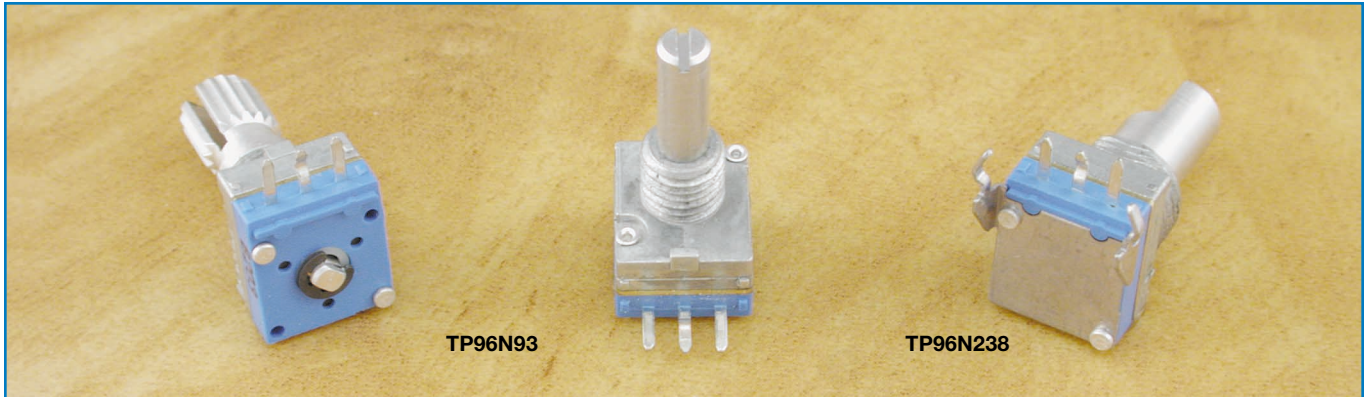


Long Life 9mm Square, Single-Turn, Carbon Panel Controls



TP96N93

TP96N238

Features

- Long life 9mm square, single-turn industrial panel controls
- Carbon film element
- Up to 300,000 cycle rotational life
- Single unit, single shaft
- Internal resin molded coating to prevent flux intrusion
- Metal shaft and bushing
- Linear taper
- Standard 15mm or 20mm shaft length
- 6mm diameter shafts in slot, flat or round end styles
- Standard PCB right angle inline pin terminals
- Vertical mount pin terminals available as special order

Specifications

Electrical

Standard Resistance Range	1kΩ to 100kΩ
Resistance Tolerance	±20% standard
End Resistance	100Ω max.
Resistance Taper	B = linear
Peak Noise (C.R.V.)	100mV max.
Power Rating	0.05 watt at +50°C, 0 watt at +70°C
Maximum Input Voltage	70VDC or power rating, whichever is smaller
Insulation Resistance	100MΩ minimum at 250VDC
Dielectric Strength	300VAC, 1 minute
Adjustment Travel	266° nominal

Mechanical

Mechanical Travel	300° ± 5°
Shaft Torque	20 gf·cm (0.277 oz·in) max.
Stop Strength	5 kgf·cm (69.31 oz·in) min.
Shaft Strength (push)	98.1 N (10 kgf) min.
Shaft Strength (tensile)	98.1 N (10 kgf) min.
Shaft End Play	±0.5 × (shaft length/30) mm max.
Mounting Nut Torque	10 kgf·cm (138.63 oz·in) min.
Marking	Model type, taper, resistance code, terminal identification, date code

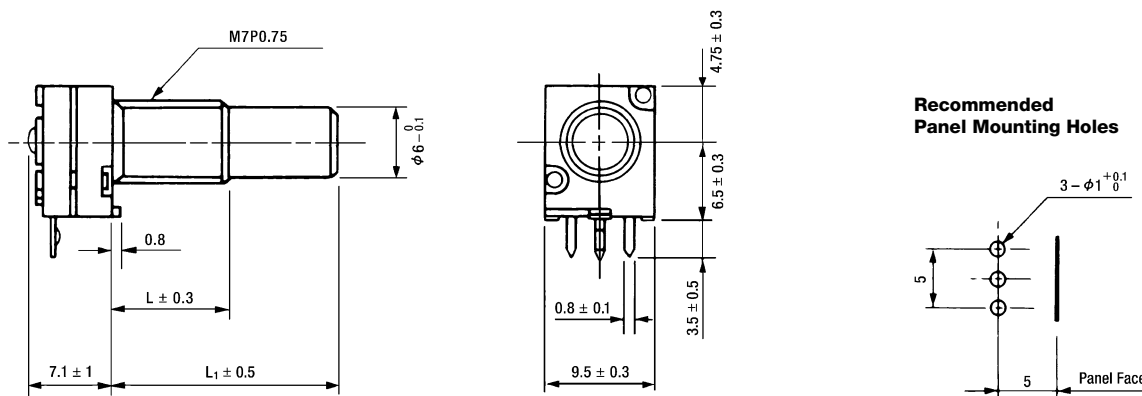
Environmental

Temperature Range	-20°C to +70°C
Temperature Characteristics	+70°C, 240 hours ΔT/R ≤ +5%, -30%
Temperature Cycle	-20°C, +70°C, 30 minutes each, 5 cycles ΔT/R ≤ +10%, -30%
Load Life	+50°C, 0.05 watt, 1,000 hours ΔT/R ≤ ±30%
Moisture and Load Life	+40°C, 90-95% RH, 0.05 watt, 350 hours ΔT/R ≤ ±20%
Vibration	10-55Hz, 1.5mm amplitude, 3 directions ΔT/R ≤ ±2.5%
Soldering Heat Resistance	350°C ± 5°C, 5 seconds ΔT/R ≤ ±5%
Rotational Life	300,000 cycles with 3.5V load ΔT/R ≤ ±15%

ΔT/R = Total Resistance Change

Note: A long life panel control should only be used in a circuit as a potentiometer (3-terminal voltage divider).

TP96N93
PCB Mount, Single Unit, Single Shaft
Right Angle Mount Pin Terminals, 3-Pin Inline Pattern



Part Numbering System

TP 9 6 N 93 15 S B 104 M

NOTE: FMS = From Mounting Surface

- **Resistance Tolerance: M** = $\pm 20\%$ (standard).
- **Resistance Code:** Expressed in ohms. A three digit code where the first two digits are significant figures, and the third digit indicates the number of zeros that follow these figures (i.e., 100 = 10 Ω ; 101 = 100 Ω ; 102 = 1,000 Ω ; 103 = 10,000 Ω ; 104 = 100,000 Ω). See table for standard resistance values.
- **Resistance Taper: B** = Linear.
- **Shaft End Style: S** = Slotted.
F = Flatted.
R = Round.
- **Standard Shaft Length: 15** = 15mm FMS.
20 = 20mm FMS.
 Up to 50mm shaft length available (special order).
- **Rotational Life: 93** = Long Life, 300,000 cycles.
Q = Long Life, 100,000 cycles (special order).
- **Style: N** = PCB Mount, Single Unit, Single Shaft, Pin Terminals, 3-Pin Inline Pattern.
- **Mechanical Travel: 6** = 300° Mechanical Travel.
- **Size: 9** = 9mm.
- **TOCOS Series Name: TP** = PCB Pin Terminals, Right Angle Mount.
RH = PCB Pin Terminals, Vertical Mount (available as special order).

Standard Resistance Values and Part Numbering Codes

Standard Nominal Total Resistance Values and Part Numbering Codes

Resistance (Ω)	Code	Resistance (Ω)	Code	Resistance (Ω)	Code
1,000	102	10,000	103	100,000	104
2,000	202	20,000	203		
5,000	502	50,000	503		

Refer to Shaft End Styles Specifications and Hardware Specifications for details and availability.
 For additional information, refer to Guidelines and Precautions for Using Panel Controls.