

Potentiometer Knobs



P16P - PA16P
Plastic knob



P16 - PA16
Metallic knob

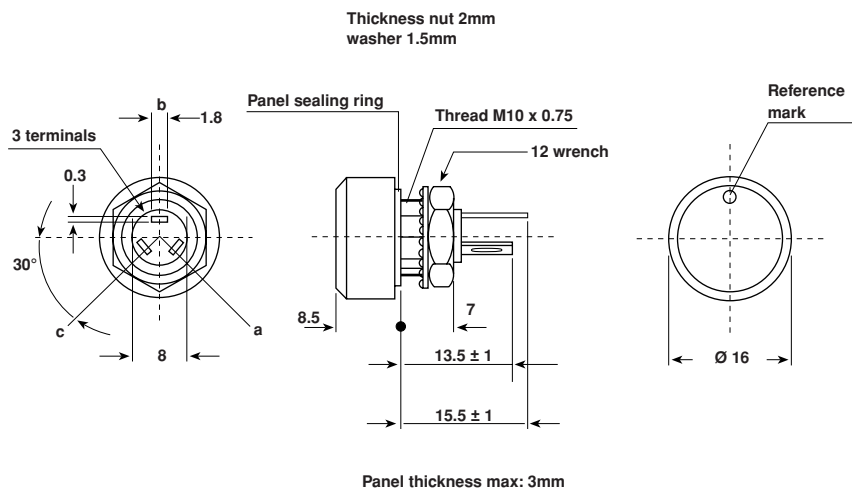
The P16 is a revolutionary concept in panel mounted potentiometers. This unique design consists of a knob driving and incorporating a cermet potentiometer. Only the mounting hardware and terminals are situated on the back side of the panel reducing to a minimum the required clearance.

FEATURES

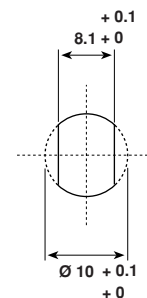
- 1 Watt at 40°C
- CECC 41300
- **P16 - P16P** version for professional and industrial applications
- **PA16 - PA16P** version for professional audio applications
- Compact (integrated knob)
- Minimum clearance requirement
- Safety in use due to good insulation: $\geq 10^4 M\Omega$ 500V_{DC}
- High dielectric strength : 2500 V_{RMS}
- Hermetically sealed and panel sealed

DIMENSIONS in millimeters

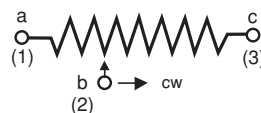
P16 - PA16



PANEL CUTOUT



CIRCUIT DIAGRAM



**ELECTRICAL SPECIFICATIONS**

	P16	P16P
Resistive Element	cermet	
Electrical Travel	270° ± 10°	
Resistance Range		
Linear Law	22Ω to 10MΩ	
Logarithmic Laws	100Ω to 2.2MΩ	
Standard Series E3	1 - 2.2 - 4.7 and on request: 1 - 2 - 5	
Tolerance	Standard	± 20%
	On Request	± 10%
Power Rating	Linear	1 W at + 40°C
	Logarithmic	0.5 W at + 40°C
Temperature Coefficient	See Standard Resistance Element Data	
Dielectric Strength (RMS)	2500V	
Limiting Element Voltage (Linear Law)	350V	
Insulation Resistance (500 VDC)	≥10 ⁴ MΩ	
Contact Resistance Variation	3% Rn or 3Ω	
End Resistance (Typical)	1Ω	
Insulation Resistance (500 VDC)	10 ⁶ MΩ	

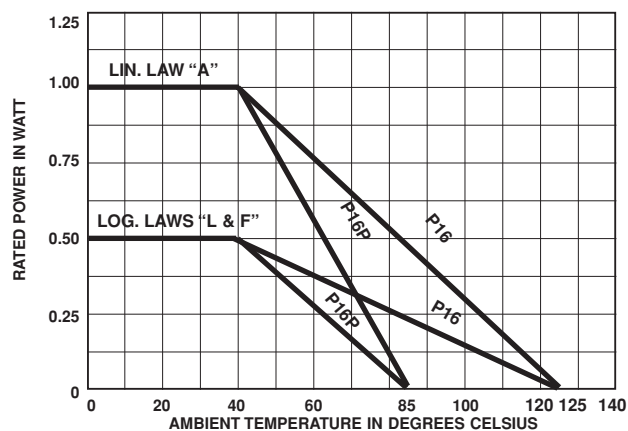
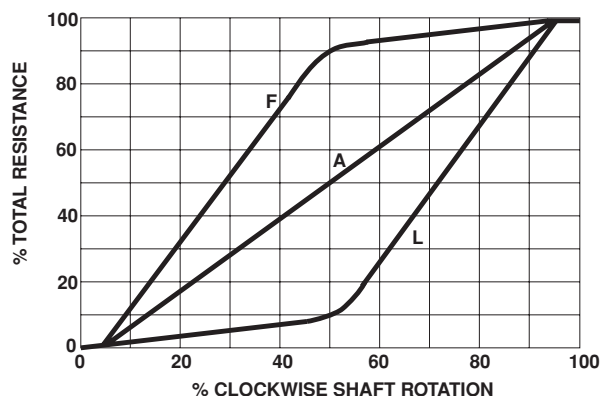
PLASTIC MATERIALS USED ARE UL 94 class VO

P16 - P16P CHARACTERISTICS**MECHANICAL SPECIFICATIONS**

Mechanical Travel	300° ± 5°
Operating Torque (Ncm)	2 typical
End Stop Torque (max. Ncm)	25
Max. Tightening Torque Of Mounting Nut (Ncm)	250
Unit Weight	4.5 g typical

ENVIRONMENTAL SPECIFICATIONS

	P16	P16P
Temperature Range	- 55°C + 125°C	- 55°C + 85°C
Climatic Category	55/100/56	55/70/56
Sealing	sealed container and panel sealed	
Protection Grades	IP67	

POWER RATING CHART**RESISTANCE LAWS**

PERFORMANCE		
TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS $\frac{\Delta R_T}{R_T}$ (%) $\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)
Load Life	1000 hours Pn 90°/30° at 40°C	± 1% Contact resistance variation : < 3% Rn
Climatic Sequence	Phase A dry heat 85°C/125°C Phase B damp heat Phase C cold -55°C Phase D damp heat 5 cycles	± 0.5% ± 1%
Humidity	56 days	± 0.5% Insulation resistance : > 10 ⁴ MΩ
Temperature Variations	5 cycles - 55°C to 85°C/125°C	± 0.5 %
Shock	50 g 11 ms 3 successive shocks in 3 directions	± 0.1% ± 0.2%
Vibration	10 - 55 Hz 0.75 mm or 10 g during 6 hours	± 0.1% ± 0.2%
Rotational Life	25000 cycles	± 3 % Contact resistance variation : < 2% Rn

STANDARD RESISTANCE ELEMENT DATA							
STANDARD RESIS- TANCE VALUES	LINEAR LAW			LOG LAWS			T.C. - 40°C + 85°C
	MAX. POWER AT 40°C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	MAX. POWER AT 40°C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	
Ω	P1 (W)	Um = √P1xRn 350 VDC	Im (mA)	P1 (W)	Um = √P1xRn 350 Vdc	Im (mA)	10 ⁻⁶ °C
22 47	1	4.69 6.85	213.2 145.8				- 50 + 200
100 220 470 1k 2.2k 4.7k 10k 22k 47k 100k 220k 470k 1M 2.2M 4.7M 10M	↓ 1 0.56 0.26 0.12 0.05 0.02 0.01	10 14.83 21.67 31.62 46.90 68.55 100 148.32 216.7 316.23 350 350 350 350 350 350	100 67.4 46.1 31.6 21.32 14.58 10 6.74 4.61 3.16 1.59 0.75 0.35 0.16 0.07 0.012	0.5 ↓ 0.5 0.26 0.12	22.4 33.2 48.5 70.7 105 153 224 332 350 350	22.4 15.1 10.3 7.07 4.77 3.26 2.24 1.51 0.74 0.35	± 100

CONTROL KNOB

Black metallic knob (N).

Black plastic knob (NP).

For white and blue color see ordering information.

Other dimensions, shapes, colours 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.

MARKING

Printed : VISHAY trademark, ohmic value, tolerance (in %), resistance law, manufacturing date.

PACKAGING

Carton box of 20 pieces.

**PROFESSIONAL AUDIO APPLICATIONS PA16 - PA16P**

The industrial cermet track is replaced by a **conductive plastic** track especially selected for its performance characteristics in relation to audio functions.

PA16 - PA16P SPECIFICATIONS

ELECTRICAL SPECIFICATIONS		
	PA16	PA16P
Resistive Element	conductive plastic	
Resistance Range PA16	A law 1k Ω to 1M Ω L, F laws 470 Ω to 500k Ω	
Tolerance	Standard	$\pm 20\%$
	On Request	$\pm 10\%$ (1k Ω to 100k Ω)
Power Rating	0.5 W at 40°C	
Temperature Coefficient	± 1000 ppm/°C	
Contact Resistance Variation Law A	2% Rn	
Limiting Element Voltage	350V	

MECHANICAL SPECIFICATIONS

Rotational Life 50000 cycles

ENVIRONMENTAL SPECIFICATIONS

Temperature Range - 25°C to + 85°C
Climatic Category 25/85/56
Sealing sealed container
and panel sealed IP67

PA16-PA16P PARTICULAR CHARACTERISTICS

NOMINAL RESISTANCE	LAWS A, L, F			T.C. - 25°C + 100°C
	MAXIMUM DISSIPATION AT 40°C	MAXIMUM VOLTAGE	MAX. CUR. THROUGH THE WIPER	
Ω	W	V	mA	ppm/°C
1k	0.5	22.4	22.4	± 1000
2.2k	↓	33.2	15.1	
4.7k		48.5	10.3	
10k		79.7	7.07	
22k		105	4.77	
47k		153	3.26	
100k		224	2.24	
220k		332	1.51	
470k	0.26	350	0.74	

PA16 PERFORMANCE

TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS	
		$\frac{\Delta R_{ac}}{R_{ac}}$ (%)	$\frac{\Delta R_{ac}}{R_{ac}}$ (%)
Long Term Damp Heat	56 days	$\pm 2\%$ Insulation resistance : > 10 ⁴ M Ω	
Load Life	1000 hours at Pn 90°/30° cycle at + 40°C	$\pm 5\%$ Insulation resistance : > 10 ⁴ M Ω Contact resistance variation : < 2% Rn	
Shock	50 g 11 ms 3 successive shocks in three axes	$\pm 0.2\%$	$\pm 0.5\%$
Vibration	10 - 55 Hz 0.75 mm or 10 g during 6 hours	$\pm 0.2\%$	$\frac{\Delta V_{ab}}{V_{ac}} \leq \pm 0.5\%$
Rotational Life	50000 cycles	$\pm 5\%$ Contact resistance variation : < 2% Rn	

ORDERING INFORMATION

P16, PA16	NP	22 kΩ	$\pm 20\%$	A	BO20
SERIES	CONTROL KNOB DESIGNATION	OHMIC VALUE	TOLERANCE	LAW	PACKAGING
	N : metallic black color NP : plastic black color W : metallic white color WP : plastic white color BP : plastic blue color			A : linear L : clockwise logarithmic F : inverse clockwise logarithmic	