

## Fully Sealed Container Cermet Potentiometer Military and Professional Grade



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 military and professional uses.

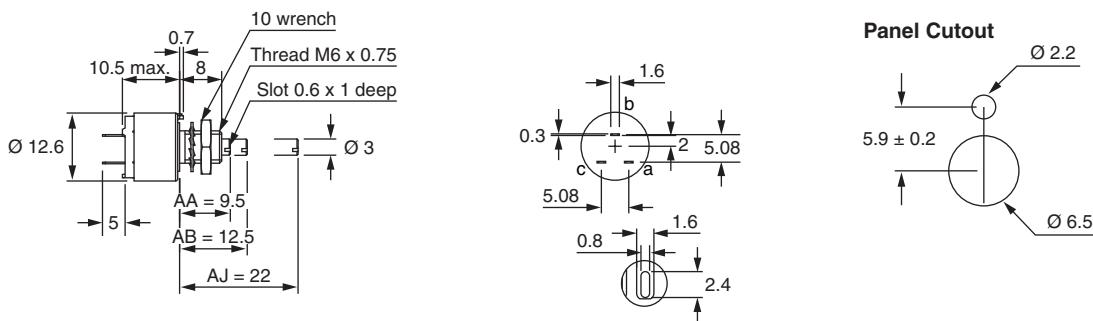
### FEATURES

- High power rating 1.5 W at 70 °C
- Product qualification:  
According to CECC 41 301-001 (A, B, C)
- Test according to CECC 41000 or IEC 60393-1
- GAM T1
- Cermet element
- Fully sealed case
- Tight temperature coefficient ( $\pm 75 \text{ ppm/}^{\circ}\text{C}$  typical)
- Mechanical strength
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

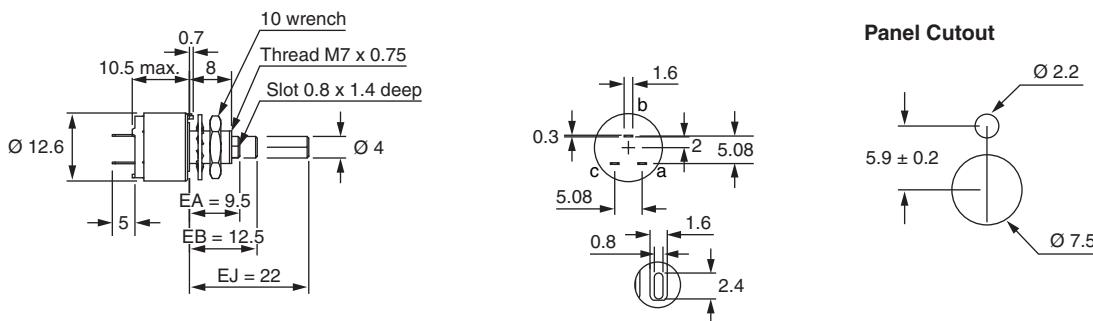


### DIMENSIONS in millimeters ( $\pm 0.5$ )

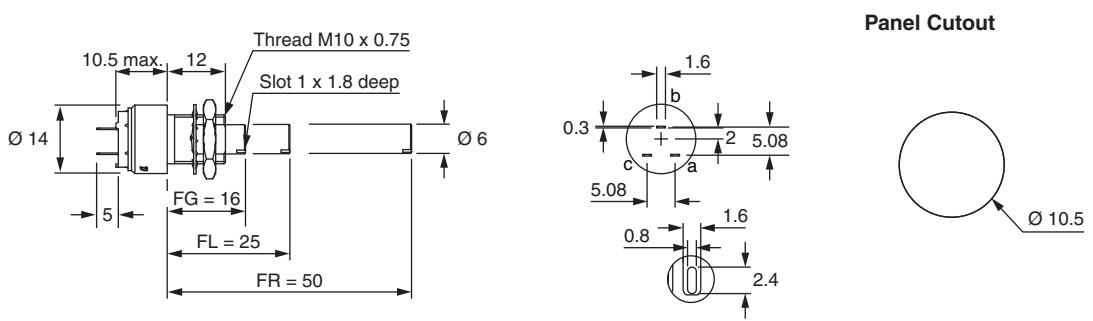
P13T-(PC32) A

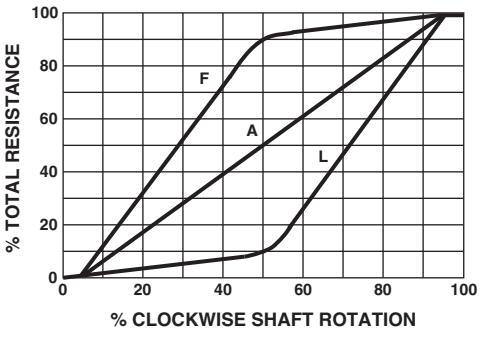
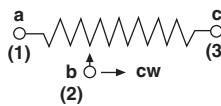


P13Q-B



P13L-(PC33) C

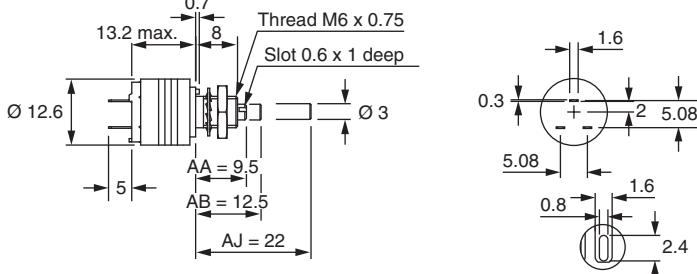
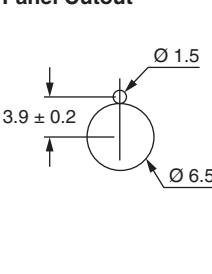
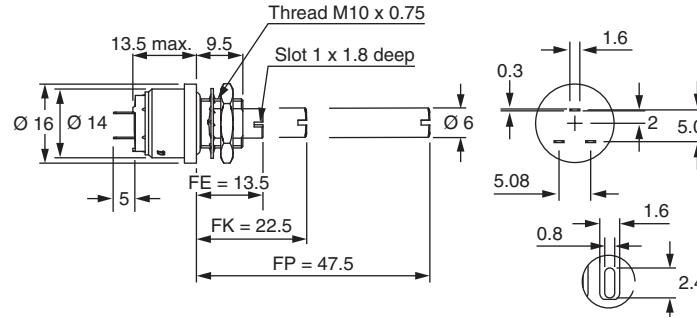
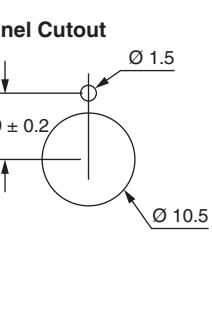
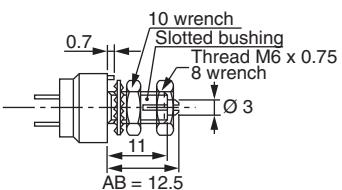
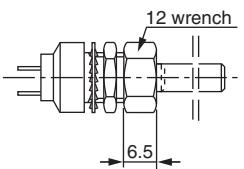


<b>ELECTRICAL SPECIFICATIONS</b>	
Resistive Element	Cermet
Electrical Travel	$270^\circ \pm 10^\circ$
Resistance Range	Linear Taper: $22\ \Omega$ to $10\ M\Omega$ Logarithmic Taper: $1\ k\Omega$ to $2.2\ M\Omega$
Standard Series e3	1, 2.2, 4.7 and on request 1, 2, 5
Tolerance	Standard: $\pm 20\%$ On Request: $\pm 10\%$ to $\pm 5\%$
Taper	 <p>The graph shows three curves: F (Fast), A (Average), and L (Slow). All curves start at (0,0) and end at (100, 100). Curve F rises most steeply, reaching 100% resistance at approximately 40% rotation. Curve A rises at a moderate rate, reaching 100% resistance at approximately 80% rotation. Curve L rises most gradually, reaching 100% resistance at approximately 100% rotation.</p>
Circuit Diagram	
Power Rating	Linear: 1.5 W at 70 °C Logarithmic: 0.75 W at 70 °C
Temperature Coefficient (Typical)	$\pm 150\ \text{ppm}/^\circ\text{C}$ For values $\geq 100\ \Omega$ and in temperature range $+ 20\ ^\circ\text{C}$ to $+ 70\ ^\circ\text{C}$ , the typical temperature coefficient is $\pm 75\ \text{ppm}/^\circ\text{C}$
Limiting Element Voltage (Linear Law)	350 V
Contact Resistance Variation	3 % $R_n$ or $3\ \Omega$
End Resistance (Typical)	1 $\Omega$
Dielectric Strength (RMS)	2000 V
Insulation Resistance (300 V <sub>DC</sub> )	$10^6\ M\Omega$
Independent Linearity (Typical)	$\pm 5\%$

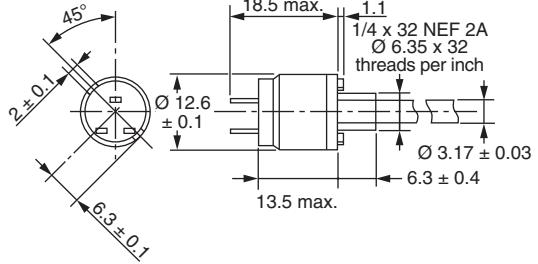
STANDARD RESISTANCE ELEMENT DATA							
STANDARD RESISTANCE VALUES	LINEAR TAPER			LOG. TAPER			TYPICAL TCR - 55 °C + 125 °C
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH WIPER	
Ω	W	V	mA	W	V	mA	ppm/°C
22	1.5	5.74	261				
47	1.5	8.4	177				
100	1.5	12.2	122				
220	1.5	18.2	82.6				
470	1.5	26.5	56.5				
1K	1.5	38.7	38.7	0.75	27	27	
2.2K	1.5	57.5	26.1	0.75	40	18	
4.7K	1.5	84	17.9	0.75	59	12	
10K	1.5	122.5	12.2	0.75	87	8.7	± 150
22K	1.5	182	8.26	0.75	128	5.8	
47K	1.5	265	5.65	0.75	187	3.9	
100K	1.22	350	3.5	0.75	273	2.7	
220K	0.56	350	1.6	0.56	350	1.6	
470K	0.26	350	0.74	0.26	350	0.74	
1M	0.12	350	0.35	0.12	350	0.35	
2.2M	0.05	350	0.16	0.05	350	0.16	
4.7M	0.026	350	0.074				
10M	0.012	350	0.035				

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 Sn	

ENVIRONMENTAL SPECIFICATIONS		
Temperature Range	- 55 °C to 125 °C	
Climatic Category	55/125/56	
Sealing	Fully sealed - Container IP67	

<b>OPTIONS</b>	
<b>Special Feature Command Shaft</b>	Length is measured from the mounting surface to the free end of the shaft. The screwdriver slot is aligned with the wiper within $\pm 10^\circ$ . Special shafts are available, in accordance to drawings supplied by customers. We recommend that customers should not machine tool shafts, in order to avoid damage. Bending or torsion of terminals should also be avoided.
<b>Panel Sealing</b>	<p>Potentiometers P13T and P13L can be fitted with a device providing sealing between the threaded bushing and the front panel. Their designation is P13P and P13N respectively or with a locating peg P13P...E and P13N...E.</p> <p><b>Panel sealed version</b>  <b>P13P</b>  <b>P13P...E: Including locating peg</b></p>  <p><b>Panel Cutout</b></p>  <p><b>Panel sealed version</b>  <b>P13N</b>  <b>P13N...E: Including locating peg</b></p>  <p><b>Panel Cutout</b></p> 
<b>Shaft Locking</b>	<p>On potentiometers equipped with a 3 mm Ø shaft, shaft locking can be obtained:</p> <ul style="list-style-type: none"> <li>Either by a taper nut tightening a slotted bushing. Ask for P13O type. These devices are normally equipped with an AB type shaft (12.5 mm with a slot).</li> </ul> <p><b>P13O</b></p>  <ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>P13L DBAN</b></p>  <p>No locking on shaft Ø 4 mm.</p>

**OPTIONS**

<b>RV6 (P13T-F55)</b>	Product in conformity with RN6/MIL-R-94/3G <b>P13T-F55</b> 
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**MARKING**

Printed:

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

**PACKAGING**

- In box

**PERFORMANCE**

TESTS	CONDITIONS	REQUIREMENTS			TYPICAL VALUES AND DRIFTS		
		$\Delta R_T/R_T$ (%)	$\Delta R_{1-2}/R_{1-2}$ (%)	OTHER	$\Delta R_T/R_T$ (%)	$\Delta R_{1-2}/R_{1-2}$ (%)	OTHER
<b>Electrical Endurance</b>	1000 h at rated power 90°/30° - ambient temp. 70 °C	± 10 %	-	Contact res. variation: < 7 % Rn	± 1 %	-	Contact res. variation: < 3 % Rn
<b>Climatic Sequence</b>	Phase A dry heat 125 °C Phase B damp heat Phase C cold - 55 °C Phase D damp heat 5 cycles	± 10 %	± 10 %	-	± 0.5 %	± 1 %	-
<b>Damp Heat, Steady State</b>	56 days 40 °C 93 % HR	± 10 %	± 10 %	Dielectric strength: 250 V Insulation resistance: > 100 MΩ	± 0.5 %	± 1 %	Dielectric strength: 1000 V Insulation resistance: > 10 <sup>4</sup> MΩ
<b>Change of Temperature</b>	5 cycles - 55 °C at + 125 °C	± 3 %	-	-	± 0.5 %	-	-
<b>Mechanical Endurance</b>	25 000 cycles	± 10 %	-	Contact res. variation: < 7 % Rn	± 3 %	-	Contact res. variation: < 2 % Rn
<b>Shock</b>	50 g's at 11 ms 3 successive shocks in 3 directions	± 2 %	-	-	± 0.1 %	± 0.2 %	-
<b>Vibration</b>	10 Hz to 55 Hz 0.75 mm or 10 g's during 6 h	± 2 %	-	-	± 0.1 %	-	$\Delta V_{1-2}/V_{1-3} < \pm 0.2 \%$

ORDERING INFORMATION (part number)																						
P	1	3	P	A	B	1	0	3	M	L	B	1	7	E								
MODEL	BUSHING								SHAFT													
P13									OHMIC VALUE	TOLERANCE												
	Ø	L	Old Codes								M = 20 %	TAPER										
T 6 8		T	Ø	L	Only with Bushing								A = Linear	PACKAGING								
Q 7 8		Q	AA 3	9.5	T, P								K	Linear law from 22 Ω to 10 MΩ	SPECIAL							
L 10 12		V	AB 3	12.5	T, P, O								L, M	Logarithmic law from 1 kΩ to 2.2. MΩ	E = Locating peg or special code given by Vishay							
O 6 11		H	AJ 3	22	T, P								R	103 = 10 kΩ								
P 6 8		TP	EA 4	9.5	Q								E									
N 10 9.5		VP	EB 4	12.5	Q								F									
			EJ 4	22	Q								G									
			FG 6	16	L								AC									
			FL 6	25	L								AM									
			FR 6	50	L								AL									
			FE 6	13	N								AC									
			FK 6	22	N								AM									
			FQ 6	47	N								AL									

PART NUMBER DESCRIPTION (for information only)													
P13	T	PE	M	10K	20 %	L		BO					e3
MODEL	BUSHING	SPECIAL	SHAFT	OHMIC VALUE	TOL.	TAPER	SPECIAL	PACKAGING	SPECIAL	SHAFT	SPECIAL	LEAD (Pb)-FREE	

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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

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### Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
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- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
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- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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## JONHON

«JONHON» (основан в 1970 г.)

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«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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