

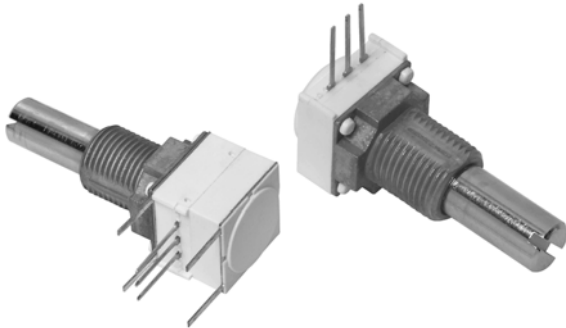
1/2" (12.7 mm) Conductive Plastic and Cermet Potentiometers

FEATURES

- Robust construction
- High rotational life (50 000 cycles)
- Up to three sections PC support plates
- Rotary switches and solder lug terminals available
- Compliant to RoHS directive 2002/95/EC since date code 0414



RoHS
COMPLIANT



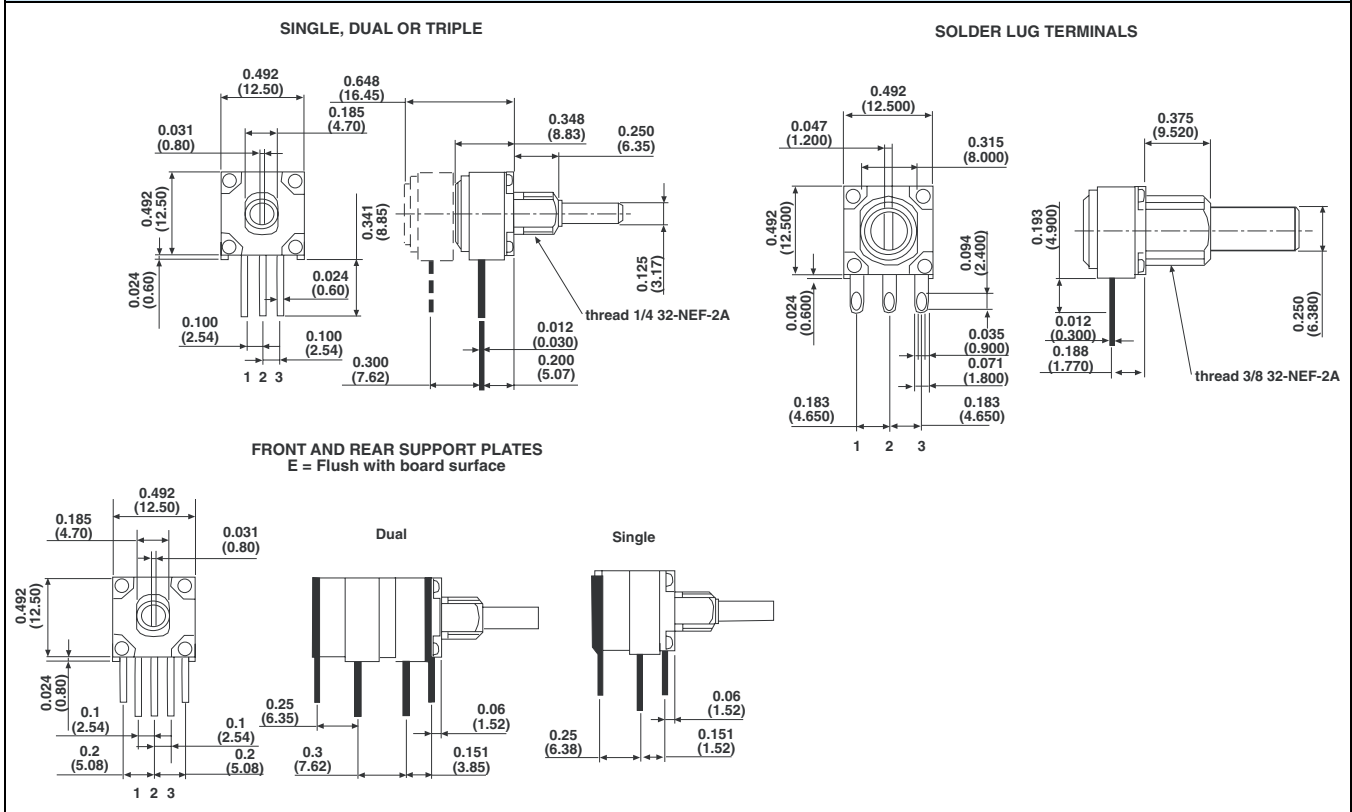
148 FEATURES

- Conductive plastic element
- Quiet electrical output

149 FEATURES

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

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





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

ELECTRICAL SPECIFICATIONS			
PARAMETER		148	149
Resistance Range	Linear	1 kΩ to 1 MΩ	100 Ω to 2 MΩ
	Non-Linear	500 Ω to 500 kΩ	250 Ω to 1 MΩ
Tolerance	Linear	10 %	10 %
	Non-Linear	20 % on request 10 %	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		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}	

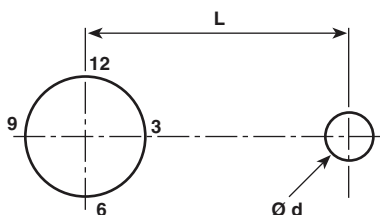
MECHANICAL SPECIFICATIONS			
Mechanical Travel		300° ± 5°	
Operating Torque (Typical)		Single section 0.2 to 3.0 oz. - in dual or triple section 0.3 to 4.5 oz.-in	
End Stop Torque	Bushing A and B	2.1 in-lbs max.	
	Bushing F	6.8 in-lbs max.	
Weight (approx.)	Single	0.19 oz.	
	Dual	0.27 oz.	
	Triple	0.35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

ENVIRONMENTAL SPECIFICATIONS		
	148	149
Operating Temperature	- 40 °C to + 120 °C	- 40 °C to + 125 °C
Storage Temperature	- 55 °C to + 120 °C	- 55 °C to + 150 °C
Temperature Cycling (5 Cycles)	- 40 °C to + 120 °C (4 % ΔR _T)	- 40 °C to + 150 °C (3 % ΔR _T)
Load Life (1000 h Rated Load at 70 °C)	10 % ΔR _T	5 % ΔR _T
Rotational Load Life	50 000 cycles	
TCR (Typical)	± 500 ppm/°C	± 150 ppm/°C
Sealing	IP64	

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.

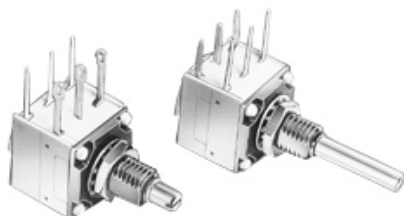
All 148, 149 bushings have a double flat. When panel mounting holes have been punched accordingly, an anti-rotation lug is not necessary.



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

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 module is 238° ± 10°.

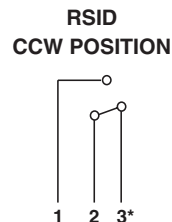
RSID SINGLE POLE CHANGEOVER

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	30 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

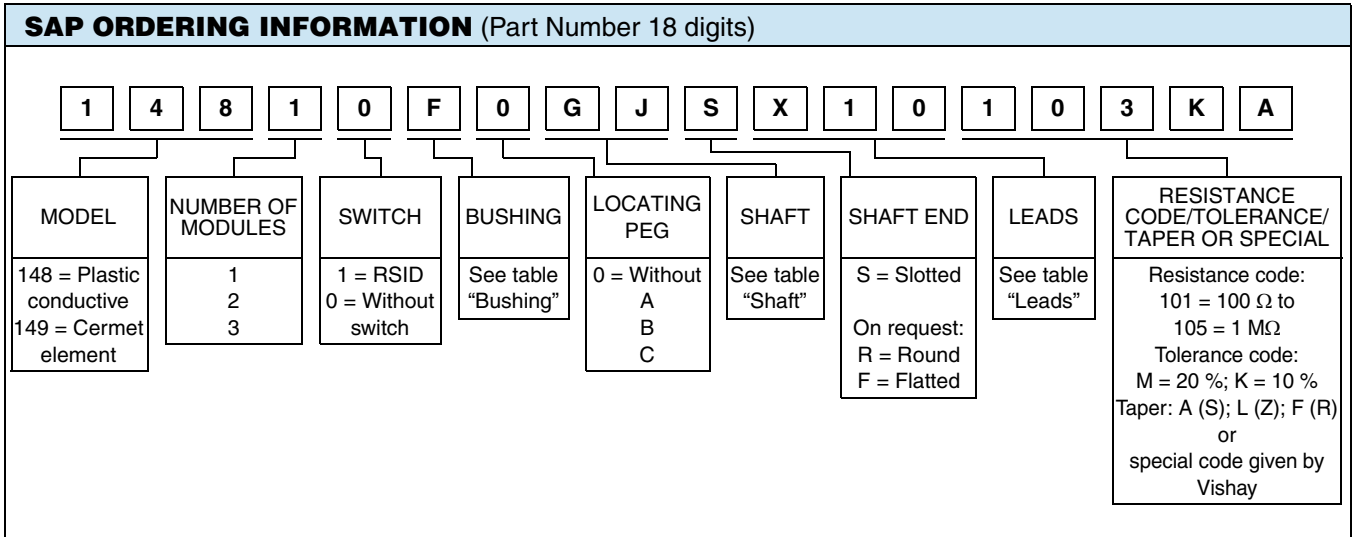


- Note**
- Common



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

Vishay Spectrol



BUSHING			
	Φ	L	OLD CODES
A	1/4"	1/4"	N
B	1/4"	3/8"	J
F	3/8"	3/8"	G

SHAFT			
	Φ	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

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



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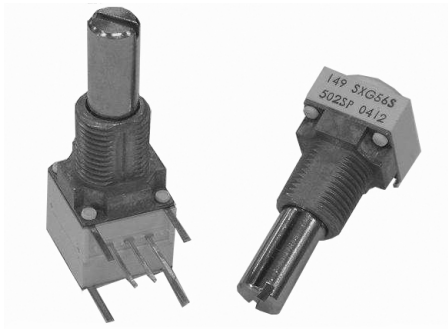
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1/2" (12.7mm) Conductive Plastic and Cermet Potentiometers



148 FEATURES

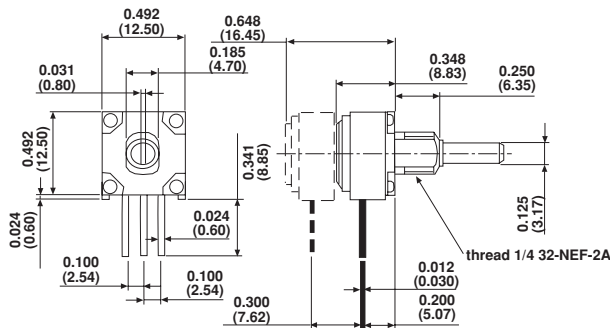
- Conductive Plastic Element
- High Rotational Life
- Quiet Electrical Output
- Robust Construction

149 FEATURES

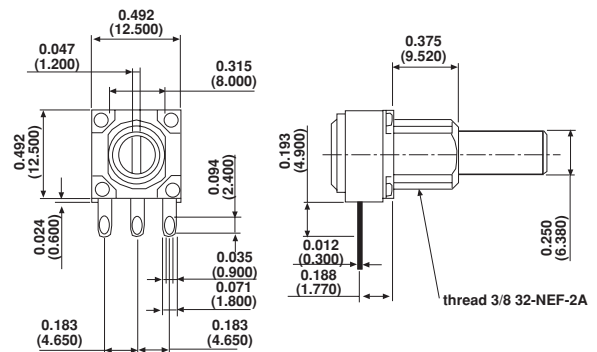
- Cermet Element
- Temperature Stable
- Robust Construction

DIMENSIONS in inches (millimeters)

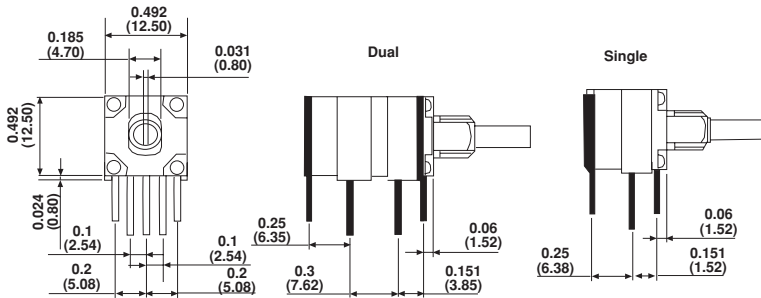
SINGLE, DUAL OR TRIPLE



SOLDER LUG TERMINALS



FRONT AND REAR SUPPORT PLATES
E = Flush with board surface



MOUNTING ACCESSORIES: PRODUCT IS SUPPLIED WITH A NUT & WASHER

OPTIONAL FEATURES

Up to three sections PC support plates
Rotary switches, detents, Solder lugs terminals.

CONSTRUCTION MATERIALS

Housing - Molded thermoplastic white
Shaft - Brass, nickel plated



ELECTRICAL SPECIFICATIONS		
PARAMETER	148	149
Resistance Range	1k Ω to 1M Ω linear 500 Ω to 500k Ω non-linear	100 Ω to 2.0M Ω linear 250 Ω to 1M Ω non-linear
Resistance Tolerance	Standard $\pm 10\%$ to 500K, $\pm 20\%$ over 500K	
Linear	Standard $\pm 10\%$ to 100K, $\pm 20\%$ over 100K	
Non-Linear	20% of the Nominal R at 50 mechanical rotation	
Taper Tolerance	$\pm 5\%$ Independent	
Linearity (Typical)	4 Ω maximum each end	
End Resistance	0.5 watts @ 70°C 0 watts @ 120°C	1 watt @ 70°C 0 watt @ 150°C
Power Rating	Non-Linear or PC mount, derate 50%	
Effective Rotation	270° $\pm 10^\circ$ without rotary switch 240° $\pm 10^\circ$ with rotary switch	
Contact Resistance Variation	1.5% of total resistance	3% of total resistance
Maximum Continuous Working Voltage	350VAC across end terminals, but within power rating	
Dielectric Withstanding Voltage	Sea Level - 750VAC 70,000 feet - 350VAC	
Switch Specifications	Rotary (AL) switch: S.P.S.T and S.P.D.T 125mA, 28VDC CCW or CW, rotational life 10,000 cycles (rated load)	

MECHANICAL SPECIFICATIONS	
Mechanical Rotation	300° $\pm 5^\circ$
Torque	
Operating	Single section 0.2 to 3.0 oz - in Dual or triple section 0.3 to 4.5 oz - in
Center Detent	0.6 to 3.0 oz - in
Stop Strength	3 in - lbs min
Weight (approx)	
Single	0.19 oz
Dual	0.27 oz
Triple	0.35 oz

ENVIRONMENTAL SPECIFICATIONS		
	148	149
Operating Temperature	- 40°C to + 120°C	- 40°C to + 150°C
Storage Temperature	- 55°C to + 120°C	- 55°C to + 150°C
Temperature Cycling (5 Cycles)	- 40°C to + 120°C (4% ΔR_t)	- 40°C to + 150°C (3% ΔR_t)
Load Life (1000hrs. Rated Load at 70°C)	10% ΔR_t	5% ΔR_t
Rotational Load Life	50,000 cycles	25,000 cycles
TCR	± 1000 ppm/°C	± 150 ppm/°C



MARKING

Unit Identification: Ink stamp on periphery

ORDERING INFORMATION								
148 MODEL	S NUMBER OF SECTIONS	X MECHANICAL CONFIGURATION	G METRIC BUSHING SIZE & SHAFT	56 SHAFT LENGTH	S SHAFT STYLE	103 RESISTANCE CODE Ω	S TAPER	P TERMINAL CONFIGURATION
				FROM THE MOUNTING SURFACE				
148 CP	S: Single	X: None (single shaft)	N: 1/4 Dia x 1/4L	Shaft length code	S: Slotted	EIA code - first 2 significant digits		P: PC, 0.250
149 Cer	D: Duals, T: Triple	S: Single w/rotary switch P: Dual w/rotary switch	J: 1/4 Dia x 3/8 L Shaft, 1/8 Dia G: 3/8 Dia x 3/8 L Shaft, 1/4 Dia	32: 1/2 in 40: 5/8 in 48: 3/4 in 56: 7/8 in 64: 1 in 80: 1 1/4 in	F: Flatted P: Plain	3rd is number of zeros		E: PC terminals with E support plate S: Solder lugs
						100 10K 500K	S: Linear ± 10%	
						250 20K 750K	Z: CW Log, ± 10%	
						500 25K 1meg	± 20% over 500K	
						750 50K 2meg	R: CCW Log,	
						1K 75K	± 10% to 500K	
						2.5K 100K	Ω ± 20%	
						5K 250K	over 500K	

SAP PART NUMBERING GUIDELINES																	
1	4	8	1	0	F	0	G	J	S	X	1	0	1	0	3	K	A
MODEL			NB OF MOD.		SWITCH	BUSHING	LOCATING PEG	SHAFT			LEADS		OHMIC VALUE/TOL/LAW OR SPECIAL				

See the end of this data book for conversion tables