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 100,000 cycles (RDC1087)
Total resistance	10kΩ
Operating temperature range	−30℃ to +85℃

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		4.4		1,000	2,000	**RDC1047A03**	
87	±1.0%		5.5	540	540	**RDC1087A01**	3

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.423).

Packing Specifications

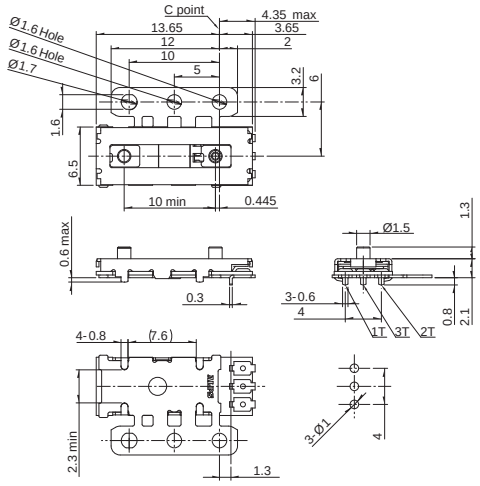
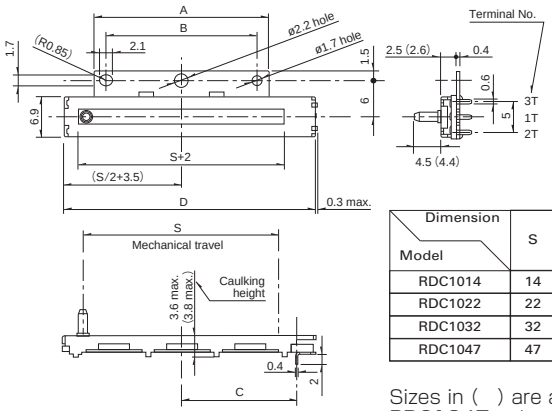
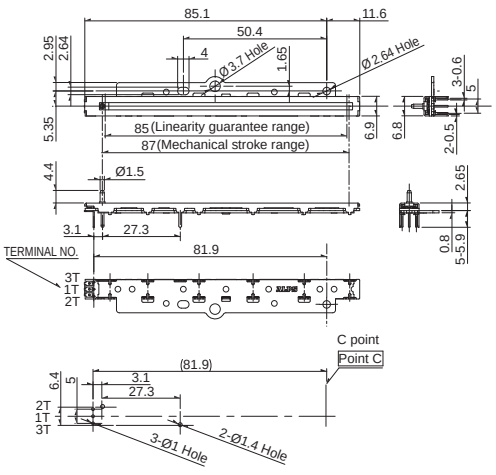
Tray

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
RDC1087	540	540	540×360×130

Refer to P.423 for product varieties.
Refer to P.426 for product specifications.
Refer to P.427 for soldering conditions.

Dimensions

Unit:mm

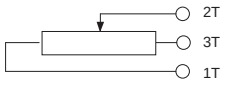
No.	Photo	Style
1	**RDC1010** 	
2	**RDC10** 	
3	**RDC1087** NEW 	

Dimension / Model	S	A	B	C	D
RDC1014	14	19	15	10	23.3
RDC1022	22	19	15	14	31.5
RDC1032	32	29	25	19	41.5
RDC1047	47	37	33	26.5	56.5

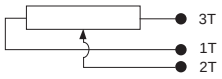
Sizes in ( ) are applicable to RDC1047 only.

Circuit Diagram

RDC1010



RDC10/RDC1087



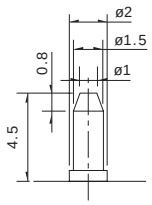
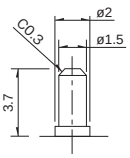
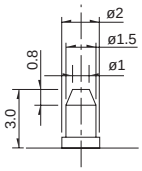
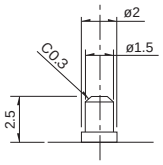
In addition to the products listed, we can accommodate the follow specifications.

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

Lever Variety

＊ Sizes in ( ) are applicable to RDC1047 only

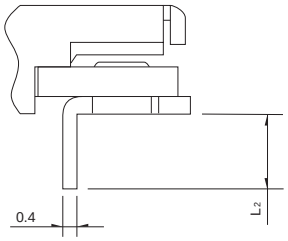
Unit:mm

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

Terminal Variety

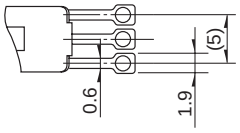
For printed wiring

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.

List of Varieties

Type		Linear Type				
Series		**RDC1010**	**RDC10**		**※ RD7**	
Photo						
Direction of lever		Vertical			Horizontal	Vertical
Linearity guarantee range		9.2mm	12mm 21mm 31mm 46mm	85mm	6mm 9mm	6mm 7mm 9mm
Travel		10mm	14mm 22mm 32mm 47mm	87mm	8mm 12mm	8mm 9mm 12mm
Operating temperature range		−30℃ to +85℃			−40℃ to +105℃	
Operating life		50,000 cycles	200,000 cycles	100,000 cycles	100,000 cycles	
Available for automotive use		—	●	—	●	
Life cycle (availability)		★2	★2		★2	
Mechanical performance	Operating force	0.25N max.			2N max.	
Electrical performance	Total resistance tolerance	±30%			±20%	
	Linearity (%)	±0.5		±1	±1	
	Rated voltage (V DC)	5			12	
Environmental performance	Cold	−40℃ 240h			−40℃ 96h	
	Dry heat	80℃ 240h	90℃ 240h	85℃ 240h	105℃ 96h	
	Damp heat	60℃, 90 to 95%RH 240h			40℃, 90 to 95%RH 96h	
Terminal style		Insertion	Lead terminal/ Insertion	Insertion	Insertion	
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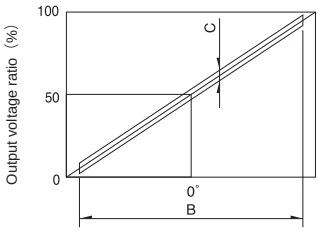
Notes

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

Model RDC50 / RDC90 / RD6R1A

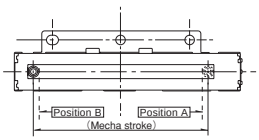
1. Reference taper : 100%/A
2. Index point (0°) is 50% output point (RDC50/RDC90)
   The center (0°) is in the configuration diagram condition (RD6R1A)

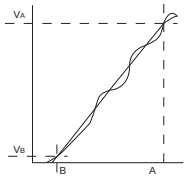


Series	A	B	C
RDC50	333.3°	±160°	±2%
RDC90	80°	±30°	±3%
	260°	±122°	
RD6R1A	320°	±155°	±2%

Model RDC10 / RD7

With rated voltage applied between terminals 1 and 3, the straight line which connects the measured output values VB and VA at specified reference positions B and A is assumed to be an ideal straight line, so that deviation against the ideal straight line when the voltage applied between terminals 1 and 3 is assumed to be 100% can be expressed as a percentage.





Resistive Position Sensors / Measurement and Test Methods

Resistive Position Sensor

(Total Resistance)

Unless otherwise specified, total resistance is the resistance measured between resistor terminals 1 and 3.

(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

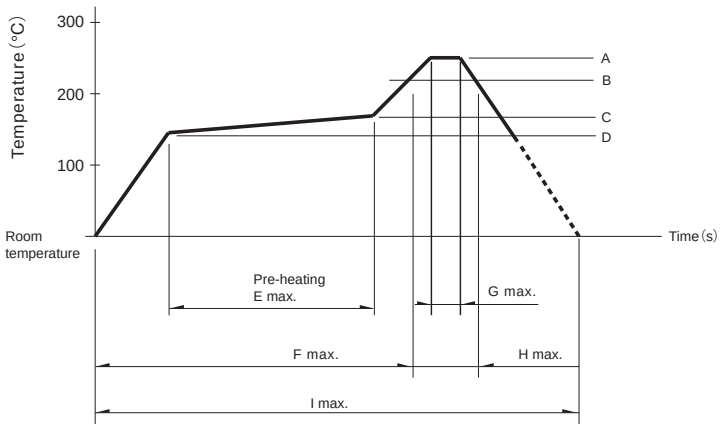
Series	Tip temperature	Soldering time
RDC50, RDC90	350±5℃	3^{+1}_{0}s
RDC10, RD7	350℃ max.	3s max.

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℃	1 min. max.	260±5℃	10±1s	1 time
RD7	100℃ max.	1 min. max.	260℃ 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℃	230℃	180℃	150℃	2 min.	—	5s	40s	4 min.	1 time
RDC90	255℃	230℃	—	—	—	2 min.	10s	1 min.	4 min.	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℃ 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.