



Knob Potentiometer



LINKS TO ADDITIONAL RESOURCES



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

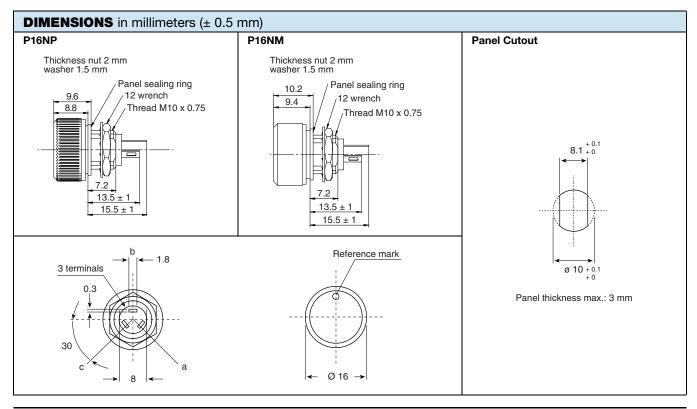




 P16 - version for professional and industrial applications (cermet)
1 W at 40 °C RoHS COMPLIANT

- PA16 version for professional audio applications (conductive plastic)
 0.5 W at 40 °C
- Compact (integrated)
- High dielectric strength: 2500 V_{RMS}
- Fully sealed and panel sealed
- Metallic or plastic knob options
- Custom knob on request
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

| 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 | 50K cycles | | | |





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| ELECTRICAL SPECIFICATIONS | | | | |
|--|--|--|--|--|
| | P16 | PA16 | | |
| Resistive element | Cermet Conductive plastic | | | |
| Electrical travel | 270° ± 10° | 270° ± 10° | | |
| Power rating chart | 0 20 40 60 | 80 100 120 140 EMPERATURE IN °C | | |
| Circuit diagram | a O (1) b O (2) | 0 3 → cw | | |
| Taper | | A L L 60 80 100 KWISE SHAFT ROTATION | | |
| Resistance range logarithmic tap | | 1 k Ω to 1 M Ω 470 Ω to 500 k Ω | | |
| Standard series E3 | 1 - 2.2 - 4.7 and on request 1 - 2 - 5 | 1 - 2.2 - 4.7 | | |
| Tolerance standa on reque | ± 10 % | ± 20 % ± 10 % (1 kΩ to 100 kΩ) | | |
| Power rating logarithm | oic 0.5 W at +40 °C | 0.5 W at +40 °C 0.25 W at +40 °C | | |
| Temperature coefficient (typical) | ± 150 ppm/°C | ± 500 ppm/°C | | |
| Dielectric strength (RMS) | 2500 V | 2500 V | | |
| Limiting element voltage (linear law) | 350 V | 350 V | | |
| Contact resistance variation | 3 % Rn or 3 Ω | 2 % Rn or 3 Ω | | |
| End resistance (typical) | 1 Ω | 1 Ω | | |
| Insulation resistance (500 V _{DC}) | 10 ⁶ MΩ | $10^6\mathrm{M}\Omega$ | | |



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| MECHANICAL SPECIFICATIONS | | | | |
|--|-----------------|--|--|--|
| Mechanical travel | 300° ± 5° | | | |
| Operating torque | 2 Ncm typical | | | |
| End stop torque | 25 Ncm maximum | | | |
| Max. tightening torque of mounting nut | 180 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

- · Ohmic value code, tolerance code and taper
- · Manufacturing date code

PACKAGING

Carton box of 20 pieces

| P16 STANDARD RESISTANCE ELEMENT DATA | | | | | | |
|--|--|---|--|--|--|--|
| STAN- | LIN | LINEAR TAPER | | | OG TAPE | R |
| DARD RESIS- TANCE VALUES | | MAX. VOLTAGE | MAX. CUR. THROUGH WIPER | MAX. POWER AT 40 °C | MAX. VOLTAGE | MAX. CUR. THROUGH WIPER |
| Ω | W | ٧ | mA | W | ٧ | mA |
| 22 47 100 220 470 1K 2.2K 4.7K 10K 22K 47K 100K 220K 470K 1M 2.2M 4.7M | 1 1 1 1 1 1 1 1 1 1 0.56 0.26 0.12 0.05 0.02 | 4.69 6.85 10 14.8 21.7 31.6 46.9 68.5 100 148 217 316 350 350 350 350 350 | 213 146 100 67.4 46.1 31.6 21.3 14.6 10 6.74 4.61 3.16 1.59 0.75 0.35 0.07 0.012 | 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 | 7.1 10.5 15.3 22.4 33.2 48.5 70.7 105 153 224 332 350 350 350 | 71 48 32.6 22.4 15.1 10.3 7.07 4.77 3.26 2.24 1.51 0.74 0.35 0.16 |

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, colors) and legends can be printed on plastic knob on request - please consult Vishay.

| PA16 STANDARD RESISTANCE ELEMENT DATA | | | | | | | |
|--|--|--|--|--|--|--|--|
| STAN- | LI | LINEAR TAPER | | | LOG TAPER | | |
| DARD RESIS- TANCE VALUES | 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 | ٧ | mA | |
| 470 1K 2.2K 4.7K 10K 22K 47K 100K 220K 470K 1M | 0.5 0.5 0.5 0.5 0.5 0.5 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 | 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25 | 10.8 15.8 23.5 34.3 50.0 74 108 158 235 343 | 23.1 16 11 7 5.0 3.4 2.3 1.6 1.1 | |



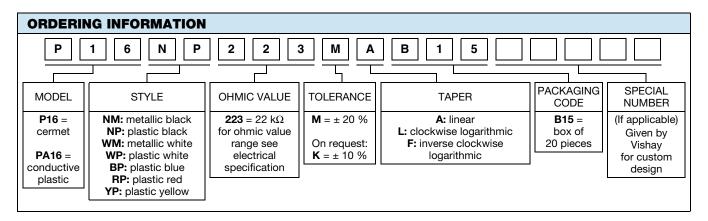
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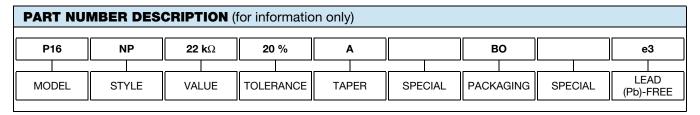
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| PERFORMANCE | | | | | |
|-------------------------|---|-------------------------------------|------------------------------|--|--|
| TESTS | CONDITIONS | TYPICAL VALUES AND DRIFTS | | | |
| IESIS | | ∆R _T /R _T (%) | $\Delta R_{1-2}/R_{1-2}$ (%) | OTHER | |
| Electrical endurance | 1000 h at rated power 90'/30' cycle at +40 °C | ± 5 % | - | Insulation resistance: $> 10^4 \text{ M}\Omega$ Contact res. variation: $< 2 \% \text{ Rn}$ | |
| Damp heat, steady state | 56 days 40 °C, 93 % HR | ± 2 % | ± 1 % | Insulation resistance: $> 10^4 \text{ M}\Omega$ | |
| Mechanical endurance | 50 000 cycles | ± 5 % | - | Contact res. variation: < 2 % Rn | |
| Shock | 50 g's at 11 ms 3 successive shocks in 3 directions | ± 0.2 % | ± 0.5 % | - | |
| Vibration | 10 Hz to 55 Hz 0.75 mm or 10 <i>g</i> 's during 6 h | ± 0.2 % | - | $\Delta V_{1-2}/\Delta V_{1-3} \le \pm \ 0.5 \ \%$ | |

Note

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





| 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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