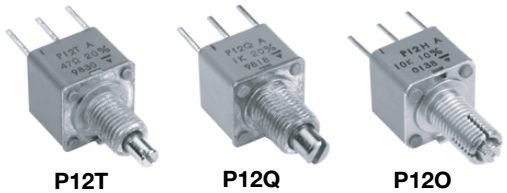
Fully Sealed Container Cermet Potentiometer Professional Grade



P12T P12Q P12O

FEATURES

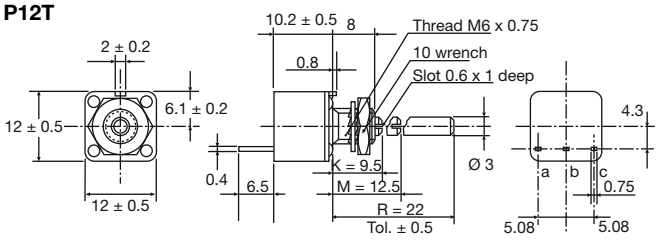
- 1 W at 70 °C
- Cermet element
- Test according to CECC 41000 or IEC 60393-1
- Full sealing
- Mechanical strength
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

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	25K cycles

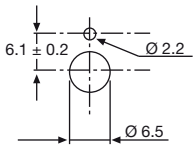
DIMENSIONS in millimeters ± 0.5 mm

P12T

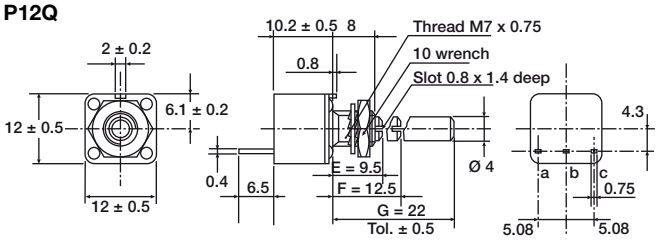


Panel cutout

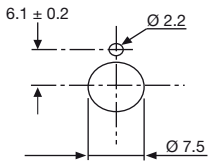
Panel thickness: 4 max.



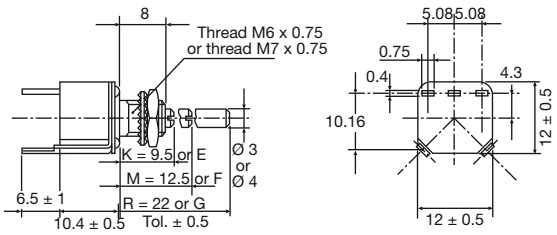
P12Q



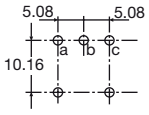
Panel cutout



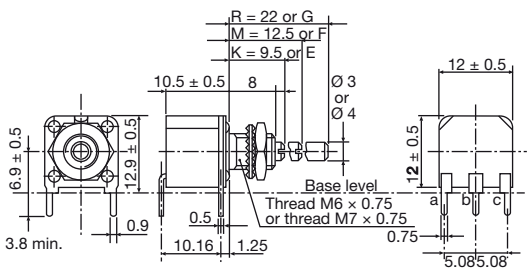
Leads Y



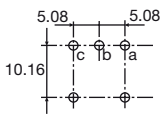
Terminal spacing

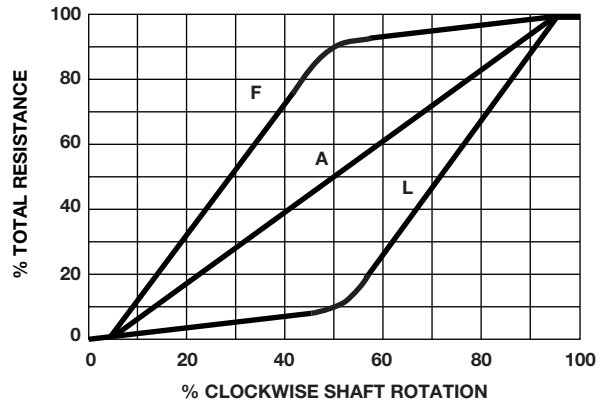
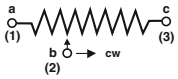
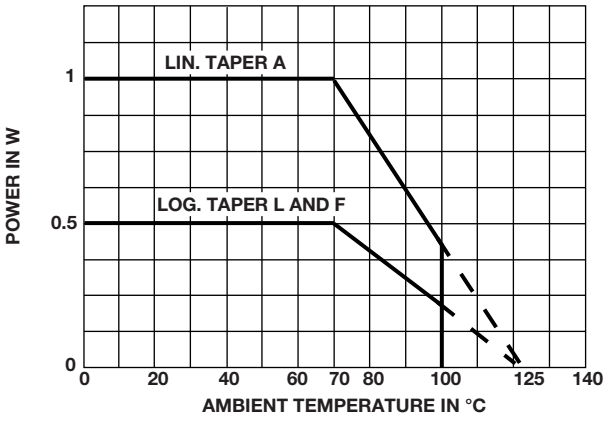


Leads X



Terminal spacing



ELECTRICAL SPECIFICATIONS		
Resistive element		Cermet
Electrical travel		270° ± 10°
Resistance range	**linear taper**	22 Ω to 10 MΩ
	logarithmic taper	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 %
Taper		
Circuit diagram		
Power rating	**linear** 1 W at +70 °C **logarithmic** 0.5 W at +70 °C	
Temperature coefficient		See Standard Resistance Element Data
Limiting element voltage (linear taper)		350 V
Contact resistance variation (typical)		3 % or 3 Ω
End resistance (typical)		1 Ω
Dielectric strength (RMS)		2000 V
Insulation resistance (500 V_{DC})		10^6 MΩ

MECHANICAL SPECIFICATIONS		
Mechanical travel		300° ± 5°
Mechanical travel		2 Ncm max.
End stop torque	bushing O bushings T and Q	15 Ncm max. 35 Ncm max.
Tightening torque		150 Ncm max.
Unit weight		7.6 g to 10 g max.

ENVIRONMENTAL SPECIFICATIONS	
Operating temperature range	-55 °C to +125 °C
Climatic category	55/100/56
Sealing	Fully sealed - Container IP67

PERFORMANCE

TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS		
		$\Delta R_T/R_T$ (%)	$\Delta R_{1\text{-}2}/R_{1\text{-}2}$ (%)	OTHER
Electrical endurance	1000 h at rated power 90'/30' - ambient temp. 70 °C	± 1 %	-	Contact res. variation: < 3 % Rn
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 % RH	± 0.5 %	± 1 %	Dielectric strength: 1000 V_{RMS} Insulation resistance: > 10^4 MΩ
Change of temperature	5 cycles -55 °C at +125 °C	± 0.5 %	-	-
Mechanical endurance	25 000 cycles	± 3 %	-	Contact res. variation: < 2 % Rn
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 *g*'s during 6 h	± 0.1 %	-	$\Delta V_{1\text{-}2}/V_{1\text{-}3} \leq$ ± 0.2 %

Note

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

STANDARD RESISTANCE ELEMENT DATA

STANDARD RESISTANCE VALUES	LINEAR TAPER			LOGS TAPER			TYPICAL TCR -55 °C +125 °C
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. WIPER CURRENT	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. WIPER CURRENT	
Ω	W	V	mA	W	V	mA	ppm/°C
22	1	4.69	213.2				± 150
47	1	6.85	145.8				
100	1	10	100				
220	1	14.8	67.4				
470	1	21.6	46.1				
1K	1	31.6	31.6	0.5	22.4	22.4	
2.2K	1	46.9	21.3	0.5	33.2	15.1	
4.7K	1	63.5	14.5	0.5	48.5	10.3	
10K	1	100	10	0.5	79.7	7.07	
22K	1	148.3	6.7	0.5	105	4.77	
47K	1	216.7	4.6	0.5	153	3.26	
100K	1	316.2	3.16	0.5	224	2.24	
220K	0.56	350	1.59	0.5	332	1.51	
470K	0.26	350	0.75	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	0.02	350	0.07				
10M	0.01	350	0.01				

MARKING

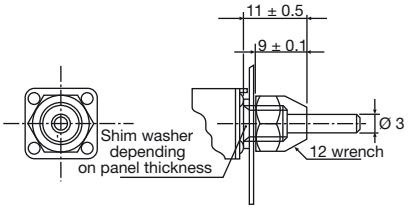
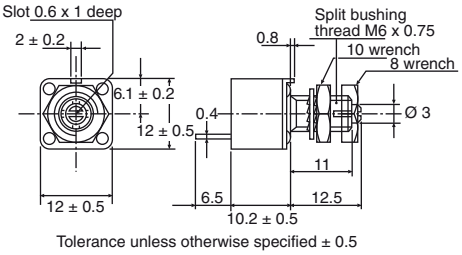
- Vishay trademark
- Part number (including ohmic value and tolerance code)
- Manufacturing date
- Marking of terminals: 1 or a

PACKAGING

- For shafts AJ, EJ: In box of 15 pieces (code B1)
- For other shafts: In box of 25 pieces (code B2)

OPTIONS

SPECIAL FEATURES

Shafts	Lengths are measured from the mounting surface to the free end of shaft. Shaft slot is aligned with the wiper within ± 10°. Special shafts are available, in accordance with drawings supplied by customers. We recommend customers not to machine shafts, in order to avoid damage. Bending or torsion of terminals should be avoided.
Shaft and panel sealing hardware	The type P12T with AB (old code M) or AJ (old code R) shaft can be provided with an optional "DE" sealing hardware which ensures sealing of both the shaft and the mounting panel. DE sealing hardware can be supplied in a separate bag. **DE shaft and panel sealing hardware** 
Shaft locking	The shaft locking bushing is available only with P12O potentiometers. Torque applied to locking nuts should not exceed 15 Ncm. **P12OL with spindle locking nut**  Tolerance unless otherwise specified ± 0.5

ORDERING INFORMATION (part number)

P	1	2	O	A	B	S	4	7	2	M	A	B	2	D	E		

MODEL

P12

BUSHING

	Ø	L	Old codes
T	6	8	T
Q	7	8	Q
O	6	11	H

SHAFT

	Ø	L	Old codes
AA	3	9.5	K
AB	3	12.5	L, M
AJ	3	22	R
EA	4	9.5	E
EB	4	12.5	F
EJ	4	22	G
AP	Custom shaft		

LEADS

S = STD
X
Y

OHMIC VALUE

Linear from 22 Ω to 10 MΩ

Logarithmic from 100 Ω to 2.2 MΩ

472 = 4.7 kΩ

TOLERANCE

M = 20 %
On request:
K = 10 %

TAPER

A = linear
L = clockwise logarithmic
F = inverse clockwise logarithmic

PACKAGING

Shafts AJ and EJ: B1 = box of 15 pieces
Other shafts: box of 25 pieces

SPECIAL

DE = shaft and panel sealed hardware or special code given by Vishay

PART NUMBER DESCRIPTION (for information only)

P12	H			L	4K7	20 %	A		BO	DE			e3
MODEL	BUSHING	LEADS	SPECIAL	SHAFT	VALUE	TOLERANCE	TAPER	SPECIAL	PACKAGING	SPECIAL	AP Nº	SPECIAL	LEAD FINISH

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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