

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]

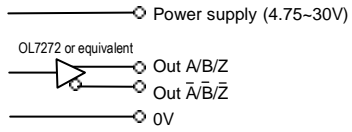
	Caution
	Use and store the equipment within the scope of the Environment (vibrations, impact, temperature, humidity, etc.) specified in the specifications. Otherwise fire or product damage may be caused.
	Understand the product first before use it.

[Installation and wiring]

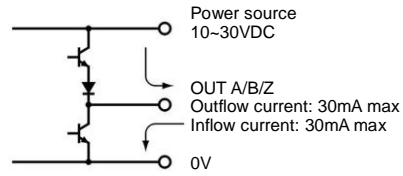
	Warning
	Use only with the power supply voltage listed in the specifications. Otherwise fire, electric shock, or accidents may be caused.
	Use only with the wiring and layout specified in the specifications. Otherwise fire, electric shock, or accidents may be caused.
	Do not apply any kind of stress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

■ Output circuit

● HTL line driver output

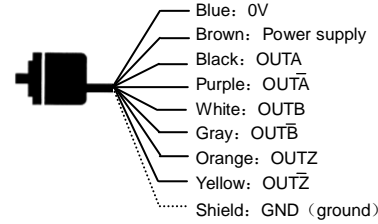


● Totem-pole output

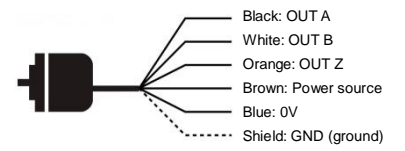


■ Connection

● Line driver output type

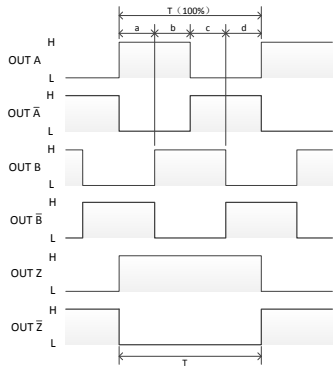


● Totem-pole output type

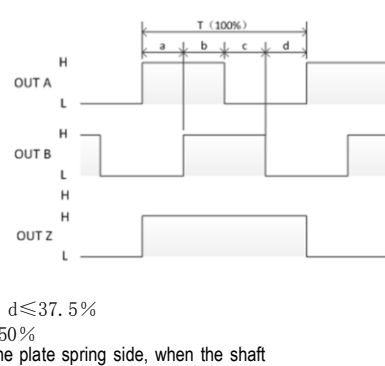


■ Output signal timing chart

● Line driver output type

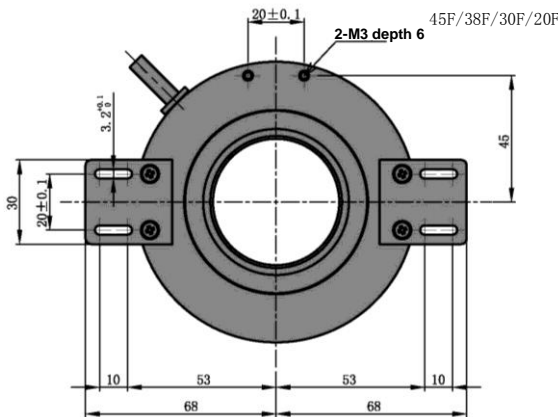


● Totem-pole output type

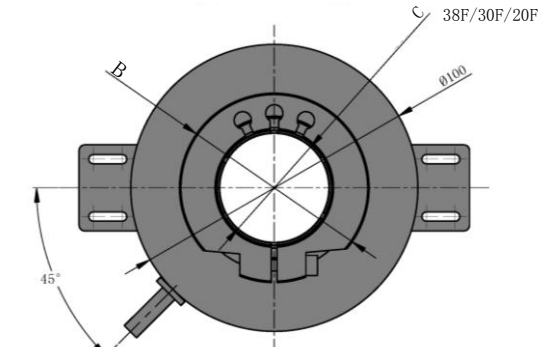
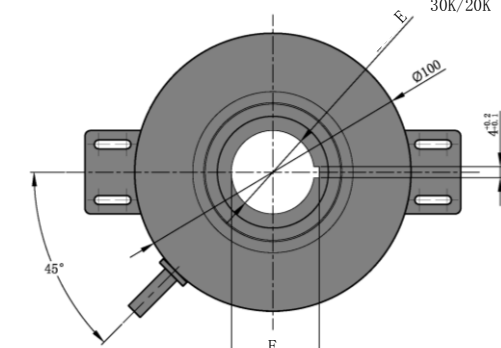
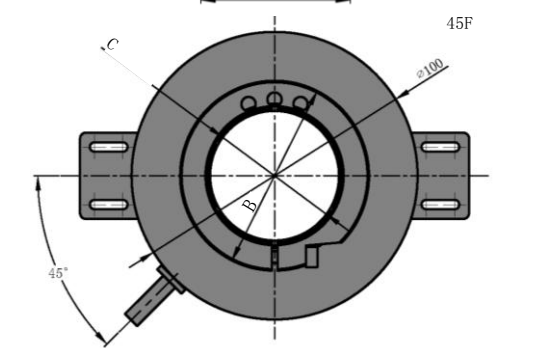
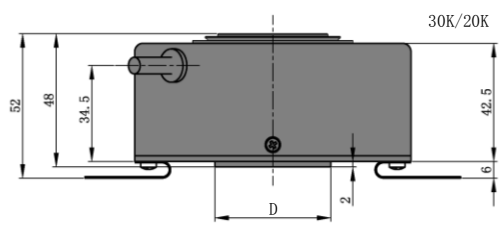
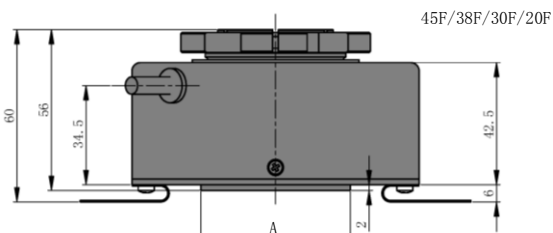
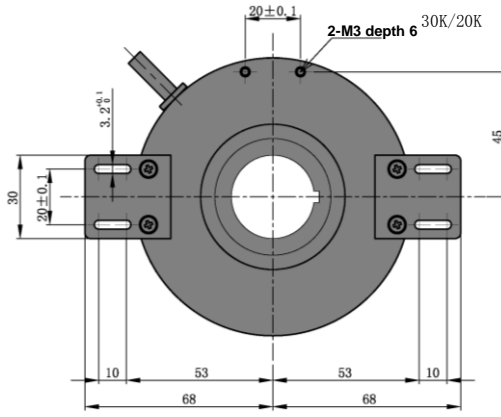


■ External dimensions

● TRD-CH□-□-45F/38F/30F/20F□



● TRD-CH□-□-30K/20K□



TYPE	30K	20K
SIZE		
D	Φ42	Φ32
E	Φ30 ^{+0.041} / _{-0.020}	Φ20 ^{+0.041} / _{-0.020}
F	31.8 ^{+0.1} / ₀	21.8 ^{+0.1} / ₀

TYPE	45F	38F	30F	20F
SIZE				
A	Φ52	Φ52	Φ42	Φ32
B	Φ66	Φ66	Φ60	Φ50
C	Φ43 ^{+0.030} / _{-0.025}	Φ38 ^{+0.030} / _{-0.025}	Φ30 ^{+0.030} / _{-0.025}	Φ20 ^{+0.045} / _{-0.025}

■ 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
- 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°C)
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 ² , AWG24 Totem-pole output type (5-core): 0.3mm ² , 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°C
	Store	-25~+90°C
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 ² , 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.

