Oriental motor

HP-P023

2-Phase Stepping Motor Encoder type

CMK Series / RBK Series

ENCODER OPERATING MANUAL

■ Product Number Code

CMK Series CMK266AP-R25
① ②

RBK Series RBK296AA-R26
① ②

Motor PK266-02A R25
① ②

①	Base Model Name Please see motor manual
②	Encoder Code

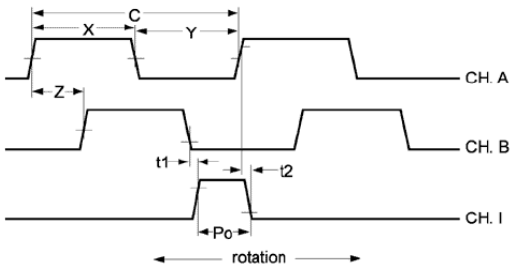
■ Encoder Specifications

Encoder Code		R15		R16	R25	R26
Motor Frame Size		28mm (1.10in.)	All others			
Model		E4 Series (US-Digital)	E5 Series (US-Digital)			
Type		Incremental				
Resolution (P/R)		200		400	200	400
Output		2-Channel A, B			3-Channel A, B, I	
Input Current (mA)		15 (Typ.)	17 (Typ.)		57 (Typ.)	
Input Voltage (V)		5±10%				
Output Type		TTL				
Output Voltage	Low	0.4V @ 8mA (Max.)	0.4V @ 3.2mA (Max.)		0.5V @ 8mA (Max.)	
	High	2.4V @ -0.2mA (Min.)	2.4V @ -40μA (Min.)		2.4V @ -200μA (Min.)	
Response Frequency (kHz)		60 (Max.)	100 (max.)			
Operating Temperature (℃)		-40 to +100				

■ Encoder Characteristics (Refer to Output Waveform below.)

Parameter	Symbol	Min.	Typ.	Max.	Units
Cycle Error		-	3	5.5	°e
Symmetry		150	180	210	°e
Quadrature		60	90	120	°e
Index Pulse Width	Po	60	90	120	°e
Ch. I Rise After Ch. B or Ch. A Fall	t1	-300	100	250	ns
Ch. I Fall After Ch. B or Ch. A Rise	t2	70	150	1000	ns

■ Output Waveform



CPR (N): The number of Cycles Per Revolution.

One Shaft Rotation: 360 mechanical degrees, N cycles.

One Electrical Degree (°e): 1/360th of one cycle.

One Cycle (C): 360 electrical degrees (°e). Each cycle can be decoded into 1 or 4 codes, referred to as X1 or X4 resolution multiplication.

Symmetry: A measure of the relationship between (X) and (Y) in electrical degrees, nominally 180°e.

Quadrature (Z): The phase lag or lead between channels A and B in electrical degrees, nominally 90°e.

Index (CH I.): The index output goes high once per revolution, coincident with the low states of channels A and B, nominally 1/4 of one cycle (90°e).

Position Error: The difference between the actual shaft position and the position indicated by the encoder cycle count.

Cycle Error: An indication of cycle uniformity. The difference between an observed shaft angle which gives rise to one electrical cycle, and the nominal angular increment of 1/N of a revolution.

■ Pin-outs

E5 Series

Pin	Lead Color	Encoder Code	
		R15, R16	R25, R26
1	Brown	GND	
2	Purple	N.C.	Index Channel
3	Blue	A Channel	
4	Orange	+5VDC power	
5	Yellow	B Channel	

Encoder Lead Wire for without Index (R15, R16)

Housing: 50-57-9405 (Molex)
Terminal: 16-02-0104 (Molex)

Lead: UL Style 3265, AWG 24
Length: 600mm (24 in.)

Encoder Lead Wire for with Index (R25, R26)

Housing: 50-57-9405 (Molex)
Terminal: 16-02-0104 (Molex)

Lead: UL Style 3265, AWG 24
Length: 600mm (24 in.)

E4 Series

Pin	Lead Color	Description
1	Red	+5VDC power
2	Blue	A Channel
3	Black	GND
4	Yellow	B Channel

Encoder Lead Wire

Housing: 51021-0400 (Molex)
Terminal: 50079-8000 (Molex)

Lead: UL Style 3265, AWG 28
Length: 600mm (24 in.)