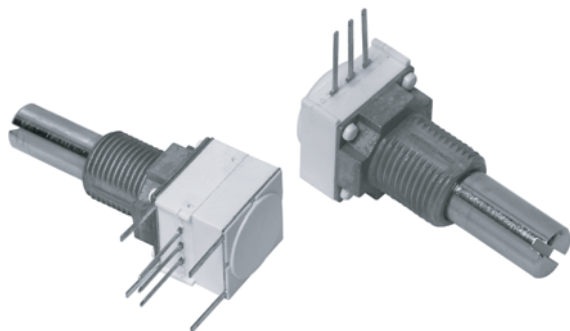




# 1/2" (12.7 mm) Conductive Plastic and Cermet Potentiometer



## FEATURES

- Robust construction
- High rotational life (50 000 cycles)
- Up to three sections PC support plates
- Rotary switches and solder lug terminals available
- 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

## 148 FEATURES

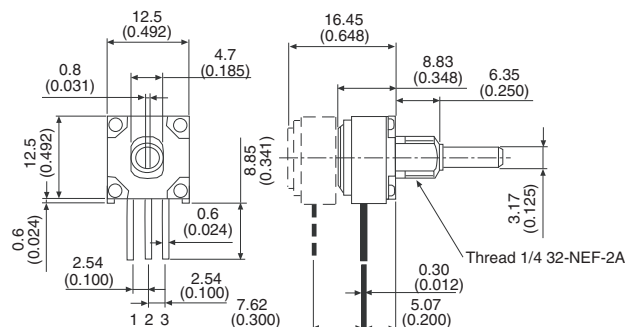
- Conductive plastic element
- Quiet electrical output

## 149 FEATURES

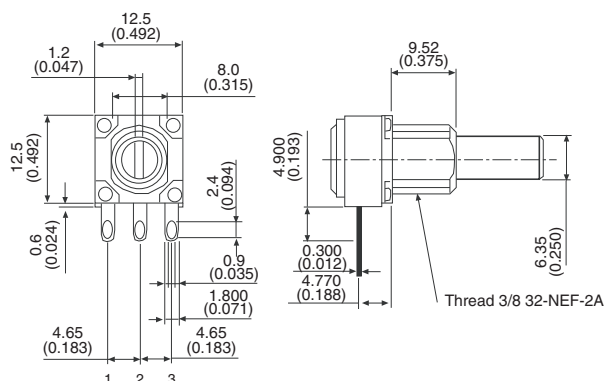
- Cermet element
- Low temperature coefficient ( $\pm 150$  ppm/°C)

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

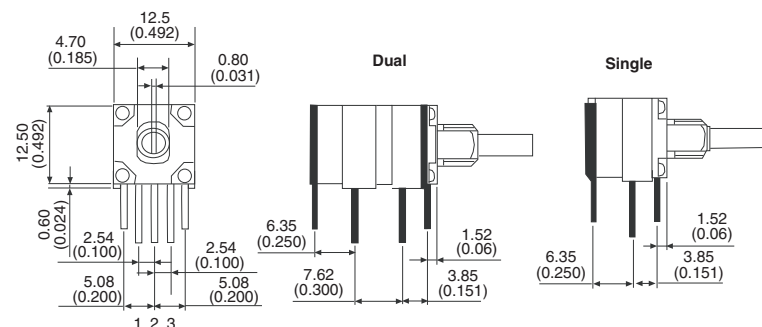
### Single, dual or triple

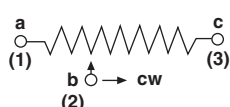


### Solder lug terminals



### Front and rear support plates E = Flush with board surface



| <b>ELECTRICAL SPECIFICATIONS</b>       |            |                                                                                    |                               |
|----------------------------------------|------------|------------------------------------------------------------------------------------|-------------------------------|
| <b>PARAMETER</b>                       |            | <b>148</b>                                                                         | <b>149</b>                    |
| Resistance Range                       | Linear     | 1 k $\Omega$ to 1 M $\Omega$                                                       | 100 $\Omega$ to 2 M $\Omega$  |
|                                        | Non-Linear | 500 $\Omega$ to 500 k $\Omega$                                                     | 250 $\Omega$ to 1 M $\Omega$  |
| Tolerance                              | Linear     | 10 %                                                                               | 10 %                          |
|                                        | Non-Linear | 20 % on request 10 %                                                               | 10 %                          |
| Linearity (Typical)                    |            | $\pm 5$ % independent                                                              |                               |
| End Resistance                         |            | 4 $\Omega$ maximum each end                                                        |                               |
| Power Rating                           |            | 0.5 W at 70 °C<br>0 W at 120 °C                                                    | 1 W at 70 °C<br>0 W at 150 °C |
|                                        |            | Non-Linear or PC mount, derate 50 %                                                |                               |
| Circuit Diagram                        |            |  |                               |
| Effective Rotation                     |            | 270° $\pm$ 10° without rotary switch<br>240° $\pm$ 10° with rotary switch          |                               |
| Contact Resistance Variation (Typical) |            | 1.5 % of total resistance                                                          | 3 % of total resistance       |
| Maximum Continuous Working Voltage     |            | 350 V <sub>AC</sub> across end terminals, but within power rating                  |                               |
| Dielectric Withstanding Voltage        |            | Sea level -750 V <sub>AC</sub>                                                     |                               |

| <b>MECHANICAL SPECIFICATIONS</b> |                     |                                                                                            |  |
|----------------------------------|---------------------|--------------------------------------------------------------------------------------------|--|
| Mechanical Travel                |                     | 300° $\pm$ 5°                                                                              |  |
| Operating Torque (Typical)       |                     | Single section 0.2 oz. to 3.0 oz. - in dual or triple section 0.3 oz.-inch to 4.5 oz.-inch |  |
| End Stop Torque                  | Bushing A and B     | 2.1 lb-inch max.                                                                           |  |
|                                  | Bushing F           | 6.8 lb-inch max.                                                                           |  |
| Weight (approx.)                 | Single              | 0.19 oz.                                                                                   |  |
|                                  | Dual                | 0.27 oz.                                                                                   |  |
|                                  | Triple              | 0.35 oz.                                                                                   |  |
| Terminals                        | Electrical Elements | e3: Pure Sn                                                                                |  |
|                                  | Switch Elements     | e4: Gold plated                                                                            |  |

| <b>ENVIRONMENTAL SPECIFICATIONS</b>    |  |                                       |                                       |
|----------------------------------------|--|---------------------------------------|---------------------------------------|
|                                        |  | <b>148</b>                            | <b>149</b>                            |
| Operating Temperature                  |  | -40 °C to +125 °C                     | -40 °C to +125 °C                     |
| Storage Temperature                    |  | -55 °C to +125 °C                     | -55 °C to +125 °C                     |
| Temperature Cycling (5 Cycles)         |  | -40 °C to +125 °C (4 % $\Delta R_T$ ) | -40 °C to +125 °C (3 % $\Delta R_T$ ) |
| Load Life (1000 h Rated Load at 70 °C) |  | 10 % $\Delta R_T$                     | 5 % $\Delta R_T$                      |
| Mechanical Endurance                   |  | 50 000 cycles                         |                                       |
| TCR (Typical)                          |  | $\pm 500$ ppm/°C                      | $\pm 150$ ppm/°C                      |
| Sealing                                |  | IP64                                  |                                       |

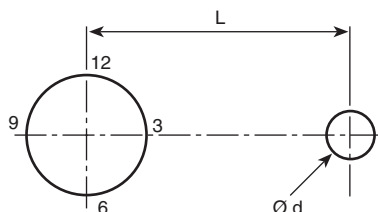
**Note**

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

### LOCATING PEGS (anti-rotation lug)

The locating peg is provided by a plate mounted on the bushing and positioned by the module sides. Four set positions are available, clock face orientation: 12, 3, 6, 9.

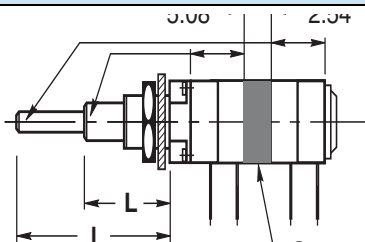
All 148, 149 bushings have a double flat. When panel mounting holes have been punched accordingly, an anti-rotation lug is not necessary.



| CODE | VERSION | BUSHING A, B | BUSHING F | EFFECTIVE HIGH PEG |
|------|---------|--------------|-----------|--------------------|
| A    | Ø d mm  | 2            | 2         | 0.7                |
|      | L mm    | 6.2          | 6.2       | -                  |
| B    | Ø d mm  | 2            | 2         | 0.7                |
|      | L mm    | 7.75         | 7.75      | -                  |
| C    | Ø d mm  | -            | 3.5       | 1.1                |
|      | L mm    | -            | 13.5      | -                  |

Locating pegs are supplied in separate bags with nuts and washers

### RSID OPTION: ROTARY SWITCH MODULES



- Rotary switches
- Current up to 2 A
- SPDT: Single pole, changeover switch in CCW position - 3 pins
- Sealing IP60

#### MODULES: RS ON/OFF SWITCH RSI CHANGEOVER SWITCH

The position of each module is free.

RS and RSI rotary switches are housed in a standard 148, 149 module size 12.7 mm x 12.7 mm x 5.08 mm (0.5" x 0.5" x 0.2"). They have the same terminal styles as the assembled electrical modules.

An assembly can comprise 1 or more switch modules.

Switch actuation is described as seen from the shaft end.  
D: means actuation in maximum CCW position

The switch actuation travel is 25° with a total mechanical travel of 300° ± 5° and electrical travel of electrical modules is 238° ± 10°.

#### RSID Single Pole CHANGEOVER

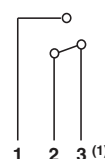
In full CCW position, the contact is made between 3 and 2 and open between 3 and 1. Switch actuation (CW direction) reverses these positions.

#### SWITCH SPECIFICATIONS

|                                        |                      |                                |
|----------------------------------------|----------------------|--------------------------------|
| Switching Power Maximum                |                      | 62.5 VA v<br>15 VA =           |
| Switching Current Maximum              |                      | 0.25 A 250 V v<br>0.5 A 30 V = |
| Maximum Current Through Element        |                      | 2 A                            |
| Contact Resistance                     |                      | 100 mΩ                         |
| Dielectric Strength                    | Terminal to Terminal | 1000 V <sub>RMS</sub>          |
|                                        | Terminal to Bushing  | 2000 V <sub>RMS</sub>          |
| Maximum Voltage Operation              |                      | 250 V v<br>30 V =              |
| Insulation Resistance Between Contacts |                      | 10 <sup>6</sup> MΩ             |
| Life at P <sub>max.</sub>              |                      | 10 000 actuations              |
| Minimal Travel                         |                      | 25°                            |
| Operating Temperature                  |                      | -40 °C to +85 °C               |

#### ELECTRICAL DIAGRAM

##### RSID CCW POSITION



#### Note

(1) Common

**ORDERING INFORMATION** (part number)

|                                                  |                   |                                |                     |                            |                   |                                                            |                   |                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |
|--------------------------------------------------|-------------------|--------------------------------|---------------------|----------------------------|-------------------|------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|
| 1                                                | 4                 | 8                              | 1                   | 0                          | F                 | 0                                                          | G                 | J                                                                                                                                                                | S | X | 1 | 0 | 1 | 0 | 3 | K | A |
| MODEL                                            | NUMBER OF MODLUES | SWITCH                         | BUSHING             | LOCATING PEG               | SHAFT             | SHAFT END                                                  | LEADS             | RESISTANCE CODE/TOLERANCE/TAPER OR SPECIAL                                                                                                                       |   |   |   |   |   |   |   |   |   |
| 148 = Plastic conductive<br>149 = Cermet element | 1<br>2<br>3       | 1 = RSID<br>0 = Without switch | See table "Bushing" | 0 = Without<br>A<br>B<br>C | See table "Shaft" | S = Slotted<br><br>On request:<br>R = Round<br>F = Flatted | See table "Leads" | Resistance code:<br>101 = 100 Ω to<br>105 = 1 MΩ<br>Tolerance code:<br>M = 20 %; K = 10 %<br>Taper: A (S); L (Z); F (R)<br>or<br>special code<br>given by Vishay |   |   |   |   |   |   |   |   |   |

**BUSHING**

|   | Ø    | L    | OLD CODES |
|---|------|------|-----------|
| A | 1/4" | 1/4" | N         |
| B | 1/4" | 3/8" | J         |
| F | 3/8" | 3/8" | G         |

**LEADS**

|     | TYPE                        | PIN SPACING      | SPACE BETWEEN MODULES | OLD CODES |
|-----|-----------------------------|------------------|-----------------------|-----------|
| X10 | PCB pins                    | 2.54 mm (0.100") | n/a                   | P         |
| X13 |                             |                  | 7.62 mm (0.300")      |           |
| A10 | PCB pins and support plates | 2.54 mm (0.100") | n/a                   | E         |
| A13 |                             |                  | 7.62 mm (0.300")      |           |
| Y00 | Solder, lugs                | 4.65 mm (0.183") | n/a                   | S         |
| Y03 |                             |                  | 7.62 mm (0.300")      |           |

**SHAFT**

|    | Ø    | L      | OLD CODES |
|----|------|--------|-----------|
| BB | 1/8" | 1/2"   | 32        |
| BG | 1/8" | 5/8"   | 40        |
| BH | 1/8" | 3/4"   | 48        |
| BJ | 1/8" | 7/8"   | 56        |
| GB | 1/4" | 1/2"   | 32        |
| GG | 1/4" | 5/8"   | 40        |
| GH | 1/4" | 3/4"   | 48        |
| GJ | 1/4" | 7/8"   | 56        |
| GL | 1/4" | 1"     | 64        |
| GN | 1/4" | 1 1/4" | 80        |

**PART NUMBER DESCRIPTION** (for information only)

|       |         |        |         |              |       |       |       |       |       |      |       |         |         |             |
|-------|---------|--------|---------|--------------|-------|-------|-------|-------|-------|------|-------|---------|---------|-------------|
| 148   | 1       | 0      | F       | 0            | GJ    | S     | X10   | BO50  | 10K   | 10 % | A     |         |         | e3          |
| MODEL | MODLUES | SWITCH | BUSHING | LOCATING PEG | SHAFT | SHAFT | LEADS | PACK. | VALUE | TOL. | TAPER | SPECIAL | SPECIAL | LEAD FINISH |



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