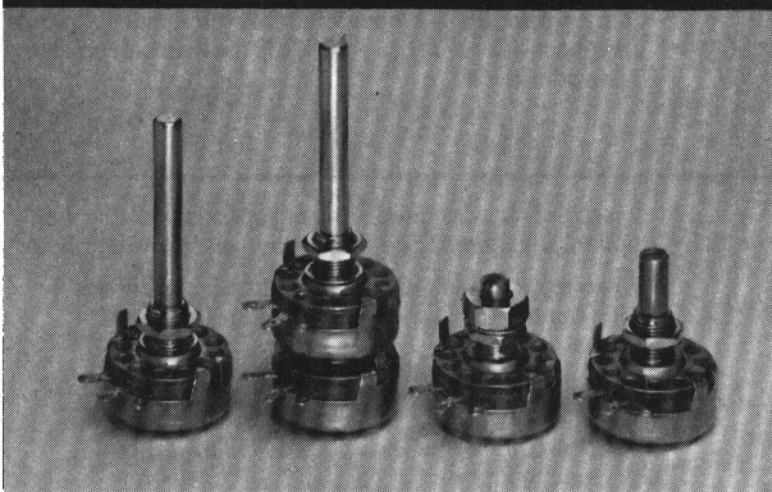


Type EJ
**Hot-Molded
 Panel Potentiometers**



Features

- 1,000,000 Mechanical Cycles
- Slip Clutch
- 2.25 Watts @ 70° C
- 50 Ohms to 5 Megohms
- Linear and Non-Linear Tapers

Benefits

- Long Rotational Life
- Durability
- High Power Capabilities
- Wide Resistance Range
- Versatility

SPECIFICATIONS

General

Availability — Type EJ Hot-Molded Panel Potentiometers are **custom** products. Refer to Type J Potentiometer information on Pages 194 and 196 for definitions of standard and custom components.

Temperature range — -55° C to +120° C.

Total resistance tolerances — ± 20% or ± 10%.

Tapers — Available in the following resistance ranges:

TAPER	TOTAL RESISTANCE RANGE
U	50 Ohms to 5.0 Megohms
A, B, S, & DB	250 Ohms to 5.0 Megohms

See Chart on Page 204 for explanation of tapers. Special tapers, where practical, can be supplied.

End Resistance — See chart on Page 204.

Electrical

Power — 2.25 watt maximum at + 70° C (single resistors only) provided voltage rating is not exceeded.

Power derating — Derate power linearly from + 70° C to zero at + 120° C. Derate power 50 percent for non-metallic mounting and for resistors with “A”, “B”, “S”, and “DB” tapers. See following pages for additional power derating information.

Voltage — 500 volts maximum working voltage (RMS or DC), or as determined by $E_{max} = \sqrt{PR}$, whichever is less (at sea level).

Dielectric withstanding voltage — Maximum continuous voltage 500 volts (RMS or DC) at sea level. Will withstand a one second test of 1000 volts (RMS or DC) at sea level or 500 volts (RMS or DC) at 3.4 inches (86,36 mm) mercury.

Voltage characteristic — 0.005 percent per volt or 0.5 ohm, whichever is greater.

Capacitance — The capacitance between terminal #1 and #3 with terminal #2 “floating” is approximately 2 to 3 pF at 1 KHz.

Electrical (continued)

The capacitance between terminal #1 (grounded to bushing) and terminal #3 (shaft in extreme clockwise position) is approximately 10 to 12 pF at 1 KHz.

The capacitance between all terminals shorted together and the bushing is approximately 15 to 20 pF at 1 KHz.

In all cases capacitance indicated is for potentiometer only and does not include capacitance of connecting wires.

Operational

Load life — 10 percent maximum change in total resistance as a result of a 1000 hour test at rated power across entire element in still air at +70° C (1.5 hours "ON", 0.5 hour "OFF").

Rotational life — 10 percent maximum change in total resistance as a result of a 1,000,000 mechanical cycle life test without load.

Mechanical

Slip clutch — The single section Type EJ is available with a slip clutch as Type EJC that prevents damage to the variable resistor when the shaft is rotated past the end stops. Slip torque is 2 ± 1 inch-pounds ($2,31 \pm 1,15$ kgf-cm).

Shafts — Diameter of shafts .250 inch (6,35 mm). Minimum length .125 inches (3,17 mm) longer than bushing. Maximum length 6.000 inches (152,40 mm). Lengths available in 1/64 inch (0,40 mm) increments. All shaft lengths are measured from the mounting face of the resistor to the free end of the shaft.

Bushings — Plain bushings only. All bushings have a 32-NEF-2A thread and are .375 inch (9,52 mm) in diameter. Length .250 inch (6,35 mm), .375 inch (9,52 mm) or .500 inch (12,70 mm), measured from the mounting surface of the bushing.

Hardware — Resistors are normally supplied with one mounting nut M-2786 and one internal tooth lock washer M-2898. Unless otherwise specified, all hardware shipped in bulk.

Locating lugs — Two locating lugs are applicable so resistors may be indexed with respect to the surface on

which they are mounted. Four lug options available. Lug option 1 standard. See dimensions on following pages.

Turning torque — At +25° C minimum torque 1 inch-ounce (0,07 kgf-cm). Maximum torque as follows:

Single — 6 inch-ounces (0,43 kgf-cm)

Dual — 9 inch-ounces (0,65 kgf-cm)

Stop torque — 12 inch-pounds (13,82 kgf-cm) minimum.

Rotation — Mechanical $312^\circ \pm 3^\circ$. Electrical 292° nominal.

Backlash — Maximum backlash: single resistors $\pm 1\text{-}1/2^\circ$, dual resistors $\pm 3^\circ$.

Construction — Materials are corrosion resistant and essentially non-magnetic; enclosure is dust and splash resistant; terminals are treated for easy soldering.

Marking — Clarostat part number and nominal total resistance are marked in two lines. Other marking possible, limited to maximum of 13 characters in each of two lines. "Type EJ" always included.

Environmental

Vibration — 2 percent maximum change in total resistance, 5 percent maximum change in resistance setting. (Tested per method 204, condition "C" of MIL-STD-202.)

Shock — 2 percent maximum change in total resistance, 5 percent maximum change in resistance setting. (Tested per method 213, condition "I" of MIL-STD-202.)

Moisture resistance — 10 percent maximum change in total resistance. (Method 106 of MIL-STD-202.)

Corrosion resistance — Materials show no corrosion after a 200 hour salt spray test. (Method 101 of MIL-STD-202.)

Effect of soldering — 2 percent maximum change in total resistance as a result of immersing the terminals in +350° C solder to within 0.125 inch (3,18 mm) of the resistor body for 5 seconds.

Temperature cycling — 3 percent maximum change in total resistance as a result of the

temperature cycling test (five cycles -55° C to +120° C).

Low temperature operation — 3 percent maximum change in total resistance as a result of the low temperature operation test (-55° C for two hours without load and 45 minutes with rated load).

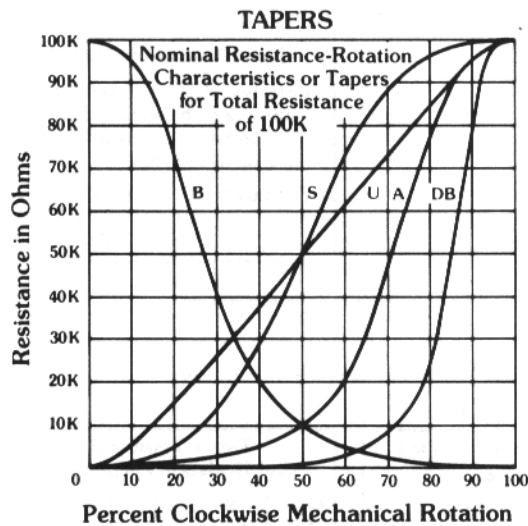
Low temperature storage — 2 percent maximum change in total resistance as a result of the storage test (24 hours at -55° C).

Temperature characteristics — Maximum percent temporary total resistance change from the +25° C value. See table below.

Nominal Resistance	Degrees Celsius — "U" Linear Taper						
	-55°	-25°	0°	+25°	+55°	+85°	+120°
100 Ohms	+4.5	+2.5	+1.5	0	± 1.0	± 1.5	+3.5
1,000 Ohms	+5.5	+3.0	+1.5	0	± 1.0	± 2.0	+4.5
10,000 Ohms	+7.0	+3.5	+2.0	0	± 1.0	± 2.5	+5.5
100,000 Ohms	+8.0	+4.0	+2.0	0	± 1.5	± 3.0	+6.0
1 Megohm	+10.0	+5.0	+2.5	0	± 1.5	± 3.5	+7.5

For "S", "A", "B" and "DB" tapers multiply percent-age figures shown above by 1.25.

Taper Data



Tapers A, DB, S and U are measured between the wiper and the counter-clockwise terminals; taper B is measured between the wiper and the clockwise terminals.

END RESISTANCE

TAPER	MINIMUM RESISTANCE BETWEEN TERMINALS 1 and 2	MINIMUM RESISTANCE BETWEEN TERMINALS 2 and 3
U & S	1	1
A	1	2
B	2	1
DB	3	2

- 1 Less than .004% of total resistance, or less than 4 ohms, whichever is less.
- 2 Less than 1% of total resistance, or less than 4 ohms, whichever is less.
- 3 Less than 4 ohms.

Additional Ratings

Multiple resistor power derating — The permissible power dissipation in one resistor element is a function of the power dissipation in the other resistor element. Maximum continuous power rating in watts with entire resistor element in the circuit are as follows:

$$\left(\frac{W_1}{2.25}\right)^2 + \left(\frac{W_2}{1.8}\right)^2 = 1 \text{ (Maximum)}$$

Where W_1 = Watts in entire first or panel resistor element.
 W_2 = Watts in entire second or rear resistor element.

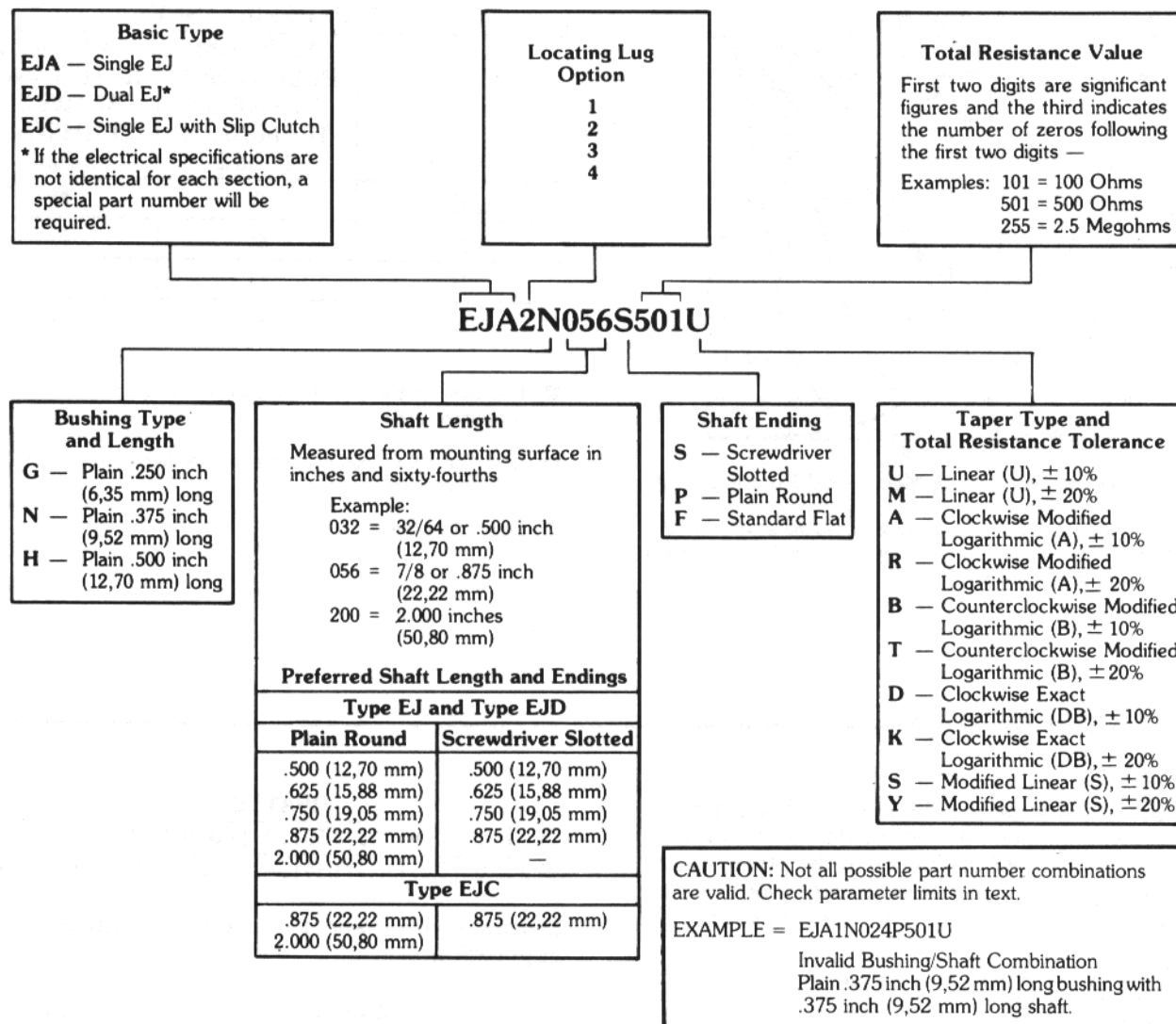
WATTS

W_1	2.25	2.00	1.75	1.50	1.25	1.00	0.75	0.50	0.25	0
W_2	0	0.83	1.13	1.34	1.49	1.61	1.70	1.76	1.79	1.80

Derating with respect to rotation — rheostat application

Percent Rotation	Multiply Wattage Rating By	Percent Rotation	Multiply Wattage Rating By
100	1.00	40	0.81
90	0.99	30	0.68
80	0.98	20	0.49
70	0.96	10	0.23
60	0.93	0	0.11
50	0.89		

Explanation of Part Numbers



Ordering Information

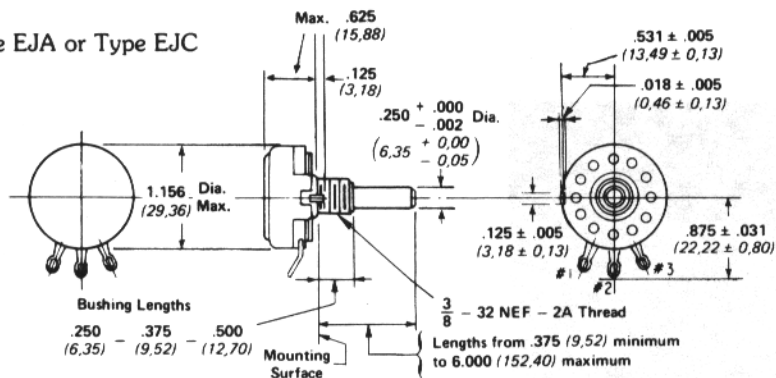
1. Type (EJA, EJD, EJC).
2. Taper (each element on multi-section controls).
3. Total resistance value (each element on multisection controls) in ohms.
4. Bushing type.
5. Bushing length in inches.
6. Shaft ending (plain, slotted, or flatted).
7. Shaft length from mounting surface in inches.
8. Locating lug option (1,2,3 or 4).
9. Mounting hardware (A-B Standard or Other).
10. Part number you have assigned, if any.
11. Marking required on the part.
12. Special features.*

*Forward complete detailed specifications to the factory.

DIMENSIONS

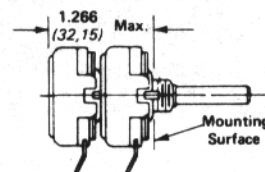
Single Resistor

Type EJA or Type EJC



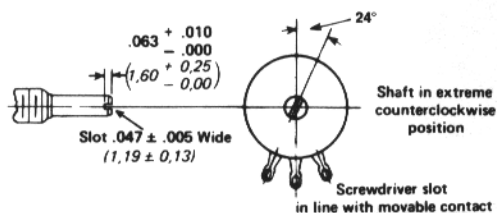
Dual Resistor

Type EJD

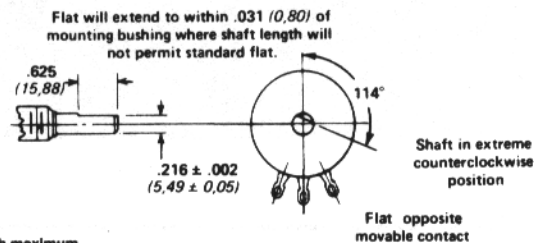


Shaft Endings

Screwdriver Slot

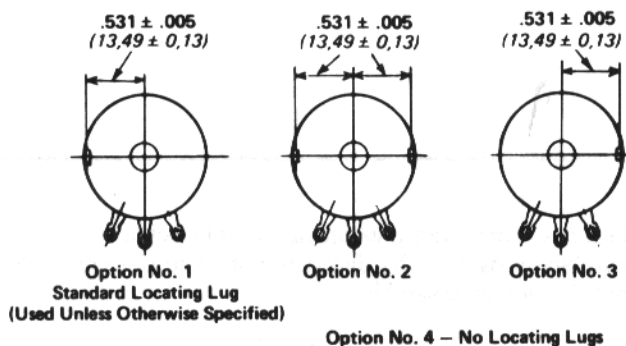


Flatted

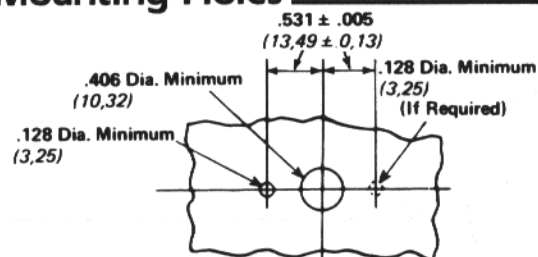


All shafts supplied with maximum chamfer .031 (0.80) x 45° at the shaft end.

Locating Lug Options



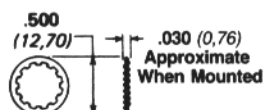
Mounting Holes



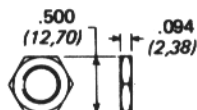
Resistor Connections



Mounting Hardware



Lock Washer M-2898



Mounting Nut M-2786

Basic dimensions in inches.
Dimensions shown in PARENTHESES are in millimeters.

TOLERANCES
Dimensional Tolerance $\pm .016$ (0.40)
Angular Tolerance $\pm 5^\circ$
Except as specified.

NOT TO SCALE