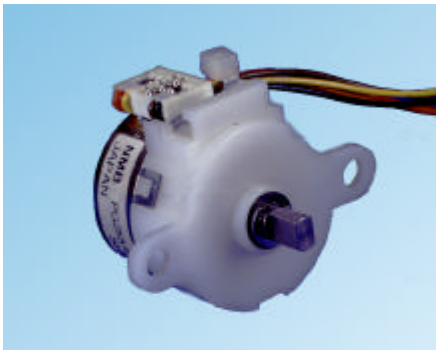
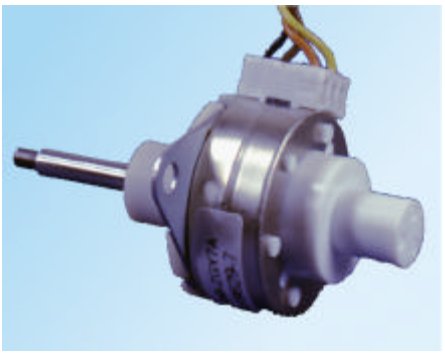
NMB Minebea is a world leader in the design and manufacture of precision stepping motors and brushless DC motors. The company offers a broad range of standard and custom designed stepping motors for OEM users.



Five new precision stepping motor series have been introduced and specified in this catalogue; the PM motor miniature series, the new gearboxmotor series, the high torque 17PM-K series, the new high torque 23KM-C series and the new low inertia motor 23KM-C7. The five new series reflect efforts of the advanced engineering design center as well as leading edge production technology and on-going quality control programs that assure complete customer satisfaction.

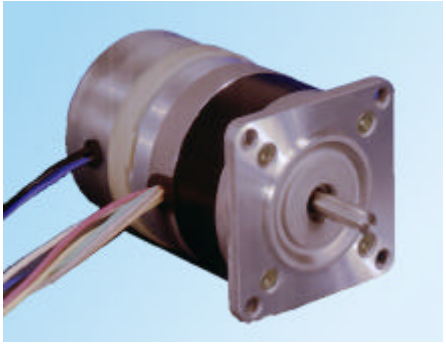
NMB Minebea provides complete in-house volume production capabilities. These exclusive features include internal production of miniature precision bearings, die coating, lamination stamping and injection molding in addition to one of the largest tool and die centers in the industry. Such capabilities and facilities reflect the company's dedication to vertical integration and the resultant product quality at competitive pricing schedules.

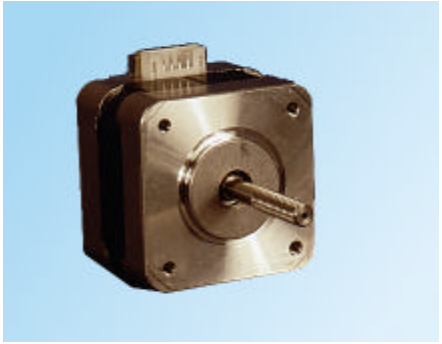


NMB Minebea is a leader in both material research and automated production technology. Since March 1993, the company is also a forerunner in the area of environmental safety. All subsidiaries and companies are CFC and trichloralathyiane free.

NMB Minebea GmbH is one of the Minebea Co. Ltd. Group of worldwide companies. NMB Minebea GmbH has access to all the extensive resources of other group companies around the globe. We can satisfy the most demanding requirements of our customers worldwide and can help you solve your application engineering problems locally.

NMB Minebea GmbH – SOLVING YOUR PROBLEMS





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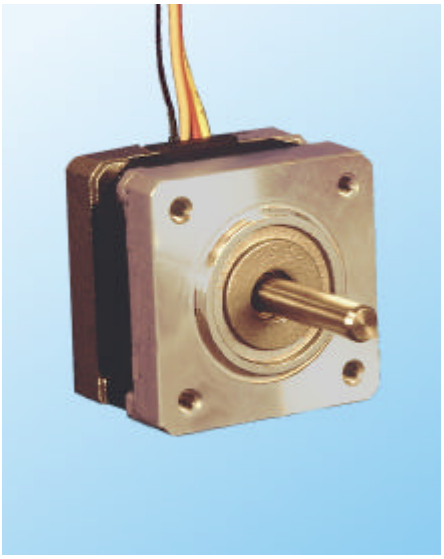
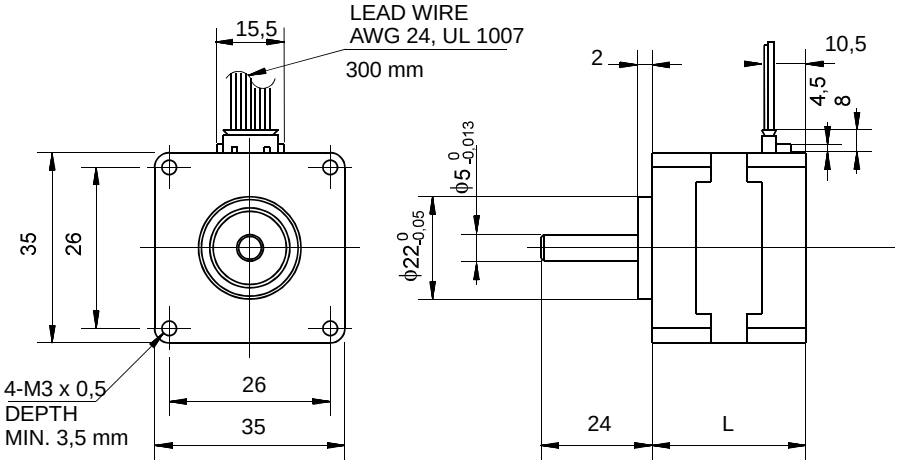




NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
14PM-M201V	1.8	Unipolar	4	0.4	9.0	4.2	0.5	11	110	26
14PM-M251V	1.8	Bipolar	5	0.4	9.0	6.0	0.5	11	110	26

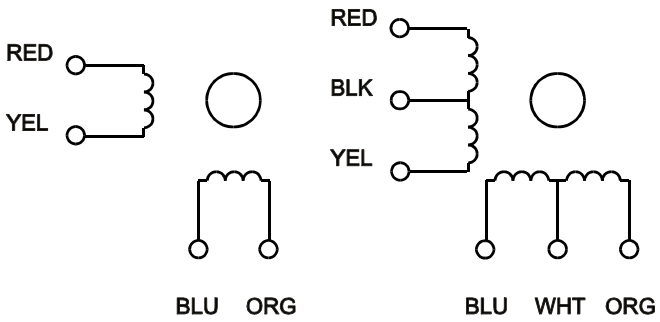
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

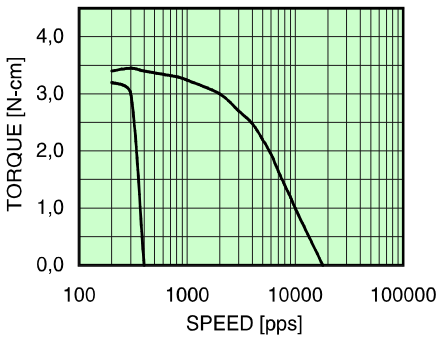
Rear Shaft, Encoder, Gearbox,
Connector Assembly

Winding Diagram

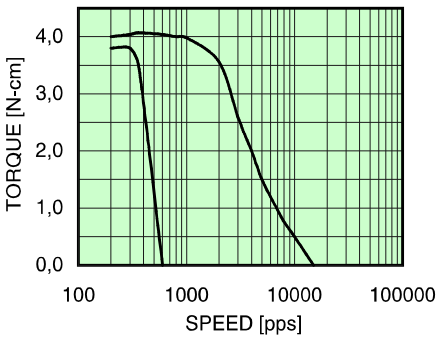


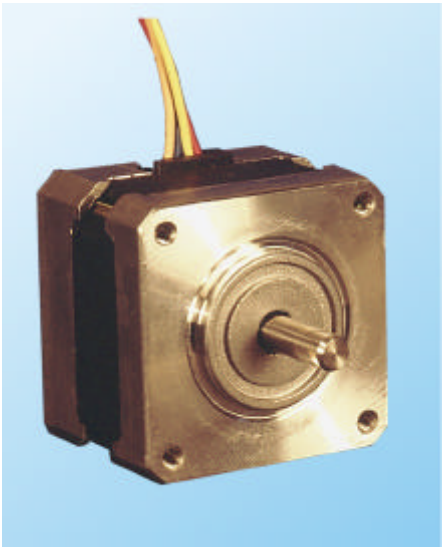
Bipolar Motor **Unipolar Motor**

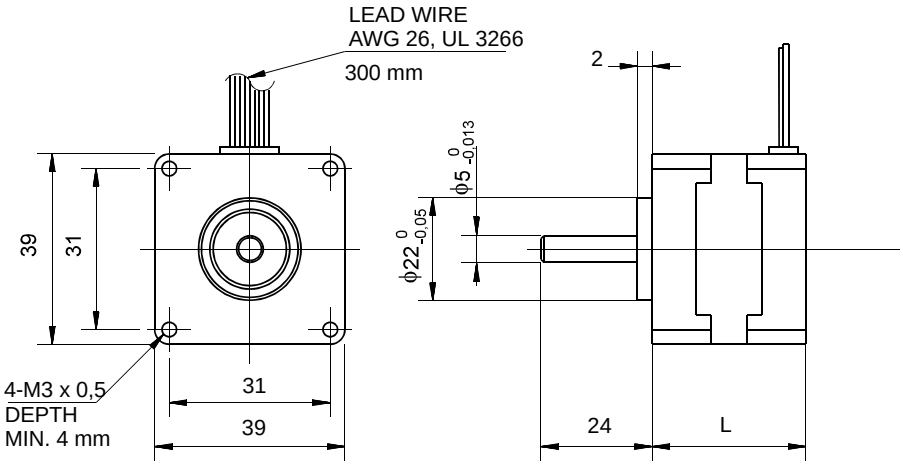
Model: 14PM-M201V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.4 A / Phase



Model: 14PM-M251V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.4 A / Phase







NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
16PY-Q205	0.9	Unipolar	6	1.0	2.5	1.0	0.3	12	120	26
16PY-Q255	0.9	Bipolar	7	1.0	2.5	1.4	0.3	12	120	26
16PY-Q057	0.9	Bipolar	10	0.8	4.5	2.0	0.5	16	170	30

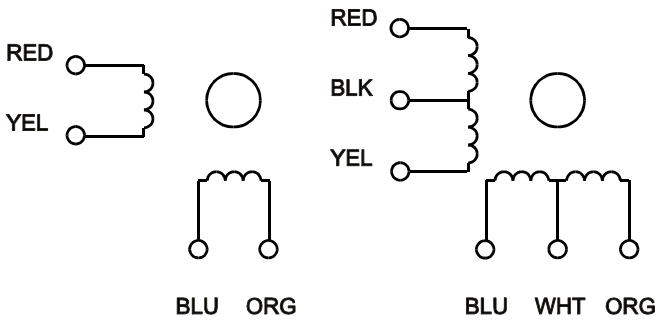
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

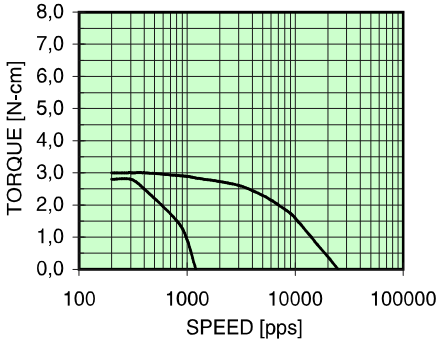
Rear Shaft, Encoder, Gearbox,
Connector Assembly

Winding Diagram

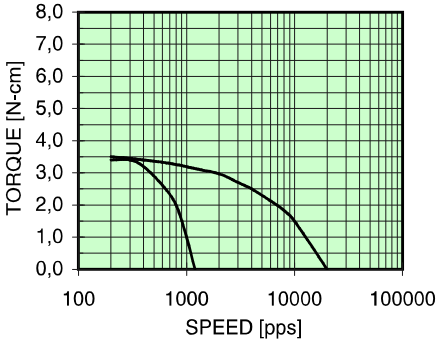


Bipolar Motor **Unipolar Motor**

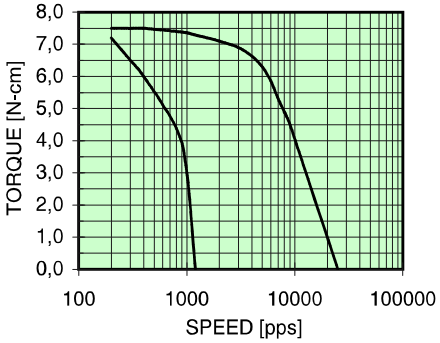
Model: 16PY-Q205
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase

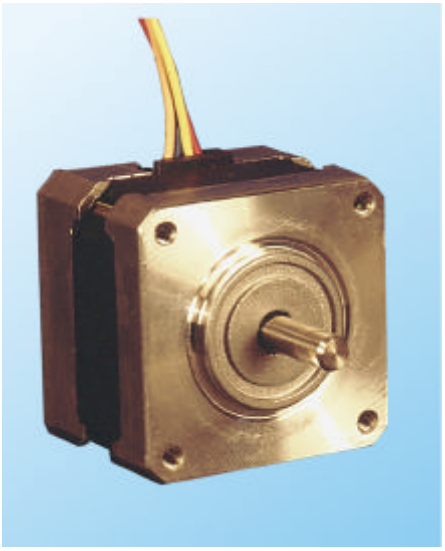


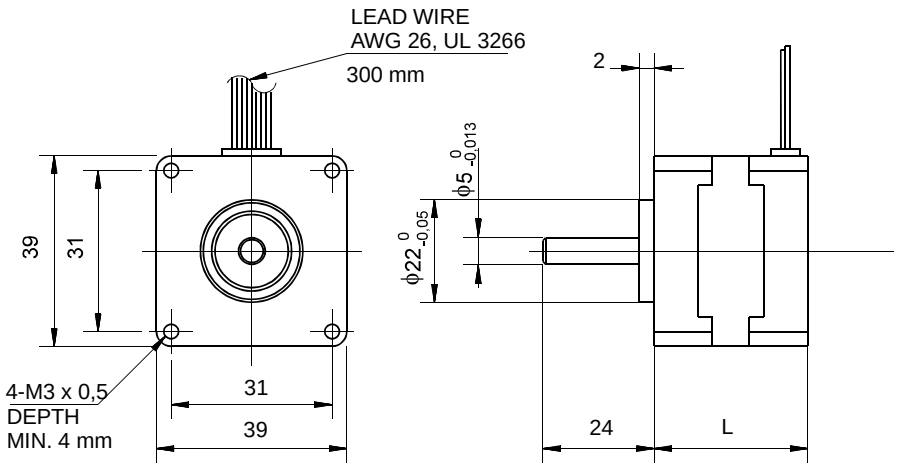
Model: 16PY-Q255
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



Model: 16PY-Q057
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.8 A / Phase







NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
16PM-M303	1.8	Unipolar	17	0.5	10.0	11.0	2.5	28	220	30
16PM-M313	1.8	Bipolar	19	0.5	10.0	17.0	2.5	28	220	30

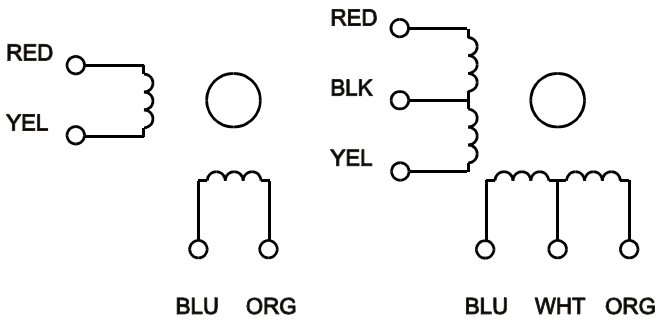
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

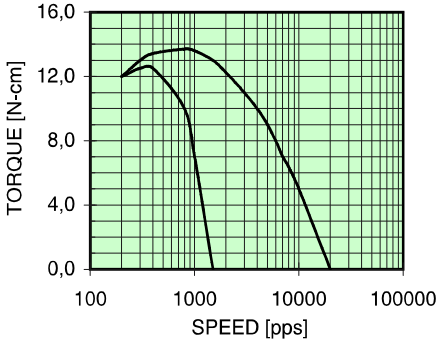
Rear Shaft, Encoder, Gearbox,
Connector Assembly

Winding Diagram

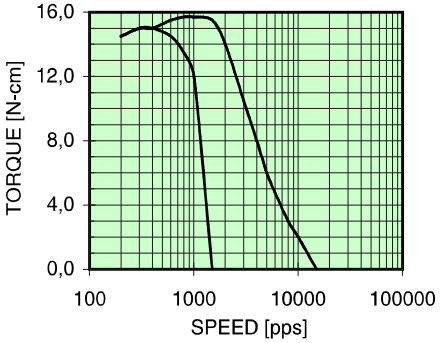


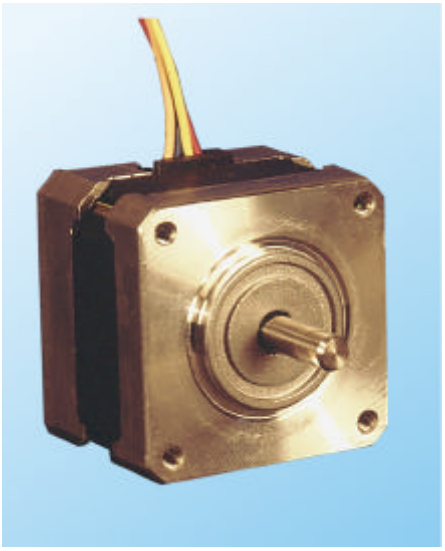
Bipolar Motor **Unipolar Motor**

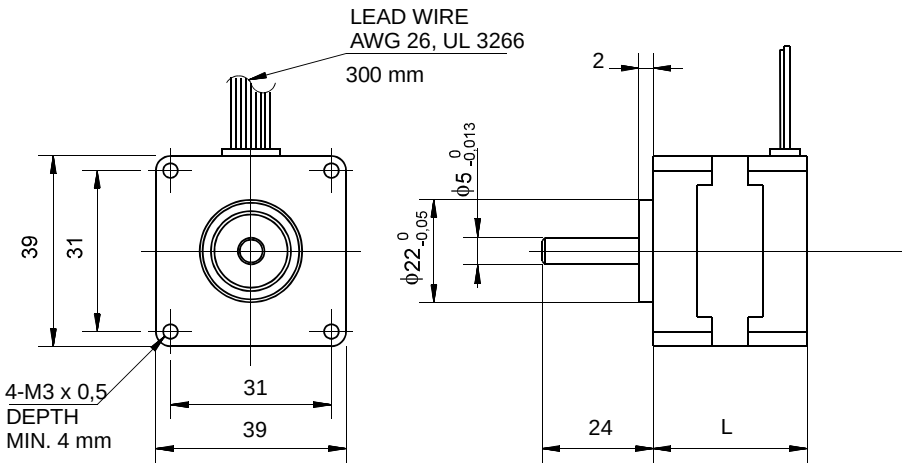
Model: 16PM-M303
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.5 A / Phase



Model: 16PM-M313
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.5 A / Phase







NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
16PU-M003	3.75	Unipolar	8	0.8	3.7	2.4	1.2	17	180	30
16PU-M013	3.75	Bipolar	10	0.8	3.7	3.8	1.2	17	180	30

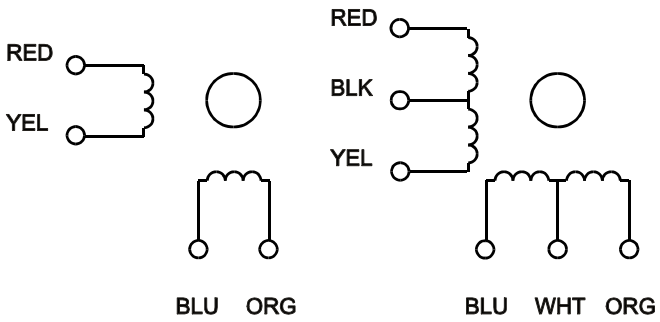
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

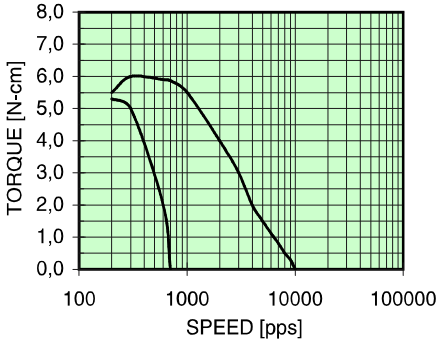
Rear Shaft, Encoder, Gearbox,
Connector Assembly

Winding Diagram

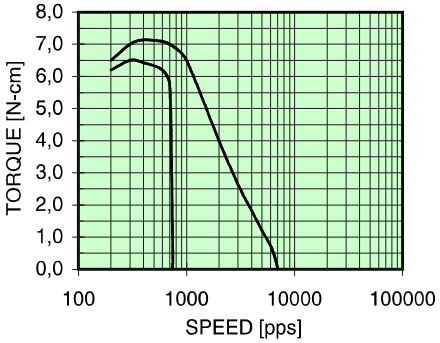


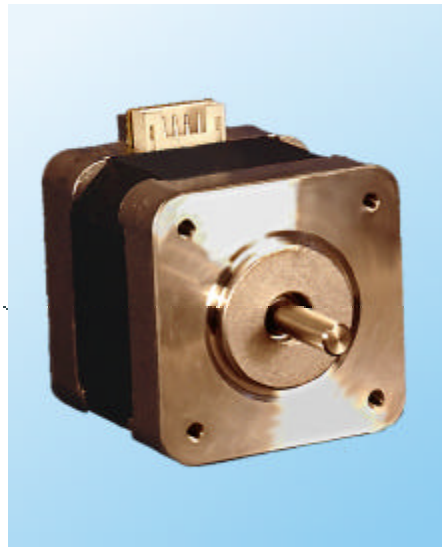
Bipolar Motor **Unipolar Motor**

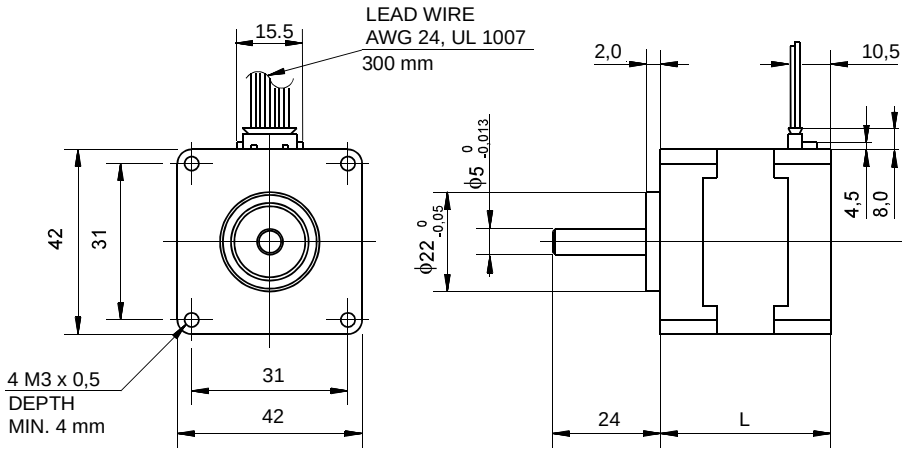
Model: 16PU-M003
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase



Model: 16PU-M013
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase







NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
17PM-K203V	1.8	Unipolar	13	0.6	5.5	4.7	0.6	28	180	30
17PM-K223V	1.8	Bipolar	15	0.6	5.5	7.4	0.6	28	180	30
17PM-K204V	1.8	Unipolar	12	0.8	3.0	2.6	0.6	28	180	30
17PM-K244V	1.8	Bipolar	14	0.8	3.0	4.1	0.6	28	180	30
17PM-K008V	1.8	Unipolar	17	0.6	8.3	8.7	0.8	34	200	34
17PM-K034V	1.8	Bipolar	20	0.6	8.3	15.0	0.8	34	200	34
17PM-K018V	1.8	Unipolar	17	1.0	3.0	2.7	0.8	34	200	34
17PM-K048V	1.8	Bipolar	20	1.0	3.0	4.9	0.8	34	200	34
17PM-K502V	1.8	Unipolar	20	0.6	8.9	9.0	0.9	40	220	36
17PM-K503V	1.8	Bipolar	23	0.6	8.9	16.2	0.9	40	220	36
17PM-K504V	1.8	Unipolar	20	1.0	3.2	3.5	0.9	40	220	36
17PM-K505V	1.8	Bipolar	23	1.0	3.2	5.9	0.9	40	220	36

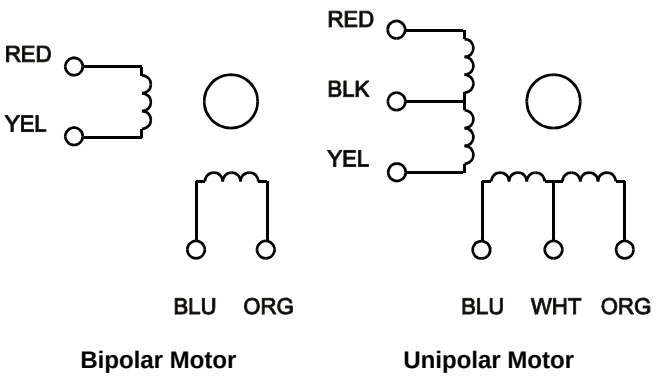
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

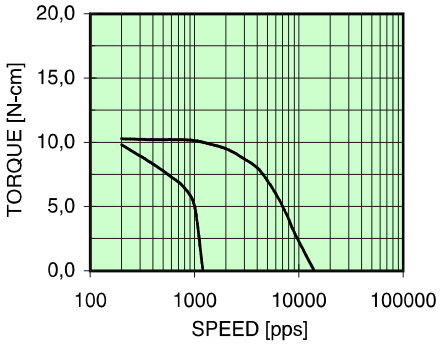
Rear Shaft, Encoder, Gearbox,
Connector Assembly

Winding Diagram

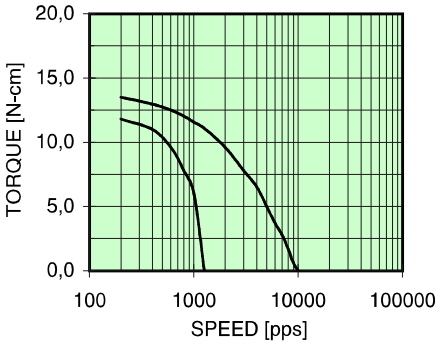


Bipolar Motor **Unipolar Motor**

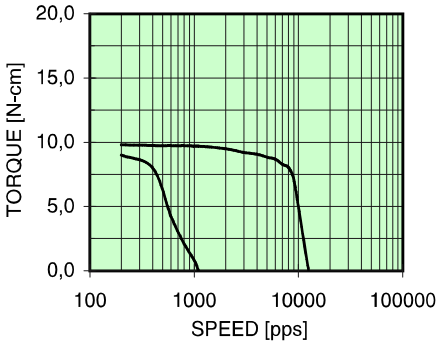
Model: 17PM-K203V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase



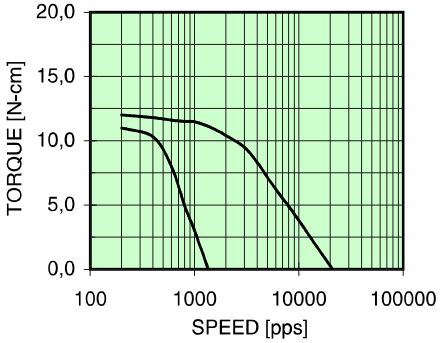
Model: 17PM-K223V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase



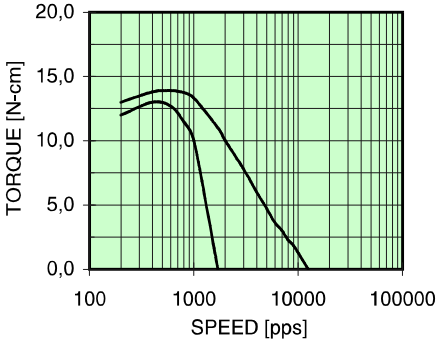
Model: 17PM-K204V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.8 A / Phase



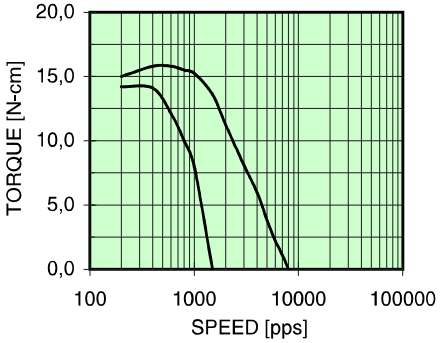
Model: 17PM-K244V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.8 A / Phase



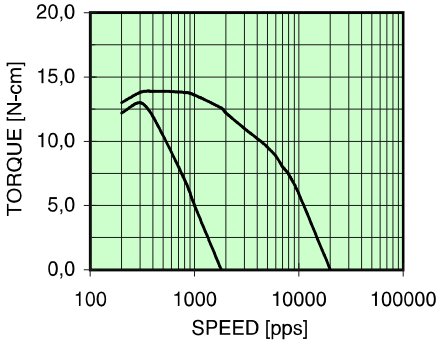
Model: 17PM-K008V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase



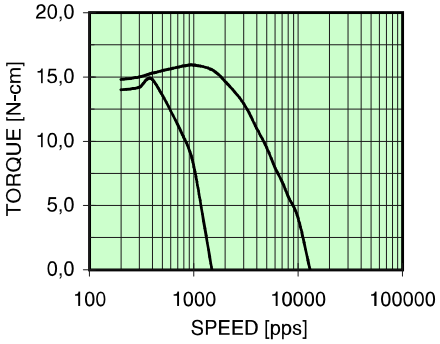
Model: 17PM-K034V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase



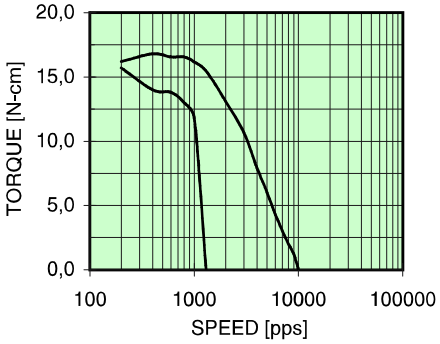
Model: 17PM-K018V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



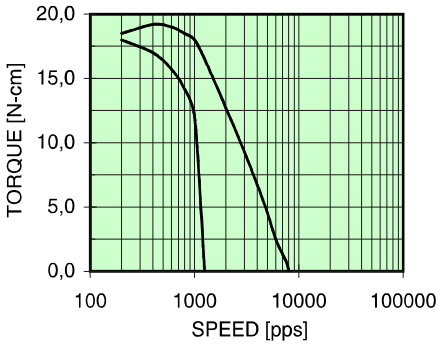
Model: 17PM-K048V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



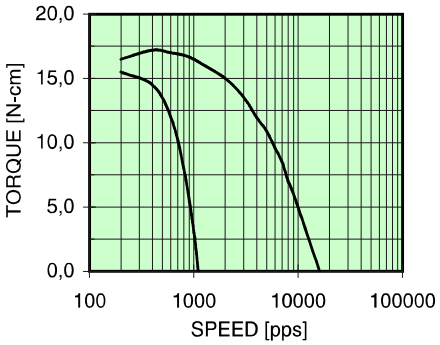
Model: 17PM-K502V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase



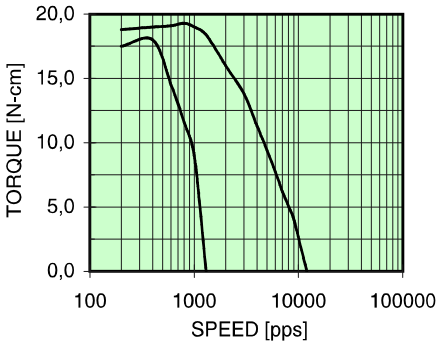
Model: 17PM-K503V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase

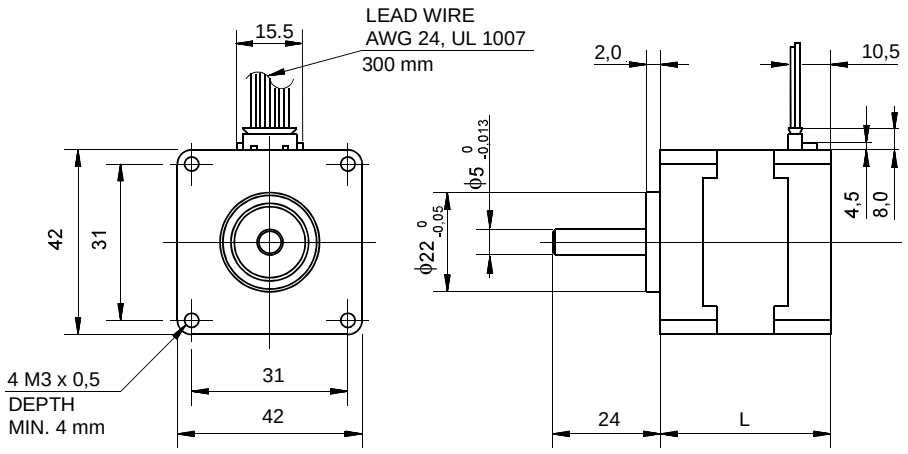


Model: 17PM-K504V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



Model: 17PM-K505V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase





NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
17PM-K302V	1.8	Unipolar	23	1.0	3.5	3.3	1.0	45	250	38
17PM-K301V	1.8	Bipolar	23	1.0	3.5	5.5	1.0	45	250	38
17PM-K304V	1.8	Unipolar	23	1.4	1.8	1.7	1.0	45	250	38
17PM-K303V	1.8	Bipolar	23	1.4	1.8	3.0	1.0	45	250	38
17PM-K103V	1.8	Unipolar	30	1.0	4.3	4.5	1.2	56	300	42
17PM-K104V	1.8	Bipolar	35	1.0	4.3	8.2	1.2	56	300	42
17PM-K106V	1.8	Unipolar	30	1.4	2.2	3.2	1.2	56	300	42
17PM-K115V	1.8	Bipolar	35	1.4	2.2	6.0	1.2	56	300	42
17PM-K403V	1.8	Unipolar	42	1.0	4.7	6.3	1.5	80	350	46
17PM-K404V	1.8	Bipolar	50	1.0	4.7	11.5	1.5	80	350	46
17PM-K401V	1.8	Unipolar	42	1.4	2.4	3.0	1.5	80	350	46
17PM-K406V	1.8	Bipolar	50	1.4	2.4	5.7	1.5	80	350	46

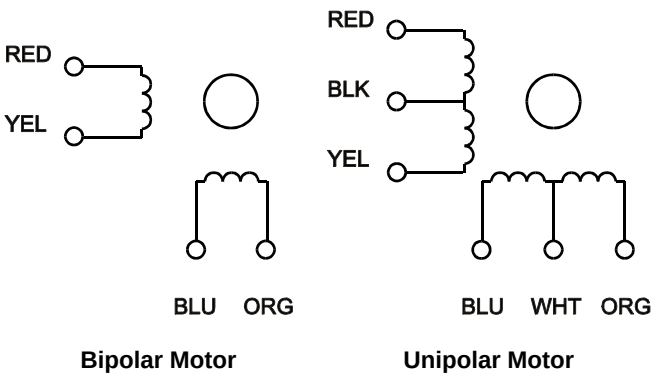
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

Rear Shaft, Encoder, Gearbox, Connector Assembly

Winding Diagram

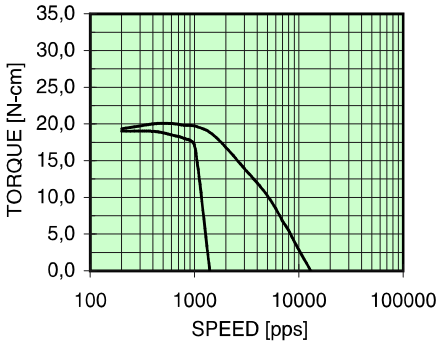


Bipolar Motor **Unipolar Motor**

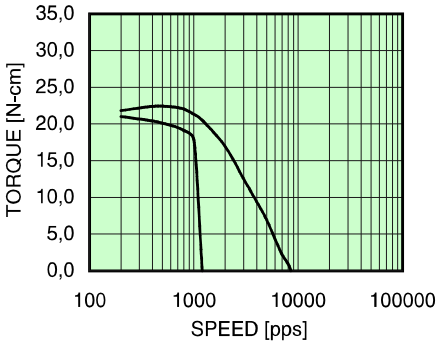
Torque Speed Characteristics

Size 42 x 42 Step Angle 1.8°

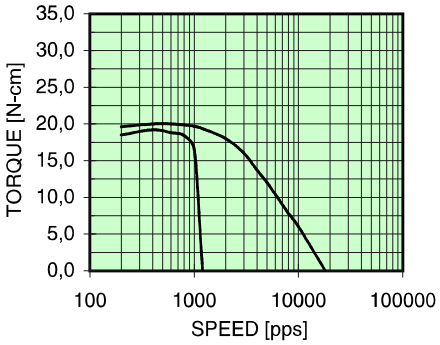
Model: 17PM-K302V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



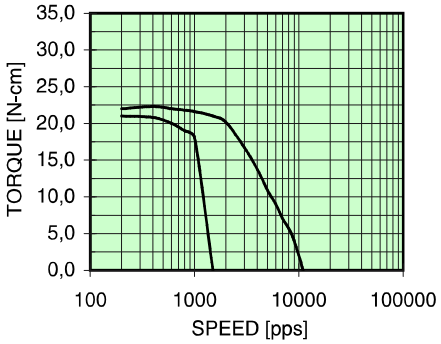
Model: 17PM-K301V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



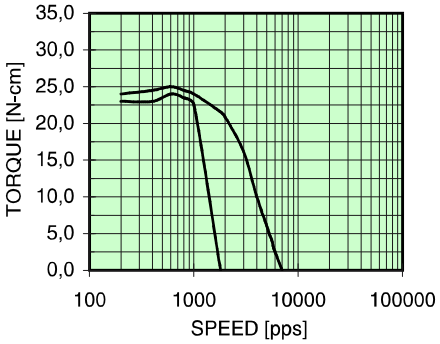
Model: 17PM-K304V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.4 A / Phase



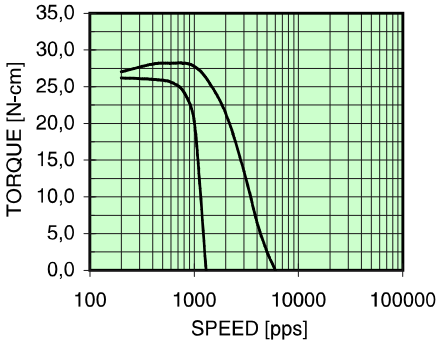
Model: 17PM-K303V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.4 A / Phase



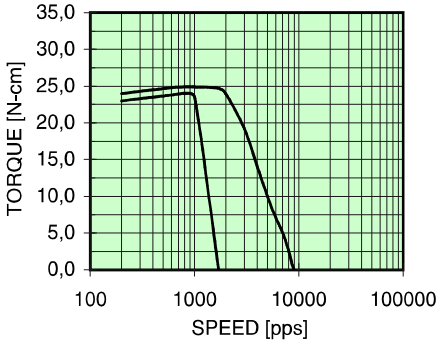
Model: 17PM-K103V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



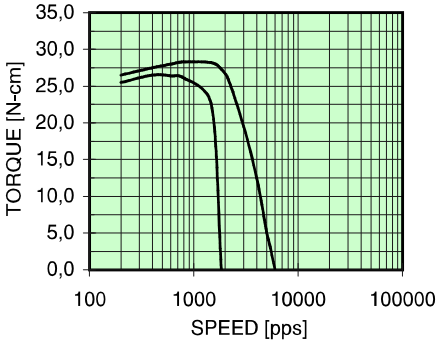
Model: 17PM-K104V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



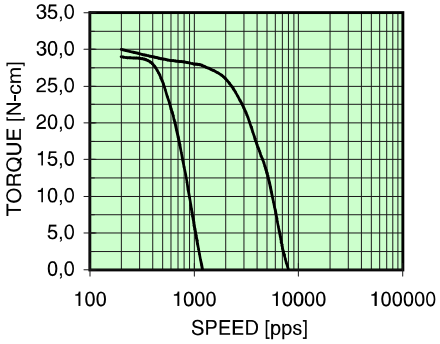
Model: 17PM-K106V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.4 A / Phase



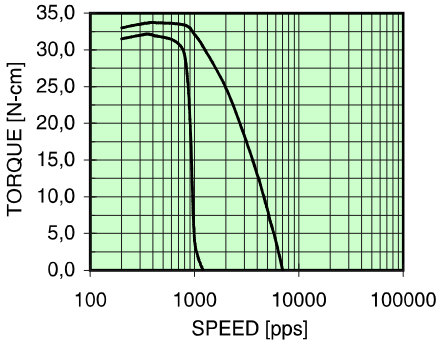
Model: 17PM-K115V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.4 A / Phase



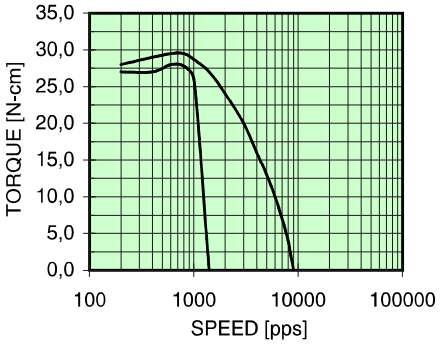
Model: 17PM-K403V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



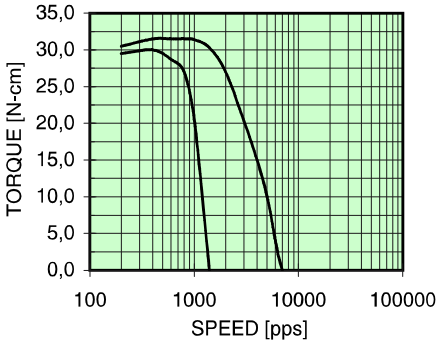
Model: 17PM-K404V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 0.6 A / Phase

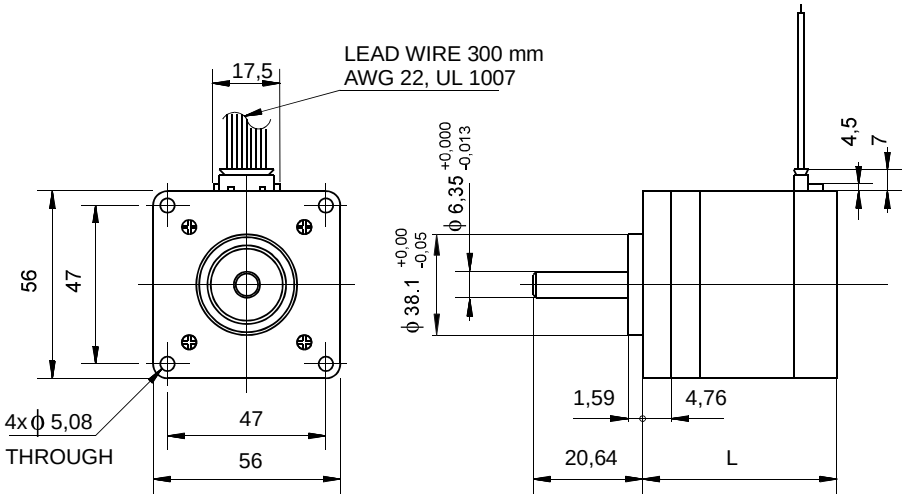


Model: 17PM-K401V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



Model: 17PM-K406V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase





NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
23LM-C202V	1.8	Unipolar	32	1.0	3.5	4.0	5.0	55	360	41
23LM-C222V	1.8	Bipolar	38	1.0	3.5	6.4	5.0	55	360	41
23LM-C250V	1.8	Unipolar	32	1.5	1.6	2.5	5.0	55	360	41
23LM-C252V	1.8	Bipolar	37	1.5	1.6	4.0	5.0	55	360	41
23LM-C304V	1.8	Unipolar	55	1.0	5.0	9.1	5.5	110	450	50
23LM-C344V	1.8	Bipolar	62	1.0	5.0	15.0	5.5	110	450	50
23LM-C343V	1.8	Unipolar	55	1.5	2.2	3.5	5.5	110	450	50
23LM-C355V	1.8	Bipolar	62	1.5	2.2	5.5	5.5	110	450	50
23LM-C004V	1.8	Unipolar	63	1.0	7.0	14.0	6.0	160	540	56
23LM-C054V	1.8	Bipolar	80	1.0	7.0	22.1	6.0	160	540	56
23LM-C047V	1.8	Unipolar	63	1.5	3.1	6.1	6.0	160	540	56
23LM-C077V	1.8	Bipolar	80	1.5	3.1	9.8	6.0	160	540	56

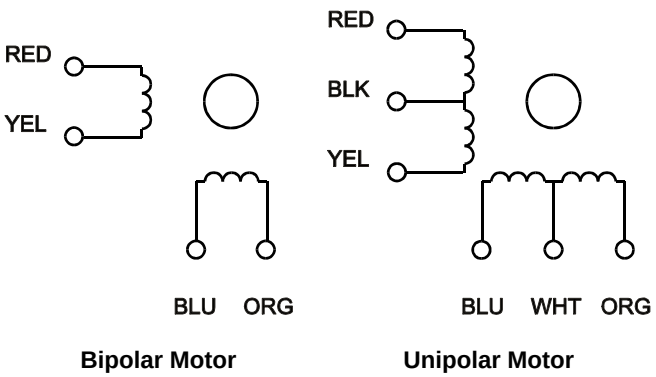
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

Rear Shaft, Encoder, Gearbox, Connector Assembly

Winding Diagram



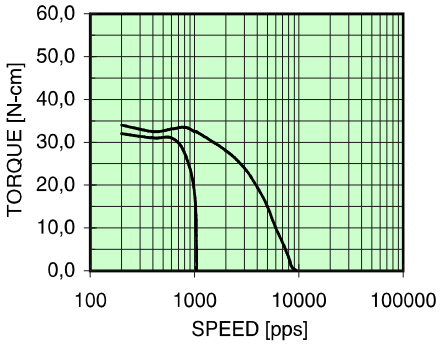
Bipolar Motor

Unipolar Motor

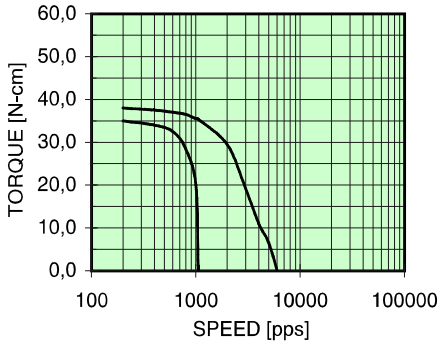
Torque Speed Characteristics

Size 56 x 56 Step Angle 1.8°

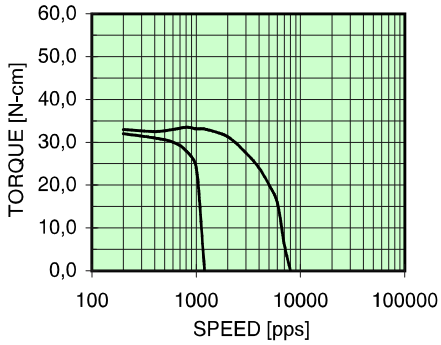
Model: 23LM-C202V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



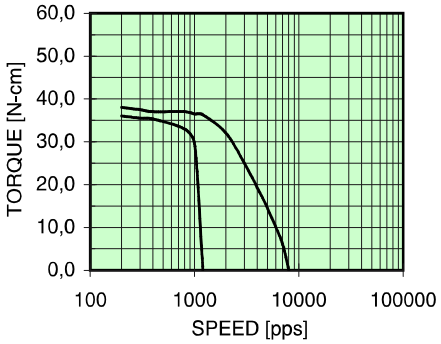
Model: 23LM-C222V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



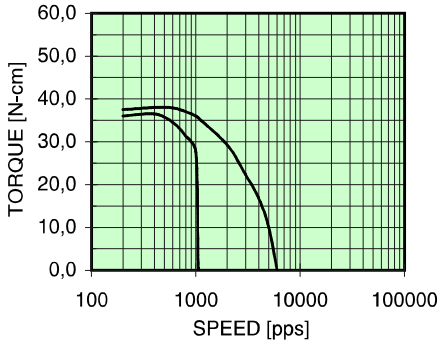
Model: 23LM-C250V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



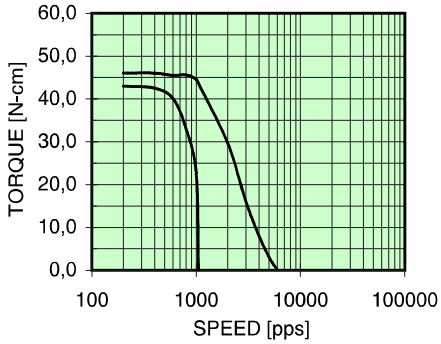
Model: 23LM-C252V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



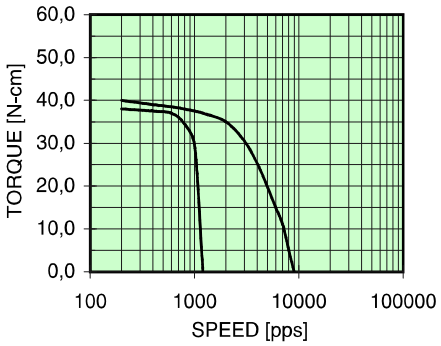
Model: 23LM-C304V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



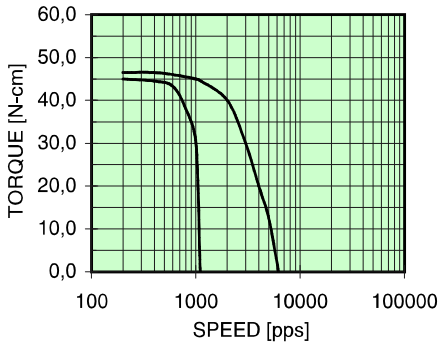
Model: 23LM-C344V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



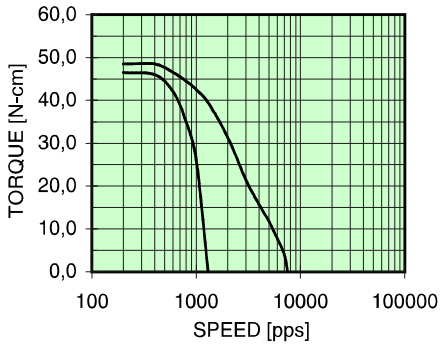
Model: 23LM-C343V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



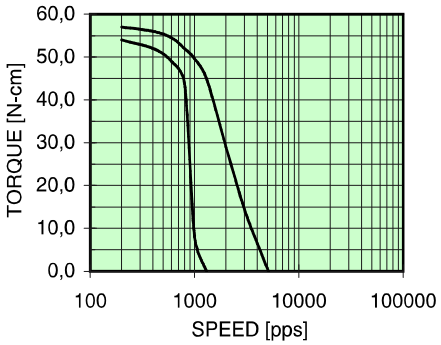
Model: 23LM-C355V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



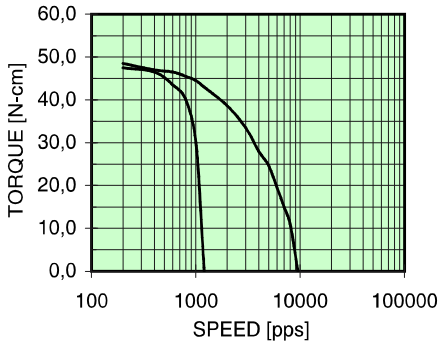
Model: 23LM-C004V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



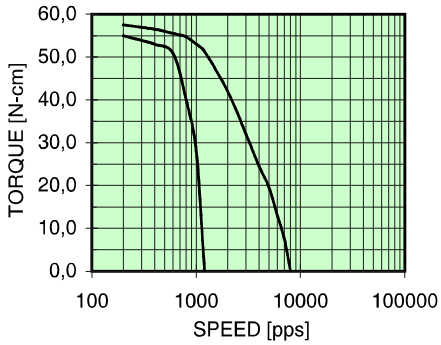
Model: 23LM-C054V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



Model: 23LM-C047V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase

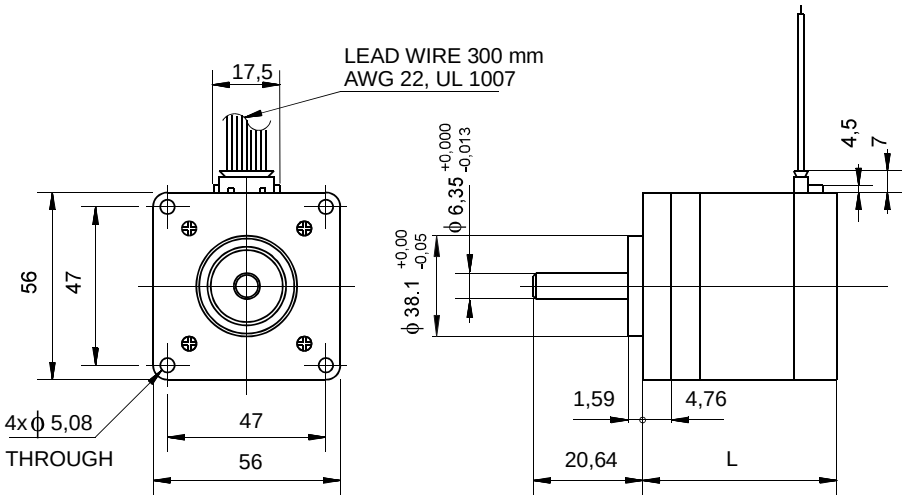


Model: 23LM-C077V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



23LM Series Low Noise

Size 56 x 56 Step Angle 1.8°



NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
23LM-K202V	1.8	Unipolar	24	1.0	3.5	5.4	1.8	55	360	41
23LM-K222V	1.8	Bipolar	27	1.0	3.5	8.9	1.8	55	360	41
23LM-K250V	1.8	Unipolar	24	1.5	1.6	3.0	1.8	55	360	41
23LM-K252V	1.8	Bipolar	27	1.5	1.6	4.9	1.8	55	360	41
23LM-K304V	1.8	Unipolar	40	1.0	5.0	12.0	2.2	110	450	50
23LM-K344V	1.8	Bipolar	47	1.0	5.0	20.0	2.2	110	450	50
23LM-K343V	1.8	Unipolar	40	1.5	2.2	4.7	2.2	110	450	50
23LM-K355V	1.8	Bipolar	47	1.5	2.2	7.3	2.2	110	450	50
23LM-K004V	1.8	Unipolar	46	1.0	7.0	18.7	2.8	160	540	56
23LM-K054V	1.8	Bipolar	52	1.0	7.0	30.0	2.8	160	540	56
23LM-K047V	1.8	Unipolar	46	1.5	3.1	8.1	2.8	160	540	56
23LM-K077V	1.8	Bipolar	52	1.5	3.1	12.8	2.8	160	540	56

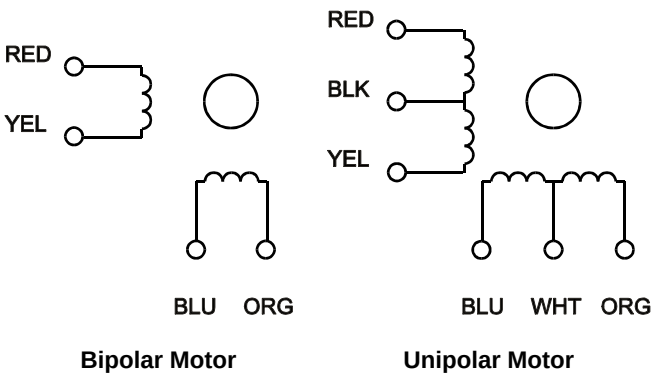
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

Rear Shaft, Encoder, Gearbox,
Connector Assembly

Winding Diagram



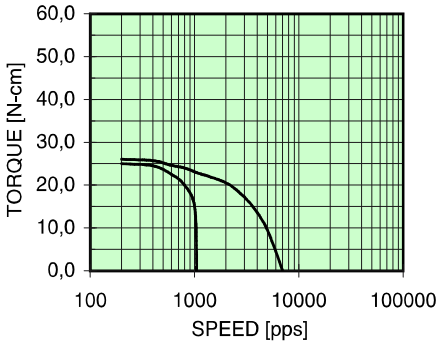
Bipolar Motor

Unipolar Motor

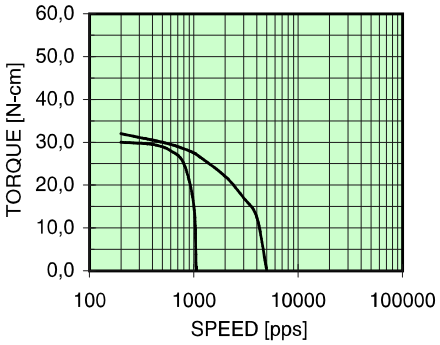
Torque Speed Characteristics

Size 56 x 56 Step Angle 1.8°

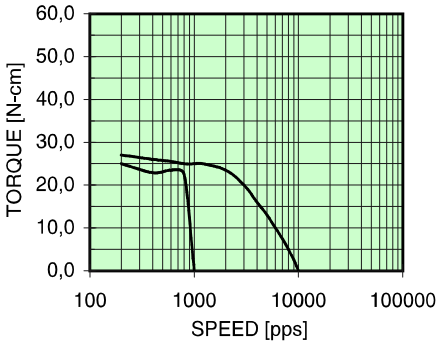
Model: 23LM-K202V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



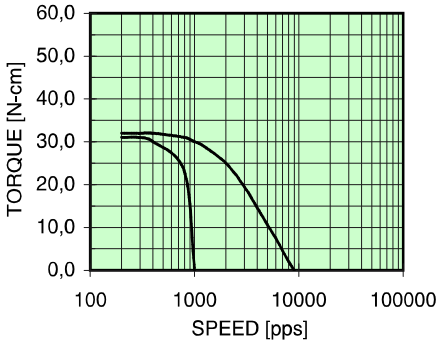
Model: 23LM-K222V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



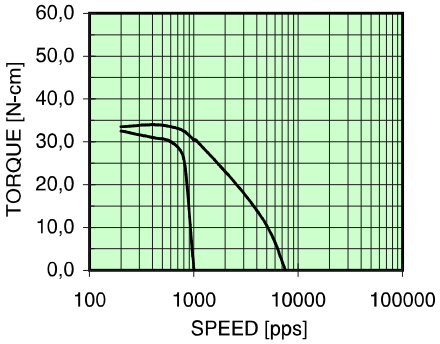
Model: 23LM-K250V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



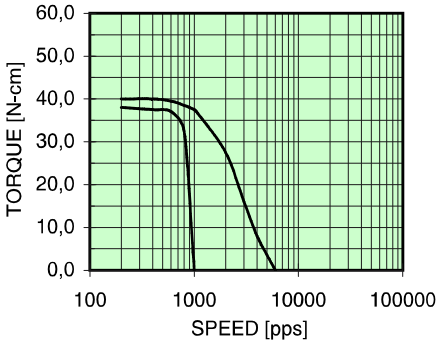
Model: 23LM-K252V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



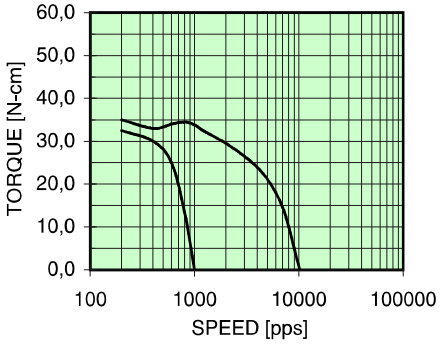
Model: 23LM-K304V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



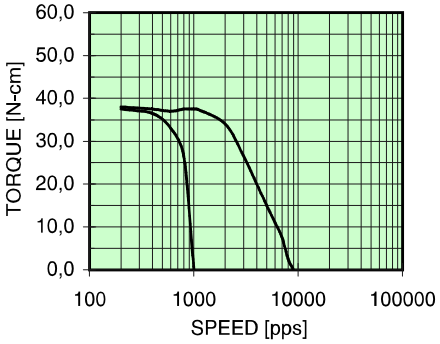
Model: 23LM-K344V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



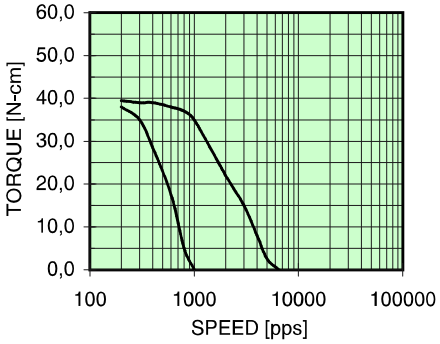
Model: 23LM-K343V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



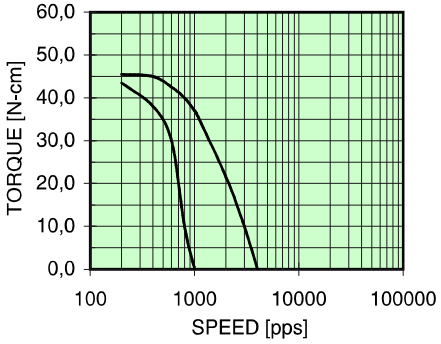
Model: 23LM-K355V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



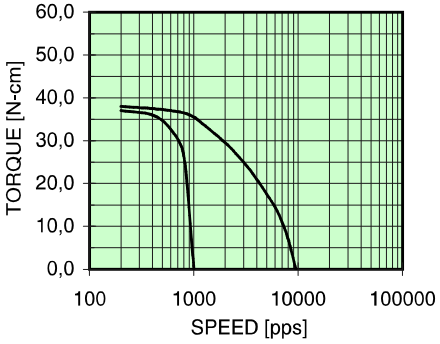
Model: 23LM-K004V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase



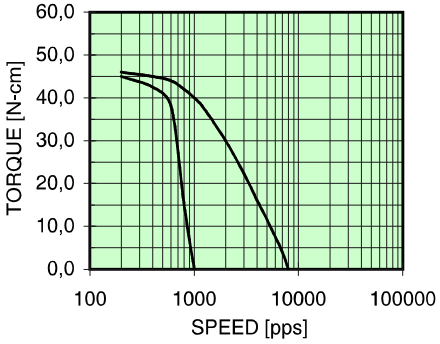
Model: 23LM-K054V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.0 A / Phase

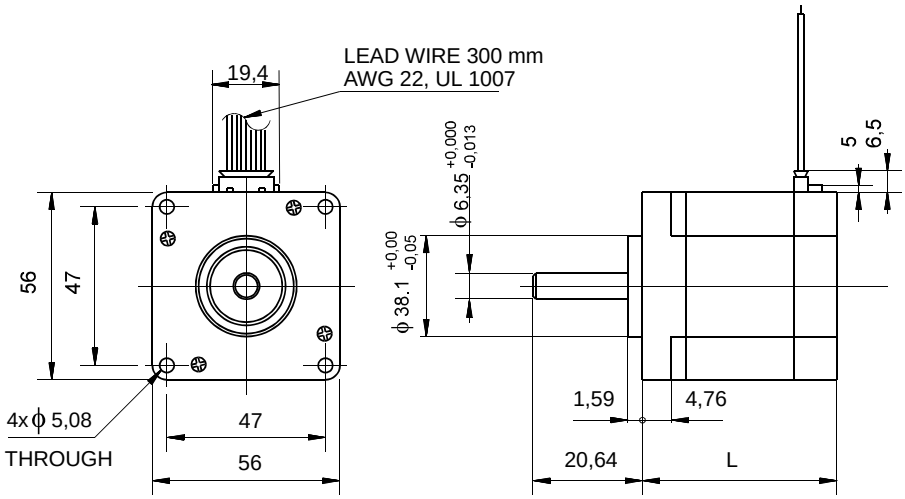


Model: 23LM-K047V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



Model: 23LM-K077V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase





NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
23KM-C213V	1.8	Unipolar	41	2.0	1.3	1.7	5.0	150	470	42
23KM-C263V	1.8	Bipolar	48	2.0	1.3	3.3	5.0	150	470	42
23KM-C307V	1.8	Unipolar	61	2.0	1.5	2.1	7.0	230	590	50
23KM-C308V	1.8	Bipolar	68	2.0	1.5	3.5	7.0	230	590	50
23KM-C033V	1.8	Unipolar	79	3.0	0.9	1.6	8.0	280	680	54
23KM-C043V	1.8	Bipolar	88	3.0	0.9	2.2	8.0	280	680	54
23KM-C101V	1.8	Unipolar	113	3.0	1.0	1.7	10.0	400	900	67
23KM-C102V	1.8	Bipolar	128	3.0	1.0	2.4	10.0	400	900	67
23KM-C733V	1.8	Unipolar	128	3.0	1.1	3.5	11.0	440	1,050	76
23KM-C743V	1.8	Bipolar	142	3.0	1.1	5.1	11.0	440	1,050	76
23KM-C709X	1.8	Bipolar	190	6.0	0.3	0.6	33.0	440	1,050	76
23KM-C711X	1.8	Bipolar	220	3.0	1.1	3.5	32.0	440	1,050	c76

Note: The 23KM-C7XX type is also available as LOW INERTIA MOTOR with a rotor inertia of 170 gcm^2.

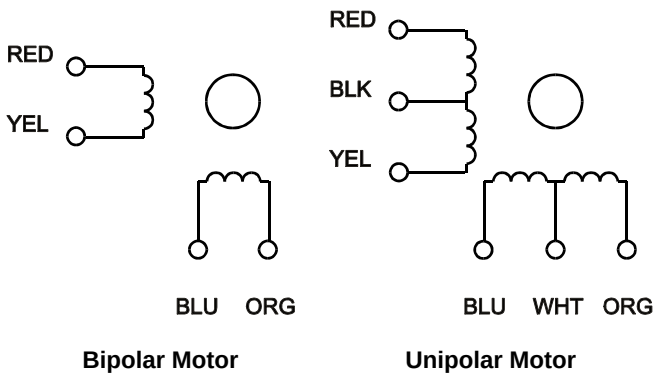
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

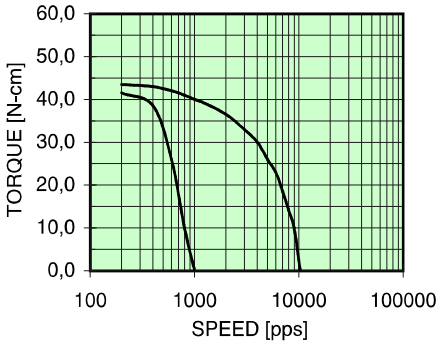
Rear Shaft, Encoder, Gearbox, Connector Assembly

Winding Diagram

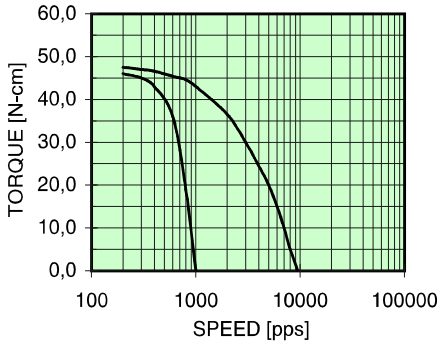


Bipolar Motor **Unipolar Motor**

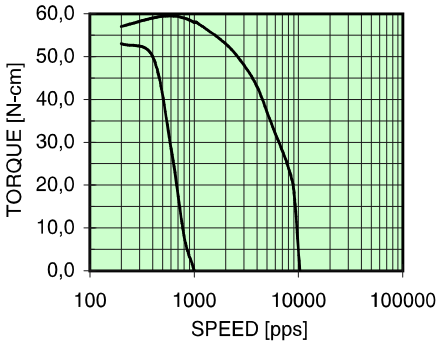
Model: 23KM-C213V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 2.0 A / Phase



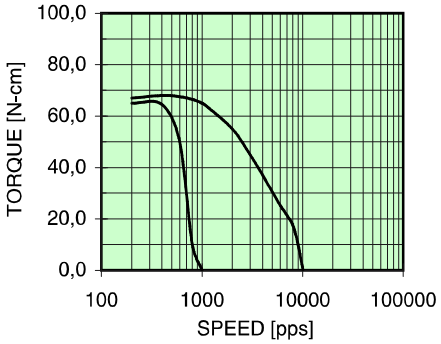
Model: 23KM-C263V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 2.0 A / Phase



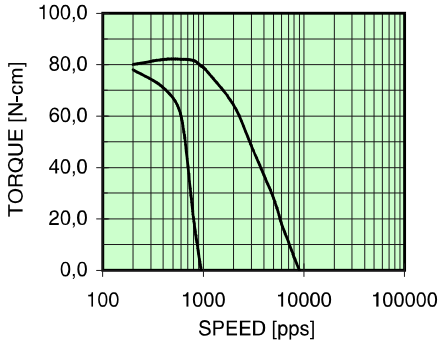
Model: 23KM-C307V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 2.0 A / Phase



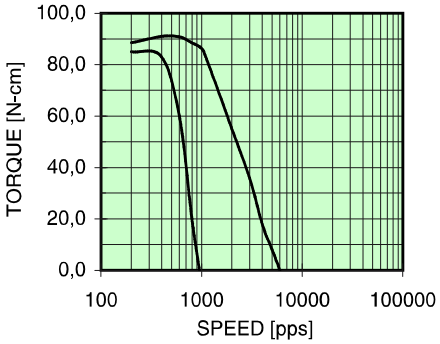
Model: 23KM-C308V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 2.0 A / Phase



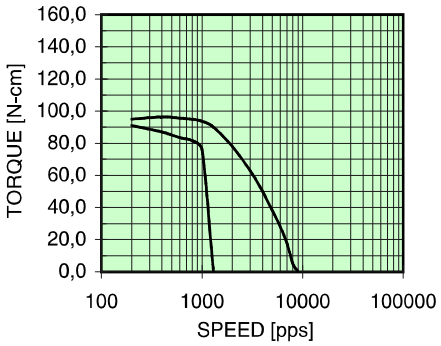
Model: 23KM-C033V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



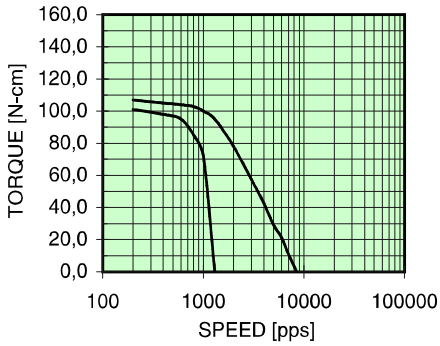
Model: 23KM-C043V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



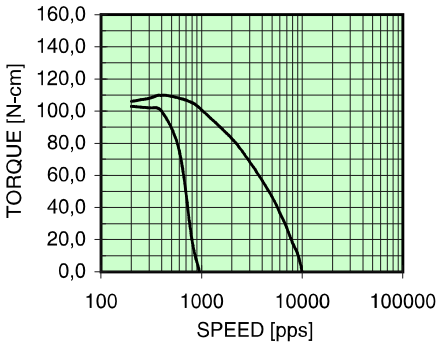
Model: 23KM-C101V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



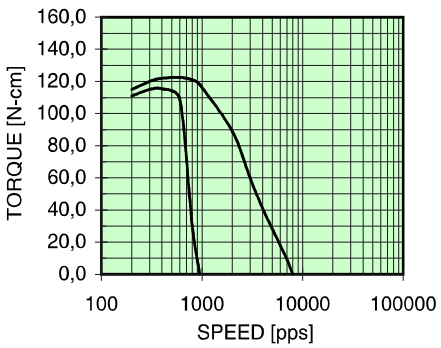
Model: 23KM-C102V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



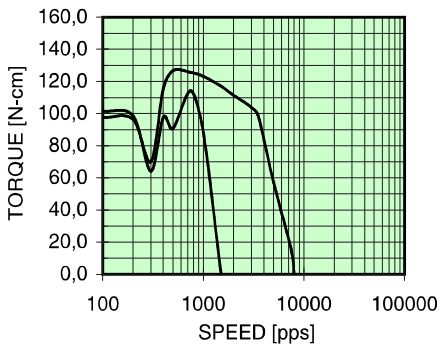
Model: 23KM-C733V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



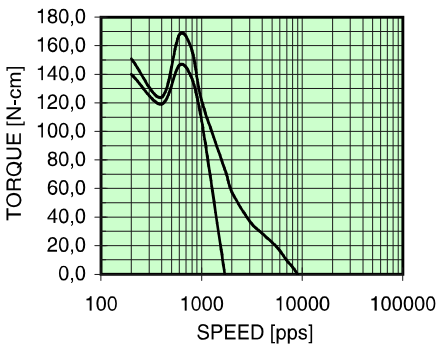
Model: 23KM-C743V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase

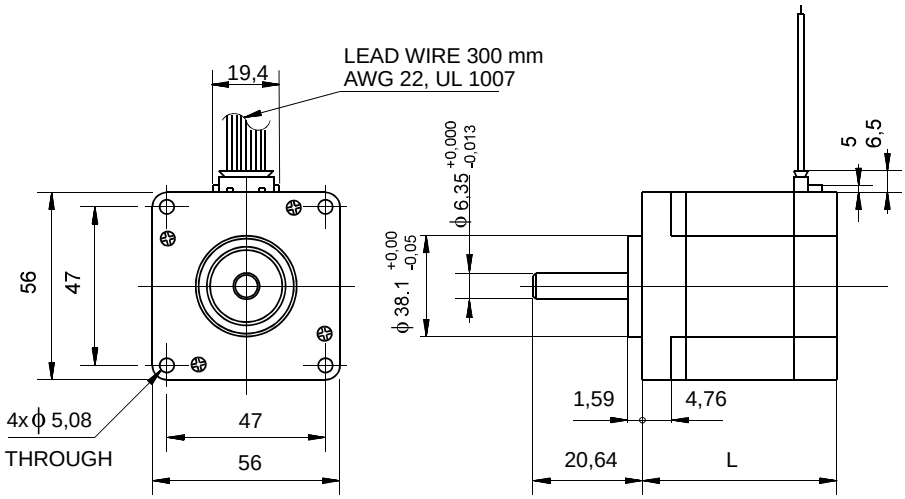


Model: 23KM-C709X
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 6.0 A / Phase



Model: 23KM-C711X
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase





NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
23KM-K213V	1.8	Unipolar	40	2.0	1.3	1.9	2.0	150	470	42
23KM-K263V	1.8	Bipolar	46	2.0	1.3	3.6	2.0	150	470	42
23KM-K307V	1.8	Unipolar	58	2.0	1.5	2.4	3.0	230	590	50
23KM-K308V	1.8	Bipolar	63	2.0	1.5	3.8	3.0	230	590	50
23KM-K033V	1.8	Unipolar	74	3.0	0.9	1.7	4.0	280	680	54
23KM-K043V	1.8	Bipolar	84	3.0	0.9	2.4	4.0	280	680	54
23KM-K101V	1.8	Unipolar	103	3.0	1.0	1.8	5.0	400	900	67
23KM-K102V	1.8	Bipolar	118	3.0	1.0	2.5	5.0	400	900	67
23KM-K732V	1.8	Unipolar	118	1.5	4.2	8.0	6.0	440	1,050	76
23KM-K733V	1.8	Unipolar	118	3.0	1.1	3.8	6.0	440	1,050	76
23KM-K743V	1.8	Bipolar	133	3.0	1.1	5.6	6.0	440	1,050	76
23KM-K723X	1.8	Bipolar	158	3.5	0.7	2.4	6.0	440	1,050	76

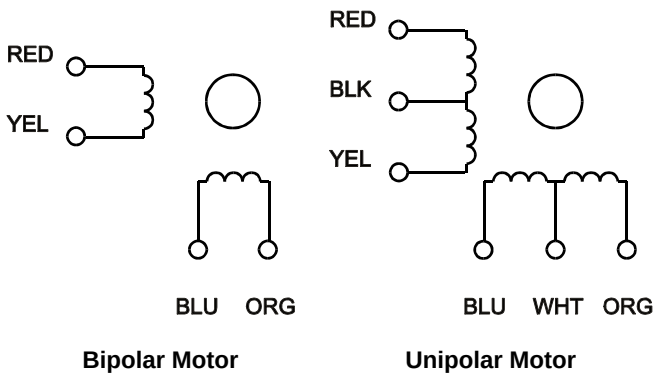
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

Rear Shaft, Encoder, Gearbox, Connector Assembly

Winding Diagram

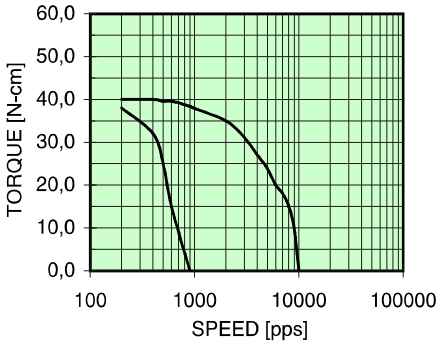


Bipolar Motor **Unipolar Motor**

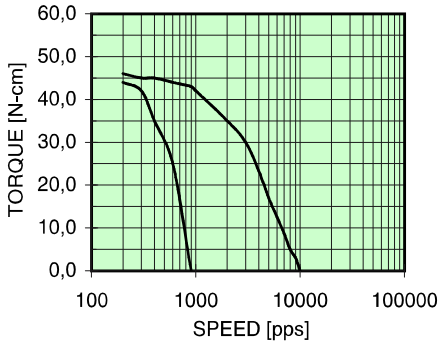
Torque Speed Characteristics

Size 56 x 56 Step Angle 1.8°

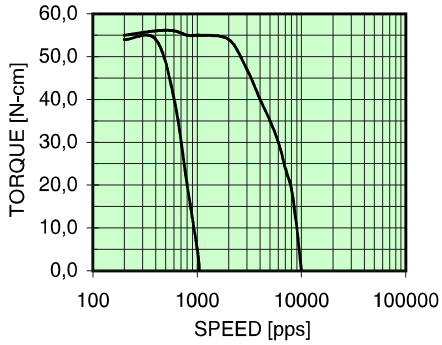
Model: 23KM-K213V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 2.0 A / Phase



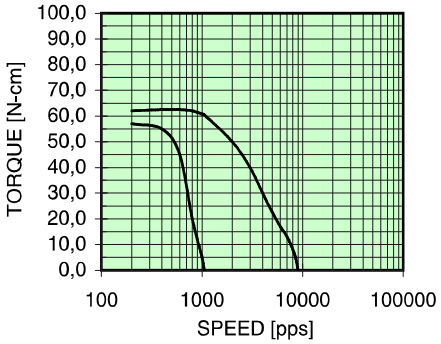
Model: 23KM-K263V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 2.0 A / Phase



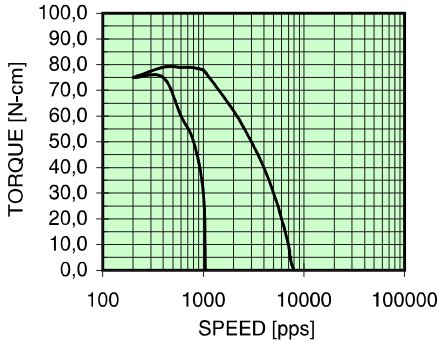
Model: 23KM-K307V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 2.0 A / Phase



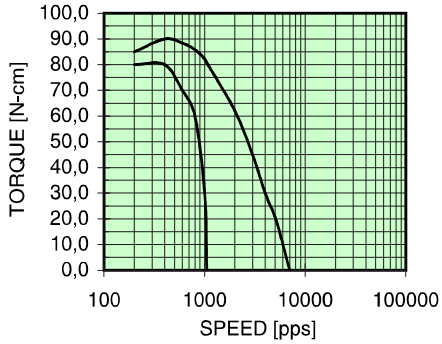
Model: 23KM-K308V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 2.0 A / Phase



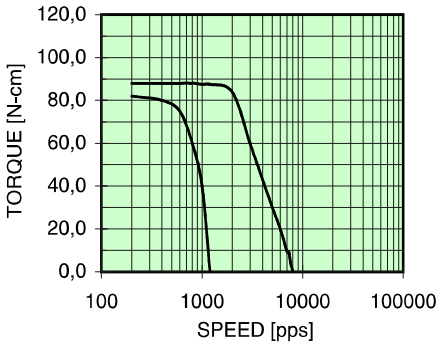
Model: 23KM-K033V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



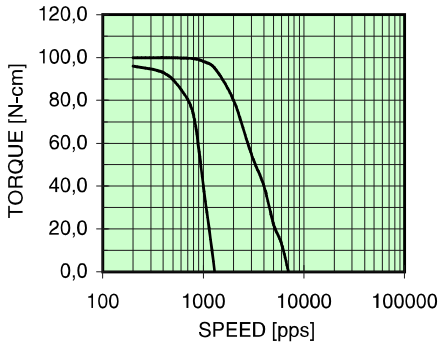
Model: 23KM-K043V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



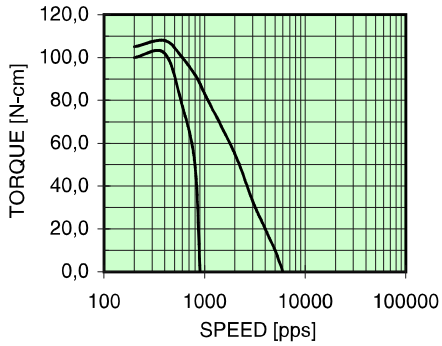
Model: 23KM-K101V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



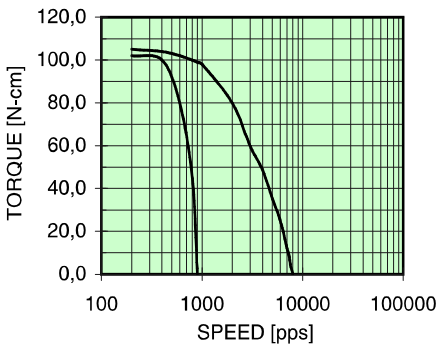
Model: 23KM-K102V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



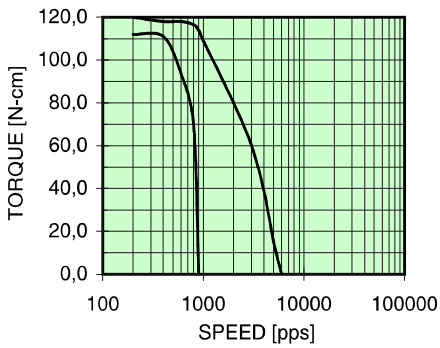
Model: 23KM-K732V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 1.5 A / Phase



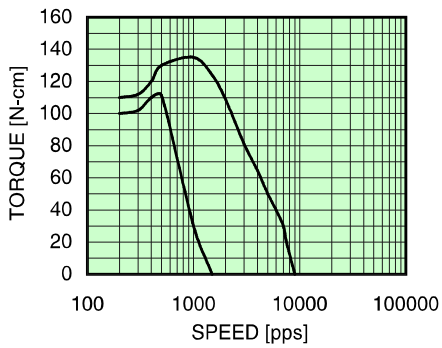
Model: 23KM-K733V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase

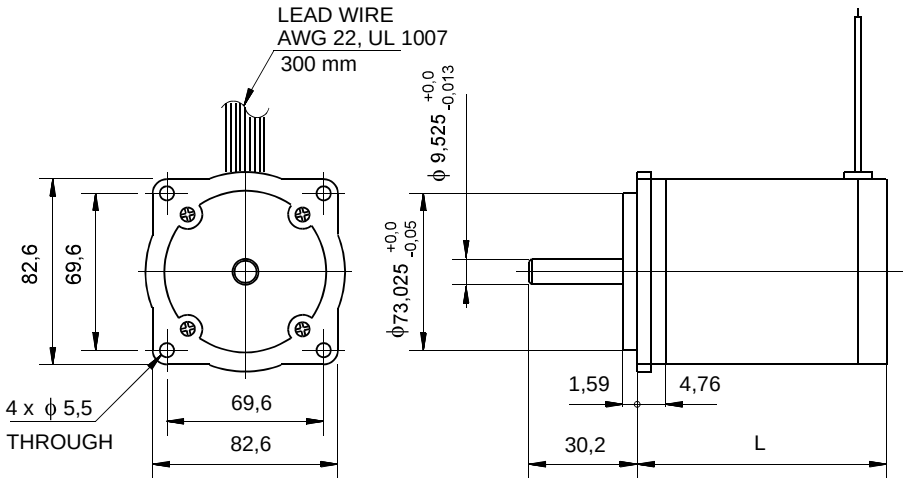


Model: 23KM-K743V
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.0 A / Phase



Model: 23KM-K723X
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 3.5 A / Phase





NMB Partnumber	Step Angle	Drive Mode	Holding Torque	Current per Phase	Resistance per Phase	Inductance per Phase	Detent Torque	Rotor Inertia	Weight	L
	[Deg]		[Ncm]	[A]	[Ω]	[mH]	[Ncm]	[gcm^2]	[g]	[mm]
34PM-C101	1.8	Unipolar	300	4.0	0.75	3.5	7.0	1100	2400	94

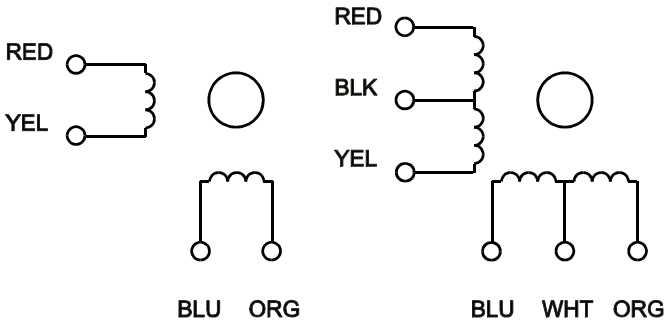
General Specification

Step Angle Accuracy:	5%
Temperature Rise:	80°C max.
Ambient Temperature Range:	-20° to +50°C
Insulation Resistance:	100 MΩ min. 500 VDC
Insulation Class:	B (130°C)
Dielectric Strength:	500 VAC for 1 min.
Radial Play:	0.02 mm max. (450 g load)
End Play:	0.08 mm max. (450 g load)

Options

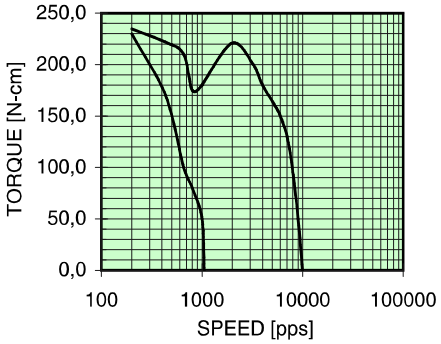
Rear Shaft, Encoder, Gearbox,
Connector Assembly

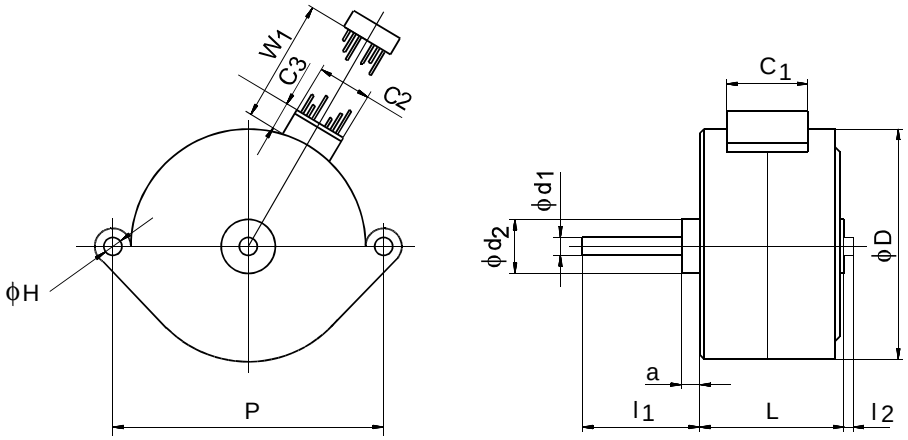
Winding Diagram



Bipolar Motor **Unipolar Motor**

Model: 34PM-C101
Driver: Chopper Dual
Drive Voltage: 24 V
Drive Current: 4.0 A / Phase





Typical Characteristics

NMB Type	Motor Size	No. of Steps per Revolution	Step Angle	Holding Torque	Max. Pull In Frequency	Torque Characteristic				Resistance per Phase	Drive Voltage
						Drive Frequency	Pull Out Torque	Drive Frequency	Pull Out Torque		
			[Deg]	[Ncm]	[pps]	[pps]	[Ncm]	[pps]	[Ncm]	[Ω]	[V]
PM10	S	20	18	0.150	2,500	400	0.100	1,000	0.080	10	5
PM15	S	20	18	0.250	1,200	250	0.200	500	0.140	100	12
PM20	S	20	18	0.550	740	100	0.350	500	0.220	100	12
	L	20	18	0.850	670	100	0.600	500	0.280	80	12
PM25	S	24	15	0.740	660	100	0.450	500	0.300	80	12
		48	7.5	1.200	1,100	200	0.800	500	0.610	65	12
	L	24	15	1.400	690	100	1.150	500	0.500	50	12
PM35	S	24	15	3.000	490	100	1.900	400	1.050	30	12
		48	7.5	4.200	710	100	2.900	400	1.750	30	12
	L	24	15	5.500	455	100	3.150	300	2.300	20	12
		48	7.5	5.800	650	100	4.700	300	3.200	20	12
PM42	S	100	3.6	4.400	750	100	4.000	600	2.100	15	12
		96	3.75	4.500	730	100	4.100	600	2.100	15	12
		48	7.5	6.800	640	100	4.900	300	3.550	15	12
	L	48	7.5	11.000	550	100	8.200	300	5.300	10	12
PM55	L	100	3.6	15.000	440	100	9.800	300	5.700	10	12
		96	3.75	16.000	430	100	10.000	300	5.700	10	12
		48	7.5	18.000	370	100	11.000	200	8.500	10	12

Above torque performance are typical values and subject to change in accordance to customers requirements.
Motor Size S = Short, L = Long

Product Code **PM 42 S - 048 - XXXX**

- Motor Series
- Motor Diameter
- Motor Size S or L
- Steps / Revolution
- Modification Code

Standard Motor Dimensions

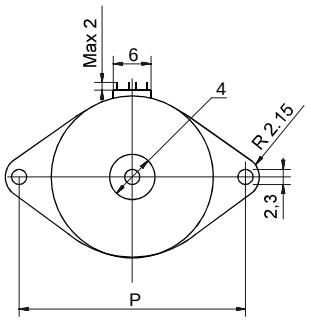
NMB Type	D	L	d_2	a	C_1	C_2	C_3	W_1 Min.	Weight	Wire	UL
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g]	[AWG]	
PM10S	10	10.2	6.0	1.2	-	6.0	-	-	8	①	-
PM15S	15	12.0	6.0	0.5	-	6.0	-	-	9	②	-
PM20S	20	15.5	6.0	1.5	11.0	7.6	4.4	70	20	28	1061
PM20L	20	19.6	6.0	1.5	11.0	7.6	4.4	70	30	28	1061
PM25S	25	12.5	7.0	1.5	11.0	7.6	4.4	70	29	28	1061
PM25L	25	17.0	7.0	1.5	11.0	7.6	4.4	70	35	28	1061
PM35S	35	15.5	10.0	1.5	13.0	13.0	5.0	70	75	26	1007
PM35L	35	22.2	10.0	1.5	13.0	13.0	5.0	70	110	26	1007
PM42S	42	15.5	10.0	1.5	13.0	13.0	5.0	70	95	26	1007
PM42L	42	22.2	10.0	1.5	13.0	13.0	5.0	70	130	26	1007
PM55L	55	26.2	11.0	1.5	13.0	13.0	5.0	70	260	26	1007
	55	26.2	③ 13.0	2.3	13.0	13.0	5.0	70	260	26	1007

Remarks:
① PM10S is available only with pin
② PM15S is available only with FPC
③ PM55L with shaft 6.35 mm

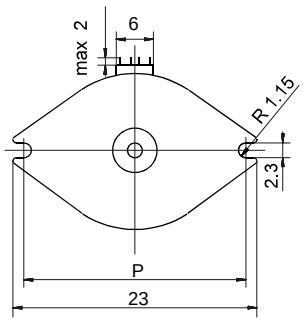
Standard Shaft Dimensions

NMB Type	d_1	l_2	Standard Shaft Length l_1 [mm]																				
	[mm]	[mm]	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	11	12	13	14	15	16	18	20	22	24
PM10S	1.5	1.0	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱										
PM15S	1.5	1.0	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱										
PM20S	1.5	1.0	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱										
PM20L	1.5	1.0	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱										
PM25S	2.0	1.0			✱	✱	✱	✱	✱	✱	✱	✱	✱										
PM25L	2.0	1.0			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱					
PM35S	2.0	1.0					✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱					
	3.0	1.0					✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱					
PM35L	2.0	1.0					✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱					
	3.0	1.0					✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱					
PM42S	3.0	1.0					✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱			
PM42L	3.0	1.0					✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱			
PM55L	4.0	1.0											✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
	6.35	1.0											✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱

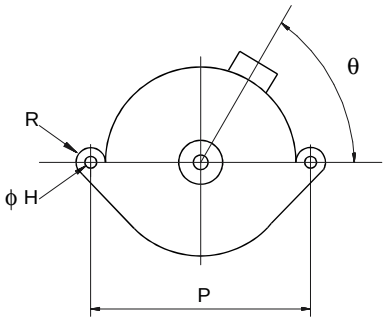
Other shaft dimensions on customer request.



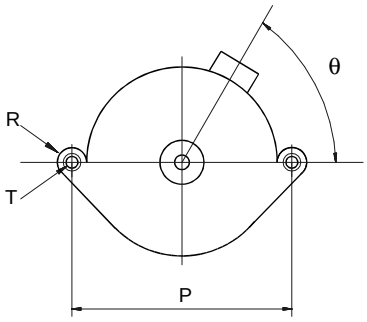
FP10



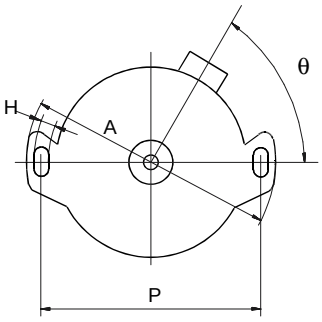
FP15



FPH



FPT

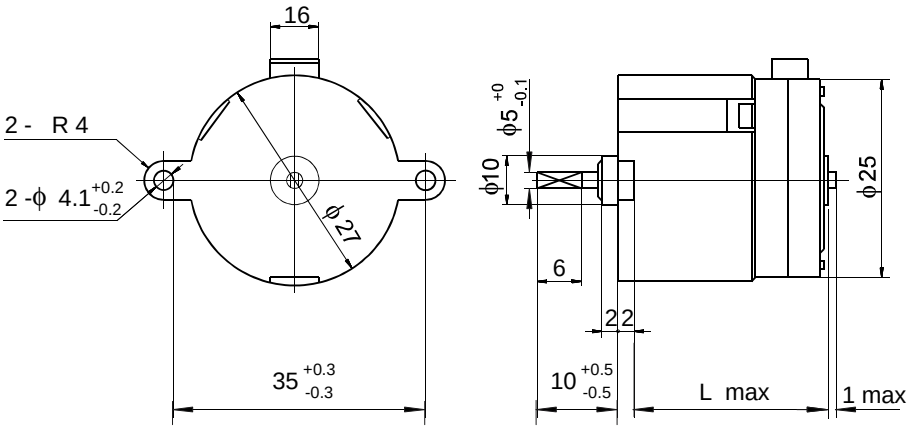


FPL

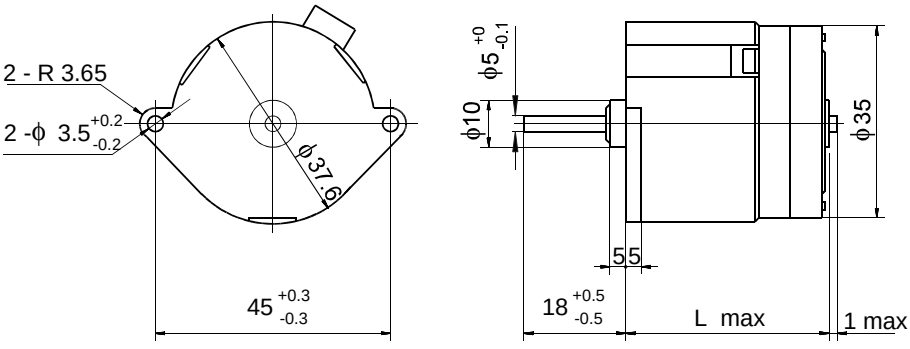
Standard Front Plate Dimensions

NMB Type	Frontplate Type	Angle of Attachment θ [Deg]									P	H	T	R	A
		30	45	60	75	90	105	120	135	150	[mm]	[mm]		[mm]	[mm]
PM10	PM10					✸					15.0	2.3	-	2.15	-
PM15	PM15					✸					20.0	2.3	-	1.15	-
PM20	FPH	✸				✸				✸	28.0	2.3	-	3.0	-
			✸	✸	✸		✸	✸	✸		25.0	2.3	-	3.0	-
	FPT	✸				✸				✸	28.0	-	M2	3.0	-
			✸	✸	✸		✸	✸	✸		25.0	-	M2	3.0	-
	FPL		✸	✸	✸	✸	✸	✸	✸		25.0	2.3	-	-	31.0
PM25	FPH	✸	✸	✸	✸	✸	✸	✸	✸	✸	32.0	3.0	-	3.3	-
	FPT	✸	✸	✸	✸	✸	✸	✸	✸	✸	32.0	-	M2.6	3.3	-
	FPL		✸	✸	✸	✸	✸	✸	✸		32.0	3.0	-	-	38.6
PM35	FPH	✸	✸	✸	✸	✸	✸	✸	✸	✸	42.0	3.2	-	3.5	-
	FPT	✸	✸	✸	✸	✸	✸	✸	✸	✸	42.0	-	M3	3.5	-
	FPL		✸	✸	✸	✸	✸	✸	✸		42.0	3.2	-	-	49.0
PM42	FPH	✸	✸	✸	✸	✸	✸	✸	✸	✸	49.5	3.5	-	3.75	-
	FPT	✸	✸	✸	✸	✸	✸	✸	✸	✸	49.5	-	M3	3.75	-
	FPL		✸	✸	✸	✸	✸	✸	✸		49.5	3.5	-	-	57.0
PM55	FPH	✸	✸	✸	✸	✸	✸	✸	✸	✸	65.0	3.5	-	5.0	-
		✸	✸	✸	✸	✸	✸	✸	✸	✸	66.7	4.3	-	5.0	-
	FPT	✸	✸	✸	✸	✸	✸	✸	✸	✸	65.0	-	M3	5.0	-
		✸	✸	✸	✸	✸	✸	✸	✸	✸	66.7	-	M3	5.0	-
	FPL		✸	✸	✸	✸	✸	✸	✸		65.0	3.5	-	-	75.0

Other front plate dimensions on customer request. Dimensions marked with (-) not applicable.



NMB Type	Motor Size	No. of Steps per Revolution	Drive Method	Gear Ratio	Resolution per Step	Torque on Shaft	Rated Current per Phase	Voltage per Phase	Resistance per Phase	L
					[Deg]	[Ncm]	[A]	[V]	[Ω]	[mm]
PG25	S	48	Unipolar	32.2	0.2329	10	0.06	12	200	24.5
		48	Unipolar	81.2	0.0923	25	0.06	12	200	24.5
		48	Unipolar	253.0	0.0296	60	0.06	12	200	24.5
	L	48	Unipolar	32.2	0.4658	15	0.11	12	110	29.0
		48	Unipolar	81.2	0.1847	35	0.11	12	110	29.0



NMB Type	Motor Size	No. of Steps per Revolution	Drive Method	Gear Ratio	Resolution per Step	Torque on Shaft	Rated Current per Phase	Voltage per Phase	Resistance per Phase	L
					[Deg]	[Ncm]	[A]	[V]	[Ω]	[mm]
PG35	S	48	Unipolar	38.1	0.1968	35	0.17	12	70	38.5
		48	Unipolar	96.0	0.0781	80	0.17	12	70	38.5
		48	Unipolar	298.6	0.0251	200	0.17	12	70	38.5
	L	48	Unipolar	38.1	0.1968	70	0.20	12	60	46.0
		48	Unipolar	96.0	0.0781	150	0.20	12	60	46.0

Torque conversion factors

	Nm	Ncm	dyn cm	kgm	kgcm	gcm	oz in
Nm	1	10^{2}	10^{7}	0.1019716	10.19716	$1.019716\text{-}10^{4}$	$1.41612\text{-}10^{2}$
Ncm	10^{-2}	1	10^{5}	10.19716	0.1019716	$1.019716\text{-}10^{2}$	1.41612
dyn cm	10^{-7}	10^{-5}	1	$1.019716\text{-}10^{-8}$	$1.019716\text{-}10^{-6}$	$1.019716\text{-}10^{-3}$	$1.41612\text{-}10^{-5}$
kgm	9.80665	$9.80665\text{-}10^{2}$	$9.80665\text{-}10^{7}$	1	10^{2}	10^{5}	$1.38874\text{-}10^{3}$
kgcm	$9.80665\text{-}10^{-2}$	9.80665	$9.80665\text{-}10^{5}$	10^{-2}	1	10^{3}	13.8874
gcm	$9.80665\text{-}10^{-5}$	$9.80665\text{-}10^{-3}$	$9.80665\text{-}10^{2}$	10^{-5}	10^{-3}	1	$1.38874\text{-}10^{-2}$
oz in	$7.06155\text{-}10^{-3}$	0.706155	$7.06155\text{-}10^{4}$	$7.20077\text{-}10^{-4}$	$7.20077\text{-}10^{-2}$	72.0077	1

Moment of inertia conversion factors

	kgm²	kgcm²	gcm²	kgm s²	kgcm s²	gcm s²	oz in²	oz in s²
kgm²	1	10^{4}	10^{7}	0,101972	10,1972	$1,01972\text{-}10^{4}$	$5,46745\text{-}10^{4}$	$1,41612\text{-}10^{2}$
kgcm²	10^{-4}	1	10^{3}	$1,01972\text{-}10^{-5}$	$1,01972\text{-}10^{-3}$	1,01972	5,46745	$1,41612\text{-}10^{-2}$
gcm²	10^{-7}	10^{-3}	1	$1,01972\text{-}10^{-8}$	$1,01972\text{-}10^{-6}$	$1,01972\text{-}10^{-3}$	$5,46745\text{-}10^{-3}$	$1,41612\text{-}10^{-5}$
kgm s²	9,80665	$9,80665\text{-}10^{-4}$	$9,80665\text{-}10^{-7}$	1	10^{2}	10^{5}	$5,36174\text{-}10^{5}$	$1,38874\text{-}10^{3}$
kgcm s²	$9,80665\text{-}10^{-2}$	$9,80665\text{-}10^{2}$	$9,80665\text{-}10^{5}$	10	1	10^{3}	$5,36174\text{-}10^{3}$	13,8874
gcm s²	$9,80665\text{-}10^{-5}$	0,980665	$9,80665\text{-}10^{2}$	10^{-5}	10^{-3}	1	5,36174	$1,38874\text{-}10^{-2}$
oz in²	$1,82901\text{-}10^{-5}$	0,182901	$1,82901\text{-}10^{2}$	$1,86506\text{-}10^{-6}$	$1,86506\text{-}10^{-4}$	0,186506	1	$2,59008\text{-}10^{-3}$
oz in s²	$7,06154\text{-}10^{-3}$	70,6154	$7,06154\text{-}10^{4}$	$7,20077\text{-}10^{-4}$	$7,20077\text{-}10^{-2}$	72,00766	$3,86089\text{-}10^{2}$	1

Motor selection usually begins with determining the required torque. Since step motors run open loop, you need to know beforehand what is the maximum torque required.

During any duty cycle, the load torque varies. Usually, the highest torque requirement is in accelerating the load from at rest to a set speed.

The following variables must be ascertained to determine the torque required to accelerate a load:

- Motor Speed (pps) accelerating from
- Motor Speed (pps) accelerating to
- Rotor Inertia (gcm²)
- Rotor Inertia < 1/10 Load Inertia
- Step Angle (degrees)

The acceleration component of the load, plus frictional loads, can be calculated as follows:

$$T_a = \alpha \times J + T_f$$

Where:

T_a = Torque required to accelerate [Ncm]

α = Angular acceleration [rad/sec²]

J = Total Inertia [gcm²]

T_f = Friction Torque [Ncm]

Total Inertia will include both load inertia and rotor inertia. Acceleration must be converted from radians per second to steps per second.

Converting for these factors we get:

$$T_a = T_f + \frac{(J_m + J_l) \times (f_2 - f_1) \times \pi \times \theta}{\Delta t \times 10^5 \times 180°}$$

Where:

J_m = Motor rotor inertia [gcm²]

J_l = Load inertia [gcm²]

f_2 = Ending frequency (high) [pps]

f_1 = Starting frequency (low) [pps]

θ = Step angle [degrees]

Δt = Time for acceleration [sec]

In case the motor will be driven in start/stop condition, Δt will be $1/f_2$.

Example:

1.) What is the required motor pull in torque T_a, start/stop condition, to accelerate an inertial load of 350 gcm² from $f_1 = 0$ to $f_2 = 200$ pps ?

2.) What is the required motor pull out torque T_a to accelerate this inertia from $f_1 = 200$ to $f_2 = 1000$ pps during 100 msec ?

Frictional load T_f is 0 Ncm.
The step angle θ is 1.8°.

Based on experience (rotor inertia < 0.1 x load inertia) we assume a motor with a rotor inertia J_m less than 35 gcm² and select the motor 17PM-K0xx type with a rotor inertia of 34 gcm².

Calculation of Pull In Torque:

$$T_a = \frac{(350 + 34) \times 200 \times \pi \times 1.8°}{0.005 \times 10^5 \times 180°}$$

T_a = 4.83 Ncm

Calculation of Pull Out Torque:

$$T_a = \frac{(350 + 34) \times (1000-200) \times \pi \times 1.8°}{0.1 \times 10^5 \times 180°}$$

T_a = 0.97 Ncm

Safety Margin:

As a safety margin, an additional torque from 50% to 100% is recommended, in case of load variance or worn parts. The total torque demand is as follow:

Pull In Torque	9.66 Ncm at 200 pps
Pull Out Torque	1.93 Ncm at 1000 pps

Improvements:

Comparing the torque graphs of the motors shown in this catalogue you will see that type 17PM-K008V will fulfil all requirements and give you enough margin for further dynamic improvements in your application.

If you need further improvements (smaller mechanical dimensions), then recalculate the above formulas with a rotor inertia of a smaller motor for example the 17PM-K2xx type with a rotor intertia of 28 gcm².

You will see, that this motor type will also achieve all requirements, depending on the safety margin used.

FAX TO: + 49 - (0) - 6103 913 220		**ATTN: Engineering Dept. Rotary Component Division**	
CUSTOMER		CONTACT	
ADDRESS		TELEPHONE	
ENDUSER		FAX	
PROJECT NO.		PROJECT NAME	
CUSTOMER PART NUMBER		NMB PARTNUMBER	
COMMERCIAL INFORMATION			
SAMPLE QTY		COMPETITOR	
SAMPLE PRICE		PART NO.	
ANNUAL QTY		APPLICATION	
TARGET PRICE		APPLICATION DETAILS	
TIME SCHEDULE			

TECHNICAL SPECIFICATION					
STEP ANGLE			HOLDING TORQUE		
DYNAMIC TORQUE			AT OPERATING FREQUENCY		
WINDING RESISTANCE			CURRENT / PHASE		
WINDING INDUCTANCE			VOLTAGE / PHASE		
PHASE ON METHOD	FULL STEP		TYPE OF WINDING	UNIPOLAR	
	HALF STEP			BIPOLAR	
	MICRO STEP				
DRIVING METHOD	CONSTANT VOLTAGE		VOLTAGE ON DRIVER IC		
	CONSTANT CURRENT				
NUMBER OF WIRES			4	6	8
MECHANICAL DIMENSIONS					
MOTOR DIAMETER			SHAFT DIAMETER		
MOTOR LENGTH			SHAFT LENGTH		
PM MOTOR ONLY					
ANGLE OF LEAD WIRES					
FRONTPLATE			FPH	FPT	FPL

SPECIAL REQUIREMENTS