

Fully Sealed Container Cermet Potentiometers Military and Professional Grade



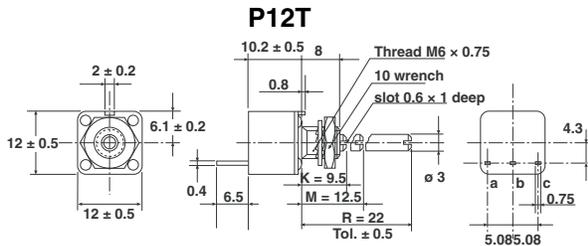
FEATURES

- 1 Watt at 70 °C
- CECC 41 300
- Full sealing
- Mechanical strength

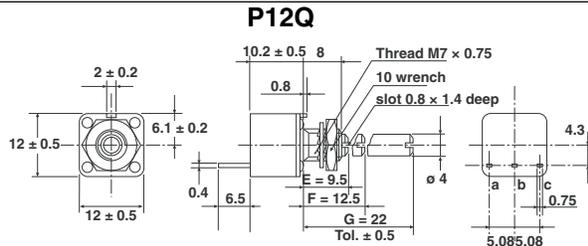
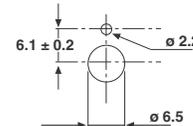


Model P12 potentiometers fully meet the requirements of CECC 41300

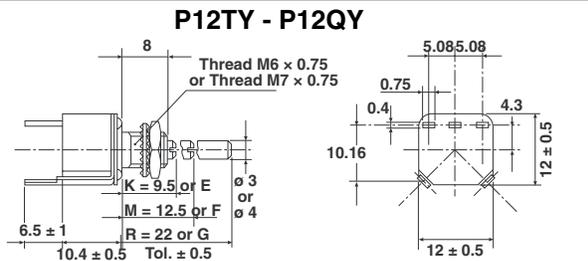
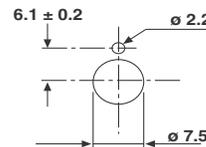
DIMENSIONS in millimeters



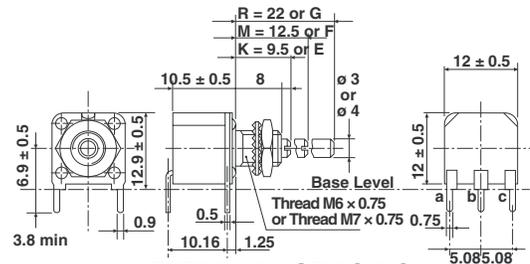
PANEL CUTOUT PANEL THICKNESS: 4 max



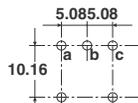
PANEL CUTOUT



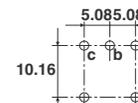
P12TX - P12QX



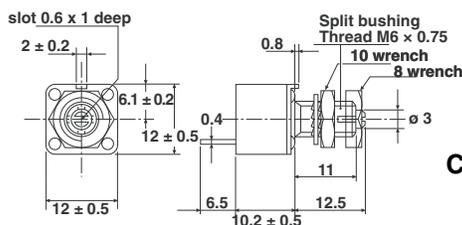
TERMINAL SPACING



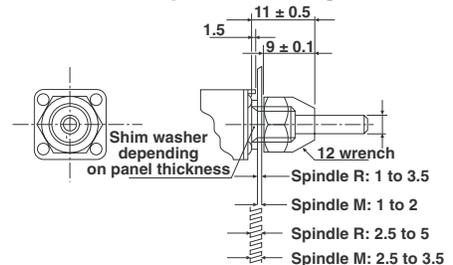
TERMINAL SPACING



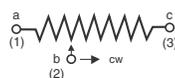
P12HL with spindle locking nut



DE Shaft and panel sealing hardware



CIRCUIT DIAGRAM



Tolerance unless otherwise specified ± 0.5



| ELECTRICAL SPECIFICATIONS | | |
|---------------------------------------|------------------|--|
| Resistive Element | | cermet |
| Electrical Travel | | 270° ± 10° |
| Resistance Range | Linear Law | 22 Ω to 10 MΩ |
| | Logarithmic Laws | 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 % |
| Power Rating | Linear | 1 W at + 70 °C |
| | Logarithmic | 0.5 W at + 70 °C |
| Temperature Coefficient | | See Standard Resistance Element Data |
| Limiting Element Voltage (Linear Law) | | 350 V |
| Contact Resistance Variation | | 3 % or 3 Ω |
| End Resistance (Typical) | | 1 Ω |
| Dielectric Strength (RMS) | | 2000 V |
| Insulation Resistance (500 VDC) | | 10 ⁶ MΩ |

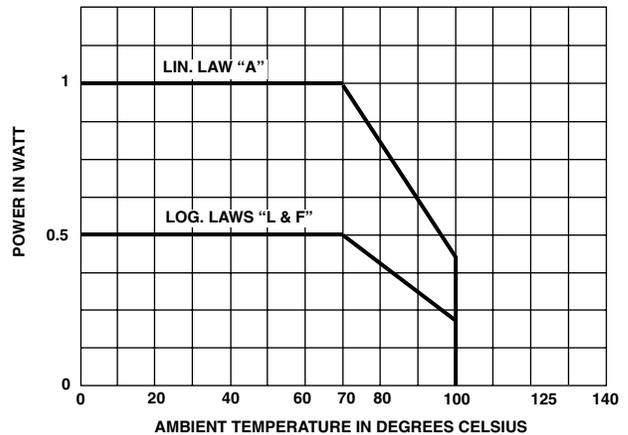
MECHANICAL SPECIFICATIONS

Mechanical Travel 300° ± 5°
 Operating Torque (max. Ncm) 2 typical
 End Stop Torque (max. Ncm) style H: 15 - T.Q.: 35
 Tightening Torque (max. Ncm) 150
 Unit Weight (max. g) 7.6 to 10

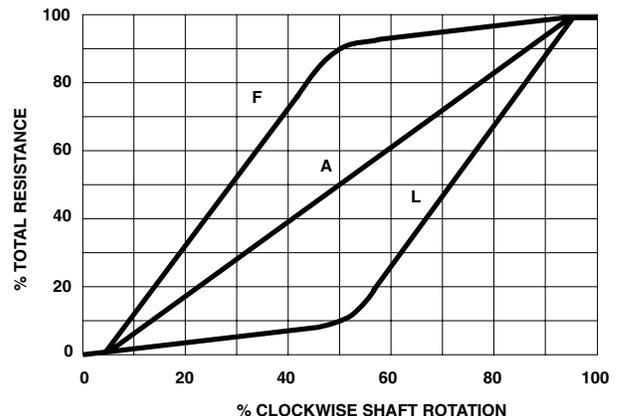
ENVIRONMENTAL SPECIFICATIONS

Temperature Range - 55 °C to + 125 °C
 Climatic Category 55/100/56
 Sealing fully sealed container IP67

POWER RATING CHART



RESISTANCE LAWS





Fully Sealed Container Cermet Potentiometers
Military and Professional Grade

Vishay Sfernice

| PERFORMANCE | | | |
|--------------------------|--|---|--|
| TESTS | CONDITIONS | TYPICAL VALUES AND DRIFTS | |
| | | $\frac{\Delta RT}{RT}$ (%) | $\frac{\Delta R_{1-2}}{R_{1-2}}$ (%) |
| Load Life | 1000 hours 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 % |
| Long Term Damp Heat | 56 days 40 °C 93 % RH | ± 0.5 % | ± 1 % |
| Rapid Temperature Change | 5 cycles - 55 °C at + 125 °C | ± 0.5 % | |
| Shock | 50 g at 11 ms 3 successive shocks in 3 directions | ± 0.1 % | ± 0.2 % |
| Vibration | 10 - 55 Hz 0.75 mm or 10 g during 6 hours | ± 0.1 % | $\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 0.2 \%$ |
| Rotational Life | 25 000 cycles | ± 3 % Contact res. variation: < 2 % Rn | |

| STANDARD RESISTANCE ELEMENT DATA | | | | | | | |
|----------------------------------|---------------------|----------------------|-----------------|---------------------|----------------------|-----------------|---------------------|
| STANDARD RESISTANCE VALUES | LINEAR LAW | | | LOGS LAW | | | TCR -55 °C + 125 °C |
| | MAX. POWER AT 70 °C | MAX. WORKING VOLTAGE | MAX. WIPER CUR. | MAX. POWER AT 70 °C | MAX. WORKING VOLTAGE | MAX. WIPER CUR. | |
| Ω | W | V | mA | W | V | mA | ppm/°C |
| 22 | 1 | 4.69 | 213.2 | | | | 0 |
| 47 | | 6.85 | 145.8 | | | | + 200 |
| 100 | | 10 | 100 | | | | |
| 220 | | 14.8 | 67.4 | | | | |
| 470 | | 21.6 | 46.1 | | | | |
| 1K | | 31.6 | 31.6 | 0.5 | 22.4 | 22.4 | |
| 2.2K | | 46.9 | 21.3 | | 33.2 | 15.1 | |
| 4.7K | | 63.5 | 14.5 | | 48.5 | 10.3 | |
| 10K | | 100 | 10 | | 79.7 | 7.07 | |
| 22K | | 148.3 | 6.7 | | 105 | 4.77 | |
| 47K | | 216.7 | 4.6 | | 153 | 3.26 | ± 100 |
| 100K | 1 | 316.2 | 3.16 | | 224 | 2.24 | |
| 220K | 0.56 | 350 | 1.59 | 0.5 | 332 | 1.51 | |
| 470K | 0.26 | 350 | 0.75 | 0.26 | 350 | 0.74 | |
| 1M | 0.12 | 350 | 0.35 | 0.12 | 350 | 0.35 | |
| 2.2M | 0.05 | 350 | 0.16 | 0.05 | 350 | 0.16 | |
| 4.7M | 0.02 | 350 | 0.07 | | | | |
| 10M | 0.01 | 350 | 0.01 | | | | |

MARKING

- Printed:
- VISHAY trademark
 - series
 - ohmic value (in Ω)
 - tolerance (in %)
 - manufacturing date
 - marking of terminals 1 or a

SPECIAL FEATURES SHAFTS

Lengths are measured from the mounting surface to the free end of shaft. Shaft slot is aligned with the wiper within ± 10°. Special shafts are available, in accordance with drawings supplied by customers. We recommend customers not to machine shafts, in order to avoid damage. Bending or torsion of terminal should be avoided.

SHAFT AND PANEL SEALING HARDWARE

The type P12T with R or M shaft can be provided with an optional “DE” sealing hardware which ensures sealing of both the shaft and the mounting panel. “DE” sealing hardware can be supplied in a separate envelope.

SHAFT LOCKING

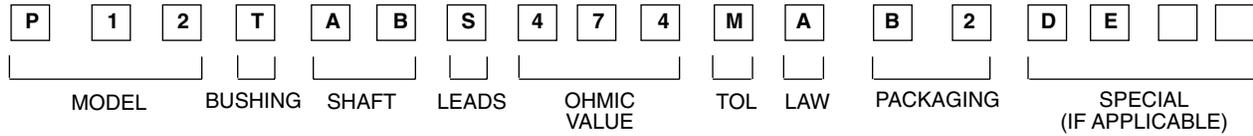
- The shaft locking bushing is available only with P12H potentiometers. Torque applied to locking nuts should not exceed 15 Ncm.



ORDERING INFORMATION

| | | | | | | | |
|----------------------------|----------|----------|---------------|-------------|-------------------|-------------------------|-----------|
| P12 OR P12H | T | M | 470 kΩ | 20 % | A | DE | BO |
| SERIES OR SHAFT LOCKING | STYLE | SHAFT | OHMIC VALUE | TOLERANCE | RESISTANCE LAW | PANEL SEALING DEVICE | PACKAGING |

SAP PART NUMBERING GUIDELINES



See the end of this data book for conversion tables



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.