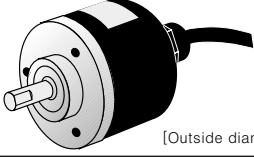
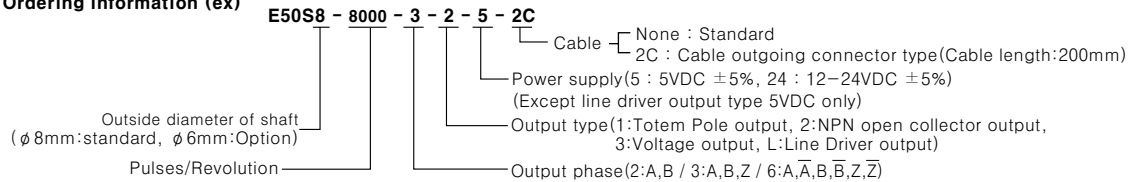


## SELECTION GUIDE

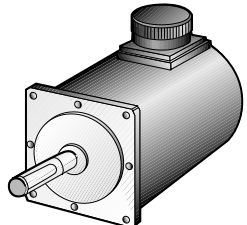
### ROTARY ENCODER(E50S SERIES)

Type		φ50mm Shaft type the encoder(INCREMENTAL TYPE)		
Model	Totem Pole output	E50S□-□-□-1-5-□	E50S□-□-□-1-24-□	
	NPN open collector output	E50S□-□-□-2-5-□	E50S□-□-□-2-24-□	
	Voltage output	E50S□-□-□-3-5-□	E50S□-□-□-3-24-□	
	Line Driver output	E50S□-□-□-L-5-□	—	
Appearances & Dimensions		 (Exception line driver output) [φ50mm, L58.3mm] [Outside diameter of shaft : φ8mm(Standard), φ6mm(Option)]		
Pulses/Revolution		*1, *2, *5, 10, *12,15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000, 6000, 8000 (Note)* Pulses are A,B phase(Line driver output are A, $\bar{A}$ , B, $\bar{B}$ ) only		
Electrical spec.	Output phase	A Phase, B Phase, Z Phase(Line driver : A, B, Z, $\bar{A}$ , $\bar{B}$ , $\bar{Z}$ Phase)		
	Phase difference of output	Output between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=A phase 1 cycle)		
	Control output	Totem Pole output	Low $\Rightarrow$ Load current:Max. 30mA, Residual voltage:Max. 0.4VDC High $\Rightarrow$ Load current:Max. 10mA, Output voltage:Min.(power supply -1.5)VDC	
		NPN open collector output	Load current:Max. 30mA, Residual voltage:Max. 0.4VDC	
		Line Driver output	Low $\Rightarrow$ Load current:Max. 20mA, Residual voltage:Max. 0.5VDC High $\Rightarrow$ Load current:Max. -20mA, Output voltage:Min. 2.5VDC	
	Max.Response frequency	180kHz		
Power supply	5VDC $\pm$ 5%(Ripple P-P:Max. 5%)		12 to 24VDC $\pm$ 5%(Ripple P-P:Max. 5%)	

#### \*Ordering information (ex)




### ROTARY ENCODER(E68S15 SERIES)

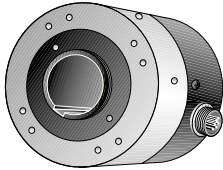
Type		φ68mm Shaft type the encoder(INCREMENTAL TYPE)	
Model	Line Driver output	<b>E68S15 - 1024 - 6 - L</b>	
Appearances & Dimensions		 [φ68mm, L123mm] [Outside diameter of shaft: φ15mm]	
Pulses/Revolution		1024	
Electrical spec.	Output phase	A Phase, B Phase, Z Phase, $\bar{A}$ Phase, $\bar{B}$ Phase, $\bar{Z}$ Phase	
	Phase difference of output	Output between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=A phase 1 cycle)	
	Control output	Line Driver output	Low $\Rightarrow$ Load current:Max. 20mA, Residual voltage:Max. 0.5VDC High $\Rightarrow$ Load current:Max. -20mA, Output voltage:Min. 2.5VDC
	Power supply	Line Driver output	5VDC $\pm$ 5%(Ripple P-P:Max. 5%)
	Max.Response frequency	110kHz	

## SELECTION GUIDE

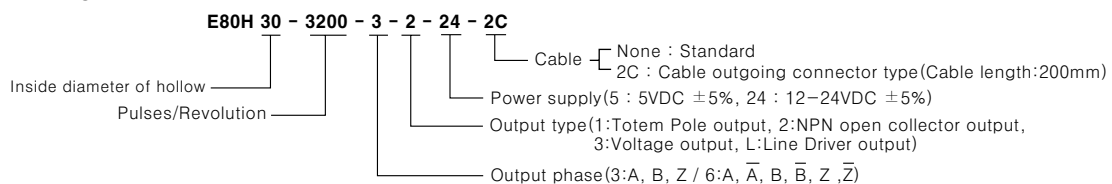
### ROTARY ENCODER(E80H SERIES)

Type		φ 80mm Hollow type encoder(INCREMENTAL TYPE)	
Model	Totem Pole output	E80H30 - □ - 3 - 1 - 5 - □	E80H30 - □ - 3 - 1 - 24 - □
	NPN open collector output	E80H30 - □ - 3 - 2 - 5 - □	E80H30 - □ - 3 - 2 - 24 - □
	Voltage output	E80H30 - □ - 3 - 3 - 5 - □	E80H30 - □ - 3 - 3 - 24 - □
	Line Driver output	E80H30 - □ - 6 - L - 5 - □	—
Appearances & Dimensions		 <p>CE (Exception line driver output)</p> <p>[φ 80mm, L45mm] [Inside diameter of hollow : φ 30mm (φ 32mm Optional)]</p>	
Pulses/Revolution		60, 100, 360, 500, 512, 1024, 3200	
Output phase		A Phase, B Phase, Z Phase(Line driver : A, B, ZPhase, $\bar{A}$ , $\bar{B}$ , $\bar{Z}$ Phase)	
Phase difference of output		Output between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T= A phase 1 cycle)	
Electrical spec.	Totem Pole output	Low $\Rightarrow$ Load current:Max. 30mA, Residual voltage:Max. 0.4VDC(Complemental output - Residual voltage:Max. 1VDC)	
	Complemental output	High $\Rightarrow$ Load current:Max. 10mA, Output voltage:Min.(Power supply - 1.5)VDC	
	NPN open collector output	Load current:Max. 30mA, Residual voltage:Max. 0.4VDC	
	Voltage output	Load current:Max. 10mA, Residual voltage:Max. 0.4VDC	
Line Driver output		Low $\Rightarrow$ Load current:Max. 20mA, Residual voltage:Max. 0.5VDC High $\Rightarrow$ Load current:Max. -20mA, Output voltage:Min. 2.5VDC	
Max.Response frequency		100kHz	
Power supply		5VDC $\pm$ 5%(Ripple P-P:Max. 5%), 12 to 24VDC $\pm$ 5%(Ripple P-P:Max. 5%)	

### ROTARY ENCODER(E100H SERIES)


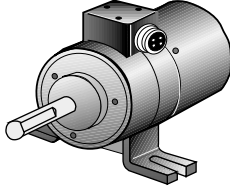
Type		φ 100mm Hollow type encoder(INCREMENTAL TYPE)	
Model	Totem Pole output	E100H35 - □ - 3 - 1 - 5 - □	E100H35 - □ - 3 - 1 - 24 - □
	NPN open collector output	E100H35 - □ - 3 - 2 - 5 - □	E100H35 - □ - 3 - 2 - 24 - □
	Voltage output	E100H35 - □ - 3 - 3 - 5 - □	E100H35 - □ - 3 - 3 - 24 - □
	Line Driver output	E100H35 - □ - 6 - L - 5 - □	—
Appearances & Dimensions		 <p>CE (Exception line driver output)</p> <p>[φ 100mm, L72.5mm] [Inside diameter of hollow : φ 35mm]</p>	
Pulses/Revolution		60, 100, 360, 500, 512, 1024, 10000	
Output phase		A, B, Z Phase(Line driver : A, B, Z, $\bar{A}$ , $\bar{B}$ , $\bar{Z}$ )	
Phase difference of output		• A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=A phase 1 cycle)	
Electrical spec.	Totem Pole output	Low $\Rightarrow$ Load current:Max. 30mA, Residual voltage:Max. 0.4VDC High $\Rightarrow$ Load current:Max. 10mA, Output voltage:Min.(Power supply - 1.5)VDC	
	NPN open collector output	Load current:Max.30mA, Residual voltage:Max.0.4VDC	
	Voltage output	Load current:Max.10mA, Residual voltage:Max.0.4VDC	
	Line Driver output	Low $\Rightarrow$ Load current:Max. 20mA, Residual voltage:Max. 0.5VDC High $\Rightarrow$ Load current:Max. -20mA, Output voltage:Min. 2.5VDC	
Power supply		5VDC $\pm$ 5%(Ripple P-P:Max. 5%)	12-24VDC $\pm$ 5%(Ripple P-P:Max. 5%)
Max.Response frequency		150kHz	
Connection		Connector connection *Connector cable length : Standard 7m(Option : 10m)	

**\* Ordering information (ex)**



# SELECTION GUIDE


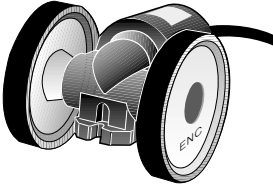
## ROTARY ENCODER(ENA SERIES)

Type	Shaft type the encoder to be mounted at the side(INCREMENTAL TYPE)		
Model	Totem Pole output	ENA-□-2-1-5      ENA-□-2-1-24	
	NPN open collector output	ENA-□-2-2-5      ENA-□-2-2-24	
	Voltage output	ENA-□-2-3-5      ENA-□-2-3-24	
Appearances & Dimensions	 		
	[W70×H82×L101mm]      [Outside diameter of shaft : φ10mm]		
Pulses/Revolution	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000, 6000, 8000 (Note)* Pulses are A,B phase only		
Electrical spec.	Output phase	A phase, B phase(Option : A phase, B phase, Z phase)	
	Phase difference of output	Output between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=Aphase 1 cycle)	
	Control output	Totem Pole output	Low $\Rightarrow$ Load current:Max. 30mA, Residual voltage:Max. 0.4VDC High $\Rightarrow$ Load current:Max. 10mA, Output voltage:Min.(Power supply -1.5)VDC
		NPN open collector output	Load current:Max. 30mA, Residual voltage:Max. 0.4VDC
		Voltage output	Load current:Max. 10mA, Residual voltage:Max. 0.4VDC
	Max.Response frequency	180kHz	
Power supply	5VDC $\pm$ 5%(Ripple P-P:Max. 5%)	12-24VDC $\pm$ 5%(Ripple P-P:Max. 5%)	

※ Ordering information (ex)

ENA - 8000 - 2 - 1 - 24 - Power supply(5 : 5VDC  $\pm$  5%, 24 : 12-24VDC  $\pm$  5%)  
 Pulses/Revolution \_\_\_\_\_ Output type(1:Totem Pole output, 2:NPN open collector output, 3:Voltage output)  
 Output phase(2:A,B / 3:A,B,Z)

## ROTARY ENCODER(ENC SERIES)

Type	Wheel type the encoder(INCREMENTAL TYPE)		
Model	Totem Pole output	ENC-1-□-1-5-□      ENC-1-□-1-24-□	
	NPN open collector output	ENC-1-□-2-5-□      ENC-1-□-2-24-□	
	Voltage output	ENC-1-□-3-5-□      ENC-1-□-3-24-□	
Appearances & Dimensions	 		
	[W70×H82×L101mm]		
Electrical spec.	Output phase	A phase, B phase	
	Phase difference of output	Output between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=Aphase 1 cycle)	
	Control output	Totem Pole output	Low $\Rightarrow$ Load current:Max. 30mA, Residual voltage:Max. 0.4VDC High $\Rightarrow$ Load current:Max. 10mA, Output voltage:Min.(Power supply -1.5)VDC
		NPN open collector output	Load current:Max. 30mA, Residual voltage:Max. 0.4VDC
		Voltage output	Load current:Max. 10mA, Residual voltage:Max. 0.4VDC
	Max.Response frequency	180kHz	
Power supply	5VDC $\pm$ 5%(Ripple P-P:Max. 5%)	12-24VDC $\pm$ 5%(Ripple P-P:Max. 5%)	

●Pulses/Revolution


NO	Min. measuring unit	Moving distance per 1 pulse	Gear ratio	Wheel circumference	Slit(P/R)
1	1mm	1mm/P	2 : 1	250mm	500Pulse
2	1cm	1cm/P	4 : 1	250mm	100Pulse
3	1m	1m/P	4 : 1	250mm	1Pulse
4	0.01yd	0.01yd/P	4 : 1	228.6mm(0.25/yd)	100Pulse
5	0.1yd	0.1yd/P	4 : 1	228.6mm(0.25/yd)	10Pulse
6	1yd	1yd/P	4 : 1	228.6mm(0.25/yd)	1Pulse

※ Ordering information (ex)

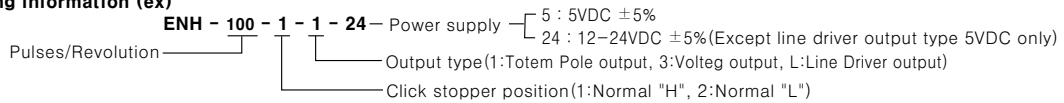
ENC - 1 - 1 - 1 - 24 - 2C  
 Cable  $\begin{cases} \text{Non : Standard} \\ \text{2C : Cable outgoing connector type(Cable length:200mm)} \end{cases}$   
 Power supply(5 : 5VDC  $\pm$  5%, 24 : 12-24VDC  $\pm$  5%)  
 Output type(1:Totem Pole output, 2:NPN open collector output, 3:Voltage output)  
 Min.measuring unit

## SELECTION GUIDE

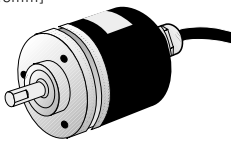
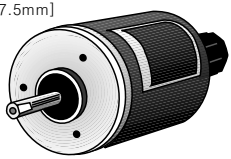
### ROTARY ENCODER(ENH SERIES)

Type	Handle type the encoder(INCREMENTAL TYPE)		
Model	Totem Pole output	ENH- □ - 1 - 1 - □	
	Voltage output	ENH- □ - 1 - 3 - □	
	Line Driver output	ENH- □ - 1 - L - □	
Appearances & Dimensions			
	[φ 80mm, L67.2mm]		
Pulses/Revolution	25P/R, 100P/R		
Click Stopper position	Normal "H"	Normal "L"	
Electrical spec.	Output phase	A Phase, B Phase(Line Driver : A, $\bar{B}$ , A, $\bar{B}$ Phase)	
	Phase difference of output	Output between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=A phase 1cycle)	
	Control output	Totem Pole output	Low ⇨ Load current:Max. 30mA, Residual voltage:Max. 0.4VDC High ⇨ Load current:Max. 10mA, Output voltage:Min. (Power supply - 1.5)VDC
		Voltage output	Load current:Max. 30mA, Residual voltage:Max. 0.5VDC
		Line Driver output	Low ⇨ Load current:Max. 20mA, Residual voltage:Max. 0.5VDC High ⇨ Load current:Max. -20mA, Output voltage:Min. 2.5VDC
	Power supply	Totem Pole output	5VDC ±5%(Ripple P-P:Max. 5%), 12 to 24VDC ±5%(Ripple P-P:Max. 5%)
Voltage output			
Line Driver output		5VDC ±5%(Ripple P-P:Max. 5%)	

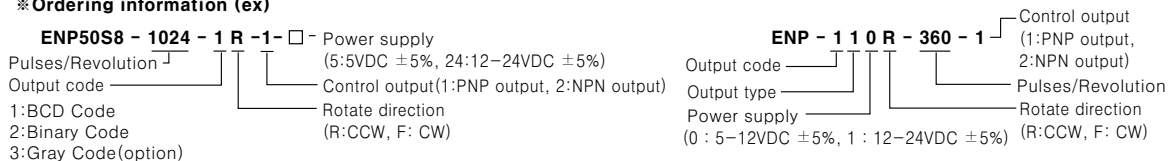
**\* Ordering information (ex)**



### ROTARY ENCODER(ENP SERIES)

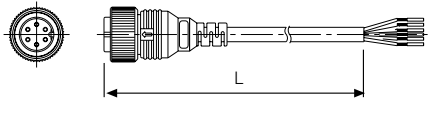
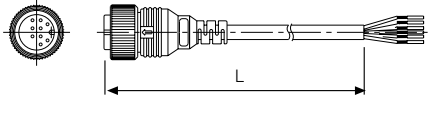
Type	φ 50mm Shaft type the encoder(ABSOLUTE TYPE)	φ 60mm Shaft type the encoder(ABSOLUTE TYPE)			
Model	PNP open collector output	ENP50S8 - □ - □ □ - 1 - □	ENP - 111 □ - □ - 1	ENP - 110 - □ - □ - 1	
	NPN open collector output	ENP50S8 - □ - □ □ - 2 - □	ENP - 111 □ - □ - 2	ENP - 110 - □ - □ - 2	
Appearances & Dimensions					
	[φ 50mm, L91.5mm] [Outside diameter of shaft : φ 8mm]		[φ 60mm, L117.5mm] [Outside diameter of shaft : φ 10mm]		
Output code	• BCD Code • Binary Code • Gray Code		• BCD Code		
Pulses/Revolution	6, 8, 12, 16, 24, 32, 40, 45, 64, 90, 128, 180, 256, 360, 512, 720, 1024		6, 8, 12, 16, 24	360	
Electrical spec.	Control output	NPN Open Collector	Output voltage:Min. (Power supply - 1.5V), Load current:Max. 32mA		
		PNP Open Collector	Load voltage:Max. 30VDC, Load current:Max. 32mA, Residual voltage:Max. 1VDC		
	Output Driver IC	NPN:TD62003F/AF(SOP16-P-225)→(H=0, L=1) PNP:TD62783F/AF(SOP18-P-375)→(H=1, L=0)		NPN:TD62380 PNP:TD62783	
	Max.Response frequency	Max. 35kHz		20kHz	
	Power supply	5VDC ±5%, 12 to 24VDC ±5%(Ripple P-P:Max. 5%)		12 to 24VDC ±5% (RippleP-P:Max. 5%)	5 to 12VDC ±5% (RippleP-P:Max. 5%)

**\* Ordering information (ex)**










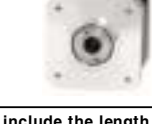


## SELECTION GUIDE

### ROTARY ENCODER CONNECTOR CABLE (Water-proof)

Appearances	Model	Inner cable numbers	L(m)	Material	Applicable output
	<b>CID6S-2</b>	6	2	PVC	Totem Pole output
	<b>CIDPU6S-2</b>			PUR	
	<b>CID6S-5</b>		5	PVC	NPN open collector output
	<b>CIDPU6S-5</b>			PUR	
	<b>CID6S-10</b>		10	PVC	Voltage output
	<b>CIDPU6S-10</b>			PUR	
	<b>CID9S-2</b>	9	2	PVC	Line Driver output
	<b>CIDPU9S-2</b>			PUR	
	<b>CID9S-5</b>		5	PVC	
	<b>CIDPU9S-5</b>			PUR	
	<b>CID9S-10</b>		10	PVC	
	<b>CIDPU9S-10</b>			PUR	

### 5-PHASE STEPPING MOTOR(AK/AHK SERIES)

Frame size	Model	Appearances	Max. holding torque (kgf·cm)	Rated current (A/Phase)	Winding resistance (Ω)	Rotor inertia (gcm <sup>2</sup> )	Motor length (mm)	Net weight (kg)	
24 Square	<b>A02K-S523(W)</b>		0.018	0.75	1.1	4.2	30.5	0.07	
	<b>A04K-S525(W)</b>		0.028	0.75	1.7	8.2	46.4	0.12	
42 Square	<b>A1K-S543(W)</b>	 AK AHK	1.3	0.75	1.7	35	33	0.25	
	<b>A2K-S544(W)</b>		1.8	0.75	2.2	54	39	0.3	
	<b>A3K-S545(W)</b>		2.4	0.75	2.2	68	47	0.4	
	<b>AH1K-S543(W)</b>		1.3	0.75	1.7	35	33	0.25	
	<b>AH2K-S544(W)</b>		1.8	0.75	2.2	54	39	0.3	
	<b>AH3K-S545(W)</b>		2.4	0.75	2.2	68	47	0.4	
60 Square	<b>A4K-S564(W)</b>		4.2	0.75	2.6	175	48.5	0.6	
	<b>A4K-M564(W)</b>		4.2	1.4	0.8	175	48.5	0.6	
	<b>A8K-S566(W)</b>		8.3	0.75	3.4	280	59.5	0.8	
	<b>A8K-M566(W)</b>		8.3	1.4	1.1	280	59.5	0.8	
	<b>A16K-M569(W)</b>		16.6	1.4	1.8	560	89	1.3	
	<b>A16K-G569(W)</b>		16.6	2.8	0.65	560	89	1.3	
	<b>AH4K-S564(W)</b>			4.2	0.75	2.6	175	48.5	0.6
	<b>AH4K-M564(W)</b>			4.2	1.4	0.8	175	48.5	0.6
	<b>AH8K-S566(W)</b>			8.3	0.75	3.4	280	59.5	0.8
	<b>AH8K-M566(W)</b>			8.3	1.4	1.1	280	59.5	0.8
	<b>AH16K-M569(W)</b>		16.6	1.4	1.8	560	89	1.3	
	<b>AH16K-G569(W)</b>		16.6	2.8	0.65	560	89	1.3	
	85 Square	<b>A21K-M596(W)</b>		21	1.4	1.76	1400	68	1.7
		<b>A21K-G596(W)</b>		21	2.8	0.4	1400	68	1.7
<b>A41K-M599(W)</b>		41		1.4	2.60	2700	98	2.8	
<b>A41K-G599(W)</b>		41		2.8	0.58	2700	98	2.8	
<b>A63K-M5913(W)</b>			63	1.4	3.92	4000	128	3.8	
<b>A63K-G5913(W)</b>			63	2.8	0.86	4000	128	3.8	
<b>AH21K-M596(W)</b>				21	1.4	1.76	1400	68	1.7
<b>AH21K-G596(W)</b>				21	2.8	0.4	1400	68	1.7
<b>AH41K-M599(W)</b>				41	1.4	2.60	2700	98	2.8
<b>AH41K-G599(W)</b>				41	2.8	0.58	2700	98	2.8
<b>AH63K-M5913(W)</b>			63	1.4	3.92	4000	128	3.8	
<b>AH63K-G5913(W)</b>			63	2.8	0.86	4000	128	3.8	

\*The length of Motor does not include the length of shaft. \*When the shaft of motor is dual axis, there is ( ) with model name.