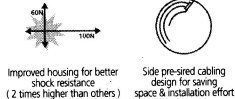
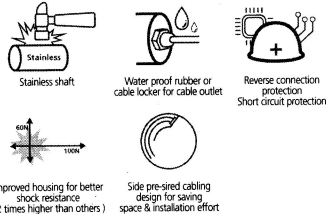
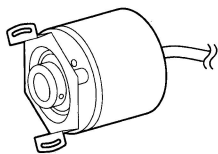


KACON Rotary ENCODER CE



Caution for your safety

※ Please keep these instructions and review them before using this unit.

※ Please observe the cautions that follow;

Warning Serious injury may result if instructions are not followed.
Caution Product may be damaged, or injury may result if instructions are not followed.

※ The following is an explanation of the symbols used in the operation
 △ caution : injury or danger may occur under special conditions.

Warning

1. When use this unit for controlling highly affective machinery to human or properties (medical equipment, vehicle, train, airplane, combustion apparatus and entertainment etc.), it is required to install fall-safe device.
 It may cause serious human injury or a fire, property.

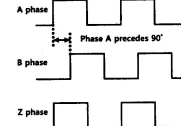
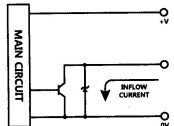
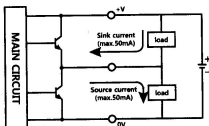
Caution

- Do not drop water or oil on this unit.**
 It may cause damage or miscontrol due to malfunction.
- Please observe voltage rating.**
 It may shorten the life cycle or damage to the product.
- Please check the polarity of power and wrong wiring.**
 It may result in damage to this unit.
- Do not short circuit the load.**
 It may result in damage to this unit.

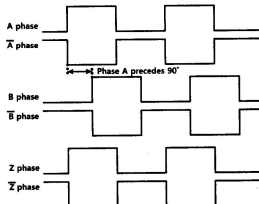
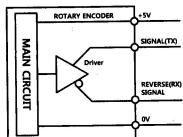
Series	Mount Type (Ømm)	Shape	Resolution	Output	Power
KR	28, 38, 40, 50	Shaft	0~5000ppr	Push Pull Output NPN Open Collector Output	5-30VDC (KR Series) 10-30VDC (KRW Series)
KRW		Hollow		Line Drive Output	5VDC (Line Drive Only)

Output Circuit

- (1) Push Pull Output (2) NPN O.C Output Output Phase



- (3) Line-driver Output



Specification

Item	Model	KR			KRW	
		Ø20	Ø38	Ø50	Ø40	Ø50
Power Supply(VDC)		5-30VDC (Line Drive : 5VDC)			10-30VDC (Line Drive : 5VDC)	
Power consumption (no load)	Push Pull	125mA				
	NPN Open Collector	80mA				
	Line Drive	80mA				
Resolution		50, 100, 200, 300, 360, 500, 600	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 2000, 2500	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 2000, 2048, 2500, 3600, 4000, 4096, 5000		
Output Phase		A, B, Z (Line Drive : A, A̅, B, B̅, Z, Z̅)				
Output Circuit		Push Pull, NPN Open Collector, Line Drive				
Control Output	Push Pull	Low => Max.80mA, Max. 0.8V, High => Max. 80mA, Output Voltage : Power Supply(5-30VDC) - 1.5V				
	NPN Open Collector	Low => Max.50mA, Max. 0.4V, High => Max. 50mA, Output Voltage : Power Supply(5-30VDC) - 70% *				
	Line Drive	Low => Max.50mA, Max. 0.4V, High => Max. 50mA, Output Voltage : Power Supply(5-30VDC) - 3.4V				
Maximum Response Frequency		Max. 300kHz				
Moment of Inertia		App. 0.7X10 ⁻⁹ kg m ²				
Protection		Reverse connection protection, Short circuit protection				
Shock		30G/11ms	50G/11ms	50G/11ms		
Vibration resistance		6G 10~2000HZ	10G 10~2000HZ	10G 10~2000HZ		
Starting Torque		<0.01Nm		<0.08Nm	IP65 : <0.01Nm (IP67 : <0.05Nm)	
Maximum Operating Speed		6,000rpm			12,000rpm	
Protection(IP)		IP50	IP54	IP65		
Cable outlet		Axial 2M cable	2M cable (Radial / Option : Axial)	2M cable (Radial / Option : Axial - M12 5pin9pin, M23 12pin)		

Terminal configuration

Push-Pull / NPN OC output

Signal	0V	+Ub	+A	+B	+Z	Shield
Color	White (WH)	Brown (BN)	Green(GN)	Gary (GY)	Blue (BU)	silver
Pin code (5-pin)	1	2	3	4	5	

RS422(Line Drive) output

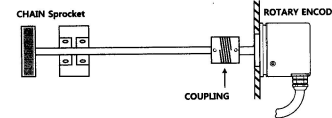
Signal	0V	+Ub	+A	-A	+B	-B	+Z	-Z	Shield
Color	White (WH)	Brown (BN)	Green(GN)	Yellow(YE)	Gary (GY)	Pink(PK)	Blue (BU)	Red (RD)	silver
Pin code (8-pin)	1	2	3	4	5	6	7	8	
Pin code (12-pin)	10	12	5	6	8	1	3	4	

Top view of pin plug

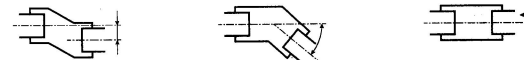
Connector type	5-pin M12 connector	8-pin M12 connector	12-pin M23 connector
Pin plug			

Precautions for Safe Use

The Rotary Encoder consists of high-precision components. Dropping the Encoder may damage it. Exercise sufficient caution when handling the Encoder. Do not allow water or oil to splash on the Encoder. When connecting with a chain timing belt and gears, hold the shaft with a bearing and use a coupling to join to the Encoder.

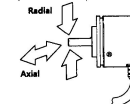


- Axial deviation Angle deviation Radial displacement

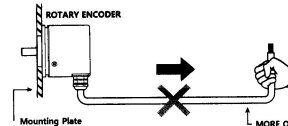


When using a coupling, do not exceed the following permitted values.

Make sure that an excessive load is not placed on the shaft when the gears engage.



When inserting the coupling into the shaft, do not tap it with a hammer or apply any other type of shock. When attaching or detaching the coupling, do not bend, compress, or pull excessively on the coupling. If connecting the cable after securing the Encoder, do not pull on the cable. Also do not apply shock to the Encoder or shaft.



When extending the cable, check the cable type and response frequency. Wire resistance and capacitance between wires may amplify residual voltage and cause waveform distortions. If the cable is extended, it is recommended to use a line-driver output. Regardless of the output type, only lengths of 30 m or less. To avoid inductive noise, keep the cabling as short as possible (particularly when inputting to an IC).

When the cable length is extended, the output waveform startup time is lengthened and it affects the phase difference characteristics of phases A and B.

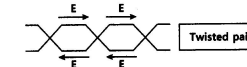
Extending the cable length not only changes the startup time, but also increases the output residual voltage.

Preventing Counting Errors

Spurious pulses due to vibration may cause counting errors if the shaft is stationary near the rise or fall of the signal. Using an up/down counter can prevent the counting of error pulses.

Extending the Cable When Using a Line-driver Output

Be sure to use shielded twisted-pair cable when extending the cable for a line-driver output, and use an RS-422A Receiver for the receiver side. The structure of twisted-pair cable is suitable for RS422 transmission. By twisting the two outputs as shown in the following diagram, electromotive force occurring in the wires is reciprocally canceled, and the noise element of normal mode is eliminated.



When using a line-driver output, a power supply of 5 VDC is needed for the Encoder. The voltage will drop approximately 1 V per 100 m of cable.



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