

# Incremental Encoder

## Series TRD-S/SH

### Operation Manual

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



Sales : 800-633-0405  
Tech Support : 770-844-4200

### 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.

### Electrical specifications

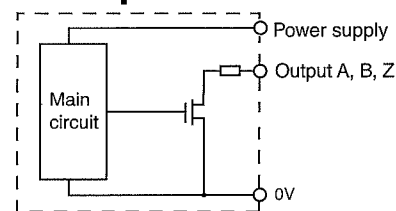
Type No.	TRD-S □ AD/BD TRD-SH □ AD/BD (□ : pulse/revolution)	TRD-S/SH □ VD (□ : pulse/revolution)		
Power supply	Operating voltage	AD: 4.75 - 13.2V DC *1 BD: 10.8 - 26.4V DC	+4.75 - 5.25V DC *1	
	Allowable ripple	3% rms or less	←	
	Current consumption	50 mA or less	150 mA or less	
Output waveform	Signal format	Quadrature output : Phase difference 25 ± 12.5%	←	
	Max. response frequency	200kHz	←	
	Operating speed	(Max. response frequency / Pulses per revolution) × 60 rpm or 6000 rpm whichever is lower.	←	
	Symmetry	50 ± 25%	←	
	Index signal width	50 - 150% of one cycle	←	
	Rising/falling time	1μs or less *2	100ns or less *2	
Output	Output configuration	N channel Mos FET. Open drain output	Line driver output (26C31 or equivalent)	
	Output current	Inflow	30 mA max.	←
		Output voltage	"H"	2.3 V or more
		"L"	0.4 V or less	0.5 V or less
	Load power supply voltage	DC 35 V or less	←	
Short-circuit protection	Between output and power supply	←		

\*1: To be supplied by class II source. \*2: With a cable of 2m or less.

### Mechanical specifications

Starting torque	Max. $1 \times 10^{-3} \text{ N}\cdot\text{m}$ (+20°C)
Shaft moment of inertia	$0.3 \times 10^{-6} \text{ kg/m}^2$
Max. allowable shaft load	Radial: 20 N
	Axial: 10 N
Max. allowable speed	$100 \text{ s}^{-1}$ (6000 rpm)
Wire size	AWG26
Weight	Approx. 150g (with 2m cable)

### Output circuit



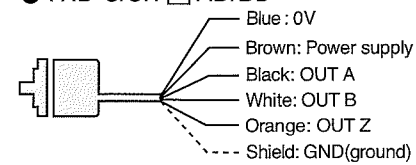
### Environmental conditions

Ambient temperature	Use temperature: -10 to 70°C, storage temperature: -25 to 85°C
Ambient humidity	25 to 85% RH (no condensation)
Protection construction	Dust-proof type: Simple dust-proof type

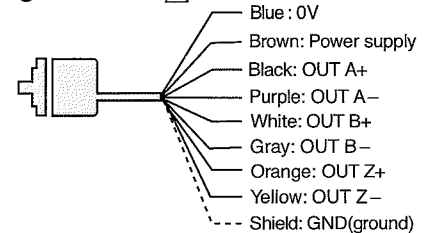
### Connection

The shield wire (GND) is not connected to the encoder body.

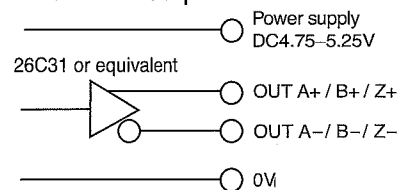
#### ● TRD-S/SH □ AD/BD



#### ● TRD-S/SH □ VD

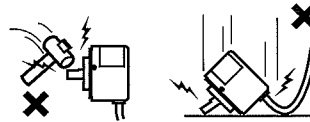


#### Line driver Output



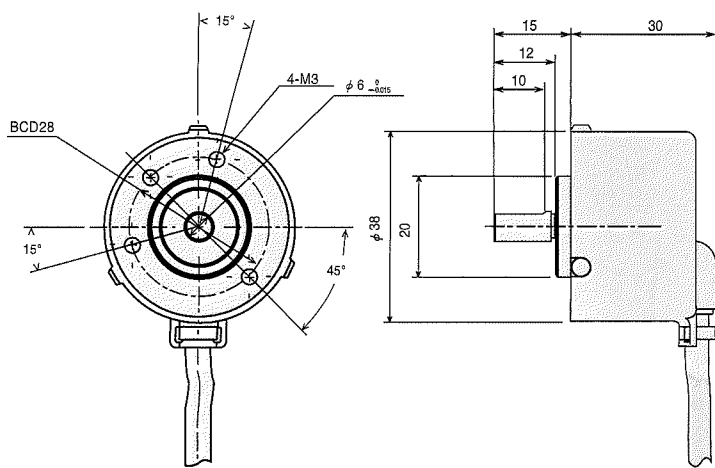
### Cautions for use

- 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.

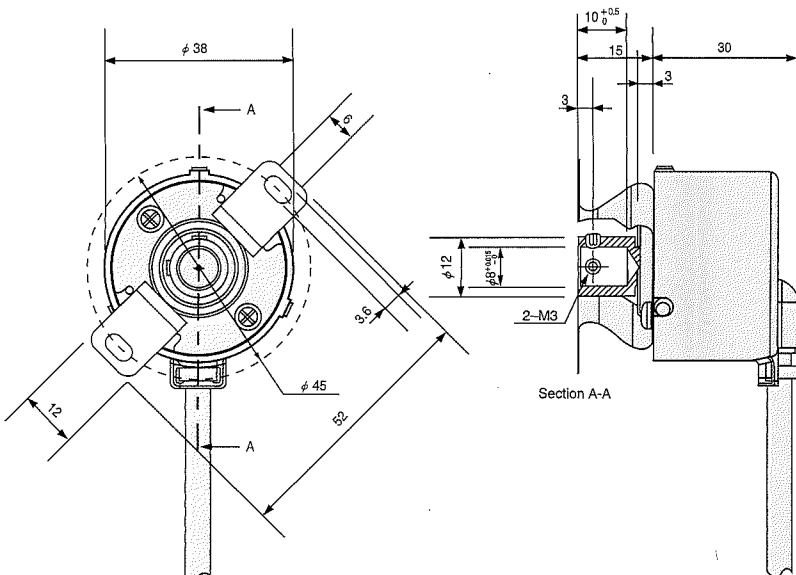


### External dimensions

#### ● TRD-S □ AD/BD/VD



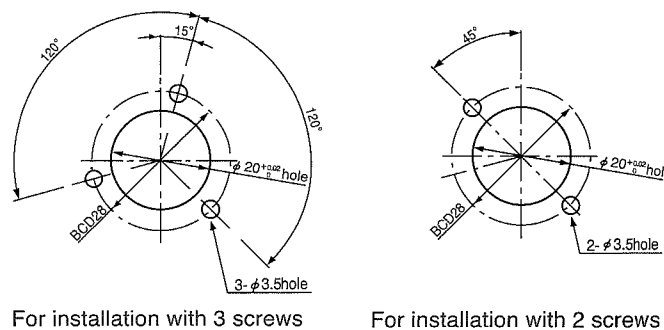
#### ● TRD-SH □ AD/BD/VD



(in mm)

### Mounting

#### ● TRD-S □ AD/BD/VD



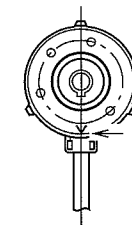
For installation with 3 screws

For installation with 2 screws

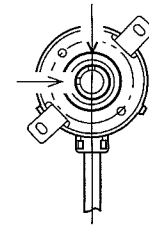
### Setting Index position

#### ● TRD-S □ □

#### ● TRD-SH □ □



Adjustment is made by the shaft notch (facing down).

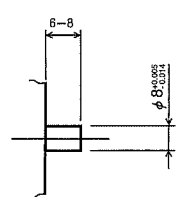


Output when the set screws are in the positions shown in the figure.

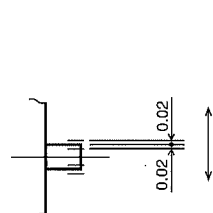
### Mating shaft requirements

#### ● TRD-SH □ AD/BD/VD

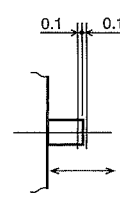
Dimensions of the mating part



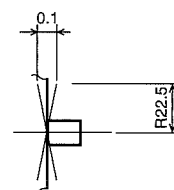
Tolerance at a right angle to the shaft



Tolerance in shaft direction



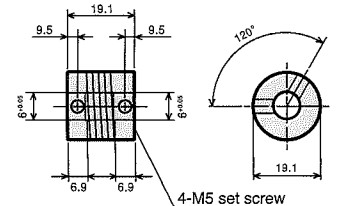
Rectangularity of the mounting surface in regard to the shaft



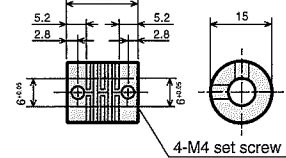
### Options

#### ● Coupling

##### RU-075D



##### GJ-6D



Type No.	Material	α	ε	S
RU-075D	Aluminum alloy (7075)	5° MAX	0.25mm MAX.	0.12mm MAX.
GJ-6D	Glass-fiber reinforced polyacetal resin	6° MAX	0.5mm MAX.	0.12mm MAX.