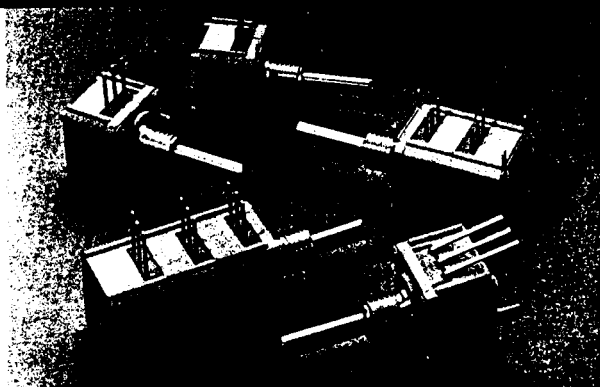


DATA SHEET

Series 308/309 Potentiometer



308: Modular Style, Conductive Plastic

309: Modular Style, Thick-Film Cermet

Description

The series 308 and 309 are high-performance, low cost potentiometers. They are also available with S.P.S.T. or S.P.D.T. rotary switch modules, S.P.S.T. momentary switch modules and/or potentiometer modules in multiple sections up to three sections.

Features

- **Compact** - 1/2 in. (12.7mm) miniature, modular size.
- **Cost-effective** - Design simplicity through fewer component parts.
- **Robust** - Horizontal or vertical mountings with support plates. Nickel-plated brass shaft and bushings in various diameters and lengths. Insert molded gold plated terminals for strength.
- **Precision Made** - screen-printed conductive plastic and thick-film cermet elements.
- **Stability** - Series 308 - 40°C to +120°C; Series 309 - 40°C to 150°C operating temperature.

Series 308 Electrical Specifications

<i>Resistance Tolerance</i>	100 Ω to 5 Megohms, linear; 500 Ω to 2 Megohms, non-linear
<i>Resistance Range</i>	Linear, thru 500K Ω , $\pm 10\%$; above 500K to 5 Megohms, $\pm 20\%$. Non-linear thru 100K Ω , $\pm 10\%$; above 100 Ω $\pm 20\%$.
<i>End Resistance</i>	Linear, 4 Ω maximum each end. Taper low side, 4 Ω maximum. High side 1% of total R.
<i>Power Rating</i>	.5 watt @ 70°C. Derated linearly to zero watts at 120°C. See Chart B, page 29. For non linear tapered units or PC mounting, derate by 50%. Trimmer style, derate by 50%.
<i>Effective Rotation</i>	265° $\pm 5^\circ$ without rotary switch; 240° $\pm 5^\circ$ with rotary switch.
<i>Dynamic Noise</i>	Standard: Linear single controls maximum initial noise level of 1.5% of total resistance. Measurement made using constant current source and oscilloscope detection technique. Special: 1%.

Series 309 Electrical Specifications

Linear: 5 Ω to 5 Megohms Taper: 100 Ω to 2 Megohms
$\pm 10\%$ standard; $\pm 5\%$ special. Trimmers $\pm 20\%$.
2 Ω maximum, 5 Ω to 2500 Ω . 4 Ω maximum, 5K Ω and above.
1 watt @ 85°C. Derate linearly to zero watts at 150°C. For tapered units, trimmers or PC mounting, derate 50%.
250° +10° -5° without rotary switch; 225° +10° -5° with rotary switch.
Standard: Linear single controls maximum initial noise level of 3% of total resistance. Measurement made using constant current source and oscilloscope detection technique. Special: 1.5%

Electrical Specifications continued, next page

<i>Electrical Rotation</i>	295° ±5°	295° ±5°
<i>Working Voltage</i>	350 Vdc across end terminals, but power not to exceed rating.	350 Vdc across end terminals, but power not to exceed rating.
<i>Resistance Temperature Characteristics</i>	See Chart C.	See Chart C.
<i>Linearity</i>	±5% independent	±5% independent
<i>Non-linear Tapers</i>	Right or left-hand available. See Chart A.	Right or left-hand available. See Chart A.
<i>Taper Tolerance</i>	±20% of nominal resistance @ 50% ±3% of mechanical rotation.	±20% of nominal resistance @ 50% ±3% of mechanical rotation.
<i>Voltage Coefficient</i>	.008%/Volt maximum	.008%/Volt maximum
<i>Dielectric Withstanding Voltage</i>	750 Vac for 60 seconds @ ATM pressure. 350 Vac for 6 seconds @ 3.4 in. Hg.	900 Vac for 60 seconds @ ATM pressure. 350 Vac for 60 seconds @ 3.4 in. Hg.

Series 308/309 Mechanical Specifications

Mechanical Rotation

295° ±5°

Stop Torque

3 lb. in. minimum (metal shaft)

Other torque options available. Please consult factory

Torque Range

.20 to 3.0 oz. in. (Single); .3 to 3.5 oz. in. (Dual);

.4 to 4.5 oz. in. (Triple).

Other torque options available. Please consult
Factory.

Torque Variation

Within control .5 oz. in. maximum

Bushing

Material: Brass nickel plated

Diameters: Supplied in .250" – 32 NEF 2A thread
(6.35mm) and .375" – 32 NEF 2A thread
(9.53mm).

Lengths: Available in .250"(6.35mm),
.375"(9.53mm), and .500"(12.7mm).

Styles: Plain, locking and trimmer.

Shaft

Material: Brass nickel plated and stainless steel

Diameters: Single shaft: .125"(3.18mm) and
.250"(6.35mm)
Concentric: .078"/.125"(1.98/3.18mm)
and .125"/.250"(3.18/6.35mm)

Lengths: Maximum of 3"(76.2mm) from bushing
mounting surface. .025"(6.35mm)
minimum on trimmer bushing

Styles: Plain, slotted, flatted and concentric

Push Momentary Switch

S.P.S.T., 125ma, 28Vdc, push momentary switch. Type DJ

Rotary Switch

S.P.S.T. and S.P.D.T., CCW or CW, 125ma, 28Vdc.
Type AL

Center Detent

Indent device which provide an indexing position.

Indent torque: .6 to 3 oz. in.

Rotational torque: .3 to 2.5 oz. in.

Indent position: Single at 50% mechanical rotation

Rotational life: 25,000 cycles

Housing

Thermoplastic polyester, blue. (U.L. SE-O rating).

Hardware

Nut: brass, nickel-plated

Lockwasher: phosphorous bronze, nickel-plated

Solvent Resistance

Housing resistant to trichlorethylene, *Chlorethene NU,
Freon TMS, **Freon TMC, toluene, MEK, ethyl acetate
and gasoline. For solvents not listed, please consult
Factory. **Note:** Units not immersion sealed

Terminals

Gold-coated PC terminals or solder hook style. PC pins fit
.100 grid spacing. Terminal mounting options available.

Weight (approx.)

Metal shaft & bushing: (Single) .19 oz., (Dual) .27 oz.,
(Triple) .35 oz.

*T.M. Dow Chemical Co.

**T.M. DuPont

Series 308/309 Operational Specifications

Operating Temperature Range

Series 308: -40°C to +120°C

Series 309: -40°C to +150°C

Storage Temperature Range

Series 308: -55°C to +120°C

Series 309: -55°C to +150°C

Rotational Life

Series 308: linear control, 50,000 cycles under load.
(plain bushing).

Change not to exceed 10% R.

Trimmer life under load is 5,000 cycles.

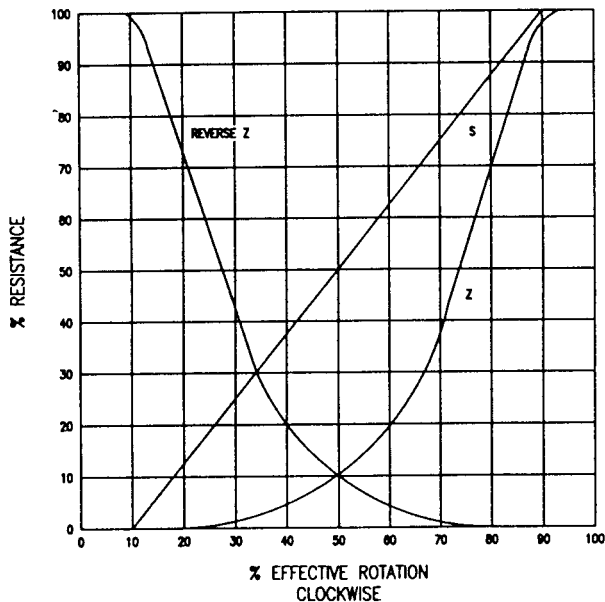
Series 309: linear control, 25,000 cycles under load.
(plain bushing).

Change not to exceed 5% R.

Trimmer life under load is 5,000 cycles.

Figure 1

Chart A



Curves Standard

The "S" taper is linear, the change in resistance value being directly proportional to the degree of rotation. It can be used either as right-hand or left-hand taper.

The "Z" taper attains 10% resistance value at 50% of clockwise rotation (left-hand).

The reverse "Z" taper attains 10% resistance values at 50% of counter-clockwise rotation (right-hand).

For conformity and special output curves, consult Factory

AL Switch Specifications

Rating

125ma 28Vdc (dry circuit)

Rotational Life

25,000 cycles under rated load

DJ Switch Specifications

Rating

125ma 28Vdc

Rotational Life

25,000 under rated load

Figure 2

Chart B

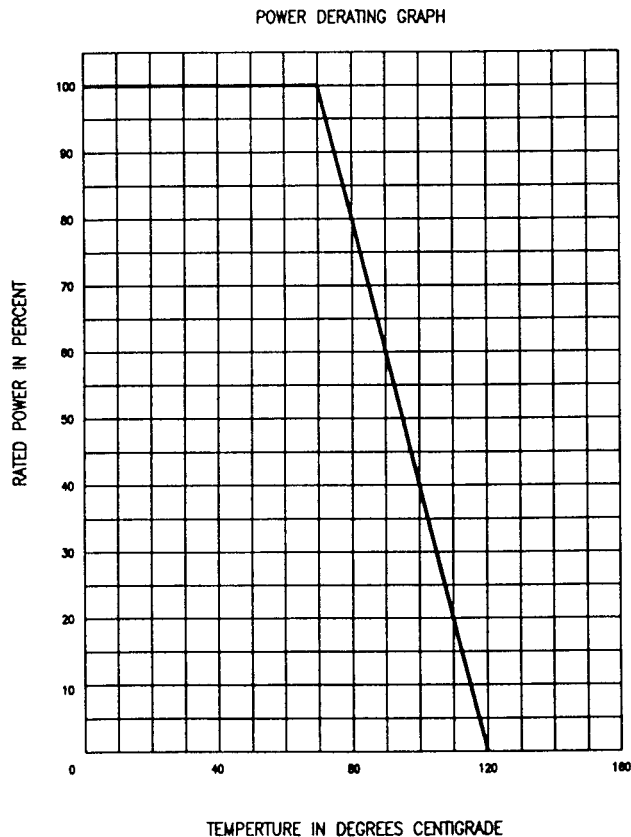


Figure 3

Chart C

Nominal Resistance	-55°C	-40°C	0°C	+25°C	+55°C	+85°C	+120°C
100 Ohms	±5.0	±4.0	±1.5	0	±1.5	±2.0	±3.5
10k Ohms	+7.0	+5.5	+2.0	0	±1.5	±2.5	±5.5
100k Ohms	+8.0	+6.0	+2.5	0	±2.0	±3.5	±6.0
1 Megohm	+10.0	+8.0	+3.0	0	±2.5	±4.0	±7.5

For non-linear tapers, multiply chart values by 1.25.

Tolerance specifications apply to all layout drawings unless otherwise specified:

fractions $\pm 1/64$ in. (.379mm);

$\pm 1/32$ in. (.794mm) over 1 in. (25.4mm);

decimals $\pm .005$ in. (.127mm);

PC board layout $\pm .010$ in. (.254mm).

Figure 4

Series 308/309

Single, Dual or Triple

(Second or Third Section May Be AL Series Rotary Switch)

Printed Circuit - Type B-22

"C" Terminal Length: .875" (22.3mm) Maximum

Standard PC Terminal Length: .250" (6.36mm)

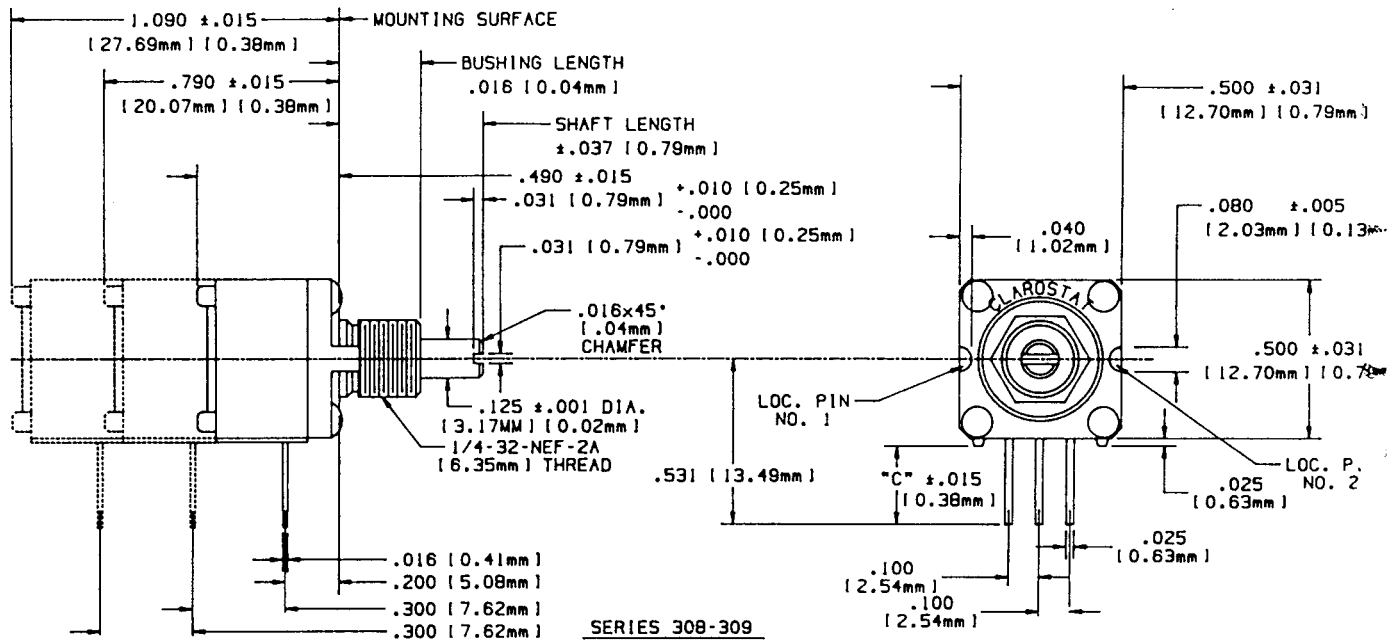


Figure 5

Series 308/309 Solder Lug Terminals

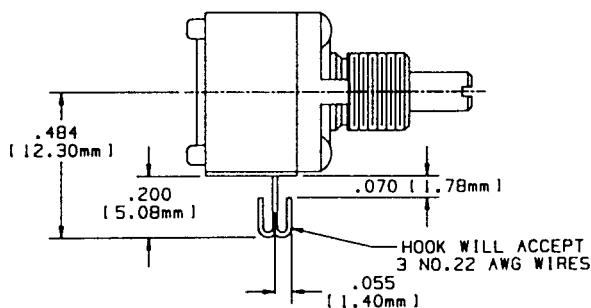


Figure 6

Series 308/309 Bushingless Trimmer

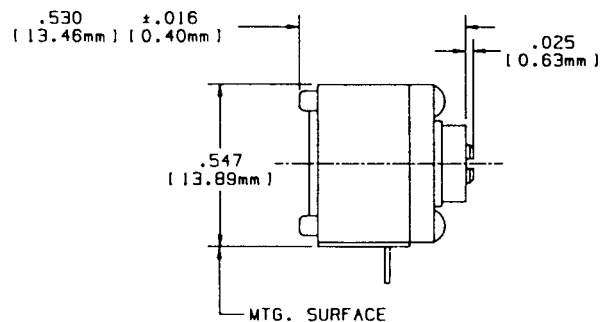


Figure 7

Series 308/309 Single, Dual, or Triple with Panel and Rear Support Plates, Horizontal Mounting

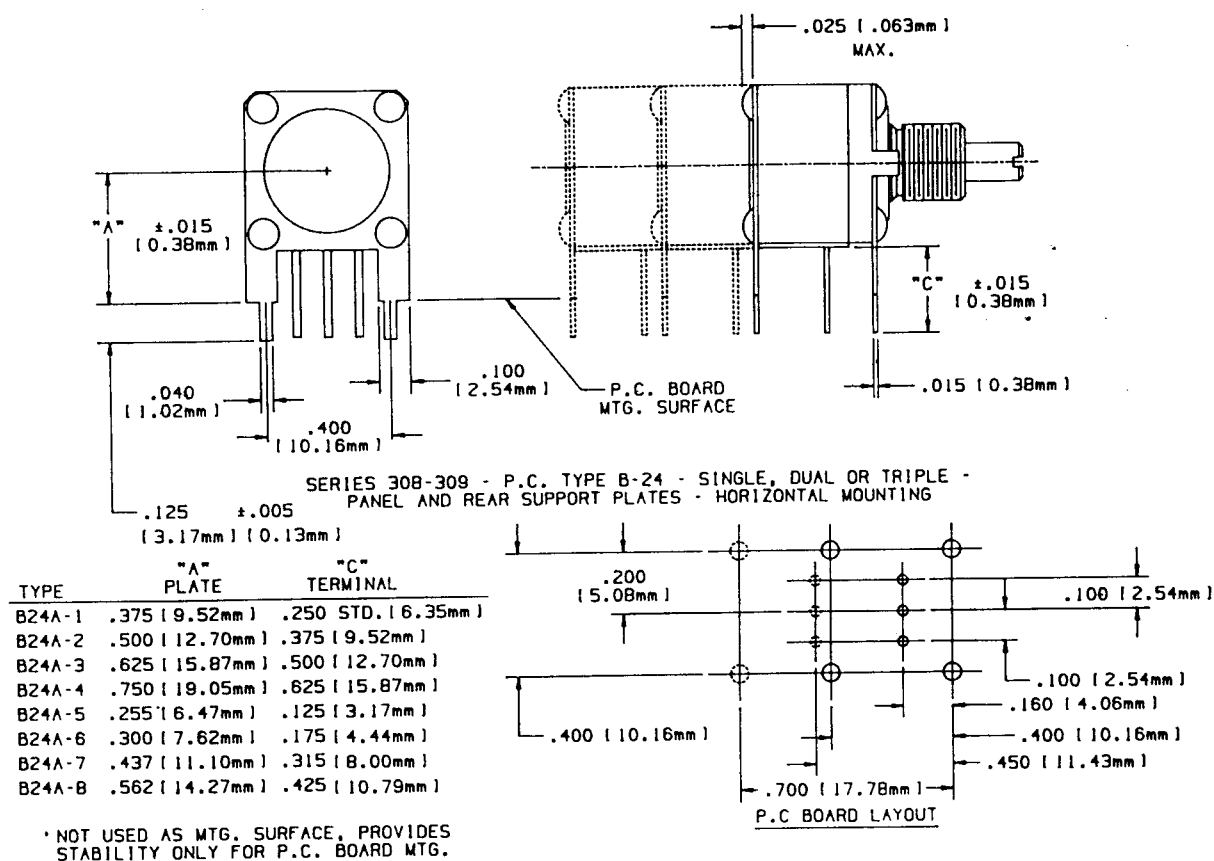


Figure 8

Series 308/309 Single or Dual with Center Detent

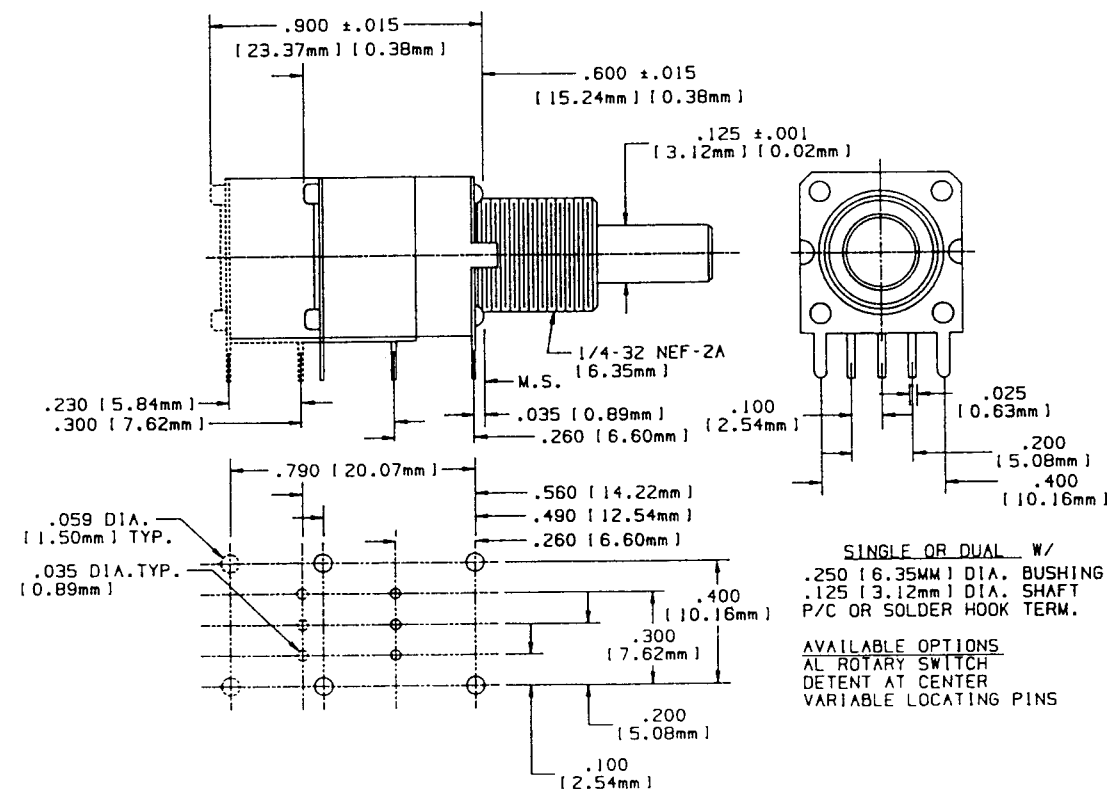


Figure 9

Series 308/309 Single or Dual with Center Detent

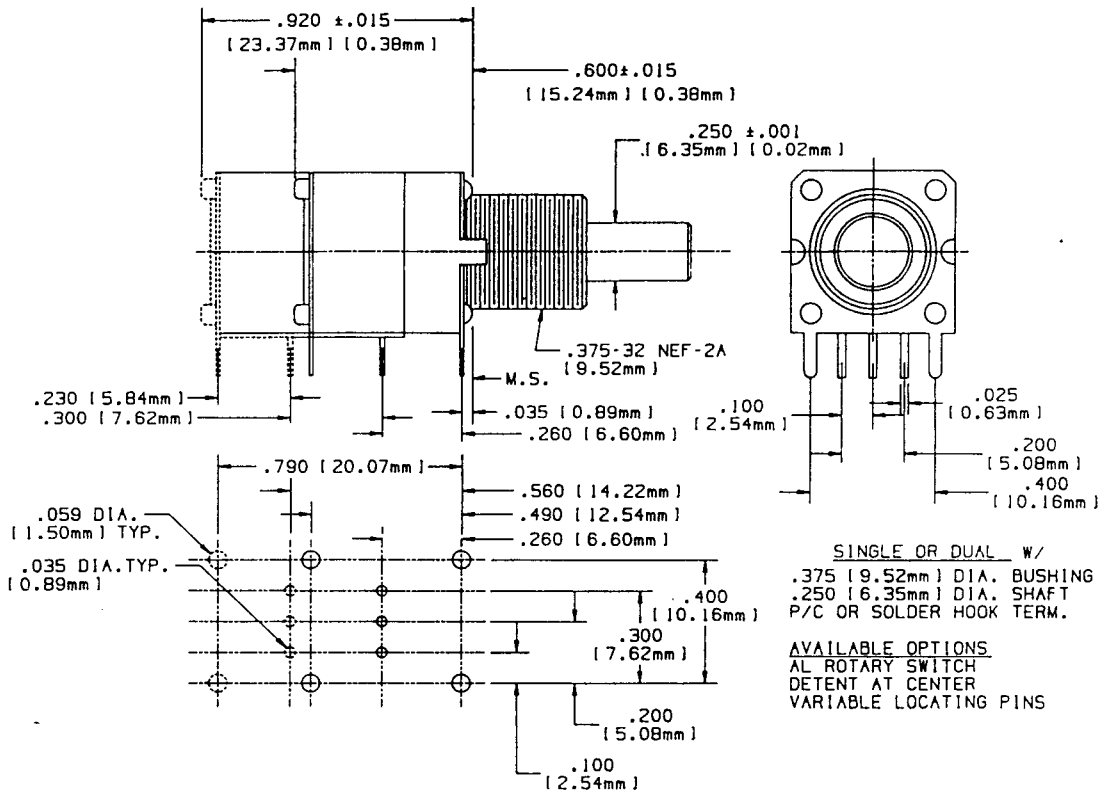


Figure 10

Series 308/309 Single, Dual or Triple with High Rotational Torque

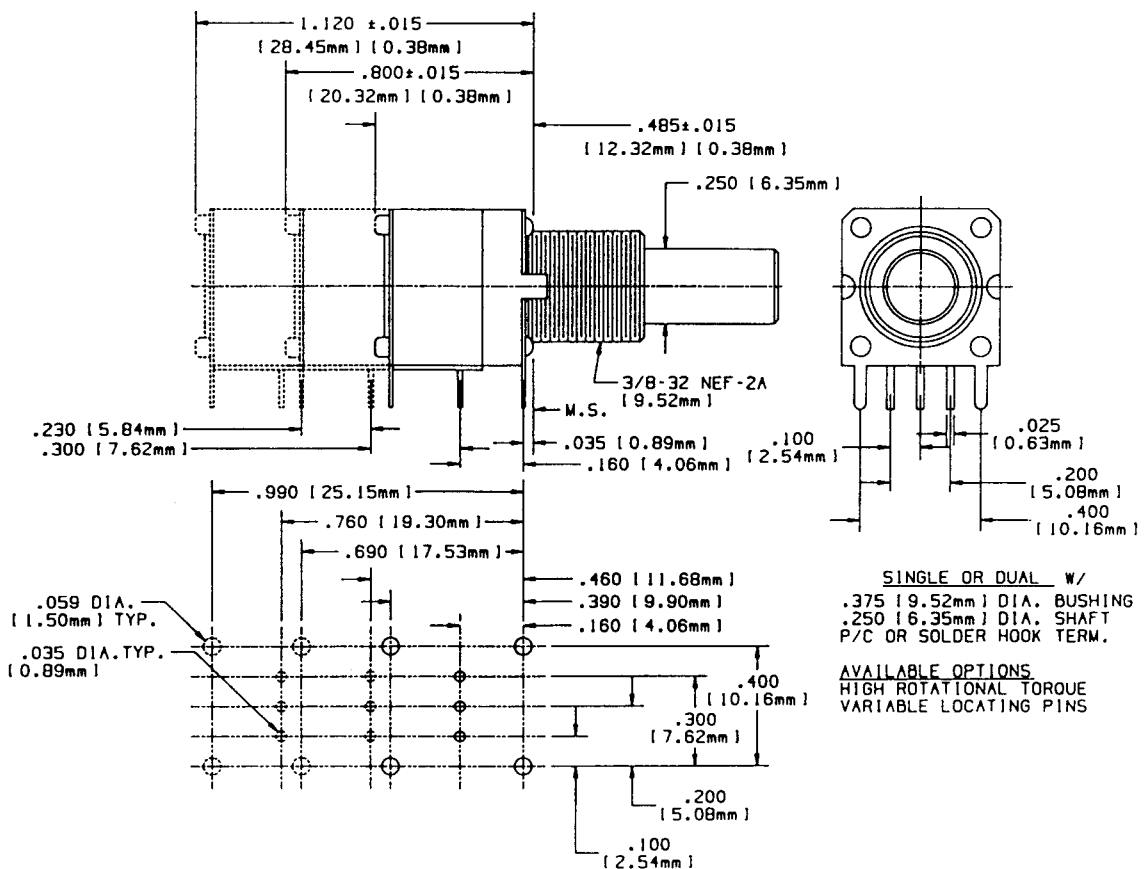


Figure 11

Series 308/309 Dual Concentric

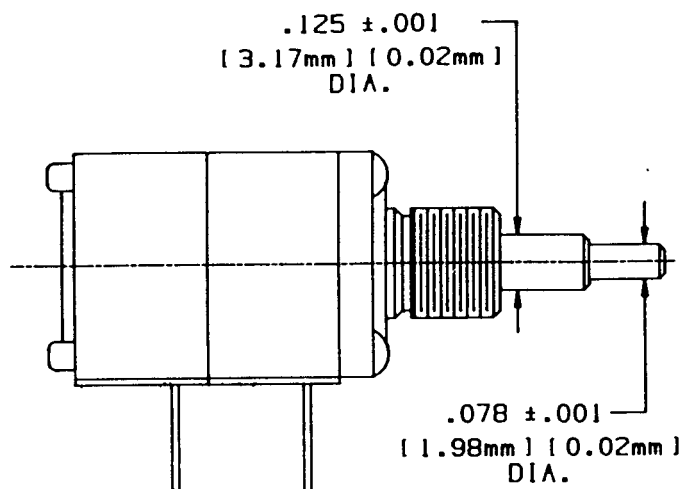


Figure 12

Series 308/309 Type C-10A Printed Circuit Terminals

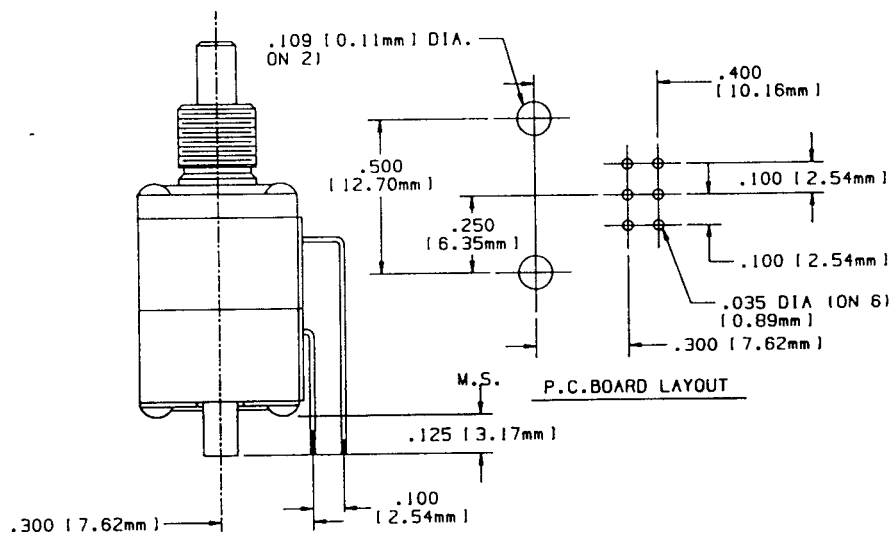


Figure 13

Series 308/309 Type A - 18A Printed Circuit Terminals

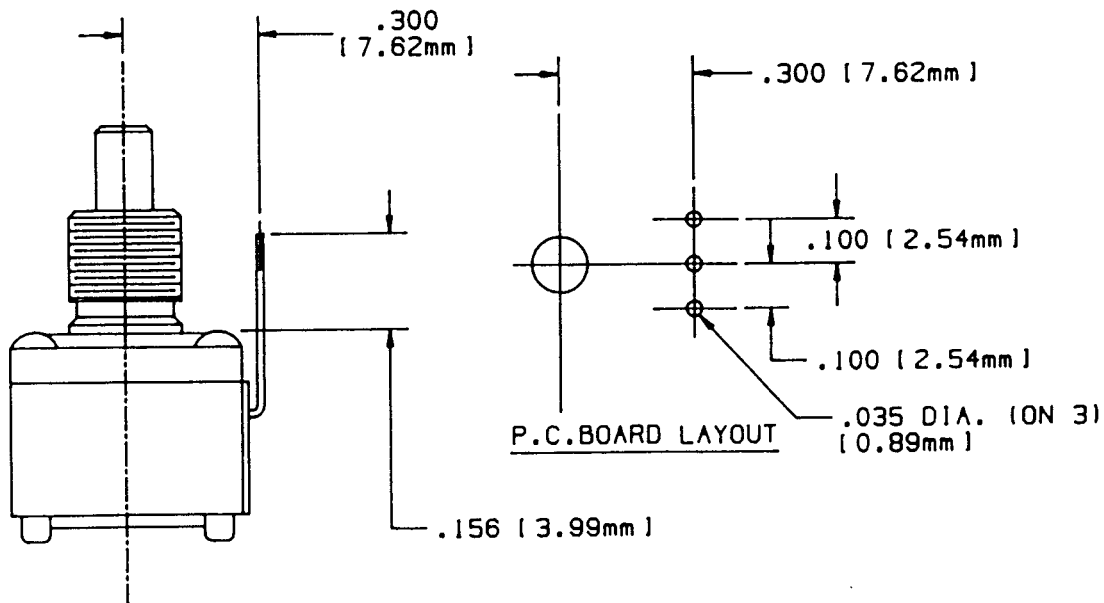


Figure 14

Series 308/309 Type C - 8A Printed Circuit Terminals

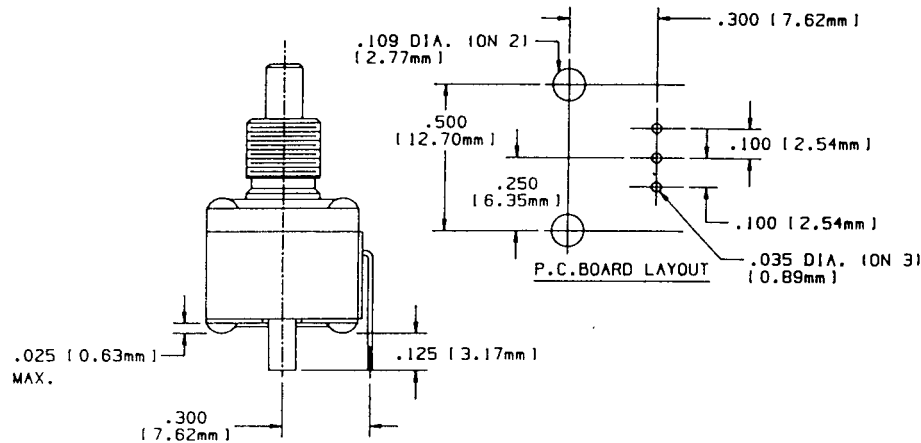
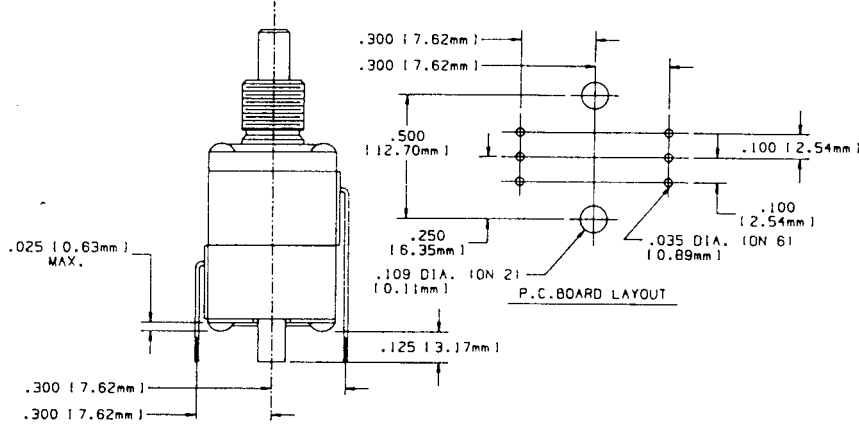


Figure 15

Series 308/309 Type C - 9A Printed Circuit Terminals



Series 308/309 Standard Resistance Values

Stock Values (Ohms)

308N				
100	1000	10K	100K	1Meg
250	2500	25K	250K	1.5Meg
500	5000	50K	500K	5Meg

308N - PC

100	1000	10K	100K	1Meg
250	2500	25K	250K	2.5Meg
500	5000	50K	500K	5Meg

308L

500	10K	100K
1000	25K	250K
5000	50K	500K

309N

100	10K	10K	100K	1Meg
250	25K	25K	250K	2.5Meg
500	50K	50K	500K	5Meg

Series 308/309 How To Order

Example: **D308-N-PPS-100-Z**

D308

Series
308 = Single
Conductive Plastic -
1/2 watt
D308 = Dual
Conductive Plastic -
1/2 watt
T308 = Triple
Conductive Plastic -
1/2 watt
309 = Single
Cermet - 1 watt
D309 = Dual
Cermet - 1 watt
T309 = Triple
Cermet - 1 watt

N

S

100K

Z

Resistance Value
(Ohms)

Taper

Z = Log

RZ = Reverse Log

S = Linear

Switches

S = Rotary switch S.P.D.T.

PM = Push Momentary S.P.S.T.

PPS = Push/pull switch S.P.D.T.

No switch requirement = Blank

Shaft & Bushing

N = Shaft: 1/8 in. (3.18mm) diameter x 3/4 in.

(19.05mm) FMS screwdriver slotted

Bushing: 1/4 in. (6.35mm) diameter x 1/4 in.

(6.35mm) length

L = Shaft: 1/8 in. (3.17mm) diameter x 7/16 in.

(11.11mm) FMS screwdriver slotted

Locking Bushing: 3/8 in. (9.52mm) x

1/4 in. (6.35mm) - 32-NEF 2A thread



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