



Coreless Motor Co., Ltd



MAIN

CORELESS MOTOR
GEAR MOTOR
BRUSHLESS MOTOR

工业级精密空心杯电机研发制造商
creative ideas for drive

COMPANY PROFILE

Coreless Motor Co., Ltd. is located in Shenzhen, the core technological innovation capital of the Greater Bay Area of China. We have a strong research and development team and manufacturing capacity, with a professional coreless motor production line, through product customization and technical innovation, to help you create high-quality transmission system. Our micro transmission solutions are widely used in medical beauty, power tools, AI intelligent robots, electronic door locks, aviation and other fields, improving the level of accurate application of products.

Based on nearly 10 years of experience in the field of coreless motor technology, we offer both brush coreless motors and brushless coreless motors with diameters ranging from 12 to 45MM, and provide with the matching DC brushless drive, speed reduction box and encoder for your choice. We provide you with accurate selection, through team work, design practical solutions; By customizing and adjusting the product parameters on demand, it can flexibly meet the power needs of various industrial automation application fields. We have passed the ISO9001:2015 quality management system certification, to ensure the consistency of the production process, delivery efficiency and traceable plasticity, to provide customers with durable, efficient, low maintenance rate of high quality motor products.

"Technology-based, innovation, and harmony." has been the development of the company's business philosophy, serving customers, committed to providing more scientific and reasonable solutions and products, and ultimately achieving "mutual benefit and win-win".

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Tattoo
Tattoo beauty



Power tools
Manipulator
Electronic door lock



AI intelligent robot
Industrial automation



Aerospace
Medical equipment

公司简介

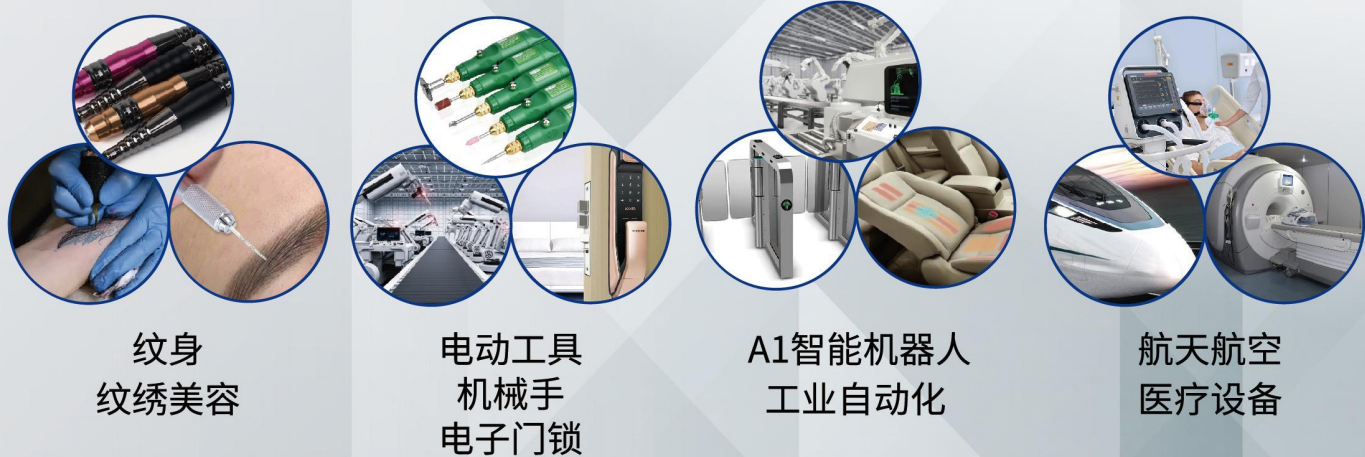
深圳市新和电机有限公司位于中国大湾区核心科技创新之都---深圳!我们拥有强大的研发团队和制造能力,拥有专业的空心杯电机生产线,通过产品定制化和技术革新,协助您创造出优质的传动系统。我们的微型传动解决方案广泛应用于医疗美容、电动工具、AI智能机器人、电子门锁、航空等领域,提高了产品精准应用的水平。

基于在空心杯电机技术领域近十年的经验,我们有刷空心电机和无刷空心杯电机直径从12到45MM都有推出,与之配套的直流无刷驱动器,减速箱和编码器都有完整的产品供应挑选。我们为您提供精准选型,通过团队合作,设计出实用的解决方案;通过订制化按需调整产品参数,灵活的满足各种工业自动化应用场的动力需求。我们通过ISO9001:2015质量管理体系认证,确保产品生产制程的一致性和出货效率及可追塑性,为客户提供耐用、高效、维修率极低的优质电机产品。

“科技为本,创新,和谐。”一直作为公司的发展经营理念,服务于客户,致力于提供更加科学、合理的方案和产品,最终达到“互利、共赢”。

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MOTOR Coreless Motor Co Ltd



CORELESS GEARMOTOR



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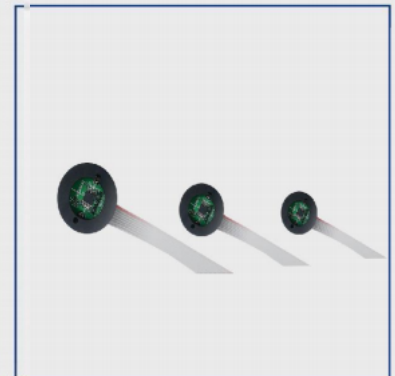
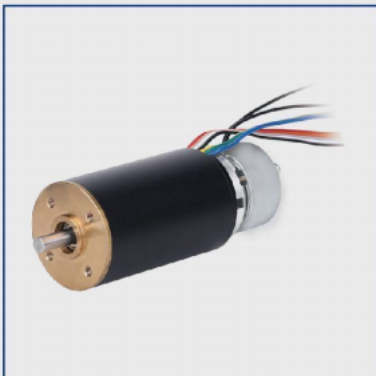
Website: www.coreless-motor.com



MOTOR Coreless Motor Co., Ltd



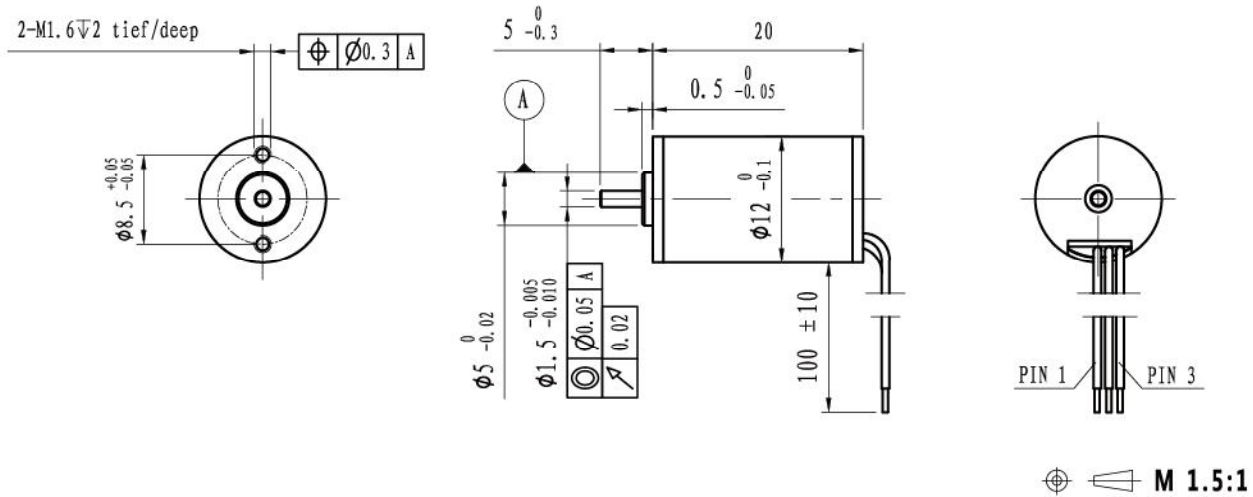
CORELESS BRUSHLESS MOTOR



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Website: www.coreless-motor.com



Sensorless		EC1220L-...	0625	0936					
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	6	9					
2	No load speed	rpm	25000	36890					
3	No load current	mA	69	83					
4	Nominal speed	rpm	16536	29888					
5	Nominal torque	mNm	1.5	1.3					
6	Nominal current	A	0.75	0.66					
7	Stall torque	mNm	4.43	6.85					
8	Stall current	A	2.07	3.1					
9	Max. efficiency	%	66.8	70					
10	Terminal resistance	Ω	2.9	2.9					
11	Terminal inductance	mH	0.19	0.19					
12	Torque constant	mNm/A	2.22	2.27					
13	Speed constant	rpm/V	4310	4212					
14	Speed/torque gradient	rpm/mNm	5642	5386					
15	Mechanical time constant	ms	10.0	9.6					
16	Rotor inertia	gcm^2	0.17	0.17					

17	Thermal resistance housing-ambient	38.3 K/W
18	Thermal resistance winding-housing	9.6 K/W
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	9.8 g

Operating Range

EC1220

The diagram based on ambient temperature of 25 °C

Power [W]

Speed [rpm]

Continuous operating range

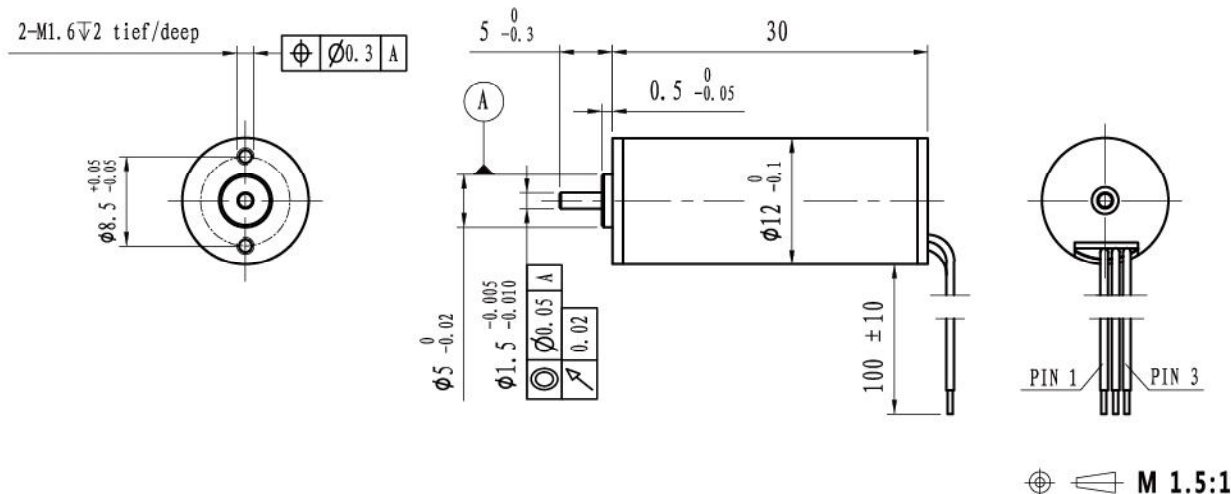
Continuous operating range with Reduced R_{th2} 50%

n-T Curve at Nominal Voltage

2 4 6 8

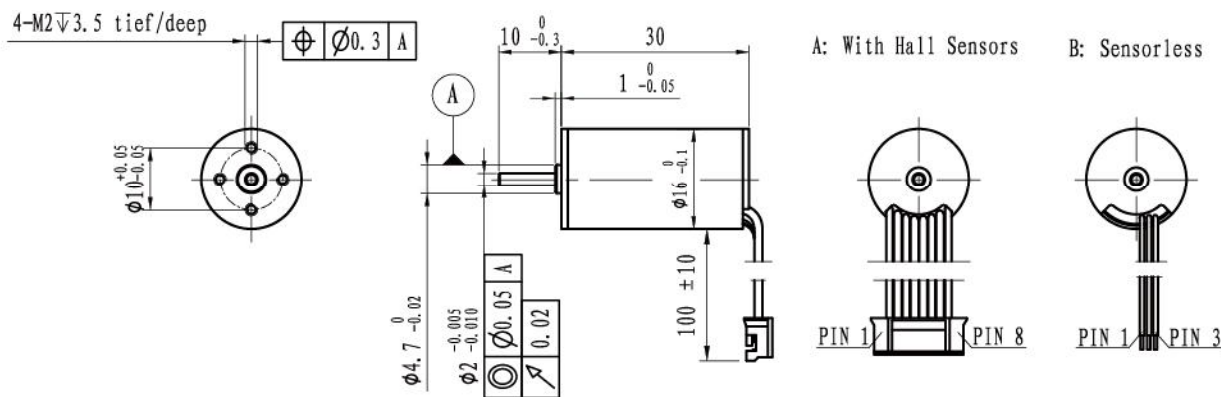
0.0 0.5 1.0 1.5 2.0 2.5 3.0

Connection						Configuration
Conection						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	Motor winding MA	AWG28	yellow			
Pin 2	Motor winding MB	AWG28	green			
Pin 3	Motor winding MC	AWG28	blue			



Sensorless EC1230L-...		0625	0925	1225					
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	20719	20565	20449					
5 Nominal torque	mNm	3	3	3					
6 Nominal current	A	1.47	0.98	0.74					
7 Stall torque	mNm	16.5	16.6	16.7					
8 Stall current	A	7.55	5.03	3.77					
9 Max. efficiency	%	76.2	75	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	1530	1512	1494					
15 Mechanical time constant	ms	5.1	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								
19 Thermal time constant winding	4 s								
20 Thermal time constant motor	240 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								
25 Radial play	preloaded								
26 Max. axial load (dynamic)	0.3								
27 Max. force for press fits (static)	11N								
28 Max. radial loading, 5mm from flange	4.3 N								
29 Number of pole pairs	1	Connection Conection PVC Pin 1 Motor winding MA AWG28 yellow Pin 2 Motor winding MB AWG28 green Pin 3 Motor winding MC AWG28 blue							
30 Number of phases	3								
31 Weight of motor	16.3 g								
		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 Series Slotless Brushless DC Motor
EC1630 $\Phi 16\text{mm} \times 30\text{mm}$

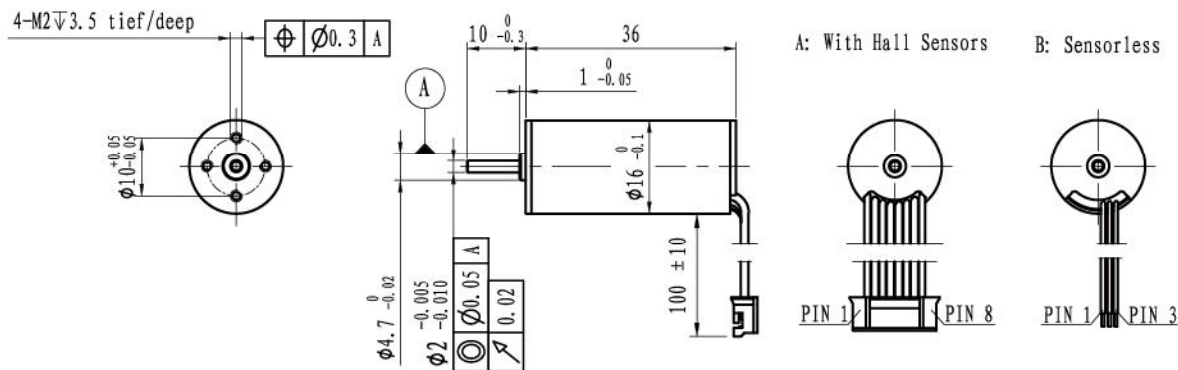


Φ $\Rightarrow$ M 1:1.2

		Sensorless	EC1630L-...	1223	1223	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		19.9	20.5	18.2				
8	Stall current	A		4.44	3.1	2.09				
9	Max. efficiency	%		61.3	60.9	61				
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		4.7	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		5.8	5.7	6.5				
16	Rotor inertia	gcm ²		0.48	0.48	0.48				

17	Thermal resistance housing-ambient	20.0 K/W	Operating Range							
18	Thermal resistance winding-housing	8.8 K/W	EC1630 The diagram based on ambient temperature of 25°C Power [W] 6 8 10 12 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	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								
	(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	25 g								

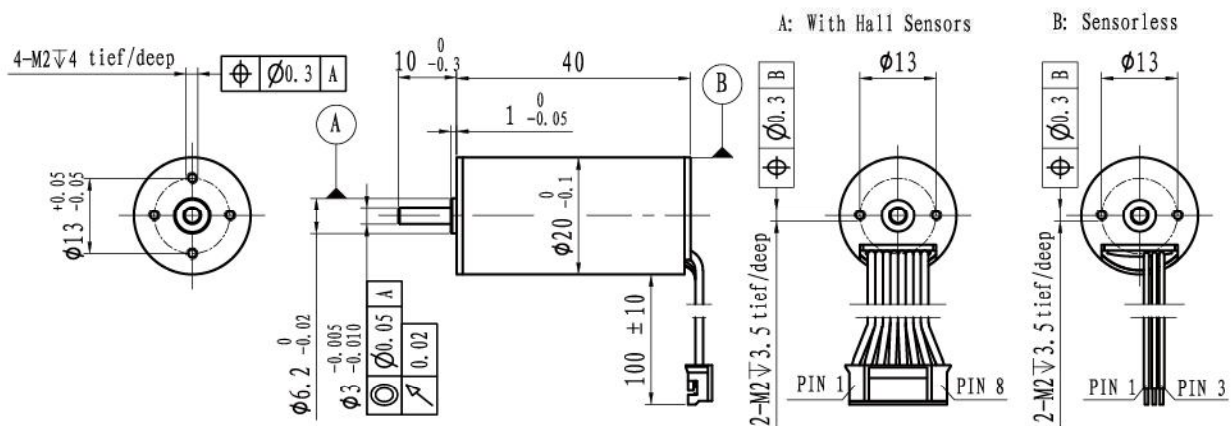
Connection			Configuration	
Connection A (Sensor)			Performance: Customized in the continuous operating range Ball bearing: Preload Flange: Standard frange front&back/customize the frange Shaft: Length/Diameter/Cut face/double shaft/hollow shaft Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length Connector: JST/MOLEX/TE	
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				
Connection B (Sensorless)				
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 1:1.2

	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	14668			
3	No load current	mA	150	110	70	50			
4	Nominal speed	rpm	11412	11930	11615	12005			
5	Nominal torque	mNm	6	6	6	6			
6	Nominal current	A	1.62	1.14	0.84	0.44			
7	Stall torque	mNm	34.3	33.5	30.5	33			
8	Stall current	A	8.57	5.88	3.99	2.21			
9	Max. efficiency	%	75.3	74.5	75.3	72.2			
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	5.8	7.79	15.3			
13	Speed constant	rpm/V	2347	1646	1227	625			
14	Speed/torque gradient	rpm/mNm	404	434	474	444			
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	Operating Range EC1636 Power [W] 9 13 17 21 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]						
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 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	32 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 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)			Configuration	
Pin 1 Motor winding MA	AWG26	yellow		
Pin 2 Motor winding MB	AWG26	green		
Pin 3 Motor winding MC	AWG26	blue		



 M 1:1.2

Sensorless With hall sensor		EC2040L-...	1218	1818	2418	3618			
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	65.9	83.9	75.3	69.5			
8	Stall current	A	10.5	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	0.30	0.62			
12	Torque constant	mNm/A	6.35	9.22	12.2	17.8			
13	Speed constant	rpm/V	1503	1035	784	536			
14	Speed/torque gradient	rpm/mNm	270	219	246	272			
15	Mechanical time constant	ms	6.4	5.2	5.8	6.4			
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							
	(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	56 g							

Operating Range

The diagram based on ambient temperature of 25 °C

Power [W] curves: 17, 22, 27, 32

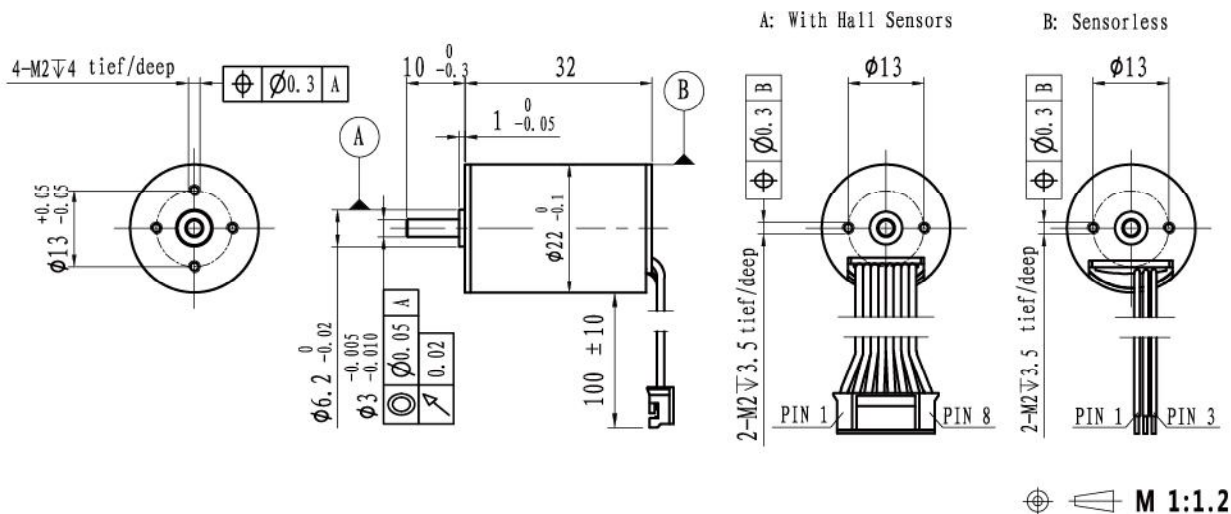
Continuous operating range (dark blue area)

Continuous operating range with Reduced R_{th2} 50% (light blue area)

n-T Curve at Nominal Voltage

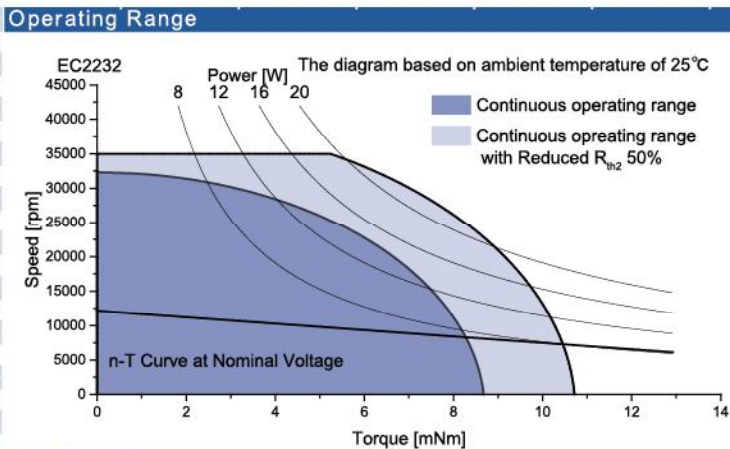
Speed [rpm] vs Torque [mNm]

Connection				Configuration
Conection A (Sensor)		PVC		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)		PVC		
Pin 1	Motor winding MA	AWG26	yellow	
Pin 2	Motor winding MB	AWG26	green	
Pin 3	Motor winding MC	AWG26	blue	

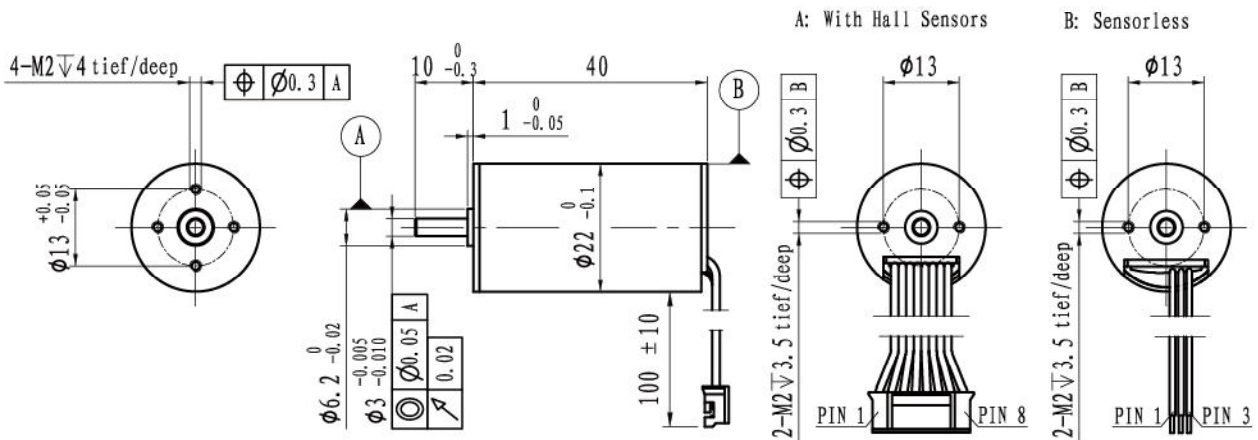


Sensorless		EC2232L-...							
With hall sensor		EC2232S-...	0612	1212	1812	2412			
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	6	12	18	24			
2	No load speed	rpm	11700	11184	12080	12164			
3	No load current	mA	230	150	86	60			
4	Nominal speed	rpm	9585	9023	9937	9358			
5	Nominal torque	mNm	6	6	6	6			
6	Nominal current	A	1.5	0.76	0.52	0.39			
7	Stall torque	mNm	33.2	31.1	33.8	26			
8	Stall current	A	7.23	3.32	2.55	1.5			
9	Max. efficiency	%	67.5	62	66.6	64			
10	Terminal resistance	Ω	0.83	3.61	7.07	16			
11	Terminal inductance	mH	0.08	0.28	0.66	1.72			
12	Torque constant	mNm/A	4.74	9.78	13.7	18.1			
13	Speed constant	rpm/V	2014	976	695	528			
14	Speed/torque gradient	rpm/mNm	353	360	357	468			
15	Mechanical time constant	ms	5.5	5.6	5.6	7.3			
16	Rotor inertia	gcm^2	1.5	1.5	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
	(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	48 g



Connection				Configuration
Conection A (Sensor)		PVC		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)		PVC		
Pin 1	Motor winding MA	AWG26	yellow	
Pin 2	Motor winding MB	AWG26	green	
Pin 3	Motor winding MC	AWG26	blue	

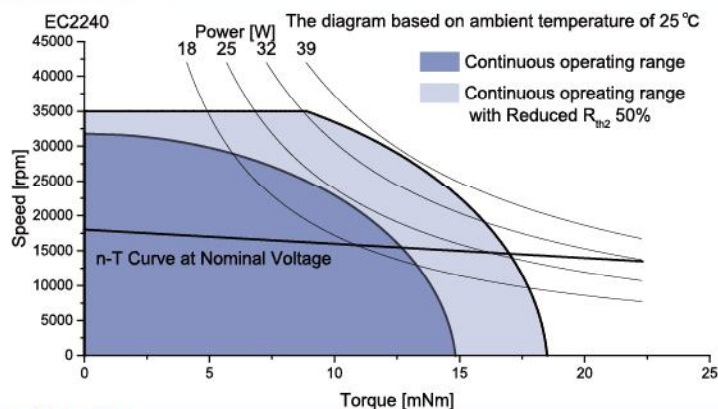


M 1:1.2

		Sensorless With hall sensor	EC2240L-...	EC2240S-...	1216	2416	3016	3616				
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	0.8	0.67				
7	Stall torque	mNm			83.9	82.8	85.2	78.5				
8	Stall current	A			12.6	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	13.4	16.9	20.2				
13	Speed constant	rpm/V			1416	712	567	472				
14	Speed/torque gradient	rpm/mNm			200	203	196	213				
15	Mechanical time constant	ms			4.7	4.8	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
	(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	64 g

Operating Range



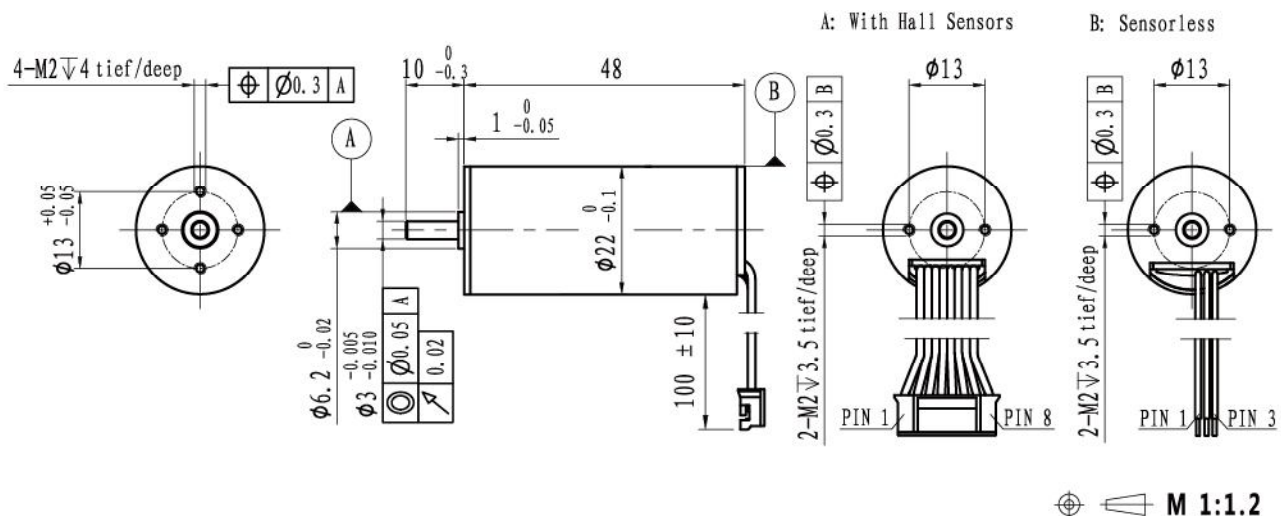
Connection

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

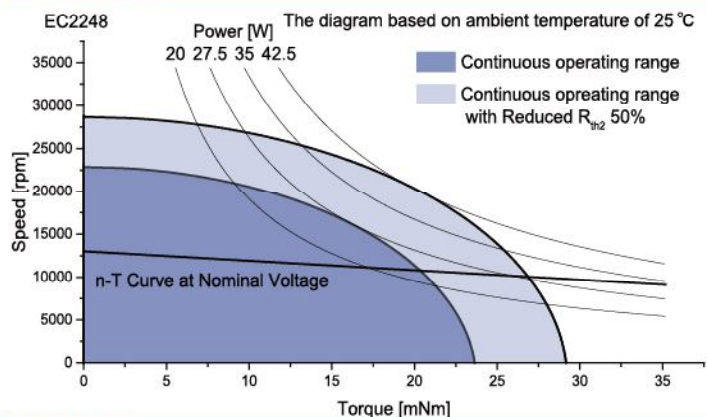
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



M 1:1.2

	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		11426	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		148	153	147	166			
8 Stall current	A		17.2	8.86	5.88	5.07			
9 Max. efficiency	%		80.6	79.7	77.8	78			
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	17.5	25.3	33.1			
13 Speed constant	rpm/V		1095	545	377	288			
14 Speed/torque gradient	rpm/mNm		87.7	84.3	91.2	82.3			
15 Mechanical time constant	ms		2.9	2.8	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								
(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	85 g								

Operating Range



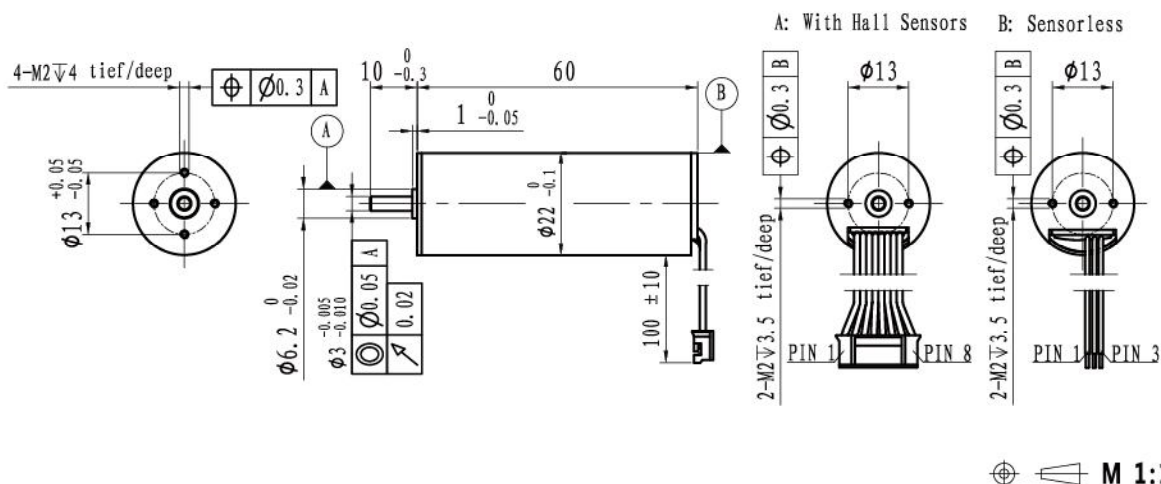
Connection

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	

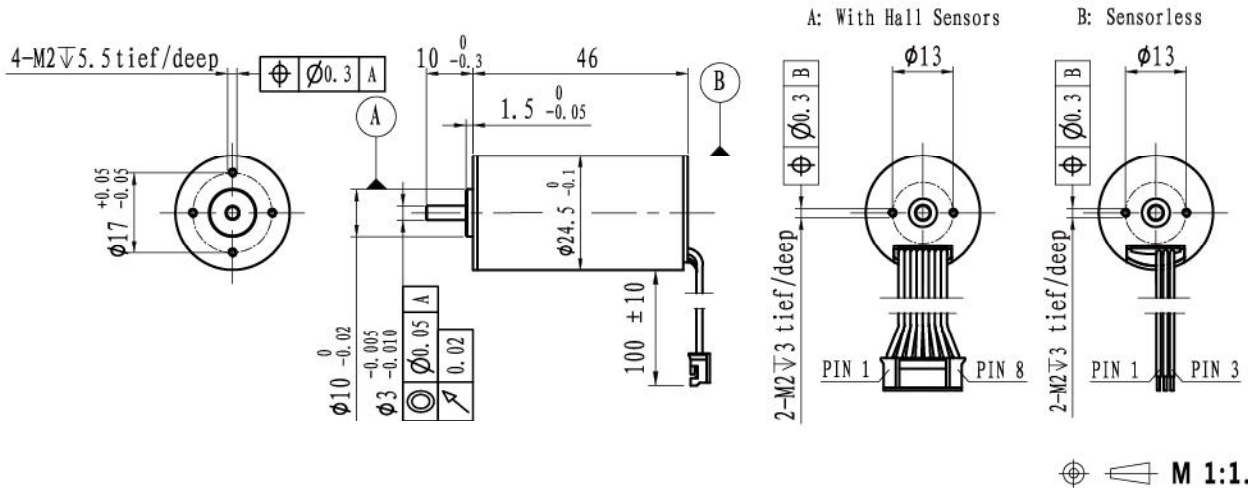
Configuration

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



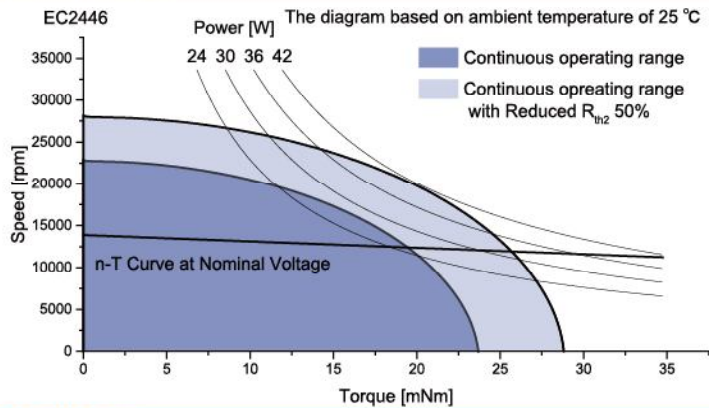
		Sensorless With hall sensor	EC2260L-...	EC2260S-...	1216	2416	3616	4816				
Motor data												
Values at nominal voltage												
1	Nominal voltage	V			12	24	36	48				
2	No load speed	rpm			16360	16086	16030	16200				
3	No load current	mA			440	230	170	110				
4	Nominal speed	rpm			14517	14441	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			249	274	269	272				
8	Stall current	A			36.4	19.7	12.9	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	0.30	0.52				
12	Torque constant	mNm/A			6.92	14.1	21.2	28				
13	Speed constant	rpm/V			1380	678	451	341				
14	Speed/torque gradient	rpm/mNm			65.8	58.8	59.5	59.7				
15	Mechanical time constant	ms			3.1	2.8	2.8	2.8				
16	Rotor inertia	gcm ²			4.5	4.5	4.5	4.5				
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 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	122 g										
Operating Range												
EC2260 The diagram based on ambient temperature of 25 °C Power [W] 40 50 60 70 Speed [rpm] 0 5000 10000 15000 20000 25000 30000 35000 40000 Torque [mNm] 0 10 20 30 40 50 Continuous operating range Continuous operating range with Reduced R_{rms} 50% n-T Curve at Nominal Voltage												

Connection				Configuration
Conection A (Sensor)		PVC		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)		PVC		
Pin 1	Motor winding MA	AWG26	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		12678	12487	12662	12446				
5	Nominal torque	mNm		18	18	18	18				
6	Nominal current	A		2.5	1.23	0.84	0.63				
7	Stall torque	mNm		173	180	199	175				
8	Stall current	A		21.9	11.2	8.28	5.46				
9	Max. efficiency	%		79.8	80	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	16.3	24.4	32.6				
13	Speed constant	rpm/V		1193	584	392	293				
14	Speed/torque gradient	rpm/mNm		81.8	76.9	69.9	79.1				
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									
	(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	92 g									

Operating Range



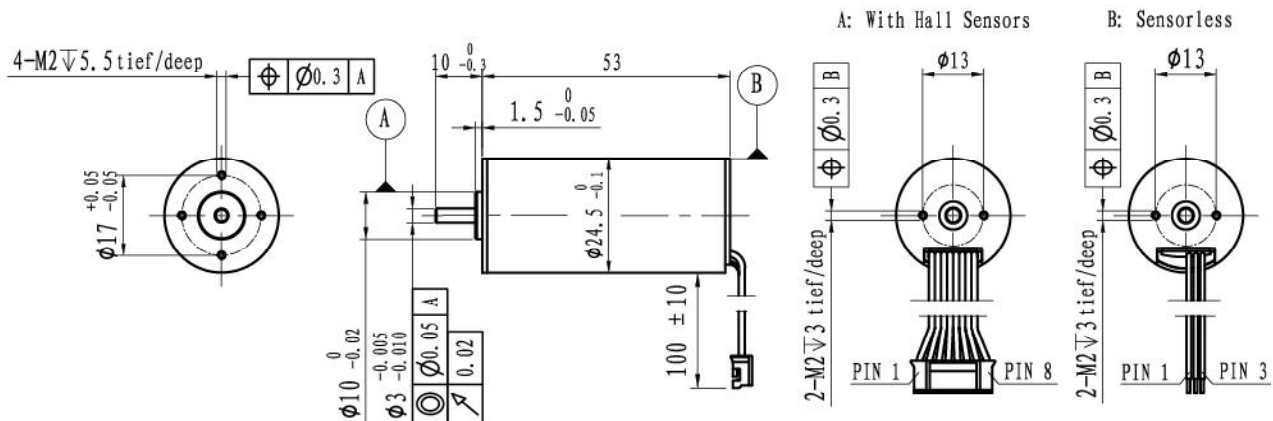
Connection

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

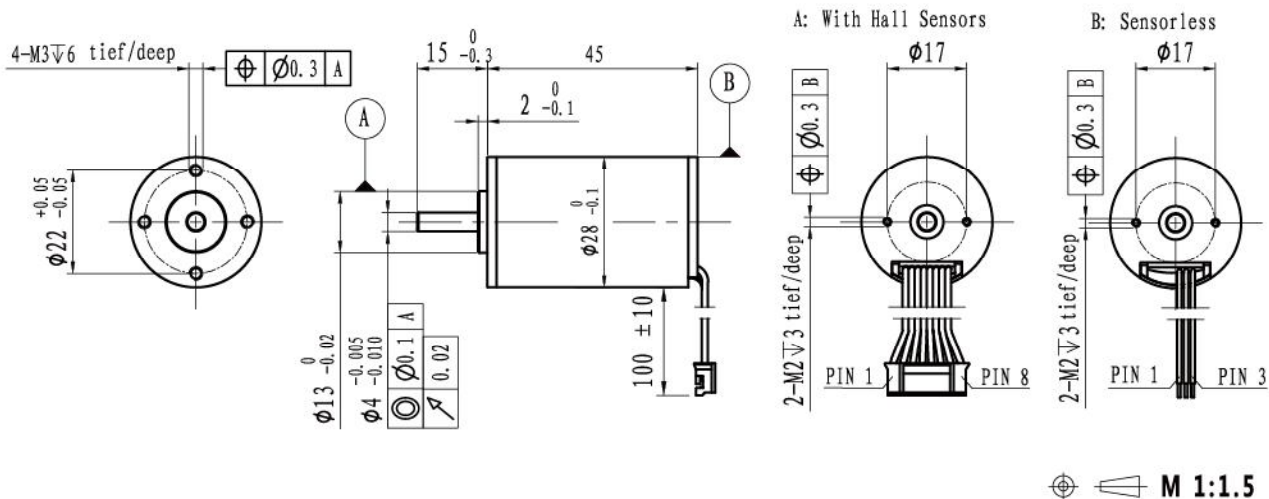
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length
Connector: JST/MOLEX/TE



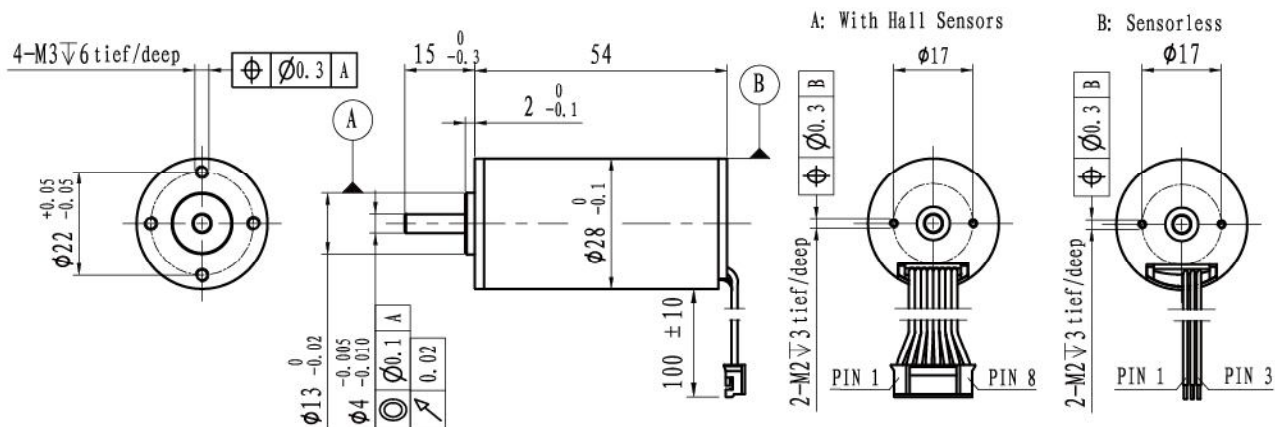
M 1:1.5

	Sensorless With hall sensor	EC2453L-... EC2453S-...	1215	2415	3615	4815				
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	293	307	293				
8 Stall current	A		35.3	20	13.8	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	14.8	22.4	29.7				
13 Speed constant	rpm/V		1268	647	426	322				
14 Speed/torque gradient	rpm/mNm		57.2	52.5	49.6	52.3				
15 Mechanical time constant	ms		3.5	3.2	3.1	3.2				
16 Rotor inertia	gcm ²		5.9	5.9	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	110 g									
Operating Range										
EC2453 The diagram based on ambient temperature of 25 °C Power [W] 30 38 46 54 Speed [rpm] Continuous operating range Continuous operating range with Reduced R_{th} 50% n-T Curve at Nominal Voltage Torque [mNm]										

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



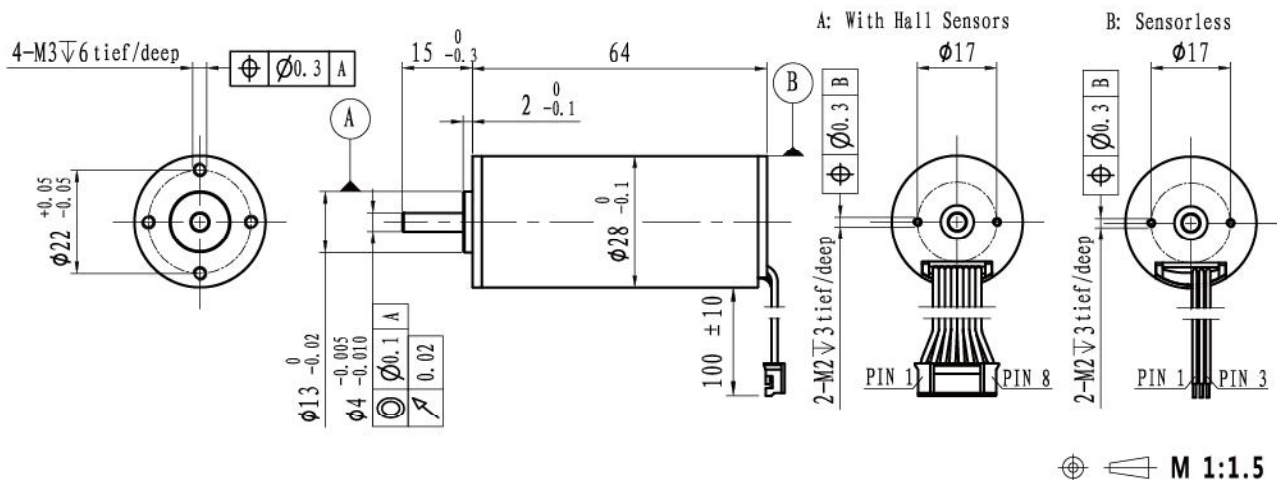
		Sensorless	EC2845L-...	1213	2413	3613	4813			
		With hall sensor	EC2845S-...							
Motor data										
Values at nominal voltage										
1	Nominal voltage	V		12	24	36	48			
2	No load speed	rpm		13737	13756	13783	13400			
3	No load current	mA		202	128	84	79			
4	Nominal speed	rpm		12232	12342	12432	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		164	175	184	161			
8	Stall current	A		20.1	10.8	7.53	4.87			
9	Max. efficiency	%		81	79.4	80	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	16.5	24.7	33.7			
13	Speed constant	rpm/V		1156	580	387	284			
14	Speed/torque gradient	rpm/mNm		83.6	78.6	75	83.1			
15	Mechanical time constant	ms		4.5	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	Operating Range EC2845 The diagram based on ambient temperature of 25 °C Continuous operating range Continuous operating range with Reduced R _{th2} 50%							
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								
	(static, shaft supported)	2000 N								
28	Max. radial loading, 5mm from flange	25 N								
29	Number of pole pairs	1	Connection							
30	Number of phases	3								
31	Weight of motor	120 g								



M 1:1.5

		Sensorless With hall sensor	EC2854L-...	EC2854S-...	1208	2408	3608	4808				
Motor data												
Values at nominal voltage												
1	Nominal voltage	V			12	24	36	48				
2	No load speed	rpm			8031	8336	8175	8325				
3	No load current	mA			142	94	65	51				
4	Nominal speed	rpm			6646	7084	6891	6805				
5	Nominal torque	mNm			35	35	35	35				
6	Nominal current	A			2.62	1.38	0.91	0.7				
7	Stall torque	mNm			203	233	223	192				
8	Stall current	A			14.5	8.66	5.43	3.58				
9	Max. efficiency	%			81.2	80.3	79.3	77.6				
10	Terminal resistance	Ω			0.83	2.77	6.63	13.4				
11	Terminal inductance	mH			0.16	0.61	1.41	2.56				
12	Torque constant	mNm/A			14.1	27.2	41.5	54.3				
13	Speed constant	rpm/V			676	351	230	176				
14	Speed/torque gradient	rpm/mNm			39.6	35.8	36.7	43.4				
15	Mechanical time constant	ms			3.5	3.2	3.3	3.9				
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												
EC2854 The diagram based on ambient temperature of 25 °C Power [W] 45 54 63 72 Speed [rpm] Torque [mNm] n-T Curve at Nominal Voltage Continuous operating range Continuous operating range with Reduced R_{th2} 50%												

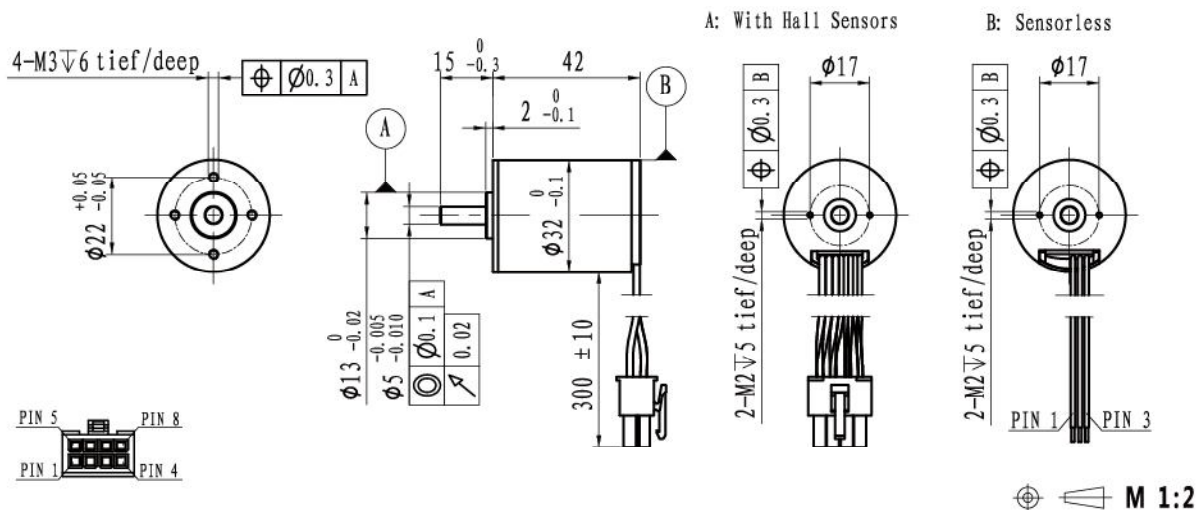
Connection			Configuration	
Connection A (Sensor)			Performance: Customized in the continuous operating range	
Pin 1 Vhall 3-18 VDC	AWG26	black	Ball bearing: Preload	
Pin 2 Hall sensor HA	AWG26	black	Flange: Standard frange front&back/customize the frange	
Pin 3 Hall sensor HB	AWG26	black	Shaft: Length/Diameter/Cut 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		
Connector				
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		



M 1:1.5

		Sensorless	EC2864L-...	1208	2408	3608	4808				
		With hall sensor	EC2864S-...								
Motor data											
Values at nominal voltage											
1	Nominal voltage	V		12	24	36	48				
2	No load speed	rpm		7956	8014	8275	7960				
3	No load current	mA		182	104	92	59				
4	Nominal speed	rpm		6712	6840	7053	6782				
5	Nominal torque	mNm		50	50	50	50				
6	Nominal current	A		3.68	1.87	1.31	0.94				
7	Stall torque	mNm		320	341	339	338				
8	Stall current	A		22.6	12.1	8.33	5.99				
9	Max. efficiency	%		82.8	82.3	80.1	81.1				
10	Terminal resistance	Ω		0.53	1.98	4.32	8.02				
11	Terminal inductance	mH		0.11	0.46	0.96	1.83				
12	Torque constant	mNm/A		14.3	28.4	41.1	57				
13	Speed constant	rpm/V		668	337	232	167				
14	Speed/torque gradient	rpm/mNm		24.9	23.5	24.4	23.6				
15	Mechanical time constant	ms		2.5	2.4	2.5	2.4				
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 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	195 g									
Operating Range											
				EC2864 Power [W] The diagram based on ambient temperature of 25°C 55 66 77 88 Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage Speed [rpm] Torque [mNm]							

Connection			Configuration	
Connection 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				
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 EC3242L-...		With hall sensor EC3242S-...		1209	2409	3609	4809			
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	8124			
5	Nominal torque	mNm		25	25	25	25			
6	Nominal current	A		2.46	1.27	0.81	0.61			
7	Stall torque	mNm		208	206	221	186			
8	Stall current	A		17.6	8.99	6.19	3.98			
9	Max. efficiency	%		72.8	71.8	74.1	72.2			
10	Terminal resistance	Ω		0.68	2.67	5.82	12.1			
11	Terminal inductance	mH		0.11	0.40	0.98	1.79			
12	Torque constant	mNm/A		12	23.5	36.4	47.7			
13	Speed constant	rpm/V		794	406	263	200			
14	Speed/torque gradient	rpm/mNm		44.9	46.1	42	50.6			
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

The diagram based on ambient temperature of 25 °C

Power [W]: 30, 40, 50, 60

Speed [rpm]: 0 to 30000

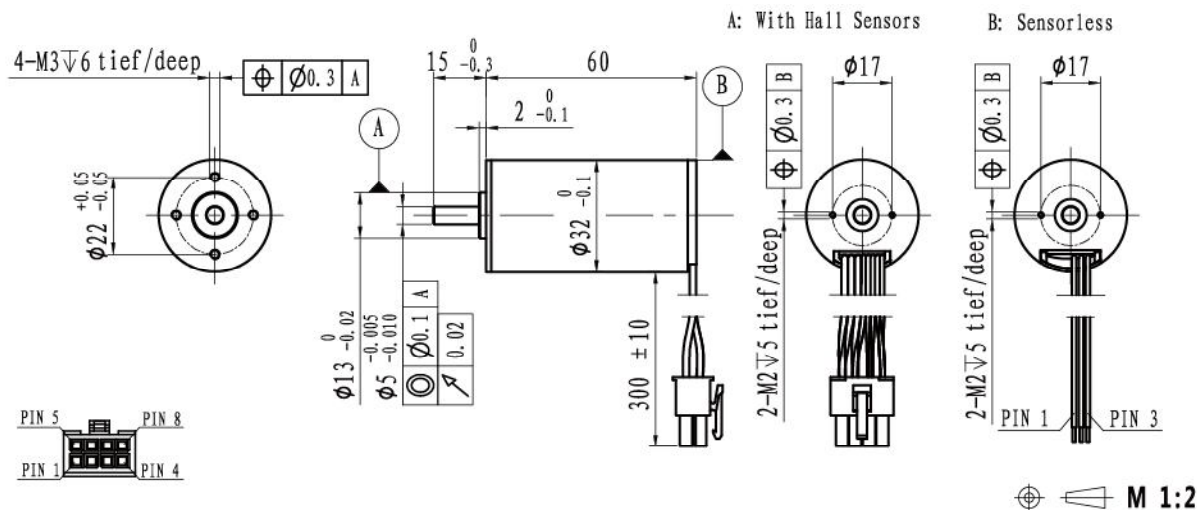
Torque [Nm]: 0 to 60

Continuous operating range

Continuous operating range with Reduced R_{th} 50%

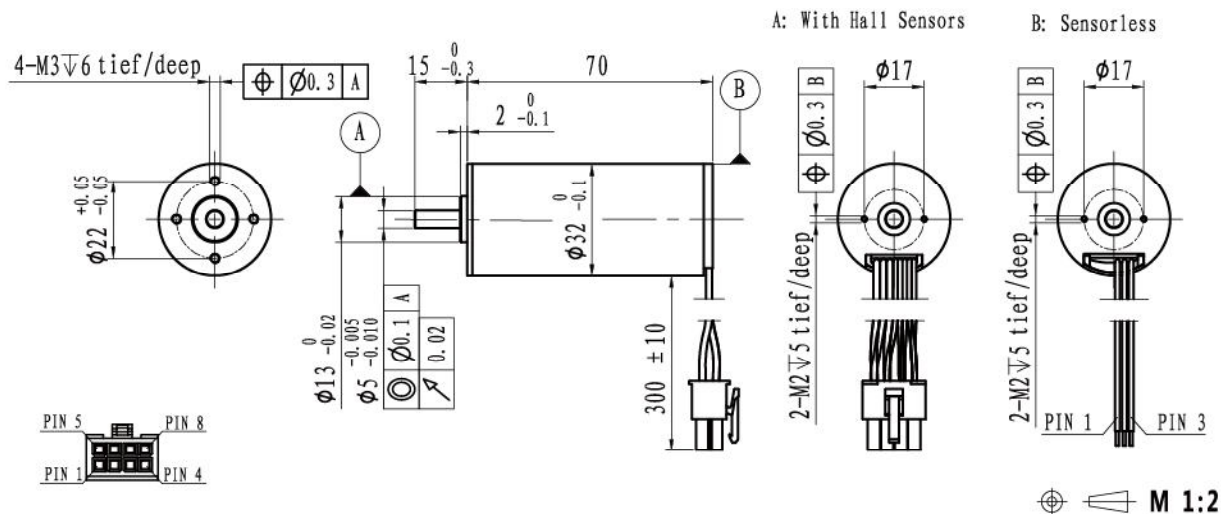
n-T Curve at Nominal Voltage

Connection			Configuration
Conection A (Sensor) PTFE			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	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	



		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		5.2	2.62	1.73	1.31				
7	Stall torque	mNm		567	546	544	536				
8	Stall current	A		54.5	26.7	17.6	13.2				
9	Max. efficiency	%		83	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	0.90	1.22				
12	Torque constant	mNm/A		10.5	20.6	31.2	40.9				
13	Speed constant	rpm/V		911	463	306	233				
14	Speed/torque gradient	rpm/mNm		19.1	20.2	20.1	20.8				
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											
				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							

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



Sensorless With hall sensor		EC3270L-... EC3270S-...	1209	2409	3609	4809			
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	2.97	2	1.49			
7	Stall torque	mNm	625	581	577	634			
8	Stall current	A	50	23.3	15.7	12.7			
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	12.6	25.1	36.9	50.1			
13	Speed constant	rpm/V	757	380	259	191			
14	Speed/torque gradient	rpm/mNm	14.4	15.6	16	14.3			
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							
	(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	256 g							

Operating Range

EC3270

The diagram based on ambient temperature of 25°C

Power [W] 70 90 110 130

Speed [rpm]

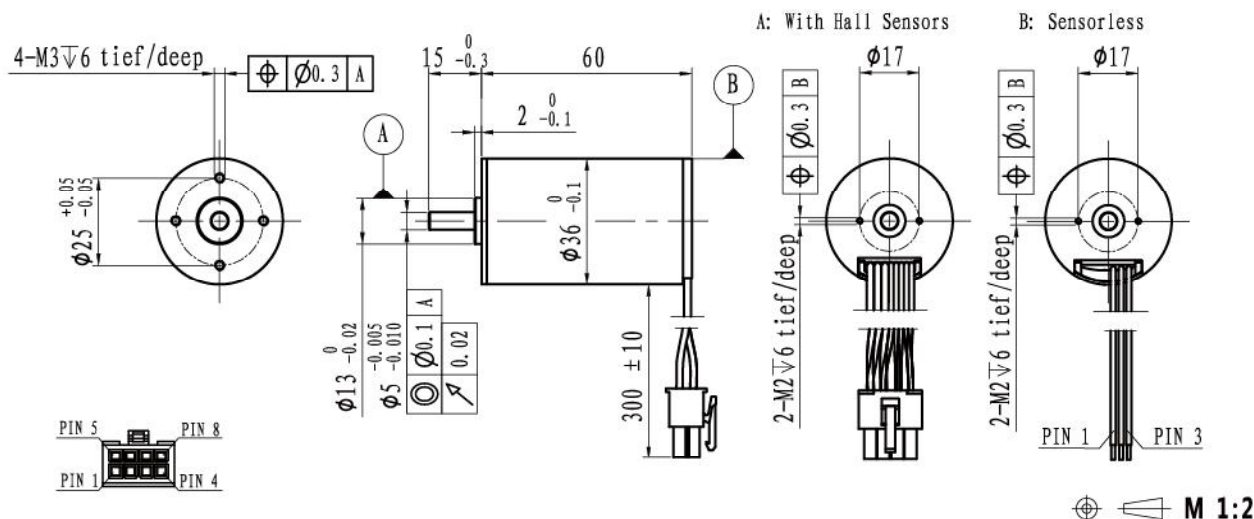
Torque [mNm]

Continuous operating range

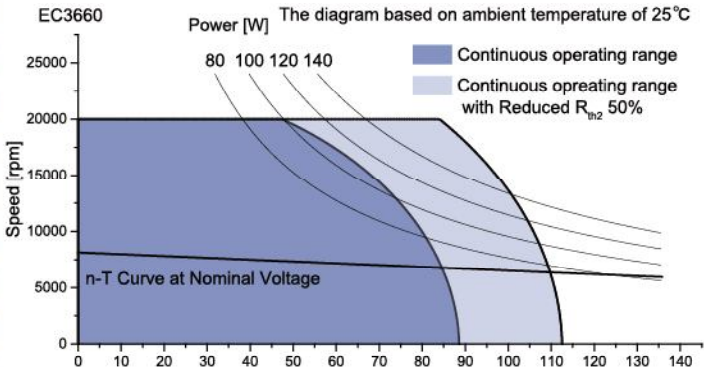
Continuous operating range with Reduced R_{n2} 50%

n-T Curve at Nominal Voltage

Connection			Configuration
Conection A (Sensor) PTFE			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	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	



		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		526	492	543	503				
8	Stall current	A		37.5	17.8	12.9	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		14.1	27.9	42.6	56.2				
13	Speed constant	rpm/V		676	342	224	170				
14	Speed/torque gradient	rpm/mNm		15.3	16.5	14.8	16.1				
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									
	(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	272 g									

Operating Range											
				EC3660							
				The diagram based on ambient temperature of 25°C							
											

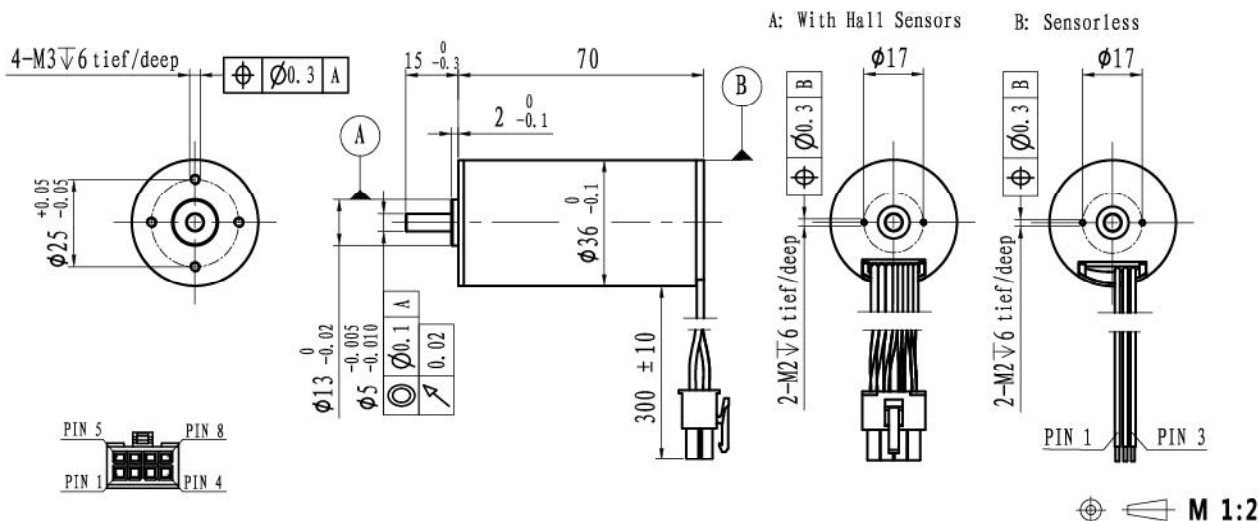
Connection

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

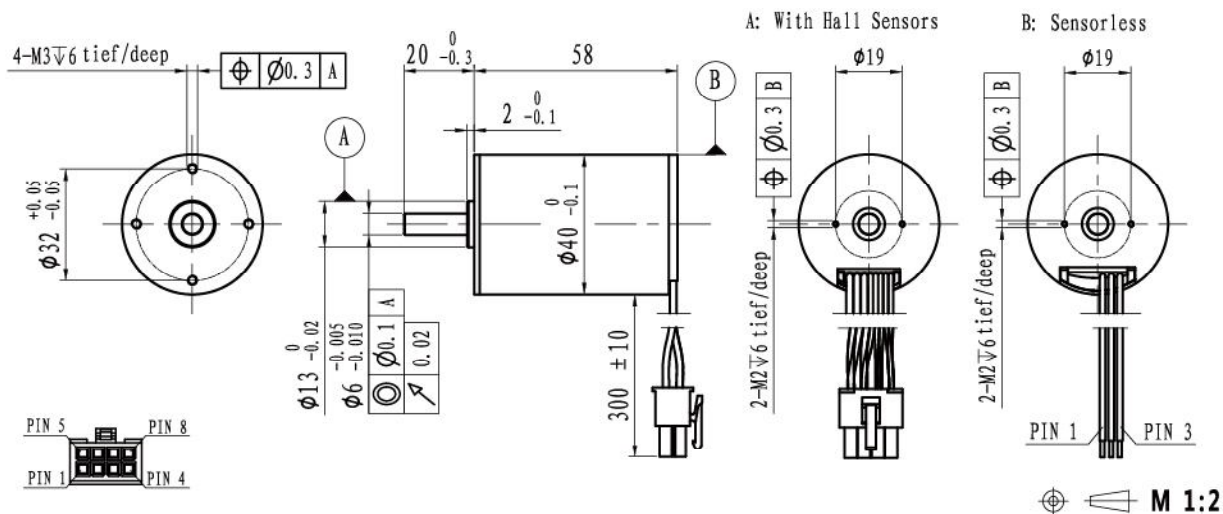
Configuration

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



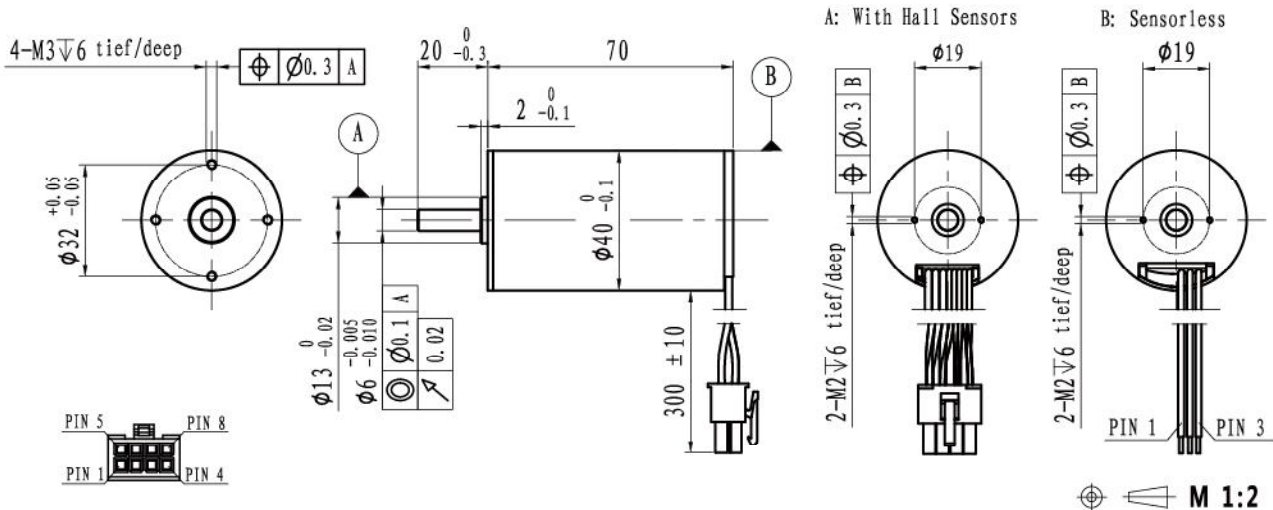
	Sensorless	EC3670L-...	1206	2406	3606	4806				
	With hall sensor	EC3670S-...								
Motor data										
Values at nominal voltage										
1 Nominal voltage	V		12	24	36	48				
2 No load speed	rpm		6578	6555	6675	6545				
3 No load current	mA		293	137	101	78				
4 Nominal speed	rpm		5300	5391	5455	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		618	676	657	687				
8 Stall current	A		36	19.6	12.9	9.96				
9 Max. efficiency	%		82.8	84	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		17.3	34.7	51.1	69.5				
13 Speed constant	rpm/V		553	275	187	137				
14 Speed/torque gradient	rpm/mNm		10.7	9.7	10.2	9.53				
15 Mechanical time constant	ms		2.4	2.2	2.3	2.1				
16 Rotor inertia	gcm ²		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										
EC3670 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_{th} 50%										

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	Green			
Pin 2 Vhall 3-18 VDC	AWG20	Red		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	
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					



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	686	664	670			
8	Stall current	A	50	24	15.7	11.9			
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	14.3	28.8	42.7	56.8			
13	Speed constant	rpm/V	670	332	224	168			
14	Speed/torque gradient	rpm/mNm	11.3	11.5	12	11.9			
15	Mechanical time constant	ms	3.5	3.6	3.7	3.7			
16	Rotor inertia	gcm ²	29.6	29.6	29.6	29.6			
17	Thermal resistance housing-ambient	4.7 K/W	Operating Range						
18	Thermal resistance winding-housing	2.2 K/W	EC4058 The diagram based on ambient temperature of 25°C Power [W] 90 110 130 150 Speed [rpm] 20000 15000 10000 5000 0 Torque [mNm] 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 Continuous operating range Continuous operating range with Reduced R_{m2} 50% n-T Curve at Nominal Voltage						
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							

Connection			Configuration
Conection A (Sensor) PTFE			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	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	

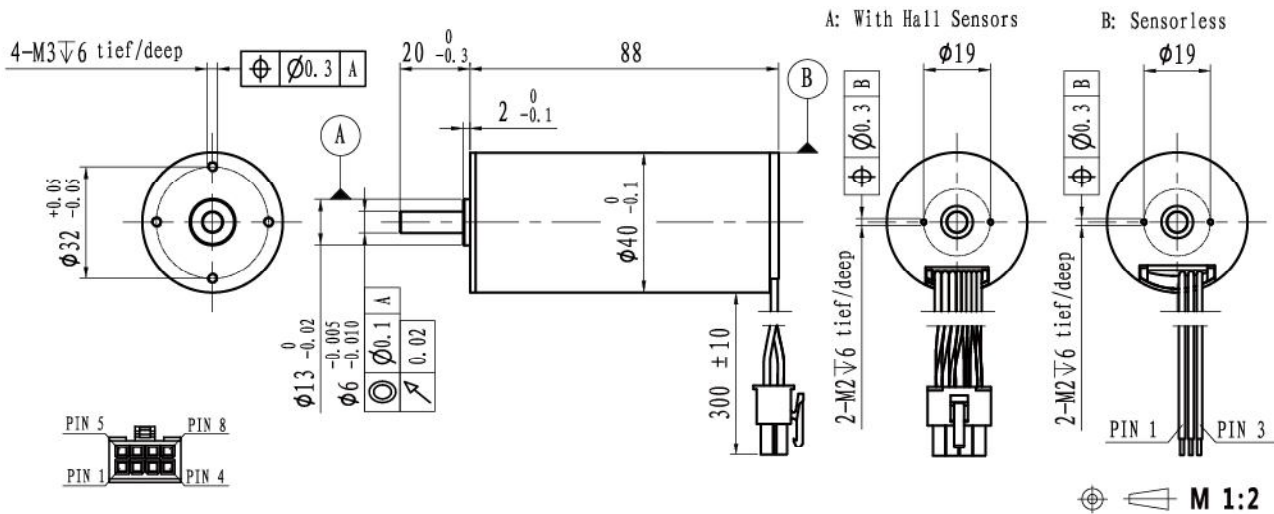


Sensorless With hall sensor		EC4070L-... EC4070S-...	1206	2408	3608	4808			
Motor data									
Values at nominal voltage									
1	Nominal voltage	V	12	24	36	48			
2	No load speed	rpm	6154	8102	8113	8061			
3	No load current	mA	264	200	190	130			
4	Nominal speed	rpm	5084	7304	7266	7238			
5	Nominal torque	mNm	130	130	130	130			
6	Nominal current	A	7.29	4.82	3.28	2.43			
7	Stall torque	mNm	748	1320	1245	1273			
8	Stall current	A	40.7	47.1	29.8	22.6			
9	Max. efficiency	%	84.5	87.4	84.7	85.4			
10	Terminal resistance	Ω	0.3	0.51	1.21	2.12			
11	Terminal inductance	mH	0.11	0.30	0.66	1.2			
12	Torque constant	mNm/A	18.5	28.2	42.1	56.5			
13	Speed constant	rpm/V	516	339	227	169			
14	Speed/torque gradient	rpm/mNm	8.23	6.14	6.52	6.33			
15	Mechanical time constant	ms	3.4	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							
	(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	415 g							

Operating Range

The diagram shows the operating range for the EC4070 motor. The y-axis represents Speed in rpm, ranging from 0 to 20,000. The x-axis represents Torque in mNm, ranging from 0 to 220. A solid line represents the n-T Curve at Nominal Voltage. Several power curves are shown, labeled with power values: 90, 130, 170, and 210 W. The diagram is divided into two regions: a dark blue region for the Continuous operating range and a light blue region for the Continuous operating range with Reduced R_{th2} 50%.

Connection			Configuration
Conection A (Sensor) PTFE			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	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	



Sensorless With hall sensor		EC4088L-... EC4088S-...	2408	3608	4808				
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	2460	2570				
8	Stall current	A	88.9	58.1	45.7				
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	28.8	42.6	56.5				
13	Speed constant	rpm/V	332	224	169				
14	Speed/torque gradient	rpm/mNm	3.11	3.26	3.14				
15	Mechanical time constant	ms	1.8	1.9	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							
	(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	571 g							

Operating Range

EC4088

The diagram based on ambient temperature of 25 °C

Power [W]

Speed [rpm]

Torque [mNm]

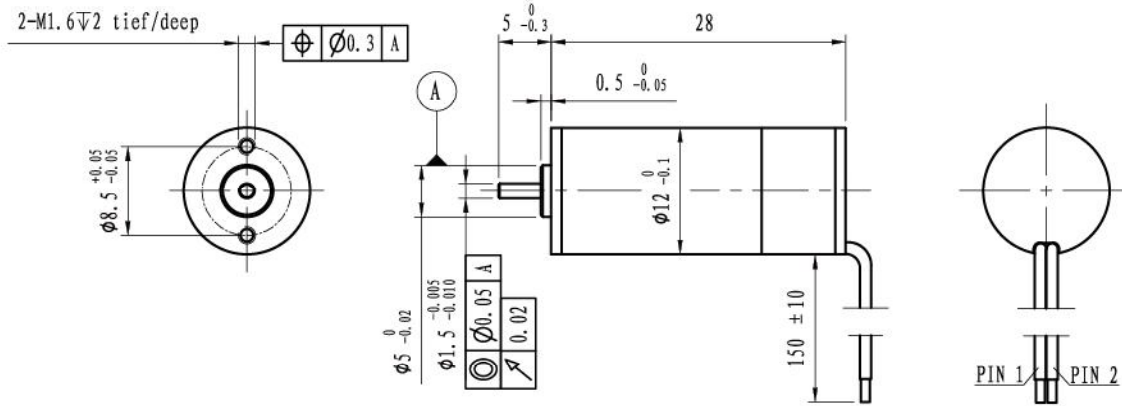
Continuous operating range

Continuous operating range with Reduced R_{th2} 50%

n-T Curve at Nominal Voltage

Connection				Configuration
Conection A (Sensor) PTFE				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	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) PTFE				
Pin 1	Motor winding MA	AWG20	Yellow	
Pin 2	Motor winding MB	AWG20	Green	
Pin 3	Motor winding MC	AWG20	Blue	

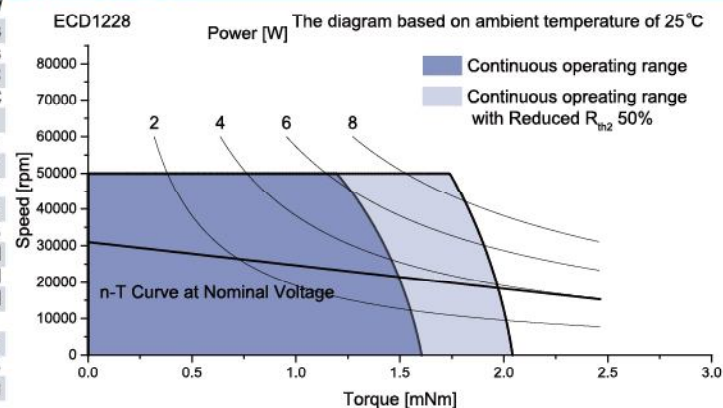
ECD Series Slotless Brushless DC motor with integrated Speed Controller
ECD1228 $\Phi 12\text{mm} \times 28\text{mm}$



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	1.78						
13	Speed constant	rpm/V	5374						
14	Speed/torque gradient	rpm/mNm	6350						
15	Mechanical time constant	ms	11.3						
16	Rotor inertia	gcm ²	0.2						
17	Thermal resistance housing-ambient	38.3 K/W							
18	Thermal resistance winding-housing	9.6 K/W							
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							

Operating Range



Controller features	
Sensor, 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

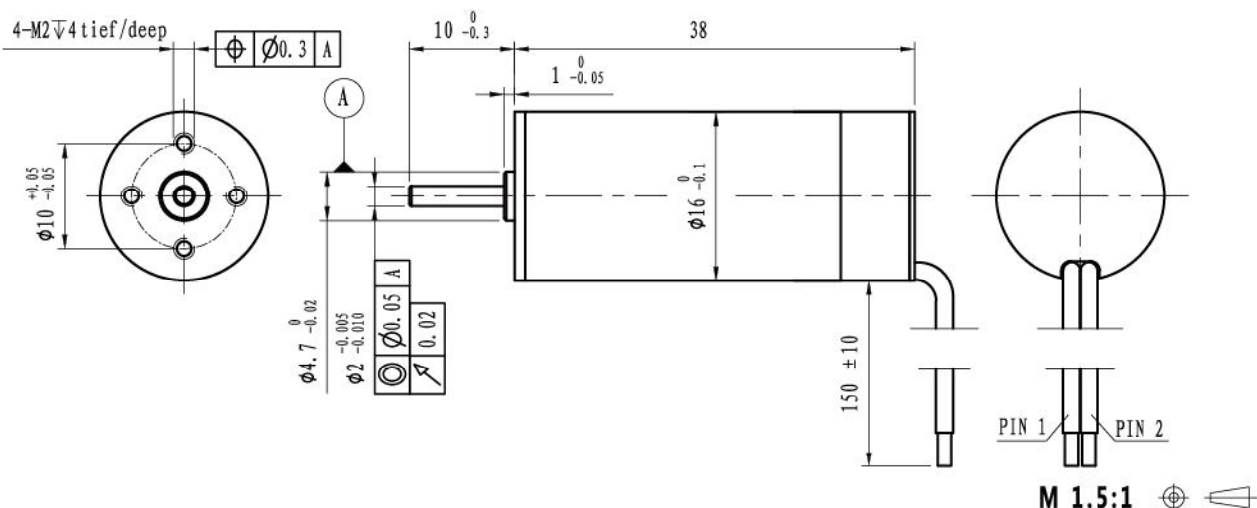
Caution:
Incorrect lead connection will damage the controller!

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

ECD Series Slotless Brushless DC motor with integrated Speed Controller
ECD1638 $\Phi 16\text{mm} \times 38\text{mm}$



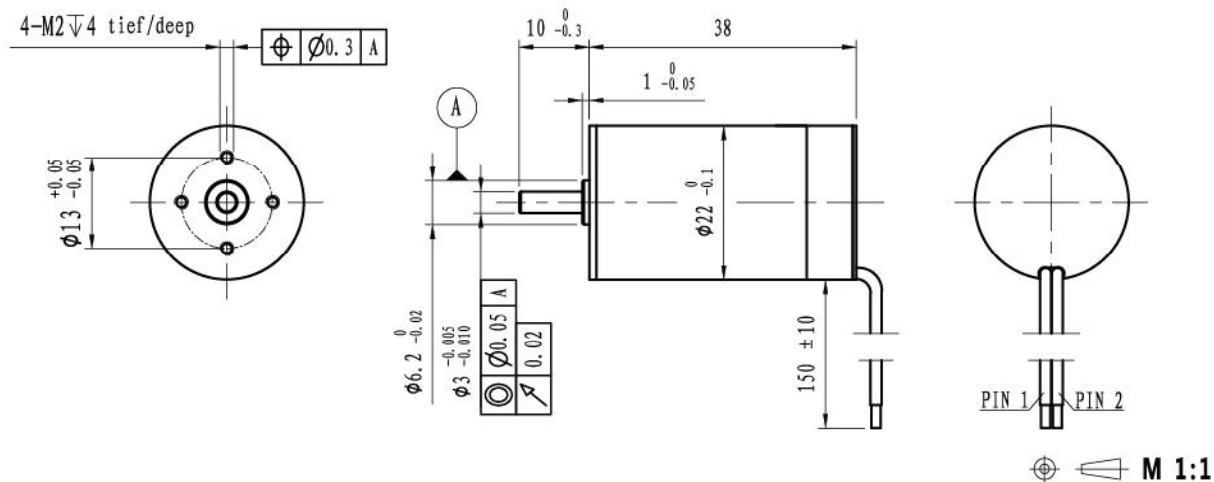
Sensorless ECD1638S-...		0608	1217						
Motor data									
Values at nominal voltage									
1 Nominal voltage	V	6	12						
2 No load speed	rpm	8832	17664						
3 No load current	mA	110	100						
4 Nominal speed	rpm	6102	14491						
5 Nominal torque	mNm	1.5	2						
6 Nominal current	A	0.37	0.43						
7 Stall torque	mNm	4.85	11.1						
8 Stall current	A	0.96	1.91						
9 Max. efficiency	%	43.7	59.5						
10 Supply voltage +Vcc	V	4.5..7	8..13						
11 Direction of rotation		CW	CW						
12 Torque constant	mNm/A	5.74	6.11						
13 Speed constant	rpm/V	1664	1562						
14 Speed/torque gradient	rpm/mNm	1820	1604						
15 Mechanical time constant	ms	8.2	7.2						
16 Rotor inertia	gcm ²	0.4	0.4						

17 Thermal resistance housing-ambient	20.2 K/W	Operating Range							
18 Thermal resistance winding-housing	8.7 K/W	The diagram based on ambient temperature of 25 °C Legend: Continuous operating range Continuous operating range with Reduced R_{th} 50%							
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								

Controller features		Configuration	
Sensorless, Open loop, $I_{max} < 0.5A$		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	PTFE	Flange: Standard frange front&back/customize the frange	
Pin 1 +VCC	AWG24 red	Shaft: Length/Diameter/Cut face	
Pin 2 GND	AWG24 black	Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length	
		Connector: JST/MOLEX/TE	

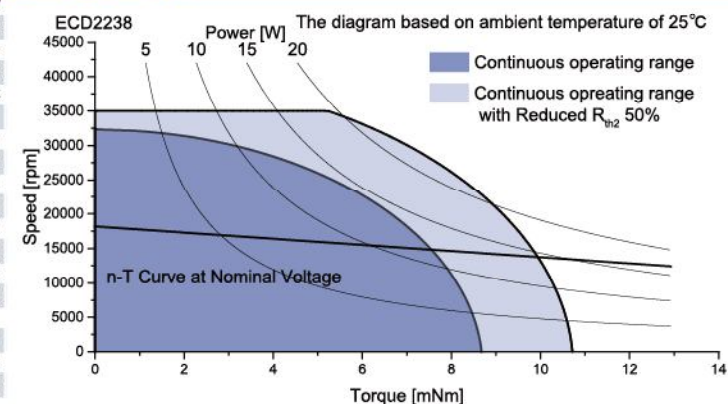
Caution:
Incorrect lead connection will damage the controller!

More :
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With hall sensor ECD2238S-...		1218	1818	2418				
Motor data								
Values at nominal voltage								
1 Nominal voltage	V	12	18	24				
2 No load speed	rpm	17445	17830	17721				
3 No load current	mA	220	150	110				
4 Nominal speed	rpm	14292	14700	14260				
5 Nominal torque	mNm	6	6	6				
6 Nominal current	A	1.13	0.75	0.57				
7 Stall torque	mNm	44.8	45.3	40.7				
8 Stall current	A	7.44	4.96	3.39				
9 Max. efficiency	%	70.2	70.3	67.7				
10 Supply voltage +Vcc	V	10..28	10..28	10..28				
11 Direction of rotation		CW	CW	CW				
12 Torque constant	mNm/A	6.15	9.32	12.3				
13 Speed constant	rpm/V	1553	1024	777				
14 Speed/torque gradient	rpm/mNm	407	399	447				
15 Mechanical time constant	ms	6.4	6.2	7.0				
16 Rotor inertia	gcm ²	1.5	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							
(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	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

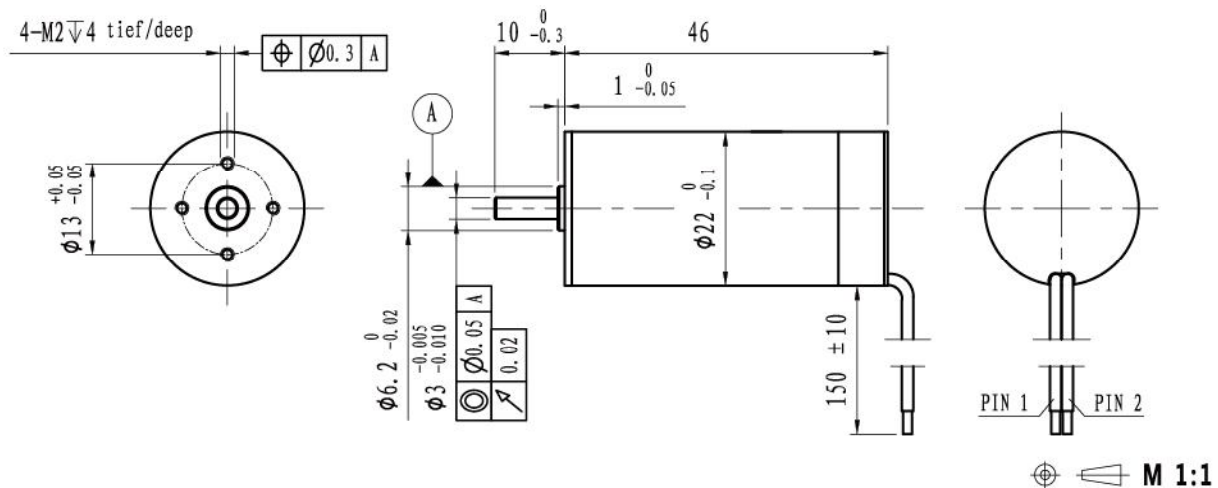
Caution:

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

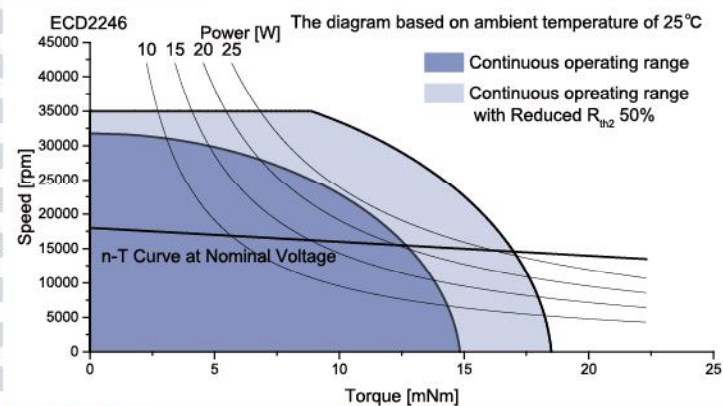
More :
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With hall sensor ECD2246S-...		1212	2416					
Motor data								
Values at nominal voltage								
1 Nominal voltage	V	12	24					
2 No load speed	rpm	11570	15627					
3 No load current	mA	170	140					
4 Nominal speed	rpm	10085	12771					
5 Nominal torque	mNm	8	12					
6 Nominal current	A	1.01	1.01					
7 Stall torque	mNm	60.4	82.8					
8 Stall current	A	6.7	6.28					
9 Max. efficiency	%	70.5	71.8					
10 Supply voltage +Vcc	V	10..28	10..28					
11 Direction of rotation		CW	CW					
12 Torque constant	mNm/A	9.2	13.4					
13 Speed constant	rpm/V	1038	712					
14 Speed/torque gradient	rpm/mNm	202	203					
15 Mechanical time constant	ms	4.8	4.8					
16 Rotor inertia	gcm ²	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
(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	79 g

Operating Range



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

Connection

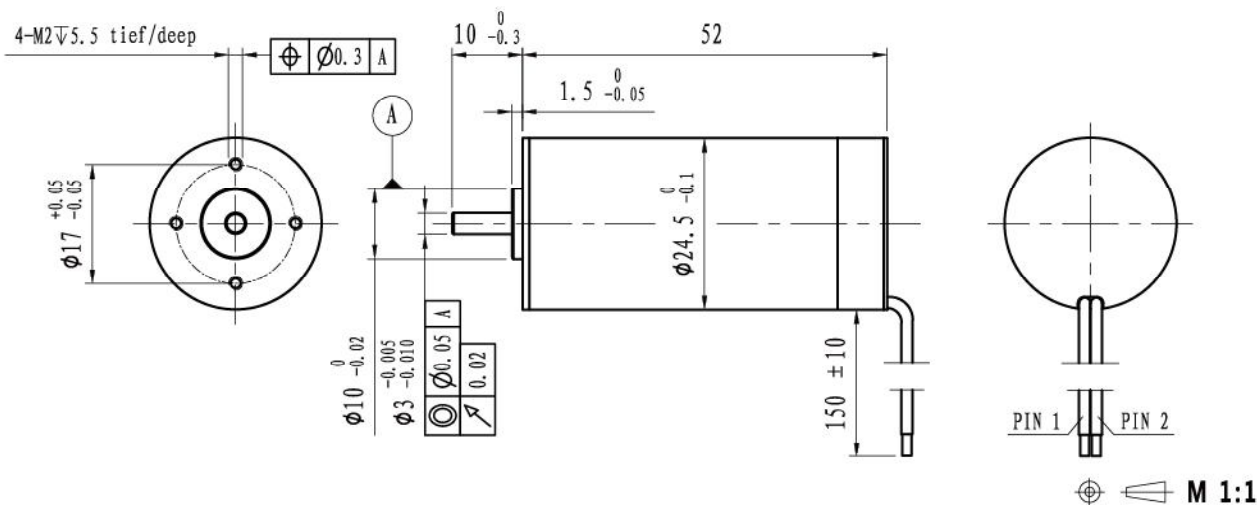
Conection	PTFE
Pin 1 +VCC	AWG24 red
Pin 2 GND	AWG24 black

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

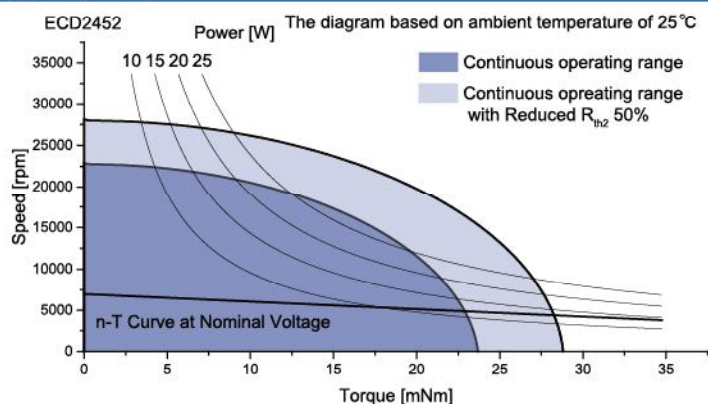
More :
Please contact our sales engineers



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	5087	5089						
5 Nominal torque	mNm	14	14						
6 Nominal current	A	0.98	0.51						
7 Stall torque	mNm	87	85.2						
8 Stall current	A	5.58	2.73						
9 Max. efficiency	%	71.7	67.9						
10 Supply voltage +Vcc	V	10..28	10..28						
11 Direction of rotation		CW	CW						
12 Torque constant	mNm/A	15.9	32						
13 Speed constant	rpm/V	601	298						
14 Speed/torque gradient	rpm/mNm	81.3	81.9						
15 Mechanical time constant	ms	3.6	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
(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	112 g

Operating Range



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

Connection

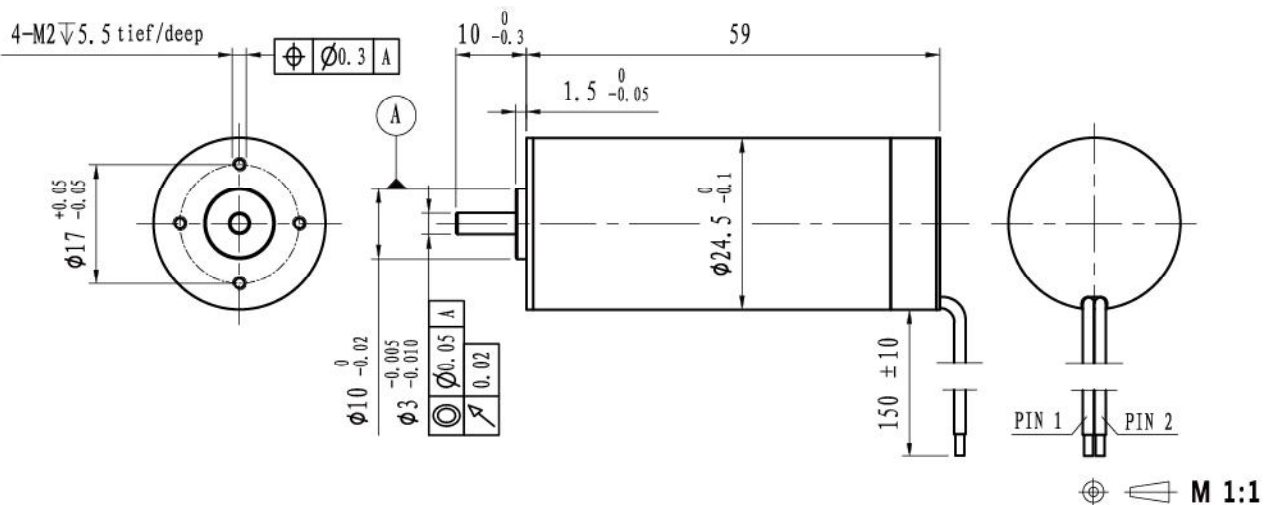
Conection	PTFE
Pin 1 +VCC	AWG24 red
Pin 2 GND	AWG24 black

Caution:
Incorrect lead connection will damage the controller!

Configuration

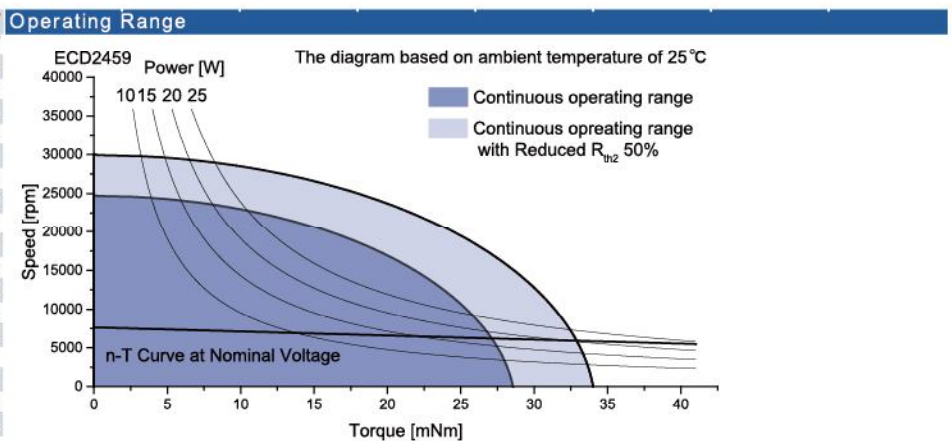
Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length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

More :
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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	114	73					
4 Nominal speed	rpm	6958	6597					
5 Nominal torque	mNm	14	20					
6 Nominal current	A	1.07	0.75					
7 Stall torque	mNm	145	145					
8 Stall current	A	10	4.98					
9 Max. efficiency	%	79.8	77.2					
10 Supply voltage +Vcc	V	10..28	10..28					
11 Direction of rotation	CW	CW	CW					
12 Torque constant	mNm/A	14.7	29.5					
13 Speed constant	rpm/V	649	324					
14 Speed/torque gradient	rpm/mNm	52.9	52.9					
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



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

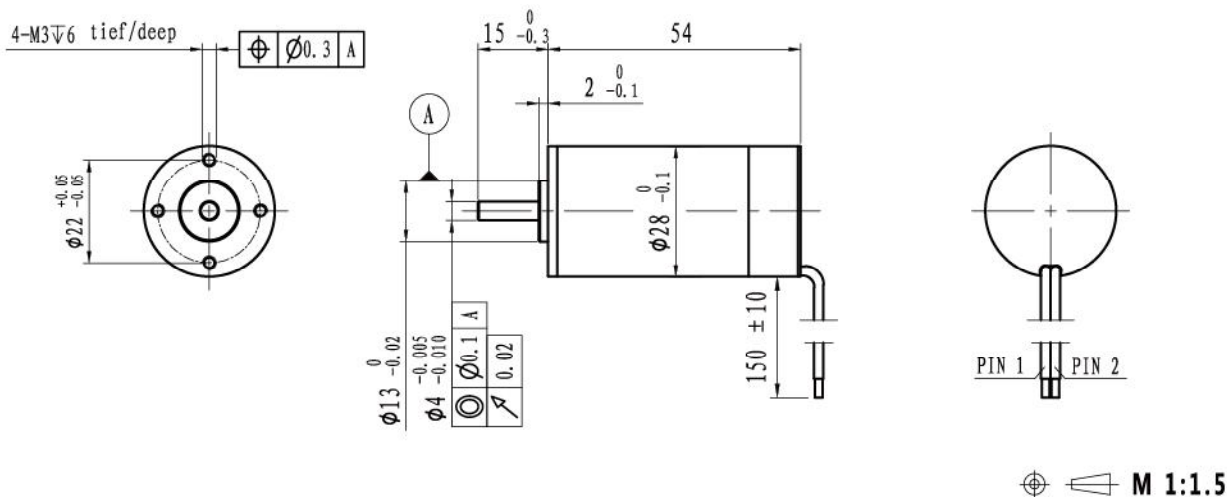
Caution:
Incorrect lead connection will damage the controller!

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

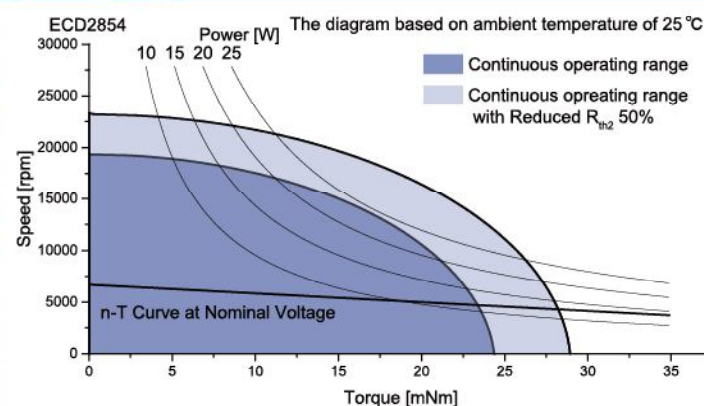
ECD Series Slotless Brushless DC motor with integrated Speed Controller
ECD2854 Ø28mmX54mm



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	5674	5157					
5 Nominal torque	mNm	15	18					
6 Nominal current	A	1.04	0.62					
7 Stall torque	mNm	85.7	78.1					
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	16.3	33.1					
13 Speed constant	rpm/V	586	288					
14 Speed/torque gradient	rpm/mNm	80.3	85.7					
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
(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	153 g

Operating Range



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

Connection

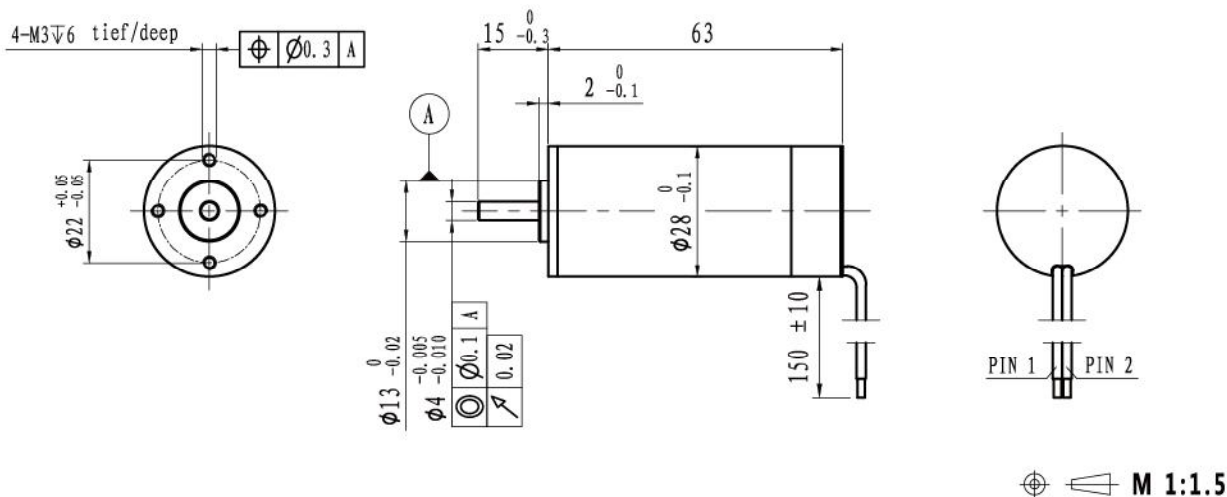
Conection	PTFE	
Pin 1 +VCC	AWG20	red
Pin 2 GND	AWG20	black

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 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	92.1					
8	Stall current	A	4.33	1.79					
9	Max. efficiency	%	76.2	66.7					
10	Supply voltage +Vcc	V	10..28	10..28					
11	Direction of rotation		CW	CW					
12	Torque constant	mNm/A	27	53.2					
13	Speed constant	rpm/V	353	179					
14	Speed/torque gradient	rpm/mNm	36.2	45.2					
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	Operating Range						
18	Thermal resistance winding-housing	5 K/W	ECD2863 Power [W] The diagram based on ambient temperature of 25°C Continuous operating range Continuous operating range with Reduced R_{m2} 50% n-T Curve at Nominal Voltage						
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	Configuration						
30	Number of phases	3							
31	Weight of motor	188 g							

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

Connection

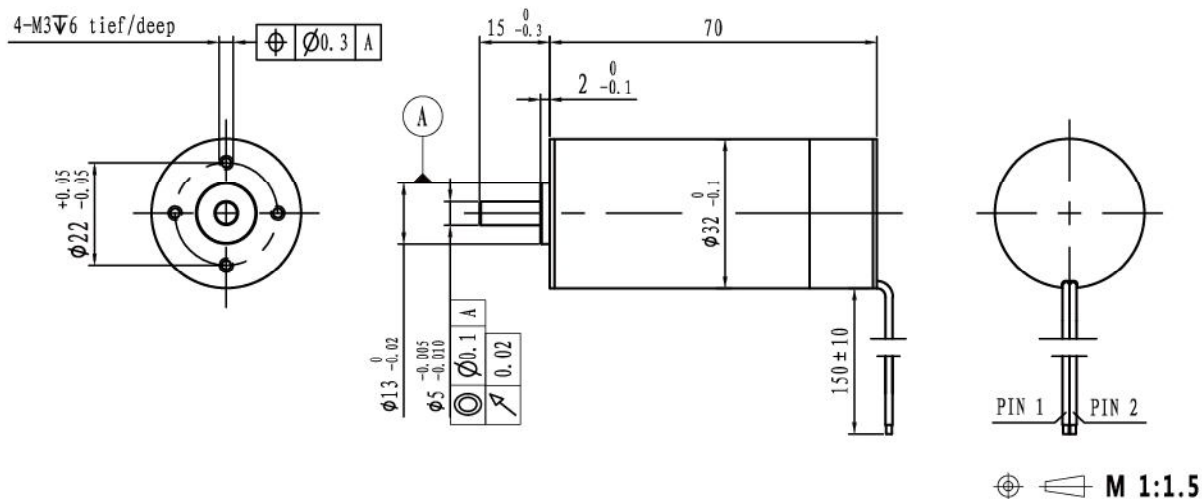
Conection	PTFE
Pin 1 +VCC	AWG20 red
Pin 2 GND	AWG20 black

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

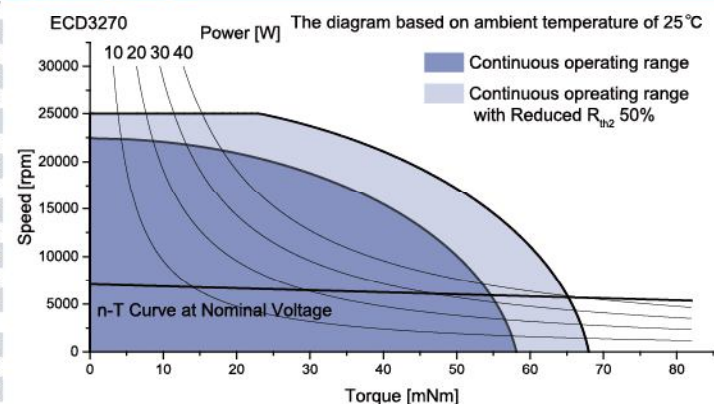
More :
Please contact our sales engineers



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	6623	6243					
5 Nominal torque	mNm	25	40					
6 Nominal current	A	1.78	1.36					
7 Stall torque	mNm	312	331					
8 Stall current	A	20	10.5					
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	15.8	31.9					
13 Speed constant	rpm/V	606	299					
14 Speed/torque gradient	rpm/mNm	23.1	21.4					
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 <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	255 g

Operating Range



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

Connection

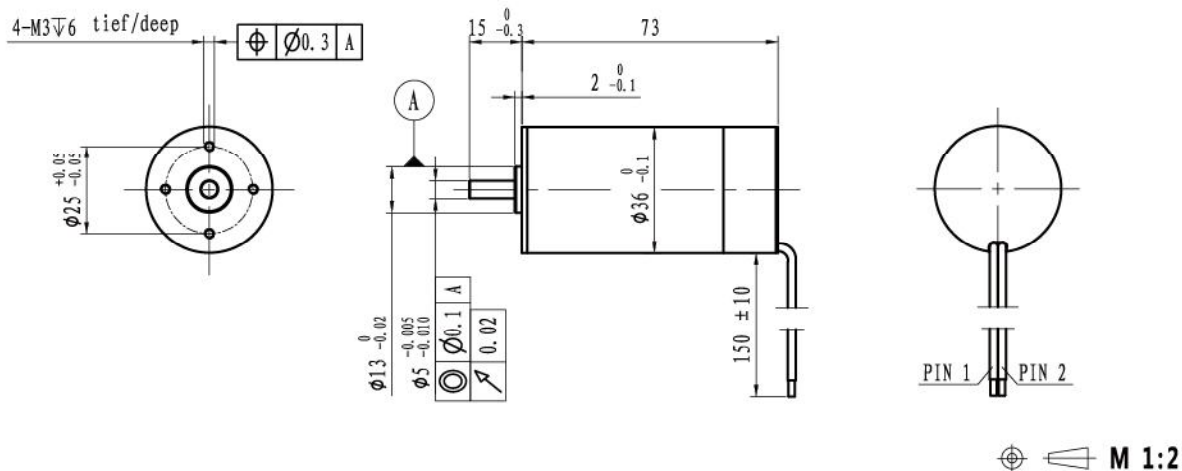
Conection	PTFE
Pin 1 +VCC	AWG20 red
Pin 2 GND	AWG20 black

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

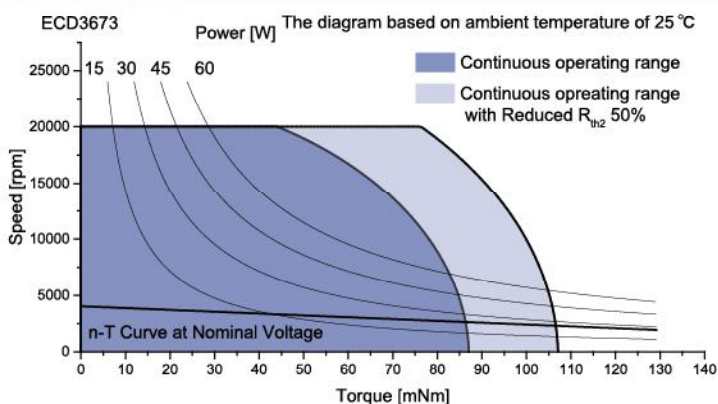
More :
Please contact our sales engineers



With hall sensor 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	247						
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	27.7	55.7						
13 Speed constant	rpm/V	345	172						
14 Speed/torque gradient	rpm/mNm	16.8	16.4						
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
18 Thermal resistance winding-housing	1.6 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	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	317 g

Operating Range



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

Connection

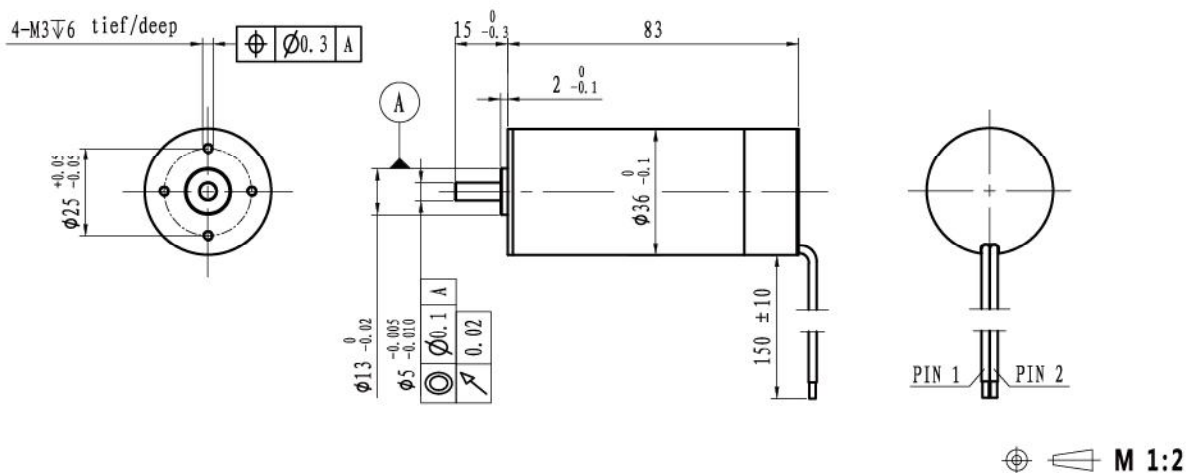
Conection	PTFE
Pin 1 +VCC	AWG20 red
Pin 2 GND	AWG20 black

Caution:
Incorrect lead connection will damage the controller!

Configuration

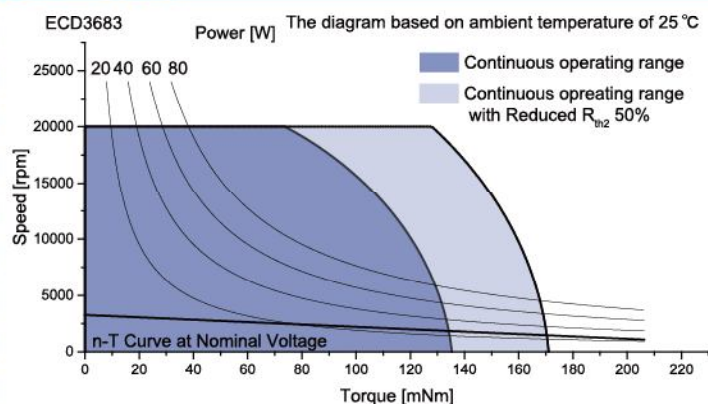
Function: On&Off/Direction/Speed control/Brake
Speed closed&open-loop Control/Speed feedback
Performance: Customized in the continuous operating range
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face
Leadwire: PVC/Silicon/Teflon/UL No/Dimension/length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

More :
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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	2294	2304						
5 Nominal torque	mNm	100	100						
6 Nominal current	A	3.04	1.53						
7 Stall torque	mNm	333	338						
8 Stall current	A	9.8	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	34.5	68.9						
13 Speed constant	rpm/V	277	139						
14 Speed/torque gradient	rpm/mNm	9.83	9.69						
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								
	(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!

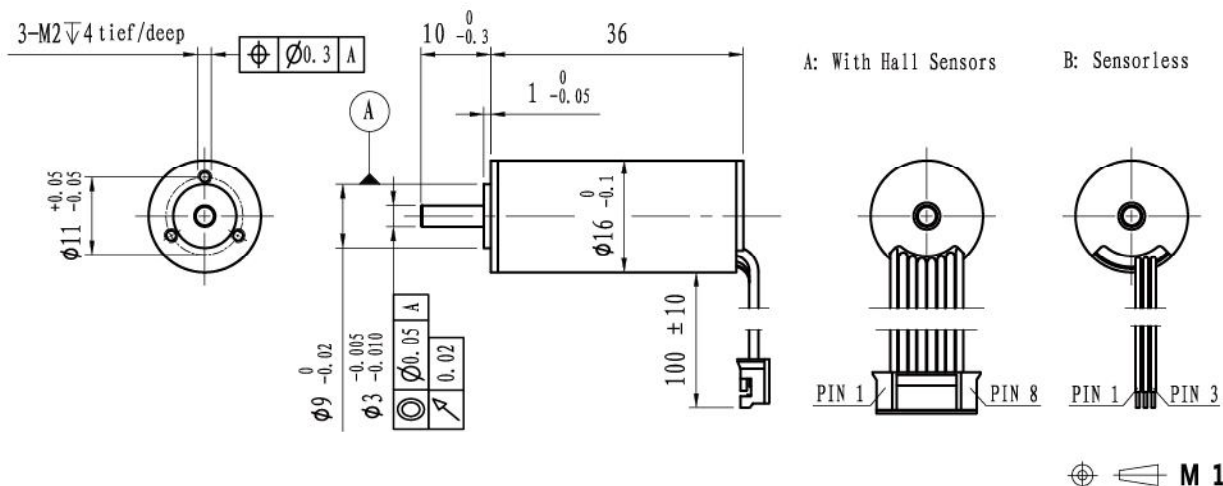
Configuration

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

ECH Series Slotless High Speed Brushless DC Motor

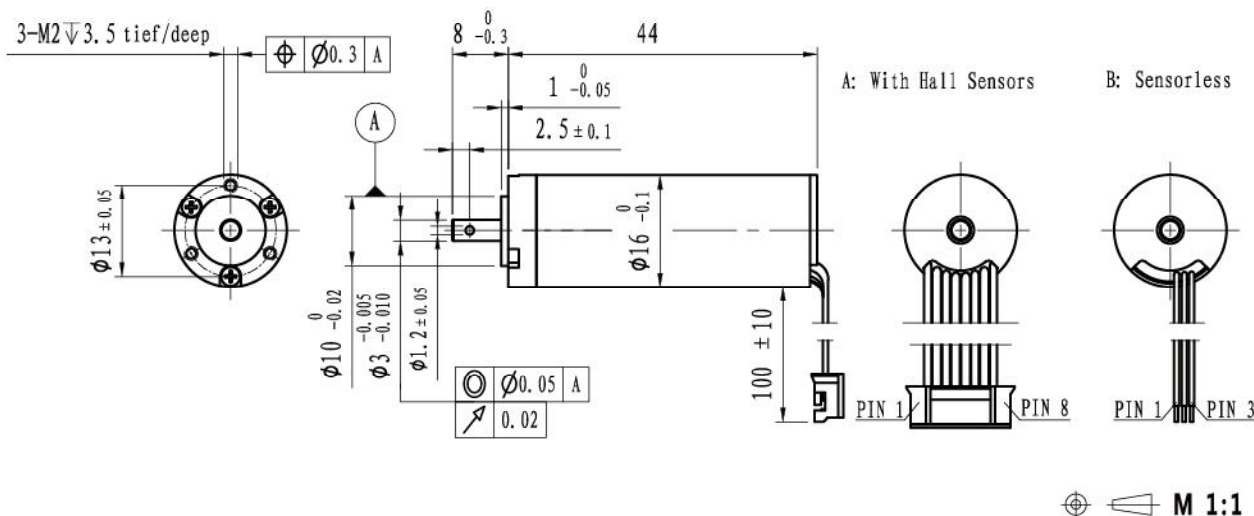
ECH1636 Ø16mmX36mm



		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		62.8	61.6	60.8					
8	Stall current	A		11.2	8.8	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	0.24					
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	Operating Range ECH1636 The diagram based on ambient temperature of 25 °C Power [W] Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage								
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									

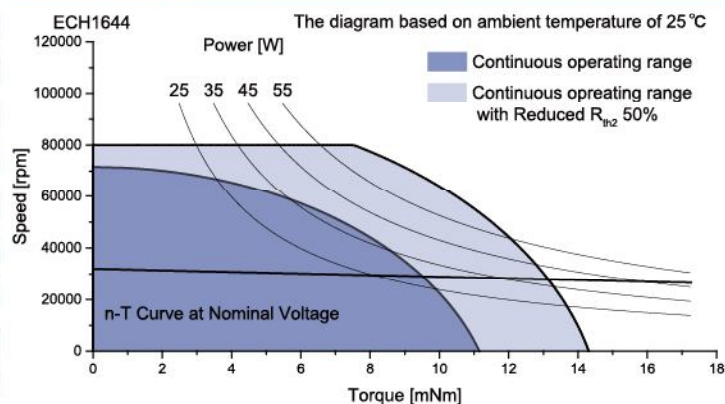
ECH Series Slotless High Speed Brushless DC Motor

ECH1644 Ø16mmX44mm



		Sensorless	ECH1644L-...	2430	3040	3640				
		With hall sensor	ECH1644S-...							
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		1.1	0.9	0.74				
7	Stall torque	mNm		93.8	92.8	89.5				
8	Stall current	A		12.7	10.2	8				
9	Max. efficiency	%		83.4	83	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	9.2	11.3				
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)	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	43g								

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

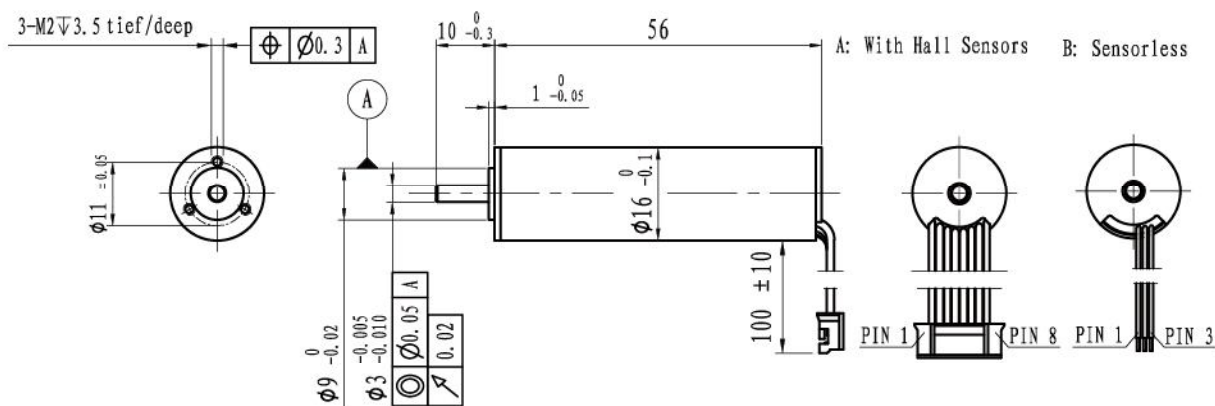
Flange: Standard frange front&back/customize the frange

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

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

Connector: JST/MOLEX/TE

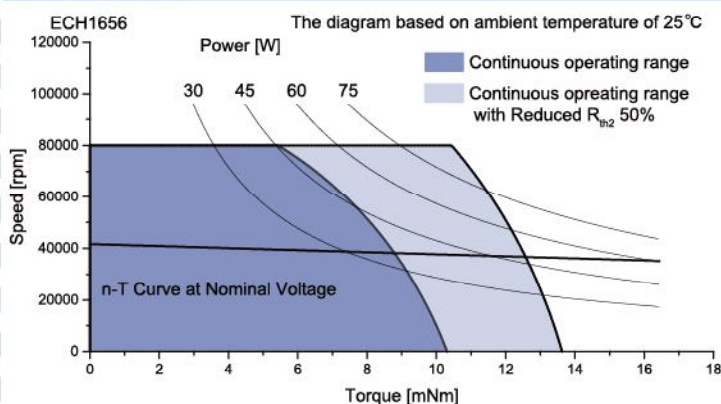
ECH Series Slotless High Speed Brushless DC Motor
ECH1656 Ø16mmX56mm



⊕ M 1:1.2

		Sensorless With hall sensor	ECH1656L-...	2440	3040	3640				
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		39232	38438	38898				
5	Nominal torque	mNm		6	6	6				
6	Nominal current	A		1.2	0.95	0.8				
7	Stall torque	mNm		103	105	103				
8	Stall current	A		18.9	15.1	12.5				
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		406	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								
	(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	50 g								

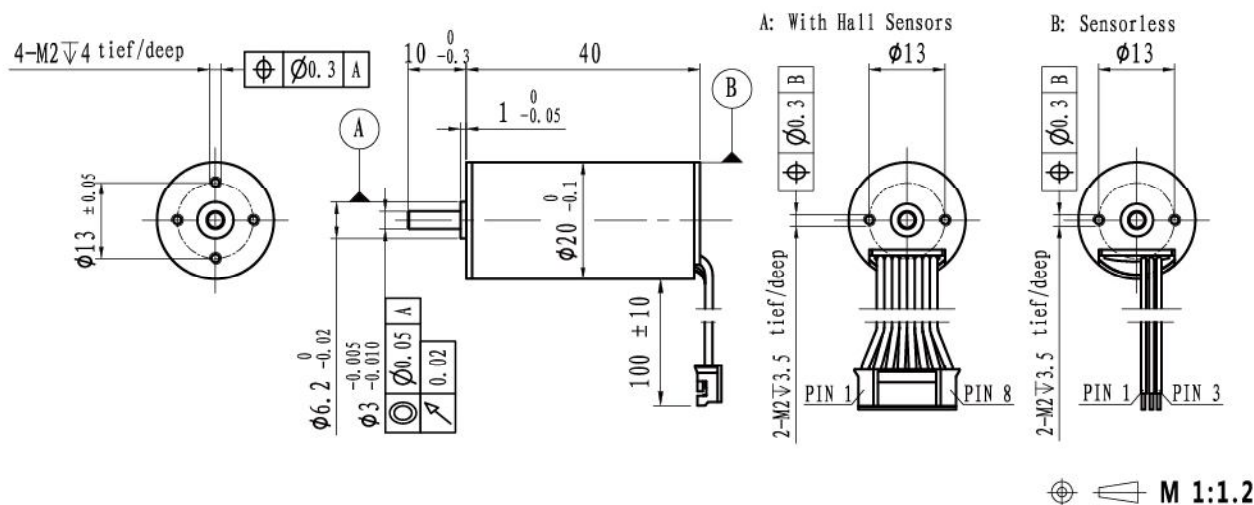
Operating Range



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

ECH Series Slotless High Speed Brushless DC Motor

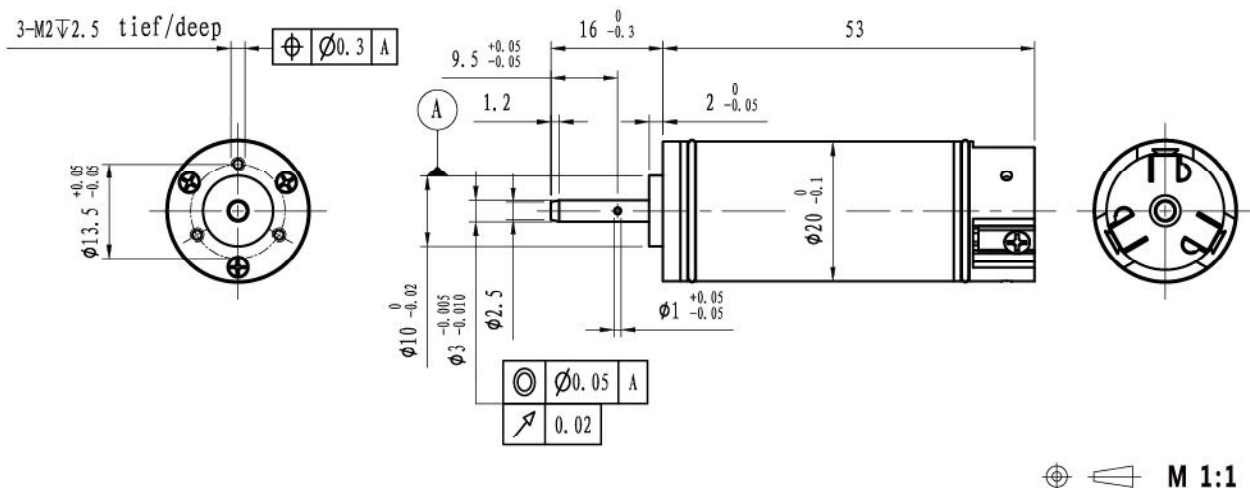
ECH2040 Ø20mmX40mm



		Sensorless	ECH2040L-...	2440	3040	3640				
		With hall sensor	ECH2040S-...							
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		37500	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	65.4	63.5				
8	Stall current	A		12.2	9.4	7.5				
9	Max. efficiency	%		85.5	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		618	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	Operating Range							
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	Connection							
30	Number of phases	3								
31	Weight of motor	53 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	

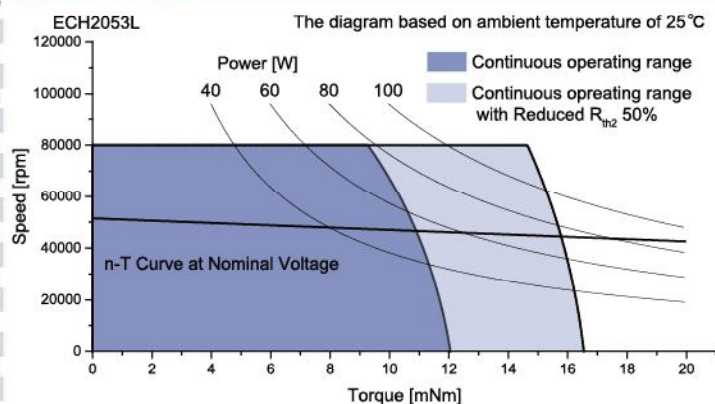
ECH Series Slotless High Speed Brushless DC Motor
ECH2053L $\Phi 20\text{mm} \times 53\text{mm}$



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	114	114	112				
8 Stall current	A	32.7	25.5	17.2	12.6				
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	0.10	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
(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	63 g

Operating Range



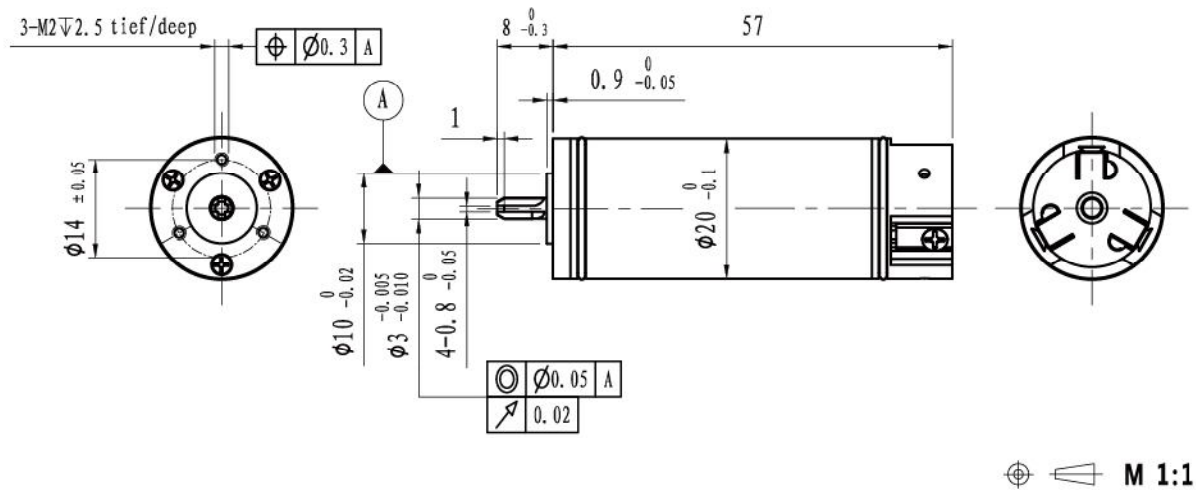
Connection

Connection
special connector
please contact sales engineer

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

ECH Series Slotless High Speed Brushless DC Motor
ECH2057L $\Phi 20\text{mm} \times 57\text{mm}$



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	47328	46436				
5 Nominal torque	mNm	15	15	15	15				
6 Nominal current	A	4.61	3.5	2.36	1.76				
7 Stall torque	mNm	191	185	194	178				
8 Stall current	A	56.3	41.4	29.2	19.9				
9 Max. efficiency	%	88.2	88	87.9	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				
13 Speed constant	rpm/V	2799	2126	1430	1061				
14 Speed/torque gradient	rpm/mNm	263	275	264	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	Operating Range							
18 Thermal resistance winding-housing	1.6 K/W	The diagram based on ambient temperature of 25°C Power [W]: 75, 100, 125, 150 Continuous operating range Continuous operating range with Reduced R_{th2} 50% n-T Curve at Nominal Voltage							
19 Thermal time constant winding	5 s								
20 Thermal time constant motor	410 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	Connection							
30 Number of phases	3								
31 Weight of motor	69 g								

Connection

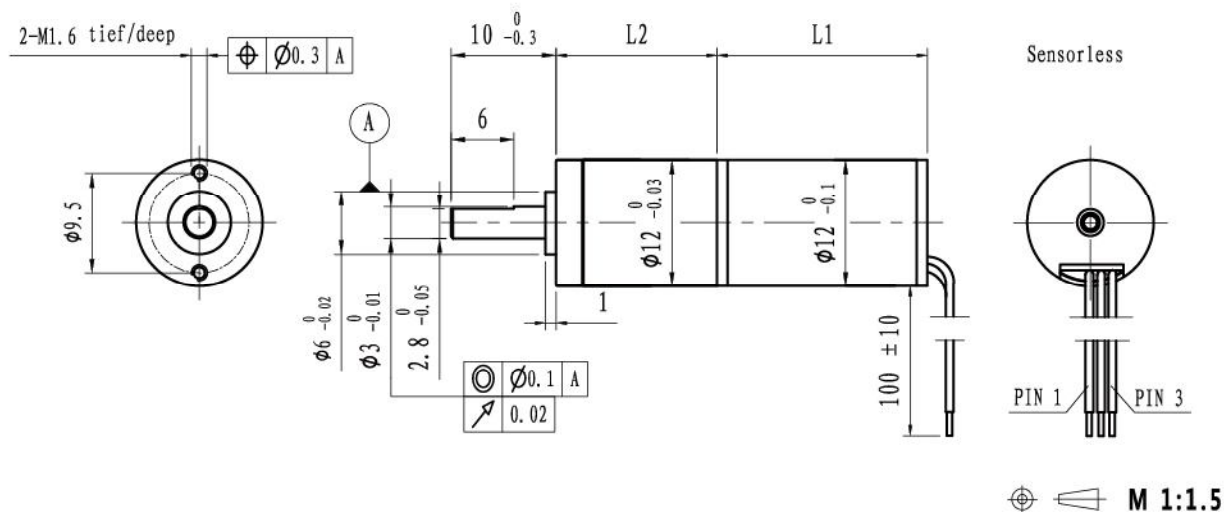
Connection

special connector
please contact sales engineer

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

ECG Series Slotless Brushless DC Gear Motor
ECG12 Φ12mm



ECG12..L P16

Motor type

1 Length of motor L1	ECG1220L	mm	20	Motor performance at P8.
	ECG1230L	mm	30	Motor performance at P9.

Gearhead Data

Sea King Shark							
2	Housing material				Steel		
3	Geartrain material				Steel		
4	Bearing type on output shaft				Ball bearing		
5	Max. radial load (10mm from flange)	N			5		
6	Max. axial load	N			5		
7	Radial play of shaft	mm			0.1		
8	Thrust play of shaft	mm			0.2		
9	Backlash at no load	°			3		
10	Max. continuous speed	rpm			42000		
11	Operating temperature range	°C			-30..+100		
12	Number of stages		1	2	3	4	5
13	Max continuous torque	Nm	0.1	0.2	0.2	0.2	0.2
14	Max. intermittent torque	Nm	0.15	0.25	0.25	0.25	0.25
15	Max. efficiency	%	90	81	73	65	59
16	Gearhead length L2	mm	15.1	17.9	20.7	23.5	26.3
17	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,

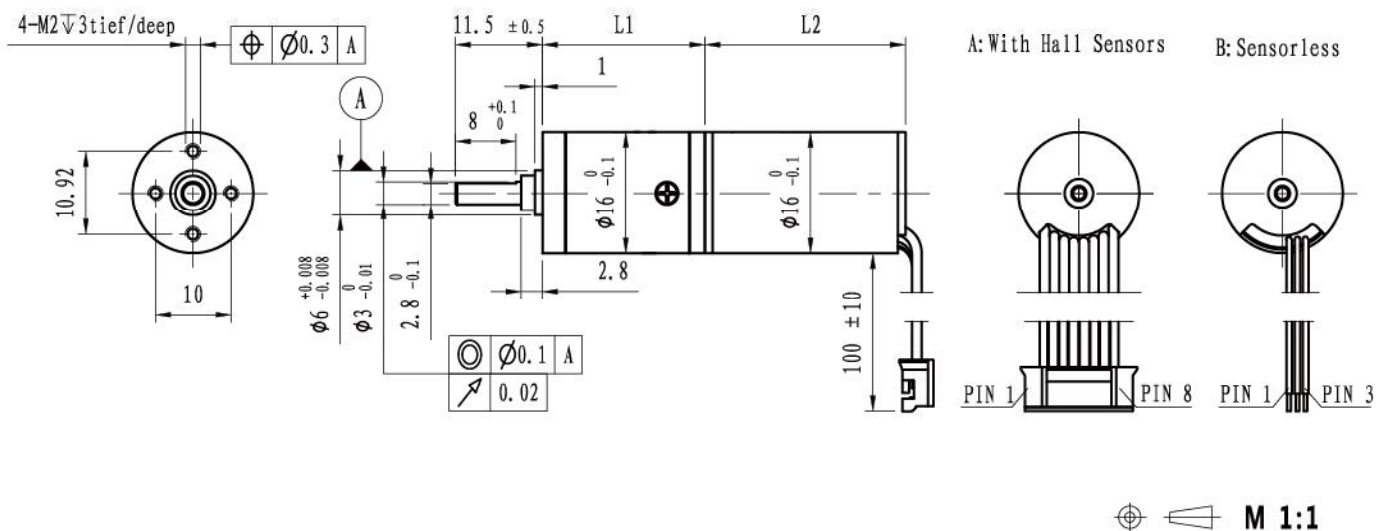
Connection

Connection (Sensorless)	PVC	
Pin 1 Motor winding MA	AWG28	yellow
Pin 2 Motor winding MB	AWG28	green
Pin 3 Motor winding MC	AWG28	blue

Configuration

Pinion: Metal/Plastic
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/Dimensions/length
Connector: JST/MOLEX/TE

More:
Special design for high speed/high torque
ECD series can be chosen in some application
Details please contact our sales engineer



ECG16..L
ECG16..S P16

Motor type					
1	Length of motor L1	ECG1630S/L	mm	30	Motor performance at P10.
		ECG1636S/L	mm	36	Motor performance at P11.
		ECG1656S/L	mm	56	Motor performance at P52.
		ECDG1638L	mm	38	Motor performance at P39.

Gearhead Data

2 Housing material		Steel				
3 Geartrain material		Steel				
4 Bearing type on output shaft		Ball bearing				
5 Max. radial load (10mm from flange)	N	15.6				
6 Max. axial load	N	4.9				
7 Radial play of shaft	mm	0.04				
8 Thrust play of shaft	mm	0.4				
9 Backlash at no load	°	2				
10 Max. continuous speed	rpm	42000				
11 Operating temperature range	°C	-30...+100				
12 Number of stages		1	2	3	4	5
13 Max continuous torque	Nm	0.42	0.6	0.75	0.9	0.9
14 Max. intermittent torque	Nm	0.84	1.2	1.5	1.8	1.8
15 Max. efficiency	%	90	83	77	72	67
16 Gearhead length L2	mm	17.9	21.8	25.7	29.6	33.5
17 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,

Connection

Configuration

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		

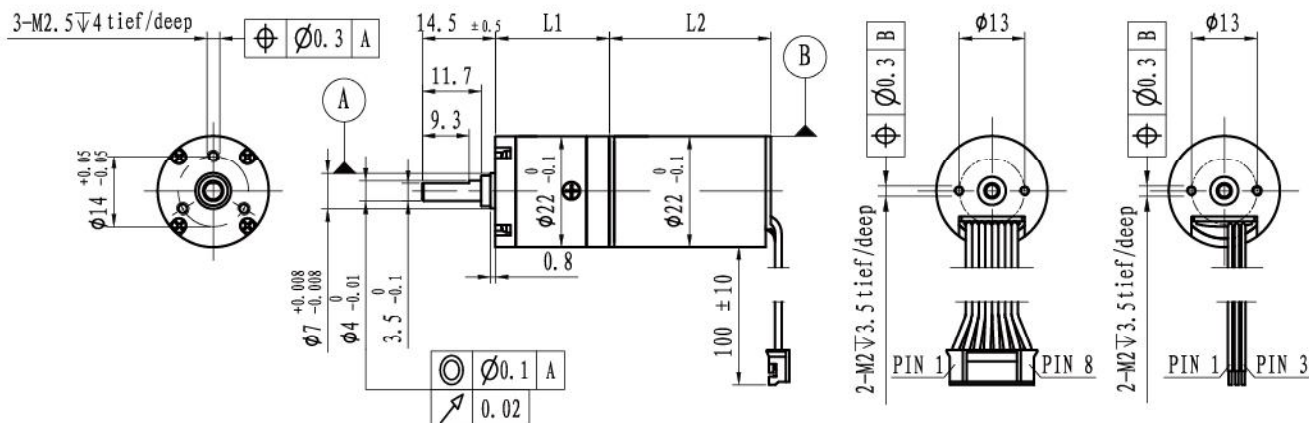
Conection B (Sensorless) PVC			
Pin 1	Motor winding	MA	AWG26 yellow
Pin 2	Motor winding	MB	AWG26 green
Pin 3	Motor winding	MC	AWG26 blue

Pinion: Metal/Plastic
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/Dimensions/length
Connector: JST/MOLEX/TE

More:
Special design for high speed/high torque
ECD series can be chosen in some application
Details please contact our sales engineer

A: With Hall Sensors

B: Sensorless



ECG22..L
ECG22..S

P22

Motor type

1 Length of motor L1	ECG2232S/L	mm	32	Motor performance at P13.
	ECG2240S/L	mm	40	Motor performance at P14.
	ECG2248S/L	mm	48	Motor performance at P15.
	ECG2260S/L	mm	60	Motor performance at P16.
	ECDG2238S	mm	38.5	Motor performance at P40.
	ECDG2246S	mm	46.5	Motor performance at P41.

Gearhead Data

2 Housing material		Steel
3 Geartrain material		Steel
4 Bearing type on output shaft		Ball bearing
5 Max. radial load (10mm from flange)	N	15.6
6 Max. axial load	N	4.9
7 Radial play of shaft	mm	0.04
8 Thrust play of shaft	mm	0.4
9 Backlash at no load	°	2
10 Max. continuous speed	rpm	42000
11 Operating temperature range	°C	-30..+100
12 Number of stages		
13 Max continuous torque	Nm	1 0.72 2 0.96 3 1.2 4 1.45 5 1.45
14 Max. intermittent torque	Nm	1.44 1.92 2.4 2.9 2.9
15 Max. efficiency	%	90 83 77 72 72
16 Gearhead length L2	mm	22.6 27.6 32.7 37.7 42.8
17 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,

Connection

Configuration

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		

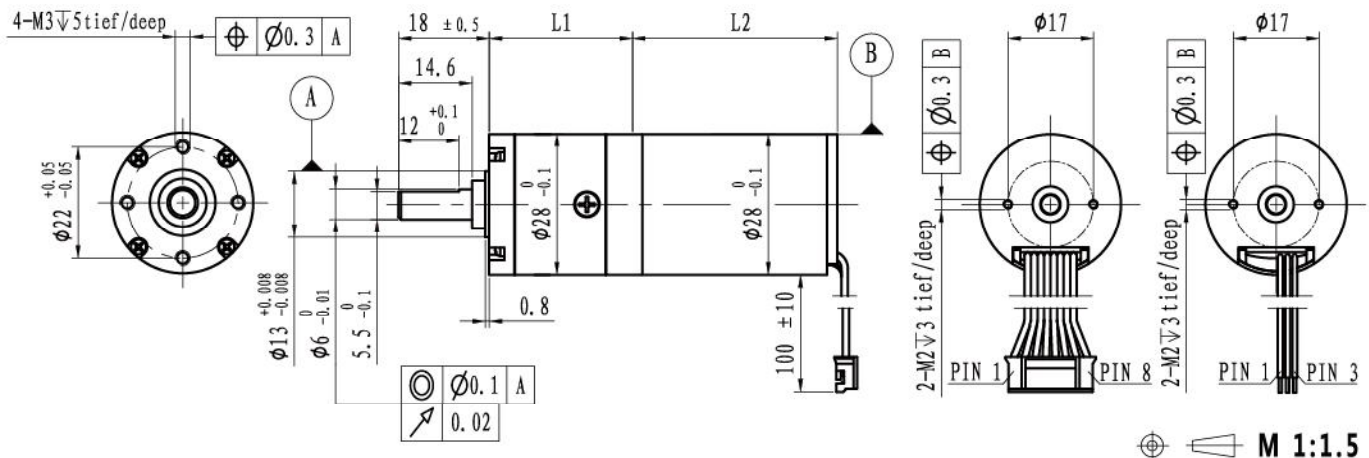
Connection B (Sensorless)	PVC	
Pin 1 Motor winding MA	AWG26	yellow
Pin 2 Motor winding MB	AWG26	green
Pin 3 Motor winding MC	AWG26	blue

Pinion: Metal/Plastic
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/Dimensions/length
Connector: JST/MOLEX/TE

More:
Special design for high speed/high torque
ECD series can be chosen in some application
Details please contact our sales engineer

A: With Hall Sensors

B: Sensorless



ECG28..L
ECG28..S P28

Motor type

1 Length of motor L1	ECG2845S/L	mm	45	Motor performance at P19.
	ECG2854S/L	mm	54	Motor performance at P20.
	ECG2864S/L	mm	64	Motor performance at P21.
	ECDG2854S	mm	54	Motor performance at P44.
	ECDG2863S	mm	63	Motor performance at P45.

Gearhead Data

2 Housing material		Steel
3 Geartrain material		Steel
4 Bearing type on output shaft		Ball bearing
5 Max. radial load (10mm from flange)	N	58.8
6 Max. axial load	N	29.4
7 Radial play of shaft	mm	0.04
8 Thrust play of shaft	mm	0.4
9 Backlash at no load	°	2
10 Max. continuous speed	rpm	36000
11 Operating temperature range	°C	-30..+100
12 Number of stages		
13 Max continuous torque	Nm	1 1.55 2.1 2.6 3.1
14 Max. intermittent torque	Nm	3.1 4.2 5.2 6.2
15 Max. efficiency	%	90 83 77 72
16 Gearhead length L2	mm	28.4 34.7 41 47.3
17 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

Connection

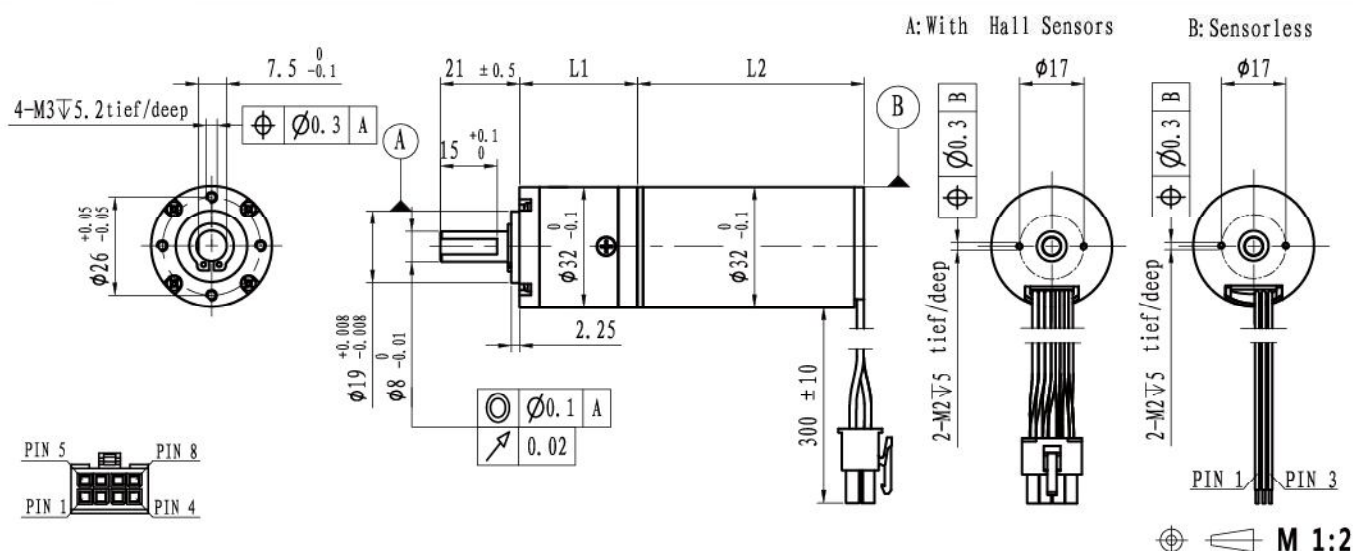
Connection A (Sensor)	PVC	
Pin 1 Vhall 3-18 VDC	AWG26	black
Pin 2 Hall sensor HA	AWG26	black
Pin 3 Hall sensor HB	AWG26	black
Pin 4 Hall sensor HC	AWG26	black
Pin 5 GND	AWG26	black
Pin 6 Motor winding MA	AWG26	black
Pin 7 Motor winding MB	AWG26	black
Pin 8 Motor winding MC	AWG26	black
Connector		
JST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

Pinion: Metal/Plastic
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/Dimensions/length
Connector: JST/MOLEX/TE

More:
Special design for high speed/high torque
ECD series can be chosen in some application
Details please contact our sales engineer

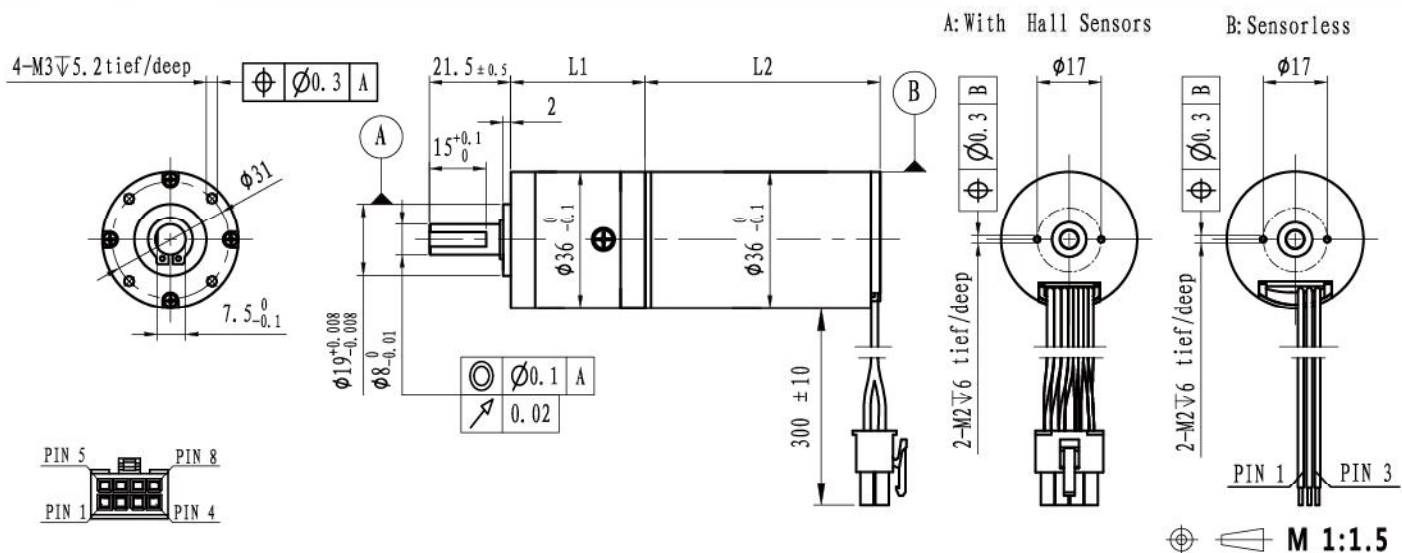
ECG32..L
ECG32..S P32

Motor type					
1	Length of motor L1	ECG3242S/L	mm	42	Motor performance at P22.
		ECG3260S/L	mm	60	Motor performance at P23.
		ECG3270S/L	mm	70	Motor performance at P24.
		ECDG3270S	mm	70	Motor performance at P46.

Gearhead Data							
2	Housing material		Steel				
3	Geartrain material		Steel				
4	Bearing type on output shaft		Ball bearing				
5	Max. radial load (10mm from flange)	N	98				
6	Max. axial load	N	58.8				
7	Radial play of shaft	mm	0.04				
8	Thrust play of shaft	mm	0.4				
9	Bcaklash at no load	°	2				
10	Max. continuous speed	rpm	36000				
11	Operating temperatue range	°C	-30..+100				
12	Number of stages		1	2	3	4	
13	Max continuous torque	Nm	2.34	3.1	3.88	4.65	
14	Max. intermittent torque	Nm	4.68	6.2	7.76	9.3	
15	Max. efficiency	%	90	83	77	72	
16	Gearhead length L2	mm	31.2	38.7	46.2	53.7	
17	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	

Connection				Configuration	204.0, 200	0702, 47.10
Conection A (Sensor)				Pinion: Metal/Plastic 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/Dimensions/length Connector: JST/MOLEX/TE More: Special design for high speed/high torque ECD series can be chosen in some application Details please contact our sales engineer		
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 HC	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			

ECG Series Slotless Brushless DC Gear Motor
ECG36 Φ36mm



ECG36..L
ECG36..S P36

Motor type

1 Length of motor L1	ECG3660S/L	mm	60	Motor performance at P25.
	ECG3670S	mm	70	Motor performance at P26.
	ECDG3673S	mm	73	Motor performance at P47.
	ECDG3683S	mm	83	Motor performance at P48.

Gearhead Data

2 Housing material		Steel
3 Geartrain material		Steel
4 Bearing type on output shaft		Ball bearing
5 Max. radial load (10mm from flange)	N	98
6 Max. axial load	N	58.8
7 Radial play of shaft	mm	0.04
8 Thrust play of shaft	mm	0.4
9 Backlash at no load	°	2
10 Max. continuous speed	rpm	30000
11 Operating temperature range	°C	-30..+100
12 Number of stages		
13 Max continuous torque	Nm	1 3.24 2 4.32 3 5.4 4 6.48
14 Max. intermittent torque	Nm	6.48 8.64 10.8 12.96
15 Max. efficiency	%	90 83 77 72
16 Gearhead length L2	mm	35.6 44.2 52.8 61.4
17 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

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 HC	AWG26 Green
Connector	
Molex5557-8P	

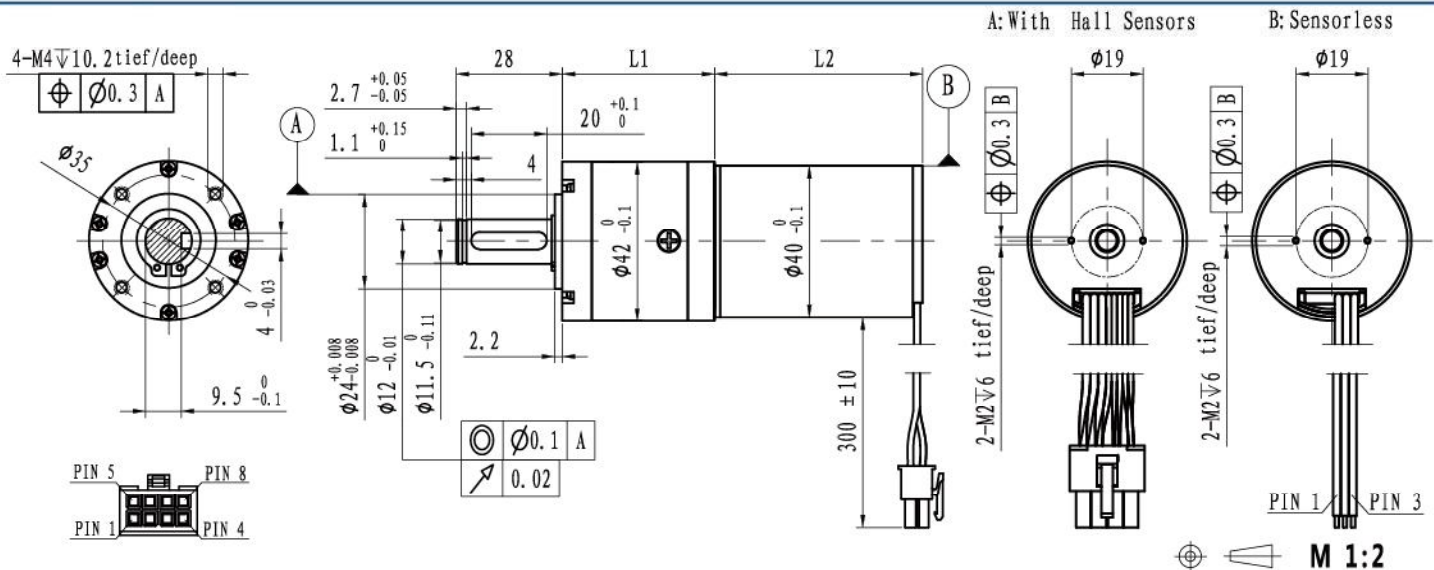
Connection B (Sensorless)	PTFE
Pin 1 Motor winding MA	AWG20 Yellow
Pin 2 Motor winding MB	AWG20 Green
Pin 3 Motor winding MC	AWG20 Blue

Configuration

Pinion: Metal/Plastic
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/Dimensions/length
Connector: JST/MOLEX/TE

More:
Special design for high speed/high torque
ECD series can be chosen in some application
Details please contact our sales engineer

ECG Series Slotless Brushless DC Gear Motor
ECG40 Φ40mm



ECG40..L
ECG40..S P42

Motor type

1 Length of motor L1	ECG4058S/L	mm	58	Motor performance at P27.
	ECG4070S/L	mm	70	Motor performance at P28.
	ECG4088S/L	mm	88	Motor performance at P29.

Gearhead Data

2 Housing material		Steel
3 Geartrain material		Steel
4 Bearing type on output shaft		Ball bearing
5 Max. radial load (10mm from flange)	N	196
6 Max. axial load	N	98
7 Radial play of shaft	mm	0.04
8 Thrust play of shaft	mm	0.4
9 Backlash at no load	°	2
10 Max. continuous speed	rpm	30000
11 Operating temperature range	°C	-30..+100
12 Number of stages		
13 Max continuous torque	Nm	1 6.5 2 8.6 3 10.8 4 13
14 Max. intermittent torque	Nm	13 17.2 21.6 26
15 Max. efficiency	%	90 83 77 72
16 Gearhead length L2	mm	43.8 54.6 65.4 76
17 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

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 HC	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

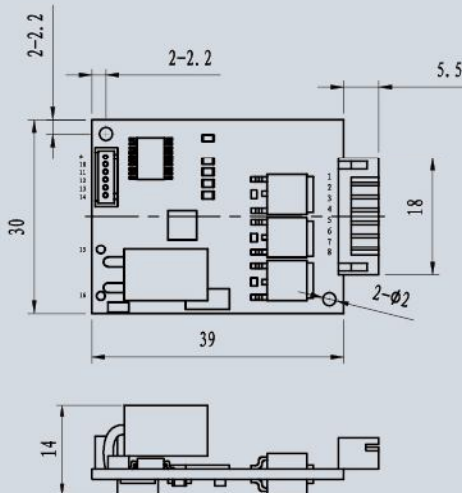
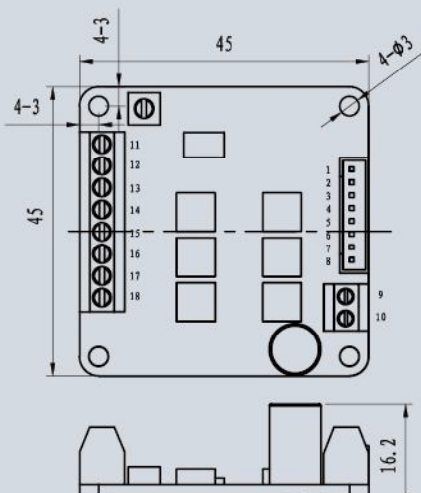
Pinion: Metal/Plastic
Ball bearing: Preload
Flange: Standard frange front&back/customize the frange
Shaft: Length/Diameter/Cut face/double shaft/hollow shaft
Leadwire: PVC/Silicon/Teflon/UL No/Dimensions/length
Connector: JST/MOLEX/TE

More:
Special design for high speed/high torque
ECD series can be chosen in some application
Details please contact our sales engineer

Motor Control

BLDC motor speed controller, Sensor, 2/3A

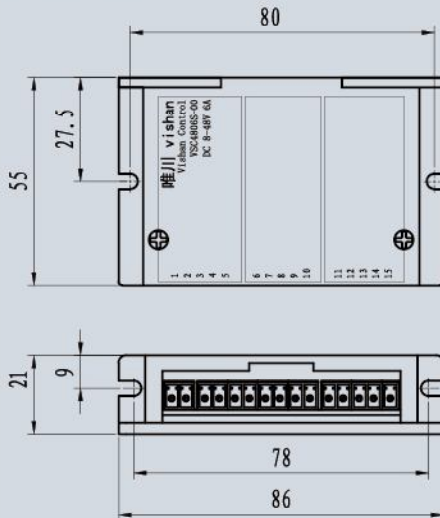
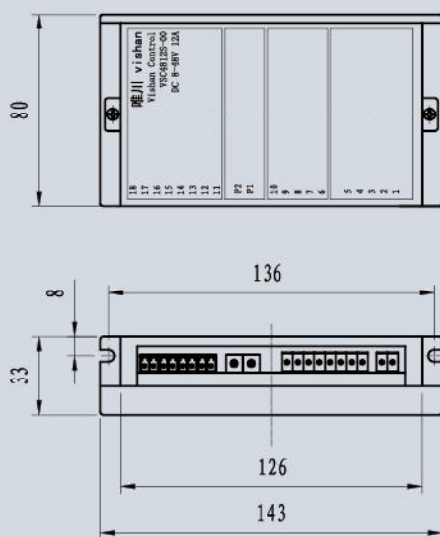


	VSC 3002S-00	VSC 3003S-00																																																																								
Operating Mode	10-30VDC, Max. Current 2A Speed controller with hall sensor, Open loop Overload protection Stall protection Sensor error protection	8-30VDC, Max. Current 3A Speed controller with hall sensor, 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)	60000rpm	60000rpm																																																																								
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°C	-30....+45°C																																																																								
19 Temperature - Storage	-40....+85°C	-40....+85°C																																																																								
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 -
Pin9	BK	Pin1	+5V, Output																																																																							
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Pin13	+5V, Output	Pin5	GND																																																																							
Pin14	GND	Pin6	MA																																																																							
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Pin16	POWER -	Pin8	MC																																																																							
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																																																																							
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Pin18	BK	Pin8	MC																																																																							
		Pin9	POWER +																																																																							
		Pin10	POWER -																																																																							

Motor Control

BLDC motor speed controller, Sensor, 6/12A

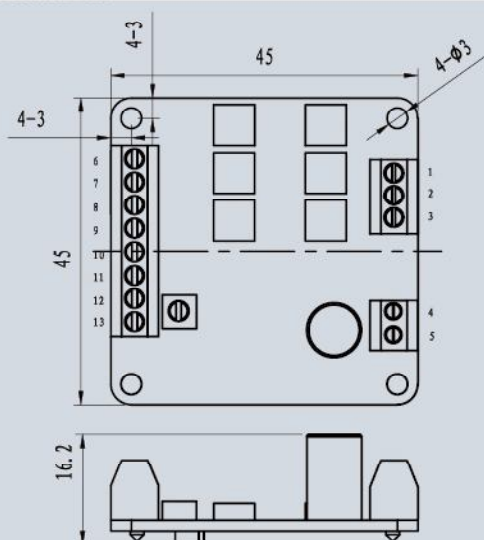
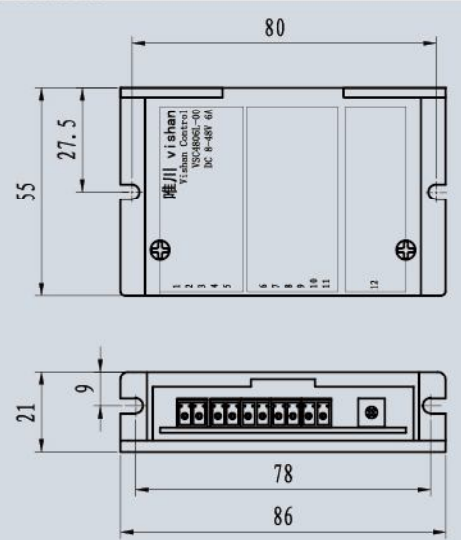


	VSC 4806S-00	VSC 4812S-00																																																																				
Operating Mode	8-48VDC, Max. Current 6A Speed controller with hall sensor, Open loop Overload protection Stall protection Sensor error protection	8-48VDC, Max. Current 12A Speed controller with hall sensor, Open loop Overload protection Stall protection Sensor error protection																																																																				
Electrical Data																																																																						
1 DC motor up to	300W	600W																																																																				
2 Operating Voltage Vcc	8-48 VDC	8-48 VDC																																																																				
3 Max.output current	8A , <30S	15A , <30S																																																																				
4 Continuous output current	6A	12A																																																																				
5 Pulse width modulation frequency	20KHz	20KHz																																																																				
6 Sampling rate PI current controller	20KHz	20KHz																																																																				
7 Max.Speed (1 pole pair)	60000rpm	60000rpm																																																																				
8 Efficiency	95%	95%																																																																				
Inputs/Outputs																																																																						
9 Hall sensor signal	HA,HB,HC	HA,HB,HC																																																																				
10 Digital inputs/outputs	3	6																																																																				
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																																																																				
15 Speed Feedback "PG"	---	OC ouput(30V/10mA max)																																																																				
16 Alarm Ouput "ALARM"	---	OC ouput(30V/10mA max)																																																																				
17 Status Indicators	Operation: LED light/Blink at 1 HZ; Error: LED Blink at 20Hz																																																																					
18 Hall sensor supply voltage	+5 VDC	+5 VDC																																																																				
19 Hall & Digital signal ground	GND	GND																																																																				
Environmental Conditions																																																																						
20 Temperature - Operation	-30....+45°C	-30....+45°C																																																																				
21 Temperature - Storage	-40....+85°C	-40....+85°C																																																																				
Mechanical Data																																																																						
22 Weight	Approx. 90 g	Approx. 300 g																																																																				
23 Dimensisons (L x W x H)	55 x 86 x 21mm	80x 143 x33mm																																																																				
24 Mounting holes	for screws M3	for screws M3																																																																				
25 Connections																																																																						
	<table><tr><td>Pin1</td><td>POWER +</td><td>Pin9</td><td>HC</td></tr><tr><td>Pin2</td><td>POWER -</td><td>Pin10</td><td>+5V, Output</td></tr><tr><td>Pin3</td><td>MA</td><td>Pin11</td><td>GND</td></tr><tr><td>Pin4</td><td>MB</td><td>Pin12</td><td>F/R</td></tr><tr><td>Pin5</td><td>MC</td><td>Pin13</td><td>EN</td></tr><tr><td>Pin6</td><td>GND</td><td>Pin14</td><td>SP</td></tr><tr><td>Pin7</td><td>HA</td><td>Pin15</td><td>+5V, Output</td></tr><tr><td>Pin8</td><td>HB</td><td></td><td></td></tr></table>	Pin1	POWER +	Pin9	HC	Pin2	POWER -	Pin10	+5V, Output	Pin3	MA	Pin11	GND	Pin4	MB	Pin12	F/R	Pin5	MC	Pin13	EN	Pin6	GND	Pin14	SP	Pin7	HA	Pin15	+5V, Output	Pin8	HB			<table><tr><td>Pin1</td><td>POWER +</td><td>Pin10</td><td>+5V, Output</td></tr><tr><td>Pin2</td><td>POWER -</td><td>Pin11</td><td>GND</td></tr><tr><td>Pin3</td><td>MA</td><td>Pin12</td><td>F/R</td></tr><tr><td>Pin4</td><td>MB</td><td>Pin13</td><td>EN</td></tr><tr><td>Pin5</td><td>MC</td><td>Pin14</td><td>Brake</td></tr><tr><td>Pin6</td><td>GND</td><td>Pin15</td><td>SP</td></tr><tr><td>Pin7</td><td>HA</td><td>Pin16</td><td>PG</td></tr><tr><td>Pin8</td><td>HB</td><td>Pin17</td><td>ALM</td></tr><tr><td>Pin9</td><td>HC</td><td>Pin18</td><td>+5V, Output</td></tr></table>	Pin1	POWER +	Pin10	+5V, Output	Pin2	POWER -	Pin11	GND	Pin3	MA	Pin12	F/R	Pin4	MB	Pin13	EN	Pin5	MC	Pin14	Brake	Pin6	GND	Pin15	SP	Pin7	HA	Pin16	PG	Pin8	HB	Pin17	ALM	Pin9	HC	Pin18	+5V, Output
Pin1	POWER +	Pin9	HC																																																																			
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Pin7	HA	Pin15	+5V, Output																																																																			
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Pin8	HB	Pin17	ALM																																																																			
Pin9	HC	Pin18	+5V, Output																																																																			

Motor Control

BLDC motor speed controller, Sensorless, 3/6A

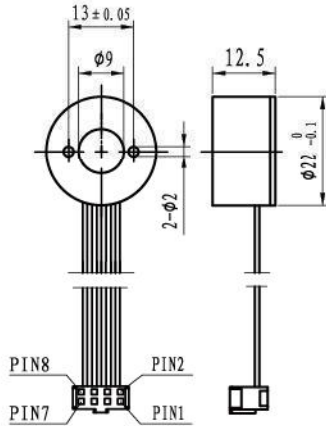


	VSC 3003L-00	VSC 4806L-00																																																								
Operating Mode	8-30VDC, Max. Current 3A Speed controller without sensor, Open loop Overload protection Stall protection CW/CCW control	8-48VDC, Max. Current 6A Speed controller without sensor, Open loop Overload protection 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)	50000rpm	50000rpm																																																								
8 Efficiency	92%	95%																																																								
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9 Digital inputs/outputs	5	4																																																								
10 Set value "SP"	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)																																																								
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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																																																							
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Pin9	GND	Pin4	POWER -																																																							
Pin10	+5V, Output	Pin5	POWER +																																																							
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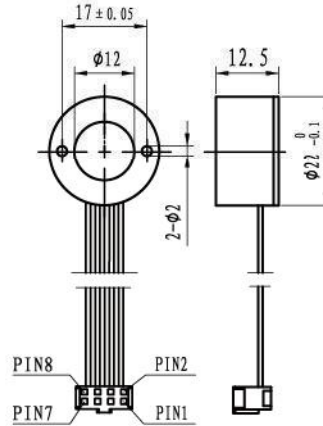
Encoder

Magnetic encoder, 3 channels, Line Driver, 1024 CPT

EN22A/EN22AL



EN22B/EN22BL



M 1:1.5

	Without line driver	EN22A	EN22AL	EN22B	EN22BL
Electrical Data					
1 Lines per revolution		1024	1024	1024	1024
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

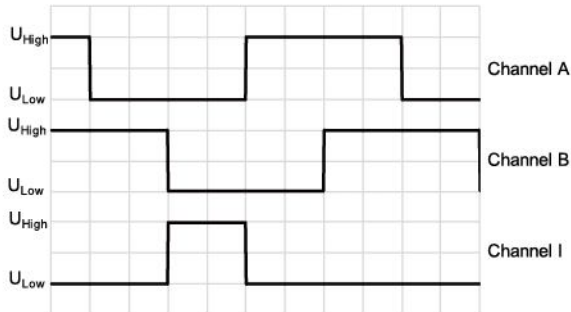
Features & Configuration

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

Output Signals

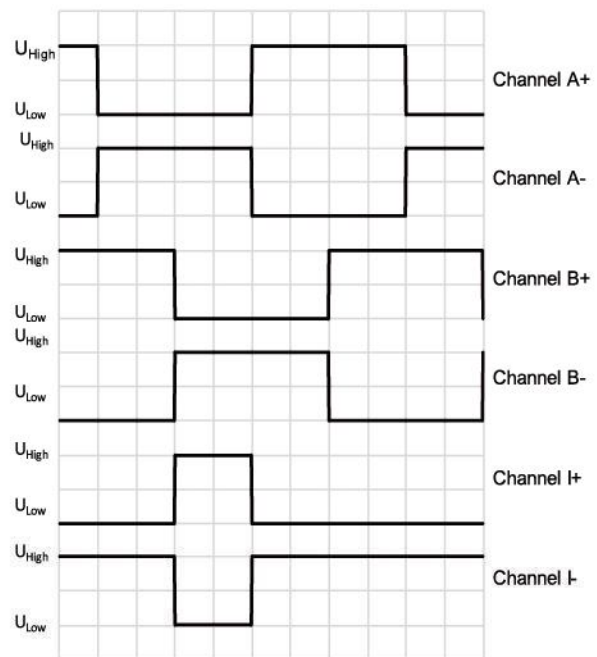
EN22A/EN22B

with counter-clockwise rotation as from the shaft end



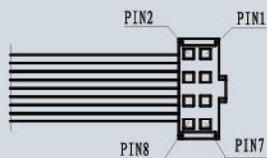
EN22AL/EN22BL

with counter-clockwise rotation as from the shaft end



Connection

Conection	EN22A/EN22B	PVC
Pin 1	GND	AWG28
Pin 2	Vcc	AWG28
Pin 3	NC	AWG28
Pin 4	I+	AWG28
Pin 5	NC	AWG28
Pin 6	B+	AWG28
Pin 7	NC	AWG28
Pin 8	A+	AWG28



Conection	EN22AL/EN22BL	PVC
Pin 1	GND	AWG28
Pin 2	Vcc	AWG28
Pin 3	I-	AWG28
Pin 4	I+	AWG28
Pin 5	B-	AWG28
Pin 6	B+	AWG28
Pin 7	A-	AWG28
Pin 8	A+	AWG28

减速箱配套，我们推出直径12-45MM机加工传动型和精密级的多速比选择，应用与无刷电机和有刷电机组合，适用于各种医疗，自动化工业的需求。

For gearboxes, we have introduced a 12-45MM diameter machined transmission type and precision multi-speed ratio options, which are used in combination with brushless motors and brushed motors, which are suitable for various medical and automation industries.



机械手
Manipulator



机械手
Manipulator



骨钻
bone drill



闸机
Gate machine

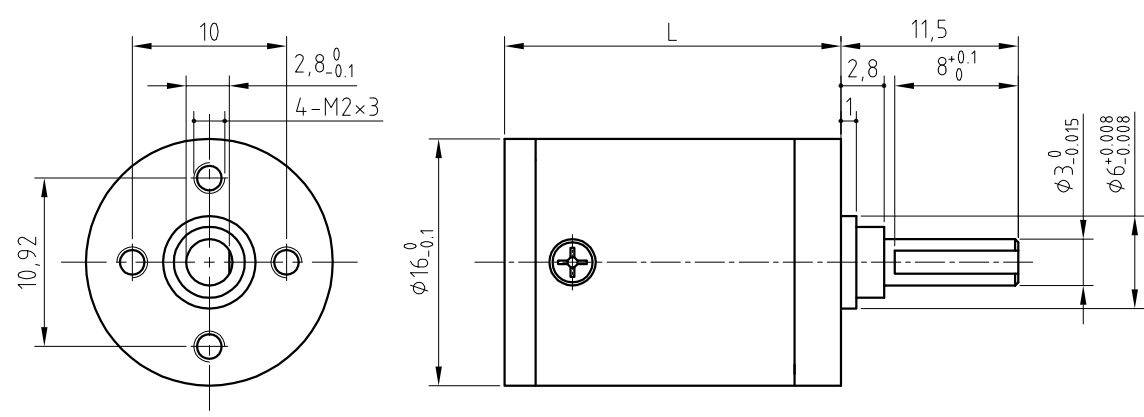


5G 传动系统
5G drive system



机器人
Robot

● 外形尺寸 APPEARANCE SIZE



外壳材料 Housing material	金属 steel
齿轮材料 Gearwhddl material	金属 steel ①
输出轴承型式 Bearing at output	滚动轴承 Ball bearings
径向负载 Radial load (10mm from flange)	≤10 Kgf
轴向负载 shaft axial load	≤4 Kgf
径向间隙 Radial play of shaft	≤0.04mm
轴向间隙 Thrust play of shaft	≤0.4mm
连续运行时最高允许输入转速 Max permissible input speed at continuous working	≤20000rpm

● 标准减速比型式 Gearboxes Specifications

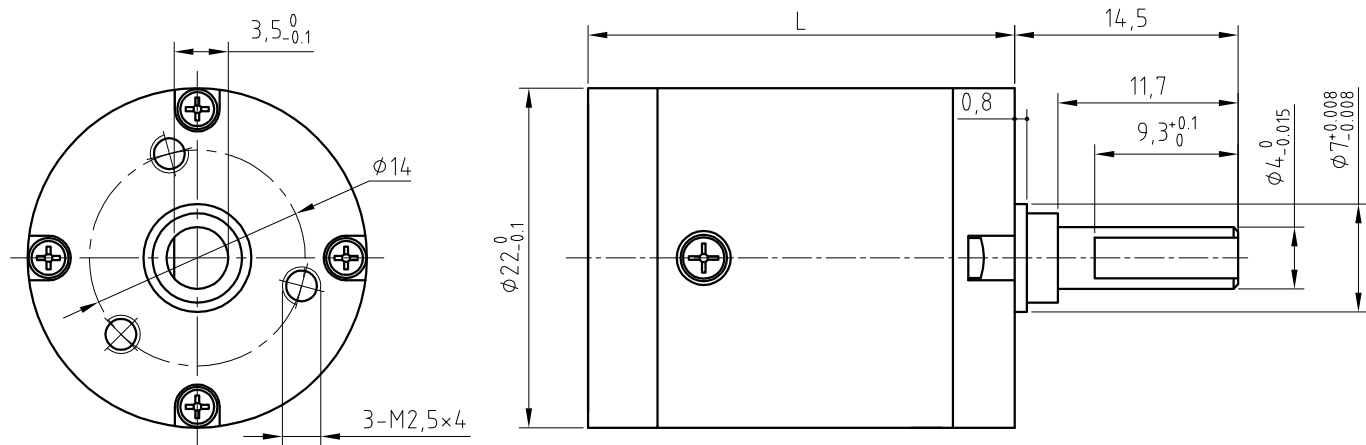
减速比 (部分) Reduction ratio (part)	额定允许负载 rated tolerance torque	瞬间允许负载 Max momentary tolerance torque	效率 Efficiency	L (mm)	背隙 (无负载时) Backlash,at no-load
3.75, 4.4, 5.4, 6.5	4.2Kgf-cm	12.6Kgf-cm	90%	17.9	≤ 5arcmin
14.1, 16.4, 19.2, 20.3, 23.7, 24.4,28.5, 29.2, 35.1, 42.3	6.0Kgf-cm	18.0Kgf-cm	81%	21.8	≤10arcmin
52.7, 61.7, 72.1, 84.3, 91.4, 103.8, 109.4, 125, 131.6, 154, 185.3, 228.15, 274.6	7.5Kgf-cm	22.5Kgf-cm	72%	25.7	≤15arcmin
197.8, 231.2, 284.8, 316.1, 333, 342.7, 389.3, 400.8, 455.2, 479.5, 493.6, 547.9 594.1, 674.8, 710.8, 812.3 855.6,1000, 1029.8, 1204 1483, 1785	9.0Kgf-cm	27Kgf-cm	65%	29.6	≤20arcmin
741.5, 867, 1013, 1067.9,1185 1248.6, 1386, 1502.9, 1620 1707, 1757, 1851, 1996,2055 2164, 2402, 2458,2530,2959 3027, 3644, 3728 ,4488,4592 5527, 6653, 8008, 9639,11602	9.0Kgf-cm	27Kgf-cm	60%	33.5	≤25arcmin

表中*指速比数值。 *—Reduction ratio

①—— 根据受力，行星轮可选用塑料。 Planet gears can be plasticaccording to torque.

精密型行星齿轮箱 PLANETARY GEAR HEAD 22P

● 外形尺寸 APPEARANCE SIZE



外壳材料 Housing material	金属 steel
齿轮材料 Gearwhddl material	金属 steel ①
输出轴承型式 Bearing at output	滚动轴承 Ball bearings
径向负载 Radial load (10mm from flange)	≤10 Kgf
轴向负载 shaft axial load	≤5 Kgf
径向间隙 Radial play of shaft	≤0.04mm
轴向间隙 Thrust play of shaft	≤0.4mm
连续运行时最高允许输入转速 Max permissible input speed at continuous working	≤20000rpm

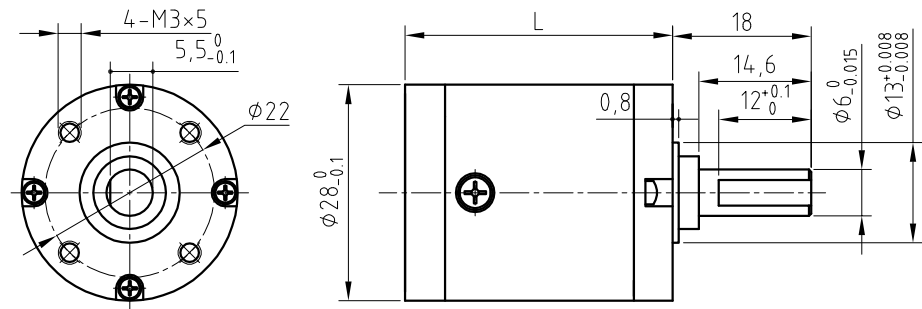
● 标准减速比型式 Gearboxes Specifications

减速比(部分) Reduction ratio (part)	额定允许负载 rated tolerance torque	瞬间允许负载 Max momentary tolerance torque	效率 Efficiency	L (mm)	背隙(无负载时) Backlash,at no-load
3.75, 4.4, 5.4, 6.5	7.2Kgf-cm	21.6Kgf-cm	90%	22.6	≤ 5arcmin
14.1, 16.4, 19.2, 20.3, 23.7, 24.4,28.5, 29.2, 35.1, 42.3	9.6Kgf-cm	28.8Kgf-cm	81%	27.6	≤10arcmin
52.7, 61.7, 72.1, 84.3, 91.4, 103.8, 109.4, 125, 131.6, 154, 185.3, 228.15, 274.6	12Kgf-cm	36Kgf-cm	72%	32.7	≤15arcmin
197.8, 231.2, 284.8, 316.1, 333, 342.7, 389.3, 400.8, 455.2, 479.5, 493.6, 547.9 594.1, 674.8, 710.8, 812.3 855.6,1000, 1029.8, 1204 1483, 1785	14.5Kgf-cm	43.5Kgf-cm	65%	37.7	≤20arcmin
741.5, 867, 1013, 1067.9,1185 1248.6, 1386, 1502.9, 1620 1707, 1757, 1851, 1996,2055 2164, 2402, 2458,2530,2959 3027, 3644, 3728 ,4488,4592 5527, 6653, 8008, 9639,11602	14.5Kgf-cm	43.5Kgf-cm	60%	42.8	≤25arcmin

表中*指速比数值。 *—Reduction ratio

①—— 根据受力，行星轮可选用塑料。 Planet gears can be plasticaccording to torque.

● 外形尺寸 APPEARANCE SIZE



外壳材料 Housing material	金属 steel
齿轮材料 Gearxheel material	金属 steel ①
输出轴承型式 Bearing at output	滚动轴承 Ball bearings
径向负载 Radial load (10mm from flange)	≤10 Kgf
轴向负载 shaft axial load	≤6 Kgf
径向间隙 Radial play of shaft	≤0. 04mm
轴向间隙 Thrust play of shaft	≤0. 4mm
连续运行时最高允许输入转速 Max permissible input speed at continuous working	≤18000rpm

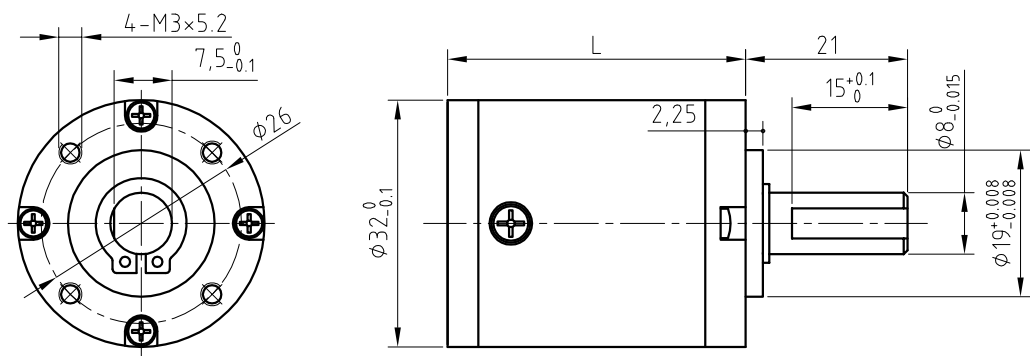
● 标准减速比型式 Gearboxes Specifications

减速比 (部分) Reduction ratio (part)	额定允许负载 rated tolerance torque	瞬间允许负载 Max momentary tolerance torque	效率 Efficiency	L (mm)	背隙 (无负载时) Backlash,at no-load
4.4, 5.25, 6.7, 8.3	15.5Kgf-cm	46.5Kgf-cm	90%	28.4	≤ 5arcmin
15.1, 16.9, 18, 19.4, 20.1, 23.1 25.6, 27.6, 29.3, 31.8, 35, 36.5 43.5, 55.2, 68.7	21Kgf-cm	63Kgf-cm	81%	34.7	≤10arcmin
61.7, 77.1, 87.6, 100.6, 109, 120 125, 129, 134.1, 139.8, 144.7, 149.1, 154, 160.4, 166.8, 183.8 191.4, 211.7, 228.4, 233.3, 243 264.5, 290, 296.3, 368.2	26Kgf-cm	78Kgf-cm	72%	41	≤15arcmin
335.9, 344.8, 373.4, 375.5 385.5, 411.4, 417.4, 428.5, 431 447.2, 460, 466.7, 479.2, 494.8 511.3, 528, 535.7, 567.9, 571.7 590.3, 630, 639.2, 656.2, 677.6 705.8, 733.7, 749.6, 759.7, 800 811.7, 833.3, 842.1, 860.4, 894.4 931.7, 964.7, 994.3, 1005, 1027 1036,1069,1112,1136,1158,1199 1236,1276,1304,1329, 1382,1523 1556,1586,1755,1892,1933,1975 2014,2403,2455,3051,3792,4713	31Kgf-cm	93Kgf-cm	65%	47.3	≤20arcmin

表中*指速比数值。 *—Reduction ratio

①—— 根据受力，行星轮可选用塑料。 Planet gears can be plastic according to torque.

● 外形尺寸 APPEARANCE SIZE



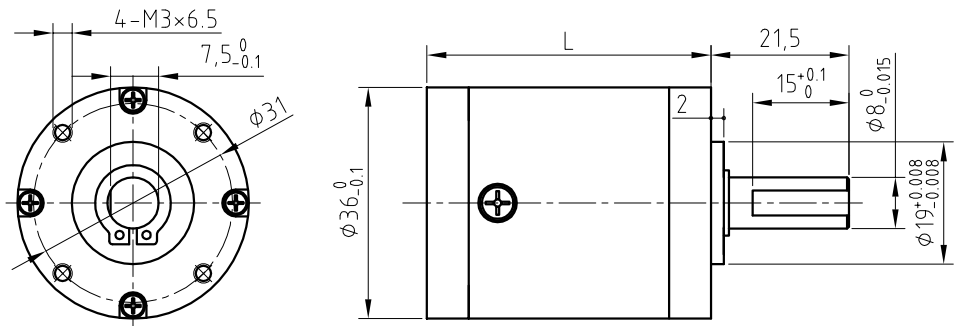
外壳材料 Housing material	金属 steel
齿轮材料	金属 steel ①
输出轴承型式 Bearing at output	滚动轴承 Ball bearings
径向负载 Radial load (10mm from flange)	≤20 Kgf
轴向负载 shaft axial load	≤12 Kgf
径向间隙 Radial play of shaft	≤0.04mm
轴向间隙 Thrust play of shaft	≤0.4mm
连续运行时最高允许输入转速 Max permissible input speed at continuous working	≤15000rpm

● 标准减速比型式 Gearboxes Specifications

减速比(部分) Reduction ratio (part)	额定允许负载 rated tolerance torque	瞬间允许负载 Max momentary tolerance torque	效率 Efficiency	L (mm)	背隙(无负载时) Backlash,at no-load
4.4, 5.25, 6.7, 8.3	23.4Kgf-cm	70.2Kgf-cm	90%	31.2	≤ 5arcmin
15.1, 16.9, 18, 19.4, 20.1, 23.1 25.6, 27.6, 29.3, 31.8, 35, 36.5 43.5, 55.2, 68.7	31.0Kgf-cm	93.0Kgf-cm	81%	38.7	≤10arcmin
61.7, 77.1, 87.6, 100.6, 109, 120 125, 129, 134.1, 139.8, 144.7, 149.1, 154, 160.4, 166.8, 183.8 191.4, 211.7, 228.4, 233.3, 243 264.5, 290, 368.2, 457.7, 568.8	38.8Kgf-cm	116.4Kgf-cm	72%	46.2	≤15arcmin
335.9, 344.8, 373.4, 375.5 385.5, 411.4, 417.4, 428.5, 431 447.2, 460, 466.7, 479.2, 494.8 511.3, 528, 535.7, 567.9, 571.7 590.3, 630, 639.2, 656.2, 677.6 705.8, 733.7, 749.6, 759.7, 800 811.7, 833.3, 842.1, 860.4, 894.4 931.7, 964.7, 994.3, 1005, 1027 1036,1069,1112,1136,1158,1199 1236,1276,1304,1329, 1382,1523 1556,1586,1755,1892,1933,1975 2014,2403,2455,3051,3792,4713	46.5Kgf-cm	139.5Kgf-cm	65%	53.7	≤20arcmin

①—— 根据受力，行星轮可选用塑料。 Planet gears can be plastic according to torque.

● 外形尺寸 APPEARANCE SIZE



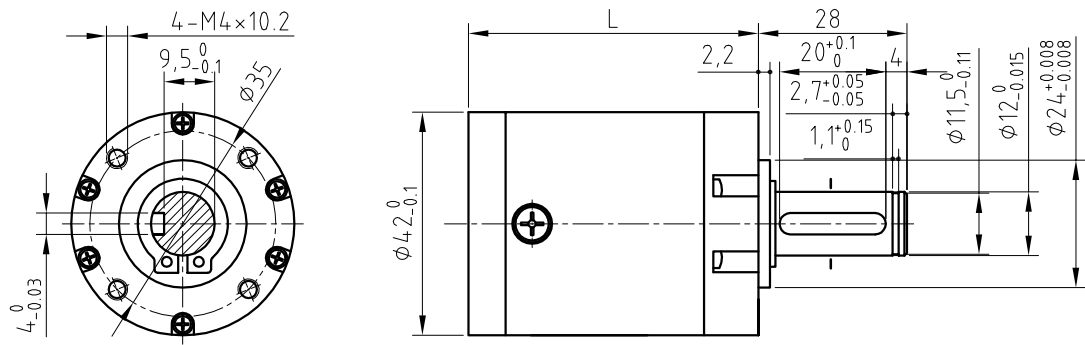
外壳材料 Housing material	金属 steel
齿轮材料 Gearxheel material	金属 steel ①
输出轴承型式 Bearing at output	滚动轴承 Ball bearings
径向负载 Radial load (10mm from flange)	≤20 Kgf
轴向负载 shaft axial load	≤12 Kgf
径向间隙 Radial play of shaft	≤0. 04mm
轴向间隙 Thrust play of shaft	≤0. 4mm
连续运行时最高允许输入转速 Max permissible input speed at continuous working	≤15000rpm

● 标准减速比型式 Gearboxes Specifications

减速比 (部分) Reduction ratio (part)	额定允许负载 rated tolerance torque	瞬间允许负载 Max momentary tolerance torque	效率 Efficiency	L (mm)	背隙 (无负载时) Backlash,at no-load
4.3, 5.1, 6.3, 7.6	32.4Kgf-cm	97.2Kgf-cm	90%	35.6	≤ 5arcmin
14.7, 16.3, 17.3, 18.6, 19.2, 21.9 23.9, 25.8, 27.2, 28.9, 32, 32.9 38.7, 39.7, 48, 58.1	43.2Kgf-cm	129.6Kgf-cm	81%	44.2	≤10arcmin
65.6, 74.6, 81.4, 90.5, 92.6, 98.5 109, 112.1, 117.2, 124.6, 132, 138 141.8, 146.7, 150.4, 162.4, 166.9 171.2, 182, 196.5, 201.5, 207.1 220.3, 243.9, 250.7,295.2, 302.6 366.2, 443.2	54.0Kgf-cm	162Kgf-cm	72%	52.8	≤15arcmin
277.4, 315.8, 335.8, 342.8, 351 373.3, 382.2, 399.4, 413.2, 424.8 450, 459.3, 472.2, 483.4, 500.1 512.7, 537.4, 555.9, 569.1, 583.5 611.5, 620.6, 632.6, 648, 670 686.9, 706.2, 719.9, 744.7, 751.1 763.6, 785, 824.4, 831.4, 847.6 854.7, 869, 893.4, 924.2, 950.1 997.8, 1006, 1023, 1052, 1078 1081, 1119, 1147, 1238, 1269, 1272 1305, 1388, 1499, 1536,1580, 1680 1860,1907,2251,2307,2793,3380	64.8Kgf-cm	194.4Kgf-cm	65%	61.4	≤20arcmin

①—— 根据受力，行星轮可选用塑料。 Planet gears can be plastic according to torque.

● 外形尺寸 APPEARANCE SIZE



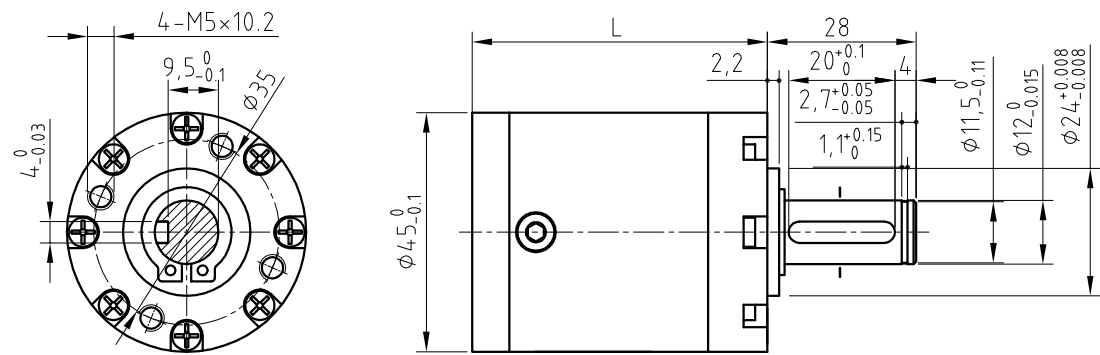
外壳材料 Housing material	金属 steel
齿轮材料 Gearwheel material	金属 steel ①
输出轴承型式 Bearing at output	滚动轴承 Ball bearings
径向负载 Radial load (10mm from flange)	≤25 Kgf
轴向负载 shaft axial load	≤15 Kgf
径向间隙 Radial play of shaft	≤0.04mm
轴向间隙 Thrust play of shaft	≤0.4mm
连续运行时最高允许输入转速 Max permissible input speed at continuous working	≤12000rpm

● 标准减速比型式 Gearboxes Specifications

减速比(部分) Reduction ratio (part)	额定允许负载 rated tolerance torque	瞬间允许负载 Max momentary tolerance torque	效率 Efficiency	L (mm)	背隙(无负载时) Backlash,at no-load
4.3, 5.1, 6.3, 7.6	65Kgf-cm	195Kgf-cm	90%	44.8	≤ 5arcmin
14.7, 16.3, 17.3, 18.6, 19.2, 21.9 23.9, 25.8, 27.2, 28.9, 32, 32.9 38.7, 39.7, 48, 58.1	86Kgf-cm	258Kgf-cm	81%	55.6	≤10arcmin
65.6, 74.6, 81.4, 90.5, 92.6, 98.5 109, 112.1, 117.2, 124.6, 132, 138 141.8, 146.7, 150.4, 162.4, 166.9 171.2, 182, 196.5, 201.5, 207.1 220.3, 243.9, 250.7,295.2, 302.6 366.2, 443.2	108Kgf-cm	324Kgf-cm	72%	66.4	≤15arcmin
277.4, 315.8, 335.8, 342.8, 351 373.3, 382.2, 399.4, 413.2, 424.8 450, 459.3, 472.2, 483.4, 500.1 512.7, 537.4, 555.9, 569.1, 583.5 611.5, 620.6, 632.6, 648, 670 686.9, 706.2, 719.9, 744.7, 751.1 763.6, 785, 824.4, 831.4, 847.6 854.7, 869, 893.4, 924.2, 950.1 997.8, 1006, 1023, 1052, 1078 1081, 1119, 1147, 1238, 1269, 1272 1305, 1388, 1499, 1536,1580, 1680 1860,1907,2251,2307,2793,3380	130Kgf-cm	390Kgf-cm	65%	77.2	≤20arcmin

①—— 根据受力，行星轮可选用塑料。 Planet gears can be plastic according to torque.

● 外形尺寸 APPEARANCE SIZE



外壳材料 Housing material	金属 steel
齿轮材料 Gearwheel material	金属 steel ①
输出轴承型式 Bearing at output	滚动轴承 Ball bearings
径向负载 Radial load (10mm from flange)	≤25 Kgf
轴向负载 shaft axial load	≤15 Kgf
径向间隙 Radial play of shaft	≤0.04mm
轴向间隙 Thrust play of shaft	≤0.4mm
连续运行时最高允许输入转速 Max permissible input speed at continuous working	≤12000rpm

● 标准减速比型式 Gearboxes Specifications

减速比(部分) Reduction ratio (part)	额定允许负载 rated tolerance torque	瞬间允许负载 Max momentary tolerance torque	效率 Efficiency	L (mm)	背隙(无负载时) Backlash,at no-load
4.3, 5.1, 6.3, 7.6	65Kgf-cm	195Kgf-cm	90%	44.8	≤ 5arcmin
14.7, 16.3, 17.3, 18.6, 19.2, 21.9 23.9, 25.8, 27.2, 28.9, 32, 32.9 38.7, 39.7, 48, 58.1	86Kgf-cm	258Kgf-cm	81%	55.6	≤10arcmin
65.6, 74.6, 81.4, 90.5, 92.6, 98.5 109, 112.1, 117.2, 124.6, 132, 138 141.8, 146.7, 150.4, 162.4, 166.9 171.2, 182, 196.5, 201.5, 207.1 220.3, 243.9, 250.7,295.2, 302.6 366.2, 443.2	108Kgf-cm	324Kgf-cm	72%	66.4	≤15arcmin
277.4, 315.8, 335.8, 342.8, 351 373.3, 382.2, 399.4, 413.2, 424.8 450, 459.3, 472.2, 483.4, 500.1 512.7, 537.4, 555.9, 569.1, 583.5 611.5, 620.6, 632.6, 648, 670 686.9, 706.2, 719.9, 744.7, 751.1 763.6, 785, 824.4, 831.4, 847.6 854.7, 869, 893.4, 924.2, 950.1 997.8, 1006, 1023, 1052, 1078 1081, 1119, 1147, 1238, 1269, 1272 1305, 1388, 1499, 1536,1580, 1680 1860,1907,2251,2307,2793,3380	130Kgf-cm	390Kgf-cm	65%	77.2	≤20arcmin

①—— 根据受力，行星轮可选用塑料。 Planet gears can be plastic according to torque.



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