Vishay Sfernice



Knob Potentiometer



DESIGN SUPPORT TOOLS

3D Models Available

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.

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				

FEATURES

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

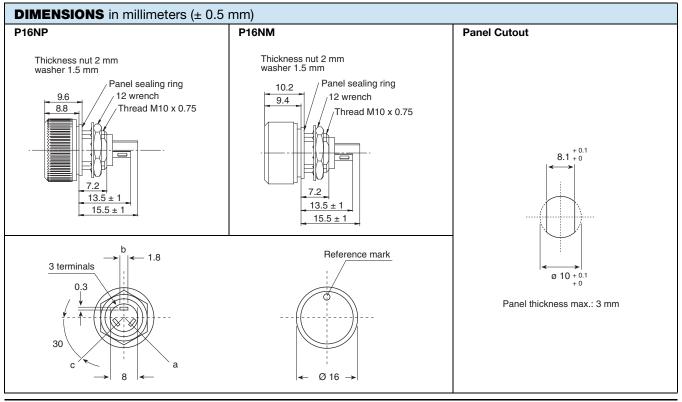


COMPLIANT

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

0.5 W at 40 °C

- High dielectric strength: 2500 V_{BMS}
- 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>



Revision: 17-Nov-17

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

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishav.com/doc?91000



Vishay Sfernice

ELECTRICAL SPECIFICATIONS					
	P16	PA16			
Resistive element	Cermet	Conductive plastic			
Electrical travel	270° ± 10°	270° ± 10°			
Power rating chart	0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.20	80 100 120 140 MPERATURE IN °C			
Circuit diagram	$ \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array}\\ \end{array}$ \left(\begin{array}{c} \end{array}\\ \end{array} \left(\begin{array}{c} \end{array} \left(\begin{array}{c} \end{array}\right)				
Taper		A L L L L L L L L L L L L L L L L L L L			
Resistance range linear taper logarithmic taper	22 Ω to 10 MΩ 100 Ω to 2.2 MΩ	1 kΩ to 1 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 on request	± 20 % ± 10 %	± 20 % ± 10 % (1 kΩ to 100 kΩ)			
Power rating linear logarithmic	1 W at +40 °C 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 ΜΩ	10 ⁶ ΜΩ			

2



www.vishay.com

P16, PA16

Vishay Sfernice

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 \$	P16 STANDARD RESISTANCE ELEMENT DATA						
STAN-	LIN	EAR TAP	PER	LOG TAPER			
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 47 100 220 470 1K 2.2K 4.7K 10K 22K 4.7K 100K 22K 47K 100K 4.70K 1M 2.2M 4.7M 10M	1 1 1 1 1 1 1 1 1 1 1 0.56 0.26 0.12 0.05 0.02 0.01	4.69 6.85 10 14.8 21.7 31.6 46.9 68.5 100 148 217 316 350 350 350 350 350 350	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 0.16 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	PA16 STANDARD RESISTANCE ELEMENT DATA						
STAN-	LI	NEAR TA	PER	LOG TAPER			
DARD RESIS- TANCE VALUES	MAX. POWER AT 40 °C		Max. Cur. Through Wiper	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	

www.vishay.com

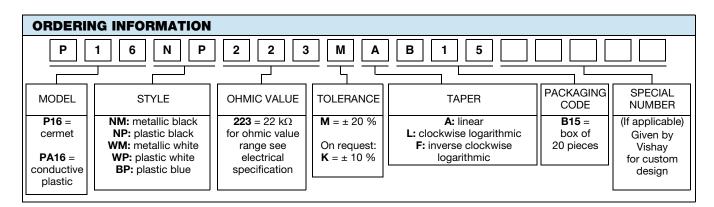
P16, PA16

Vishay Sfernice

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 <i>g</i> '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

4



Vishay

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.