

Koyo®

Incremental Encoder Series TRD-MX

Operation Manual

Thank you for purchasing this series TRD-MX Incremental Encoder. Please read this Operation Manual carefully before applying this product.
KEEP MANUAL IN A SAFE PLACE.

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Safety Consideration

Warning This indicates contents which can cause large accidents leading to loss of life or severe injury when the indication is disregarded and wrong handling is executed.

Caution This indicates contents which can cause injury or material damage when the indication is disregarded and wrong handling is executed.

Explanation of the pictograms

- This symbol indicates a general prohibition.
- This symbol indicates a compulsory item or an instruction.

[Operating environment and conditions]

Warning

- Do not use in a combustible or explosive atmosphere. Otherwise personal injury or fire may be caused.
- Do not use this product for applications related to human safety. Use is assumed in an application where an accident or incorrect use will not immediately cause danger to humans.

[Operating environment and conditions]

Caution

- Use and store the equipment within the scope of the environment (vibrations, impact, temperature, humidity, etc.) specified in the specifications. Otherwise fire or product damage may be caused.
- Understand the product first before use it.

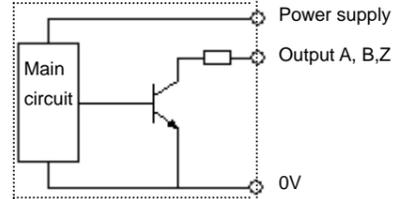
[Installation and wiring]

Warning

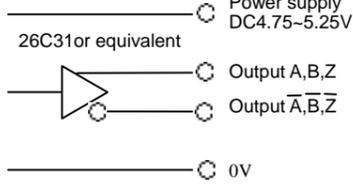
- Use only with the power supply voltage listed in the specifications. Otherwise fire, electric shock, or accidents may be caused.
- Use only with the wiring and layout specified in the specifications. Otherwise fire, electric shock, or accidents may be caused.
- Do not apply any kind of stress to the wires. Otherwise electric shock or fire may be caused.

Output circuit

Open Collector Output

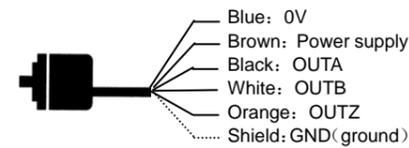


Line driver Output

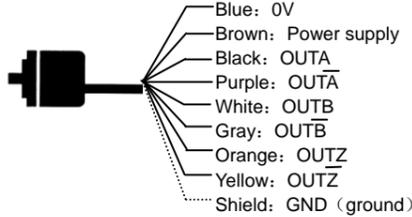


Connection

TRD-MX□A/B



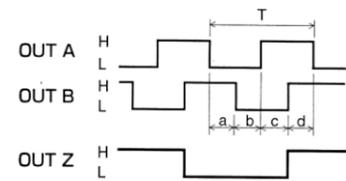
TRD-MX□V



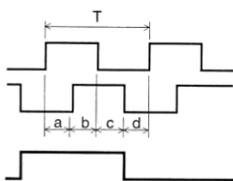
Output signal timing chart

(CW rotation viewed from input-shaft of encoder)

TRD-MX□A/B

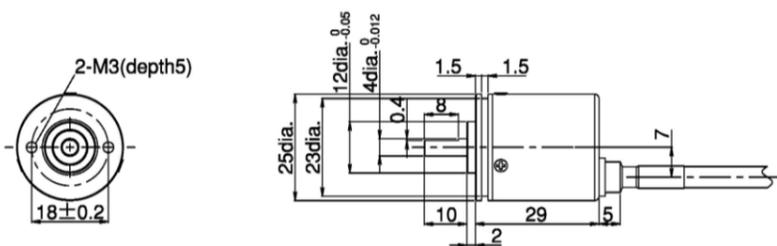


TRD-MX□V

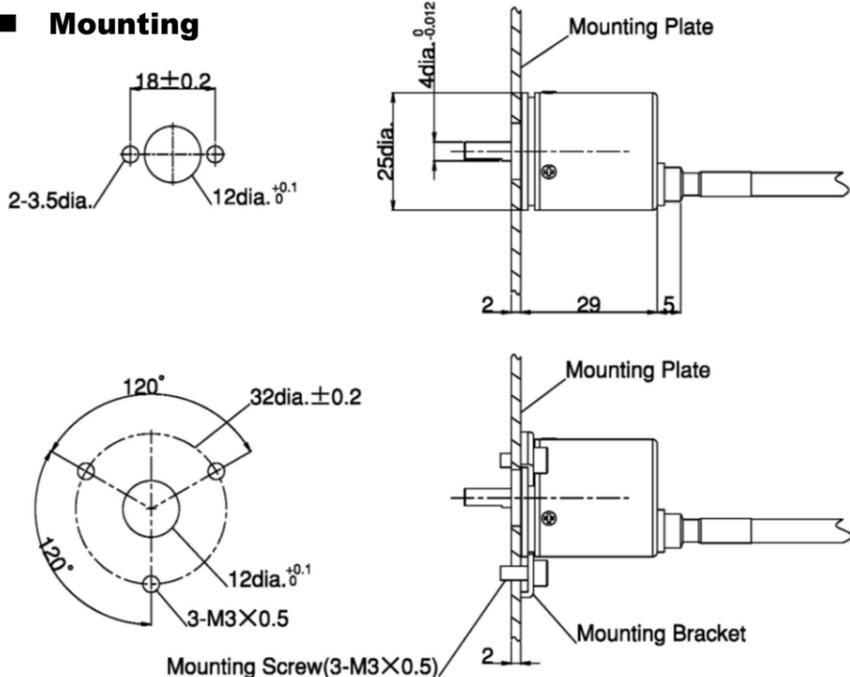


a, b, c, d = (25 ± 12.5%) T

External dimensions



Mounting



Electrical specifications

Type No.		TRD-MX□A/B	TRD-MX□V	
Power supply	Operating voltage ^{*1}	A: 4.5V~13.2V DC B: 10.8V~26.4V DC	4.75V~5.25V DC	
	Allowable ripple	3%rms Max.	3%rms Max.	
	Current consumption(no load)	50mA Max.	50mA Max.	
Output waveform	Signal format	Quadrature output	Quadrature output	
	Max. response frequency	100kHz	100kHz	
	Operating speed	(Maximum response frequency/Pulse) × 60	(Maximum response frequency/Pulse) × 60	
	Symmetry	50 ± 25%	50 ± 25%	
	Index signal width	100 ± 50%	100 ± 50%	
	Rising/falling time ^{*2}	2µs Max.	2µs Max.	
Output	Output configuration	NPN open collector	Line driver (26C31 or equivalent)	
	Output logic	Negative logic (active low)	Positive logic (active high)	
	Output current	Inflow	30mA Max.	20mA Max.
		Outflow	-	-
	Output voltage	"H"	-	2.5V Min.
		"L"	0.4V Max.	0.5V Max.
Load power supply voltage	DC30V Max.	-		

*1: To be supplied by class II source.

*2: With a cable of 1m or less. Maximum load.

Mechanical specifications

Starting torque	Max. 0.001N · m (+20°C)	
Shaft moment of inertia	1 × 10 ⁻⁷ kg · m ²	
Max. allowable shaft load	Radial	10N
	Thrust	5N
Max. allowable speed	6000rpm	
Cable	Material	Oil-resistant PVC ^{*3}
	Nominal core cross section	0.14mm ²
	External diameter	5.0mm
Weight	Approx. 0.08kg ^{*4}	

*3 MX□A/B: 5-core shielded cable (AWG26)

MX□V: 8-core shielded cable (AWG26)

*4 with 1m cable

Environmental requirements

Ambient temperature	Operation	-10~+70°C
	Store	-25~+85°C
Ambient humidity	35~85%RH (non-condensing)	
Withstand voltage	Grounded through capacitor ^{*5}	Power and signal lines are in the casing.
Insulation resistance	20MΩ min.	Shield line is not in the casing.
Vibration resistance	10 to 55Hz with 0.75mm amplitude ^{*6}	
Shock resistance	11ms with 490m/s ² ^{*7}	
Protection construction	IP50 (Dust proof)	

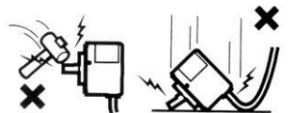
*5: A capacitor of 0.01µF/630V is connected between 0V and FG lines.

*6: Durable for 1h along 3 axes } It is an examination condition, and it can not

*7: Applied 3 times 3 axes } guarantee for consecutive use.

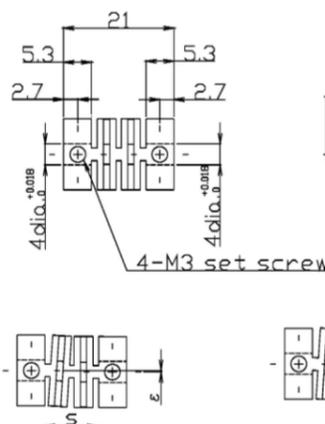
Cautions for use

- Do not wire the cable in parallel with other power lines and do not share a duct with other cables.
- Use capacitors or surge absorption elements to remove the sparks caused by relays and switches in the control panel as far as possible.
- Be sure to connect all wires properly, as wrong wiring can damage the internal circuitry.
- Erroneous pulses may be caused at the time of power ON and power OFF. After power ON, wait for at least 0.5 sec before use.
- Do not disassemble the product.
- As the rotary encoder is composed of precision parts, its function will be impaired when it is subjected to shocks. Use sufficient care for handling and mounting.

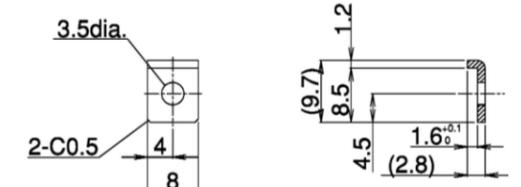


Options

● Coupling(GJ-4)



● Mounting bracket(MM-4)



Type No.	Material	α	ε	s
GJ-4	PBT resin	5° MAX	0.5mmMAX	0.12mmMAX