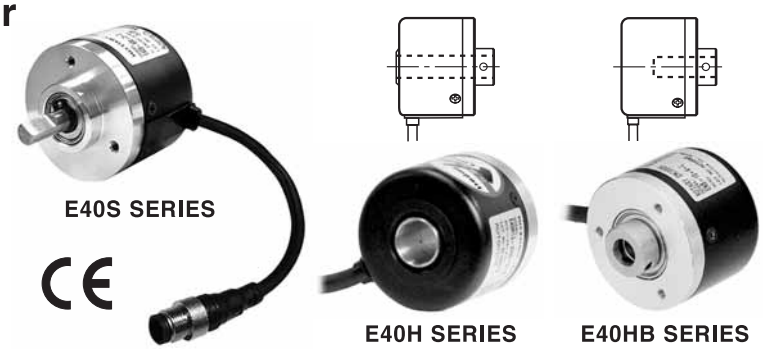
Diameter ϕ40mm Shaft type/Hollow type/Built-in type Incremental Rotary encoder

▣Features

- ●Easy installation at narrow space
- ●Small rotor inertia
- ●Wide range of power supply : 5VDC, 12-24VDC ±5%
- ●Various output types

Please read "Caution for your safety" in operation manual before using.



▣Ordering information

E40 H | 8 | — | 5000 | — | 3 | — | N | — | 24 | — |

Series	Shaft type	Hollow type	Pulse/1Revolution	Output phase	Output	Power supply	Cable
S:Shaft type H:Hollow type HB:Hollow built-in type	External 6: ϕ6mm 8: ϕ8mm	Inner 6: ϕ6mm 8: ϕ8mm 10: ϕ10mm 12: ϕ12mm	Refer to resolution	2:A, B 3:A, B, Z 4:A, $\overline{A}$, B, $\overline{B}$ 6:A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$	T:Totem pole output N:NPN open collector output 3:Voltage output L:Line driver output(※)	5 :5VDC ±5% 24:12-24VDC ±5%	No mark:Normal type (※) 2C:Cable outgoing connector type

※Standard : E40S6-PULSE-3-N-24
E40H8-PULSE-3-N-24
E40HB8-PULSE-3-N-24

※Standard:A, B, Z ※The power of Line driver is only for 5VDC

※Cable length : 250mm

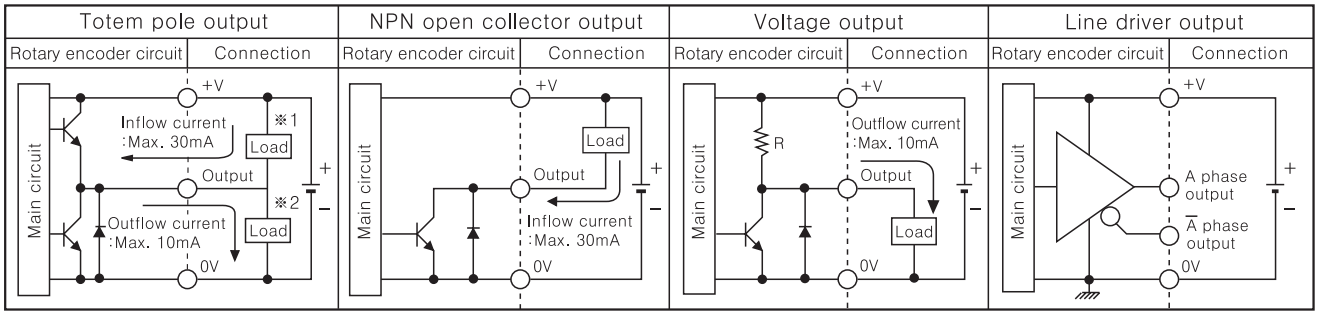
▣Specifications

Item			Diameter ϕ40mm shaft type of Incremental rotary encoder	
Resolution(P/R)			**(Note1)** *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 (Not indicated type is available to customize)	
Electrical specification	Output phase		A, B, Z phase(Line driver : A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ phase)	
	Phase difference of output		Phase difference between A and B : $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)	
	Control output	Totem pole output	• Low ☞ Load current:Max. 30mA, Residual voltage : Max. 0.4VDC • High ☞ Load current:Max. 10mA, Output voltage(Power supply 5VDC):Min. (Power supply-2.0)VDC, Output voltage(Power supply 12-24VDC):Min. (Power supply-3.0)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 ☞ Load current : Max. 20mA, Residual : Max. 0.5VDC High ☞ Load current : Max. -20mA, Output voltage : Min. 2.5VDC	
	Response time (Rise/Fall)	Totem pole output	Max. 1μs	• Measuring condition ☞ Cable length : 2m, I sink = Max. 20mA
		NPN open collector output	Max. 1μs	
		Voltage output	Max. 1μs	
		Line driver output	Max. 0.5μs	
	Max. Response frequency		300kHz	
	Power supply		• 5VDC ±5%(Ripple P-P:Max. 5%) • 12-24VDC ±5%(Ripple P-P:Max. 5%)	
	Current consumption		Max. 80mA(disconnection of the load), Line driver output:Max. 50mA(disconnection of the load)	
	Insulation resistance		Min. 100MΩ(at 500VDC)	
	Dielectric strength		750VAC 50/60Hz for 1 minute(Between all terminals and case)	
	Connection		Cable outgoing type, 200mm cable outgoing connector type	
Mechanical specification	Starting torque		Shaft Type : Max. 40gf • cm(0.004N • m), Holl Type : Max. 50gf • cm(0.005N • m)	
	Rotor inertia		Max. 40g • cm^2 (4×10^{-6} kg • m^2)	
	Shaft loading		Radial : Max. 2kgf, Thrust : Max. 1kgf	
	Max. allowable revolution		**(Note2)** 5000rpm	
Vibration			1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours	
Shock			Max. 50G	
Ambient temperature			-10 ~ 70℃(at non-freezing status), Storage:-25 ~ 85℃	
Ambient humidity			35~85%RH, Storage: 35~90%RH	
Protection			IP50(IEC standard)	
Cable			ϕ5mm, 5P, Length : 2m, Shield cable(Line driver output : ϕ5mm, 8P)	
Accessory			• Shaft type: ϕ6mm coupling standard, ϕ8mm coupling(Option) • Hole type : Bracket	
Unit weight			Approx. 120g	
Approval			CE (Except for Line driver output)	

※**(Note1)** '*' pulse is only for A, B phase(Line Driver output is for A, $\overline{A}$, B, $\overline{B}$ phase)

※**(Note2)** Max. allowable revolution ≧ Max. response revolution 【Max. response revolution(rpm) = $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60$ sec】

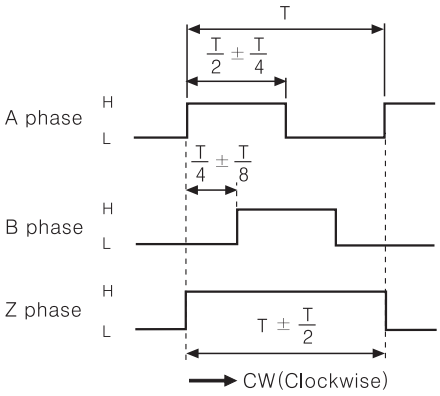
▣Control output diagram



☞ Totem pole output type can be used for NPN open collector output type(※1) or Voltage output type(※2).
☞ All output circuits of A, B, Z phase is same. (Line driver output is A, A, B, B, Z, Z)

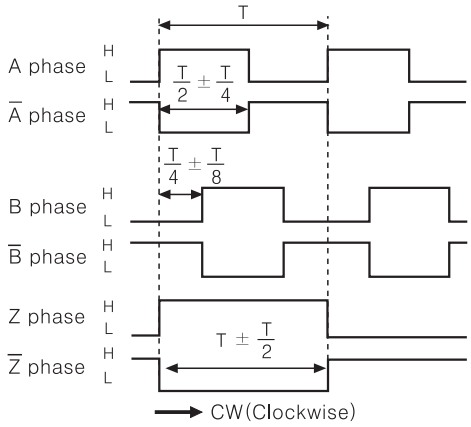
▣Output waveform

●Totem pole output / NPN open collector output / Voltage output



※CW : In a view of shaft

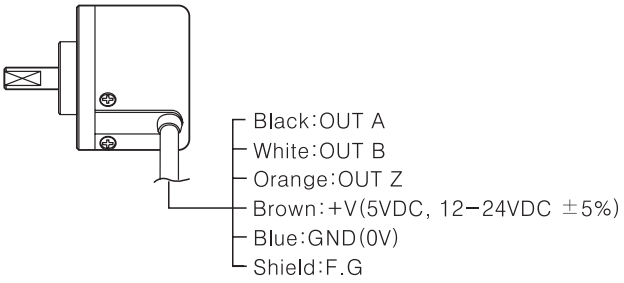
●Line driver output



▣Connections

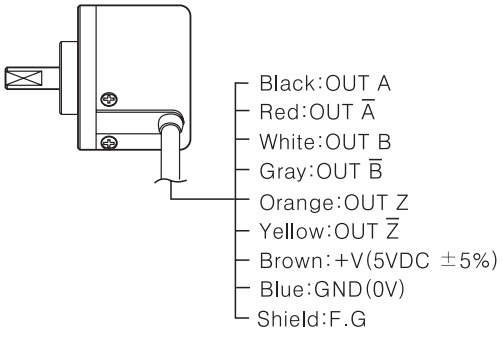
■Normal type

●Totem pole output / NPN open collector output / Voltage output



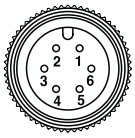
※Unused wires must be insulated.
※The metal case and shield wire of encoder should be grounded(F.G).

●Line driver output



■ Cable outgoing connector type

●Totem pole output
NPN open collector output
Voltage output



●Line driver output

Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT Ā	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G	Shield	⑥	OUT B̄	Gray
			⑦	OUT Z	Orange
			⑧	OUT Z̄	Yellow
			⑨	F.G	Shield

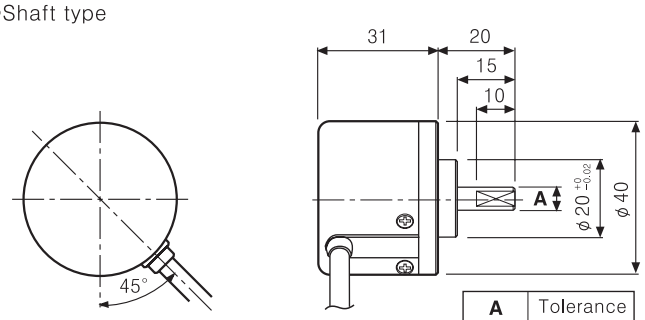
※F.G(Field Ground):It should be grounded seperately.

▣Dimensions

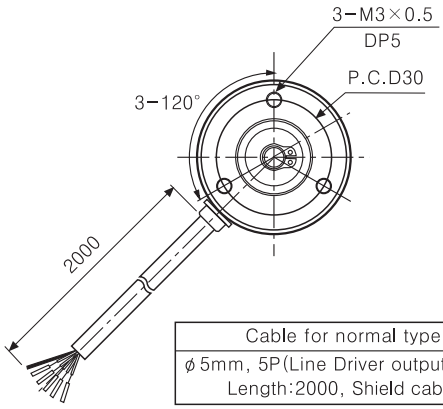
■Normal type

(Unit:mm)

●Shaft type

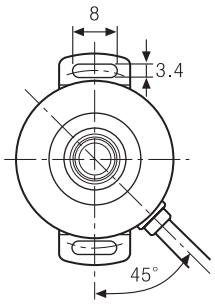


A	Tolerance
ϕ6	−0.01 −0.015
ϕ8	−0.01 −0.02

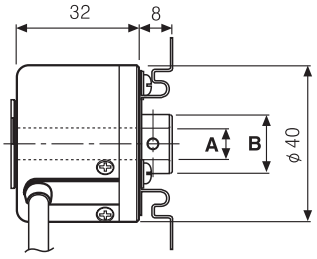


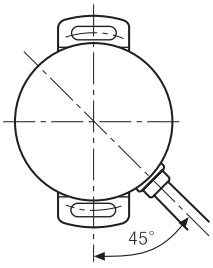
Cable for normal type
ϕ5mm, 5P(Line Driver output : 8P), Length:2000, Shield cable

●Hollow shaft / Hollow shaft built−in type

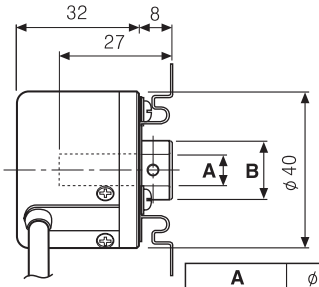


E40H

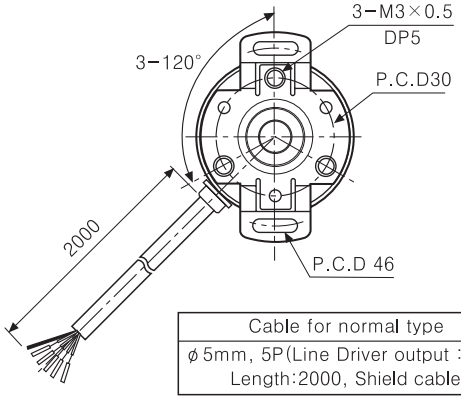




E40HB

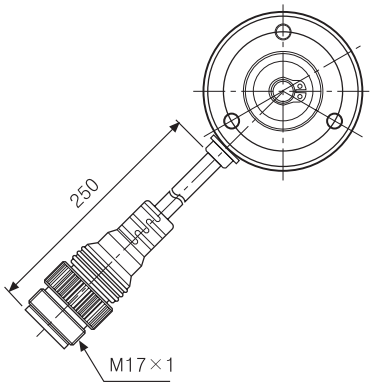


A	ϕ6	ϕ8	ϕ10	ϕ12
B	ϕ15		ϕ17	
Tolerance	+0.015 −0			



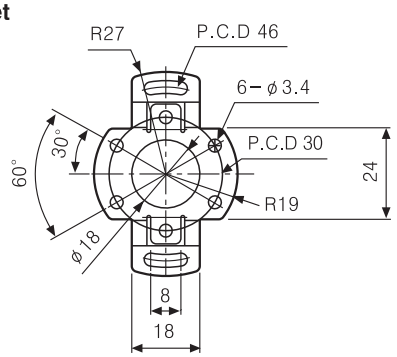
Cable for normal type
ϕ5mm, 5P(Line Driver output : 8P), Length:2000, Shield cable

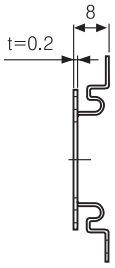
■Cable outgoing connector type



※The connector cable is optional and refer to M−46 for the specification.

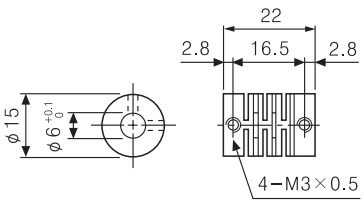
◎Bracket





◎Coupling(E40S)

● ϕ6 Coupling



● ϕ8 Coupling