## FEATURES
- Contactless, manual adjustment only
- Compact, light weight
- With click (REC20, REC20C, REC20D, RECW20D)
- Panel seal type (RESW20D, RECW20D)
- RoHS compliant

## PART NUMBER DESIGNATION

### Series name
- REC W 20 D - 50 - 201 - 1

### Output connection
- 1 : Cable wire

### Output phase
- 2 : “A” & “B”

### Resolution (P/R)
- 25, 50

### Model

### Part number

### Output wave form
- Saturated wave
- Pseudosquare wave
- Square wave

### Output terminal
- Pin terminal
- Cable wire

### Click
- Without click
- With click

### Panel seal
- Without click
- With click
- Non Panel seal

### Resolution
- 50 (P/R)
- 100 (P/R)
- 50 (P/R)
- 100 (P/R)
- 25 (P/R)
- 50 (P/R)
- 25 (P/R)
- 50 (P/R)

### Item
- RES20-50-200
- RES20-100-200
- RES20-50-200-Z
- RES20-100-200-Z
- RES20B-25-201-1
- RES20D-25-201-1
- REC20-25-201-1
- REC20D-25-201-1
- RES20D-50-201-1
- RES20D-50-200-2
- RES20B-50-201-1
- RES20D-50-201-1
- REC20D-50-201-1
- REC20D-50-201-1
- RESW20D-25-201-1
- RESW20D-50-201-1
- RECW20D-25-201-1
- RECW20D-50-201-1

* Verify the above part numbers when placing orders.
The knob is available.
## STANDARD SPECIFICATIONS

### Electrical characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>RES20</th>
<th>RES20-Z</th>
<th>REC20</th>
<th>RES20B</th>
<th>REC20C</th>
<th>RES20D</th>
<th>REC20D</th>
<th>RESW20D</th>
<th>RECW20D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>DC5 V ± 5 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input current max</td>
<td>mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>40</td>
<td>50</td>
<td>70</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output wave form</td>
<td></td>
<td>Saturated wave</td>
<td>Pseudosquare wave</td>
<td>Square wave</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output phases</td>
<td></td>
<td>A, B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>50</td>
<td>100</td>
<td>50</td>
<td>100</td>
<td>25</td>
<td>50</td>
<td>25, 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase difference of outputs A &amp; B</td>
<td></td>
<td>90° ± 45°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum frequency response</td>
<td>Hz</td>
<td>500</td>
<td>100</td>
<td>500</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output signal</td>
<td>&quot;0 (Low)&quot;</td>
<td>+ 4.0 V minimum</td>
<td>+ 1.0 V maximum</td>
<td>+ 0.5 V maximum</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Light source</td>
<td></td>
<td>LED</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Mechanical characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>RES20</th>
<th>RES20-Z</th>
<th>REC20</th>
<th>RES20B</th>
<th>REC20C</th>
<th>RES20D</th>
<th>REC20D</th>
<th>RESW20D</th>
<th>RECW20D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting torque mN·m (gf·cm) max</td>
<td>2.94</td>
<td>4.90</td>
<td>2.94</td>
<td>4.90</td>
<td>1.18 ± 0.78 (12 ± 8)</td>
<td>2.94 ± 1.96 (30 ± 20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Click torque mN·m (gf·cm) max</td>
<td>19.6</td>
<td>(200) maximum</td>
<td>19.6</td>
<td>(200) maximum</td>
<td>9.81 ± 4.9 (100 ± 50)</td>
<td>11.8 ± 4.9 (120 ± 50)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Click number</td>
<td>25</td>
<td>50</td>
<td>25</td>
<td>50</td>
<td>25, 50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shaft loading (When mounting)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radial</td>
<td></td>
<td>9.81 N (1 kgf) maximum</td>
<td>4.90 N (500 gf) maximum</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Axial</td>
<td></td>
<td>4.9 N (500 gf) maximum</td>
<td>2.94 N (300 gf) maximum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net weight</td>
<td>Approx. 20 g</td>
<td>Approx. 20 g</td>
<td>Approx. 25 g</td>
<td>Approx. 10 g</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength of tighten screw</td>
<td>0.98 N·m (10 kgf·cm) maximum</td>
<td>0.49 N·m (5 kgf·cm) maximum</td>
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</tr>
</tbody>
</table>

### Environmental characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>RES20</th>
<th>RES20-Z</th>
<th>REC20</th>
<th>RES20B</th>
<th>REC20C</th>
<th>RES20D</th>
<th>REC20D</th>
<th>RESW20D</th>
<th>RECW20D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temp. range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 – 50 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temp. range</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>– 20 – 80 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Protection grade</td>
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<tr>
<td></td>
<td>IP40</td>
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</tr>
</tbody>
</table>

Note) Manual setting only.
### RELIABILITY TEST

The output shall satisfy the criteria below after the following tests.

<table>
<thead>
<tr>
<th>Test item</th>
<th>Test conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibration</td>
<td>Power OFF</td>
</tr>
<tr>
<td>Amplitude: 1.52 mm or 98.1 m/s² (10 G) whichever is smaller. 10 ~ 500 Hz excursion 15 min/cycle, 8 cycles each for X, Z, directions.</td>
<td></td>
</tr>
<tr>
<td>Shock</td>
<td>Power OFF</td>
</tr>
<tr>
<td>3 times each in directions (X, Z) at 490 m/s² (50 G), 11 ms.</td>
<td></td>
</tr>
<tr>
<td>High temperature exposure</td>
<td>Power OFF, 80 °C 96 h</td>
</tr>
<tr>
<td>Power ON</td>
<td>50 °C 96 h</td>
</tr>
<tr>
<td>Low temperature exposure</td>
<td>Power OFF, –20 °C 96 h</td>
</tr>
<tr>
<td>Power ON</td>
<td>0 °C 96 h</td>
</tr>
<tr>
<td>Humidity</td>
<td>Power OFF, 40 °C Relative humidity 90 ~ 95 % 96 h</td>
</tr>
<tr>
<td></td>
<td>(To be measured after wiping out moisture and leaving samples for 1 h at normal temperature and humidity after the test.)</td>
</tr>
<tr>
<td>Thermal shock</td>
<td>Power OFF, To be done 10 cycles with the following condition</td>
</tr>
<tr>
<td></td>
<td>(To be measured after leaving samples for 1 h at normal temperature and humidity after the test.)</td>
</tr>
<tr>
<td></td>
<td>80 °C ± 2 °C 0.5 h, –20 °C ± 2 °C 0.5 h</td>
</tr>
</tbody>
</table>

### OUTLINE DIMENSIONS

- **RES20D/RESW20D**
  - (Without click / Without click, With panel seal)

- **REC20D/RECW20D**
  - (With click / With click, With panel seal)

#### < Attachment >

1. Nut
2. Washer

*Water resistant washer will be provided for panel seal type. Position stopper (metal piece) is available.

#### < Option (Stopper) >

- **RES20D / REC20D / RESW20D / RECW20D**

The stopper can be provided upon request.
OUTLINE DIMENSIONS

RES20/RES20-Z
(Without click)

REC20
(With click)

REC20C
(With click)

< Accessories >

1. Nut
2. Washer
3. Stopper

Unless otherwise specified, tolerance: ± 0.4 (Unit: mm)
● KNOB FOR SETTING ENCODERS

The knobs are sold separately as an optional item.

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■ OUTPUT

● RES20D/REC20D/RESW20D/RECW20D

- Square wave
- Output "A"
- Output "B"
- Click point
- a, b, c, d ≥ 1/10T

● RES20

- Saturated wave
- Output "A"
- Output "B"
- CW
- 1/2T
- CCW
- 1/4T ± 1/8T

● RES20 Z

- Output "A"
- Output "B"
- a, b, c, d ≥ 100 μs
- CW
- 2.5 V

● REC20/RES20B/REC20C

- Square wave
- Output "A"
- Output "B"
- CW
- 1
- CCW
- 1/4T ± 1/8T
- Click range

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Unless otherwise specified, tolerance: ± 0.4 (Unit: mm)

Use a hexagon wrench for 1.5 fastening.

Knurl (All surrounding area)
**OUTPUT CIRCUIT**

- **RES20**
  
  - Vcc 5 V
  - Output "A" (White)
  - Output "B" (Green)
  - 4.7 kΩ
  - 1 kΩ
  - 85 Ω min.

- **RES20-Z**
  
  - Vcc 5 V
  - Output "A" (White)
  - Output "B" (Green)
  - 120 Ω
  - 15 kΩ
  - 15 kΩ
  - GND

- **REC20/RES20B/REC20C**
  
  - Vcc 5 V (Red)
  - Output "A" (White)
  - "B" (Green)
  - 1 kΩ
  - 0 V (Black)

- **RES20D/REC20D/RESW20D/RECW20D**
  
  - Vcc 5 V (Red)
  - IC
  - Output "A" (White)
  - "B" (Green)
  - 4.7 kΩ
  - 0 V (Black)

**EXTERNAL SCHEMATICS**

- **RES20**
  
  - Vcc 5 V
  - Output "A"
  - "B"
  - 85 Ω min.
  - 5 kΩ
  - 5 kΩ
  - 0 V
  - +5 V