**Vishay Sfernice** 



### **Knob Potentiometer**

### FEATURES

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

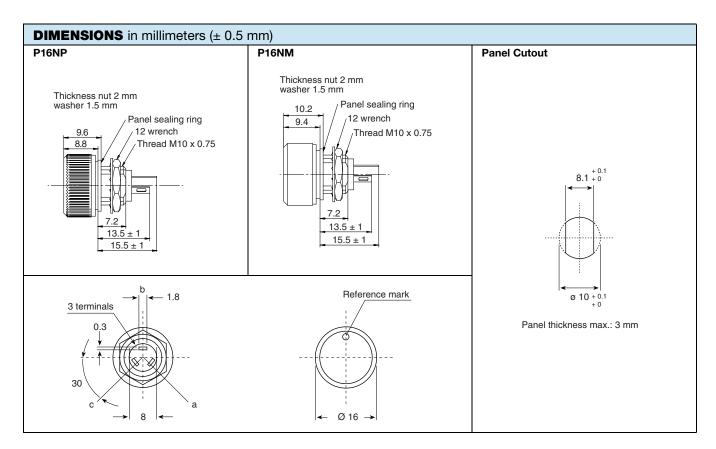


COMPLIANT

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

0.5 W at 40 °C

- High dielectric strength: 2500 V<sub>BMS</sub>
- 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>





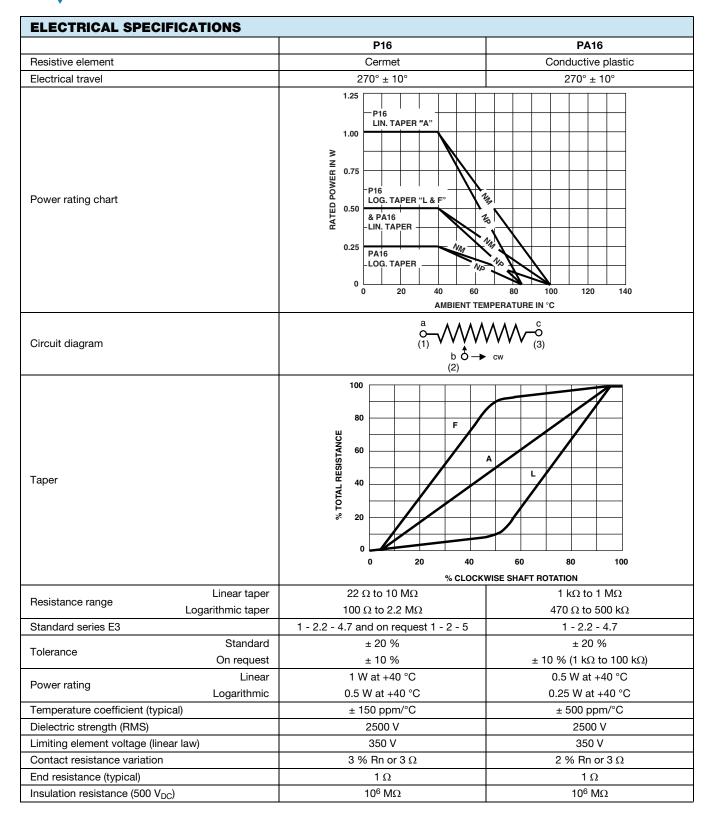
The P16 is a revolutionary concept in panel mounted potentiometers. This unique design consists of a knob driving and incorporating a cermet potentiometer. Only the mounting hardware and terminals are situated on the back side of the panel reducing to a minimum the required clearance.

Revision: 24-Sep-15



## P16, PA16

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Document Number: 51036



www.vishay.com

P16, PA16

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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 | 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 | Ν | ΛA | ١R | K | IN | IG |
|---------|---|----|----|---|----|----|
|---------|---|----|----|---|----|----|

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

#### PACKAGING

• Carton box of 20 pieces

| P16 \$                                                                                                                               | P16 STANDARD RESISTANCE ELEMENT DATA                                                                |                                                                                                                                  |                                                                                                                                          |                                                                    |                                                                                                      |                                                                                                          |  |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--|
| STAN-                                                                                                                                | LIN                                                                                                 | IEAR TAP                                                                                                                         | PER                                                                                                                                      | LOG TAPER                                                          |                                                                                                      |                                                                                                          |  |
| DARD<br>RESIS-<br>TANCE<br>VALUES                                                                                                    |                                                                                                     | MAX.<br>VOLTAGE                                                                                                                  | Max.<br>Cur.<br>Through<br>Wiper                                                                                                         | MAX.<br>POWER<br>AT<br>40 °C                                       | MAX.<br>VOLTAGE                                                                                      | Max.<br>Cur.<br>Through<br>Wiper                                                                         |  |
| Ω                                                                                                                                    | w                                                                                                   | v                                                                                                                                | mA                                                                                                                                       | w                                                                  | v                                                                                                    | mA                                                                                                       |  |
| 22<br>47<br>100<br>220<br>470<br>1K<br>2.2K<br>470<br>47K<br>100K<br>22K<br>47K<br>100K<br>220K<br>470K<br>1M<br>2.2M<br>4.7M<br>10M | 1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>0.56<br>0.26<br>0.12<br>0.05<br>0.02<br>0.01 | 4.69<br>6.85<br>10<br>14.8<br>21.7<br>31.6<br>46.9<br>68.5<br>100<br>148<br>217<br>316<br>350<br>350<br>350<br>350<br>350<br>350 | 213<br>146<br>100<br>67.4<br>46.1<br>31.6<br>21.3<br>14.6<br>10<br>6.74<br>4.61<br>3.16<br>1.59<br>0.75<br>0.35<br>0.16<br>0.07<br>0.012 | 0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.5 | 7.1<br>10.5<br>15.3<br>22.4<br>33.2<br>48.5<br>70.7<br>105<br>153<br>224<br>332<br>350<br>350<br>350 | 71<br>48<br>32.6<br>22.4<br>15.1<br>10.3<br>7.07<br>4.77<br>3.26<br>2.24<br>1.51<br>0.74<br>0.35<br>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                                                                   | NEAR TA                                                                | PER                                                                          |                                                              | LOG TAP                                                                | ER                                                              |  |
| DARD<br>RESIS-<br>TANCE<br>VALUES                                            | MAX.<br>POWER<br>AT<br>40 °C                                         |                                                                        | Max.<br>Cur.<br>Through<br>Wiper                                             | MAX.<br>POWER<br>AT<br>40 °C                                 | MAX.<br>VOLTAGE                                                        | Max.<br>Cur.<br>Through<br>Wiper                                |  |
| Ω                                                                            | W                                                                    | v                                                                      | mA                                                                           | w                                                            | v                                                                      | mA                                                              |  |
| 470<br>1K<br>2.2K<br>4.7K<br>10K<br>22K<br>47K<br>100K<br>220K<br>470K<br>1M | 0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.5<br>0.26<br>0.12 | 22.4<br>33.2<br>48.5<br>70.7<br>105<br>153<br>224<br>332<br>350<br>350 | 22.4<br>15.1<br>10.3<br>7.07<br>4.77<br>3.26<br>2.24<br>1.51<br>0.74<br>0.35 | 0.25<br>0.25<br>0.25<br>0.25<br>0.25<br>0.25<br>0.25<br>0.25 | 10.8<br>15.8<br>23.5<br>34.3<br>50.0<br>74<br>108<br>158<br>235<br>343 | 23.1<br>16<br>11<br>7<br>5.0<br>3.4<br>2.3<br>1.6<br>1.1<br>0.7 |  |

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SHAY, www.vishay.com

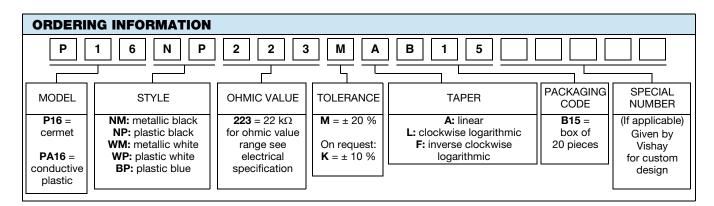
## P16, PA16

Vishay Sfernice

| PERFORMANCE             |                                                           |                                             |                                         |                                                                             |  |  |
|-------------------------|-----------------------------------------------------------|---------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------|--|--|
| TESTS                   | CONDITIONS                                                | TYPICAL VALUES AND DRIFTS                   |                                         |                                                                             |  |  |
| 12313                   | CONDITIONS                                                | ∆ <b>R</b> <sub>T</sub> /R <sub>T</sub> (%) | ∆R <sub>1-2</sub> /R <sub>1-2</sub> (%) | OTHER                                                                       |  |  |
| Electrical endurance    | 1000 h at rated power<br>90'/30' cycle at +40 °C          | ± 5 %                                       | -                                       | Insulation resistance: > $10^4 M\Omega$<br>Contact res. variation: < 2 % Rn |  |  |
| Damp heat, steady state | 56 days<br>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<br>3 successive shocks<br>in 3 directions | ± 0.2 %                                     | ± 0.5 %                                 | -                                                                           |  |  |
| Vibration               | 10 Hz to 55 Hz<br>0.75 mm or 10 <i>g</i> 's<br>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 kΩ | 20 %      | Α     |         | ВО        |         | e3                |
| MODEL                                          | STYLE | VALUE | TOLERANCE | TAPER | SPECIAL | PACKAGING | SPECIAL | LEAD<br>(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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