

ENP Series

Diameter ϕ 60mm Shaft type Absolute Rotary encoder

■ Features

- Able to measure absolute variable angle with BCD code.
- Strong against external impact.
- Memorizing the absolute position when power is cut off.

■ Application

- Precision numerical control machine for industrial plant.

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



■ Ordering information

Series	Output code	Output	Power supply	Revolution direction	Revolution/1Pulse	Control output
ENP	1	1	1	R	360	1
Diameter ϕ 60mm shaft type (External diameter : ϕ 10mm)	1:BCD code	0:Negative logic 1:Positive logic	0:5–12VDC \pm 5% 1:12–24VDC \pm 5%	F:Output value increase at CW direction R:Output value increase at CCW direction	006:6 division 008:8 division 012:12 division 016:16 division 024:24 division 360:360 division	P:PNP open collector output N:NPN open collector output

*Since the output type is related with control output, please select the model name in specification when ordering the item.

*PNP output is not available in negative logic.

■ Specifications

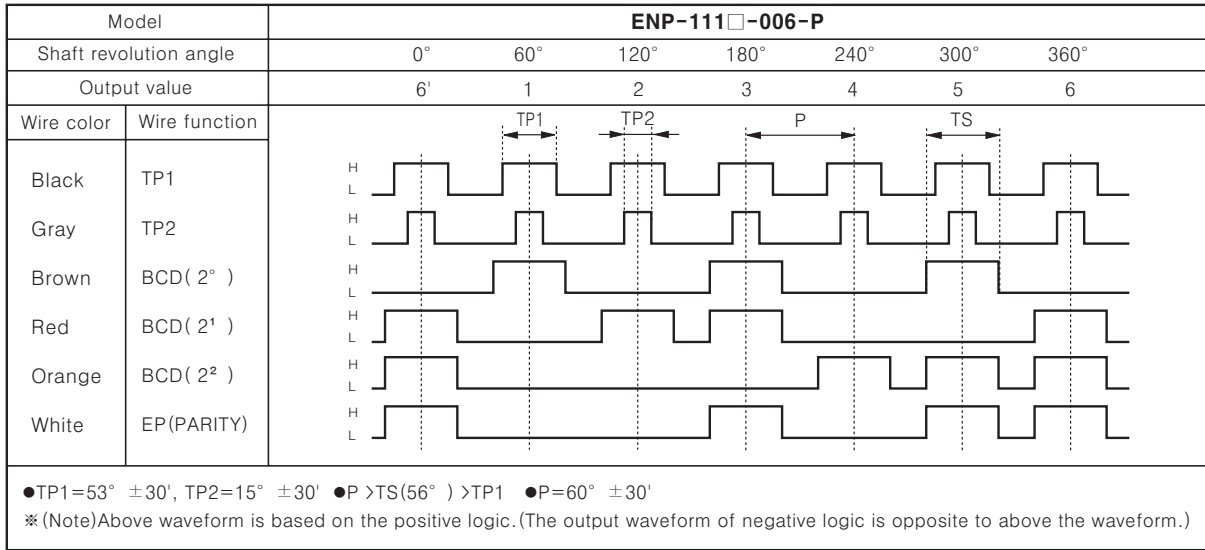
Item		Diameter ϕ 60mm shaft type of Absolute rotary encoder							
Model	PNP open collector output	ENP-111□-006-P	ENP-111□-008-P	ENP-111□-012-P	ENP-111□-016-P	ENP-111□-024-P	ENP-110□-360-P		
	NPN open collector output	ENP-101□-006-N	ENP-101□-008-N	ENP-101□-012-N	ENP-101□-016-N	ENP-101□-024-N	ENP-100□-360-N		
Resolution		6 division	8 division	12 division	16 division	24 division	360 division		
Electrical specification	Output phase		TP(Timing Pulse) : 2bit TS(Signal Pulse) : 4bit(BCD, EP)	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 5bit(BCD, EP)	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 6bit(BCD, EP)	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 6bit(BCD, EP)	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 7bit(BCD, EP)	TS(Signal Pulse) : 10bit(BCD)	
	Output of phase differences		TP1:53° ±30' TP2:15° ±30' P:60° ±30' TS:56° ±30'	TP1:39° ±30' TP2:15° ±30' P:45° ±30' TS:42° ±30'	TP1:3° ±30' TP2:15° ±30' P:30° ±30' TS:26° ±30'	TP1:2° ±30' TP2:11.25° ±30' P:22.5° ±30' TS:19.5° ±30'	TP1:8° ±30' TP2:3° ±30' P:15° ±30' TS:11° ±30'	TS:1° ±30'	
	Control output	PNP open collector output	Output voltage : Min. (Power supply−1.5)VDC, Load current : Max. 32mA						
		NPN open collector output	Load current : Max. 32mA, Residual voltage : Max. 1VDC						
	Response time (Rise & Fall)	PNP open collector output	TON=500ns, TOFF=Max. 2.5 μ s (Cable length:1m, I sink =32mA)						
		NPN open collector output	TON=400ns, TOFF=Max. 1.5 μ s (Cable length:1m, I sink =32mA)						
	Max. Response frequency		20kHz						
	Power supply		12–24VDC ±5% (Ripple P–P:Max. 5%)						5–12VDC ±5% (Ripple P–P:Max. 5%)
	Current consumption		Max. 150mA(disconnection of the load)					Max. 200mA(disconnection of the load)	
	Insulation resistance		Min. 20M Ω (at 500VDC mega between all terminals and case)						
	Dielectric strength		500VAC 50/60Hz for 1 minute (Between all terminals and case)						
	Connection		Cable outgoing type						
Mechanical specification	Starting torque	Max. 500gf · cm(0.05N · m)							
	Rotor inertia	Max. 300g · cm ² (3×10 ^{−5} kg · m ²)							
	Shaft loading	Radial : 10kgf, Thrust : 2.5kgf							
	Mechanical revolution	(Note1)	3600rpm						
Vibration		1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours							
Shock		Max. 75G							
Ambient temperature		−10 ~ 60℃ (at non-freezing status), Storage:−25 ~ 85℃							
Ambient humidity		35~85%RH, Storage : 35~90%RH							
Protection		IP50(IEC standard)							
Cable		ϕ 8mm, 12P, Length : 1m, Double shield cable							
Accessory		Fixing bracket, Coupling							
Unit weight		Approx. 577g						Approx. 690g	

※(★Note1)Max. allowable revolution \geq Max. response revolution 【Max. response revolution(rpm) = $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$ 】

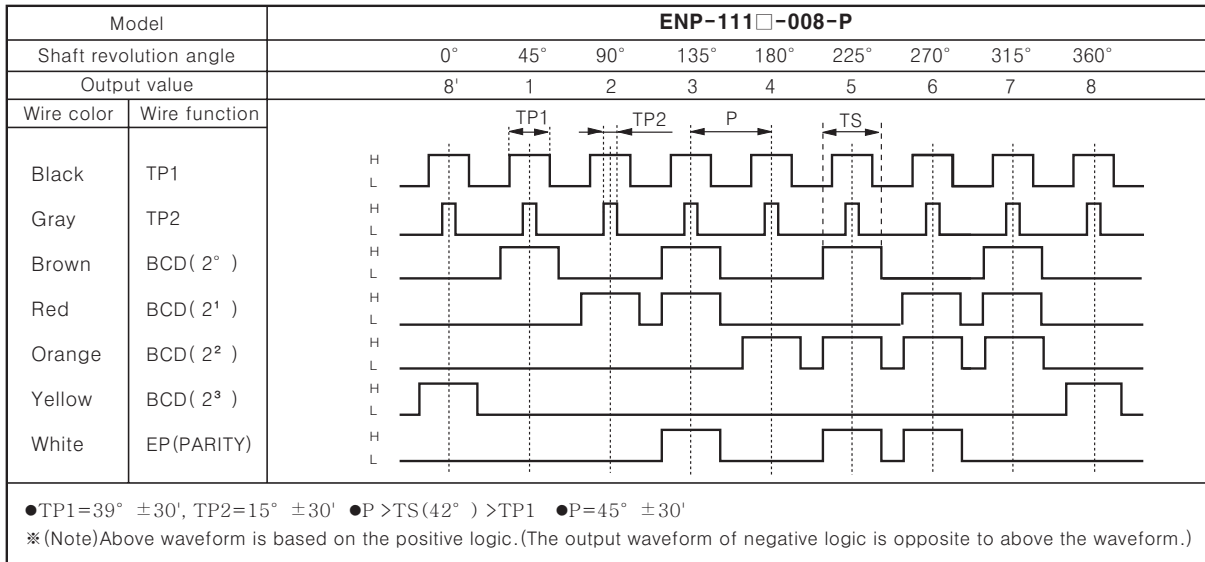
ϕ 60mm Shaft AbsoluteType

■ Output waveform

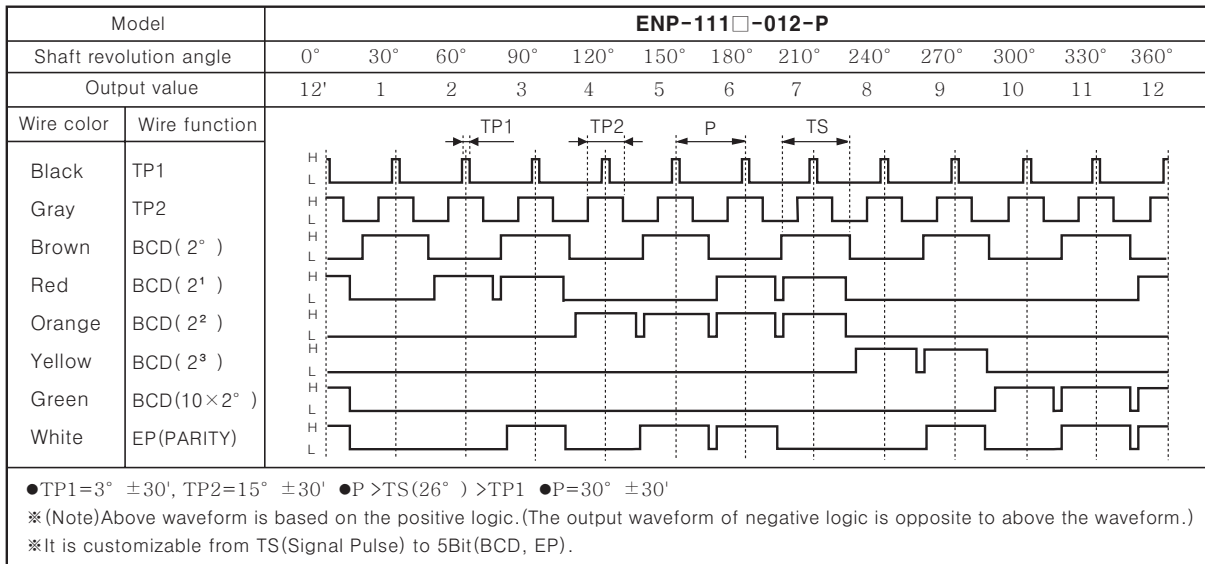
● 6 division



●8 division



●12 division



(A)
Counter

(B)
Timer

(C)
Temp.
controller

(D)
Power
controller

(E)
Panel
meter

(F)
Tacho/
Speed/
Pulse
meter

(G)
Display
unit

(H)
Sensor
controller

(I)
Switching
power
supply

(J)
Proximity
sensor

(K)
Photo
electric
sensor

(L)
Pressure
sensor

(M)
Rotary
encoder

(N)
Stepping
motor &
Driver &
Controller

(O)
Graphic
panel

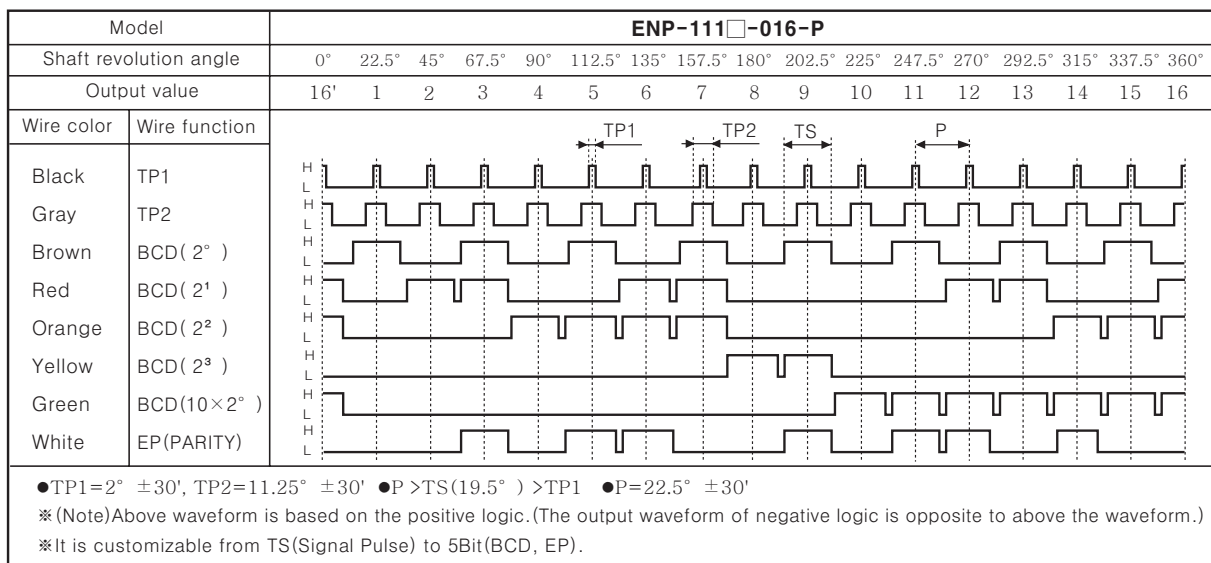
(P)
Field
network
device

(Q)
Production
stoppage
models &
replacement

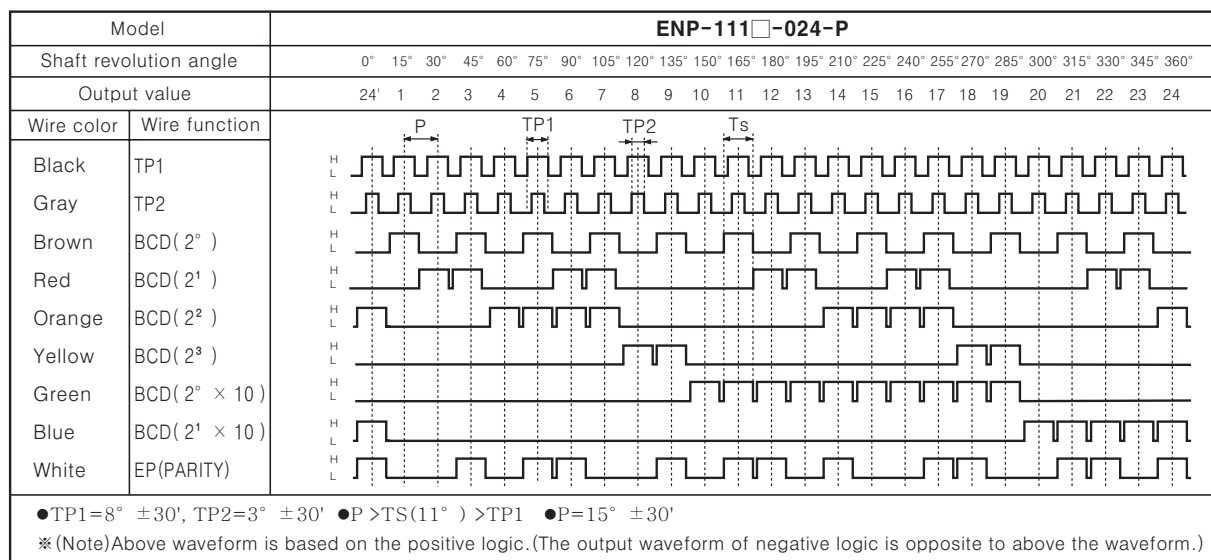
ENP Series

■ Output waveform

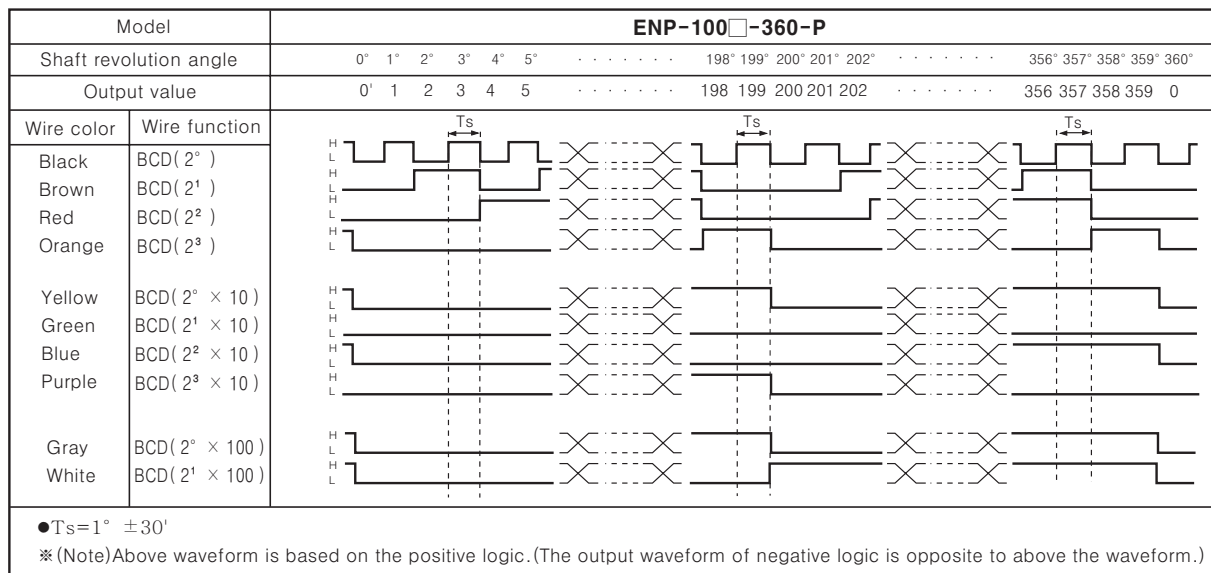
●16 division



●24 division

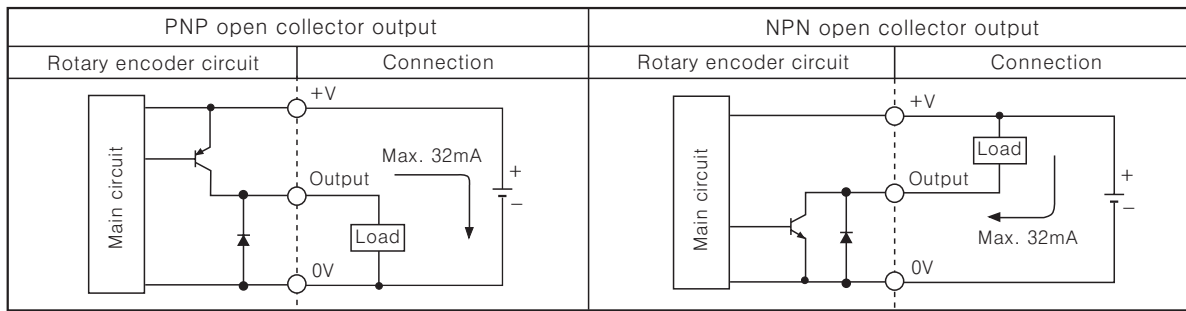


●360 division



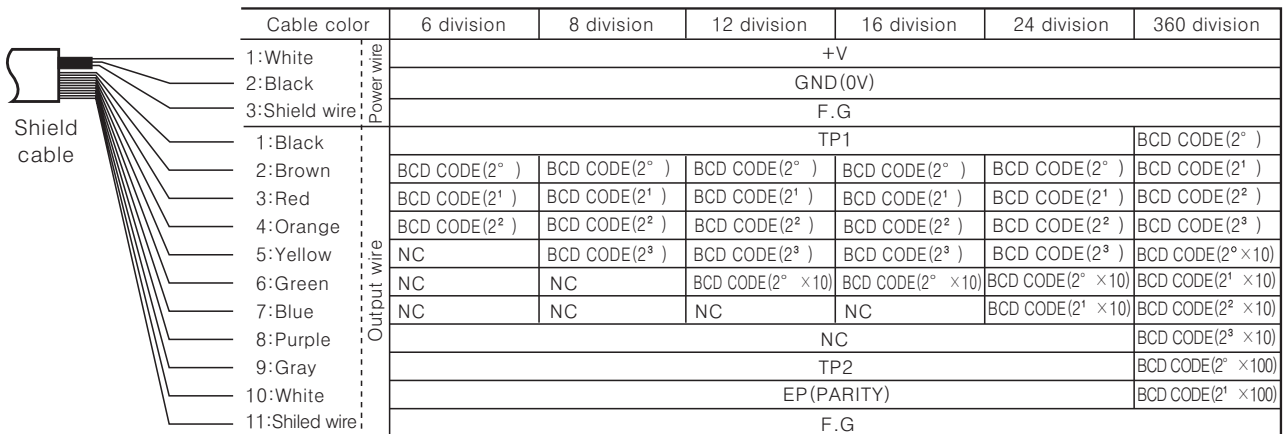
Ø 60mm Shaft Absolute Type

■ Control output diagram



※Output circuit of all phases is same.

■ Connections



※Unused wires must be insulated.

✱The metal case and shield wire should be grounded (F.G).

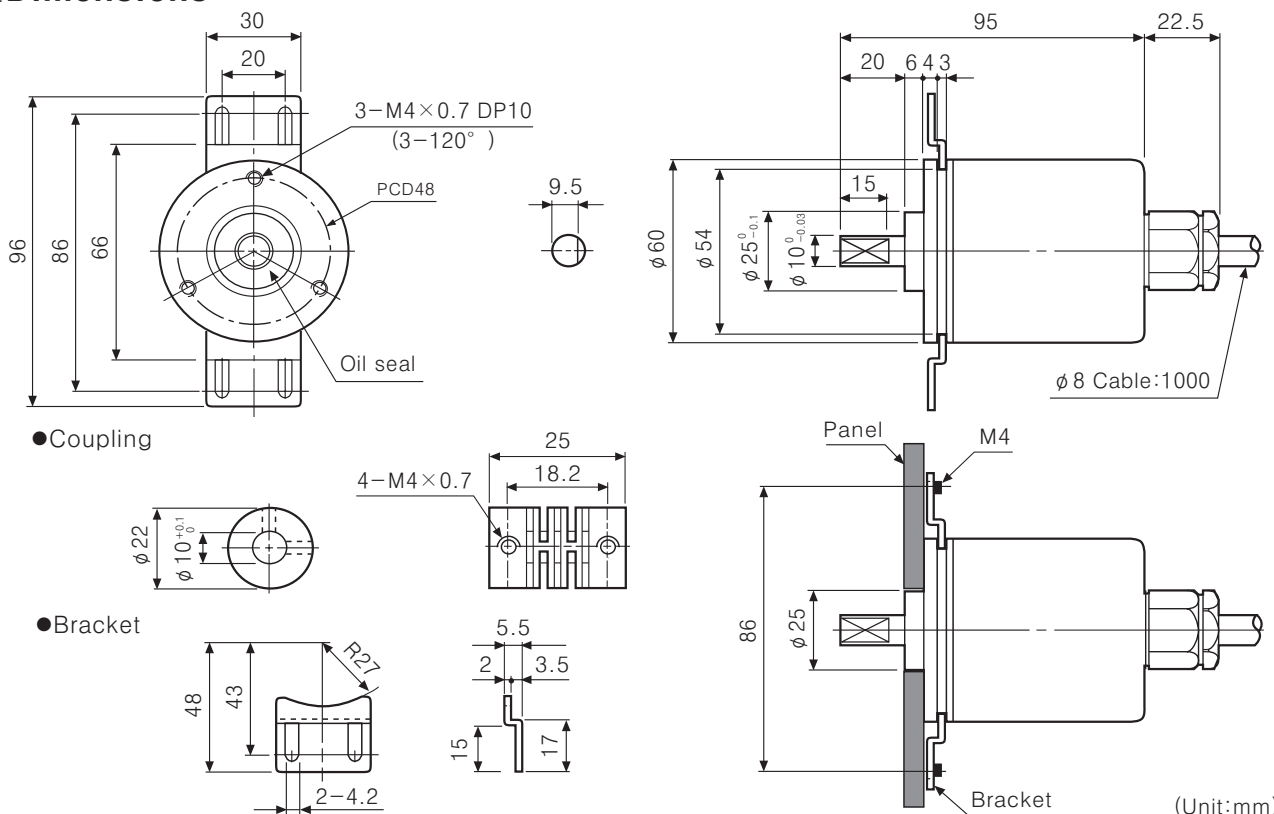
※NC : Not Connected.

※TP1/TP2 : It is an enablement signal to decide signal recognition for output easily because, output signal cycle is long in low resolution model.

※Ep : It is a parity signal to be outputted as odd number of parity.

*Output cable must not be short-circuited, because Driver IC is used in output circuit.

▣ Dimensions



(Unit:mm)

(A)
Counter

(B)
Timer

(C)
Temp.
controller

(D)
Power
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(E)
Panel
meter

(F)
Tacho/
Speed/
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