front&back/customize the frange

Shaft: Length/Diameter/Cut face/double shaft/hollow shaft

More:

Special design for high speed/high torque

Details please contact our sales engineer

Vishan

Motor controller

Model	Type	Voltage (mNm)	Rated Current (A)	Page
VSC 3002S	Sensor	10-30	2	132
VSC 3003S	Sensor	8-30	3	132
VSC 4806S	Sensor	8-48	6	133
VSC 4812S	Sensor	8-48	12	133
VSC 3003L	Sensorless	8-30	3	134
VSC 4806L	Sensorless	8-48	6	134
VSC 3003SL	Compatible	10-30	3	135
VMC 2403S	Motion control	10-28	3	136

Our brushless DC motor controller can drive Hall and non-Hall motors, as well as servo motors, and can be customized with flexible functions and dimensions to better suit your products.



Basic Data:

For motor with hallsensor/without hallsensor

For Motion control

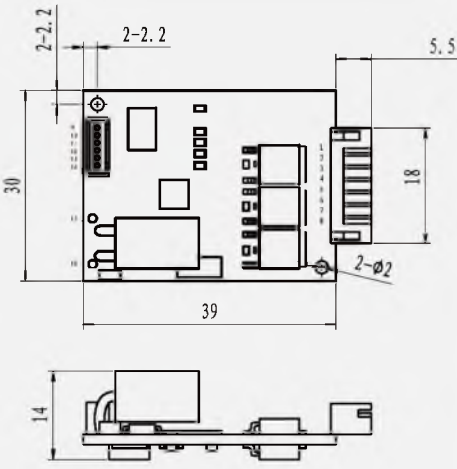
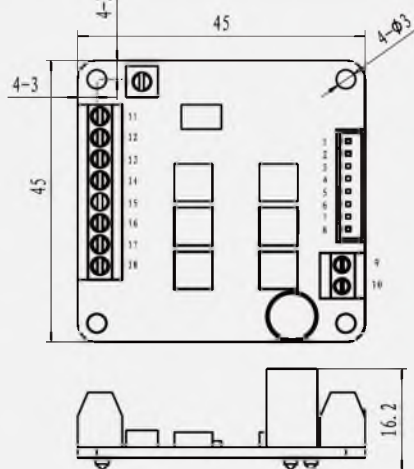
Operate voltage range: 4.5V-48VDC

Maximum continuous current: 30A

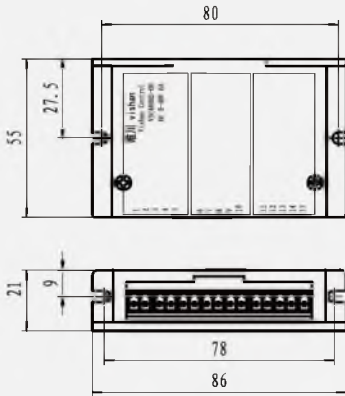
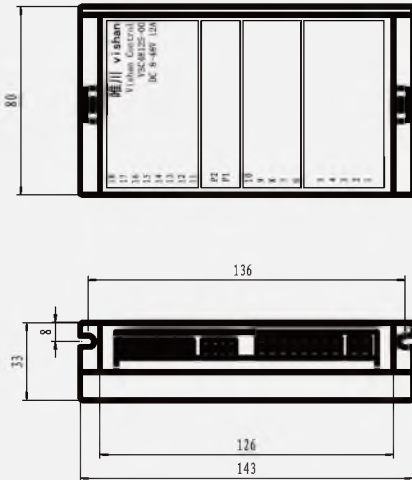
Maximum Permissible speed: 1,00,000rpm

Operate temperature: -30°C~+80°C

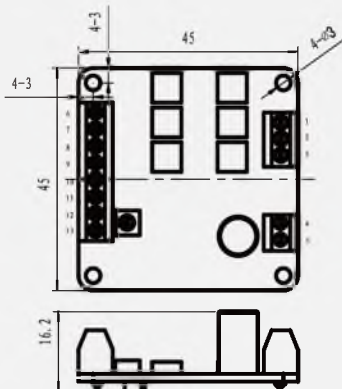
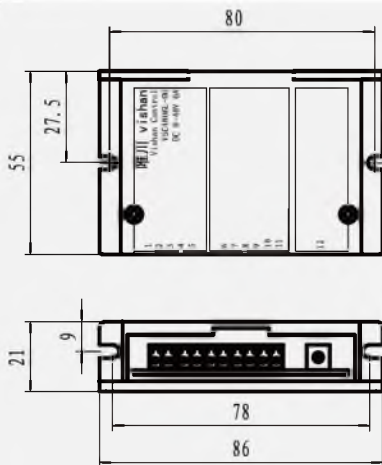


	VSC 3002S	VSC 3003S																																																																								
Operating Mode	10-30VDC, Max. Current 2A Speed controller with hall sensor, Open loop Overload protection Stall protection Sensor error protection	8-30VDC, Max. Current 3A Speed controller with hall sensor, Open loop Overload protection Stall protection Sensor error protection																																																																								
Electrical Data																																																																										
1 DC motor up to	60W	90W																																																																								
2 Operating Voltage Vcc	10-30 VDC	8-30 VDC																																																																								
3 Max.output current	5A , <60S	5A , <60S																																																																								
4 Continuous output current	2A	3A																																																																								
5 Pulse width modulation frequency	20KHz	20KHz																																																																								
6 Sampling rate PI current controller	20KHz	20KHz																																																																								
7 Max.Speed (1 pole pair)	6000rpm	6000rpm																																																																								
8 Efficiency	92%	92%																																																																								
Inputs/Outputs																																																																										
9 Hall sensor signal	HA,HB,HC	HA,HB,HC																																																																								
10 Digital inputs/outputs	4	5																																																																								
11 Set value "SP"	Set value speed 0.... +5V (1024 steps)	Set value speed 0.... +5V (1024 steps)																																																																								
12 Enable "EN"	Enable 0...+5V	Enable 0...+5V																																																																								
13 Direction "F/R"	Direction 0...+5V	Direction 0...+5V																																																																								
14 Brake "BK"	Brake 0...+5V	Brake 0...+5V																																																																								
15 Speed Feedback "PG"	---	TTL																																																																								
16 Status Indicators	Operation: LED light/Blink at 1 HZ; Error: LED Blink at 20Hz																																																																									
17 Hall sensor supply voltage	+5 VDC	+5 VDC																																																																								
18 Hall & Digital signal ground	GND	GND																																																																								
Environmental Conditions																																																																										
18 Temperature - Operation	-30....+45℃	-30....+45℃																																																																								
19 Temperature - Storage	-40....+85℃	-40....+85℃																																																																								
Mechanical Data																																																																										
20 Weight	Approx. 15 g	Approx. 20 g																																																																								
21 Dimensions (L x W x H)	30 x 39 x 14mm	45 x 45 x16.2mm																																																																								
22 Mounting holes	for screws M2	for screws M3																																																																								
23 Connections																																																																										
	<table><tr><td>Pin9</td><td>BK</td><td>Pin1</td><td>+5V, Output</td></tr><tr><td>Pin10</td><td>SP</td><td>Pin2</td><td>HA</td></tr><tr><td>Pin11</td><td>F/R</td><td>Pin3</td><td>HB</td></tr><tr><td>Pin12</td><td>EN</td><td>Pin4</td><td>HC</td></tr><tr><td>Pin13</td><td>+5V, Output</td><td>Pin5</td><td>GND</td></tr><tr><td>Pin14</td><td>GND</td><td>Pin6</td><td>MA</td></tr><tr><td>Pin15</td><td>POWER +</td><td>Pin7</td><td>MB</td></tr><tr><td>Pin16</td><td>POWER -</td><td>Pin8</td><td>MC</td></tr></table>	Pin9	BK	Pin1	+5V, Output	Pin10	SP	Pin2	HA	Pin11	F/R	Pin3	HB	Pin12	EN	Pin4	HC	Pin13	+5V, Output	Pin5	GND	Pin14	GND	Pin6	MA	Pin15	POWER +	Pin7	MB	Pin16	POWER -	Pin8	MC	<table><tr><td>Pin11</td><td>PG</td><td>Pin1</td><td>+5V, Output</td></tr><tr><td>Pin12</td><td>SP</td><td>Pin2</td><td>HA</td></tr><tr><td>Pin13</td><td>GND</td><td>Pin3</td><td>HB</td></tr><tr><td>Pin14</td><td>GND</td><td>Pin4</td><td>HC</td></tr><tr><td>Pin15</td><td>+5V, Output</td><td>Pin5</td><td>GND</td></tr><tr><td>Pin16</td><td>EN</td><td>Pin6</td><td>MA</td></tr><tr><td>Pin17</td><td>F/R</td><td>Pin7</td><td>MB</td></tr><tr><td>Pin18</td><td>BK</td><td>Pin8</td><td>MC</td></tr><tr><td></td><td></td><td>Pin9</td><td>POWER +</td></tr><tr><td></td><td></td><td>Pin10</td><td>POWER -</td></tr></table>	Pin11	PG	Pin1	+5V, Output	Pin12	SP	Pin2	HA	Pin13	GND	Pin3	HB	Pin14	GND	Pin4	HC	Pin15	+5V, Output	Pin5	GND	Pin16	EN	Pin6	MA	Pin17	F/R	Pin7	MB	Pin18	BK	Pin8	MC			Pin9	POWER +			Pin10	POWER -
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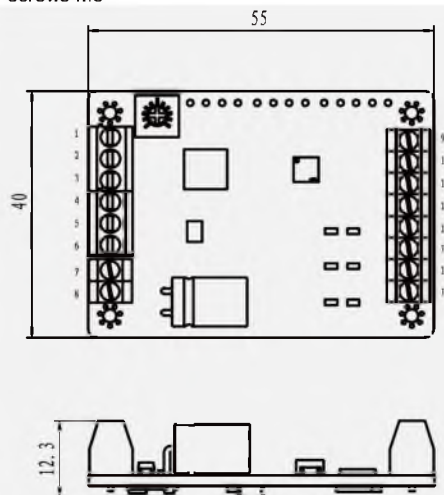
	VSC 4806S	VSC 4812S																																																																								
Operating Mode	8-48VDC, Max. Current 6A Speed controller with hall sensor, Open loop Overload protection Stall protection Sensor error protection	8-48VDC, Max. Current 12A Speed controller with hall sensor, Open loop Overload protection Stall protection Sensor error protection																																																																								
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9 Hall sensor signal	HA,HB,HC	HA,HB,HC																																																																								
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12 Enable "EN"	Enable 0...+5V	Enable 0...+5V																																																																								
13 Direction "F/R"	Direction 0...+5V	Direction 0...+5V																																																																								
14 Brake "BK"	---	Brake 0...+5V																																																																								
15 Speed Feedback "PG"	---	OC ouput(30V/10mA max)																																																																								
16 Alarm Ouput "ALARM"	---	OC ouput(30V/10mA max)																																																																								
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23 Dimensisons (L x W x H)	55 x 86 x 21mm	80 x 143 x33mm																																																																								
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Pin9	BK	Pin1	+5V, Output																																																																							
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Pin15	+5V, Output	Pin5	GND																																																																							
Pin16	EN	Pin6	MA																																																																							
Pin17	F/R	Pin7	MB																																																																							
Pin18	BK	Pin8	MC																																																																							
		Pin9	POWER +																																																																							
		Pin10	POWER -																																																																							



	VSC 3003L	VSC 4806L																																																								
Operating Mode	8-30VDC, Max. Current 3A Speed controller without sensor, Open loop Overload protection Stall protection CW/CCW control	8-48VDC, Max. Current 6A Speed controller without sensor, Open loop Overload protection Stall protection CW/CCW control																																																								
Electrical Data																																																										
1 DC motors up to	90W	300W																																																								
2 Operating Voltage Vcc	8-30 VDC	8-48 VDC																																																								
3 Max.output current	5A , <60S	8A , <30S																																																								
4 Continuous output current	3A	6A																																																								
5 Pulse width modulation frequency	16KHz	16KHz																																																								
6 Sampling rate PI current controller	16KHz	16KHz																																																								
7 Max.Speed (1 pole pair)	5000rpm	5000rpm																																																								
8 Efficiency	92%	95%																																																								
Inputs/Outputs																																																										
9 Digital inputs/outputs	5	4																																																								
10 Set value "RV"	Set value speed 0.... +5V (1024 steps)	Set value speed 0.... +5V (1024 steps)																																																								
11 Enable "EN"	Enable 0...+5V	Enable 0...+5V																																																								
12 Direction "F/R"	Direction 0...+5V	Direction 0...+5V																																																								
13 Brake "BK"	Brake 0...+5V	- - -																																																								
14 Speed Feedback "PG"	TTL	OC ouput(30V/10mA max)																																																								
15 Status Indicators	Operation: LED light/Blink at 1 HZ; Error: LED Blink at 20Hz																																																									
Environmental Conditions																																																										
16 Temperature - Operation	-30....+45°C	-30....+45°C																																																								
17 Temperature - Storage	-40....+85°C	-40....+85°C																																																								
Mechanical Data																																																										
18 Weight	Approx. 20 g	Approx. 90 g																																																								
19 Dimensisons (L x W x H)	45 x 45 x16.2mm	55 x 86 x 21mm																																																								
20 Mounting holes	for screws M3	for screws M3																																																								
21 Connections																																																										
	<table><tr><td>Pin6</td><td>PG</td><td>Pin1</td><td>MC</td></tr><tr><td>Pin7</td><td>SP</td><td>Pin2</td><td>MB</td></tr><tr><td>Pin8</td><td>GND</td><td>Pin3</td><td>MA</td></tr><tr><td>Pin9</td><td>GND</td><td>Pin4</td><td>POWER -</td></tr><tr><td>Pin10</td><td>+5V, Output</td><td>Pin5</td><td>POWER +</td></tr><tr><td>Pin11</td><td>EN</td><td></td><td></td></tr><tr><td>Pin12</td><td>F/R</td><td></td><td></td></tr><tr><td>Pin13</td><td>BK</td><td></td><td></td></tr></table>	Pin6	PG	Pin1	MC	Pin7	SP	Pin2	MB	Pin8	GND	Pin3	MA	Pin9	GND	Pin4	POWER -	Pin10	+5V, Output	Pin5	POWER +	Pin11	EN			Pin12	F/R			Pin13	BK			<table><tr><td>Pin1</td><td>POWER +</td><td>Pin6</td><td>GND</td></tr><tr><td>Pin2</td><td>POWER -</td><td>Pin7</td><td>PG</td></tr><tr><td>Pin3</td><td>MA</td><td>Pin8</td><td>SP</td></tr><tr><td>Pin4</td><td>MB</td><td>Pin9</td><td>F/R</td></tr><tr><td>Pin5</td><td>MC</td><td>Pin10</td><td>EN</td></tr><tr><td></td><td></td><td>Pin11</td><td>+5V, Output</td></tr></table>	Pin1	POWER +	Pin6	GND	Pin2	POWER -	Pin7	PG	Pin3	MA	Pin8	SP	Pin4	MB	Pin9	F/R	Pin5	MC	Pin10	EN			Pin11	+5V, Output
Pin6	PG	Pin1	MC																																																							
Pin7	SP	Pin2	MB																																																							
Pin8	GND	Pin3	MA																																																							
Pin9	GND	Pin4	POWER -																																																							
Pin10	+5V, Output	Pin5	POWER +																																																							
Pin11	EN																																																									
Pin12	F/R																																																									
Pin13	BK																																																									
Pin1	POWER +	Pin6	GND																																																							
Pin2	POWER -	Pin7	PG																																																							
Pin3	MA	Pin8	SP																																																							
Pin4	MB	Pin9	F/R																																																							
Pin5	MC	Pin10	EN																																																							
		Pin11	+5V, Output																																																							

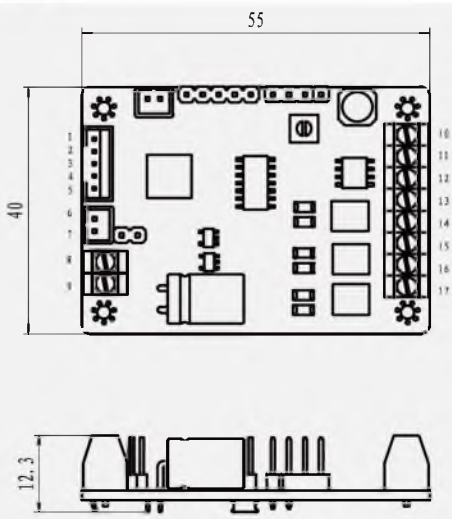


VSC 3003SL	
Operating Mode	10-28V, Max.Current 3 A Speed controller compatible with sensor and sensorless Over voltage protection Over current protection Over temperature protection Stall protection
Electrical Data	
1 DC motor up to	100W
2 Operating Voltage Vcc	10-30VDC
3 Max.output current	10A(<20S)
4 Continuous output current	3A
5 Pulse width modulation frequency	20KHZ
6 Sampling rate PI current controller	20KHZ
7 Max.Speed (1 pole pair)	5000rpm
8 Efficiency	95%
Inputs/Outputs	
9 Hall sensor signal	HA, HB, HC
10 Digital inputs/outputs	4
11 Set value "SP"	Set value speed 0...+5.0V(4096 steps)
12 Enable "EN"	Enable 0.0V
13 Direction "F/R"	Direction 0.0V
14 Brake "BK"	---
15 Speed Feedback "PG"	OC output(30V/10mA)
16 Alarm Output "ALARM"	OC output(30V/10mA)
17 Status Indicators	Ready:LED Blink at 2Hz;Error:LED blink at 10Hz
18 Hall sensor supply voltage	+5 VDC
19 Hall & Digital signal ground	GND
Environmental Conditions	
20 Temperature - Operation	-30...+45°C
21 Temperature - Storage	-40...+85°C
Mechanical Data	
22 Weight	approx.18.6g
23 Dimensions (L x W x H)	55 x 40 x 12.3mm
24 Mounting holes	for screws M3
25 Connections	



Pin1	GND	Pin9	3.3V
Pin2	ALM	Pin10	HA
Pin3	FG	Pin11	HB
Pin4	FR	Pin12	HC
Pin5	EN	Pin13	GND
Pin6	SP	Pin14	MA
Pin7	POWER +	Pin15	MB
Pin8	POWER -	Pin16	MC



VMC 2403S																																					
Operating Mode	10-28VDC, Max Current 3A Can be configured as position,speed,current mode Over voltage protection Over current protection Overload protection Over temperature protection Encoder error protection																																				
Electrical Data																																					
1 DC motor up to	100W																																				
2 Operating Voltage Vcc	10-28 VDC																																				
3 Max.output current	10 A(<20S)																																				
4 Continuous output current	3 A																																				
5 Pulse width modulation frequency	20KHz																																				
6 Sampling rate PI current controller	20KHz																																				
7 Sampling rate PI speed controller	2KHz																																				
8 Sampling rate PI current controller	2KHz																																				
9 Max.Speed (1 pole pair)	20000rpm(sinusoidal)																																				
10 Efficiency	98%																																				
Inputs/Outputs																																					
11 Hall sensor signal	HA,HB,HC																																				
12 Encoder-signal	A, B																																				
13 Hall sensor supply voltage output	3.3V																																				
14 Encoder supply voltage output	5.0V																																				
15 Communication interface	RS485																																				
16 Protocol	MODBUS-RTU																																				
17 Baudrate	38400																																				
18 Status Indicators	Ready:green LED light and red LED Blink at 2HZ;Error:green LED Blink at 10Hz and red LED light																																				
Environmental Conditions																																					
20 Temperature - Operation	-30....+45°C																																				
21 Temperature - Storage	-40....+85°C																																				
Mechanical Data																																					
22 Weight	Approx. 16.7 g																																				
23 Dimensions (L x W x H)	55 x 40 x 12.3mm																																				
24 Mounting holes	for screws M2																																				
25 Connections																																					
	<table><tr><td>Pin 1</td><td>I</td><td>Pin10</td><td>3.3V</td></tr><tr><td>Pin 2</td><td>B</td><td>Pin11</td><td>3.3V</td></tr><tr><td>Pin 3</td><td>A</td><td>Pin12</td><td>HB</td></tr><tr><td>Pin 4</td><td>3.3V</td><td>Pin13</td><td>HC</td></tr><tr><td>Pin 5</td><td>GND</td><td>Pin14</td><td>GND</td></tr><tr><td>Pin 6</td><td>485_A</td><td>Pin15</td><td>MA</td></tr><tr><td>Pin 7</td><td>485_B</td><td>Pin16</td><td>MB</td></tr><tr><td>Pin 8</td><td>POWER +</td><td>Pin17</td><td>MC</td></tr><tr><td>Pin 9</td><td>POWER -</td><td></td><td></td></tr></table>	Pin 1	I	Pin10	3.3V	Pin 2	B	Pin11	3.3V	Pin 3	A	Pin12	HB	Pin 4	3.3V	Pin13	HC	Pin 5	GND	Pin14	GND	Pin 6	485_A	Pin15	MA	Pin 7	485_B	Pin16	MB	Pin 8	POWER +	Pin17	MC	Pin 9	POWER -		
Pin 1	I	Pin10	3.3V																																		
Pin 2	B	Pin11	3.3V																																		
Pin 3	A	Pin12	HB																																		
Pin 4	3.3V	Pin13	HC																																		
Pin 5	GND	Pin14	GND																																		
Pin 6	485_A	Pin15	MA																																		
Pin 7	485_B	Pin16	MB																																		
Pin 8	POWER +	Pin17	MC																																		
Pin 9	POWER -																																				

Vishan

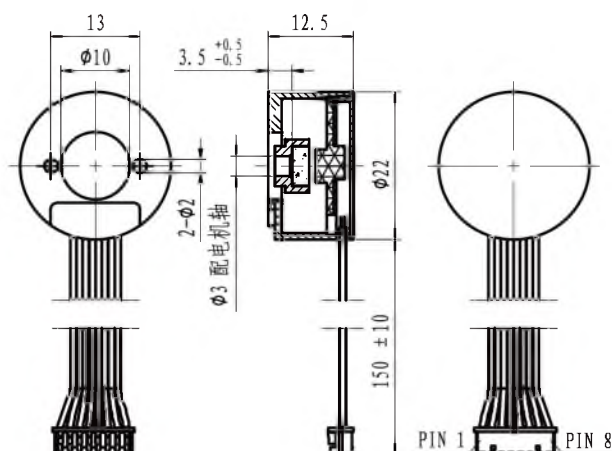
Encoder

We offer a wide range of flexible encoder options, whether magnetic, optic or absolute, from the smallest $\Phi 8$ mm to $\Phi 28$ mm, there is a product to suit your application.

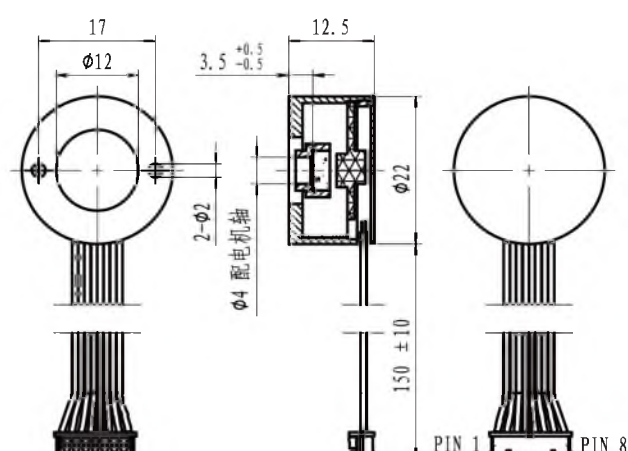
**Basic Data:**

Magnetic encoders
Optical encoders
High position accuracy, Repeability
And high signal quality
Multifarious function customization

EN22A/EN22AL



EN22B/EN22BL



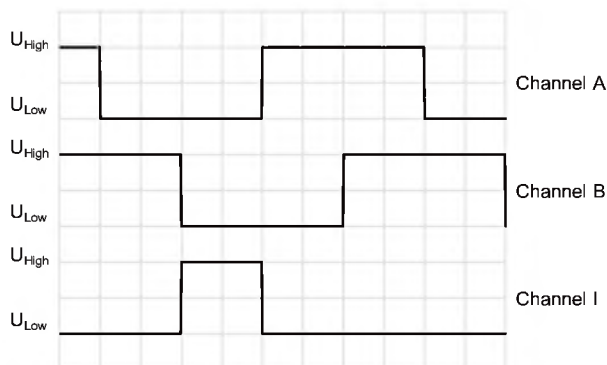
	Without line driver	EN22A	EN22AL	EN22B	EN22BL
Electrical Data					
1 Lines per revolution		4096	4096	4096	4096
2 Number of channels		3	3	3	3
3 Max. speed	rpm	20000	20000	20000	20000
4 Supply voltage	V	5	5	5	5
5 Output signal		TTL	TTL	TTL	TTL
6 Index pulse width	°e	90	90	90	90
7 Phase shift, Channel A to B	°e	90	90	90	90
8 Interia of code disc	gcm ²	0.7	0.7	0.7	0.7
9 Operating temperature range	°C	-40..+125	-40..+125	-40..+125	-40..+125

Features & Configuration

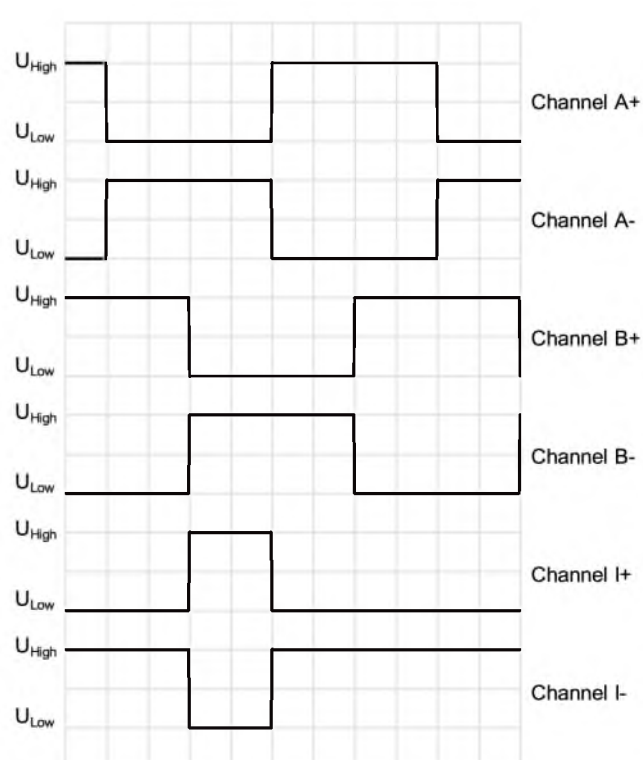
- Magnetic rotary encoder chip
- Output interface: ABI
- Configuration programmable : Zero position, ABI line per revolution
- ABI binary pulse count: 4096, 2048, 1024, 512, 256ppr
- Optional line driver : Provide four channel differential line driver with complementary outputs for EN22AL and EN22BL

Output Signals**EN22A/EN22B**

with counter-clockwise rotation as from the shaft end

**EN22AL/EN22BL**

with counter-clockwise rotation as from the shaft end

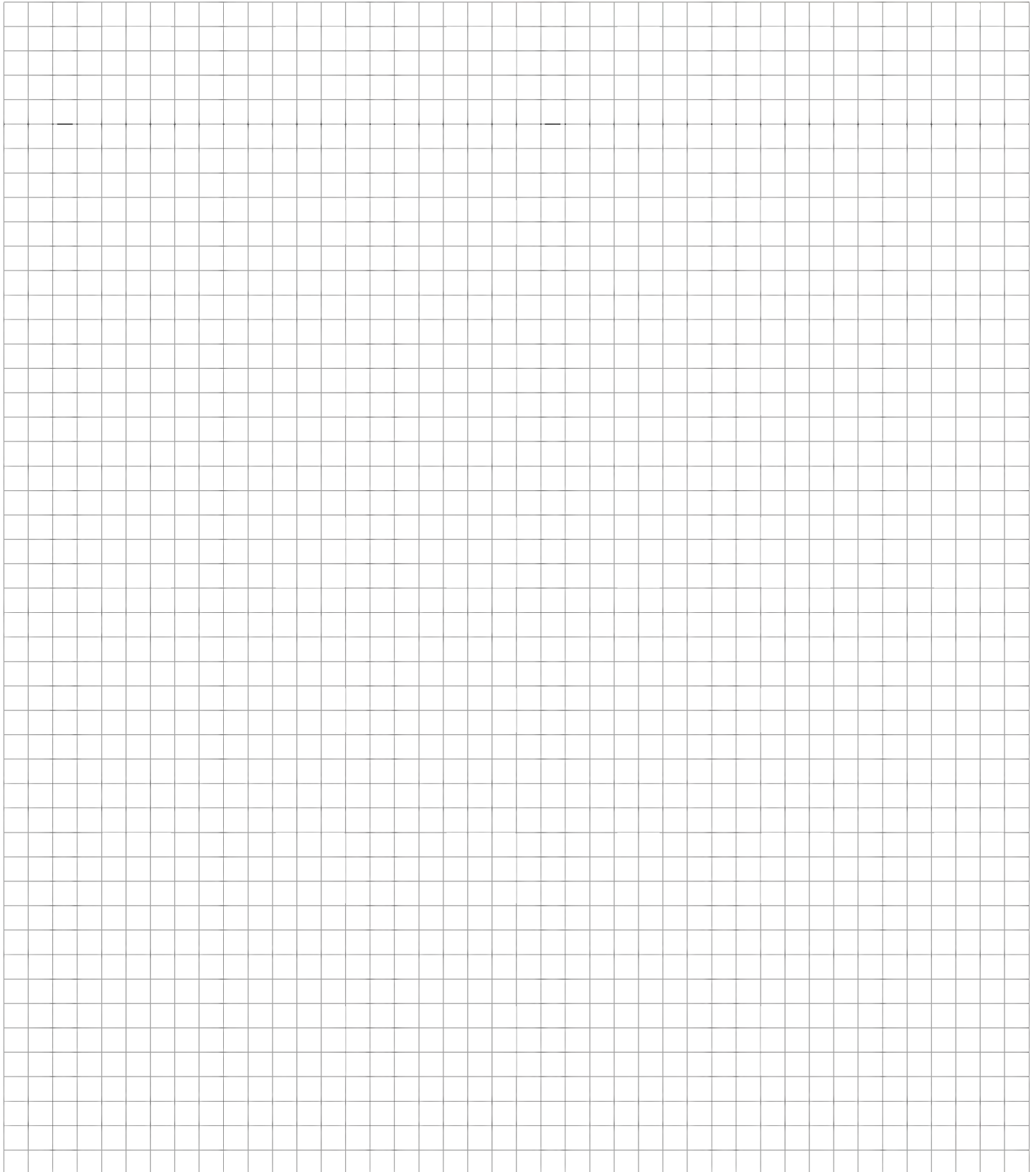
**Connection**

Conection	EN22A/EN22B	PVC
Pin 1	A+	AWG28 yellow
Pin 2	NC	AWG28 grey
Pin 3	B+	AWG28 green
Pin 4	NC	AWG28 orange
Pin 5	I+	AWG28 blue
Pin 6	NC	AWG28 white
Pin 7	Vcc	AWG28 red
Pin 8	GND	AWG28 black

Conection	EN22AL/EN22BL	PVC
Pin 1	A+	AWG28 yellow
Pin 2	A-	AWG28 grey
Pin 3	B+	AWG28 green
Pin 4	B-	AWG28 orange
Pin 5	I+	AWG28 blue
Pin 6	I-	AWG28 white
Pin 7	Vcc	AWG28 red
Pin 8	GND	AWG28 black

Subject: _____

Date: _____





BLDC MOTOR & CONTROLLER



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Mob: +86(0)186 7666 0161

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