

Knob Potentiometer with Switch



The P16S 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.

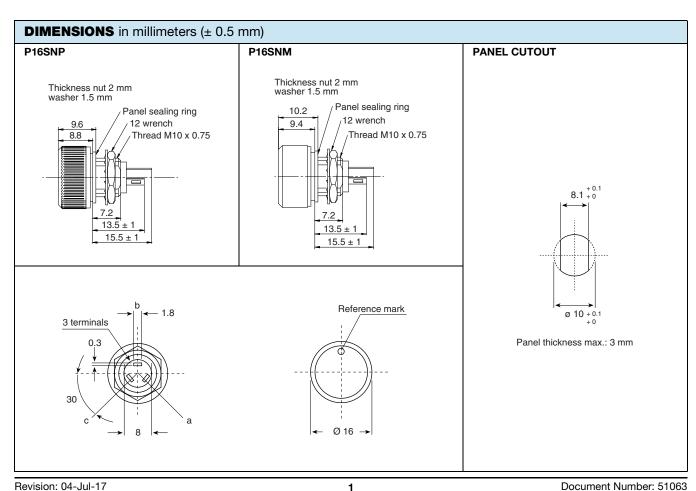
QUICK REFERENCE DATA					
Multiple module	No				
Switch module	Yes				
Detent module	Yes				
Special electrical laws	A: linear, L: logarithmic, F: reverse logarithmic				
Sealing level	IP 67				
Lifespan	10K cycles (switch), 50K cycles (track)				

FEATURES

• P16S - version for military, professional and industrial applications (cermet): 1 W at 40 °C

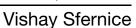


- PA16S version for professional audio applications (conductive plastic): 0.5 W at 40 °C
- Compact (integrated)
- Detent and electric cut off at beginning of travel
- Fully sealed and panel sealed
- Metallic or plastic knob options
- · Custom knob on request
- Test according to CECC 41000 or IEC 60393-1
- · Material categorization: for definitions of compliance please see www.vishay.com/doc?99912





		P16S	PA16S			
Decisting plans and						
Resistive element		Cermet	Conductive plastic			
Electrical travel		220° ± 10°	220° ± 10°			
Power rating chart		1.25 P16S LIN. TAPER "A" 1.00 P16S LOG. TAPER "L & F" & PA16S LIN. TAPER 0.25 PA16S LOG. TAPER 0 20 40 60 AMBIENT TEM				
Circuit diagram		$ \stackrel{a}{\circ} \longrightarrow \bigvee_{(1)} \longrightarrow \stackrel{c}{\circ} \longrightarrow c$				
Taper		100 Switch on-off 80				
Resistance range	linear law logarithmic laws	22 Ω to 10 M Ω 100 Ω to 2.2 M Ω	1 kΩ to 1 MΩ			
Standard series e3		1 - 2.2 - 4.7 and on request 1 - 2 - 5	470 Ω to 500 kΩ 1 - 2.2 - 4.7			
standard		± 20 %	± 20 %			
Tolerance	on request	± 10 %	\pm 10 % (1 kΩ to 100 kΩ)			
D	linear	1 W at +40 °C	0.5 W at +40 °C			
Power rating logarithmic		0.5 W at +40 °C	0.25 W at +40 °C			
Temperature coefficient (typical)		± 150 ppm	± 500 ppm			
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})		$10^6\mathrm{M}\Omega$	$10^6\mathrm{M}\Omega$			





MECHANICAL SPECIFICATIONS				
Mechanical travel	300° ± 5°			
Operating torque	2 Ncm typical			
End stop torque	25 Ncm maximum			
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				

SWITCH ELECTRICAL AND MECHANICAL SPECIFICATIONS				
ON / OFF switch	Actuation in co	Actuation in counter clockwise position (between terminal a and terminal b)		
Switching ourrent	P16S	100 mA max.		
Switching current	PA16S	1 mA max.		
Switch actuation torque	4 Ncm min.			
Switch actuation travel	30° ± 5°			
Dielectric strength terminal to terminal (RMS)	1000 V			
Insulation resistance between contacts	$10^6\mathrm{M}\Omega$			
Switch mechanical endurance	10 000 cycles			
1 cycle	ON-OFF-ON			

Note

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

MARKING

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

PACKAGING

Carton box of 20 pieces

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.

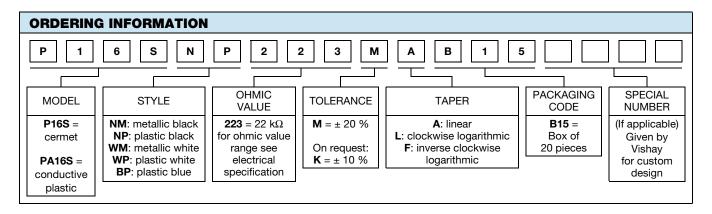
STANDARD RESISTANCE ELEMENT DATA												
	P16S CERMET						PA16S CONDUCTIVE PLASTIC					
STANDARD	ı	INEAR TAP	PER	LOGARITHMIC TAPER		LINEAR TAPER			LOGARITHMIC TAPER			
RESISTANCE VALUES	MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER
Ω	W	٧	mA	W	٧	mA	W	V	mA	W	٧	mA
22	1	4.69	213									
47	1	6.85	146									
100	1	10	100	0.5	7.1	71						
220	1	14.8	67.4	0.5	10.5	48						
470	1	21.7	46.1	0.5	15.3	32.6				0.25	10.8	23.1
1K	1	31.6	31.6	0.5	22.4	22.4	0.5	22.4	22.4	0.25	15.8	16
2.2K	1	46.9	21.3	0.5	33.2	15.1	0.5	33.2	15.1	0.25	23.5	11
4.7K	1	68.5	14.6	0.5	48.5	10.3	0.5	48.5	10.3	0.25	34.3	7
10K	1	100	10	0.5	70.7	7.07	0.5	70.7	7.07	0.25	50	5
22K	1	148	6.74	0.5	105	4.77	0.5	105	4.77	0.25	74	3.4
47K	1	217	4.61	0.5	153	3.26	0.5	153	3.26	0.25	108	2.3
100K	1	316	3.16	0.5	224	2.24	0.5	224	2.24	0.25	158	1.6
220K	0.56	350	1.59	0.5	332	1.51	0.5	332	1.51	0.25	235	1.1
470K	0.26	350	0.75	0.26	350	0.74	0.26	350	0.74	0.25	343	0.7
1M	0.12	350	0.35	0.12	350	0.35	0.12	350	0.35			
2.2M	0.05	350	0.16	0.056	350	0.16						
4.7M	0.02	350	0.07									
10M	0.01	350	0.012									

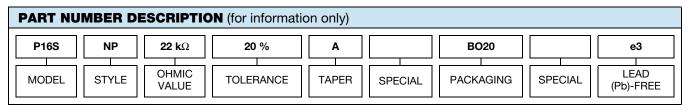
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Vishay Sfernice

PERFORMANCE						
TECTO	CONDITIONS	TYPICAL VALUES AND DRIFTS				
TESTS	CONDITIONS	∆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: $< 2 \%$ 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 dimensions	± 0.2 %	± 0.5 %	-		
Vibration	10 Hz to 55 Hz 0.75 mm or 10 <i>g</i> 's during 6 h	± 0.2 %	-	$\Delta V_{1-2}/\Delta V_{1-3} \le \pm \ 0.5 \%$		





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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