


## Detects the Rotary Encoder Direction

- Input phase difference signal from the Encoder to detect the direction of rotation.
- High-speed response at 120 kHz.
- Mounts to DIN Track. Thin design enables superb mounting efficiency.
- Front-panel switch enables reversing phase Z logic. Enables connecting either voltage outputs or open-collector outputs.



 Be sure to read *Safety Precautions* on page 3.

## Ordering Information

Power supply voltage	Output configuration	Model
12 to 24 VDC	Open-collector output	<b>E63-WF5C</b>

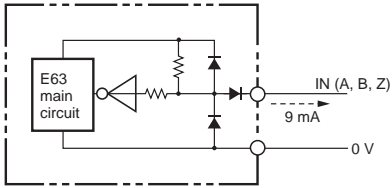
## Ratings and Specifications

### Direct Discrimination Unit [Refer to *Dimensions* on page 4.]

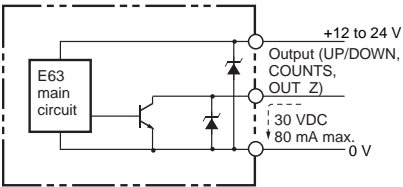
Item	Model	E63-WF5C
Power supply voltage		12 VDC –10% to 24 VDC +15%, ripple (p-p): 5% max.
Current consumption		50 mA max.
Input	Input signal	Phases A, B, and Z (phase difference signals)
	Phase difference	90° ±45° max.
	ON	6 mA max. at 0 to 2 V
	OFF	1.5 mA max. at 8 to 24 V
	Input short current	9 mA
	Max. applied voltage	30 V max.
	Input impedance	Approx. 1 Ω
Output	Output signal	UP/DOWN (direction detection), COUNTS output (count), OUT Z
	Output configuration	Open-collector output
	Output capacity	Applied voltage: 30 VDC max. Sink current: 80 mA max. Residual voltage: 1 V max. (at sink current of 80 mA) Residual voltage: 0.4 V max. (at sink current of 20 mA)
Maximum response frequency		120 kHz
Output response time		2 μs max.
Indicators		Power indicator (red), Phase Z output indicator (green)
Ambient temperature range		Operating: –10 to 55°C (with no icing), Storage: –25 to 80°C (with no icing)
Ambient humidity range		Operating/Storage: 35% to 85% (with no condensation)
Vibration resistance		Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions
Shock resistance		Destruction: 300 m/s <sup>2</sup> 3 times each in X, Y, and Z directions
Connection method		Terminal block
Material		Case: ABS
Weight (packed state)		Approx. 100 g
Accessories		Instruction manual (S3D8 Connector is not provided.)

I/O Circuit Diagrams

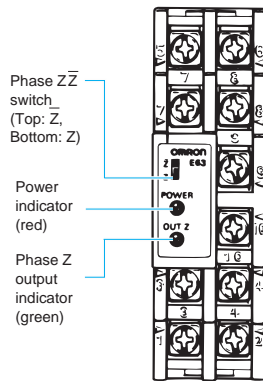
Input Circuits (IN A, IN B, IN Z)



Output Circuits (UP/DOWN, COUNTS, OUT Z)



Operate

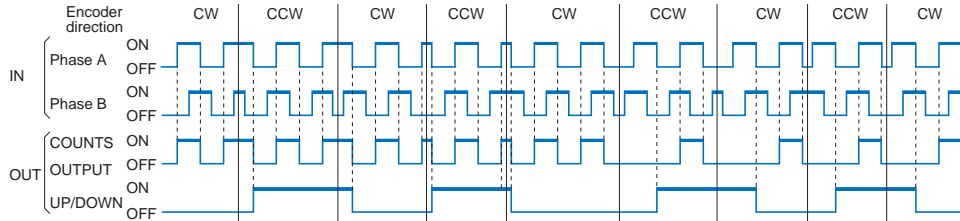


Terminal No.	Signal
1	0 V (common)
2	Encoder power supply: 12 to 24 VDC
3	IN A
4	IN B
5	0 V (common)
6	Power supply: 12 to 24 V
7	COUNTS output
8	UP/DOWN
9	OUT Z
10	IN Z

Note: Terminals 2 and 6 are connected internally.

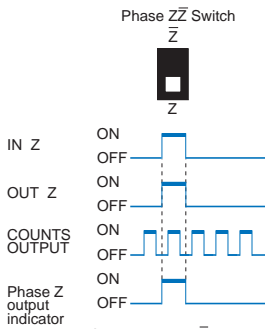
Timing Charts

Relation between Inputs (phase A and phase B) and Outputs (COUNTS, UP/DOWN)



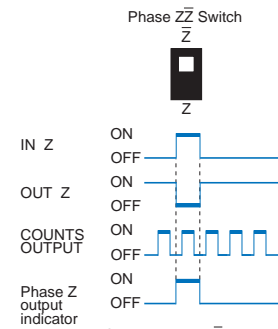
Relation between IN Z and OUT Z

Using a Rotary Encoder with an Open-collector Output

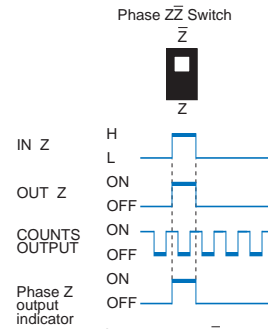


\*Set the phase Z Z-bar switch to Z-bar.

Using a Rotary Encoder with a Voltage Output



\*Set the phase Z Z-bar switch to Z-bar.

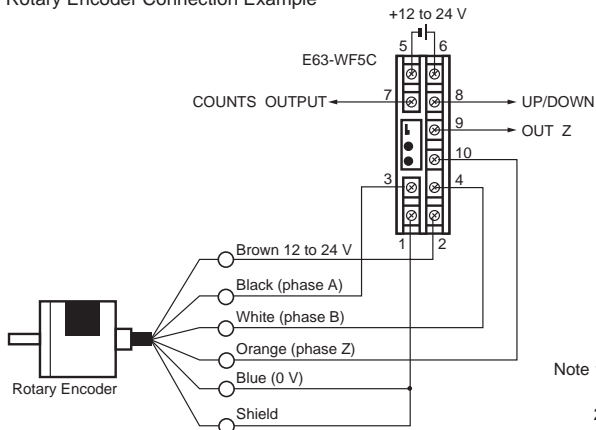


\*Set the phase Z Z-bar switch to Z-bar.

Note: The output from a Rotary Encoder with a Voltage Output can switch 9 mA.

Connection

Rotary Encoder Connection Example



- Note 1: Used only to reset the counter using phase Z. When doing so, set the phase Z Z-bar switch to Z-bar and use a Rotary Encoder with an Open-collector Output.
- Note 2: When using phase Z, be sure that the width of phase Z is the same as or wider than the width of phase A.
- Note 3: Use one of the following Rotary Encoders: E6A2-CW3C, E6A2-CW5C, E6A2-CWZ3C, E6B2-CWZ6C, E6H-CWZ6C, E6C2-CWZ6C, or E6D-CWZ2C.

## Safety Precautions

Refer to *Warranty and Limitations of Liability*.

### WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly.  
Do not use it for such purposes.

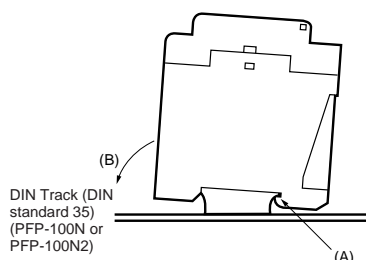


### Precautions for Correct Use

Do not use the Encoder under ambient conditions that exceed the ratings.

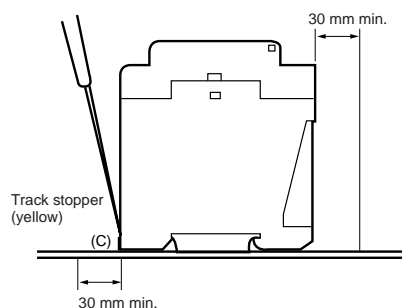
#### ● Mounting

- Mount to DIN Track as shown in the following diagram.
- Hook part (A) at the top of the E63-WF on the DIN Track first and then press in on the E63-WF in the direction indicated by (B).



#### ● Removal from DIN Track

Pull down on the track stopper (C) with a flat-blade screwdriver and then remove the E63-WF from the DIN Track. When using DIN standard 35 track, keep other devices on the track separated from the E63-WF by at least 30 mm to facilitate mounting and removal.



- Do not place the connection cable together with high-voltage cables. Keep it isolated from other cables whenever possible.
- The response speed of the E63-WF is 120 kHz. Do not allow the Rotary Encoder to exceed this speed.

#### ● Connection

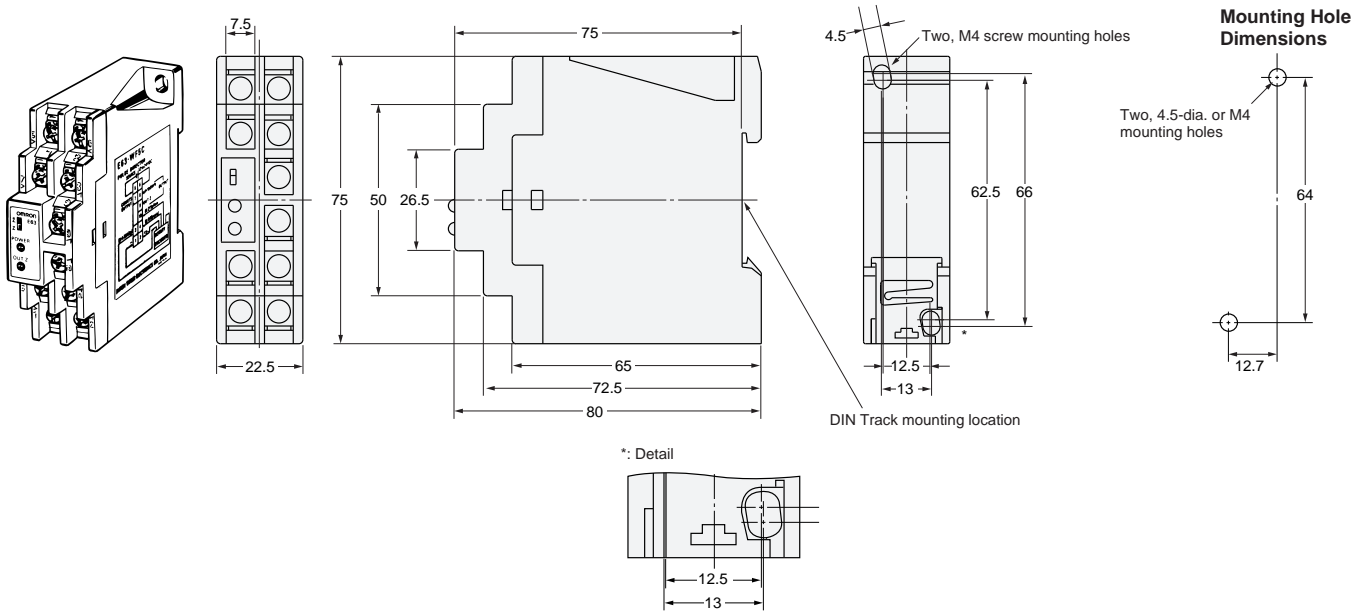
Spurious pulses may be generated when power is turned ON and OFF. Wait at least 0.1 s after turning ON the power to the Encoder before using the connected device, and stop using the connected device at least 0.1 s before turning OFF the power to the Encoder. Also, turn ON the power to the load only after turning ON the power to the Encoder.

(Unit: mm)

## Dimensions

Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

### E63-WF



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