TP Series
Tiny Pushbutton Switches

Features/Benefits

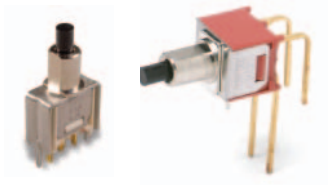
- ***Subminiature size—capable of switching 1 AMP***
- ***Vertical & right angle terminations***
- ***PC & panel mount models***
- ***Snap-in front panel mounting available***
- ***Epoxy terminal seal-compatible with bottom wash cleaning***
- ***RoHS compliant models available***

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 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

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

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 85°C.

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

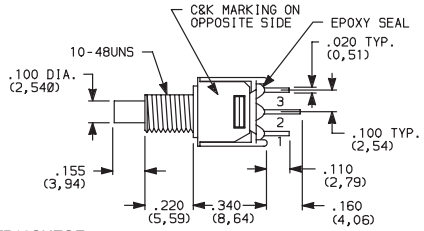
Frame Color
- **2** Black
- **NONE** Models with no frame

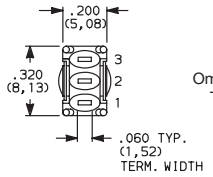
TP Series
Tiny Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
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





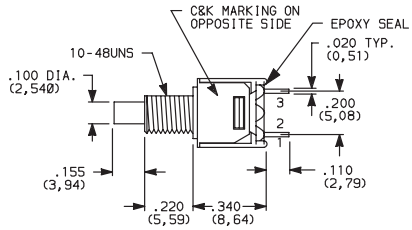
Omit terminal 2 for TP11 models.

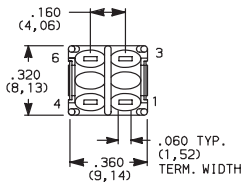
Terminal Nos. For Reference Only

Part number shown: TP12SHZQE

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
DP	TP21	OFF	MOM.	OPEN	1-3,4-6	DPST 1 3 4 6

DPST





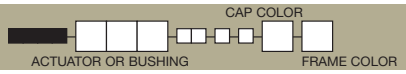
Terminal Nos. For Reference Only

Part number shown: TP21SHZQE

MOM. = Momentary

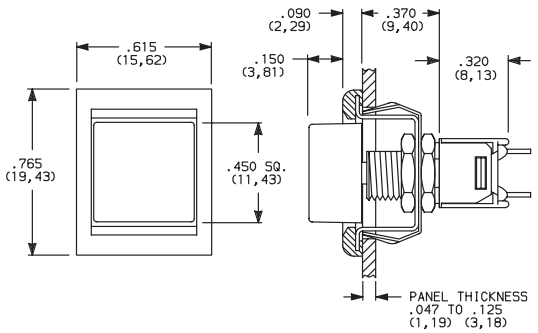
All models with all options when ordered with G, Q or R contact material.

ACTUATOR—SNAP-IN FRONT MOUNT

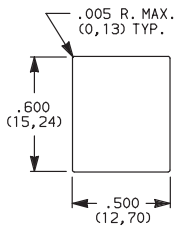


J81 SNAP-IN WITH FRAME





PANEL MOUNTING



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.

Third Angle Projection

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

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

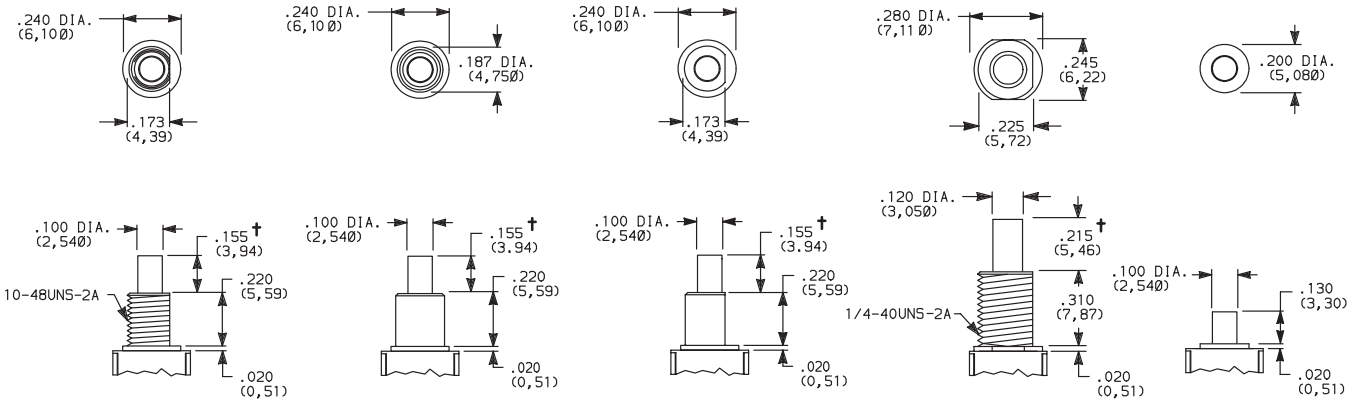
SH8 .155" HIGH PLUNGER, .220" HIGH BUSHING, UNTHREADED

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

LT .215" HIGH PLUNGER, .310" HIGH BUSHING, THREADED

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

MS9 .130" HIGH PLUNGER



Standard with Z, C, W terminations.

Standard with A, AV, V3 terminations.

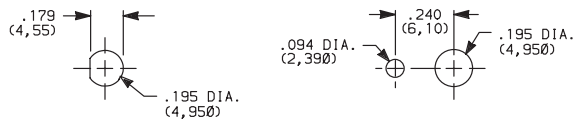
Not available with Z terminations.

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

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

PANEL MOUNTING

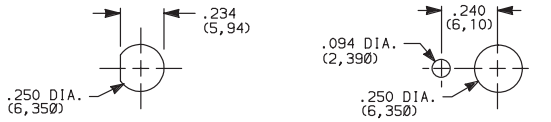
10-48 BUSHING



Without locking ring

With standard locking ring

1/4 IN. BUSHING



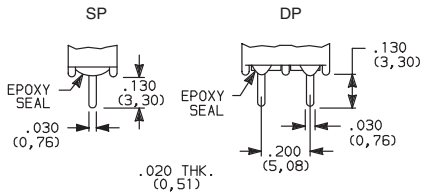
Without locking ring

With standard locking rin

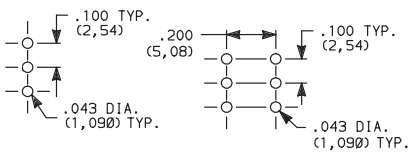
NOTE: One mounting nut, locking ring and lockwasher supplied standard with 10-48 threaded bushings (two nuts with 1/4-40 bushings). Optional mounting nut and locking ring styles and finishes available separately, see section "Technical Data and Additional Hardware".

TERMINATIONS

C PC THRU-HOLE

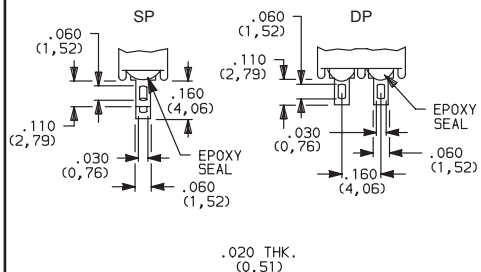


PC MOUNTING



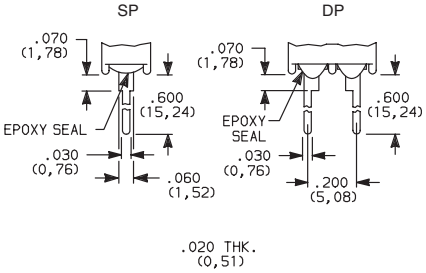
Omit center holes for TP11 models

Z SOLDER LUG



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

W WIRE WRAP



Third Angle Projection

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

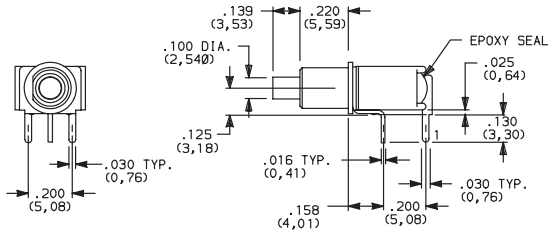
TP Series
Tiny Pushbutton Switches

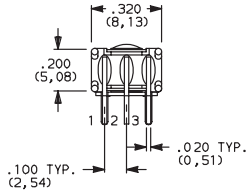
TERMINATIONS

A RIGHT ANGLE, PC THRU-HOLE



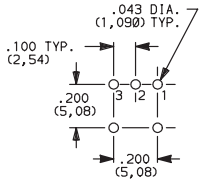
TP12SH9ABE
SPDT





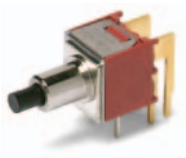
TP11 Models:
omit terminal 2.

PC MOUNTING

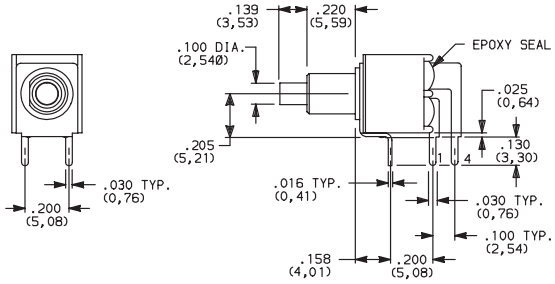


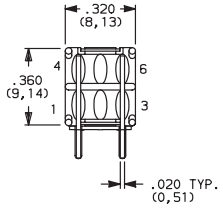
TP11 Models:
omit hole 2.

A RIGHT ANGLE, PC THRU-HOLE

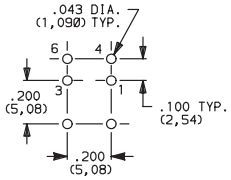


TP21SH9ABE
DPST

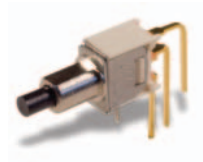




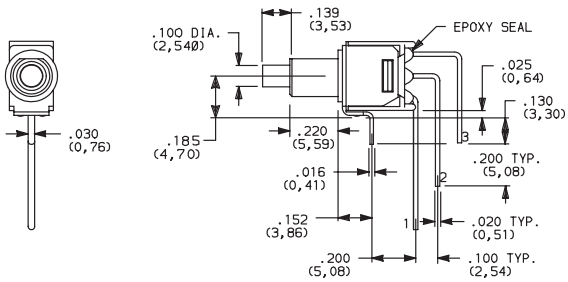
PC MOUNTING



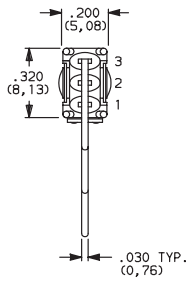
AV VERTICAL RIGHT ANGLE, PC THRU-HOLE



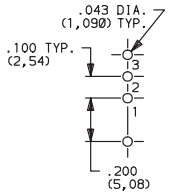
TP12SH9AVBE
SPDT



TP11 Models:
omit terminal 2.



PC MOUNTING



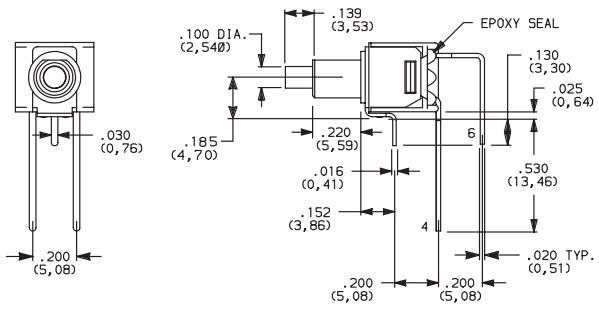
TP11 Models:
omit hole 2.

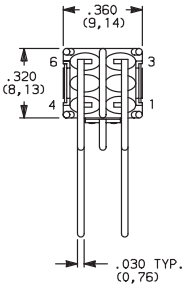
NOTE: Terminal bend radii and lead-in manufacturing option.

AV VERTICAL RIGHT ANGLE, PC THRU-HOLE

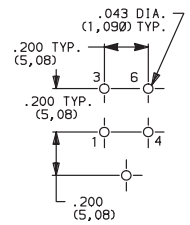


TP21SH9AVBE
DPST





PC MOUNTING



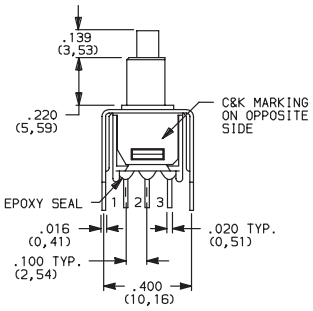
NOTE: Terminal bend radii and lead-in manufacturing option.

Third Angle Projection

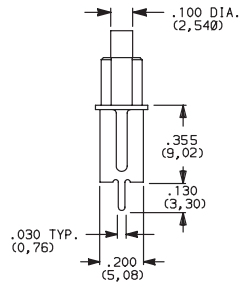
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

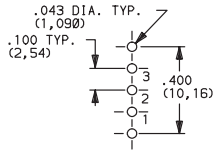
V3 VERTICAL MOUNT, V-BRACKET



TP11 Models:
omit terminal 2.



PC MOUNTING

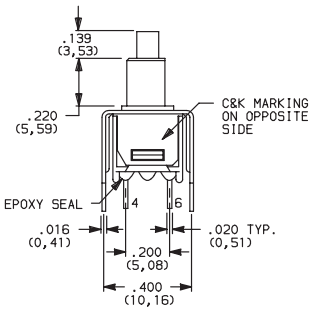


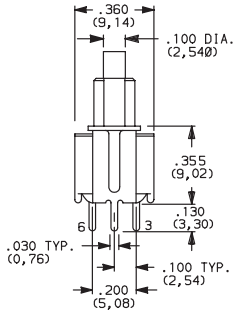
TP11 Models:
omit hole 2.



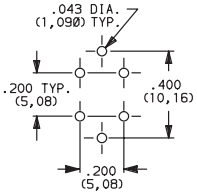
TP12SH9V3BE
SPDT

V3 VERTICAL MOUNT, V-BRACKET





PC MOUNTING





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 1 AMP @ 120 V AC OR 28 V DC.
R		MATTE-TIN [6]		

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

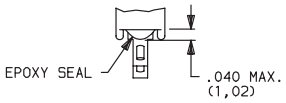
[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
[2] END CONTACTS: Coin silver, with gold plate over nickel plate.
[3] CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.
[4] END CONTACTS: Coin silver, silver plated.
[5] CENTER CONTACT & ALL TERMINALS: 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 ® 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



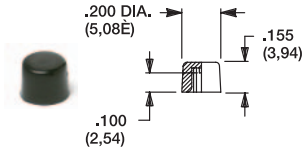
Third Angle Projection

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

TP Series
Tiny Pushbutton Switches

AVAILABLE HARDWARE

Cap, .100" DIA. Plungers

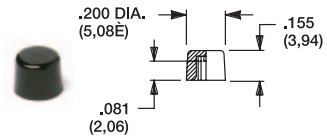


PART NO.

508101000 WHITE
508102000 BLACK

Material: Nylon
Finish: Gloss

Cap, .100" DIA. Plungers
(Recommended for S9 plunger)

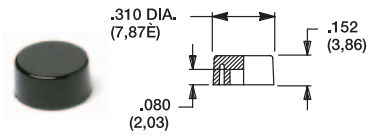


PART NO.

538701000 WHITE
538702000 BLACK

Material: Nylon
Finish: Gloss

Cap, .100" DIA. Plungers

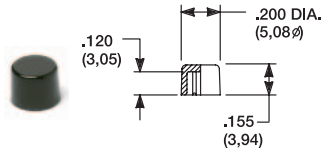


PART NO.

465801000 WHITE
465802000 BLACK

Material: Nylon
Finish: Gloss

Cap, .120" DIA. Plungers

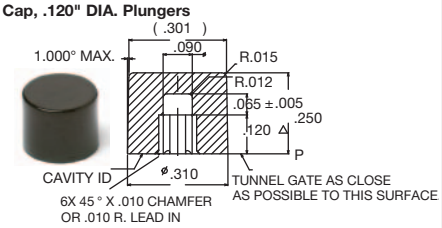


PART NO.

708901000 WHITE
708902000 BLACK

Material: Nylon
Finish: Gloss

Cap, .120" DIA. Plungers

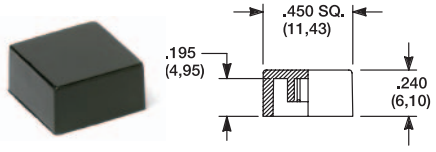


PART NO.

891D01000 WHITE
891D02000 BLACK

Material: Nylon
Finish: Gloss

Cap, J81 option only



PART NO.

484601000 WHITE
484602000 BLACK

Material: Nylon
Finish: Gloss

PART NO.

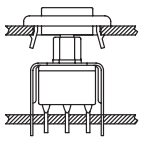
798201000 WHITE
798202263 BLACK

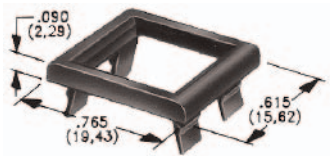
Material: Nylon
Finish: Matte

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

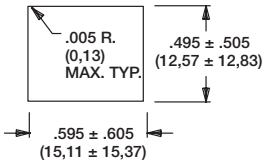




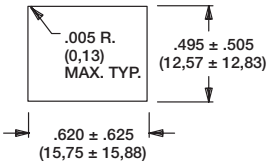
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
PART NO.	**PART NO.**	**PART NO.**	**PART NO.**
432502263	432602263	432702263	432802263 BLACK

PANEL MOUNTING

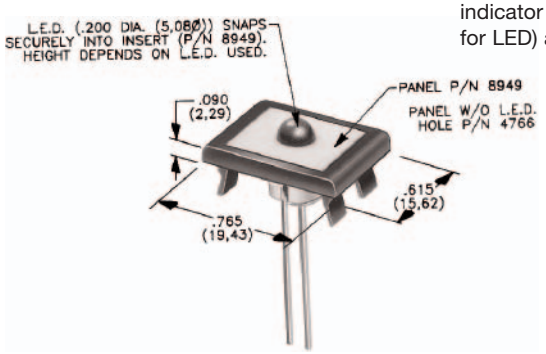
For part numbers
432502263, 432602263



For part numbers
432702263, 432802263



Panel Inserts



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	BLANK PANEL INSERT WITHOUT HOLE FOR LED
PART NO.	**PART NO.**
894902000	476602000 BLACK

Third Angle Projection

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