

# Industrial Potentiometer



## FEATURES

- High power rating 2 W at 70 °C
- Full sealing
- Low contact resistance variation (1 % typical)
- Robust nickel plated brass shaft
- Use of faston 2.86 connections
- Cermet element
- Center detent option (haptic technology)
- Test according to CECC 41000 or IEC 60393-1
- Electrical performance in accordance with MIL-PRF-94 standards
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT

## LINKS TO ADDITIONAL RESOURCES



QUICK REFERENCE DATA	
Multiple module	No
Switch module	n/a
Detent module	Yes
Special electrical laws	A: linear, L: logarithmic, F: reverse logarithmic
Sealing level	IP 67
Lifespan	25K cycle

**DIMENSIONS** in millimeters (inches) ± 0.5 mm (± 0.02")

**PRV4F**

Technical drawing showing dimensions in millimeters (mm) and inches (in). Key dimensions include: shaft diameter Ø 19.6 (0.772), shaft length 8 (0.315), total length 20 max. (0.787), contact diameter Ø 6.35 (1/4"), contact length 9.52 (0.375), shaft thread Ø 9.52 (3/8") 32 UNEF-2A, contact length L, contact diameter 2.85 (0.112), contact length 0.5 (0.020), contact diameter 5.2 (0.205), contact angle 76°, contact radius R = 5.2, contact width 0.5, contact height 3, contact diameter 2.85.

Length L	1/2"	7/8"	2"
Shaft code	GBS	GJS	GRS



ELECTRICAL SPECIFICATIONS		
Resistive element		Cermet
Electrical travel		270° ± 10°
Resistance range	Linear taper	20 Ω to 10 MΩ
	Logarithmic taper	100 Ω to 2.5 MΩ
Standard series		1 - 2 - 2.5 - 5
Tolerance	Standard	± 20 %
	On request	± 10 %
Taper		<p>The graph plots Total Resistance (%) on the y-axis (0 to 100) against Clockwise Shaft Rotation (%) on the x-axis (0 to 100). Three curves are shown: 'F' (orange) rises steeply to ~90% at 50% rotation; 'A' (blue) rises linearly to 100% at 100% rotation; 'L' (green) rises slowly to ~10% at 50% rotation, then more steeply to 100% at 100% rotation.</p>
Circuit diagram		<p>The diagram shows a potentiometer with three terminals: 'a' (1) on the left, 'b' (2) at the center, and 'c' (3) on the right. An arrow labeled 'cw' indicates clockwise rotation.</p>
Power rating	Linear Logarithmic	2 W at 70 °C 1 W at 70 °C
		<p>The graph plots Power (W) on the y-axis (0 to 2) against Ambient Temperature (°C) on the x-axis (0 to 140). Two lines are shown: 'Linear taper "A"' (blue) is constant at 2 W until 70 °C, then drops to 0 W at 125 °C; 'Logarithmic taper "L and F"' (orange) is constant at 1 W until 70 °C, then drops to 0 W at 125 °C.</p>
Temperature coefficient (typical)		300 ppm/°C
Limiting element voltage (linear law)		500 V
Contact resistance variation (typical)		1 % R <sub>n</sub> or 3 Ω
End resistance		4 Ω
Dielectric strength (RMS)		1500 V
Insulation resistance (500 V <sub>DC</sub> )		10 <sup>4</sup> MΩ
Independent linearity (typical)		5 %



STANDARD RESISTANCE ELEMENT DATA						
STANDARD RESISTANCE VALUES	LINEAR TAPER			LOGARITHMIC TAPER		
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT WIPER	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT WIPER
Ω	W	V	mA	W	V	mA
20	2	6.32	316			
25	2	7.07	283			
50	2	10.0	200			
100	2	14.1	141	1	10.0	100
200	2	20.0	100.0	1	14.1	70.7
250	2	22.4	89.4	1	15.8	53.2
500	2	31.6	53.2	1	22.4	44.7
1K	2	44.7	44.7	1	31.5	31.6
2K	2	53.2	31.6	1	44.7	22.4
2.5K	2	70.7	28.3	1	50.0	20.0
5K	2	100	20.00	1	70.7	14.1
10K	2	141	14.14	1	100	10.0
20K	2	200	10.00	1	141	7.07
25K	2	224	6.04	1	158	6.32
50K	2	315	6.32	1	224	4.47
100K	2	447	4.47	1	315	3.16
200K	2	500	2.50	1	447	2.24
250K	1	500	2.00	1	499	2.00
500K	1	500	1.00	0.50	500	1.00
1M	0.25	500	0.50	0.25	500	0.50
2M	0.13	500	0.25	0.13	500	0.25
2.5M	0.10	500	0.20	0.10	500	0.20
5M	0.05	500				
10M	0.03	500				

MECHANICAL SPECIFICATIONS	
Mechanical travel	300° ± 5°
Operating torque / typical value	2 Ncm (2.83 oz.-inch)
End stop torque	70 Ncm max. (6 lb-inch max.)
Tightening torque of mounting nut	200 Ncm max. (17.3 lb-inch max.)
Unit weight	23 g to 32 g max. (0.82 oz. to 1.14 oz.)

ENVIRONMENTAL SPECIFICATIONS	
Temperature range	-55 °C to +125 °C
Climatic category	55/125/10
Sealing	Fully sealed - container IP 67



OPTIONS	
Special feature command shaft	Length is measured from the mounting surface to the free end of the shaft. The screwdriver slot is aligned with the wiper within $\pm 10^\circ$ . Special shafts are available, in accordance to drawings supplied by customers. We recommend that customers should not machine tool shafts, in order to avoid damage. Bending or torsion of terminals should also be avoided.
PRV4 LPRP - with locating peg	

CENTER DETENT (haptic technology)	
<ul style="list-style-type: none"> <li>Positive tactile feedback with stable position in mid mechanical travel</li> <li>Output ratio 50 % <math>\pm</math> 10 %</li> <li>Rotational life: 10 000 actuations</li> </ul>	
<b>ORDERING INFORMATION</b> (first order only)	
<div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">CV1M</div>	

MARKING
<ul style="list-style-type: none"> <li>Vishay trademark</li> <li>Full ordering information (see Ordering Information table)</li> <li>Manufacturing date</li> <li>Marking of terminals 1, 2, 3</li> </ul>

PERFORMANCE				
TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS		
		$\Delta R_T/R_T$ (%)	$\Delta R_{1-2}/R_{1-2}$ (%)	OTHER
Electrical endurance	1000 h at rated power 90°/30° - ambient temp. 70 °C	$\pm 3$ %	$\pm 5$ %	Contact res. variation: < 5 %
Moisture resistance	MIL-STD-202 method 105 10 cycles of 24 h constituted with damp heat - cold - vibrations	$\pm 2$ %	$\pm 3$ %	Dielectric strength: 100 V <sub>RMS</sub> Insulation resistance: > 10 <sup>4</sup> M $\Omega$
Damp heat, steady state	10 days 40 °C, 93 % HR	$\pm 2$ %	$\pm 3$ %	Dielectric strength: 100 V <sub>RMS</sub> Insulation resistance: > 10 <sup>4</sup> M $\Omega$
Change of temperature	5 cycles -55 °C at +125 °C	$\pm 1$ %	-	$\Delta V_{1-2}/V_{1-3} < \pm 2$ %
Mechanical endurance	25 000 cycles	$\pm 5$ %	-	-
Shock	MIL-STD-202 method 213/1 100 g's at 6 ms 3 successive shocks in 3 directions	$\pm 1$ %	-	$\Delta V_{1-2}/V_{1-3} < \pm 1$ %
Vibration	MIL-STD-202 method 204/D 20 g's at 12 h	$\pm 1$ %	-	$\Delta V_{1-2}/V_{1-3} < \pm 1$ %

**Note**

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



ORDERING INFORMATION (part number)																	
P	R	V	4	F	L	G	J	S	1	0	2	M	L				
MODEL	BUSHING	OPTION	SHAFT	SHAFT END	OHMIC VALUE	TOLERANCE	TAPER	SPECIAL									
PRV4	F = Ø 3/8"	L = LPRP 0 = no option	GB GJ GR AP = custom shaft	S = slotted On request: R = round F = flatted D = knurled or C = custom	Linear from 20 Ω to 10 MΩ  Logarithmic from 100 Ω to 2.5. MΩ  102 = 1 kΩ	M = 20 %  On request: K = 10 %	A = linear L = clockwise logarithmic F = inverse clockwise logarithmic	CV1M = detent option or special code given by Vishay									

PART NUMBER DESCRIPTION (for information only)													
PRV4	F	L	GJ	S	1K	20 %	L			BO50			e3
MODEL	BUSHING	OPTION	SHAFT	SHAFT END	VALUE	TOLERANCE	TAPER	DETENT OPTION	PACKAGING	AP N°	SPECIAL	LEAD (Pb)-FREE	

ACCESSORIES	
Additional Accessories (to order separately)	<a href="http://www.vishay.com/doc?51051">www.vishay.com/doc?51051</a>
Control knobs	<a href="http://www.vishay.com/doc?51101">www.vishay.com/doc?51101</a>

RELATED DOCUMENTS	
<b>APPLICATION NOTES</b>	
Potentiometers and Trimmers	<a href="http://www.vishay.com/doc?51001">www.vishay.com/doc?51001</a>
Guidelines for Vishay Sfernice Resistive and Inductive Components	<a href="http://www.vishay.com/doc?52029">www.vishay.com/doc?52029</a>
Capabilities and Custom Options	<a href="http://www.vishay.com/doc?48485">www.vishay.com/doc?48485</a>



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