

# N-6R

## 6-mm miniature carbon SMD reflow potentiometer

The N-6R is a unique, fully RoHS & REACH ready Miniature Control Potentiometer with all the features of traditional full size potentiometers. The combination of wide electrical angle, ROHS reflow capability, reduced form factor, tape on reel packaging for automated high speed placement and extra long mechanical life provides market leading performance in a compact & robust design.

The N-6R has been conceived for the Industrial, Automotive and Appliance markets to provide a cost effective control solution. Further options include improved linearity and a selection of custom shafts and knobs.



### KEY FEATURES

- ▶ SMD for RoHS reflow soldering
- ▶ Up to 10k cycles mechanical life
- ▶ Endless rotation upon request
- ▶ Carbon resistive element
- ▶ Plastic substrate
- ▶ Over-moulding manufacturing technique
- ▶ Embossed Tape (for SMD) packaging for automatic insertion or bulk for manual assembly
- ▶ Wiper positioned at 50%
- ▶ Both sides cross slot easy adjustment
- ▶ Accidental rotor movement protected
- ▶ Traceability ensured by date code marking
- ▶ IP54 protection according to IEC 60529

### ELECTRICAL SPECIFICATIONS

Taper	Linear
Range of values*	{Decad. 1.0 - 2.0 - 2.2 - 2.5 - 4.7 - 5.0}
Standard version	$250\Omega \leq R_n \leq 500K\Omega$
Long-life version	$1K\Omega \leq R_n \leq 500K\Omega$
Tolerance*	$\pm 30\%$
Max. Voltage	100 VDC
Nominal power 50°C (122°F)	0.1 W
Residual resistance	$\leq 2\% R_n$ (100 min.)
Equivalent noise resistance	$\leq 5\% R_n$
Operating temperature **	-25°C to +70°C (-13°F to +158°F)

\* Others available on request \*\* Up to 85°C depending on application.

### MECHANICAL SPECIFICATIONS

Mechanical rotation angle	$280^\circ \pm 10^\circ$
Electrical rotation angle	$245^\circ \pm 25^\circ$
Torque	
Rotational	0.2 to 3 Ncm (0.28 to 4.2 in-oz)
Stop	> 7.5 Ncm (>10.5 in-oz)
Life	Up to 10.000 cycles

### APPLICATIONS

- ▶ Home and building automation
- ▶ Appliances
- ▶ Timer and control relays
- ▶ Power Supplies
- ▶ Alarms and Detectors
- ▶ Light dimmers

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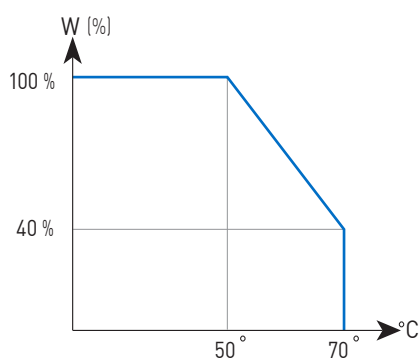
## 6-mm miniature carbon SMD reflow potentiometer

### ENVIRONMENTAL TESTING

	Test conditions [CEI 393-1]	$\Delta R$ - Typical test results
Electrical life	1.000h at 50°C; 0.1 W	±5%
Mechanical life	Standard version: 100 cycles at 10 to 15 cpm Long-life version: 10.000 cycles at 10 to 15 cpm	±3 % ( $R_n < 1\text{ M}\Omega$ ) ±4 % ( $R_n < 1\text{ M}\Omega$ )
Temperature coefficient	-25° C; +70° C	±300 ppm/°C ( $R_n \leq 100\text{K}$ )
Thermal cycling	16h at 85°C and 2h at -25°C	±2.5%
Damp heat	500h at 40°C and 95% relative humidity (RH)	±5%
Vibration	2h each plane at 10Hz - 55Hz	±2%
Storage	6 month at 23°C ±2°C and 50% RH	±2.5%

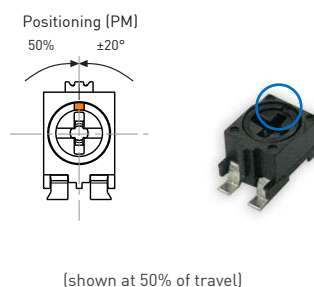
Out of range values may not comply with these results. Standard test conditions: temperature: 23°C ±2°C and 45% to 70% RH

### POWER RATING CURVE



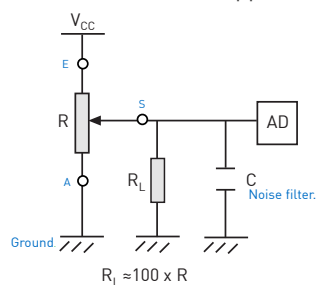
### POSITIONING

Marking in the rotor indicates the wiper's position.

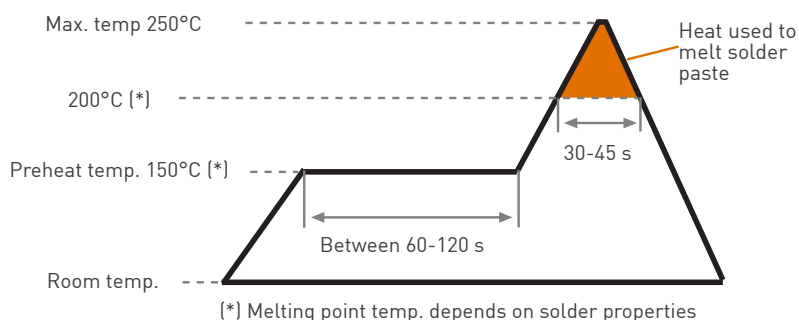


### RECOMMENDED CONNECTIONS

Recommended connection circuit for a position sensor or control application (voltage divider circuit electronic design).



### RECOMMENDED REFLOW PROFILE



The recommended reflow profile is provided as a guideline. Optimal profile may differ due to oven type, assembly layout or other design or process variables. Customers should verify actual device performance in their specific application and reflow process. Please contact Piher if you require additional support.

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### HOW TO ORDER

Example: N6L50T8S-102-3030

N6	L	50	--	S	---	---	R	--
Series	Mounting method	Terminal size	Packaging <sup>1</sup>	Mounting type	Ω-Value <sup>2</sup>	Tolerance <sup>3</sup>	Life	
	L - lay down	50 - 5.0mm	T0 = bulk T7 = embossed tape T8 = embossed tape (sealed for vacuum pickup)	S = SMD	251 = 250Ω ... 504 = 500KΩ	2020 = ±20% 3030 = ±30%	[empty] - 100 cycles E - 10k cycles	

1. T8 sealed for vacuum pickup with sticker on bottom side. Version with sticker on top side available on request.

2. Ω- Value: XXX - First two digits of Ω-value

XXX - Number of zeros

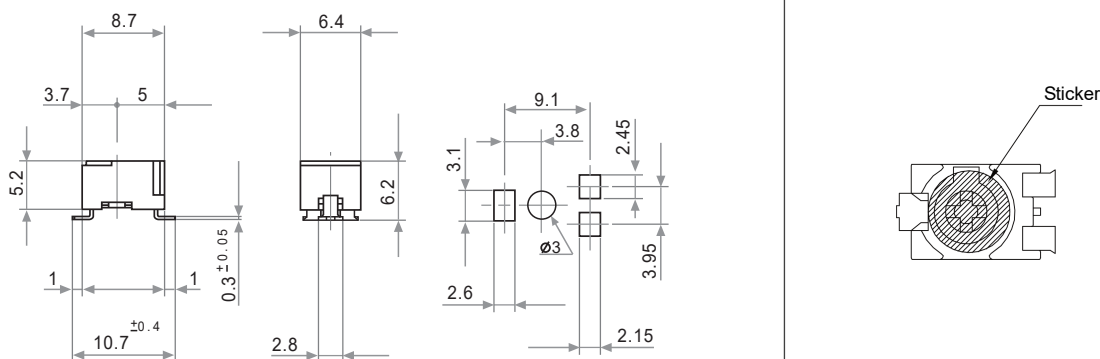
3. Tolerance: Default tolerance is ± 30%. For ±20% and others: check availability

### DIMENSIONS IN MM

#### SMD

N6L50 S

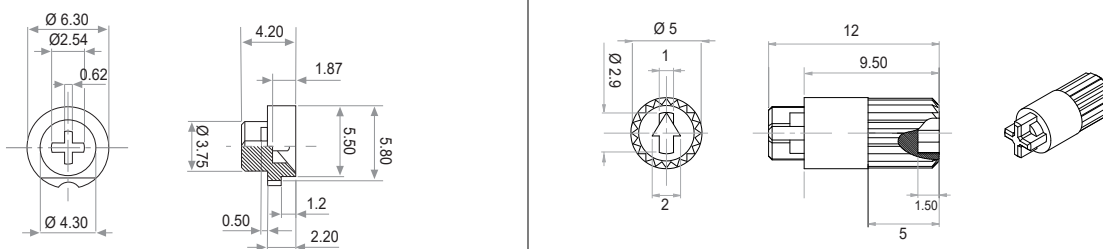
T8 with sticker at bottom side



### KNOBS / SHAFTS

Knob - Ref.: 5680 (colour: white)

Shaft - Ref.: 6133 (colour: black)



Please order both Knob and Shaft separately. If you wish to use your own custom plastic shaft/knob/actuator please contact Piher for advice about compatible materials.

For other rotor or knob/shaft colours please contact us at [info@piher.net](mailto:info@piher.net)



Download the STEP files here:  
[www.piher.net](http://www.piher.net)

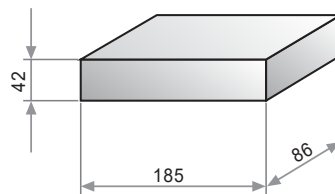
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### PACKAGING

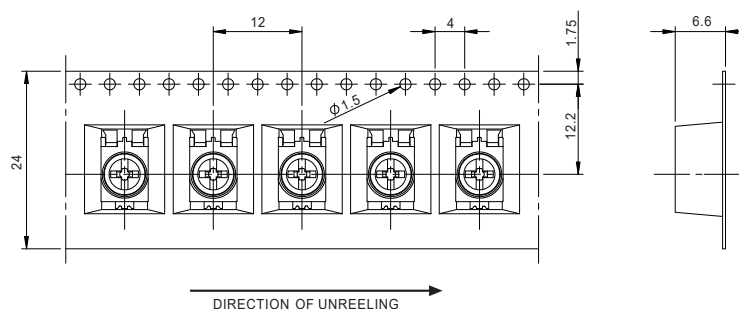
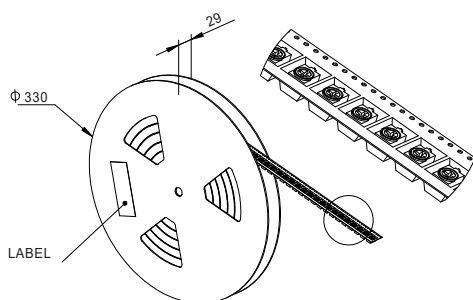
T0 - Bulk

500 units per box



### T7 / T8 - Embossed Tape

750 units/reel



### OUR ADVANTAGE

- ▶ Leading-edge innovative position sensing solutions
  - ▷ Contactless (Hall-effect and Inductive Technology)
  - ▷ Contacting (Potentiometers, Printed Electronics)
- ▶ Engineering design-in support
- ▶ All our products can be customized to fit target application and customer requirement
- ▶ Capability to move seamlessly from development to true high-volume production
- ▶ A global footprint with global engineering and commercial support
- ▶ One-stop shop not limited to position sensors (temperature, pressure, gas,...) through group collaboration
- ▶ Flexibility and entrepreneurship of a medium-sized company with the backing of Amphenol Corporation



Please always use the latest updated datasheets and 3D models published on our website.

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