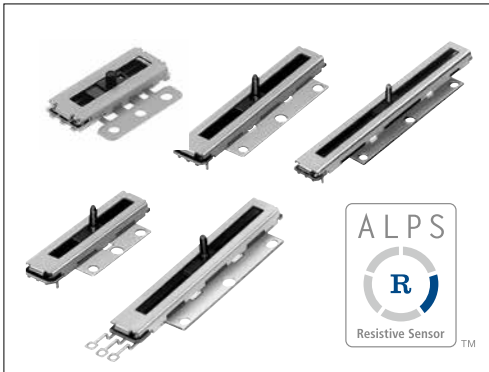


RDC10 Linear Type

The high accuracy space saving design contributes to reduced weight and size of sets



Typical Specifications

| Items | Specifications |
|-----------------------------|---|
| Rated Voltage | 5V DC |
| Operating life | 50,000 cycles (RDC1010) 200,000 cycles |
| Total resistance | 10kΩ |
| Operating temperature range | -30°C to +85°C |

Product Line

| Travel (mm) | Linearity | Length of lever (mm) | Length of terminal (mm) | Minimum order unit (pcs.) | | Model No. | Drawing No. |
|-------------|-----------|----------------------|-------------------------|---------------------------|--------|-------------------|-------------|
| | | | | Japan | Export | | |
| 10 | ±0.5% | 1.3 | 0.8 | 980 | 2,940 | RDC1010A12 | 1 |
| 14 | | 4.5 | 2 | 2,400 | 4,800 | RDC1014A09 | 2 |
| 22 | | | | 2,100 | 4,200 | RDC1022A05 | |
| 32 | | | | 900 | 1,800 | RDC10320RB | |
| 47 | | | | 1,000 | 2,000 | RDC1047A03 | |
| | | 4.4 | | | | | |

Notes

1. RDC1014, RDC1022, RDC1032 and RDC1047 Series can be for automotive use.
2. RDC1014, RDC1022, RDC1032 and RDC1047 Series are available in different varieties to the above.
See Product Varieties (P.463).

Packing Specifications

Tray

| Model No. | Number of packages (pcs.) | | Export package measurements (mm) |
|----------------|---------------------------|------------------------|----------------------------------|
| | 1 case /Japan | 1 case /export packing | |
| RDC1010 | 980 | 2,940 | 360×270×230 |
| RDC1014 | 2,400 | 4,800 | 508×374×272 |
| RDC1022 | 2,100 | 4,200 | 508×374×302 |
| RDC1032 | 900 | 1,800 | 540×360×205 |
| RDC1047 | 1,000 | 2,000 | 508×374×272 |

Refer to P.463 for product varieties.
Refer to P.466 for product specifications.
Refer to P.467 for soldering conditions.

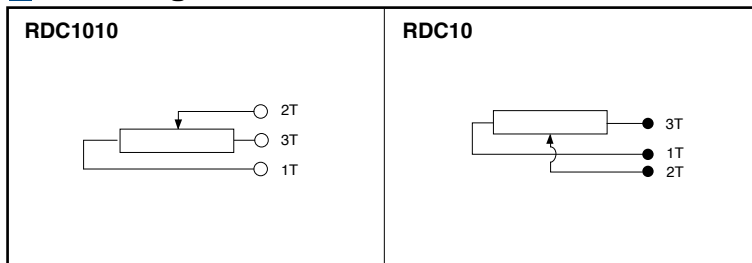
RDC10 Linear Type

Dimensions

Unit:mm

| No. | Photo | Style | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|---|---|-----------|------|---|---|---|---------|----|----|----|----|---------|----|----|----|----|---------|----|----|----|----|---------|----|----|----|------|
| 1 |  |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 |  |  <table border="1" data-bbox="1123 1207 1430 1359"> <thead> <tr> <th>Dimension</th> <th>S</th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>RDC1014</td> <td>14</td> <td>19</td> <td>15</td> <td>10</td> </tr> <tr> <td>RDC1022</td> <td>22</td> <td>19</td> <td>15</td> <td>14</td> </tr> <tr> <td>RDC1032</td> <td>32</td> <td>29</td> <td>25</td> <td>19</td> </tr> <tr> <td>RDC1047</td> <td>47</td> <td>37</td> <td>33</td> <td>26.5</td> </tr> </tbody> </table> <p>Sizes in () are applicable to RDC1047 only.</p> | Dimension | S | A | B | C | RDC1014 | 14 | 19 | 15 | 10 | RDC1022 | 22 | 19 | 15 | 14 | RDC1032 | 32 | 29 | 25 | 19 | RDC1047 | 47 | 37 | 33 | 26.5 |
| Dimension | S | A | B | C | | | | | | | | | | | | | | | | | | | | | | | |
| RDC1014 | 14 | 19 | 15 | 10 | | | | | | | | | | | | | | | | | | | | | | | |
| RDC1022 | 22 | 19 | 15 | 14 | | | | | | | | | | | | | | | | | | | | | | | |
| RDC1032 | 32 | 29 | 25 | 19 | | | | | | | | | | | | | | | | | | | | | | | |
| RDC1047 | 47 | 37 | 33 | 26.5 | | | | | | | | | | | | | | | | | | | | | | | |

Circuit Diagram



Resistive Position Sensors

Rotary Type

Linear Type

Linear Type / Product Varieties

In addition to the products listed, we can accommodate the follow specifications.

Applicable to **RDC1014, RDC1022, RDC1032, RDC1047** only

■ Lever Variety * Sizes in () are applicable to RDC1047 only Unit:mm

| Length | 4.5 (4.4) | 3.7 (3.6) | 3 (2.9) | 2.5 (2.4) |
|------------|--------------|--------------|------------|--------------|
| Dimensions | | | | |

■ Terminal Variety

For printed wiring Unit:mm

| | | | | |
|--------------------------|-----|---|---|-----|
| Dimensions | | | | |
| Length L ₂ | 1.5 | 2 | 4 | 5.5 |

For lead wiring Unit:mm

| | |
|------------|--|
| Dimensions | |
|------------|--|

Note

 Shows the specification recommended by Alps Alpine.

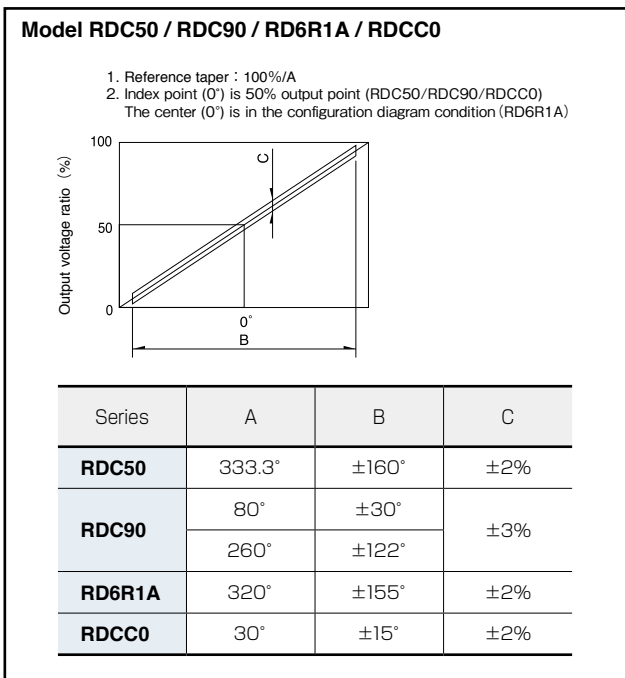
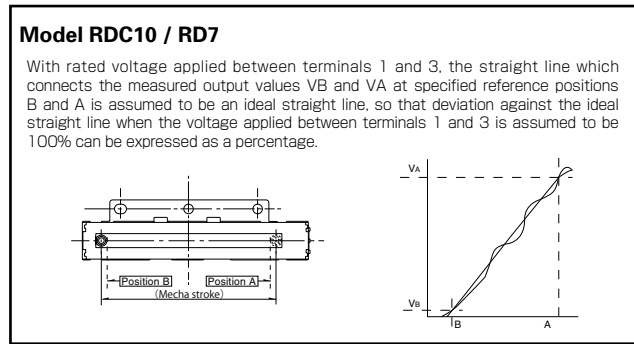
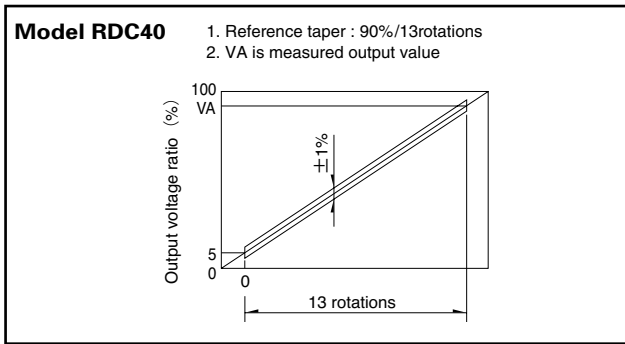
| Type | Magnetic Rotary Type | Linear Type | | | |
|--------------------------------|---|---|---|---|-----------------------|
| Series | RDCC0 | RDC1010 | RDC10 | ※ RD7 | |
| Photo |  |  |  |  | |
| Direction of lever | Vertical | | | Vertical Horizontal | |
| Effective electrical angle (°) | 30 | — | — | — | |
| Linearity guarantee range (°) | ±15 | — | — | — | |
| Travel | — | 10mm | 14mm 22mm 32mm 47mm | 8mm 12mm 8mm 9mm 12mm | |
| Operating temperature range | 0°C to +50°C | -30°C to +85°C | | -40°C to +105°C | |
| Operating life | 10,000,000 cycles | 50,000 cycles | 200,000 cycles | 100,000 cycles | |
| Available for automotive use | — | — | ● | ● | |
| Life cycle (availability) |  |  |  |  | |
| Mechanical performance | Operating force | — | 0.25N max. | | |
| | Rotational torque | 5mN·m max. | — | — | |
| Electrical performance | Total resistance tolerance | — | ±30% | | |
| | Linearity (%) | ±2 | ±0.5 | | |
| | Rated voltage (V DC) | 5 | | | 12 |
| Environmental performance | Cold | -40°C 240h | | | -40°C 96h |
| | Dry heat | 85°C 240h | 80°C 240h | 90°C 240h | 105°C 96h |
| | Damp heat | 60°C, 90 to 95%RH 240h | | | 40°C, 90 to 95%RH 96h |
| Terminal style | Connector | Insertion | Lead terminal/Insertion | Insertion | |
| Page | 460 | 461 | | 464 | |

| | |
|---|-----|
| Resistive Position Sensors Measurement and Test Methods | 466 |
| Resistive Position Sensors Soldering Conditions | 467 |
| Resistive Position Sensors Cautions | 468 |

Notes

1. ※ The RD7 series are used to detect vehicle headlight angles.
2. ● Indicates applicability to all products in the series.

Method for Regulating the Linearity



Resistive Position Sensors / Measurement and Test Methods

Resistive Position Sensor

[Total Resistance]

The total resistance, with the shaft (lever) placed at the end of terminal 1 or 3, shall be determined by measuring the resistance between the resistor terminals 1 and 3 unless otherwise specified.

[Rating Voltage]

The rating voltage corresponding to the rated power shall be determined by the following equation. When the resulting rated voltage exceeds the maximum operating voltage of a specific resistor, the maximum operating voltage shall be taken as the rated voltage.

$$E = \sqrt{P \cdot R}$$

E : Rated voltage (V)
P : Rated power (W)
R : Total nominal resistance (Ω)

Reference for Manual Soldering

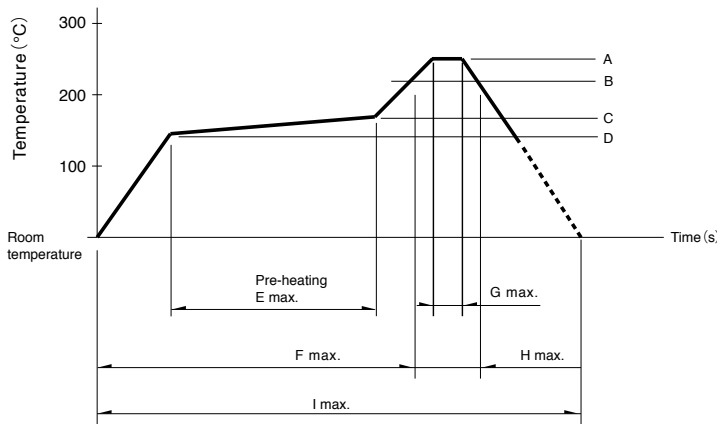
| Series | Tip temperature | Soldering time |
|---------------------|-----------------|-------------------------------|
| RDC50, RDC90 | 350±5°C | 3 ⁺ ₀ s |
| RDC10, RD7 | 350°C max. | 3s max. |

Reference for Dip Soldering

| Series | Preheating | | Dip soldering | | No. of solders |
|-----------------------|-------------------------------|--------------|-----------------------|----------------|----------------|
| | Soldering surface temperature | Heating time | Soldering temperature | Soldering time | |
| RDC501, RDC502 | 100 to 150°C | 1minute max. | 260±5°C | 10±1s | 1 time |
| RD7 | 100°C max. | 1minute max. | 260°C max. | 5s max. | 1 time |

Example of Reflow Soldering Condition

1. Cleaning sensors should not be attempted.
2. Type of solder to be used Use cream solder that contains 10 to 15 %wt flux.
3. Number of solder applications - apply solder only once
4. Recommended reflow conditions



| Series | A | B | C | D | E | F | G | H | I | No. of reflows |
|--------------------------|-------|-------|-------|-------|-------|-------|-----|-------|-------|----------------|
| RDC503 RDC506 | 250°C | 230°C | 180°C | 150°C | 2min. | — | 5s | 40s | 4min. | 1 time |
| RDC90 | 255°C | 230°C | — | — | — | 2min. | 10s | 1min. | 4min. | 1 time |

Notes

1. When using an infrared reflow oven, solder may not always be applied as intended. Be sure to use a hot air reflow oven or a type that uses infrared rays in combination with hot air.
2. The temperatures given above are the maximum temperatures at the terminals of the sensor when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the sensor may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the sensor does not rise to 250°C or greater.
3. Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.

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