Resistive Position Sensors

List of Varieties

Ser	ies	RDC50	RDC90	RD6R1A	RDC10	RD7	
Pho	oto		•				
Control part orientation		Horizontal Vertical	Vertical	-	Vertical	Horizontal Vertical	
Ту	pe		Rotary		Lin	ear	
Termina	al style	Insertion Reflow	Reflow	Connector terminal	Inse	rtion	
Dimensio	ons (mm)	11.0×3.9×13.5 11.0×12.0×2.2 11.0×12.0×2.75 11.0×12.0×3.5	11.0×13.7×3.2	20.6×32.5×3.6	6.5×17.3×2.1 6.9×23.5×2.9 6.9×31.5×2.9 6.9×41.5×2.9 6.9×56.5×3.0 6.9×96.7×3.45	9.0×15.8×3.7 10.0×5.0×15 10.0×5.0×19.0 10.0×15.0×4.5 10.0×18.0×5.0	
Total resistance		4.7kΩ 10kΩ	3.3kΩ 10kΩ	3.8kΩ	10kΩ	2.2kΩ 4.7kΩ 5kΩ 10kΩ	
Effective ele	ctrical range	150° 333.3°	80° 260°	320°	-		
Linearity gua	rantee range	140° 320°	60° 244°	310°	9.2mm 12mm 20mm 30mm 45mm 85mm	6mm 7mm 9mm	
Line	arity	±2%	±3%	±2%	±0.5% ±1%	±1%	
Operatir	ng force		-		0.25N max.	2N max.	
Rotation	al torque	2mN·n	n max.	100mN·m	-	_	
Electrical performance	Total resistance tolerance	±31	0%	±20%	±30%	±20%	
	Rated voltage		5V	DC		_	
	Cold		-40℃ 168h		-40°C 240h	-40℃ 96h	
Environmental test	Dry heat	120°C	168h	85°C 168h	80°C 240h 85°C 240h 105°C 96h 90°C 240h		
	Damp heat	60°C, 90 to 9	95%RH 96h	80°C, 90 to 95%RH 96h	60°C, 90 to 95%RH 240h 40°C, 90 to 95%RH 96f		
Auton	notive	•	•	•	0	•	

⚠Note

lacktriangle Indicates applicability to all products in the series, while \bigcirc indicates applicability to some products in the series.

Compact, high-precision, and high-heat-resistant design, suitable for all position detection needs.





■ Type: Rotary

Applications: Energy_Industrial: Robots, drones, Industrial equipment
Healthcare: Healthcare equipment, Nursing care equipment
Analysis, test equipment: Analysis, test equipment
Home: Major home appliances, Office equipment
Audio_TV: Visual, Audio
Automotive: Navigation/audio systems, HVAC

■ Product List

Products No.	Control part orientation	Mounting method	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
RDC501051A	Vertical	Manual, DIP	320°	±2%	1 OkΩ	1,000,000	11.0×12.0×3.5	•	1
RDC501052A	Vertical	Manual, DIP	320°	±2%	1 OkΩ	1,000,000	11.0×12.0×3.5	•	2
RDC502012A	Horizontal	Manual, DIP	320°	±2%	1 OkΩ	1,000,000	11.0×3.9×13.5	•	3
RDC503051A	Vertical	Reflow	320°	±2%	1 OkΩ	1,000,000	11.0×12.0×2.75	•	4
RDC503052A	Vertical	Reflow	320°	±2%	1 OkΩ	1,000,000	11.0×12.0×2.75	•	5
RDC503051A	Vertical	Reflow	140°	±2%	4.7kΩ	1,000,000	11.0×12.0×2.75	•	4
RDC506018A	Vertical	Reflow (Low-profile)	320°	±2%	1 OkΩ	1,000,000	11.0×12.0×2.2	•	6
RDC506A03A	Vertical	Reflow (Low- profile, Long- life, Without case hole)	320°	±2%	10kΩ	2,000,000	11.0×12.0×2.2	•	7

⚠Note

- 1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
- 2. Please place purchase orders per minimum order unit (integer).

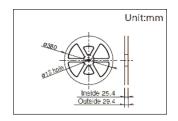
■ Packing Specifications

Tray

Products No.	Number of pa	Export package measurements		
Fibuucts No.	1 case / Japan	1 case / export packing		
RDC501051A RDC501052A	1,500	3,000	526×370×191	
RDC502012A	1,600	1,600	370×280×92	

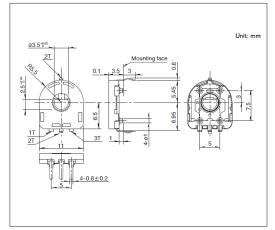
Taping

	Numb	per of packages	(pcs.)	Tape width	Export package	
Products No.	1 reel	1 case / Japan	1 case / export packing	(mm)	measurements (mm)	
RDC503051A RDC503052A RDC503051A	1,300	3,900	3,900	24	415×407×135	
RDC506018A RDC506A03A	1,200	3,600	3,600	24	415×407×135	

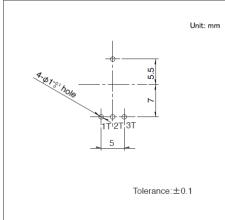


Drawing No.1

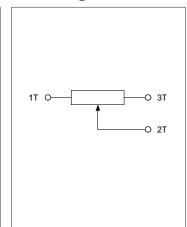
■ Dimensions



■ Mounting Hole Dimensions



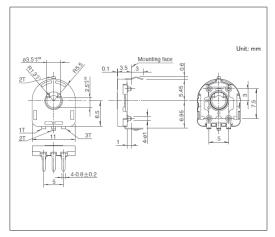
■ Circuit Diagram



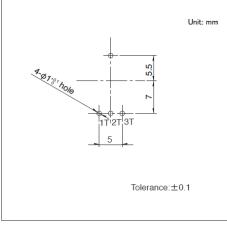
Viewed from mounting side

Drawing No.2

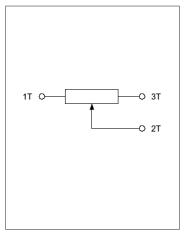
■ Dimensions



■ Mounting Hole Dimensions



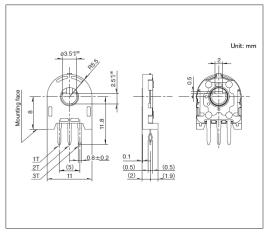
■ Circuit Diagram



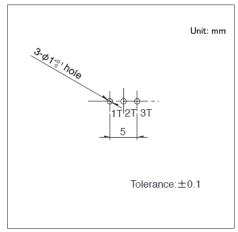
Viewed from mounting side

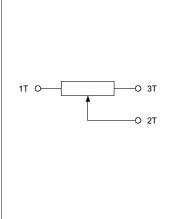
Drawing No.3

■ Dimensions



■ Mounting Hole Dimensions

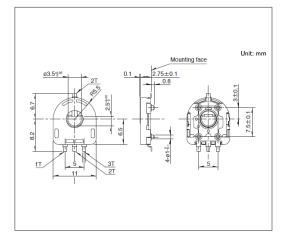




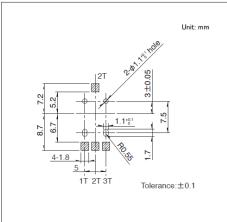
Viewed from mounting side

Drawing No.4

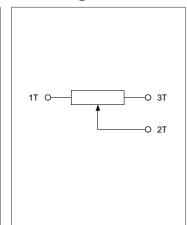
■ Dimensions



■ Mounting Hole Dimensions



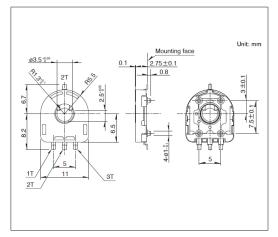
■ Circuit Diagram



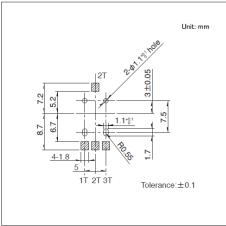
Viewed from mounting side

Drawing No.5

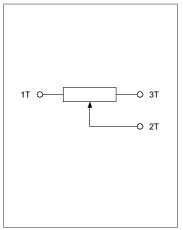
■ Dimensions



■ Mounting Hole Dimensions



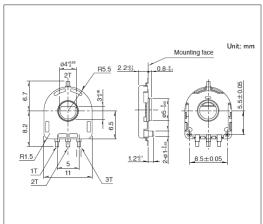
■ Circuit Diagram



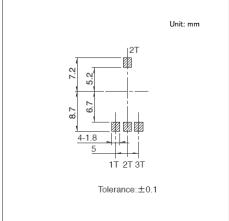
Viewed from mounting side

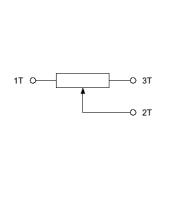
Drawing No.6

■ Dimensions



■ Land Dimensions

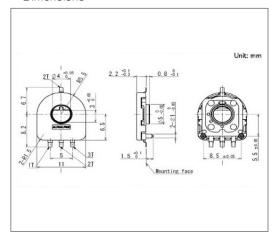




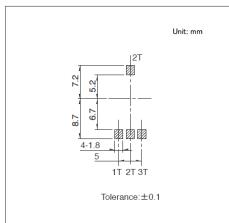
Viewed from mounting side

Drawing No.7

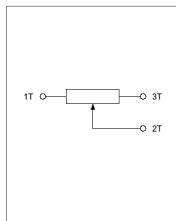
Dimensions



■ Land Dimensions



■ Circuit Diagram



Viewed from mounting side

Compact Long-life Rotary Type RDC90 Series

10 million operation cycles in a compact design.





■ Type: Rotary

Applications:Energy_Industrial:Robots, drones,Industrial equipment
Home:Major home appliances,Office equipment
Navigation/audio systems, HVAC:Navigation/audio systems,
HVAC

■ Product List

Products No.	Control part orientation	Mounting method	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
RDC9010006	Vertical	Reflow (Long-life)	60°	±3%	3.3kΩ	10,000,000	11.0×13.7×3.2	•	1
RDC9010007	Vertical	Reflow (Long-life)	244°	±3%	1 OkΩ	10,000,000	11.0×13.7×3.2	•	ı



- 1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
- 2. Please place purchase orders per minimum order unit (integer).

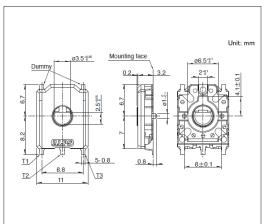
■ Packing Specifications

Tray

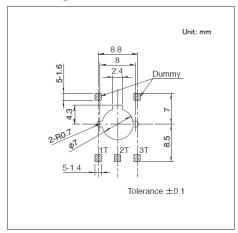
Number of	packages(pcs.)	Export package		
1 case / Japan	1 case / export packing	measurements (mm)		
1,960	1,960	300×240×270		

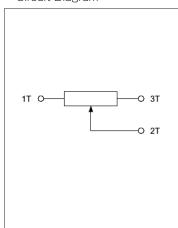
Drawing No.1

■ Dimensions



■ Mounting Hole Dimensions





Viewed from mounting side

Rotary Type RD6R1A Series

Long-life sensor compliant with absolute linearity specifications.





■ Type: Rotary

Applications: Automotive: Navigation/audio systems, HVAC

■ Product List

Products No.	Mounting method	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
RD6R1A0008	Connector type	310°	±2%	3.8kΩ	500,000	20.6×32.5×3.6	•	1



- 1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
- 2. Please place purchase orders per minimum order unit (integer).

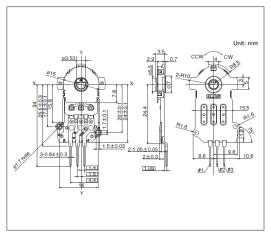
■ Packing Specifications

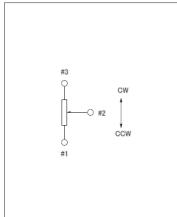
Tray

Number of pa	Export package measurements	
1 case / Japan	measurements (mm)	
1,800	1,800	540×360×250

Drawing No.1

■ Dimensions





Linear Type RDC10 Series

High-precision (±0.5% relative linearity) space-saving design, contributing to set miniaturization.





*Please check the product list for compatible products

■ Type: Linear

Applications: Energy_Industrial: Robots, drones

Game: Home handheld consoles, Virtual/augmented reality Healthcare: Healthcare equipment, Analysis, test equipment Nursing care equipment: Nursing care equipment Home: Major home appliances, Office equipment Automotive: Navigation/audio systems, HVAC

■ Product List

Products No.	Control part orientation	Travel (mm)	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
RDC1010A12	Vertical	10	9.2mm	±0.5%	10kΩ	50,000	6.5×17.3×2.1	_	1
RDC1014A09	Vertical	14	12mm	±0.5%	10kΩ	200,000	6.9×23.5×2.9	•	
RDC1022A05	Vertical	22	20mm	±0.5%	10kΩ	200,000	6.9×31.5×2.9	•	2
RDC10320RB	Vertical	32	30mm	±0.5%	10kΩ	200,000	6.9×41.5×2.9	•	۷
RDC1047A03	Vertical	47	45mm	±0.5%	10kΩ	200,000	6.9×56.5×3.0	•	
RDC1087A01	Vertical	87	85mm	±1%	10kΩ	100,000	6.9×96.7×3.45	_	3



- 1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
- 2. Please place purchase orders per minimum order unit (integer).
- 3. RDC1014, RDC1022, RDC1032 and RDC1047 Series are available in different varieties to product line.

■ Packing Specifications

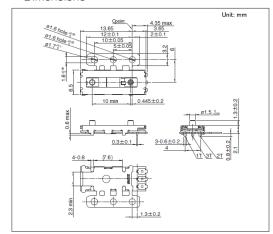
Tray

Products No.	Number of pa	ackages(pcs.)	Export package measurements
Floudets No.	1 case / Japan 1 case / export packing		(mm)
RDC1010A12	980	2,940	360×270×230
RDC1014A09	2,400	4,800	508×374×272
RDC1022A05	2,100	4,200	508×374×302
RDC10320RB	900	1,800	540×360×205
RDC1047A03	1,000	2,000	508×374×272
RDC1087A01	540	540	540×360×130

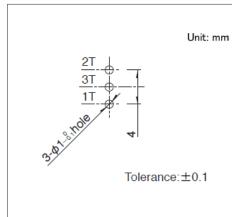
Linear Type RDC10 Series

Drawing No.1

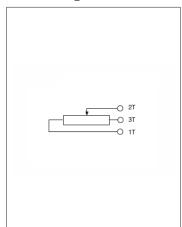
■ Dimensions



■ Mounting Hole Dimensions

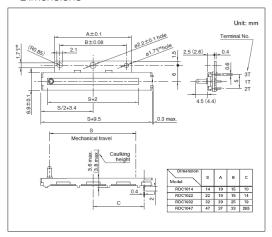


■ Circuit Diagram

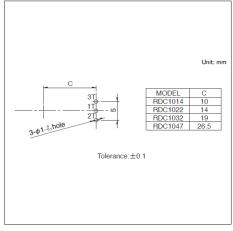


Drawing No.2

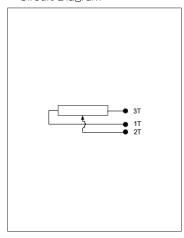
■ Dimensions



■ Mounting Hole Dimensions

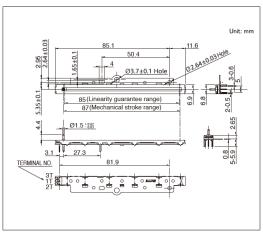


■ Circuit Diagram

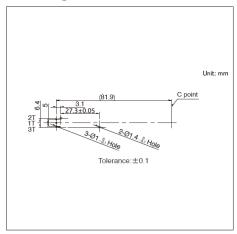


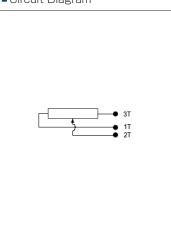
Drawing No.3

■ Dimensions



■ Mounting Hole Dimensions





Resistive Position Sensors

Linear Type (Exclusively Used to Detect the Angle of Vehicle Head Lights) RD7 Series

High-precision, space-saving design dedicated to headlight angle detection.



Automotive

■ Type: Linear

Applications: Automotive: Headlights

■ Product List

Products No.	Control part orientation	Travel (mm)	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
RD708A029A	Horizontal	8	6mm	±1%	4.7kΩ	100,000	10.0×5.0×15	•	1
RD7081015A	Vertical	8	7mm	±1%	5kΩ	100,000	10.0×15.0×4.5	•	2
RD7091008A	Vertical	9	7mm	±1%	5kΩ	100,000	9.0×15.8×3.7	•	3
RD712A028A	Horizontal	12	9mm	±1%	2.2kΩ	100,000	10.0×5.0×19.0	•	4
RD7121008A	Vertical	12	9mm	±1%	10kΩ	100,000	10.0×18.0×5.0	•	5

⚠Note

- 1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
- 2. For Linearity, various specifications will be available, depending on the applications. Please consult with us when lacing your orders.
- 3. Please place purchase orders per minimum order unit (integer).

■ Packing Specifications

Tray

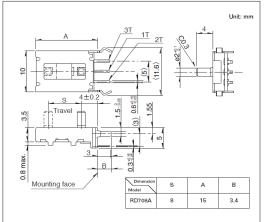
Products No.	Number of pa	Export package measurements	
Floudets No.	1 case / Japan	1 case / export packing	(mm)
RD708A029A RD712A028A	2,000	4,000	527×363×215
RD7081015A	1,500	3,000	507×363×216
RD7091008A	1,800	3,600	508×364×192
RD7121008A	1,800	3,600	507×363×216

Linear Type (Exclusively Used to Detect the Angle of Vehicle Head Lights)

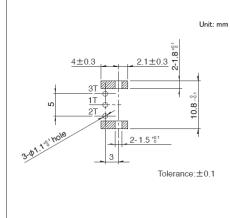
RD7 Series

Drawing No.1

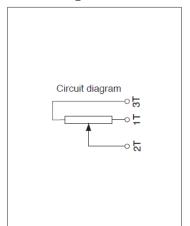
■ Dimensions



■ Mounting Hole Dimensions



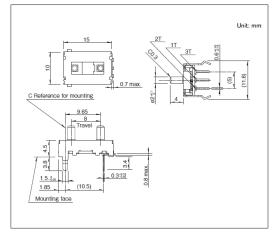
■ Circuit Diagram



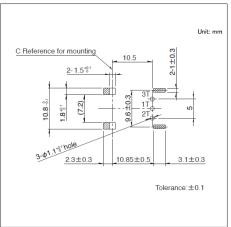
Viewed from mounting side Do not wire the shaded area

Drawing No.2

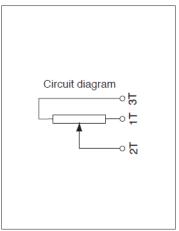
■ Dimensions



■ Mounting Hole Dimensions



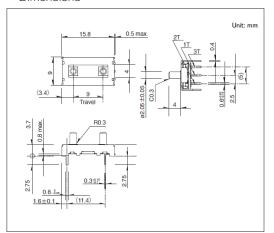
■ Circuit Diagram



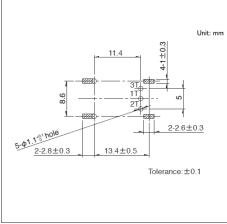
Viewed from mounting side Do not wire the shaded area

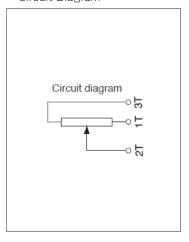
Drawing No.3

■ Dimensions



■ Mounting Hole Dimensions





Viewed from mounting side Do not wire the shaded area

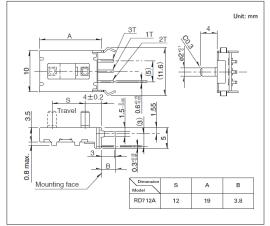


Linear Type (Exclusively Used to Detect the Angle of Vehicle Head Lights)

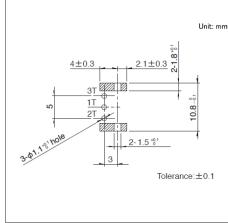
RD7 Series

Drawing No.4

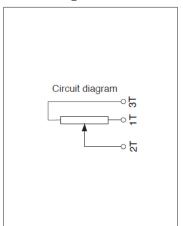
■ Dimensions



■ Mounting Hole Dimensions



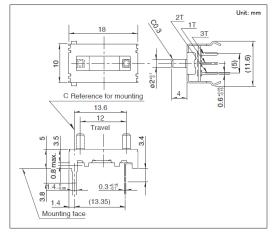
■ Circuit Diagram



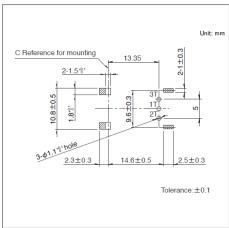
Viewed from mounting side Do not wire the shaded area

Drawing No.5

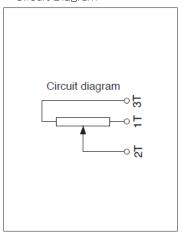
■ Dimensions



■ Mounting Hole Dimensions



■ Circuit Diagram



Viewed from mounting side Do not wire the shaded area

Resistive Position Sensors / Soldering Conditions

■ Reference for Manual Soldering

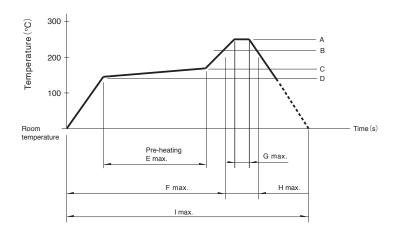
Series	Tip temperature	Soldering time		
RDC50, RDC90	350±5℃	3 ⁺¹ ₀ s		
RDC10, RD7	350°C max.	3s max.		

■ Reference for Dip Soldering

	Preheating		Dip so			
Series	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	No. of solders	
RDC501, RDC502	100 to 150℃	1 min. max.	260±5℃	10±1s	1 time	
RD7	100°C max.	1 min. 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	А	В	С	D	E	F	G	н	1	No. of reflows
RDC503 RDC506	250℃	230℃	180℃	150℃	2min.	_	5s	40s	4min.	1 time
RDC90	255℃	230℃	_	_	_	2min.	10s	1 min.	4min.	1 time

⚠Note

- 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.

Resistive Position Sensors / Cautions

Use of Chemicals

The sensors make use of synthetic resins, therefore avoid use in environments where there is a strong presence of gases from chemicals such as ammonia, amines, alkaline aqueous solutions, aromatic hydrocarbons, ketones, esters and halogenated hydrocarbons.

Measures to Deal with Noise Problems

While data is being received from the sensor, on rare occasions, penetrating external noise may cause interference with the outputs.

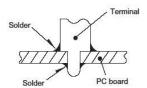
To minimize the probability of this phenomenon pay attention to the following when you program the relevant software

ex)

- · Receiving of data should always be repeated a number of times to ensure that you obtain a mean value.
- · Have the system determine when/how to invalidate any data received in error.
- · When doubt occurs let the system receive the subject data again and reconfirm that you have eliminated the anomaly.

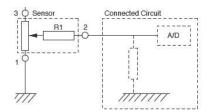
Soldering

Avoid wiring and soldering that causes the solder to seep through to the top of the PC board (as illustrated). This can lead to a contact failure in the terminal section. If solder seepage is unavoidable, please consult with us.



Connection Impedance

Resistive position sensors are constructed in a way that contact resistance (R1 below) occurs within the sensor. To reduce the effect of contact resistance (R1), set the impedance within the circuit connected to the output terminal to greater than 1M Ω .



Dew Condensation

Avoid using the sensor where dew or water vapor might be caused to condense on the surface of the resistor - deterioration of insulation or shorting may occur.

Storage

- 1. Store the products as delivered, at a normal temperature and humidity, without direct sunshine and corrosive gas ambient. Use them at an earliest possible timing, not later than six months upon receipt.
- 2. After breaking the seal, keep the products in a plastic bag to shut out ambient air, store them in the same environment as above, and use them up as soon as possible.
- 3. Do not stack too many switches.