

JTEKT

Incremental Encoder

Series TRD-2G

Operation Manual

Thank you for purchasing this series TRD-2G Incremental Encoders. Please read this Operation Manual carefully before applying this product.

PLEASE KEEP THIS MANUAL IN A SAFE PLACE!

JTEKT ELECTRONICS (WUXI) CO.,LTD.

Add: No.6 Lianhe Road, Hudai Town Binhu District, Wuxi, Jiangsu, P.R.China

Pc: 214161

Tel: (0510)85167888

https://www.jtektele.com.cn

Fax: (0510)85161393

JELWX-M8171D-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 combustibile 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

Line driver Output

Power source: 4.75~5.25VDC

26C31 or equivalent

OUT A/B/Z

OUT $\bar{A}/\bar{B}/\bar{Z}$

0V

Totem-pole Output

Power source:10~30VDC

OUT A/B/Z

Outflow current:30mA max.

Inflow current:30mA max.

0V

Connection

Totem-pole Output

Black: OUT A

White: OUT B

Orange: OUT Z

Brown: Power source

Blue: 0V

Shield: Ground

Line driver Output

Black: OUT A

Purple: OUT \bar{A}

White: OUT B

Gray: OUT \bar{B}

Orange: OUT Z

Yellow: OUT \bar{Z}

Brown: Power source

Blue: 0V

Shield: Ground

Pin of connector type

A O F

B O E

C O D

Output signal timing chart

Line driver Output

Forward rotation

Reverse rotation

OUTA

OUTB

OUTZ

Forward rotation means clockwise revolution viewed from the shaft.

12.5%≤a,b,c,d≤37.5%, 50%≤T≤150%

Totem-pole Output

Forward rotation

Reverse rotation

OUTA

OUTB

OUTZ

Z

ZL

Forward rotation means clockwise revolution viewed from the shaft.

12.5%≤a,b,c,d≤37.5%, 50%≤T≤150%

Composition of model number

TRD-2G1000-RZVL

Series

Resolution(Pulse)
(600,1000,1024,1200,1500,
1800,2000,2048,2400,3000,
3600,4096,5000,8192,10000)

Signal type
RZ: Two-phase with home position

Output type
Blank: Totem-pole
V: Line driver

Home position reverse operation symbol
Blank: home position normal operation type
L: home position reverse operation type

Connection
Blank: Rear cable
W: Dust and splash proofed
C: Connector
CW: Dust and splash proofed with connector
S: Side cable

Mechanical specifications

Starting torque (+20℃)	≤0.003N・m
Dust and splash proofed:	≤0.02N・m
Shaft moment of inertia	5.7×10 ⁻⁶ kg・m ²
Allowable shaft load	Radial 80N
	Axial 40N
Max. allowable rotation speed	5000rpm
Service life of bearing	1.2×10 ⁹ revolutions (calculated value at the maximum load)
Cable	Material Oil-proofed PVC(with shielded cable)
	Nominal section area of core 0.3 mm ²
	External diameter Approx.6.0 mm
Weight	Approx.350g (without cable)

Environmental requirements

Ambient temperature	Operation temperature: -10~+70℃
	Storage temperature: -25~+85℃
Ambient humidity	35~85%RH (without condensation)
Withstand voltage	AC500V 1minute *Note 1
Insulation resistance	50MΩ min. (Excluding shield between power supply, signal cable, and case.)
Vibration resistance	Durable for 1h along 3 axes at 10 to 55Hz with 0.75 mm amplitude
Shock resistance	11ms with 490m/s ² applied 3 times 3 axes, total 18 times
Protection construction	Dust proofed: IP50
	Dust and splash proofed: IP65

Note1: Shield cable is connected to the encoder body. The enclosure is connected with 0V through a 630V 0.01μF capacitance.

Electrical specifications

Type No.	TRD-2G	
Power source	Power source voltage	4.75~5.25VDC (Line driver output)
	Allowable ripple	10~30VDC (Totem-pole output)
	Current consumption	≤3%rms
Signal format	Max. response frequency	100mA Max. (without load)
	Electric Max. allowable speed	Two-phase A and B+Phase Z
	Duty ratio	200kHz (Maximum response frequency/Pulse)×60 (The encoder can not respond to revolution faster than the electric maximum allowable speed.)
Index signal width	Phase Shift	50%±25%
	Index signal width	25%±12.5%
	Rise and Fall time	100%±50%
Output	Output type	2μs Max. (Cable: 2m, output current : 20mA (resistance load))
	Output voltage	Line driver output (26C31 or equivalent)
	Output current	Totem-pole output
	Output current	30mA max.

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.
- Use a specified coupling for connecting the encoder shaft and the shaft of a machine to be controlled. Do not squeeze the shaft into the coupling.
- The service life of the bearing is largely affected by the amount of load to the shaft. Try to reduce the load as much as possible.
- 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. Use sufficient care for handling and mounting.

External dimensions(Cable length:2m)

1. Dust proofed with side cable (S type)

2. Dust and splash proofed with rear cable (W type)

3. Connector with rear cable (C type)

4. Connector /Dust and splash proofed with rear cable (CW type)

Options

RU-100

GJ-10

25.4

3.8

3.8

10^{+0.05}

6.9

6.9

4-M5 set screw(Torque:3.6N・m)

120°

25.4

26.2

7.1

3.6

7.1

3.6

22

10^{+0.05}

4-M4 set screw (Torque:0.45N・m)

ε

α

S

Type No.	Material	α	ε	s
RU-100	Aluminum alloy (7075)	5° MAX	0.25mmMAX	0.12mmMAX
GJ-10	Glass-fiber reinforced polyacetal resin	5° MAX	0.5mmMAX	0.12mmMAX