

# TRD-K Series

## Features

### φ78 Absolute Type

- Resolutions up to 10 bits (1,024) are available.
- High axial load due to strengthened spindle (Radial 100 N / thrust 50 N)
- Robust type using a φ10 mm stainless steel shaft
- Gray code output that eliminates reading errors
- Use of a metal slit board delivers an impact resistance of 980m/s<sup>2</sup>.
- Installation using a servo mount convenient for origin adjustment is possible.



## Model Number List

Type	Model Number	Resolution	Cable Length	Remarks	
Dustproof and waterjet-proof Type with Cables Taken Out from the Side	TRD-K180-YS	180 (8-bit)	2 m	Provided with an FC-21 dedicated connector	Provided with a cable expansion connection connector
	TRD-K256-YS	256 (8-bit)			
	TRD-K360-YS	360 (9-bit)		TRD-K360-YCS	TRD-K360-YPS
	TRD-K512-YS	512 (9-bit)		TRD-K512-YCS	TRD-K512-YPS
	TRD-K720-YS	720 (10-bit)		TRD-K720-YCS	TRD-K720-YPS
	TRD-K1024-YS	1,024 (10-bit)		TRD-K1024-YCS	TRD-K1024-YPS
Dustproof and Waterjet-proof Connector Type (with Cables Taken Out from the Back)	TRD-K360-YC2	360 (9-bit)	No		
	TRD-K512-YC2	512 (9-bit)			
	TRD-K720-YC2	720 (10-bit)			
	TRD-K1024-YC2	1,024 (10-bit)			

**TRD-K**   **-Y C S**

- Series classification
- Resolution
- Gray code output
- Connection form
- C : Provided with an FC-21 dedicated connector
- P : Provided with a cable expansion connection connector
- C2: Dustproof and waterjet-proof connector type (with cables taken out from the back)
- With cables taken out from the side

## Electrical Specifications

Model Number		TRD-K <span style="border: 1px solid black; padding: 0 2px;"> </span> -Y <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;"> </span>
Power Supply	Supply Voltage	10.8 to 26.4 V DC
	Allowable Ripple	3% rms or less
	Consumption Current	70 mA or lower (No load)
Output Code		Gray binary
Maximum Response Frequency		20 kHz
Precision		(360 / (Resolution x 2))°
Rotation Direction		Increase of output code in clockwise rotation (CW)
Output	Output Form	NPN open collector output
	Output Logic	Negative logic (Active low)
	Residual Voltage	0.4 V or lower
	Sink Current	30 mA or lower
	Load Supply Voltage	30 V DC or lower
Rise / Fall Time*		Not larger than 2.0 μs (Load resistance 1 kΩ)

\*Cable length 2 m, maximum load

## Mechanical Specifications

Starting Torque	0.1 N·m or less (+20°C)
Moment of Inertia	1 x 10 <sup>-5</sup> kg·m <sup>2</sup>
Shaft Allowable Load	Radial: 100 N
	Thrust: 50 N
Maximum Allowable Number of Revolutions (Note 1)	5,000 rpm
Cable	Outside diameter φ7.8 mm 12-core shielded oil-resistant vinyl chloride cable Core wire nominal cross-sectional area: 0.3 mm <sup>2</sup>
Weight	Type with cable taken out from the side: Approx. 750 g (With 2 m cable) Connector type: Approx. 500 g

Note 1: Maximum number of revolutions that can be mechanically endured





## Environmental Requirements

Use Ambient Temperature	-10 to +50°C
Storage Ambient Humidity	-25 to +80°C
Use Ambient Humidity	35 to 85% RH (No condensation)
Withstand Voltage	500 V AC 50/60 Hz 1 minute*
Insulation Resistance	10 MΩ or higher (500 V DC mega)
Vibration Resistance (Endurance)	Displacement half amplitude: 0.75 mm, 10 to 55 Hz, 3 axial directions, each 1 h
Impact Resistance (Endurance)	980 m/s <sup>2</sup> 11 ms, each 3 times in 3 axial directions
Protective Structure	IP65 (Dustproof and waterjet-proof type)

\* The power supply, signal lines, and shield between the cases are excluded.

# TRD-K Series

## Specifications

P L C H M I SENSOR ENCODER COUNTER INFORMATION Rotary Encoder  
Lineup

Selection Guide

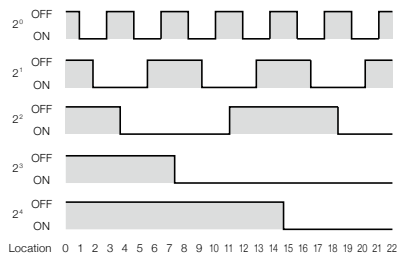
Incremental Type

Absolute Type

TRD-NA

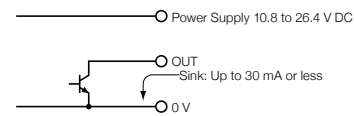
TRD-K

### Output Waveform



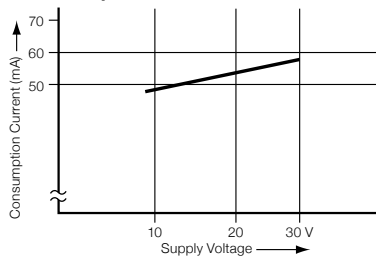
### Output Circuit

#### Open Collector



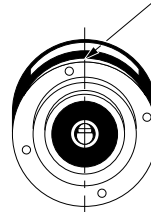
### Electrical Characteristics (Typical)

#### Consumption Current Characteristics



### Home Position

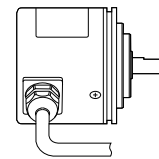
Match the Cover Installation Screw on the Nameplate Side and the Notch of the Shaft (Upward-pointing).



### Connection

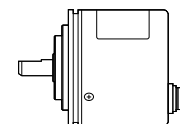
#### Type with Cable Taken Out from the Side

Line Color \ Model Number	TRD-K1024-□ TRD-K720-□	TRD-K360-□ TRD-K512-□	TRD-K180-□ TRD-K256-□
Red	Power supply +12/24 V	←	←
Black	Power supply 0 V	←	←
Brown	Output	2 <sup>0</sup>	←
Orange		2 <sup>1</sup>	←
Yellow		2 <sup>2</sup>	←
Green		2 <sup>3</sup>	←
Blue		2 <sup>4</sup>	←
Purple		2 <sup>5</sup>	←
Gray		2 <sup>6</sup>	←
White		2 <sup>7</sup>	←
Pink		2 <sup>8</sup>	(Not connected)
Light Blue	2 <sup>9</sup>	(Not connected)	(Not connected)
Shield	GND	←	←

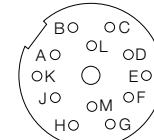


### Dustproof and Waterjet-proof Connector Type

Pin No. \ Model Number	TRD-K1024-□ TRD-K720-□	TRD-K360-□ TRD-K512-□
A	Power supply +12/24 V	←
B	Output	2 <sup>0</sup>
C		2 <sup>1</sup>
D		2 <sup>2</sup>
E		2 <sup>3</sup>
F		2 <sup>4</sup>
G		2 <sup>5</sup>
H		2 <sup>6</sup>
J		2 <sup>7</sup>
K		2 <sup>8</sup>
L	2 <sup>9</sup>	(Not connected)
M	Power supply 0 V	←



Connector  
<Pin Assignment Figure>



\*Figure Seen from Wiring Side  
(Back side)

PLC

HMI

SENSOR

ENCODER

COUNTER

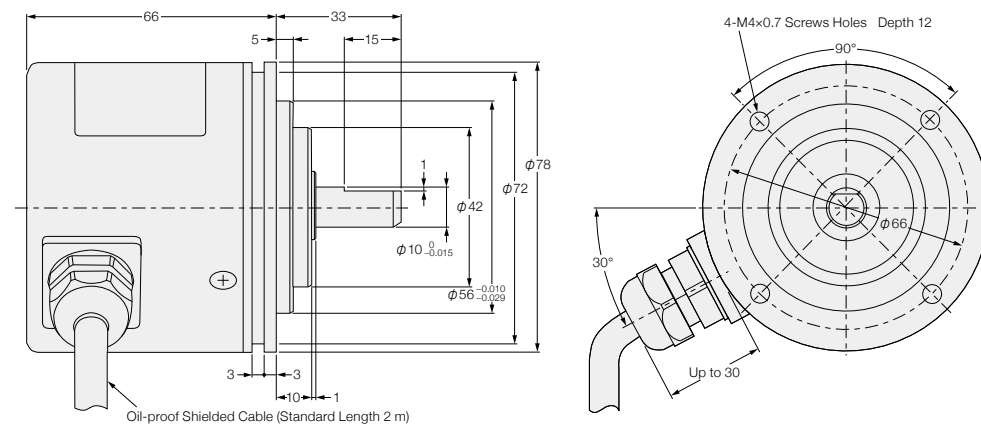
INFORMATION

# TRD-K Series

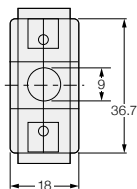
## Dimensions

### Dimensions (Unit: mm)

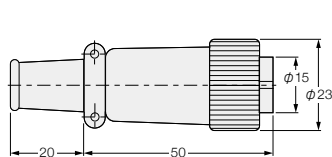
#### Type with Cable Taken Out from the Side (TRD-K□-YS)



FC-21 dedicated connector  
(TRD-K□-YCS)  
Model: Made by Honda MR-16L/MR-16M

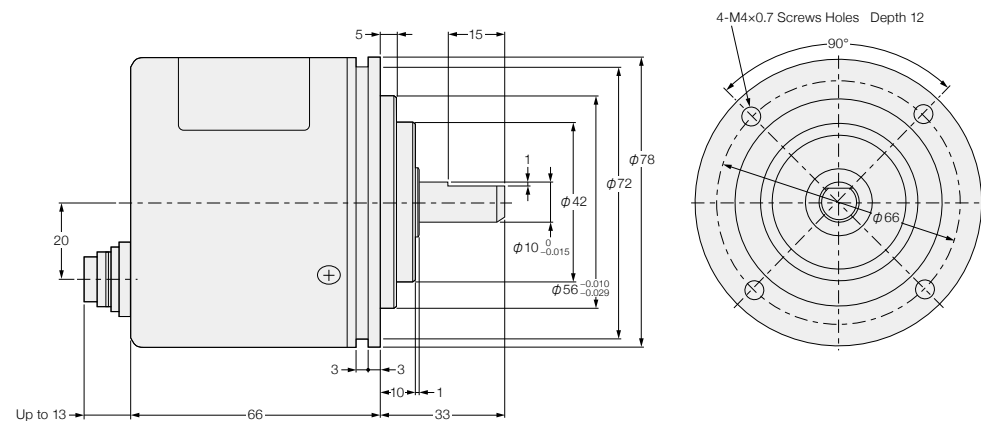


Cable expansion connection connector  
(TRD-K□-YPS)  
Model: Made by Hirose RM15TPD-12P



\* Connector is not equipped with the cable for TRD-K□-YS

#### Dustproof and Waterjet-proof Connector Type (TRD-K□-YC2)

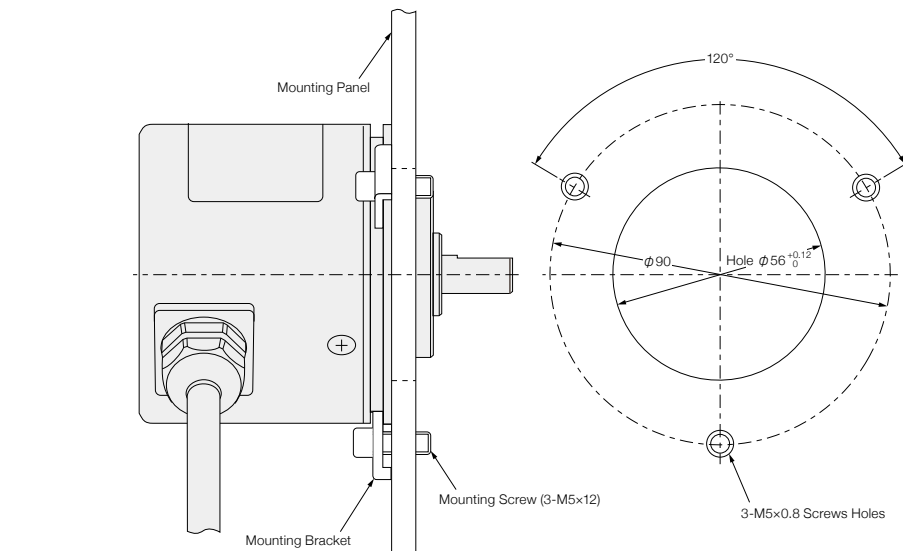


Model numbers of connectors  
(Option)

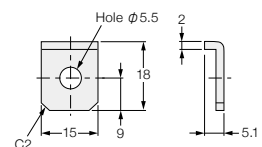
- Straight: BMCC-12
- Angular: BAFC-12

\* For details, see the page on options.

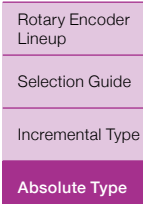
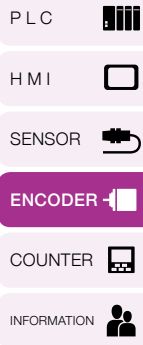
#### Servo Mount Metal Mounting State Diagram



Servo mount metal fixture KM-9  
(Accessories)



# TRD-K Series



TRD-NA

TRD-K