

# Koyo

Large Diameter Thru-shaft Incremental Encoder

## Series TRD-CH

### Operation Manual

Thank you for purchasing the TRD-CH series Incremental Encoder. Please read this Operation Manual carefully before applying this product.

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KEW-M8174D-E

#### 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.

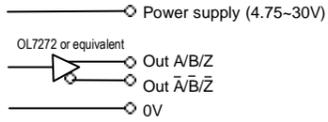
#### [Installation and wiring]

**Warning**

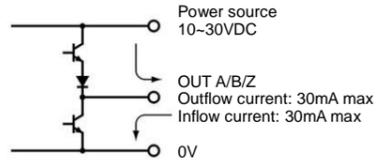
- Use only with the power supply voltage listed in the specifications. Otherwise fire, electric shock, or accidents may be caused.
- Use only with the wiring and layout specified in the specifications. Otherwise fire, electric shock, or accidents may be caused.
- Do not apply any kind of stress to the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

#### Output circuit

- HTL line driver output

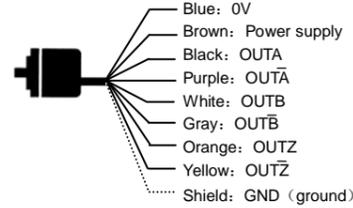


- Totem-pole output

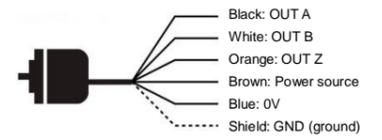


#### Connection

- Line driver output type

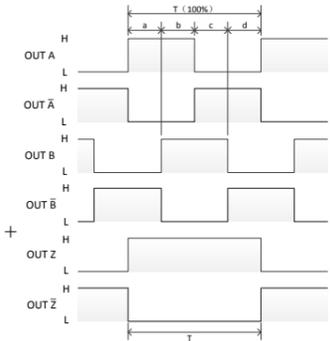


- Totem-pole output type

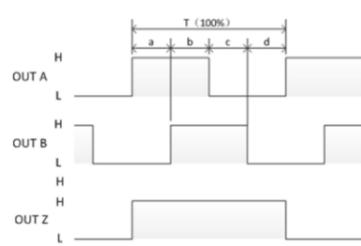


#### Output signal timing chart

- Line driver output type

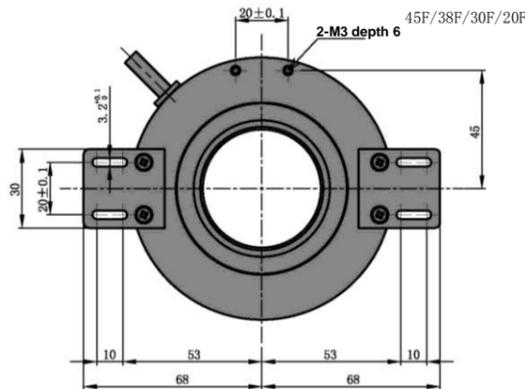


- Totem-pole output type

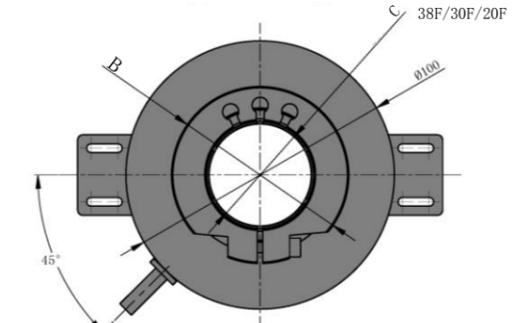
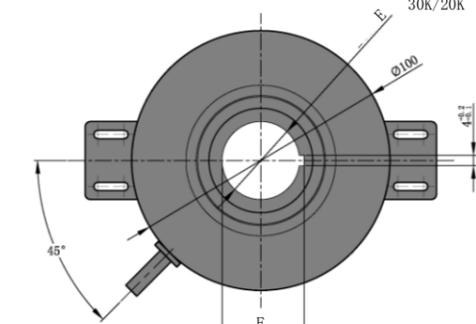
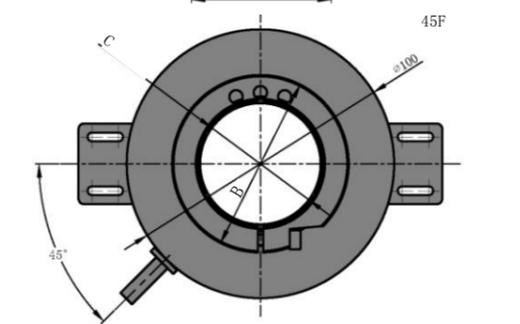
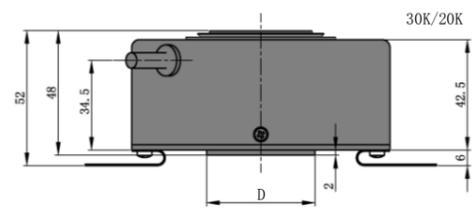
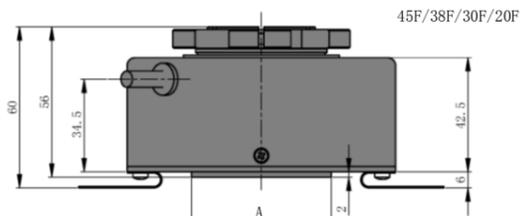
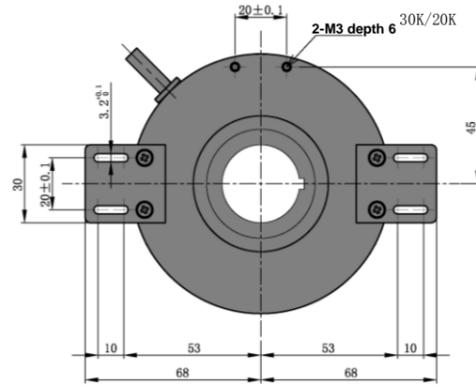


#### External dimensions

- TRD-CH□-□-45F/38F/30F/20F□



- TRD-CH□-□-30K/20K□



TYPE	30K	20K
SIZE		
D	Φ42	Φ32
E	Φ30 <sup>+0.041</sup> / <sub>-0.020</sub>	Φ20 <sup>+0.041</sup> / <sub>-0.020</sub>
F	31.8 <sup>+0.1</sup> / <sub>0</sub>	21.8 <sup>+0.1</sup> / <sub>0</sub>

TYPE	45F	38F	30F	20F
A	Φ52	Φ52	Φ42	Φ32
B	Φ66	Φ66	Φ60	Φ50
C	Φ45 <sup>+0.030</sup> / <sub>-0.025</sub>	Φ38 <sup>+0.030</sup> / <sub>-0.025</sub>	Φ30 <sup>+0.030</sup> / <sub>-0.025</sub>	Φ20 <sup>+0.045</sup> / <sub>-0.025</sub>

#### Composition of model number

TRD-CH 2048 RZ VH □ 45 F 5M \*\*\*\*

- Special specification
- Cable length: Blank: cable length is 2m (standard length), 5M: cable length is 5m (Optional length)
- Plate spring form PCD: F: PCD106-126, C: specific PCD, K: kewway, D: specific PCD
- Pore size: φ: 20, 30, 38, 45
- Origin signal logic: Blank: origin positive logic, L: origin negative logic
- Output configuration: Blank: totem-pole output, VH: HTL line driver output
- Signal format: Two-phase output with origin
- Pulses per revolution: 1000, 1024, 2000, 2048, 4096, 5000, 8192, 10000
- Series

#### Electrical specifications

Type No.	Line driver output type	Totem-pole output type
Power supply	Operating voltage: DC4.75~30V	DC10~30V
	Allowable ripple: ≤3%rms	
	Current consumption: ≤100mA (no load)	
Output waveform	Signal format: Two-phase output with origin	
	Max. response frequency ※1: 200kHz	100kHz
	Duty rate: 50±25%	
	phase difference: 25±12.5%	
	Origin signal width: 100±50%	
Output	Rising/falling time: ≤2μs (With a cable of 2m, Output current is 20mA (Resistive load))	
	Output configuration: Line driver output (OL7272 or equivalent)	Totem-pole output
Output voltage	"H": ≥[Power supply voltage]-2.5V	≥[Power supply voltage]-4V
	"L": ≤2V	≤2V
Output current	Outflow current "H": ≤20mA	≤30mA
	Inflow current "L": ≤20mA	≤30mA

※1 The maximum response frequency depends on the resolution of the encoder, please refer to the Rotary Encoders catalog for details.

#### Mechanical specifications Environmental requirements

Starting torque	Max. 0.1N·m (+20℃)
Max. allowable shaft load	Radial: 140N
	Thrust: 70N
Max. allowable speed	3000rpm
Cable	Material: Oil-resistant PVC shielded twisted pair cable
	Nominal core cross section: Line driver output type (8-core twisted pair): 0.2mm <sup>2</sup> , AWG24; Totem-pole output type (5-core): 0.3mm <sup>2</sup> , AWG22
	External diameter: Approx. 6mm
Weight	Approx. 1kg (With 2m cable)

※1: Two 0.01μF/630V capacitors are each connected between the case and positive pole of power supply, the case and negative pole of power supply.

Ambient Temperature	Operation	-20~+85℃
	Store	-25~+90℃
Ambient humidity	35~85%RH (non-condensing)	
Withstand voltage	AC500V for 1 min ※1	
Insulation resistance	≥50MΩ Among power supply, signal line and the case	
Vibration resistance	10~55Hz with 0.75mm amplitude ※2	
Shock resistance	490m/s <sup>2</sup> , 11ms ※3	
Protection construction	IP40: Dust-proof proofed	

※2: Durable for 1h along 3 axes  
※3: Applied 3 times 3 axes  
Only under test conditions, long-term use can not be guaranteed.

#### 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. Do not expose the product for a long time to water, even if it is a dust-resistant, jet-proof type. Wipe off any water getting onto the product.
- As the rotary encoder is composed of precision parts, its function will be impaired when it is subjected to shocks. Take sufficient care for handling and mounting.
- Avoid using this product in the following places: the place where there is excessive vibration and shock, the encoder may be damaged; the place where there are devices with strong magnetic and strong electrical interference; the place where there is flammable, corrosive gases, splashing water, oil and dusty; the place where the temperature and humidity exceeds the standard; the place where strong base and strong acid materials nearby; the place where receives direct sunlight.

