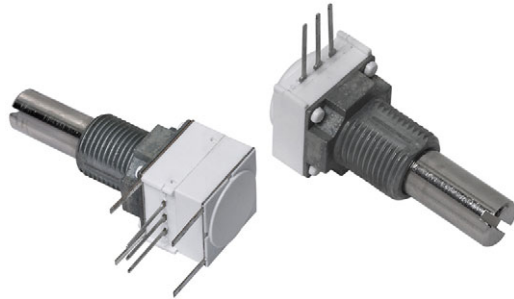


1/2" (12.7 mm) Conductive Plastic and Cermet Potentiometer



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


RoHS
COMPLIANT

LINKS TO ADDITIONAL RESOURCES



| QUICK REFERENCE DATA | |
|-------------------------|--|
| Multiple module | Up to 3 modules |
| Switch module | Yes |
| Detent module | n/a |
| Special electrical laws | A: linear, L: logarithmic, F: reverse logarithmic |
| Sealing level | IP 64 |
| Lifespan | 50K cycles |

148 FEATURES

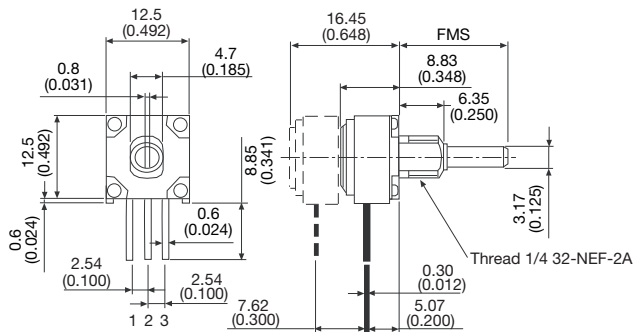
- Conductive plastic element
- Quiet electrical output

149 FEATURES

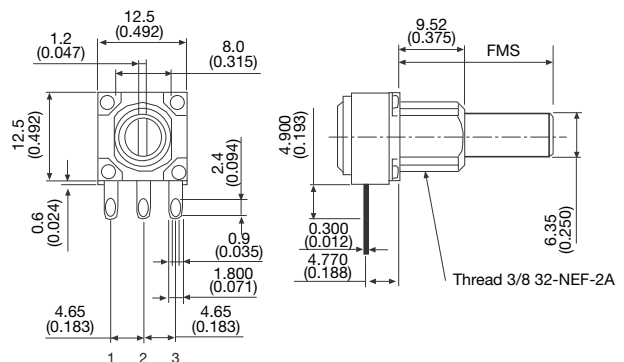
- Cermet element
- Low temperature coefficient (± 150 ppm/ $^{\circ}$ C)

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

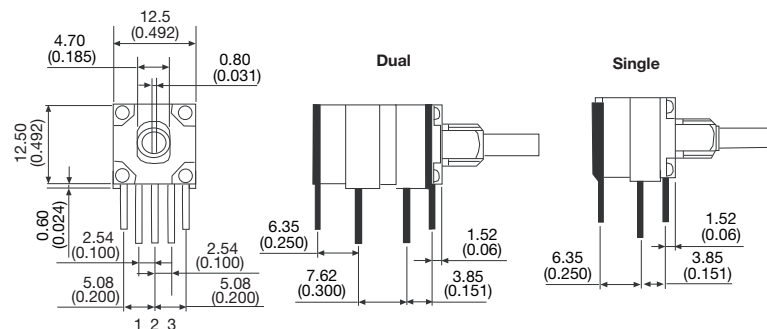
Single, dual or triple



Solder lug terminals



Front and rear support plates E = flush with board surface





| ELECTRICAL SPECIFICATIONS | | | |
|--|------------|---|-------------------------------|
| PARAMETER | | 148 | 149 |
| Resistance range | linear | 1 kΩ to 500 kΩ | 100 Ω to 2 MΩ |
| | non-linear | 500 Ω to 250 kΩ | 250 Ω to 1 MΩ |
| Tolerance | linear | 10 % | 10 % |
| | non-linear | 20 % on request | 10 % |
| Linearity (typical) | | ± 5 % independent | |
| End resistance | | 4 Ω maximum each end | |
| Power rating | | 0.5 W at 70 °C 0 W at 120 °C | 1 W at 70 °C 0 W at 150 °C |
| | | Non-linear or PC mount, derate 50 % | |
| Circuit diagram | | | |
| Effective rotation | | 270° ± 10° without rotary switch 240° ± 10° with rotary switch | |
| Contact resistance variation (typical) | | 1.5 % of total resistance | 3 % of total resistance |
| Maximum continuous working voltage | | 350 V _{AC} across end terminals, but within power rating | |
| Dielectric withstanding voltage | | Sea level -750 V _{AC} | |

| MECHANICAL SPECIFICATIONS | | | |
|----------------------------|---------------------|--|--|
| Mechanical travel | | 300° ± 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 | |

| ENVIRONMENTAL SPECIFICATIONS | | |
|--|--|--|
| | 148 | 149 |
| 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 % ΔR _T) | -40 °C to +125 °C (3 % ΔR _T) |
| Load life (1000 h rated load at 70 °C) | 10 % ΔR _T | 5 % ΔR _T |
| Mechanical endurance | 50 000 cycles | |
| TCR (typical) | ± 500 ppm/°C | ± 150 ppm/°C |
| Sealing | IP64 | |

Note

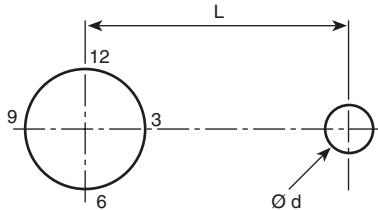
- Nothing stated herein shall be construed as a guarantee of quality or durability

| MARKING |
|--|
| Vishay logo, SAP code of ohmic value, tolerance in %, variation law, manufacturing date (four digits), "3" for the lead 3, product series (148, 149) |

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.

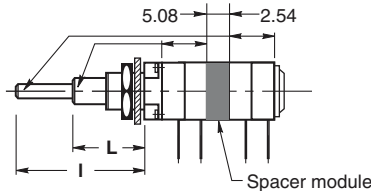
All 148, 149 bushings have a double flat. When panel mounting holes have been punched accordingly, an anti-rotation lug is not necessary.



| 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

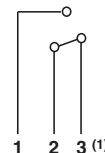
In full CCW position, the contact is made between 3 and 2 and open between 3 and 1. Switch actuation (CW direction) reverses these positions.

SWITCH SPECIFICATIONS

| | | |
|--|----------------------|--------------------------------|
| Switching power maximum | | 62.5 VA v 15 VA = |
| Switching current maximum | | 0.25 A 250 V v 0.5 A 30 V = |
| Maximum current through element | | 2 A |
| Contact resistance | | 100 mΩ |
| Dielectric strength | Terminal to terminal | 1000 V _{RMS} |
| | Terminal to bushing | 2000 V _{RMS} |
| Maximum voltage operation | | 250 V v 30 V = |
| Insulation resistance between contacts | | 10 ⁶ MΩ |
| Life at P _{max.} | | 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 MODULES | SWITCH | BUSHING | LOCATING PEG | SHAFT | SHAFT END | LEADS | RESISTANCE CODE / TOLERANCE / TAPER OR SPECIAL | | | | | | | | | |
| 148 = plastic conductive 149 = cermet element | 1 2 3 | 1 = RSID 0 = without switch | See table "Bushing" | 0 = without A B C | See table "Shaft" | S = slotted On request: R = round F = flatted | See table "Leads" | Resistance code: 101 = 100 Ω to 105 = 1 MΩ Tolerance code: M = 20 %; K = 10 % Taper: A (S); L (Z); F (R) or Special code 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 |

| SHAFT | | | |
|-------|------|--------|-----------|
| | Ø | FMS | 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 |

| 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 | Sold, lugs | 4.65 mm (0.183") | n/a | S |
| Y03 | | | 7.62 mm (0.300") | |

| PART NUMBER DESCRIPTION (for information only) | | | | | | | | | | | | | | |
|--|---------|--------|---------|--------------|-------|-------|-------|-------|-------|------|-------|---------|---------|-------------|
| 148 | 1 | 0 | F | 0 | GJ | S | X10 | BO50 | 10K | 10 % | A | | | e3 |
| MODEL | MODULES | SWITCH | BUSHING | LOCATING PEG | SHAFT | SHAFT | LEADS | PACK. | VALUE | TOL. | TAPER | SPECIAL | SPECIAL | LEAD FINISH |

| ACCESSORIES | |
|--|--|
| Additional Accessories (to order separately) | www.vishay.com/doc?51051 |

| RELATED DOCUMENTS | |
|--|--|
| APPLICATION NOTES | |
| Potentiometers and Trimmers | www.vishay.com/doc?51001 |
| Guidelines for Vishay Sernice Resistive and Inductive Components | www.vishay.com/doc?52029 |



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