TP Series
Tiny Pushbutton Switches

Features/Benefits

- *Subminiature size—capable of switching 1 AMP*
- *Vertical & right angle terminations*
- *PC & panel mount models*
- *Snap-in front panel mounting available*
- *Epoxy terminal seal-compatible with bottom wash cleaning*
- *RoHS compliant models available*

®
Models Available

Typical Applications

- *Telecommunications and networking equipment*
- *Computers and peripherals*
- *Instrumentation and controls*

Specifications

CONTACT RATING: B contact material: 0.4 VA max. @ 20 V AC or DC max. Q contact material: 1 AMP @ 120 V AC or 28 V DC. See page A-19 for additional ratings.

ELECTRICAL LIFE: TP11, TP21 MODELS: 60,000 make-and-break cycles at full load. TP12 MODELS: 30,000 cycles.

CONTACT RESISTANCE: Below 20 mΩ15 typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9\Omega$ 15min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°15C to 85°15C.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

NOTE: Any models supplied with Q, B, P, R or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

CASE: Glass filled nylon 4/6 or 6/6, flame retardant, heat stabilized or diallyl phthalate (DAP), (UL 94V-0).

PLUNGER: Thermoplastic polyester (UL 94V-0).

CAP & FRAME: Nylon, black standard.

BUSHING: Brass, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass, matte-tin plated.

END CONTACTS: B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Coin silver, silver plated. See page A-19 for additional contact materials.

CENTER CONTACT & ALL TERMINALS: B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Copper alloy, silver plated. See page A-19 for additional contact materials.

TERMINAL SEAL: Epoxy. Refer to soldering and cleaning in Technical Data Chapter

HARDWARE: Nut & Locking Ring: Brass nickel plated. Lockwasher: Steel, nickel plated.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-16 thru A-20. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.

Switch Function
TP11 SPST Off-Mom.
TP12 SPDT On-Mom.
TP21 DPST Off-Mom.

Actuator or Bushing
SH .155" high plunger, threaded, .220" high bushing, flat
SH8 .155" high plunger, unthreaded, .220" high bushing, round
SH9 .155" high plunger, unthreaded, .220" high bushing, flat
J81 Snap-in with frame
LT .215" high plunger, threaded, .310" high bushing, flat
LT9 .215" high plunger, unthreaded, .310" high bushing, flat
MS9 .130" high plunger, .020" high bushing, round

Terminations
A Right angle, PC thru-hole
C PC Thru-hole
Z Solder lug
AV Vertical right angle, PC thru-hole
V3 Vertical mount, v-bracket
W Wire wrap

Contact Material
B Gold
P Gold, matte-tin
Q Silver
G Gold over silver
R Gold over silver, matte-tin

Seal
E Epoxy

Cap Color
2 Black
NONE Models with no cap
1 White

Frame Color
2 Black
NONE Models with no frame

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TP Series
Tiny Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
		C&K marking on opposite side		C&K marking on opposite side		
SP	**TP11**	OFF	MOM.	OPEN	1-3	SPST 1 ●—● 3
	TP12	ON	MOM.	2-1	2-3	SPDT NC 1 ● ●2 (COMMON) ● 3 NO

SPDT

C&K MARKING ON OPPOSITE SIDE
EPOXY SEAL
.020 TYP. (0,51)
10-48UNS
.100 DIA. (2,540)
.100 TYP. (2,54)
.155 (3,94)
.220 (5,59)
.340 (8,64)
.110 (2,79)
.160 (4,06)
.200 (5,08)
.320 (8,13)
.060 TYP. (1,52) TERM. WIDTH

Omit terminal 2 for TP11 models.

Terminal Nos. For Reference Only

Part number shown: TP12SHZQE

| DP | **TP21** | OFF | MOM. | OPEN | 1-3,4-6 | DPST   1 3 4 6 |

DPST

C&K MARKING ON OPPOSITE SIDE
EPOXY SEAL
.020 TYP. (0,51)
10-48UNS
.100 DIA. (2,540)
.200 (5,08)
.155 (3,94)
.220 (5,59)
.340 (8,64)
.110 (2,79)
.160 (4,06)
.320 (8,13)
.360 (9,14)
.060 TYP. (1,52) TERM. WIDTH

Terminal Nos. For Reference Only

Part number shown: TP21SHZQE

MOM. = Momentary

All models ®🆄🅻 with all options when ordered with G, Q or R contact material.

ACTUATOR—SNAP-IN FRONT MOUNT

CAP COLOR
ACTUATOR OR BUSHING
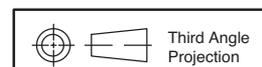FRAME COLOR

J81 SNAP-IN WITH FRAME

.615 (15,62)
.765 (19,43)
.450 SQ. (11,43)
.090 (2,29)
.150 (3,81)
.370 (9,40)
.320 (8,13)

PANEL MOUNTING
.005 R. MAX. (0,13) TYP.
.600 (15,24)
.500 (12,70)

PANEL THICKNESS .047 TO .125 (1,19) (3,18)
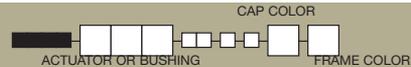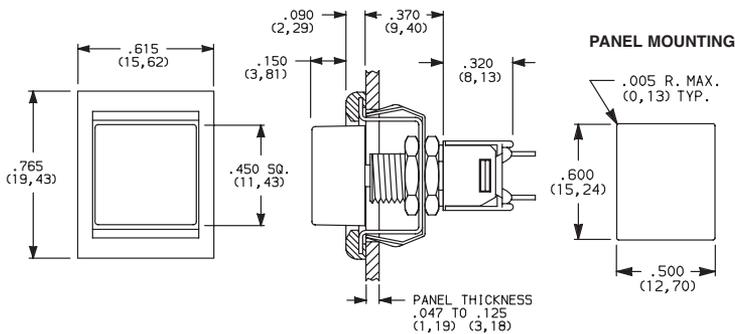
OPTION CODE	CAP COLOR
2	BLACK
1	WHITE

OPTION CODE	FRAME COLOR
2	BLACK
NONE	No Frame Color (J80 option)

Cap and Frame Finish: matte. Other colors available, consult Customer Service Center.

NOTE: Available with Z, C, or W terminations.

NOTE: Caps & frames available separately, see page A-20.

C&K

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

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BUSHING

ACTUATOR OR BUSHING

SH .155" HIGH PLUNGER, .220" HIGH BUSHING, THREADED, FLAT

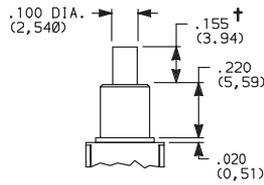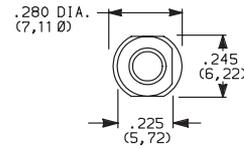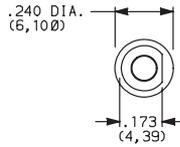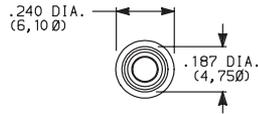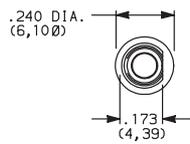**SH8** .155" HIGH PLUNGER, .220" HIGH BUSHING, UNTHREADED

SH9 .155" HIGH PLUNGER, .220" HIGH BUSHING, UNTHREADED, FLAT

LT .21517" HIGH PLUNGER, .310" HIGH BUSHING, THREADED

MS9 .130" HIGH PLUNGER

LT9 .215"17 HIGH PLUNGER, .310" HIGH BUSHING, UNTHREADED

.240 DIA. (6,10 Ø)

.173 (4,39)

.100 DIA. (2,540)

10-48UNS-2A

.155 † (3,94)

.220 (5,59)

.020 (0,51)
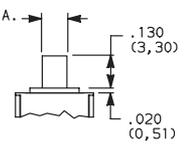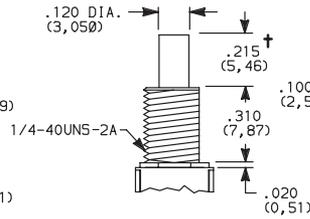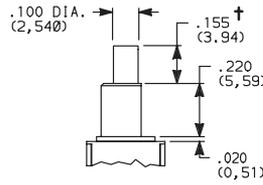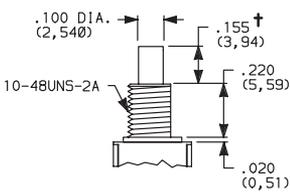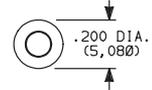
Standard with Z, C, W terminations.

.240 DIA. (6,10 Ø)

.187 DIA. (4,750)

.100 DIA. (2,540)

.155 † (3,94)

.220 (5,59)

.020 (0,51)

.240 DIA. (6,10 Ø)

.173 (4,39)

.100 DIA. (2,540)

.155 † (3,94)

.220 (5,59)

.020 (0,51)

Standard with A, AV, V3 terminations.

.280 DIA. (7,11 Ø)

.245 (6,22)

.225 (5,72)

.120 DIA. (3,050)

1/4-40UNS-2A

.215 † (5,46)

.310 (7,87)

.020 (0,51)

.200 DIA. (5,080)

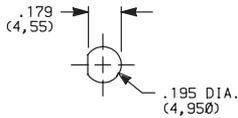.100 DIA. (2,540)

.130 (3,30)

.020 (0,51)

Not available with Z terminations.

† Subtract .016 (0,41) for models with A, AV or V3 terminations.

NOTE: Caps available for plunger options, see page A-20.
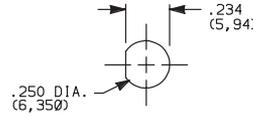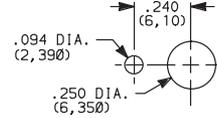

PANEL MOUNTING

10-48 BUSHING

.179 (4,55)

.195 DIA. (4,950)

Without locking ring

.240 (6,10)

.094 DIA. (2,390)

.195 DIA. (4,950)
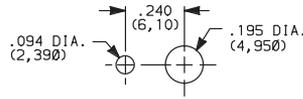
With standard locking ring

1/4 IN. BUSHING

.234 (5,94)

.250 DIA. (6,350)

Without locking ring

.240 (6,10)

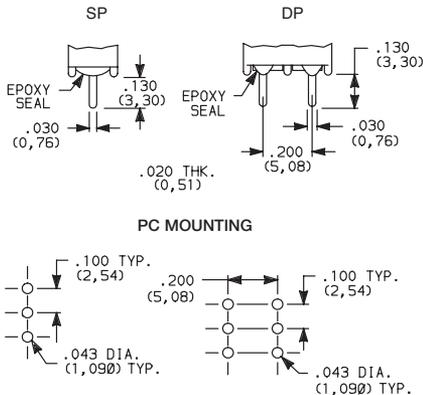.094 DIA. (2,390)

.250 DIA. (6,350)

With standard locking ring

NOTE: One mounting nut, locking ring and lockwasher supplied standard with 10-48 threaded bushings (two nuts with 1/4-40 bushings). Optional mounting nut and locking ring styles and finishes available separately, see section "Technical Data and Additional Hardware".
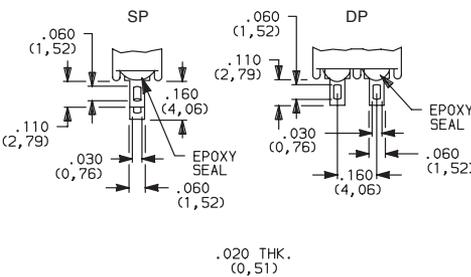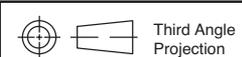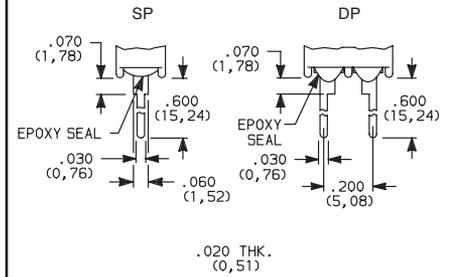

TERMINATIONS

C PC THRU-HOLE

SP

DP

EPOXY SEAL

.130 (3,30)

.030 (0,76)

EPOXY SEAL

.130 (3,30)

.200 (5,08)

.030 (0,76)

.020 THK. (0,51)

PC MOUNTING

.100 TYP. (2,54)

.043 DIA. (1,090) TYP.

.200 (5,08)

.100 TYP. (2,54)

.043 DIA. (1,090) TYP.

Omit center holes for TP11 models

Z SOLDER LUG

SP

.060 (1,52)

.110 (2,79)

.030 (0,76)

.160 (4,06)

EPOXY SEAL

.060 (1,52)

DP

.060 (1,52)

.110 (2,79)

.030 (0,76)

EPOXY SEAL

.060 (1,52)

.160 (4,06)

.020 THK. (0,51)

Not available with MS9 bushing or P or R contact material.

W WIRE WRAP

SP

.070 (1,78)

EPOXY SEAL

.030 (0,76)

.600 (15,24)

.060 (1,52)

DP

.070 (1,78)

EPOXY SEAL

.030 (0,76)

.600 (15,24)

.060 (1,52)

.200 (5,08)

.020 THK. (0,51)

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

C&K

Pushbutton

A

TERMINATIONS

A RIGHT ANGLE, PC THRU-HOLE

TP12SH9ABE
SPDT

.139 (3,53)
.220 (5,59)
.100 DIA. (2,540)
EPOXY SEAL
.025 (0,64)
.125 (3,18)
.130 (3,30)
.016 TYP. (0,41)
.030 TYP. (0,76)
.030 TYP. (0,76)
.158 (4,01)
.200 (5,08)
.200 (5,08)

.320 (8,13)
.200 (5,08)
.100 TYP. (2,54)
.020 TYP. (0,51)

TP11 Models: omit terminal 2.
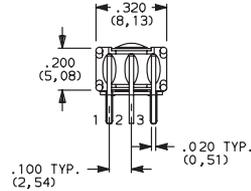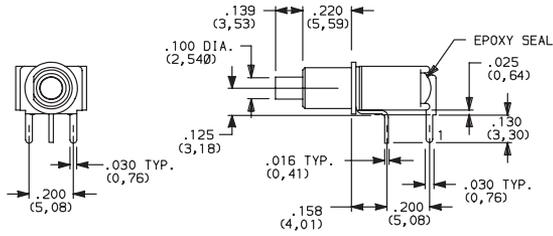
PC MOUNTING
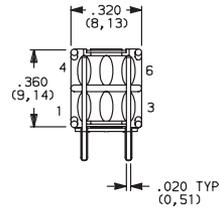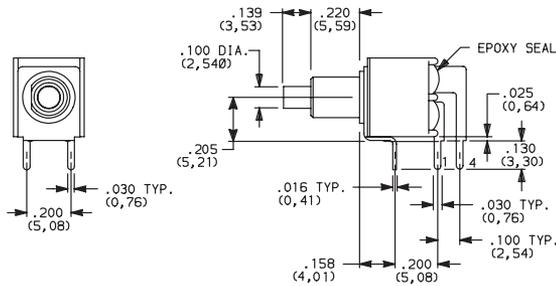.043 DIA. (1,090) TYP.
.100 TYP. (2,54)
.200 (5,08)
.200 (5,08)
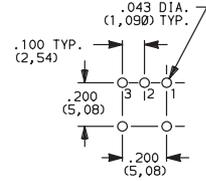
TP11 Models: omit hole 2.
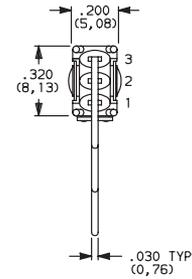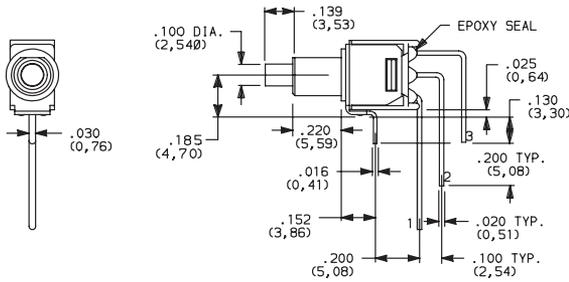
A RIGHT ANGLE, PC THRU-HOLE

TP21SH9ABE
DPST

.139 (3,53)
.220 (5,59)
.100 DIA. (2,540)
EPOXY SEAL
.025 (0,64)
.205 (5,21)
.130 (3,30)
.016 TYP. (0,41)
.030 TYP. (0,76)
.030 TYP. (0,76)
.100 TYP. (2,54)
.158 (4,01)
.200 (5,08)

.320 (8,13)
.360 (9,14)
.020 TYP. (0,51)

PC MOUNTING
.043 DIA. (1,090) TYP.
.200 (5,08)
.100 TYP. (2,54)
.200 (5,08)
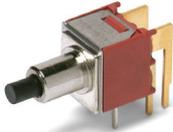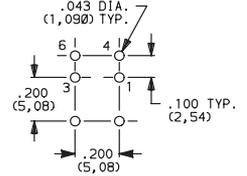
AV VERTICAL RIGHT ANGLE, PC THRU-HOLE

TP12SH9AVBE
SPDT

.139 (3,53)
.100 DIA. (2,540)
EPOXY SEAL
.025 (0,64)
.130 (3,30)
.185 (4,70)
.220 (5,59)
.200 (5,08)
.016 (0,41)
.020 TYP. (0,51)
.152 (3,86)
.200 (5,08)
.100 TYP. (2,54)
.030 (0,76)

.200 (5,08)
.320 (8,13)
.030 TYP. (0,76)

TP11 Models: omit terminal 2.

PC MOUNTING
.043 DIA. (1,090) TYP.
.100 TYP. (2,54)
.200 (5,08)
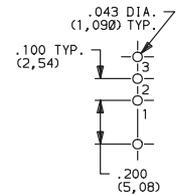
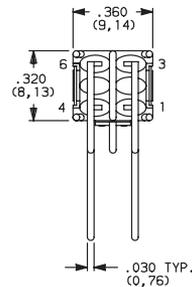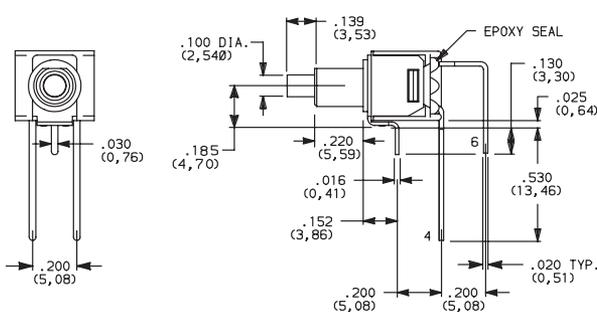**TP11 Models: omit hole 2.**

NOTE: Terminal bend radii and lead-in manufacturing option.

AV VERTICAL RIGHT ANGLE, PC THRU-HOLE

TP21SH9AVBE
DPST
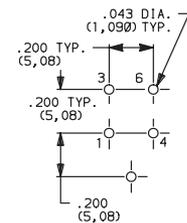
.139 (3,53)
.100 DIA. (2,540)
EPOXY SEAL
.130 (3,30)
.025 (0,64)
.185 (4,70)
.220 (5,59)
.016 (0,41)
.530 (13,46)
.152 (3,86)
.020 TYP. (0,51)
.030 (0,76)
.200 (5,08)
.200 (5,08)
.200 (5,08)

.360 (9,14)
.320 (8,13)
.030 TYP. (0,76)

PC MOUNTING
.043 DIA. (1,090) TYP.
.200 TYP. (5,08)
.200 TYP. (5,08)
.200 (5,08)

NOTE: Terminal bend radii and lead-in manufacturing option.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

C&K

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3

TERMINATIONS

V3 VERTICAL MOUNT, V-BRACKET

.139 (3,53)
.220 (5,59)
C&K MARKING ON OPPOSITE SIDE
EPOXY SEAL
1 2 3
.016 (0,41)
.020 TYP. (0,51)
.100 TYP. (2,54)
.400 (10,16)

TP11 Models: omit terminal 2.

.100 DIA. (2,540)
.355 (9,02)
.130 (3,30)
.030 TYP. (0,76)
.200 (5,08)
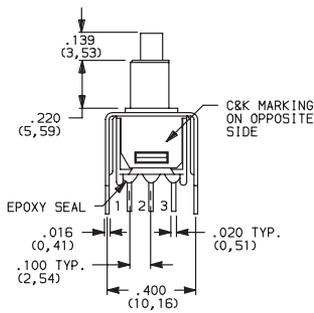
PC MOUNTING
.043 DIA. TYP. (1,090)
.100 TYP. (2,54)
3
2
1
.400 (10,16)
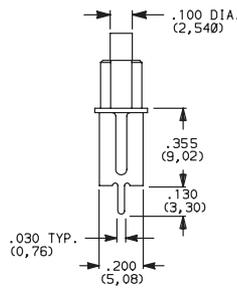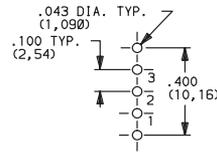
TP11 Models: omit hole 2.

TP12SH9V3BE SPDT

V3 VERTICAL MOUNT, V-BRACKET

.139 (3,53)
.220 (5,59)
C&K MARKING ON OPPOSITE SIDE
EPOXY SEAL
4 6
.016 (0,41)
.020 TYP. (0,51)
.200 (5,08)
.400 (10,16)

.360 (9,14)
.100 DIA. (2,540)
.355 (9,02)
.130 (3,30)
.030 TYP. (0,76)
6 3
.100 TYP. (2,54)
.200 (5,08)

PC MOUNTING
.043 DIA. (1,090) TYP.
.200 TYP. (5,08)
.400 (10,16)
.200 (5,08)
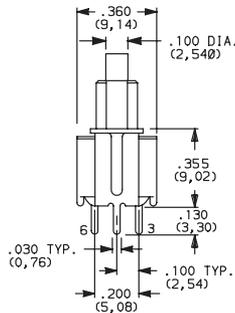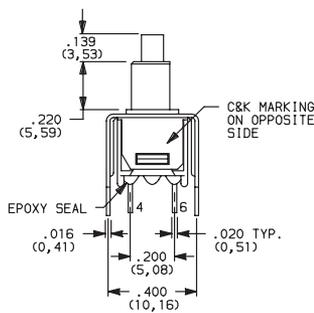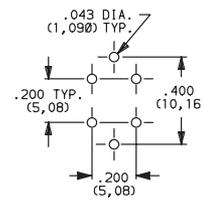
TP21SH9V3BE DPST

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD [1]	GOLD [1]	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN [6]		
Q	SILVER [4,5]	SILVER [5]	POWER	1 AMP @ 120 V AC OR 28 V DC.
G	GOLD OVER SILVER [2,3]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR
R		MATTE-TIN [6]		1 AMP @ 120 V AC OR 28 V DC.

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

[2] END CONTACTS: Coin silver, with gold plate over nickel plate.

[3] CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

[4] END CONTACTS: Coin silver, silver plated.

[5] CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.

[6] TERMINALS: Copper alloy, with matte-tin over nickel plate.

NOTE: Any models supplied with P, R, Q, B or G contact material are RoHS compliant.

All models ®𝗨𝗟 with all options when ordered with R, G, or Q contact material.
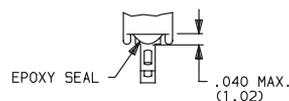B contact material standard with A, AV, V3 & W terminations.
Q contact material standard with C & Z terminations
P, R contact materials not available with Z terminations.

SEAL

E EPOXY SEAL

EPOXY SEAL
.040 MAX. (1,02)

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

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AVAILABLE HARDWARE

Cap, .100" DIA. Plungers

.200 DIA. (5,08)
.155 (3,94)
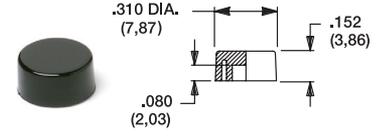.100 (2,54)
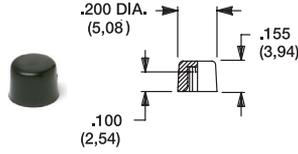
PART NO.
508101000 WHITE
508102000 BLACK

Material: Nylon
Finish: Gloss
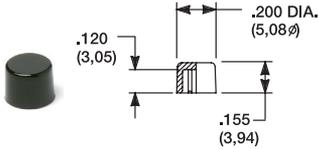
Cap, .100" DIA. Plungers (Recommended for S9 plunger)

.200 DIA. (5,08)
.155 (3,94)
.081 (2,06)
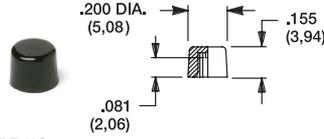
PART NO.
538701000 WHITE
538702000 BLACK

Material: Nylon
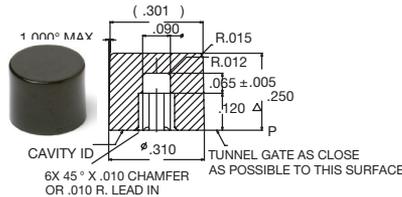Finish: Gloss

Cap, .100" DIA. Plungers

.310 DIA. (7,87)
.152 (3,86)
.080 (2,03)

PART NO.
465801000 WHITE
465802000 BLACK

Material: Nylon
Finish: Gloss

Cap, .120" DIA. Plungers

.120 (3,05)
.200 DIA. (5,08∅)
.155 (3,94)
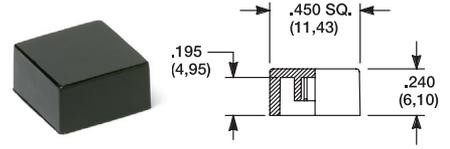
PART NO.
708901000 WHITE
708902000 BLACK

Material: Nylon
Finish: Gloss

Cap, .120" DIA. Plungers

1.000° MAX.
(.301)
.090
R.015
R.012
.065 ±.005
.250
.120 ∆
P
CAVITY ID
∅ .310
6X 45° X .010 CHAMFER OR .010 R. LEAD IN
TUNNEL GATE AS CLOSE AS POSSIBLE TO THIS SURFACE

PART NO.
891D01000 WHITE
891D02000 BLACK

Material: Nylon
Finish: Gloss

Cap, J81 option only
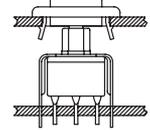
.450 SQ. (11,43)
.195 (4,95)
.240 (6,10)

PART NO.
484601000 WHITE
484602000 BLACK

Material: Nylon
Finish: Gloss

PART NO.
798201000 WHITE
798202263 BLACK

Material: Nylon
Finish: Matte

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware". Other cap colors available, consult Customer Service Center.

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.
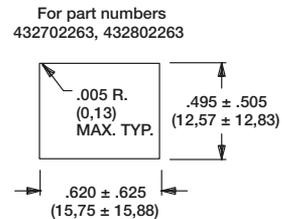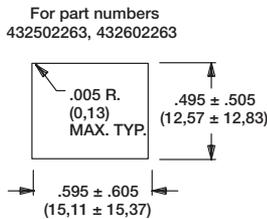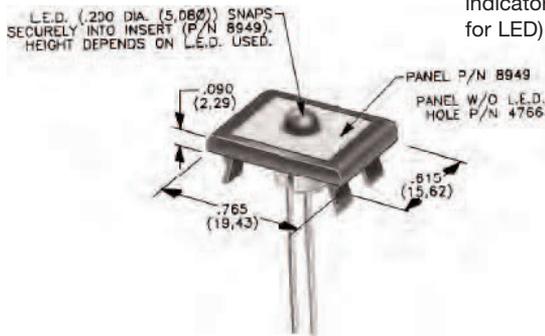
TYPICAL APPLICATION

.090 (2,29)
.765 (19,43)
.615 (15,62)

.090" (2,29) PANEL THK.

PART NO.
432702263

.125" (3,18) PANEL THK.

PART NO.
432802263 BLACK

PANEL MOUNTING

For part numbers 432502263, 432602263

.005 R. (0,13) MAX. TYP.
.495 ± .505 (12,57 ± 12,83)
.595 ± .605 (15,11 ± 15,37)

For part numbers 432702263, 432802263

.005 R. (0,13) MAX. TYP.
.495 ± .505 (12,57 ± 12,83)
.620 ± .625 (15,75 ± 15,88)

Panel Inserts

L.E.D. (.200 DIA. (5,08∅)) SNAPS SECURELY INTO INSERT (P/N 8949). HEIGHT DEPENDS ON L.E.D. USED.

.090 (2,29)
PANEL P/N 8949
PANEL W/O L.E.D. HOLE P/N 4766
.615 (15,62)
.765 (19,43)

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. LED not included.

PANEL INSERT WITH HOLE FOR LED

PART NO.
894902000

BLANK PANEL INSERT WITHOUT HOLE FOR LED

PART NO.
476602000 BLACK
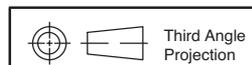
Third Angle Projection

Dimensions are shown: Inches (mm)
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[C&K Switches](#):

  TP11SHZBE   TP12SH9AQE   TP11SH8ABE   TP11SH8CBE   TP11SHZQE   TP11SH9ABE   TP11SH9CBE
TP11SH9AVBE   TP11SH8CQE   TP21SHZQE   TP11LTZQE   TP12SH8AQE   TP12SH9AVBE   TP12SH8ABE
TP12SH8AVBE   TP12SHZQE   TP12SH9ABE   TP11J81ZBE12   TP11J81ZBE22   TP11J81ZQE22   TP11LT9ABE
TP11LTAQE   TP11LTAVBE   TP11LTCBE   TP11LTCQE   TP11LTZBE   TP11MS9ABE   TP11MS9CBE   TP11MS9V3BE
  TP11SH8AGE   TP11SH8AQE   TP11SH8AVBE   TP11SH8V3QE   TP11SH9V3BE   TP11SHABE   TP11SHCBE
TP11SHCQE   TP12LT9ABE   TP12MS9ABE   TP12SH8AGE   TP12SH9CBE   TP12SH9V3BE   TP12SHCQE
TP12SHZBE   TP21MS9ABE   TP21SH8ABE   TP21SH9ABE   TP21SHZBE   TP12SHCBE   TP12MS9AVBE   TP11LTABE
  TP12SH8CBE   TP11LT9AVBE   TP11MS9CQE   TP21SHZGE   TP11SH9AQE   TP11LTWGE   TP21LTCGE
TP11J81ZQE12   TP11LTAGE   TP12SH9V3QE   TP12SH9AVGE   TP11MS9CGE   TP11LT9V3QE   TP11SH8AVGE
TP11LTWQE   TP11SHAVBE   TP12J81ZQE22   TP11SHAGE   TP11J81ZGE22   TP12MS9CQE   TP21MS9V3BE
TP21SHCQE   TP11MS9AQE   TP12MS9CBE   TP11SH8ZQE   TP21J81CBE22   TP11LT9CBE   TP12LTCQE
TP21SH9AVBE   TP11SHZGE   TP11SH9AVKE   TP12SH8V3BE   TP11MS9AVQE   TP12SHCPE   TP11SH9AVQE
TP21SHABE   TP12LTCBE   TP12SH9AGE   TP11SHWKE   TP12LTZGE   TP12J81CBE22   TP11LT9V3LE
TP11LT9V3BE   TP21SHCGE   TP11SHWQE   TP21MS9CBE   TP11SH9V3QE   TP12SHAGE   TP12LTZQE