

# TOKYO SOKUTEIKIZAI CO., LTD.

## Rotary Encoder Catalogue

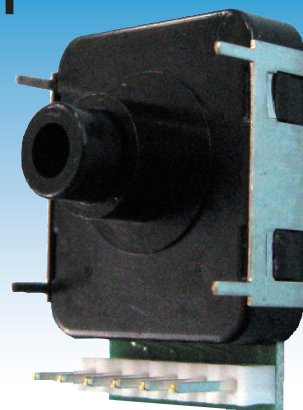
RE 2 9	_____	P . 0 2
thin, lightweight, resin shaft/case		
RE 2 5	_____	P . 0 4
waterproof model available, operated at 3.3V/5V		
RE 2 4	_____	P . 0 6
dual (inner/outer) shaft: inner for push button, outer for rotation		
RE 2 3	_____	P . 0 8
push button function added to the rotating shaft, low price		



# Ultra Slimline Rotary Encoder with Push Switch



## RE29 Series



### Outline

RE29 series pack compact rotary encoder with dual-functional resin shaft into the space-saving resin enclosure. RE29 is recommended for wide range of machines including measurement components, medical and telecommunication devices.

### Features

- Extremely thin (6.6mm) and lightweight (7g)
- Multi-functional with 2 way acting – push switch function and rotating function – shaft
- Eco friendly:
  - 1) Low cost and lesser parts by VA design
  - 2) RoHS compliant
- Designed to be soldered to printed circuit board

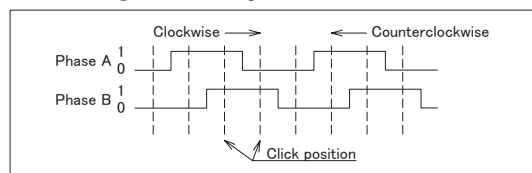
### Specifications

1. Electrical and Mechanical specifications			
Items		Rated Value	
Rotary Encoder	Number of Pulses		6 PPR
	Number of Clicks		24 Clicks
	Supply Voltage		DC3.3V $\pm 5\% \leq 20\text{mA}$ 6mA TYP
			DC5V $\pm 5\% \leq 10\text{mA}$ 4mA TYP
	Output Signals		Channel A/B: Square Wave CMOS chip
	Output Voltage	High	(Supply Voltage – 2.5V) $\leq$
		Low	$\leq 0.5\text{V}$
	Response Frequency		100Hz
	Rotational Torque		$4 \pm 2 \text{ mN} \cdot \text{m}$
Push switch	Rating of contact		$\leq \text{DC12V } 0.1 \sim 10\text{mA}$ (Resistance load)
	Travel of switch		$0.2 \pm 0.1 \text{ mm}$
	Operational Force		$5 \pm 2 \text{ N}$
Weight		7g	

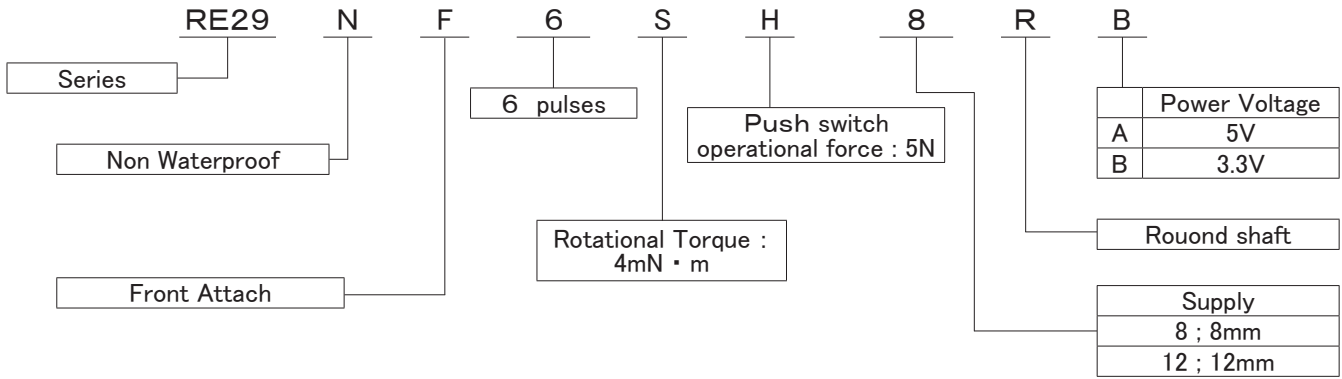
2. Reliability and Environmental Specifications			
Items			Rated Value
Durability of operating area	Thrust direction	Push	100N
		Pull	50N
	Radial		1N · m
Rotational durability			1 million strokes (No load)
Screw Torque			Not more than 1N · m
Heat resistance of solder	Solder bit temp.: MAX 350℃		Within 3 seconds for each terminal
Operating temperature			-0℃ ~ +55℃ 32F ~ 131F
Storage temperature			- 40℃ ~ +85℃ - 40F ~ 185F

### Output Waveform

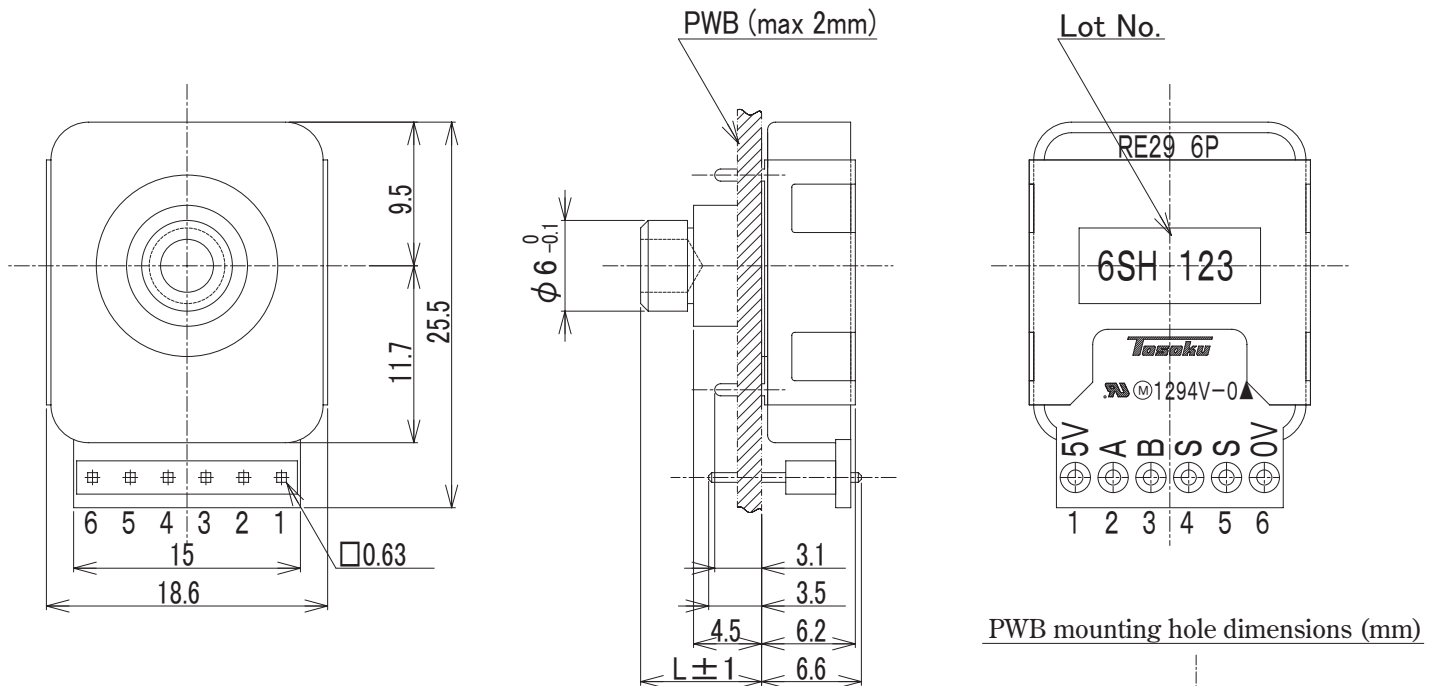
- 1) Turning the shaft clockwise will generate the signal A when the signal B outputs a low voltage (0);
- 2) Rotating the shaft counter-clockwise will generate the signal A when the signal B outputs a high voltage(1);
- 3) Either signal A or B switches from 0→1 or 1→0 for every single click (Quad edge evaluation spec).



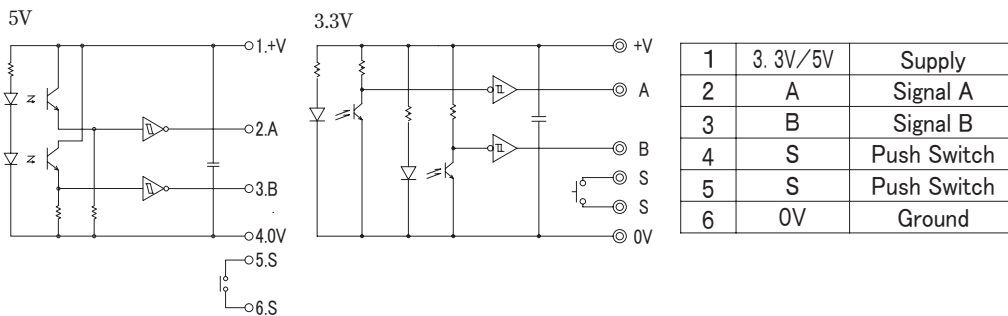
## Part Number Designation



## Dimensions (mm)



## Circuitry



## Precautions

Wiring	Use buffering amplifier when extending lead wire over 30cm.
Soldering	Do not put a load on the terminal area during and immediately after soldering.
Operation	Do not use flow/reflow soldering machines.
Power	Use under specified power voltage and connect properly.

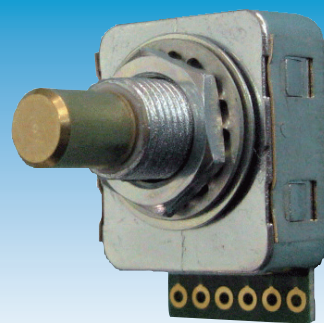
## Warranty

- 1 year from the date of shipment

# Optical Rotary Encoder



## RE25 Series



### Outline

RE25 is a VA designed eco friendly – power-saving and low cost with lesser parts – rotary encoder. Its size, mounting procedures and inner-structures have been designed for a wide-array of uses; measurement devices, medical equipments, industrial machineries, telecommunication devices and machine tools.

### Features

- Eco friendly:
  - 1) Power-saving
  - 2) Low cost and lesser parts by VA design
  - 3) RoHS compliant
- Thin-line (18.8x25.5x8.9mm) and lightweight (18g)
- Various types of models with options: lead wire with or without connector, clamp for horizontal/vertical mounting
- Long-lasting without “contact chatter” due to its optical switching function
- Waterproofed model available

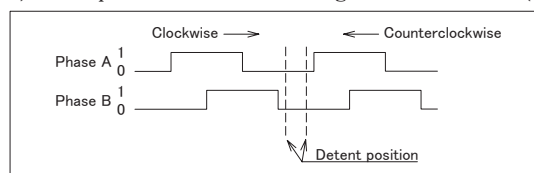
### Specifications

1. Electrical and Mechanical specifications			
Items		Rated Value	
Number of pulses		16PPR, 25PPR	
Supply voltage		3.3V±10%	5V±10%
		20mA	10mA
Output signals		Channel A/B: Square Wave CMOS chip	
Output voltage	High	Supply Voltage(3.3V): $-0.3V \leq$ , (5V): $-0.5V \leq$	
	Low	$\leq 0.4V$	
Response frequency		200Hz	
Rotational Torque	Light: S	$4 \pm 1 \text{mN} \cdot \text{m}$	
	Standard: C	$6 \pm 2 \text{mN} \cdot \text{m}$	
	Medium: M	$10.5 \pm 3.5 \text{mN} \cdot \text{m}$	
	High: H	$16 \pm 5 \text{mN} \cdot \text{m}$	
Weight		18g	

2. Reliability and Environmental specifications			
Items			Rated Value
Durability of operating area	Thrust direction	Push	100N
		Pull	50N
	Radial		1N · m
Rotational durability	Light: S		1 million strokes (No load)
	Standard: C		
	Medium: M		
	High: H		100 thousand strokes (No load)
Screw Torque			Not more than 1N · m
Heat resistance of solder	Solder bit temp.: MAX 350℃		Within 3 seconds for each terminal
Operating temperature			0℃ ~ +55℃ 32F ~ 131F
Storage temperature			- 40℃ ~ +85℃ - 40F ~ 185F

### Output Waveform

- 1) Turning the shaft clockwise will generate the signal A when the signal B outputs a low voltage (0);
- 2) Rotating the shaft counter-clockwise will generate the signal A when the signal B outputs a high voltage(1);
- 3) Detent positions are where both signal A and B are low (0).



# Part Number Designation

Series

	Waterproof
N	No
P	Yes

	Wiring
S	Standard
C	With wire
F	Front Mount
V	Vortical Mount

RE25

N

S

25

C

20

R

A

	Pulse
16	16PPR
25	25PPR

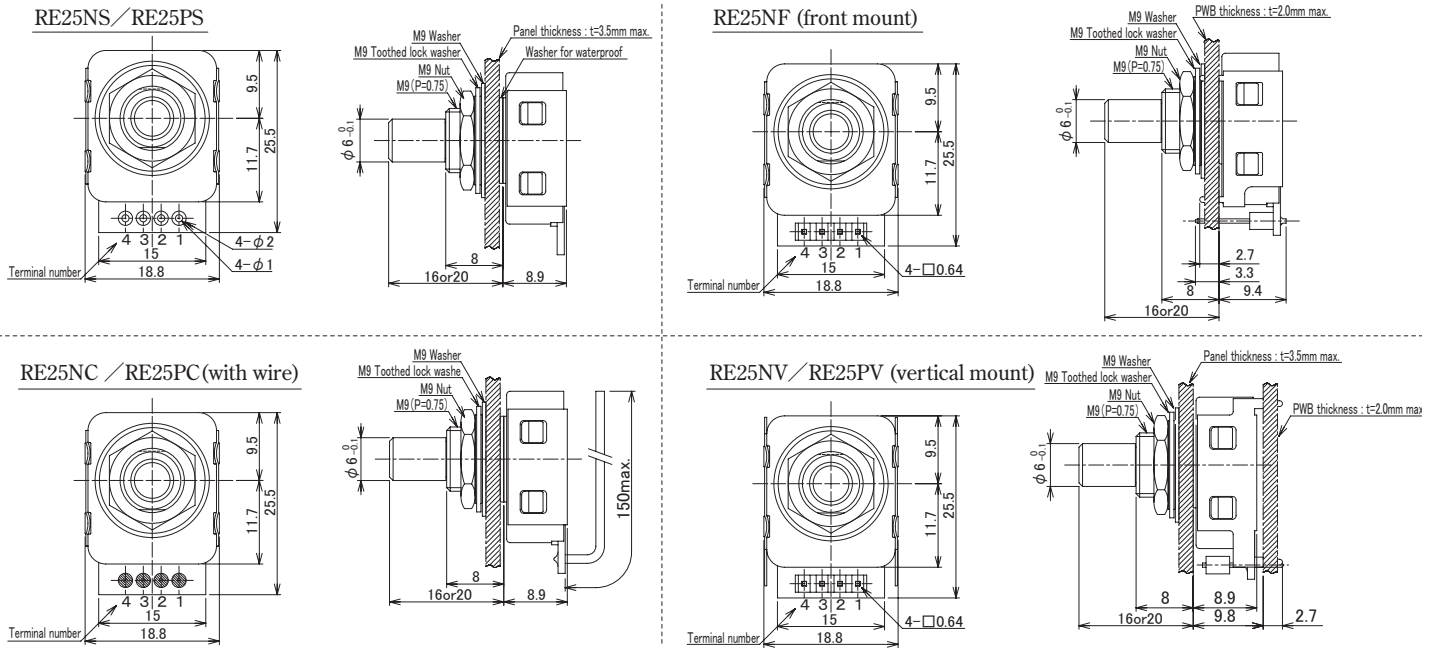
	Click	Rotation Torque
S	With	4mN · m
C		6mN · m
M		10.5mN · m
H		16mN · m
Non	W/O	≤ 4mN · m

	Power Voltage
A	5V
B	3.3V

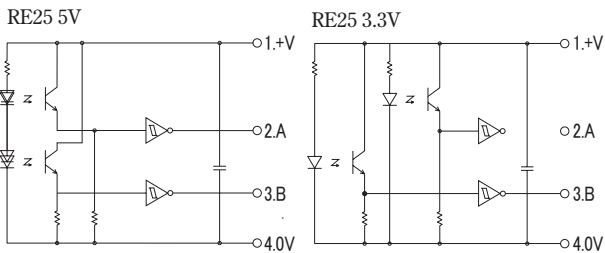
	Shaft Shape
R	Round

	Shaft length
16	16mm
20	20mm

## Dimensions (mm)



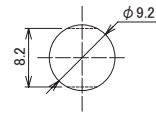
## Circuitry



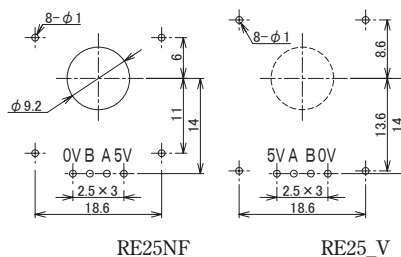
### Terminal number

1	3.3V/5V	Supply
2	A	Signal A
3	B	Signal B
4	0V	Ground

### Mounting hole dimensions (mm)



### PWB mounting hole dimensions (mm)



## Precautions

Wiring	Use buffering amplifier when extending lead wire over 30cm.
Soldering	Do not put a load on the terminal area during and immediately after soldering.
Operation	Do not use flow/reflow soldering machines.
Power	Use under specified power voltage and connect properly.
Waterproofing	Do not fasten tighter with the torque of more than 1.5N · m.

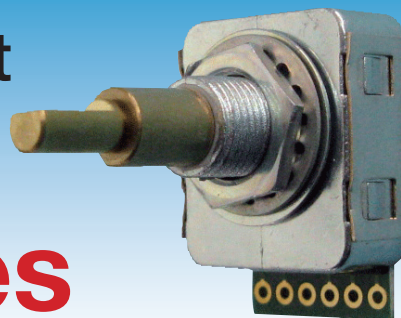
## Warranty

- 1 year from the date of shipment.

# Rotary Encoder with Dual Functional Shaft



## RE24 Series



### Outline

RE24 rotary encoder series contain unique mechanism for its shaft; its rotational outer axis for rotary encoder and the inner axis for push switch. RE24 is designed for use in various industrial areas: measurement component, medical equipment, industrial machinery, telecommunication device and machine tool.

### Features

- Dual inner/outer axes mechanism to help prevent misoperation
- Eco friendly:
  - 1) Low cost and lesser parts by VA design
  - 2) RoHS compliant
- Thin-line (18.8x25.5x8.9mm) and lightweight (18g)
- Long-lasting without “contact chatter” due to its optical switching function
- Specially designed knob (GG60) available

### Specifications

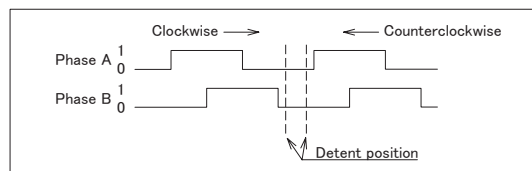
1. Electrical and Mechanical specifications			
Items		Rated Value	
Number of pulses		16PPR, 25PPR	
Supply voltage		3.3V±10%	5V±10%
		20mA	10mA
Output signals		two square wave output (A/B), CMOS chip	
Output voltage	High	(Supply Voltage – 0.5V) ≤	
	Low	≤ 0.5V	
Response frequency		200Hz	
Rotational torque	Light: S	4±1mN · m	
	Standard: C	6±2mN · m	
	Medium: M	10.5±3.5mN · m	
	High: H	16±5mN · m	
Push switch	Rating of contact		≤ DC12V      0.1 ~ 10mA
	Travel of switch		0.2±0.1mm
	Operational Force	S	3.2±1N
		M	4.0±1N
		H	5.0±1N
Weight		18g	

Note : In case Rotational Torque M or H, Operational Torque should be either M or H.

2. Reliability and Environmental specifications			
Items			Rated Value
Durability of operating area	Thrust direction	Push	100N
		Pull	50N
	Radial		1N · m
Rotational durability	Light: S		1 million strokes (No load)
	Standard: C		
	Medium: M		
	High: H		100 thousand strokes (No load)
Screw Torque			Not more than 1N · m
Heat resistance of solder	Solder bit temp.: MAX 350℃		Within 3 seconds for each terminal
Operating temperature			0℃ ~ +55℃ 32F ~ 131F
Storage temperature			- 40℃ ~ +85℃ - 40F ~ 185F

### Output Waveform

- 1) Turning the shaft clockwise will generate the signal A when the signal B outputs a low voltage (0);
- 2) Rotating the shaft counter-clockwise will generate the signal A when the signal B outputs a high voltage (1);
- 3) Detent positions are where both signal A and B are low (0).

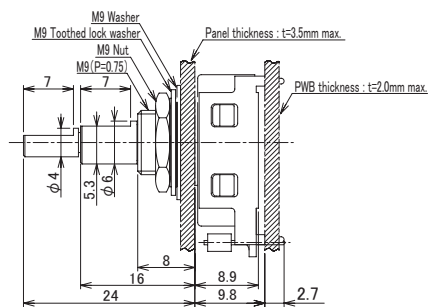
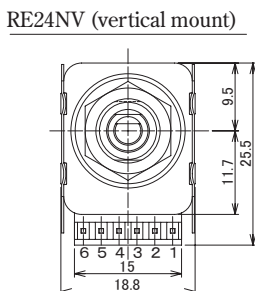
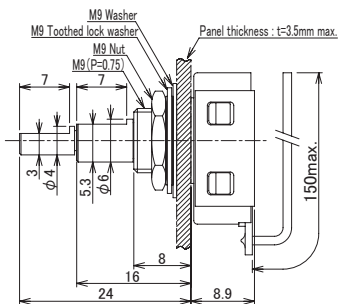
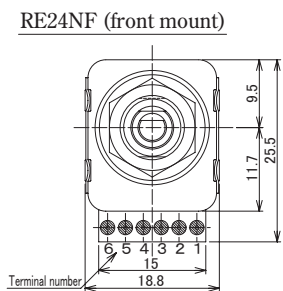
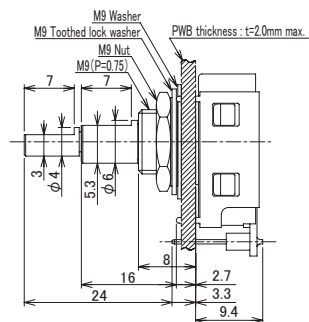
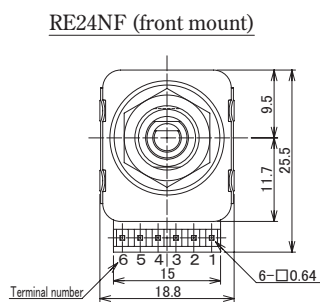
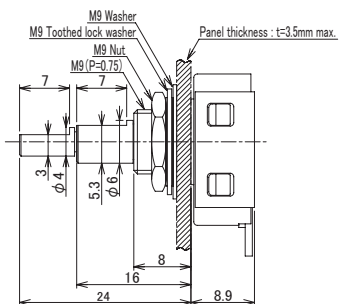
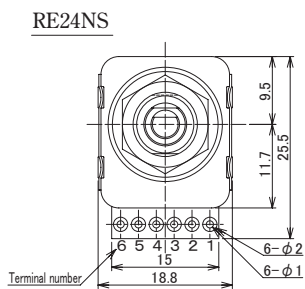


## Part Number Designation

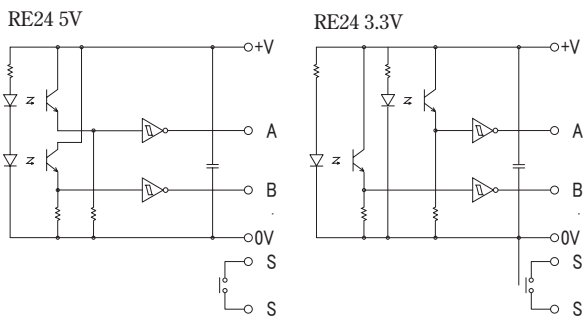
The diagram illustrates the wiring connections for the motor. The motor has terminals labeled RE24, N, S, 25, C, S, 16/24, R, and A. The connections are as follows:

- RE24** is connected to the **Series** terminal of the **Waterproof** switch.
- N** is connected to the **Standard** terminal of the **Wiring** switch.
- S** is connected to the **16PPR** terminal of the **Pulse** switch.
- 25** is connected to the **25PPR** terminal of the **Pulse** switch.
- C** is connected to the **3.2N** terminal of the **Push Switch Force** switch.
- S** is connected to the **5N** terminal of the **Push Switch Force** switch.
- 16/24** is connected to the **16** terminal of the **Shaft length** switch.
- R** is connected to the **Flat** terminal of the **Shaft Shape** switch.
- A** is connected to the **5V** terminal of the **Power Voltage** switch.

### Dimensions (mm)



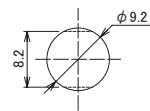
## Circuitry



## Terminal number

1	3.3V/5V	Supply
2	A	Signal A
3	B	Signal B
4	0V	Ground
5	S	Push Switch
6	S	Push Switch

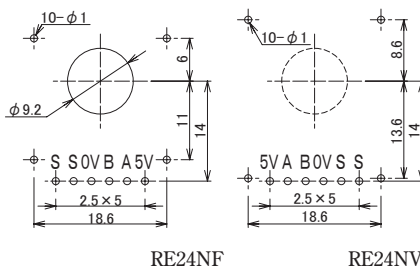
Mounting hole dimensions (mm)



## Precautions

Wiring	Use buffering amplifier when extending lead wire over 30cm.
Soldering	Do not put a load on the terminal area during and immediately after soldering.
Operation	Do not use flow/reflow soldering machines.
Power	Use under specified power voltage and connect properly.
Waterproofing	Do not fasten tighter with the torque of more than 1.5N·m.

PWB mounting hole dimensions (mm)



## Warranty

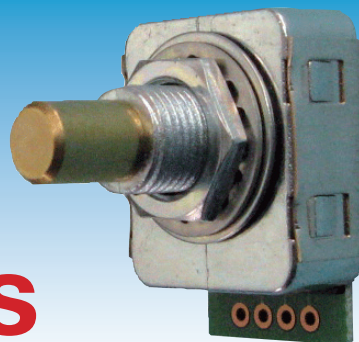
- 1 year from the date of shipment.



# Optical Rotary Encoder with Push Switch



## RE23 Series



### Outline

RE23 series are optical rotary encoders with dual functions of pushing and rotating on its shaft. Its size, mounting procedures and inner-structures have been designed for a wide-array of uses; measurement devices, medical equipments, industrial machineries, telecommunication devices and machine tools.

### Features

- Multi-functional with 2 way acting – pushing and rotating – shaft
- Eco friendly:
  - 1) Low cost and lesser parts by VA design
  - 2) RoHS compliant
- Thin-line (18.8x25.5x8.9mm) and lightweight (18g)
- Various types of models with options: lead wire with or without connector, clamp for horizontal/vertical mounting
- Long-lasting without “contact chatter” due to its optical switching function

### Specifications

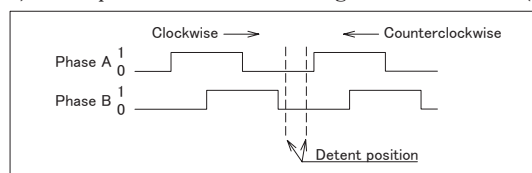
1. Electrical and Mechanical specifications				
Items		Rated Value		
Number of pulses		16PPR, 25PPR		
Supply voltage		3.3V±10%	5V±10%	
		20mA	10mA	
Output signals		Channel A/B: Square Wave CMOS chip		
Output voltage	High	(Supply Voltage – 0.5V) ≤		
	Low	≤ 0.5V		
Response frequency		200Hz		
Rotational torque	Light: S	4±1mN · m		
	Standard: C	6±2mN · m		
	Medium: M	10.5±3.5mN · m		
	High: H	16±5mN · m		
Push switch	Rating of contact	≤ DC12V                      0.1 ~ 10mA		
	Travel of switch	0.2±0.1mm		
	Operational Force	S	3.2±1N	
		M	4.0±1N	
		H	5.0±1N	
Weight		18g		

Note : In case Rotational Torque M or H, Operational Torque should be either M or H.

2. Reliability and Environmental specifications			
Items			Rated Value
Durability of operating area	Thrust direction	Push	100N
		Pull	50N
	Radial		1N · m
Rotational durability	Light: S		1 million strokes (No load)
	Standard: C		
	Medium: M		100 thousand strokes (No load)
	High: H		
Screw Torque			Not more than 1N · m
Heat resistance of solder	Solder bit temp.: MAX 350℃		Within 3 seconds for each terminal
Operating temperature			0℃ ~ +55℃ 32F ~ 131F
Storage temperature			- 40℃ ~ +85℃ - 40F ~ 185F

### Output Waveform

- 1) Turning the shaft clockwise will generate the signal A when the signal B outputs a low voltage (0);
- 2) Rotating the shaft counter-clockwise will generate the signal A when the signal B outputs a high voltage (1);
- 3) Detent positions are where both signal A and B are low (0).



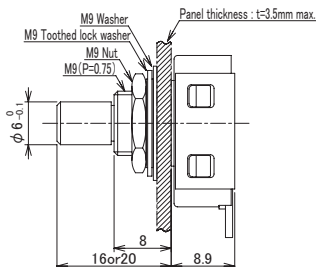
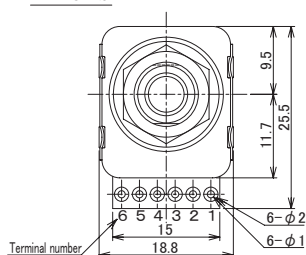
## Part Number Designation

Diagram illustrating the connection of the motor's pins to the breadboard:

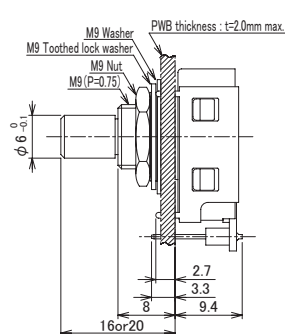
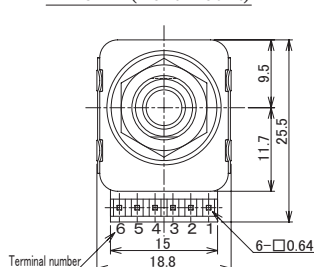
- RE23**: Connected to **Series**.
- N**: Connected to **Waterproof** (No).
- S**: Connected to **Pulse** (16PPR, 25PPR).
- 25**: Connected to **Click** (S, C, M, H, Non) and **Rotation Torque** (4mN · m, 6mN · m, 10.5mN · m, 16mN · m,  $\leq 4\text{mN} \cdot \text{m}$ ).
- C**: Connected to **Push Switch Force** (S, H).
- S**: Connected to **Push Switch Force** (S, H).
- 20**: Connected to **Shaft Shape** (R) and **Shaft length** (16, 20).
- R**: Connected to **Power Voltage** (A, B).
- A**: Connected to **Power Voltage** (A, B).

### Dimensions (mm)

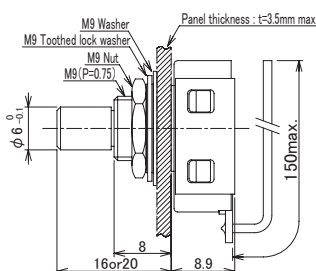
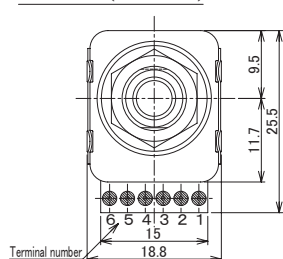
RE23NS



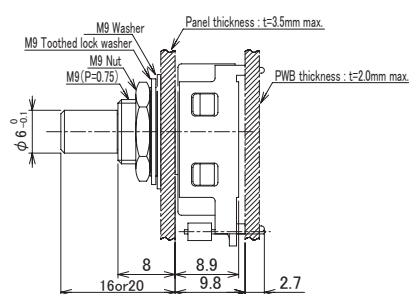
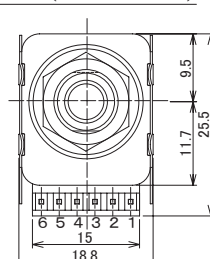
RE23NF (front mount)



RE23NC (with wire)

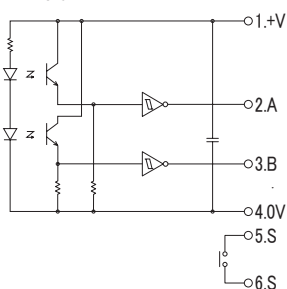


RE23NV (vertical mount)

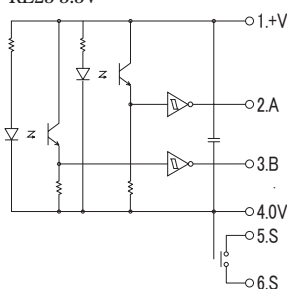


## Circuitry

RE23 5V



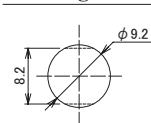
RE23 3.3V



Terminal number

1	3.3V/5V	Supply
2	A	Signal A
3	B	Signal B
4	0V	Ground
5	S	Push Switch
6	S	Push Switch

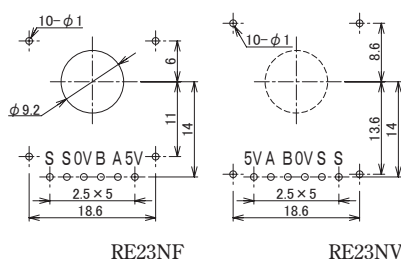
Mounting hole dimensions (mm)



## Precautions

Wiring	Use buffering amplifier when extending lead wire over 30cm.
Soldering	Do not put a load on the terminal area during and immediately after soldering.
Operation	Do not use flow/reflow soldering machines.
Power	Use under specified power voltage and connect properly.
Waterproofing	Do not fasten tighter with the torque of more than 1.5N·m.

PWB mounting hole dimensions (mm)



## Warranty

- 1 year from the date of shipment.