



The Innovative Switch Company

Cole's quality Open Frame Instrument Rotary Switch provides low contact resistance ($.005\Omega$), very high contact reliability, smooth action with positive positioning, precision design, and trouble free construction of glass epoxy insulators and silver conductors.

Rated for 100,000 cycles minimum, the contact mechanism is a bifurcated brush, promising 100% redundancy and avoidance of contact failure. In addition, it has been designed and manufactured to meet or exceed all applicable requirements of MIL-DTL-3786, MIL-T-945, QQ-P-416, MIL-S-13282, MIL-STD-202, MIL-A-8625, and MIL-STD-167. All Open Frame Series switches are available pre-wired to terminal boards or connectors.

Cole's Open Frame switches are ideal for high voltage, high current, and low resistance applications.



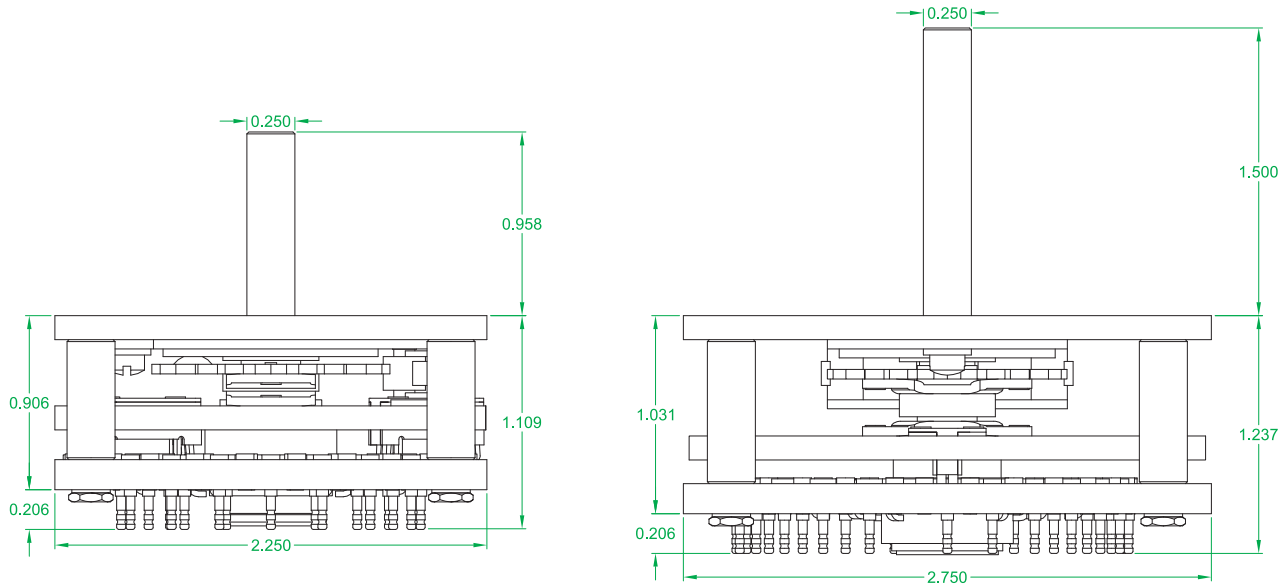
OPEN FRAME SERIES

Open Frame Instrument Switches

OPEN FRAME SERIES

Open Frame Instrument Switches

Very Low Electrical Resistance, Very Stable Electrical Contacts, 64 Positions Max



Open Frame
2.25 inch. square deck
(See Page 4)

Open Frame
2.75 inch. square deck
(See Page 3)

NOTES:

Open Frame - .250 Shaft Dia., 2.25 inch. square deck, (See Page 4).

Open Frame - .250 Shaft Dia., 2.75 inch. square deck, (See Page 3).

OPEN FRAME SERIES

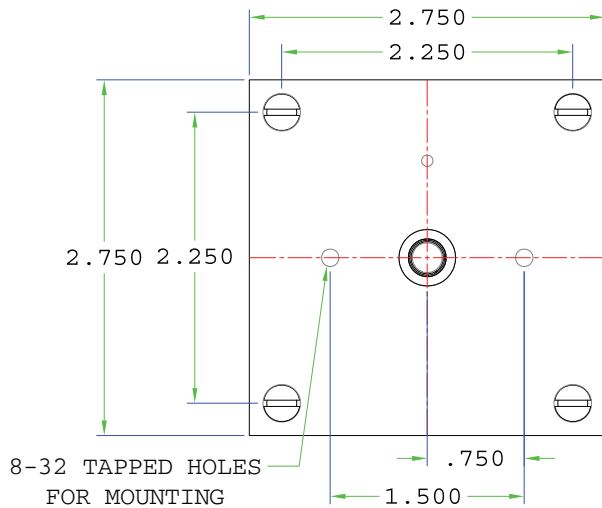
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Very Low Electrical Resistance, Very Stable Electrical Contacts, 64 Positions Max

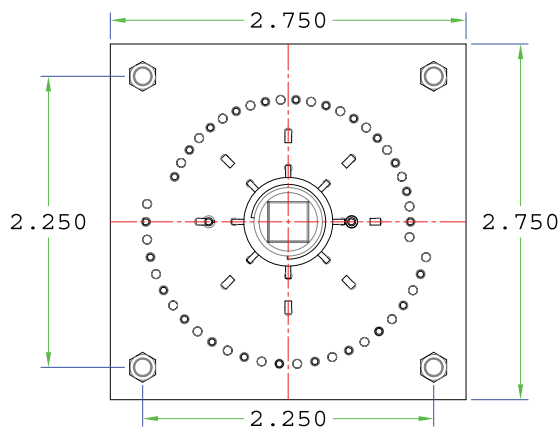
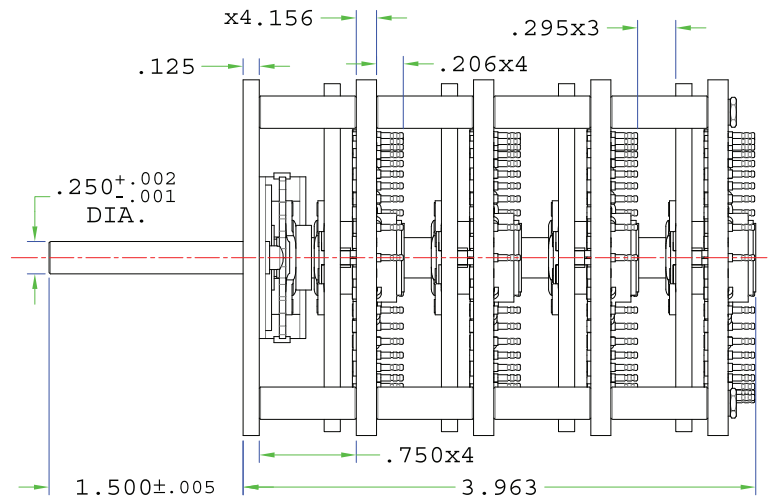
Features

- * Solid Silver and Silver Plated Conductors.
- * Very Low Resistance (.005Ω).
- * High Current Capacity.
- * User Adjustable Stop.
- * Pre-Wired Option for Ease of Installation.
- * Glass Epoxy as Strong Stable Insulator.
- * Bifurcated Brush Contacts for high reliability.
- * 13+ Decks as Special Order.
- * Up to 12 Decks as Standard.
- * 8 Poles Maximum Available.
- * 64 Positions Maximum Available.

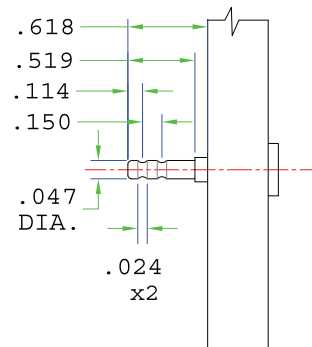
Front View



Side View



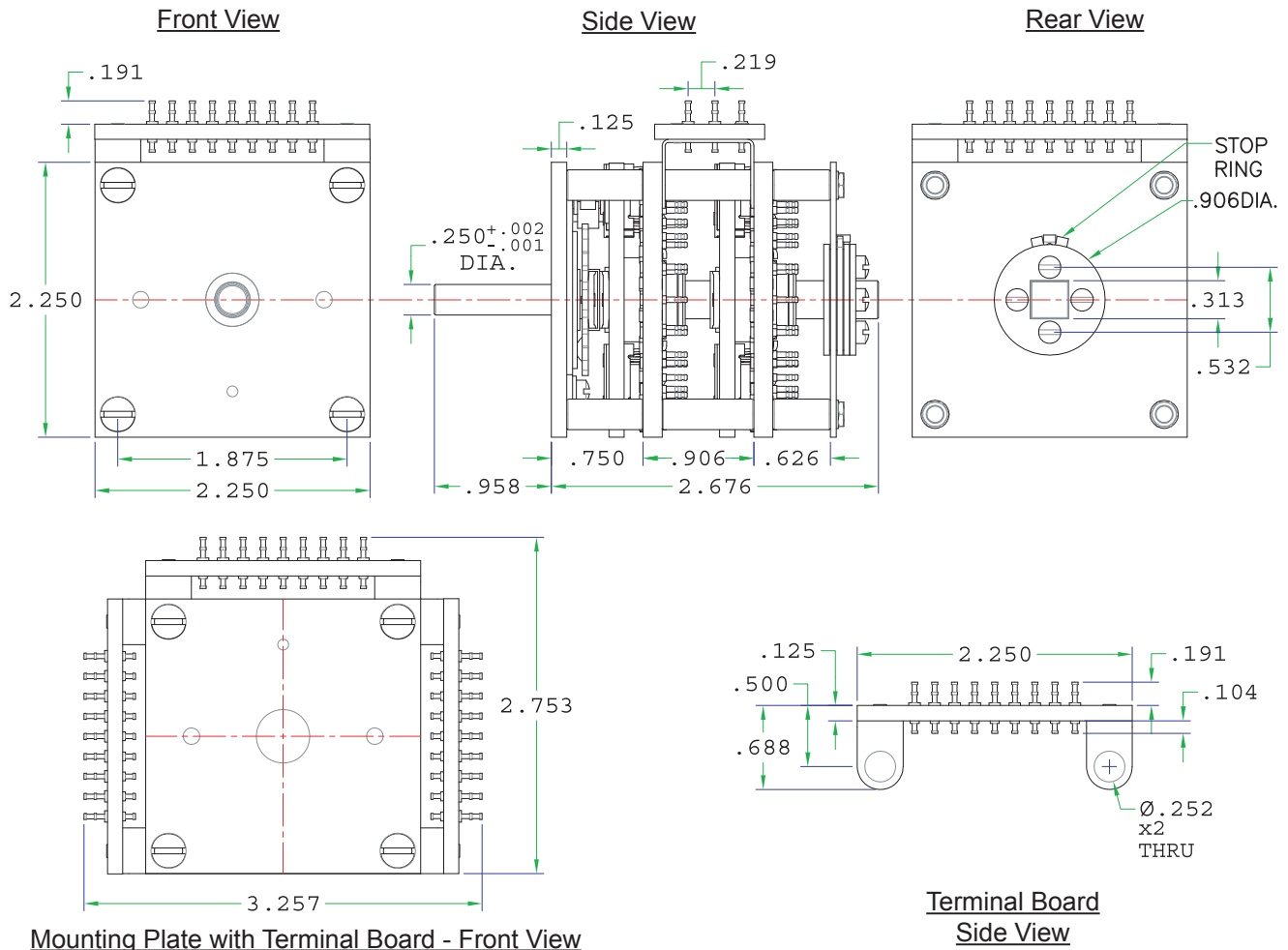
Rear View



Contact Silver Detail

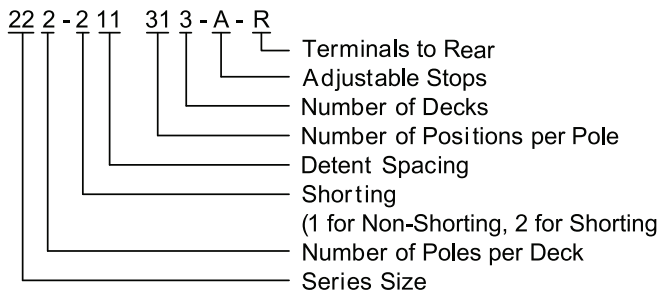
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ORDERING INFORMATION

Sample Code



Switch shown in the sample code is a 2-1/4 Square, 2 Poles per Deck, Shorting, 11-1/4 Detent, 31 positions per Pole, 3 Decks, Adjustable Stop, Terminals to Rear.

OPTIONS

The following options can be added to the standard switch. When ordering, simply add the letters after the basic part number.

- A = Adjustable stops.
- F = Fixed stop between the first and last position on a full-turn switch.
- L = Low Level.
- R = Terminals to rear.



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ISO9001 CERTIFIED

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OPEN FRAME SERIES

Open Frame Instrument Switches

INSTRUMENT SERIES SWITCH SELECTION GUIDE - Positions Available for Maximum Rotation

| DETENT SPACING | SWITCH SERIES | 1 POLE | | 2 POLE | | 3 POLE | | 4 POLE | | 5 POLE | | 6 POLE | | 7 POLE | | 8 POLE | |
|----------------|---------------|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|
| | | NS | S | NS | S | NS | S | NS | S | NS | S | NS | S | NS | S | NS | S |
| 5 5/8° | 26 | | 64 | | 31 | | | | 15 | | | | | | | | |
| 6° | 26 | | 60 | | 29 | | 19 | | 11 | | 11 | | | | | | |
| 7.2° | 26 | | 50 | | 50 | | 24 | | 24 | | | | | | | | |
| 7 1/2° | 22 | | 48 | | 48 | | 23 | | 23 | | 15 | | 15 | | | | |
| | 26 | | 48 | | 48 | | 23 | | 23 | | 15 | | 15 | | 11 | | 11 |
| 9° | 16 | | 40 | | 19 | | 9 | | 9 | | | | | | | | |
| | 22 | | 40 | | 40 | | 19 | | 19 | | 12 | | 12 | | | | |
| | 26 | | 40 | | 40 | | 19 | | 19 | | 12 | | 12 | | 9 | | 9 |
| 10° | 14 | | 36 | | 17 | | 11 | | | | | | | | | | |
| | 16 | | 36 | | 17 | | 11 | | 8 | | | | | | | | |
| | 22 | | 36 | | 36 | | 17 | | 17 | | 11 | | 11 | | | | |
| | 26 | | 36 | | 36 | | 17 | | 17 | | 11 | | 11 | | | | |
| 11 1/4° | 14 | | 32 | | 15 | | | | | | | | | | | | |
| | 16 | | 32 | | 15 | | 7 | | 7 | | | | | | | | |
| | 22 | | 32 | | 32 | | 15 | | 15 | | 9 | | 9 | | | | |
| | 26 | 32 | 32 | 16 | 16 | | 15 | 8 | 15 | | 9 | | 9 | | 7 | | 7 |
| 12° | 26 | 30 | 30 | 15 | | 10 | | 6 | | | | | | | | | |
| 14.4° | 22 | 25 | | 12 | | | | | | | | | | | | | |
| | 26 | 25 | | 25 | | 12 | | 12 | | | | | | | | | |
| 15° | 14 | | 24 | | 11 | | 7 | | | | | | | | | | |
| | 16 | | 24 | | 12 | | 8 | | 6 | | | | | | | | |
| | 22 | 24 | 24 | 24 | 24 | 12 | 12 | 12 | 12 | 8 | 8 | 8 | 8 | | | | |
| | 26 | 24 | 24 | 24 | 24 | 12 | 12 | 12 | 12 | 8 | 8 | 8 | 8 | 6 | 6 | 6 | 6 |
| 18° | 16 | 20 | | 10 | | 5 | | 5 | | | | | | | | | |
| | 22 | 20 | | 20 | | 10 | | 10 | | 6 | | 6 | | | | | |
| | 26 | 20 | | 20 | | 10 | | 10 | | 6 | | 6 | | 5 | | 5 | |
| 20° | 14 | 18 | | 9 | | 6 | | | | | | | | | | | |
| | 16 | 18 | | 9 | | 6 | | 4 | | | | | | | | | |
| | 22 | 18 | | 18 | | 9 | | 9 | | 6 | | 6 | | | | | |
| | 26 | 18 | | 18 | | 9 | | 9 | | 6 | | 6 | | | | | |
| 22 1/2° | 14 | 16 | | 8 | | | | | | | | | | | | | |
| | 16 | 16 | | 8 | | 4 | | 4 | | | | | | | | | |
| | 22 | 16 | | 16 | | 8 | | 8 | | 5 | | 5 | | | | | |
| | 26 | 16 | | 16 | | 8 | | 8 | | 5 | | 5 | | 4 | | 4 | |
| 30° | 14 | 12 | | 6 | | 4 | | | | | | | | | | | |
| | 16 | 12 | | 6 | | 4 | | 3 | | | | | | | | | |
| | 22 | 12 | | 12 | | 6 | | 6 | | 4 | | 4 | | | | | |
| | 26 | 12 | | 12 | | 6 | | 6 | | 4 | | 4 | | 3 | | 3 | |

NOTES:

Series Size:

14=1-1/2" Square.

22=2-1/4" Square.

16=1-3/4" Square.

26=2-3/4" Square.

NS=Non-Shorting.

S=Shorting.

- Position listed are maximum available, full rotation, within configuration parameters.
- Non-Shorting contacts will be furnished unless otherwise specified.

- Refer to series configuration specifications for complete details and proper identification.
- Larger deck sizes, detent spacing variation available for special applications.



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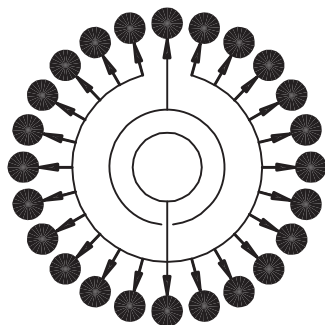
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OPEN FRAME SERIES

Open Frame Instrument Switches

SIMULTANEOUS PARALLELING SWITCH



SIMULTANEOUS
PARALLELING

| SIMULTANEOUS PARALLELING SWITCH | | | | |
|---------------------------------|-------------------|------------------------|-----------------------------|---------------------|
| Non-Shorting Basic I.D. | Detent(°) Spacing | Position Full Rotation | Positions Maximum With Stop | Shorting Basic I.D. |
| 26SP-111 | 11 1/4 | 32 | 31 | 26SP-211 |
| 26SP-112 | 12 | 30 | 29 | 26SP-212 |
| 26SP-115 | 15 | 24 | 23 | 26SP-215 |
| 26SP-120 | 20 | 18 | 18 | 26SP-220 |
| 26SP-122 | 22 1/2 | 16 | 16 | 26SP-222 |
| 26SP-130 | 30 | 12 | 12 | 26SP-230 |
| 26SP-140 | 40 | 9 | 9 | 26SP-240 |
| 26SP-145 | 45 | 8 | 8 | 26SP-245 |

*Where it is required to have no open circulating between positions, including the independent contact when the switch is rotated, use these SHORTING Basic I.D. numbers.

FUNCTION: The typical schematic left, is 24 positions, 15 degrees, 23 of the positions are shorted together by 23 finger brushes connected in common to one collector ring. The 24th position is contacted by an entirely separate finger brush which is connected to a separate collector ring. As the switch is rotated, the separate brush makes contact with each switch position while simultaneously all other positions are shorted together. No second one pole deck is required to perform this function, thus overall length is reduced and wiring time costs are reduced.

ONE PIECE FINGER BRUSHES: No mechanically or solder joined sections in the solid, stress-free one piece finger brush assembly. Solid fine silver finger brush contacts, stator contacts and collector rings.

BINARY CODING OR POSITION SELECTION: Paralleling decks singly or in tandem are used for binary coding or position selection allowing minimum amount of interconnecting circuit and remote control.

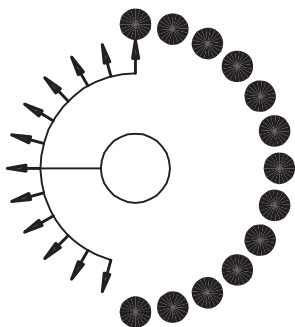
APPLICATION EXAMPLES:

- 1) Low voltage signal testing.
- 2) Multiple circuit cable testing, both continuity and voltage breakdown.
- 3) Current testing circuits to ground or common.
- 4) Solid state testing where it is desirable to connect all circuits to eliminate transients causing erroneous test data.
- 5) One or more paralleling decks can be included in a standard multi-deck switch to meet all types of requirements.

OPEN FRAME SERIES

Open Frame Instrument Switches

PROGRESSIVELY PARALLELING (SHORTING) SWITCH



PROGRESSIVELY
PARALLELING

| PROGRESSIVELY PARALLELING (SHORTING) SWITCH | | |
|---|-------------------|-----------------------------|
| Shorting Basic I.D. | Detent(°) Spacing | Positions Maximum With Stop |
| 26PP-211 | 11 1/4 | 16 |
| 26PP-212 | 12 | 15 |
| 26PP-215 | 15 | 12 |
| 26PP-220 | 20 | 9 |
| 26PP-222 | 22 1/2 | 8 |
| 26PP-230 | 30 | 6 |
| 26PP-240 | 40 | 4 |
| 26PP-245 | 45 | 4 |

MAXIMUM ROTATION: 180 Degrees.

FUNCTION: The one piece finger brush assembly progressively connects (or shorts) together the switch positions sequentially as the switch is rotated.

ONE PIECE FINGER BRUSHES: No mechanically or solder joined section in the solid, stress-free one piece finger brush assembly. Solid fine silver finger brush contacts, stator contacts and collector rings.

APPLICATION EXAMPLES: This type of switch is utilized for paralleling capacitors in capacitance decade units, for varying capacity values in multiple fixed frequency generators, receivers, transmitters, etc. It is used in many resistance bridge, strain gage and transducer applications, synchro systems, remote controlling, and computer systems. One or more progressively paralleling decks can be included in a standard multi-deck switch to meet all types of requirements, providing it does not rotate over 180 degrees.

NOTES

Current Rating: 1 1/2 amp with standard finger brush. Resistance: 0.005 ohms.

OPEN FRAME SERIES

Open Frame Instrument Switches

Open Frame Technical Data

| Specification | Unit | Value | Note: |
|---|-----------------|-------------------------|--|
| Military Specifications | | MIL-DTL-3786 | |
| Continuous (Non-Switching) Current Carrying Capacity | Amps | 15 | at 28 VDC, with max. contact temperature rise of 20°C |
| Switching Current Capacity at 28 VDC resistive | Amps | 5 | at Atmospheric pressure with 85°C and at reduced Barometric pressure with 25°C |
| Switching Current Capacity at 115 VAC resistive | Amps | 5 | |
| Switching Current Capacity at 28 VDC inductive (2.8 H.) | Amps | 3 | |
| Switching Current Capacity at 28 VDC Lamp Load | Amps | 3 | |
| Low Level max. capacity | mA | 10 | at 30 millivolts DC max. |
| Dielectric Strength, min. | VRMS | 1,500 | |
| Contact resistance, max. (initial) | milliohms (mΩ) | 0.5 | |
| Contact resistance, max. (after life) | milliohms (mΩ) | 20 | |
| Insulation resistance, min. (initial) | megaohms (MΩ) | 100,000 | at 100 VAC |
| Insulation resistance, min. (after life) | megaohms (MΩ) | 50,000 | at 100 VAC |
| Switching Life, min | cycles | 25,000 | at rated loads, sea-level, 25°C, 68% relative humidity |
| Mechanical Life, min | cycles | 100,000 | |
| Rotational Torque, min. | inch pounds | 1.5 | |
| Rotational Torque, max. | inch pounds | 10 | |
| Stop Strength, max. | inch pounds | 50 | |
| Mounting Ferrule Strength | inch pounds | N/A | |
| Withstanding Shaft Push Force | pounds | 200 | |
| Weight | grams | 140 | 2 inch. Square |
| Molded Parts | | Glass Epoxy-Mil P 18177 | |
| Contact Surfaces | | Pure, Solid Silver | Gold plate is an option |
| Altitude | feet | 80,000 | Typical pressure at 80,000 feet: 0.4 psi |
| Temperature, min. | degrees Celsius | -55 | |
| Temperature, max. | degrees Celsius | 125 | |
| Vibration Tested | | Meets | Per MIL-DTL-3786, MIL-STD-202, Method 204, test condition "B", vibration grade 3 |
| Impact Shock, Medium | | Meets | MIL-STD 202; Method 213 |
| Impact Shock, High | | Meets | at 100g, MIL-STD 202, Method 207 |
| Moisture Resistant | | No | |
| Salt Spray Resistant | | No | |
| Explosion Proof | | No | |
| Immersion | | No | |
| EMI/RFI | | Meets | MIL-DTL-3786, 2 ohms Shaft to ground max. |
| Capacitance, min | picofarad (pF) | 2-1/2 | measured between contacts and between ring and contacts |
| Capacitance, max | picofarad (pF) | 4 | measured between contacts and between ring and contacts |

