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MOONS'
moving in better ways

- All specifications and technical parameters of the products provided in this catalog are for reference only, and are subject to change without notice. For details, please contact our sales team.

PM STEP MOTORS



MOONS'
moving in better ways

PM STEP MOTORS

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Product List

Product Line Up

Series	Outer Diameter (mm)	Length (mm)	Step No.	Step Angle (°)
8PM020S	8	8.5	20	18
10PM020S	10	8.5	20	18
15PM020S	15	11.4	20	18
15PM020D	15	20.1	20	18
20PM020S	20	14.3	20	18
20PM020L	20	19.3	20	18
25PM024S	25	12.5	24	15
25PM048S	25	12.5	48	7.5
25PM024L	25	17.0	24	15
25PM048L	25	17.0	48	7.5
28PN024L	28	15.0	24	15
35PM024S	35	15.3	24	15
35PM048S	35	15.3	48	7.5
35PM024L	35	21.3	24	15
35PM048L	35	21.3	48	7.5
42PM048S	42	15.3	48	7.5
42PM096S	42	15.3	96	3.75
42PM048L	42	21.3	48	7.5
42PM096L	42	21.3	96	3.75
Series	Outer Diameter (mm)	Shaft Stroke (mm)	Step No.	Step Travel (mm)
20LN024M	20	20	24	0.0254
20LN024L	20	12.5	24	0.0254
25LN024L	25	20	24	0.0508
25LN024S	25	13	24	0.0254
28LN024L	28	13	24	0.0420
35LN024L	35	36	24	0.0333
35LN024L	35	12	24	0.0333

Model Numbering System

42 PM 048 L 1 - 003 02

Base frame code

Outer diameter size: 42mm diameter = 42

Motor type code

PM: permanent magnet step motor

LN: permanent magnet linear step motor

Step code

020: 20 steps per rotation, 18° step angle

024: 24 steps per rotation, 15° step angle

048: 48 steps per rotation, 7.5° step angle

096: 96 steps per rotation, 3.75° step angle

Length code

S: short version

M: middle version

L: long version

Magnet grade code

Resistance code

Winding resistance: 30hm = 003

Mechanical code

Product
Overview

Rotary
Motors

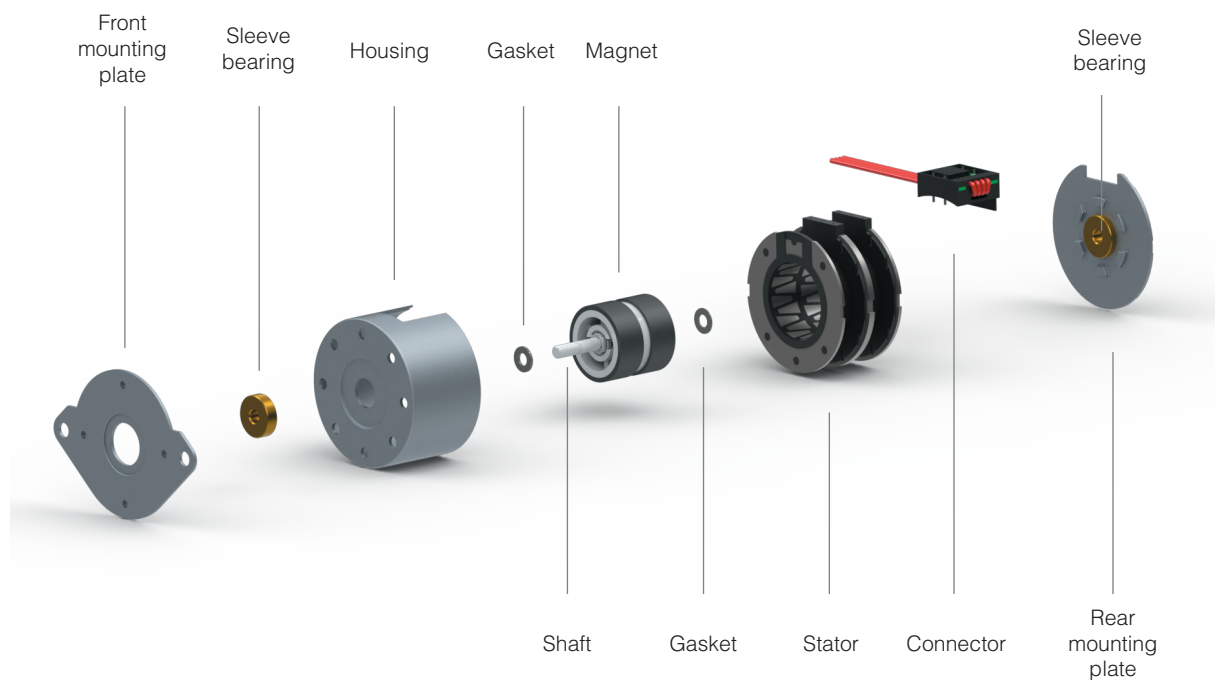
Linear
Actuators

Gearmotors

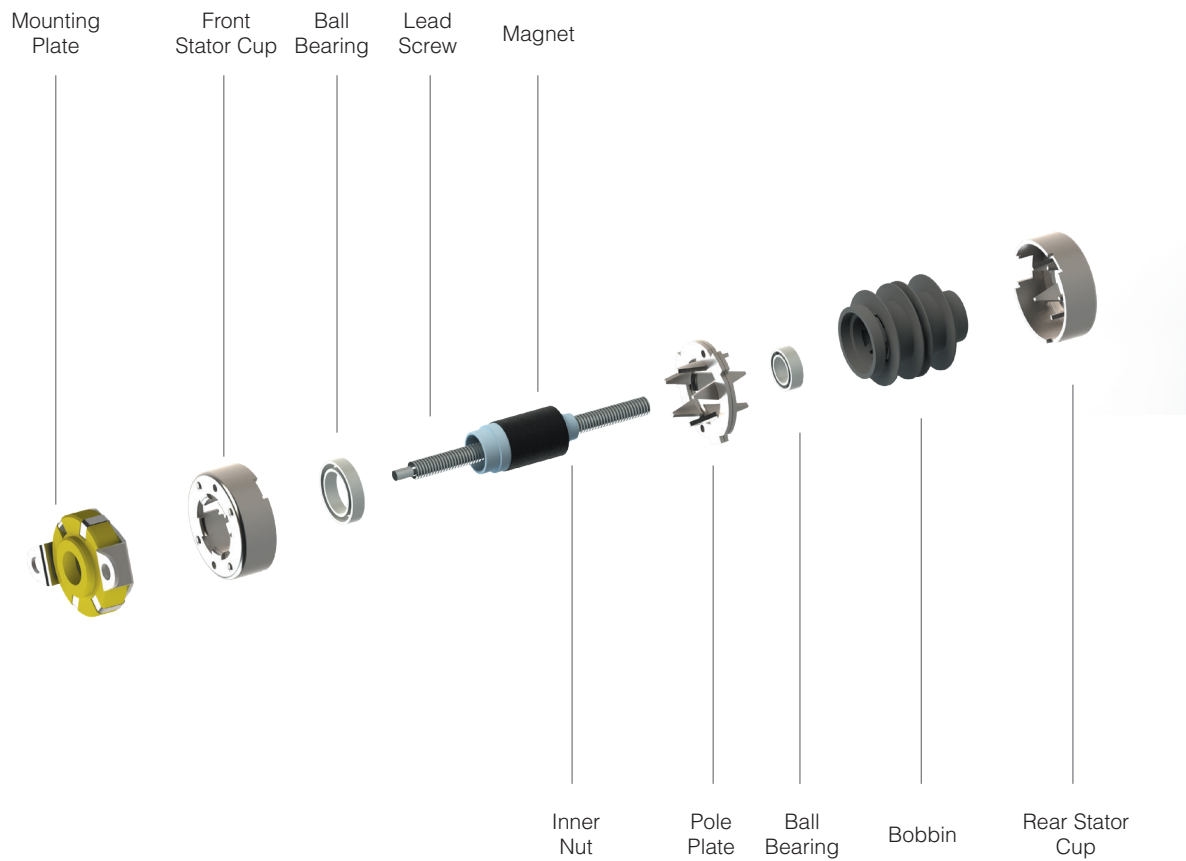
Technical

Structure

Rotary Motors

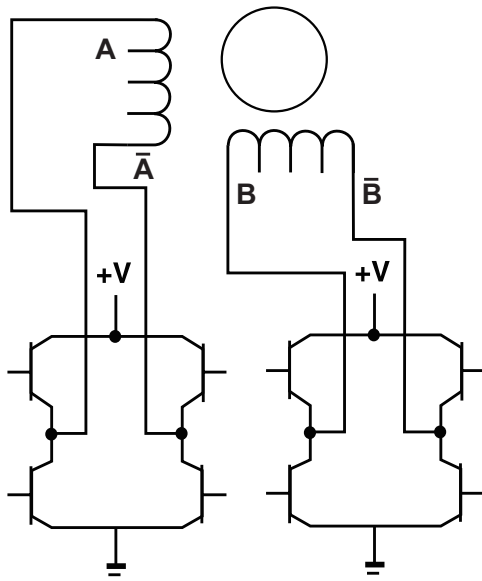


Linear Actuators



Operating Principles

Schematic Diagrams



Step Sequence

CONNECTOR PIN LOCATION							
PIN NO.	COLOR	CCW ← → CW (SEEN FROM FLANGE SIDE)				PHASE	
1	BLACK	ON	ON			ON	A
2	YELLOW			ON	ON		$\bar{A}$
3	ORANGE		ON	ON			B
4	BROWN	ON			ON	ON	$\bar{B}$

Operating Principles

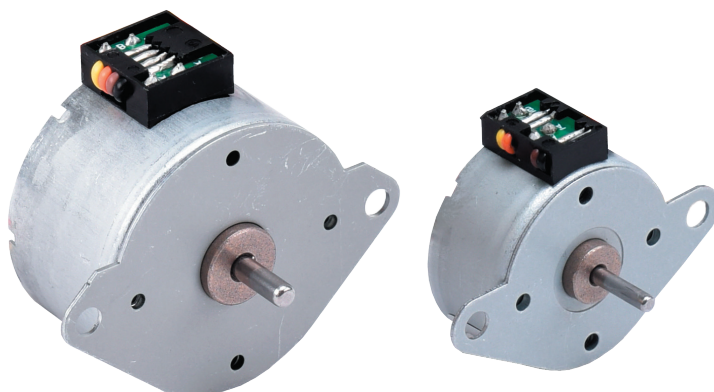
In response to each individual control pulse and direction signal, the drive applies power to the motor windings to cause the rotor to take a step forward, a step in reverse, or hold in position.

For example, in a 7.5 degree two phase step motor: When both phases are energized with DC current, the motor will stop rotating and hold in position. The maximum torque the motor can hold in place with rated DC current, is the rated holding torque. If the current in one phase is reversed, the motor will move 1 step (7.5 degrees) in a known direction. If the current in the other phase had been reversed, the motor would move 1 step (7.5 degrees) in the other direction. As current is reversed in each phase in sequence, the motor continues to step in the desired direction. These steps are very accurate. For a 7.5 degree step motor, there are exactly 48 steps in one revolution.

Two phase stepping motors are furnished with two types of windings: bipolar or unipolar. In a bipolar motor there is one winding on each phase. The motor moves in steps as the current in each winding is reversed. This requires a drive with eight electronic switches. In a unipolar motor there are two windings on each phase. The two windings on each phase are connected in opposite directions. Phase current is reversed by turning on alternate windings on the same phase. This requires a drive with only four electronic switches. Bipolar operation typically provides 40% more holding torque than unipolar, because 100% of the winding is energized in the bipolar arrangement.

Rotary Motors

- Ø8mm
- Ø10mm
- Ø15mm
- Ø20mm
- Ø25mm
- Ø28mm
- Ø35mm
- Ø42mm



8PM020S - Ø8mm, S, 18°



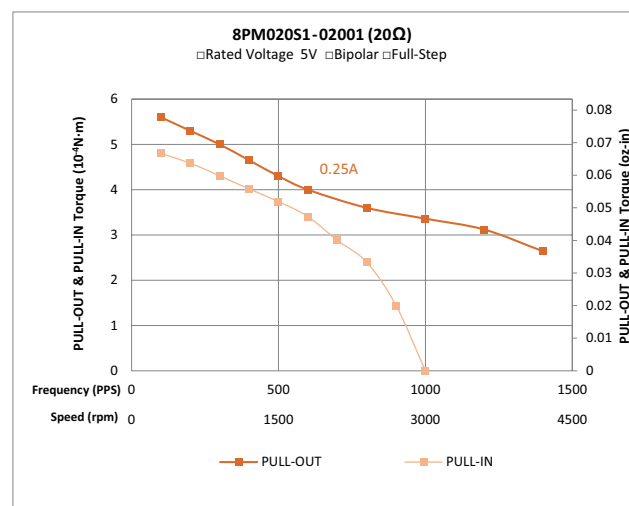
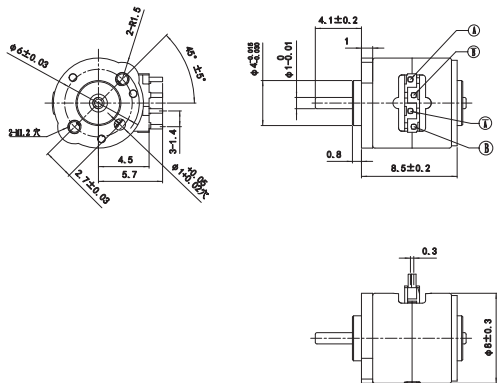
- Phases 2
- Steps / Revolution 18°
- Shaft Load
 - Radial 0.2N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class E, 120°C
- Insulation Resistance 50 MegOhms

Motor Data

Model Number			8PM020S1-02001
Length			8.5mm (0.33in.)
Step Angle	°		18
Rated Voltage	V		5
Holding Torque	10 ⁻⁴ Nm	Typ.	4
	oz-in	Typ.	0.06
Coil Resistance	Ohms	±10% @ 20°C	20
Coil Inductance	mH	Typ.	2.8
Detent Torque	10 ⁻⁴ Nm	Max.	1.5
	oz-in	Max.	0.02
Rotor Inertia	gcm ²		0.1
	10 ⁻⁴ oz-in ²		5.5
Motor Weight	g		2.2
	Lbs		0.005

^ Preferred model

Dimensions: mm



8PM020S - Ø8mm, S, 18°



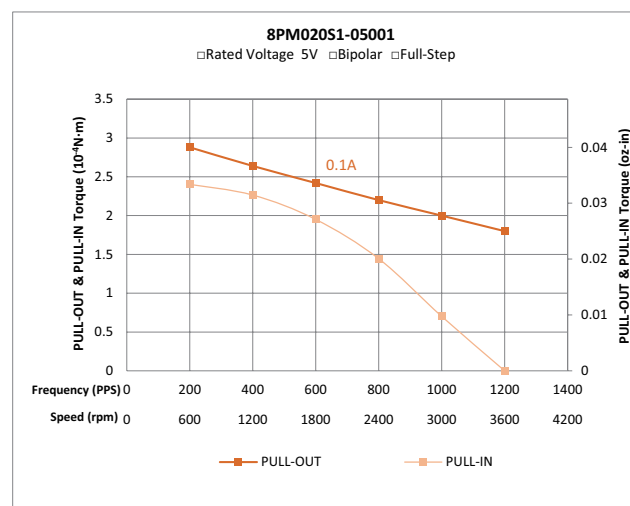
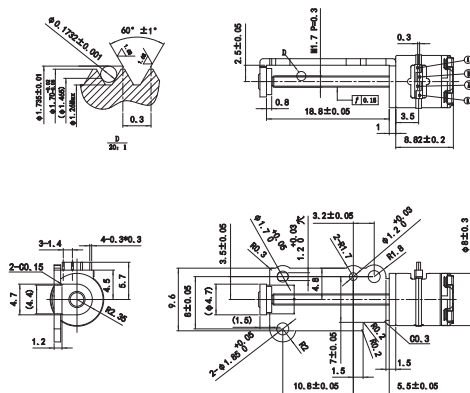
- Phases 2
- Steps / Revolution 18°
- Shaft Load
 - Radial 0.2N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class E, 120°C
- Insulation Resistance 50 MegOhms

Motor Data

Model Number			8PM020S1-05001
Length			8.82 (0.35in.)
Step Angle	°		18
Rated Voltage	V		5
Holding Torque	10 ⁻⁴ Nm	Typ.	4
	oz-in	Typ.	0.06
Coil Resistance	Ohms	±10% @ 20°C	50
Coil Inductance	mH	Typ.	18.2
Detent Torque	10 ⁻⁴ Nm	Max.	1.5
	oz-in	Max.	0.02
Rotor Inertia	gcm ²		0.1
	10 ⁻⁴ oz-in ²		5.5
Motor Weight	g		4
	Lbs		0.009

^ Preferred model

Dimensions: mm



Product
Overview

Rotary
Motors

Linear
Actuators

Gearmotors

Technical

10PM020S - Ø10mm, S, 18°



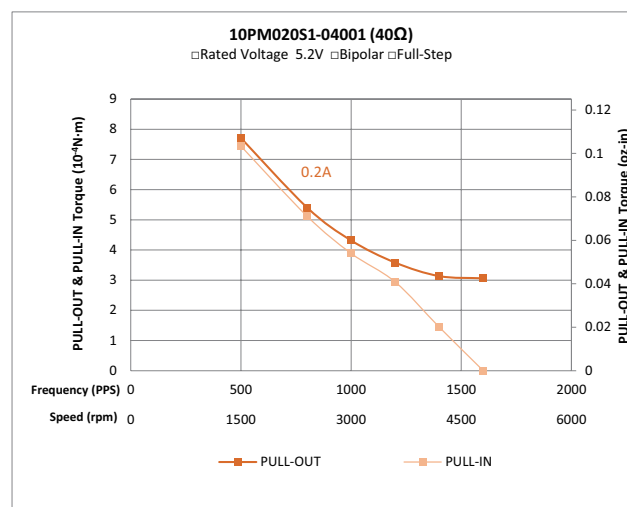
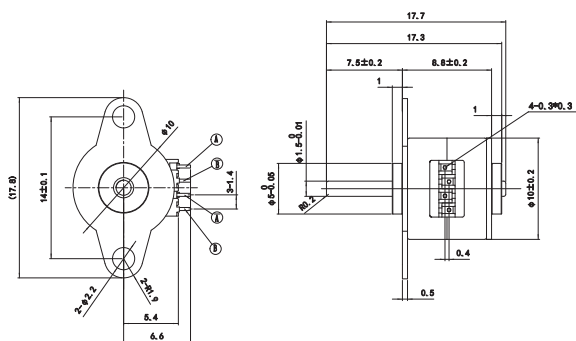
- Phases 2
- Steps / Revolution 18°
- Shaft Load
 - Radial 1.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class E, 120°C
- Insulation Resistance 50 MegOhms

Motor Data

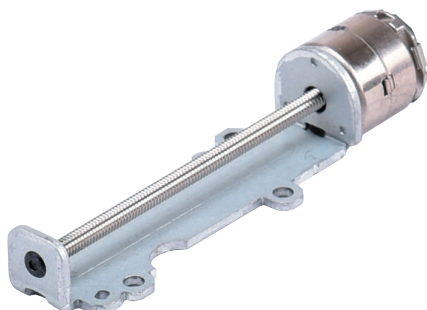
Model Number			10PM020S1-04001
Length			8.8mm (0.35in.)
Step Angle	°		18
Rated Voltage	V		5.2
Holding Torque	10 ⁻⁴ Nm	Typ.	5
	oz-in	Typ.	0.07
Coil Resistance	Ohms	±10% @ 20°C	40
Coil Inductance	mH	Typ.	5.6
Detent Torque	10 ⁻⁴ Nm	Max.	2
	oz-in	Max.	0.03
Rotor Inertia	gcm ²		0.3
	10 ⁻⁴ oz-in ²		16.4
Motor Weight	g		4
	Lbs		0.009

^ Preferred model

Dimensions: mm



10PM020S - Ø10mm, S, 18°



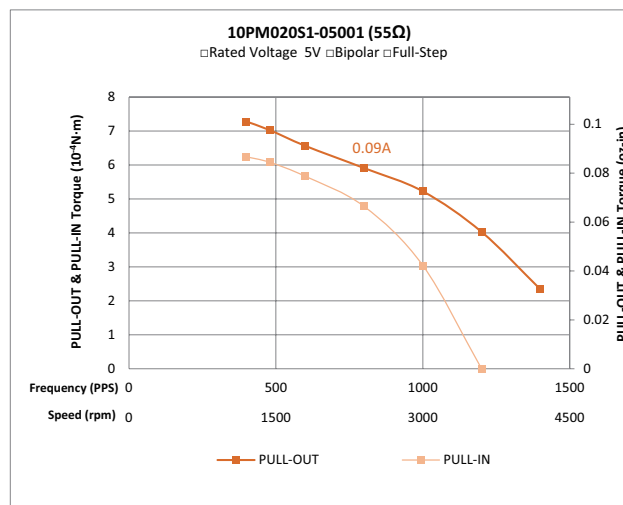
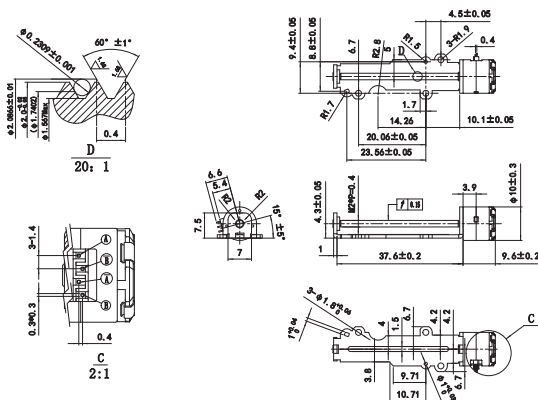
- Phases 2
- Steps / Revolution 18°
- Shaft Load
 - Radial 0.2N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class E, 120°C
- Insulation Resistance 50 MegOhms

Motor Data

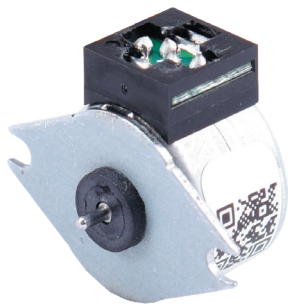
Model Number			10PM020S1-05001
Length			9.6 (0.38in.)
Step Angle	°		18
Rated Voltage	V		5
Holding Torque	10 ⁻⁴ Nm	Typ.	6
	oz-in	Typ.	0.08
Coil Resistance	Ohms	±10% @ 20°C	55
Coil Inductance	mH	Typ.	7.2
Detent Torque	10 ⁻⁴ Nm	Max.	2.5
	oz-in	Max.	0.03
Rotor Inertia	gcm ²		0.3
	10 ⁻⁴ oz-in ²		16.4
Motor Weight	g		8
	Lbs		0.018

^ Preferred model

Dimensions: mm



15PM020S - Ø15mm, S, 18°



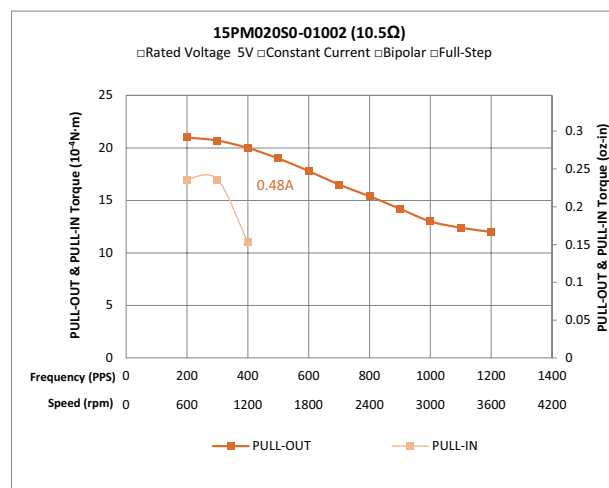
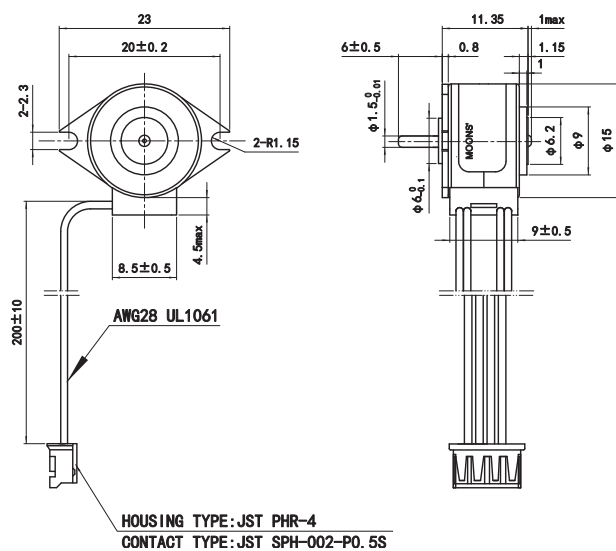
- Phases 2
- Steps / Revolution 20(18°)
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

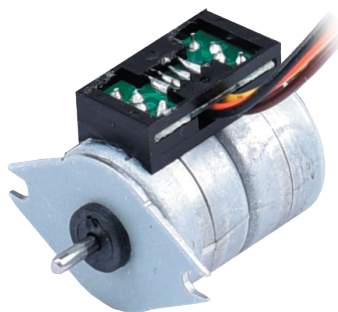
Model Number			15PM020S0-01002
Length			11.35mm (0.45in.)
Step Angle	°		18
Rated Current	Amps		0.48
Holding Torque	10 ⁻⁴ Nm	Typ.	36
	oz-in	Typ.	0.5
Coil Resistance	Ohms	±10% @ 20°C	10.5
Coil Inductance	mH	Typ.	2.8
Detent Torque	10 ⁻⁴ Nm	Max.	13
	oz-in	Max.	0.18
Rotor Inertia	gcm ²		0.039
	10 ⁻⁴ oz-in ²		2.1
Motor Weight	g		9
	Lbs		0.02

^ Preferred model

Dimensions: mm



15PM020D - Ø15mm, S, 18°



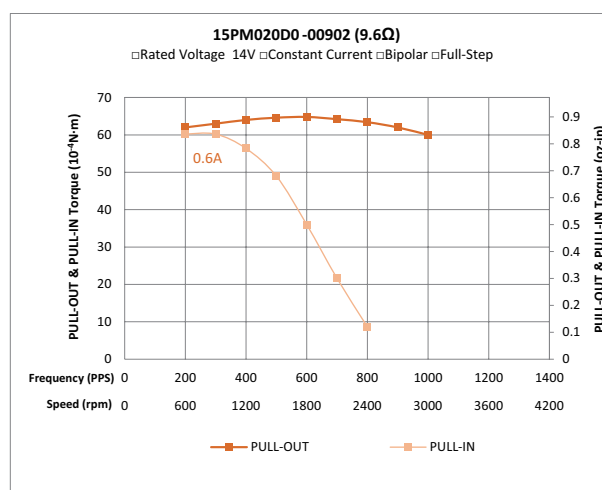
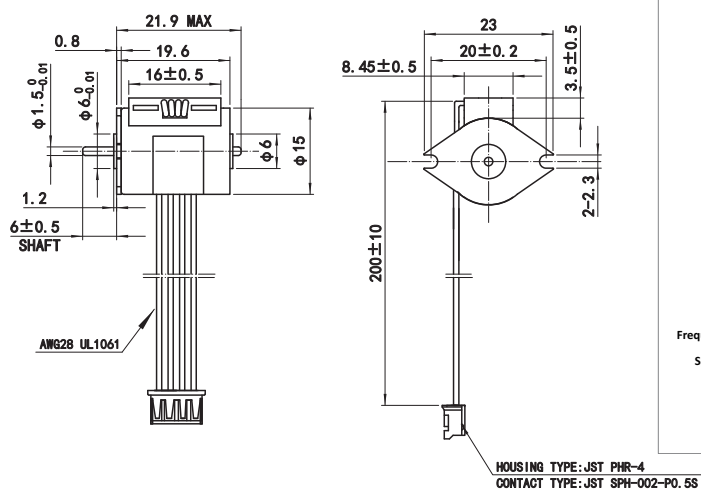
- Phases 2
- Steps / Revolution 20(18°)
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

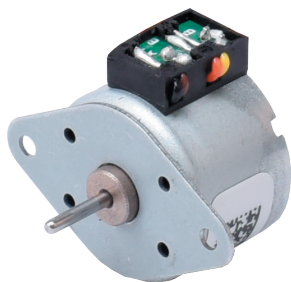
Model Number			15PM020D0-00902
Length			19.6mm (0.79in.)
Step Angle	°		18
Rated Current	Amps		0.6
Holding Torque	10 ⁻⁴ Nm	Typ.	72
	oz-in	Typ.	1.0
Coil Resistance	Ohms	±10% @ 20°C	9.6
Coil Inductance	mH	Typ.	2.65
Detent Torque	10 ⁻⁴ Nm	Max.	14
	oz-in	Max.	0.19
Rotor Inertia	gcm ²		0.072
	10 ⁻⁴ oz-in ²		3.9
Motor Weight	g		18
	Lbs		0.04

^ Preferred model

Dimensions: mm



20PM020S - Ø20mm, S, 18°



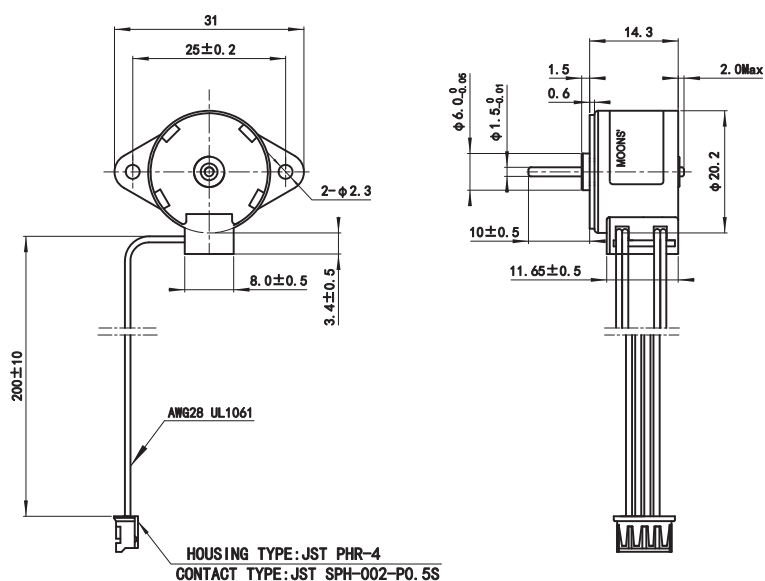
- Phases 2
- Steps / Revolution 20(18°)
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

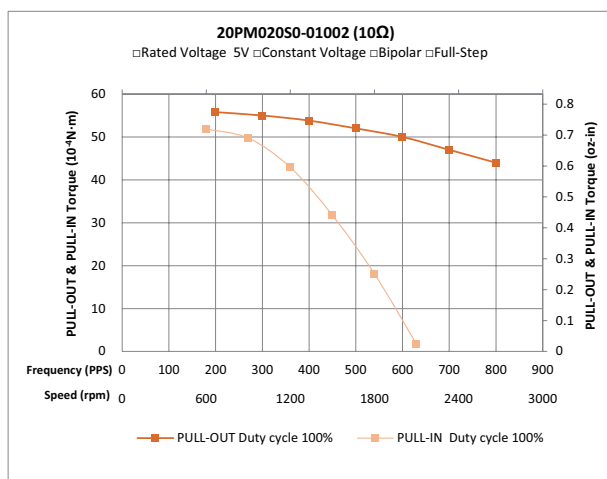
Model Number			20PM020S0-01002	20PM020S0-02501
Length			14.3mm (0.56in.)	
Step Angle	°		18	
Rated Current	Amps		0.33	0.21
Holding Torque	10 ⁻⁴ Nm	Typ.	85	85
	oz-in	Typ.	1.18	1.18
Coil Resistance	Ohms	±10% @ 20°C	10.3	25
Coil Inductance	mH	Typ.	5.1	11.7
Detent Torque	10 ⁻⁴ Nm	Max.	18	18
	oz-in	Max.	0.25	0.25
Rotor Inertia	gcm ²		0.25	0.25
	10 ⁻⁴ oz-in ²		13.7	13.7
Motor Weight	g		21	
	Lbs		0.046	

^ Preferred model

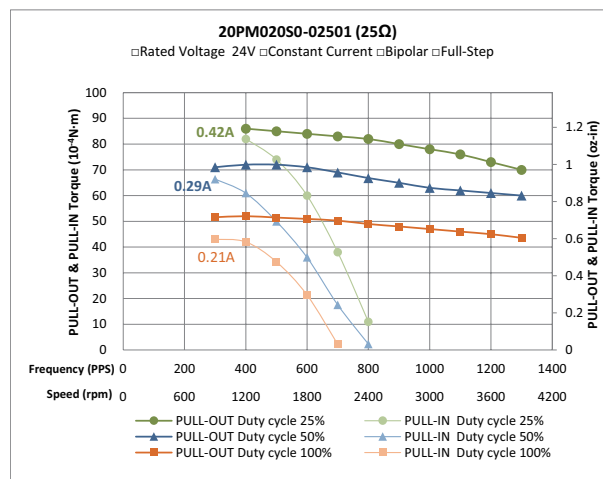
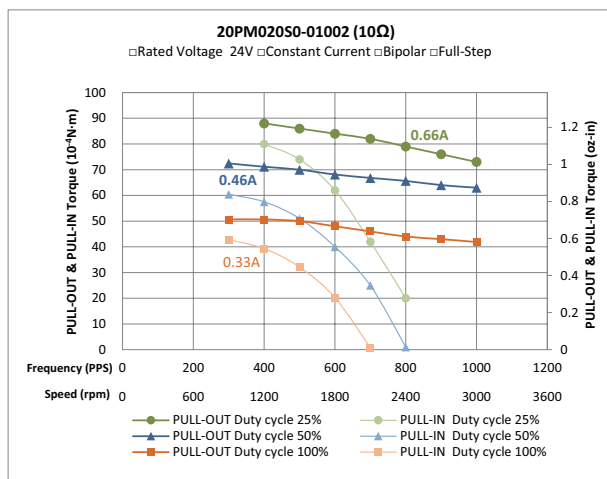
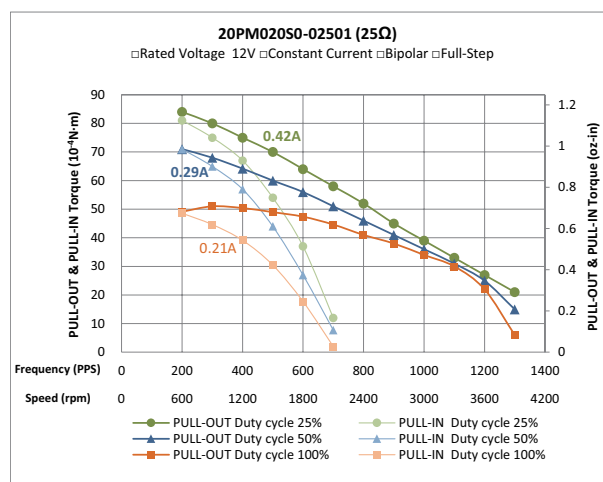
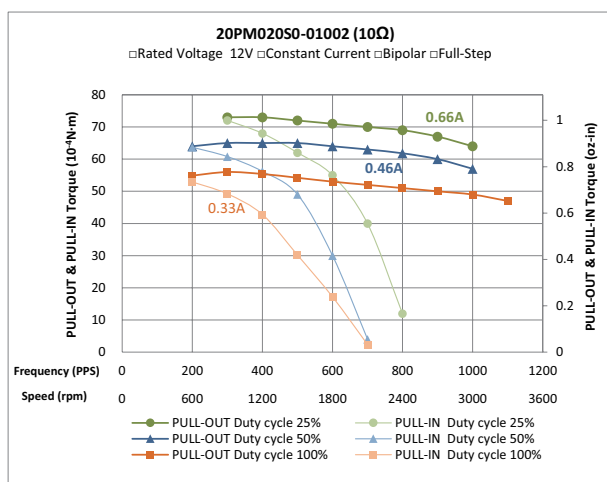
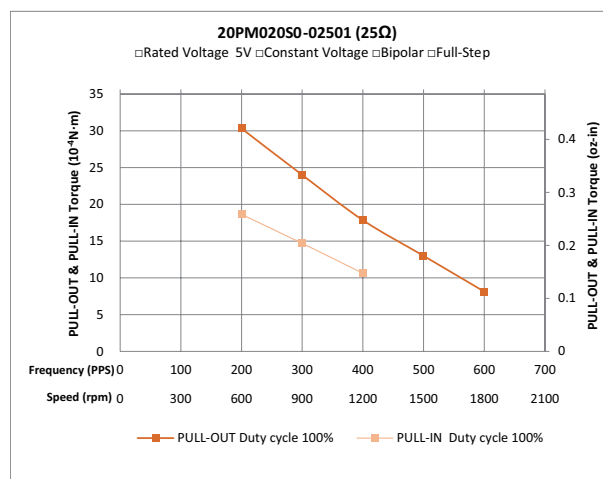
Dimensions: mm



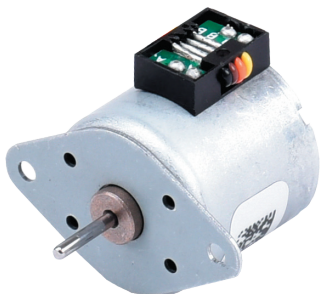
20PM020S0-01002



20PM020S0-02501



20PM020L - Ø20mm, L, 18°



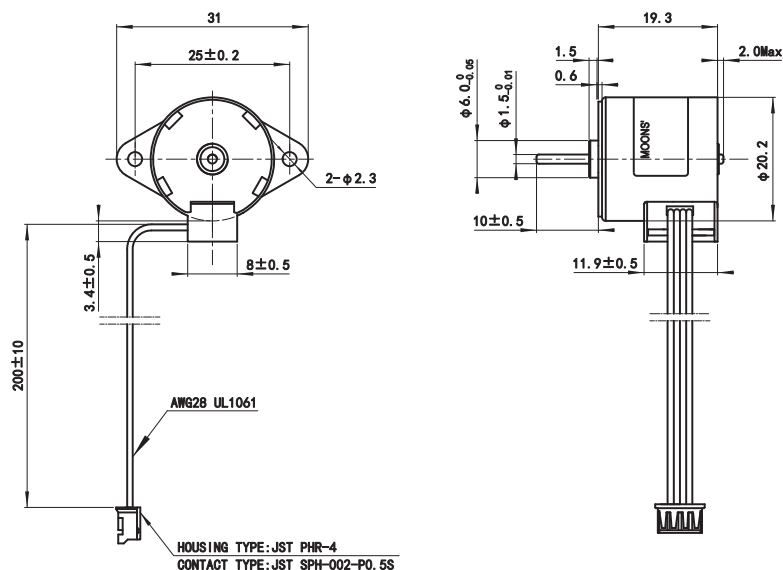
- Phases 2
- Steps / Revolution 20(18°)
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

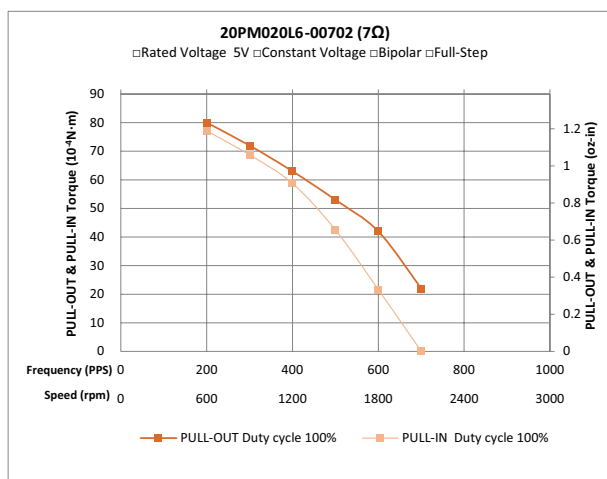
Model Number			20PM020L6-00702	20PM020L6-02101
Length			19.3mm (0.76in.)	
Step Angle	°		18	
Rated Current	Amps		0.43	0.25
Holding Torque	10 ⁻⁴ Nm	Typ.	120	120
	oz-in	Typ.	1.67	1.67
Coil Resistance	Ohms	±10% @ 20°C	7	21.5
Coil Inductance	mH	Typ.	5.6	16.5
Detent Torque	10 ⁻⁴ Nm	Max.	25	25
	oz-in	Max.	0.35	0.35
Rotor Inertia	gcm ²		0.41	0.41
	10 ⁻⁴ oz-in ²		22.4	22.4
Motor Weight	g		27	
	Lbs		0.060	

^ Preferred model

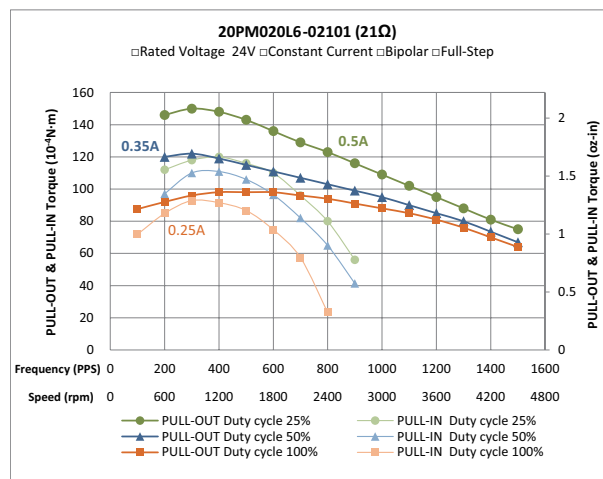
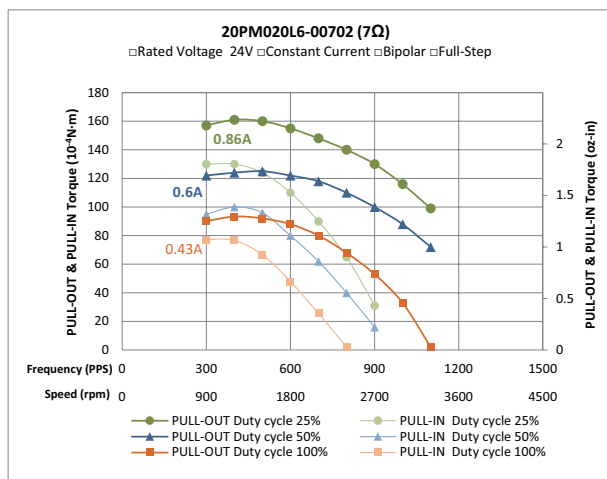
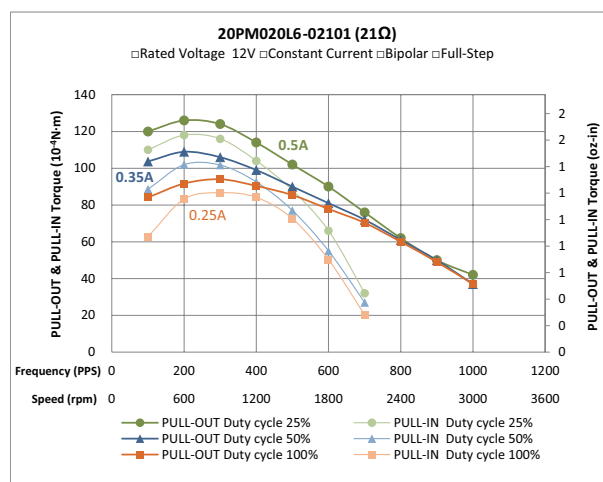
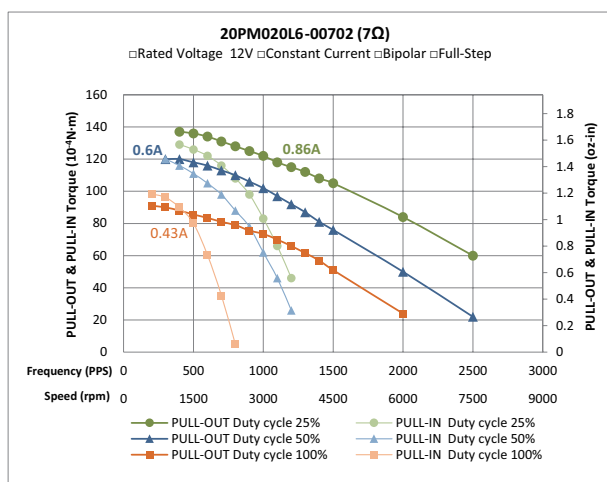
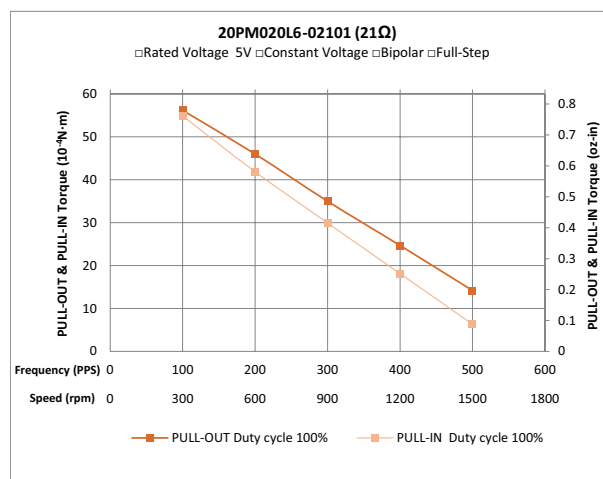
Dimensions: mm



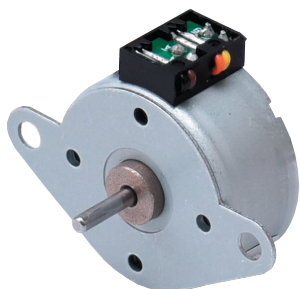
20PM020L6-00702



20PM020L6-02101



25PM024S - Ø25mm, S, 15°



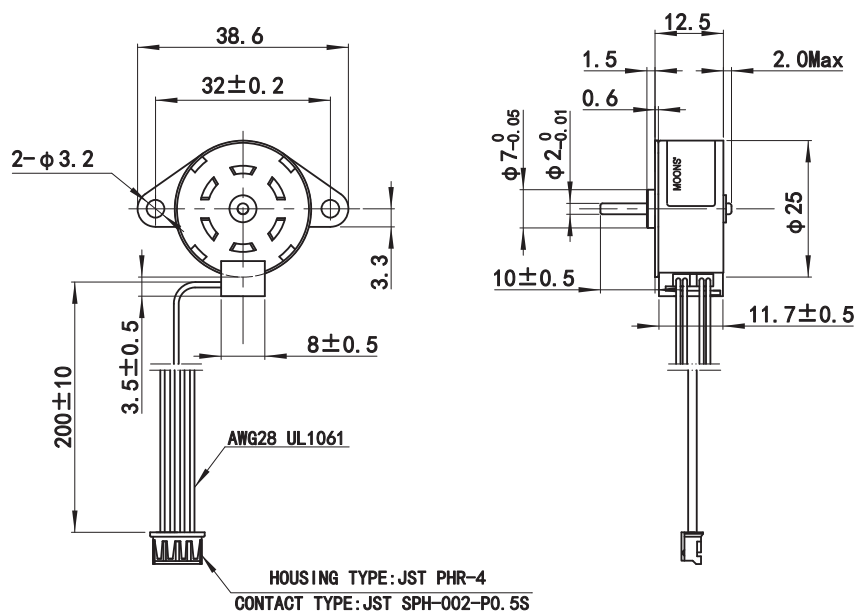
- Phases 2
- Steps / Revolution 15°
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

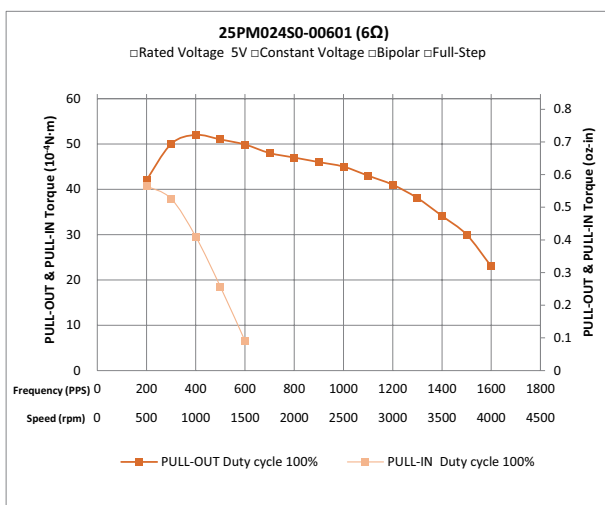
Model Number			25PM024S0-00601	25PM024S0-01602
Length			12.5mm (0.49in.)	
Step Angle	°		15	
Rated Current	Amps		0.5	0.32
Holding Torque	10 ⁻⁴ Nm	Typ.	100	110
	oz-in	Typ.	1.39	1.53
Coil Resistance	Ohms	±10% @ 20°C	6	16
Coil Inductance	mH	Typ.	3	8.6
Detent Torque	10 ⁻⁴ Nm	Max.	25	25
	oz-in	Max.	0.35	0.35
Rotor Inertia	gcm ²		0.56	0.56
	10 ⁻⁴ oz-in ²		30.6	30.6
Motor Weight	g		30	
	Lbs		0.066	

^ Preferred model

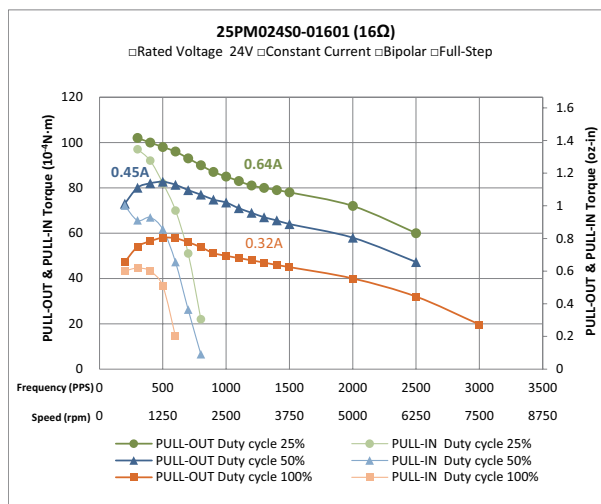
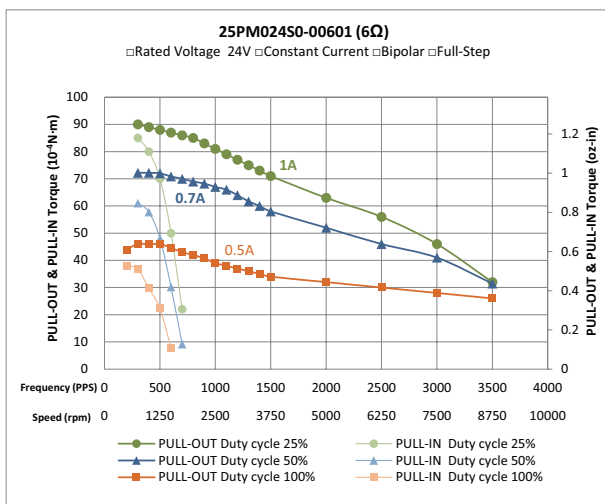
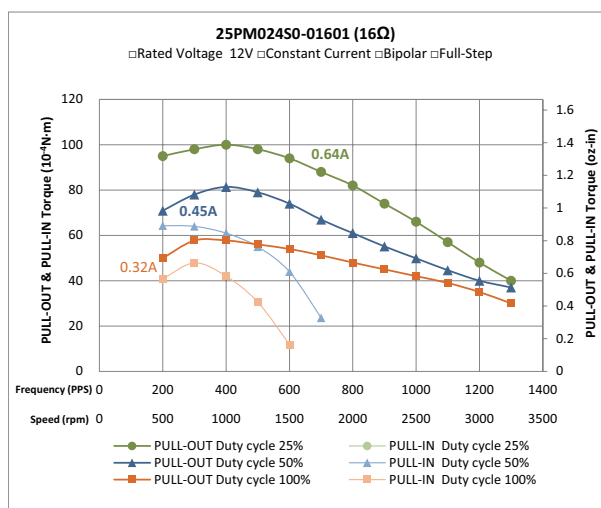
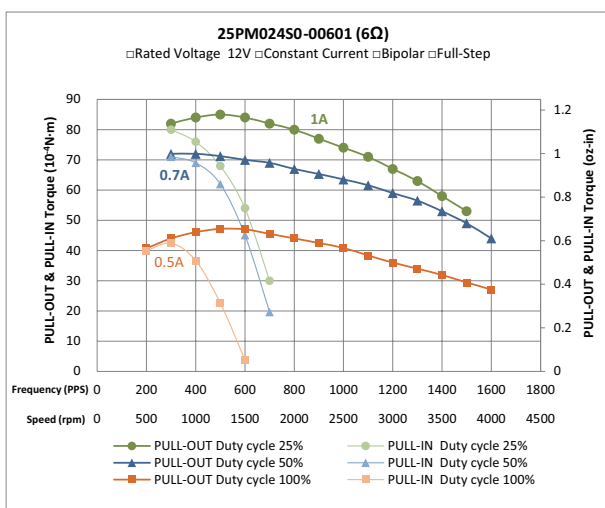
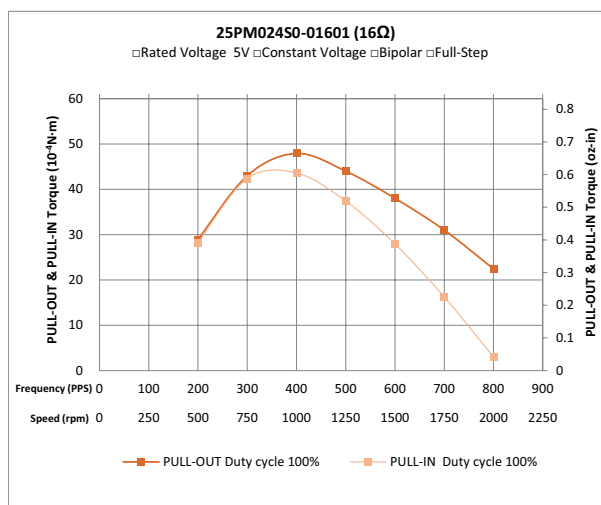
Dimensions: mm



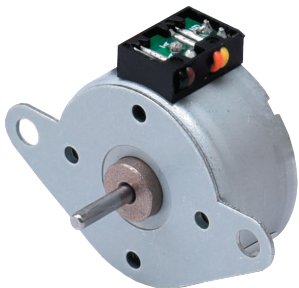
25PM024S0-00601



25PM024S0-01602



25PM048S - Ø25mm, S, 7.5°



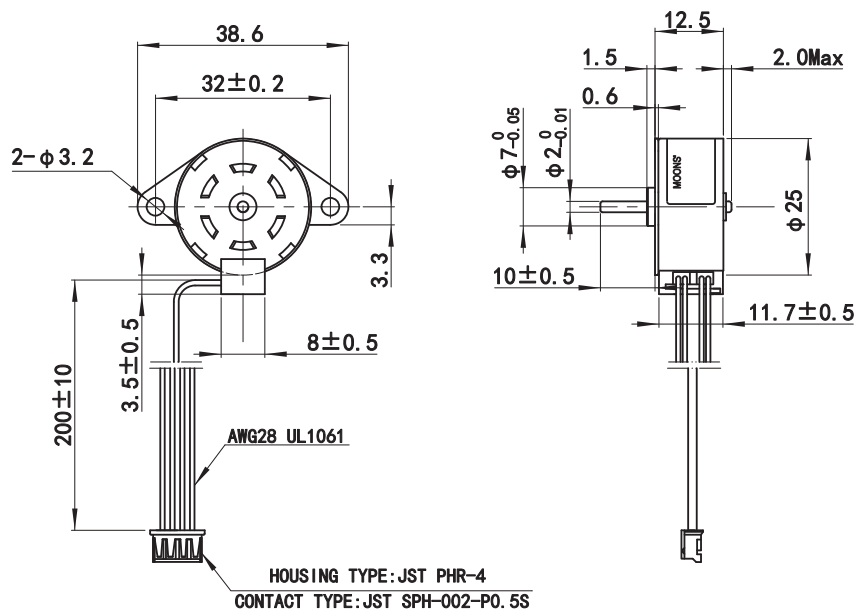
- Phases 2
- Steps / Revolution 7.5°
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

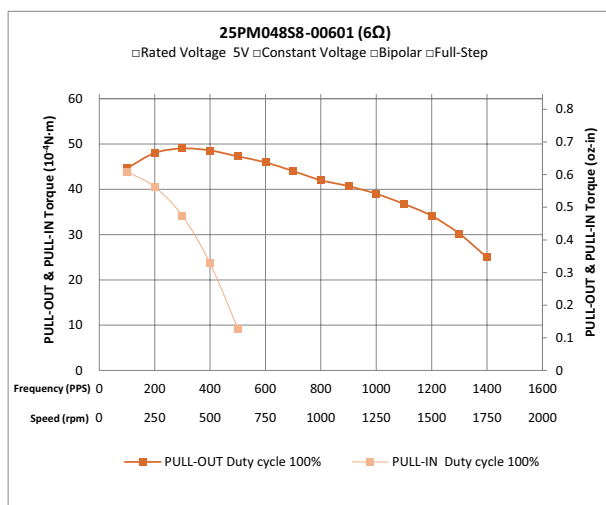
Model Number			25PM048S8-00601	25PM048S8-01601
Length			12.5mm (0.49in.)	
Step Angle	°		7.5	
Rated Current	Amps		0.5	0.32
Holding Torque	10 ⁻⁴ Nm	Typ.	160	160
	oz-in	Typ.	2.22	2.22
Coil Resistance	Ohms	±10% @ 20°C	6	16
Coil Inductance	mH	Typ.	2.7	8
Detent Torque	10 ⁻⁴ Nm	Max.	25	25
	oz-in	Max.	0.35	0.35
Rotor Inertia	gcm ²		0.56	0.56
	10 ⁻⁴ oz-in ²		30.6	30.6
Motor Weight	g		30	
	Lbs		0.066	

^ Preferred model

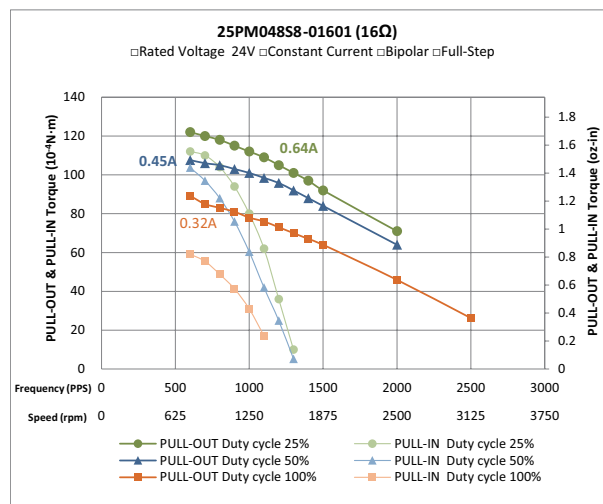
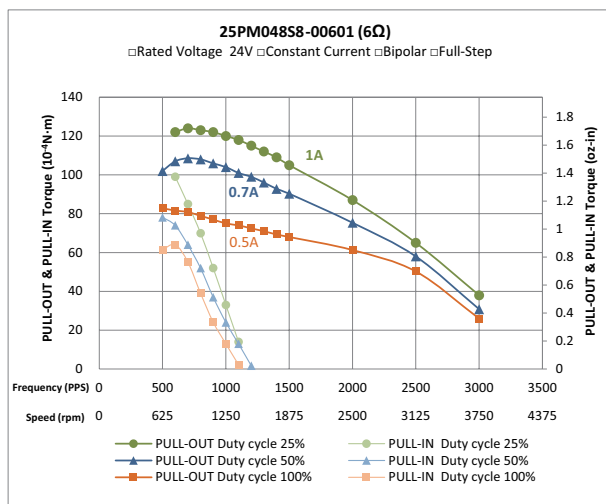
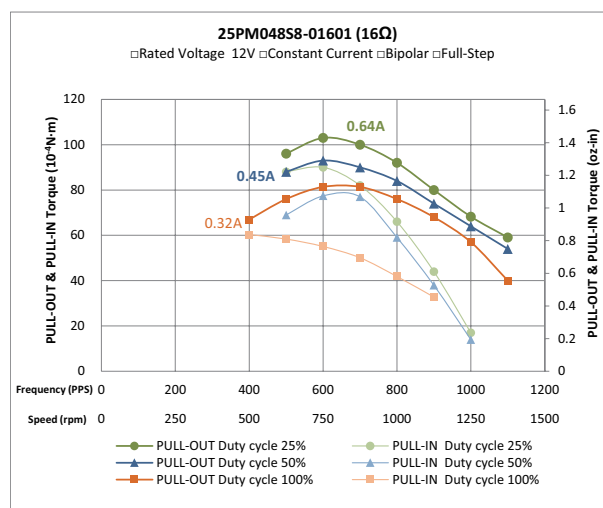
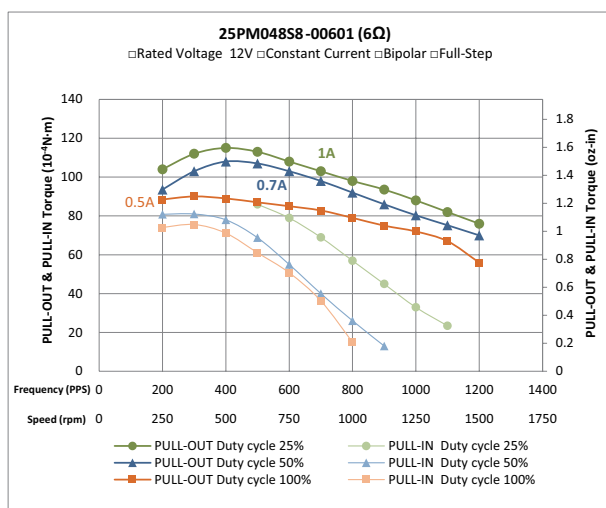
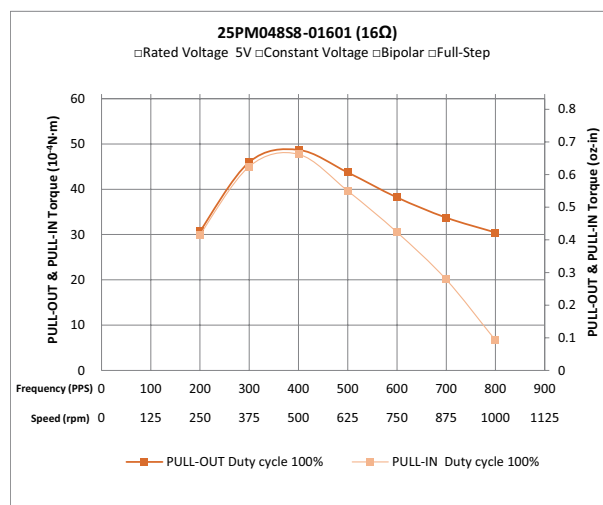
Dimensions: mm



25PM048S8-00601



25PM048S8-01601



25PM024L - Ø25mm, L, 15°



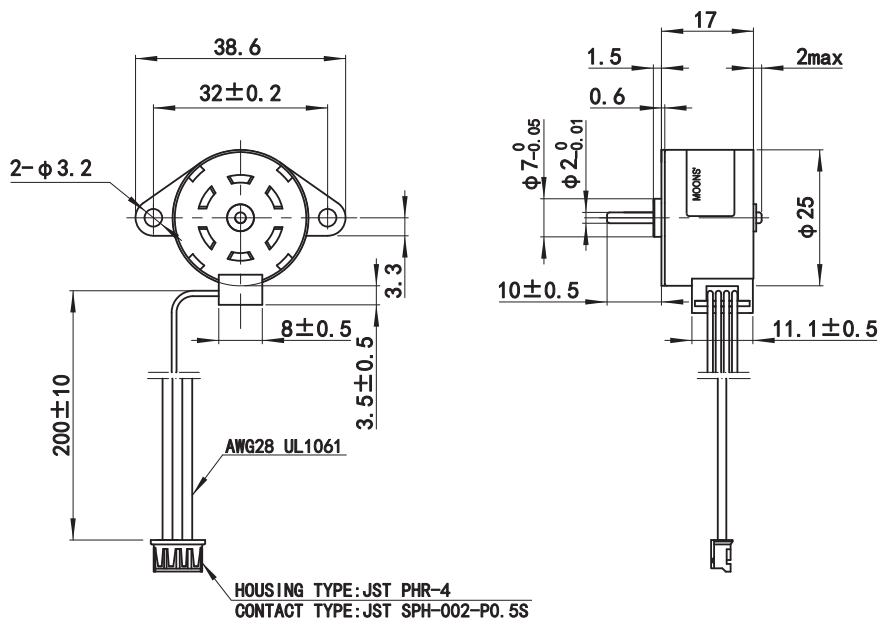
- Phases 2
- Steps / Revolution 15°
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

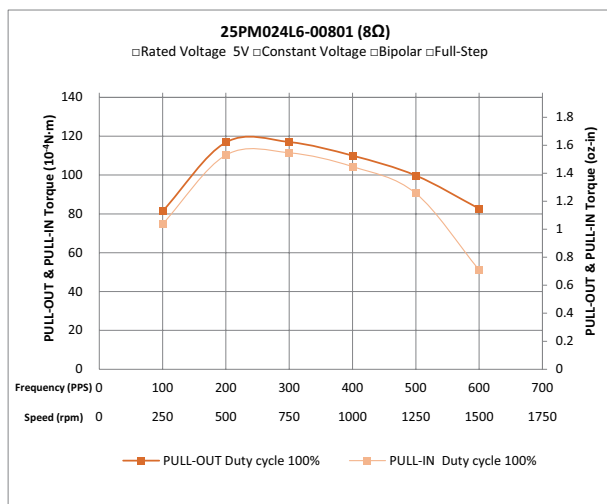
Model Number			25PM024L6-00801	25PM024L6-01401
Length			17mm (0.67in.)	
Step Angle	°		15	
Rated Current	Amps		0.47	0.35
Holding Torque	10 ⁻⁴ Nm	Typ.	170	180
	oz-in	Typ.	2.36	2.50
Coil Resistance	Ohms	±10% @ 20°C	8	14
Coil Inductance	mH	Typ.	6	11.5
Detent Torque	10 ⁻⁴ Nm	Max.	25	25
	oz-in	Max.	0.35	0.35
Rotor Inertia	gcm ²		0.85	0.85
	10 ⁻⁴ oz-in ²		46.5	46.5
Motor Weight	g		39	
	Lbs		0.086	

^ Preferred model

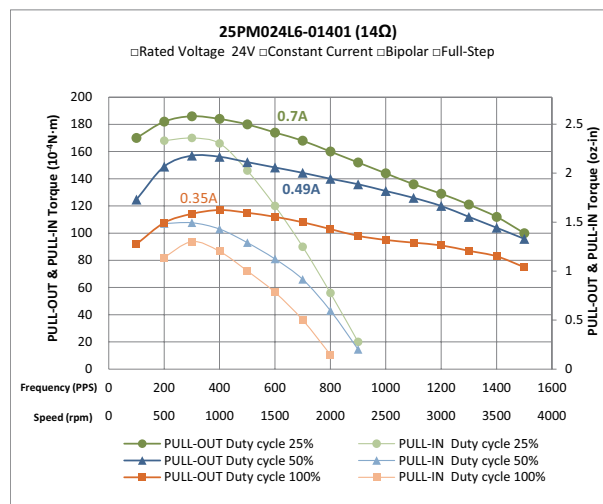
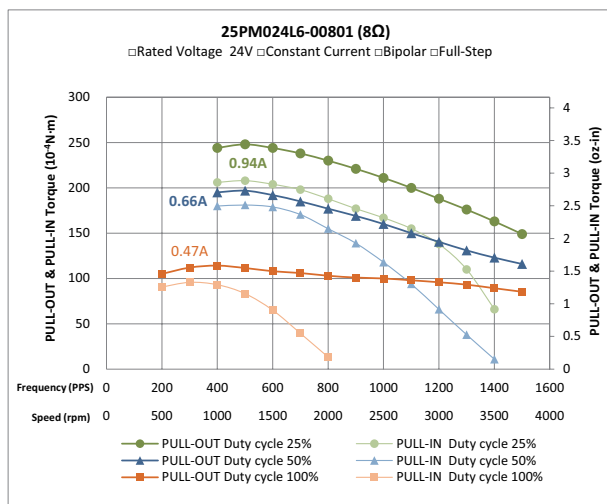
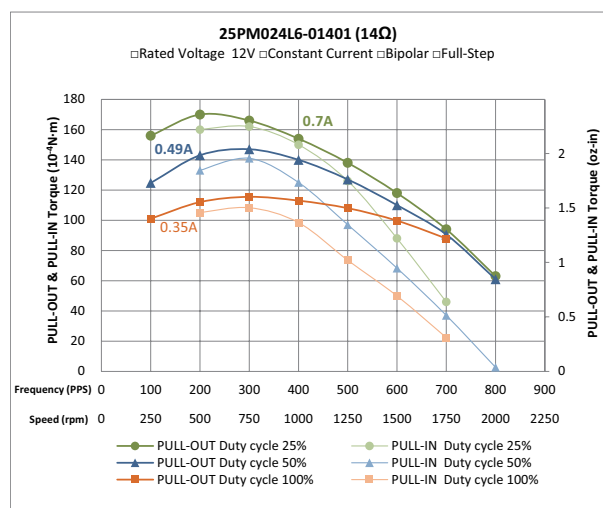
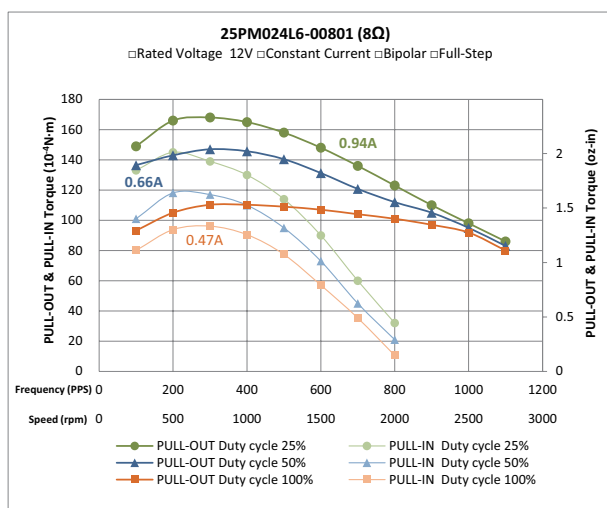
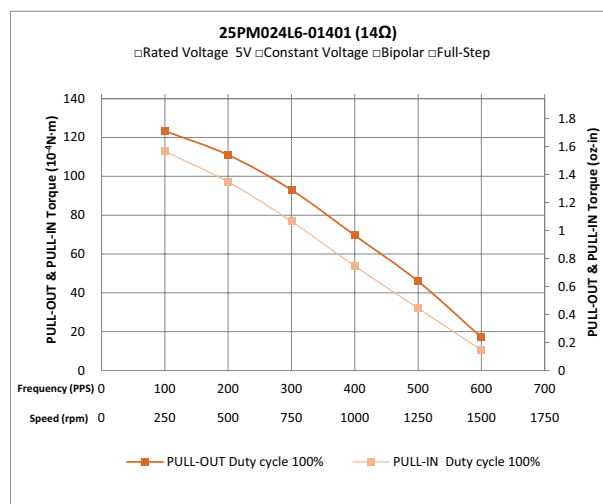
Dimensions: mm



25PM024L6-00801



25PM024L6-01401



25PM048L - Ø25mm, L, 7.5°



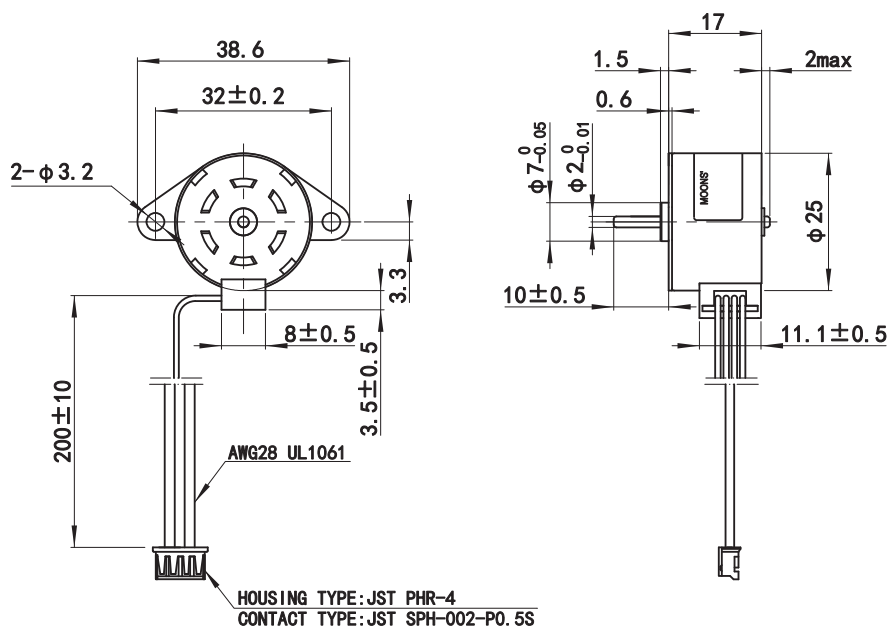
- Phases 2
- Steps / Revolution 7.5°
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

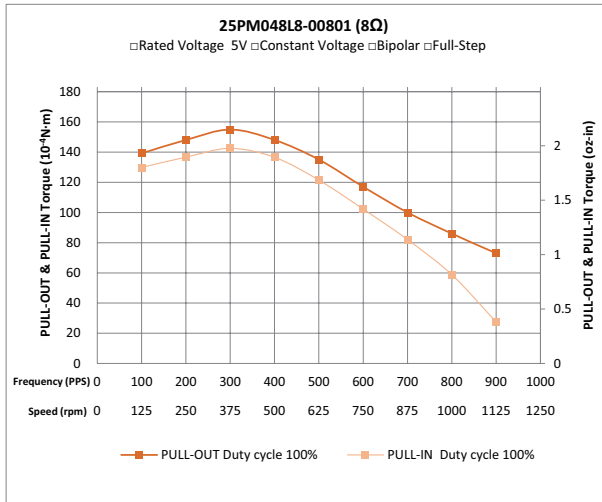
Model Number			25PM048L8-00801	25PM048L8-01401
Length			17mm (0.67in.)	
Step Angle	°		7.5	
Rated Current	Amps		0.47	0.35
Holding Torque	10 ⁻⁴ Nm	Typ.	250	270
	oz-in	Typ.	3.47	3.75
Coil Resistance	Ohms	±10% @ 20°C	8	14
Coil Inductance	mH	Typ.	7.5	13
Detent Torque	10 ⁻⁴ Nm	Max.	45	45
	oz-in	Max.	0.63	0.63
Rotor Inertia	gcm ²		0.85	0.85
	10 ⁻⁴ oz-in ²		46.5	46.5
Motor Weight	g		39	
	Lbs		0.086	

^ Preferred model

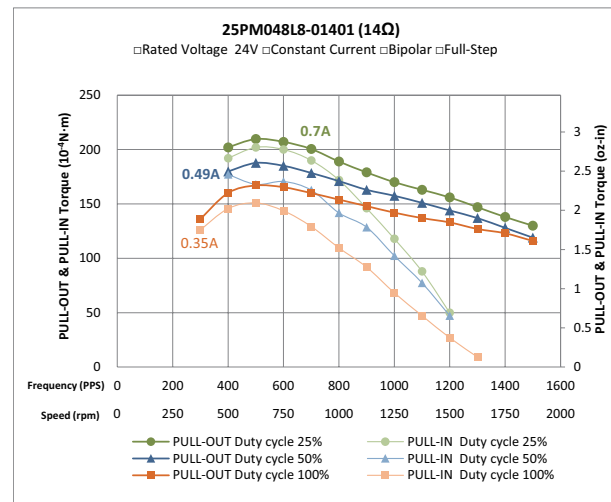
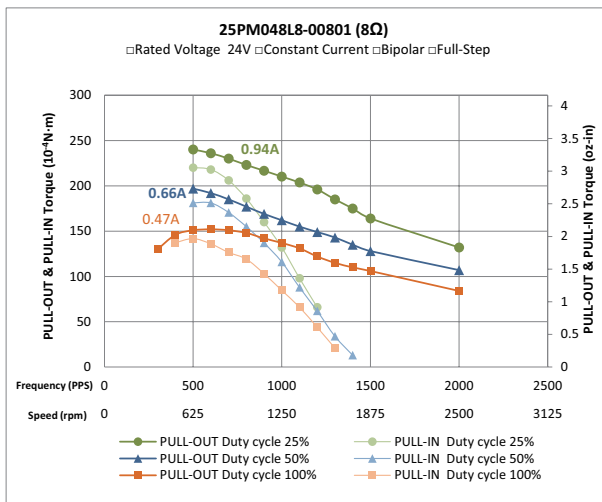
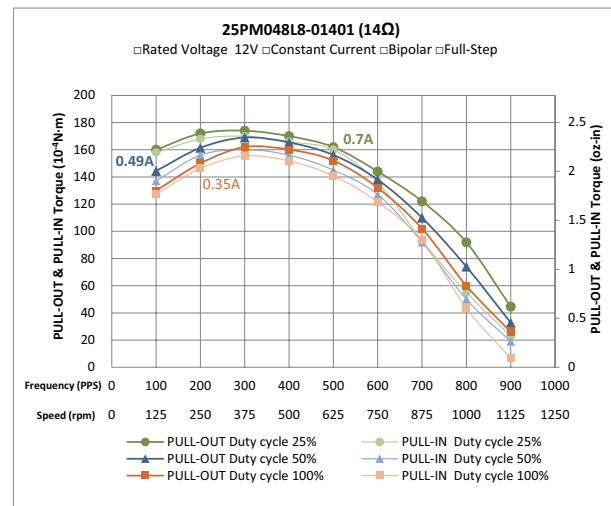
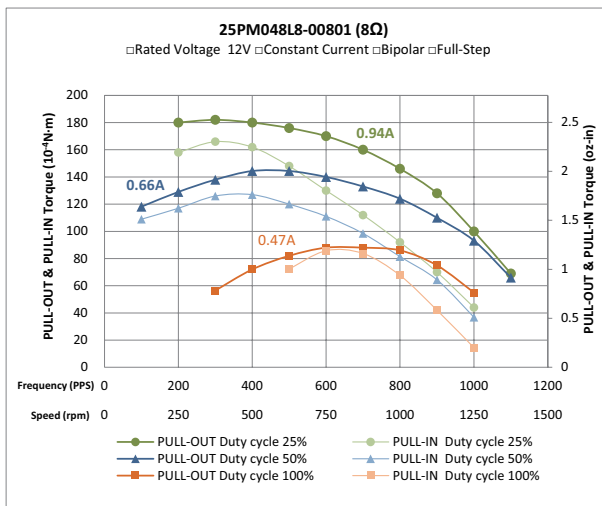
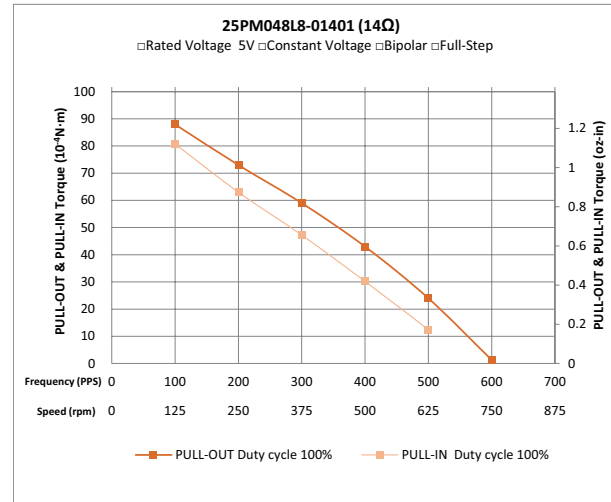
Dimensions: mm



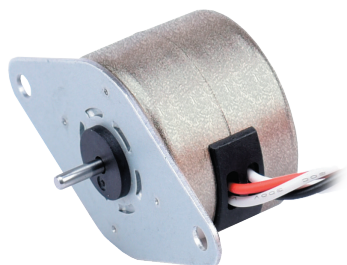
25PM048L8-00801



25PM048L8-01401



28PN024L - Ø28mm, L, 15°



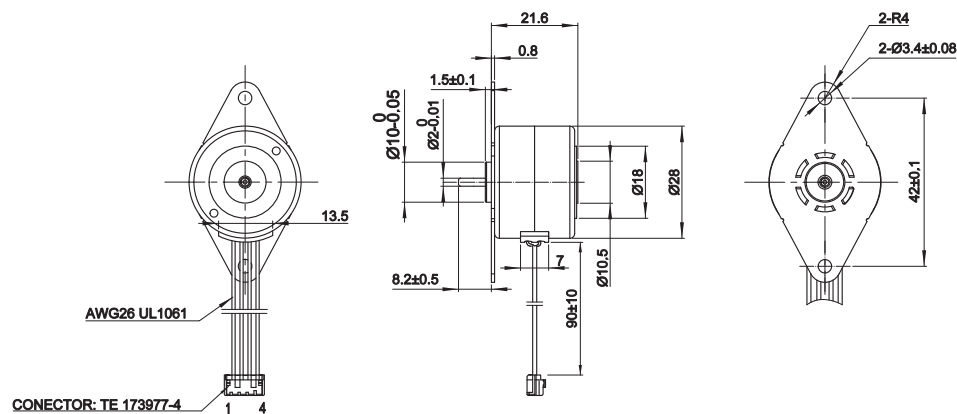
- Phases 2
- Steps / Revolution 15°
- Shaft Load
 - Axial 1N
 - Radial 5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

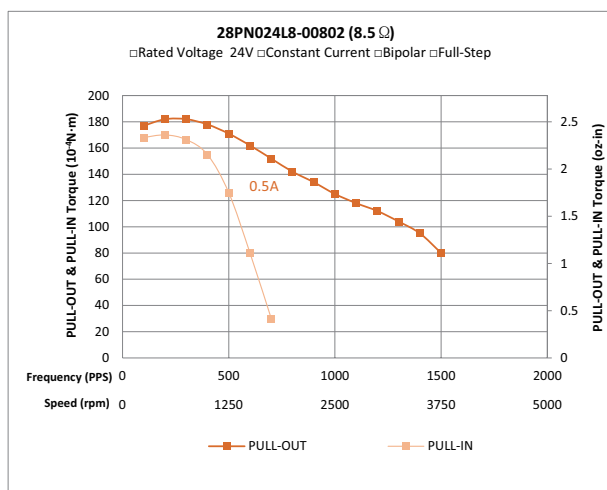
Model Number			28PN024L8-00802	28PN024L6-02402
Length			21.6mm (0.85in.)	
Step Angle	°		15	
Rated Current	Amps		0.5	0.16
Holding Torque	10 ⁻⁴ Nm	Typ.	330	160
	oz-in	Typ.	4.58	2.22
Coil Resistance	Ohms	±10% @ 20°C	8.5	24
Coil Inductance	mH	Typ.	7	18.4
Detent Torque	10 ⁻⁴ Nm	Max.	65	50
	oz-in	Max.	0.90	0.69
Rotor Inertia	gcm ²		3.9	3.9
	10 ⁻⁴ oz-in ²		213.3	213.3
Motor Weight	g		60	
	Lbs		0.132	

^ Preferred model

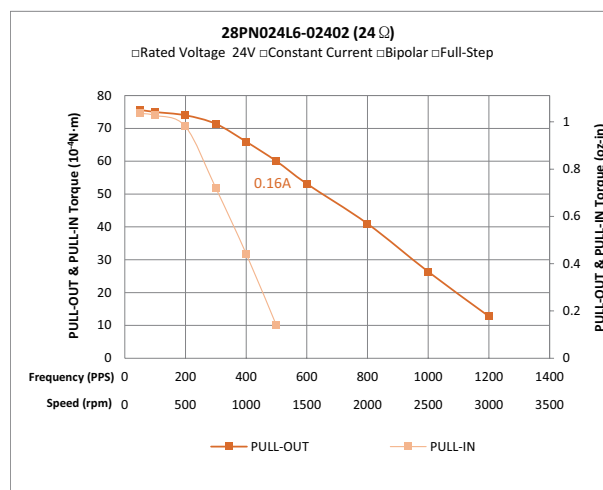
Dimensions: mm



28PN024L8-00802



28PN024L6-02402



35PM024S - Ø35mm, S, 15°



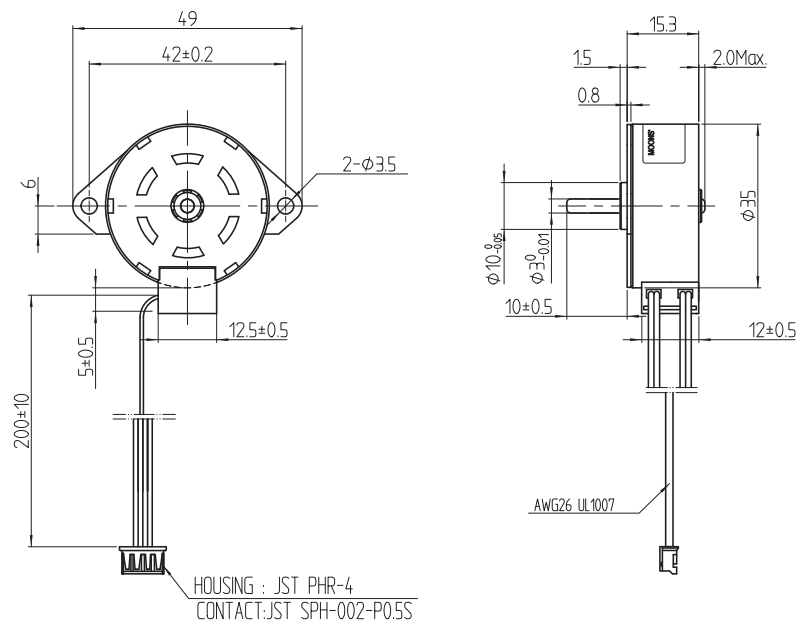
- Phases 2
- Steps / Revolution 15°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

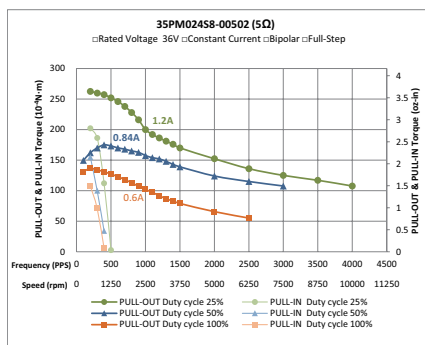
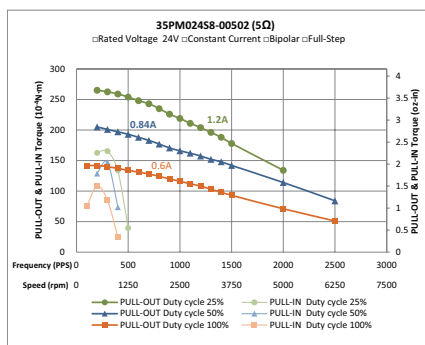
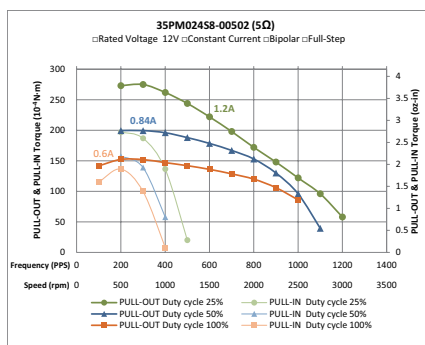
Model Number			35PM024S8-00502	35PM024S8-01201	35PM024S8-08001
Length			15.3mm (0.60in.)		
Step Angle	°		15		
Rated Current	Amps		0.6	0.38	0.15
Holding Torque	10 ⁻⁴ Nm	Typ.	220	220	220
	oz-in	Typ.	3.06	3.06	3.06
Coil Resistance	Ohms	±10% @ 20°C	5	12	80
Coil Inductance	mH	Typ.	4	10	73
Detent Torque	10 ⁻⁴ Nm	Max.	60	60	60
	oz-in	Max.	0.83	0.83	0.83
Rotor Inertia	gcm ²		2.9	2.9	2.9
	10 ⁻⁴ oz-in ²		153	153	153
Motor Weight	g		70		
	Lbs		0.15		

^ Preferred model

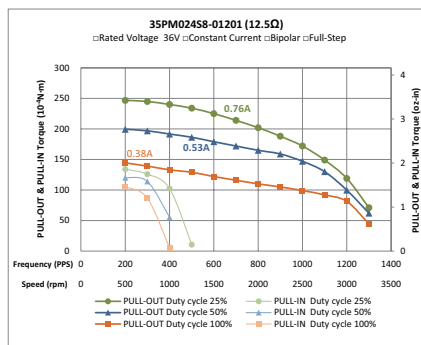
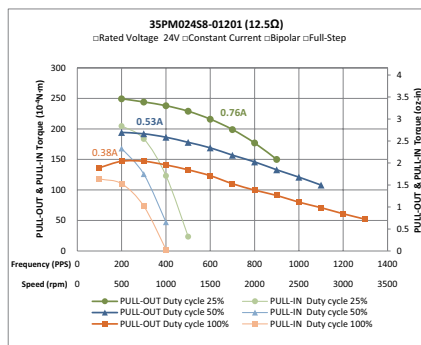
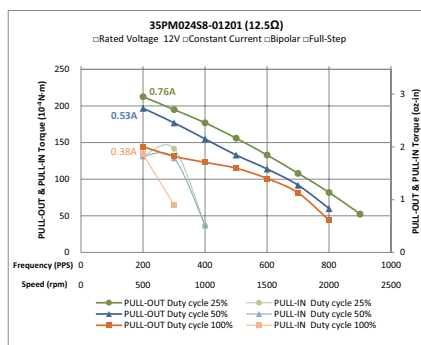
Dimensions: mm



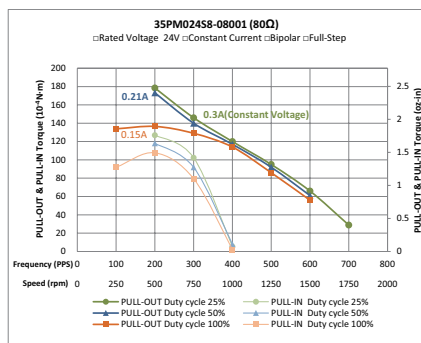
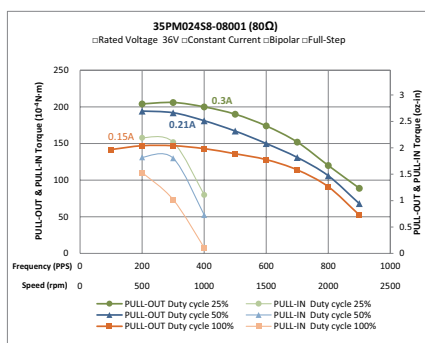
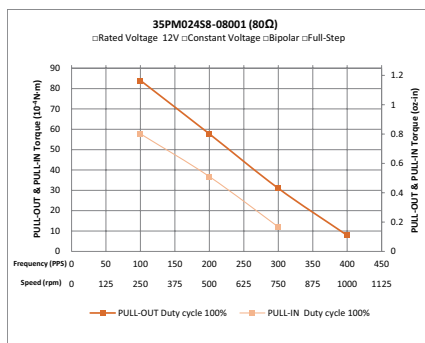
35PM024S8-00502



35PM024S8-01201



35PM024S8-08001



35PM048S - Ø35mm, S, 7.5°



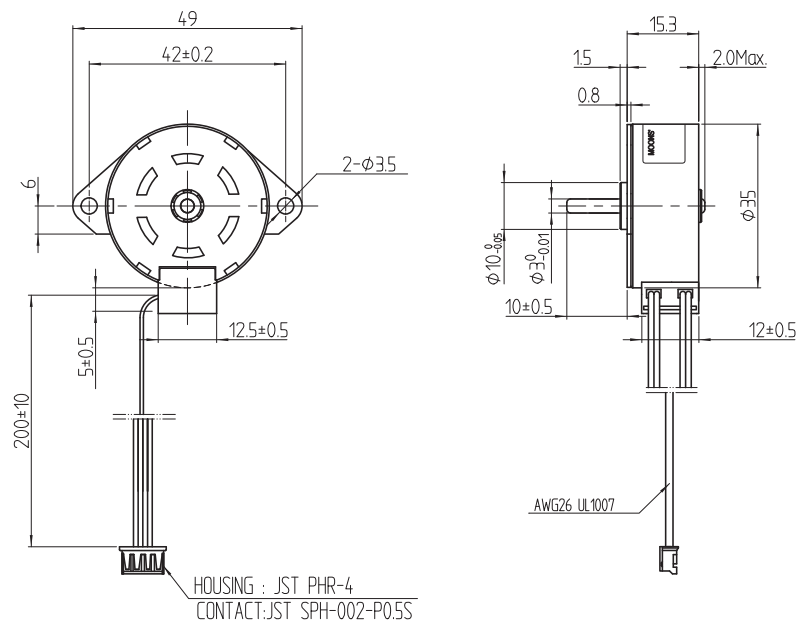
- Phases 2
- Steps / Revolution 7.5°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

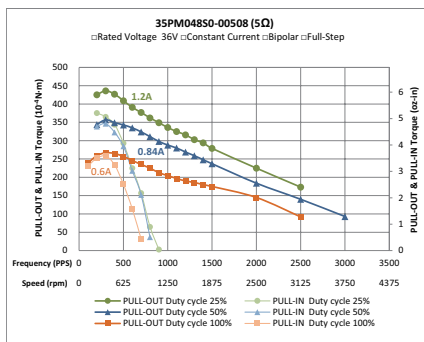
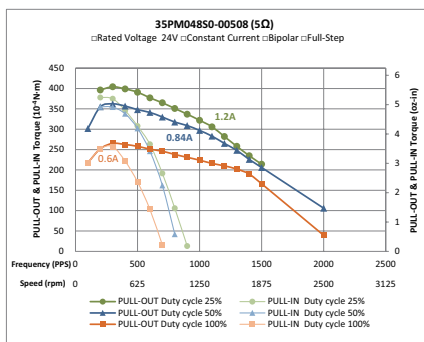
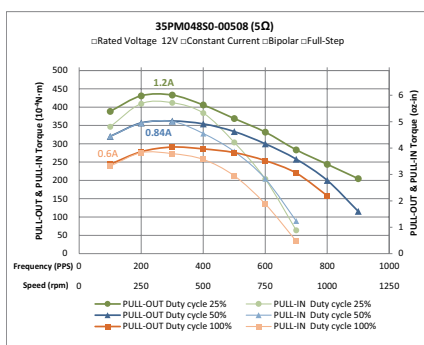
Model Number			35PM048S0-00508	35PM048S0-01203	35PM048S8-08001
Length			15.3mm (0.60in.)		
Step Angle	°		7.5		
Rated Current	Amps		0.6	0.38	0.15
Holding Torque	10 ⁻⁴ Nm	Typ.	480	460	460
	oz-in	Typ.	6.67	6.39	6.39
Coil Resistance	Ohms	±10% @ 20°C	5	12	80
Coil Inductance	mH	Typ.	5.4	11.9	74
Detent Torque	10 ⁻⁴ Nm	Max.	75	75	75
	oz-in	Max.	1.04	1.04	1.04
Rotor Inertia	gcm ²		2.9	2.9	2.9
	10 ⁻⁴ oz-in ²		153	153	153
Motor Weight	g		70		
	Lbs		0.15		

^ Preferred model

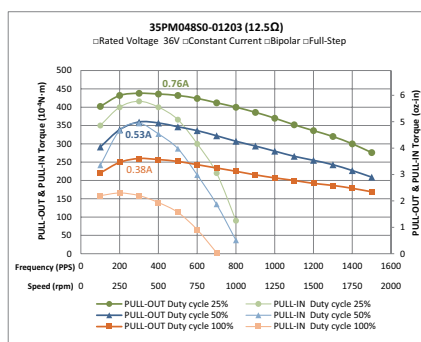
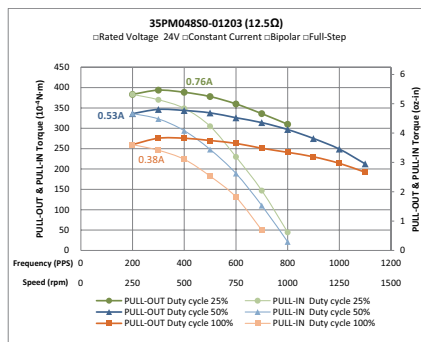
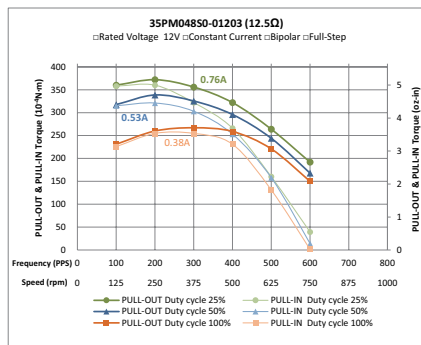
Dimensions: mm



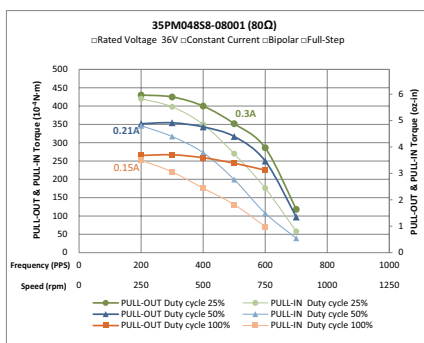
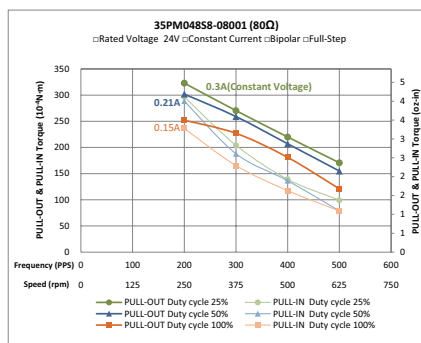
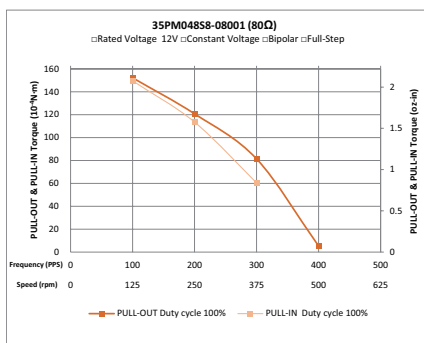
35PM048S0-00508



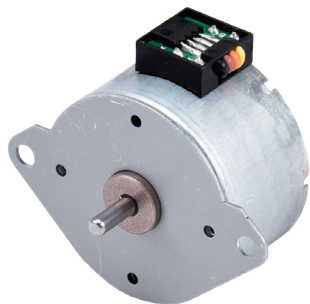
35PM048S0-01203



35PM048S8-08001



35PM024L - Ø35mm, L, 15°



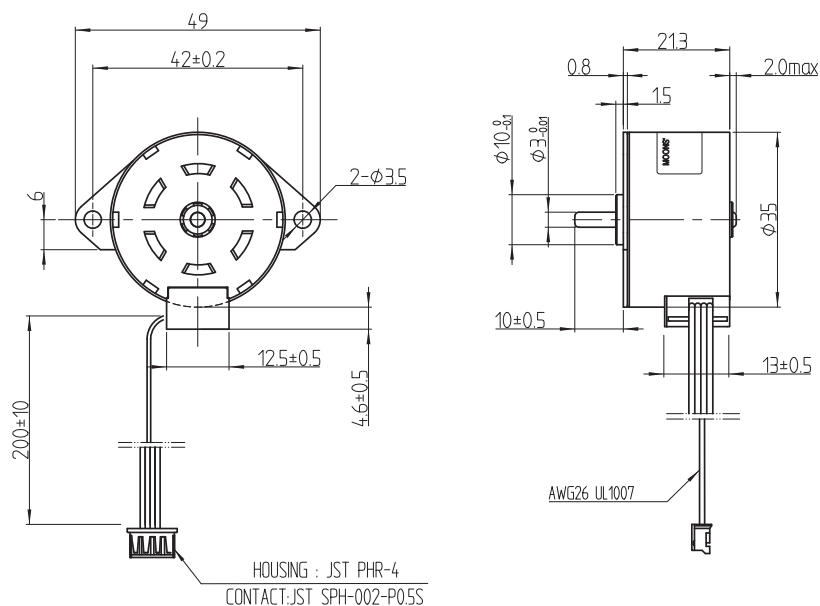
• Phases	2
• Steps / Revolution	15°
• Shaft Load	
Axial	1N
Radial	7.5N
• IP Rating	40
• Approvals	RoHS
• Operating Temp.	-20°C to +50°C
• Insulation Class	B, 130°C
• Insulation Resistance	100 MegOhms

Motor Data

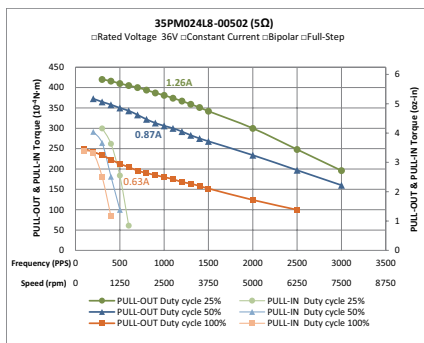
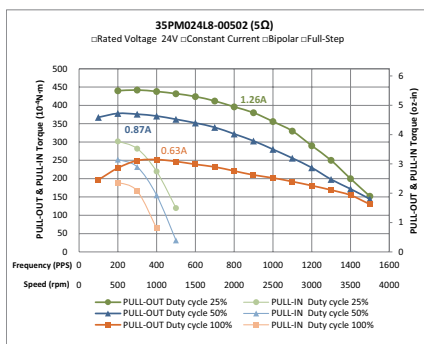
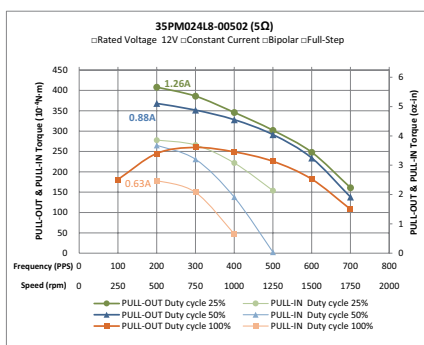
Model Number			35PM024L8-00502	35PM024L8-01202	35PM024L8-07501
Length			21.3 mm (0.84 in.)		
Step Angle	°		15		
Rated Current	Amps		0.63	0.4	0.16
Holding Torque	10 ⁻⁴ Nm	Typ.	420	420	360
	oz-in	Typ.	5.83	5.83	5.00
Coil Resistance	Ohms	±10% @ 20°C	5.3	12.5	75
Coil Inductance	mH	Typ.	7.7	18.2	87
Detent Torque	10 ⁻⁴ Nm	Max.	75	75	75
	oz-in	Max.	1.04	1.04	1.04
Rotor Inertia	gcm ²		4.65	4.65	4.65
	10 ⁻⁴ oz-in ²		257	257	257
Motor Weight	g		90		
	Lbs		0.2		

^ Preferred model

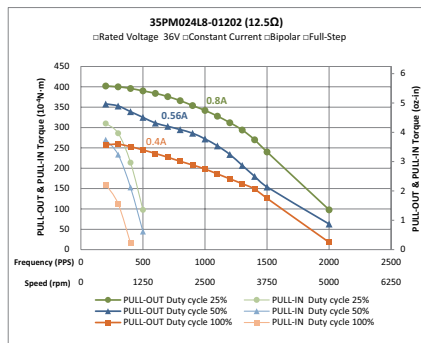
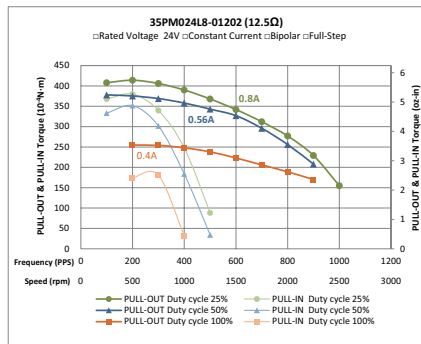
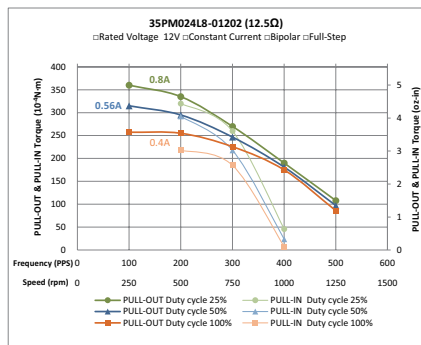
Dimensions: mm



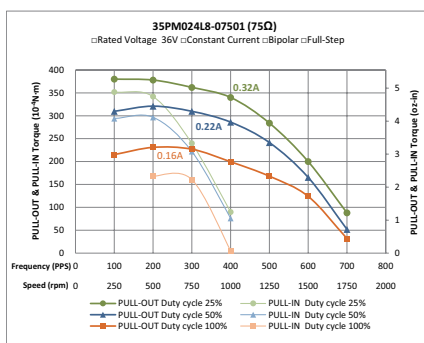
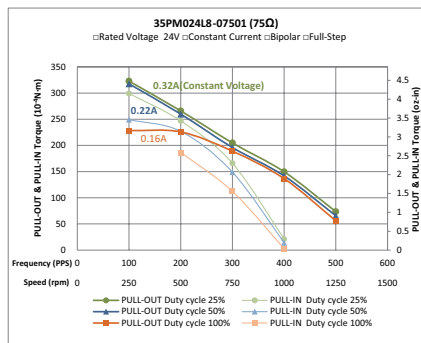
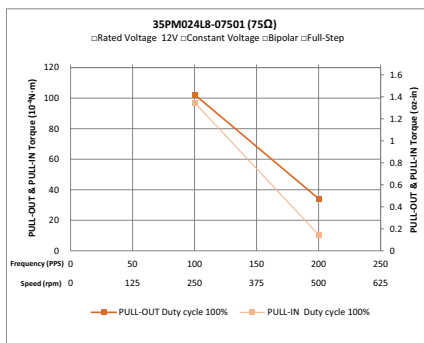
35PM024L8-00502



35PM024L8-01202



35PM024L8-07501



35PM048L - Ø35mm, L, 7.5°



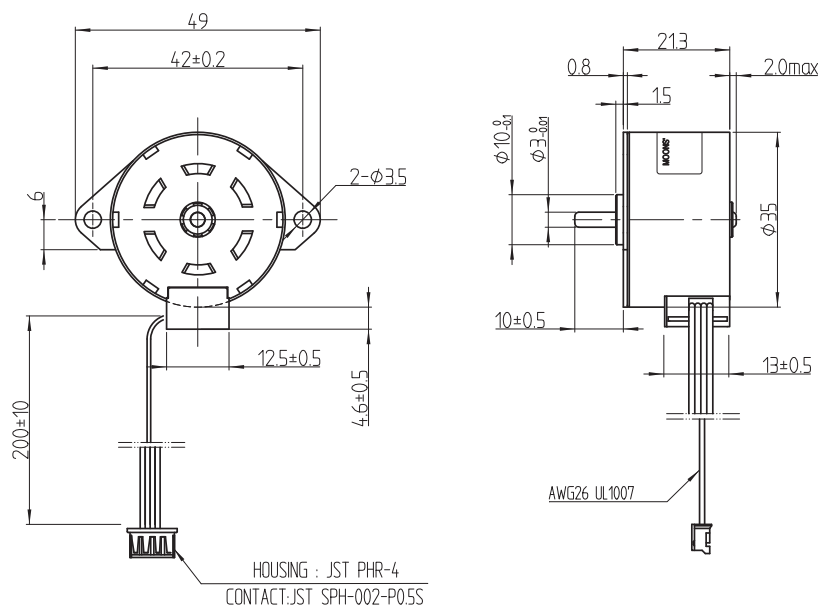
- Phases 2
- Steps / Revolution 7.5°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

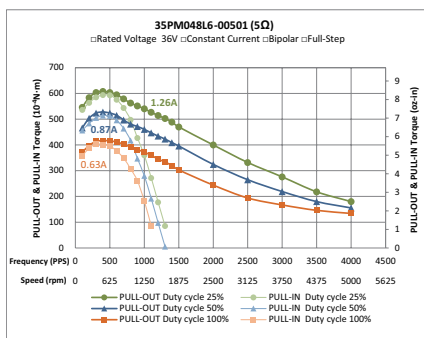
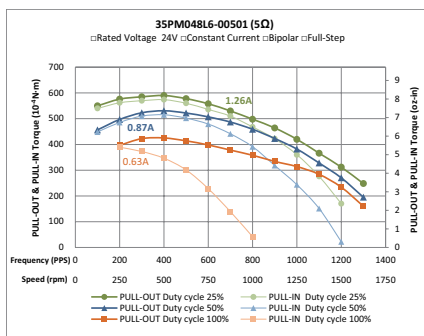
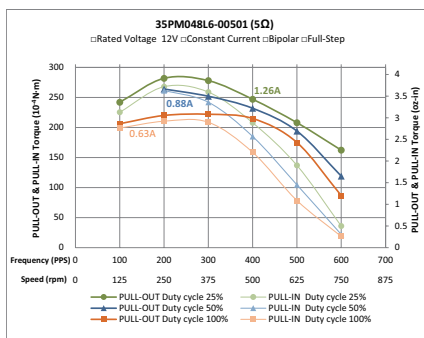
Model Number			35PM048L6-00501	35PM048L6-01201	35PM048L6-07501
Length			21.3 mm (0.84 in.)		
Step Angle	°		7.5		
Rated Current	Amps		0.63	0.4	0.16
Holding Torque	10 ⁻⁴ Nm	Typ.	620	620	620
	oz-in	Typ.	8.61	8.61	8.61
Coil Resistance	Ohms	±10% @ 20°C	5	12.5	75
Coil Inductance	mH	Typ.	8.6	21.3	102
Detent Torque	10 ⁻⁴ Nm	Max.	95	95	95
	oz-in	Max.	1.32	1.32	1.32
Rotor Inertia	gcm ²		4.65	4.65	4.65
	10 ⁻⁴ oz-in ²		257	257	257
Motor Weight	g		90		
	Lbs		0.2		

^ Preferred model

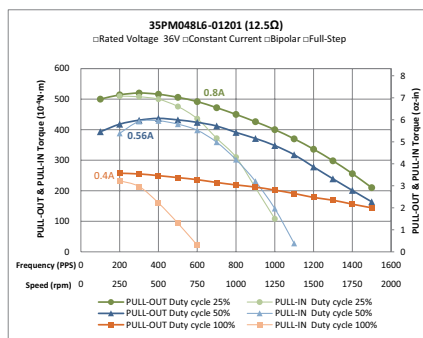
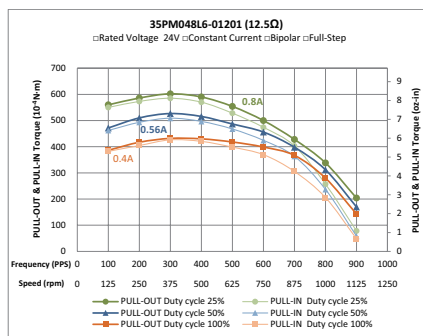
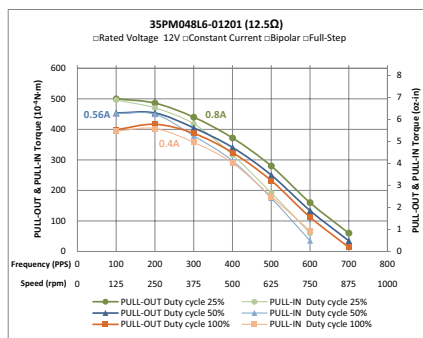
Dimensions: mm



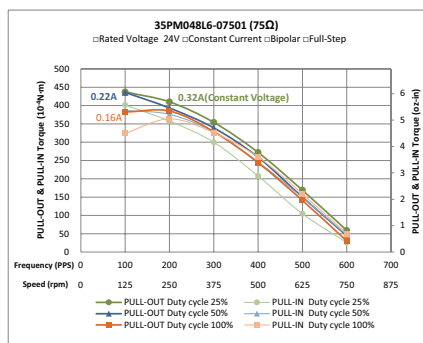
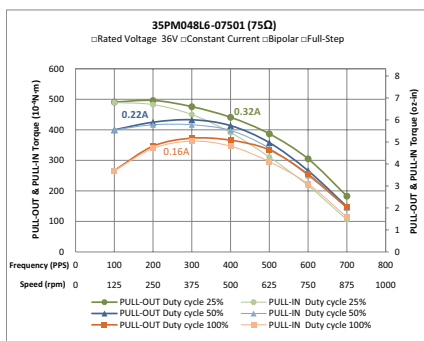
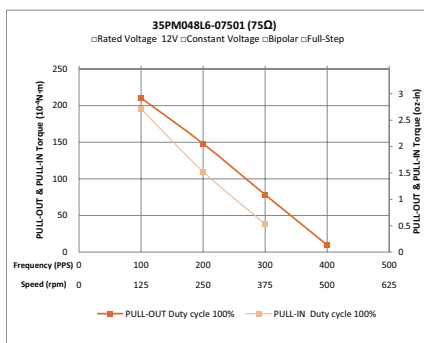
35PM048L6-00501



35PM048L6-01201



35PM048L6-07501



42PM048S - Ø42mm, S, 7.5°



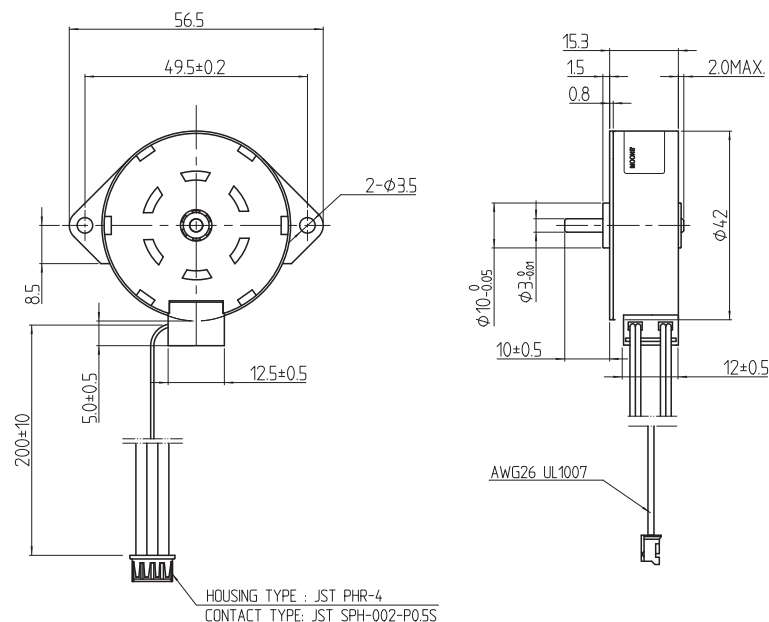
- Phases 2
- Steps / Revolution 7.5°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

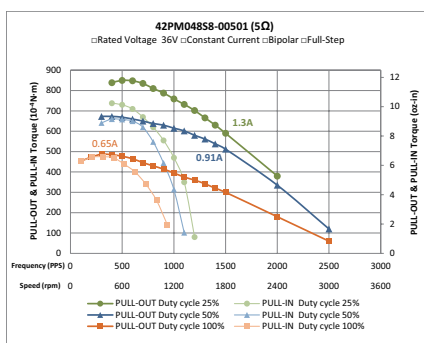
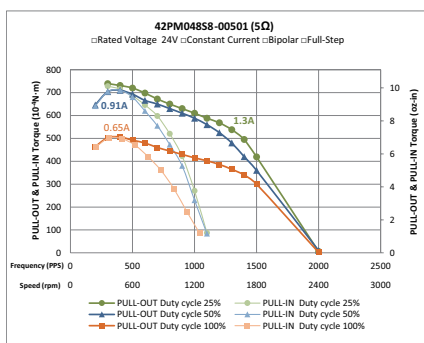
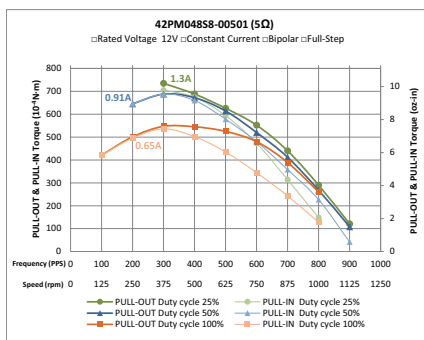
Model Number			42PM048S8-00501	42PM048S8-01209	42PM048S8-08001
Length			15.3mm (0.60in.)		
Step Angle	°		7.5		
Rated Current	Amps		0.65	0.42	0.15
Holding Torque	10 ⁻⁴ Nm	Typ.	740	640	640
	oz-in	Typ.	10.28	8.89	8.89
Coil Resistance	Ohms	±10% @ 20°C	5.4	11.5	80
Coil Inductance	mH	Typ.	6	12	79
Detent Torque	10 ⁻⁴ Nm	Max.	85	85	85
	oz-in	Max.	1.18	1.18	1.18
Rotor Inertia	gcm ²		7.26	7.26	7.26
	10 ⁻⁴ oz-in ²		404	404	404
Motor Weight	g		90		
	Lbs		0.2		

^ Preferred model

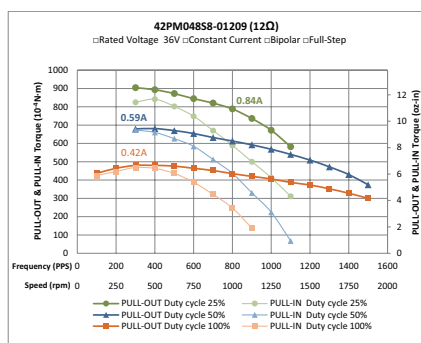
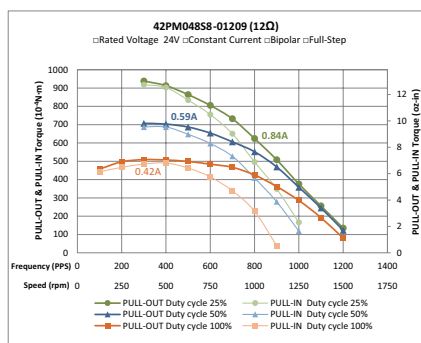
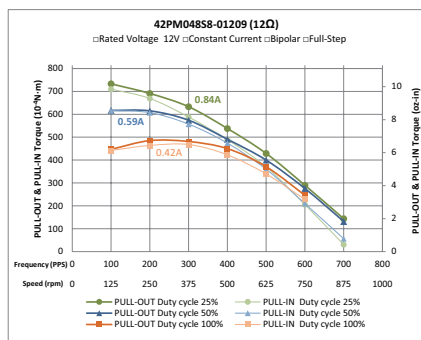
Dimensions: mm



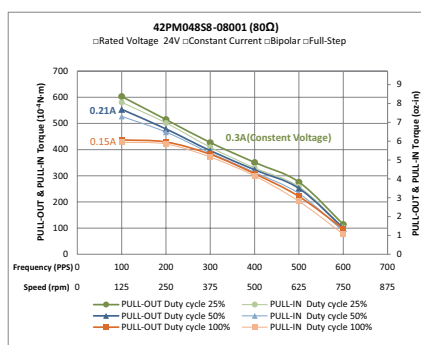
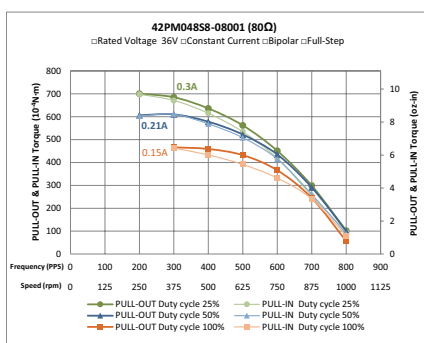
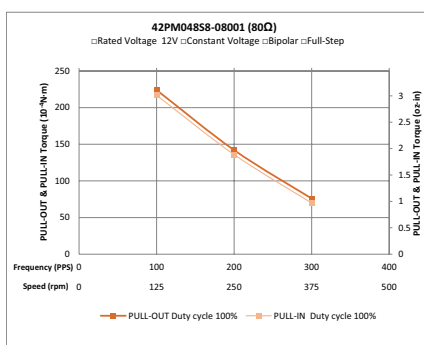
42PM048S8-00501



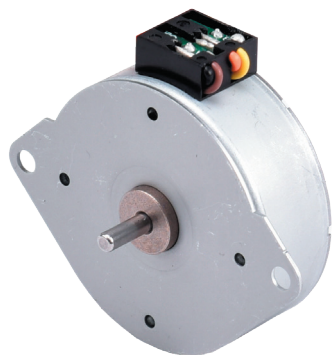
42PM048S8-01209



42PM048S8-08001



42PM096S - Ø42mm, S, 3.75°



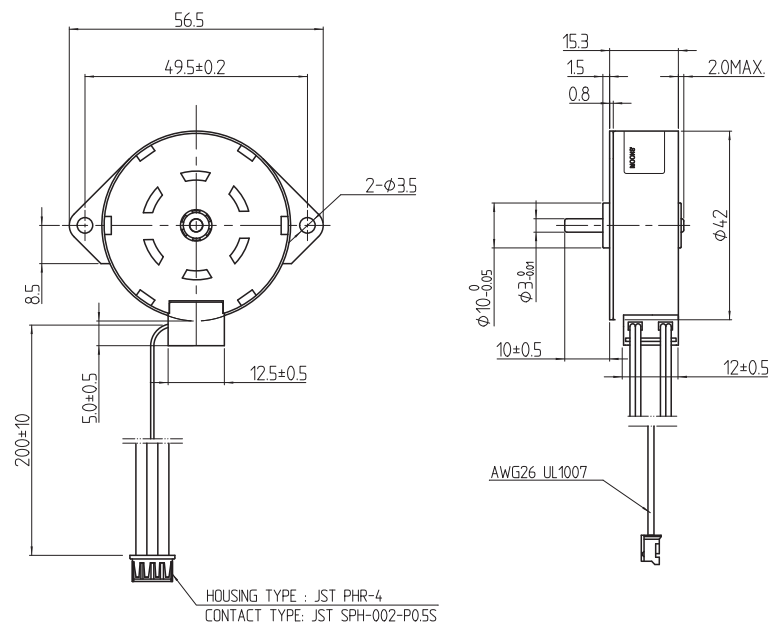
- Phases 2
- Steps / Revolution 3.75°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

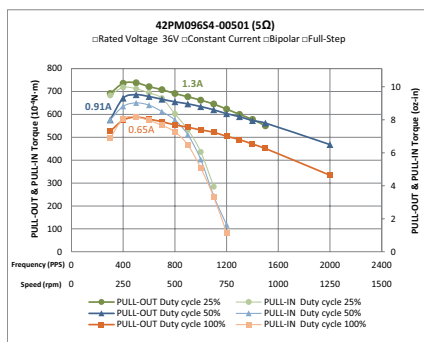
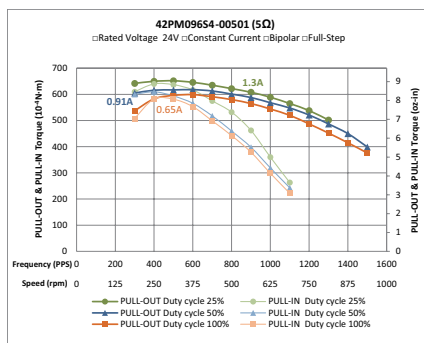
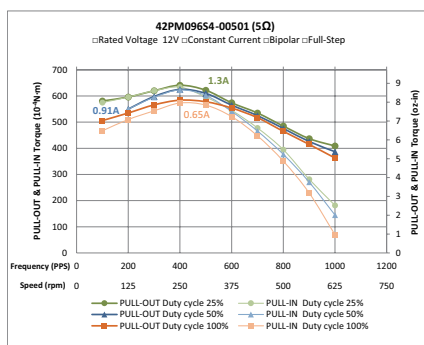
Model Number			42PM096S4-00501	42PM096S4-01201	42PM096S4-08001
Length			15.3mm (0.60in.)		
Step Angle	°		3.75		
Rated Current	Amps		0.65	0.42	0.15
Holding Torque	10 ⁻⁴ Nm	Typ.	540	540	540
	oz-in	Typ.	7.50	7.50	7.50
Coil Resistance	Ohms	±10% @ 20°C	5.5	11.5	80
Coil Inductance	mH	Typ.	7.1	15.2	91
Detent Torque	10 ⁻⁴ Nm	Max.	65	65	65
	oz-in	Max.	0.90	0.90	0.90
Rotor Inertia	gcm ²		7.26	7.26	7.26
	10 ⁻⁴ oz-in ²		404	404	404
Motor Weight	g		90		
	Lbs		0.2		

^ Preferred model

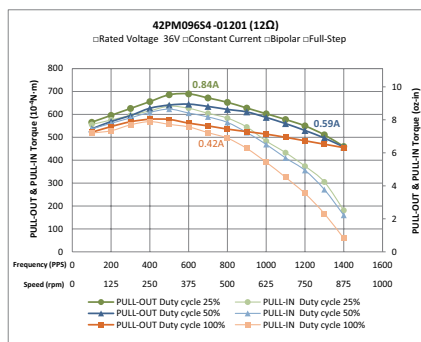
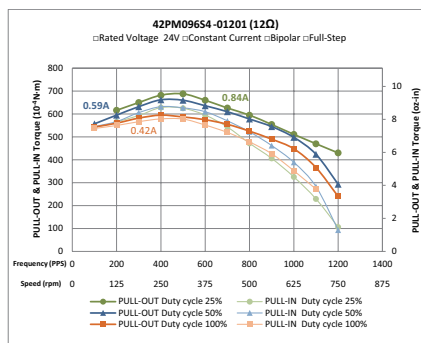
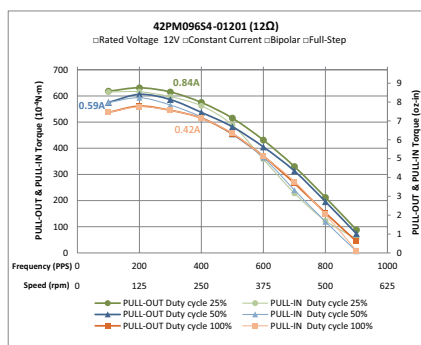
Dimensions: mm



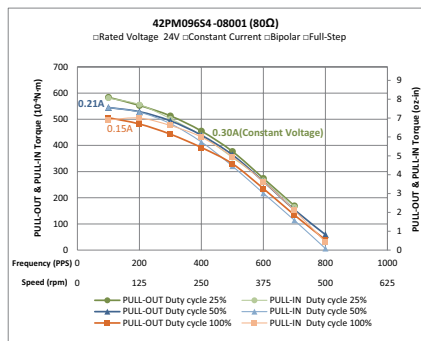
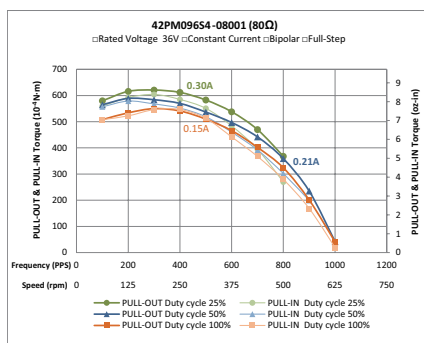
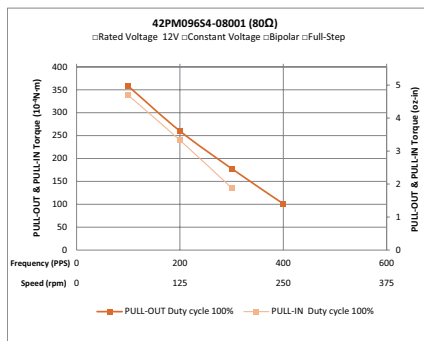
42PM096S4-00501



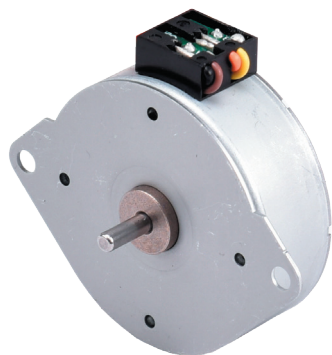
42PM096S4-01201



42PM096S4-08001



42PM100S - Ø42mm, S, 3.6°



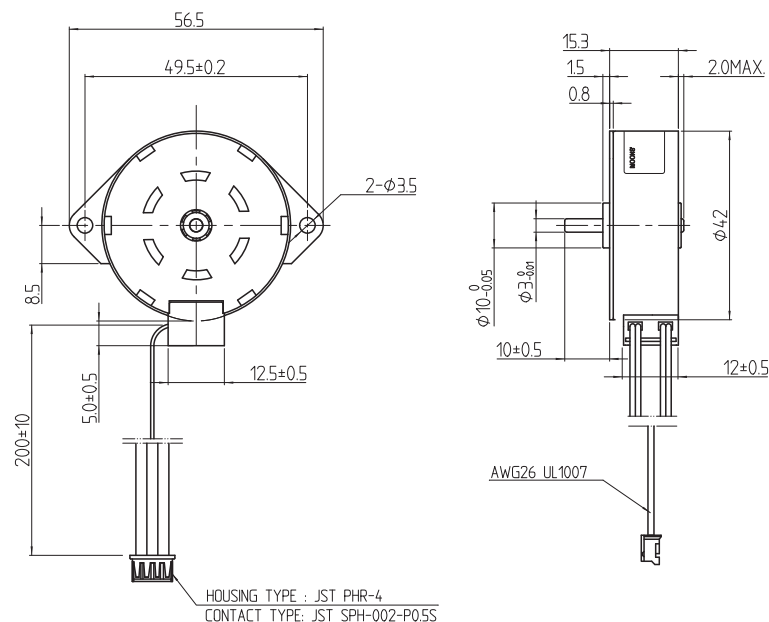
- Phases 2
- Steps / Revolution 3.6°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

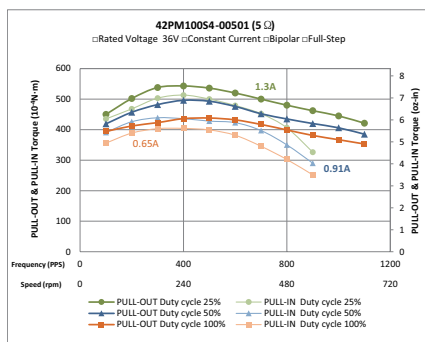
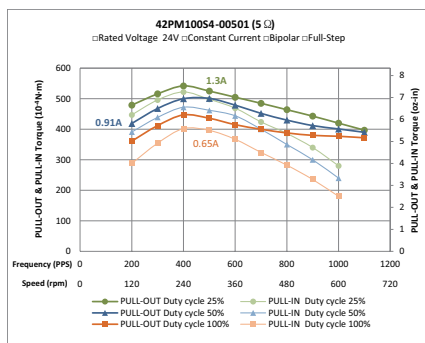
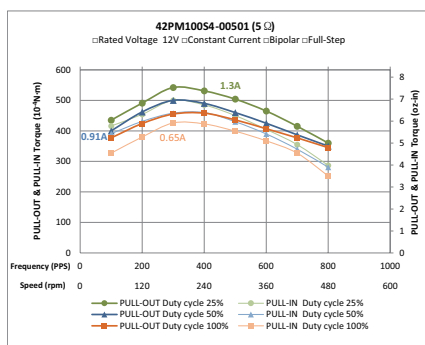
Model Number			42PM100S4-00501	42PM100S4-01201	42PM100S4-08001
Length			15.3mm (0.60in.)		
Step Angle	°		3.6		
Rated Current	Amps		0.65	0.42	0.15
Holding Torque	10 ⁻⁴ Nm	Typ.	540	540	540
	oz-in	Typ.	7.50	7.50	7.50
Coil Resistance	Ohms	±10% @ 20°C	5.5	11.5	80
Coil Inductance	mH	Typ.	6.6	14.3	87
Detent Torque	10 ⁻⁴ Nm	Max.	65	65	65
	oz-in	Max.	0.90	0.90	0.90
Rotor Inertia	gcm ²		7.26	7.26	7.26
	10 ⁻⁴ oz-in ²		404	404	404
Motor Weight	g		90		
	Lbs		0.2		

^ Preferred model

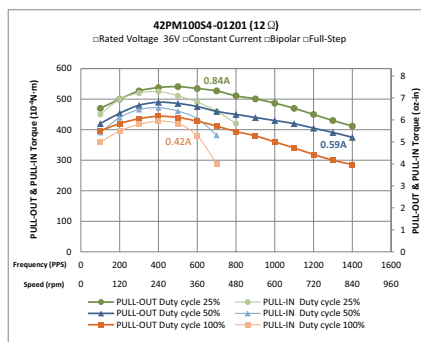
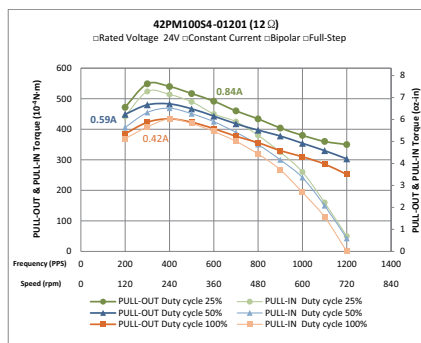
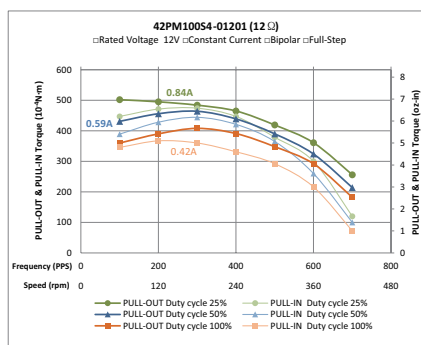
Dimensions: mm



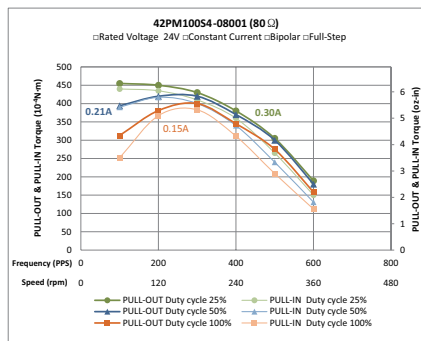
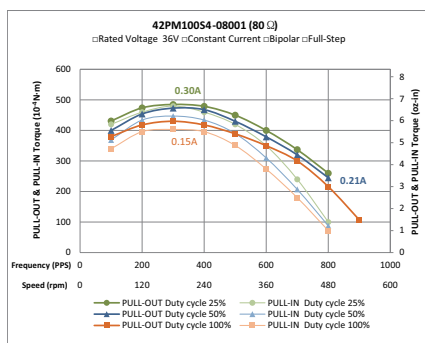
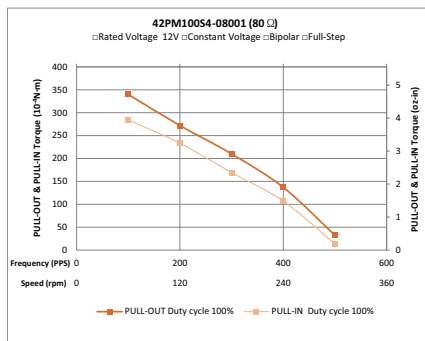
42PM100S4-00501



42PM100S4-01201



42PM100S4-08001



42PM048L - Ø42mm, L, 7.5°



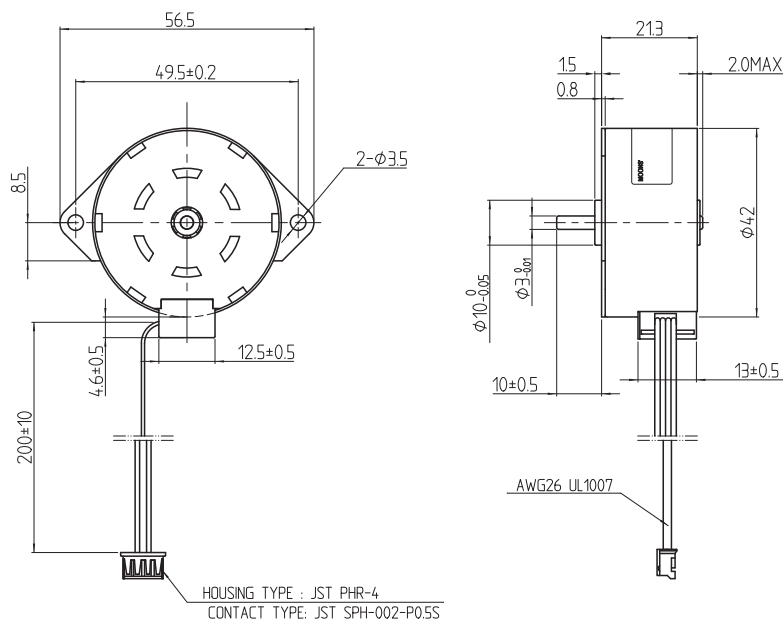
- Phases 2
- Steps / Revolution 7.5°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

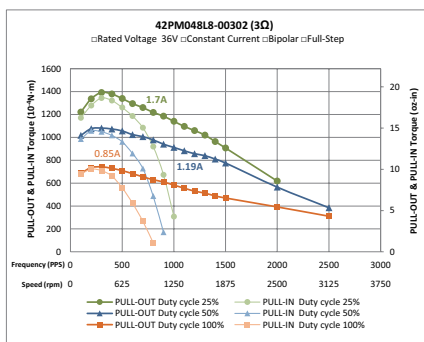
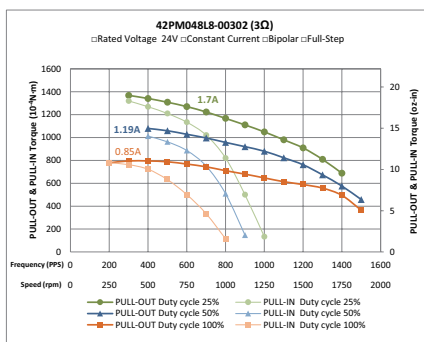
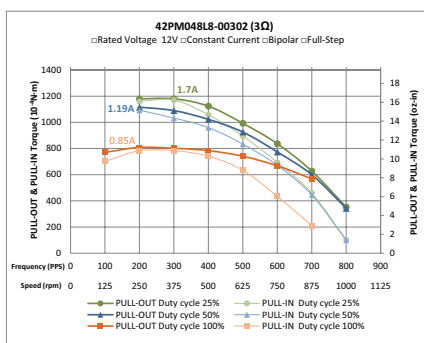
Model Number			42PM048L8-00302	42PM048L8-00703	42PM048L8-06001
Length			21.3 mm (0.84 in.)		
Step Angle	°		7.5		
Rated Current	Amps		0.85	0.55	0.2
Holding Torque	10 ⁻⁴ Nm	Typ.	950	950	1020
	oz-in	Typ.	13.20	13.20	14.17
Coil Resistance	Ohms	±10% @ 20°C	3.2	7	60
Coil Inductance	mH	Typ.	4.7	11.8	90
Detent Torque	10 ⁻⁴ Nm	Max.	140	140	140
	oz-in	Max.	1.94	1.94	1.94
Rotor Inertia	gcm ²		11.57	11.57	11.57
	10 ⁻⁴ oz-in ²		601	601	601
Motor Weight	g		120		
	Lbs		0.26		

^ Preferred model

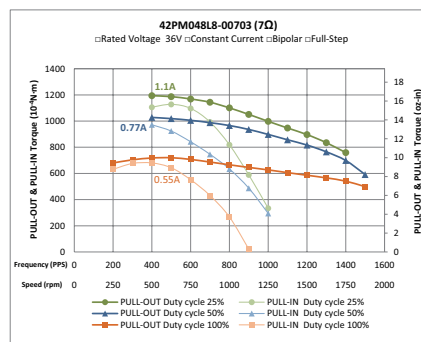
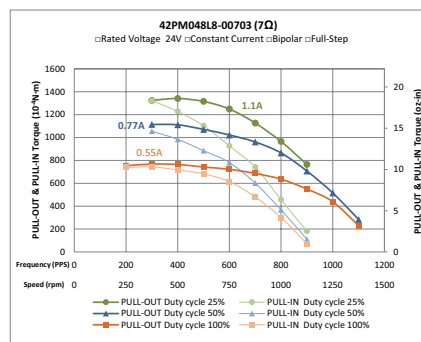
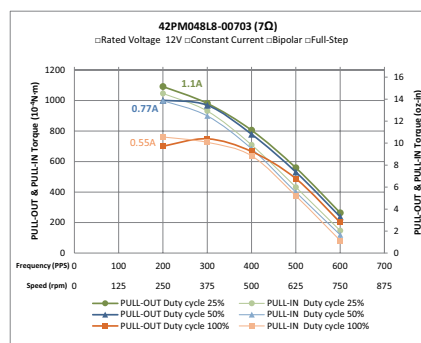
Dimensions: mm



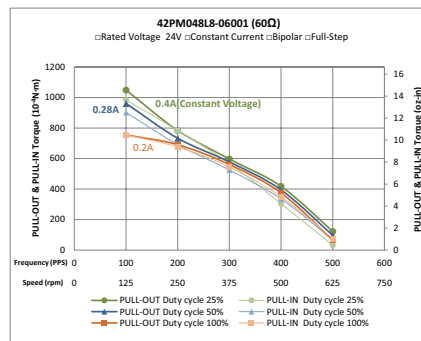
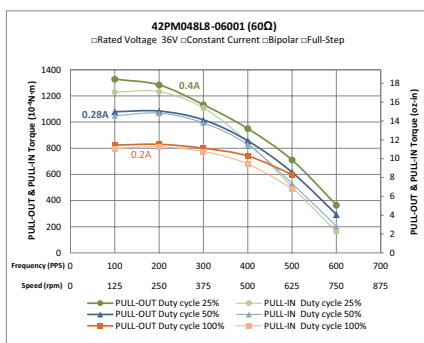
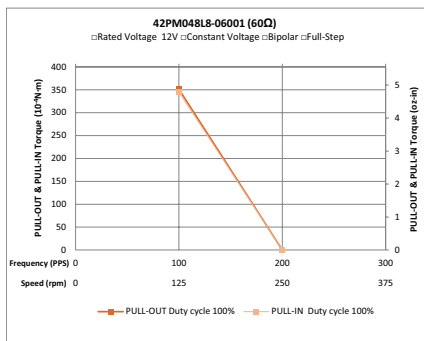
42PM048L8-00302



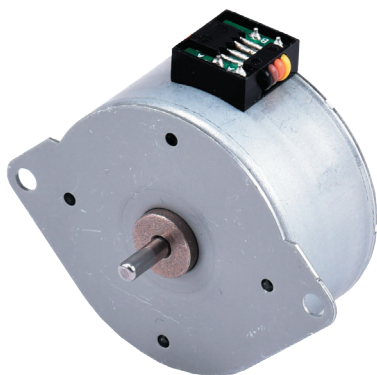
42PM048L8-00703



42PM048L8-06001



42PM096L - Ø42mm, L, 3.75°



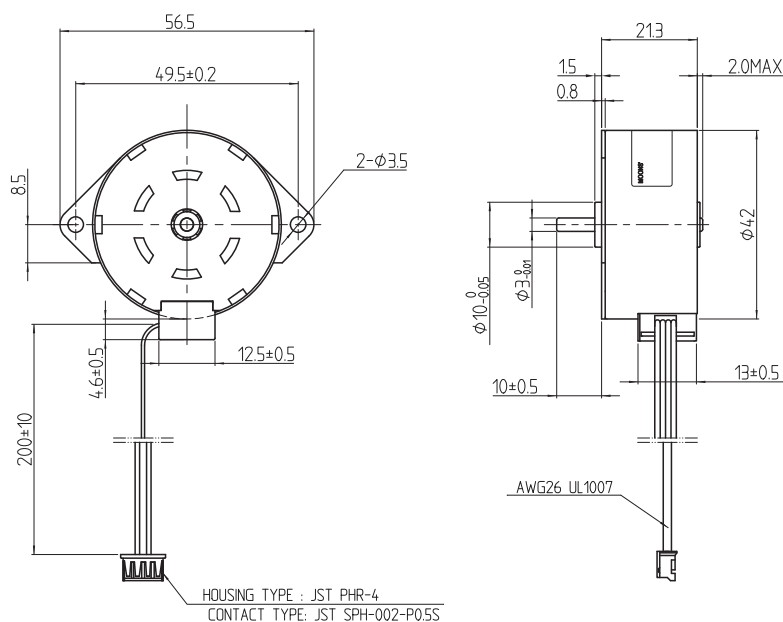
- Phases 2
- Steps / Revolution 3.75°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

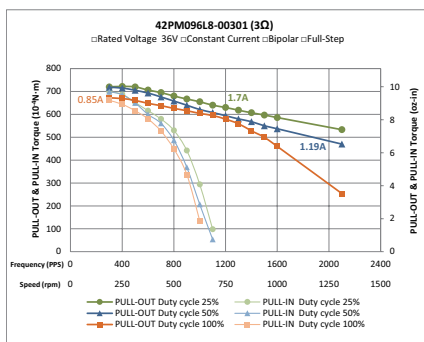
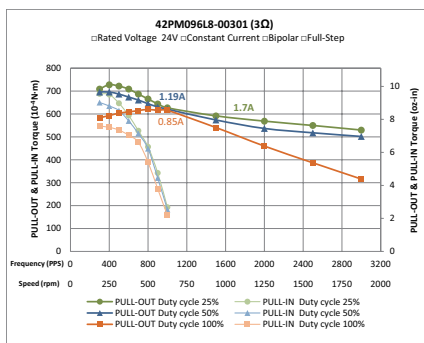
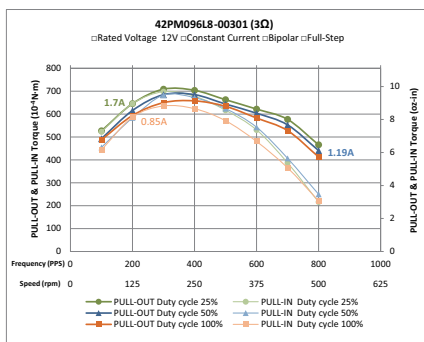
Model Number			42PM096L8-00301	42PM096L8-00701	42PM096L8-06001
Length			21.3 mm (0.84 in.)		
Step Angle	°		3.75		
Rated Current	Amps		0.85	0.55	0.2
Holding Torque	10 ⁻⁴ Nm	Typ.	780	780	780
	oz-in	Typ.	10.83	10.83	10.83
Coil Resistance	Ohms	±10% @ 20°C	3.1	7	60
Coil Inductance	mH	Typ.	5.5	12.1	100
Detent Torque	10 ⁻⁴ Nm	Max.	120	120	120
	oz-in	Max.	1.67	1.67	1.67
Rotor Inertia	gcm ²		11.57	11.57	11.57
	10 ⁻⁴ oz-in ²		601	601	601
Motor Weight	g		120		
	Lbs		0.26		

^ Preferred model

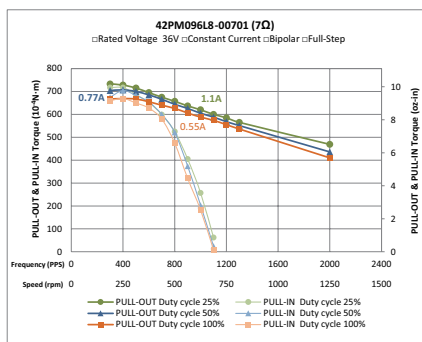
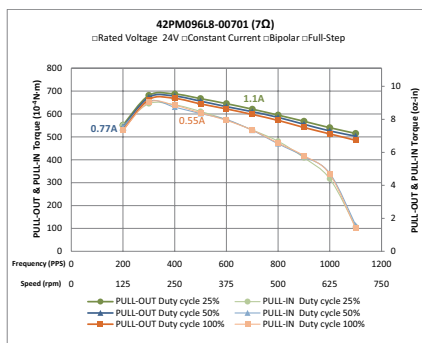
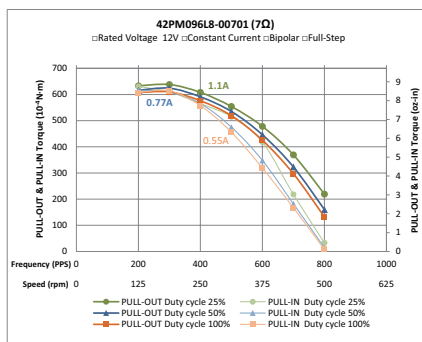
Dimensions: mm



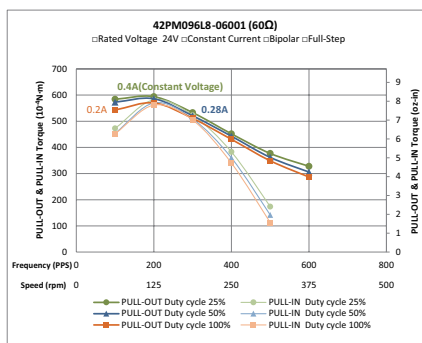
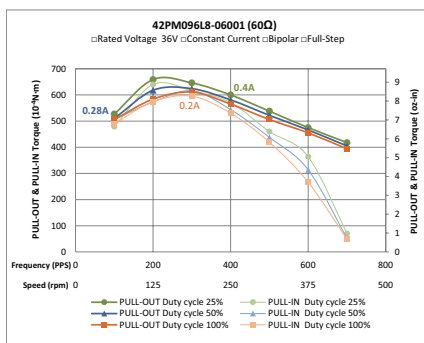
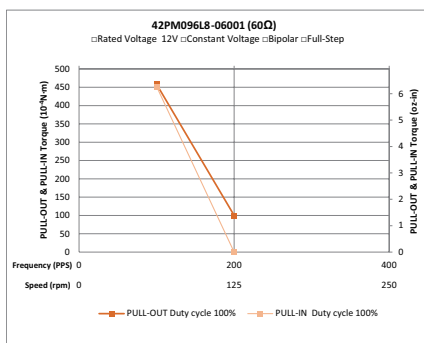
42PM096L8-00301



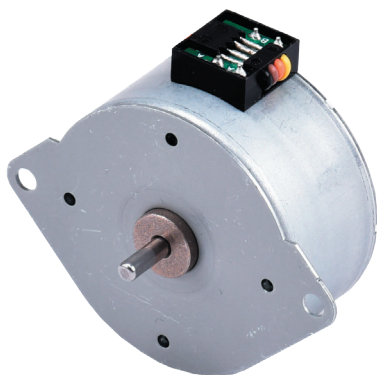
42PM096L8-00701



42PM096L8-06001



42PM100L - Ø42mm, S, 3.6°



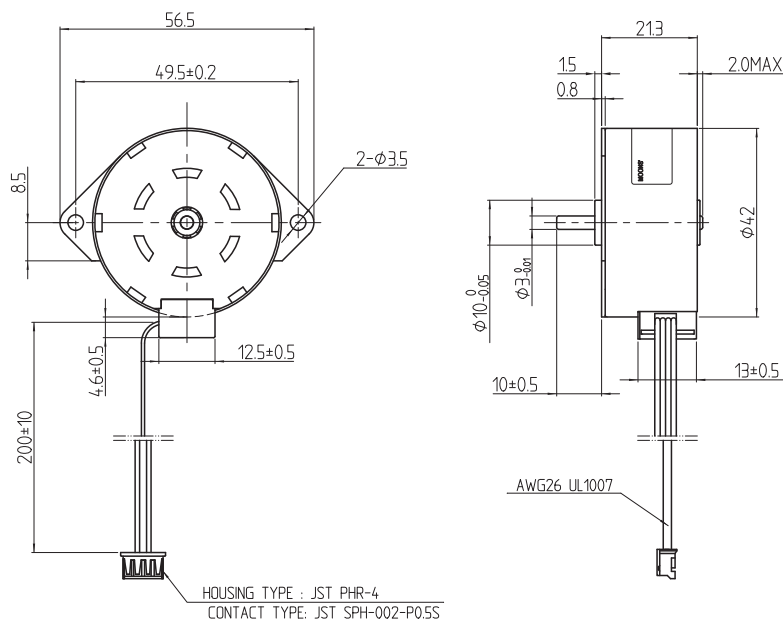
- Phases 2
- Steps / Revolution 3.6°
- Shaft Load
 - Axial 1N
 - Radial 7.5N
- IP Rating 40
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

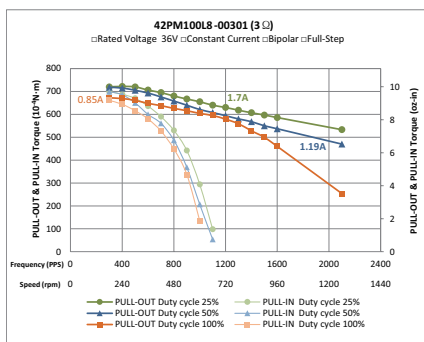
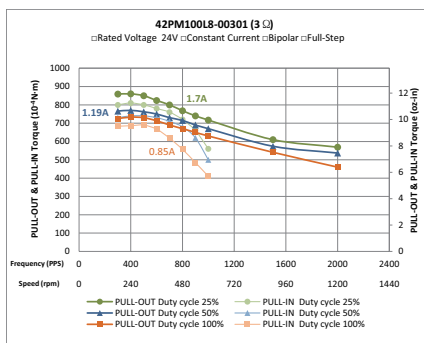
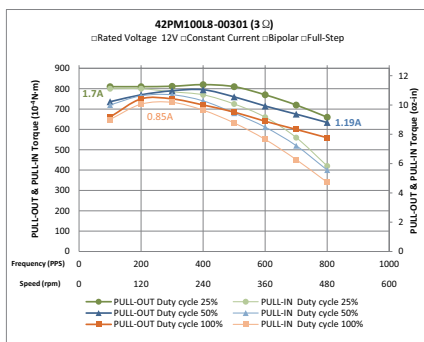
Model Number			42PM100L8-00301	42PM100L8-00701	42PM100L8-06001
Length			21.3 mm (0.84 in.)		
Step Angle	°		3.6		
Rated Current	Amps		0.85	0.55	0.2
Holding Torque	10 ⁻⁴ Nm	Typ.	850	850	850
	oz-in	Typ.	11.81	11.81	11.81
Coil Resistance	Ohms	±10% @ 20°C	3.1	7	60
Coil Inductance	mH	Typ.	5.2	11.6	98
Detent Torque	10 ⁻⁴ Nm	Max.	140	140	140
	oz-in	Max.	1.94	1.94	1.94
Rotor Inertia	gcm ²		11.57	11.57	11.57
	10 ⁻⁴ oz-in ²		601	601	601
Motor Weight	g		120		
	Lbs		0.26		

^ Preferred model

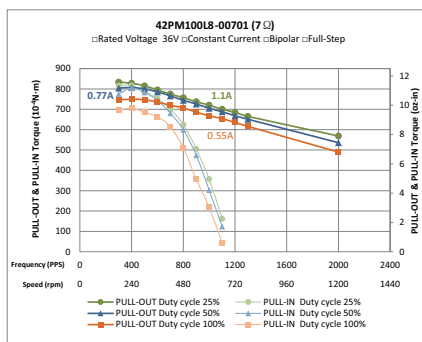
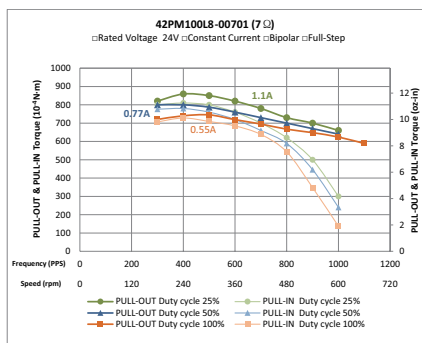
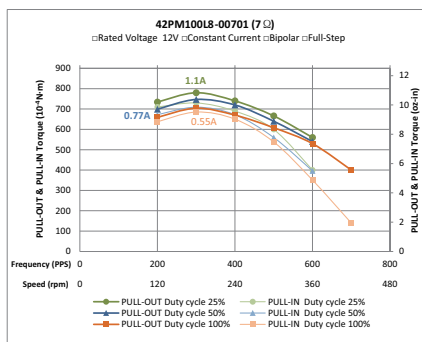
Dimensions: mm



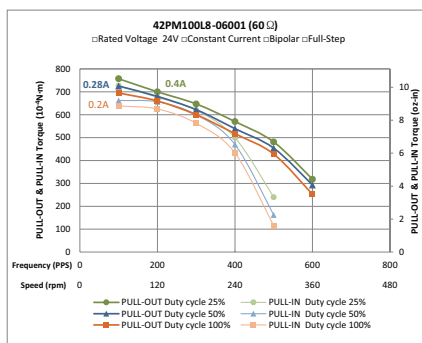
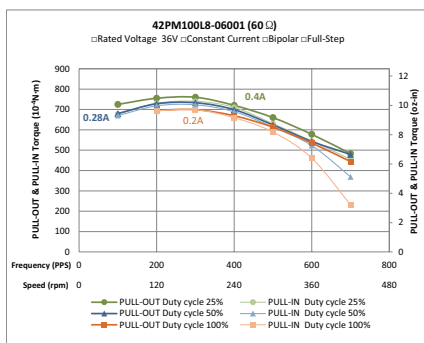
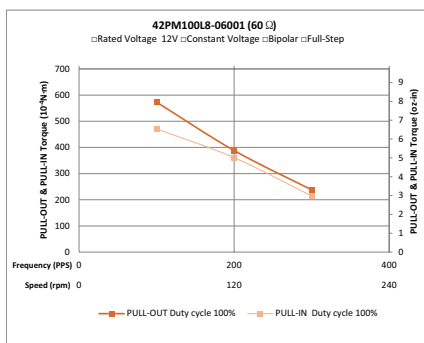
42PM100L8-00301



42PM100L8-00701



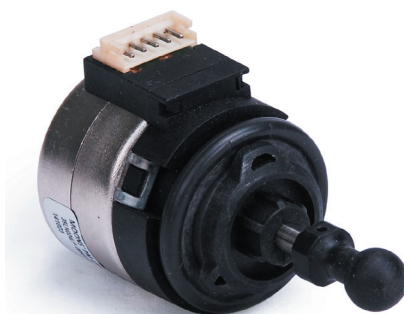
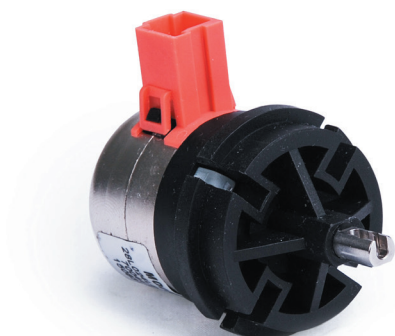
42PM100L8-06001



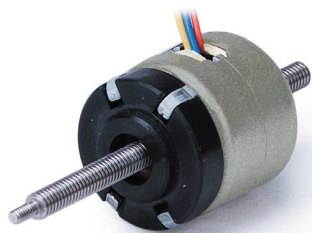
Note

Linear Actuators

- Ø20mm
- Ø25mm
- Ø28mm
- Ø35mm



20LN024M0 - 00601 Non-Captive



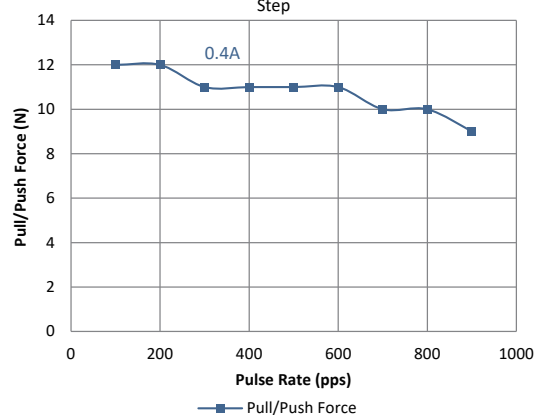
- Phases 2
- Steps 24
- Shaft Stroke 20 mm
- Linear Step Travel 0.0254 mm
- Bearing System 2 Ball Bearings
- Ambient Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100MegOhms

Motor Data

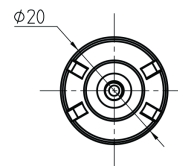
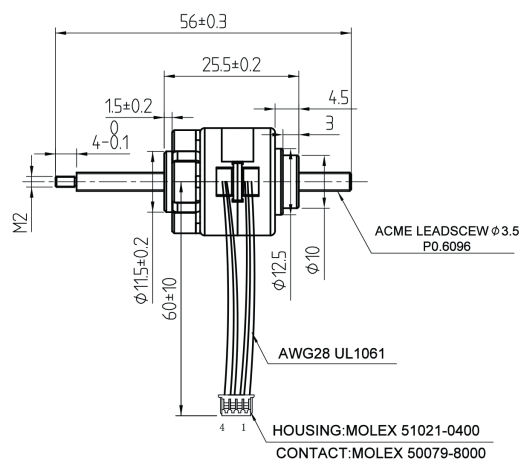
Model Number			20LN024M0-00601
Step Angle	°		15
Constant Current	Amps		0.4
Holding Force	N	Typ.	30
	oz	Typ.	107.9
Coil Resistance	Ohms	±7% @ 25°C	5.8
Coil Inductance	mH	±15%	2.85
Pull/Push Force	N	@ 400pps	9
	oz		32.4
Rated Net Weight	g		27
	Lbs		0.060

20LN024M0-00601 (5.8Ω)

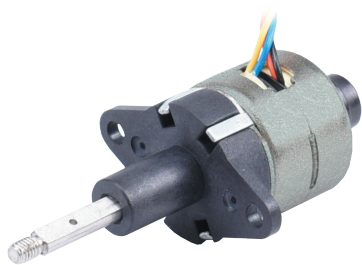
□Rated Voltage 3.4V □Constant Current □Bipolar □Full-Step



Dimensions: mm



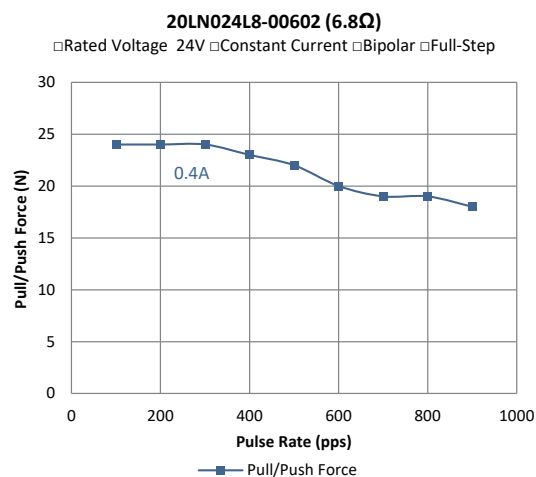
20LN024L8 - 00602 Captive



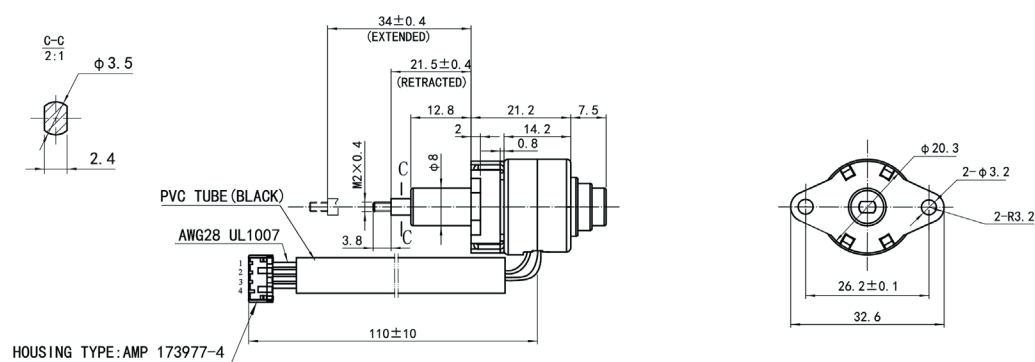
- Phases 2
- Steps 24
- Shaft Stroke 12.5 mm
- Linear Step Travel 0.0254 mm
- Bearing System 2 Ball Bearings
- Ambient Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100MegOhms

Motor Data

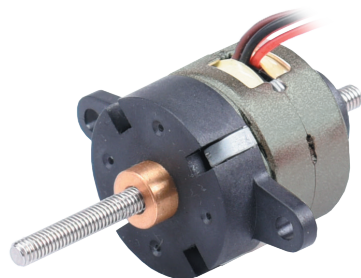
Model Number			20LN024L8-00602
Step Angle	°		15
Constant Current	Amps		0.4
Holding Force	N	Typ.	40
	oz	Typ.	143.88
Coil Resistance	Ohms	±7% @ 25°C	6.8
Coil Inductance	mH	±15%	3.29
Pull/Push Force	N	@ 400pps	23
	oz		82.7
Rated Net Weight	g		32
	Lbs		0.071



Dimensions: mm



25LN024L4 - 00801 Non-Captive



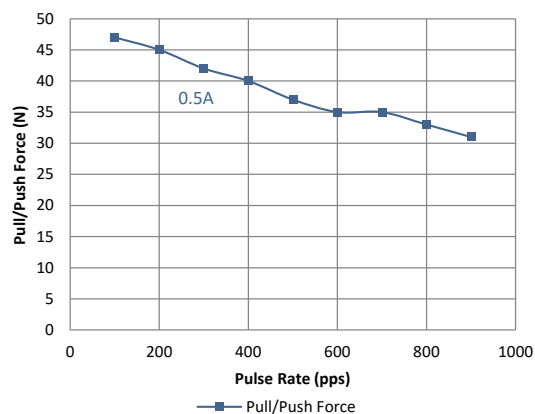
- Phases 2
- Steps 24
- Shaft Stroke 20 mm
- Linear Step Travel 0.0508 mm
- Bearing System 2 Ball Bearings
- Ambient Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100MegOhms

Motor Data

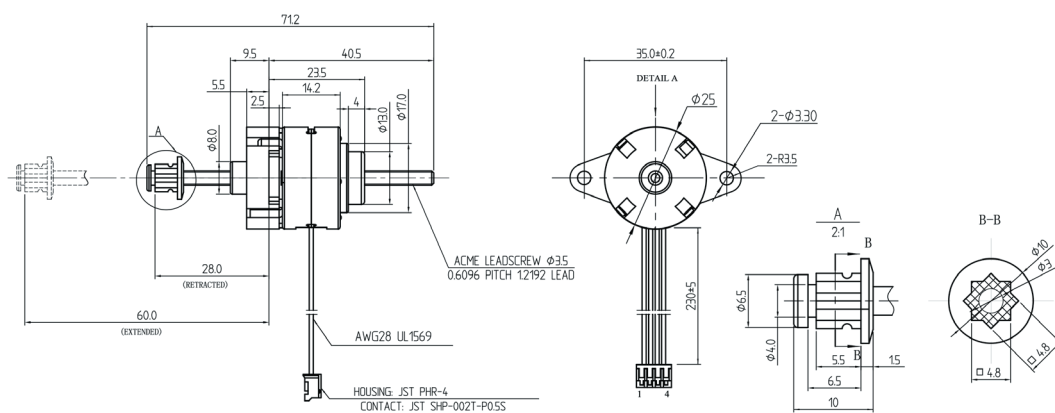
Model Number			25LN024L4-00801
Step Angle	°		15
Constant Current	Amps		0.5
Holding Force	N	Typ.	40
	oz	Typ.	143.9
Coil Resistance	Ohms	±7% @ 25°C	8.5
Coil Inductance	mH	±15%	4.5
Pull/Push Force	N	@ 400pps	31.5
	oz		113.3
Rated Net Weight	g		45
	Lbs		0.099

25LN024L4-00801 (8.5Ω)

□ Rated Voltage 24V □ Constant Current □ Bipolar □ Full-Step



Dimensions: mm



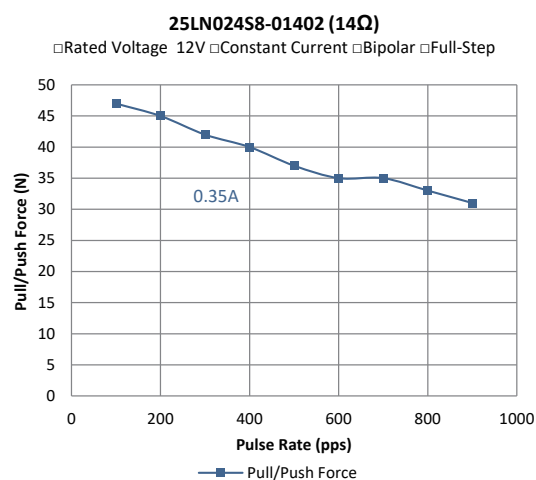
25LN024S8 - 01402 Captive



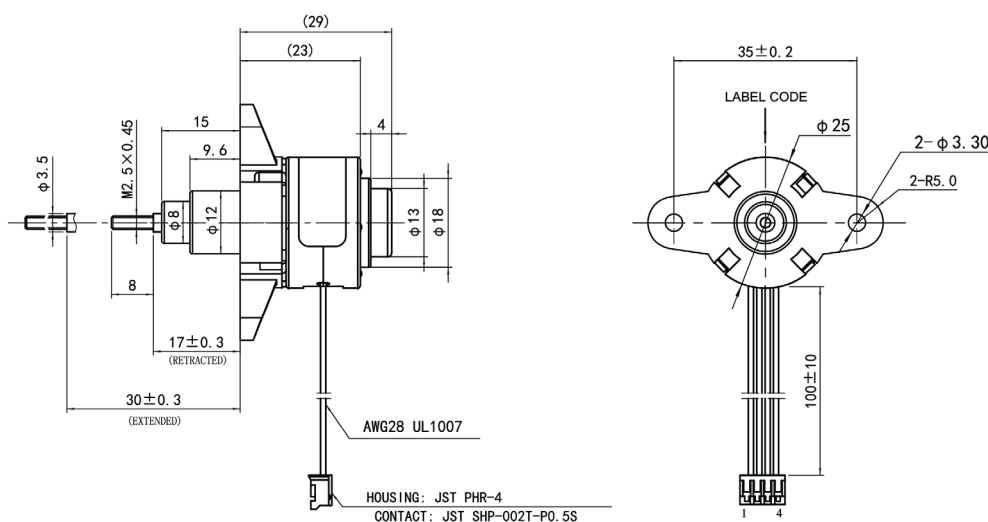
- Phases 2
- Steps 24
- Shaft Stroke 13 mm
- Linear Step Travel 0.0254 mm
- Bearing System 2 Ball Bearings
- Ambient Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100MegOhms

Motor Data

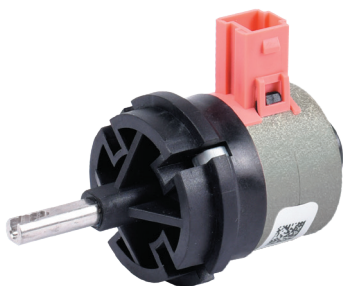
Model Number			25LN024S8-01402
Step Angle	°		15
Constant Current	Amps		0.35
Holding Force	N	Typ.	40
	oz	Typ.	143.9
Coil Resistance	Ohms	±7% @ 25°C	14
Coil Inductance	mH	±15%	9.1
Pull/Push Force	N	@ 400pps	32
	oz		115.1
Rated Net Weight	g		45
	Lbs		0.099



Dimensions: mm



28LN024L8 - 15002 Captive



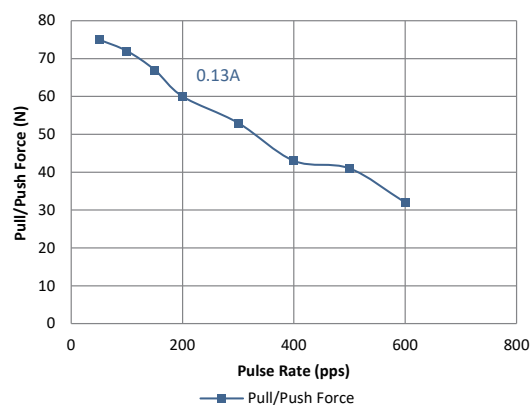
- Phases 2
- Steps 24
- Shaft Stroke 13 mm
- Linear Step Travel 0.042 mm
- Bearing System 2 Ball Bearings
- Ambient Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100MegOhms

Motor Data

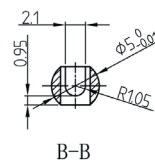
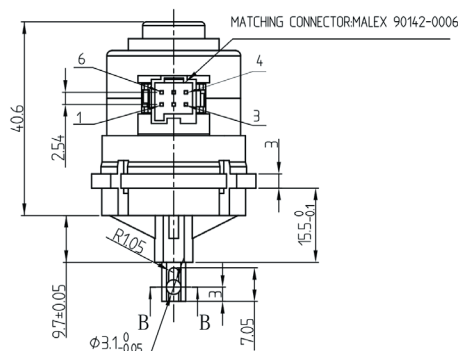
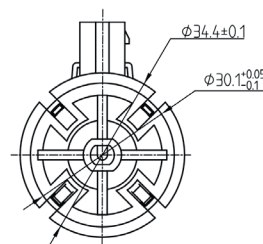
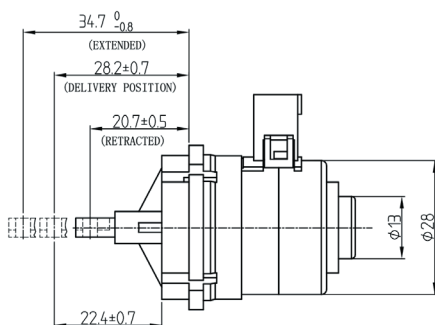
Model Number			28LN024L8-15002
Step Angle	°		15
Constant Current	Amps		0.13
Holding Force	N	Typ.	40
	oz	Typ.	143.88
Coil Resistance	Ohms	±7% @ 25°C	150
Coil Inductance	mH	±15%	112
Pull/Push Force	N	@ 400pps	45
	oz		161.9
Rated Net Weight	g		45
	Lbs		0.099

28LN024L8-15002 (150Ω)

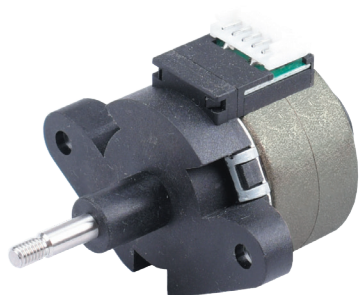
□ Rated Voltage 24V □ Constant Current □ Bipolar □ Full-Step



Dimensions: mm



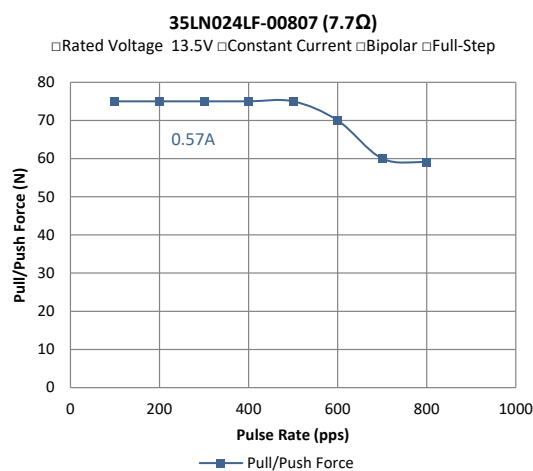
35LN024LF - 00807 Captive



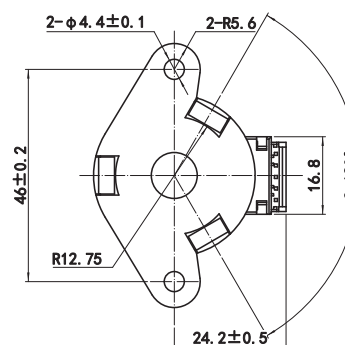
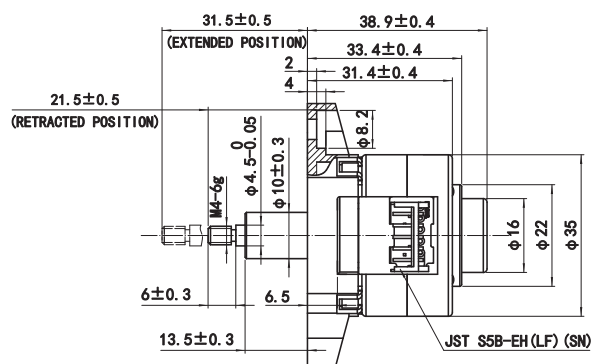
- Phases 2
- Steps 24
- Shaft Stroke 12 mm
- Linear Step Travel 0.0333 mm
- Bearing System 2 Ball Bearings
- Ambient Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100MegOhms

Motor Data

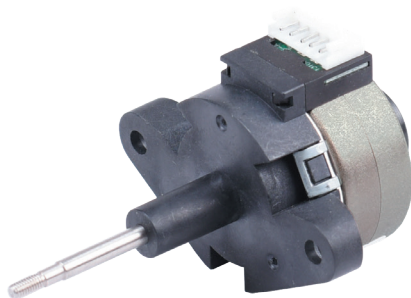
Model Number			35LN024LF-00807
Step Angle	°		15
Constant Current	Amps		0.57
Holding Force	N	Min.	40
	oz	Min.	143.9
Winding	Ohms	±7% @ 23°C	7.7
	mH	±15%	9.75
Pull/Push Force	N	@ 364pps	50
	oz		179.9
Rated Net Weight	g		115
	Lbs		0.254



Dimensions: mm



35LN048S8 - 00801 Captive

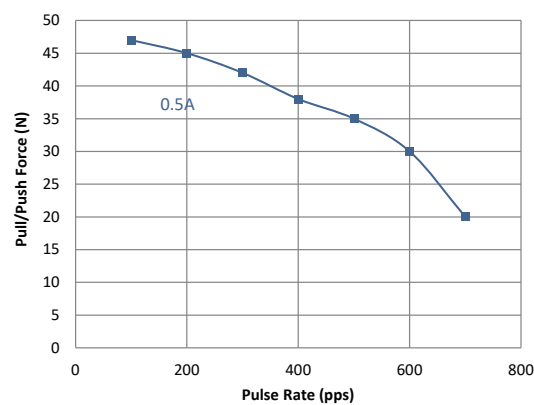


- Phases 2
- Steps 48
- Shaft Stroke 13.5 mm
- Linear Step Travel 0.021 mm
- Bearing System 2 Ball Bearings
- Ambient Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100MegOhms

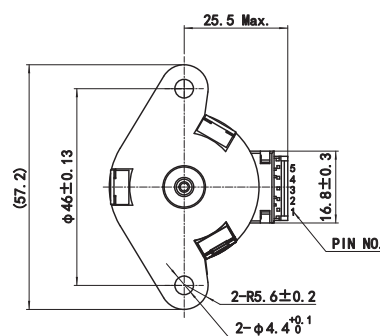
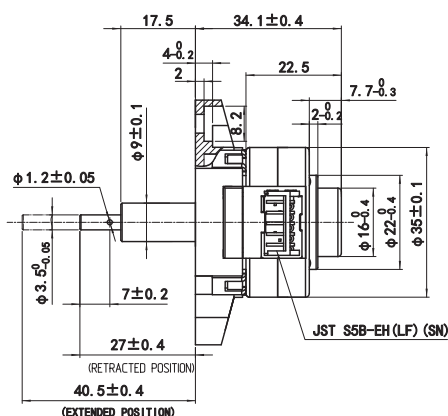
Motor Data

Model Number			35LN048S8-00801
Step Angle	°		7.5
Constant Current	Amps		0.5
Holding Force	N	Min.	40
	oz	Min.	143.9
Winding	Ohms	±7% @ 23°C	7.7
	mH	±15%	8.29
Pull/Push Force	N	@ 600pps	30
	oz		107.9
Rated Net Weight	g		88
	Lbs		0.194

35LN048S8-00801 (7.7 Ω)
 □Rated Voltage 12V □Constant Current □Bipolar □Full-Step



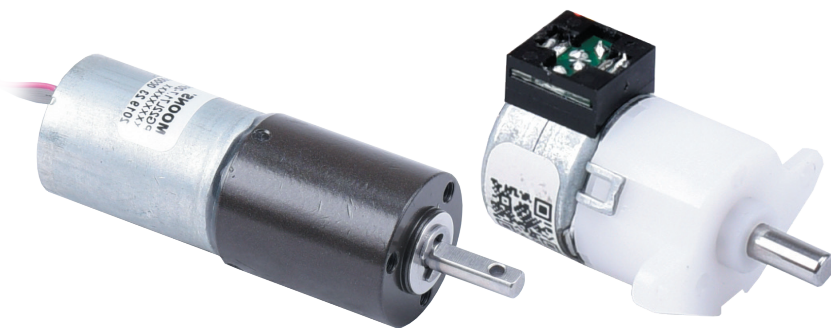
Dimensions: mm



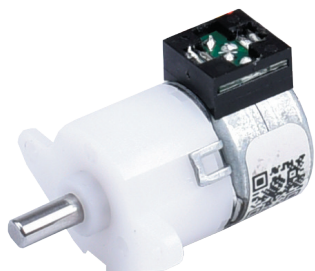
Gearmotor

PG15L

PG22L



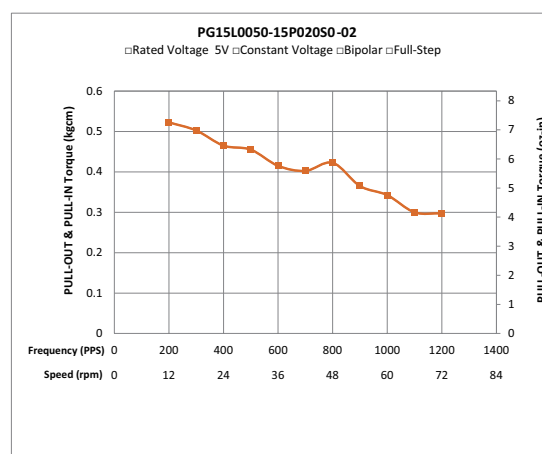
PG15L0050-15P020S0-02

Product
Overview

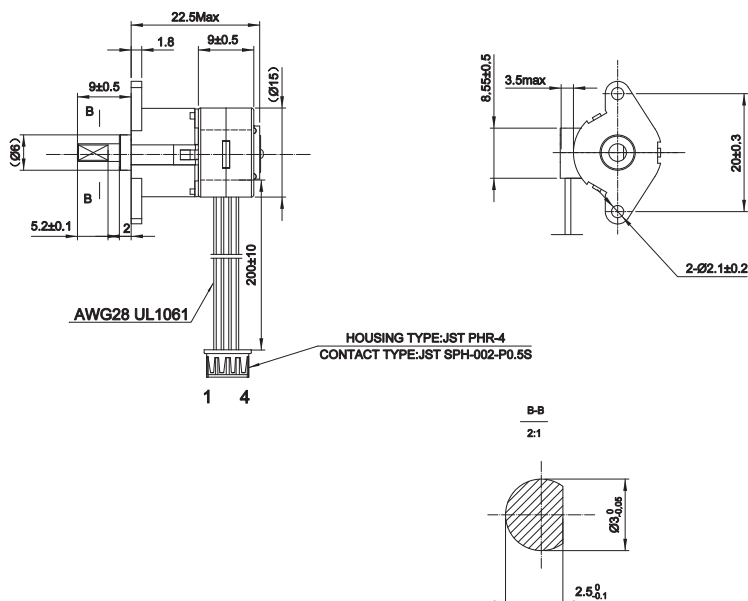
- Phases 2
- Steps / Revolution 0.36°
- IP Rating 40
- Approvals RoHS
- Operating Temp. 0°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

Phases		2
Steps/Revolution		18°/50(0.36°)
Rated Voltage	Vdc	5
Frame Size	mm	15mm
Length	mm	22.5
Gear Ratio		50:1
Resistance	Ohms $\pm 10\%$ @ 20°C	10
Coil Type		Bi-Polar
Insulations Class		Class E(120°C)
IP Rating		IP40
Weight	g	11

Rotary
Motors

Dimensions: mm



Gearmotors

Technical

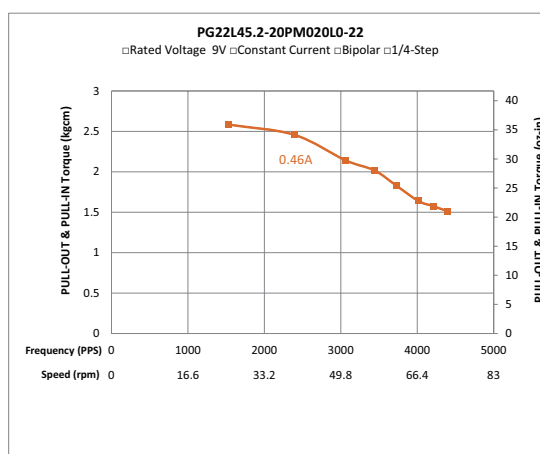
PG22L45.2-20PM020L0-22



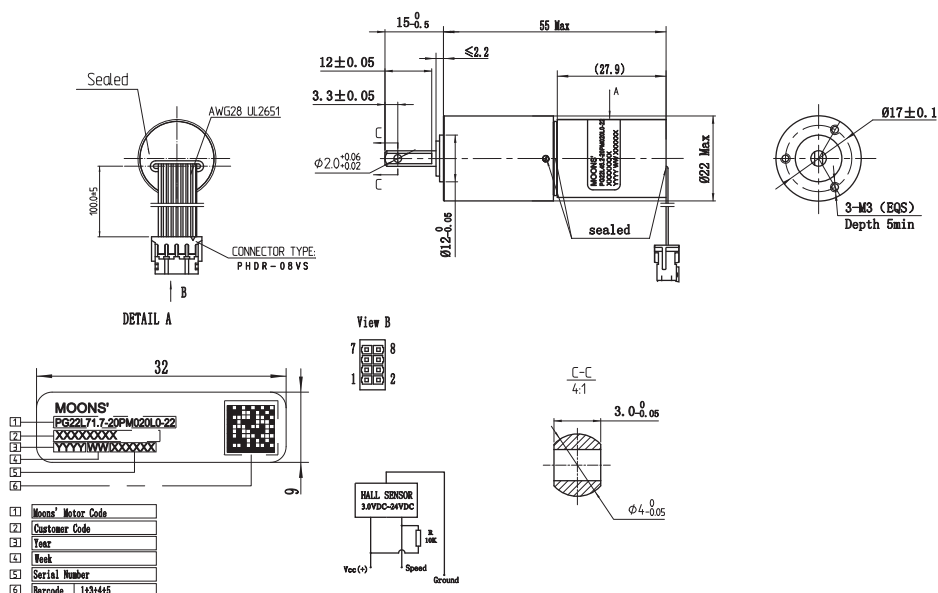
- Phases 2
- Steps / Revolution 0.4°
- IP Rating 56
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

Phases		2
Steps/Revolution		18°/45(0.4°)
Rated Voltage	Vdc	8.5
Frame Size	mm	22mm
Length	mm	60
Gear Ratio		45.2:1
Resistance	Ohms ±10% @20°C	6.4
Coil Type		Bi-Polar
Insulations Class		Class B(130°C)
IP Rating		IP56
Weight	g	120



Dimensions: mm



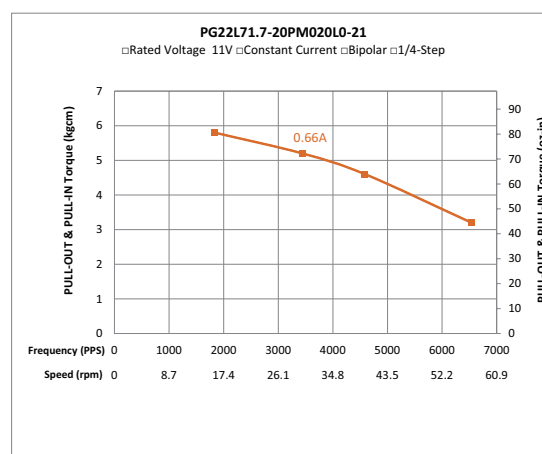
PG22L71.7-20PM020L0-21

Product
Overview

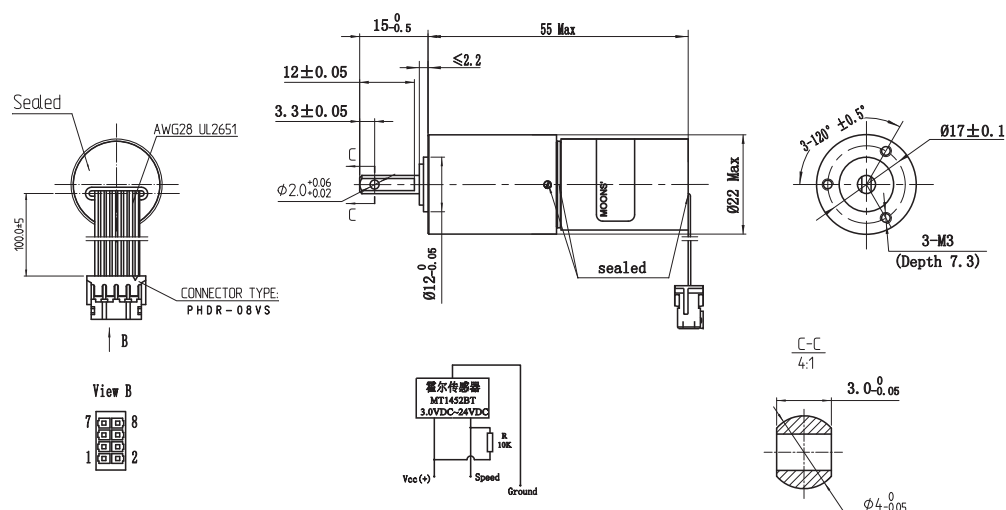
- Phases 2
- Steps / Revolution 0.25°
- IP Rating 56
- Approvals RoHS
- Operating Temp. -20°C to +50°C
- Insulation Class B, 130°C
- Insulation Resistance 100 MegOhms

Motor Data

Phases		2
Steps/Revolution		18°/72(0.25°)
Rated Voltage	Vdc	9.2
Frame Size	mm	22mm
Length	mm	55
Gear Ratio		71.7:1
Resistance	Ohms $\pm 10\%$ @20°C	6.4
Coil Type		Bi-Polar
Insulations Class		Class B(130°C)
IP Rating		IP56
Weight	g	100

Rotary
Motors

Dimensions: mm



Gearmotors

Technical

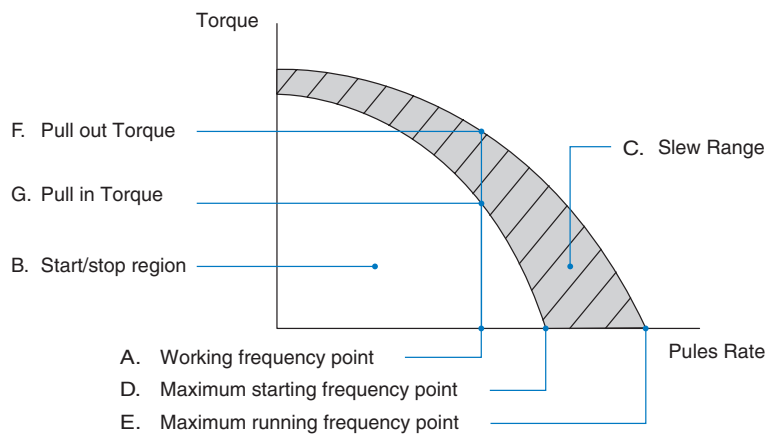
Technical

- Speed-Torque Characteristics
- About Rated Current
- Conversion Factors



Speed-Torque Characteristics

The dynamic torque curve is an important aspect of stepping motor's output performance. The followings are some keyword explanations.



A. Working frequency point express the stepping motors rotational speed versus the drive pulse rate.

$$n = q * \text{Hz} / (360 * D)$$

n: rev/sec

Hz: the frequency value or the driver pulse rate.

D: the subdividing value of motor driver

q: the step angle of stepping motor

B. Start/Stop region: the region in which a stepping motor can be directly started or stopped.

C. Slew Range: the motor cannot be started directly in this area. It must be started in the start/stop region first and then accelerated to this area. In this area, the motor can not be directly stopped, either. Otherwise this will lead to losing-step. The motor must be decelerated back to the start/stop region before it can be stopped.

D. Maximum starting frequency point at this point, the stepping motor can reach its maximum starting speed under unloaded condition.

E. Maximum running frequency point at this point the stepping motor can reach its maximum running speed under an unloaded condition.

F. Pull-in Torque: the maximum dynamic torque value that a stepping motor can load directly at the particular operating frequency point.

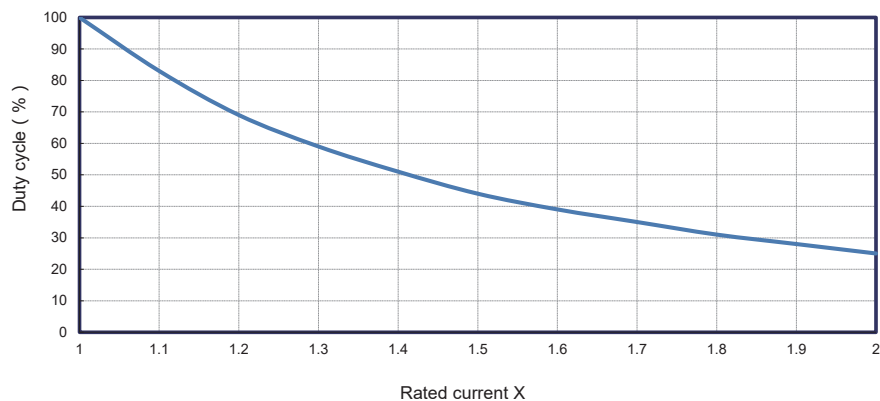
G. Pull-out Torque: the maximum dynamic torque value that a stepping motor can load at the particular operating frequency point when the motor has been started. Because of the inertia of rotation the Pull-Out Torque is always larger than the Pull-In Torque.

About Rated Current

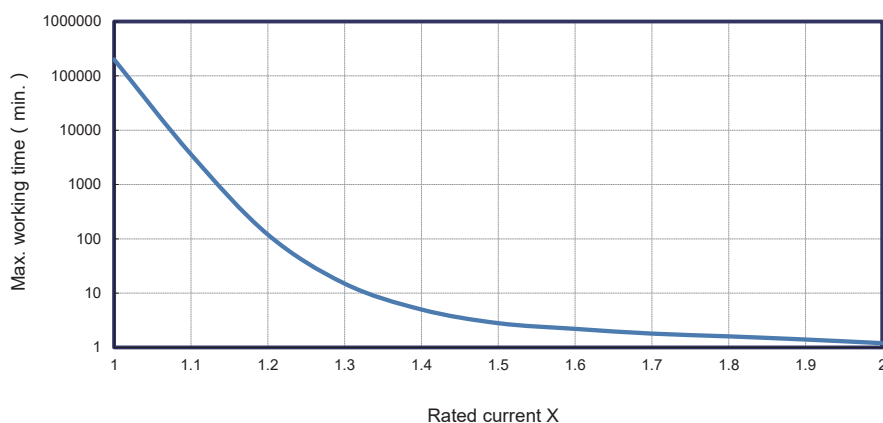
Rated current of PM stepper is limited by thermal characteristics.

In actual application, to get higher output torque we can supply with higher current, which extend rated value. In such case, the motor can't be in continuous working, otherwise the winding will be overheat even damage device. Duty cycle need to be not reach to 100%, also we must consider Max. working time - Ton Max.

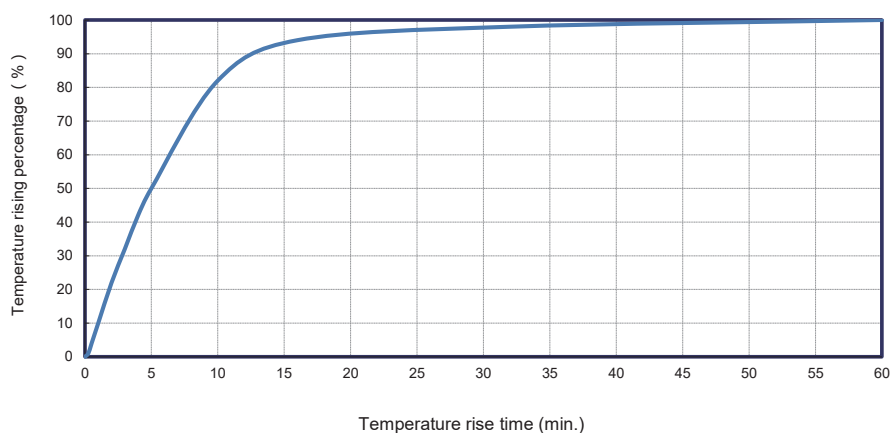
How to define the duty cycle with multiple of rated current



How to calculate the max. Single working time with multiple of rated current



Motor winding temperature rising curve



Conversion Factors

Length

A \ B	mm	cm	m	inch	feet
mm	--	0.1	0.001	0.03937	0.003281
cm	10	--	0.01	0.3937	0.03281
m	1,000	100	--	39.37	3.281
inch	25.4	2.54	0.0254	--	0.08333
feet	304.8	30.48	0.348	12	--

Multiply "A" units
by conversion factor
to obtain "B" units

Force

A \ B	g	kgf	oz	lb	Newton
g	--	0.001	0.03527	0.002205	0.0098
kgf	1,000	--	35.27	22.05	9.807
oz	28.35	0.02835	--	0.0625	0.278
lb	453.6	0.4536	16	--	4.448
Newton	102	0.102	3.597	0.2248	--

Torque

A \ B	Nm	Ncm	mNm	kgm*	kgcm*	gcm*	oz-in	lb-ft	lb-in
Nm	--	100	1,000	0.102	10.2	10,200	141.6	0.7376	8.851
Ncm	0.01	--	10	0.00102	0.102	102	1.416	0.007376	0.08851
mNm	0.001	0.1	--	0.000102	0.0102	10.2	0.1416	0.000738	0.008851
kgm*	9.807	980.7	9807	--	100	100,000	1,389	7.233	86.8
kgcm*	0.09807	9.807	98.07	0.01	--	1,000	13.89	0.07233	0.868
gcm*	9.81E-05	0.009807	0.09807	0.00001	0.001	--	0.01389	7.23E-05	0.000868
oz-in	0.007062	0.7062	7.062	0.00072	0.07201	72.01	--	0.00521	0.0625
lb-ft	1.356	135.6	135.6	0.1383	13.83	13,830	192	--	12
lb-in	0.113	11.3	113	0.01152	1.152	1,152	16	0.0833	--

Inertia

A \ B	kgm ²	kgcm ²	gcm ²	oz-in ²	oz-in-sec ²	lb-in ²	lb-in-sec ²	lb-ft ²	lb-ft-sec ² (slug ft ²)
kgm ²	--	10,000	10,000,000	54,700	142	3,420	8.85	23.7	0.738
kgcm ²	0.0001	--	1,000	5.47	0.0142	0.342	0.000885	0.00237	7.38E-05
gcm ²	1E-07	0.001	--	0.00547	1.42E-05	0.000342	8.85E-07	2.37E-06	7.38E-08
oz-in ²	1.83E-05	0.1829	183	--	0.00259	0.0625	0.000162	0.000434	1.35E-05
oz-in-sec ²	0.00706	70.62	70,600	386	--	24.1	0.0625	0.168	0.00521
lb-in ²	0.000293	2.926	2,930	16	0.0414	--	0.00259	0.00694	0.000216
lb-in-sec ²	0.113	1,130	1,130,000	6,180	1.6	386	--	2.68	0.0833
lb-ft ²	0.0421	421.4	421,000	2,300	5.97	144	0.373	--	0.318
lb-ft-sec ² (slug ft ²)	1.36	13,600	13,600,000	74,100	192	4,630	12	32.2	--

