

Micro Motion Systems with ironless winding

Company Profile

MOONS' is one of the largest integrated manufacturers of motion control products within China, using internationally proven scientific management tools along with the pursuit for professional applied technologies.

MOONS' continuously develops products that conserve energy, are more convenient and efficient in utilization and application, bringing assurance to the customers and creating values for them.

MOONS' products range from factory automation components to the intelligent LED drivers, from the intelligent management system of large industrial equipment to the control actuator in automotive and telecommunication devices.

- MOONS' was established in February 1994.
- Headquartered in Shanghai, China.
- Overseas companies located in North America, Europe , East Asia and Southeast Asia.



Product Feature

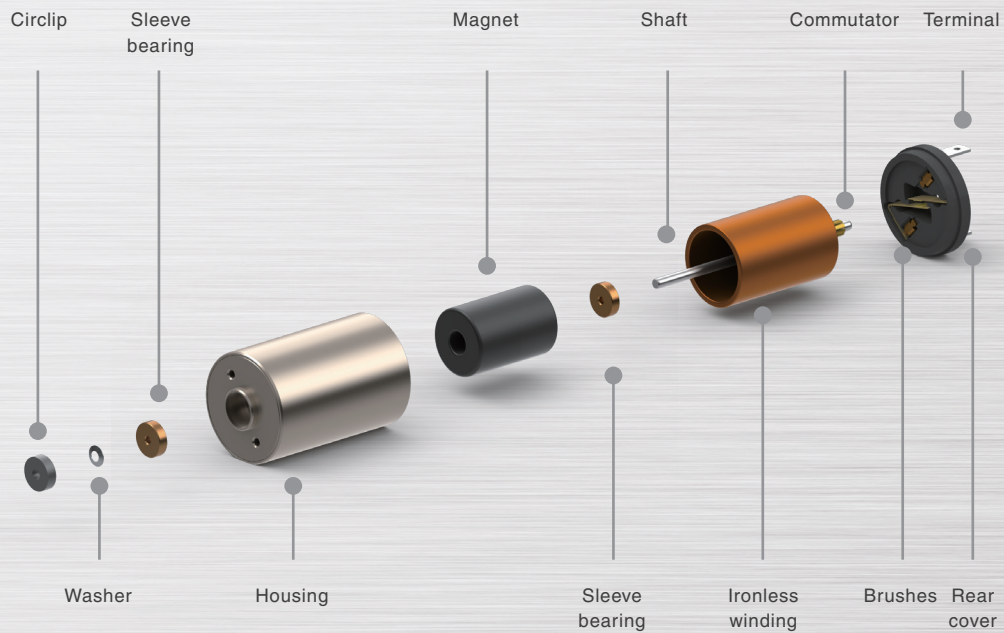
MOONS' EC motor and DC motor use independent patented ironless winding. this special design can bring high speed, high torque and low noise. Because of no cogging and compact structure, we can get smoother running at high or low speed, more accurate control, higher efficiency and higher power density.

- Ironless Winding
- Small Size
- High Torque
- High Speed

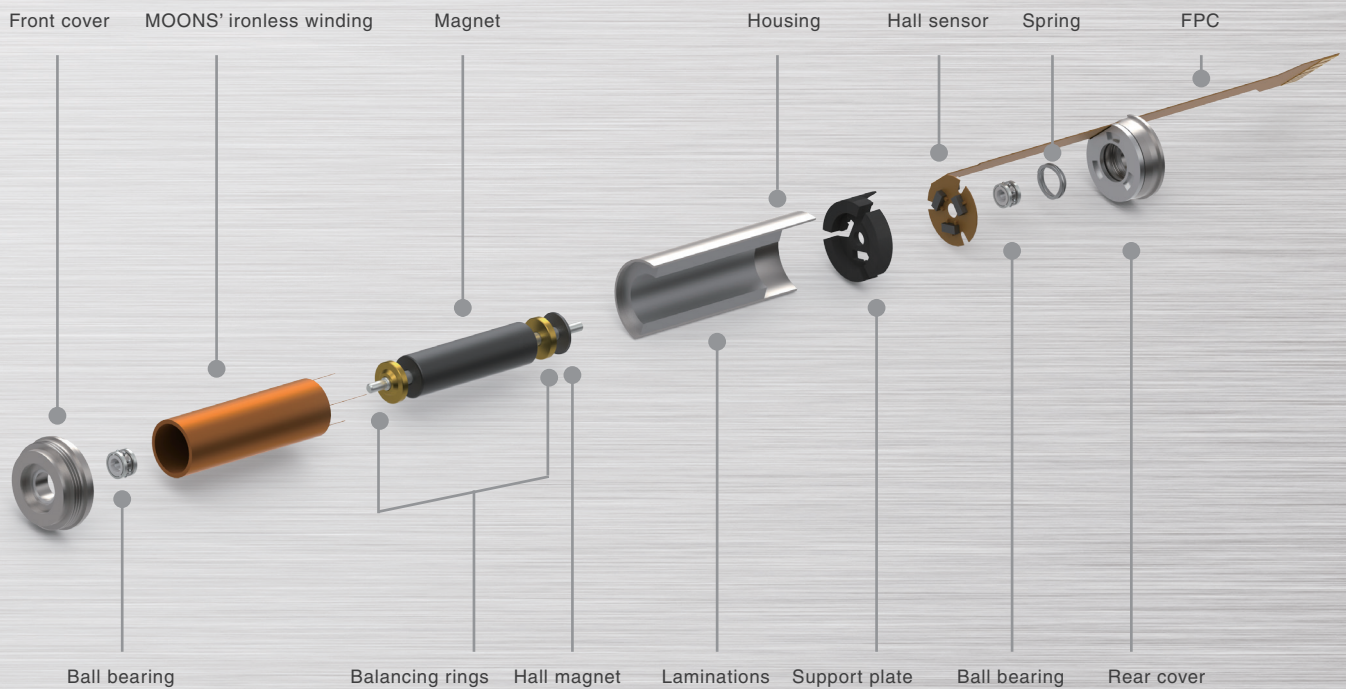
Product Code

		EC	U	13	038	H	24
Motor Commutation							
EC	Slotless Brushless DC Motor						
DC	Coreless Brushed DC Motor						
Motor Type							
U	Universal Series						
Motor Diameter							
13	Diameter (mm)						
Motor Length							
038	Length (mm)						
Feedback Method (EC)							
H	With Hall Sensors						
N	Sensorless						
Brush Material (DC)							
P	Precious Metal Brushes						
G	Graphite Brushes						
Rated Voltage							
03	Rated Voltage(3v = 03, 24v = 24)						

DC Series Motor Structure



EC Series Motor Structure

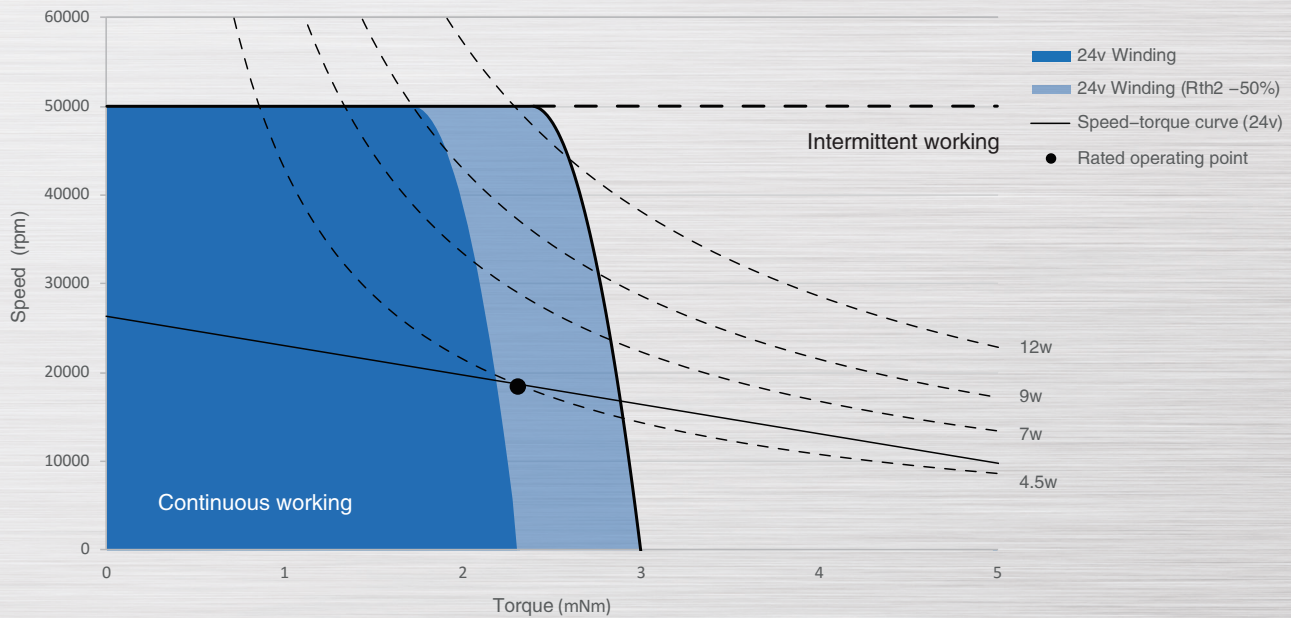


ECU13026 Ø13mm 4.5/9W

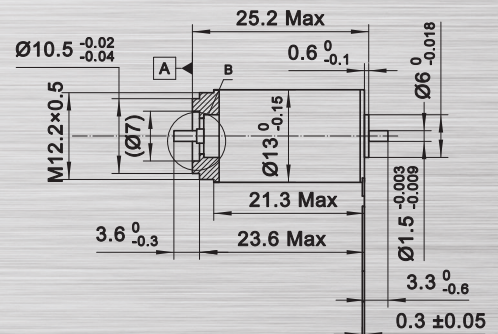
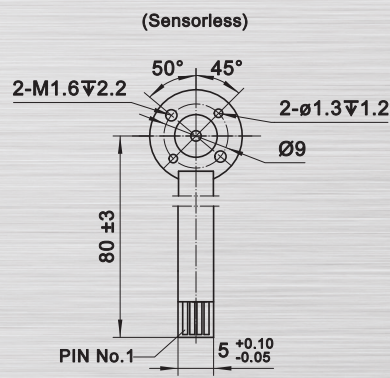
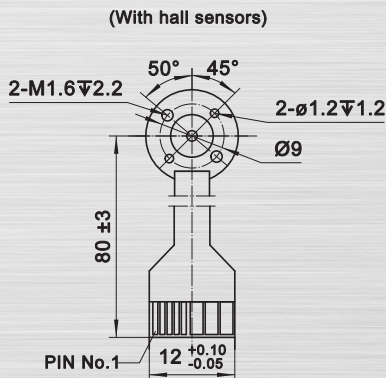
Motor Data		Part Numbers				
With hall sensors		ECU13026H06	ECU13026H09	ECU13026H12	ECU13026H18	ECU13026H24
Sensorless		ECU13026N06	ECU13026N09	ECU13026N12	ECU13026N18	ECU13026N24
Nominal voltage	V	6	9	12	18	24
No load speed	rpm	29200	31000	28000	28400	27600
No load current	mA	165	120	77	56	42
Rated speed	rpm	19800	21500	19300	19300	19300
Rated torque	mNm	2.33	2.45	2.31	2.41	2.33
Rated current	A	1.35	1.01	0.64	0.44	0.32
Stall torque	mNm	7.88	10.37	8.45	8.55	7.83
Stall current	A	3.97	3.60	1.96	1.40	0.96
Max efficiency	%	64	67	65	64	64
Terminal Resistance	Ohm	1.51	2.65	6.11	13.4	25.1
Terminal Inductance	mH	0.021	0.044	0.095	0.209	0.377
Torque constant	mNm / A	1.95	2.88	4.15	6.11	8.19
Speed constant	rpm / V	4867	3444	2333	1578	1150
Speed/torque gradient	rpm / mNm	3706	2990	3314	3320	3524
Mechanical time constant	ms	7.89	6.85	7.11	7.45	7.62

Specification		
Max speed	rpm	50000
Rotor inertia	gcm ²	0.194
Number of pole pairs		1
Ambient temperature	° C	-40~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	33.5
Winding - Housing	° C/ W	2.5
Thermal time constant		
Motor	s	190
Winding	s	0.75
Max axial load	N	1
Max radial load	N	4
Weight	g	19

Operating Range



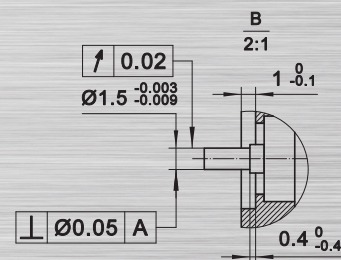
Dimension



	With hall sensors	Sensorless
PIN No.	Signal	Signal
1	4.5-24VDC	Winding 1
2	Hall 3	Winding 2
3	Hall 1	Winding 3
4	Hall 2	N.C.
5	GND	
6	Winding 3	
7	Winding 2	
8	Winding 1	

	With hall sensors	Sensorless
Connection	Part number	Part number
Tyco	1-84959-3	84959-4
Molex	52207-1133	52207-0433
Molex	52089-1119	52089-0419

FPC, 11-pol, Pitch 1.0mm, top contact style.

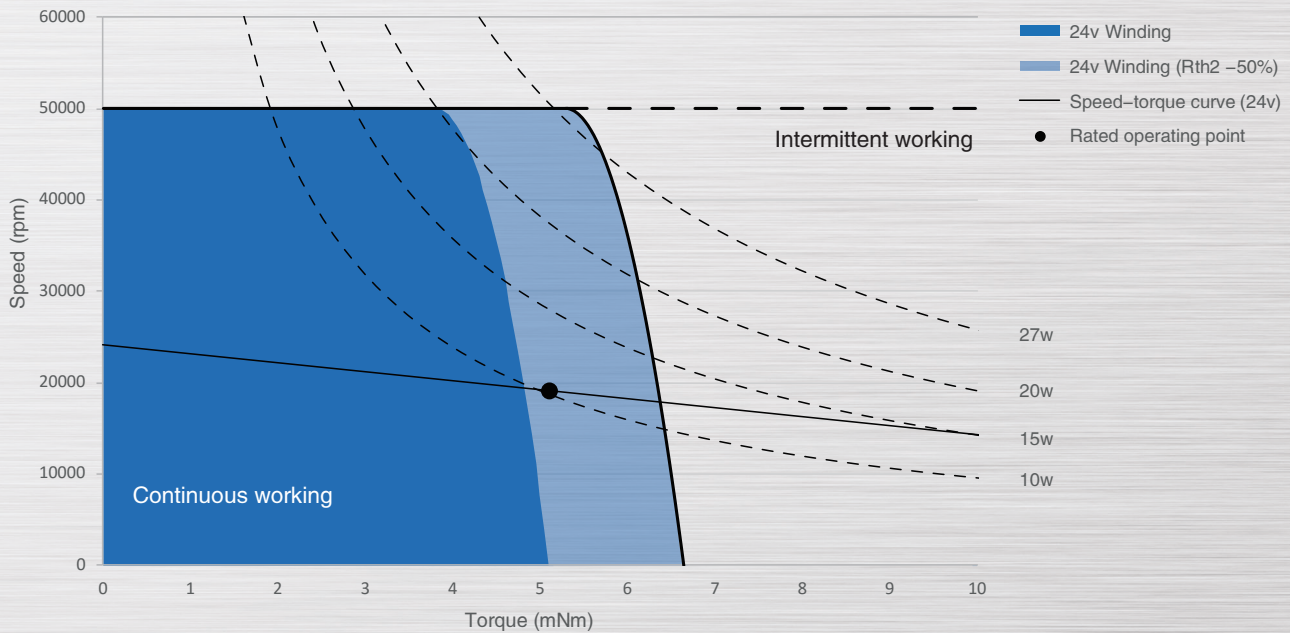


ECU13038 Ø13mm 10/20W

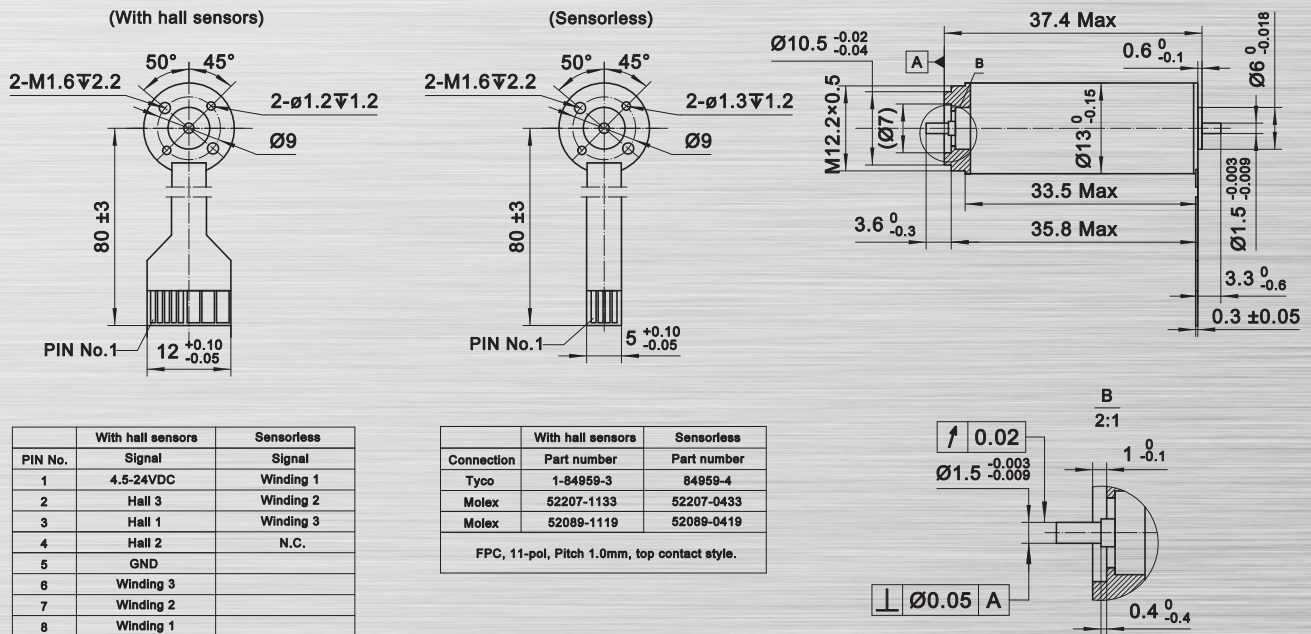
Motor Data		Part Numbers					
With hall sensors		ECU13038H06	ECU13038H09	ECU13038H12	ECU13038H18	ECU13038H24	ECU13038H36
Sensorless		ECU13038N06	ECU13038N09	ECU13038N12	ECU13038N18	ECU13038N24	ECU13038N36
Nominal voltage	V	6	9	12	18	24	36
No load speed	rpm	24600	24600	24700	25400	24700	27000
No load current	mA	200	135	97	71	52	41
Rated speed	rpm	18000	19000	19000	19000	19900	22000
Rated torque	mNm	5.13	5.55	5.18	5.50	5.13	5.40
Rated current	A	2.23	1.70	1.12	0.81	0.55	0.45
Stall torque	mNm	21.23	25.87	23.71	28.70	24.63	28.57
Stall current	A	9.23	7.63	5.11	4.19	2.64	2.28
Max efficiency	%	74	76	75	76	74	77
Terminal Resistance	Ohm	0.65	1.18	2.35	4.30	9.09	15.8
Terminal Inductance	mH	0.010	0.024	0.041	0.085	0.159	0.299
Torque constant	mNm / A	2.30	3.39	4.64	6.85	9.33	12.53
Speed constant	rpm / V	4100	2733	2058	1411	1029	750
Speed/torque gradient	rpm / mNm	1159	951	1042	885	1003	945
Mechanical time constant ms		3.95	3.15	3.60	3.00	3.45	3.10

Specification		
Max speed	rpm	50000
Rotor inertia	gcm ²	0.325
Number of pole pairs		1
Ambient temperature	° C	-40~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	25.2
Winding - Housing	° C/ W	1.27
Thermal time constant		
Motor	s	254
Winding	s	0.64
Max axial load	N	0.8
Max radial load	N	4
Weight	g	29

Operating Range



Dimension



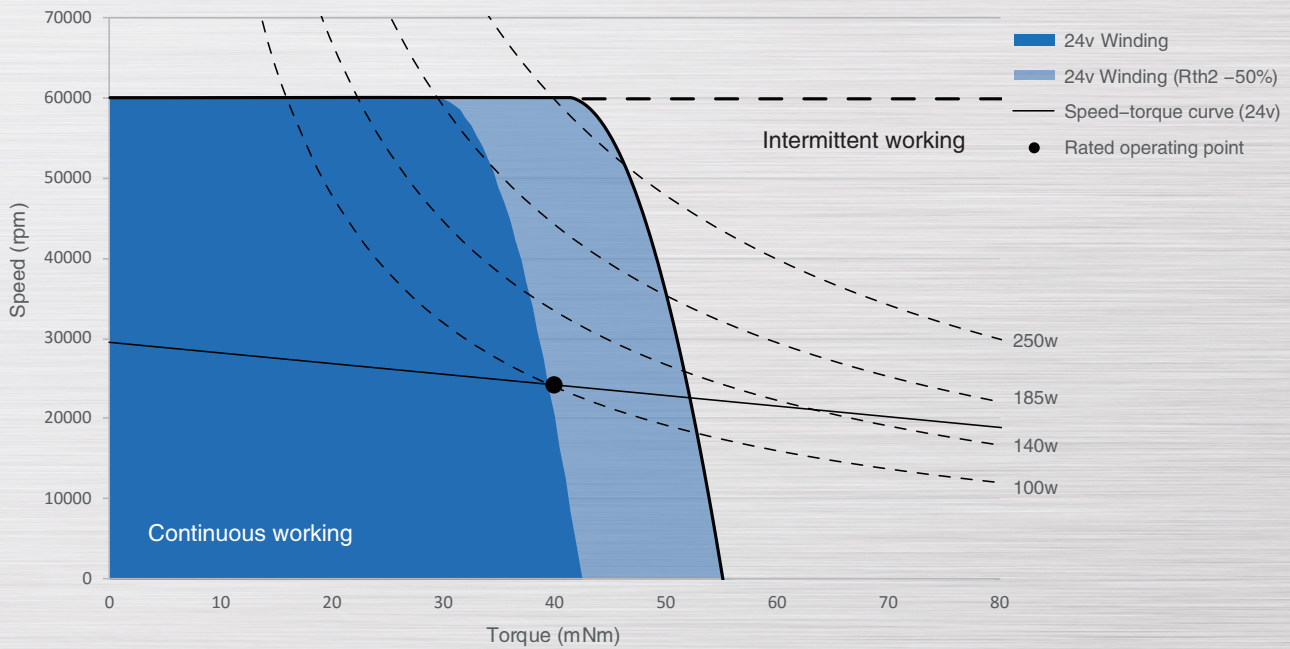
ECU22063 Ø22mm 100/185W

Preliminary Version

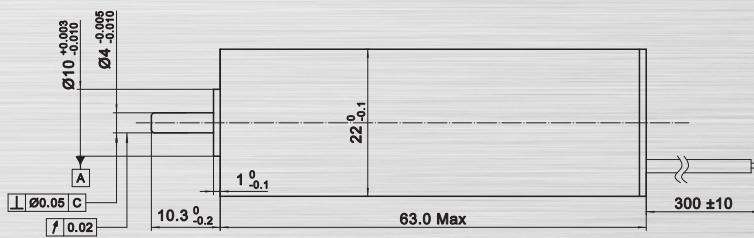
Motor Data		Part Numbers	
With hall sensors		ECU22063H24	ECU22063H48
Sensorless		ECU22063N24	ECU22063N48
Nominal voltage	V	24	48
No load speed	rpm	29500	32200
No load current	mA	347	201
Rated speed	rpm	27200	30400
Rated torque	mNm	47.5	45.9
Rated current	A	6.43	3.42
Stall torque	mNm	609.1	821.7
Stall current	A	86.1	60.2
Max efficiency	%	88	88
Terminal Resistance	Ohm	0.28	0.80
Terminal Inductance	mH	0.025	0.090
Torque constant	mNm / A	7.08	13.65
Speed constant	rpm / V	1350	700
Speed/torque gradient	rpm / mNm	48	39
Mechanical time constant	ms	2.81	2.16

Specification		
Max speed	rpm	60000
Rotor inertia	gcm ²	5.030
Number of pole pairs		1
Ambient temperature	° C	-20~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	7.3
Winding - Housing	° C/ W	1
Thermal time constant		
Motor	s	355
Winding	s	5
Max axial load	N	3.5
Max radial load	N	16
Weight	g	130

Operating Range

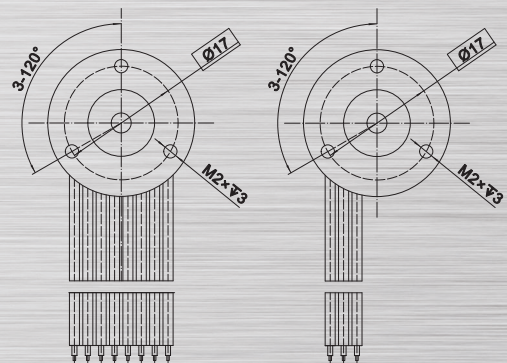


Dimension



A With hall sensors

B Sensorless



Connection A

red	AWG22	Motor winding 1	yellow	AWG26	GND
black	AWG22	Motor winding 2	blue	AWG26	Hall sensor 1
white	AWG22	Motor winding 3	green	AWG26	Hall sensor 2
grey	AWG26	VHall 3...24VDC	brown	AWG26	Hall sensor 3

Connection B

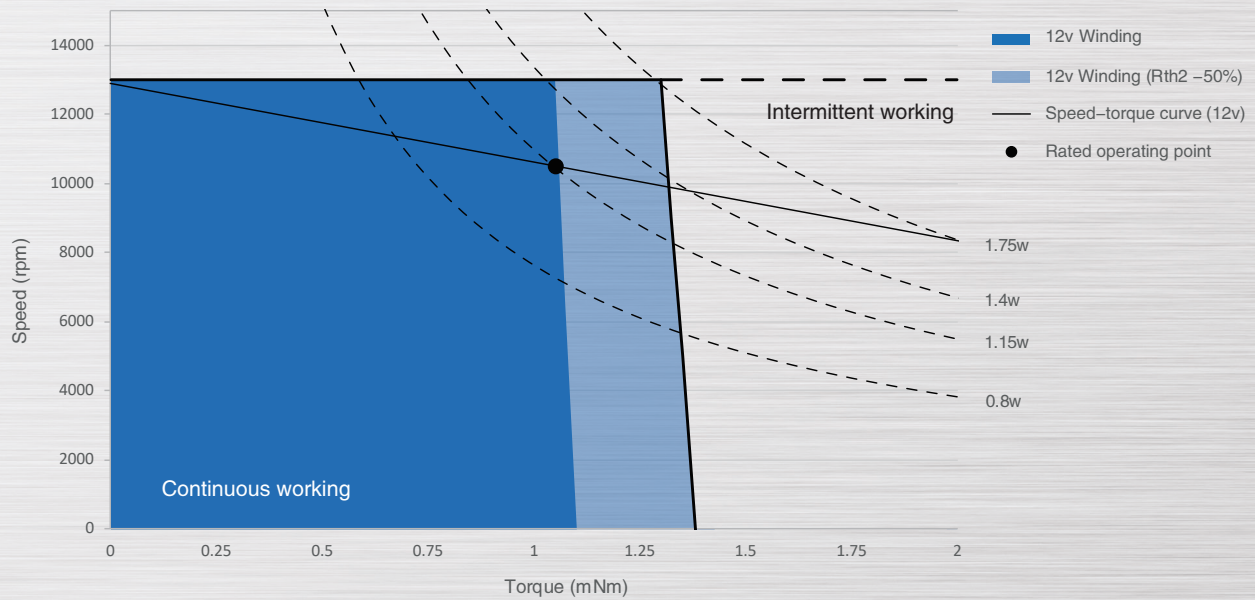
red	AWG22	Motor winding 1
black	AWG22	Motor winding 2
white	AWG22	Motor winding 3

DCU13020 Ø13mm Precious Metal Brushes 1.15W

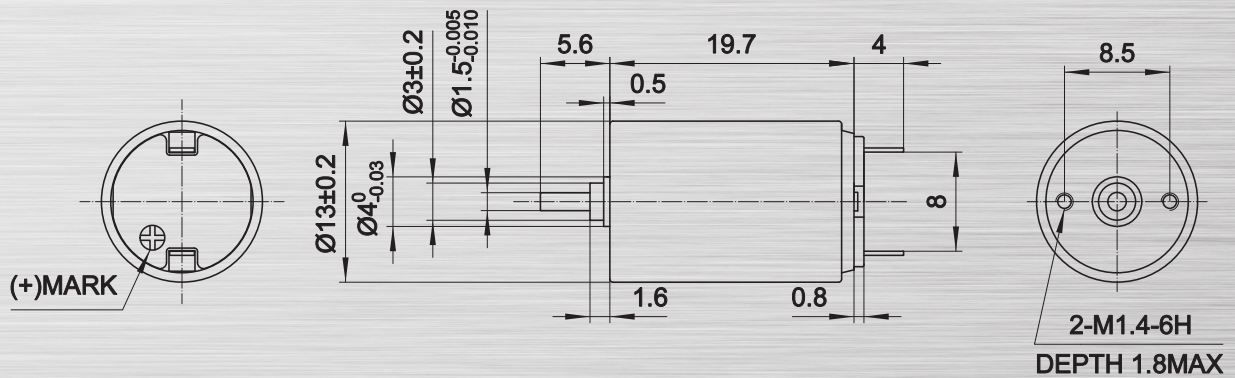
Motor Data		Part Numbers		
		DCU13020P06	DCU13020P09	DCU13020P12
Nominal voltage	V	6	9	12
No load speed	rpm	12100	12400	12900
No load current	mA	23	12	8
Rated speed	rpm	9450	9850	10250
Rated torque	mNm	1.03	1.12	1.10
Rated current	A	0.25	0.17	0.14
Stall torque	mNm	4.98	5.38	5.54
Stall current	A	1.11	0.77	0.65
Max efficiency	%	73	80	79
Terminal Resistance	Ohm	5.4	11.7	18.6
Terminal Inductance	mH	0.111	0.254	0.392
Torque constant	mNm / A	4.5	7.0	8.6
Speed constant	rpm / V	2060	1400	1090
Speed/torque gradient	rpm / mNm	2563	2287	2407
Mechanical time constant	ms	9.22	7.82	7.92
Rotor inertia	gcm ²	0.355	0.319	0.319

Specification		
Max speed	rpm	13000
Number of pole pairs		1
Number of commutator segments		5
Ambient temperature	° C	-10~+60
Max winding temperature	° C	85
Thermal resistance		
Housing - Ambient	° C/ W	55
Winding - Housing	° C/ W	17
Thermal time constant		
Motor	s	80
Winding	s	5
Axial play	mm	≤0.3
Weight	g	14

Operating Range



Dimension

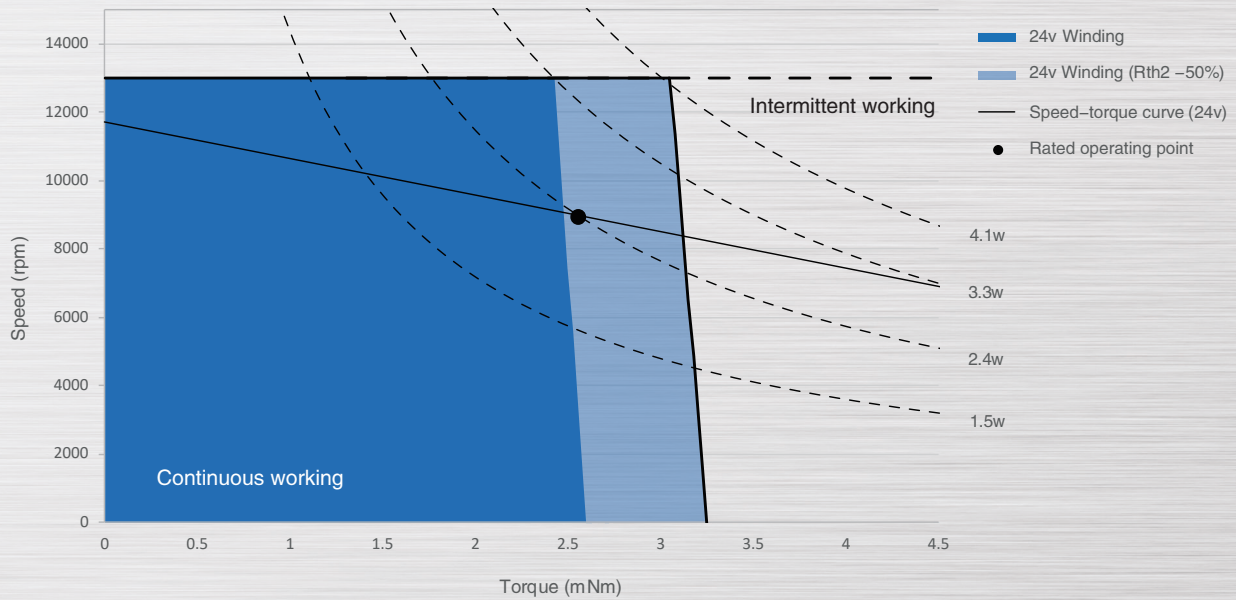


DCU13028 Ø13mm Precious Metal Brushes 2.4W

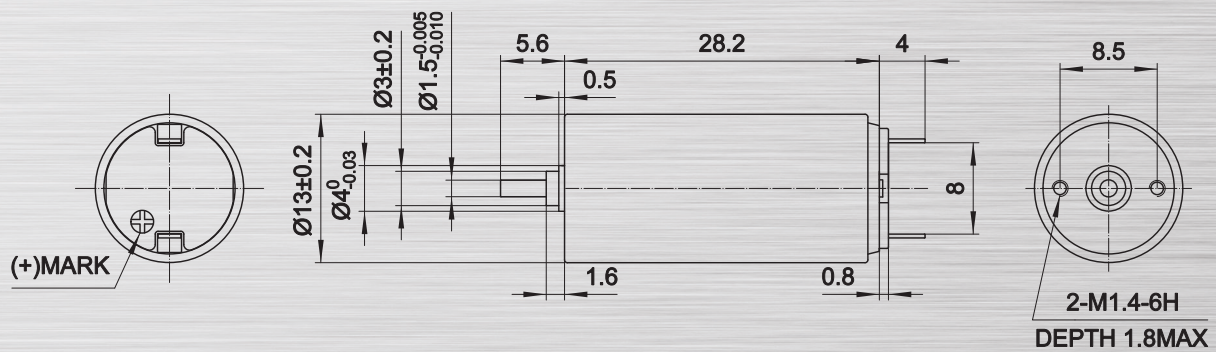
Motor Data		Part Numbers		
		DCU13028P12	DCU13028P18	DCU13028P24
Nominal voltage	V	12	18	24
No load speed	rpm	11800	11400	11700
No load current	mA	17	11	8
Rated speed	rpm	9000	8600	8900
Rated torque	mNm	2.57	2.57	2.58
Rated current	A	0.29	0.18	0.14
Stall torque	mNm	11.07	10.61	10.92
Stall current	A	1.17	0.72	0.57
Max efficiency	%	78	78	78
Terminal Resistance	Ohm	10.3	25.1	42.2
Terminal Inductance	mH	0.253	0.595	1.03
Torque constant	mNm / A	9.5	14.8	19.2
Speed constant	rpm / V	1000	645	495
Speed/torque gradient	rpm / mNm	1090	1094	1093
Mechanical time constant	ms	4.77	4.80	4.79
Rotor inertia	gcm ²	0.419	0.421	0.419

Specification		
Max speed	rpm	13000
Number of pole pairs		1
Number of commutator segments		5
Ambient temperature	° C	-10~+60
Max winding temperature	° C	85
Thermal resistance		
Housing - Ambient	° C/ W	38
Winding - Housing	° C/ W	10
Thermal time constant		
Motor	s	240
Winding	s	5
Axial play	mm	≤0.3
Weight	g	21

Operating Range



Dimension

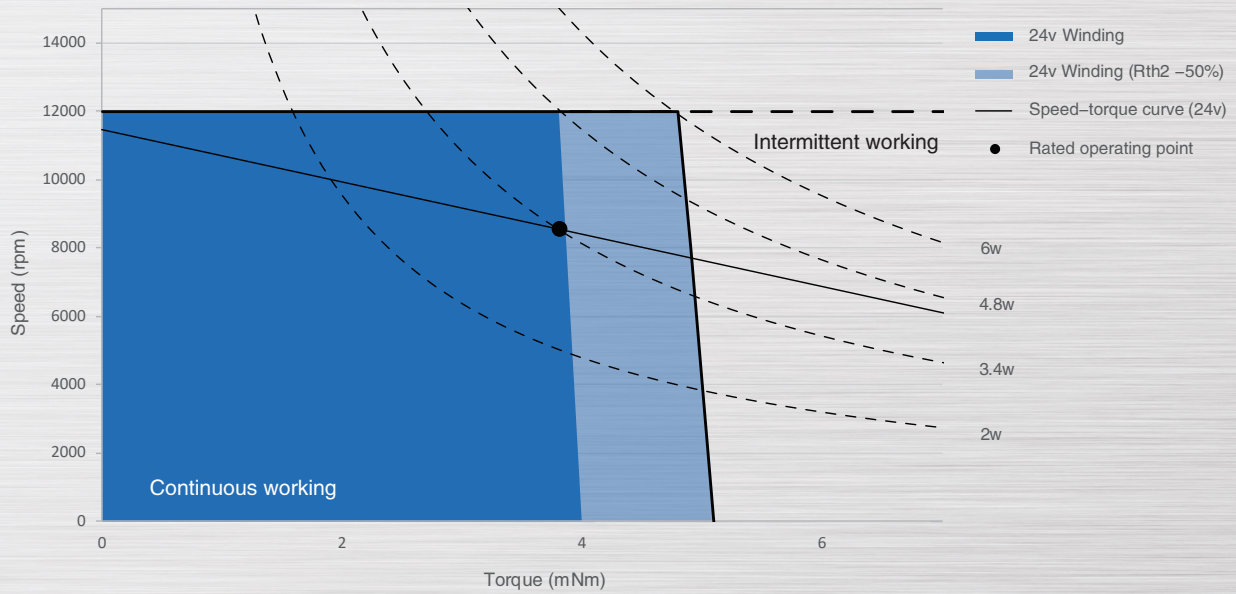


DCU17025 Ø17mm Precious Metal Brushes 3.4W

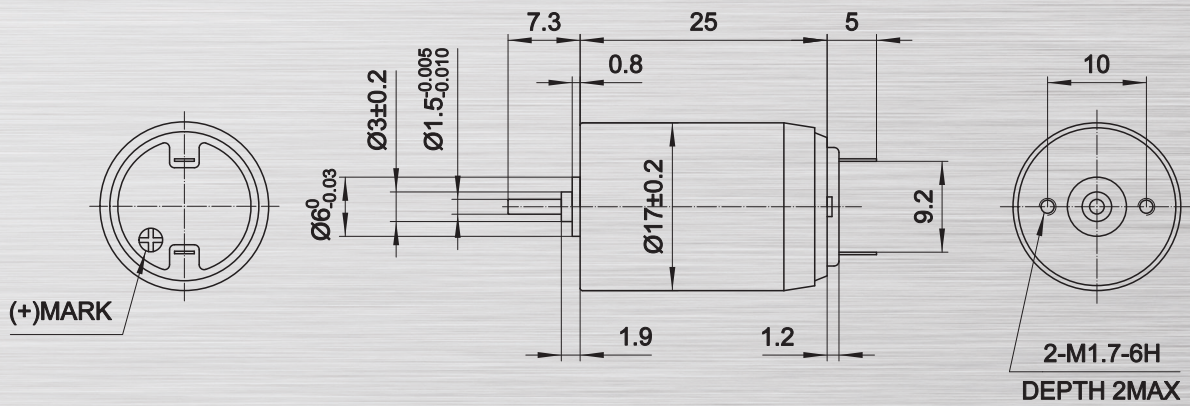
Motor Data		Part Numbers	
		DCU17025P12	DCU17025P24
Nominal voltage	V	12	24
No load speed	rpm	10400	11400
No load current	mA	8	4
Rated speed	rpm	7300	8250
Rated torque	mNm	4.09	4.03
Rated current	A	0.39	0.21
Stall torque	mNm	14.11	14.87
Stall current	A	1.32	0.75
Max efficiency	%	83	86
Terminal Resistance	Ohm	9.1	31.8
Terminal Inductance	mH	0.280	0.957
Torque constant	mNm / A	10.7	19.7
Speed constant	rpm / V	870	480
Speed/torque gradient	rpm / mNm	759	782
Mechanical time constant	ms	5.91	6.09
Rotor inertia	gcm ²	0.752	0.746

Specification		
Max speed	rpm	12000
Number of pole pairs		1
Number of commutator segments		5
Ambient temperature	° C	-10~+60
Max winding temperature	° C	125
Thermal resistance		
Housing - Ambient	° C/ W	29
Winding - Housing	° C/ W	5
Thermal time constant		
Motor	s	270
Winding	s	7
Axial play	mm	≤0.3
Weight	g	30

Operating Range



Dimension



DCU24032

Ø24mm Graphite Brushes 9.5W

Preliminary Version

Motor Data		Part Numbers	
		DCU24032G12	DCU24032G24
Nominal voltage	V	12	24
No load speed	rpm	9670	9630
No load current	mA	26	21
Rated speed	rpm	7500	7750
Rated torque	mNm	10.45	11.84
Rated current	A	0.93	0.52
Stall torque	mNm	47.59	61.44
Stall current	A	4.14	2.61
Max efficiency	%	83	84
Terminal Resistance	Ohm	2.9	9.2
Terminal Inductance	mH	0.062	0.293
Torque constant	mNm / A	11.5	23.5
Speed constant	rpm / V	810	405
Speed/torque gradient	rpm / mNm	209	159
Mechanical time constant	ms	6.49	5.31
Rotor inertia	gcm ²	2.680	3.490

Specification

Max speed rpm 10000

Number of pole pairs 1

Number of commutator segments 5

Ambient temperature ° C -10~+60

Max winding temperature ° C 125

Thermal resistance

Housing - Ambient ° C/ W 24

Winding - Housing ° C/ W 5

Thermal time constant

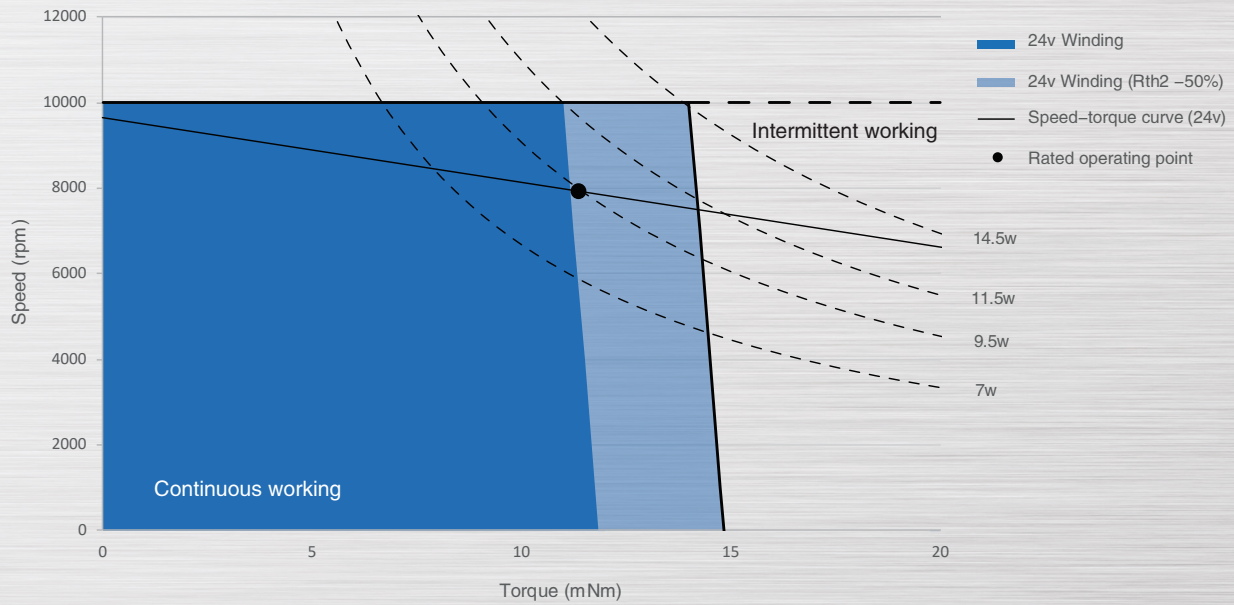
Motor s 650

Winding s 9

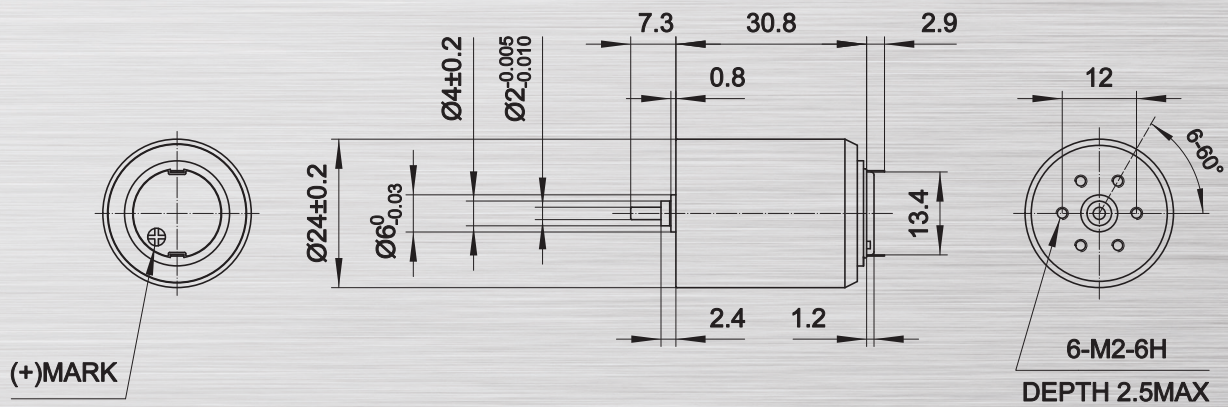
Axial play mm ≤0.3

Weight g 79

Operating Range



Dimension



PG13C Planetary Gearhead Ø13mm 0.3Nm

Gearhead Data

Reduction Ratio		16:1	66:1	271:1
		19:1	77:1	315:1
			90:1	366:1
				425:1

Number of stages		2	3	4
Max. continuous torque	Nm	0.20	0.30	0.30
Max. intermittent torque	Nm	0.30	0.45	0.45
Weight	g	13.5	16.0	18.9
Max. efficiency	%	81	73	66
Gearhead length L	mm	19.1	22.9	26.6

Specification

Planetary gearhead	Straight teeth	
Output shaft	Stainless steel, hardened	
Bearing at output	Sleeve bearing	
Radial play	mm	≤ 0.1
Axial play	mm	≤ 0.25
Max. radial load	N	5
Max. axial load	N	5 (5mm from flange)
Max. force for press fits	N	15
Recommend input speed	rpm	≤ 10000
Direction of rotation (drive to output)	=	
Ambient temperature	° C	-10~+60

Dimension



PG22C Planetary Gearhead Ø22mm 0.8Nm

Gearhead Data

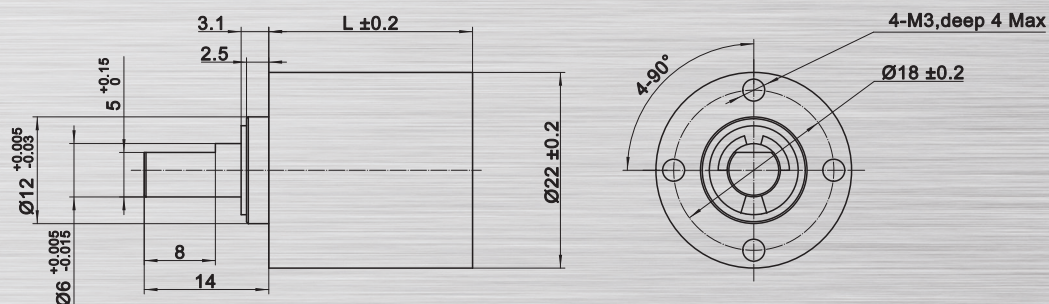
Reduction Ratio	4:1	16:1	64:1	256:1
	5:1	19:1	76:1	304:1
		22:1	90:1	361:1
			107:1	428:1
				509:1

Number of stages		1	2	3	4
Max. continuous torque	Nm	0.20	0.40	0.60	0.80
Max. intermittent torque	Nm	0.30	0.60	0.90	1.20
Weight	g	34.3	34.6	54.4	64.0
Max. efficiency	%	81	66	53	43
Gearhead length L	mm	17.7	22.9	28.1	33.3

Specification

Planetary gearhead		Straight teeth
Output shaft		Stainless steel, hardened
Bearing at output		Sleeve bearing
Radial play	mm	≤ 0.1
Axial play	mm	≤ 0.35
Max. radial load	N	8
Max. axial load	N	15 (5mm from flange)
Max. force for press fits	N	100
Recommend input speed	rpm	≤ 10000
Direction of rotation (drive to output)		=
Ambient temperature	° C	-10~+60

Dimension

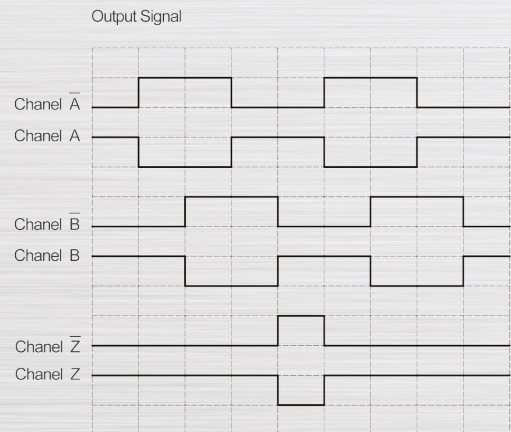
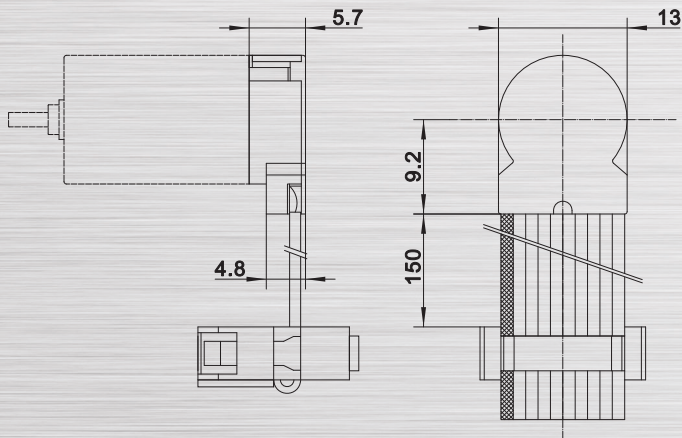


Technical

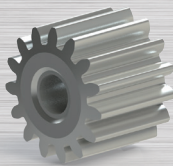
Encoder - ME13C



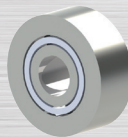
- Magnetoresistive principle
- Incremental encoder
- With index (Chanel Z)
- With line driver (A- B- Z-)
- 32/64/128/256 lines per revolution
- Ø13mm diameter, suitable for brushless & brushed motors



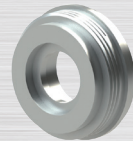
Customized Components



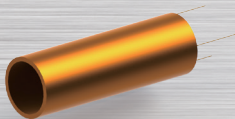
Pinion



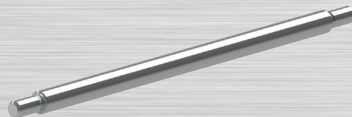
Bearing



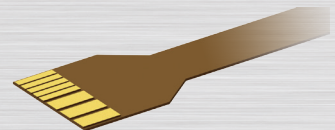
Flange



Winding

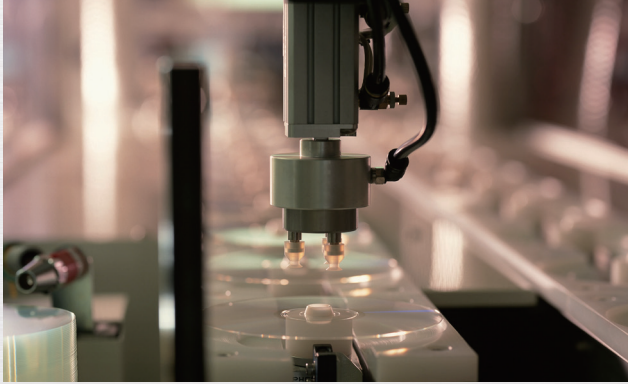


Shaft

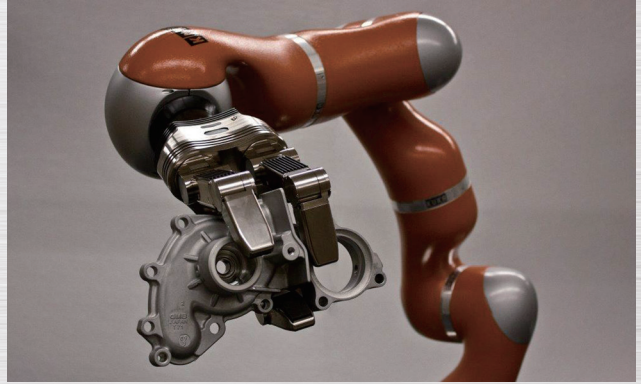


FPC & Cables

Application



Factory Automation



Robotics



Medical Technology



Laboratory Automation



Aerospace



Measuring Technology

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