P16, PA16

Vishay Sfernice

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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

- Test according to CECC 41000 or IEC 60393-1
- P16 version for professional and industrial applications (cermet)
 T W at 40 °C

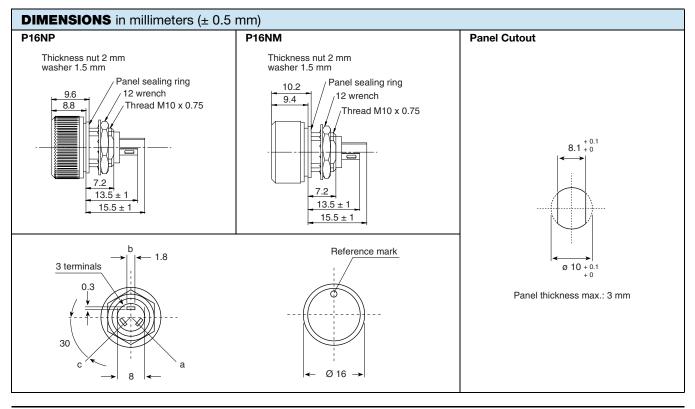


- PA16 version for professional audio applications (conductive plastic)
- Compact (integrated)

0.5 W at 40 °C

- 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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1 For technical questions, contact: <u>sferpottrimmers@vishay.com</u> Document Number: 51036

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P16, PA16

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ELECTRICAL SPECIFICATIONS P16 PA16 Resistive element Cermet Conductive plastic Electrical travel 270° ± 10° 270° ± 10° 1.25 P16 LIN. TAPER "A' 1.00 RATED POWER IN W 0.75 P16 N LOG. TAPER "L & F Power rating chart 0.50 & PA16 -LIN, TAPER 3 0.25 PA16 LOG. TAPER 0 20 120 0 40 60 80 100 140 AMBIENT TEMPERATURE IN °C -0 (3) Circuit diagram ьŌ (2)100 80 F % TOTAL RESISTANCE 60 Α L Taper 40 20 0 0 20 40 60 80 100 % CLOCKWISE SHAFT ROTATION 1 k Ω to 1 M Ω Linear taper 22 Ω to 10 M Ω Resistance range Logarithmic taper 100 Ω to 2.2 MΩ 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 ± 20 % Standard ± 20 % Tolerance On request ± 10 % \pm 10 % (1 k Ω to 100 k Ω) 1 W at +40 °C 0.5 W at +40 °C Linear Power rating 0.5 W at +40 °C Logarithmic 0.25 W at +40 °C Temperature coefficient (typical) ± 150 ppm/°C ± 500 ppm/°C **Dielectric strength (RMS)** 2500 V 2500 V 350 V 350 V Limiting element voltage (linear law) 3 % Rn or 3 Ω 2 % Rn or 3 Ω Contact resistance variation End resistance (typical) 1Ω 1Ω Insulation resistance (500 V_{DC}) $10^6 M\Omega$ $10^6 M\Omega$

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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

Hardware: nuts, washer, and O-ring are separately supplied (not mounted on the potentiometer), in a small bag placed in the packaging.

| P16 STANDARD RESISTANCE ELEMENT DATA | | | | | | |
|--------------------------------------|--------------|--------------------|----------------------------------|------------------------------|----------------------|----------------------------------|
| STAN- | LIN | IEAR TAP | PER | L | 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 | v | mA | w | v | mA |
| 22 47 | 1 | 4.69 6.85 | 213 146 | | | |
| 100 220 470 | 1 1 1 | 10 14.8 21.7 | 100 67.4 46.1 | 0.5 0.5 | 7.1 10.5 | 71 48 |
| 1K 2.2K | 1 | 31.6 46.9 | 31.6 21.3 | 0.5 0.5 0.5 | 15.3 22.4 | 32.6 22.4 |
| 4.7K 10K | 1 1 | 68.5 100 | 14.6 10 | 0.5 0.5 | 33.2 48.5 70.7 | 15.1 10.3 7.07 |
| 22K 47K 100K | 1 1 1 | 148 217 316 | 6.74 4.61 | 0.5 0.5 0.5 | 105 153 | 4.77 3.26 |
| 220K 470K | 0.56 | 350 350 | 3.16 1.59 0.75 | 0.5 0.5 0.5 | 224 332 | 2.24 1.51 |
| 1M 2.2M | 0.12 0.05 | 350 350 | 0.35 0.16 | 0.26 0.12 | 350 350 350 | 0.74 0.35 0.16 |
| 4.7M 10M | 0.02 0.01 | 350 350 | 0.07 0.012 | 0.056 | | |

CONTROL KNOB

Black metallic knob (NM). Black plastic knob (NP). For white, blue, red, and yellow color see ordering information. Other dimensions, shape, marking, 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 | PA16 STANDARD RESISTANCE ELEMENT DATA | | | | | | |
|--|--|--|--|--|--|---|--|
| STAN- | LI | NEAR TA | PER | LOG TAPER | | | |
| DARD RESIS- TANCE VALUES | MAX. POWER AT 40 °C | MAX. VOLTAGE | | MAX. POWER AT 40 °C | MAX. VOLTAGE | Max. Cur. Through Wiper | |
| Ω | w | V | mA | W | V | 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 0.7 | |

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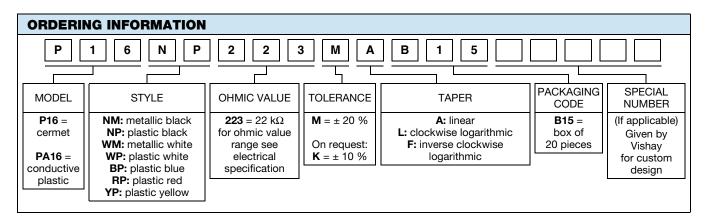
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| PERFORMANCE | | | | | |
|-------------------------|---|---------------------------|--|---|--|
| TESTS | CONDITIONS | TYPICAL VALUES AND DRIFTS | | | |
| 12313 | CONDITIONS | ∆ R⊺/R⊺ (%) | ∆ R₁₋₂/R₁₋₂ (%) | OTHER | |
| Electrical endurance | 1000 h at rated power 90'/30' cycle at +40 °C | ±5% | - | Insulation resistance: > $10^4 M\Omega$ Contact res. variation: < 2 % Rn | |
| Damp heat, steady state | 56 days 40 °C, 93 % HR | ±2% | ±1% | Insulation resistance: > $10^4 M\Omega$ | |
| 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 g's during 6 h | ± 0.2 % | - | $\Delta V_{1\text{-}2}/\Delta V_{1\text{-}3} \leq \pm \ 0.5 \ \%$ | |

Note

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



| PART NUMBER DESCRIPTION (for information only) | | | | | | | | |
|--|-------|---------------|-----------|-------|---------|-----------|---------|-------------------|
| P16 | NP | 22 k Ω | 20 % | Α | | во | | e3 |
| | | | | | | | | |
| MODEL | STYLE | VALUE | TOLERANCE | TAPER | SPECIAL | PACKAGING | SPECIAL | LEAD (Pb)-FREE |

| 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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