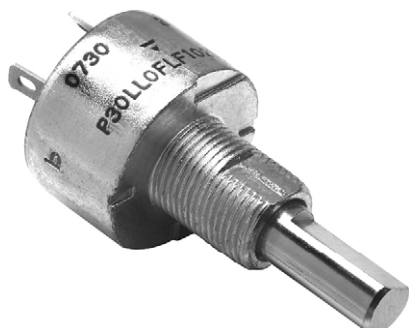




# Long Life Potentiometer - 2 Million Cycles, Heavy Duty - Cermet, Fully Sealed



## FEATURES

- 2 million cycles
- High power rating 3 W at 70 °C
- Cermet element
- Low temperature coefficient ( $\pm 150$  ppm/°C typical)
- Custom designs on request
- Tests according to CECC 41000 or IEC 60393-1
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

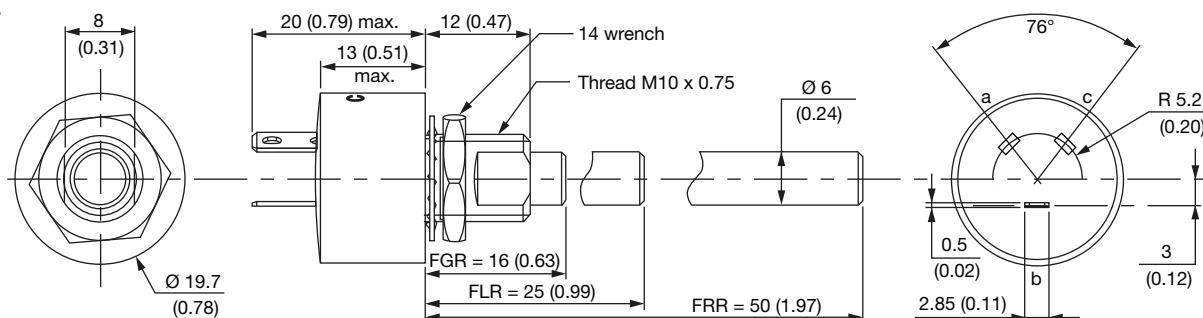
## LINK TO ADDITIONAL RESOURCES



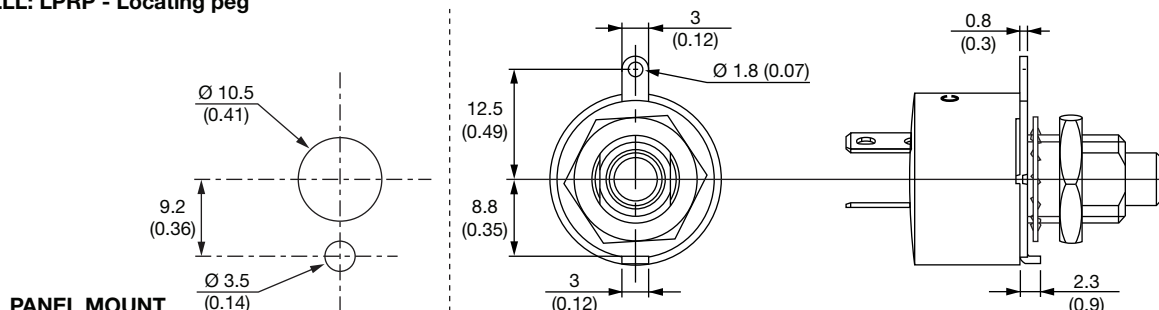
QUICK REFERENCE DATA	
Multiple module	No
Switch module	n/a
Detent module	n/a
Special electrical laws	A: linear, L: logarithmic, F: reverse logarithmic
Sealing level	IP 67
Lifespan	2M cycles

## DIMENSIONS in millimeters (inches) $\pm 0.5$ mm ( $\pm 0.02$ " )

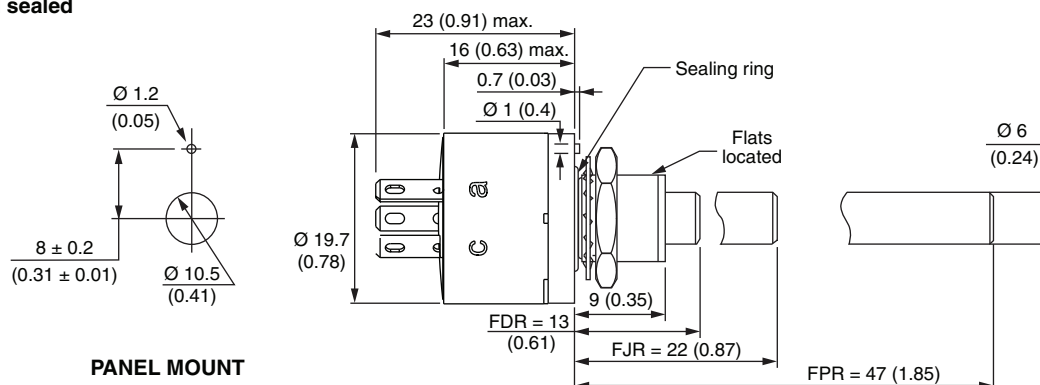
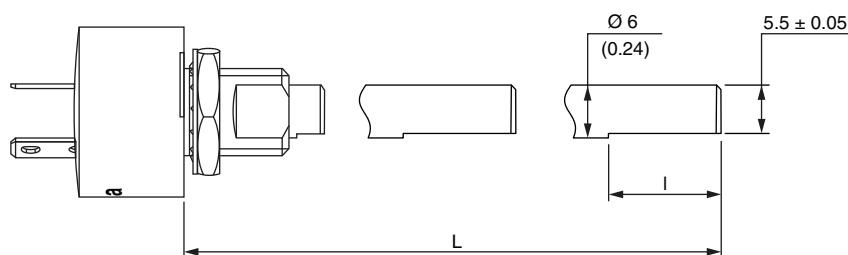
### P30LL



### P30LLL: LPRP - Locating peg



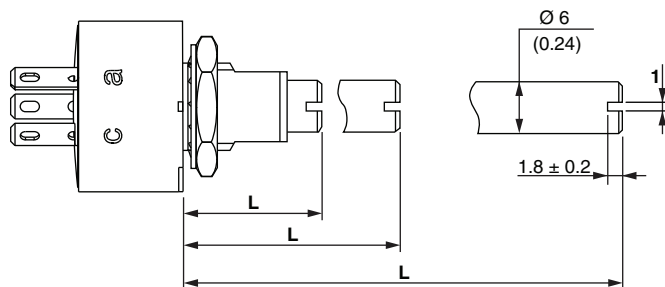
**DIMENSIONS** in millimeters (inches)  $\pm 0.5$  mm ( $\pm 0.02$ ")

**P30LME: Panel sealed**

**PANEL MOUNT**
**Standard shaft style F (flatted)**


MODEL	SHAFT CONFIGURATION	L (mm)	I (mm)
P30LL	FGF	16	3.17
	FLF	25	12
	FRF	30	12
P30LM	FDF	13	3.17
	FJF	22	12
	FPF	47	12

**Note**

- Shaft shown at center position. Flat opposite to the wiper

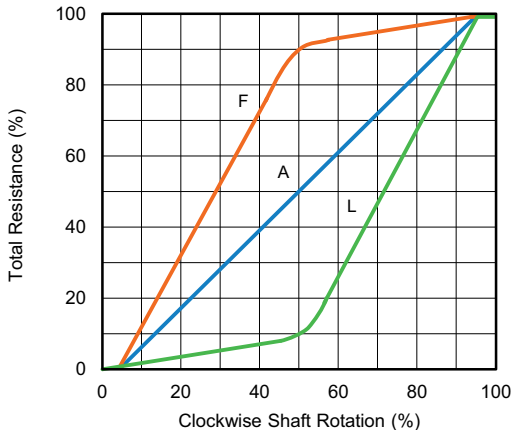
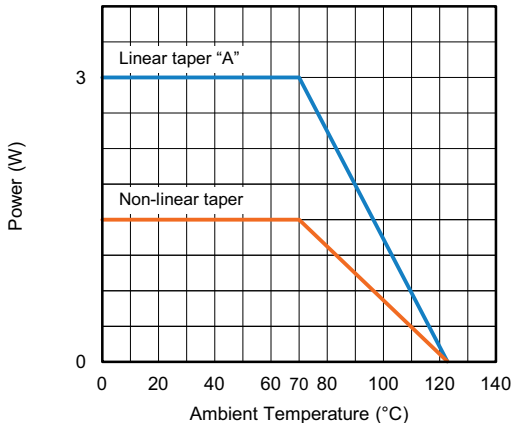
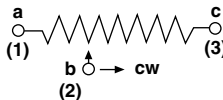
**Standard shaft style S (slotted)**


MODEL	SHAFT CONFIGURATION	L (mm)
P30LL	FGS	16
	FLS	25
	FRS	50
P30LM	FDS	13
	FJS	22
	FPS	47

**Note**

- Slot aligned to the wiper at  $\pm 10^\circ$



ELECTRICAL SPECIFICATIONS																																	
Resistive element		Cermet																															
Electrical travel		270° ± 10°																															
Standard resistance values		1 kΩ - 5 kΩ - 10 kΩ - 50 kΩ																															
Tolerance		20 %																															
Taper																																	
Power rating	Linear Non-linear taper	3 W at 70 °C 1.5 W at 70 °C																															
Circuit diagram																																	
Standard resistance element data		<table><tr><th rowspan="2">RESISTANCE VALUE (kΩ)</th><th colspan="2">LINEAR TAPER</th><th colspan="2">NON-LINEAR TAPER</th></tr><tr><th>MAX. POWER AT 70 °C (W)</th><th>MAX. WORKING VOLTAGE (V)</th><th>MAX. POWER AT 70 °C (W)</th><th>MAX. WORKING VOLTAGE (V)</th></tr><tr><td>1</td><td>3</td><td>54.8</td><td>1.5</td><td>38.7</td></tr><tr><td>5</td><td>3</td><td>122</td><td>1.5</td><td>86.6</td></tr><tr><td>10</td><td>3</td><td>173</td><td>1.5</td><td>122</td></tr><tr><td>50</td><td>1.8</td><td>300</td><td>1.5</td><td>274</td></tr></table>			RESISTANCE VALUE (kΩ)	LINEAR TAPER		NON-LINEAR TAPER		MAX. POWER AT 70 °C (W)	MAX. WORKING VOLTAGE (V)	MAX. POWER AT 70 °C (W)	MAX. WORKING VOLTAGE (V)	1	3	54.8	1.5	38.7	5	3	122	1.5	86.6	10	3	173	1.5	122	50	1.8	300	1.5	274
RESISTANCE VALUE (kΩ)	LINEAR TAPER		NON-LINEAR TAPER																														
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50	1.8	300	1.5	274																													
Temperature coefficient (typical)		± 150 ppm/°C																															
Limiting element voltage		300 V																															
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 %																															

**MECHANICAL SPECIFICATIONS**

Mechanical travel	$300^{\circ} \pm 5^{\circ}$	
Operating torque / typical value	2 Ncm	2.83 oz.-inch
End stop torque	70 Ncm max.	99 oz.-inch max.
Tightening torque of mounting nut	250 Ncm max.	22.13 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	$-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	
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 $\pm 10^{\circ}$ . 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.
Panel sealing	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.
Locating peg	Location is obtained by fitting a special washer on the mounting face of the potentiometer.

**MARKING**

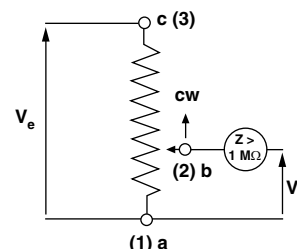
- Vishay trademark
- Full ordering information (see Ordering Information table)
- Manufacturing date code
- Marking of terminals 3, and a, b, c

**APPLICATION NOTE**

The potentiometer shall be used in voltage divider with an impedance load at least 100 times higher than the total potentiometer nominal resistance value.

Advised load impedance:

1 M $\Omega$  min. for resistance range of 1k $\Omega$  to 50 k $\Omega$





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	± 20 %	± 20 %	-
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: > 100 MΩ
Change of temperature	5 cycles -55 °C at +125 °C	± 0.5 %	-	-
Mechanical endurance	2 000 000 cycles at rated power Turn angle: ± 60° Temperature: 20 °C	± 20 %	-	Independent linearity: ± 10 %
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	3	0	L	L	0	F	G	R	1	0	3	M
MODEL	BUSHING	OPTION	SHAFT			RESISTANCE CODE / TOLERANCE CODE / TAPER			SPECIAL NUMBER			
P30L	L = M10 x 0.75 M = panel sealed M10 x 0.75	0 = none E = with locating peg (for M bushing only) L = LPRP	Diameter	Length	End Shaft Shape	Ohmic Value	Tolerance	Taper	(if applicable) Given by Vishay for custom design			
			F = Ø 6 mm AP = custom shaft	For L bushing G = 16 mm L = 25 mm R = 50 mm  For M bushing D = 13 mm J = 22 mm P = 47 mm	R = round  On request: S = slotted D = custom end shaft F = flatted	102 = 1 kΩ 502 = 5 kΩ 103 = 10 kΩ 503 = 50 kΩ	M = 20 %	A = linear L = logarithmic F = inverse clockwise logarithmic				

PART NUMBER DESCRIPTION (for information only)												
P30L	L	0	FGR	10K	20 %	A		BO10				e3
MODEL	BUSHING	OPTION	SHAFT	VALUE	TOLERANCE	TAPER	SPECIAL	PACKAGING	SPECIAL	SPECIAL	SPECIAL	LEAD (Pb)-FREE

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