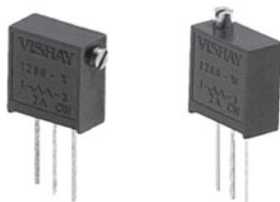


# Bulk Metal® Foil Ultra High Technology Precision Trimming Potentiometers, 3/8" Square, RJ24 Style, Designed to Meet or Exceed the Requirements of MIL-PRF-39035, Char. H with a Smooth and Unidirectional Output



## INTRODUCTION

Vishay Foil Resistors (VFR) precision trimmers have the Bulk Metal® Foil resistive element which possesses a unique inherent temperature and load life stability. Plus, their advanced virtually back lash-free adjustment mechanism makes them easy to set quickly and accurately and keeps the setting exactly on target.

## FEATURES

- Temperature coefficient of resistance (TCR):  $\pm 10$  ppm/°C (-55 °C to +150 °C ref. at +25 °C); through the wiper <sup>(2)</sup>;  $\pm 25$  ppm/°C (see table 2 for low values)
- A smooth and unidirectional resistance with RoHS\* leadscrew adjustment COMPLIANT
- Load life stability: 0.1 % typical  $\Delta R$ , 1.0 % maximum  $\Delta R$  under full rated power at +85 °C for 10 000 h
- Settability: 0.05 % typical; 0.1 % maximum
- Setting stability: 0.1 % typical; 0.5 % maximum
- Power rating: 0.25 W at +85 °C
- Resistance range: 5  $\Omega$  to 10 k $\Omega$
- Resistance tolerance:  $\pm 5$  %,  $\pm 10$  %
- "O"-ring prevents ingress of fluids during any board cleaning operation
- Electrostatic discharge (ESD) up to 25 000 V
- Terminal finish: tin/lead or lead free

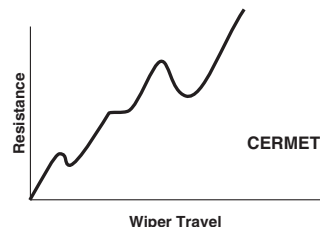
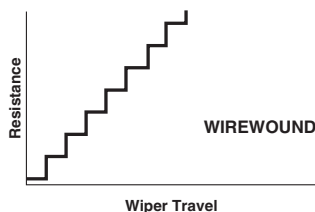
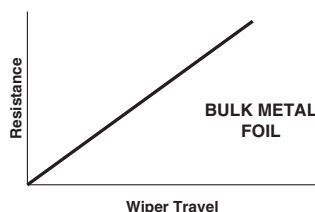


TABLE 1 - MODEL SELECTION

| MODEL | TERMINATION STYLE         | AVERAGE WEIGHT (g) | POWER RATING at +85 °C AMBIENT | NO. OF TURNS |
|-------|---------------------------|--------------------|--------------------------------|--------------|
| 1260  | W-edge mount, top adjust  | 0.4                | 0.25 W                         | 21 $\pm$ 2   |
|       | X-edge mount, side adjust |                    |                                |              |

### Note

- See figure 1

TABLE 2 - 1260 (RJ24 STYLE) SERIES ELECTRICAL SPECIFICATIONS

|                                                                                                                       |                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Temperature Coefficient of Resistance (TCR) 50 $\Omega$ to 10 k $\Omega$ End-to-end <sup>(1)</sup>                    | $\pm 10$ ppm/°C maximum (-55 °C to +150 °C, +25 °C ref.)                                          |
| Temperature Coefficient of Resistance (TCR) 5 $\Omega$ , 10 $\Omega$ and 20 $\Omega$ Through the wiper <sup>(2)</sup> | $\pm 20$ ppm/°C<br>$\pm 25$ ppm/°C                                                                |
| Stability<br>Load life at 10 000 h                                                                                    | 0.1 % typical $\Delta R$<br>1.0 % maximum $\Delta R$ (under full rated power of 0.25 W at +85 °C) |
| Power Rating <sup>(3)</sup>                                                                                           | 0.25 W at +85 °C                                                                                  |
| Settability                                                                                                           | 0.05 % typical;<br>0.1 % maximum                                                                  |
| Setting Stability                                                                                                     | 0.1 % typical;<br>0.5 % maximum                                                                   |
| Contact Resistance<br>Variation - CRV (noise)                                                                         | 3 $\Omega$ typical;<br>10 $\Omega$ maximum                                                        |
| Hop-off                                                                                                               | 0.25 % typical;<br>1.0 % maximum                                                                  |
| High-Frequency Operation<br>Rise/decay time<br>Inductance<br>Capacitance                                              | 1 ns without ringing<br>0.08 $\mu$ H typical<br>0.5 pF typical                                    |
| Operating Temperature Range                                                                                           | -55 °C to +150 °C                                                                                 |

TABLE 3 - VALUES VS. TOLERANCES

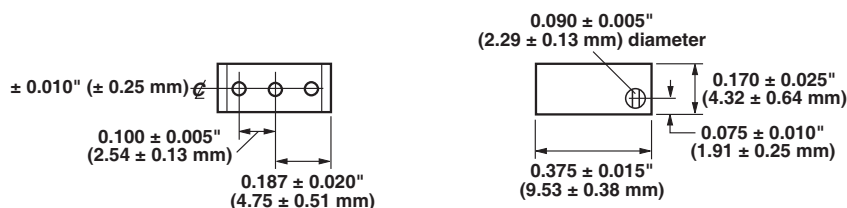
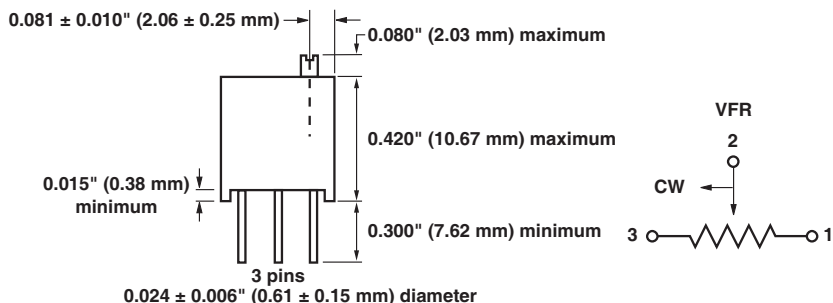
| STANDARD RESISTANCE VALUES (in $\Omega$ ) | STANDARD TOLERANCE |
|-------------------------------------------|--------------------|
| 5, 10                                     | $\pm 10$ %         |
| 20, 50, 100, 200, 500, 1K, 2K, 5K, 10K    | $\pm 5$ %          |

TABLE 4 - MECHANICAL SPECIFICATIONS

|                       |                                |
|-----------------------|--------------------------------|
| Adjustment Turns      | 21 $\pm$ 2                     |
| Mechanical Stops      | Wiper idles - no discontinuity |
| Internal Terminations | All welded - no flux           |
| Case Material         | Diallyl-phthalate: black (DAP) |
| Shaft Torque          | 3 oz. in. maximum              |
| Backlash              | 0.005 % typical                |

**FIGURE 1 - SCHEMATIC AND DIMENSIONS** in Inches (Millimeters)

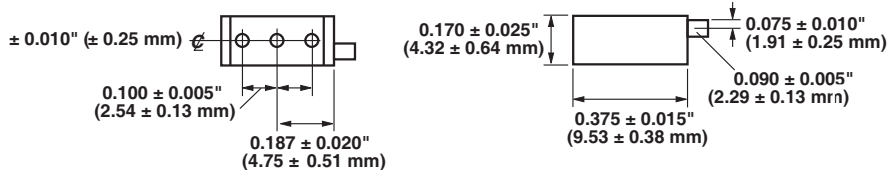
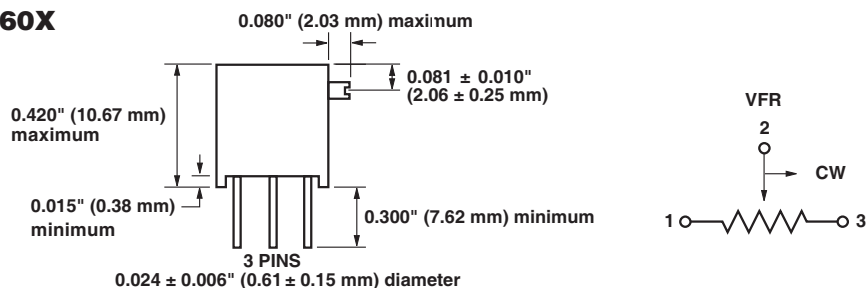
### 1260W



### STANDARD MARKING:

Model No.  
Date Code  
Resistance Value  
Tolerance  
Termination Finish - in case of  
Lead Free (L.F)

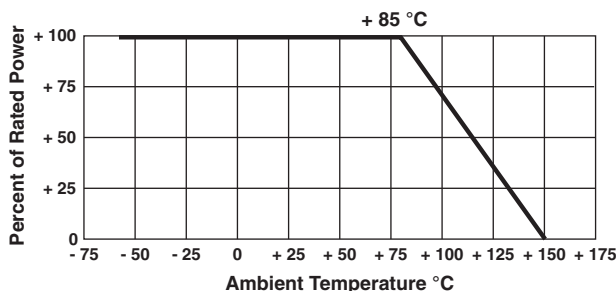
### 1260X



### NOTES:

Adjustment screw 0.090" (2.29 mm) diameter with 0.020" (0.51 mm) x 0.031" (0.79 mm) slot. Model 1260 has solder plated copper terminal pins. 0.024" (0.61 mm) diameter, 0.300" (7.62 mm) length minimum.

**FIGURE 2 - POWER DERATING CURVE**



**TABLE 5 - COMPARISON**

|                                                                                                                                                                                                                                                                                                                          | MIL-PRF-39035/2 CHARACTERISTIC H <sup>(4)</sup>                                                                                                                                                                 | 1260 MAXIMUM                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TEST GROUP I</b><br>Conditioning<br>Contact resistance variation - CRV (noise)<br>Immersion                                                                                                                                                                                                                           | $\pm 1.0 \%$<br>$\pm 3.0 \%$ or $3 \Omega$ <sup>(5)</sup><br>No continuous stream of bubbles                                                                                                                    | $\pm 0.5 \%$<br>3 $\Omega$ typical, 10 $\Omega$ maximum<br>No continuous stream of bubbles                                                                                                                                                                         |
| <b>TEST GROUP Ia</b><br>Visual and mechanical<br>Actual effective electrical travel<br>End resistance<br><br>Dielectric withstanding voltage - DWV<br>Per MIL-STD-202, methods 301 and 105<br>Atmospheric pressure<br>Barometric pressure<br>Insulation resistance<br>Shaft torque<br>Thermal shock<br>Setting stability | No failures<br>10 to 25 turns<br>2 % or 2 $\Omega$ <sup>(5)</sup><br><br>600 V <sub>AC</sub> , 1 min<br>250 V <sub>AC</sub> , 1 min<br>$\geq 1000 M\Omega$<br>3 oz. in. maximum<br>$\pm 1.0 \%$<br>$\pm 1.0 \%$ | No failures<br>21 $\pm 2$ turns<br>2 $\Omega$ for values $\leq 1 k\Omega$ ;<br>5 $\Omega$ for values $\geq 2 k\Omega$ ;<br><br>600 V <sub>AC</sub> , 1 min<br>250 V <sub>AC</sub> , 1 min<br>$> 1000 M\Omega$<br>3 oz. in. maximum<br>$\pm 0.5 \%$<br>$\pm 0.5 \%$ |
| <b>TEST GROUP II</b><br>Solderability                                                                                                                                                                                                                                                                                    | Per MIL-STD-202, method 208                                                                                                                                                                                     | Per MIL-STD-202, method 208                                                                                                                                                                                                                                        |
| <b>TEST GROUP III</b><br>Resistance temperature characteristic - TCR<br>Moisture resistance<br>Contact resistance variation - CRV (noise)                                                                                                                                                                                | $\pm 0.005 \%/^{\circ}\text{C}$ ( $\pm 50 \text{ ppm}/^{\circ}\text{C}$ )<br>$\pm 1.0 \%$<br>3.0 % or 3 $\Omega$ <sup>(5)</sup>                                                                                 | $\pm 0.001 \%/^{\circ}\text{C}$ ( $\pm 10 \text{ ppm}/^{\circ}\text{C}$ )<br>$\pm 0.5 \%$<br>3 $\Omega$ typical, 10 $\Omega$ maximum                                                                                                                               |
| <b>TEST GROUP IV</b><br>Settability<br>Shock<br>Setting stability<br>Vibration<br>Setting stability<br>Contact resistance variation - CRV (noise)<br>Salt spray                                                                                                                                                          | $\pm 1.0 \%$<br>$\pm 1.0 \%$<br>$\pm 1.0 \%$<br>$\pm 1.0 \%$<br>$\pm 1.0 \%$<br>3.0 % or 3 $\Omega$ <sup>(5)</sup><br>No corrosion                                                                              | $\pm 0.1 \%$<br>$\pm 0.5 \%$<br>$\pm 0.5 \%$<br>$\pm 0.5 \%$<br>$\pm 0.5 \%$<br>3 $\Omega$ typical, 10 $\Omega$ maximum<br>No corrosion                                                                                                                            |
| <b>TEST GROUP V</b><br>Solder heat<br>Low-temperature operation<br>Setting stability<br>Low-temperature storage<br>High-temperature exposure<br>Setting stability<br>Contact resistance variation - CRV (noise)<br>Integrity of shaft                                                                                    | $\pm 1.0 \%$<br>$\pm 1.0 \%$<br>$\pm 2.0 \%$<br>$\pm 1.0 \%$<br>$\pm 3.0 \%$<br>$\pm 2.0 \%$<br>3.0 % or 3 $\Omega$ <sup>(5)</sup><br>No loosening or breakage                                                  | $\pm 0.1 \%$<br>$\pm 0.5 \%$<br>$\pm 0.5 \%$<br>$\pm 0.5 \%$<br>$\pm 0.5 \%$<br>$\pm 0.5 \%$<br>3 $\Omega$ typical, 10 $\Omega$ maximum<br>No loosening or breakage                                                                                                |
| <b>TEST GROUP VI</b><br>Rotational life (200 cycles)<br>Contact resistance variation - CRV (noise)<br>Terminal strength                                                                                                                                                                                                  | $\pm 2.0 \%$<br>3.0 % or 3 $\Omega$ <sup>(5)</sup><br>2 lbs.                                                                                                                                                    | $\pm 2.0 \%$<br>3 $\Omega$ typical, 10 $\Omega$ maximum<br>2 lbs.                                                                                                                                                                                                  |
| <b>TEST GROUP VII</b><br>Life (2000 h) at + 85 $^{\circ}\text{C}$<br>Life (10 000 h) at + 85 $^{\circ}\text{C}$                                                                                                                                                                                                          | $\pm 3.0 \%$<br>$\pm 5.0 \%$                                                                                                                                                                                    | $\pm 0.1 \%$ typical, $\pm 1.0 \%$ maximum<br>$\pm 0.1 \%$ typical, $\pm 1.0 \%$ maximum                                                                                                                                                                           |
| <b>TEST GROUP VIII</b><br>Solvent resistance                                                                                                                                                                                                                                                                             | No failures                                                                                                                                                                                                     | No failures                                                                                                                                                                                                                                                        |

**Notes**

- (1) Maximum TCR applies to the 3  $\sigma$  (sigma) limit or 99.73 % of a production lot. (Measured end-to-end with wiper off the element.)
- (2) Measurements of TCR through the wiper are influenced more by setting stability and the percentage of the total resistance in use (at the wiper) than by fundamental resistance change due to temperature alone. The parameter shown in table 2 is a 2  $\sigma$  distribution typifying the behavior of the device when used with 40 % or more of the total resistance in use.
- (3) Derated linearly for full power at + 85  $^{\circ}\text{C}$  to zero power at + 150  $^{\circ}\text{C}$ . See figure 2.
- (4) All  $\Delta R$ 's are measured to the tolerance specified + 0.01  $\Omega$ .
- (5) Whichever is greater.  
Special available options:  
Special marking  
Power conditioning and screening operations.

**VFR TRIMMERS ARE INSPECTED**

100 % for:

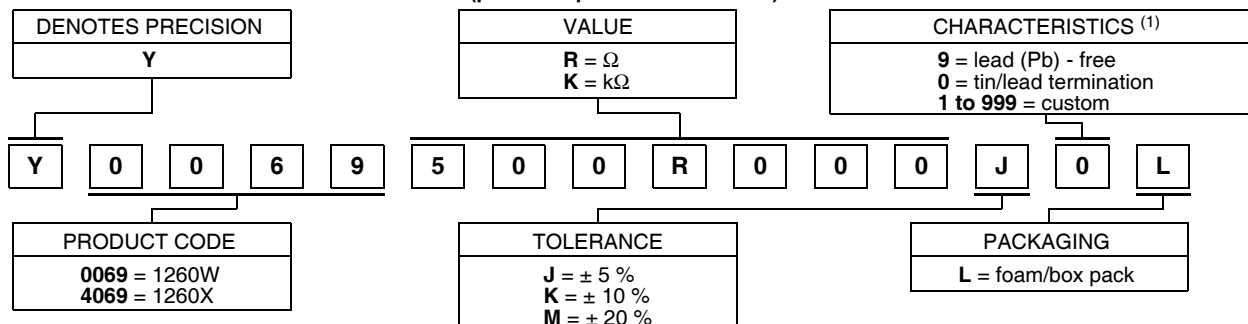
- Immersion
- Resistance tolerance check
- End resistance
- Visual-mechanical
- Dynamic tests for continuity, CRV

By sample for:

- TCR
- DWV

**TABLE 6 - GLOBAL PART NUMBER INFORMATION**

**NEW GLOBAL PART NUMBER: Y0069500R000J0L (preferred part number format)**



FOR EXAMPLE: ABOVE GLOBAL ORDER Y0069 500R000 J 0 L:

TYPE: 1260W

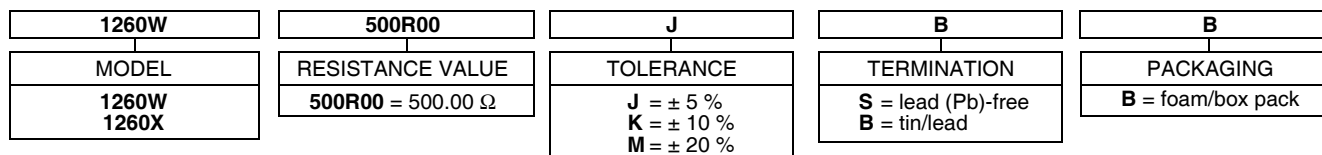
VALUE: 500.0  $\Omega$

ABSOLUTE TOLERANCE:  $\pm 5.0\%$

TERMINATION: tin/lead

PACKAGING: foam/box pack

**HISTORICAL PART NUMBER: 1260W 500R00 J B B (will continue to be used)**



**Note**

<sup>(1)</sup> For non-standard requests, please contact application engineering.