Fully Sealed Container Cermet Potentiometers
Military and Professional Grade

P13V

P13T

P13 potentiometers fully conform to CECC 41301-001 specification. 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

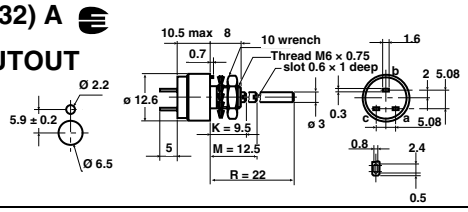
- High power rating 1.5 Watt at 70 °C
- CECC 41 301-001 (A, B, C)
- GAM T1
- Fully sealed case
- Tight temperature coefficient (± 75 ppm/°C typical)
- Mechanical strength

RoHS COMPLIANT

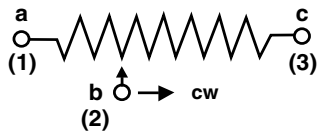
DIMENSIONS in millimeters

P13T - (PC32) A

PANEL CUTOUT

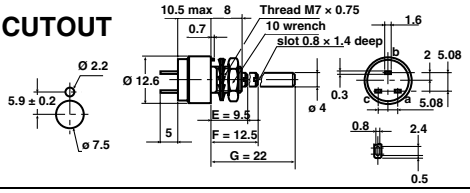


CIRCUIT DIAGRAM

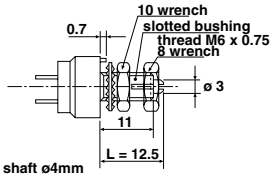


P13Q - B

PANEL CUTOUT



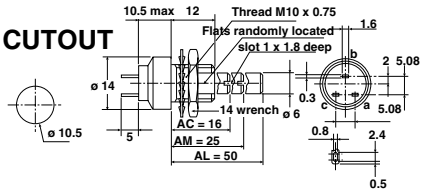
P13H



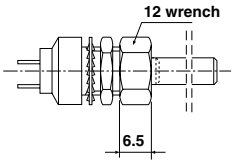
No locking on shaft ø4mm

P13V - (PC33) C

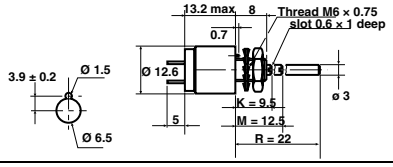
PANEL CUTOUT



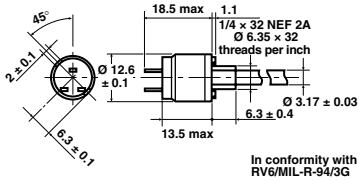
P13V DBAN



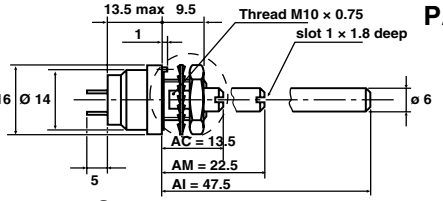
Panel sealed version
P13TP - P13TPE
TPE: Including locating ped



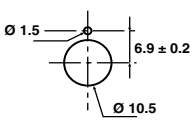
P13T - F55



Panel sealed version
P13VP - P13VPE
VPE: Including locating ped



PANEL CUTOUT



Undergoes European Quality Insurance System

ELECTRICAL SPECIFICATIONS		
Resistive Element		cermet
Electrical Travel		270° ± 10°
Resistance Range	**Linear Law**	22 Ω to 10 MΩ
	Logarithmic Laws	100 Ω to 2.2 MΩ
Standard series E3		1 - 2.2 - 4.7 and on request 1 - 2 - 5
Tolerance	**Standard**	± 20 %
	On Request	± 10 % - ± 5 %
Power Rating	**Linear**	1.5 W at + 70 °C
	Logarithmic	0.75 W at + 70 °C
Temperature Coefficient		See Standard Resistance Element Data
Limiting Element Voltage (Linear Law)		350 V
Contact Resistance Variation		3 % Rn or 3 Ω
End Resistance (Typical)		1 Ω
Dielectric Strength (RMS)		2000 V
Insulation Resistance (500 VDC)		10^6 MΩ

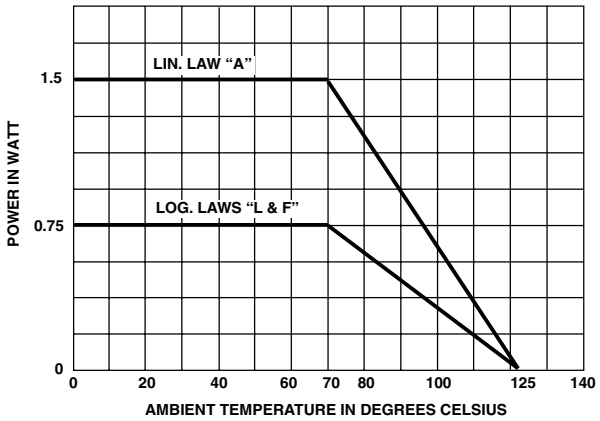
MECHANICAL SPECIFICATIONS

Mechanical Travel	300° ± 5°
Operating Torque (max. Ncm)	2 typical
End Stop Torque (max. Ncm)	style T.Q.: 35 - V: 80
Tightening Torque (max. Ncm)	T.Q.: 150 - V: 250
Unit Weight (max. g)	6 to 18

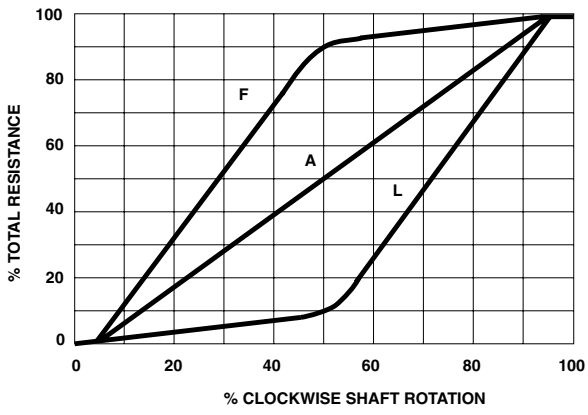
ENVIRONMENTAL SPECIFICATIONS

Temperature Range	- 55 °C to + 125 °C
Climatic Category	55/100/56
Sealing	fully sealed container IP67

POWER RATING CHART



RESISTANCE LAWS



TEMPERATURE COEFFICIENT

For values ≥ 100 ohms and in the temperature range + 20 °C to + 70 °C, the typical temperature coefficient is ± 75 ppm/°C.

PERFORMANCE

NF C 83-253				TYPICAL VALUES AND DRIFTS	
TESTS	CONDITIONS	$\frac{\Delta RT}{RT}$ (%) REQUIREMENTS	$\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)	$\frac{\Delta RT}{RT}$ (%)	$\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)
Climatic Sequence	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 %
Long Term Damp Heat	56 days 40 °C 93 % RH	± 10 % Dielectric strength: 250 V Insulation resistance: > 100 MΩ	± 10 %	± 0.5 % Dielectric strength: 1000 V Insulation resistance: > 10^4 MΩ	± 1 %
Rotational Life	25 000 cycles	± 10 % Contact res. variation: < 7 % Rn		± 3 % Contact res. variation: < 2 % Rn	
Load Life	1000 h at rated power 90'/30' - ambient temp. 70 °C	± 10 % Contact res. variation: < 7 % Rn		± 1 % Contact res. variation: < 3 % Rn	
Rapid Temperature Change	5 cycles - 55 °C at + 125 °C	± 3 %		± 0.5 %	
Shocks	50 g at 11 ms 3 successive shocks in 3 directions	± 2 %		± 0.1 %	± 0.2 %
Vibrations	10 - 55 Hz 0.75 mm or 10 g during 6 hours	± 2 %		± 0.1 %	$\frac{\Delta V_{1-2}}{V_{1-3}}$ < ± 0.2 %

STANDARD RESISTANCE ELEMENT DATA

STANDARD RESISTANCE VALUES	LINEAR LAW			LOGS LAW			TCR - 55 °C + 125 °C
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. WIPER CUR.	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. WIPER CUR.	
Ω	W	V	mA	W	V	mA	ppm/°C
22	1.5	5.74	261				0
47		8.4	177				+ 200
100		12.2	122				
220		18.2	82.6				
470		26.5	56.5				
1K		38.7	38.7	0.75	27	27	
2.2K		57.5	26.1		40	18	
4.7K		84	17.9		59	12	
10K		122.5	12.2		87	8.7	
22K		182	8.26		128	5.8	
47K	1.5	265	5.65		187	3.9	± 100
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				

MARKING

Printed:
- VISHAY trademark
- series
- style
- ohmic value (in Ω, kΩ or MΩ)
- tolerance (in %)
- resistance law
- manufacturing date
- marking of terminals a

SPECIAL FEATURES
PANEL SEALING

Potentiometers P13T and P13V can be fitted with a device providing sealing between the threaded bushing and the front panel. Their designation is P13TP and P13VP respectively or with a locating peg P13TPE and P13VPE.

SHAFT

Shaft lengths are measured from the mounting surface to the free end of the potentiometer. Special shafts are available, provided customer supplies a drawing.

The shaft slot is aligned to the wiper within ± 10°.

SHAFT LOCKING

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 P13H type. These devices are normally equipped with an L type shaft (12.5 mm with a slot),
- 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.

ORDERING INFORMATION

P13	T	P OR PE	M	22 kΩ	± 20 %	A	XX	BO
SERIES	STYLE	PANEL SEALING	SHAFT	OHMIC VALUE	TOLERANCE	LAW	SPECIAL FEATURES	PACKAGING
	T 6 mm dia, 3 mm dia. shaft		**K** 9.5 mm, slotted **M** 12.5 mm, slotted **R** 22 mm, plain		**± 20 %** standard **± 10 %** on request	**A** Linear **L** clockwise logarithmic **F** inverse clockwise logarithmic	F55 DBAN F32 (PCB style)	
	Q 7 mm dia, 4 mm dia. shaft		**E** 9.5 mm, slotted **F** 12.5 mm, slotted **G** 22 mm, plain					
	V 10 mm dia, 6 mm dia. shaft		**AC** 16 mm, slotted **AM** 25 mm, slotted **AL** 50 mm, plain					
	locking **H** 6 mm dia, 3 mm dia. shaft		**L** 12.5 mm, slotted **AP** special shafts					
	VP 9.5 mm dia, 6 mm dia. shaft		**AC** 13 mm, slotted **AM** 22 mm, slotted **AL** 47 mm, plain					

SAP PART NUMBERING GUIDELINES

P	1	3	T	A	B	2	2	3	M	A	B	1	7				
MODEL			BUSHING	SHAFT		OHMIC VALUE			TOL	LAW	PACKAGING			SPECIAL (IF APPLICABLE)			

See the end of this data book for conversion tables

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.