COMPLIANT



# Long Life Cermet Potentiometer up to 2 Million Cycles

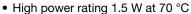


Their excellent performances are due to the use of a cermet-track sealed in a large case.

P13 interchangeability with RV6, combined with the excellent stability of its rated characteristics make it fully acceptable for industrial and professional uses.

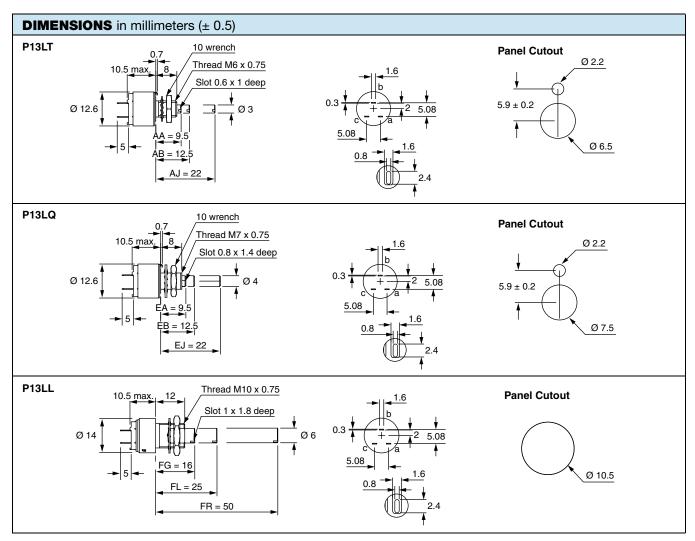
#### **FEATURES**

- 2 million cycles for bushing L and N
- 1 million cycles for bushing T, Q, O, and P



- Test according to CECC 41000 or IEC 60393-1
- Cermet element
- · Fully sealed case
- Mechanical strength
- · Custom designs on request
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

QUICK REFERENCE DATA	
Multiple module	No
Switch module	n/a
Detent module	n/a
Special electrical laws	A: linear, L: logarithmic, F: reverse logarithmic
Sealing level	IP 67
Lifespan	1M cycles





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ELECTRICAL SPECIFICATIONS					
Resistive element		Cermet			
Electrical travel		270° ± 10°			
Standard resistance value		1 kΩ, 5 kΩ, 10 kΩ, 50 kΩ			
Tolerance		± 20 %			
Taper		100 80 F 100 100 100 100 100 % CLOCKWISE SHAFT ROTATION			
Circuit diagram		a			
Power rating	Linear 1.5 W at 70 ° Logarithmic 0.75 W at 70		1.5 LIN. TAPE  NULLIN. TAPE  LOG. TAPE  LOG. TAPE  LOG. TAPE  O 0 20 4  AMBIENT	PER	
		Line	<b>-</b>	Non Lin	<b>T</b>
Standard resistance element data	Resista Valu (kΩ	Max. Powe	ear Taper  Max. Working Voltage (V)	Max. Power at 70 °C (W)	Max. Working Voltage (V)
Claires a rodotario comoni data	1 5 10 50		38.7 86.6 122 274	0.75 0.75 0.75 0.75	27.4 61.2 87 194
Temperature coefficient (typical)			± 150 ppm/°C	;	
Limiting element voltage (linear law)			350 V		
End resistance (typical)			1 Ω		
Dielectric strength (RMS)			2000 V		
nsulation resistance (300 V <sub>DC</sub> )		10 <sup>6</sup> MΩ			
	i	± 5 %			

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MECHANICAL SPECIFICATIONS			
Mechanical travel	300° ± 5°		
Operating torque (typical)	2 Ncm max.	2.85 oz. inch max.	
End stop torque			
Style T, Q	35 Ncm max.	3.1 lb inch max.	
Style L	80 Ncm max.	7.1 lb inch max.	
Tightening torque of mounting nut			
Style T, Q	150 Ncm max.	13.3 lb inch max.	
Style L	250 Ncm max.	22.1 lb inch max.	
Unit weight	6 g to 18 g max.	0.22 oz. to 0.64 oz.	
Terminals	e3: Pure	e Sn	

ENVIRONMENTAL SPECIFICATIONS			
Temperature range	-55 °C to +125 °C		
Climatic category	55/125/56		
Sealing	Fully sealed - container IP67		

OPTIONS		
Special feature command shaft	Length is measured from the mounting surface to the free end of the shaft aligned with the wiper within $\pm$ 10°. Special shafts are available, in accordanby customers. We recommend that customers should not machine tool s damage. Bending or torsion of terminals should also be avoided.	ce to drawings supplied
	Potentiometers P13LT and P13LL can be fitted with a device providing sealing bushing and the front panel. Their designation is P13LP and P13LN respective P13LPE and P13LNE.	
	Panel sealed version P13LP P13LPE: Including locating peg	
Panel sealing	0.7 Thread M6 x 0.75 Slot 0.6 x 1 deep  Ø 12.6  AA = 9.5 AB = 12.5 AJ = 22	Panel Cutout  3.9 ± 0.2 Ø 6.5
	Panel sealed version P13LN P13LNE: Including locating peg	
	13.5 max. 9.5 Slot 1 x 1.8 deep 0.3	Panel Cutout  0 1.5  6.9 ± 0.2  0 10.5

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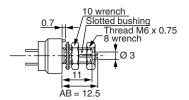
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### **OPTIONS**

On potentiometers equipped with a 3 mm Ø shaft, shaft locking can be obtained:

• Either by a taper nut tightening a slotted bushing. Ask for P13LO type. These devices are normally equipped with an AB type shaft (12.5 mm with a slot).

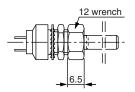
### P13LO



#### Shaft locking

Or by a tightening nut locked by a screw. Ask for ES1 type. On potentiometers equipped with a Ø 6 mm shaft, locking can be obtained by a taper nut applying pressure on a slotted notched washer. This device is supplied in a box as an accessory. Ask for DBAN. These devices are ordered separately. Please consult Vishay Sfernice.

#### P13LL DBAN



No locking on shaft Ø 4 mm.

## **MARKING**

### Printed:

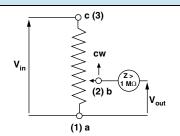
- · Vishay trademark
- Part number (including ohmic value code, tolerance code and taper)
- Manufacturing date code
- Marking of terminals a

### **APPLICATION NOTE**

The potentiometer shall be used in voltage divider with an impedance load at least 100 times higher than the total potentiometer nominal resistance value.

Advised load impedance:

1 M $\Omega$  min. for resistance range of 1 k $\Omega$  to 50 k $\Omega$ 



### **PACKAGING**

- In box of 8 pieces for shafts FR and FQ
- In box of 10 pieces for shafts FE, FL, FG, and FK
- In box of 15 pieces for shafts AJ and EJ
- In box of 25 pieces for shafts AB, AA, EA, and EB

Hardware: nuts, washer, and O-ring are separately supplied (not mounted on the potentiometer), in a small bag placed in the packaging.

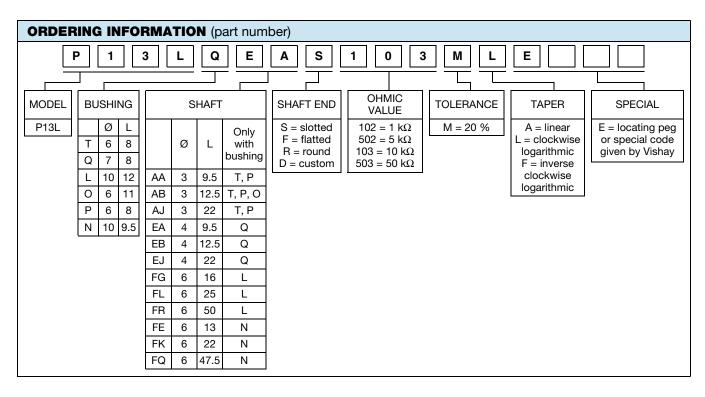


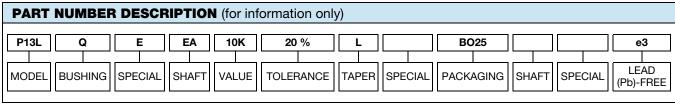
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PERFORMANCE					
		TYPICAL VALUES AND DRIFTS			
TESTS CONDITIONS		∆R <sub>T</sub> /R <sub>T</sub> (%)	∆R <sub>1-2</sub> /R <sub>1-2</sub> (%)	OTHER	
Electrical endurance	1000 h at rated power 90'/30' - ambient temperature 70 °C	± 20 %	± 20 %	-	
Climatic sequence	Phase A dry heat 125 °C Phase B damp heat Phase C cold -55 °C Phase D damp heat 5 cycles	± 0.5 %	± 1 %	-	
Damp heat, steady state	56 days, 40 °C 93 % HR	± 0.5 %	± 1 %	Dielectric strength: 1000 V Insulation resistance: $> 10^4 \text{ M}\Omega$	
Change of temperature	5 cycles, -55 °C at +125 °C	± 0.5 %	-	-	
Mechanical endurance	Bushings L and N: 2 000 000 cycles Bushings T, Q, O, and P: 1 000 000 cycles at rated power Turn angle ± 60° Temperature ± 20 °C	± 20 %	-	Independent linearity: ± 10 %	
Shock	50 g's at 11 ms, 3 successive shocks in 3 directions	± 0.1 %	± 0.2 %	-	
Vibration	10 Hz to 55 Hz, 0.75 mm or 10 <i>g</i> 's during 6 h	± 0.1 %	-	$\Delta V_{1-2}/V_{1-3} < \pm 0.2 \%$	

#### Note

· Nothing stated herein shall be construed as a guarantee of quality or durability









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# Vishay Sfernice

ACCESSORIES	
Additional Accessories (to order separately)	www.vishay.com/doc?51051

RELATED DOCUMENTS	
APPLICATION NOTES	
Potentiometers and Trimmers	www.vishay.com/doc?51001
Guidelines for Vishay Sfernice Resistive and Inductive Components	www.vishay.com/doc?52029



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