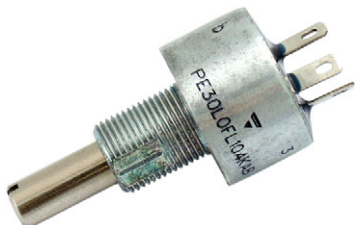




# Fully Sealed Potentiometer Professional Grade



## FEATURES

- High power rating 3 W at 70 °C
- Low temperature coefficient (150 ppm/°C typical)
- Cermet element
- Full sealing
- Use of faston 2.86 connections
- Tests according to CECC 41000 or IEC 60393-1
- Wires and connectors available
- Custom design on request
- Center detent option (haptic technology)
- 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

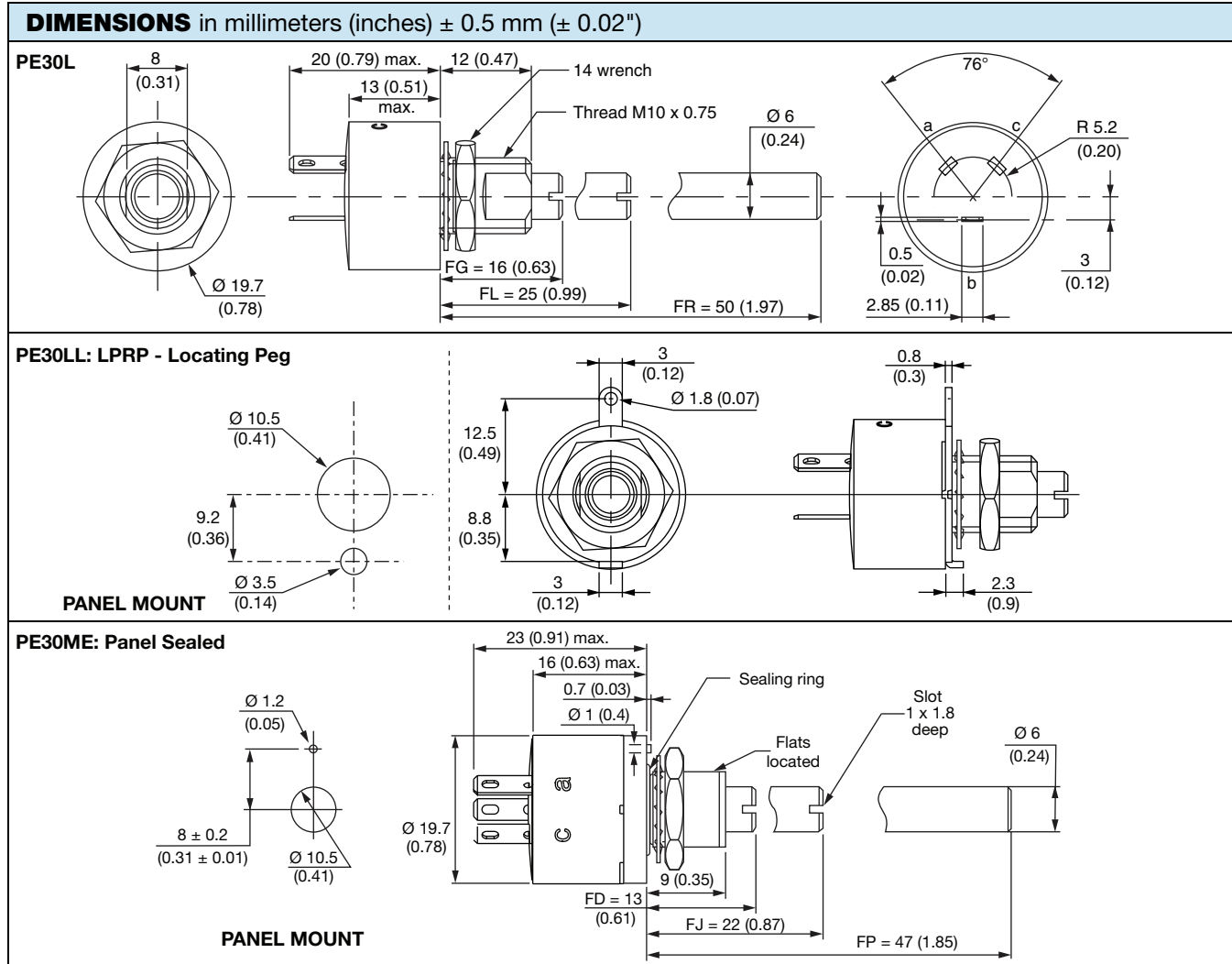


3D Models



Capabilities and Custom Options

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 cycles





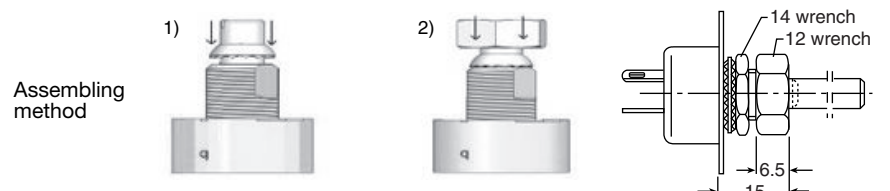
ELECTRICAL SPECIFICATIONS		
Resistive element		Cermet
Electrical travel		270° ± 10°
Resistance range	Linear taper Logarithmic taper	22 Ω to 10 MΩ 100 Ω to 2.2 MΩ
Standard series E3		1 - 2.2 - 4.7 and on request 1 - 2 - 5
Tolerance	Standard On request	± 20 % ± 10 % to ± 5 %
Taper		<p>The graph plots Total 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) is a logarithmic taper that rises steeply from 0% at 0° to about 90% at 50° and then levels off to 100% at 100°; 'A' (blue) is a linear taper rising from 0% at 0° to 100% at 100°; 'L' (green) is a logarithmic taper that stays near 0% until about 50° and then rises to 100% at 100°.</p>
Power rating	Linear Logarithmic	<p>The graph plots Power (W) on the y-axis (0 to 3) against Ambient Temperature (°C) on the x-axis (0 to 140). Two curves are shown: 'Linear taper "A"' (blue) is constant at 3 W from 0°C to 70°C, then drops linearly to 0 W at 120°C; 'Logarithmic taper "L and F"' (orange) is constant at 1.5 W from 0°C to 70°C, then drops linearly to 0 W at 120°C.</p>
Circuit diagram		<p>The circuit diagram shows a potentiometer with three terminals: 'a' (1) on the left, 'b' (2) in the center, and 'c' (3) on the right. A wiper is connected to terminal 'b' (2) and is labeled 'cw' with an arrow pointing clockwise.</p>
Temperature coefficient (typical)		± 150 ppm/°C
Limiting element voltage		300 V
Contact resistance variation (typical)		3 % R <sub>n</sub> or 3 Ω
End resistance (typical)		1 Ω
Dielectric strength (RMS)		2500 V
Insulation resistance (300 V <sub>DC</sub> )		10 <sup>5</sup> MΩ
Independent linearity (typical)		± 5 %



STANDARD RESISTANCE ELEMENT DATA						
STANDARD RESISTANCE VALUES	LINEAR TAPER			LOGS TAPER		
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH WIPER
Ω	W	V	mA	W	V	mA
22	3	8.1	369			
47	3	11.9	252			
100	3	17.3	173	1.5	12.2	122
220	3	25.7	116	1.5	18.2	82.6
470	3	37.5	79	1.5	26.6	56.6
1K	3	54.8	54	1.5	38.7	38.7
2.2K	3	81.2	37	1.5	57.4	26.1
4.7K	3	118.7	25	1.5	83.9	17.9
10K	3	173.2	17	1.5	122	12.2
22K	3	256.9	11	1.5	181.6	8.25
47K	1.91	299.6	6.3	1.5	265	5.64
100K	0.90	300.0	3	0.9	300	3
220K	0.41	300.0	1.36	0.41	300	1.36
470K	0.19	298.8	0.63	0.19	300	0.63
1M	0.09	300.0	0.3	0.09	300	0.30
2.2M	0.04	296.6	0.13	0.04	300	0.13
4.7M	0.02	300.0	0.06			
10M	0.01	300.0	0.03			

MECHANICAL SPECIFICATIONS	
Mechanical travel	300° ± 5°
Operating torque / typical value	2 Ncm / 2.83 oz.-inch
End stop torque	70 Ncm max. / 6.51 lb oz.-inch max.
Tightening torque of mounting nut	250 Ncm max. / 22 lb-inch max.
Unit weight	23 g to 32 g max. / 0.8 oz. to 1.13 oz.
Terminals	e3: pure Sn

ENVIRONMENTAL SPECIFICATIONS	
Temperature range	-55 °C to +125 °C
Climatic category	55/125/56
Sealing	Fully sealed - container IP67

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 ± 10°. 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.
Panel sealing (PE30M)	The panel sealing device consists of a ring located in a groove on the potentiometer face. Sealing is obtained by tightening the ring against the panel when mounting the potentiometer. Old code: PE30P
Locating peg (PE30LL)	Location is obtained by fitting a special washer on the mounting face of the potentiometer. Old code: LPRP
Shaft locking (PE30LD)	The shaft locking device consists of a tapered nut tightening a slotted notched washer against both bushing and shaft. DBAN tightening torque is 200 Ncm, shaft locking torque being 30 Ncm. DBAN is also available with all special types. This device is normally supplied in a separate bag. Can be pre-mounted on request.  



<b>CENTER DETENT</b> (haptic technology)	
<ul style="list-style-type: none"> <li>• Positive tactile feedback with stable position in mid mechanical travel</li> <li>• Output ratio 50 % ± 10 %</li> <li>• Rotational life: 10 000 actuations</li> </ul>	
<b>ORDERING INFORMATION</b> (first order only)	
<div style="border: 1px solid black; padding: 5px; display: inline-block;">CV1M</div>	

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

<b>PERFORMANCE</b>				
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	± 1 %	-	Contact res. variation: < 3 % Rn
Climatic sequence	Phase A dry heat 125 °C Phase B damp heat Phase C cold -55 °C Phase D damp heat 5 cycles	± 0.5 %	± 1 %	-
Damp heat, steady state	56 days 40 °C 93 % HR	± 0.5 %	± 1 %	Insulation resistance: > 10 <sup>4</sup> MΩ
Change of temperature	5 cycles -55 °C at +125 °C	± 0.5 %	-	-
Mechanical endurance	25 000 cycles	± 3 %	-	Contact res. variation: < 2 % Rn
Shock	50 g's at 11 ms 3 successive shocks in 3 directions	± 0.1 %	± 0.2 %	-
Vibration	10 Hz to 55 Hz 0.75 mm or 10 g's during 6 h	± 0.1 %	± 0.2 %	-

**Note**

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



ORDERING INFORMATION (part number)																	
P	E	3	0	L	B	F	G	2	0	4	M	A	B				
MODEL	BUSHING	OPTION	SHAFT			OHMIC VALUE	TOLERANCE	TAPER	PACKAGING	SPECIAL NUMBER							
PE30	L = M10 x 0.75 M = panel sealed M10 x 0.75	0 = none For L bushing D = DBAN L = LPRP B = DBAN and LPRP For M bushing E = peg A = peg and DBAN	For L bushing (= old codes): FG 16 mm, slotted = AC FL 25 mm, slotted = AM FR 50 mm, plain = AL  For M bushing FD = 13 mm, slotted = AC FJ = 22 mm, slotted = AM FP = 47 mm, plain = AL AP = custom shaft			A law = from 22 Ω to 10 MΩ  L and F laws = from 100 Ω to 2.2 MΩ	M = ± 20 % On request: K = ± 10 % J = ± 5 %	A = linear L = clockwise logarithmic F = clockwise inverse logarithmic	B = box of 10 pieces	(if applicable) Given by Vishay for custom design or E105 CV1M							

PART NUMBER DESCRIPTION (for information only)													
PE30		LPRP	AC	200K	20 %	A	DBAN		CV1M	BO			e3
MODEL	FEATURES	OPTION	SHAFT	VALUE	TOL.	TAPER	OPTION	SPECIAL	DETENT	PACKAGING	CUSTOM SHAFT	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	
APPLICATION NOTES	
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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