

# ROTARY ENCODER

# CB·CD

## INCREMENTAL·SHAFT TYPE



## CB Series

- Outside:  $\phi 38$  (Shaft:  $\phi 6$ ), PCD 30
- Wide Range of High Resolution Models
- High Reliability and Performance
- Economical
- Universal Mounting - Fits to almost all Standard Mounting dimensions
- Suitable for General or Industrial Applications

Outside

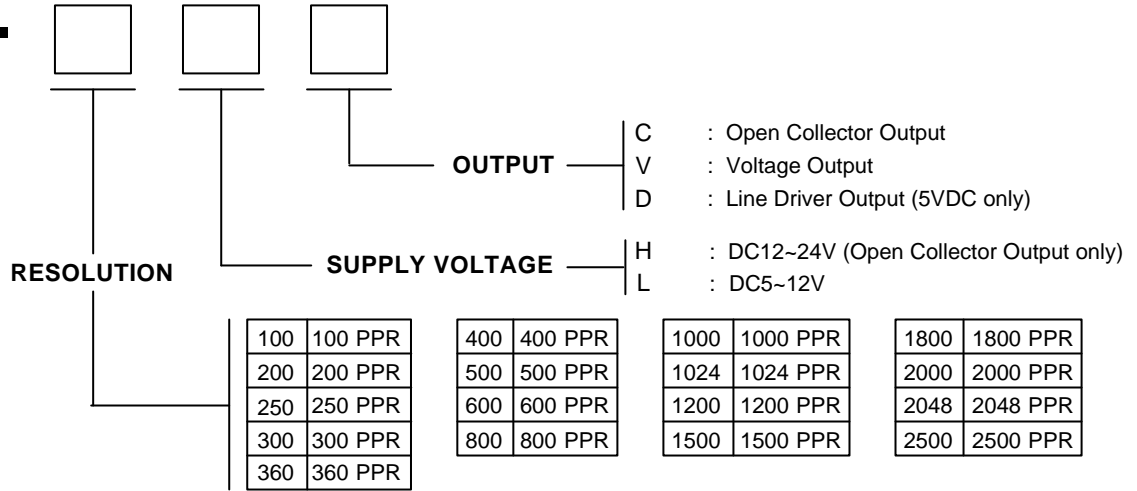
## CD Series

- Outside:  $\phi 55$  (Shaft:  $\phi 8$ ), PCD 48
- Wide Range of High Resolution Models
- High Performance Version
- Environmentally Strong
- Economical
- Suitable for General or Industrial Applications

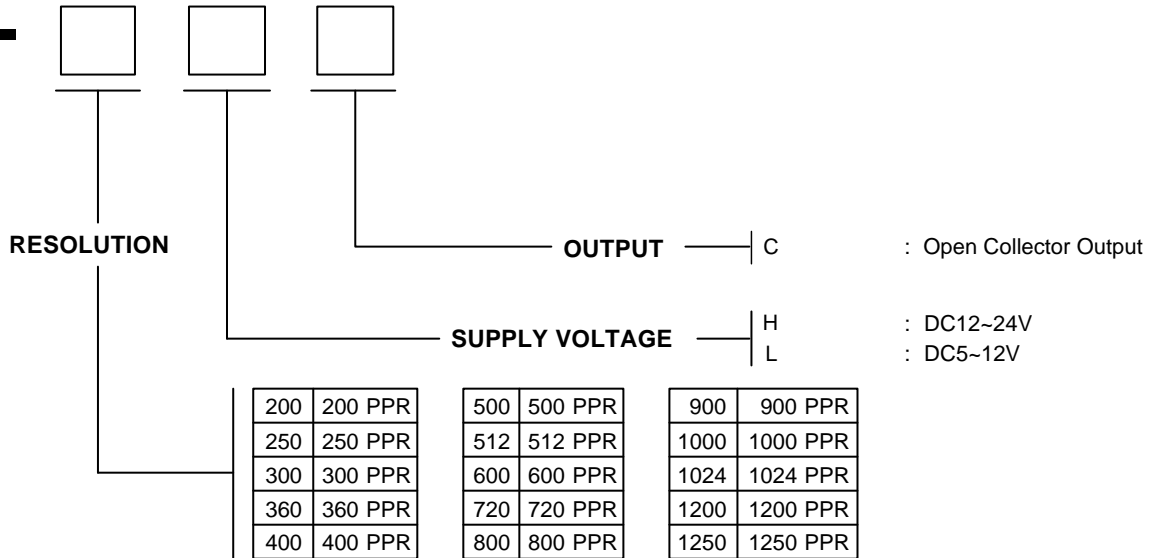


# MODELS

## CB -

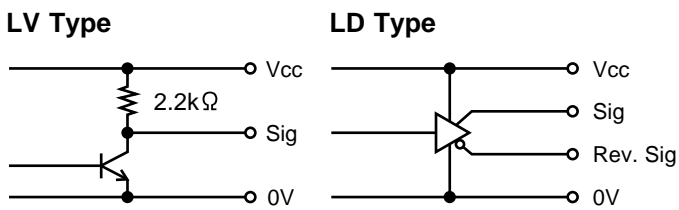


## CD -



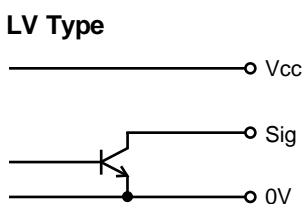
## CIRCUIT OF OUTPUT SIGNAL

### • CB Series



• LC and HC Types are without Pull-up Resistor.

### • CD Series



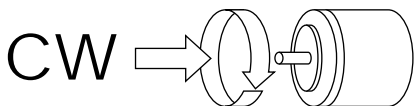
## CONNECTION

Signal	COLOR OF WIRE		CD Series
	CB Series		
	D Type	C Type	
Vcc	Brown		
0V	Blue		
A	Black		
$\bar{A}$	Black/Red	—	
B	White		
$\bar{B}$	White/Red	—	
Z	Orange		
$\bar{Z}$	Orange/Red	—	
Shield	—		

# SPECIFICATIONS

		CB Series				CD Series		
ELECTRICAL	Model	CB-□HC	CB-□LC	CB-□LV	CB-□LD	CD-□HC	CD-□LC	
	Power Supply (Ripple 3% max.)	DC12~24V±10%	DC5~12V±10%		DC5V±10%	DC12~24V±10%	DC5~12V±10%	
	Current Consumption	50 mA max.				40 mA max.		
	Output	Open Collector		Voltage	Line Driver	Open Collector		
	Output Signal	90° Quadrature + Zero Marking				90° Quadrature + Zero Marking		
	Output Phase	A,B,Z			A,B,Z,Ā,Ḃ,Ż	A,B,Z		
	Output Capacity	Sink Current : 35 mA max. Residual Voltage : 0.5V max.		Sink Current : 20 mA max.	± 20 mA	Sink Current : 60 mA max. Residual Voltage : 0.5V max.		
	Max. Applied Voltage	30V max.				50V max.		
	Output Voltage	—		H: Supply Voltage -1 V min. L: 0.5 V max.	H: 2.5 V min. L: 0.5 V max.	—		
	Max. Freq. Response	100 kHz				100 kHz		
	Signal Rise/Fall Time (Pull-up resistor 2.2kΩ, 1m Cable)	1 μs max.			0.1 μs max.	1 μs max.		
	Insulation Resistance	20M Ω min. (DC100V Megger)				20M Ω min. (DC100V Megger)		
	Output Impedance (Voltage Output only)	—		2.2k Ω	—	—		
	Cable Length	500 <sup>+10</sup> mm				2000 <sup>+100</sup> mm		
	Outside Diameter	φ 5.1 mm				φ 5.5 mm		
MECHANICAL	Max. Speed of Shaft	6000 rpm				5000 rpm		
	Moment of Inertia	6x10 <sup>-7</sup> kg·m <sup>2</sup> max.				8x10 <sup>-7</sup> kg·m <sup>2</sup> max.		
	Starting Torque	1.0x10 <sup>-3</sup> N·m max.				2.0x10 <sup>-2</sup> N·m max.		
	Angular Acceleration	10 <sup>5</sup> rad/s <sup>2</sup>				10 <sup>4</sup> rad/s <sup>2</sup>		
	Max. Shaft Loading	Radial	25N max.				30N max.	
		Axial	15N max.				30N max.	
Weight	Approx. 120g (with 0.5m Cable)				Approx. 290g (with 2m Cable)			
ENVIRONMENTAL	Operating Temperature	-10 ~ +70 °C (Non-Condensing, Non-Freezing)				-10 ~ +70 °C (Non-Condensing, Non-Freezing)		
	Storage Temperature	-25 ~ +80 °C (Non-Condensing, Non-Freezing)				-25 ~ +80 °C (Non-Condensing, Non-Freezing)		
	Operating Humidity	35 ~ 95% (Non-Condensing)				35 ~ 95% (Non-Condensing)		
	Vibration Resistance	10~55 Hz, Width (P-P) 1.5mm (2 hours each in X,Y,Z Direction)				10~55 Hz, Width (P-P) 1.5mm (2 hours each in X,Y,Z Direction)		
	Shock Resistance	6 ms, 980 m/s <sup>2</sup> (3 times each in X,Y,Z Direction)				6 ms, 980 m/s <sup>2</sup> (3 times each in X,Y,Z Direction)		
	Protection	Equivalent to IP50				Equivalent to IP50		

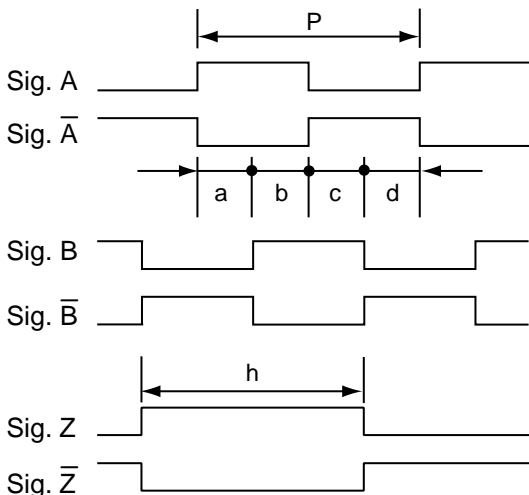
# WAVEFORM



These figures show the waveforms when the shaft is rotated Clockwise (CW) when viewing towards the encoder shaft.

## ● CB Series

A pulse at Signal A should be completed within the period that Signal Z is at H-Level.



$$P = \frac{1}{PPR}$$

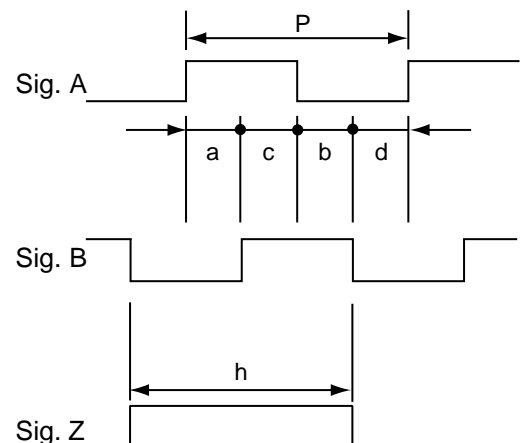
$$a, b, c, d = \frac{P}{4} \pm \frac{P}{8}$$

$$h = P \pm \frac{P}{2}$$

Phase Ā, Ḃ, Ż are applicable only for Type D Output.

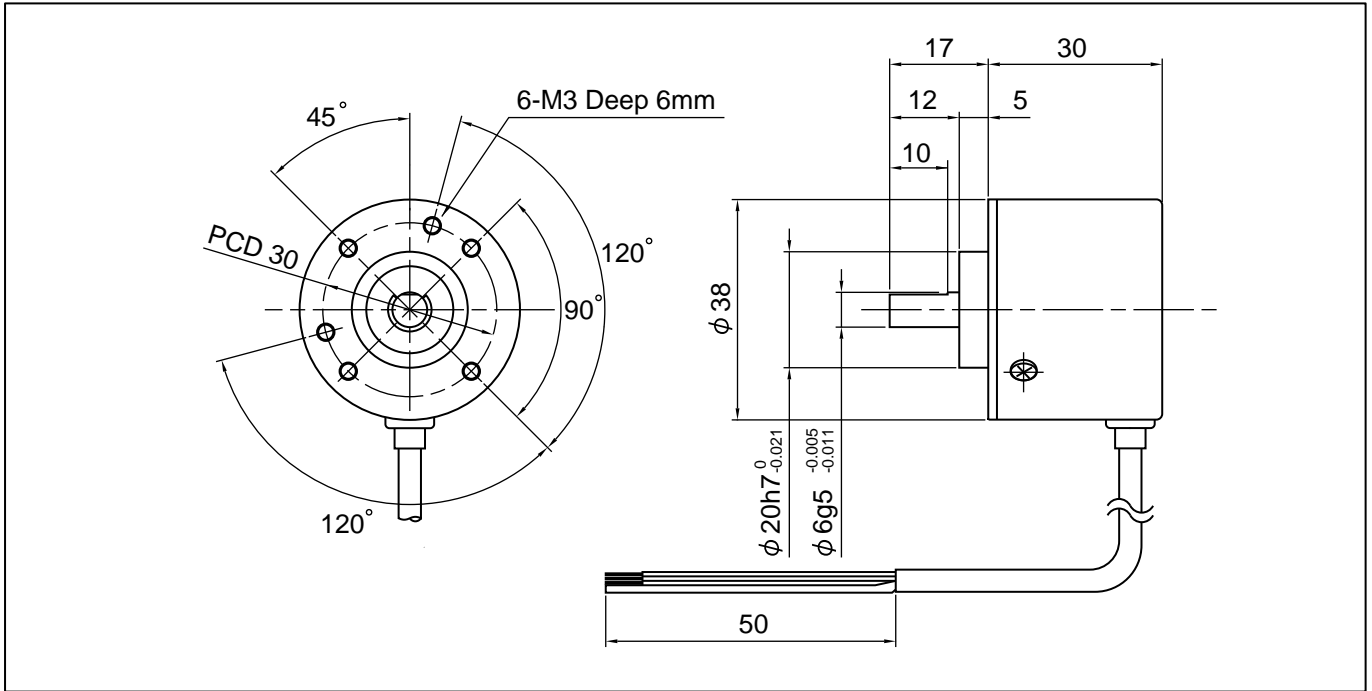
## ● CD Series

Positional relationship of Signals A, B and Z is not specified.

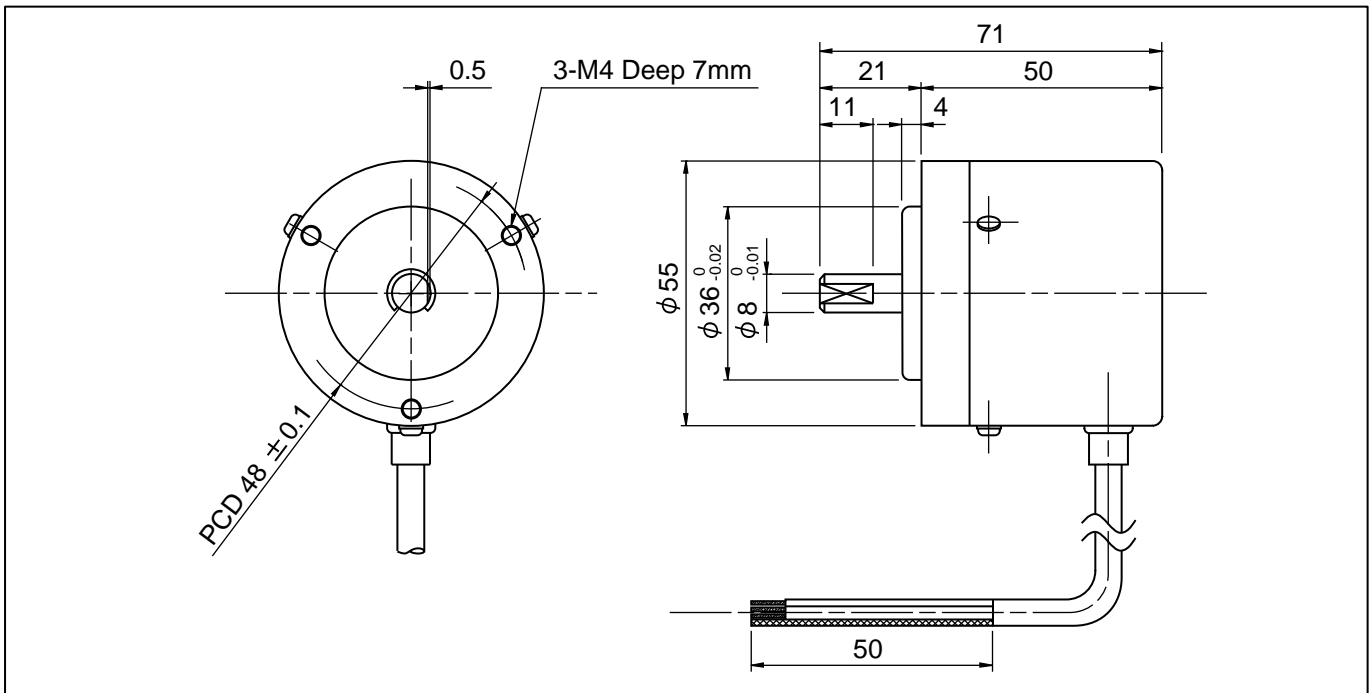


# DIMENSIONS

## ● CB Series



## ● CD Series



### For Inquiries:

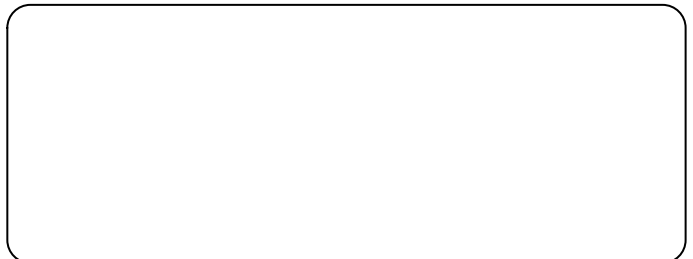
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