

JTEKT

Absolute Type Rotary Encoder Series TRD-NA Operation Manual

Thank you for purchasing this series TRD-NA Absolute type Rotary Encoder. Please read this Operation Manual carefully before applying this product.

JTEKT ELECTRONICS (WUXI) CO.,LTD.

Add: No.6 Lianhe Road, Hudai Town Binhu District, Wuxi, Jiangsu, P.R.China
Pc: 214161 https://www.jktele.com.cn
Tel: (0510)85167888 Fax: (0510)85161393

JELWX-M8168C-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

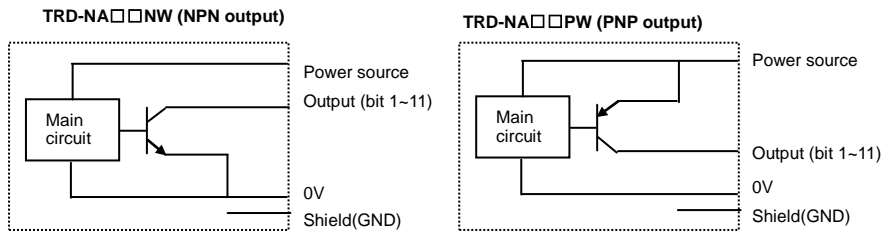
- Use and store the equipment within the scope of the environment (vibrations, impact, temperature, humidity, etc.) specified in the specifications. Otherwise fire or product damage may be caused.
- Understand the product first before use it.

[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



Environmental Conditions

Operating ambient temperature	Operation temperature: -10~+60°C Storage temperature: -25~+85°C
Operating / Storage ambient humidity	25~85%RH (non-condensing)
Voltage withstand	Removed for capacitor earth
Insulation resistance	10 MΩ min.
Vibration resistance	Durable for one hour along three axes at 10 to 55Hz with 0.75mm amplitudes
Shock resistance	11ms with 980 m/s ² applied three times along three axes
Protection construction	IP65 : Dust and splash proofed

Connection

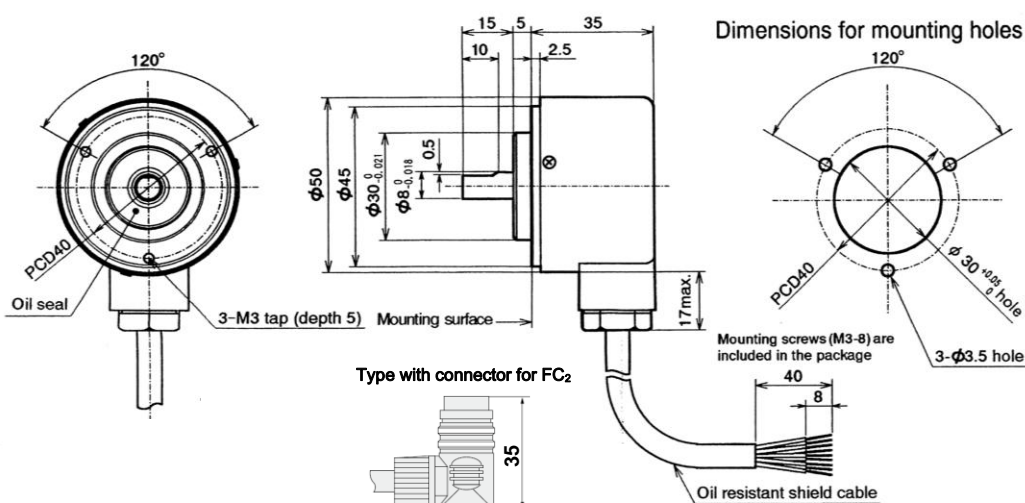
GND(Shield wire) is not connected to the main unit. The case is ground via capacitor to the 0V line.

Color of cable	Pin number	Resolution							
		2048	1024/720	512/360	256/180	128	64	32	
Blue	A	0V	0V	-	-	-	-	-	-
Brown	B	+12~24V	+12~24V	-	-	-	-	-	-
Black	C	Bit1 (2 ⁰)	Bit1 (2 ⁰)	Not connected	-	-	-	-	-
Red	D	Bit2 (2 ¹)	Bit2 (2 ¹)	Bit1 (2 ⁰)	Not connected	-	-	-	-
Orange	E	Bit3 (2 ²)	Bit3 (2 ²)	Bit2 (2 ¹)	Bit1 (2 ⁰)	Not connected	-	-	-
Yellow	F	Bit4 (2 ³)	Bit4 (2 ³)	Bit3 (2 ²)	Bit2 (2 ¹)	Bit1 (2 ⁰)	Not connected	-	-
Green	G	Bit5 (2 ⁴)	Bit5 (2 ⁴)	Bit4 (2 ³)	Bit3 (2 ²)	Bit2 (2 ¹)	Bit1 (2 ⁰)	Not connected	-
Purple	H	Bit6 (2 ⁵)	Bit6 (2 ⁵)	Bit5 (2 ⁴)	Bit4 (2 ³)	Bit3 (2 ²)	Bit2 (2 ¹)	Bit1 (2 ⁰)	-
Gray	J	Bit7 (2 ⁶)	Bit7 (2 ⁶)	Bit6 (2 ⁵)	Bit5 (2 ⁴)	Bit4 (2 ³)	Bit3 (2 ²)	Bit2 (2 ¹)	-
White	K	Bit8 (2 ⁷)	Bit8 (2 ⁷)	Bit7 (2 ⁶)	Bit6 (2 ⁵)	Bit5 (2 ⁴)	Bit4 (2 ³)	Bit3 (2 ²)	-
Black/White	L	Bit9 (2 ⁸)	Bit9 (2 ⁸)	Bit8 (2 ⁷)	Bit7 (2 ⁶)	Bit6 (2 ⁵)	Bit5 (2 ⁴)	Bit4 (2 ³)	-
Red/White	M	Bit10 (2 ⁹)	Bit10 (2 ⁹)	Bit9 (2 ⁸)	Bit8 (2 ⁷)	Bit7 (2 ⁶)	Bit6 (2 ⁵)	Bit5 (2 ⁴)	-
Orange/White	-	Bit11 (2 ¹⁰)	Not connected	-	-	-	-	-	-
Shield	-	GND	-	-	-	-	-	-	-

※ () In parentheses is the bit corresponding to binary code.

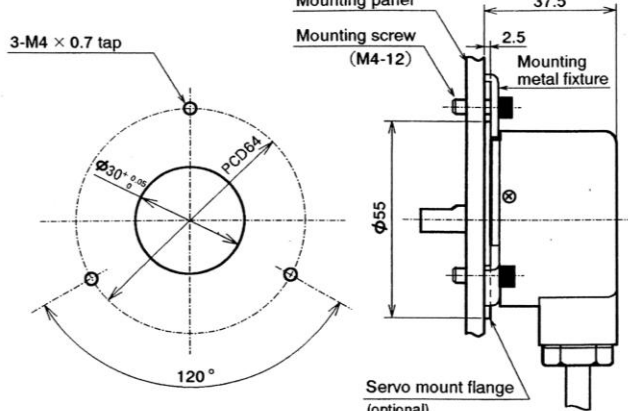
Most significant bit

External dimensions



Mounting

● Servo Mount Metal Fixture

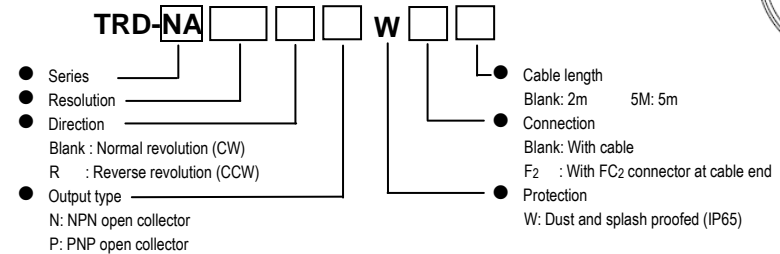


Electrical specifications

Type number	TRD-NA□□NW	TRD-NA□□PW		
Power supply	Operating voltage	10.8~26.4VDC	10.8~26.4VDC ⁴	
	Allowable ripple	≤3%rms	-	
	Current consumption	≤70mA (100mA max. for 2048 resolution)	≤100mA	
	Output code	Gray binary ¹	-	
	Max. response frequency	20kHz ²	-	
Output	Precision	[360/(resolution×2)] ³	-	
	Rotation direction	Normal (CW) or reverse (CCW) ³	-	
	Output type	Open collector NPN output	Open collector PNP output	
	Output logic	Negative logic (low active)	Positive logic (high active)	
	Residual voltage	0.4V max.	1.5V max.	0.5V max.
Load	Sinking current	16mA	32mA	30mA
	Load voltage	30VDC max.	-	-
	Rise time / Fall time	2.0μs max. (at 1kΩ load resistance)	3.0μs max. (at 1kΩ load resistance)	

¹: 38 Gray codes at 180 resolution, 76 Gray codes at 360 resolution, and 152 Gray codes at 720 resolution.
²: Maximum revolution speed = (Maximum response frequency / resolution)×60.
 The encoder does not respond to revolution faster than the maximum speed.
³: When viewed from the shaft, CW is clockwise direction and CCW is anti-clockwise direction.
⁴: When the load is maximum and the cable is 2 m or less.

Composition of model number

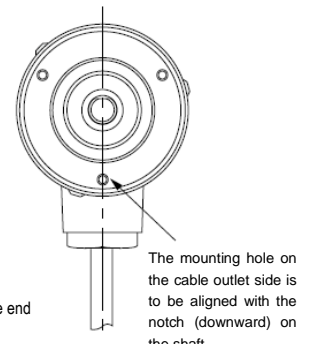
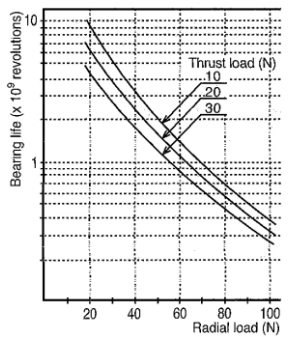


Mechanical specifications

Starting torque	3×10 ⁻² N·m max. (+20°C)
Shaft moment of inertia	2×10 ⁻⁶ kg·m ²
Allowable load	Radial : 50N
	Thrust : 30N
Maximum allowable speed*	3000rpm (continuous) 5000rpm (momentary)
Cable	External diameter: φ7mm (13-core max. φ7.5mm) 12-core oil resistant shield cable Nominal section area of core: 0.14 mm ²
Mass (Weight)	Approx.300g (with 2m cable)

* Highest speed that can support mechanical integrity of the encoder.

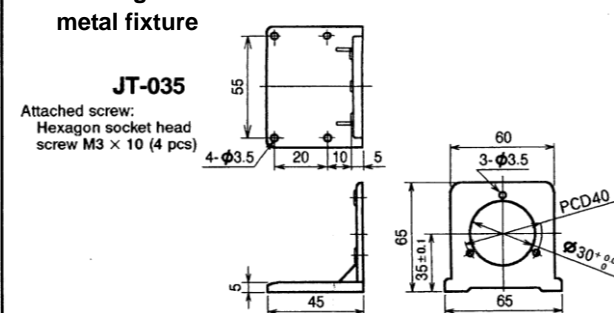
Bearing life



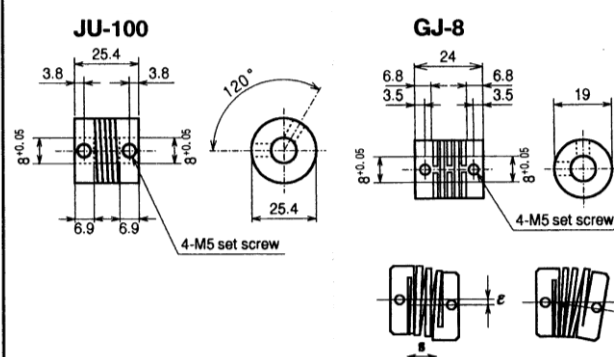
Home position

Options

● Mounting metal fixture

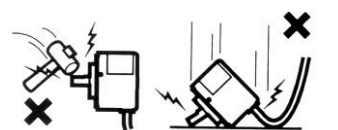


● Coupling



Type	Material	α	ε	δ
JU-100	Aluminum alloy(7075)	5° MAX.	0.25mm MAX.	0.12mm MAX.
GJ-8	Glass fiber reinforced polyacetal resin	5° MAX.	0.5 mm MAX.	0.12mm 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.
- 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.