

2-Phase Hybrid Stepping Motor

1.8°

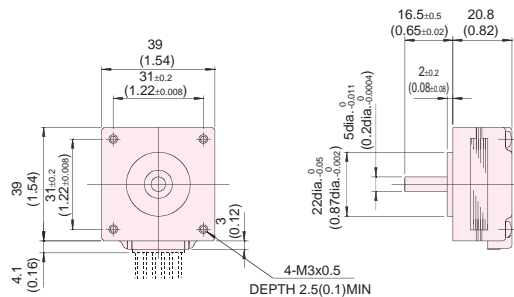
KH39 series 800 type

HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL	UNIT	KH39EM2	
		-801	-851
SHAFT	————	SINGLE	
DRIVE METHOD	————	UNI-POLAR	BI-POLAR
NUMBER OF PHASES	————	2	2
STEP ANGLE	deg./step	1.8	1.8
VOLTAGE	V	5.6	3.6
CURRENT	A/PHASE	0.4	0.6
RESISTANCE	Ω/PHASE	14.0	6.0
INDUCTANCE	mH/PHASE	6.4	5.5
HOLDING TORQUE	mN • m	59	78
	oz • in	8.3	11
DETENT TORQUE	mN • m	7.9	7.9
	oz • in	1.1	1.1
ROTOR INERTIA	g • cm ²	14	14
	oz • in ²	0.08	0.08
WEIGHT	g	110	110
	lb	0.24	0.24
INSULATION CLASS	————	E EQUIVALENT (120°C 248°F) (UL VALUE : CLASS B-130°C)	
INSULATION RESISTANCE	————	500VDC 100MΩmin.	
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.	
OPERATING TEMP.RANGE	°C	0 to 50	
ALLOWABLE TEMP.RISE	deg.	70	

DIMENSIONS unit = mm (inch)

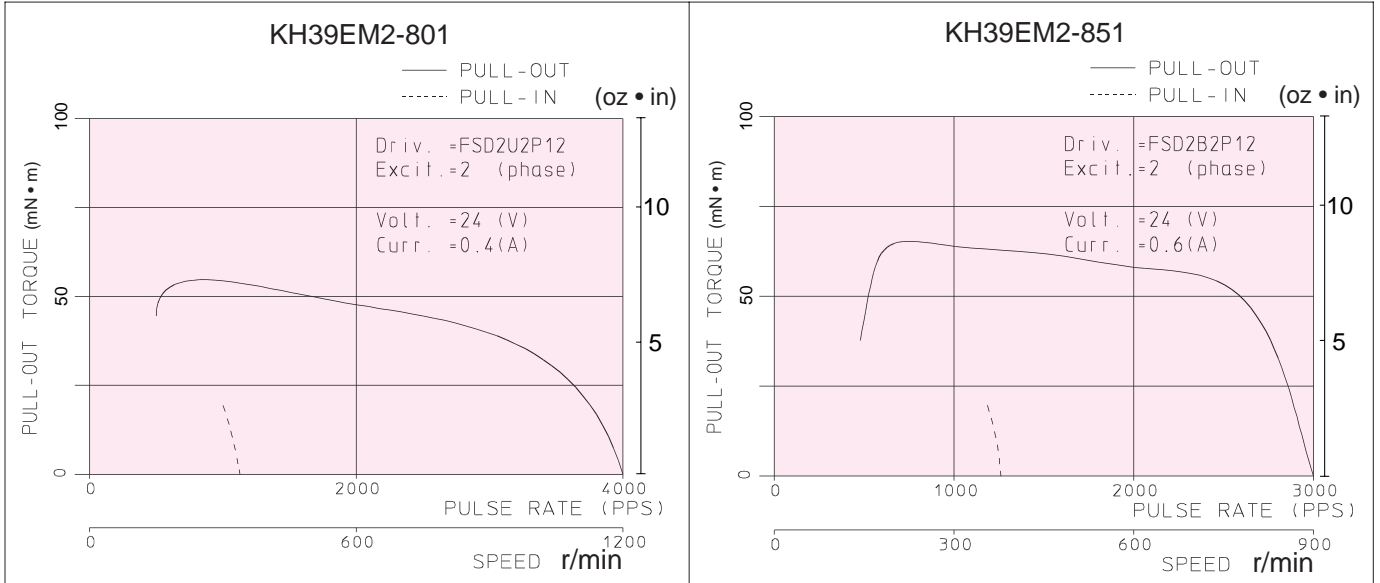




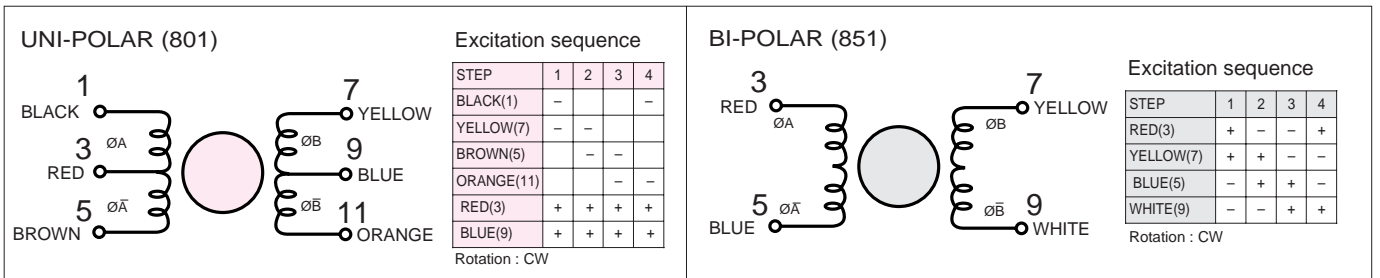
Features

1. High torque
Output is 1.3 times as high as conventional products.
2. Low noise -7dB(A) quieter than conventional products.

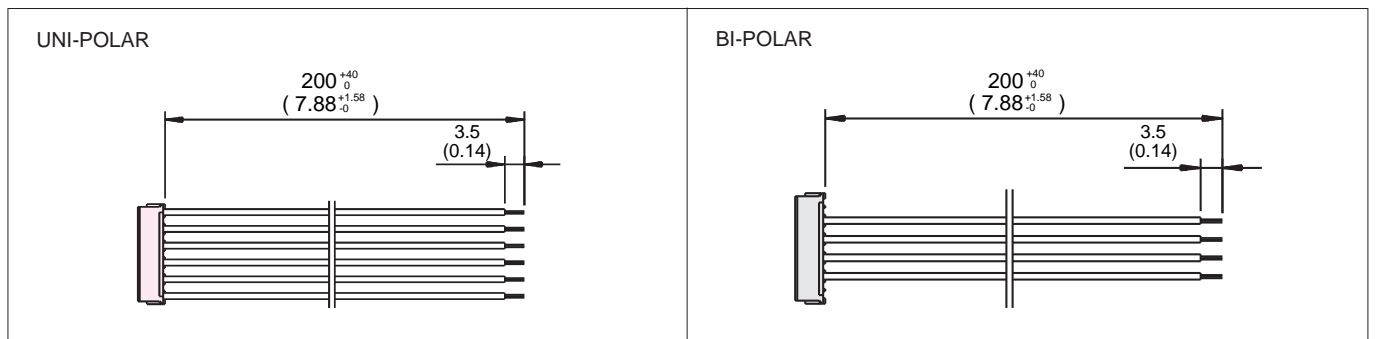
■ TORQUE CHARACTERISTICS VS PULSE RATE



■ CONNECTION DIAGRAMS



■ CONNECTION CABLE TO MOTOR unit = mm (inch)



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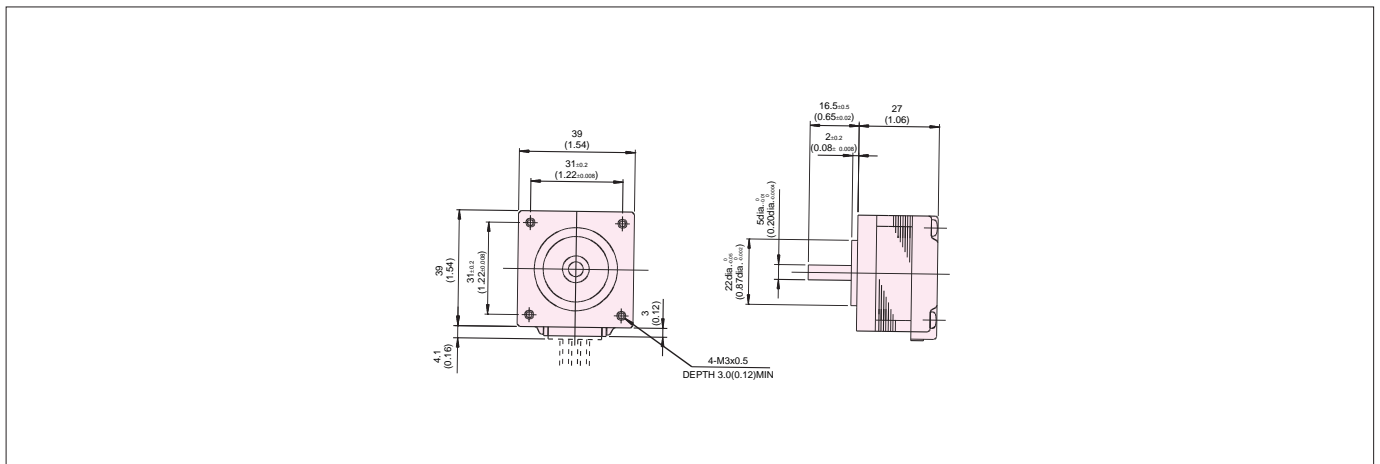
KH39 series 800 type

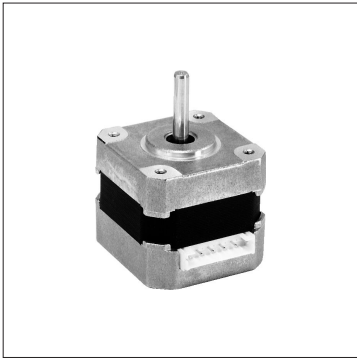
HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL	UNIT	KH39FM2	
		-801	-851
DRIVE METHOD	————	UNI-POLAR	(BI-POLAR)
NUMBER OF PHASES	————	2	2
STEP ANGLE	deg./step	1.8	1.8
VOLTAGE	V	6.3	4
CURRENT	A/PHASE	0.42	0.67
RESISTANCE	Ω/PHASE	15.0	6.0
INDUCTANCE	mH/PHASE	8.5	6.8
HOLDING TORQUE	mN • m	88	118
	oz • in	13	17
DETENT TORQUE	mN • m	9.8	9.8
	oz • in	1.4	1.4
ROTOR INERTIA	g • cm ²	19	19
	oz • in ²	0.10	0.10
WEIGHT	g	160	160
	lb	0.35	0.35
INSULATION CLASS	————	E EQUIVALENT (120°C 248°F) (UL VALUE : CLASS B-130°C)	
INSULATION RESISTANCE	————	500VDC 100MΩmin.	
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.	
OPERATING TEMP.RANGE	°C	0 to 50	
ALLOWABLE TEMP.RISE	deg.	70	

DIMENSIONS unit = mm (inch)

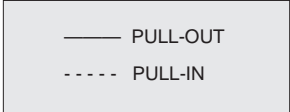
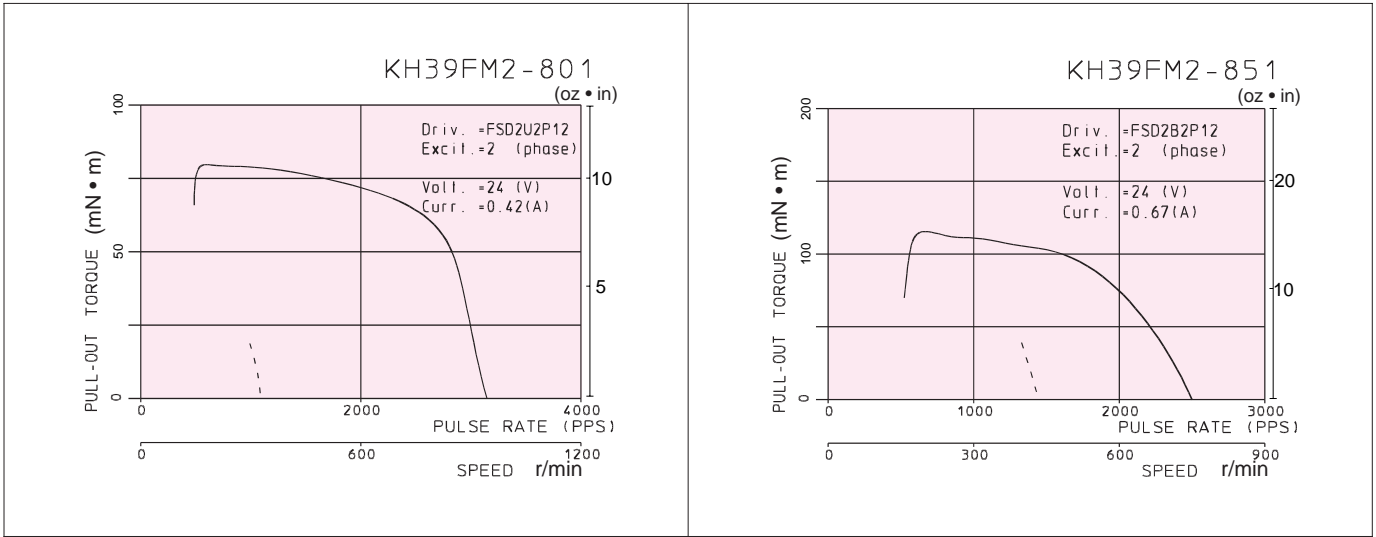




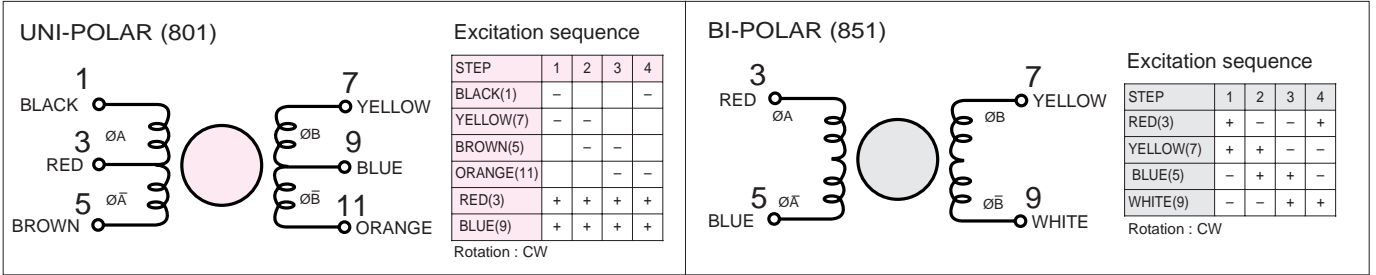
Features

1. High torque
Output is 1.3 times as high as conventional products.
2. Low noise -7dB(A) quieter than conventional products.

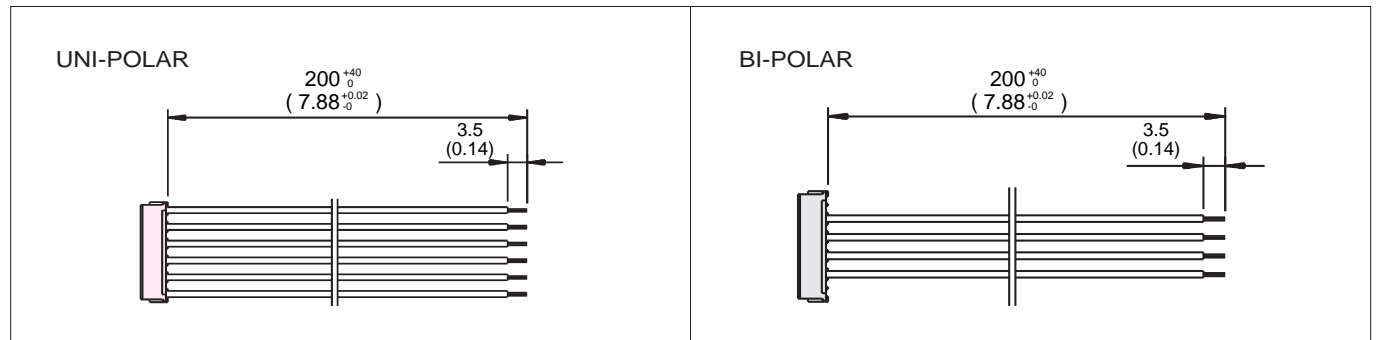
■ TORQUE CHARACTERISTICS vs. PULSE RATE



■ CONNECTION DIAGRAMS



■ CONNECTION CABLE TO MOTOR unit = mm (inch)



2-Phase Hybrid Stepping Motor

1.8°

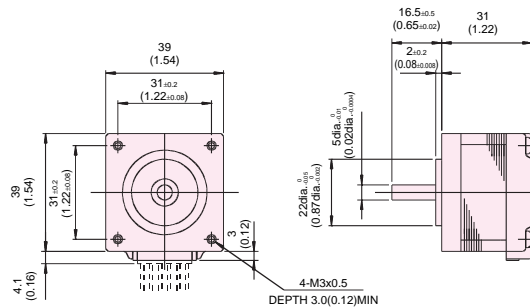
KH39 series 800 type

HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL	UNIT	KH39GM2	
		-801	-851
DRIVE METHOD	————	UNI-POLAR	(BI-POLAR)
NUMBER OF PHASES	————	2	2
STEP ANGLE	deg./step	1.8	1.8
VOLTAGE	V	6.4	4.6
CURRENT	A/PHASE	0.47	0.65
RESISTANCE	Ω/PHASE	13.6	7.0
INDUCTANCE	mH/PHASE	9.8	9.8
HOLDING TORQUE	mN • m	127	157
	oz • in	18	22
DETENT TORQUE	mN • m	11.8	11.8
	oz • in	1.7	1.7
ROTOR INERTIA	g • cm ²	27	27
	oz • in ²	0.15	0.15
WEIGHT	g	240	240
	lb	0.53	0.53
INSULATION CLASS	————	E EQUIVALENT (120°C 248°F) (UL VALUE : CLASS B-130°C)	
INSULATION RESISTANCE	————	500VDC 100MΩmin.	
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.	
OPERATING TEMP.RANGE	°C	0 to 50	
ALLOWABLE TEMP.RISE	deg.	70	

DIMENSIONS unit = mm (inch)

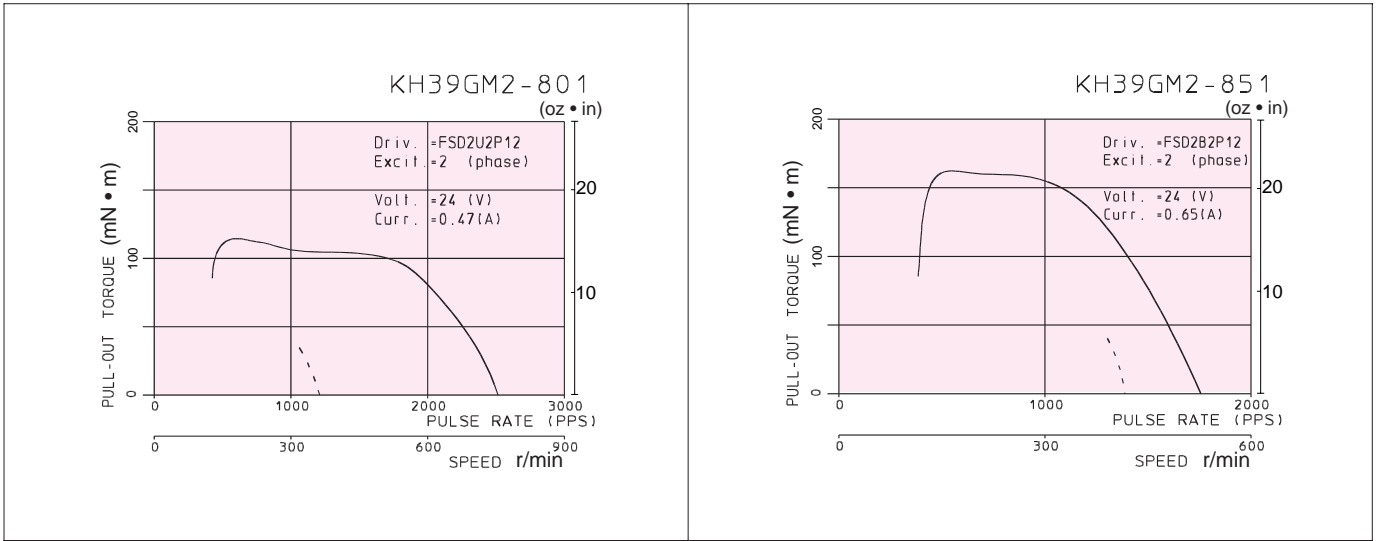




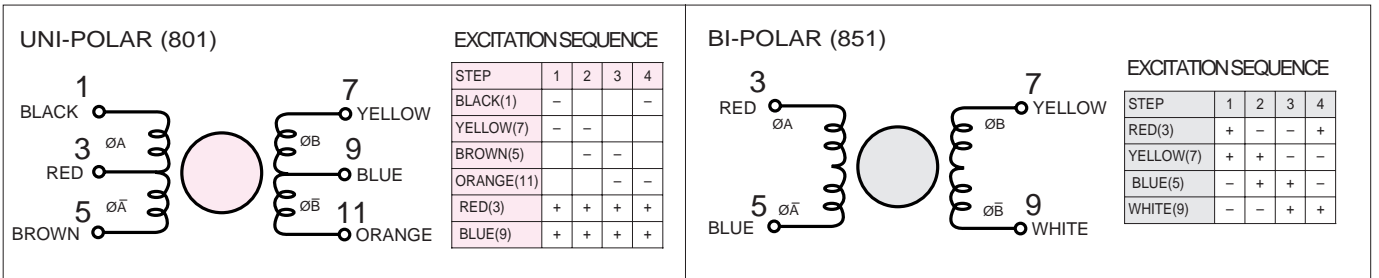
Features

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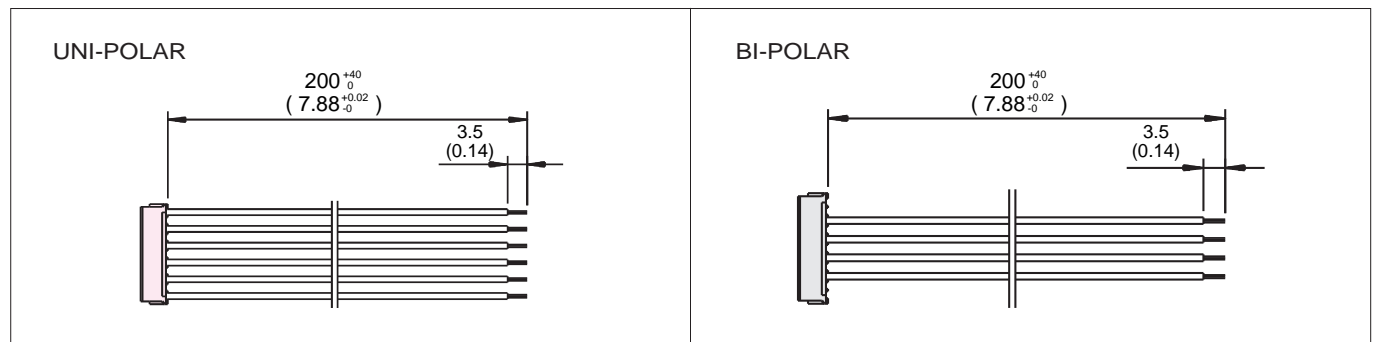
■ TORQUE CHARACTERISTICS vs. PULSE RATE



■ CONNECTION DIAGRAMS



■ CONNECTION CABLE TO MOTOR unit = mm (inch)



2-Phase Hybrid Stepping Motor

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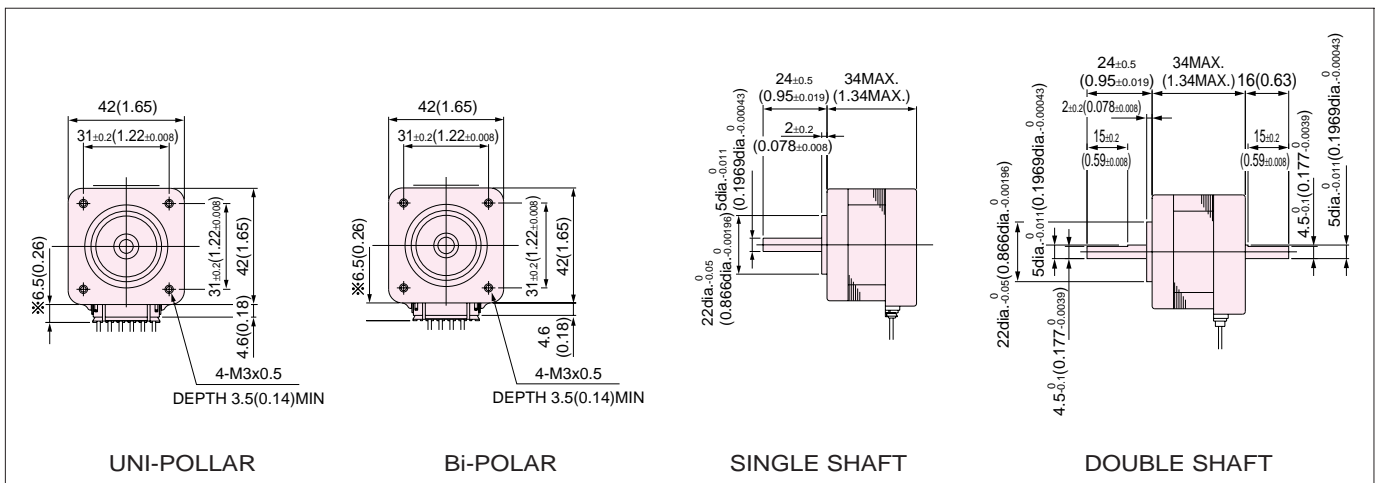
KH42 series 900 type

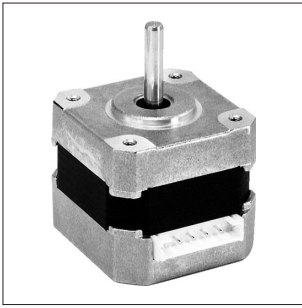
HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL	KH42HM2				
	SINGLE SHAFT	-901	-902	-903	-951
	DOUBLE SHAFT	-911	-912	-913	-961
DRIVE METHOD	————	UNI-POLAR			BI-POLAR
NUMBER OF PHASES	————	2			2
STEP ANGLE	deg./step	1.8			1.8
VOLTAGE	V	3.06	5.57	6.76	3.10
CURRENT	A/PHASE	0.9	0.58	0.46	1.0
WINDING RESISTANCE	Ω/PHASE	3.4	9.6	14.7	3.1
INDUCTANCE	mH/PHASE	2.4	6.0	9.3	4.3
HOLDING TORQUE	mN • m	140	140	140	197
	oz • in	20	20	20	20
DETENT TORQUE	mN • m	11.8	11.8	11.8	11.8
	oz • in	1.7	1.7	1.7	2.1
ROTOR INERTIA	g • cm ²	38	38	38	38
	oz • in ²	0.21	0.21	0.21	0.21
WEIGHTS	g	200	200	200	200
	lb	0.44	0.44	0.44	0.57
INSULATION CLASS	————	JIS Class E (120°C 248°F) (UL VALUE : CLASS B-130°C 266°F)			
INSULATION RESISTANCE	————	500VDC 100MΩmin.			
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.			
OPERATING TEMP. RANGE	°C	0 to 50			
ALLOWABLE TEMP.RISE	deg.	70			

DIMENSIONS unit = mm (inch)





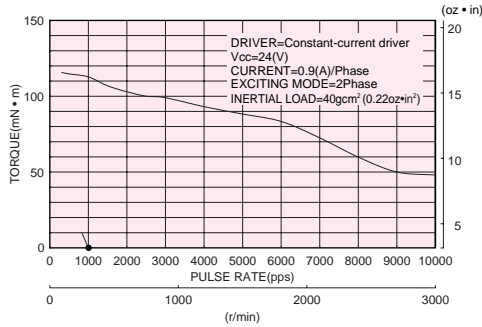
Features

- Improved Dynamic Torque
(1.2 times torque of our previous model is generated at 300 r/min, on model : KH42JM2-901)
- Lowered Vibration & Noise Level
(by increased stiffness of body construction)
- Improved Efficiency
(1.1 times of our previous model, by high grade materials.)

TORQUE CHARACTERISTICS vs. PULSE RATE

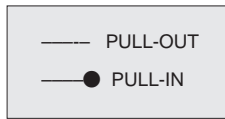
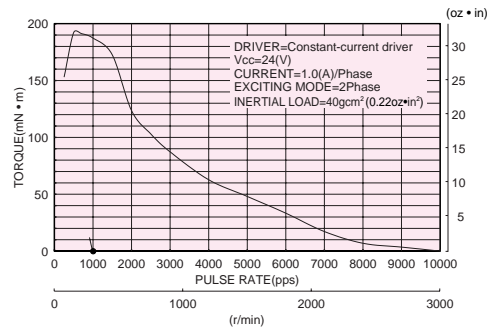
UNI-POLAR

KH42HM2-901, 911

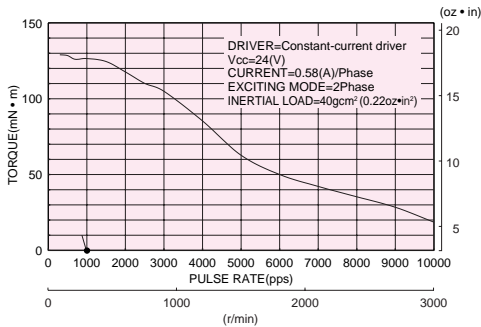


BI-POLAR

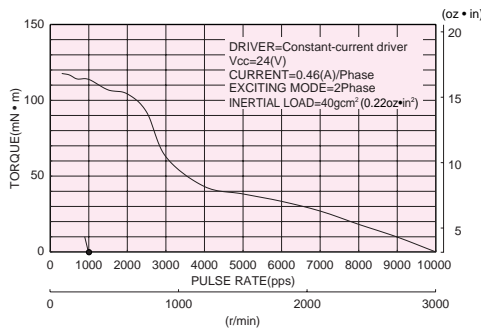
KH42HM2-951, 961



KH42HM2-902, 912

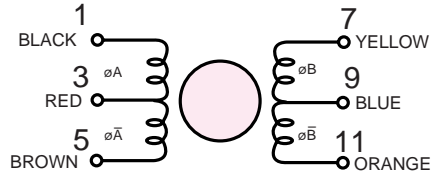


KH42HM2-903, 913



CONNECTION DIAGRAMS

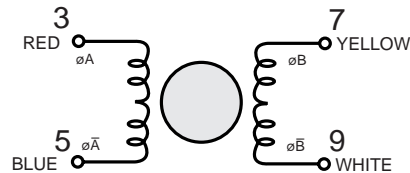
UNI-POLAR



EXCITATION SEQUENCE

STEP	1	2	3	4
BLACK(1)	-	-	-	-
YELLOW(7)	-	-	-	-
BROWN(5)	-	-	-	-
ORANGE(11)	-	-	-	-
RED(3)	+	+	+	+
BLUE(9)	+	+	+	+

BI-POLAR

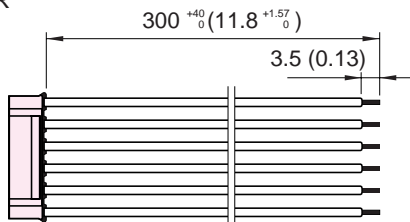


EXCITATION SEQUENCE

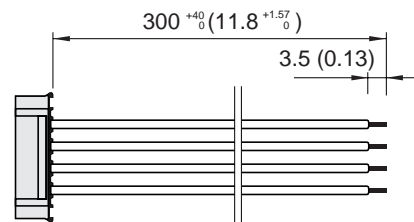
STEP	1	2	3	4
RED(3)	+	-	-	+
YELLOW(7)	+	+	-	-
BLUE(5)	-	+	+	-
WHITE(9)	-	-	+	+

CONNECTION CABLE TO MOTOR unit = mm (inch)

UNI-POLAR



BI-POLAR



2-Phase Hybrid Stepping Motor

1.8°

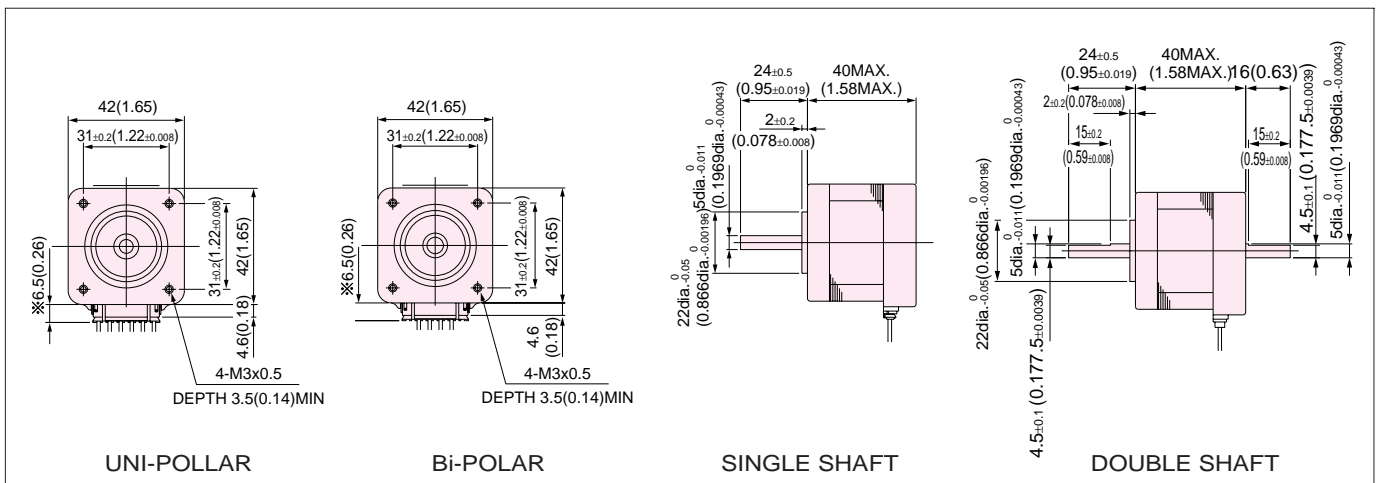
KH42 series 900 type

HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL	KH42JM2				
	SINGLE SHAFT	-901	-902	-903	-951
	DOUBLE SHAFT	-911	-912	-913	-961
DRIVE METHOD	————	UNI-POLAR			BI-POLAR
NUMBER OF PHASES	————	2			2
STEP ANGLE	deg./step	1.8			1.8
VOLTAGE	V	3.42	4.4	9.25	4.59
CURRENT	A/PHASE	1.2	0.88	0.5	0.85
WINDING RESISTANCE	Ω/PHASE	2.85	5.5	18.5	5.4
INDUCTANCE	mH/PHASE	2.5	5.1	16.3	9.3
HOLDING TORQUE	mN • m	236	236	236	314
	oz • in	33	33	33	44
DETENT TORQUE	mN • m	14.7	14.7	14.7	14.7
	oz • in	2.1	2.1	2.1	2.1
ROTOR INERTIA	g • cm ²	56	56	56	56
	oz • in ²	0.3	0.3	0.3	0.3
WEIGHTS	g	260	260	260	260
	lb	0.57	0.57	0.57	0.57
INSULATION CLASS	————	JIS Class E (120°C 248°F) (UL VALUE : CLASS B-130°C 266°F)			
INSULATION RESISTANCE	————	500VDC 100MΩmin.			
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.			
OPERATING TEMP. RANGE	°C	0 to 50			
ALLOWABLE TEMP. RISE	deg.	70			

DIMENSIONS unit = mm (inch)





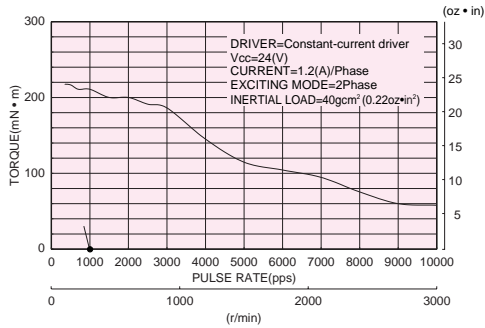
Features

- Improved Dynamic Torque
(1.2 times torque of our previous model is generated at 300 r/min, on model : KH42JM2-901)
- Lowered Vibration & Noise Level
(by increased stiffness of body construction)
- Improved Efficiency
(1.1 times of our previous model, by high grade materials.)

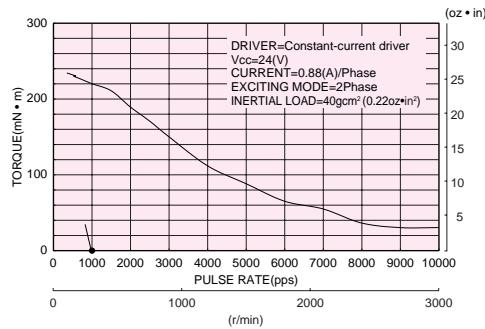
TORQUE CHARACTERISTICS vs. PULSE RATE

UNI-POLAR

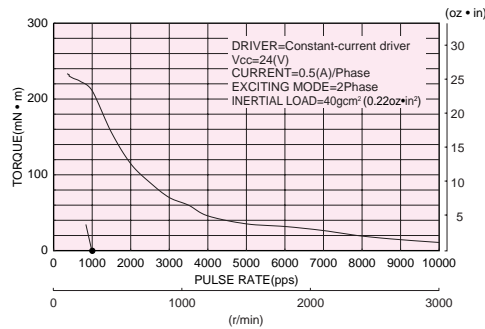
KH42JM2-901, 911



KH42JM2-902, 912

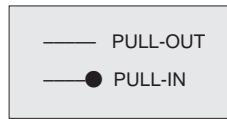
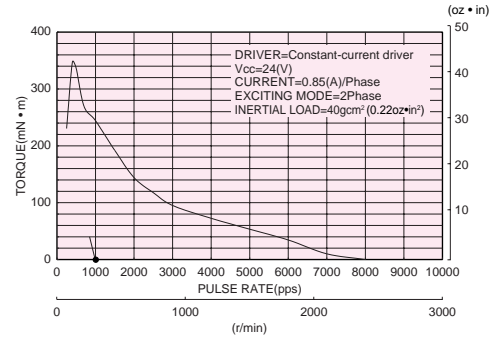


KH42JM2-903, 913



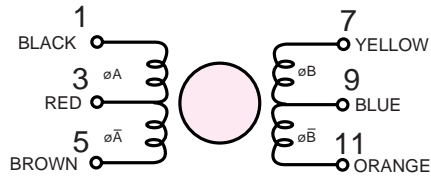
BI-POLAR

KH42JM2-951, 961



CONNECTION DIAGRAMS

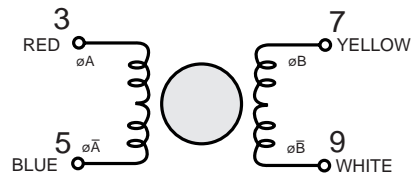
UNI-POLAR



EXCITATION SEQUENCE

STEP	1	2	3	4
BLACK(1)	-	-	-	-
YELLOW(7)	-	-	-	-
BROWN(5)	-	-	-	-
ORANGE(11)	-	-	-	-
RED(3)	+	+	+	+
BLUE(9)	+	+	+	+

BI-POLAR

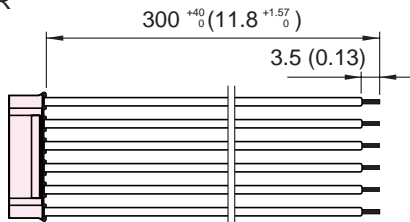


EXCITATION SEQUENCE

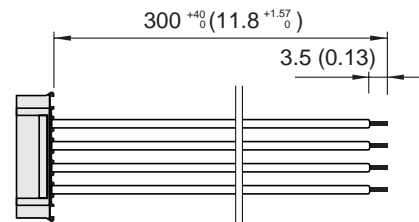
STEP	1	2	3	4
RED(3)	+	-	-	+
YELLOW(7)	+	+	-	-
BLUE(5)	-	+	+	-
WHITE(9)	-	-	+	+

CONNECTION CABLE TO MOTOR unit = mm (inch)

UNI-POLAR



BI-POLAR



2-Phase Hybrid Stepping Motor

1.8°

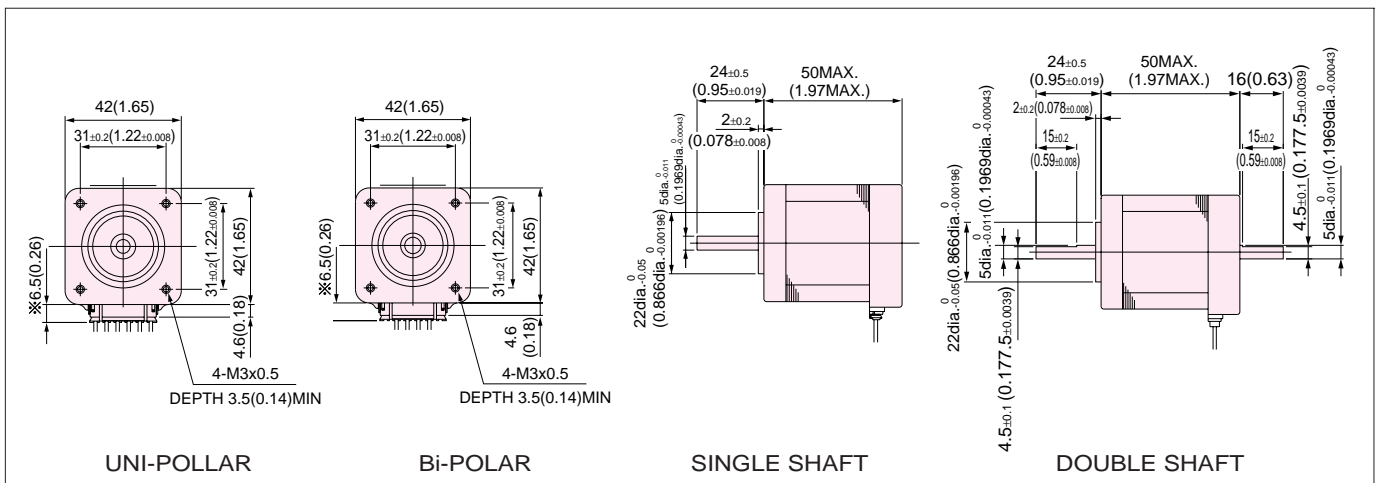
KH42 series 900 type

HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL	KH42KM2		
	SINGLE SHAFT	-901	-951
	DOUBLE SHAFT	-911	-961
DRIVE METHOD	————	UNI-POLAR	BI-POLAR
NUMBER OF PHASES	————	2	2
STEP ANGLE	deg./step	1.8	1.8
VOLTAGE	V	3.72	2.76
CURRENT	A/PHASE	1.2	1.2
WINDING RESISTANCE	Ω/PHASE	3.1	2.3
INDUCTANCE	mH/PHASE	3.1	4.0
HOLDING TORQUE	mN • m	340	403
	oz • in	48	57
DETENT TORQUE	mN • m	19.6	19.6
	oz • in	2.8	2.8
ROTOR INERTIA	g • cm ²	85	85
	oz • in ²	0.46	0.46
WEIGHTS	g	360	360
	lb	0.79	0.79
INSULATION CLASS	————	JIS Class E (120°C 248°F) (UL VALUE : CLASS B-130°C 266°F)	
INSULATION RESISTANCE	————	500VDC 100MΩmin.	
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.	
OPERATING TEMP. RANGE	°C	0 to 50	
ALLOWABLE TEMP. RISE	deg.	70	

DIMENSIONS unit = mm (inch)





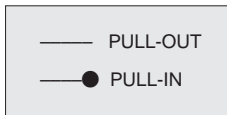
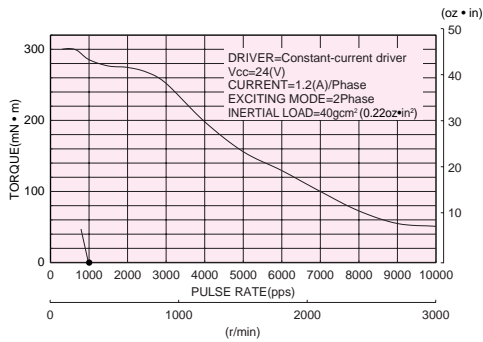
Features

- Improved Dynamic Torque
(1.2 times torque of our previous model is generated at 300 r/min, on model : KH42JM2-901)
- Lowered Vibration & Noise Level
(by increased stiffness of body construction)
- Improved Efficiency
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TORQUE CHARACTERISTICS vs. PULSE RATE

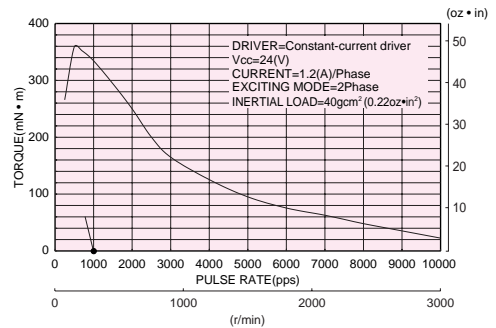
UNI-POLAR

KH42KM2-901, 911



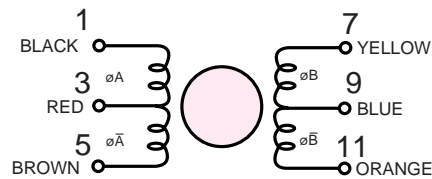
BI-POLAR

KH42KM2-951, 961



CONNECTION DIAGRAMS

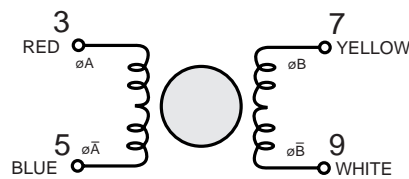
UNI-POLAR



EXCITATION SEQUENCE

STEP	1	2	3	4
BLACK(1)	-	-	-	-
YELLOW(7)	-	-	-	-
BROWN(5)	-	-	-	-
ORANGE(11)	-	-	-	-
RED(3)	+	+	+	+
BLUE(9)	+	+	+	+

BI-POLAR

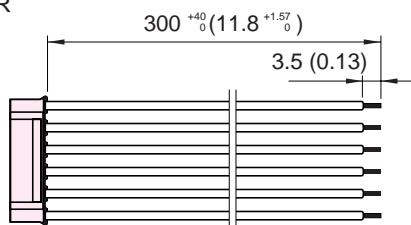


EXCITATION SEQUENCE

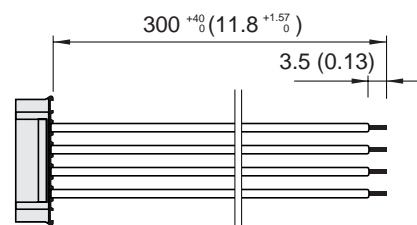
STEP	1	2	3	4
RED(3)	+	-	-	+
YELLOW(7)	+	+	-	-
BLUE(5)	-	+	+	-
WHITE(9)	-	-	+	+

CONNECTION CABLE TO MOTOR unit = mm (inch)

UNI-POLAR



BI-POLAR



2-Phase Hybrid Stepping Motor

1.8°

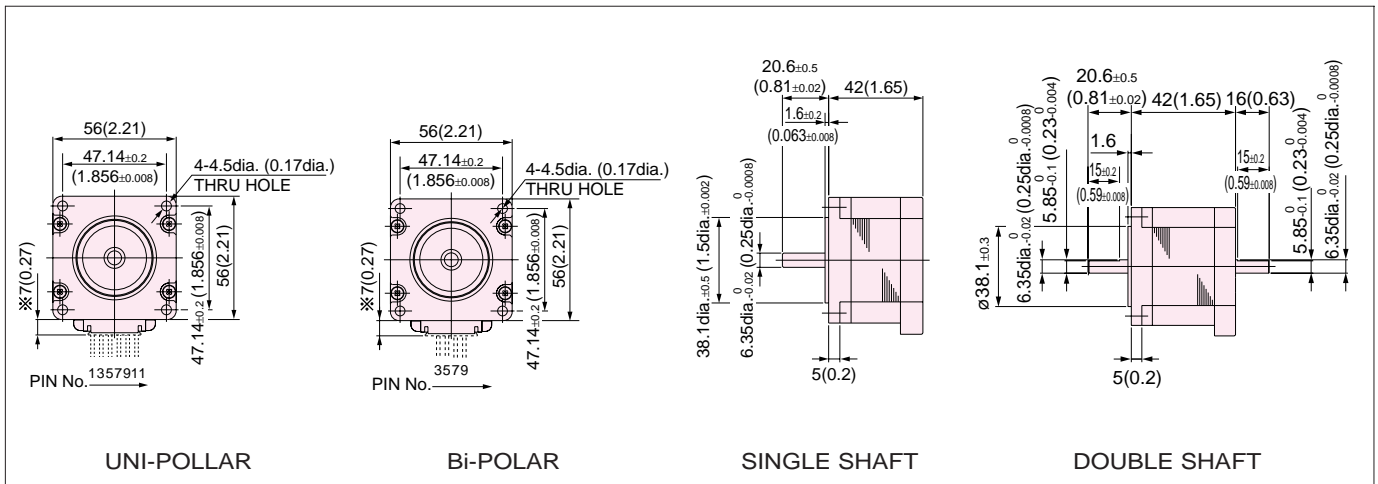
KH56 series 900 type

HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL		KH56JM2				
		SINGLE SHAFT	-901	-902	-903	-951
		DOUBLE SHAFT	-911	-912	-913	-961
DRIVE METHOD	————	UNI-POLAR			BI-POLAR	
NUMBER OF PHASES	————	2			2	
STEP ANGLE	deg./step	1.8			1.8	
VOLTAGE	V	1.74	2.78	4.9	1.96	
CURRENT	A/PHASE	3.0	2.0	1.0	2.0	
WINDING RESISTANCE	Ω/PHASE	0.58	1.39	4.9	0.98	
INDUCTANCE	mH/PHASE	0.61	1.8	6.68	2.27	
HOLDING TORQUE	mN • m	422	422	422	490	
	oz • in	60	60	60	69	
DETENT TORQUE	mN • m	25	25	25	25	
	oz • in	3.5	3.5	3.5	3.5	
ROTOR INERTIA	g • cm ²	115	115	115	115	
	oz • in ²	0.62	0.62	0.62	0.62	
WEIGHTS	g	400	400	400	400	
	lb	0.88	0.88	0.88	0.88	
INSULATION CLASS	————	JIS Class E (120°C 248°F) (UL VALUE : CLASS B 130°C 266°F)				
INSULATION RESISTANCE	————	500VDC 100MΩmin.				
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.				
OPERATING TEMP. RANGE	°C	0 to 50				
ALLOWABLE TEMP. RISE	deg.	70				

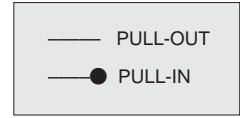
DIMENSIONS unit = mm (inch)





Features

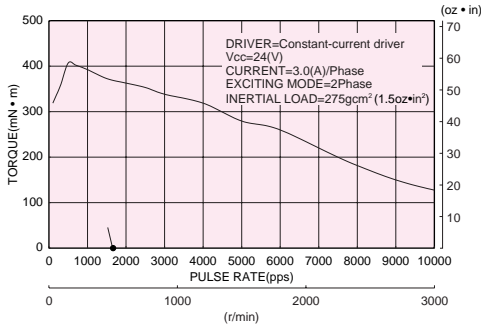
- Stronger torque generated in higher speed zone (KH56KM2-901 generates 1.2 times torque of our previous model at 1200 r/min. speed)
- Lowered Vibration by increased stiffness of body construction (lowered by 10% than our previous model)
- Improved Efficiency (1.1 times of our previous model, by high grade materials)



TORQUE CHARACTERISTICS vs. PULSE RATE

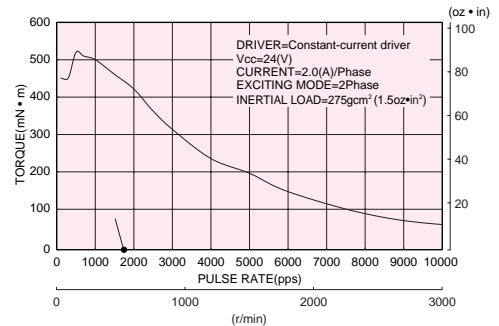
UNI-POLAR

KH56JM2-901, 911

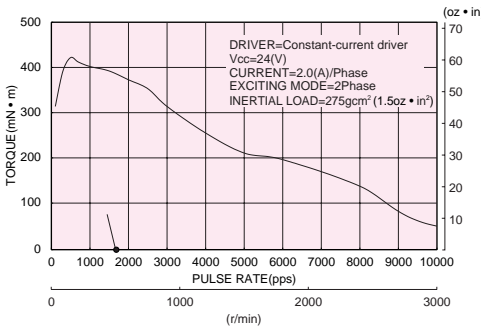


BI-POLAR

KH56JM2-951, 961

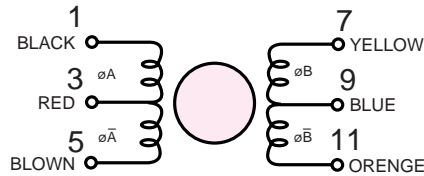


KH56JM2-902, 912



CONNECTION DIAGRAMS

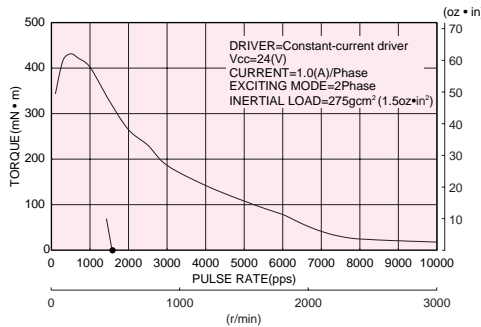
UNI-POLAR



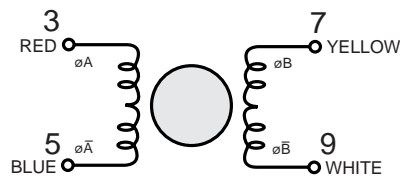
EXCITATION SEQUENCE

STEP	1	2	3	4
BLACK	-	-	-	-
YELLOW	-	-	-	-
BLOWN	-	-	-	-
ORENGE	-	-	-	-
RED	+	+	+	+
BLUE	+	+	+	+

KH56JM2-903, 913



BI-POLAR

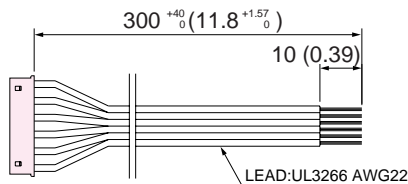


EXCITATION SEQUENCE

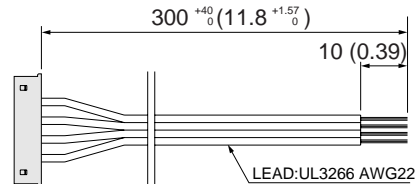
STEP	1	2	3	4
RED	+	+	-	-
YELLOW	-	+	+	-
BLUE	-	-	+	+
WHITE	+	-	-	+

CONNECTION CABLE TO MOTOR unit = mm (inch)

UNI-POLAR



BI-POLAR



2-Phase Hybrid Stepping Motor

1.8°

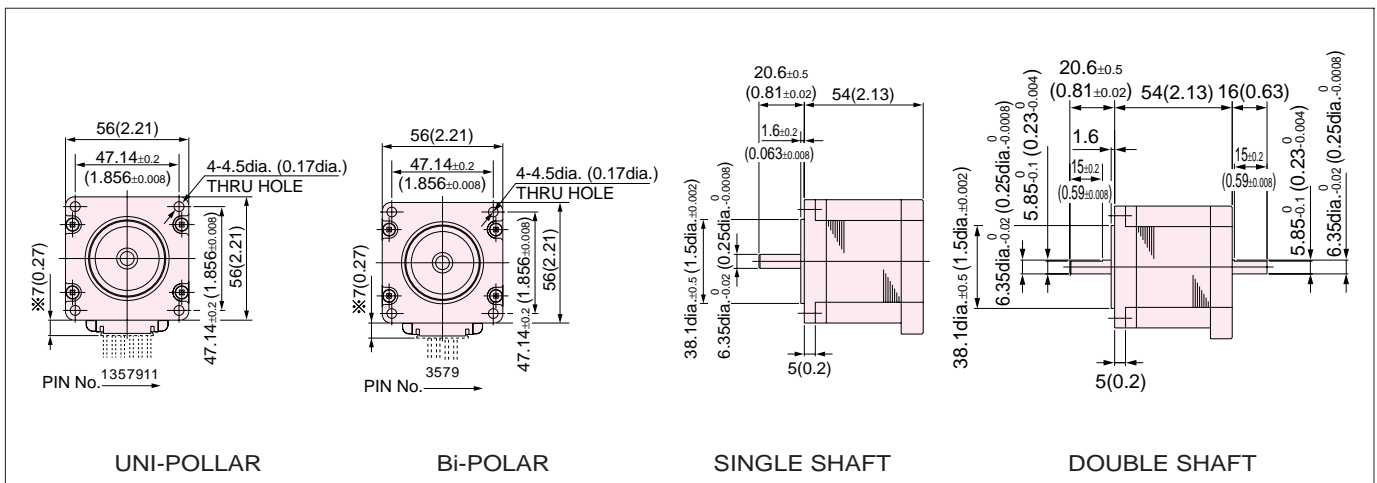
KH56 series 900 type

HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL		KH56KM2				
		SINGLE SHAFT	-901	-902	-903	-951
		DOUBLE SHAFT	-911	-912	-913	-961
DRIVE METHOD	————	UNI-POLAR			BI-POLAR	
NUMBER OF PHASES	————	2			2	
STEP ANGLE	deg./step	1.8			1.8	
VOLTAGE	V	2.3	3.6	6.71	2.4	
CURRENT	A/PHASE	3.0	2.0	1.0	2.0	
WINDING RESISTANCE	Ω/PHASE	0.77	1.79	6.71	1.32	
INDUCTANCE	mH/PHASE	1.04	1.7	9.36	3.19	
HOLDING TORQUE	mN • m	834	834	834	932	
	oz • in	118	118	118	132	
DETENT TORQUE	mN • m	37	37	37	37	
	oz • in	5.2	5.2	5.2	5.2	
ROTOR INERTIA	g • cm ²	188	188	188	188	
	oz • in ²	1.0	1.0	1.0	1.0	
WEIGHTS	g	650	650	650	650	
	lb	1.4	1.4	1.4	1.4	
INSULATION CLASS	————	JIS Class E (120°C 248°F) (UL VALUE : CLASS B 130°C 266°F)				
INSULATION RESISTANCE	————	500VDC 100MΩmin.				
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.				
OPERATING TEMP. RANGE	°C	0 to 50				
ALLOWABLE TEMP. RISE	deg.	70				

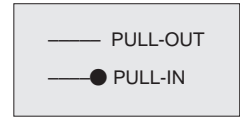
DIMENSIONS unit = mm (inch)





Features

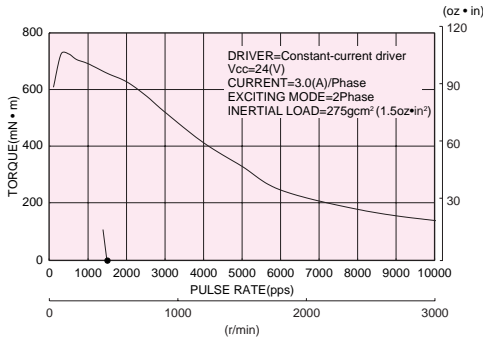
- Stronger torque generated in higher speed zone (KH56KM2-901 generates 1.2 times torque of our previous model at 1200 r/min. speed)
- Lowered Vibration by increased stiffness of body construction (lowered by 10% than our previous model)
- Improved Efficiency (1.1 times of our previous model, by high grade materials)



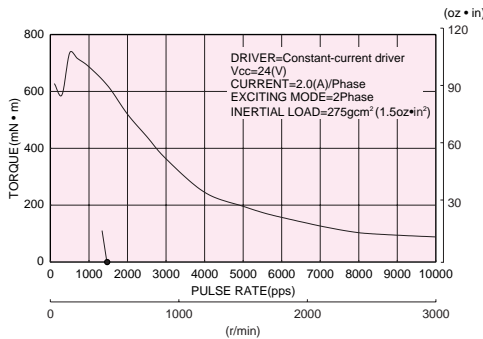
TORQUE CHARACTERISTICS vs. PULSE RATE

UNI-POLAR

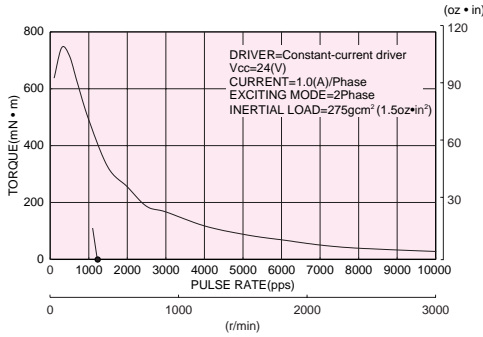
KH56KM2-901, 911



KH56KM2-902, 912

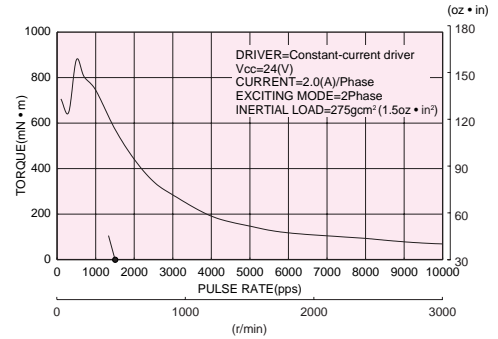


KH56KM2-903, 913



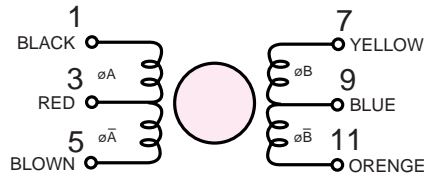
BI-POLAR

KH56KM2-951, 961



CONNECTION DIAGRAMS

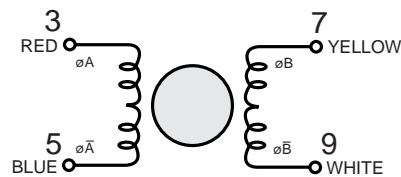
UNI-POLAR



EXCITATION SEQUENCE

STEP	1	2	3	4
BLACK	-	-	-	-
YELLOW	-	-	-	-
BLOWN	-	-	-	-
ORENGE	-	-	-	-
RED	+	+	+	+
BLUE	+	+	+	+

BI-POLAR

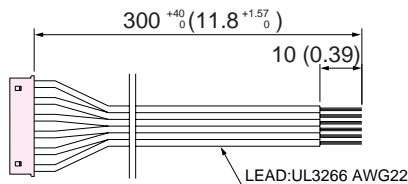


EXCITATION SEQUENCE

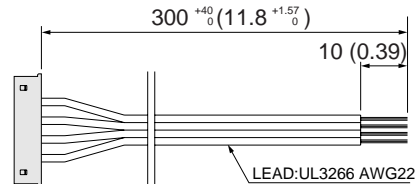
STEP	1	2	3	4
RED	+	+	-	-
YELLOW	-	+	+	-
BLUE	-	-	+	+
WHITE	+	-	-	+

CONNECTION CABLE TO MOTOR unit = mm (inch)

UNI-POLAR



BI-POLAR



2-Phase Hybrid Stepping Motor

1.8°

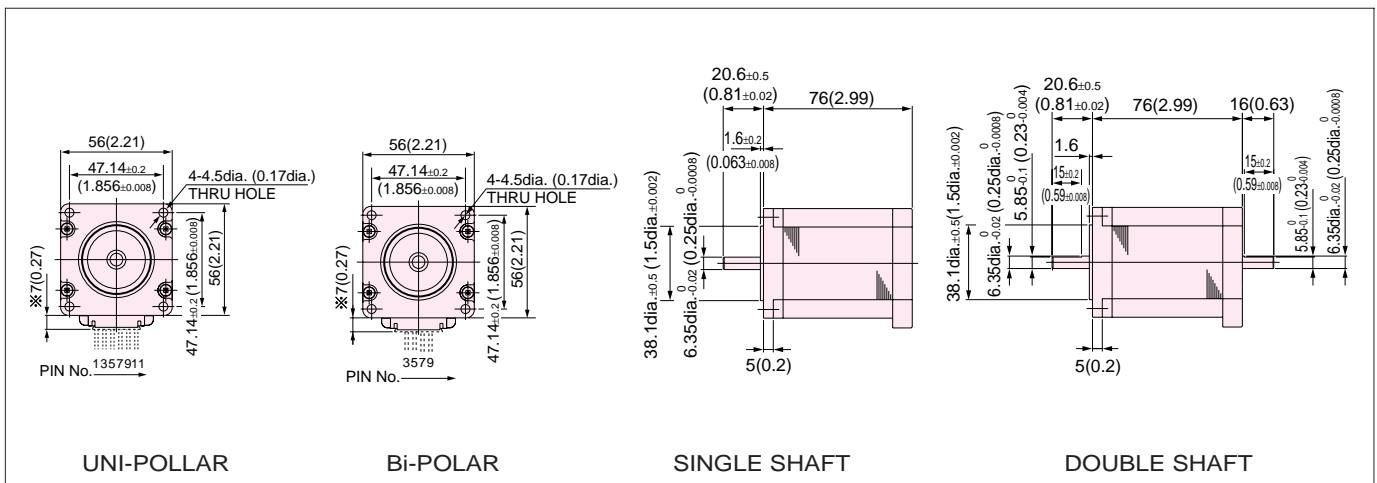
KH56 series 900 type

HIGH TORQUE, LOW VIBRATION AND LOW NOISE

STANDARD SPECIFICATIONS

MODEL		KH56QM2			
		-901	-902	-903	-951
	SINGLE SHAFT	-901	-902	-903	-951
	DOUBLE SHAFT	-911	-912	-913	-961
DRIVE METHOD	————	UNI-POLAR			BI-POLAR
NUMBER OF PHASES	————	2			2
STEP ANGLE	deg./step	1.8			1.8
VOLTAGE	V	3.54	5.46	9.9	4.0
CURRENT	A/PHASE	3.0	2.0	1.0	2.0
WINDING RESISTANCE	Ω/PHASE	1.18	2.73	9.9	2.0
INDUCTANCE	mH/PHASE	2.4	5.4	21.6	7.35
HOLDING TORQUE	mN • m	1324	1324	1324	1373
	oz • in	187	187	187	194
DETENT TORQUE	mN • m	69	69	69	69
	oz • in	9.8	9.8	9.8	9.8
ROTOR INERTIA	g • cm ²	269	269	269	269
	oz • in ²	1.47	1.47	1.47	1.47
WEIGHTS	kg	1.0	1.0	1.0	1.0
	lb	2.2	2.2	2.2	2.2
INSULATION CLASS	————	JIS Class E (120°C 248°F) (UL VALUE : CLASS B 130°C 266°F)			
INSULATION RESISTANCE	————	500VDC 100MΩmin.			
DIELECTRIC STRENGTH	————	500VAC 50HZ 1min.			
OPERATING TEMP. RANGE	°C	0 to 50			
ALLOWABLE TEMP. RISE	deg.	70			

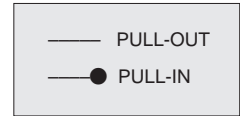
DIMENSIONS unit = mm (inch)





Features

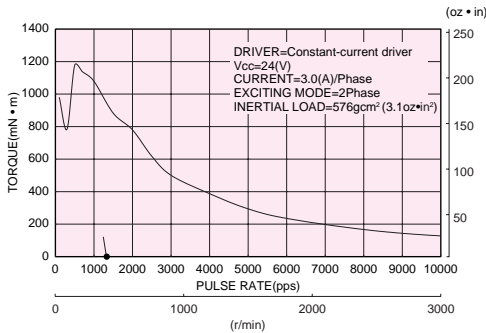
- Stronger torque generated in higher speed zone (KH56KM2-901 generates 1.2 times torque of our previous model at 1200 r/min. speed)
- Lowered Vibration by increased stiffness of body construction (lowered by 10% than our previous model)
- Improved Efficiency (1.1 times of our previous model, by high grade materials)



TORQUE CHARACTERISTICS vs. PULSE RATE

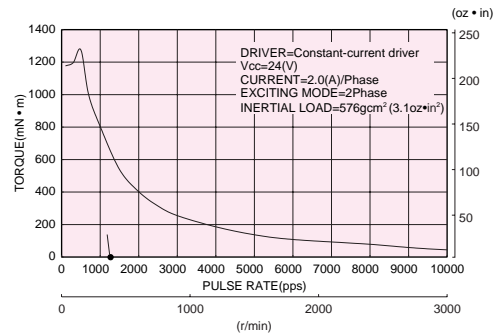
UNI-POLAR

KH56QM2-901, 911

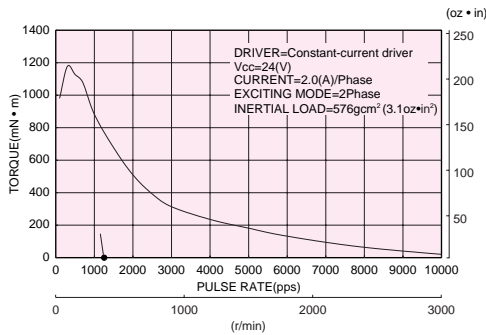


BI-POLAR

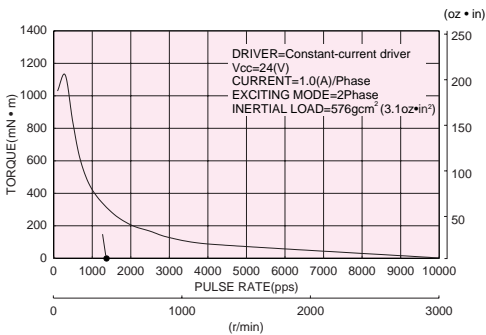
KH56QM2-951, 961



KH56QM2-902, 912

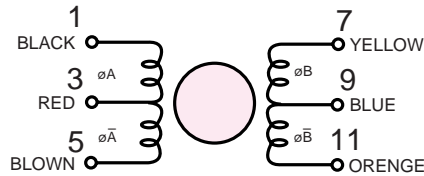


KH56QM2-903, 913



CONNECTION DIAGRAMS

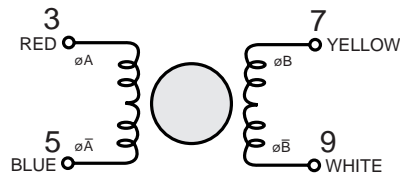
UNI-POLAR



EXCITATION SEQUENCE

STEP	1	2	3	4
BLACK	-	-	-	-
YELLOW	-	-	-	-
BLOWN	-	-	-	-
ORENGE	-	-	-	-
RED	+	+	+	+
BLUE	+	+	+	+

BI-POLAR

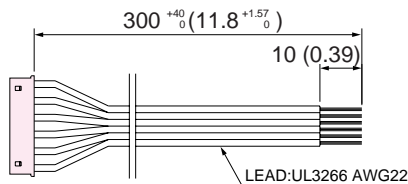


EXCITATION SEQUENCE

STEP	1	2	3	4
RED	+	+	-	-
YELLOW	-	+	+	-
BLUE	-	-	+	+
WHITE	+	-	-	+

CONNECTION CABLE TO MOTOR unit = mm (inch)

UNI-POLAR



BI-POLAR

