

## Fully Sealed Container Cermet Potentiometers Military and Professional Grade



### FEATURES

- 3 Watt at 70°C
- High power rating
- Low temperature coefficient
- Excellent stability
- Full sealing
- Low contact resistance variation
- Mechanical strength
- Use of faston 2.86 connections

ELECTRICAL SPECIFICATIONS		
Resistive Element		cermet
Electrical Travel		270° ± 10°
Resistance Range	Linear Law	22Ω to 10MΩ
	Logarithmic Laws	100Ω to 2.2MΩ
Standard Series E3		1 - 2.2 - 4.7 and on request 1 - 2 - 5
Tolerance	Standard	± 20%
	On Request	± 10% - ± 5%
Power Rating	Linear	3 W at 70°C
	Logarithmic	1.5 W at 70°C
Temperature Coefficient		See Standard Resistance Element Data
Limiting Element Voltage (Linear Law)		300V
Contact Resistance Variation		3% Rn or 3Ω
End Resistance (Typical)		1Ω
Dielectric Strength (RMS)		2500V
Insulation Resistance (500 VDC)		10 <sup>6</sup> MΩ

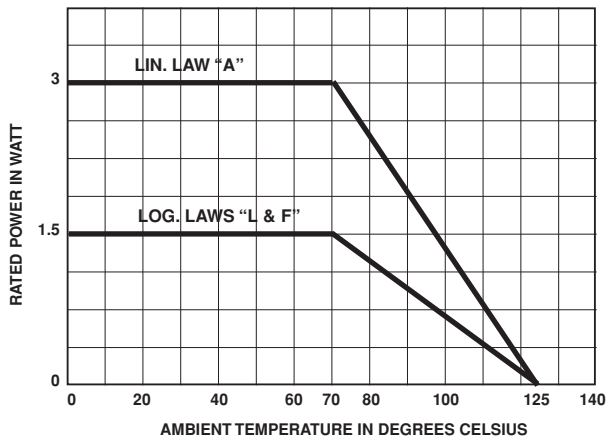
### MECHANICAL SPECIFICATIONS

Mechanical Travel	300° ± 5°
Operating Torque (max. Ncm)	3 typical
End Stop Torque (max. Ncm)	70
Max. Tightening Torque Of Mounting Nut (Ncm)	250
Unit Weight (max. g)	23 to 32

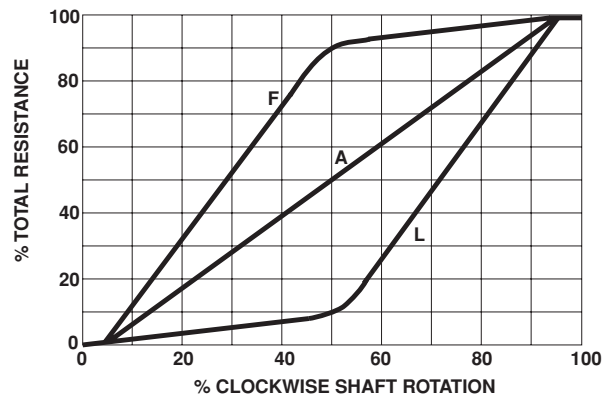
### ENVIRONMENTAL SPECIFICATIONS

Temperature Range	- 55°C + 125°C
Climatic Category	55/125/56
Sealing	fully sealed container IP67

### POWER RATING CHART



### RESISTANCE LAWS

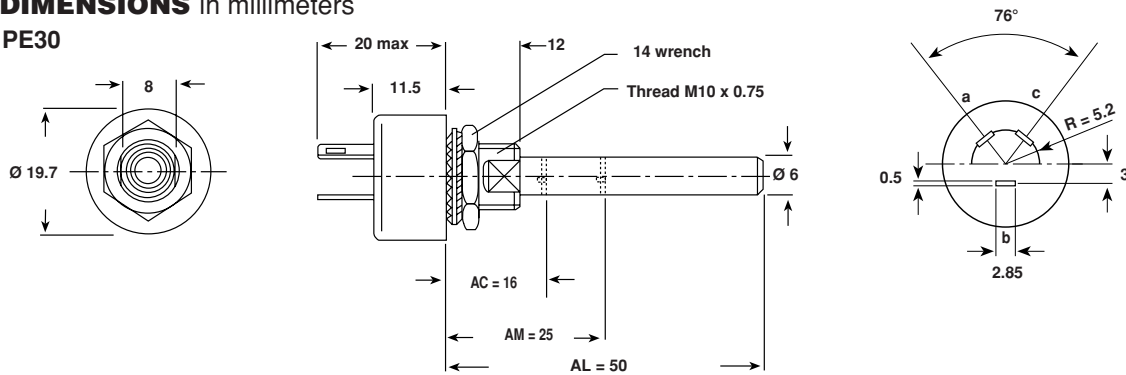


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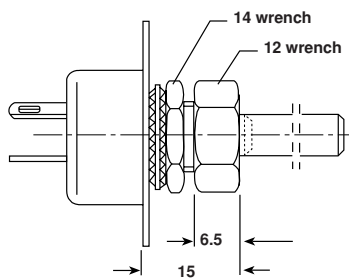
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**DIMENSIONS** in millimeters

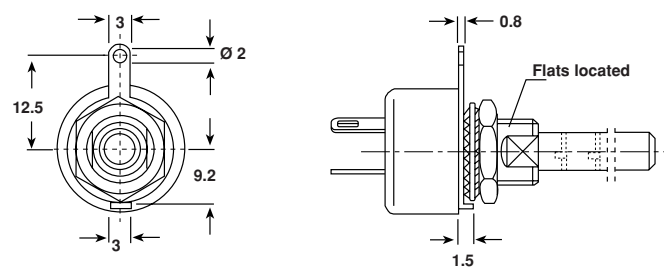
**PE30**



**DBAN SHAFT LOCKING**



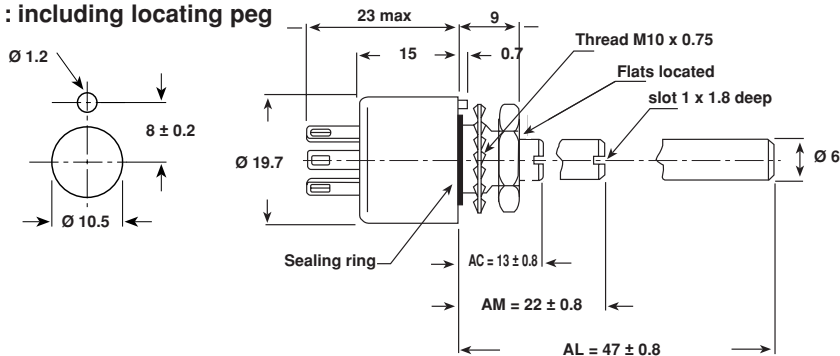
**PE30 LPRP - WITH LOCATING PEG**



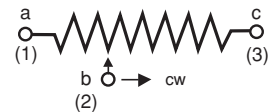
**PANEL SEALED VERSION**

**PE30P - PE30PE**

**PE : including locating peg**



**CIRCUIT DIAGRAM**



Tolerance unless otherwise specified ± 0.5

**SPECIAL FEATURES**

**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 shafts, in order to avoid damage. Bending or torsion of terminals should also be avoided.

**PANEL SEALING : PE30 P**

The panel sealing device consists of a ring located in a slot on the potentiometer face. Sealing is obtained by tightening the ring against the panel when mounting the potentiometer.

**LINEARITY**

The typical linearity of linear variation law potentiometers is ±5%. Guaranteed linearity on request. Consult VISHAY.

**SHAFT LOCKING : DBAN**

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.

**LOCATING PEG : LPRP**

Location is obtained by fitting a special washer in 2 holes drilled at 180° in the potentiometer face.

# PE30

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PERFORMANCE						
NF C 83-253					TYPICAL VALUES AND DRIFTS	
TESTS	CONDITIONS	$\frac{\Delta RT}{RT}(\%)$	REQUIREMENTS	$\frac{\Delta R_{1-2}}{R_{1-2}}(\%)$	$\frac{\Delta RT}{RT}(\%)$	$\frac{\Delta R_{1-2}}{R_{1-2}}(\%)$
Climatic Sequence	Phase A dry heat 125°C Phase B damp heat Phase C cold -55°C Phase D damp heat 5 cycles	± 10%		± 10%	± 0.5%	± 1%
Long Term Damp Heat	56 days	± 10%	Insulation resist. > 100MΩ		± 0.5%	± 1%
Rotational Life	25000 cycles	± 10%	Contact res. variat.: < 7% Rn		± 3%	Contact res. variat.: < 2% Rn
Load Life	1000 h at rated power 90°/30° - ambient temp. 70°C	± 10%	Contact res. variat.: < 7% Rn		± 1%	Contact res. variat.: < 3% Rn
Rapid Temperature Change	5 cycles - 55°C to + 125°C	± 3%			± 0.5%	
Shock	50 g 11 ms 3 successive shocks in 3 directions	± 2%			± 0.1%	± 0.2 %
Vibration	10 - 55 Hz 0.75mm or 10 g during 6 hours	± 2%			± 0.1%	± 0.2 %

STANDARD RESISTANCE ELEMENT DATA							
STANDARD RESISTANCE VALUES	LINEAR LAW			LOG LAWS			T.C. -55°C +125°C
	MAX. POWER AT +70°C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	MAX. POWER AT +70°C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	
Ω	W	V	mA	W	V	mA	ppm/°C
22	3	8.12	369				200
47	3	11.87	252				
100	3	17.32	173				±100
220	3	25.69	116				
470	3	37.55	79				
1k	3	54.77	54	1.5	38.7	38.7	
2.2k	3	81.24	37	1.5	57.4	26.1	
4.7k	3	118.74	25	1.5	83.9	17.9	
10k	3	173.20	17	1.5	122	12.2	
22k	3	256.9	11	1.5	181.6	8.25	
47k	1.91	300	6.3	1.5	265	5.64	
100k	0.90	300	3	0.9	300	3	
220k	0.41	300	1.36	0.41	300	1.36	
470k	0.19	300	0.63	0.19	300	0.63	
1M	0.09	300	0.30	0.09	300	0.30	
2.2M	0.04	300	0.13				
4.7M	0.02	300	0.06				
10M	0.01	300	0.03				

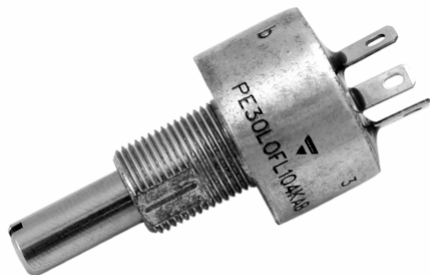
## MARKING

VISHAY trademark, series, NF types if applicable, ohmic value (in Ω, kΩ, MΩ), tolerance (in %), manufacturing date, marking of terminals 1, 2, 3 or a, b, c.

ORDERING INFORMATION						
SERIES	FEATURE	SHAFT LENGTH	OHMIC VALUE	TOLERANCE	LAW	PACKAGING
PE30	P	AC	200 kΩ	± 20%	A	BO10
	P	AC				
	LPRP	AM				
	DBAN	AL				

\* PE Panel sealing with locating peg (former designation E108)

# Fully Sealed Potentiometer Military and Professional Grade



## FEATURES

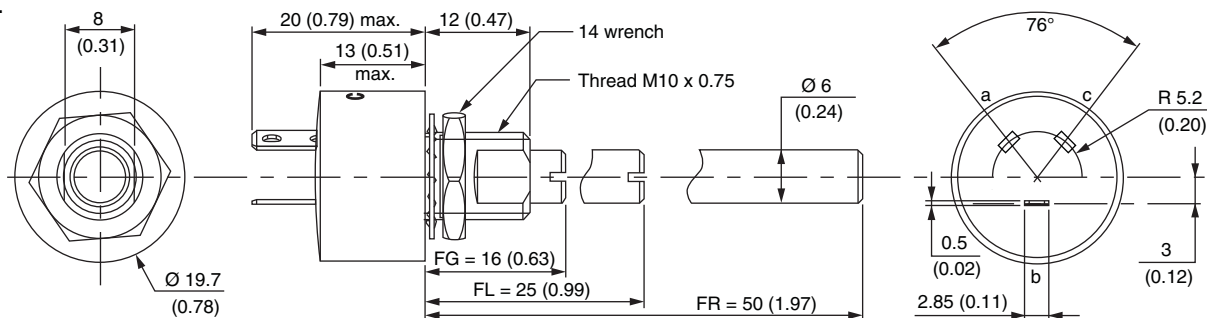
- High power rating 3 W at 70 °C
- Low temperature coefficient (150 ppm/°C typical)
- Cermet element
- Full sealing
- Use of faston 2.86 connections
- Tests according to CECC 41000 or IEC 60393-1
- Wires and connectors available
- Custom design on request
- Center detent option
- Compliant to RoHS Directive 2002/95/EC



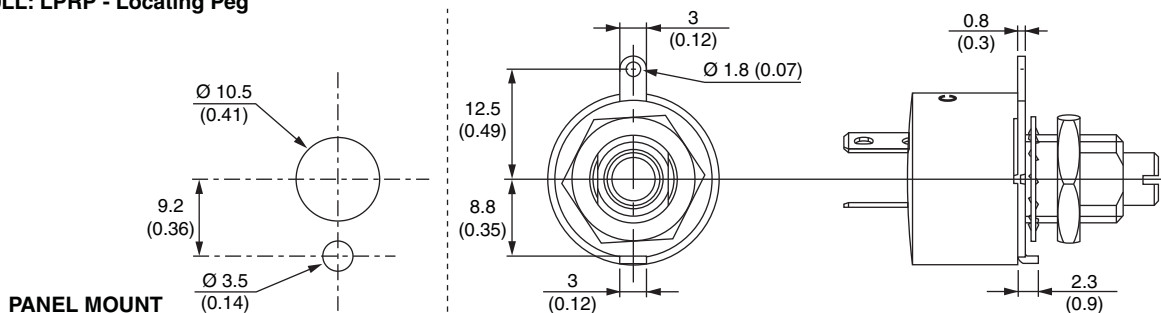
**RoHS**  
COMPLIANT

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

#### PE30L

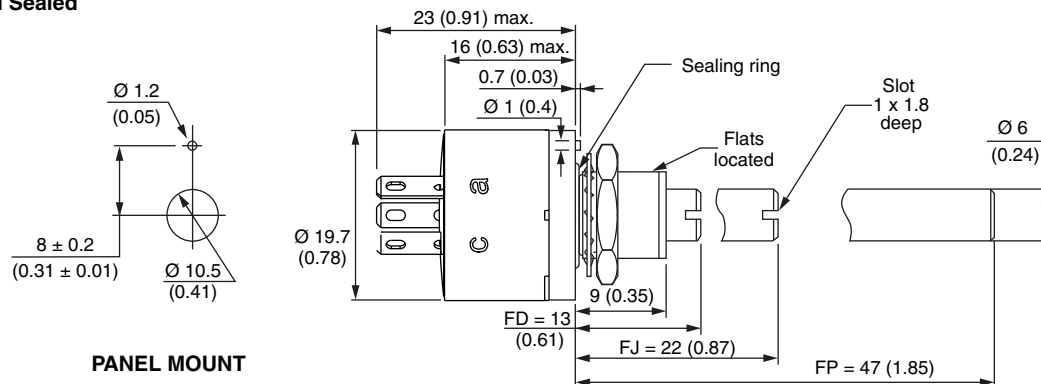


#### PE30LL: LPRP - Locating Peg



#### PANEL MOUNT

#### PE30ME: Panel Sealed



#### PANEL MOUNT

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Fully Sealed Potentiometer  
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ELECTRICAL SPECIFICATIONS		
Resistive Element		Cermet
Electrical Travel		270° ± 10°
Resistance Range	Linear Taper	22 Ω to 10 MΩ
	Logarithmic Taper	100 Ω to 2.2 MΩ
Standard Series E3		1 - 2.2 - 4.7 and on request 1 - 2 - 5
Tolerance	Standard	± 20 %
	On Request	± 10 % to ± 5 %
Taper		<p>The graph plots % Total Resistance (0 to 100) against % Clockwise Shaft Rotation (0 to 100). Curve F (Logarithmic) rises steeply from 0% at 0° to about 80% at 40°, then levels off to 100% at 100°. Curve A (Linear) is a straight line from (0,0) to (100,100). Curve L (Logarithmic) stays near 0% until about 50°, then rises to 100% at 100°.</p>
Power Rating	Linear	3 W at 70 °C
	Logarithmic	1.5 W at 70 °C
		<p>The graph plots Power in W (0 to 3) against Ambient Temperature in °C (0 to 140). LIN. TAPER A maintains a constant 3 W power rating up to 70 °C, then drops to 0 W at 120 °C. LOG. TAPER L and F maintain a constant 1.5 W power rating up to 70 °C, then drop to 0 W at 120 °C.</p>
Circuit Diagram		<p>The diagram shows a potentiometer with three terminals: 'a' (1) at the left end, 'c' (3) at the right end, and 'b' (2) at the center wiper. An arrow labeled 'cw' indicates clockwise rotation.</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 %

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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	119.9	25	1.5	83.9	17.9
10K	3	173	17	1.5	122	12.2
22K	3	257.7	11	1.5	181.6	8.25
47K	1.91	300	6.3	1.5	265	5.64
100K	0.90	300	3	0.9	300	3
220K	0.41	300	1.36	0.41	300	1.36
470K	0.19	300	0.63	0.19	300	0.63
1M	0.09	300	0.30	0.09	300	0.30
2.2M	0.04	300	0.13	0.04	300	0.13
4.7M	0.02	300	0.06			
10M	0.01	300	0.03			

MECHANICAL SPECIFICATIONS		
Mechanical Travel	300° ± 5°	
Operating Torque (Typical)	3 Ncm max.	4.25 oz.-inch max.
End Stop Torque	120 Ncm max.	10.51 lb oz.-inch max.
Tightening Torque of Mounting Nut	250 Ncm max.	22 lb-inch max.
Unit Weight	23 to 32 g max.	0.8 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

# PE30

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OPTIONS	
Locating Peg (PE30LL)	Location is obtained by fitting a special washer on the mounting face of the potentiometer. Old code: LPRP
Shaft Locking (PE30LD)	<p>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.</p> <p><b>Assembling Method</b></p>

CENTER DETENT
<ul style="list-style-type: none"> <li>Stable position in mid mechanical travel</li> <li>Output ratio 50 % ± 10 %</li> <li>Rotational life: 10 000 actuations</li> </ul>
ORDERING INFORMATION (First order only)
CV1M

MARKING
<ul style="list-style-type: none"> <li>Vishay trademark</li> <li>Part number (including ohmic value and tolerance code)</li> <li>Manufacturing date code</li> <li>Marking of terminals 3, and a, b, c</li> </ul>

PERFORMANCES				
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 %	-

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ORDERING INFORMATION (Part Number)																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">P</td> <td style="width: 20px; text-align: center;">E</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">L</td> <td style="width: 20px; text-align: center;">B</td> <td style="width: 20px; text-align: center;">F</td> <td style="width: 20px; text-align: center;">G</td> <td style="width: 20px; text-align: center;">2</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">4</td> <td style="width: 20px; text-align: center;">M</td> <td style="width: 20px; text-align: center;">A</td> <td style="width: 20px; text-align: center;">B</td> <td style="width: 20px; text-align: center;"></td> <td style="width: 20px; text-align: center;"></td> <td style="width: 20px; text-align: center;"></td> <td style="width: 20px; text-align: center;"></td> </tr> </table>										P	E	3	0	L	B	F	G	2	0	4	M	A	B				
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 A = Peg and DBAN  For M bushing E = Peg	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			A law = from 22 Ω to 10 MΩ  L and F laws = from 100 Ω to 2.2 MΩ	± 20 % On request: ± 10 % ± 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