Slotless
BLDC Motor

ECU13026
ECU13038
ECU16036
ECU22048
ECH16056 High speed
ECH22045 High speed

ECU13026 Ø13mm 5/7.5W

Motor Data		Part Numbers				
		ECU13026H06	ECU13026H09	ECU13026H12	ECU13026H18	ECU13026H24
Nominal voltage	V	6	9	12	18	24
No load speed	rpm	24900	27600	24600	25100	26100
No load current	mA	130	115	76	54	49
Rated speed	rpm	17000	20100	16900	17200	18600
Max. continuous torque	mNm	2.58	2.81	2.69	2.62	2.53
Max. continuous current	A	1.27	1.02	0.65	0.44	0.34
Stall torque	mNm	8.9	11.8	9.7	9.6	9.9
Stall current	A	3.92	3.78	2.09	1.41	1.14
Max efficiency	%	65	69	66	66	67
Resistance (phase-phase)	Ohm	1.53	2.38	5.74	12.8	21.0
Inductance (phase-phase)	mH	0.019	0.036	0.081	0.174	0.285
Torque constant	mNm / A	2.27	3.13	4.66	6.85	8.64
Speed constant	rpm / V	4200	3055	2050	1395	1105
Speed/torque gradient	rpm / mNm	2826	2326	2526	2608	2685
Mechanical time constant	ms	5.74	4.73	5.13	5.30	5.46
Rotor inertia	gcm^2	0.194	0.194	0.194	0.194	0.194

Specification

Bearing		Ball bearing
Max speed	rpm	40000
Axial play	mm	0..0.05
Radial play		Preloaded
Max axial load (dynamic)	N	1
Max. force for press fits (static)	N	10
Max radial load (5mm from flange)	N	4
Ambient temperature	° C	-40~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	32.0
Winding - Housing	° C/ W	3.69
Thermal time constant		
Motor	s	250
Winding	s	1.08
Number of pole pairs		1
Number of phases		3
Weight	g	19

Combination

Gearbox
PG13C
Ø13mm 0.3Nm 16:1-425:1
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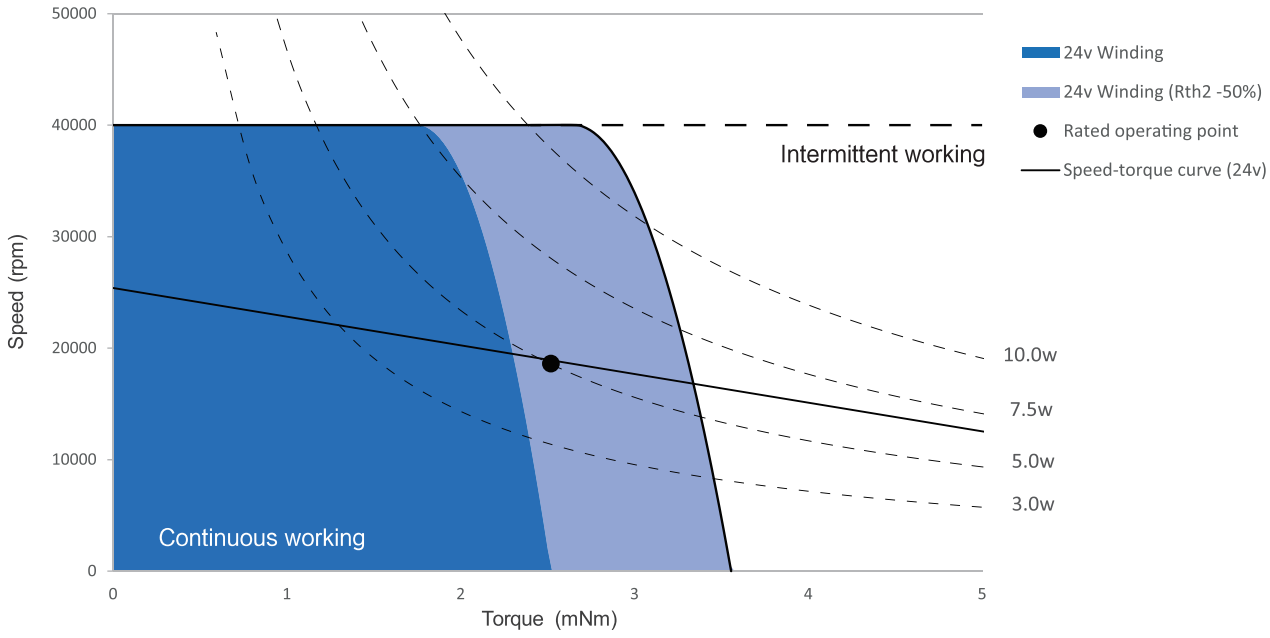
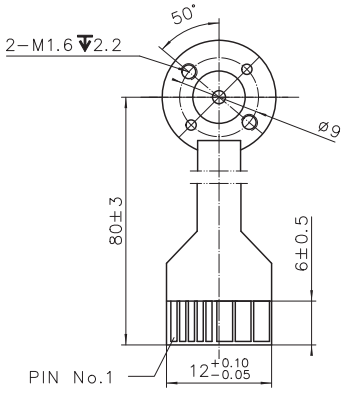
Encoder
Please contact local sales.

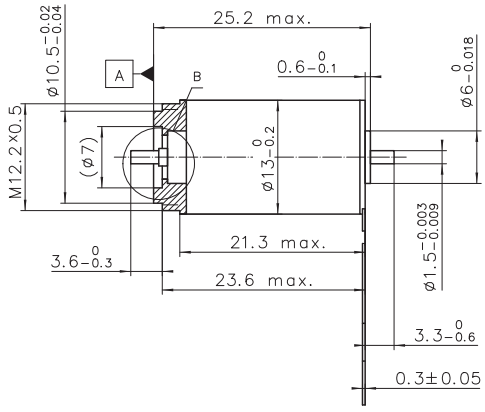
Option
FPC / Cable
With hall sensor / Sensorless

Operating Range

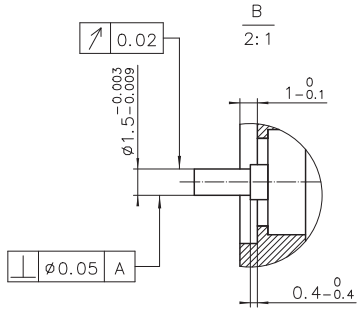


Dimension





PIN No.	Signal
1	4.5–24VDC
2	Hall IC 3
3	Hall IC 1
4	Hall IC 2
5	GND
6	Winding 3
7	Winding 2
8	Winding 1



ECU13026Hxx-S001

ECU13038 Ø13mm 10/15W

Motor Data		Part Numbers					
		ECU13038H06	ECU13038H09	ECU13038H12	ECU13038H18	ECU13038H24	ECU13038H36
Nominal voltage	V	6	9	12	18	24	36
No load speed	rpm	23700	23400	23000	23400	24500	25600
No load current	mA	215	185	140	121	90	84
Rated speed	rpm	17900	18000	17400	19000	18600	20200
Max. continuous torque	mNm	5.05	5.56	5.51	5.57	5.13	5.55
Max. continuous current	A	2.33	1.70	1.23	0.91	0.63	0.49
Stall torque	mNm	22.1	27.1	26.2	29.9	25.8	33.6
Stall current	A	9.23	7.38	5.19	4.23	2.73	2.46
Max efficiency	%	71	73	73	74	74	74
Resistance (phase-phase)	Ohm	0.65	1.22	2.31	4.26	8.80	14.6
Inductance (phase-phase)	mH	0.008	0.020	0.037	0.097	0.130	0.267
Torque constant	mNm / A	2.39	3.67	5.04	7.07	9.45	13.64
Speed constant	rpm / V	3990	2600	1895	1350	1010	700
Speed/torque gradient	rpm / mNm	1084	864	869	813	940	750
Mechanical time constant	ms	3.69	2.94	2.96	2.77	3.20	2.55
Rotor inertia	gcm^2	0.325	0.325	0.325	0.325	0.325	0.325

Specification

Bearing		Ball bearing
Max speed	rpm	40000
Axial play	mm	0..0.05
Radial play		Preloaded
Max axial load (dynamic)	N	1
Max. force for press fits (static)	N	10
Max radial load (5mm from flange)	N	4
Ambient temperature	° C	-40~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	23.0
Winding - Housing	° C/ W	1.89
Thermal time constant		
Motor	s	350
Winding	s	0.90
Number of pole pairs		1
Number of phases		3
Weight	g	29

Combination

Gearbox
PG13C
Ø13mm 0.3Nm 16:1-425:1
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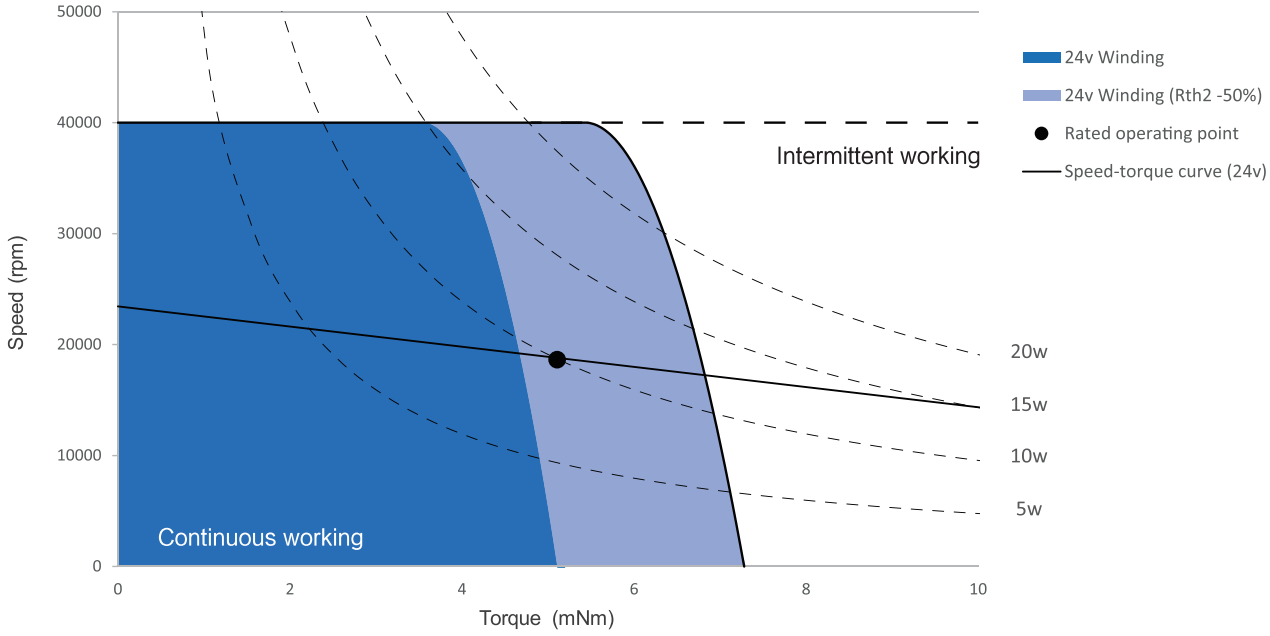
Encoder
Please contact local sales.

Option
FPC / Cable
With hall sensor / Sensorless

Operating Range



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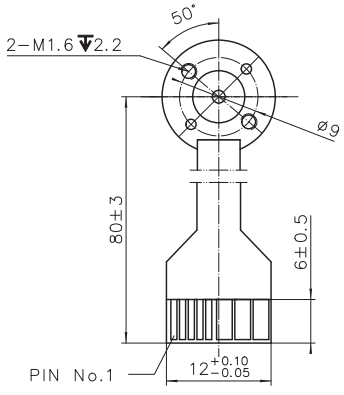
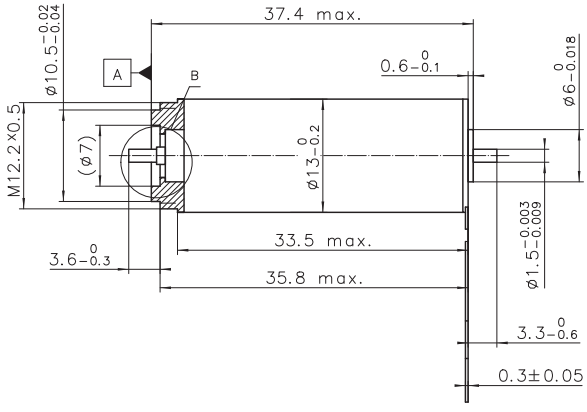
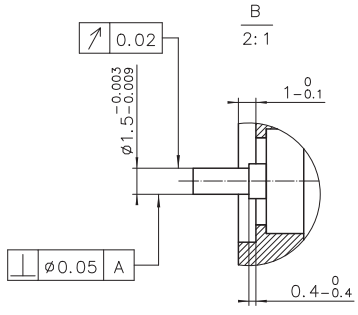




PIN No.	Signal
1	4.5−24VDC
2	Hall IC 3
3	Hall IC 1
4	Hall IC 2
5	GND
6	Winding 3
7	Winding 2
8	Winding 1



ECU13038Hxx−S001

ECU16036 Ø16mm 14/23W

Motor Data		Part Numbers			
		ECU16036H12	ECU16036H18	ECU16036H24	ECU16036H36
Nominal voltage	V	12	18	24	36
No load speed	rpm	14800	17100	15000	17200
No load current	mA	165	160	115	100
Rated speed	rpm	11800	13800	11900	14000
Max. continuous torque	mNm	10.2	9.7	9.9	9.4
Max. continuous current	A	1.49	1.11	0.76	0.57
Stall torque	mNm	56.0	61.5	57.8	63.5
Stall current	A	7.27	6.02	3.75	3.16
Max efficiency	%	81	81	80	80
Resistance (phase-phase)	Ohm	1.65	2.99	6.40	11.4
Inductance (phase-phase)	mH	0.102	0.180	0.409	0.707
Torque constant	mNm / A	7.70	10.21	15.40	20.10
Speed constant	rpm / V	1240	935	620	475
Speed/torque gradient	rpm / mNm	266	274	258	269
Mechanical time constant	ms	1.67	1.72	1.62	1.69
Rotor inertia	gcm^2	0.6	0.6	0.6	0.6

Specification

Bearing		Ball bearing
Max speed	rpm	30000
Axial play	mm	0..0.14
Radial play		Preloaded
Max axial load (dynamic)	N	1
Max. force for press fits (static)	N	18
Max radial load (5mm from flange)	N	6
Ambient temperature	° C	-40~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	20.5
Winding - Housing	° C/ W	3.30
Thermal time constant		
Motor	s	525
Winding	s	1.35
Number of pole pairs		1
Number of phases		3
Weight	g	44

Combination

Gearbox
PG16C
Ø16mm 0.5Nm 19:1-850:1
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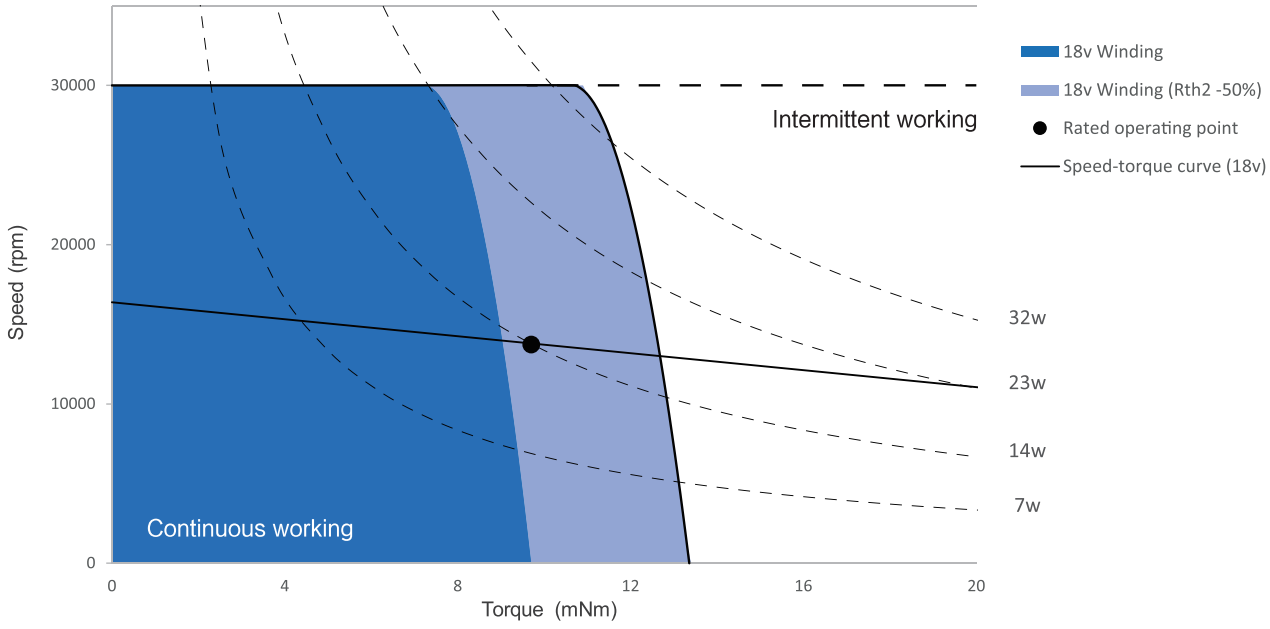
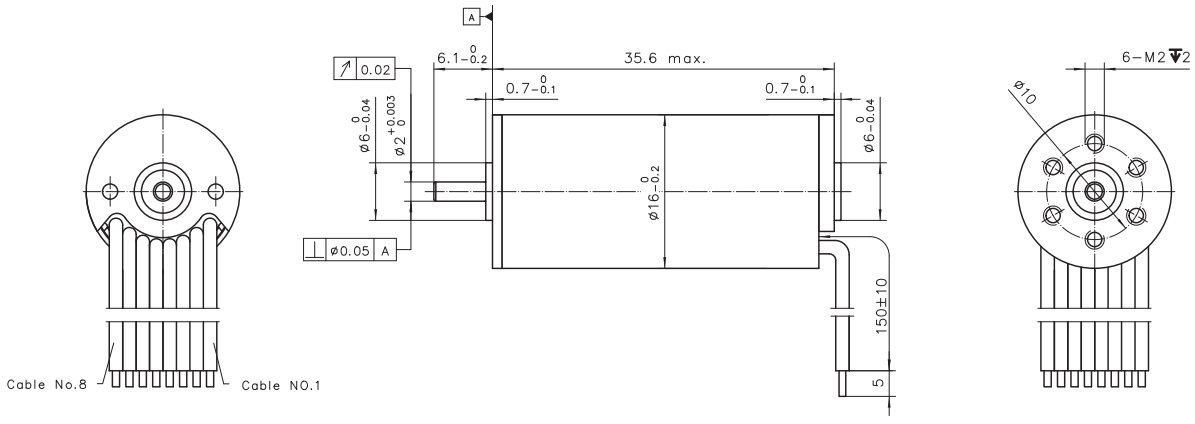
Encoder
Please contact local sales.

Option
With hall sensor / Sensorless

Operating Range



Dimension



Connection (Cable AWG 24)

Cable No.	Signal	Color
1	Motor winding 1	brown
2	Motor winding 2	red
3	Motor winding 3	orange
4	V_{Hall} 3...24VDC	yellow
5	GND	green
6	Hall IC 1	blue
7	Hall IC 2	violet
8	Hall IC 3	grey

ECU16036Hxx-S101

ECU22048 Ø22mm 55/75W

Motor Data		Part Numbers			
		ECU22048H18	ECU22048H24	ECU22048H36	ECU22048H48
Nominal voltage	V	18	24	36	48
No load speed	rpm	19500	19200	19400	19900
No load current	mA	342	326	295	253
Rated speed	rpm	17000	16400	16600	17100
Max. continuous torque	mNm	33.1	32.5	31.6	31.1
Max. continuous current	A	4.04	2.94	2.01	1.56
Stall torque	mNm	322.8	316.6	328.9	341.0
Stall current	A	36.00	25.53	17.91	14.29
Max efficiency	%	86	86	86	85
Resistance (phase-phase)	Ohm	0.50	0.94	2.01	3.36
Inductance (phase-phase)	mH	0.052	0.104	0.230	0.391
Torque constant	mNm / A	8.97	12.40	18.36	23.87
Speed constant	rpm / V	1065	770	520	400
Speed/torque gradient	rpm / mNm	59	58	57	56
Mechanical time constant	ms	2.40	2.36	2.30	2.28
Rotor inertia	gcm^2	3.86	3.86	3.86	3.86

Specification

Bearing		Ball bearing
Max speed	rpm	30000
Axial play	mm	0..0.14
Radial play		Preloaded
Max axial load (dynamic)	N	3.5
Max. force for press fits (static)	N	60
Max radial load (5mm from flange)	N	15
Ambient temperature	° C	-40~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	9.0
Winding - Housing	° C/ W	1.75
Thermal time constant		
Motor	s	510
Winding	s	2.51
Number of pole pairs		1
Number of phases		3
Weight	g	110

Combination

Gearbox
PG22C
Ø22mm 0.8Nm 4:1-509:1
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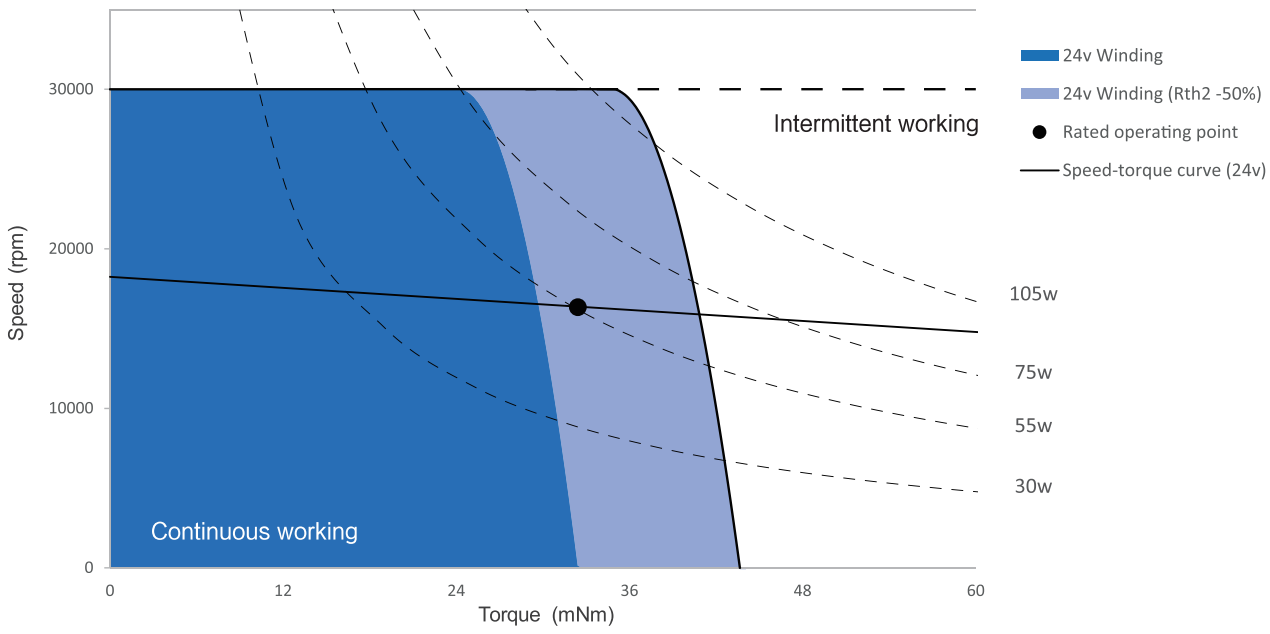
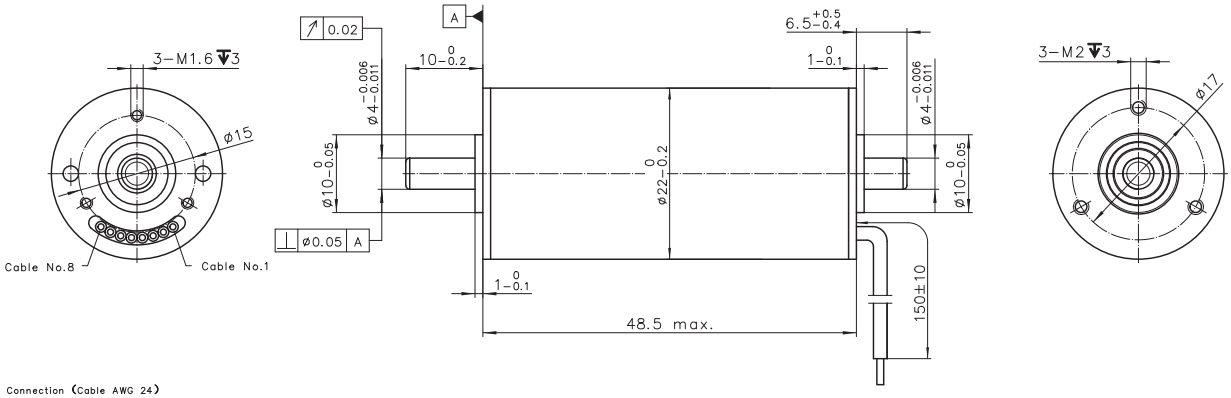
Encoder
Please contact local sales.

Option
With hall sensor / Sensorless

Operating Range



Dimension



Connection (Cable AWG 24)

Cable No.	Signal	Color
1	Motor winding 1	brown
2	Motor winding 2	red
3	Motor winding 3	orange
4	V_{Hall} 3...24VDC	yellow
5	GND	green
6	Hall IC 1	blue
7	Hall IC 2	violet
8	Hall IC 3	grey

ECU22048Hxx−S101

ECH16056 Ø16mm 75/90W

Motor Data		Part Numbers			
		ECH16056H18	ECH16056H24	ECH16056H36	ECH16056H48
Nominal voltage	V	18	24	36	48
No load speed	rpm	47600	40800	49600	44800
No load current	mA	560	510	680	530
Rated speed	rpm	44700	38200	46600	42200
Max. continuous torque	mNm	15.8	16.3	13.2	13.1
Max. continuous current	A	4.93	3.41	2.57	1.82
Stall torque	mNm	302.8	299.6	317.6	310.3
Stall current	A	83.72	53.33	45.57	30.38
Max efficiency	%	90	89	89	87
Resistance (phase-phase)	Ohm	0.22	0.45	0.79	1.58
Inductance (phase-phase)	mH	0.019	0.045	0.081	0.151
Torque constant	mNm / A	3.62	5.62	6.97	10.21
Speed constant	rpm / V	2640	1700	1370	935
Speed/torque gradient	rpm / mNm	157	136	155	145
Mechanical time constant	ms	1.17	1.01	1.15	1.08
Rotor inertia	gcm^2	0.71	0.71	0.71	0.71

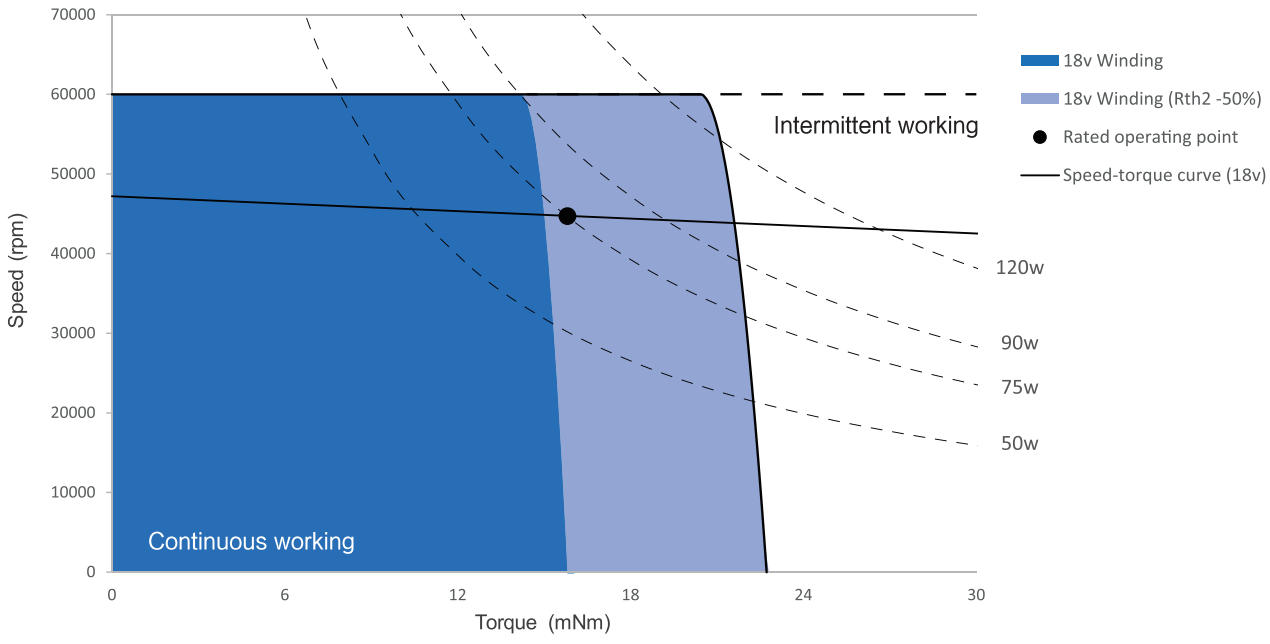
Specification		
Bearing		Ball bearing
Max speed	rpm	60000
Axial play	mm	0..0.29
Radial play		Preloaded
Max axial load (dynamic)	N	1.5
Max. force for press fits (static)	N	60
Max radial load (5mm from flange)	N	10
Ambient temperature	° C	-40~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	9.0
Winding - Housing	° C/ W	1.75
Thermal time constant		
Motor	s	588
Winding	s	2.06
Number of pole pairs		1
Number of phases		3
Weight	g	73

Combination

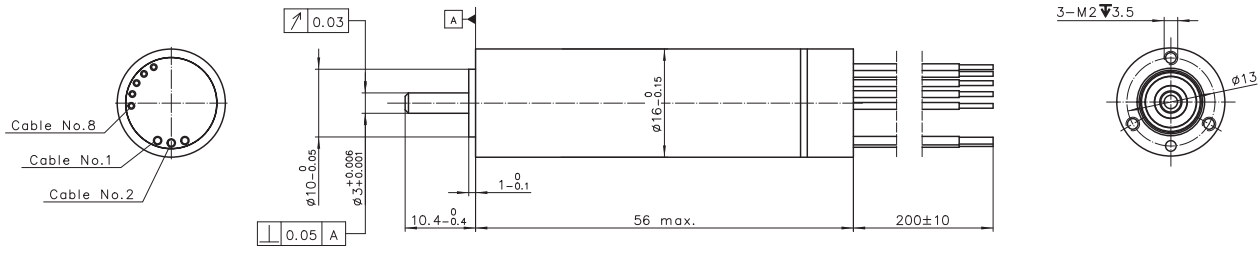
Gearbox
Encoder
Please contact local sales.

Option
With hall sensor / Sensorless

Operating Range



Dimension



Connection

Cable No.	Signal	Color	Wire gage
1	Motor winding 1	red	AWG 22
2	Motor winding 2	black	
3	Motor winding 3	white	
4	V_{Hall} 3...24VDC	orange	AWG 26
5	GND	blue	
6	Hall IC 1	yellow	
7	Hall IC 2	brown	
8	Hall IC 3	grey	

ECH16056Hxx-S001

ECH22045 Ø22mm 80/100W

Motor Data		Part Numbers			
		ECH22045H18	ECH22045H24	ECH22045H36	ECH22045H48
Nominal voltage	V	18	24	36	48
No load speed	rpm	38900	40500	39000	39700
No load current	mA	450	540	520	480
Rated speed	rpm	35400	37200	35100	36300
Max. continuous torque	mNm	19.0	21.2	18.5	19.4
Max. continuous current	A	4.65	4.19	2.54	2.10
Stall torque	mNm	314.1	436.7	379.9	451.1
Stall current	A	69.23	75.00	41.38	37.80
Max efficiency	%	89	90	89	89
Resistance (phase-phase)	Ohm	0.26	0.32	0.87	1.27
Inductance (phase-phase)	mH	0.024	0.038	0.097	0.162
Torque constant	mNm / A	4.54	5.82	9.18	11.94
Speed constant	rpm / V	2105	1640	1040	800
Speed/torque gradient	rpm / mNm	121	90	99	85
Mechanical time constant	ms	2.38	1.77	1.94	1.68
Rotor inertia	gcm^2	1.88	1.88	1.88	1.88

Specification

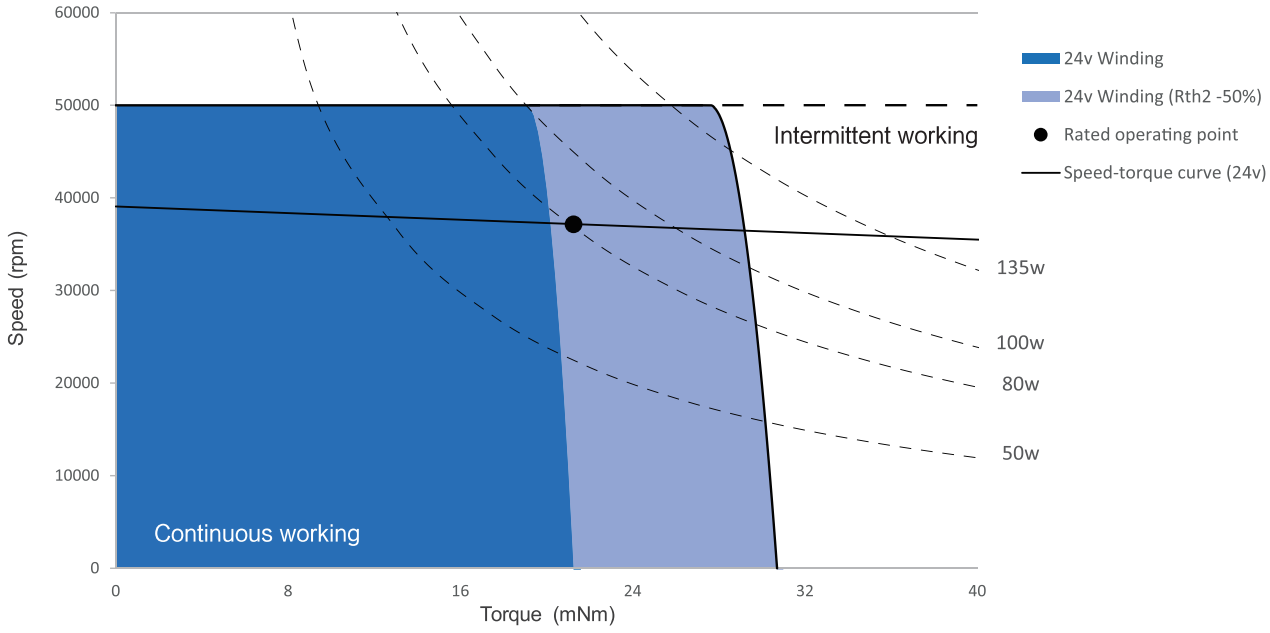
Bearing		Ball bearing
Max speed	rpm	50000
Axial play	mm	0..0.24
Radial play		Preloaded
Max axial load (dynamic)	N	4
Max. force for press fits (static)	N	110
Max radial load (5mm from flange)	N	16
Ambient temperature	° C	-40~+100
Max winding temperature	° C	155
Thermal resistance		
Housing - Ambient	° C/ W	15.0
Winding - Housing	° C/ W	0.60
Thermal time constant		
Motor	s	450
Winding	s	1.83
Number of pole pairs		1
Number of phases		3
Weight	g	98

Combination

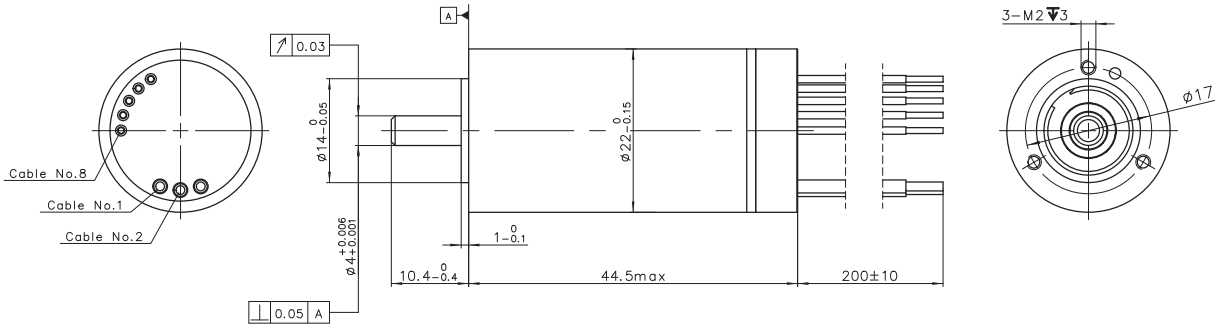
Gearbox
Encoder
Please contact local sales.

Option
With hall sensor / Sensorless

Operating Range



Dimension



Connection

Cable No.	Signal	Color	Wire gage
1	Motor winding 1	red	AWG 22
2	Motor winding 2	black	
3	Motor winding 3	white	
4	V_{Hall} 3...24VDC	orange	AWG 26
5	GND	blue	
6	Hall IC 1	yellow	
7	Hall IC 2	brown	
8	Hall IC 3	grey	

ECH22045Hxx-S001