Tokyo Sokuteikizai Co., Ltd.

Manual Pulse Generator
Catalogue

RE45TV .................................................................................................. P. 03
thin (8.5㎜), hermetically sealed

RE45B .................................................................................................. P. 05
long life, various options

RE46 ..................................................................................................... P. 07
large wheel, yet thin

RE47 ..................................................................................................... P. 09
most compact and thin
RE45T/V series are compact optical manual pulse generators that allow accurate and smooth manual motion for NC machine tools, industrial machines etc.

**Features**
- Eco friendly: RoHS compliant
- Various Options
  - terminal block mounted type/direct moulding type
  - output circuit: CMOS, open collector, line driver
- Enclosed structure design
- Protection from flux
- 100PPR, 25PPR available
- Long life use

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>RE45T***5</th>
<th>RE45T***1</th>
<th>RE45T***D</th>
<th>RE45T***T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>5V input</td>
<td>12V input</td>
<td>Differential line</td>
<td>Photo coupler</td>
</tr>
<tr>
<td>Power Voltage</td>
<td>DC5V±10%</td>
<td>DC12V±10%</td>
<td>DC5V±10%</td>
<td>DC10.8V to 26.4V</td>
</tr>
<tr>
<td>Current Power</td>
<td>≤80mA</td>
<td>≤60mA</td>
<td>≤50mA (90mA typ)</td>
<td>≤80mA</td>
</tr>
<tr>
<td>Current Power  (Open collector)</td>
<td>≤30mA</td>
<td>≤40mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out put</td>
<td>CMOS (45T)</td>
<td>2.2KΩ pull-up or open collector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out put voltage</td>
<td>level 1: (Power voltage -0.5V) ≤</td>
<td>level 0: ≤0.4V (No-load)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector voltage</td>
<td>not more than DC30V or 50mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse per revolution</td>
<td>100pulses/100Click or 25Pulses/100Click</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Click torque</td>
<td>S: (Soft torque) 8 ~ 16mN.m</td>
<td>C: (Standard) 32 ~ 64mN.m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotational Durability</td>
<td>Over a million times</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection against water</td>
<td>2m water resistant (2b) (Do not push or rotate under the water)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-10℃ ~ 60℃</td>
<td>~</td>
<td>14F</td>
<td>140F</td>
</tr>
</tbody>
</table>

**Part number designation**

- **RE45T**
  - **1** Number of pulses
    - 1: 100PPR
    - 2: 25PPR
  - **2** Click
    - C: Standard
    - S: Soft
    - Blank: without click
  - **3** Supply Voltage
    - 1: 12V
    - 2: 24V
    - 5: 5V
  - **4** Output
    - M: CMOS
    - O: Open Collector
    - D: Line Driver
    - R: Pull up
  - **5** Dial Knob
    - B: 15mm, with Tosoku logo
    - C: 15mm, without logo
    - D: 15mm, with customer logo
    - H: 25mm with Tosoku logo
    - J: 25mm without logo
    - K: 25mm, with customer logo
  - **6** Dial base / Shaft length
    - Blank: W/O dial base, 16mm
    - 0: W/O dial base, 18mm
    - 1: With dial base, 18mm

Models | Supply | Out put | Pulse Per Revolution |
-------|--------|---------|----------------------|
RE45T1_M5 | 5V | 5V | 100PPR Standard model for 5V |
RE45T1_K1 | 12V | 12V | 100PPR Standard model for 12V |
RE45T1_O5 | 5V | OC | 100PPR |
RE45T1_O1 | 12V | OC | 100PPR |
RE45T1_O2 | 24V | OC | 100PPR 12V ~ 24V input, photo coupler only |
RE45T1_D5 | 5V | Differential Line | 100PPR Special model for noise resistance |
RE45T2_M5 | 5V | 5V | 25PPR |
RE45T2_M1 | 12V | 5V | 25PPR 12V input, 5V output |
RE45T2_O1 | 12V | OC | 25PPR |
RE45T2_O2 | 24V | OC | 25PPR 12V ~ 24V input, photo coupler only |
RE45T2_D5 | 5V | Differential Line | 25PPR Special model for noise resistance |

* Differential Line: Connect with terminating resistance 100Ω (Based on RS-422 line receiver).
* 5V: power voltage = 12V. Output voltage = 5V
* OC (For photo coupler): Out put voltage/0 level = transistor /OFF= Current/0
Dimensions (mm)

![Dimensions Diagram]

Precautions

<table>
<thead>
<tr>
<th>Soldering</th>
<th>Temperature</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Soldering</td>
<td>Up to 350°</td>
<td>Within 3 seconds for each terminal</td>
</tr>
<tr>
<td>Flow soldering</td>
<td>Up to 260°</td>
<td>Within 5 seconds for each terminal</td>
</tr>
</tbody>
</table>

NOTE: Do not put pressure on terminal during heating or soon after.

Circuitry

- **CMOS (M)**
  - ![CMOS Circuit]
  - TC4050

- **Open Collector (O)**
  - ![Open Collector Circuit]
  - +V
  - A/B
  - 0V

- **Pull up (R)**
  - ![Pull up Circuit]
  - +V
  - A/B
  - 0V

- **Line driver (D)**
  - ![Line Driver Circuit]
  - +V
  - A/B
  - 0V

Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage (1);
RE45B series are optical manual pulse generator developed for NC machine tools.

**Features**

- Eco friendly: RoHS compliant
- Comfortable wide knob
- Various Options
- Printing Logo type on the wheel cover upon request
- Long life use

**Specifications**

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<thead>
<tr>
<th>Application</th>
<th>5V input</th>
<th>2V input</th>
<th>Differential line</th>
<th>Photo coupler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Voltage</td>
<td>DC5V±10%</td>
<td>DC12V±10%</td>
<td>DC5V±10%</td>
<td>DC10.8V to 26.4V</td>
</tr>
<tr>
<td>Current power (pull up)</td>
<td>≤ 80mA</td>
<td>≤ 60mA</td>
<td>≤ 150mA (90mA typ)</td>
<td>≤ 60mA</td>
</tr>
<tr>
<td>Current power (Open collector)</td>
<td>≤ 30mA</td>
<td>≤ 40mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>330ΩPull-up or Open collector</td>
<td>2.2KΩPull-up or Open collector</td>
<td>RS-422A (Line driver)</td>
<td>Open collector (Current output type)</td>
</tr>
<tr>
<td>Output voltage</td>
<td>1 level: (Power voltage - 0.5V)</td>
<td>≤</td>
<td>Terminating register at receiver:1000/phrase</td>
<td>level: Transistor/ON</td>
</tr>
<tr>
<td>Output voltage (pull up)</td>
<td>0 level: ≤ 0.4V (No-load)</td>
<td>≤</td>
<td>0 level: Transistor/ON</td>
<td>level: Transistor/OFF</td>
</tr>
<tr>
<td>Collector voltage</td>
<td>≤ DC30V</td>
<td></td>
<td></td>
<td>≤ 30V</td>
</tr>
<tr>
<td>Collector voltage (Open corrector)</td>
<td>≤ 40mA</td>
<td></td>
<td></td>
<td>≤ 50mA</td>
</tr>
<tr>
<td>Pulse per revolution</td>
<td>100 pulse/100 Click or 25 pulse/100 Click</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Click torque</td>
<td>A, B, C: 8 ~ 16 mN.m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotational Durability</td>
<td></td>
<td></td>
<td>Over a million rotations</td>
<td></td>
</tr>
<tr>
<td>Water resistance</td>
<td>D type only: 2m water resistant (2h)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-10℃</td>
<td>~</td>
<td>60℃</td>
<td>14F 140F</td>
</tr>
</tbody>
</table>

**Part number designation**

<table>
<thead>
<tr>
<th>RE45B</th>
<th>A</th>
<th>1</th>
<th>2</th>
<th>R</th>
<th>5</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE45B_1R5</td>
<td>5V</td>
<td>5V</td>
<td>100PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_1R1</td>
<td>12V</td>
<td>12V</td>
<td>100PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_1O5</td>
<td>5V</td>
<td>OC</td>
<td>100PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_1O1</td>
<td>12V</td>
<td>OC</td>
<td>100PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_1O2</td>
<td>24V</td>
<td>OC*</td>
<td>100PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_1D5</td>
<td>5V</td>
<td>Differential Line*</td>
<td>100PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_2R5</td>
<td>5V</td>
<td>5V</td>
<td>25PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_2R3</td>
<td>12V</td>
<td>3V*</td>
<td>25PPR</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_2O5</td>
<td>12V</td>
<td>OC</td>
<td>25PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_2O1</td>
<td>12V</td>
<td>OC</td>
<td>25PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_2O2</td>
<td>24V</td>
<td>OC*</td>
<td>25PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE45B_2D5</td>
<td>5V</td>
<td>Differential Line*</td>
<td>100PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 5V: Supply voltage = 12V, Output voltage = 5V
* OC: For photo coupler only, Supply voltage = 12 ~ 24V

*Differential Line: Connect with terminating resistance 1000Ω (Based on RS-422 line receiver).
Dimensions (mm)

- **Type A (with 80 φ dial / mounted by 3 nuts)**
  - Panel thickness: t=3 max
  - Terminal Block with Cover
  - 3-M4 Studs L=8
  - 3-φ4 Holes
  - φ53
  - φ72
  - φ80±1

- **Type C (with 66 φ dial / mounted by 1 nut)**
  - Panel thickness: t=1.5~2.0
  - Terminal Block with Cover
  - φ60±0.5
  - M9 P.O. 75
  - φ5.9
  - φ6
  - φ68±1
  - φ68±1

- **Type D (without dial)**
  - Panel thickness: t=3 max
  - Terminal Block with Cover
  - φ60±0.5
  - φ6
  - 16
  - 26
  - 30

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**Circuitry**

- **Open collector (code: O)**
  - +V
  - A/B
  - 0V

- **Voltage Output (code: R)**
  - +V
  - A/B
  - 0V

- **Line Driver (code: D)**
  - +V
  - A/B
  - 26C31
  - A/B
  - 0V

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**Output Waveform**

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage (1);
RE46 series are incremental optical manual pulse generators developed for NC machine tools. The depth of the surface-bottom is mere 8mm which allows you to save space behind the panel.

**Features**

- Eco friendly: RoHS compliant
- Fine operability with a large wheel and a weight inside
- Various Options of the input/output circuit: CMOS, open collector, line driver
- Chattering-free and long-life use with optical unit
- Original logos available on the wheel cover

**Specifications**

<table>
<thead>
<tr>
<th>Application</th>
<th>5V input</th>
<th>12V input</th>
<th>Differential line</th>
<th>Photo coupler(12 ~ 24V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Voltage</td>
<td>DC5V±10%</td>
<td>DC12V±10%</td>
<td>DC5V±10%</td>
<td>DC10.8V to 26.4V</td>
</tr>
<tr>
<td>Current power (pull up)</td>
<td>≤ 80mA</td>
<td>≤ 60mA</td>
<td>≤ 150mA (90mATyp)</td>
<td>≤ 60mA</td>
</tr>
<tr>
<td>Current power (Open collector)</td>
<td>≤ 30mA</td>
<td>≤ 40mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>3300 Pul up or Open collector</td>
<td>2.2KΩ Pul up or Open collector</td>
<td>RS-422A (Line driver)</td>
<td>Open collector (Current output type)</td>
</tr>
<tr>
<td>Output voltage (pull up)</td>
<td>1 level: (Power voltage -0.5V) ≤ 0 level: ≤ 0.4V(NO-Load)</td>
<td>≤ DC30V</td>
<td>Terminating register at receiver:100Ω/phrase</td>
<td>Level/Transistor/ON 0V/level/Transistor/0FF</td>
</tr>
<tr>
<td>Collector voltage (Open corrector)</td>
<td>≤ DC30V</td>
<td>≤ 50mA</td>
<td></td>
<td>≤ 30V</td>
</tr>
<tr>
<td>Pulse per revolution</td>
<td>100pulse/100Click or 25pulse/100Click</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Click torque</td>
<td>32 ~ 64mN.cm (320 ~ 640gf.cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotational Durability</td>
<td>Over a million rotations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-10°C ~ 60°C (14°F ~ 140°F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>220g</td>
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</tbody>
</table>

**Part number designation**

<table>
<thead>
<tr>
<th>RE46</th>
<th>A</th>
<th>1</th>
<th>2</th>
<th>C</th>
<th>R</th>
<th>5</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>①</td>
<td>②</td>
<td>③</td>
<td>④</td>
<td>⑤</td>
<td>⑥</td>
<td></td>
</tr>
<tr>
<td>① Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>② Number of Pulses</td>
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<tr>
<td>1: 100PPR</td>
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<td>2: 25PPR</td>
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<tr>
<td>③ Click</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C: Standard</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>④ Output</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>R: Voltage Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>O: Open Collector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D: Line Driver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Models**

- RE46A1CR5_ 5V 5V 100PPR
- RE46A1CR1_ 12V 12V 100PPR
- RE46A1CO5_ 5V OC 100PPR
- RE46A1CO1_ 12V OC 100PPR
- RE46A2CR5_ 5V 5V 25PPR
- RE46A2CR1_ 12V 5V 25PPR
- RE46A2CO5_ 5V OC 25PPR
- RE46A2CO1_ 12V OC 25PPR
- RE46A2CO2_ 24V OC 25PPR
- RE46A2CD5_ 5V Differential Line 25PPR
- RE46A3CR5_ 5V 5V 100PPR
- RE46A3CR1_ 12V 12V 100PPR
- RE46A3CO5_ 5V OC 100PPR
- RE46A3CO1_ 12V OC 100PPR
- RE46A3CO2_ 24V OC 100PPR
- RE46A3CD5_ 5V Differential Line 25PPR

*Diffenential Line: Connect with terminating resistor 100Ω(Based on RS-422 line receiver).
*5V: Supply voltage=12V, Output voltage=5V
*OC: For photo coupler only, Supply voltage 12 ~ 24V
Panel Mounting Hole

Dimensions (mm)

Panel Mounting Hole

Thickness of the Panel : \( \leq 3 \) mm
Recommended Torque for fastening the nut : \( 0.4 \sim 0.5 \) N·m (4~5 Kgf·cm)

Circuitry

- Open collector (code:O)
  - \(+V\)
  - \(A/B\)
  - \(0V\)

- Voltage Output (code:R)
  - \(+V\)
  - \(A/B\)
  - \(0V\)

- Line Driver (code:D)
  - \(+V\)
  - \(A/B\)
  - \(\bar{A}/\bar{B}\)
  - \(26C31\)
  - \(0V\)

Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage (1);

Line Driver (6 terminals)

Accessories
- M4 Nut : \( t=3.2mm \)
- M4 Teeth Washer : \( t=0.9mm \)
- M4 Washer : \( t=0.8mm \)
Manual Pulse Generator

RE47 series

RE47 is an incremental optical manual pulse generator developed mainly for NC machine tools. The series are most compact of all MPGs on our line-up and universally compatible with various sorts of compact MPGs.

Outline

Features

- Eco friendly: RoHS compliant
- \( \phi \) 60mm diameter
- Less than 10mm in depth (from surface-to-bottom) allows you to save space behind the panel
- Fine operability with a weight inside of the dial.
- Various Options of the input/output circuit: CMOS, open collector, line driver
- Chattering-free and long-life use with optical unit
- Original logos available on the dial

Specifications

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<tr>
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<th>12V input</th>
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<th>Photo coupler(12 ~ 24V)</th>
</tr>
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<tr>
<td>Power Voltage</td>
<td>DC5V±10%</td>
<td>DC12V±10%</td>
<td>DC5V±10%</td>
<td>DC10.8V to 26.4V</td>
</tr>
<tr>
<td>Current power (pull up)</td>
<td>( \leq 80\text{mA} )</td>
<td>( \leq 60\text{mA} )</td>
<td>( \leq 150\text{mA (90mAtyp)} )</td>
<td>( \leq 60\text{mA} )</td>
</tr>
<tr>
<td>Current power (Open collector)</td>
<td>( \leq 30\text{mA} )</td>
<td>( \leq 40\text{mA} )</td>
<td>( \leq 40\text{mA} )</td>
<td>( \leq 60\text{mA} )</td>
</tr>
<tr>
<td>Output</td>
<td>330Ω Pull-up or Open collector</td>
<td>2.2KΩ Pull-up or Open collector</td>
<td>RS-422A (Line driver)</td>
<td>Open collector (Current output type)</td>
</tr>
<tr>
<td>Output voltage (pull up)</td>
<td>1 level: (Power voltage -0.5V) ( \leq 0\text{V (No-load)} )</td>
<td>1 level: Transistor/ON</td>
<td>Terminating register at receiver:100Ω/phrase</td>
<td>( \leq 30\text{V} )</td>
</tr>
<tr>
<td>Collector voltage (Open corrector)</td>
<td>( \leq 50\text{mA} )</td>
<td>( \leq 50\text{mA} )</td>
<td>( \leq 50\text{mA} )</td>
<td>( \leq 50\text{mA} )</td>
</tr>
<tr>
<td>Pulse per revolution</td>
<td>100 pulse/100 Click or 25 pulse/100 Click</td>
<td>1P5S</td>
<td>1 level: Transistor/ON</td>
<td></td>
</tr>
<tr>
<td>Panel water resistance</td>
<td>IP54</td>
<td></td>
<td>Level Transistor/ON</td>
<td></td>
</tr>
<tr>
<td>Click torque</td>
<td>( 8 \sim 18\text{mN.m (80 \sim 160gf.cm)} )</td>
<td>1 level: Transistor/ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotational Durability</td>
<td>Over a million rotations</td>
<td></td>
<td>0 level: Transistor/OFF</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-10℃ ~ 60℃</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>85g</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part number designation

<table>
<thead>
<tr>
<th>RE47</th>
<th>A</th>
<th>1</th>
<th>2</th>
<th>S</th>
<th>3</th>
<th>R</th>
<th>4</th>
<th>5</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Type</td>
<td>③ Supply Voltage</td>
<td>⑤ Differential Line*</td>
<td>⑦ Pulse Per Revolution</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>② Number of Pulses</td>
<td>④ Output</td>
<td>⑥ Dial Knob (color black)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>③ Click</td>
<td>④ Output</td>
<td>⑥ Dial Knob (color black)</td>
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<td></td>
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</tr>
<tr>
<td>④ Soft</td>
<td>⑤ Open Collector</td>
<td>⑥ Dial Knob (color black)</td>
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<td></td>
</tr>
<tr>
<td>⑤ (R, O, D)</td>
<td>⑥ Line Driver</td>
<td>⑦ Pulse Per Revolution</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- RE47A1SR5_ 5V 5V 100PPR
- RE47A1SR1_ 12V 12V 100PPR
- RE47A1SO5_ 5V OC 100PPR
- RE47A1SO1_ 12V OC 100PPR
- RE47A1SO2_ 24V OC* 100PPR
- RE47A1SD5_ 5V Differential Line* 100PPR
- RE47A1SR5_ 5V 5V 100PPR
- RE47A1SR1_ 12V 5V 100PPR
- RE47A1SO5_ 5V OC 100PPR
- RE47A1SO1_ 12V OC 100PPR
- RE47A1SO2_ 24V OC* 100PPR
- RE47A1SD5_ 5V Differential Line* 100PPR

* Differential Line: Connect with terminating resistance 100Ω (Based on RS-422 line receiver).
* 5V: Supply voltage = 12V, Output voltage = 5V
* OC: For photo coupler only, Supply voltage 12 ~ 24V

Eco friendly: RoHS compliant
φ 60mm diameter
Less than 10mm in depth (from surface-to-bottom) allows you to save space behind the panel
Fine operability with a weight inside of the dial.
Various Options of the input/output circuit: CMOS, open collector, line driver
Chattering-free and long-life use with optical unit
Original logos available on the dial
Panel Mounting Hole

3- φ 3.6
φ 53±0.2
φ 46±0.5

Thickness of the Panel : ≤ 3 mm
Recommended Torque for fastening the nut :
0.4 ~ 0.5 N·m (4~5 Kg·cm)

Circuitry

- Open collector (code:O)

  ![Open collector](image)

- Voltage Output (code:R)

  ![Voltage Output](image)

- Line Driver (code:D)

  ![Line Driver](image)

Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage (1);