

MINEBEA CO. LTD - hybrid stepper motor

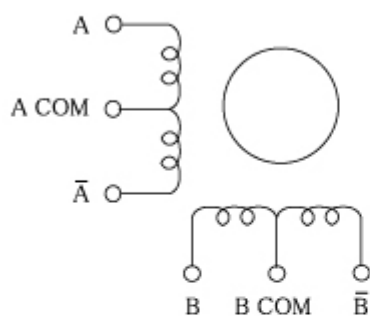
<http://www.minebea.co.jp/english/index.html>

<http://www.eminebea.com/content/html/en/engineering/hybrids/index.shtml>

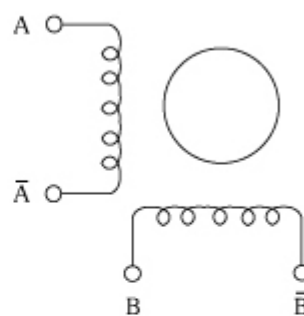
Winding Diagram and Switching Sequence

■ Winding Diagram

• Unipolar



• Bipolar



■ Switching Sequence

• Unipolar

Dual					
step	A	B	Ā	B̄	A B -COM
1	-	-	0	0	+
2	0	-	-	0	+
3	0	0	-	-	+
4	-	0	0	-	+

CW Rotation Facing Mounting End

• Bipolar

Dual				
step	A	B	Ā	B̄
1	+	+	-	-
2	-	+	+	-
3	-	-	+	+
4	+	-	-	+

CW Rotation Facing Mounting End

General Specification

Glossary	Specification
Step Accuracy	±5%
Temperature Rise	80°C MAX
Ambient Temperature Range	-20°C □ +50°C
Insulation Resistance	100 MΩ MIN .DC 500V
Dielectric Strength	AC 500V 1min
Radial Play	20 μm MAX. (at 4.4N { 450gf } [Load])
End Play	80 μm MAX. (at 4.4N { 450gf } [Load])

17 P M - K O 23 X - X X X

(1) Size

Motor O.D. in tenth of an inch

(4) Type of Laminated Stator

- M 2 Phase Hybrid (Standard)
- C 2 Phase Hybrid (High Torque)
- H 2 Phase Hybrid (High Torque)
- K 2 Phase Hybrid (Low Noise, Low Vibration)
- J 2 Phase Hybrid (Better Performance at high speed)
- Z 2 Phase Hybrid (High Resolution)

(3) Step Angle

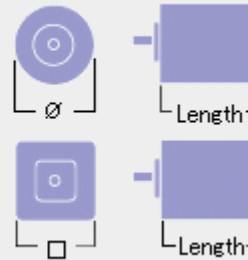
M	1.8
U	3.75
Y	0.9

(7) standard - Drive Sequence

U	Unipolar
B	Bipolar

(2) Type of Motor

- P Laminated Stack Stepping Motor □42 and below
- L Laminated Stack Stepping Motor ○56
- K Laminated Stack Stepping Motor □56
- T Flat Laminated Stack Stepping Motor
- S Laminated Stack Stepping Motor ○71



(9) Custom - Mechanical Variation

17 P M - K O 23 X - X X X

(6) Electrical Variation

(5) Motor Length at right



(ex) Model 10PU-M002B
Motor Length at right 22mm

Model	Length	Variation								Unit mm
		0	1	2	3	4	5	7	8	
10PU-M□**	22			18						
14P*-□**	26			22						
16TM-M□**							15.5			
17P*-□**	34	42	30	38	48			26		
19TM-J□**	23								21	
23LM-□**	56.5			41	49.5					
23KM-□**	54	67	42	50				76		
29KM-K□**	55.5	67.5	43.5	51.5			39.5	77.5		

(8) Custom - Gear & Pulley

G With Gear
P With Pulley
None Without Gear/Pulley

(10) Custom - Type of Flanges

Type of Flanges		Motor side Connection	Size						
			10	14	16	17	19	23	29
V	Cast Alminum	*1		○		○		○	○
W	Cast Alminum	*2				○		○	○
VS	Cast Alminum	*1		○		○			
WS	Cast Alminum	*2				○			
VM	Machined Sheet Metal	*1	○	○		○			
WM	Machined Sheet Metal	*2		○		○			
VT	Machined Sheet Metal	*1				○			
VW	Machined Sheet Metal	*2				○			

*1 Motor Side Connector

*2 Direct Lead Wire