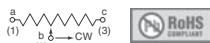




## Single Turn Cermet Knob Potentiometers

### P16 Series 1W



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

#### FEATURES:

- Test according to CECC 41300
- For professional and industrial applications
- Compact (integrated)
- Minimum clearance required
- Safety in use due to good insulation:  $>10^4 M\Omega$  500VDC

#### ELECTRICAL SPECIFICATIONS:

- Resistive Element: Cermet
- Electrical Travel:  $270^\circ \pm 10^\circ$
- Tolerance (Standard):  $\pm 20\%$
- Power Rating (Linear): 1W @  $40^\circ C$
- Limiting Element Voltage (Linear Law): 350V
- Contact Resistance Variation: 3% Rn or  $3\Omega$
- End Resistance:  $1\Omega$  typical
- Dielectric Strength (RMS): 2500V
- Insulation Resistance:  $\geq 10^9 M\Omega$

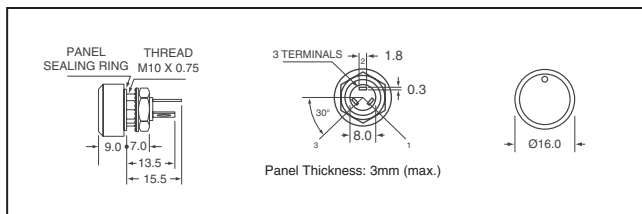
#### MECHANICAL SPECIFICATIONS:

- Mechanical Travel:  $300^\circ \pm 5^\circ$
- Operating Torque: 2Ncm typical
- End Stop Torque: 25Ncm maximum
- Maximum Tightening Torque of Mounting Nut: 250Ncm
- Unit Weight: 4.5g typical

#### ENVIRONMENTAL SPECIFICATIONS:

- Temperature Range:  $-40^\circ C$  –  $85^\circ C$
- Sealing: Sealed container and panel sealed
- Protection Grades: IP67

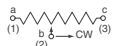
Dimensions in mm



Resistance ( $\Omega$ )	Digi-Key Part No.	Price Each			
		1	10	50	100
100	P16NP-100-ND	15.04	12.20	9.76	8.95
470	P16NP-470-ND	15.04	12.20	9.76	8.95
1.0K	P16NP-1.0K-ND	15.04	12.20	9.76	8.95
2.2K	P16NP-2.2K-ND	15.04	12.20	9.76	8.95
4.7K	P16NP-4.7K-ND	15.04	12.20	9.76	8.95
10K	P16NP-10K-ND	15.04	12.20	9.76	8.95
22K	P16NP-22K-ND	15.04	12.20	9.76	8.95
47K	P16NP-47K-ND	15.04	12.20	9.76	8.95
100K	P16NP-100K-ND	15.04	12.20	9.76	8.95
470K	P16NP-470K-ND	15.04	12.20	9.76	8.95
1.0M	P16NP-1.0M-ND	15.04	12.20	9.76	8.95

## Single Turn Cermet Fully Sealed Potentiometers

### PE30 Series 3W



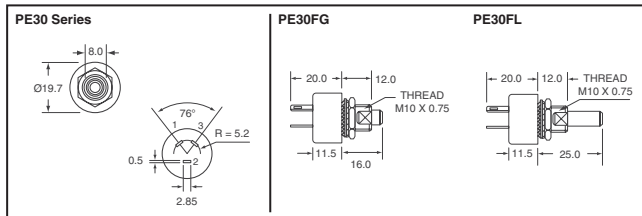
#### FEATURES:

- High power rating
- Low temperature coefficient (100ppm/ $^\circ C$  typical)
- Full sealing
- Mechanical strength
- Use of faston 2.86 connections
- Test according to CECC 41 000

#### ELECTRICAL SPECIFICATIONS:

- Resistive Element: Cermet
- Electrical Travel:  $270^\circ \pm 10^\circ$
- Tolerance (Standard):  $\pm 20\%$
- Power Rating (Linear): 3W @  $70^\circ C$
- Limiting Element Voltage (Linear Law): 300V
- Contact Resistance Variation: 3% Rn or  $3\Omega$
- End Resistance:  $1\Omega$  typical
- Dielectric Strength (RMS): 2500V
- Insulation Resistance (500VDC):  $10^6 M\Omega$

Dimensions in mm



Resistance ( $\Omega$ )	Digi-Key Part No.	Digi-Key Part No.	Price Each			
			1	10	50	100
<b>PE30FG and PE30FL Series</b>						
1.0K	PE30FG-1.0K-ND	PE30FL-1.0K-ND	22.74	18.20	16.68	15.17
4.7K	PE30FG-4.7K-ND	PE30FL-4.7K-ND	22.74	18.20	16.68	15.17
10K	—	PE30FL-10K-ND	22.74	18.20	16.68	15.17

## Single and Dual-Ganged Conductive Plastic Potentiometers

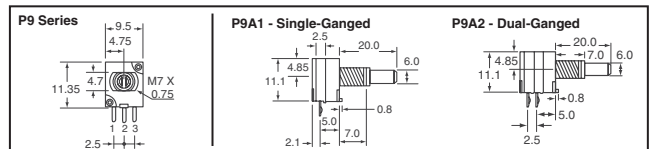
### P9 Series

FEATURES: • Conductive plastic element • Ultra compact (extra miniature module size)

ELECTRICAL SPECIFICATIONS: • Resistive Element: Conductive Plastic • Electrical Travel:  $270^\circ \pm 10^\circ$  • Tolerance (Standard):  $\pm 20\%$  • Power Rating @  $70^\circ C$  (Linear Law): 0.1W • Power Rating @  $70^\circ C$  (Multiple assemblies Linear Law): 0.05W per module • Temperature Coefficient:  $\pm 500$  ppm typical • Limiting Element Voltage: 10VDC, 50VAC • End Resistance:  $3\Omega$  typical • Contact Resistance Variation (Linear Law - Typical): 2% of nominal resistance • Independent Linearity (Linear Law):  $\pm 5\%$  typical • Insulation Resistance: 100M $\Omega$  @ 250VDC • Dielectric Strength (RMS): 300VAC during 1 minute • Attenuation (Typical): 90dB max. / 0.05dB min.

MECHANICAL SPECIFICATIONS: • Mechanical Travel:  $300^\circ \pm 5^\circ$  • Mechanical Rotation Life: 25,000 cycles • Operating Torque: 0.2Ncm up to 2.5Ncm typical • End Stop Torque: 50Ncm

Dimensions in mm



Resistance ( $\Omega$ )	Digi-Key Part No.	Price Each			
		1	10	50	100
<b>P9A1 Series</b>					
1.0K	P9A1-1.0K-ND	7.14	5.80	4.64	4.25
10K	P9A1-10K-ND	8.67	7.03	5.63	5.16
50K	P9A1-50K-ND	8.67	7.03	5.63	5.16
<b>P9A2 Series</b>					
1.0K	P9A2-1.0K-ND	12.23	9.92	7.94	7.28
10K	P9A2-10K-ND	12.23	9.92	7.94	7.28
50K	P9A2-50K-ND	12.23	9.92	7.94	7.28

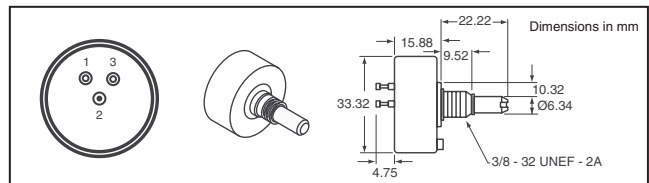


## Wirewound Potentiometers

### 132 Series, 2.75W, 1 5/16" Single-Turn

Electrical Specifications: • Housing: Molded glass filled thermoplastic • Rear Lid: Glass filled thermostat plastic • Shaft: Stainless Steel, non-magnetic • Terminals: Brass, plated for solderability, non-passivated • Resistance tolerance:  $\pm 3\%$  Power Rating: 2.75W (Derated to 0 +  $125^\circ C$ )

Features: • Continuous Rotation or with Mechanical Stops • Rotational Life, Shaft Revolutions: 500,000 • Mounting Hardware included

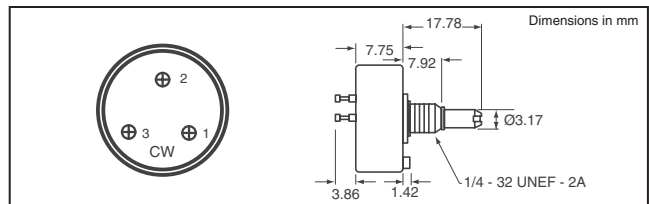


Res. $\Omega$	Digi-Key Part No.	Price Each			Vishay Part No.
		1	5	10	
<b>Continuous Rotation</b>					
1.0K	SP132C-1.0K-ND	27.83	25.13	22.41	132-0-0-102
2.0K	SP132C-2.0K-ND	27.83	25.13	22.41	132-0-0-202
5.0K	SP132C-5.0K-ND	27.83	25.13	22.41	132-0-0-502
10K	SP132C-10K-ND	27.83	25.13	22.41	132-0-0-103
<b>Mechanical Stops</b>					
1.0K	SP132S-1.0K-ND	27.25	24.78	22.72	132-2-0-102
2.0K	SP132S-2.0K-ND	27.25	24.78	22.72	132-2-0-202
5.0K	SP132S-5.0K-ND	27.25	24.78	22.72	132-2-0-502
10K	SP132S-10K-ND	27.25	24.78	22.72	132-2-0-103

### 140 Series, 2W, 1/2" Single-Turn

Electrical Specifications: • Resistance Tolerance:  $\pm 5\%$  • Power Rating: 2W at  $40^\circ C$  ambient derating linearly to 0 at  $125^\circ C$  • Rotational Life: 500,000 Shaft Revolutions • Temperature Range:  $-55^\circ C$  –  $125^\circ C$

Material Specifications: • Shaft: Stainless steel, non-magnetic, non-passivated • Housing: Aluminum, anodized • Rear Lid: Molded glass filled thermoset plastic • Terminals: Brass, gold plated • Lockwasher Internal Tooth: Steel, nickel plated • Panel Nut: Brass, nickel plated • Mounting Hardware included



Res. $\Omega$	Digi-Key Part No.	Price Each			Vishay Part No.
		1	5	10	
1.0K	SP140-1.0K-ND	63.50	45.25	38.50	140-0-0-102
2.0K	SP140-2.0K-ND	63.50	45.25	38.50	140-0-0-202
5.0K	SP140-5.0K-ND	63.50	45.25	38.50	140-0-0-502
10K	SP140-10K-ND	63.50	45.25	38.50	140-0-0-103

(Continued)

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### 157 Series, 1.5W, 7/8" Single-Turn

**Environmental Specifications:** • Temperature: -55°C – 125°C • Rotational Life: 10 million shaft revolutions  
 • Moisture Resistance: Yes • Vibration: 15g 10 to 2000Hz • Shock: 50g • Salt Spray: 96 hours • Load Life: 900 hours

**Material Specifications:** • Housing/Bushing: Aluminum, anodized • Rear Lid: Ceramic • Shaft: Stainless Steel • Terminals: Solderable • Bushing Mount Hardware: Lockwasher, Internal Tooth Steel, Nickel plated • Panel Nut: Brass, Nickel plated • Mounting Hardware included

Dimensions in mm

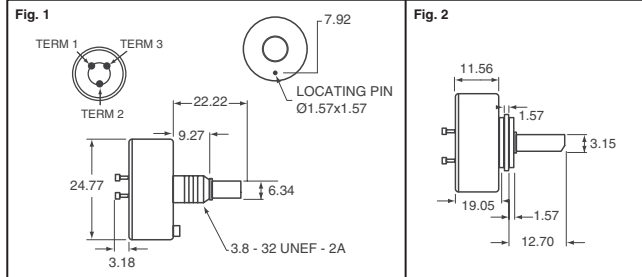


Fig.	Res. $\Omega$	Digi-Key Part No.	1	Price Each	5	10	Vishay Part No.
<b>Bushing Mount</b>							
1	1.0K	SP157P-1.0K-ND	21.42	13.79	11.75	157-11102	
	2.0K	SP157P-2.0K-ND	21.42	13.79	11.75	157-11202	
	5.0K	SP157P-5.0K-ND	21.42	13.79	11.75	157-11502	
	10K	SP157P-10K-ND	21.42	13.79	11.75	157-11103	
	20K	SP157P-20K-ND	21.42	13.79	11.75	157-11203	
	50K	SP157P-50K-ND	21.42	13.79	11.75	157-11503	
2	1.0K	SP157S-1.0K-ND	44.60	28.75	25.30	157-21102	
	2.0K	SP157S-2.0K-ND	44.60	28.75	25.30	157-21202	
	5.0K	SP157S-5.0K-ND	44.60	28.75	25.30	157-21502	
	10K	SP157S-10K-ND	44.60	28.75	25.30	157-21103	

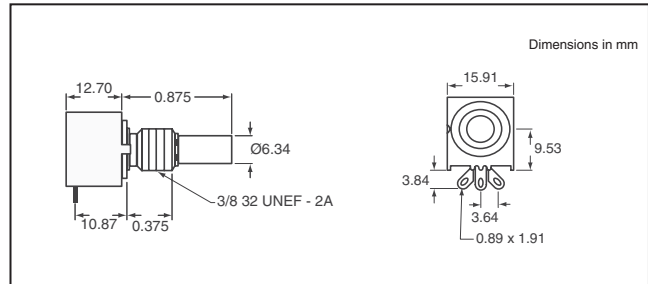
Res. $\Omega$	Digi-Key Part No.	1	Price Each	5	10	Vishay Part No.
500	SP535-500-ND	15.54	14.60	13.76	535-11501	
1.0K	SP535-1.0K-ND	15.54	14.60	13.76	535-11102	
2.0K	SP535-2.0K-ND	15.54	14.60	13.76	535-11202	
5.0K	SP535-5.0K-ND	15.54	14.60	13.76	535-11502	
10K	SP535-10K-ND	15.54	14.60	13.76	535-11103	
20K	SP535-20K-ND	15.54	14.60	13.76	535-11203	
50K	SP535-50K-ND	19.70	18.55	17.87	535-11503	

### 1W Industrial Rotary Position Sensor

#### 657 Series

**Electrical Specifications:** • Resistance Tolerance:  $\pm 20\%$  • Linearity:  $\pm 2\%$  • Power Rating: 1.0W at 85°C  
 • Electrical Travel:  $240^\circ \pm 4^\circ$  • Dielectric Withstanding: 500V<sub>RMS</sub> at 60Hz minimum • Output Smoothness: 0.2% maximum.

**Features:** • Fully Sealed to IP67 • Reliable conductive Plastic Technology • Stainless Steel Shaft



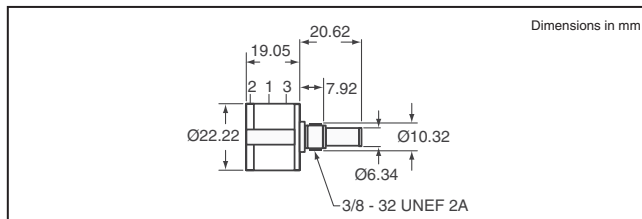
Res. $\Omega$	Digi-Key Part No.	1	Price Each	5	10	25	Vishay Part No.
1.0K	SP657-1.0K-ND	16.34	12.83	9.62	8.91	657-0-0-102	
2.0K	SP657-2.0K-ND	16.34	12.83	9.62	8.91	657-0-0-202	
5.0K	SP657-5.0K-ND	16.34	12.83	9.62	8.91	657-0-0-502	
10K	SP657-10K-ND	16.34	12.83	9.62	8.91	657-0-0-103	
20K	SP657-20K-ND	16.34	12.83	9.62	8.91	657-0-0-203	
50K	SP657-50K-ND	16.34	12.83	9.62	8.91	657-0-0-503	

## G

### Wirewound Precision Potentiometers

#### 533, 534, 535 Series, 7/8" Multi-turn

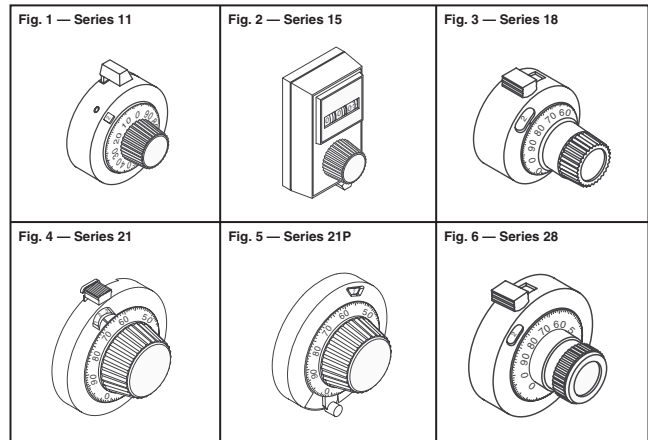
Electrical Specifications			
Parameter	Series 533	Series 534	Series 535
Standard Tool	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$
Linearity (Independent)	$\pm 0.25\%$	$\pm 0.20\%$	$\pm 0.25\%$
Noise	100Q ENR	100Q ENR	100Q ENR
Rotation (Electrical and Mechanical)	$1080^\circ \pm 10^\circ$	$3600^\circ \pm 10^\circ$	$1800^\circ \pm 10^\circ$
Power Rating	1.0W	2.0W	1.5W
Insulation Resistance	1000M $\Omega$ minimum 500VDC		
Dielectric Strength	1000VRMS minimum 60HZ		
Absolute Minimum Resistance	Not to exceed linearity x total resistance or 1 $\Omega$ , whichever is greater.		



Res. $\Omega$	Digi-Key Part No.	1	Price Each	5	10	Vishay Part No.
<b>533 Series — 3 Turn</b>						
100	SP533-100-ND	16.20	14.73	13.89	533-11101	
200	SP533-200-ND	16.20	14.73	13.89	533-11201	
500	SP533-500-ND	16.20	14.73	13.89	533-11501	
1.0K	SP533-1.0K-ND	16.20	14.73	13.89	533-11102	
2.0K	SP533-2.0K-ND	16.20	14.73	13.89	533-11202	
5.0K	SP533-5.0K-ND	16.20	14.73	13.89	533-11502	
10K	SP533-10K-ND	16.20	14.73	13.89	533-11103	
20K	SP533-20K-ND	24.47	22.25	20.97	533-11203	
<b>534 Series — 10 Turn</b>						
100	SP534-100-ND	13.48	13.29	10.73	534-11101	
200	SP534-200-ND	13.48	13.29	10.73	534-11201	
500	SP534-500-ND	13.48	13.29	10.73	534-11501	
1.0K	SP534-1.0K-ND	13.48	13.29	10.73	534-11102	
2.0K	SP534-2.0K-ND	13.48	13.29	10.73	534-11202	
5.0K	SP534-5.0K-ND	13.48	13.29	10.73	534-11502	
10K	SP534-10K-ND	13.48	13.29	10.73	534-11103	
20K	SP534-20K-ND	13.48	13.29	10.73	534-11203	
50K	SP534-50K-ND	17.08	15.73	14.58	534-11503	
100K	SP534-100K-ND	13.48	13.29	10.73	534-11104	
<b>535 Series — 5 Turn</b>						
100	SP535-100-ND	15.54	14.60	13.76	535-11101	
200	SP535-200-ND	15.54	14.60	13.76	535-11201	

### Concentric Scale Dials

#### 11, 15, 18, 21, 21P and 28 Series



**Features:**

**11 Series:** • Round Vernier Scale • 1" Diameter • Satin Chrome, black markings

**15 Series:** • 3 digit • Satin Clear Anodize • Rectangular Digital Scale • 1" Wide

**18 Series:** • No Backlash • Compact requires minimal panel space (22, 2mm diameter requirement) • For use with precision potentiometers or other rotating devices • Designed for metal shaft, 1 set screw • High force "Click Brake" • Satin Chrome, black markings

**21 Series:** • Satin Chrome, black markings • Round Vernier Scale • 1-13/16" Diameter

**21P Series:** • Round Vernier Scale • 1-13/16" Diameter (46.0mm) • Material: Plastic ABS Mold

**28 Series:** • Laser Machined Markings • Accepts 1/4" Shaft • 1 Set Screw • Clear Satin Anodized housing, black rotor, white markings

Fig.	Turns	Shaft Diameter	Body Diameter	Digi-Key Part No.	1	Price Each	5	10	Vishay Part No.
1	10	1/4"	25.4mm	SP011-1-11-ND	18.25	17.45	16.77	011-1-11	
2	10	1/4"	—	SP015-1-11-ND	18.56	17.85	17.19	015-1-11	
3	15	1/4"	22.2mm	SP018-1-11-ND	9.68	9.31	8.96	018-1-11	
4	15	1/4"	46.02mm	SP021-1-11-ND	19.00	18.20	17.51	021-1-11	
5	11	1/4"	46mm	SP021P-1-11-ND	13.80	13.25	12.75	021P-1-11	
6	21	—	28mm	SP028-1-11-ND	17.85	17.18	16.51	028-1-11	

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