Knob Potentiometer

The P16 is a revolutionary concept in panel mounted potentiometers. This unique design consists of a knob driving and incorporating a cermet potentiometer. Only the mounting hardware and terminals are situated on the back side of the panel reducing to a minimum the required clearance.

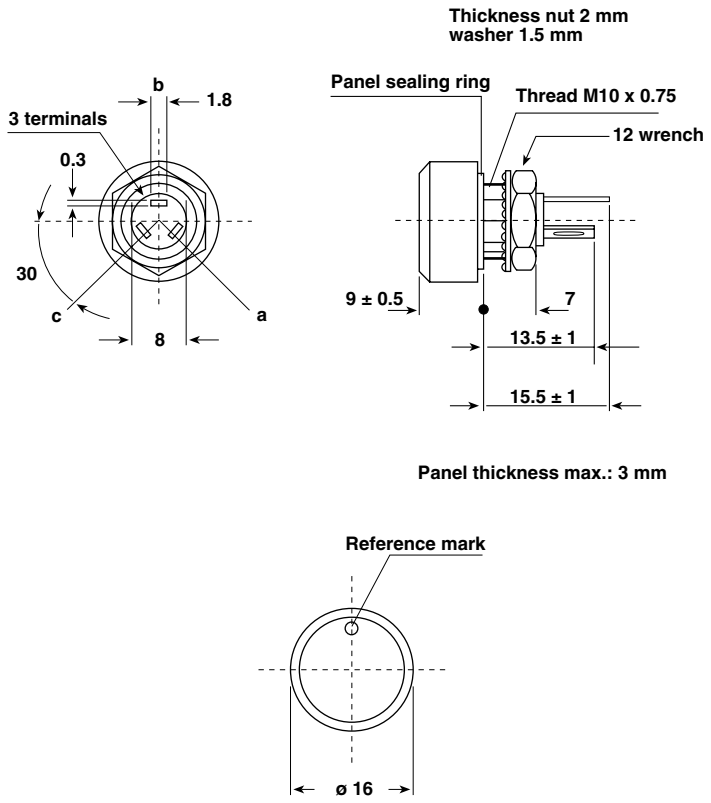
FEATURES

- 1 W at 40 °C
- Test according to CECC 41300
- **P16 -** version for professional and industrial applications
- **PA16 -** version for professional audio applications
- Compact (integrated)
- Minimum clearance required
- Safety in use due to good insulation: > 10^4 MΩ 500 V_{DC}
- High dielectric strength: 2500 V_{RMS}
- Fully sealed and panel sealed
- Metallic or plastic knob options
- Cermet or conductive plastic

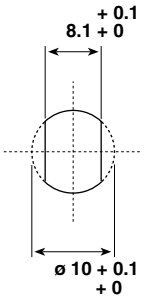
RoHS COMPLIANT

DIMENSIONS in millimeters (± 0.5 mm)

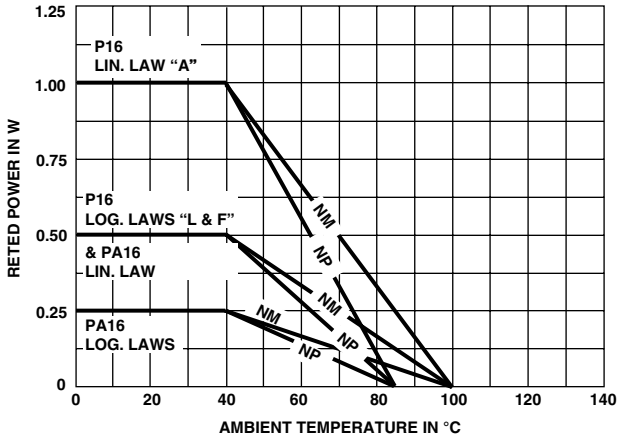
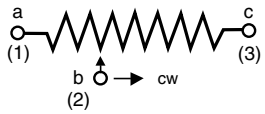
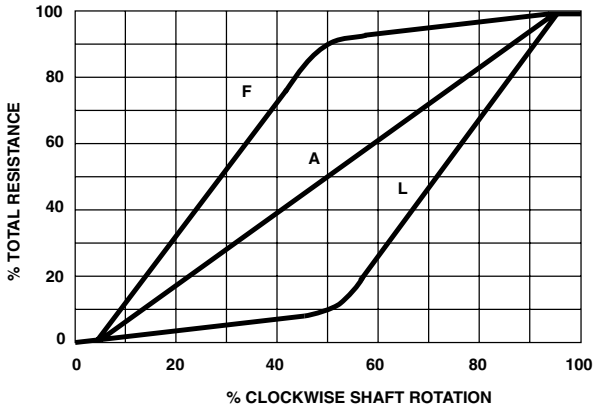
P16 - PA16



PANEL CUTOUT



ELECTRICAL SPECIFICATIONS

	P16	PA16
Resistive Element	cermet	conductive plastic
Electrical Travel	270° ± 10°	270° ± 10°
Power Rating Chart		
Circuit Diagram		
Resistance Laws		
Resistance Range — **linear law**	22 Ω to 10 MΩ	1 kΩ to 1 MΩ
Resistance Range — **logarithmic laws**	100 Ω to 2.2 MΩ	470 Ω to 500 kΩ
Standard Series E3	1 - 2.2 - 4.7 and on request 1 - 2 - 5	1 - 2.2 - 4.7
Tolerance — **standard**	± 20 %	± 20 %
Tolerance — **on request**	± 10 %	± 10 % (1 kΩ to 100 kΩ)
Power Rating — **linear**	1 W at + 40 °C	0.5 W at + 40 °C
Power Rating — **logarithmic**	0.5 W at + 40 °C	0.25 W at + 40 °C
Temperature Coefficient (Typical)	± 150 ppm/°C	± 1000 ppm/°C
Dielectric Strength (RMS)	2500 V	2500 V
Limiting Element Voltage (Linear Law)	350 V	350 V
Insulation Resistance (500 VDC)	≥ 10^4 MΩ	≥ 10^4 MΩ
Contact Resistance Variation	3 % Rn or 3 Ω	2 % Rn or 3 Ω
End Resistance (Typical)	1 Ω	1 Ω
Insulation Resistance (500 VDC)	10^6 MΩ	10^6 MΩ

MECHANICAL SPECIFICATIONS	
Mechanical Travel	300° ± 5°
Operating Torque	2 Ncm typical
End Stop Torque	25 Ncm maximum
Max. Tightening Torque of Mounting Nut	250 Ncm maximum
Unit Weight	4.5 g typical

ENVIRONMENTAL SPECIFICATIONS		
	Metallic Knob	**Plastic Knob**
Temperature Range	- 40 °C to 125 °C	- 40 °C to 85 °C
Climatic Category	40/100/56	40/85/56
Sealing	sealed container and panel sealed	
Protection Grades	IP67	

MARKING

- VISHAY trademark
- Ohmic value
- Tolerance (in %)
- Resistance law
- Manufacturing date

PACKAGING

- Carton box of 20 pieces

CONTROL KNOB

Black metallic knob (NM).

Black plastic knob (NP).

For white and blue color see ordering information.

Other dimensions, shapes, colors of control knobs are manufactured on request - please consult VISHAY.

Other reference marks (shapes, colours) and legends can be printed on plastic knob on request - please consult VISHAY.

P16 STANDARD RESISTANCE ELEMENT DATA

STANDARD RESISTANCE VALUES	LINEAR LAW			LOG LAW			TYP. TCR - 40 °C + 85 °C
	MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER	
Ω	W	V	mA	W	V	mA	10^{-6}/°C
22	1	4.69	213				
47		6.85	146				
100		10	100	0.5	7.1	71	
220		14.8	67.4		10.5	48	
470		21.7	46.1		15.3	32.6	
1K		31.6	31.6		22.4	22.4	
2.2K		46.9	21.3		33.2	15.1	
4.7K		68.5	14.6		48.5	10.3	
10K		100	10		70.7	7.07	
22K		148	6.74		105	4.77	± 150
47K		217	4.61		153	3.26	
100K	1	316	3.16		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	0.056	350	0.16	
4.7M	0.02	350	0.07				
10M	0.01	350	0.012				

PA16 STANDARD RESISTANCE ELEMENT DATA

STANDARD RESISTANCE VALUES	LINEAR LAW			LOG LAW			TYP. TCR - 55°C + 125 °C
	MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 70 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER	
Ω	W	V	mA	W	V	mA	ppm/°C
470				0.25	10.8	23.1	
1K	0.5	22.4	22.4		15.8	16	
2.2K		33.2	15.1		23.5	11	
4.7K		48.5	10.3		34.3	7	
10K		79.7	7.07		50.0	5.0	
22K		105	4.77		74	3.4	± 1000
47K		153	3.26		108	2.3	
100K		224	2.24		158	1.6	
220K	0.5	332	1.51		235	1.1	
470K	0.26	350	0.74	0.25	343	0.7	
1M	0.12	350	0.35				

PERFORMANCE

TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS	
		$\Delta R_T/R_T$ (%)	$\Delta R_{1-2}/R_{1-2}$ (%)
Load Life	1000 h at Pn 90'/30' cycle at + 40 °C	± 5 % Insulation resistance: > 10^4 MΩ Contact res. variation: < 2 % Rn	-
Long Term Damp Heat	56 days 40 °C, 93 % HR	± 2 % Insulation resistance: > 10^4 MΩ	± 1 %
Shock	50 g at 11 ms 3 successive shocks in 3 axes	± 0.2 %	± 0.5 %
Vibration	10 - 55 Hz 0.75 mm or 10 g during 6 h	± 0.2 %	$\Delta V_{1-2}/\Delta V_{1-3} \leq$ ± 0.5 %
Rotational Life	50 000 cycles	± 5 % Contact res. variation: < 2 % Rn	-

SAP ORDERING INFORMATION

P	1	6	N	P	2	2	3	M	A	B	1	5						

MODEL	STYLE	OHMIC VALUE	TOLERANCE	TAPER	PACKAGING CODE	SPECIAL NUMBER
P16 = Cermet **PA16** = Conductive plastic	**NM**: Metallic black **NP**: Plastic black **WM**: Metallic white **WP**: Plastic white **BP**: Plastic blue	**223** = 22 kΩ for ohmic value range see ELECTRICAL SPECIFICATION	**M** = ± 20 % on request **K** = ± 10 %	**A**: Linear **L**: Clockwise logarithmic **F**: Inverse clockwise logarithmic	**B15** = Box of 20 pieces	(if applicable) given by VISHAY for custom design

PART NUMBER DESCRIPTION (for information only)

P16	NP	22 kΩ	20 %	A		BO20		e3
MODEL	STYLE	VALUE	TOLERANCE	TAPER	SPECIAL	PACKAGING	SPECIAL	LEAD (Pb)-FREE

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