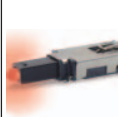



















Pushbutton Product Selection Guide

Pushbutton									
Series	ELUM	EP	TP	E020	8020	E010	8060	8500	KM
Switch Type	Mom./ Latching	Tiny	Tiny	Snap-acting Mom.	Snap-acting Mom.	Miniature	Alternate Action	Sub-miniature	Sub-miniature
Poles/Throws	SPDT	SPST, SPDT, DPST	SPST, SPDT, DPST	SPDT, DPDT	SPDT, DPDT, 3PDT, 4PDT	SPDT	SPDT, DPDT	SPST	SPST, SPDT
Max. Current	3.5 VA	1 Amp	1 Amp	1 Amp	1 Amp	4 Amps	6 Amps	3 Amps	1 Amp
Process Sealed		•		•		•			
Illuminated	•				•		•	•	
PCB Mount Options									
Thru-hole	•	•	•	•	•	•	•	•	•
Vertical		•	•	•	•	•	•	•	•
Right Angle	•	•	•	•	•	•	•	•	•
Surface Mount	•	•							
Panel Mount			•		•	•	•	•	•
Page No.	A-4	A-9	A-15	A-21	A-29	A-46	A-52	A-62	A-67

Pushbutton							
Series	8600	8700	GP	PN	PHA	F	NE-18
Switch Type	Micro-miniature	Over Travel	Ultra-miniature	Alternate & Mom. Action	Short Stroke	Alternate & Mom. Action	Mains / Power
Poles/Throws	SPST	SPST	SPST, SPDT	SPDT, DPDT, 4PDT	DPDT, 4PDT, 6PDT	DPDT, 4PDT, 6PDT, 8PDT, 10PDT	DPST, DPDT Varied
Max. Current	500 mA	1 Amp	0.4 VA	200 mA	100 mA	500 mA	6 A
Process Sealed			•				
PCB Mount Options							
Thru-hole	•	•	•	•	•	•	•
Vertical	•	•	•				
Right Angle			•	•	•	•	•
Surface Mount			•				
Panel Mount	•	•				•	•
Page No.	A-71	A-74	A-77	A-81	A-84	A-88	A-98

Pushbutton Product Selection Guide



A

Pushbutton

Pushbutton					
Series	FP	AP	HP	NP	PBA
Switch Type	Ultra Miniature	Industrial	Hall Effect	Sealed Power	Snap-acting Momentary
Poles/Throws	SPST	SPST	Linear Output	SPDT	DPST
Max. Current	0.4VA	400 mA	10 mA	5 A	250 mA
Process Sealed	•	IP67	IP68	IP68	
PCB Mount Options					
Thru-hole	•	•		•	•
Vertical	•	•	•	•	
Right Angle	•				
Panel Mount		•	•	•	
Wire Leads		•	•	•	
Solder Lug		•		•	
Page No.	A-107	A-110	A-116	A-118	A-125



A

Pushbutton

ELUM™ Series Right Angle Illuminated Latching Pushbutton

**LEAD FREE
COMPATIBLE OPTION**

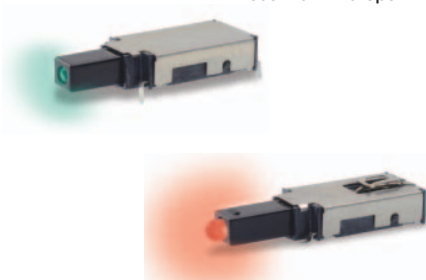
Features/Benefits

- **SPDT (N.O. & N.C.)**
- **Low height above PCB**
- **Reliable self-cleaning contact**
- **Surface-mount or thru-hole PCB**
- **Standard or custom actuator**
- **Central LED illumination**
- **Latching or Momentary**
- **Long travel. Smooth feel**
- **RoHS compliant and compatible**

Typical Applications

- **Telecom network equipment**
- **Automotive electronics**
- **Consumer electronics**
- **Computer, server, modem, data storage**
- **Professional instrumentation, medical**

Patent Numbers
6,974,924 B2 US
EP1583118B1 Europe



Materials

FIXED CONTACTS AND TERMINALS: Stainless steel, silver plated with gold flash (STD.)

MOVABLE CONTACTS: Copper alloy, silver plated with gold flash (STD.)

BASE: Glass filled LCP (UL94V-0)

ACTUATOR: Glass filled nylon 4/6 (UL94V-0)

COVER: Stainless steel

Electrical

MAXIMUM POWER: 3.5 VA

MIN./MAX. VOLTAGE: 20 mV – 50 VDC

MIN./MAX. CURRENT: 0.01 mA – 250 mA

DIELECTRIC STRENGTH: ≥ 250 Vrms

CONTACT RESISTANCE: ≤ 50 m Ω

INSULATION RESISTANCE: $\geq 10^9$ Ω

BOUNCE TIME: ≤ 1 ms

LED SPECIFICATIONS: See page A-5

Mechanical

OPERATING FORCE: 2.5 N at Full Travel

SWITCHING TRAVEL: .067" (1.7 mm)

LATCH TRAVEL: .131" (3.6 mm)

FULL TRAVEL: .200" (5.1 mm)

Operating Environment

OPERATING TEMPERATURE: -40°C TO 80°C.

STORAGE TEMPERATURE: -40°C TO 80°C.

RELATIVE HUMIDITY: 90% R.H. @ 80°C.

OPERATING LIFE: 30,000 Cycles.

VIBRATION: Per EIA 186-E Method

MECHANICAL SHOCK: Per EIA 186-E Method 12.

OVERLOAD: Withstands 40 N for 1 minute without damage

Process Environment

SOLDERABILITY: According to Mil STD 202F Method 208D or EIA RS-186E Method 9.

LEAD FREE PROCESS COMPATIBLE: 260°C peak, 10 seconds Max. above 250° C.

WASHING PROCESS: No clean process compatible (SMT)

Bottom wash compatible (Thru-hole)

SHEAR TEST (SWITCH/PCB): > 40 N

Packaging

"SA" Terminal Style SMT: Tape and reel per EIA 481-2 (450/reel)

"TH" Terminal Style PC: Tray (60/tray)

NOTE: Any models supplied with Q, contact material are RoHS compliant.

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

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

Designation	ELUM	ELUM	Series	Switch Function	OA	Momentary	OC***	Momentary short travel	EE	Latching (push-push)	Terminal Style	TH	Right Angle, PC thru-hole	SA	Right Angle, surface mount	Contact Material*	Q	Silver with gold flash	Illumination	(NONE)	Models without illumination	1	LED White	2	LED Bi-color – Red (Green)	3	LED Red	5	LED Amber	6	LED Green	7	LED Blue	8	LED Bi-Color – Amber (Green)	Actuator Style**	C02	Black without window	C12	Black with window	C22	Black with window and snap feature for custom actuators
--------------------	-------------	-------------	---------------	------------------------	-----------	------------------	--------------	-------------------------------	-----------	-----------------------------	-----------------------	-----------	----------------------------------	-----------	-----------------------------------	--------------------------	----------	-------------------------------	---------------------	---------------	------------------------------------	----------	------------------	----------	-----------------------------------	----------	----------------	----------	------------------	----------	------------------	----------	-----------------	----------	-------------------------------------	-------------------------	------------	-----------------------------	------------	--------------------------	------------	--

* Other plating options available, please contact Customer Service.

** Custom actuators available, please contact Customer Service.

*** Short travel available in momentary only.



Third Angle
Projection

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

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ELUM™ Series Right Angle Illuminated Latching Pushbutton

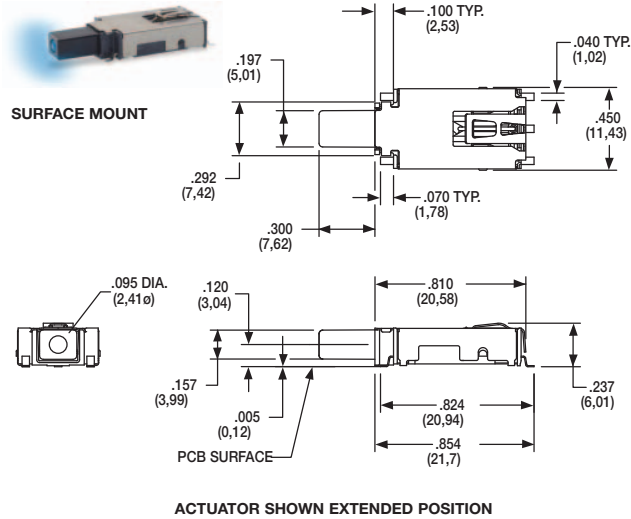


A

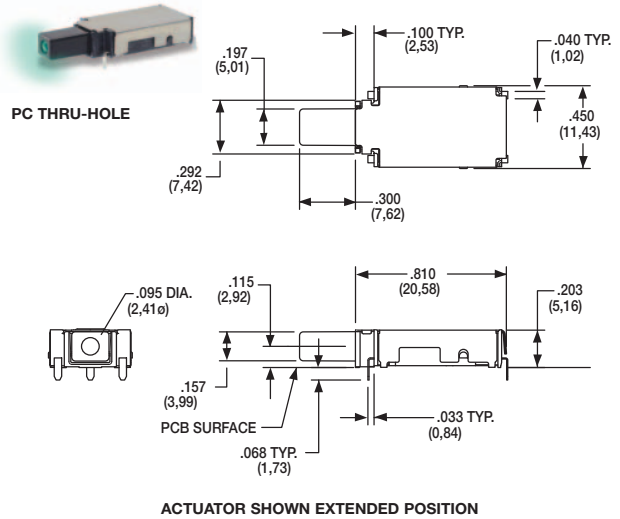
Pushbutton

STANDARD OPTIONS

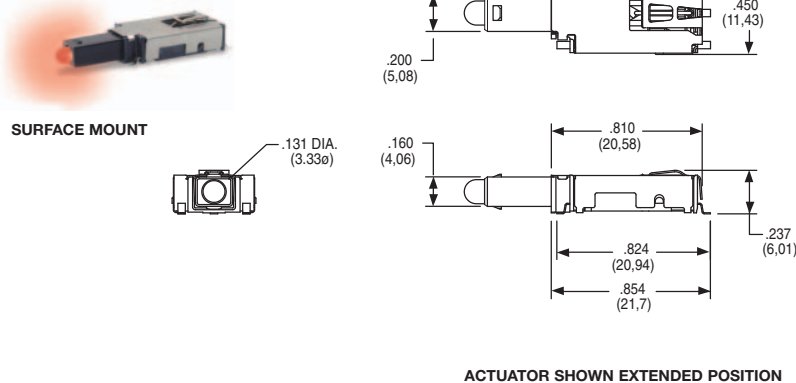
ELUMEEA7C12



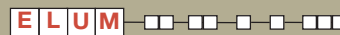
ELUMOATHQ6C12



ELUMEEA3C22



DESIGNATION



ELUM ELUM SERIES, Illuminated Latching Pushbutton

SWITCH FUNCTION



		POSITION 1		POSITION 2		SCHEMATIC
OPTION CODE	NO. OF POLES	SWITCH FUNCTION	CONNECTED TERMINALS	SWITCH FUNCTION	CONNECTED TERMINALS	<p>4 NC 3 C NO 2</p> <p>SPDT</p> <p>5 1</p> <p>+ Anode - Cathode</p>
OA / OC	SP Momentary	ON	3 - 4	ON (Mom.)	3 - 2	
EE	SP Latching (Push-Push)	ON	3 - 4	ON	3 - 2	

For SPST N.O. function, only terminals 3 & 2 are used.

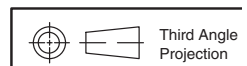
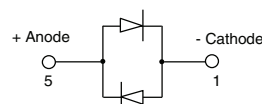
For SPST N.C. function, only terminals 3 & 4 are used.

Circuit: Make before break

LED pins 1 & 5 are independent of switch function.

NOTE:

For bi-color LED's the polarity must be reversed to alternate the color



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

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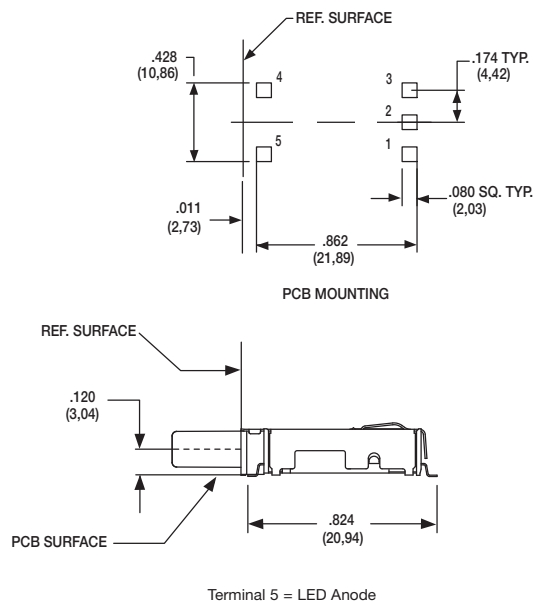


ELUM™ Series Right Angle Illuminated Latching Pushbutton

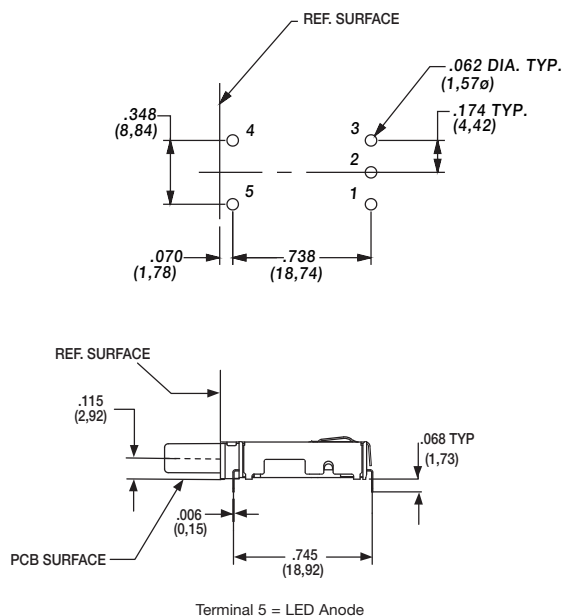
TERMINAL STYLE



SA RIGHT ANGLE, SURFACE MOUNT



TH RIGHT ANGLE, PC THRU-HOLE



CONTACT MATERIAL



OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS
Q	SILVER WITH GOLD FLASH	SILVER WITH GOLD FLASH	250 mA

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

FIXED CONTACTS AND TERMINALS: Stainless steel, silver plated with gold flash

MOVABLE CONTACTS: Copper alloy, silver plated with gold flash

NOTE: Any models supplied with Q, contact material are RoHS compliant.

ILLUMINATION



OPTION CODE	ILLUMINATION TYPE	TYPICAL INTENSITY* MIN	TYPICAL INTENSITY* MAX	PEAK WAVELENGTH	Vf Forward Voltage
		(mcd)		(nm)	
0	Model without illumination	N/A		N/A	
1	LED Super White	4,000	5,000	N/A	3.5
2	LED Bi-Color – Red (Green)	10	20	635/565	2.0
3	LED Red	4	8	700	2.0
5	LED Amber	35	50	610	2.0
6	LED Green	35	50	565	2.0
7	LED Super Blue	800	1,500	470	3.8
8	LED Bi-Color – Amber (Green)	10	10	585/565	2.0

*LED FORWARD CURRENT: 20 mA

LED FORWARD VOLTAGE: see chart above

LED REVERSE VOLTAGE: 5.0 V MAX

* For information on specific and custom LED, please contact Customer Service.



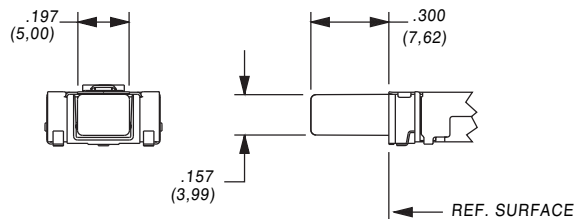
Third Angle
Projection

ELUM™ Series Right Angle Illuminated Latching Pushbutton

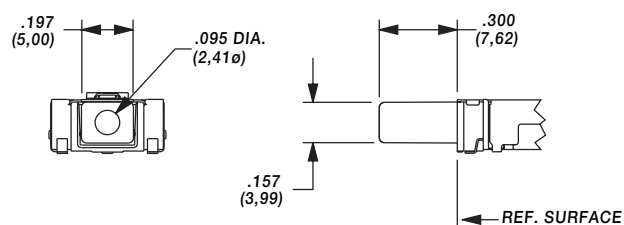


ACTUATOR STYLE*

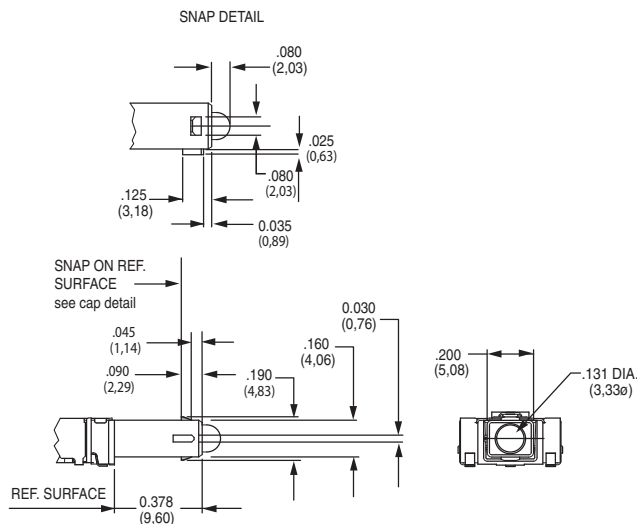
C02 BLACK WITHOUT WINDOW



C12 BLACK WITH WINDOW

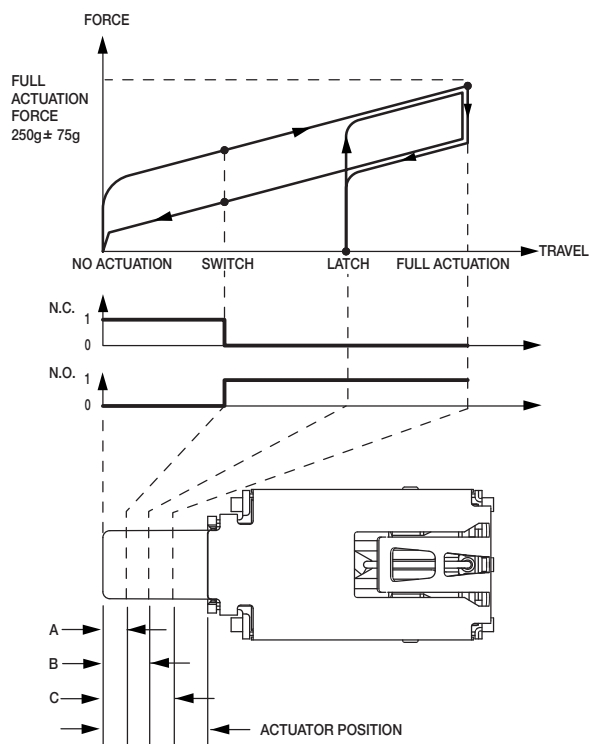


C22 BLACK WITH WINDOW AND SNAP FEATURE TO ACCEPT CUSTOM CAP



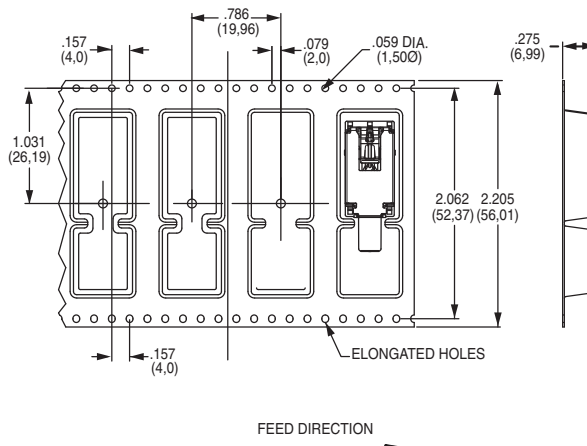
* Custom actuators available, please contact Customer Service.

FORCE TRAVEL DIAGRAM



OA, EE ACTUATOR POSITION			
A	SWITCH POINT	.067 ± .020	1,7 ± 0.5mm
B	LATCH	.131 ± .020	3,3 ± 0.5mm
C	FULL ACTUATION	.200 ± .020	5,1 ± 0.5mm
OC ACTUATOR POSITION			
A	SWITCH POINT	.067 ± .020	1,7 ± 0.5mm
C	FULL ACTUATION	.098 ± .020	2,5 ± 0.5mm

TAPE & REEL



Third Angle
Projection



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

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Pushbutton
A

ELUM™ Series Right Angle Illuminated Latching Pushbutton

AVAILABLE HARDWARE

Cap

**PART NO.**

957C00000 High temperature black cap with universal standby symbol

956C02000 High temperature black cap with no symbol

Material: 4/6 Nylon SMT compatible

Cap

**PART NO.**

181D01000 Paint and Laser Etched with black paint and universal standby symbol

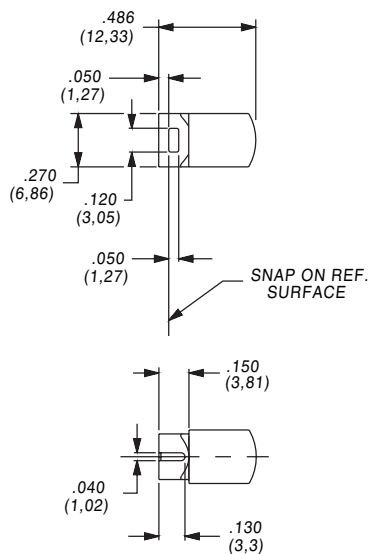
Material: Clear polycarbonate

Cap

**PART NO.**

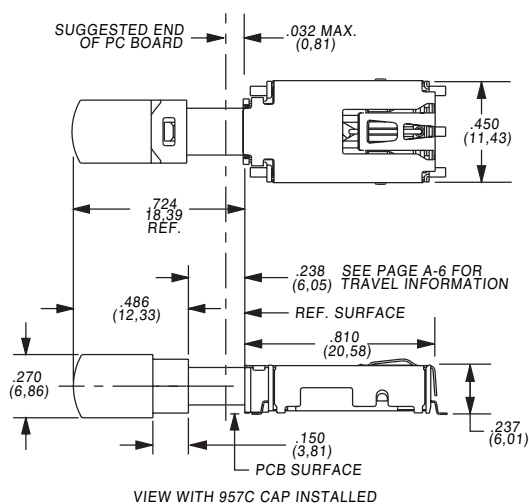
181D00000 Paint and laser etched with white paint underlay and black paint with universal standby symbol.

Material: Clear polycarbonate



NOTE: Caps are for use with the C22 actuator style. Other colors and symbols available, consult Customer Service Center.

CAP INSTALLATION



Third Angle
Projection

C&K

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

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EP Series Sealed Tiny Pushbutton Switches



A

Pushbutton

Features/Benefits

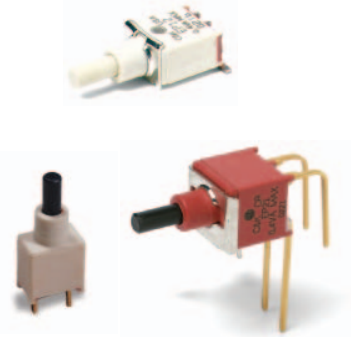
- Sealed against solder & cleaning processes
- Thru-hole and surface mount models
- Snap-fitting actuator accepts standard caps
- Tape & reel packaging available
- RoHS compliant models available



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. See page A-13 for additional ratings.

ELECTRICAL LIFE: EP11, EP21 models: 60,000 make-and-break cycles at full load. EP12 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).

DEGREE OF PROTECTION: IP57; Protection against harmful dust deposit, full-scale voltage protection, temporary immersion.

PACKAGING: Surface mount switches standard in anti-static tape and reel packaging per EIA 481-3, see page A-14 for drawings and reel information. Tape and cover strip are conductive for use near statically sensitive components, consult Customer Service Center.

Materials

CASE & BUSHING: High temperature material, glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0) on EP11 / EP12 models; glass filled nylon 6/6 on EP21.

PLUNGER: Thermoplastic polyester or glass filled nylon (UL 94V-0), with internal o-ring seal. SA surface mount: High temperature material, glass filled LCP (UL 94V-0).

SWITCH SUPPORT: Brass, matte-tin plated.

CONTACTS & TERMINALS: B contact material: Copper alloy, with gold plate over nickel plate. See page A-13 for additional contact materials.

TERMINAL SEAL: Epoxy.

NOTE: Any models supplied with Q, B, P, S, 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.

CAUTION: PC mounting layouts and pads as shown are designed to be compatible with the latest equipment and reflow techniques. Care should be taken in the design and location of PC lands to suit individual needs. Orientation relative to reflow direction may significantly impact solder joint integrity.

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-10 thru A-14. For additional options not shown in catalog, consult Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.

<div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div>		
Switch Function EP11 SPST Off-Mom. EP12 SPDT On-Mom. EP21 DPST Off-Mom.	Plunger S .215" high S1 .110" high S2 .465" high FP Flush R Snap-fitting, .215 high Bushing D1 Unthreaded Terminations A Right angle, PC thru-hole C PC Thru-hole AV Vertical right angle, PC thru-hole AV3 Vertical right angle, snap-in, PC thru-hole SA Right angle, surface mount SA1 Right angle, surface mount rear facing V3 Vertical mount, v-bracket V31 Vertical mount, v-bracket, snap-in (EP11 & EP12 only) W Wire wrap	Contact Material B Gold P Gold, matte-tin Q Silver S Silver, matte-tin G Gold over silver R Gold over silver, matte tin
		Seal E Epoxy



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



A

Pushbutton

EP Series Sealed Tiny Pushbutton Switches

SWITCH FUNCTION

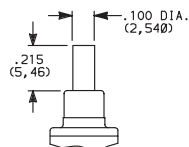
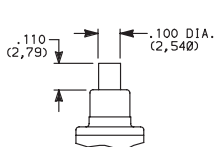
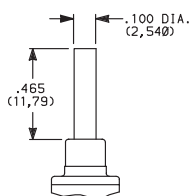
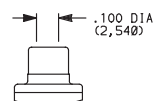
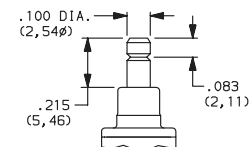


NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
		C&K marking on opposite side		C&K marking on opposite side		
SP	EP11	OFF	MOM.	OPEN	1-3	SPST
	EP12	ON	MOM.	2-1	2-3	SPDT
SPDT						
 Part number shown: EP12SD1CBE						
DP	EP21	OFF	MOM.	OPEN	1-3,4-6	DPST
DPST						
 Part number shown: EP21SD1CBE						

MOM. = Momentary

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

PLUNGER

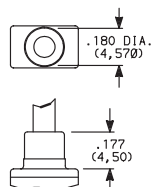
**S** .215" HIGH**S1** .110" HIGH**S2** .465" HIGH**FP** FLUSH PLUNGER**R** SNAP-FITTING

S1 & S2 actuators are not available with EP12 & EP21 models.

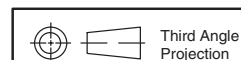
FP & R actuators are not available with EP21 model.

NOTE: Caps available for plunger options, see page A-14.

BUSHING

**D1** UNTHREADED

NOTE: Internal actuator o-ring standard.

C&KDimensions are shown: Inches (mm)
Specifications and dimensions subject to change

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EP Series Sealed Tiny Pushbutton Switches



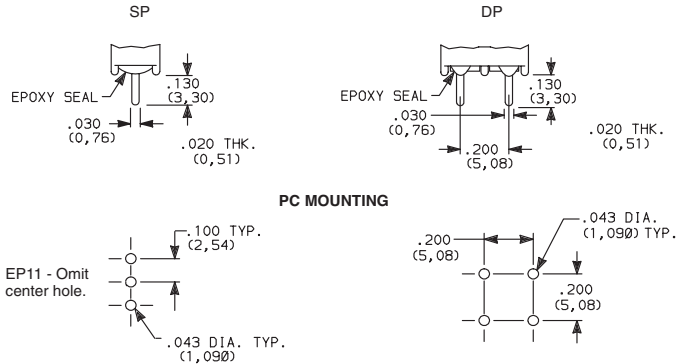
A

Pushbutton

TERMINATIONS

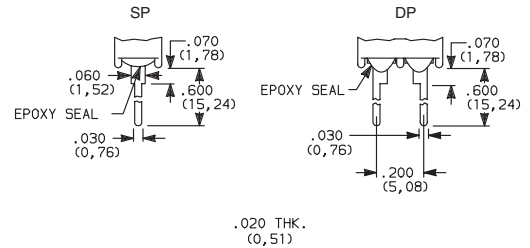


C PC THRU-HOLE



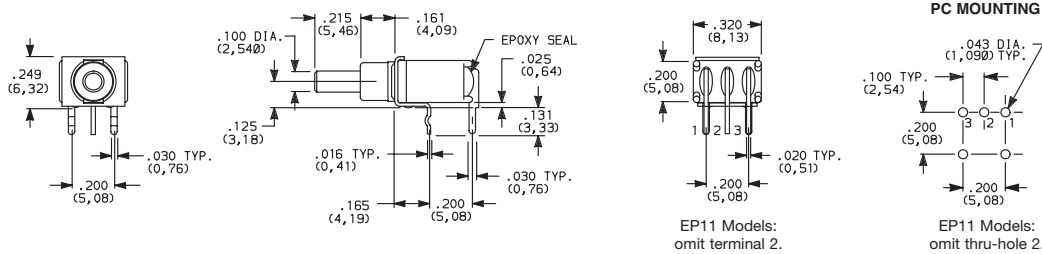
SP and DP

W WIRE WRAP

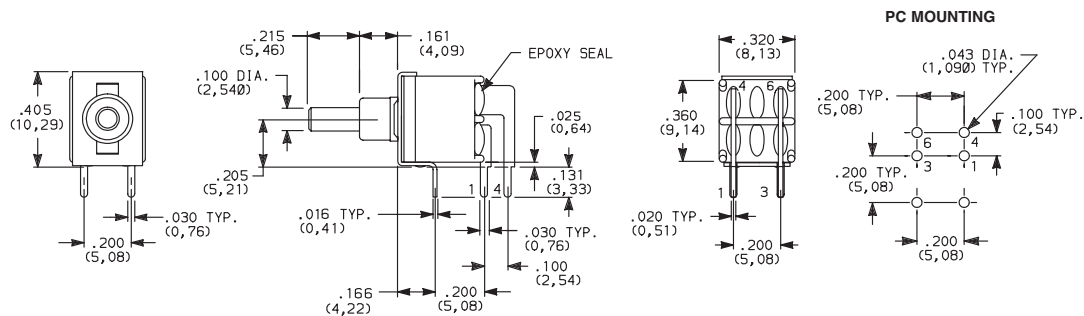


SP and DP

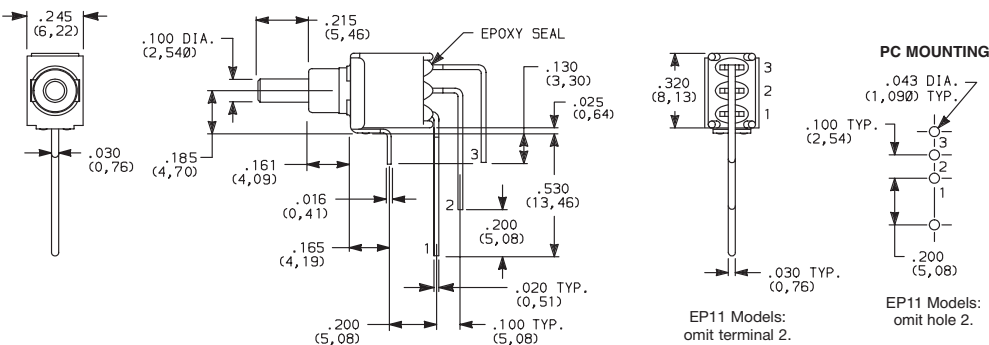
A RIGHT ANGLE, PC THRU-HOLE



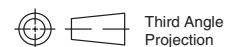
A RIGHT ANGLE, PC THRU-HOLE



AV VERTICAL RIGHT ANGLE, PC THRU-HOLE



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



Third Angle
Projection

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

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A

Pushbutton

EP Series Sealed Tiny Pushbutton Switches

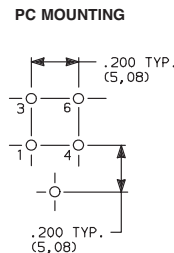
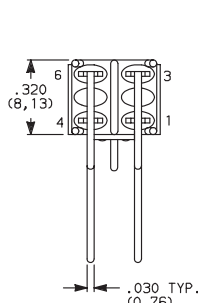
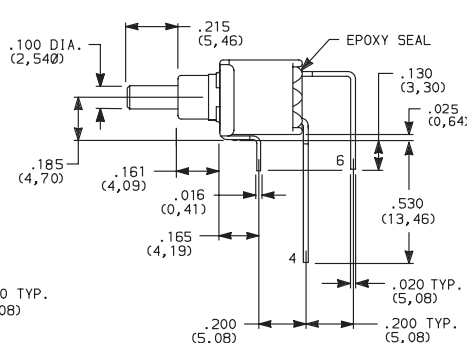
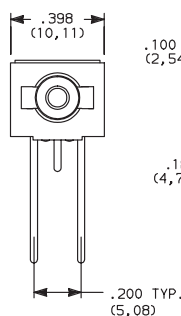
TERMINATIONS



AV VERTICAL RIGHT ANGLE, THRU-HOLE



EP21SD1AVBE
DPST

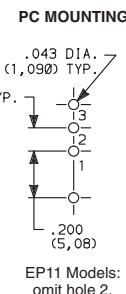
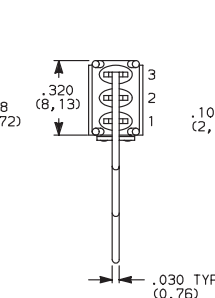
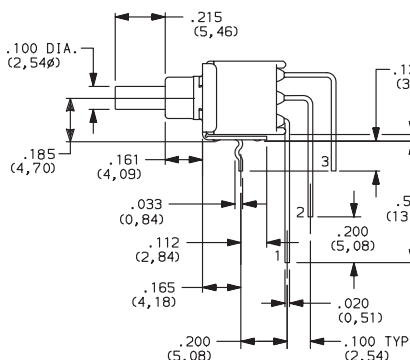
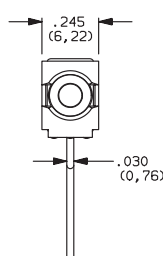


NOTE: Terminal bend radii and lead-in manufacturing option.

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



EP12SD1AV3BE
SPST

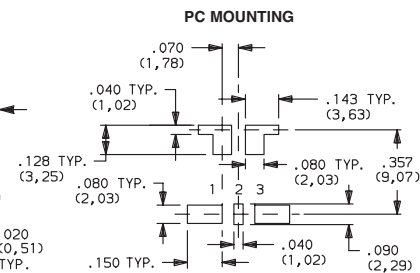
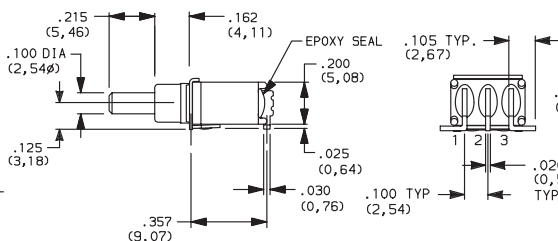
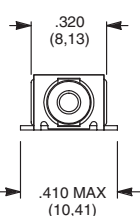


EP11 Models:
omit hole 2.

SA RIGHT ANGLE, SURFACE MOUNT



EP12SD1SAPE
SPDT



EP11 Models:
omit pad 2.

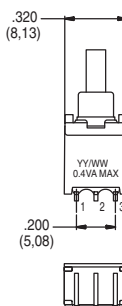
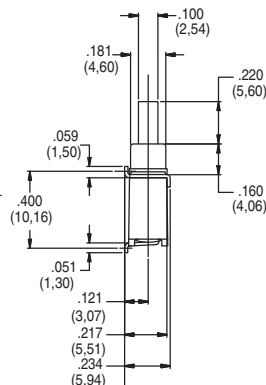
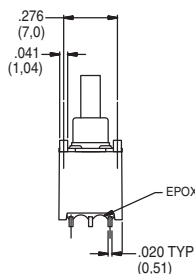
Available with P contact material only.
Not Available on DPST models.

EP11 Models:
omit terminal 2.

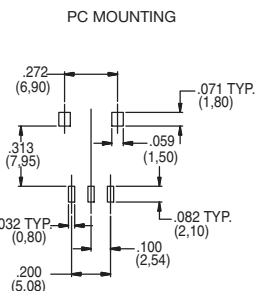
SA1 RIGHT ANGLE, SURFACE MOUNT



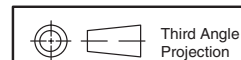
EP12SD1SA1BE
SPDT



TERMINAL NOS.
FOR REF. ONLY



SA1 is only available with B and P contact materials.
Not Available on DPST models.



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

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EP Series Sealed Tiny Pushbutton Switches



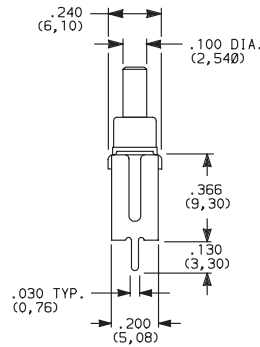
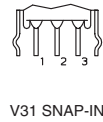
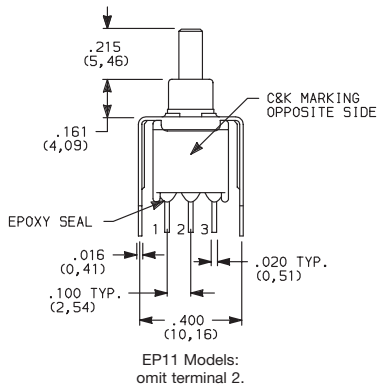
A

Pushbutton

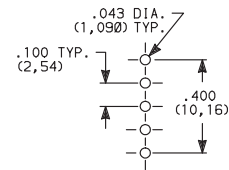
TERMINATIONS



- V3** VERTICAL MOUNT, V-BRACKET
V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING

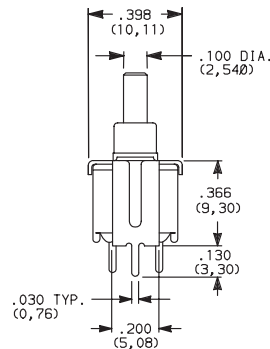
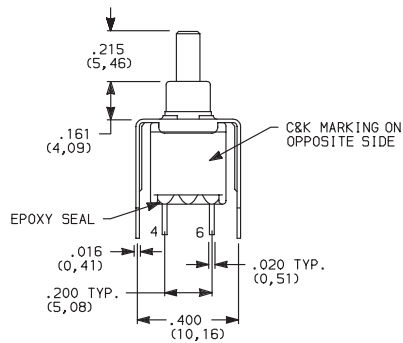


EP11 Models:
omit centerhole.

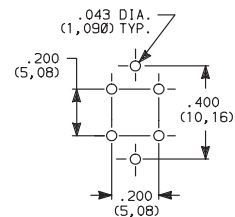


EP12SD1V3BE
SPDT

- V3** VERTICAL MOUNT, V-BRACKET



PC MOUNTING



EP21SD1V3BE
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.
S		MATTE-TIN ⁶		
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.

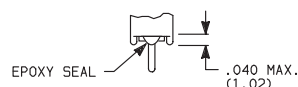
NOTE: Any models supplied with Q, B, P, S, R or G contact material are RoHS compliant.

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

SEAL



- E** EPOXY SEAL



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

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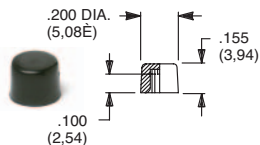




EP Series Sealed Tiny Pushbutton Switches

AVAILABLE HARDWARE

Cap



PART NO.

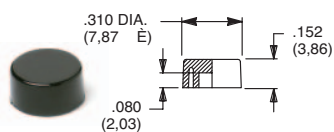
508101000 WHITE
508102000 BLACK
508103000 RED

Material: Nylon

Finish: Gloss

Not for use on S1 plunger

Cap



PART NO.

465801000 WHITE
465802000 BLACK
465803000 RED

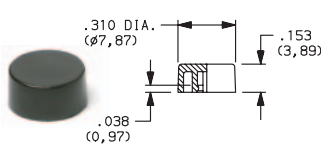
Material: Nylon

Finish: Gloss

Not for use on S1 plunger

Cap

Compatible with snap-fitting plungers
EP11 & EP12 Models. R option only.



PART NO.

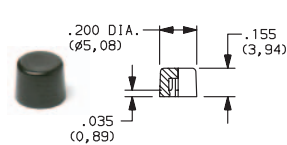
585A01000 WHITE
585A02000 BLACK
585A03000 RED

Material: Nylon

Finish: Gloss

Cap

Compatible with snap-fitting plungers
EP11 & EP12 Models. R option only.



PART NO.

785A01000 WHITE
785A02000 BLACK
785A03000 RED

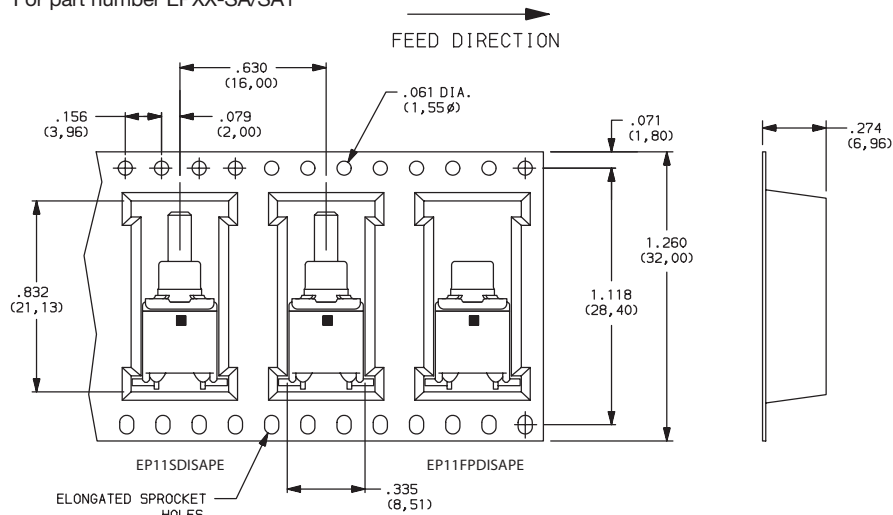
Material: Nylon

Finish: Gloss

NOTE: Other colors available, consult Customer Service Center.

TAPE & REEL

For part number EPXX-SA/SA1



REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600

TP Series Tiny Pushbutton Switches



A

Pushbutton



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: 10⁹Ω 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.

<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>			
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



A

Pushbutton

TP Series Tiny Pushbutton Switches

SWITCH FUNCTION

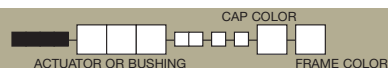


NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
		C&K marking on opposite side		C&K marking on opposite side		
SP	TP11	OFF	MOM.	OPEN	1-3	SPST
	TP12	ON	MOM.	2-1	2-3	SPDT
SPDT Part number shown: TP12SHZQE Terminal Nos. For Reference Only						
DP	TP21	OFF	MOM.	OPEN	1-3,4-6	DPST
DPST Part number shown: TP21SHZQE Terminal Nos. For Reference Only						

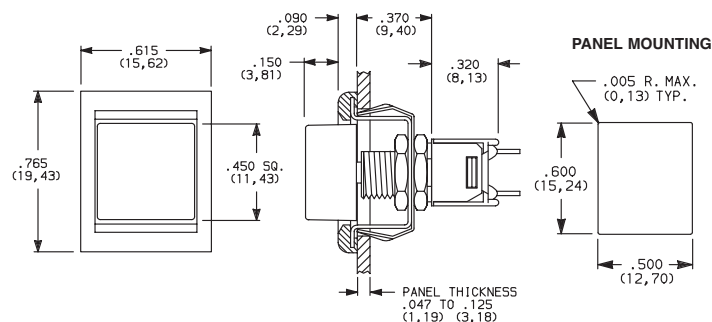
MOM. = Momentary

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

ACTUATOR—SNAP-IN FRONT MOUNT



J81 SNAP-IN WITH FRAME



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.

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to changewww.ck-components.com

TP Series Tiny Pushbutton Switches



A

Pushbutton

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

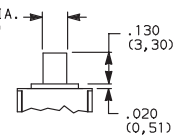
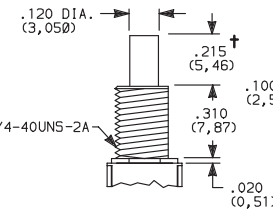
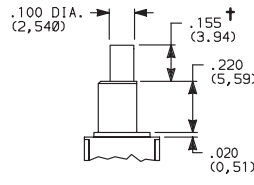
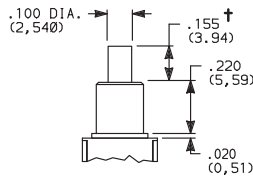
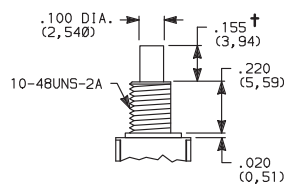
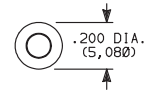
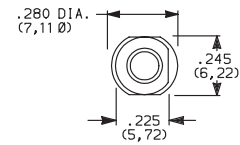
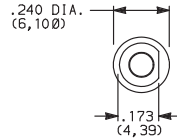
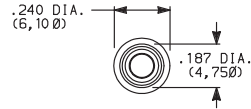
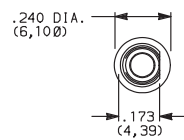
SH8 .155" HIGH PLUNGER,
.220" HIGH BUSHING,
UNTHREADED

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

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

MS9 .130" HIGH
PLUNGER

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



Standard with Z, C, W terminations.

Standard with A, AV, V3 terminations.

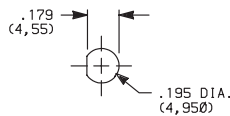
Not available with
Z terminations.

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

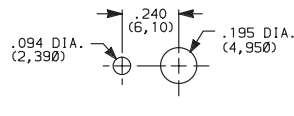
NOTE: Caps available for plunger options, see page A-20.

PANEL MOUNTING

10-48 BUSHING

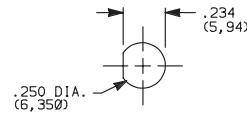


Without locking ring

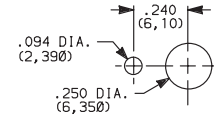


With standard locking ring

1/4 IN. BUSHING



Without locking ring



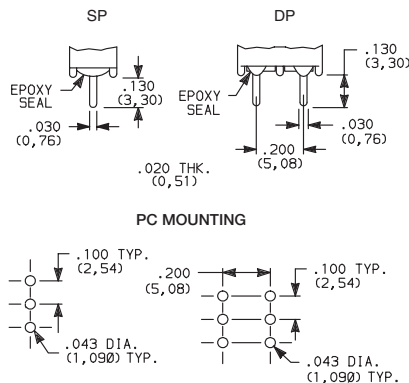
With standard locking ring

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

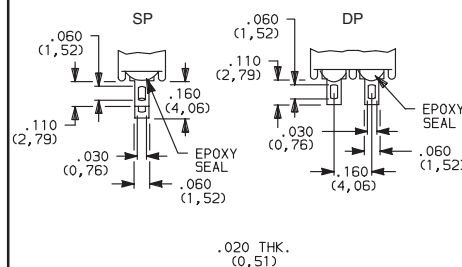


C PC THRU-HOLE



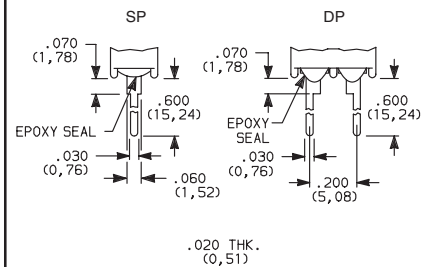
Omit center holes
for TP11 models

Z SOLDER LUG



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

W WIRE WRAP



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

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TP Series Tiny Pushbutton Switches



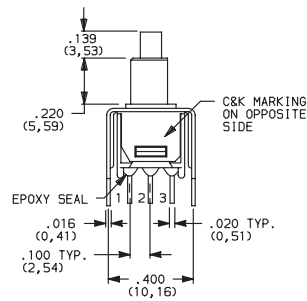
A

Pushbutton

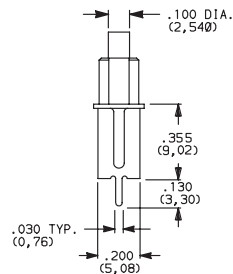
TERMINATIONS



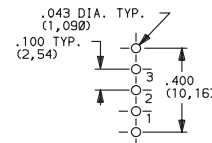
V3 VERTICAL MOUNT, V-BRACKET



TP11 Models:
omit terminal 2.



PC MOUNTING

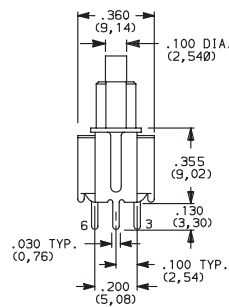
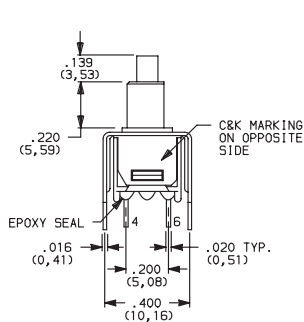


TP11 Models:
omit hole 2.

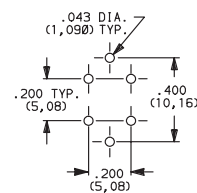


TP12SH9V3BE
SPDT

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.

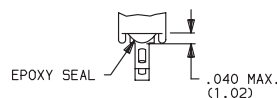
Q contact material standard with C & Z terminations

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

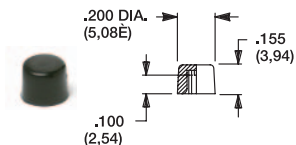
www.ck-components.com



TP Series Tiny Pushbutton Switches

AVAILABLE HARDWARE

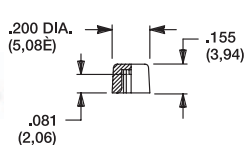
Cap, .100" DIA. Plungers


PART NO.

508101000 WHITE
508102000 BLACK

Material: Nylon
Finish: Gloss

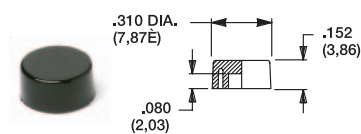
Cap, .100" DIA. Plungers (Recommended for S9 plunger)


PART NO.

538701000 WHITE
538702000 BLACK

Material: Nylon
Finish: Gloss

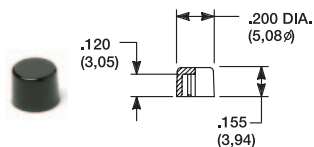
Cap, .100" DIA. Plungers


PART NO.

465801000 WHITE
465802000 BLACK

Material: Nylon
Finish: Gloss

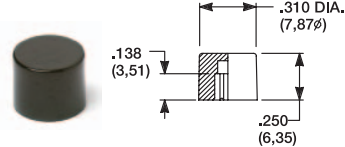
Cap, .120" DIA. Plungers


PART NO.

708901000 WHITE
708902000 BLACK

Material: Nylon
Finish: Gloss

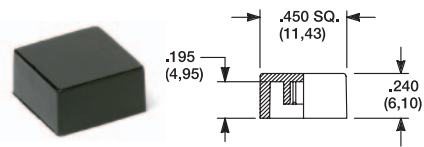
Cap, .120" DIA. Plungers


PART NO.

801801000 WHITE
801802000 BLACK

Material: Nylon
Finish: Gloss

Cap, J81 option only


PART NO.

484601000 WHITE
484602000 BLACK

Material: Nylon
Finish: Gloss

PART NO.

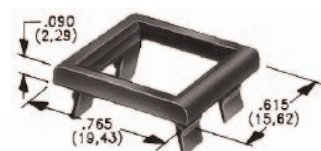
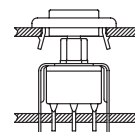
798201000 WHITE
798202263 BLACK

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.

PART NO.

432502263

.062" (1,57) PANEL THK.

PART NO.

432602263

.090" (2,29) PANEL THK.

PART NO.

432702263

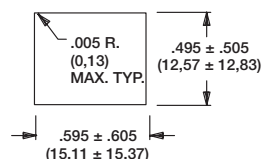
.125" (3,18) PANEL THK.

PART NO.

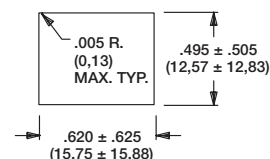
432802263 BLACK

PANEL MOUNTING

For part numbers
432502263, 432602263

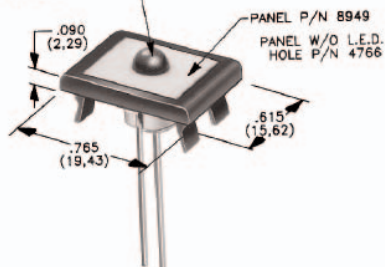


For part numbers
432702263, 432802263



Panel Inserts

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



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



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

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E020 Series Sealed Snap-acting Momentary Pushbutton Switches



A

Pushbutton

Features/Benefits

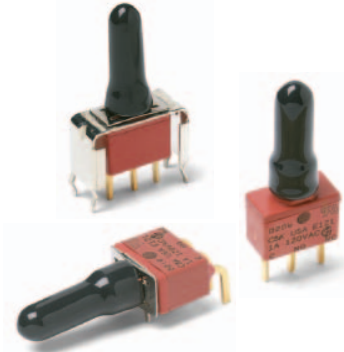
- Process sealed with disposable splashproof boot
- Long life contact design
- Snap-fitting plunger available
- RoHS compliant models available



Models Available

Typical Applications

- Instrumentation
- Telecommunications and networking equipment
- Computers and peripherals



Specifications

CONTACT RATING: B contact material (EX25 Models): 0.4 VA max. @ 20 V AC or DC max. G contact material (EX21 Models): 1 AMP @120 V AC or 28 V DC or 0.4 VA max. @ 20 V AC or DC max. Note: Break-before-make contacts. Multi-pole contacts do not make and break simultaneously. See page A-26 for additional ratings.

ELECTRICAL LIFE: 60,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 50 mΩ typ. initial @ 2–4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10⁹Ω min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 75°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

SOLDERABILITY: Per MIL-STD-202F method 208D, or

EIA RS-186E method 9 (1 hour steam aging).

NOTE: Any models supplied with P, R, B 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 & BUSHING: Glass filled nylon 6/6, flame retardant (UL 94V-0).

PLUNGER: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0).

SWITCH SUPPORT: Brass or steel, matte-tin.

SWITCH SUPPORT RETAINER: Stainless steel.

N.O. & N.C. CONTACTS: EX25 MODELS: B contact material: Copper alloy, with gold plate over nickel plate. EX21 MODELS: G contact material: Coin silver, with gold plate over nickel plate. See page A-26 for additional contact materials.

COMMON CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate. See page A-26 for additional contact materials.

TERMINAL SEAL: Epoxy.

DISPOSABLE BOOT: Vinyl splashproof boot supplied standard. Remove and discard only after soldering and cleaning processes are complete.

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-22 thru A-28. For additional options not shown in catalog, consult our Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.

Switch Function

- E121** SPDT On-Mom. 1 Amp
- E221** DPDT On-Mom. 1 Amp
- E125** SPDT On-Mom. 0.4VA
- E225** DPDT On-Mom. 0.4VA

Plunger

- S** .282" high
- M** .331" high, snap-fitting
- S1** .332" high

Bushing

- D1** Unthreaded
- D3** .180" high, unthreaded

Terminations

- A** Right angle, PC thru-hole
- AV2** Vertical right angle, PC thru-hole
- C** PC Thru-hole
- A3** Right angle, snap-in, PC thru-hole
- AV3** Vertical right angle, snap-in, PC thru-hole
- V3** .460" high, V-bracket
- V4** .630" high, V-bracket
- V6** .460" high, V-bracket
- V8** .953" high, V-bracket
- V31** .460" high, snap-in V-bracket
- V41** .630" high, snap-in V-bracket
- V61** .460" high, snap-in V-bracket

Contact Material

- B** Gold
- G** Gold over silver
- P** Gold, matte-tin
- R** Gold over silver, matte-tin

Seal

- E** Epoxy and disposable splashproof boot



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

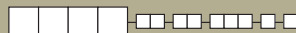







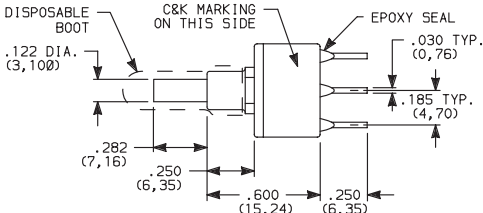
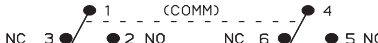
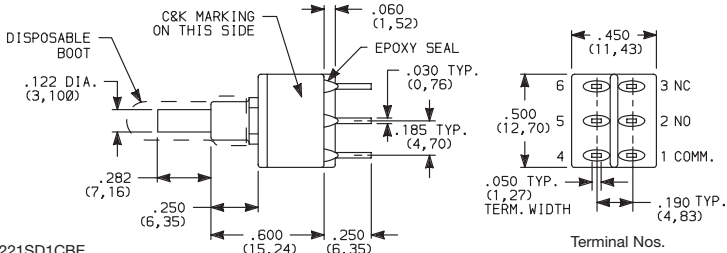
A

Pushbutton

E020 Series Sealed Snap-acting Momentary Pushbutton Switches

SWITCH FUNCTION



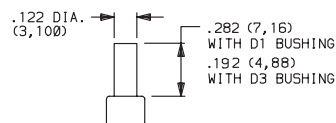
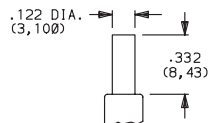
NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
						
		C&K marking this side		C&K marking this side		
SP	E121	ON	MOM.	1-3	1-2	
	E125	ON	MOM.			
SPDT						
						
Part number shown: E121SD1CGE						
DP	E221	ON	MOM.	1-3,4-6	1-2,4-5	
	E225	ON	MOM.			
DPDT						
						
Part number shown: E221SD1CBE						

MOM. = Momentary

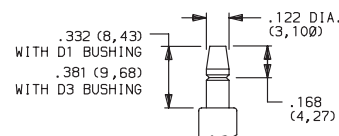
E121, E221 models with all options when ordered with G or R contact material.

EX25 models must be ordered with B or P contact material.
EX21 models must be ordered with G or R contact material.

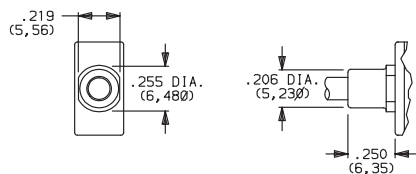
PLUNGER

**S** .282" HIGH**S1** .332" HIGH

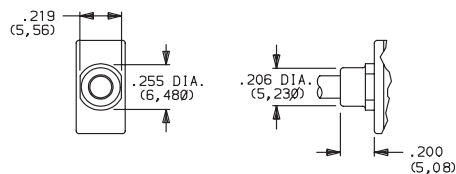
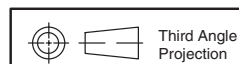
Not Available with D1 bushing.

M .332" HIGH SNAP-FITTING**NOTE:** Caps available for all plunger options, see page A-27.

BUSHING

**D1** UNTHREADED

Not available with S1 actuator.

D3 .180" HIGH UNTHREADED**NOTE:** Disposable splashproof vinyl over actuator and bushing supplied std., see page A-26.Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change**C&K**

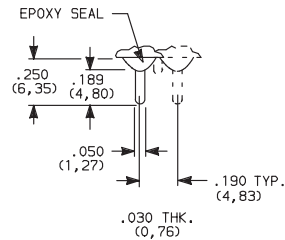
www.ck-components.com

E020 Series Sealed Snap-acting Momentary Pushbutton Switches

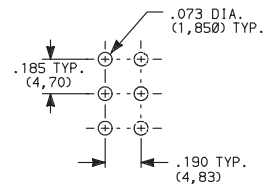
TERMINATIONS



C PC THRU-HOLE

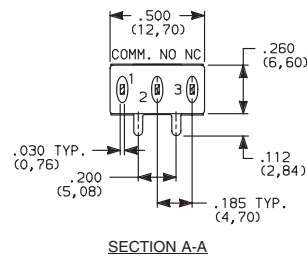
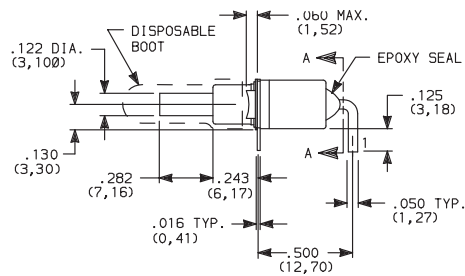
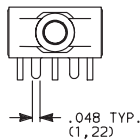


PC MOUNTING



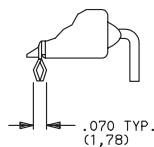
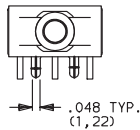
SPDT and DPDT

A RIGHT ANGLE, PC THRU-HOLE

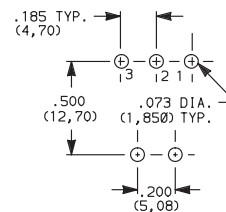


E121SD1AGE
SPDT

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE

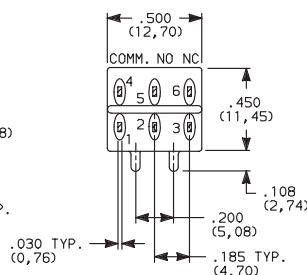
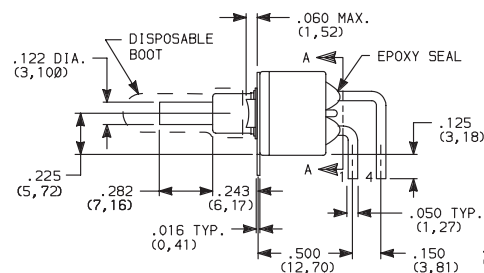
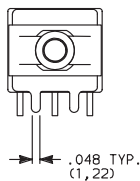


PC MOUNTING



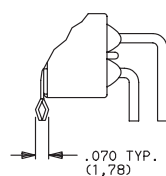
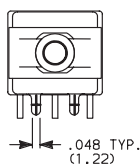
NOTE: Terminal bend radii and lead-in manufacturing option.

A RIGHT ANGLE, PC THRU-HOLE

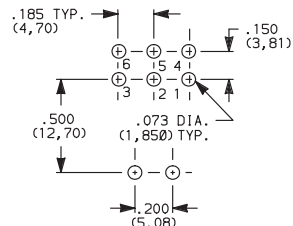


E221SD1AGE
DPDT

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



PC MOUNTING



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



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



A

Pushbutton



A

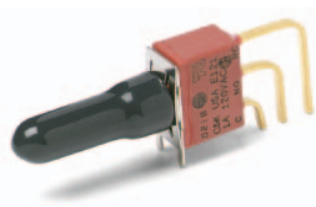
Pushbutton

E020 Series Sealed Snap-acting Momentary Pushbutton Switches

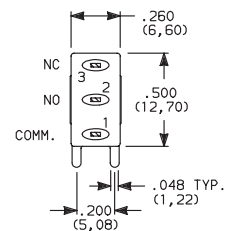
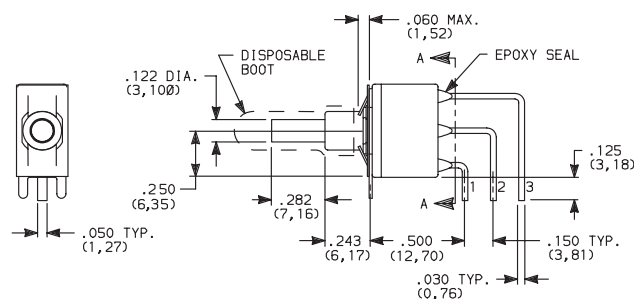
TERMINATIONS



AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE,
.150" PITCH

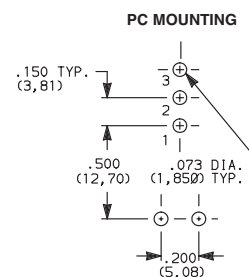
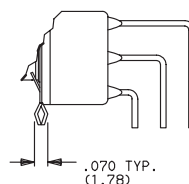
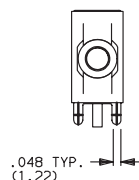


**E121SD1AV2GE
SPDT**



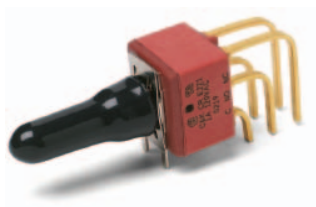
SECTION A-A

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE,
.150" PITCH

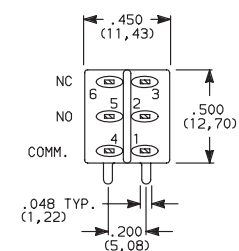
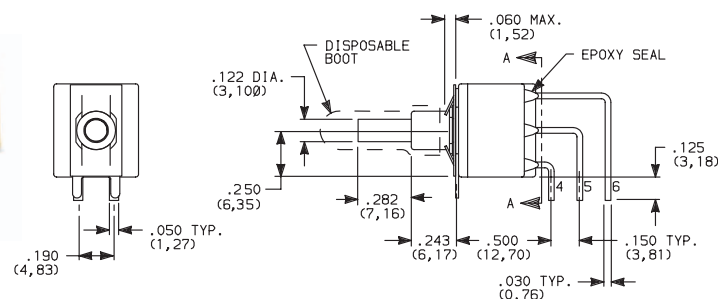


NOTE: Terminal bend radii and lead-in manufacturing option.

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE,
.150" PITCH

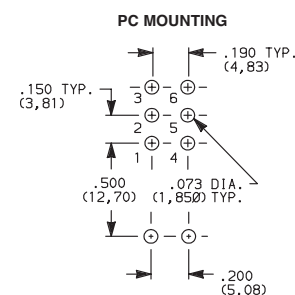
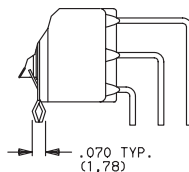
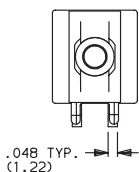


**E221SD1AV2GE
DPDT**



SECTION A-A

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE,
.150" PITCH



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



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

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C&K

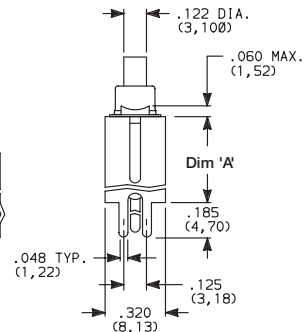
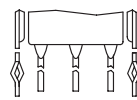
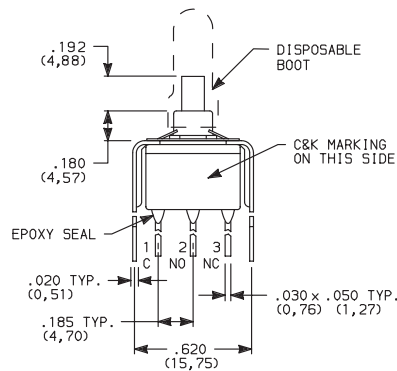
E020 Series Sealed Snap-acting Momentary Pushbutton Switches

TERMINATIONS

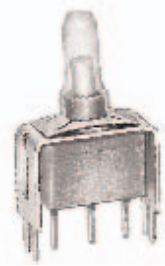
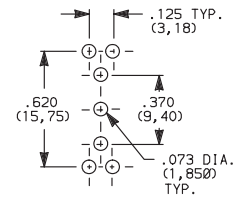


V3, V4 VERTICAL MOUNT, V-BRACKET

V31, V41 VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING

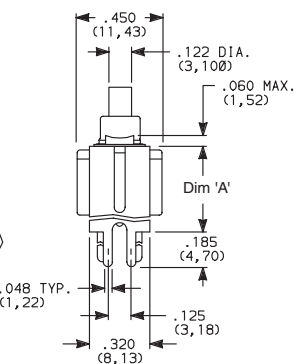
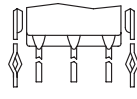
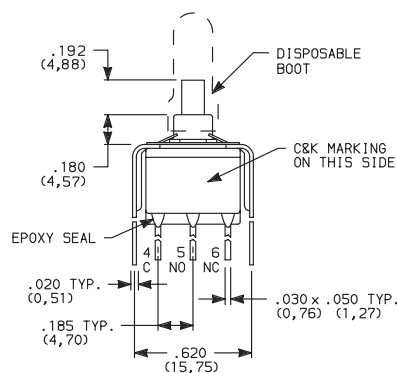


**E121SD3_GE
SPDT**

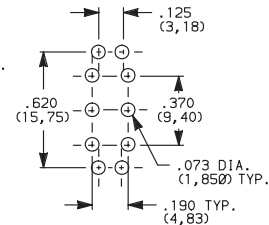
OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4, V41	.630 (16,00)

V3, V4 VERTICAL MOUNT, V-BRACKET

V31, V41 VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING

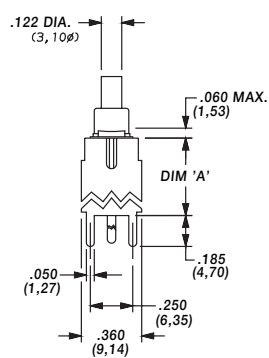
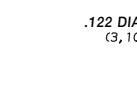
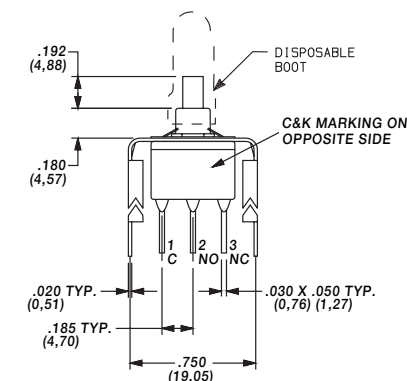


**E221SD3_GE
DPDT**

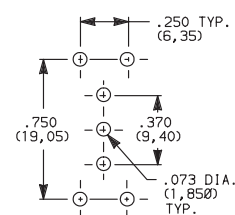
OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4, V41	.630 (16,00)

V6, V8 VERTICAL MOUNT, V-BRACKET

V61, V81 VERTICAL MOUNT, V-BRACKET, SNAP-IN

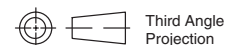


PC MOUNTING



**E121SD3_GE
SPDT**

OPTION CODE	DIM 'A'
V6, V61	.460 (11,68)
V8, V81	.953 (24,21)



Third Angle
Projection



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



A

Pushbutton



A

Pushbutton

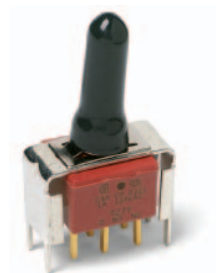
E020 Series Sealed Snap-acting Momentary Pushbutton Switches

TERMINATIONS

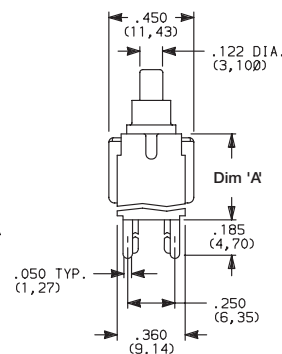
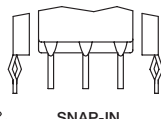
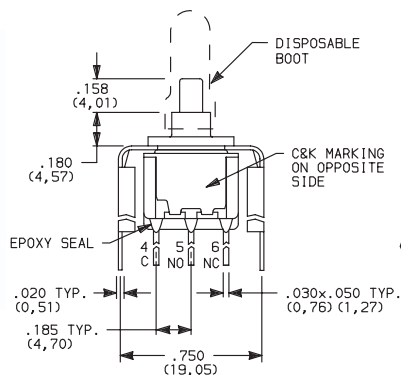


V6, V8 VERTICAL MOUNT, V-BRACKET

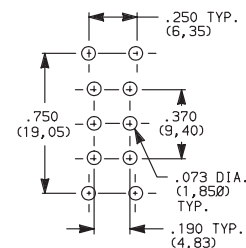
V61, V81 VERTICAL MOUNT, V-BRACKET, SNAP-IN



E221SD3V6GE
DPDT



PC MOUNTING



OPTION CODE	DIM 'A'
V6, V61	.460 (11,68)
V8, V81	.953 (24,21)

CONTACT MATERIAL



OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD ¹	GOLD ¹	LOW LEVEL/DRY CIRCUIT	EX25 MODELS ONLY: 0.4 VA MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN ⁴		
G	GOLD OVER SILVER ^{2,3}	GOLD ³	LOW LEVEL/DRY CIRCUIT OR POWER	EX21 MODELS ONLY: 0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
R		MATTE-TIN ⁴		

* 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 N.O. AND N.C. CONTACTS: Coin silver, with gold plate over nickel plate.

³ COMMON CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

⁴ TERMINALS: Copper alloy, with matte-tin alloy over nickel plate.

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

E121, E221 models with all options when ordered with mandatory G, or R contact material.

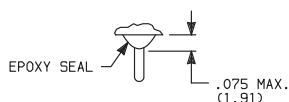
P or B contact material must be ordered with EX25 models.

R or G contact material must be ordered with EX21 models.

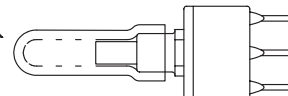
SEAL



E EPOXY SEAL AND DISPOSABLE SPLASHPROOF BOOT



Disposable splashproof boot supplied standard. Remove and discard boot *only after* soldering and cleaning processes are complete.



C&K



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

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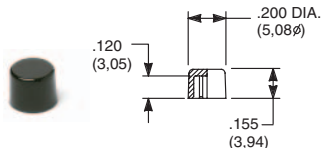
E020 Series Sealed Snap-acting Momentary Pushbutton Switches



A
Pushbutton

AVAILABLE HARDWARE

Cap

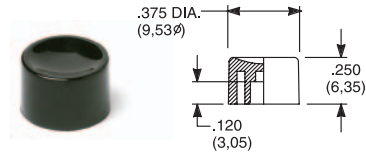


PART NO.

708901000 WHITE
708902000 BLACK
708903000 RED

Material: Nylon
Finish: Gloss

Cap

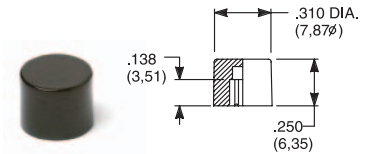


PART NO.

752701000 WHITE
752702000 BLACK
752703000 RED

Material: Nylon
Finish: Gloss

Cap

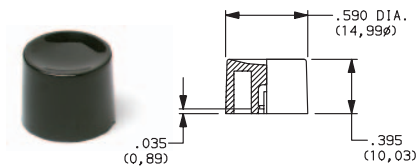


PART NO.

801801000 WHITE
801802000 BLACK
801803000 RED

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

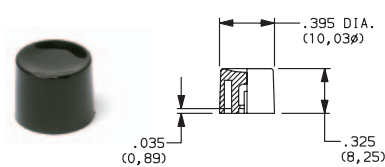


PART NO.

894001000 WHITE
894002000 BLACK
894003000 RED

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

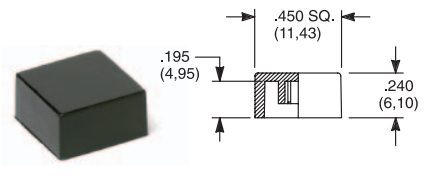


PART NO.

894101000 WHITE
894102000 BLACK
894103000 RED

Material: Nylon
Finish: Gloss

Cap



PART NO.

484601000 WHITE
484602000 BLACK
484603000 RED

Material: Nylon
Finish: Gloss

PART NO.

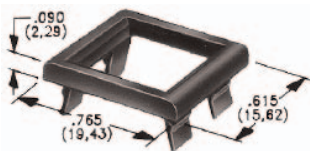
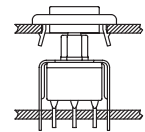
798201000 WHITE
798202263 BLACK
798203000 RED

Material: Nylon
Finish: Matte

NOTE: 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.

PART NO.

432501000
432502263
432503000

.062" (1,57) PANEL THK.

PART NO.

432601000
432602263
432603000

.090" (2,29) PANEL THK.

PART NO.

432701000
432702263
432703000

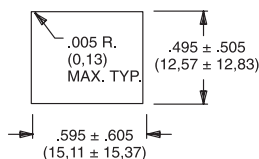
.125" (3,18) PANEL THK.

PART NO.

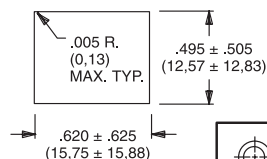
432801000 WHITE
432802263 BLACK
432803000 RED

PANEL MOUNTING

For part numbers
4325xxxxx, 4326xxxxx



For part numbers
4327xxxxx, 4328xxxxx



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





A

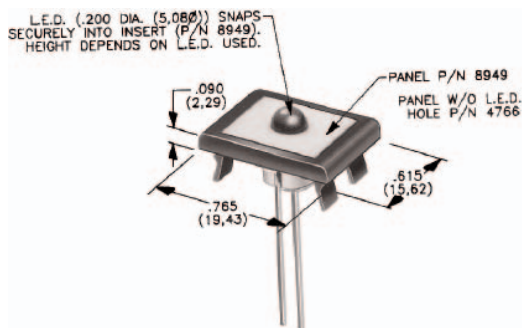
Pushbutton

E020 Series Sealed Snap-acting Momentary Pushbutton Switches

AVAILABLE HARDWARE

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

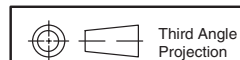
PART NO.

894901000
894902000
894903000

PART NO.

476601000 WHITE
476602000 BLACK
476603000 RED

Special colors, custom markings available, consult Customer Service Center.



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

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8020 Series Snap-acting Momentary Pushbutton Switches



A

Pushbutton

Features/Benefits

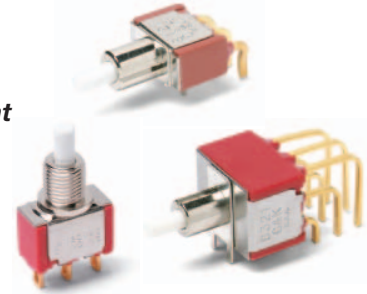
- **Positive tactile feel**
- **Multi-positions available**
- **Wide variety of termination options**
- **Epoxy terminal seal compatible with bottom wash cleaning**
- **RoHS compliant models available**



Models Available

Typical Applications

- **Instrumentation**
- **Computer peripherals**
- **Telecommunications equipment**



Specifications

CONTACT RATING: B contact material (8X25 Models): 0.4 VA max. @ 20 V AC or DC maximum. G contact material (8X21, U8X1 Models): 1 AMP @ 120 V AC or 28 V DC or 0.4 VA max. @ 20 V AC or DC max. Note: Break-before-make contacts. Multi-pole contacts do not make and break simultaneously. See page A-43 for additional ratings.

ELECTRICAL LIFE: 60,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 50 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10⁹Ω min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: 8X2X MODELS: -30°C to 75°C. U8X1 MODELS: -30°C to 65°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

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

NOTE: Any models supplied with 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 6/6 or diallyl phthalate (DAP), flame retardant (UL 94V-0).

PLUNGER: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0).

CAP & FRAME: Nylon, black, standard.

BUSHING: Brass or zinc, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass or steel, matte-tin plated.

N.O. & N.C. CONTACTS: 8X21, U8X1 MODELS: G contact material: Coin silver, with gold plate over nickel plate. See page A-43 for additional contact materials.

8X25 MODELS: B contact material: Copper alloy, with gold plate over nickel plate. See page A-43 for additional contact materials.

COMMON CONTACT & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

TERMINAL SEAL: Epoxy. Refer to soldering and cleaning 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-30 thru A-45. 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.

<div style="display: flex; justify-content: space-around; border-bottom: 1px solid black; height: 20px; width: 100%;"></div>				
Switch Function 8121 SPDT On-Mom. 1 Amp 8125 SPDT On-Mom. 0.4VA 8221 DPDT On-Mom. 1 Amp 8225 DPDT On-Mom. 0.4VA 8321 3PDT On-Mom. 1 Amp 8325 3PDT On-Mom. 0.4VA 8421 4PDT On-Mom. 1 Amp 8425 4PDT On-Mom. 0.4VA Note: UL/CSA models available, see page A-30 and A-31.	Actuator or Plunger S Plunger NONE Snap-in J80 Snap-in J81 Snap-in w/frame J82 Snap-in w/frame for LED J83 Snap-in w/frame & flush cap J84 Snap-in w/frame for LED, flush cap J85 Snap-in w/frame & LED J95 PC w/V-bracket & LED L Plunger M Snap-fitting plunger	Bushing D9 .280" high, keyway H .250" high, flat NONE No bushing choice required D .280" high, keyway D2 .288" high, flat D3 .180" high D8 .288" high, flat H9 .250" high, flat, hi torque Y .350" high, keyway Y3 6.35mm high, keyway, hi torque Y4 .378" high, flat, hi torque Y9 .350" high, keyway	Contact Material B Gold P Gold, matte-tin G Gold over silver R Gold over silver, matte-tin Seal E Epoxy I Epoxy potted base Cap Color 2 Black NONE Models without caps 1 White 3 Red 4 Orange 5 Yellow 6 Green 7 Blue 9 Gray	Frame Color 2 Black NONE Models without frame 1 White 3 Red 5 Yellow 6 Green 9 Gray LED Color 3 Red NONE Models without LED 5 Yellow 6 Green
Terminations A Right angle, PC thru-hole AV2 Vertical right angle, PC thru-hole C PC Thru-hole Z Solder lug A2 Right angle, PC thru-hole A3 Right angle, snap-in, PC thru-hole A4 Right angle, PC thru-hole, reversed terminals A6 Right angle, PC thru-hole AV Vertical right angle, PC thru-hole AV1 Vertical right angle, PC thru-hole AV3 Vertical right angle, snap-in, PC thru-hole R Right angle with PCB R2 Right angle with PCB, reversed terminals V2 .555" high, V-bracket V3 .460" high, V-bracket V4 .630" high, V-bracket V6 .460" high, V-bracket V7 .630" high, V-bracket V8 .953" high, V-bracket V9 1.150" high, V-bracket V31 .460" high, snap-in V-bracket V61 .460" high, snap-in V-bracket W .750" long, wire wrap W1 .964" long, wire wrap W3 .425" long, wire wrap W4 1.062" long, wire wrap Z3 Quick connect				



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



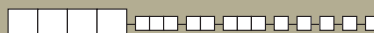
Pushbutton

www.ck-components.com

8020 Series Snap-acting Momentary Pushbutton Switches

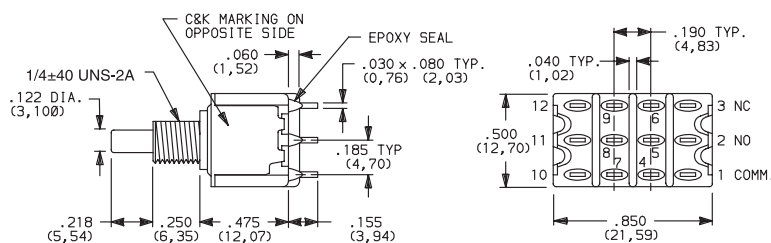


SWITCH FUNCTION



NO. POLES	MODEL NO.	UL/CSA* MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
			POS. 1	POS. 2	POS. 1	POS. 2	
4P	8421	U841	ON	MOM.	1-3,4-6,7-9,10-12	1-2,4-5,7-8,10-11	
	8425		ON	MOM.			

4PDT



Part number shown: 8421SHZGE

Terminal Nos.
For Reference Only

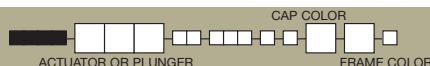
MOM. = Momentary

* U811 thru U841 model numbers with all options (except R, R2 terminations) when ordered with G or R contact material.

8X25 models must be ordered with B or P contact material.

8X21 and U8X1 models must be ordered with G or R contact material.

ACTUATOR—SNAP-IN FRONT MOUNT

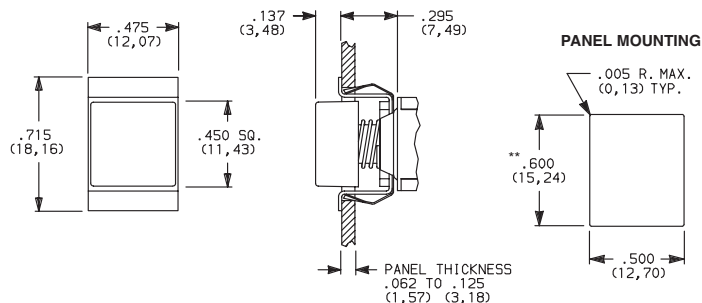


OPTION CODE	CAP AND FRAME COLOR
2	BLACK
NONE	No Frame Color (J80 option)
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

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

NOTE: Caps and frames available separately, see pages A-44 and A-45.

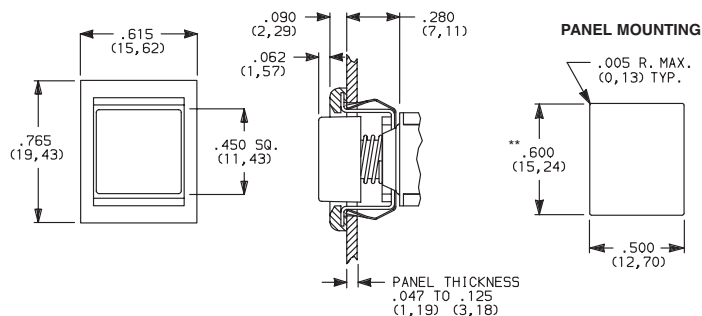
J80 SNAP-IN



NOTE: No frame color choice required.

** Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

J81 SNAP-IN WITH FRAME



NOTE: Available with C, W-W4, Z or Z3 terminations and SPDT and DPDT models only.

** Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.



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



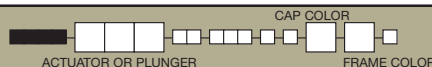


A

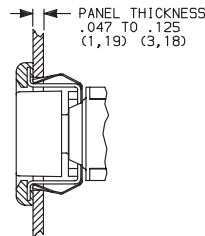
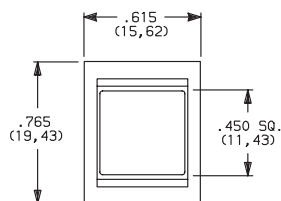
Pushbutton

8020 Series Snap-acting Momentary Pushbutton Switches

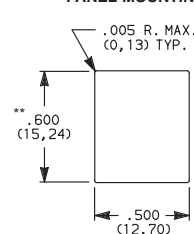
ACTUATOR—SNAP-IN FRONT MOUNT



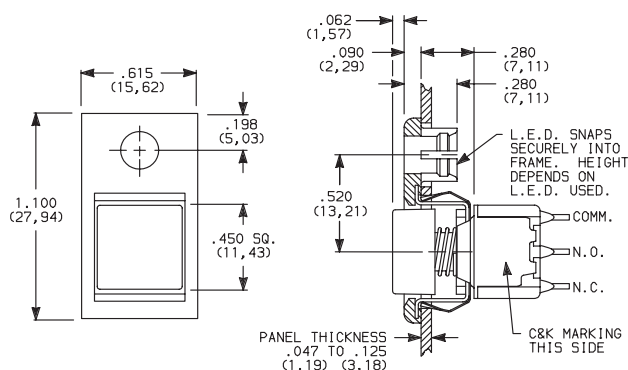
J83 SNAP-IN WITH FRAME AND FLUSH CAP



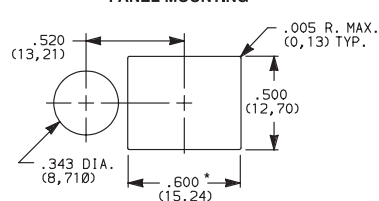
PANEL MOUNTING



J82 SNAP-IN WITH FRAME FOR LED



PANEL MOUNTING

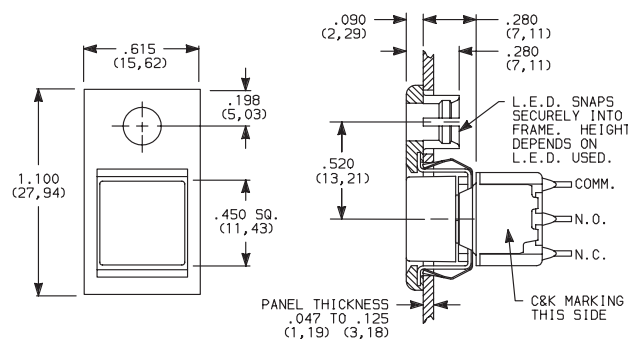


* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

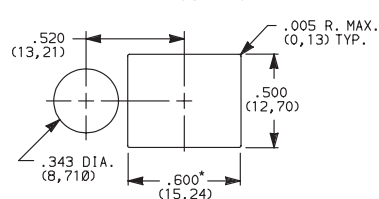
LED not included.

For LED information, see page A-45.

J84 SNAP-IN WITH FRAME FOR LED, FLUSH CAP



PANEL MOUNTING



* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

LED not included.

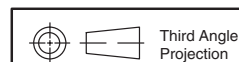
For LED information, see page A-45.

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

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

Available with C, W-W4, Z or Z3 terminations and SPDT and DPDT models only.

NOTE: Caps and frames available separately, see pages A-44 and A-45.



Third Angle Projection

C&K

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

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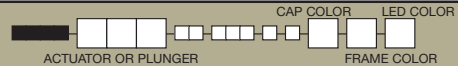
8020 Series Snap-acting Momentary Pushbutton Switches



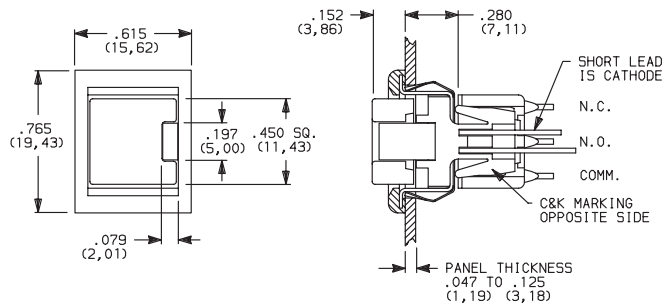
A

Pushbutton

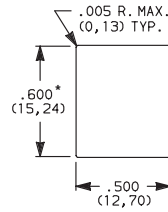
ACTUATOR—SNAP-IN FRONT MOUNT



J85 SNAP-IN WITH FRAME AND LED



PANEL MOUNTING



* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.



8121J85ZGE223
SPST

Available with C, W-W4, Z or Z3 terminations and SPDT models only. For LED information see page A-45.

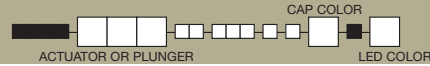
NOTE: Caps & frames available separately, see pages A-44 and A-45.

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

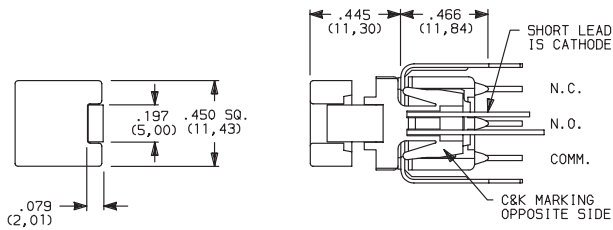
OPTION CODE	LED COLOR
3	RED
5	YELLOW
6	GREEN

For LED information see page A-45.

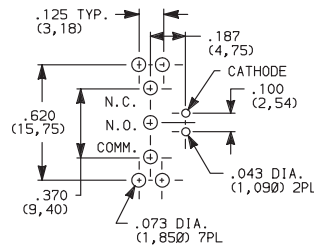
ACTUATOR—PC MOUNT



J95 PC WITH V-BRACKET AND LED



PC MOUNTING



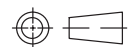
8121J95V3GE23
SPST

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

OPTION CODE	LED COLOR
3	RED
5	YELLOW
6	GREEN

For LED information see page A-45.

NOTE: Caps available separately, see page A-44. Available with V3 terminations and SPDT models only.



Third Angle
Projection

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



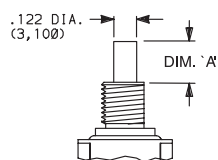


8020 Series Snap-acting Momentary Pushbutton Switches

PLUNGER

ACTUATOR OR PLUNGER

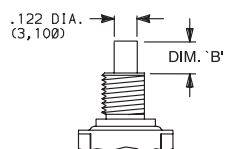
S PLUNGER



NONE NO PLUNGER CHOICE REQUIRED
(JXX ACTUATORS)

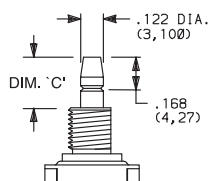
AVAILABLE BUSHINGS	DIM. 'A' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'A' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'A' FOR V3-V61 TERMINATIONS
D, D9	.244 (6,20)	.228 (5,79)	.224 (5,69)
H, H9	.218 (5,54)	.202 (5,13)	.198 (5,03)
Y, Y9	.203 (5,16)	.187 (4,75)	.183 (4,65)
Y3	(5,54)	(5,13)	(5,03)
Y4	.185 (4,70)	.169 (4,29)	.165 (4,19)
D2, D8	N/A	.232 (5,89)	.228 (5,79)
D3	N/A	.162 (4,11)	.158 (4,01)

L PLUNGER



AVAILABLE BUSHINGS	DIM. 'B' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'B' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'B' FOR V3-V61 TERMINATIONS
Y, Y9	.178 (4,52)	.162 (4,11)	.158 (4,01)
Y4	.090 (2,29)	.074 (1,88)	.070 (1,78)

M SNAP-FITTING PLUNGER



AVAILABLE BUSHINGS	DIM. 'C' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'C' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'C' FOR V3-V61 TERMINATIONS
D, D9	.297 (7,54)	.281 (7,14)	.277 (7,04)
H, H9	.267 (6,78)	.251 (6,38)	.247 (6,27)
Y, Y9	.259 (6,58)	.243 (6,17)	.239 (6,07)
Y3	(6,78)	(6,37)	(6,27)
Y4	.259 (6,58)	.243 (6,17)	.239 (6,07)
D2, D8	N/A	.273 (6,93)	.269 (6,83)
D3	N/A	.361 (9,17)	.357 (9,07)

N/A = NOT AVAILABLE

NOTE: When selecting plunger option, bushing selection must also be made, see next page. No plunger option is required when any JXX actuator option is selected. Additional plunger lengths are available on SPDT and DPDT models, consult Customer Service Center. Not all plunger lengths sufficient for use with caps, see page A-44.

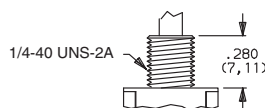
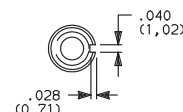
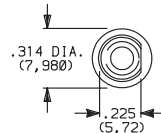
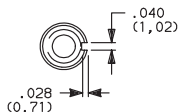
BUSHING

NONE NO BUSHING
CHOICE REQUIRED
(JXX ACTUATORS)

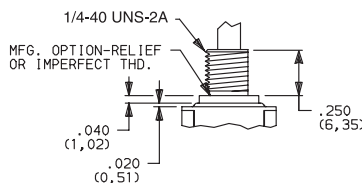
D .280" HIGH THREADED, KEYWAY
D9 .280" HIGH UNTHREADED,
KEYWAY

H .250" HIGH THREADED, FLAT
H9 .250" HIGH UNTHREADED, FLAT

Y .350" HIGH THREADED, KEYWAY
Y9 .350" HIGH UNTHREADED, KEYWAY

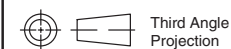


D9 bushing standard with A-A6,
R, R2 AV-AV3 terminations.



H bushing standard with C, W-W4, Z or Z3 terminations.
H, H9 bushings not available on single pole models with
A3-A6, R, R2 terminations.

**Will withstand 12 in./lbs. of torque with
no distortion.**



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

C&K

8020 Series Snap-acting Momentary Pushbutton Switches



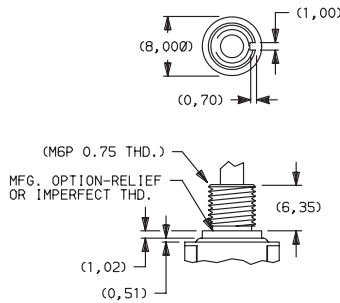
A

Pushbutton

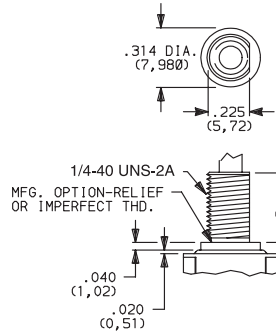
BUSHING



Y3 6.35mm THREADED, KEYWAY

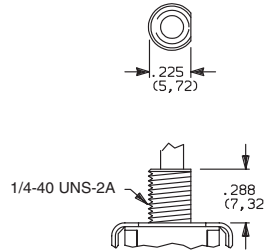


Y4 .378" HIGH THREADED, FLAT

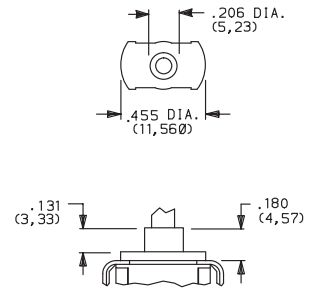


D2 .288" HIGH THREADED, FLAT

D8 .288" HIGH UNTHREADED, FLAT



D3 .180" HIGH UNTHREADED



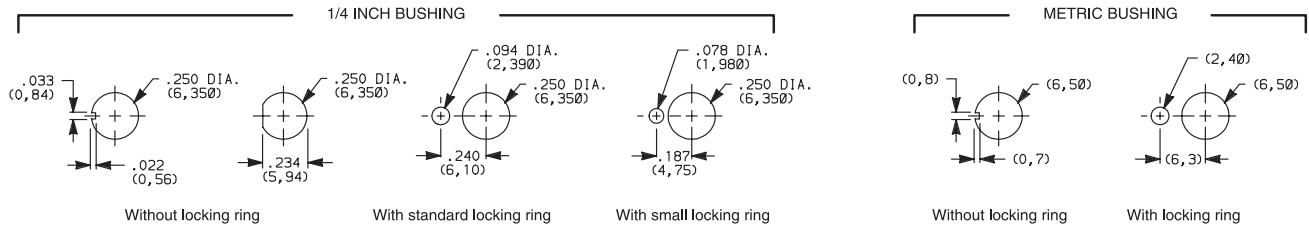
Y3 & Y4 bushings not available on single pole models with A3-A6, R, R2 terminations. Will withstand 12 in./lbs. of torque with no distortion.

D2, D8 bushings not available with C, W-W4, Z, Z3 terminations.

D3 bushing available with A, A2, A3, AV, AV2, AV3 and V2-V61 terminations only.

NOTE: No bushing option choice required when JXX actuator option is selected. When selecting bushing option, plunger selection must also be made, see previous page. Plunger lengths vary with bushing and termination options selected.

PANEL MOUNTING

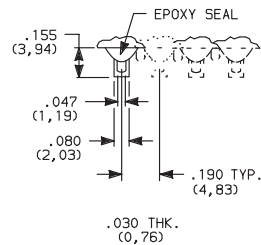


NOTE: Two mounting nuts, locking ring and lockwasher supplied standard with threaded bushings. Optional mounting nut and locking ring styles available, see section "Technical Data and Additional Hardware".

TERMINATIONS



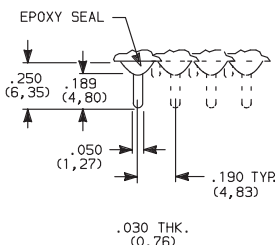
Z SOLDER LUG



SPDT thru 4PDT

Not available with J95 actuator, P or R contact material.

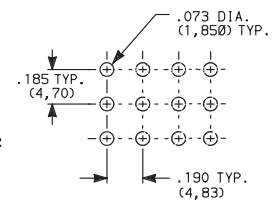
C PC THRU-HOLE



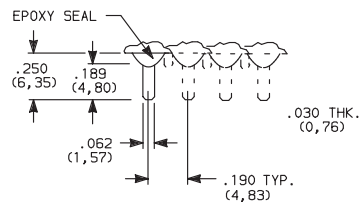
SPDT thru 4PDT

Not available with J95 actuator option.

PC MOUNTING



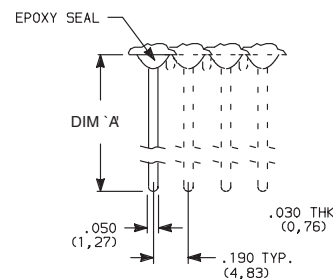
Z3 QUICK CONNECT



SPDT thru 4PDT

Not available with J95 actuator, P or R contact material. Mating quick connector available, order part number 530100000, page A-44.

W W1, W3, W4 WIRE WRAP



SPDT thru 4PDT

OPTION CODE	DIM 'A'
W	.750 (19,05)
W1	.964 (24,49)
W3	.425 (10,80)
W4	1.062 (26,97)

Not available with J95 actuator option.



Third Angle Projection



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

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**A****Pushbutton**

8020 Series Snap-acting Momentary Pushbutton Switches

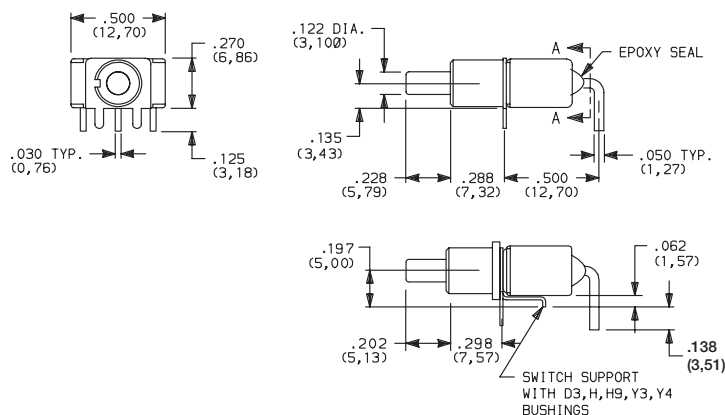
TERMINATIONS



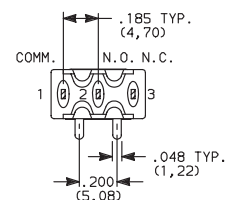
A RIGHT ANGLE, PC THRU-HOLE



**8121SD9AGE
SPDT**



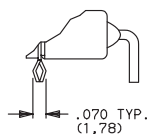
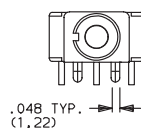
Part Number 8121SH9AGE



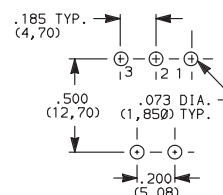
SECTION A-A

Terminal Nos.
For Reference Only.

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE

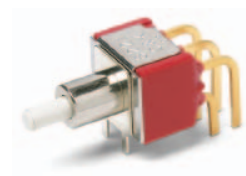


PC MOUNTING

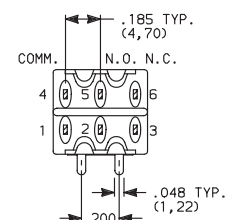
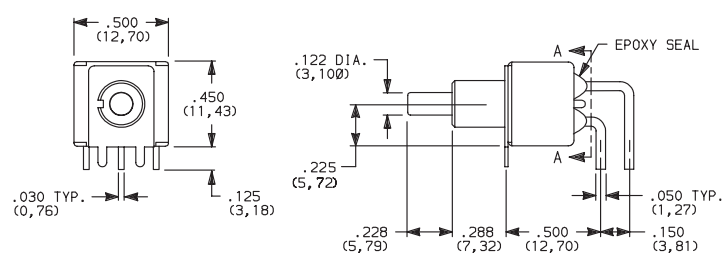


Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

A RIGHT ANGLE, PC THRU-HOLE

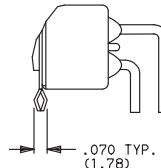
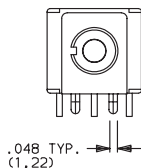


**8221SD9AGE
DPDT**

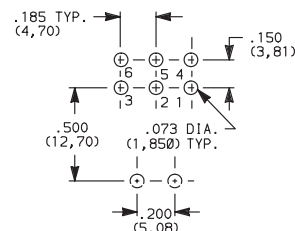


SECTION A-A

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



PC MOUNTING



Not available with JXX actuators and I seal option.
Terminal bend radii and lead-in manufacturing option.



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

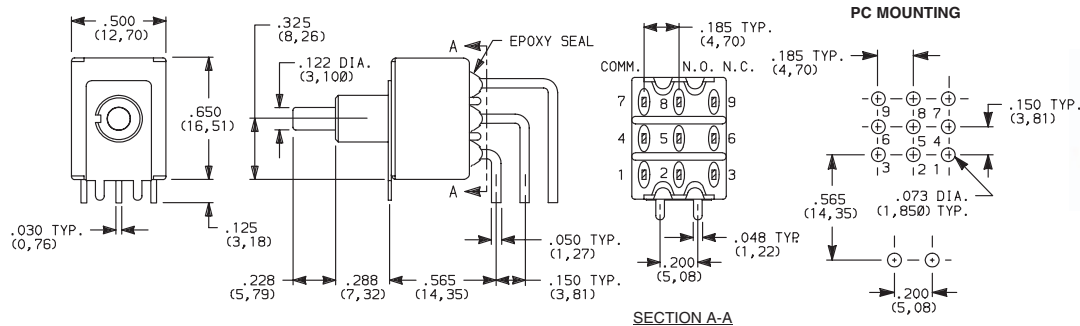
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8020 Series Snap-acting Momentary Pushbutton Switches

TERMINATIONS

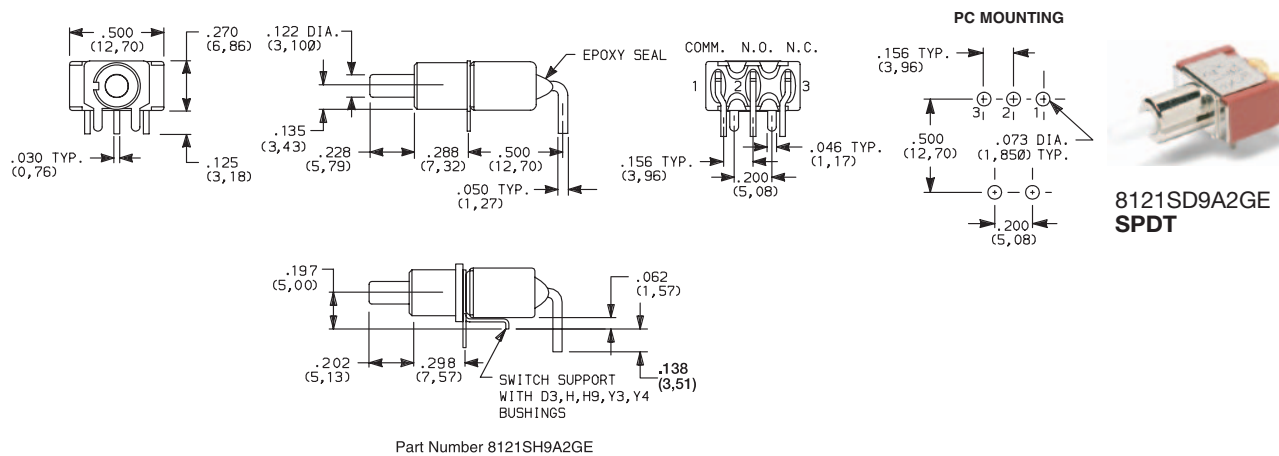


A RIGHT ANGLE, PC THRU-HOLE



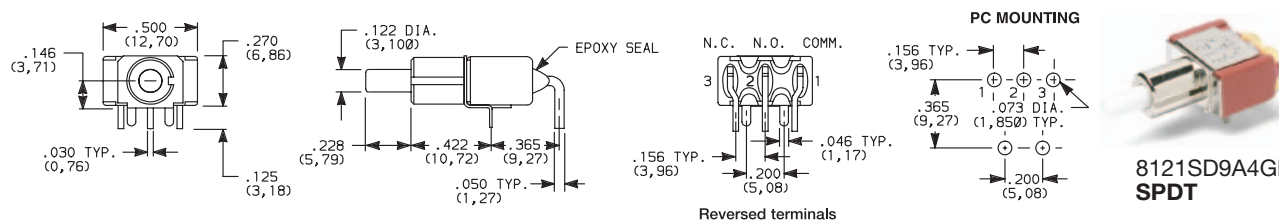
Not available with JXX actuators and I seal option.
Terminal bend radii and lead-in manufacturing option.

A2 RIGHT ANGLE, PC THRU-HOLE



Not available with JXX actuators, I seal option.
Terminal bend radii and lead-in manufacturing option.

A4 RIGHT ANGLE, PC THRU-HOLE, REVERSED TERMINALS



Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings and I seal.
Terminal bend radii and lead-in manufacturing option.

The A4 and R2 termination options are functionally identical and fit the same PC mounting pattern. The switches, however, are shifted relative to the mounting holes. The PC pattern must clear the switch support legs. Unlike the R2, the A4 option is available with UL/CSA.



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



Pushbutton



A

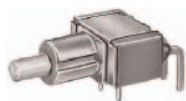
Pushbutton

8020 Series Snap-acting Momentary Pushbutton Switches

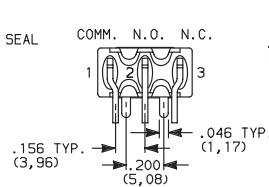
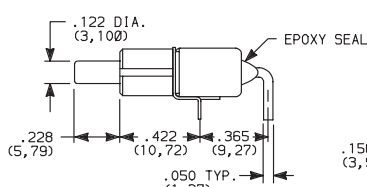
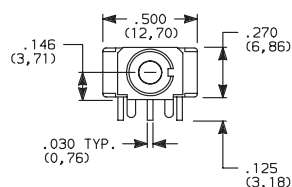
TERMINATIONS



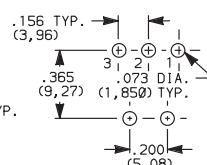
A6 RIGHT ANGLE, PC THRU-HOLE



8121SD9A6GE
SPDT



PC MOUNTING



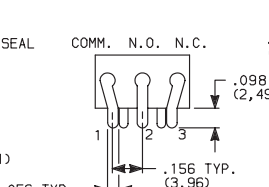
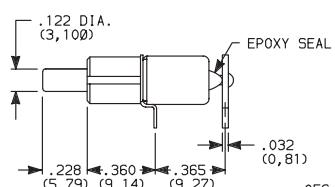
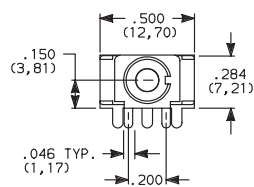
The A6 and R termination options are functionally identical and fit the same PC mounting pattern. The switches, however, are shifted relative to the mounting holes. The PC pattern must clear the switch support legs. Unlike the R, the A6 option is available with UL/CSA.

Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings and I seal. Terminal bend radii and lead-in manufacturing option.

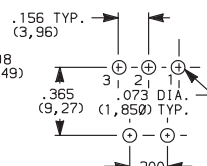
R RIGHT ANGLE WITH PCB



8121SD9RGE
SPDT



PC MOUNTING

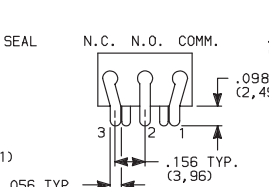
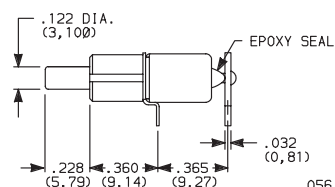
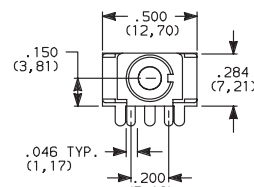


Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings, I seal option. R termination not UL/CSA approved.

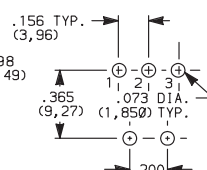
R2 RIGHT ANGLE WITH PCB, REVERSED TERMINALS



8121SD9R2GE
SPDT



PC MOUNTING



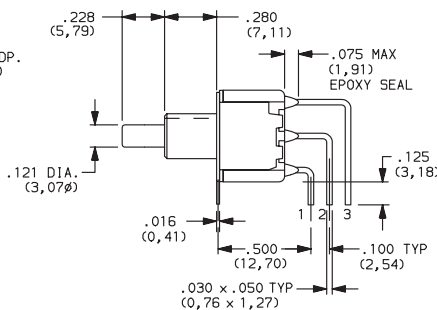
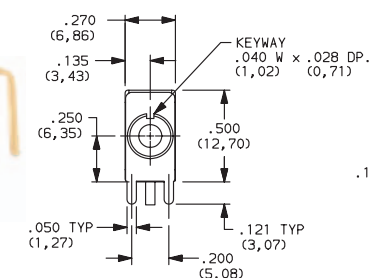
Reversed terminals

Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings, I seal option. R2 termination not UL/CSA approved.

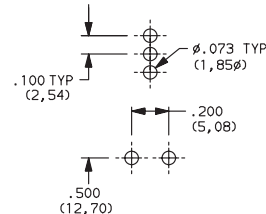
AV VERTICAL RIGHT ANGLE, PC THRU-HOLE, .100" PITCH



8121SD9AVGE
SPDT



PC MOUNTING



Third Angle
Projection

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

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8020 Series Snap-acting Momentary Pushbutton Switches



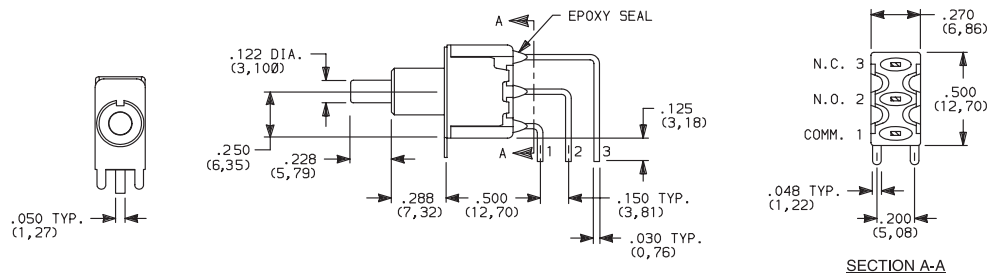
A

Pushbutton

TERMINATIONS

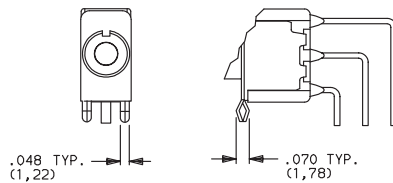


AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

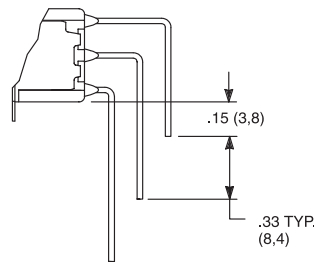


8121SD9AV2GE
SPDT

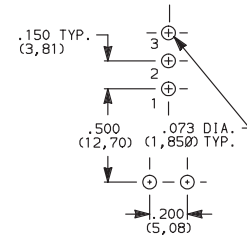
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



AV1 VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH

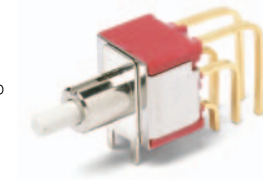
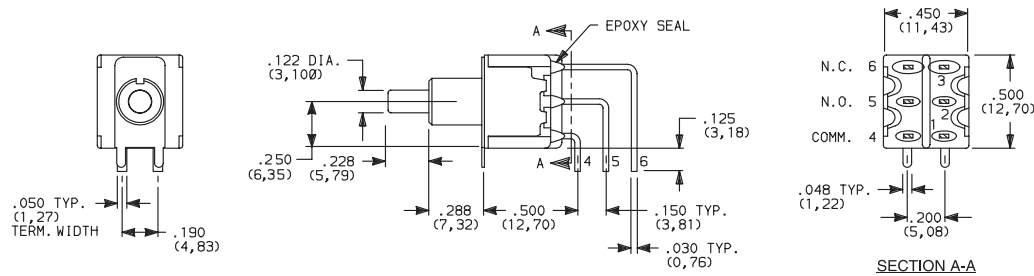


PC MOUNTING



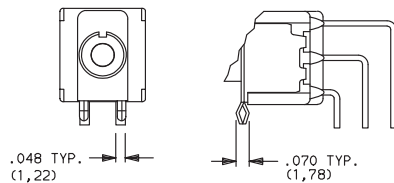
Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

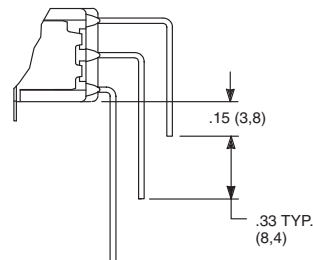


8221SD9AV2GE
DPDT

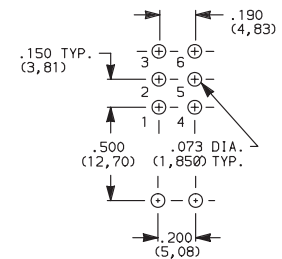
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



AV1 VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH



PC MOUNTING



Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.



Third Angle
Projection

C&K

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

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A

Pushbutton

8020 Series Snap-acting Momentary Pushbutton Switches

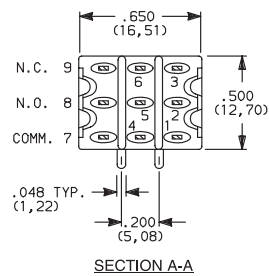
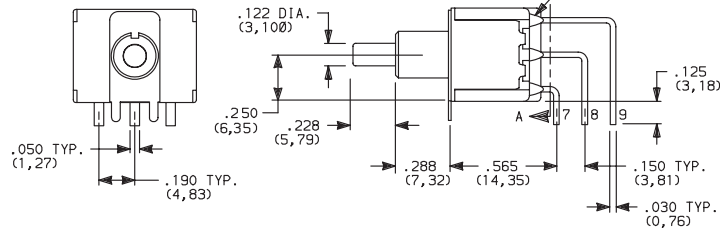
TERMINATIONS



AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

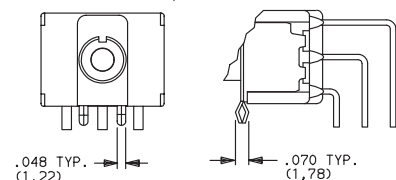


8321SD9AV2GE
3PDT

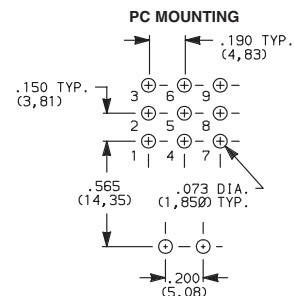
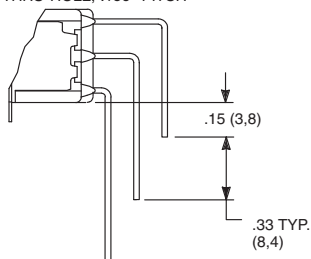


SECTION A-A

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



AV1 VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH



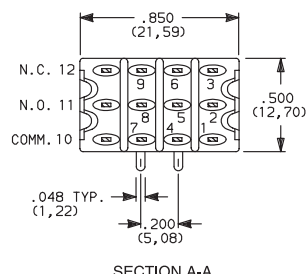
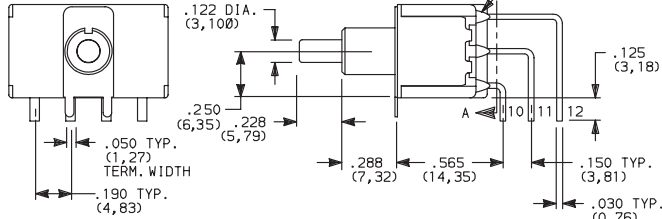
PC MOUNTING

Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

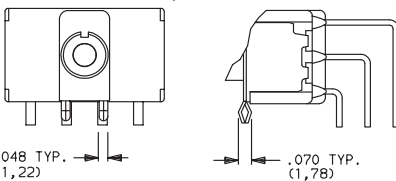


8421SD9AV2GE
4PDT

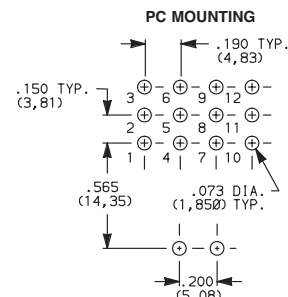
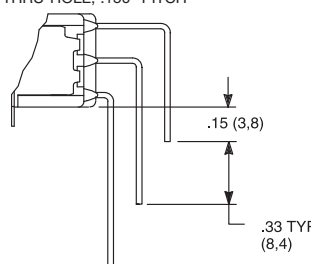


SECTION A-A

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



AV1 VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH

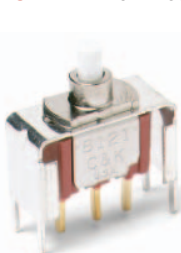


PC MOUNTING

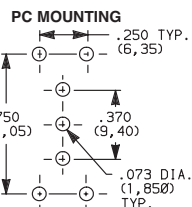
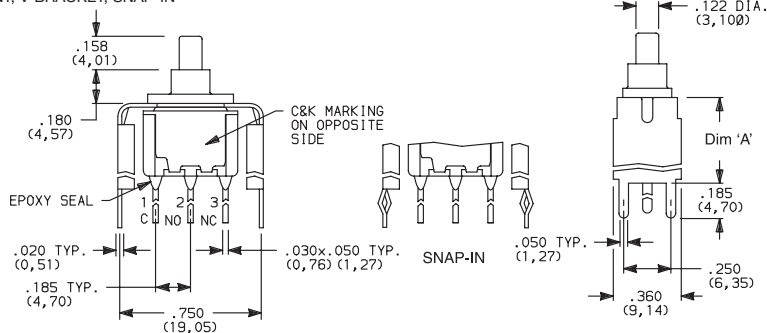
Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

V2, V6, V7, V8 VERTICAL MOUNT, V-BRACKET

V61 VERTICAL MOUNT, V-BRACKET, SNAP-IN



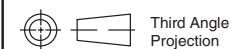
8121SD3_GE
SPDT



PC MOUNTING

OPTION CODE	DIM 'A'
V2	.555 (14,10)
V6, V61	.460 (11,68)
V7	.630 (16,00)
V8	.953 (24,21)

Not available with JXX actuators and I seal.



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

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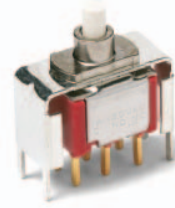
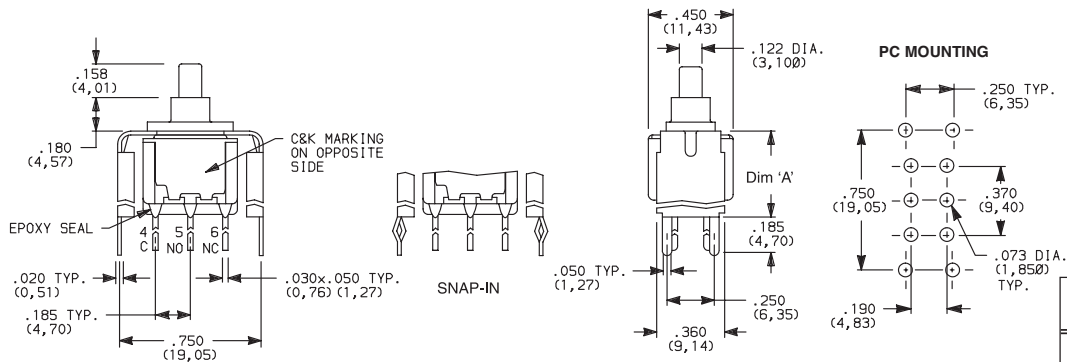
8020 Series Snap-acting Momentary Pushbutton Switches

TERMINATIONS



V2, V6, V7, V8 VERTICAL MOUNT, V-BRACKET

V61 VERTICAL MOUNT, V-BRACKET, SNAP-IN

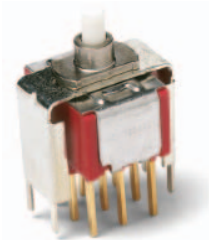
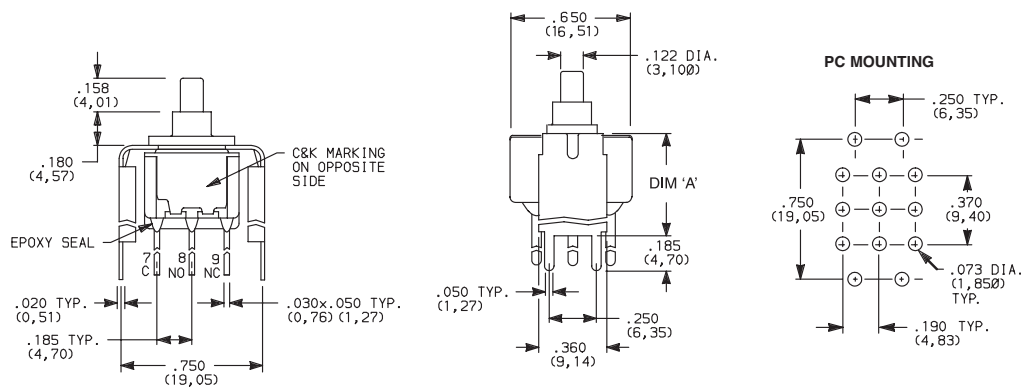


**8221SD3_GE
DPDT**

OPTION CODE	DIM 'A'
V2	.555 (14,10)
V6, V61	.460 (11,68)
V7	.630 (16,00)
V8	.953 (24,21)

Not available with JXX actuators and I seal.

V2, V7, V8 VERTICAL MOUNT, V-BRACKET

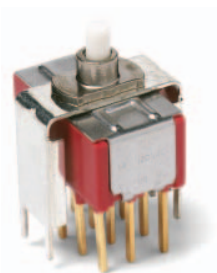
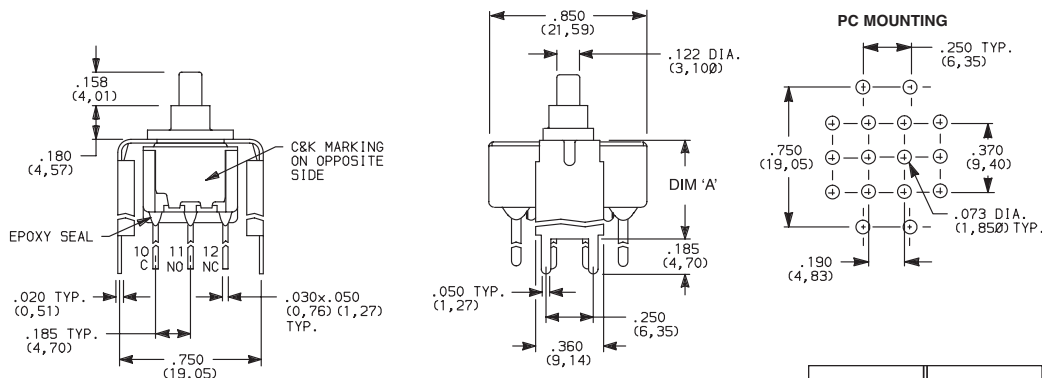


**8321SD3_GE
3PDT**

OPTION CODE	DIM 'A'
V2	.555 (14,10)
V7	.630 (16,00)
V8	.953 (24,21)

Not available with JXX actuators and I seal.

V2, V7, V8 VERTICAL MOUNT, V-BRACKET



**8421SD3_GE
4PDT**

OPTION CODE	DIM 'A'
V2	.555 (14,10)
V7	.630 (16,00)
V8	.953 (24,21)



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



Pushbutton



A

Pushbutton

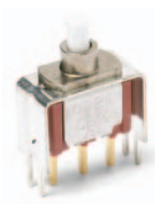
8020 Series Snap-acting Momentary Pushbutton Switches

TERMINATIONS

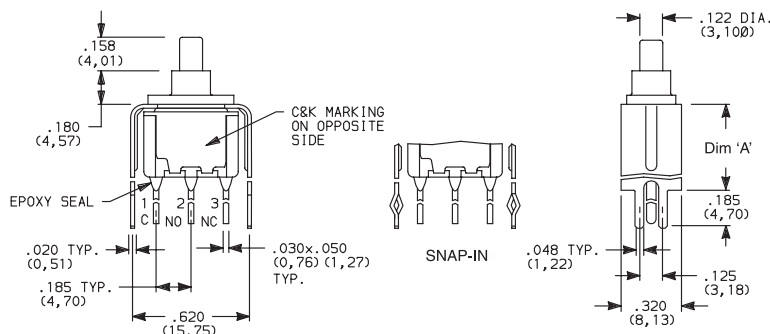


V3, V4, V9 VERTICAL MOUNT, V-BRACKET

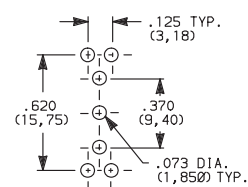
V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN



8121SD3_GE
SPDT



PC MOUNTING



OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)
V9	1.150 (29,21)

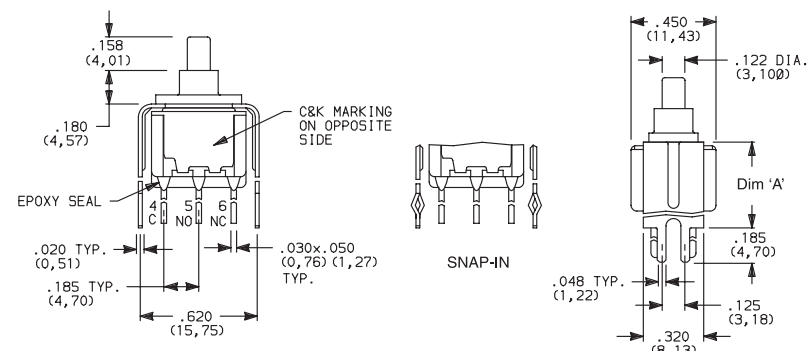
Not available with J8X actuators and I seal.

V3, V4, V9 VERTICAL MOUNT, V-BRACKET

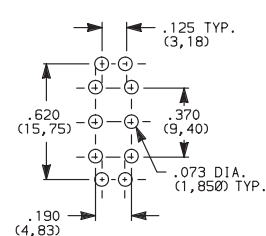
V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN



8221SD3_GE
DPDT



PC MOUNTING



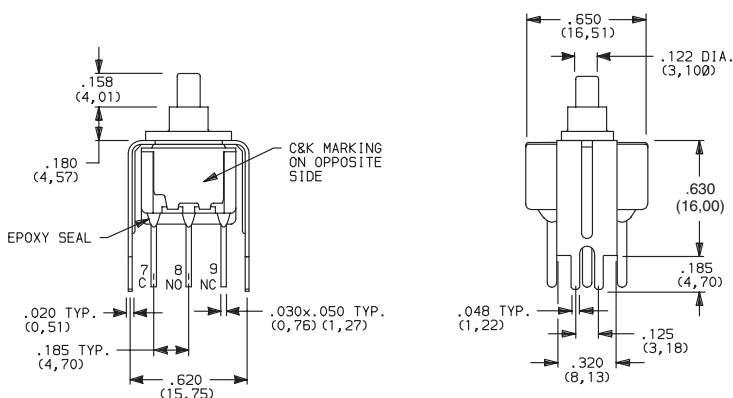
OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)
V9	1.150 (29,21)

Not available with J8X actuators and I seal.

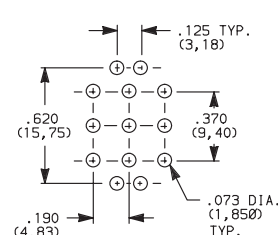
V4, V9 VERTICAL MOUNT, V-BRACKET



8321SD3V4GE
3PDT



PC MOUNTING



OPTION CODE	DIM 'A'
V4	.630 (16,00)
V9	1.150 (29,21)

Not available with JXX actuators and I seal.



Third Angle
Projection

C&K

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

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A

Technical drawings of the 12NC12C component showing front, side, and PC mounting views with dimensions in inches and millimeters.

Front View:

- Top pin diameter: .158 (4,01)
- Top pin length: .180 (4,57)
- Bottom pins: 10 C, 11 NC, 12 NC
- Bottom pin length: .185 TYP. (4,70)
- Bottom pin diameter: .020 TYP. (0,51)
- Bottom pin spacing: .620 (15,75)
- Bottom pin diameter: .030x.050 TYP. (0,76) (1,27)
- Label: C&K MARKING ON OPPOSITE SIDE
- Label: EPOXY SEAL

Side View:

- Top pin diameter: .850 (21,59)
- Top pin length: .122 DIA. (3,100)
- Bottom pins: .630 (16,00)
- Bottom pin length: .185 (4,70)
- Bottom pin diameter: .048 TYP. (1,22)
- Bottom pin spacing: .125 (3,18)
- Bottom pin diameter: .320 (8,13)

PC MOUNTING:

- Pin 10: .125 TYP. (3,18)
- Pin 11: .620 (15,75)
- Pin 12: .370 (9,40)
- Pin 13: .073 DIA. (1,850) TYP.
- Pin 14: .190 (4,83)

Not available with JXX actuators and I seal.

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

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

B or P contact material must be ordered with 8X25 models.

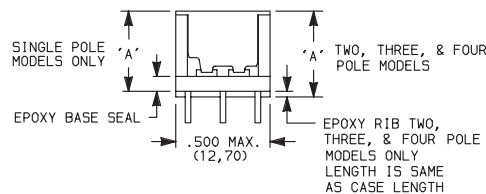
G or R contact material must be ordered with 8X21, U8X1 models.

P or R contact material not available with Z, Z3 terminations.

```

graph LR
    n1[ ] --- n2[ ]
    n2 --- n3[ ]
    n3 --- n4[ ]
    n4 --- n5[ ]
    n5 --- n6[ ]
    n6 --- n7[ ]
    n7 --- n8[ ]
    n8 --- null(( ))
    style n1 fill:#000,stroke:#000
    style n2 fill:#000,stroke:#000
    style n3 fill:#000,stroke:#000
    style n4 fill:#000,stroke:#000
    style n5 fill:#000,stroke:#000
    style n6 fill:#000,stroke:#000
    style n7 fill:#000,stroke:#000
    style n8 fill:#fff,stroke:#000
    style null fill:none,stroke:none
  
```

EPOXY POTTED BASE



NOTE: Available with C, W-W4, Z, Z3 terminations only.



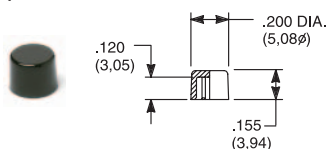
www.ck-components.com



8020 Series Snap-acting Momentary Pushbutton Switches

AVAILABLE HARDWARE

Cap

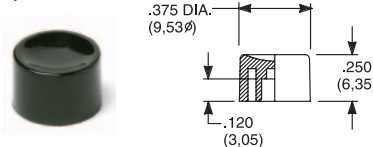


PART NO.

708901000 WHITE
708902000 BLACK
708903000 RED
708904000 ORANGE
708905000 YELLOW
708906000 GREEN
708907000 BLUE
708909000 GRAY

Material: Nylon
Finish: Gloss

Cap

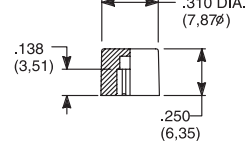


PART NO.

752701000 WHITE
752702000 BLACK
752703000 RED
752704000 ORANGE
752705000 YELLOW
752706000 GREEN
752707000 BLUE
752709000 GRAY

Material: Nylon
Finish: Gloss

Cap

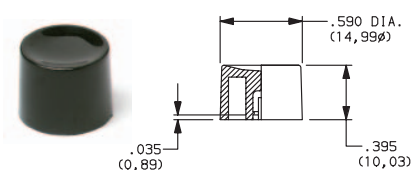


PART NO.

801801000 WHITE
801802000 BLACK
801803000 RED
801804000 ORANGE
801805000 YELLOW
801806000 GREEN
801807000 BLUE
801809000 GRAY

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

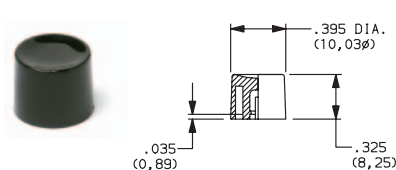


PART NO.

894001000 WHITE
894002000 BLACK
894003000 RED
894004000 ORANGE
894005000 YELLOW
894006000 GREEN
894007000 BLUE
894009000 GRAY

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

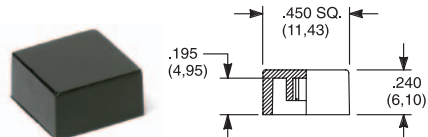


PART NO.

894101000 WHITE
894102000 BLACK
894103000 RED
894104000 ORANGE
894105000 YELLOW
894106000 GREEN
894107000 BLUE
894109000 GRAY

Material: Nylon
Finish: Gloss

Cap, J80, J81, J82, J83 & J84 options only



PART NO.

484601000 WHITE
484602000 BLACK
484603000 RED
484604000 ORANGE
484605000 YELLOW
484606000 GREEN
484607000 BLUE
484609000 GRAY

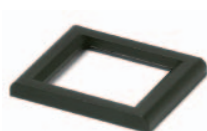
Material: Nylon
Finish: Gloss

PART NO.

798201000 WHITE
798202263 BLACK
798203000 RED
798204000 ORANGE
798205000 YELLOW
798206000 GREEN
798207000 BLUE
798209000 GRAY

Material: Nylon
Finish: Matte

Frame



PART NO.

615601000 WHITE
615602263 BLACK
615603000 RED
615605000 YELLOW
615606000 GREEN
615609000 GRAY

Material: Nylon
Finish: Matte

Frame

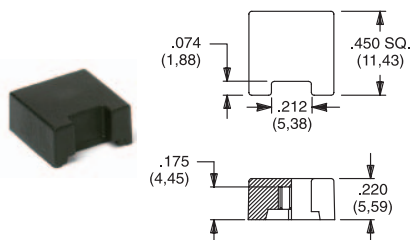


PART NO.

613301000 WHITE
613302263 BLACK
613303000 RED
613305000 YELLOW
613306000 GREEN
613309000 GRAY

Material: Nylon
Finish: Matte

Cap, J85 & J95 options only



PART NO.

459701000 WHITE
459702000 BLACK
459703000 RED
459704000 ORANGE
459705000 YELLOW
459706000 GREEN
459707000 BLUE
459709000 GRAY

Material: Nylon
Finish: Gloss

PART NO.

476801000 WHITE
476802000 BLACK
476803000 RED
476804000 ORANGE
476805000 YELLOW
476806000 GREEN
476807000 BLUE
476809000 GRAY

Material: Nylon
Finish: Matte

Fits Z3 Termination
female connector

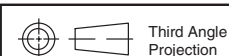
PART NO.

530100000

Available in loose pieces.

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".

Other cap & frame colors available, consult Customer Service Center.



Third Angle
Projection

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

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C&K

8020 Series Snap-acting Momentary Pushbutton Switches



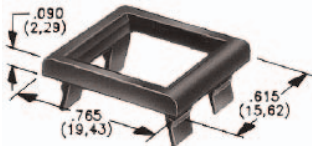
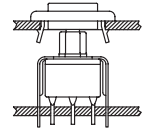
A

Pushbutton

AVAILABLE HARDWARE

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.

432501000
432502263
432503000
432505000
432506000
432509000

PART NO.

432601000
432602263
432603000
432605000
432606000
432609000

PART NO.

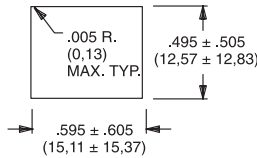
432701000
432702263
432703000
432705000
432706000
432709000

PART NO.

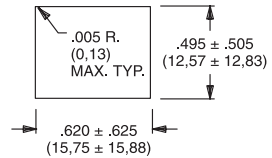
432801000 WHITE
432802263 BLACK
432803000 RED
432805000 YELLOW
432806000 GREEN
432809000 GRAY

PANEL MOUNTING

For part numbers
4325xxxxx, 4326xxxxx

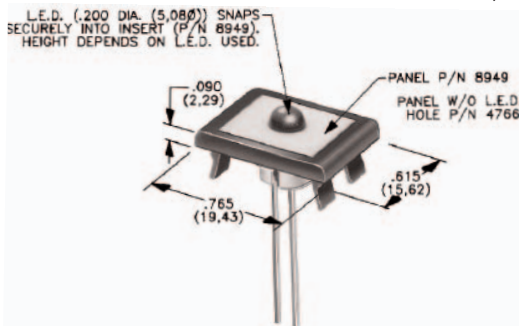


For part numbers
4327xxxxx, 4328xxxxx



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

PART NO.

894901000
894902000
894903000
894905000
894906000
894909000

BLANK PANEL INSERT
WITHOUT HOLE FOR LED

PART NO.

476601000 WHITE
476602000 BLACK
476603000 RED
476605000 YELLOW
476606000 GREEN
476609000 GRAY

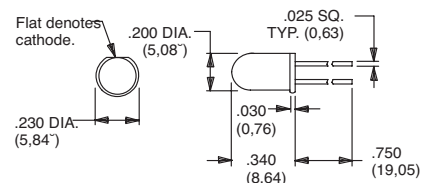
Special colors, custom markings available, consult Customer Service Center.

LED INFORMATION

SWITCHES WITH LED SUPPLIED: J85, J95 OPTIONS:

Rectangular LEDs are supplied on 8020 Series pushbutton switches with J85 and J95 options. These LEDs are factory installed and are not replaceable. The following specifications apply:

OPTION CODE	COLOR	TYP. INTENSITY	TYP. FORWARD VOLTAGE	TYP. FORWARD CURRENT	MAX RATINGS AT 25°C AMBIENT TEMPERATURE		
					FORWARD VOLTAGE	CONTINUOUS FORWARD CURRENT	POWER DISSIPATION
6	Green	1.0 mcd	2.1 V	20 mA	2.5 V	50 mA	125 mW
3	Red*	0.5 mcd		10 mA		30 mA	75 mW
5	Yellow	4.0 mcd		20 mA		50 mA	125 mW



Suggested LED for J82 & J84 options.
Dimensions for reference only.

Process Information: Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.

Caution: Circuit elements must limit forward current of LED to 50mA max. continuous.

* Extra-bright red LED available (typ. intensity 4.5 mcd), consult Customer Service Center. LEDs are not supplied with J82, J84 options. LED snaps into switch frame surrounding actuator and is wired externally.



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

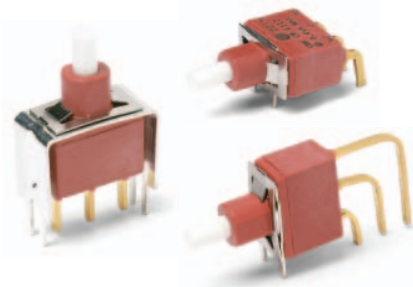




A

Pushbutton

E010 Series Sealed Momentary Pushbutton Switches



Features/Benefits

- Process sealed, withstands soldering and cleaning
- Long life contact design
- Snap-fitting plunger available, accepts a variety of caps
- RoHS compliant models available

Typical Applications

- Instrumentation
- Telecommunications and networking equipment
- Computers and peripherals



Specifications

CONTACT RATING: Q contact material: 4 AMPS @ 125 V AC or 28 V DC. See page A-50 for additional ratings.

ELECTRICAL LIFE: 40,000 make-and-break cycles at full load.

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

INSULATION RESISTANCE: 10⁹Ω min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 75°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

SOLDERABILITY: Per MIL-STD-202F method 208D, or

EIA RS-186E method 9 (1 hour steam aging).

NOTE: Any models supplied with P, Q, B 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 & BUSHING: Glass filled nylon 6/6, flame retardant (UL 94V-0).

PLUNGER: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0), with internal o-ring seal standard.

SWITCH SUPPORT: Brass or steel, matte-tin plated.

SWITCH SUPPORT RETAINER: Stainless steel.

END CONTACTS: Q contact material: Coin silver, silver plated. See A-50 for additional ratings.

CENTER CONTACTS & ALL TERMINALS: Q contact material: Copper alloy, silver plated. See page A-50 for additional ratings.

TERMINAL SEAL: Epoxy.

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-47 thru A-51. For additional options not shown in catalog, consult Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Switch Function			Plunger			Bushing			Terminations		
E112 SPDT On-Mom.			S .222" high			D1 Unthreaded			A Right angle, PC thru-hole		
			L .338" high						AV2 Vertical right angle, PC thru-hole		
			M .331" high, snap-fitting						C PC Thru-hole		
									A3 Right angle, snap-in, PC thru-hole		
									AV3 Vertical right angle, snap-in, PC thru-hole		
									R2 Right angle with PCB		
									V3 .460" high, V-bracket		
									V4 .630" high, V-bracket		
									V6 .460" high, V-bracket		
									V8 .953" high, V-bracket		
									V31 .460" high, snap-in V-bracket		
									V81 .953" high, snap-in V-bracket		
									V91 1.150" high, snap-in V-bracket		
									W .750" long, wire wrap		
									Z Solder lug		
									Contact Material		
									B Gold		
									P Gold, matte-tin		
									Q Silver		
									G Gold over silver		
									Seal		
									E Epoxy		



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

E010 Series Sealed Momentary Pushbutton Switches



A

Pushbutton

SWITCH FUNCTION



NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
		C&K marking this side	C&K marking this side	C&K marking this side	C&K marking this side	
SP	E112	ON	MOM.	2-1	2-3	SPDT NC 1 2 (COMM) 3 NO
<p>SPDT</p> <p>Part number shown: E112SD1CQE</p>						

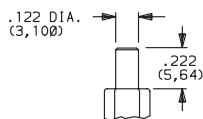
MOM. = Momentary

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

PLUNGER



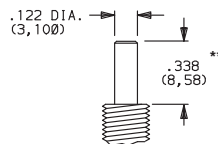
S .218" HIGH



Standard with D1 bushing (as shown).

† Subtract .100 (2,54) from plunger length when ordered with Y bushing.

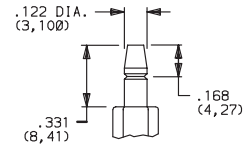
L .338" HIGH



Standard with Y bushing (as shown).

** Add .100 (2,54) from plunger length when ordered with D1 bushing.

M .331" HIGH, SNAP-FITTING

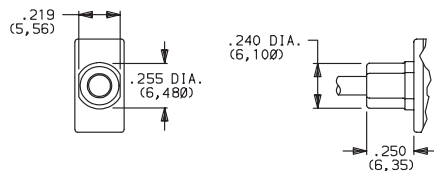


NOTE: Caps available for all plunger options, see pages A-50 and A-51.

BUSHING

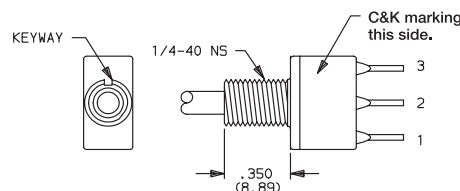


D1 UNTHREADED



S plunger standard with D1 bushing.

Y THREADED, KEYWAY

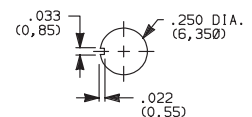


L plunger standard with Y bushing. Available only with C, Z terminations.

Hardware: One dress nut part number 299D01201, one hex nut and lockwasher supplied standard.

Withstands 4 in./lbs. without distortion.

PANEL MOUNTING



NOTE: Internal o-ring actuator seal standard for all bushing options.



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



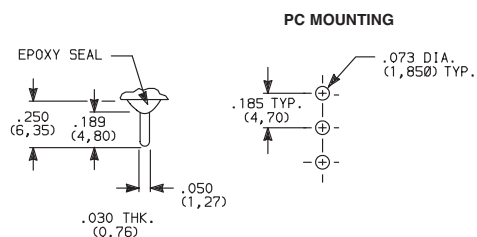


E010 Series Sealed Momentary Pushbutton Switches

TERMINATIONS

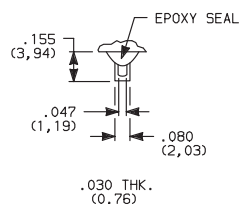


C PC THRU-HOLE



SPDT

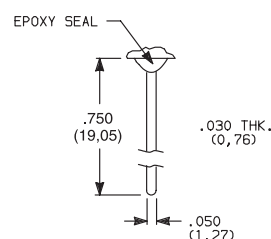
Z SOLDER LUG



SPDT

Not available with P contact materials.

W WIRE WRAP

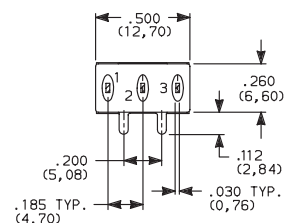
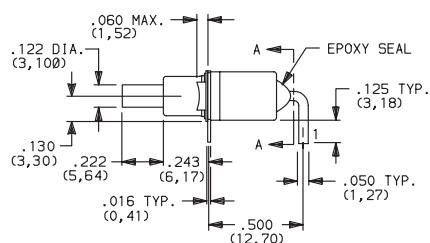
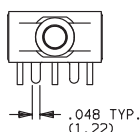


SPDT

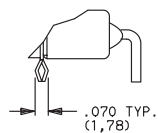
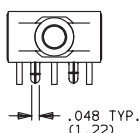
A RIGHT ANGLE, PC THRU-HOLE



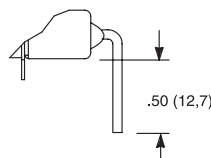
**E112SD1ABE
SPDT**



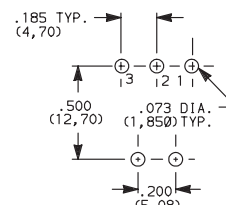
A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



AW RIGHT ANGLE, EXTENDED, PC THRU-HOLE

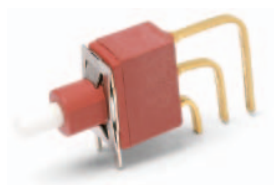


PC MOUNTING

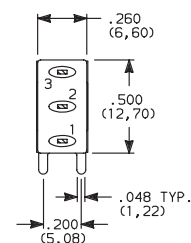
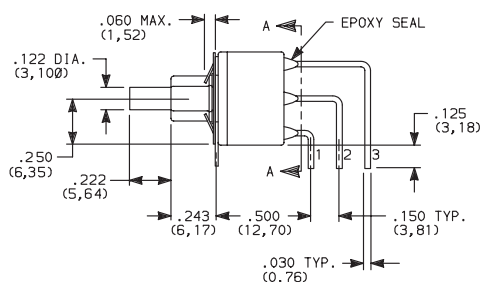
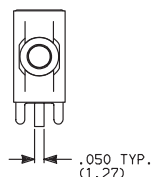


NOTE: Terminal bend radii and lead-in manufacturing option.
Available with D1 bushing only.

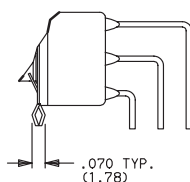
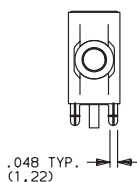
AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH



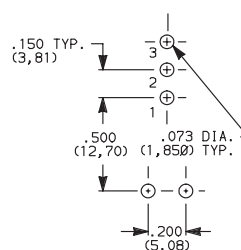
**E112SD1AV2BE
SPDT**



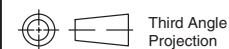
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



PC MOUNTING



NOTE: Terminal bend radii and lead-in manufacturing option.
Available with D1 bushing only.



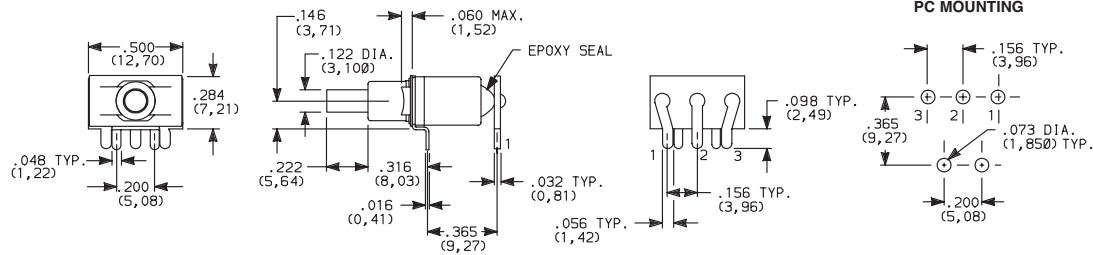
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

E010 Series Sealed Momentary Pushbutton Switches

TERMINATIONS



R2 RIGHT ANGLE WITH PCB

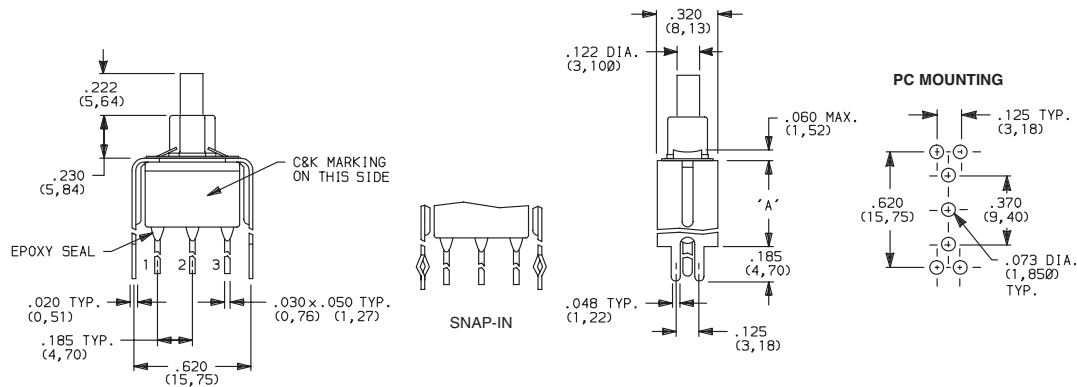


**E112SD1R2BE
SPDT**

NOTE: Available with D1 bushing and B contact material only.

V3, V4 VERTICAL MOUNT, V-BRACKET

V31, V91 VERTICAL MOUNT, V-BRACKET, SNAP-IN



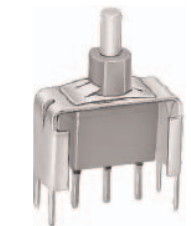
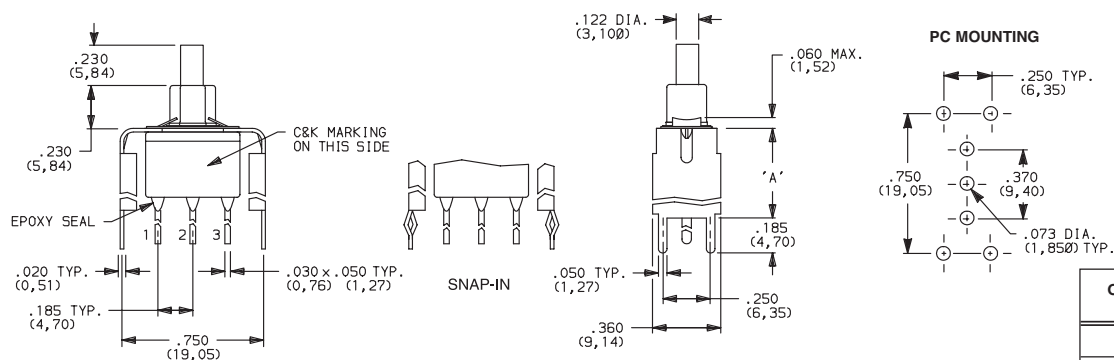
**E112SD1_BE
SPDT**

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)
V91	1.150 (29,21)

NOTE: Available with D1 bushing only.

V6, V8 VERTICAL MOUNT, V-BRACKET

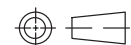
V81 VERTICAL MOUNT, V-BRACKET, SNAP-IN



**E112SD1_BE
SPDT**

OPTION CODE	DIM 'A'
V6	.460 (11,68)
V8, V81	.953 (24,21)

NOTE: Available with D1 bushing only.



Third Angle
Projection

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

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A

Pushbutton



A

Pushbutton

E010 Series Sealed Momentary Pushbutton Switches

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	4 AMPS @ 125 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 4 AMPS @ 125 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: Coin silver, with gold plate over nickel plate.

⁴ END CONTACTS: Coin silver, silver plated.

⁵ CENTER CONTACTS & ALL TERMINALS: Copper alloy, silver plated.

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

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

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

B contact material standard with all terminations except C, Z.

B contact material must be ordered with R2 terminations.

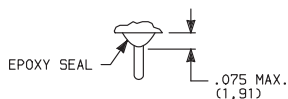
Q contact material standard with C, Z terminations.

P contact materials not available with Z terminations.

SEAL

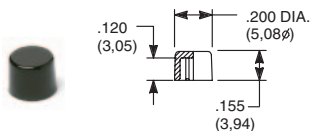


E EPOXY SEAL



AVAILABLE HARDWARE

Cap

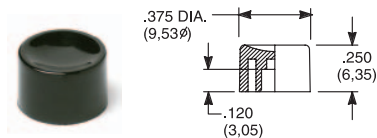


PART NO.

708901000 WHITE
708902000 BLACK
708903000 RED

Material: Nylon
Finish: Gloss

Cap

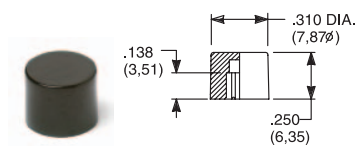


PART NO.

752701000 WHITE
752702000 BLACK
752703000 RED

Material: Nylon
Finish: Gloss

Cap

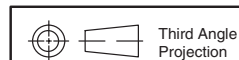


PART NO.

801801000 WHITE
801802000 BLACK
801803000 RED

Material: Nylon
Finish: Gloss

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



Third Angle
Projection

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

C&K

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E010 Series Sealed Momentary Pushbutton Switches

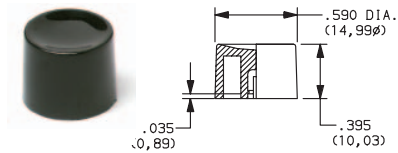


A

Pushbutton

AVAILABLE HARDWARE

Cap, Snap-fitting plunger

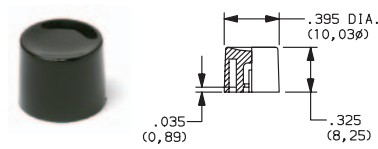


PART NO.

894001000 WHITE
894002000 BLACK
894003000 RED

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

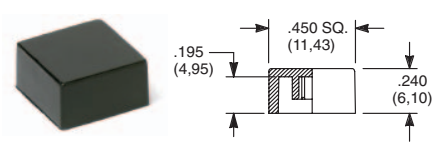


PART NO.

894101000 WHITE
894102000 BLACK
894103000 RED

Material: Nylon
Finish: Gloss

Cap



PART NO.

484601000 WHITE
484602000 BLACK
484603000 RED

Material: Nylon
Finish: Gloss

PART NO.

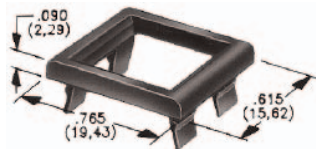
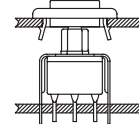
798201000 WHITE
798202263 BLACK
798203000 RED

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.

432501000
432502263
432503000

PART NO.

432601000
432602263
432603000

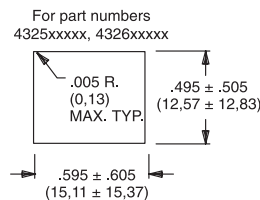
PART NO.

432701000
432702263
432703000

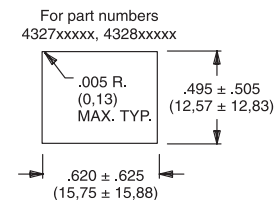
PART NO.

432801000 WHITE
432802263 BLACK
432803000 RED

PANEL MOUNTING



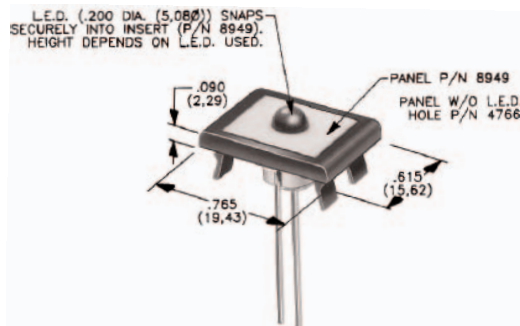
For part numbers
4325xxxxx, 4326xxxxx



For part numbers
4327xxxxx, 4328xxxxx

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

PART NO.

894901000
894902000
894903000

BLANK PANEL INSERT
WITHOUT HOLE FOR LED

PART NO.

476601000 WHITE
476602000 BLACK
476603000 RED

Special colors, custom markings available, consult Customer Service Center.



Third Angle
Projection

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

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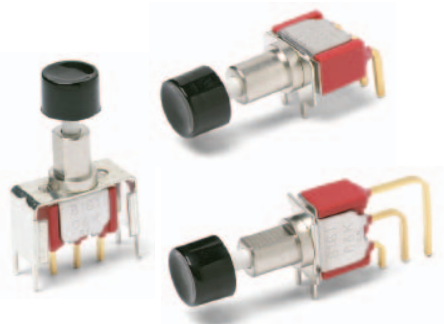


A

Pushbutton

8060 Series

Alternate Action and Momentary Pushbutton Switches



Features/Benefits

- Long travel
- Available with LED
- Long life contact design
- Epoxy terminal seal compatible with bottom wash cleaning
- RoHS compliant models available

Typical Applications

- Instrumentation
- Computers and peripherals
- Telecommunications and networking equipment



Models Available

Specifications

CONTACT RATING: Q contact material: 6 AMPS @ 120 V AC or 28 V DC; 3 AMPS @ 250 V AC. See page A-59 for additional ratings.

ELECTRICAL LIFE: 50,000 make-and-break cycles at full load.

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

INSULATION RESISTANCE: 10⁹Ω min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 65°C

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

CAP INSTALLATION FORCE: 10 lbs. maximum permissible.

NOTE: Any models supplied with P, R, S, Q, B 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 6/6 or diallyl phthalate (DAP), flame retardant (UL 94V-0).

PLUNGER: S, S1, S2 Options: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0). L, L1 Options: Brass, nickel plated.

CAP & FRAME: Nylon, black standard.

BUSHING: Brass or zinc, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass or steel, matte-tin plated.

END CONTACTS: Q contact material: Coin silver, silver plated. See page A-59 for additional contact materials.

CENTER CONTACT & ALL TERMINALS: Q contact material: Copper alloy, silver plated. See page A-59 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-53 thru A-61. 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

- 8161** SPDT On-On
8168 SPDT On-Mom.
8261 DPDT On-On

Actuator or Plunger

- S** .710" high plunger with .375" dia. cap
J80 Snap-in
J81 Snap-in with frame
J82 Snap-in with frame for LED
J86 Snap-in with frame & LED
L .740" high plunger with .395" dia. cap
L1 .740" high plunger with .590" dia. cap
S1 .615" high plunger with .200" dia. cap
S2 .710" high plunger with .310" dia. cap

Bushing

- H** .300" high, flat, hi torque
H9 .300" high, flat, hi torque
NONE No bushing choice required
Y3 7.6mm, keyway

Terminations

- A** Right angle, PC thru-hole
AV2 Vertical right angle, PC thru-hole
C PC Thru-hole
Z Solder lug
A3 Right angle, snap-in, PC thru-hole
AV3 Vertical right angle, snap-in, PC thru-hole
V3 .460" high, V-bracket
V4 .630" high, V-bracket
V6 .460" high, V-bracket
V21 .555" high, snap-in V-bracket
V31 .460" high, snap-in V-bracket
W .750" long, wire wrap
Z3 Quick connect

Contact Material

- B** Gold
P Gold, matte-tin
Q Silver
S Silver, matte-tin
G Gold over silver
R Gold over silver, matte-tin

Seal

- E** Epoxy
I Epoxy potted base

Cap Color

- 2** Black
1 White
3 Red
4 Orange
5 Yellow
9 Gray

Frame Color

- 2** Black

LED Color

- 3** Red
NONE Models without LED



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

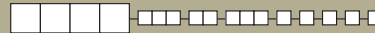
8060 Series Alternate Action and Momentary Pushbutton Switches





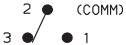


A

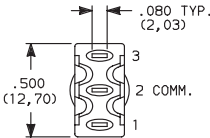
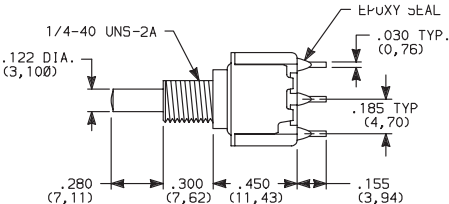
Pushbutton

SWITCH FUNCTION

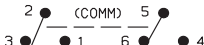


NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
						
		C&K marking this side		C&K marking this side		
SP	8161 8168	ON	ON	2-3	2-1	
		ON	MOM.	2-3	2-1	
SPDT						

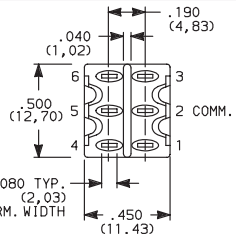
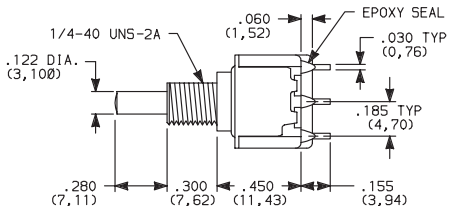
SPDT



Terminal Nos.
For Reference Only

DP	8261	ON	ON	2-3,5-6	2-1,5-4	
DPDT						

DPDT

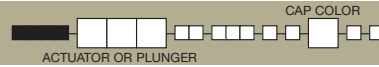


Terminal Nos.
For Reference Only

MOM. = Momentary

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

ACTUATOR—SNAP-IN FRONT MOUNT



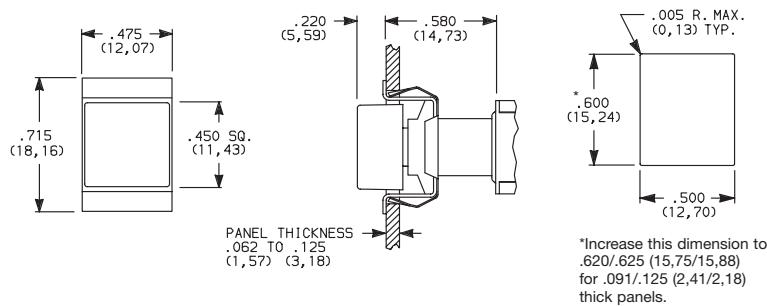
OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

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

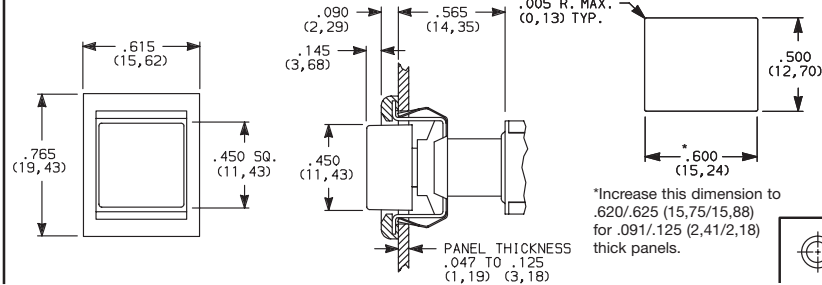
Available with C, W, Z or Z3 terminations.

NOTE: Caps & frames available separately, see pages A-60 and A-61.

J80 SNAP-IN



J81 SNAP-IN WITH BLACK FRAME



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



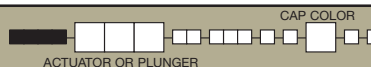
A

Pushbutton

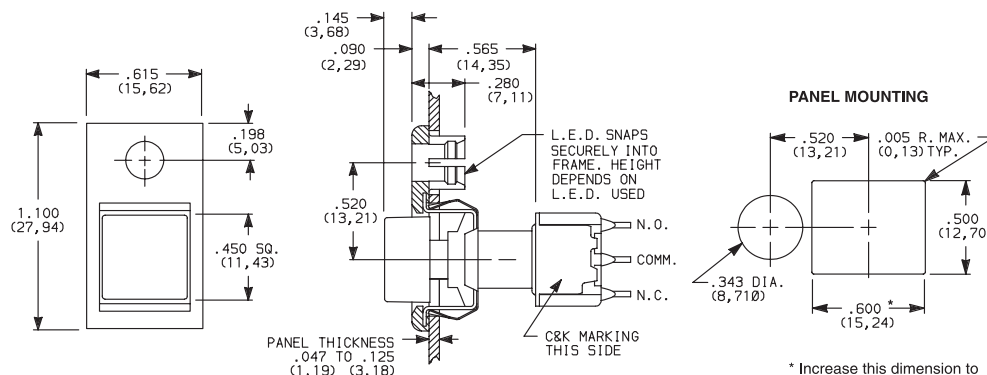
8060 Series

Alternate Action and Momentary Pushbutton Switches

ACTUATOR—SNAP-IN FRONT MOUNT



J82 SNAP-IN WITH BLACK FRAME FOR LED



Available with C, W, Z or Z3 terminations.

LED not included.

For LED information, see page A-61.

NOTE: Caps & frames available separately, see pages A-60 and A-61.

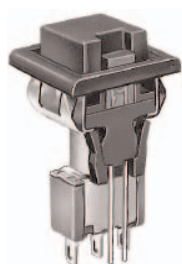
Other colors available, consult Customer Service Center.

OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

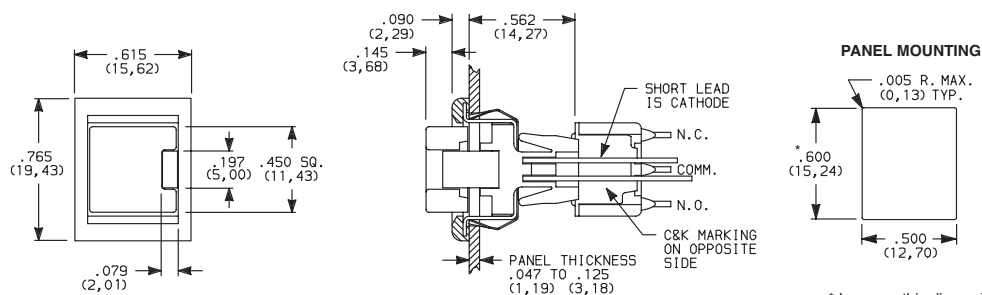
ACTUATOR—SNAP-IN FRONT MOUNT



J86 SNAP-IN WITH BLACK FRAME AND LED



8161J86ZQE223
SPDT



* Increase this dimension to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thick panels.

Available with C, W, Z or Z3 terminations and SPDT models only.

NOTE: Caps & frames available separately, see pages A-60 and A-61.

Other colors available, consult Customer Service Center.

OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

OPTION CODE	LED COLOR
3	RED

For LED information, see page A-61.



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

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C&K

8060 Series Alternate Action and Momentary Pushbutton Switches



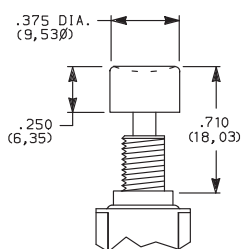
A

Pushbutton

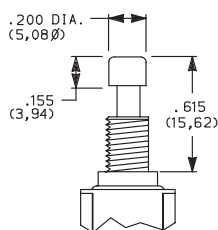
PLUNGER



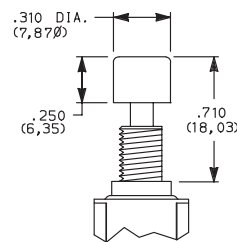
S PLUNGER WITH CAP P/N 7527



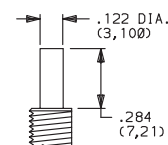
S1 PLUNGER WITH CAP P/N 7089



S2 PLUNGER WITH CAP P/N 8018

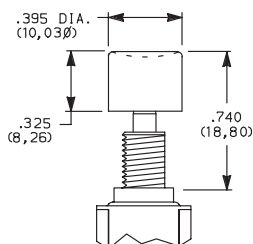


S, S1, S2 plunger dimensions.

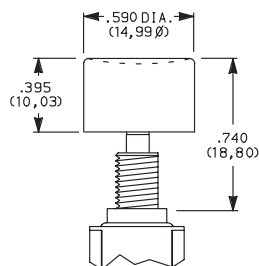


Plunger material: Glass filled nylon or glass filled polyester (UL 94V-0).

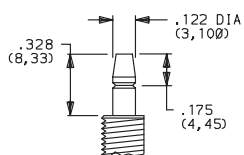
L PLUNGER WITH CAP P/N 8941



L1 PLUNGER WITH CAP P/N 8940



L, L1 plunger dimensions.



Plunger Material: Brass, chrome plated.

OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

Cap Finish: gloss. Cap supplied not installed. Other colors available, consult Customer Service Center.

NOTE: When selecting plunger and cap option, bushing selection must also be made, see below.

BUSHING



H .300" HIGH THREADED, FLAT

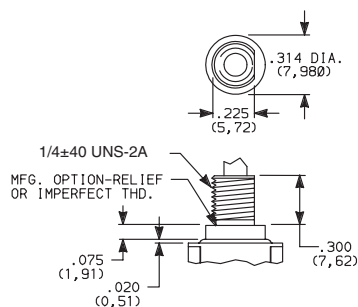
H9 .300" HIGH UNTHREADED, FLAT

NONE

NO BUSHING CHOICE REQUIRED
(JXX ACTUATORS)

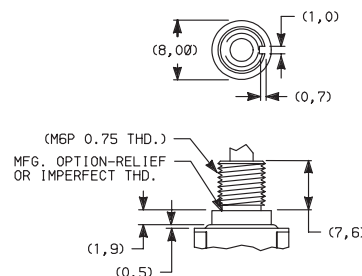
Y3

7.6mm THREADED, KEYWAY



H bushing standard with C, W, Z or Z3 terminations.
H9 bushing standard with A, A3, AV2, AV3, or V3-V31 terminations.

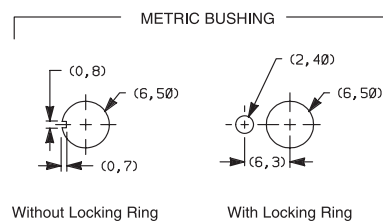
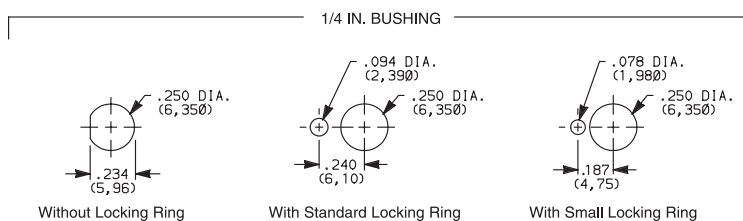
Withstands 12 in./lbs. of torque with no distortion.



Withstands 12 in./lbs. of torque with no distortion.

NOTE: When selecting bushing option, plunger selection must also be made, see above. No bushing option choice required when any JXX actuator option is selected.

PANEL MOUNTING



NOTE. Two mounting nuts, locking ring and lockwasher supplied standard with threaded bushings. Optional mounting nut and locking ring styles and finishes available, see section "Technical Data and Additional Hardware".



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





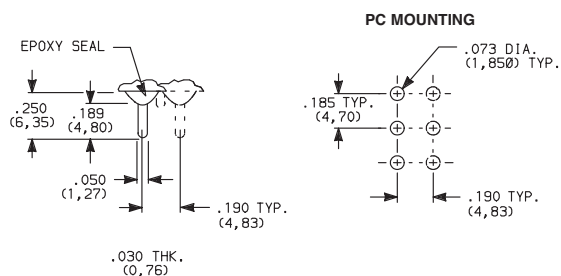
8060 Series

Alternate Action and Momentary Pushbutton Switches

TERMINATIONS

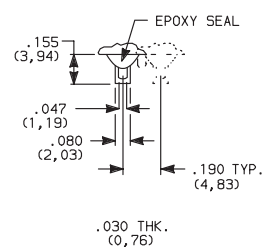


C PC THRU-HOLE



SPDT and DPDT

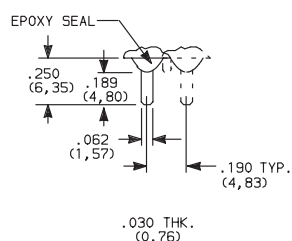
Z SOLDER LUG



SPDT and DPDT

Not available with P, S or R contact material.

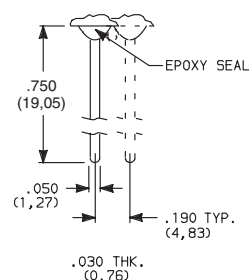
Z3 QUICK CONNECT



SPDT and DPDT

Not available with P, S or R contact material.
Mating quick connector available;
order part number 530100000, page A-61.

W WIRE WRAP

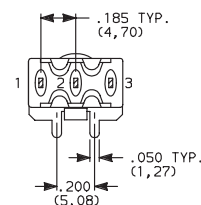
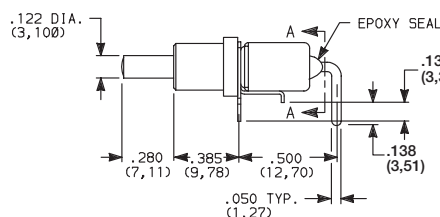
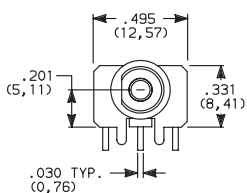


SPDT and DPDT

A RIGHT ANGLE, PC THRU-HOLE

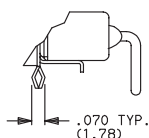
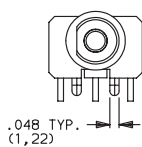


8161SH9ABE2
SPDT

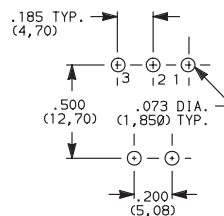


SECTION A-A

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



PC MOUNTING



NOTE: PC pattern must clear switch support leg.

Not available with I seal.
Terminal bend radii and lead-in manufacturing option.



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

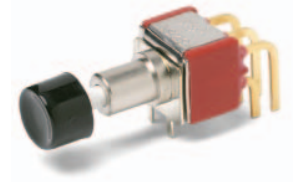
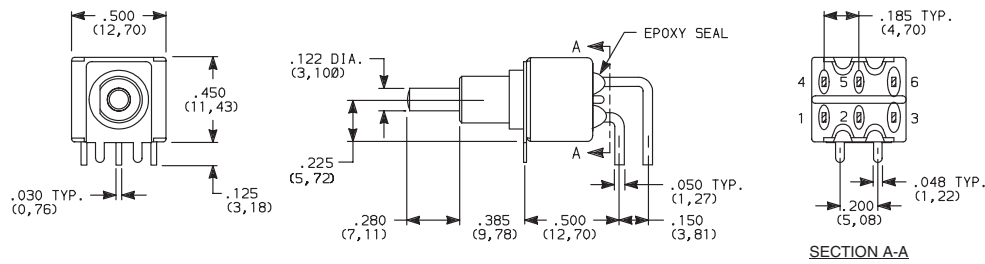


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8060 Series Alternate Action and Momentary Pushbutton Switches

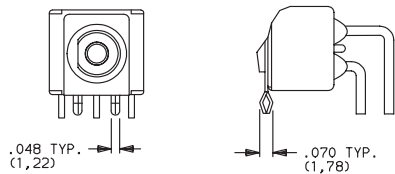
TERMINATIONS

A RIGHT ANGLE, PC THRU-HOLE

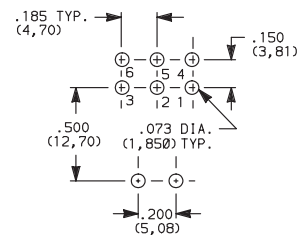


8261SH9ABE2
DPDT

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE

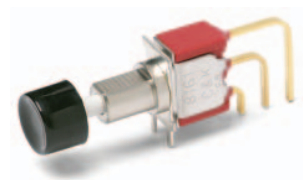
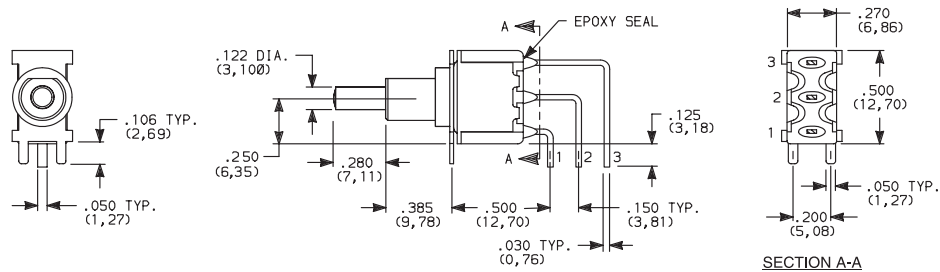


PC MOUNTING



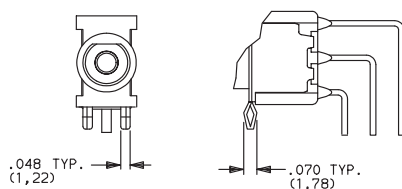
Not available with I seal.
Terminal bend radii and lead-in manufacturing option.

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150° PITCH

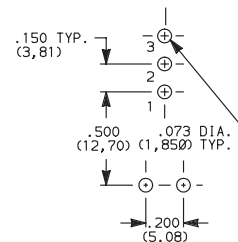


8161SH9AV2BE2
SPDT

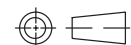
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150° PITCH



PC MOUNTING



Not available with I seal.
Terminal bend radii and lead-in manufacturing option.



Third Angle
Projection



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

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Pushbutton



A

Pushbutton

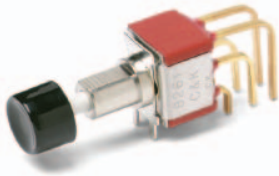
8060 Series

Alternate Action and Momentary Pushbutton Switches

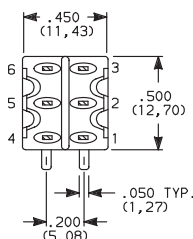
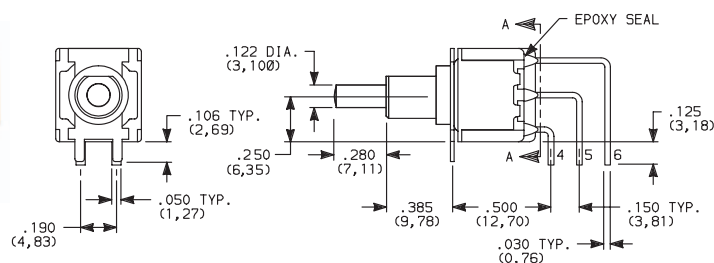
TERMINATIONS



AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

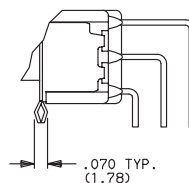
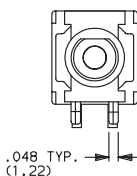


8261SH9AV2BE2
DPDT

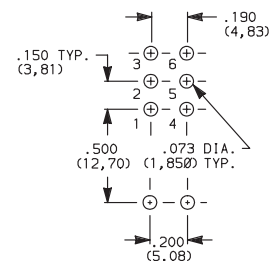


SECTION A-A

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



PC MOUNTING



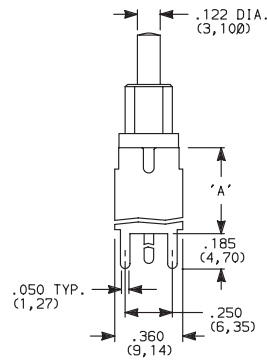
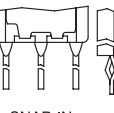
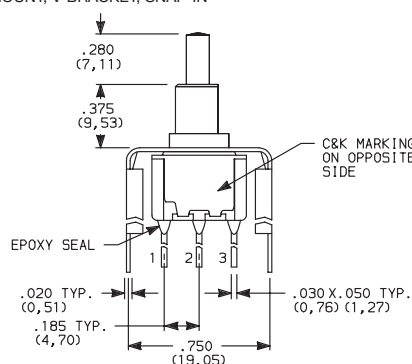
Not available with I seal.
Terminal bend radii and lead-in manufacturing option.

V6 VERTICAL MOUNT, V-BRACKET

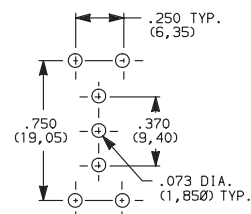
V21 VERTICAL MOUNT, V-BRACKET, SNAP-IN



8161SH9_BE2
SPDT



PC MOUNTING



OPTION CODE	DIM 'A'
V21	.555 (14,10)
V6	.460 (11,68)

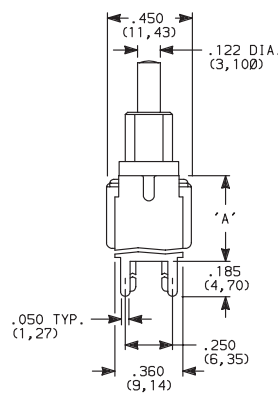
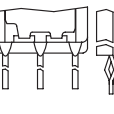
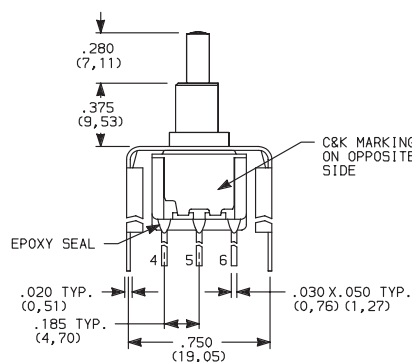
Not available with I seal.

V6 VERTICAL MOUNT, V-BRACKET

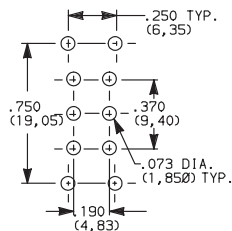
V21 VERTICAL MOUNT, V-BRACKET, SNAP-IN



8261SH9_BE2
DPDT



PC MOUNTING



OPTION CODE	DIM 'A'
V21	.555 (14,10)
V6	.460 (11,68)

Not available with I seal.



Third Angle
Projection

C&K

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

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8060 Series Alternate Action and Momentary Pushbutton Switches



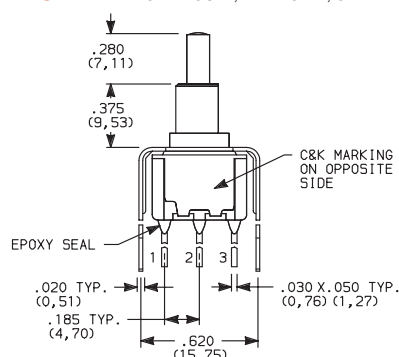
A

Pushbutton

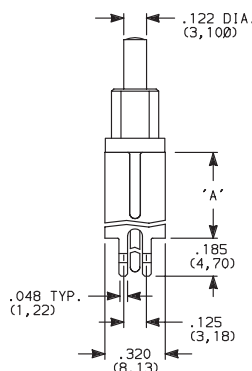
TERMINATIONS

V3, V4 VERTICAL MOUNT, V-BRACKET

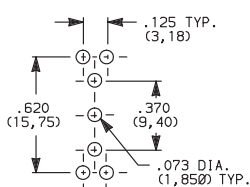
V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN



Not available with I seal.



PC MOUNTING

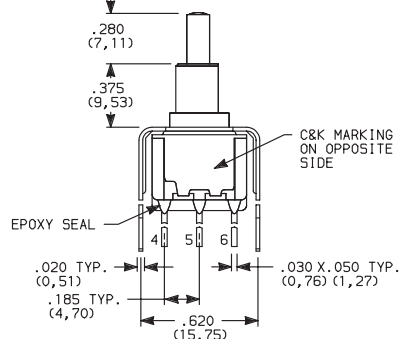


8161SH9_BE2
SPDT

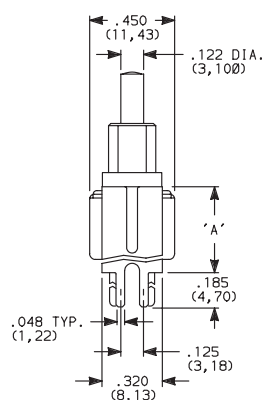
OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)

V3, V4 VERTICAL MOUNT, V-BRACKET

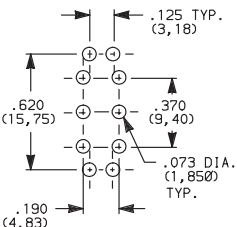
V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN



Not available with I seal.



PC MOUNTING



8261SH9_BE2
DPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)

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	6 AMPS @ 120 V AC OR 28 V DC; 3 AMPS @ 250 V AC.
S		MATTE-TIN ⁶		
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 6 AMPS @ 120 V AC OR 28 V DC; 3 AMPS @ 250 V AC.
R		MATTE-TIN ⁶		

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

- CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
- END CONTACTS: Coin silver, with gold plate over nickel plate.
- CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.
- END CONTACTS: Coin silver, silver plated.
- CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.
- TERMINALS: Copper alloy, with matte-tin over nickel plate.

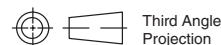
NOTE: Any models supplied with P, S, R, Q, B or G contact material are RoHS compliant.

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

B contact material standard with all terminations except C, Z & Z3.

Q contact material standard with C, Z & Z3 terminations.

P, S & R contact materials not available with Z & Z3 terminations.



Third Angle
Projection



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

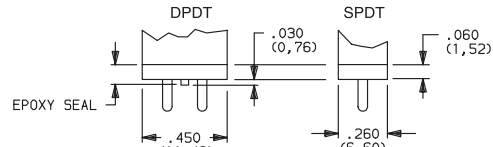
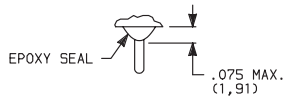
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8060 Series

Alternate Action and Momentary Pushbutton Switches

SEAL

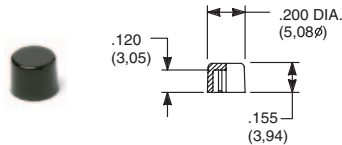
E EPOXY SEAL**I** EPOXY POTTED BASE

LENGTH IS SAME AS SWITCH BODY

NOTE: Available with C, W, Z, Z3 terminations only.

AVAILABLE HARDWARE

Cap

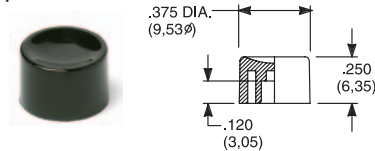


PART NO.

708901000 WHITE
708902000 BLACK
708903000 RED
708904000 ORANGE
708905000 YELLOW
708909000 GRAY

Material: Nylon
Finish: Gloss

Cap

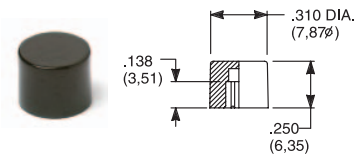


PART NO.

752701000 WHITE
752702000 BLACK
752703000 RED
752704000 ORANGE
752705000 YELLOW
752709000 GRAY

Material: Nylon
Finish: Gloss

Cap

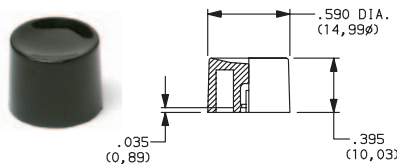


PART NO.

801801000 WHITE
801802000 BLACK
801803000 RED
801804000 ORANGE
801805000 YELLOW
801809000 GRAY

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

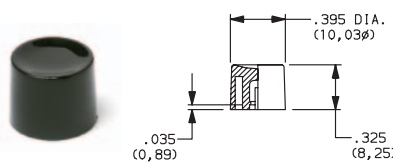


PART NO.

894001000 WHITE
894002000 BLACK
894003000 RED
894004000 ORANGE
894005000 YELLOW
894009000 GRAY

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

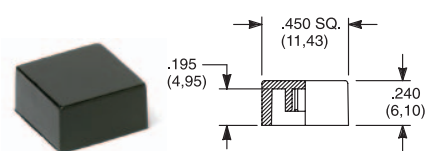


PART NO.

894101000 WHITE
894102000 BLACK
894103000 RED
894104000 ORANGE
894105000 YELLOW
894109000 GRAY

Material: Nylon
Finish: Gloss

Cap, J80, J81 & J82 options only



PART NO.

484601000 WHITE
484602000 BLACK
484603000 RED
484604000 ORANGE
484605000 YELLOW
484609000 GRAY

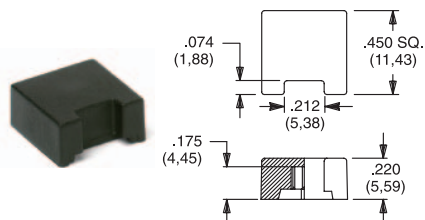
Material: Nylon
Finish: Gloss

PART NO.

798201000 WHITE
798202263 BLACK
798203000 RED
798204000 ORANGE
798205000 YELLOW
798209000 GRAY

Material: Nylon
Finish: Matte

Cap, J86 & J96 options only



PART NO.

459701000
459702000
459703000
459704000
459705000
459709000

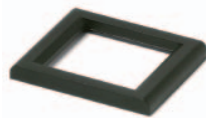
Material: Nylon
Finish: Gloss

PART NO.

476801000 WHITE
476802000 BLACK
476803000 RED
476804000 ORANGE
476805000 YELLOW
476809000 GRAY

Material: Nylon
Finish: Matte

Frame



PART NO.

615602263 BLACK

Material: Nylon
Finish: Matte

Frame

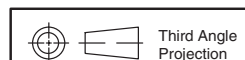


PART NO.

613302263 BLACK

Material: Nylon
Finish: Matte

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



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

www.ck-components.com

8060 Series Alternate Action and Momentary Pushbutton Switches

AVAILABLE HARDWARE

Fits Z3 Termination
female connector

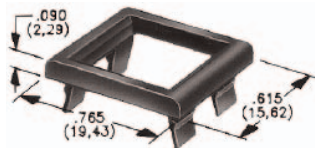
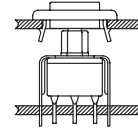
PART NO.
530100000

Available in loose pieces.



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.

PART NO.
432502263

.062" (1,57) PANEL THK.

PART NO.
432602263

.090" (2,29) PANEL THK.

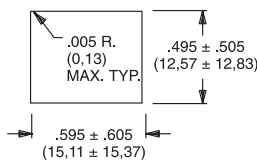
PART NO.
432702263

.125" (3,18) PANEL THK.

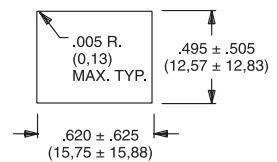
PART NO.
432802263 BLACK

PANEL MOUNTING

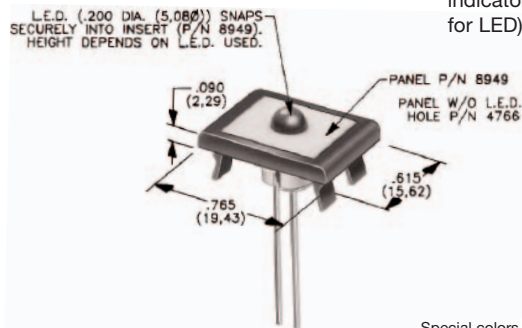
For part numbers
4325xxxxx, 4326xxxxx



For part numbers
4327xxxxx, 4328xxxxx



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

PART NO.
894902000

BLANK PANEL INSERT
WITHOUT HOLE FOR LED

PART NO.
476602000 BLACK

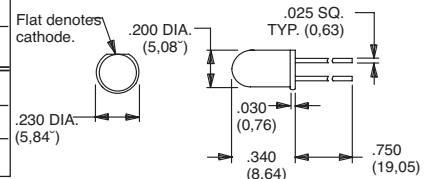
Special colors, custom markings available, consult Customer Service Center.

LED INFORMATION

SWITCHES WITH LED SUPPLIED: J86 OPTION:

Rectangular LEDs are supplied on 8060 Series pushbutton switches with J86 option. These LEDs are factory installed and are not replaceable. The following specifications apply:

OPTION CODE	COLOR	TYP. INTENSITY	TYP. FORWARD VOLTAGE	TYP. FORWARD CURRENT	MAX RATINGS AT 25°C AMBIENT TEMPERATURE		
					FORWARD VOLTAGE	CONTINUOUS FORWARD CURRENT	POWER DISSIPATION
6	Green	1.0 mcd	2.1 V	20 mA	2.5 V	50 mA	125 mW
3	Red*	0.5 mcd		10 mA		30 mA	75 mW
5	Yellow	4.0 mcd		20 mA		50 mA	125 mW



Process Information: Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.

Caution: Circuit elements must limit forward current of LED to 50mA max. continuous.

* Extra-bright red LED available (typ. intensity 4.5 mcd), consult Customer Service Center.

LEDs are not supplied with J82 & J84 options. LED snaps into switch frame surrounding actuator and is wired externally.

Suggested LED for J82 & J84 options.
Dimensions for reference only.



Third Angle
Projection

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



A

Pushbutton



- **Detection**
- **Telecommunications and networking equipment**
- **Computers and peripherals**

Models Available

8500 Series Subminiature Pushbutton Switches



A

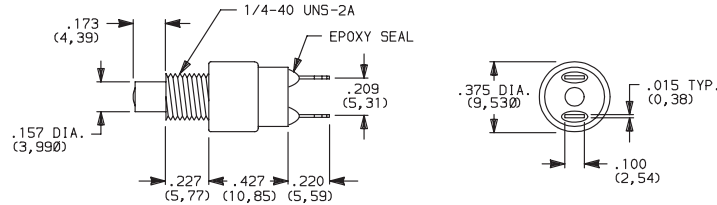
Pushbutton

SWITCH FUNCTION



NO. POLES	MODEL NO.	RATING	SWITCH FUNCTION		TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
			POS. 1	POS. 2			
SP	8531	1 AMP	OFF	MOM.	.095 (2,41) TYP. with overtravel .042 (1,07) TYP.	7.7 oz (220g) TYP.	N.O. with overtravel
	8551	3 AMPS					

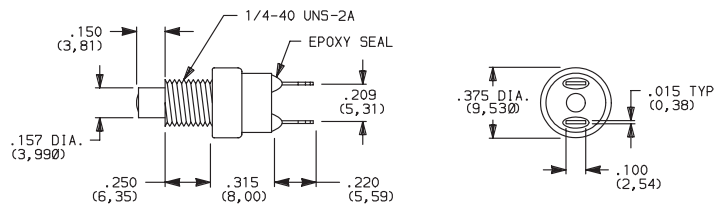
SPST



Part number shown: 8531MZQE2

SP	8532	1 AMP	OFF	MOM.	.050 (1,27) TYP.	6 oz (170g) TYP.	N.O.
	8552	3 AMPS					

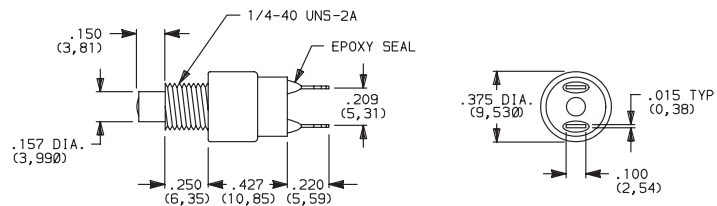
SPST



Part number shown: 8532MZQE2


SP	8533	1 AMP	ON	MOM.	.080 (2,03) TYP. with pretravel .057 (1,45) TYP.	11.5 oz (456 g) TYP.	N.C. with pretravel
	8534	1 AMP			.032 (0,81) TYP. with overtravel .028 (0,71) TYP.	10.3 oz (282g) TYP.	N.C. with overtravel

SPST



Part number shown: 8533MZQE2

MOM. = Momentary

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



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

www.ck-components.com

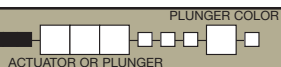


A

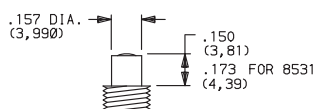
Pushbutton

8500 Series Subminiature Pushbutton Switches

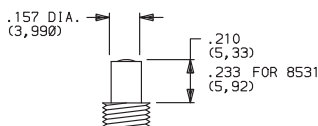
PLUNGER



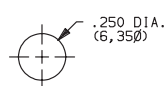
M .150" HIGH PLUNGER



S .210" HIGH PLUNGER



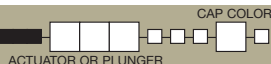
PANEL MOUNTING



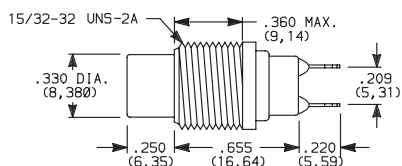
OPTION CODE	PLUNGER COLOR
2	BLACK
3	RED

NOTE: One mounting nut and lockwasher supplied with all actuators (except T actuator: two nuts supplied).

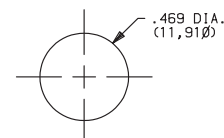
ACTUATOR



T 15/32 BUSHING



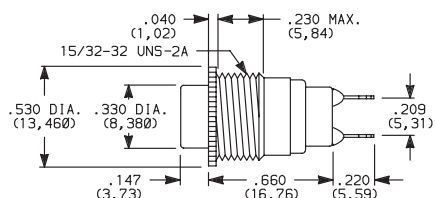
PANEL MOUNTING



OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
9	GRAY

NOTE: No frame color choice required.

T1 15/32 BUSHING WITH FRAME



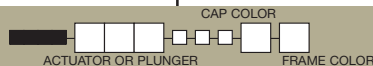
NOTE: No frame color choice required.
Available with 8532 and 8534 models only.

Cap Finish: gloss. Other colors available, consult Customer Service Center.

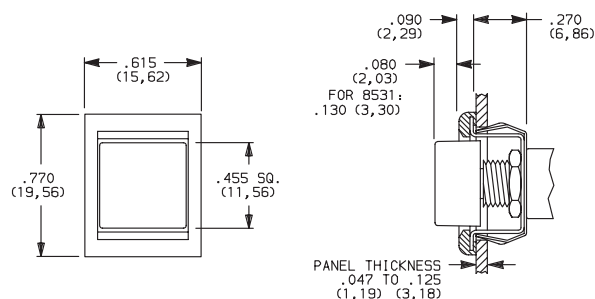
One mounting nut and lockwasher supplied with all actuators (except T actuator: two nuts supplied).

NOTE: Caps available for plunger options, see page A-65.

ACTUATOR—SNAP-IN FRONT MOUNT



J81 SNAP-IN WITH FRAME



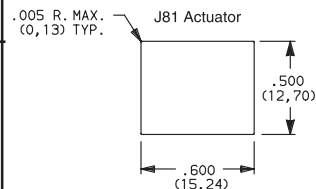
OPTION CODE	CAP AND FRAME COLOR
2	BLACK

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

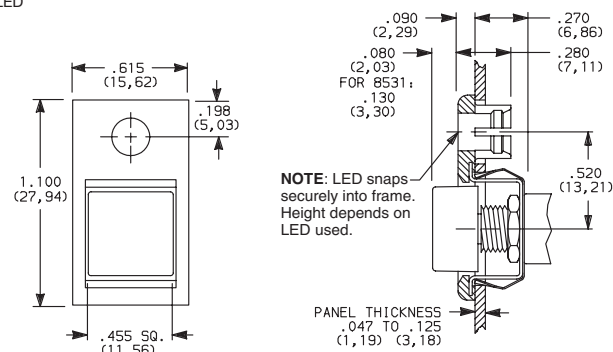
One mounting nut and lockwasher supplied with all actuators.

NOTE: Caps & frames available separately, see pages A-65 and A-66.

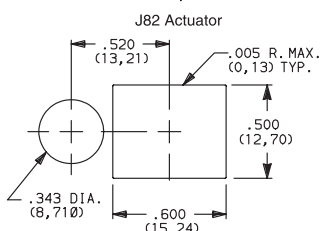
PANEL MOUNTING



J82 SNAP-IN WITH FRAME FOR LED



NOTE: LED snaps securely into frame. Height depends on LED used.



LED not included.
For LED information, see page A-66.



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

www.ck-components.com

C&K

8500 Series Subminiature Pushbutton Switches

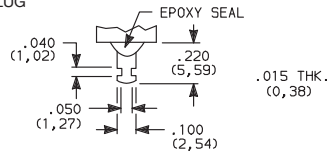


A

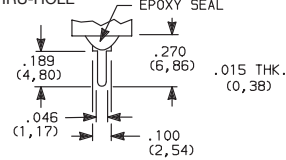
Pushbutton

TERMINATIONS

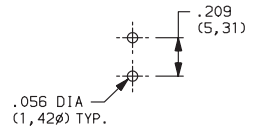
Z SOLDER LUG



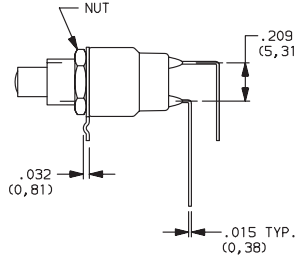
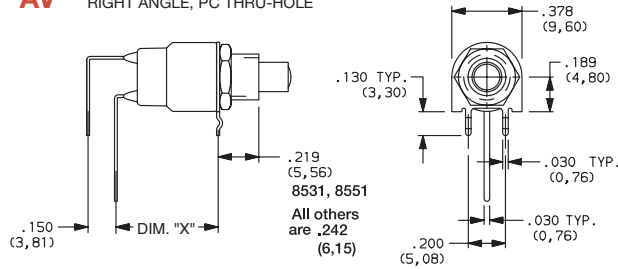
C PC THRU-HOLE



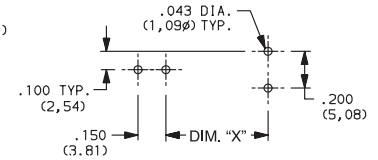
PC MOUNTING



AV RIGHT ANGLE, PC THRU-HOLE



PC MOUNTING



Available with

MODEL NO.	DIM "X"
8531, 8533	0.550
8532, 8534	0.438

NOTE: Available with M or S plunger models, and B contact material only.

CONTACT MATERIAL

OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	TERMINAL PLATING	CONTACT MATERIAL	RATINGS	
B	YES	YES	GOLD ¹	GOLD	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
Q	YES	YES	SILVER ⁴	SILVER ⁵	POWER	853X MODELS: 1 AMP @ 120 V AC OR 28 V DC. 855X MODELS: 3 AMPS @ 120 V AC OR 28 V DC.
G	YES	YES	GOLD OVER SILVER ²	GOLD ³	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 V MAX @20 V AC OR DC MAX. OR 853X MODELS: 1 AMP @ 120 V AC OR 28 V DC. 855X MODELS: 3 AMPS @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 CONTACTS: Coin silver, with gold plate over nickel plate.

³ TERMINALS: Copper alloy, with gold plate over nickel plate.

⁴ CONTACTS: Coin silver, silver plated.

⁵ TERMINALS: Copper alloy, silver plated.

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

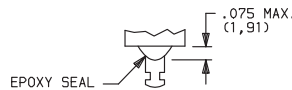
All models  with all options when ordered with G or Q contact material.

Q contact material standard with C, Z terminations.

8551 & 8552 available with Q contact material only.

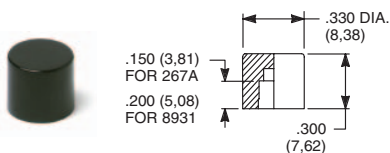
SEAL

E EPOXY SEAL



REPLACEMENT HARDWARE

Cap for 0.157" dia. plungers



PART NO.

267A01000 WHITE
267A02000 BLACK
267A03000 RED
267A09000 GRAY

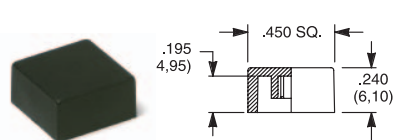
85X2T, 8534T
models only
Material: Nylon
Finish: Gloss

PART NO.

893101000 WHITE
893102000 BLACK
893103000 RED
893109000 GRAY

85X1T, 8532T1,
8533T, 8534T1 models only
Material: Nylon
Finish: Gloss

Cap, J80, J81 & J 82 options only



PART NO.

448901000 WHITE
448902000 BLACK
448903000 RED
448909000 GRAY

Material: Nylon
Finish: Gloss or matte

Frame



PART NO.

613302263 BLACK

Material: Nylon
Finish: Matte



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

www.ck-components.com



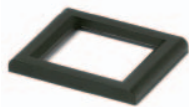
Other colors available, consult Customer Service Center.



8500 Series Subminiature Pushbutton Switches

AVAILABLE HARDWARE

Frame



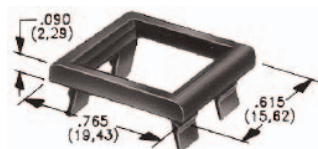
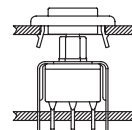
PART NO.
615602263 BLACK

Material: Nylon
Finish: Matte

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".
Other 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.

PART NO.
432502263

.062" (1,57) PANEL THK.

PART NO.
432602263

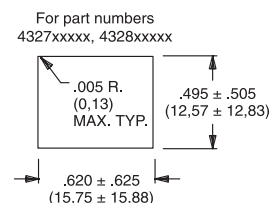
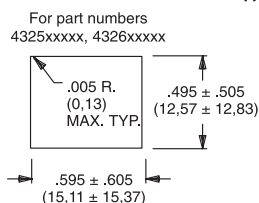
.090" (2,29) PANEL THK.

PART NO.
432702263

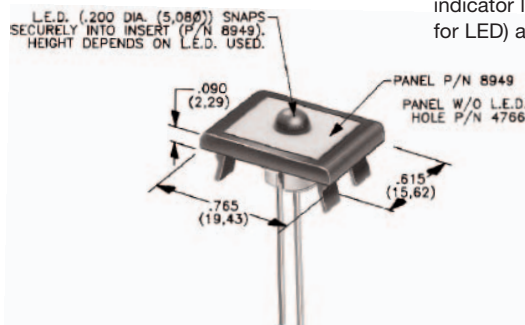
.125" (3,18) PANEL THK.

PART NO.
432802263 BLACK

PANEL MOUNTING



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

PART NO.
894902000

BLANK PANEL INSERT
WITHOUT HOLE FOR LED

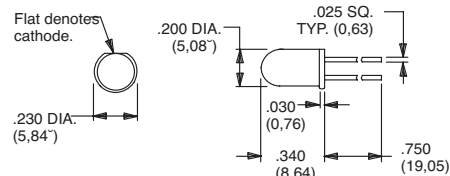
PART NO.
476602000 BLACK

Special colors, custom markings available, consult Customer Service Center.

LED INFORMATION

Process Information: Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.

LEDs are not supplied with J82 option. LED snaps into switch frame surrounding actuator and is wired externally.



Suggested LED for J82 option.
Dimensions for reference only.

KM Series Subminiature Pushbutton Switches



A

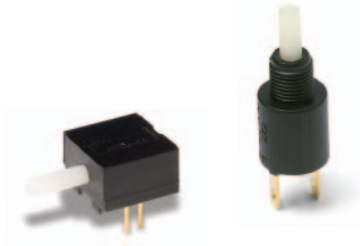
Pushbutton

Features/Benefits

- **Reliable contact design**
- **Available with pretravel and overtravel**
- **Extended overtravel option**
- **RoHS compliant**

Typical Applications

- **Alarm systems**
- **Computers**
- **Detector switch application**



Models Available

Specifications

CONTACT RATING: Q contact material (KM11, KM12 Models): 0.25 AMPS @ 125 V AC or DC (UL); (KM33 Model): 1 AMP @ 125 V AC or 28 V DC. See page A-69 for additional ratings.

ELECTRICAL LIFE: 10,000 actuations min. at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10⁹Ω min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 85°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

NOTE: Any models supplied with Q or B 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

HOUSING & BUSHING: 6/6 nylon (UL94V-2), black.

ACTUATOR: 6/6 nylon (UL 94V-2), natural. Internal o-ring seal, available on KM11 & KM33 models.

MOVABLE CONTACT: B contact material: Bronze or copper, with gold plate over nickel plate. See page A-69 for additional contact materials.

STATIONARY CONTACTS & TERMINALS: B contact material: Copper, with gold plate over nickel plate. See page A-69 for additional contact materials.

RETURN SPRING: Music wire, phosphor coated.

MOUNTING NUT: Brass, nickel plated.

TERMINAL SEAL: Epoxy.

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-68 and A-70. For additional options not shown in catalog, consult Customer Service Center.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Switch Function						
KM12 On-Mom., SPDT KM11 Off-Mom., SPST, N.O. KM33 On-Mom., SPST, N.C.						
Actuator						
02 .398" high, .122" dia. KM12 01 .122" dia. KM11, Stepped, .108" dia. KM33						
Bushing/Mounting Style						
A Right angle RR 1/4-40 thread, .225" high						
Terminations						
05 .110" quick connect 08 Right angle, PC thru-hole 02 PC Thru-hole						
Contact Material						
B Gold Q Silver						
Seal						
NONE No seal E Epoxy						



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

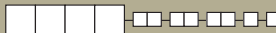


A

Pushbutton

KM Series Subminiature Pushbutton Switches

SWITCH FUNCTION

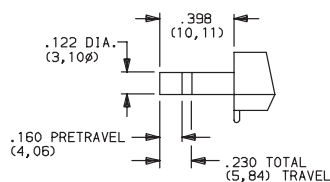


NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
SP	KM11	OFF	MOM.	OPEN	2-1	SPST N.O.
	KM33	ON	MOM.	2-1	OPEN	SPST N.C.
SPST <p>Part number shown: KM1101RR05BE</p>						
SP	KM12	ON	MOM.	2-1	4-3	SPDT
SPDT <p>Part number shown: KM1202A08BE</p>						

ACTUATOR

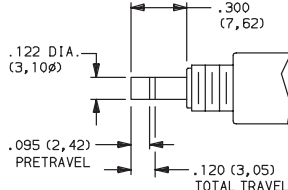


02 .398" HIGH, .122" DIA.

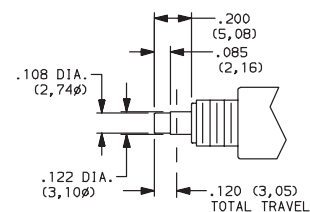


KM12 models only.

01 .122" DIA.



KM11 models only.



KM33 models only.

NOTE: Caps available for plunger options, see page A-70.



Third Angle
Projection

C&K

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

www.ck-components.com

KM Series Subminiature Pushbutton Switches



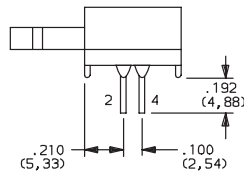
A

Pushbutton

BUSHING/ MOUNTING STYLE

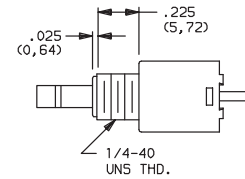


A RIGHT ANGLE



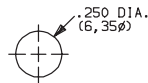
KM12 models only.

RR 1/4-40 THREAD, .225" HIGH



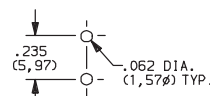
KM11 & KM33 models only.

PANEL MOUNTING

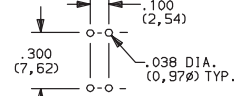


KM11 & KM33 models.

PC MOUNTING



KM11 models only.

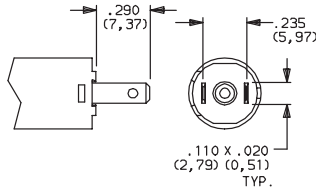


KM12 models only.

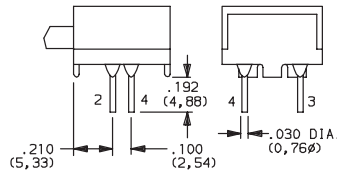
TERMINATIONS



05 .110" QUICK CONNECT

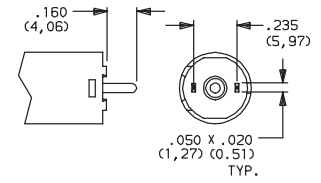


08 RIGHT ANGLE, PC THRU-HOLE



KM12 models only.

02 PC THRU-HOLE



KM11 models only.

CONTACT MATERIAL



OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT AND TERMINAL MATERIAL	RATINGS	
B	YES	YES	GOLD ¹	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
Q	YES	YES	SILVER ²	POWER	0.25 AMPS @ 125 V AC OR DC (KM11, KM12) (UL) 1 AMP @ 125 V AC OR 28 V DC (KM33).


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

¹ STATIONARY CONTACTS & TERMINALS: Copper, with gold plate over nickel plate.
MOVABLE CONTACT: Phosphor bronze or beryllium copper, with gold plate over nickel plate.

² STATIONARY CONTACTS & TERMINALS: Copper, silver plated (standard with all termination options).
MOVABLE CONTACT: Phosphor bronze or beryllium copper, silver plated.

³ STATIONARY CONTACTS & TERMINALS: Copper, with gold plate over nickel plate over silver plate.
MOVABLE CONTACT: Phosphor bronze or beryllium copper, with gold plate over nickel plate over silver plate.

NOTE: Any models supplied with Q or B contact material are RoHS compliant.

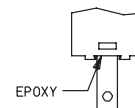
KM11, KM12 models  when ordered with 'Q' contact material.

SEAL



NONE NO SEAL

E EPOXY SEAL



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



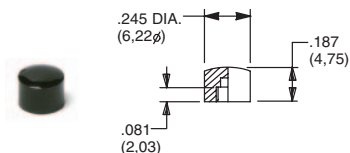
www.ck-components.com



KM Series Subminiature Pushbutton Switches

AVAILABLE HARDWARE

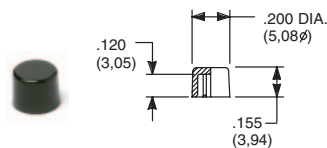
Cap, KM33 models

**PART NO.**

785101000 WHITE
785102000 BLACK
785103000 RED

Material: Nylon
Finish: Gloss

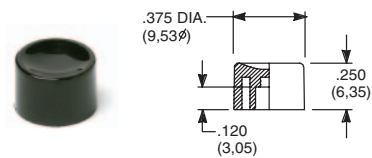
Cap, KM11 models

**PART NO.**

708901000 WHITE
708902000 BLACK
708903000 RED

Material: Nylon
Finish: Gloss

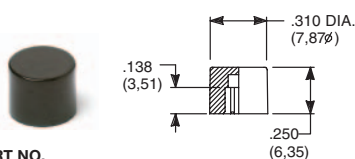
Cap, KM11 models

**PART NO.**

752701000 WHITE
752702000 BLACK
752703000 RED

Material: Nylon
Finish: Gloss

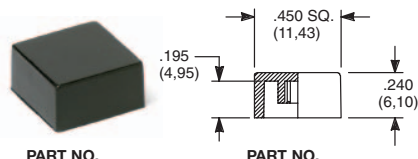
Cap, KM11 models

**PART NO.**

801801000 WHITE
801802000 BLACK
801803000 RED

Material: Nylon
Finish: Gloss

Cap, KM11 models

**PART NO.**

484601000 WHITE
484602000 BLACK
484603000 RED

Material: Nylon
Finish: Gloss

PART NO.

798201000 WHITE
798202263 BLACK
798203000 RED

Material: Nylon
Finish: Matte

NOTE: Other cap colors available, consult Customer Service Center.

8600 Series Microminiature Pushbutton Switches



A

Pushbutton

Features/Benefits

- Available with overtravel
- Normally closed models available
- Microminiature size ideal for applications where space is limited
- RoHS compliant

Typical Applications

- Detection
- Telecommunications and networking equipment
- Computers and peripherals



Models Available

Specifications

CONTACT RATING: Q contact material (8631, 8632 Models): 500 mA @ 120 V AC or 28 V DC; 250 mA @ 250 V AC; (8633 Model): 250 mA @ 120 V AC or 28 V DC; 125 mA @ 250 V AC. See page A-73 for additional ratings.

ELECTRICAL LIFE:
8631 and 8633 MODELS: 250,000 actuations at full load.
8632 MODEL: 100,000 actuations at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 109 Ω min.

DIELECTRIC STRENGTH: 500 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 65°C.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9.

Materials

CASE: Glass filled phenolic or diallyl phthalate (DAP), (UL94V-0).

PLUNGER: Glass filled nylon (UL94V-0), black standard.

BUSHING: Brass, nickel plated.

CONTACTS: Q contact material: Coin silver, silver plated.
See page A-73 for additional contact materials.

TERMINALS:
8631, 8632 MODELS: Copper alloy, silver plated.
8633 MODEL: Q contact material: Coin silver.
See page A-73 for additional contact materials.

TERMINAL SEAL:
8633 MODEL: Epoxy.
8631, 8632 MODELS: Terminals insert molded.

HARDWARE: Nut: Brass, nickel plated.

NOTE: Any models supplied with Q, B 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.

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-72 and A-73. For additional options not shown in catalog, consult Customer Service Center.

<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> </div>			
Switch Function 8631 SPST Off-Mom. 8632 SPST Off-Mom. 8633 SPST On-Mom.	Termination Z Solder lug C PC Thru-hole	Contact Material B Gold Q Silver G Gold over silver	Seal D No epoxy E Epoxy
Plunger Color 2 Black 3 Red			



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



A

Pushbutton

8600 Series Microminiature Pushbutton Switches

SWITCH FUNCTION



NO. POLES	MODEL NO.	SWITCH FUNCTION		TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
		POS. 1	POS. 2			
SP	8631	OFF	MOM.	.040 (1,02) TYP.	5 oz (140g) TYP.	N.O.
SPST PANEL MOUNTING 						
SP	8632	OFF	MOM.	.106 (2,69) TYP. with overtravel .024 (0,61) TYP.	6.25 oz (177g) TYP.	N.O. with overtravel
SPST PANEL MOUNTING 						
SP	8633	ON	MOM.	.048 (1,22) TYP.	5 oz (140g) TYP.	N.C.
SPST PANEL MOUNTING 						

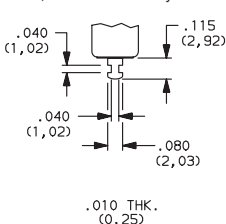
MOM. = Momentary

NOTE: Caps available for plunger options, see page A-73.

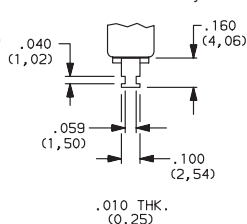
TERMINATIONS

**Z** SOLDER LUG**C** PC THRU-HOLE

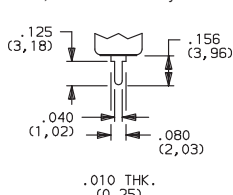
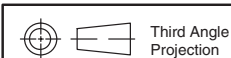
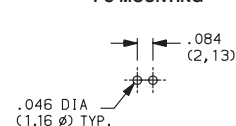
8631, 8632 models only.



8633 models only.



8631, 8632 models only.

**PC MOUNTING**Third Angle
ProjectionDimensions are shown: Inches (mm)
Specifications and dimensions subject to changewww.ck-components.com

8600 Series Microminiature Pushbutton Switches



A

Pushbutton

CONTACT MATERIAL



OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	YES	YES	GOLD ¹	GOLD ¹	LOW LEVEL/ DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
Q	YES	YES	SILVER ⁴	SILVER ⁵	POWER	8631, 8632 MODELS: 500 mA @ 120 V AC OR 28 V DC; 250 mA @ 250 V AC. 8633 MODELS: 250 mA @ 120 V AC OR 28 V DC; 125 mA @ 250 V AC.
G	YES	YES	GOLD OVER SILVER ⁴	GOLD ³	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 8631, 8632 MODELS: 500 mA @ 120 V AC OR 28 V DC; 250 mA @ 250 V AC. 8633 MODELS: 250 mA @ 120 V AC OR 28 V DC; 125 mA @ 250 V AC.

* 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 CONTACTS: Coin silver, with gold plate over nickel plate.

³ TERMINALS: Copper alloy, with gold plate over nickel plate.
8633 model only: Coin silver, with gold plate over nickel plate.

⁴ CONTACTS: Coin silver, silver plated.

⁵ TERMINALS: Copper alloy, silver plated. 8633 model only: coin silver.

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

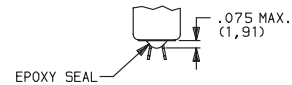
8631, 8632 models  with all options when ordered with G or Q contact material.
Q contact material standard with C, Z terminations.

SEAL



D NO EPOXY SEAL

E EPOXY SEAL



Not available on 8633 model.
Standard on 8631, 8632 models.

Not available on 8631, 8632 models.
Standard on 8633 model only.

PLUNGER COLOR



OPTION CODE	COLOR
2	BLACK
3	RED

AVAILABLE HARDWARE

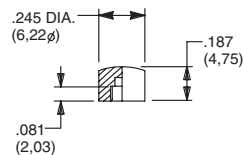
Cap



PART NO.

785101000 WHITE
785102000 BLACK
785103000 RED

Material: Nylon
Finish: Gloss



NOTE: Other cap colors available, consult Customer Service Center.



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



8700 Series

Overtravel Pushbutton Switches



- Features/Benefits**
 - Extended pre-travel or over-travel
 - Heavy-duty brass plunger
 - Long electrical life – 100K cycles
 - RoHS compliant

Typical Applications
 - Telecommunications
 - High end Instrumentation
 - Medical & test equipment
 - Detection

Specifications

CONTACT RATING: Q contact material: 1 AMP @ 120 V AC or 28 V DC. See page A-76 for additional ratings.

ELECTRICAL LIFE: 100,000 actuations at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. Initial @ 2-4 V DC, 100 mA.

INSULATION RESISTANCE: 10³Ω min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 65°C.

NOTE: Any models supplied with Q, or B 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: Diallyl phthalate (DAP) (UL 94V-0).

PLUNGER:
8731 – .390" brass, nickel plated.
8732 – .390" PBT polyester, black.

BUSHING: brass, nickel plated.

CONTACTS: Q contact material: Coin silver, silver plated. See page A-76 for additional contact materials.

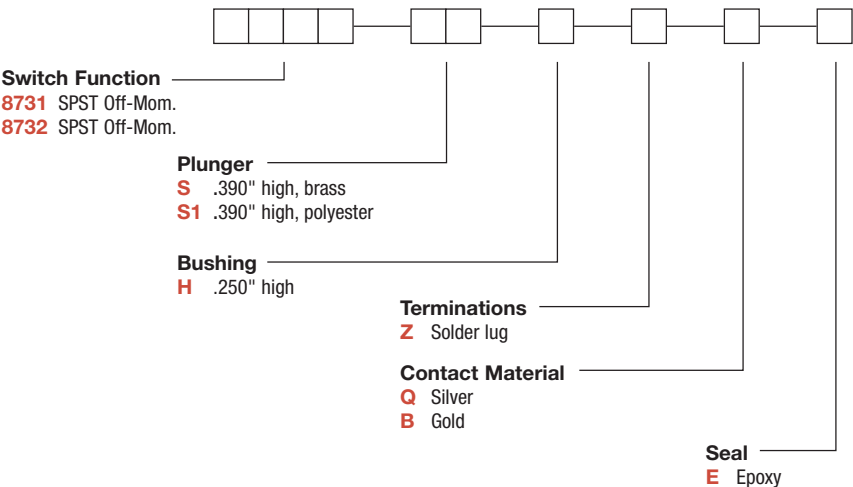
TERMINALS: Q contact material: Copper alloy, silver plated. See page A-76 for additional contact materials.

TERMINAL SEAL: Epoxy.

HARDWARE: Nut: Brass, nickel plated; lockwasher: Steel, bright nickel plate. One mounting nut & lockwasher supplied with all switches.

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-75 and A-76. 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.



8700 Series Overtravel Pushbutton Switches



A

Pushbutton

SWITCH FUNCTION



NO. POLES	MODEL NO.	SWITCH FUNCTION		TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
		POS. 1	POS. 2			
SP	8731	OFF	MOM.	.390 (9,91) TYP. with overtravel .311 TYP.	4.7 oz TYP.	N.O. with overtravel SPST
SPST Part number shown: 8731SHZQE						
SP	8732	OFF	MOM.	.390 (9,91) TYP. with overtravel .350 TYP.	2.2 oz TYP.	N.O. with overtravel SPST
SPST Part number shown: 8732S1HZQE						

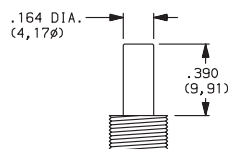
MOM. = Momentary

PLUNGER

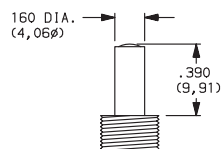


S .390" HIGH, BRASS

S1 .390" HIGH, PBT POLYESTER



Available with 8731 model only.

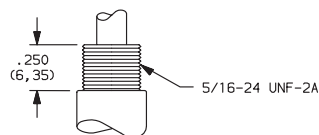


Available with 8732 model only.

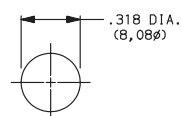
BUSHING



H .250" HIGH



PANEL MOUNTING



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

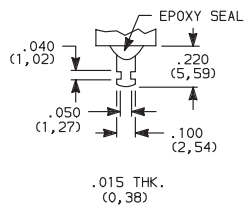
www.ck-components.com

**A**

Pushbutton

8700 Series Overtravel Pushbutton Switches

TERMINATIONS

**Z** SOLDER LUG

CONTACT MATERIAL

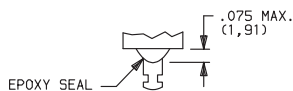


OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
Q	YES	YES	SILVER	SILVER	POWER	1 AMP @ 125 V AC OR 28 V DC.
B	YES	YES	GOLD	GOLD	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.

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

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

SEAL

**E** EPOXY SEALThird Angle
Projection

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

www.ck-components.com

GP Series Sealed Ultraminiature Pushbutton Switches



A

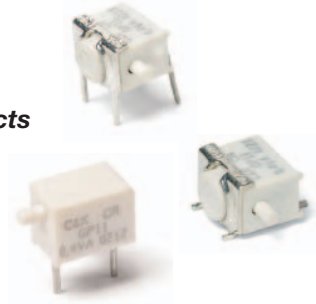
Pushbutton

Features/Benefits

- Ultraminiature design saves space
- Process compatible, withstands most soldering and washing processes
- Thru-hole and surface mount models available
- Sealed construction—internal o-ring and epoxy base
- RoHS compliant

Typical Applications

- Telecommunications and network equipment
- Computers and peripheral products
- Instrumentation
- Medical Applications



Specifications

CONTACT RATING: 0.4 VA max. @ 20 V AC or DC max.

MECHANICAL & ELECTRICAL LIFE: 40,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 50 mΩ typ. initial @ 2-4 V DC, 100 mA.

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

DIELECTRIC STRENGTH: 500 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).

DEGREE OF PROTECTION: IP57; Protection against harmful dust deposit, full-scale voltage protection, temporary immersion.

PACKAGING: Surface mount switches standard in anti-static tape and reel packaging per EIA 481-3, see page A-80 for drawings and reel information. Thru-Hole parts are shipped in trays.

All models are RoHS compliant and compliant.

Materials

HOUSING & BASE: Glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0).

ACTUATOR: Glass filled nylon 4/6, flame retardant (UL 94V-0) with standard internal o-ring seal.

SWITCH SUPPORT: Brass, tin plated.

MOVABLE CONTACT: Copper alloy, with gold plate over nickel plate.

STATIONARY CONTACTS Copper alloy, with gold plate over nickel plate.

TERMINALS: Copper alloy, with gold flash over nickel plate.

TERMINAL SEAL: Epoxy/Urethane. All terminals insert molded.

NOTE: Any models supplied with B contact material are RoHS compliant and compatible.

NOTE: Materials listed above are general specifications. Specifications available for specific and custom switches, consult Customer Service Center.

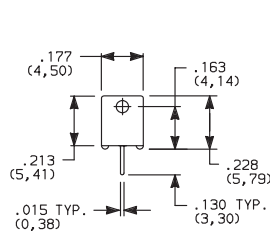
CAUTION: PC mounting layouts and pads as shown are designed to be compatible with the latest equipment and reflow techniques. Care should be taken in the design and location of PC lands to suit individual needs. Orientation relative to reflow direction may significantly impact solder joint integrity.

How To Order

Complete part numbers for GP Series Sealed Ultraminiature Pushbutton Switches are shown on pages A-78 thru A-80.

PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
GP11MCBE	OFF	MOM.	
Conn. Terms.	OPEN	1-3	
GP12MCBE	ON	MOM.	
Conn. Terms.	2-1	2-3	

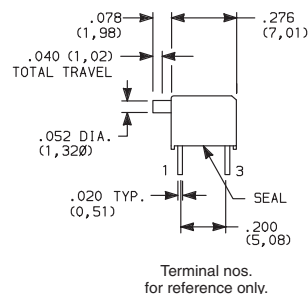
MOM. = Momentary



PC MOUNTING



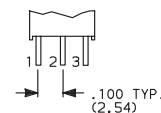
GP11—omit center hole.



Terminal nos. for reference only.



GP11MCBE
SPST



GP12 Model



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

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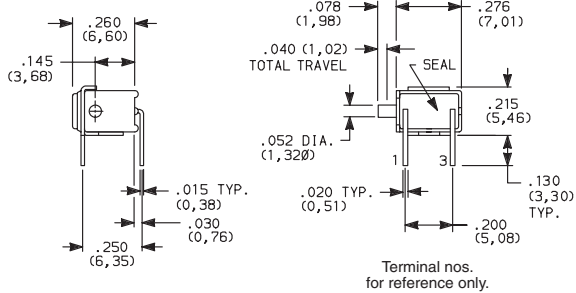
A

Pushbutton

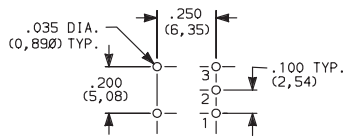
GP Series Sealed Ultraminiature Pushbutton Switches



GP11MABE
SPST

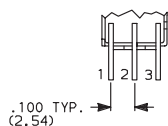


PC MOUNTING



GP11- omit hole 2.

GP12 Model

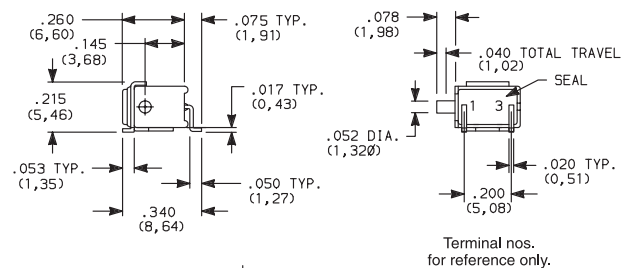


PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
GP11MABE	OFF	MOM.	
Conn. Terms.	OPEN	1-3	
GP12MABE	ON	MOM.	
Conn. Terms.	2-1	2-3	

MOM. = Momentary

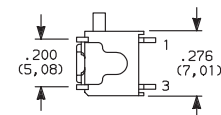


GP11MSABE
SPST



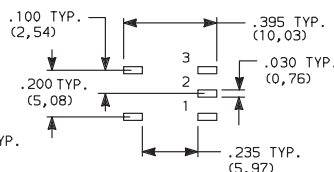
Terminal nos.
for reference only.

PC MOUNTING



GP12 Model

GP11- omit pad 2.

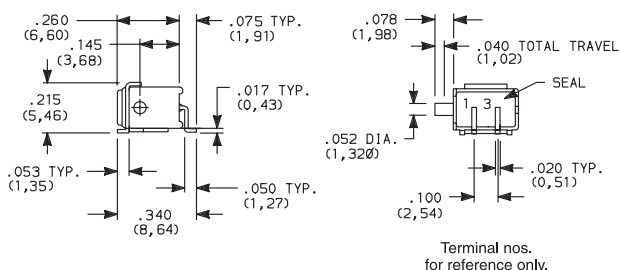


PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
GP11MSABE	OFF	MOM.	
Conn. Terms.	OPEN	1-3	
GP12MSABE	ON	MOM.	
Conn. Terms.	2-1	2-3	

MOM. = Momentary

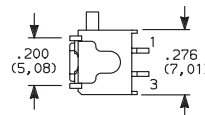


GP11MSA1BE
SPST



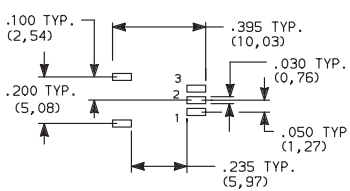
Terminal nos.
for reference only.

PC MOUNTING



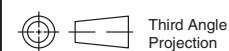
GP12 Model

GP11- omit pad 2.



PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
GP11MSA1BE	OFF	MOM.	
Conn. Terms.	OPEN	1-3	
GP12MSA1BE	ON	MOM.	
Conn. Terms.	2-1	2-3	

MOM. = Momentary



Third Angle
Projection

C&K

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

www.ck-components.com

GP Series Sealed Ultraminiature Pushbutton Switches

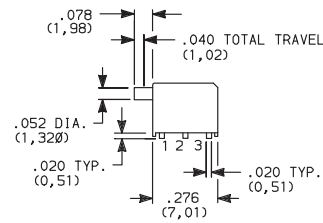
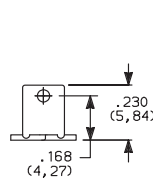


A

Pushbutton

PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
GP12MSCBE	ON	MOM.	
Conn. Terms.	2-1	2-3	

MOM. = Momentary

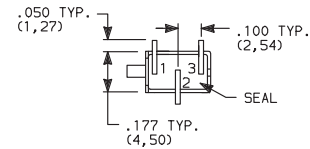
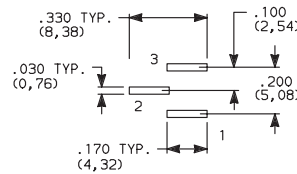


Terminal nos.
for reference only.

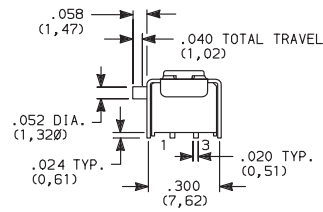
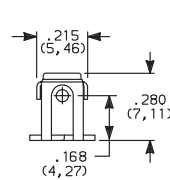


**GP12MSCBE
SPDT**

PC MOUNTING



NOTE: Recommended for infrequent use applications only
For increased switch mounting strength, order, SV1 termination style with support bracket (see below).

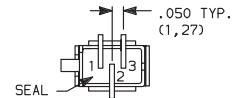
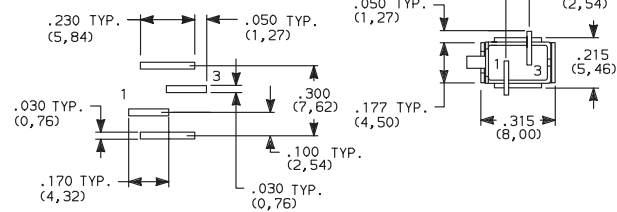


**GP11MSV1BE
SPST**

PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
GP11MSV1BE	OFF	MOM.	
Conn. Terms.	OPEN	1-3	
GP12MSV1BE	ON	MOM.	
Conn. Terms.	2-1	2-3	

MOM. = Momentary

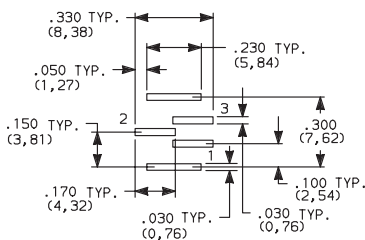
PC MOUNTING GP11 MODELS



GP12 Model

Terminal nos.
for reference only.

PC MOUNTING GP12 Models



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



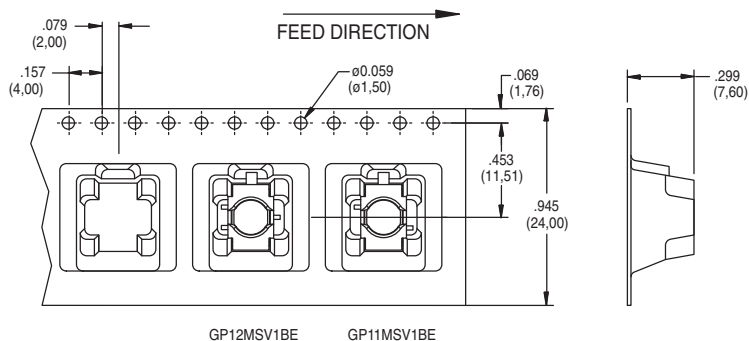


GP Series Sealed Ultraminiature Pushbutton Switches

TAPE & REEL

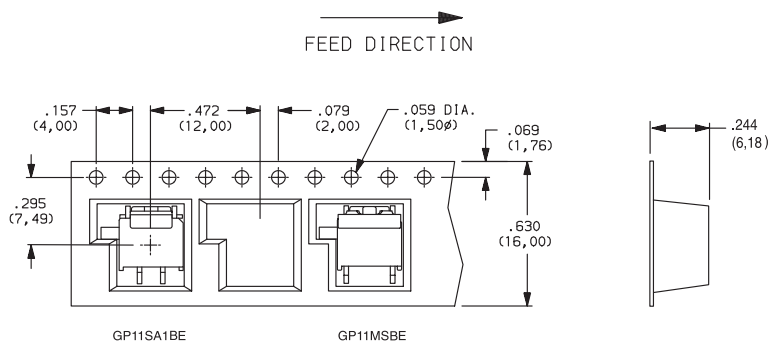
For part numbers GP11MSV1BE, GP12MSV1BE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



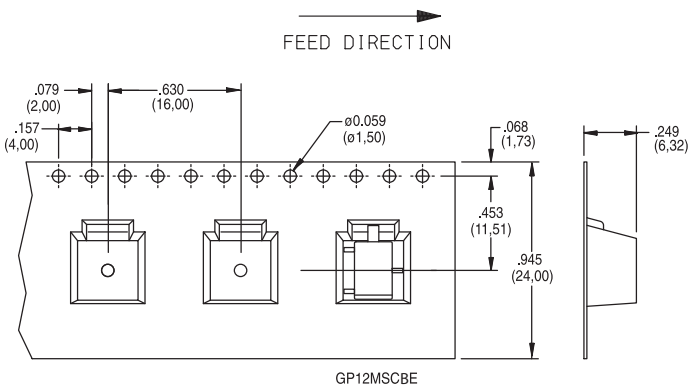
For part numbers GPXXSA1BE, GPXXMSABE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



For part numbers GP12MSCBE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



PN Series Alternate & Momentary Action Pushbutton Switches



A

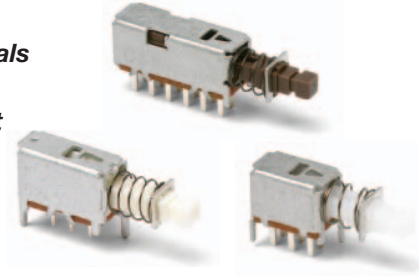
Pushbutton

Features/Benefits

- Momentary or locking action
- 3 actuation forces for customized feel
- Low cost, reliable contact design
- 1-4 poles available
- RoHS compliant

Typical Applications

- Computers and peripherals
- Instrumentation and measurement equipment
- Non-power, on-off switch applications



Specifications

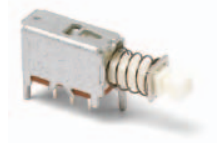
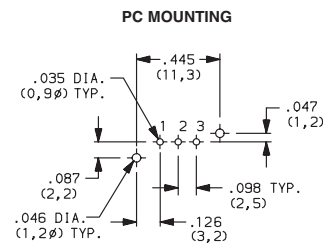
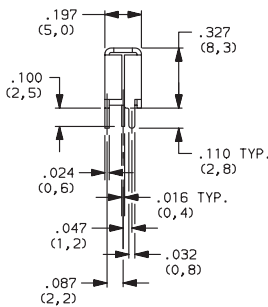
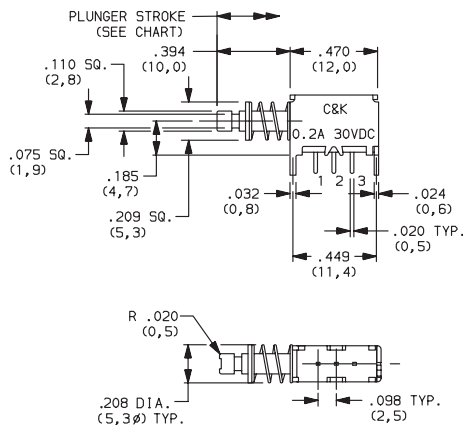
CONTACT RATING: 0.2 AMP @ 30 V DC max.
ELECTRICAL LIFE: 10,000 make-and-break cycles at full load.
MECHANICAL LIFE: 10,000 on/off cycles.
CONTACT RESISTANCE: 50 mΩ max. initial,
100 milliohms max. at end of life.
INSULATION RESISTANCE: 100 MΩ min. at 500 V DC.
DIELECTRIC STRENGTH: 500 V AC min.
OPERATING/STORAGE TEMPERATURES: -10°C to 60°C.
PACKAGING: Switches are supplied in anti-static bags
or anti-static trays.

Materials


FRAME: Tin plated steel.
ACTUATOR: Polyacetal. Color: Manufacturing option.
BASE: Laminated phenolic.
TERMINALS: Silver plated brass.
MOVABLE CONTACTS: Silver plated (or clad) phosphor bronze.
RETURN SPRING: Music wire.
DETENT SPRING: Phosphor bronze.
DETENT SPRING PLATE: Phosphor bronze.
RETURN SPRING RETAINER RING: Nickel (or tin) plated steel.
TERMINAL SEAL: Epoxy.

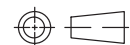
How To Order

Complete part numbers for PN Series Alternate & Momentary Action Pushbutton Switches are shown on pages A-82 thru A-83.



PN11SBSA03QE
SPDT

PART NUMBER	SWITCH FUNCTION	OPERATING FORCE (typ.)	STROKE		SHORTING/ NON-SHORTING	SCHEMATIC
			LOCK STROKE	FULL STROKE		
PN11SBNA03QE	SPDT Momentary	120g max.	—	.140 (3,5)	Non-Shorting	
PN11SCNA03QE	SPDT Momentary	150g	—			
PN11SHNA03QE	SPDT Momentary	230g	—			
PN11SJNA03QE	SPDT Momentary	330g	—			
PN12SHNA03QE	SPDT Locking	230g	.100g (2,5)	.140 (3,5)	Shorting	
PN12SJNA03QE	SPDT Locking	330g	.100g (2,5)			
PN11SBSA03QE	SPDT Momentary	120g max.	—			
PN11SCSA03QE	SPDT Momentary	150g	—			
PN11SHSA03QE	SPDT Momentary	230g	—			
PN11SJSA03QE	SPDT Momentary	330g	—			
PN12SHSA03QE	SPDT Locking	230g	.100g (2,5)			
PN12SJSA03QE	SPDT Locking	330g	.100 (2,5)			



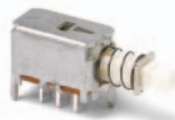
Third Angle
Projection

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

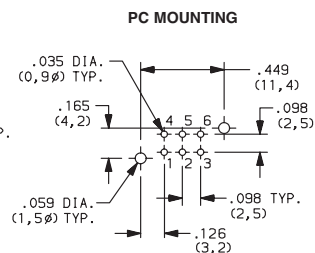
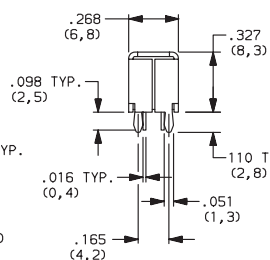
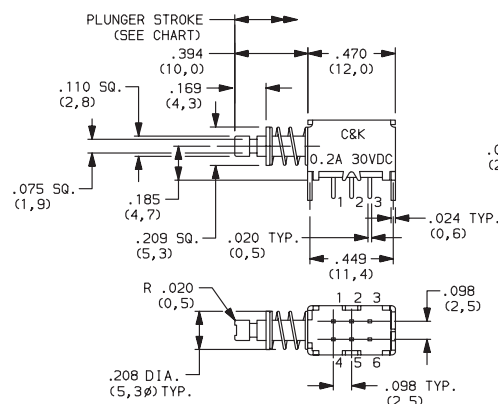
www.ck-components.com


**A****Pushbutton**

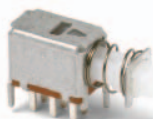
PN Series Alternate & Momentary Action Pushbutton Switches



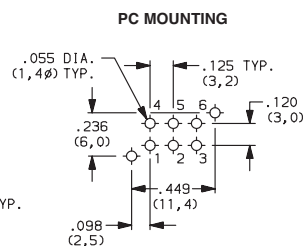
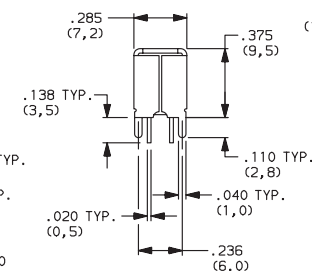
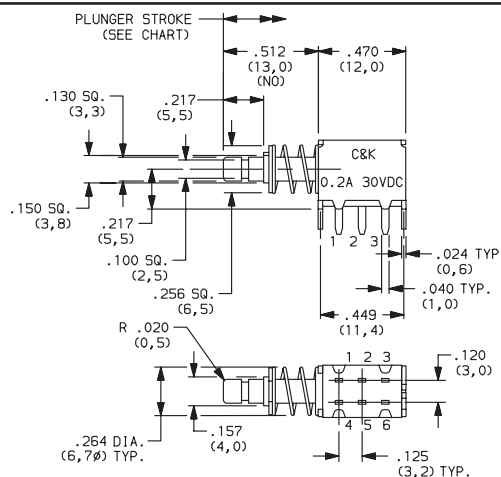
**PN21SBSA03QE
DPDT**




PART NUMBER	SWITCH FUNCTION	OPERATING FORCE (typ.)	STROKE		SHORTING/ NON-SHORTING	SCHEMATIC	
			LOCK STROKE	FULL STROKE			
PN21SBSA03QE	DPDT Momentary	120g max.	—	.140 (3,5)	Non-Shorting		
PN21SDNA03QE	DPDT Momentary	175g	—				
PN21SJNA03QE	DPDT Momentary	330g	—				
PN22SJNA03QE	DPDT Locking	330g	.100 (2,5)				
PN21SBSA03QE	DPDT Momentary	120g max.	—	.140 (3,5)	Shorting		
PN21SDSA03QE	DPDT Momentary	175g	—				
PN21SJSA03QE	DPDT Momentary	330g	—				
PN22SJSA03QE	DPDT Locking	330g	.100 (2,5)				



**PN21LASA03QE
DPDT**



PART NUMBER	SWITCH FUNCTION	OPERATING FORCE (typ.)	STROKE		SHORTING/ NON-SHORTING	SCHEMATIC	
			LOCK STROKE	FULL STROKE			
PN21LANA03QE	DPDT Momentary	100g max.	—	.140 (3,5)	Non-Shorting		
PN21LFNA03QE	DPDT Momentary	120g	—				
PN21LDNA03QE	DPDT Momentary	175g	—				
PN21LENA03QE	DPDT Momentary	300g	—				
PN22LENA03QE	DPDT Locking	300g	.100 (2,5)				
PN21LASA03QE	DPDT Momentary	100g max.	—	.140 (3,5)	Shorting		
PN21LFSA03QE	DPDT Momentary	120g	—				
PN21LDSA03QE	DPDT Momentary	175g	—				
PN21LESA03QE	DPDT Momentary	300g	—				
PN22LESA03QE	DPDT Locking	300g	.100 (2,5)				



Third Angle
Projection

C&K

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

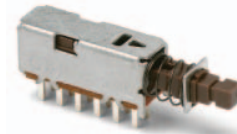
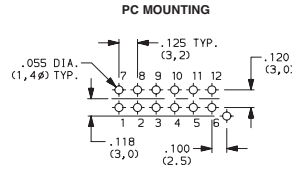
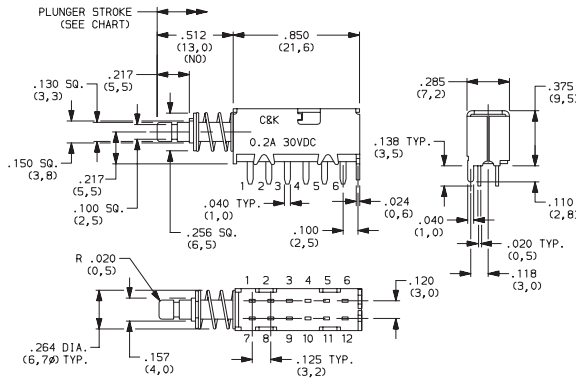
www.ck-components.com

PN Series Alternate & Momentary Action Pushbutton Switches

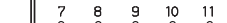



A

Pushbutton

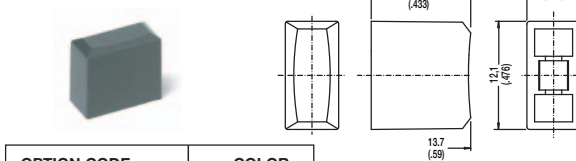


PN41LGSA02QE
4PDT

PART NUMBER	SWITCH FUNCTION	OPERATING FORCE (typ.)	STROKE		SHORTING/ NON-SHORTING	SCHEMATIC
			LOCK STROKE	FULL STROKE		
PN41LGNA02QE	4PDT Momentary	175g	—	.140 (3,5)	Non-Shorting	
PN41LENA02QE	4PDT Momentary	300g				
PN42LENA02QE	4PDT Locking	300g	.100 (2,5)			
PN41LGSA02QE	4PDT Momentary	175g	—	.140 (3,5)	Shorting	
PN41LESA02QE	4PDT Momentary	300g				
PN42LESA02QE	4PDT Locking	300g	.100 (2,5)			

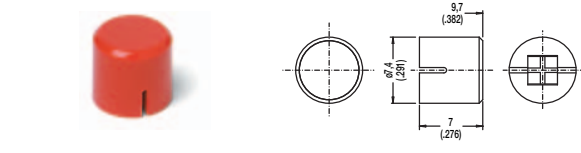
BUTTONS MUST BE ORDERED SEPARATELY. SHIPPED IN BULK.

PE



OPTION CODE	COLOR
RD	Red
GY	Gray
BK	Black
WH	White

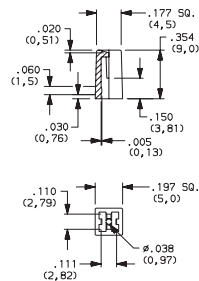
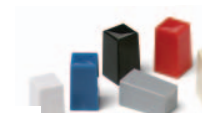
PV



PE and PV buttons fit .130" square plungers

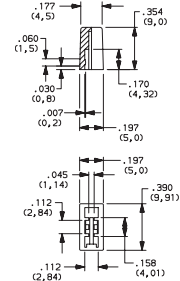
Indexed

- G001A Black
- G001G Gray
- G001I Ivory
- G001R Red



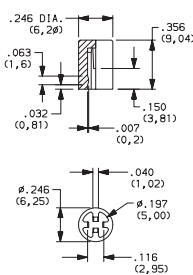
Rectangular

- G002A Black
- G002G Gray
- G002I Ivory
- G002R Red



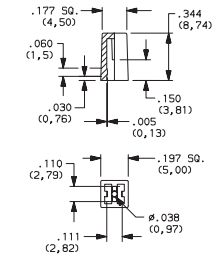
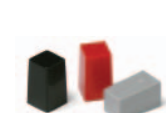
Round

- G003A Black
- G003G Gray
- G003I Ivory
- G003R Red



Square

- G004A Black
- G004G Gray
- G004I Ivory
- G004R Red



G001, G002, G003 and G004 buttons fit .110" square plungers.



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



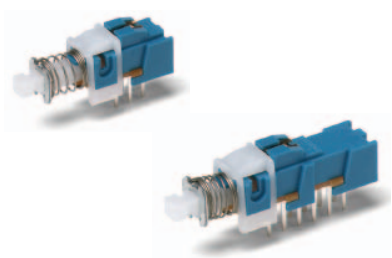
www.ck-components.com



A

Pushbutton

PHA Series Short Stroke Pushbutton Switches



Features/Benefits

- Momentary or latching action
- Low cost, reliable contact design
- 2 & 4 pole configurations
- Sealed contacts
- Optional buttons
- RoHS compliant

Typical Applications

- Computers and peripherals
- Instrumentation and measurement equipment
- Non-power, on-off switch applications

Specifications

SWITCHING POWER MAX.: 3 W DC
SWITCHING VOLTAGE MAX.: 30 V DC
SWITCHING CURRENT MAX.: 100 mA DC
DIELECTRIC STRENGTH (50 Hz/1 min.): 500 V between open contacts. 1500 V between chassis and contacts.
OPERATING LIFE: 10,000 cycles at rated load
CONTACT RESISTANCE: 20 m ohms initial Ω
INSULATION RESISTANCE: 100 M ohms Ω
TOTAL TRAVEL/LATCHING TRAVEL: 2.5mm/1.5mm
(.098 inch/.059 inch)
OPERATING FORCE:
170 grams \pm 50 grams (1.67 \pm 0.98N)
230 grams \pm 50 grams (2.26 \pm 0.98N)
SEALING: Sealed contacts.

Materials

FIXED TERMINAL: Brass, silver plated.
MOVABLE CONTACT: Phosphor bronze, silver plated.
SWITCH BODY: PPE
ACTUATOR: POM
STANDOFF CLIP: POM
RETURN SPRING: Music wire.
RETURN SPRING RETAINER: Carbon steel, tin plated.
DETENT SPRING PLATE: Phosphor bronze.
DETENT SPRING: Stainless steel.
BASE: Laminated phenolic.
TERMINAL SEAL: Epoxy.

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

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-85 thru A-87. For additional options not shown in catalog, consult Customer Service Center.

Switch		Button					
<input type="checkbox"/> P	<input type="checkbox"/> H	<input type="checkbox"/> A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contact Arrangement		Mechanical Function		Indexed		Round	
2U 2 Changeovers		OA Momentary		G001A Black		G003A Black	
4U 4 Changeovers		EE Push-push		G001G Gray		G003G Gray	
				G001I Ivory		G003I Ivory	
				G001R Red		G003R Red	
				Rectangular		Square	
				G002A Black		G004A Black	
				G002G Gray		G004G Gray	
				G002I Ivory		G004I Ivory	
				G002R Red		G004R Red	

BUTTON REMOVAL

A button of a push-push switch should only be removed in the "OFF" non-latching position.



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

www.ck-components.com

PHA Series Short Stroke Pushbutton Switches

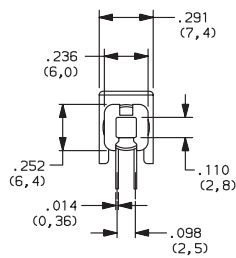
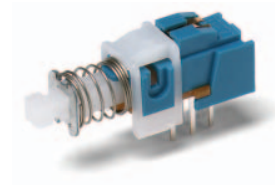
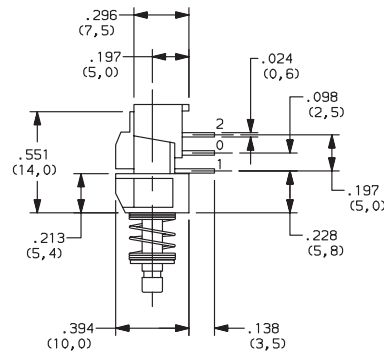
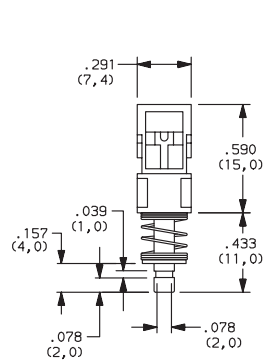


A

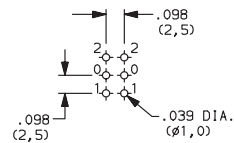
Pushbutton

DESIGNATION 

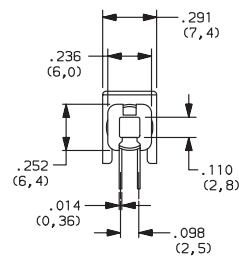
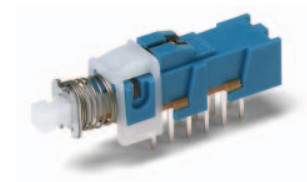
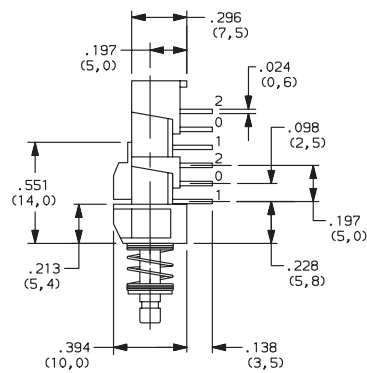
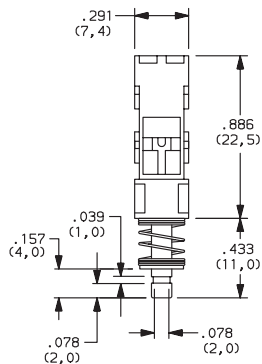
2U 2 CHANGEOVERS



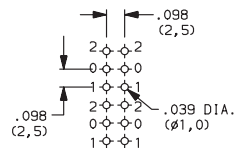
PC MOUNTING



4U 4 CHANGEOVERS



PC MOUNTING



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

www.ck-components.com



PHA Series

Short Stroke Pushbutton Switches

A

Pushbutton

CONTACT ARRANGEMENT



OPTION CODE	NO. OF POLES *	SCHEMATIC
2U	2PDT	
4U	4PDT	2X

*Non-shorting contacts.

MECHANICAL FUNCTION



OPTION CODE	FUNCTION
OA	Momentary
EE	Push-push



Third Angle
Projection

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

www.ck-components.com

PHA Series Short Stroke Pushbutton Switches



A

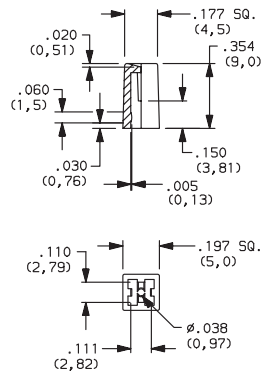
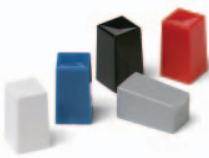
Pushbutton

BUTTONS



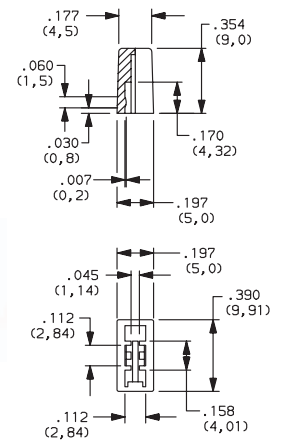
Indexed

- G001A** Black
- G001G** Gray
- G001I** Ivory
- G001R** Red



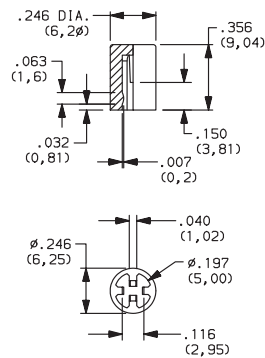
Rectangular

- G002A** Black
- G002G** Gray
- G002I** Ivory
- G002R** Red



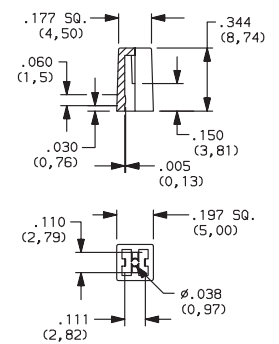
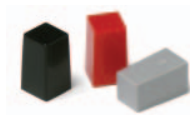
Round

- G003A** Black
- G003G** Gray
- G003I** Ivory
- G003R** Red



Square

- G004A** Black
- G004G** Gray
- G004I** Ivory
- G004R** Red



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

www.ck-components.com



F Series Pushbutton Switches

Features/Benefits

- Up to 10 poles per module
- Various contact terminals
- Various mounting & switch ganging configurations
- Mechanical indicator buttons
- RoHS compliant

Typical Applications

- Audio selection
- Digital equipment interface
- Medical equipment interface



Specifications

SWITCHING POWER: F module max. AC/DC: Silver: 50 VA/15W, Gold: 1 VA/300 mW.

SWITCHING VOLTAGE: F module max. AC/DC: Silver: 125/30V, Gold: 50/30 V.

SWITCHING CURRENT: F module max. AC/DC: Silver: 0.5A/0.5A, Gold: 0.04A/0.01A.

CARRYING CURRENT: Max at $du = 20^\circ\text{C}$: Silver: < 2A, Gold: <0.5A.

DIELECTRIC STRENGTH (50 Hz, 1 min.): Chassis/contact: $\wedge 1500\text{V}$
Between contacts: $\wedge 1500\text{V}$.

OPERATING LIFE "OA/EE" (24V/200mA): $>10^5$ operations
"GR": $>3.5 \times 10^4$ operations.

CONTACT RESISTANCE: Initial: Typical %10 m Ω , max. 20 m Ω
After operating life: %100 m Ω

INSULATION RESISTANCE: $\wedge 10^9 \Omega$ between open contacts,
 $\wedge 10^9 \Omega$ between chassis and contacts.

CAPACITANCE (at $f = 10 \text{ kHz}$): %0.7 pF between 2 contacts.

TOTAL TRAVEL/LATCHING TRAVEL: 4.7mm/3.3mm (.185 inch/.130 inch).

All models and options are RoHS compliant and compatible.

NOTE: All models and options are RoHS compliant and compatible.

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

TYPICAL F OPERATING FORCE: 2U: 6.5N (650 grams); 4U: 6.5N (650 grams); 6U: 7.5N (750 grams); 8U: 9.0N (900 grams); 10U: 9.0N (900 grams).

EUROPEAN TYPICAL SF OPERATING FORCE:

2U: $3.5\text{N} \pm 0.5\text{N}$ (350 grams ± 100 grams); 4U: $5\text{N} \pm 1\text{N}$ (500 grams ± 100 grams); 6U: $6.5\text{N} \pm 1\text{N}$ (650 grams ± 100 grams); 8U: $9.0\text{N} \pm 1\text{N}$ (900 grams ± 100 grams).

OPERATING TEMPERATURE RANGE: -40°C to 70°C .

Materials

HOUSING: Polycarbonate UL 94V-0 or polyester UL 94V-0.

ACTUATOR: Polyester UL 94V-0.

MOVABLE CONTACTS: Bimetal brass, silver plated, gold plate over nickel.

STATIONARY CONTACTS & TERMINALS: Brass, silver plated, gold plated.

TERMINAL BOARD: Polyester UL 94V-0.

RETURN SPRING: Music wire.

TERMINAL SEAL: RTV adhesive sealant.

CHASSIS: Steel.

LOCKOUT PIN: Steel.

BLOCKERS: Steel.

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-89 thru A-97. For additional options not shown in catalog, consult Customer Service Center.

If requesting only a switch, select either a North American or European switch as noted below. Chassis and buttons are sold separately. If multiple stations are selected, we will assume all switches are the same unless noted otherwise.

North American Order Code - Switch Only

Designation	Terminal Sealing	Terminal Style	Contact Material
F F Series	(NONE) None	(NONE) Solder lugs & PC pins	(NONE) Silver, AG
FLT Light touch F series	TB Top/bottom	01A Cut solder lugs	AU Gold
ZF Central mounted F series		01B Cut PC pins, for other configurations, consult factory	
Contact Arrangement		Electrical Function	Dress nut*
2U 2PDT		(NONE) BBM	(NONE) No dress nut
4U 4PDT		M MBB (special)	B Black
6U 6PDT	Mechanical Function		C Chrome
8U SPDT	OA Momentary		
10U 10PDT	EE Alternate (push-push)		
	GR Interlock		
	AOR Central release		
	OASP Momentary with lockout		
	GRSP Interlock with lockout		



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

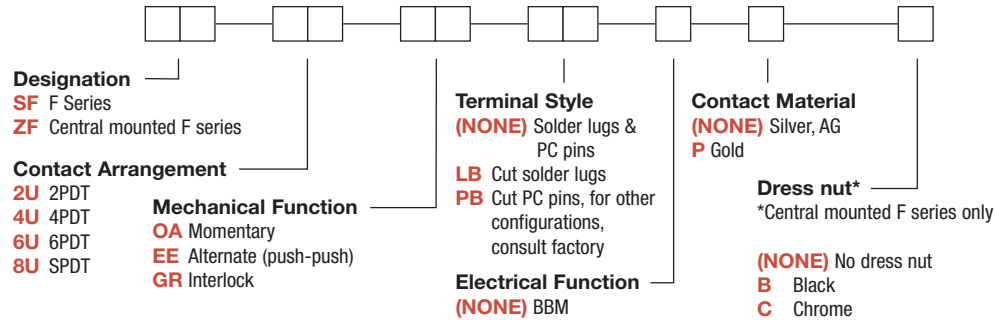
F Series Pushbutton Switches



A

Pushbutton

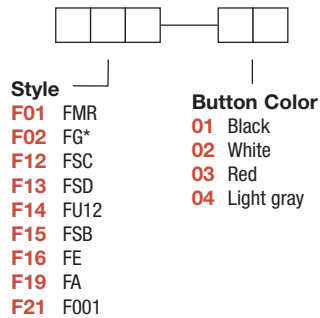
European Order Code - Switch Only



*Minimum order quantities apply.

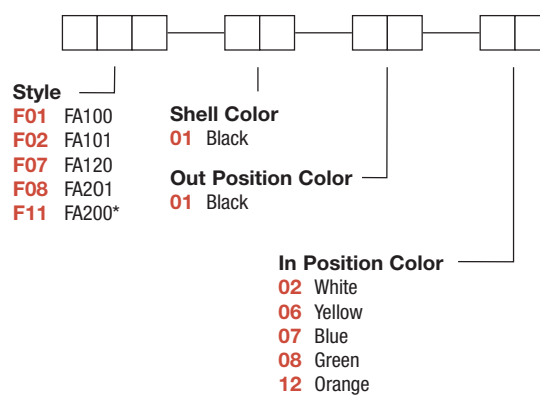
Order Code - Buttons

Solid Buttons



*Button options for central mounting configurations, use 'FG' for central mount with chrome dress nut, use 'FA200' for central mount with black dress nut.

Mechanical Indicator Buttons



BUTTON REMOVAL

A button of a push-push switch should only be removed in the "OFF" non-latching position.



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



A

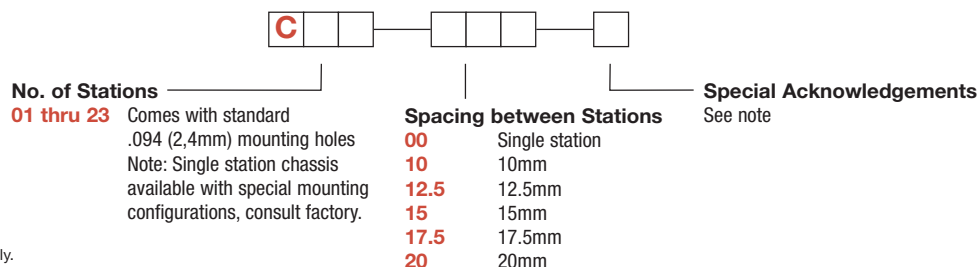
Pushbutton

F Series Pushbutton Switches

Order Code - Chassis

To order a switch with chassis, create the switch part number listed above and add the Chassis part number configurator information at the end of the part number.

Note: We do not guarantee or recommend interlocking beyond 10 stations.

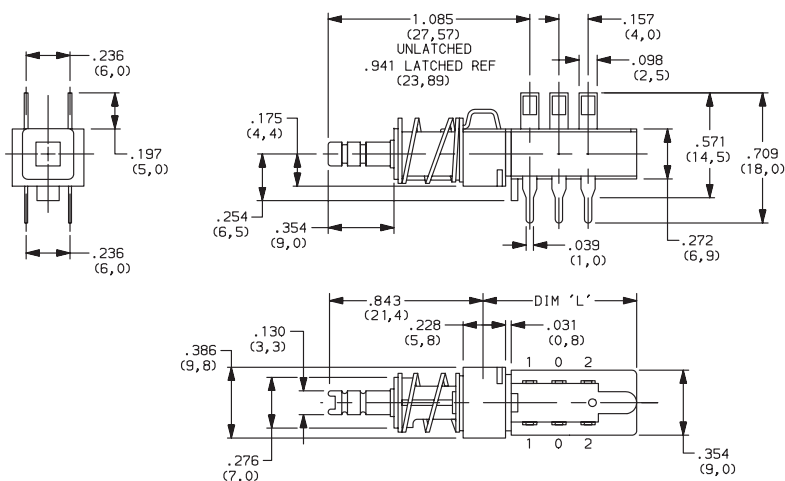


*Minimum order quantities apply.

SWITCHES WITH STANDARD OPTIONS

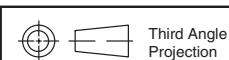
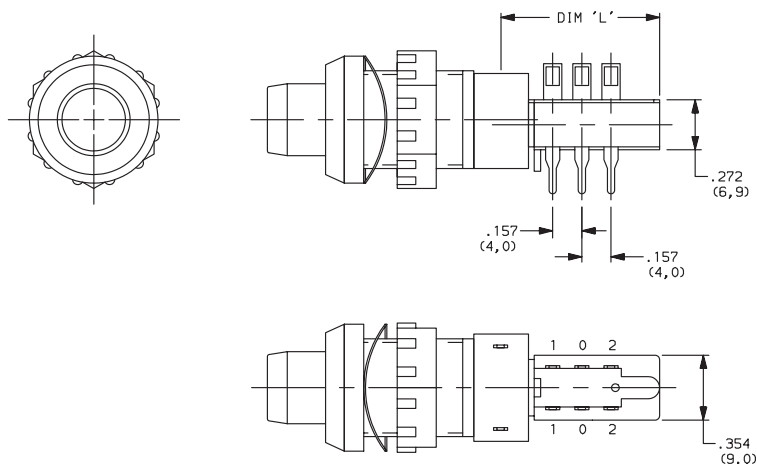
F2UEE

CONTACT ARRANGEMENT	LENGTH DIM 'L'
2U	0.827 (21,00)
4U	1.300 (33,00)
6U	1.770 (45,00)
8U	2.240 (57,00)
10U	2.720 (69,00)



ZF2UEEBF11010108

CONTACT ARRANGEMENT	LENGTH DIM 'L'
2U	0.827 (21,00)
4U	1.300 (33,00)
6U	1.770 (45,00)
8U	2.240 (57,00)
10U	2.720 (69,00)



Third Angle
Projection

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

www.ck-components.com

F Series Pushbutton Switches



A

Pushbutton

DESIGNATION



Designation, North America

F F Series
FLT Light touch F series
ZF Central mounted F series

Designation, Europe

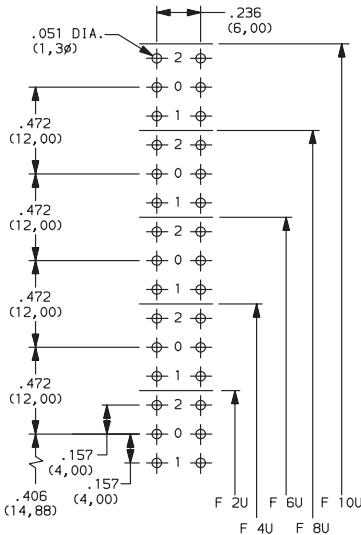
SF F Series
ZF Central mounted F series

CONTACT ARRANGEMENT

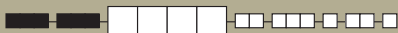


OPTION CODE	NO. OF POLES	SCHEMATIC
2U	2PDT	
4U	4PDT	2X
6U	6PDT	3X
8U	8PDT	4X
10U	10PDT	5X

PC MOUNTING



MECHANICAL FUNCTION



North America

OPTION CODE	FUNCTION
OA	Momentary
EE	Alternate (push-push)
GR	Interlock
AOR	Central release
OASP	Momentary with lockout
GRSP	Interlock with lockout

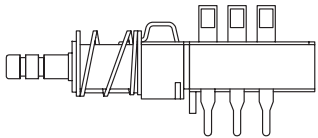
Europe

OPTION CODE	FUNCTION
OA	Momentary
EE	Alternate (push-push)
GR	Interlock

TERMINAL SEALING

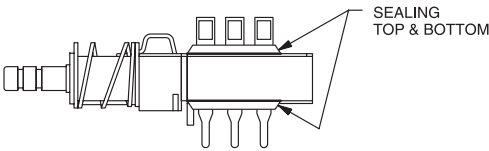


(NONE) NO SEAL



F2UEE shown in example above.

TB TOP & BOTTOM



NOTE: Available for North America only



Third Angle
Projection



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

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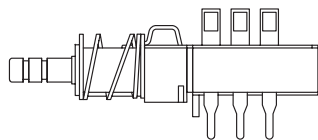
Pushbutton
A

F Series Pushbutton Switches

TERMINAL STYLE

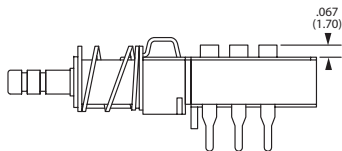


(NONE) SOLDER LUGS & PC PINS



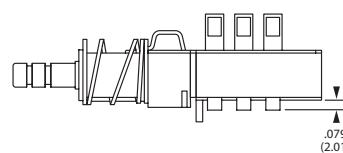
01A CUT SOLDER LUGS (North America)

LB CUT SOLDER LUGS (Europe)



01B CUT PC PINS (North America)

PB CUT PC PINS (Europe)



ELECTRICAL FUNCTION



OPTION CODE	FUNCTION
(NONE)	BBM Non-shorting
M	MBB Shorting (North America only)

CONTACT MATERIAL



NORTH AMERICA OPTION CODE	EUROPE OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	MATERIAL	RATING
(NONE)	(NONE)	YES	YES	SILVER, AG	50 VA/15 W; 125/30 V; 0.5/0.5 A
AU	P	YES	YES	GOLD	1 VA/300mW; 50/30 V; 0.04 A/0.01 A

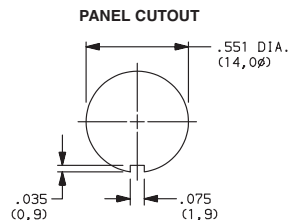
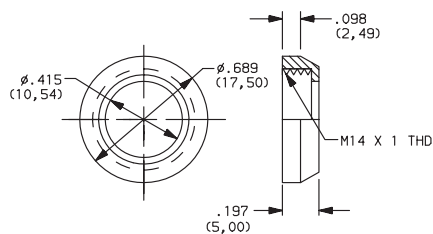
* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

DRESS NUT



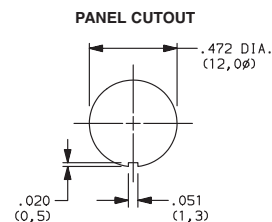
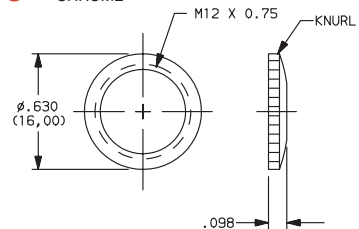
(NONE) NO DRESS NUT FOR F & F/LT
DESIGNATIONS

B BLACK

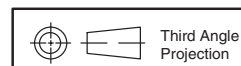


NOTE: Available with ZF designation and FA200 buttons.

C CHROME



NOTE: Available with ZF designation and FG button.



Third Angle
Projection

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

C&K

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F Series Pushbutton Switches

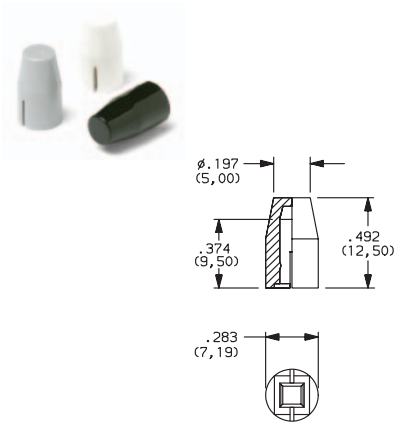
SOLID BUTTON

COLOR

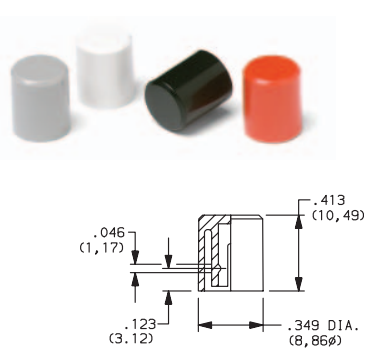
STYLE

STYLE

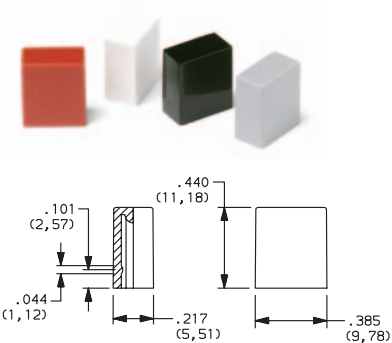
F01 FMR



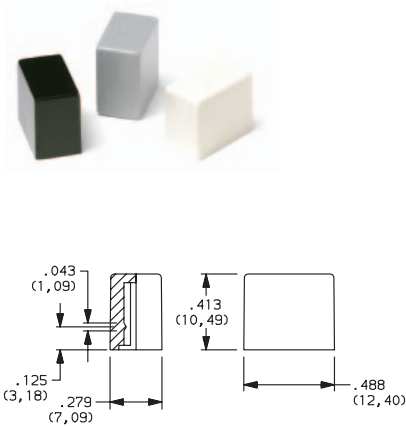
F02 FG



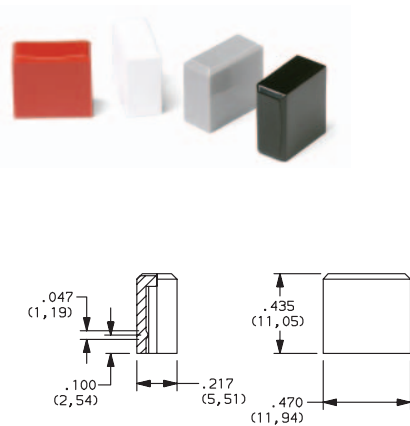
F12 FSC



F13 FSD



F14 FU12



OPTION CODE	COLOR
01	BLACK
02	WHITE
03	RED
04	LT. GRAY

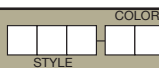


A

Pushbutton

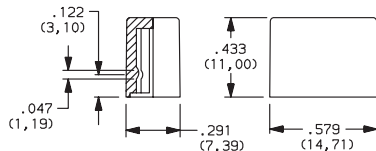
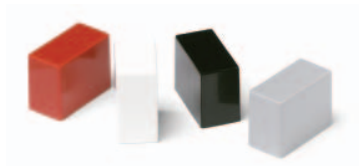
F Series Pushbutton Switches

SOLID BUTTON

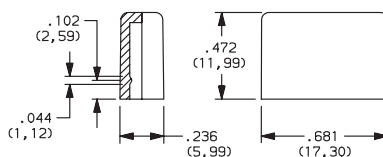


STYLE

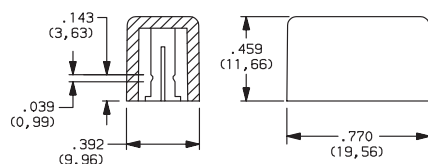
F15 FSB



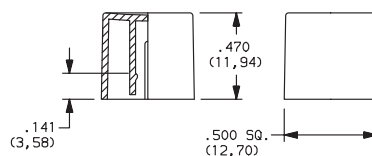
F16 FE



F19 FA



F21 F001



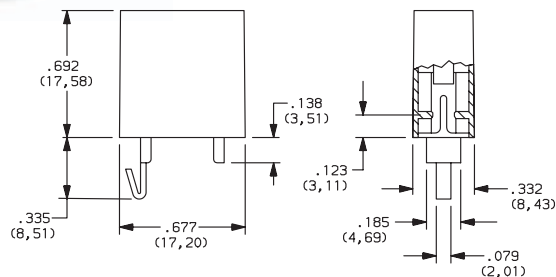
OPTION CODE	COLOR
01	BLACK
02	WHITE
03	RED
04	LT. GRAY

MECHANICAL BUTTON

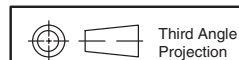
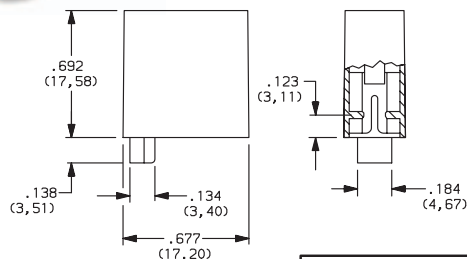


STYLE

F01 FA100



F02 FA101



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

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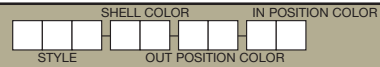
F Series Pushbutton Switches



A

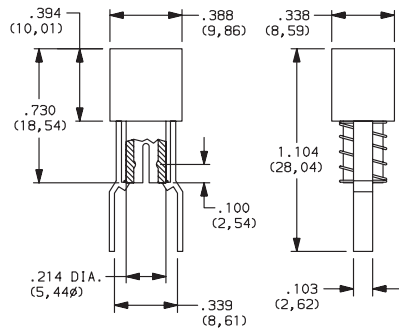
Pushbutton

MECHANICAL BUTTON

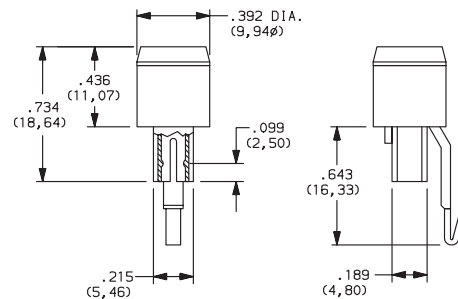


STYLE

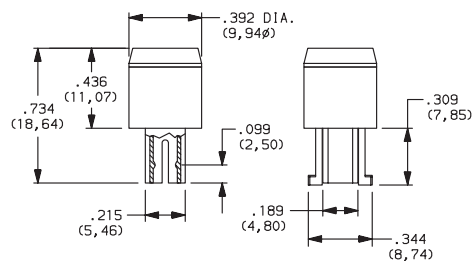
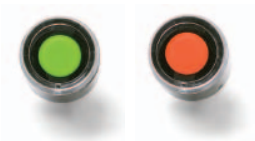
F07 FA120



F08 FA201



F11 FA200



SHELL COLOR

01 BLACK

OUT POSITION COLOR

01 BLACK

IN POSITION COLOR

OPTION CODE	COLOR
02	WHITE
06	YELLOW
07	BLUE
08	GREEN
12	ORANGE

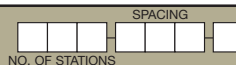


Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

www.ck-components.com

**A****Pushbutton**

F Series Pushbutton Switches

CHASSIS

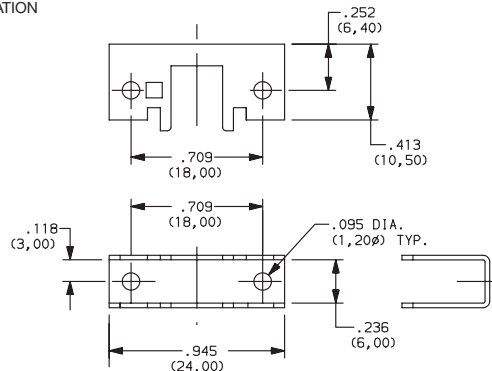
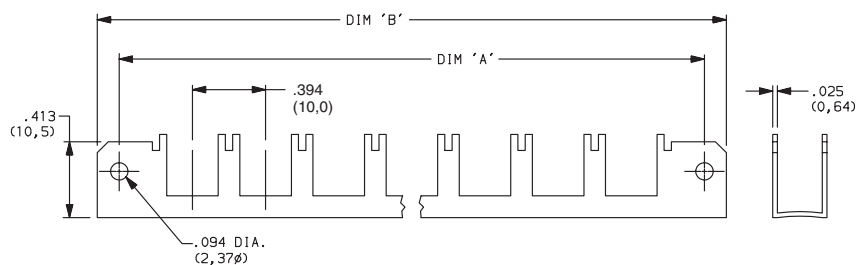
NUMBER OF STATIONS

C00 Thru C10

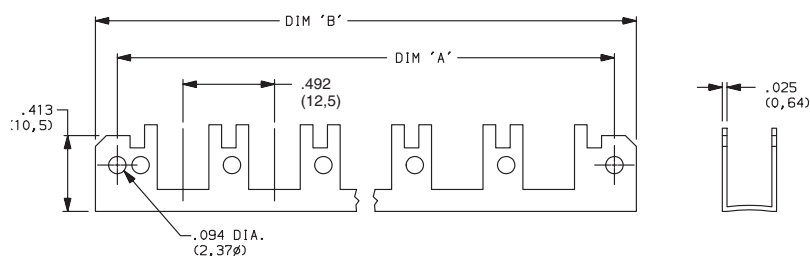
Comes with standard 0.094 (2,44mm) mounting holes

NOTE: Single station chassis available with mounting configurations, consult factory.

SPACING

00 SINGLE STATION**10** 10mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.182 (30,02)	1.418 (36,02)	0.005
3	1.575 (40,01)	1.811 (46,00)	0.010
4	1.969 (50,01)	2.205 (56,01)	0.010
5	2.363 (60,02)	2.599 (66,01)	0.010
6	2.757 (70,03)	2.993 (76,02)	0.015
7	3.150 (80,01)	3.386 (86,00)	0.015
8	3.544 (90,02)	3.780 (96,01)	0.015
9	3.938 (100,03)	4.174 (106,02)	0.015
10	4.331 (110,01)	4.567 (116,00)	0.015

12.5 12.5mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.200 (30,48)	1.436 (36,47)	0.005
3	1.692 (42,98)	1.928 (48,97)	0.010
4	2.184 (55,47)	2.420 (61,47)	0.010
5	2.676 (67,97)	2.912 (73,96)	0.010
6	3.169 (80,49)	3.405 (86,49)	0.015
7	3.661 (92,99)	3.897 (98,98)	0.015
8	4.153 (105,49)	4.389 (111,48)	0.015
9	4.645 (117,98)	4.881 (123,98)	0.015
10	5.137 (130,48)	5.373 (136,47)	0.015

Third Angle
Projection**C&K**Dimensions are shown: Inches (mm)
Specifications and dimensions subject to changewww.ck-components.com

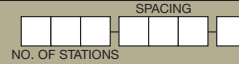
F Series Pushbutton Switches



A

Pushbutton

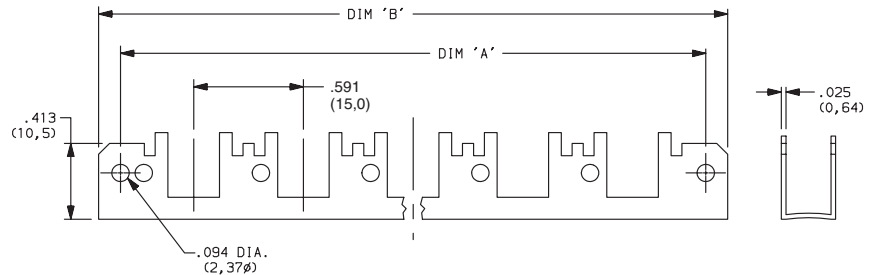
CHASSIS



SPACING

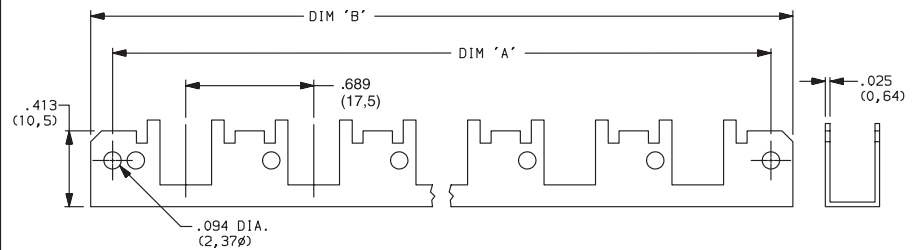
15 15mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.374 (34,90)	1.615 (41,02)	0.005
3	1.969 (50,01)	2.205 (56,01)	0.010
4	2.560 (65,02)	2.796 (71,02)	0.010
5	3.150 (80,01)	3.386 (86,00)	0.010
6	3.741 (95,02)	3.977 (101,02)	0.015
7	4.332 (110,03)	4.568 (116,03)	0.015
8	4.922 (125,02)	5.158 (131,01)	0.015
9	5.513 (140,03)	5.749 (146,02)	0.015
10	6.103 (155,02)	6.339 (161,01)	0.015



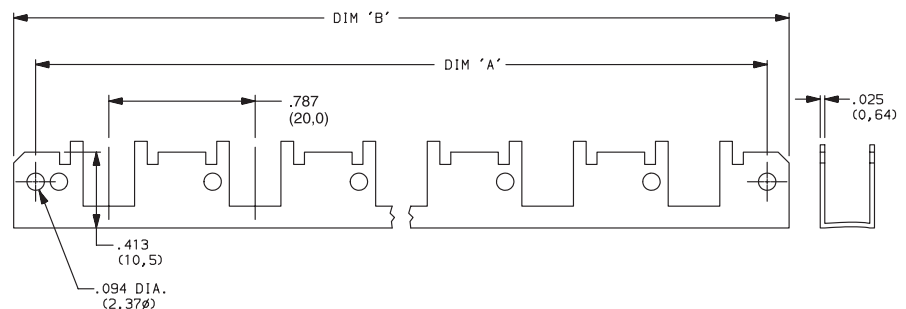
17.5 17.5mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.477 (37,52)	1.713 (43,51)	0.005
3	2.166 (55,02)	2.402 (61,01)	0.010
4	2.855 (75,52)	3.091 (78,51)	0.010
5	3.544 (90,02)	3.780 (96,01)	0.010
6	4.233 (107,52)	4.469 (113,51)	0.015
7	4.922 (125,02)	5.158 (131,01)	0.015
8	5.611 (142,52)	5.847 (148,51)	0.015
9	6.300 (160,02)	6.536 (166,01)	0.015
10	6.989 (177,52)	7.225 (183,52)	0.015



20 20mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.575 (40,01)	1.811 (46,00)	0.005
3	2.363 (60,02)	2.599 (66,01)	0.010
4	3.150 (80,01)	3.386 (86,00)	0.010
5	3.938 (100,03)	4.174 (106,02)	0.010
6	4.725 (120,02)	4.961 (126,01)	0.015
7	5.512 (140,00)	5.748 (146,00)	0.015
8	6.300 (160,02)	6.536 (166,01)	0.015
9	7.087 (180,01)	7.323 (186,00)	0.015
10	7.875 (200,03)	8.111 (206,02)	0.015



Third Angle
Projection

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





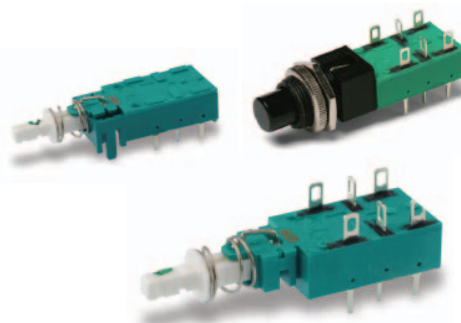
NE-18 Series Mains / Power Switches

Features/Benefits

- Chassis or panel mount
- Various buttons
- Various contact configurations
- RoHS compliant

Typical Applications

- Mains/power switching
- Consumer electronics
- Audio equipment
- Digital products



Specifications

POWER CONTACT:

SWITCHING POWER MAX. AC/DC: NE18: 1500/100 W,
NE18CTII: 1000/100 W; AC (Inductive $\cos \phi = 0.6$): NE18: 900W,
NE18CTII: 600W.

SWITCHING VOLTAGE MAX. AC/DC: 250/100V

SWITCHING CURRENT MAX. AC/DC

AC (Inductive $\cos \phi = 0.6$): NE18: $6 A^2$ /1 A, NE18CTII: $4 A^2$ /1 A

INRUSH CURRENT MAX. AC¹: NE18: 36 A, NE18CTII: 64 A

DIELECTRIC STRENGTH (50 Hz, 1 min.): 2000 V

OPERATING LIFE AT MAX. LOAD AND AT MAX. INRUSH
CURRENT: 10^4 operations⁵

CONTACT RESISTANCE: Initial: 50m Ω ; After 10^4 operations: 70m Ω .

INSULATION RESISTANCE: $10^{12} \Omega$ chassis – nearest contact;

$10^{12} \Omega$ mains contact – mains contact; $10^{12} \Omega$ mains contact –
mains contact after 10^4 operations.

LOW VOLTAGE CONTACT:

SWITCHING POWER MAX.: 12W

SWITCHING VOLTAGE MAX.: 24V

SWITCHING CURRENT MAX.: 0.5A

TOTAL TRAVEL: 4.7mm (.185 inch)

LATCHING TRAVEL: 3.3mm (.130 inch)

OPERATING FORCE: Without auxiliary low voltage contacts:

NE18: 7N (700 grams); NE18CTII: 9.5N (950 grams).

With auxiliary low voltage contacts: NE18: 8N (800 grams);

NE18CTII: 11N (1100 grams).

SEALING: Dust proof.

Materials

HOUSING, ACTUATOR & TERMINAL BOARD: Thermoplastic
polyester (UL 94V-0).

MOVABLE CONTACT: Silver nickel alloy, silver plated.

FIXED CONTACTS: Silver nickel alloy, silver plated.

COMMON CONTACTS & TERMINALS: Copper alloy, silver plated.

RETURN SPRING: Music wire.

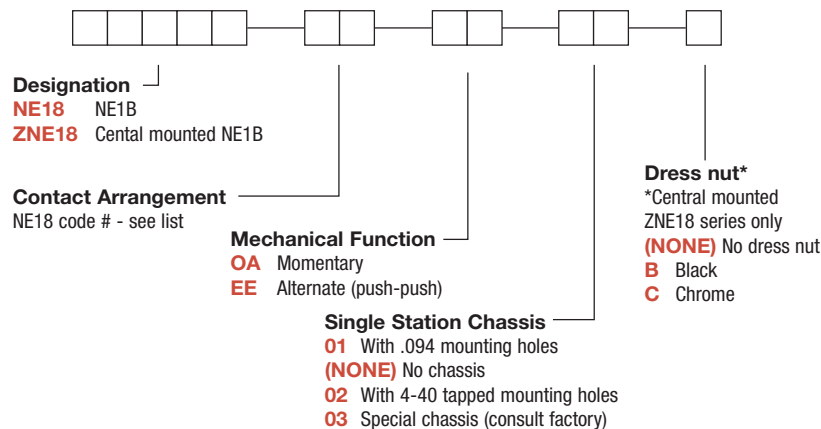
NOTE: All models are RoHS compliant and compatible.

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

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-99 thru A-106. For additional options not shown in catalog, consult Customer Service Center.

If requesting only a switch, select the switch as noted below. Buttons are sold separately.



NE-18 Series Mains / Power Switches



A

Pushbutton

Order Code - Buttons

Solid Buttons

Style	Button Color
F01 FMR	01 Black
F02 FG*	02 White
F12 FSC	03 Red
F13 FSD	04 Light gray
F14 FU12	
F15 FSB	
F16 FE	
F19 FA	
F21 F001	

Mechanical Indicator Buttons

Style	Shell Color	Out Position Color	In Position Color
F01 FA100	01 Black	01 Black	02 White
F02 FA101			06 Yellow
F07 FA120			07 Blue
F08 FA201			08 Green
F11 FA200*			12 Orange

*Button options for central mounting configurations, use 'FG' for central mount with chrome dress nut, use 'FA200' for central mount with black dress nut.

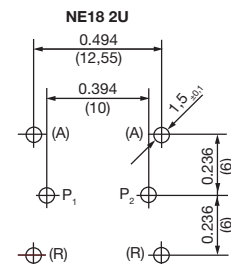
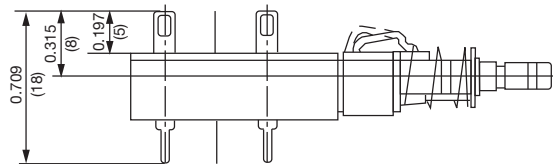
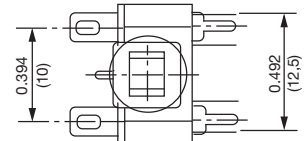
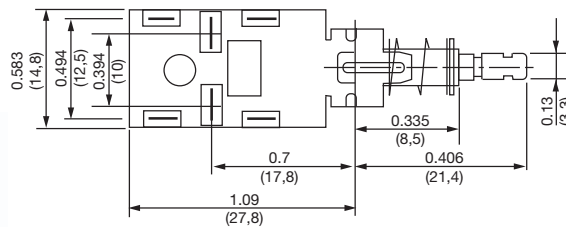
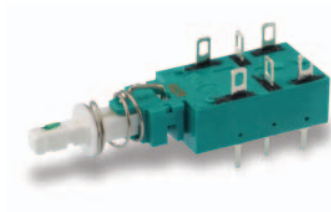
BUTTON REMOVAL

A button of a push-push switch should only be removed in the "OFF" non-latching position.

DESIGNATION & SWITCHES WITH STANDARD OPTIONS



NE1838EE



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

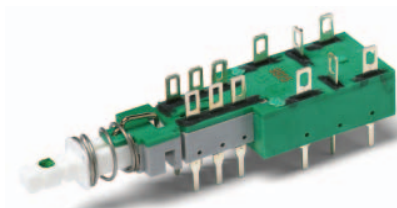
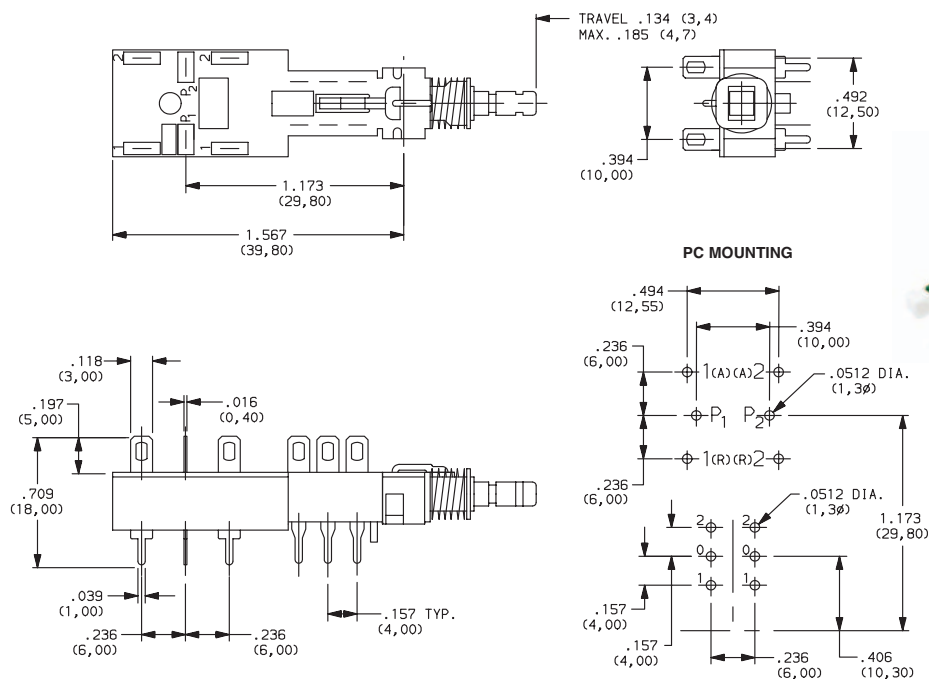
www.ck-components.com

NE-18 Series Mains / Power Switches

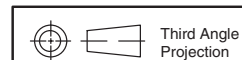
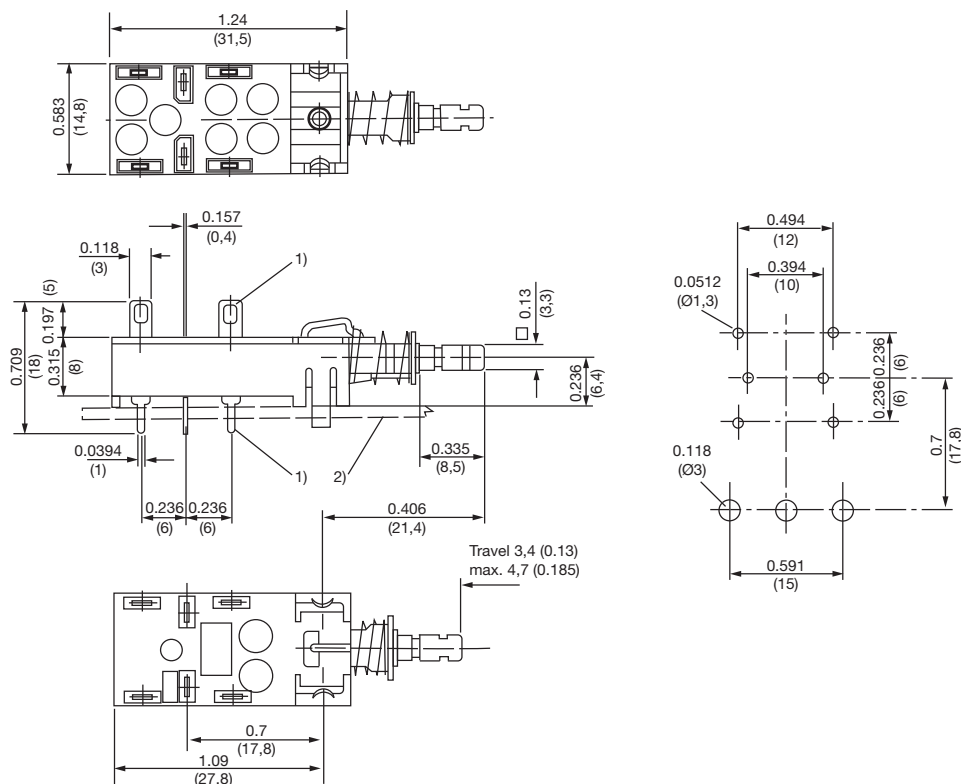
DESIGNATION & SWITCHES WITH STANDARD OPTIONS



NE1839EE



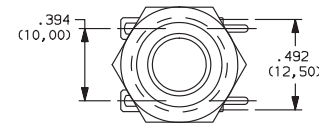
NE1848EE



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

www.ck-components.com

Pushbutton



www.ck-components.com



A

Pushbutton

NE-18 Series Mains / Power Switches

CONTACT ARRANGEMENT



OPTION CODE Contact capacity and availability	STYLE	ELECTRICAL CIRCUIT
37	NE18 – 2AX	DPST
38	NE18 – 2UX	DPDT
51	2U + NE18 – 2AX	DPST*
52 (4A/64)	NE18CTII – 2AX	DPST
39	2U + NE18 – 2UX	DPDT*
41	NE18 – 2AP	DPST
42	NE18 – 2UP	DPDT
43	NE18 – 2AW	DPST
44	NE18 – 2UW	DPDT
45	NE18 – 2ASX	DPST

* 2U + Denotes auxiliary set of low current contacts DPDT
 2A = DPST
 2U = DPDT
 S = Snap-in mounting
 X = Solder lug/PC pins
 W = Solder lugs only
 P = PC pins only

OPTION CODE Contact capacity and availability	STYLE	ELECTRICAL CIRCUIT
46	NE18 – 2USX	DPDT
47	NE18 – 2ASP	DPST
48	NE18 – 2USP	DPDT
49	NE18 – 2ASW	DPST
50	NE18 – 2USW	DPDT
53 (4A/64)	2U + NE18CTII – 2AX	DPST
54	2U + NE18 – 2AW	DPST
55	2U + NE18 – 2AP	DPST
56	2U + NE18 – 2UW	DPDT
57	2U + NE18 – 2UP	DPDT

NOTES

1. Contact plating is silver on all Power Switches.
2. The electrical function is Break Before Make (BBM) on all Power Switches.
3. The terminals will be epoxy sealed.

TYPE	POSSIBLE CONTACT ARRANGEMENT		CONTACT SPACING	PROTECTION CLASS (CEE 24)	APPROVALS
	POWER CONTACTS ¹	AUXILIARY CONTACTS			
NE18	2A ²	2U	> 3mm (.118 inch)	II	VDE, UL
NE18	2A ² 2U	2U	> 3mm (m) (.118 inch)	I	VDE, UL
NE18CTII	2A ²	2U	> 3mm (.118 inch)	II	VDE, UL

- 1) A = make contact, R = break contact, U = changeover contact, m = VDE sign for switches with a contact spacing (air gap) < 3mm (.118 inch) according to VDE 0630/CEE 24.
- 2) With 2A mains contacts: Mounting only by PC pins is not sufficient.
- 3) BSI only for 2U mains contacts.

MECHANICAL FUNCTION



OPTION CODE	FUNCTION
OA	Momentary
EE	Alternate (push-push)



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

www.ck-components.com

NE-18 Series Mains / Power Switches



A

Pushbutton

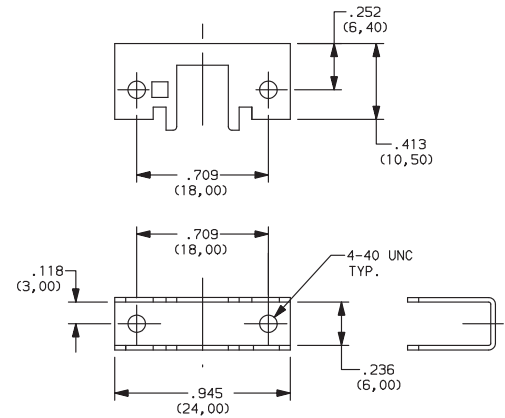
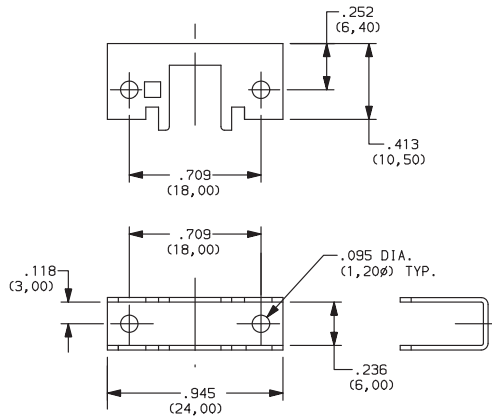
SINGLE STATION CHASSIS



01 WITH .094 MOUNTING HOLES

(NONE) NO CHASSIS

02 WITH 4-40 TAPPED MOUNTING HOLES



03 SPECIAL CHASSIS (CONSULT FACTORY)

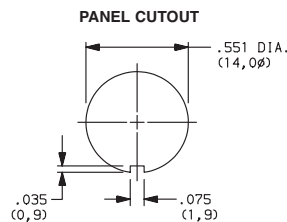
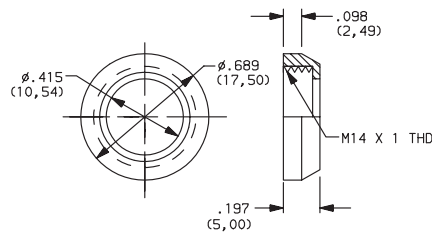
DRESS NUT



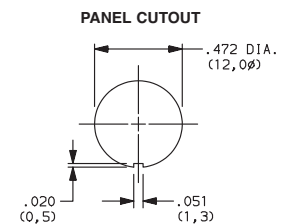
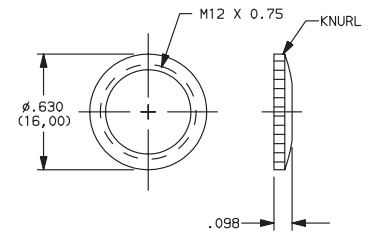
(NONE) NO DRESS NUT

B BLACK

C CHROME



NOTE: Available with ZNE18 designation and FA200 buttons.



NOTE: Available with ZNE18 designation and FG button.

C&K



Third Angle
Projection

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

www.ck-components.com



A

Pushbutton

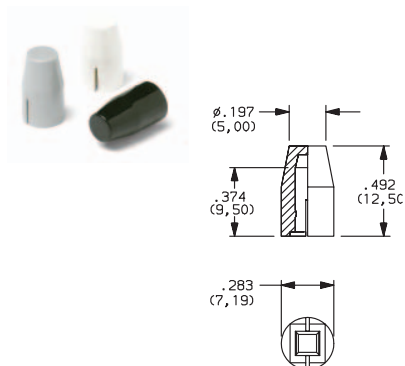
NE-18 Series Mains / Power Switches

SOLID BUTTON

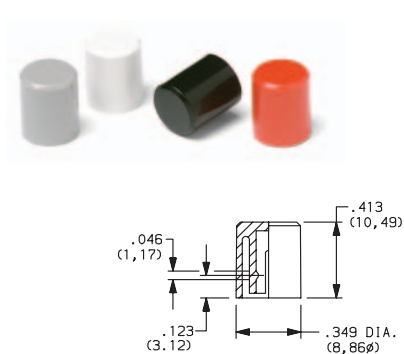


STYLE

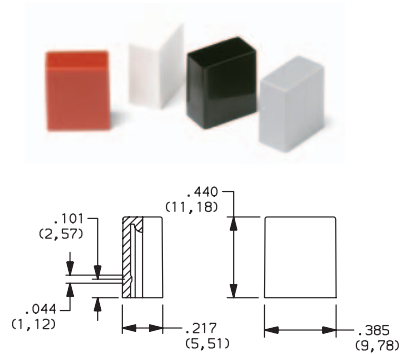
F01 FMR



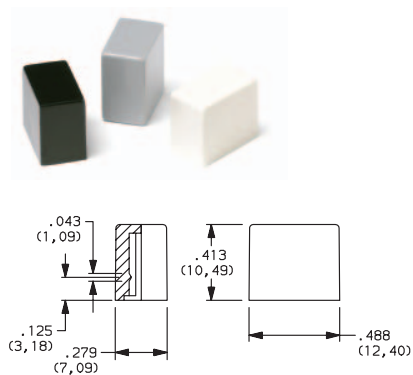
F02 FG



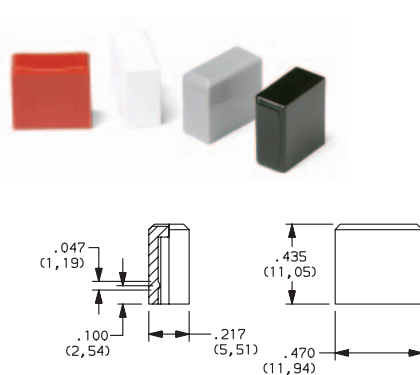
F12 FSC



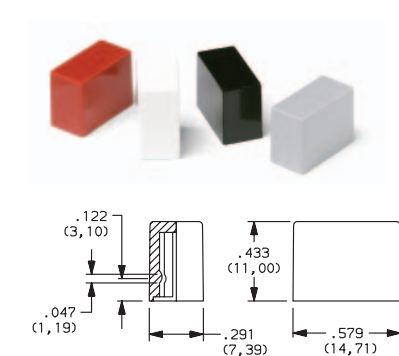
F13 FSD



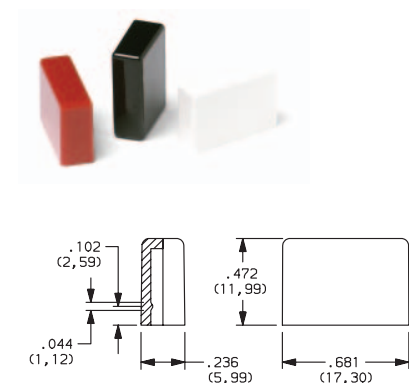
F14 FU12



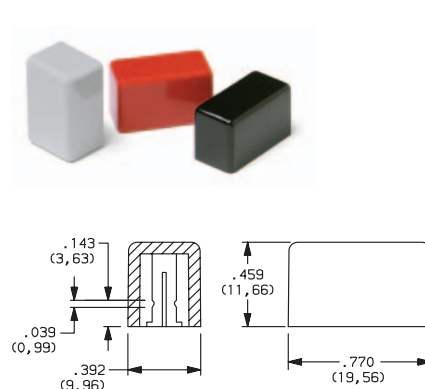
F15 FSB



F16 FE



F19 FA



OPTION CODE	COLOR
01	BLACK
02	WHITE
03	RED
04	LT. GRAY

Third Angle
Projection

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

www.ck-components.com

C&K

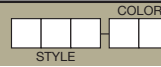
NE-18 Series Mains / Power Switches



A

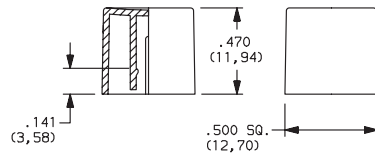
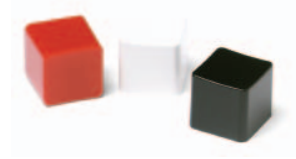
Pushbutton

SOLID BUTTON



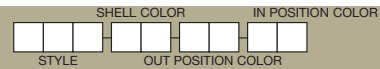
STYLE

F21 F001



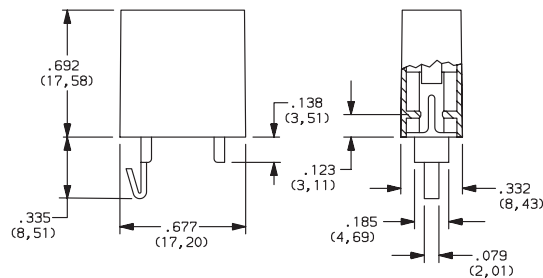
OPTION CODE	COLOR
01	BLACK
02	WHITE
03	RED
04	LT. GRAY
09	BLACK/CHROME (F03,F06 & F07 buttons only)

MECHANICAL BUTTON

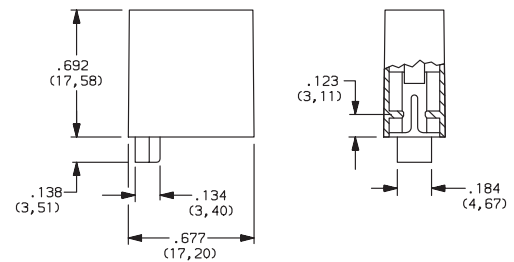


STYLE

F01 FA100



F02 FA101



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

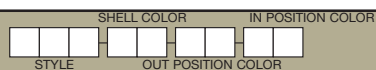
www.ck-components.com



NE-18 Series Mains / Power Switches

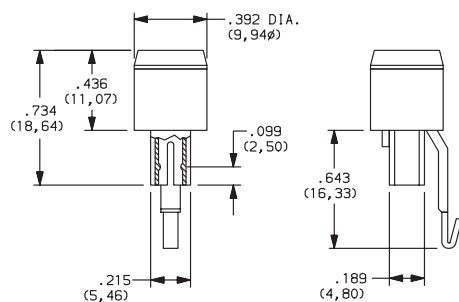
Pushbutton
A

MECHANICAL BUTTON

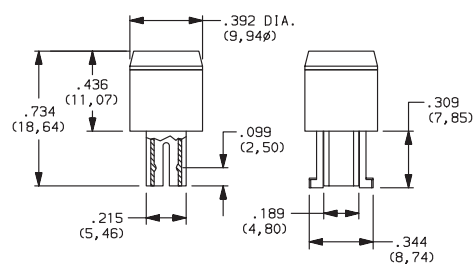


STYLE

F08 FA201



F11 FA200



SHELL COLOR

01 BLACK

OUT POSITION COLOR

01 BLACK

IN POSITION COLOR

OPTION CODE	COLOR
02	WHITE
06	YELLOW
07	BLUE
08	GREEN
12	ORANGE



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

www.ck-components.com

NEW!

FP Series Sealed Ultra Miniature Pushbutton Switches

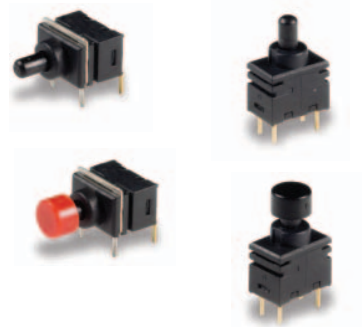


Features/Benefits

- Vertical and right angle mount
- Extended operating life 50,000 cycles
- Optional caps
- Sealed against soldering and cleaning processes
- RoHS compliant

Typical Applications

- Networking equipment
- Modems
- Reset functions
- Instrumentation



Specifications

CONTACT RATING: Max. 0.4 VA (28 V DC or V AC).
ELECTRICAL LIFE: 50,000 cycles.
CONTACT RESISTANCE: (10mA @ 2 V DC) 80 mΩ max. initial.
INSULATION RESISTANCE: 500MΩ min. @ 500 V DC - 1 minute.
OPERATING TEMPERATURE: -20°C to 80°C.
SOLDERABILITY: Per MIL-STD-202F method 208D, or
EIA RS-186E method 9.
PACKAGING:
Tray pack - 100 switches per tray.
Caps (optional) - Bulk bag; 100 caps per bag.

Materials

MOVABLE CONTACTS:
Base metal: Phosphor bronze
Plating: Gold over nickel plate
FIXED CONTACTS:
Base metal: Brass
Plating: Gold over nickel plate
COVER: PA66 - Black
ACTUATOR: PPS - Black
BASE: PPS - Black
SUPPORT BRACKET (A1 Terminal Style only): Steel with tin plate

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

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-108 thru A-109. For additional options not shown in catalog, consult Customer Service Center.

Designation	Actuator Length	Terminal Style	Contact Plating	Packaging	Cap
F P 1 1	S P	C 1	B 1	T P	0 0
FP11 Normally open	SP Standard plunger 3.3mm	C1 Vertical A1 Right Angle	B1 Gold over nickel plate	TP Tray packaging	00 No cap 01 White cap - bulk bagged 02 Black cap - bulk bagged 03 Red cap - bulk bagged



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



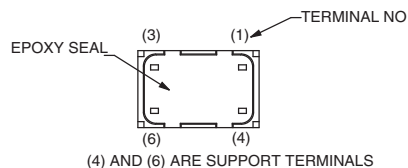
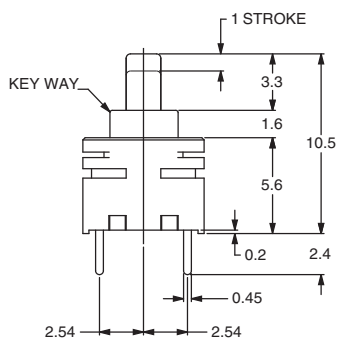
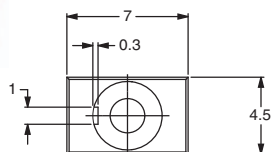
A

Pushbutton

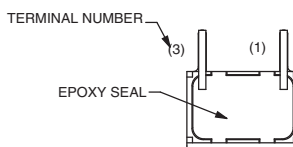
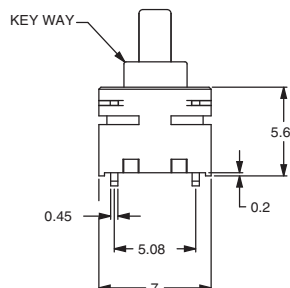
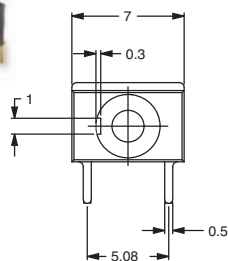
FP Series Sealed Ultra Miniature Pushbutton Switches **NEW!**

SWITCH FUNCTION

C1 VERTICAL



A1 RIGHT ANGLE

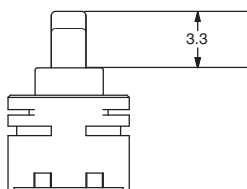


MODEL NO.	SWITCH FUNCTION	
	POS. 1	POS. 2
FP11		
	OFF	MOM
	CONNECTED TERMINALS	
	OPEN	1-3

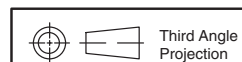


ACTUATOR LENGTH

SP STANDARD PLUNGER 3.3MM



C&K



Third Angle
Projection

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

www.ck-components.com

NEW!

FP Series Sealed Ultra Miniature Pushbutton Switches

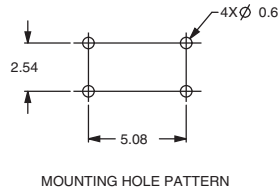
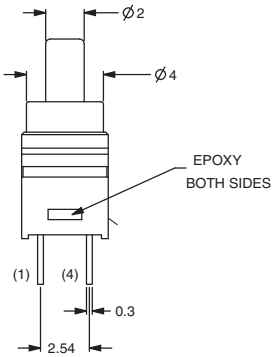


A

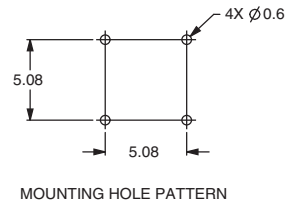
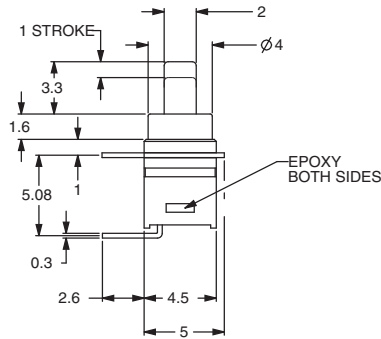
Pushbutton

TERMINAL STYLE

C1 VERTICAL



A1 RIGHT ANGLE



CONTACT PLATING

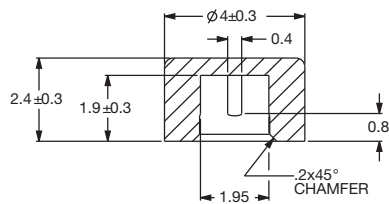
B1 GOLD OVER NICKEL PLATE

PACKAGING

TP TRAY PACKAGING

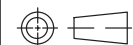
CAPS

OPTION CODE	DESCRIPTION
00	NO CAP
01	WHITE CAP, BULK BAGGED
02	BLACK CAP, BULK BAGGED
03	RED CAP, BULK BAGGED



To purchase Caps separately without switch,
please use these part numbers

PART #	COLOR
798D01000	WHITE
798D02000	BLACK
798D03000	RED



Third Angle
Projection

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

www.ck-components.com



NEW!

Typical Applications

- **Harsh environments**
- **Off-Road**
- **Industrial**
- **Medical**
- **Transportation**
- **Joystick control modules**
- **Gaming**
- **Military**



Materials

HOUSING: PBT
BASE: PBT
CAP: PBT
ACTUATOR:
Illuminated: Clear polycarbonate
Non-illuminated: PBT

INTERNAL SEAL: Silicone rubber
TERMINALS: Copper alloy, gold over silver plating
MOVABLE CONTACT: Copper alloy, gold over silver plating
TERMINAL SEAL: Epoxy

Operating Environment

OPERATING TEMPERATURE: -40°C to 85°C (+105°C non-illuminated)
ESD PROTECTION: 20 KV min.

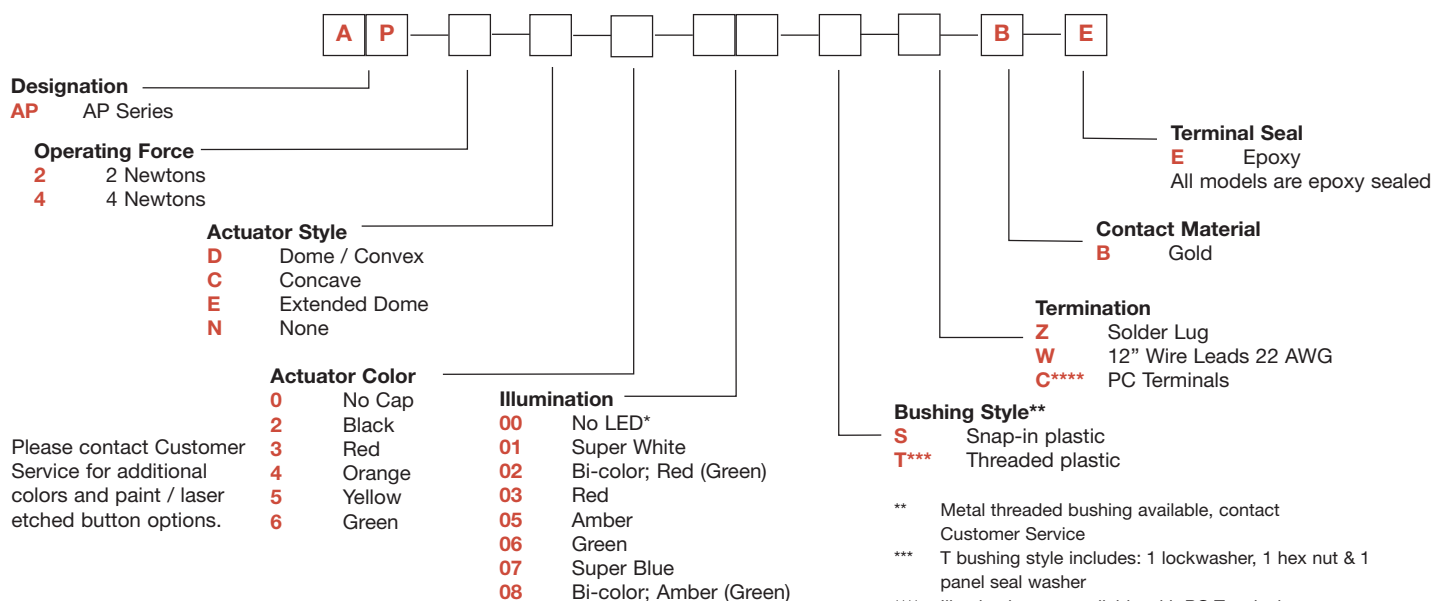
Process Environment

SEALING: IP67

DIELECTRIC STRENGTH: 1000 V AC min.
INSULATION RESISTANCE: 1 G Ω @ 500 VDC
INITIAL CONTACT RESISTANCE 50 m Ω max (without wire leads)
BOUNCE TIME: <5 ms

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

To order, simply select desired option from each category and place in the appropriate box.



* No LED available in short body only

** Metal threaded bushing available, contact
Customer Service

*** T bushing style includes: 1 lockwasher, 1 hex nut & 1
panel seal washer

**** Illumination not available with PC Terminals

Contact Customer Service for additional hardware options.

Specifications and dimensions subject to change

A-110

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NEW!

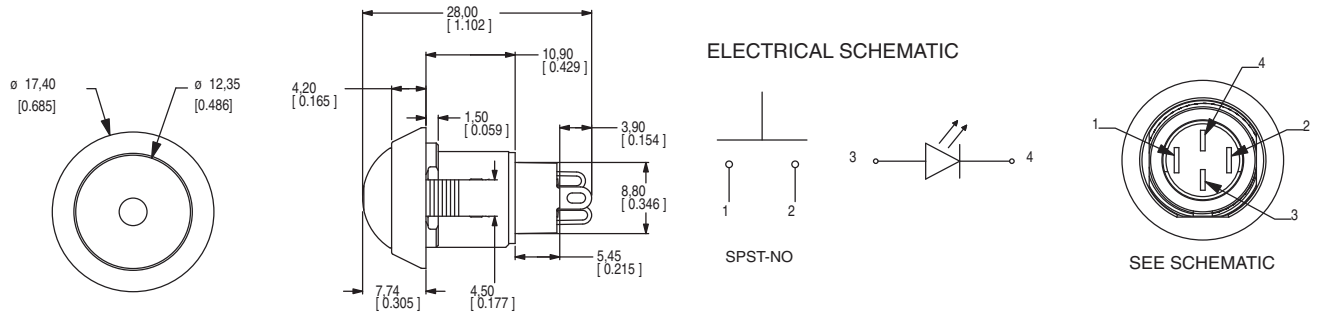
AP Series Industrial Pushbutton Switch



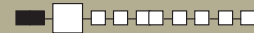
A

Pushbutton

STANDARD VIEW

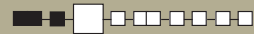


OPERATING FORCE

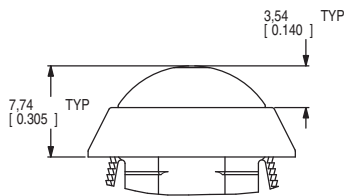


OPTION CODE	OPERATING FORCE
2	2 N, 200 g
4	4 N, 400 g

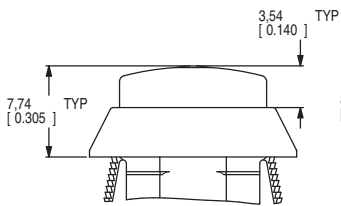
ACTUATOR STYLE



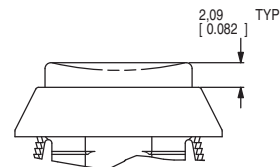
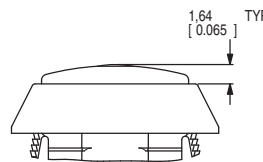
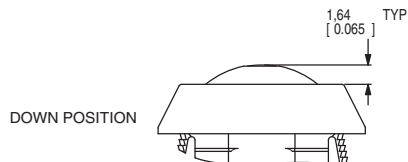
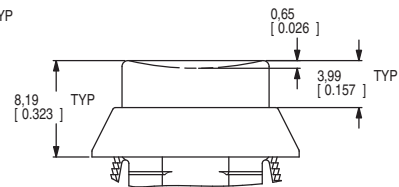
D DOME / CONVEX



E EXTENDED DOME



C CONCAVE

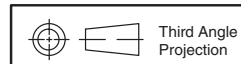


ACTUATOR COLOR



OPTION CODE	ACTUATOR COLOR
0	No Cap
2	Black
3	Red
4	Orange
5	Yellow
6	Green

For additional colors please contact Customer Service.



Third Angle Projection



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

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A

Pushbutton

AP Series Industrial Pushbutton Switch

NEW!

ILLUMINATION



OPTION CODE	ILLUMINATION TYPE	TYPICAL INTENSITY*		PEAK WAVELENGTH	Vf Forward Voltage
		MIN	MAX		
		(mcd)		(nm)	
00	Model without illumination	N/A		N/A	
01	LED Super White	4,000	5,000	N/A	3.5
02	LED Bi-Color – Red (Green)	10	20	635/565	2.0
03	LED Red	4	8	700	2.0
05	LED Amber	35	50	610	2.0
06	LED Green	35	50	565	2.0
07	LED Super Blue	800	1,500	470	3.8
08	LED Bi-Color – Amber (Green)	10	10	585/565	2.0

*LED FORWARD CURRENT: 20 mA

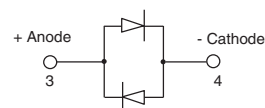
LED FORWARD VOLTAGE: see chart above

LED REVERSE VOLTAGE: 5.0 V MAX

* For information on specific and custom LED, please contact Customer Service.

NOTE:

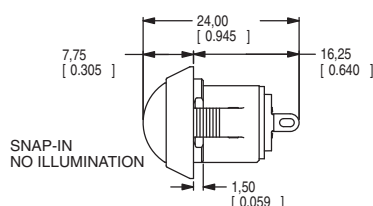
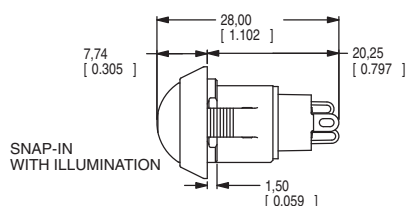
For bi-color LED's the polarity must be reversed to alternate the color



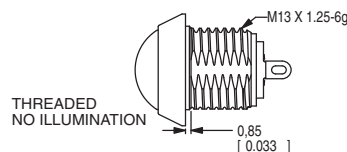
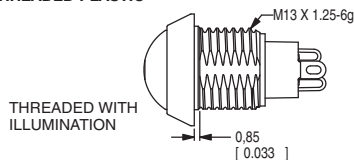
BUSHING STYLE



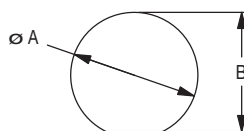
S SNAP-IN



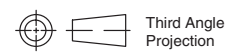
T THREADED PLASTIC



PANEL CUTOUT



PANEL THICKNESS	DIM A (± 0.05 mm)	DIM B (± 0.05 mm)
1 mm [0.039 in]	13.70 mm [0.539 in]	13.00 mm [0.512 in]
2 mm [0.079 in]	13.80 mm [0.539 in]	13.00 mm [0.512 in]
3 mm [0.118 in]	13.90 mm [0.547 in]	13.10 mm [0.516 in]
THREADED BODY MIN PANEL THICKNESS 1 mm	13.70 mm [0.539 in]	13.00 mm [0.512 in]



C&K

A 0.1mm min. chamfer on the leading edge of the mounting hole is recommended for snap-in version.

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

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NEW!

AP Series Industrial Pushbutton Switch



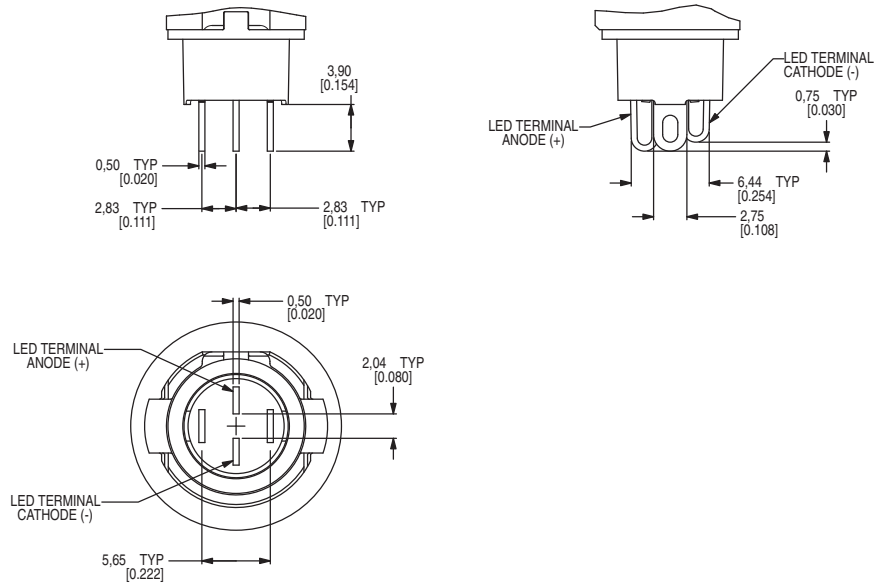
A

Pushbutton

TERMINATION

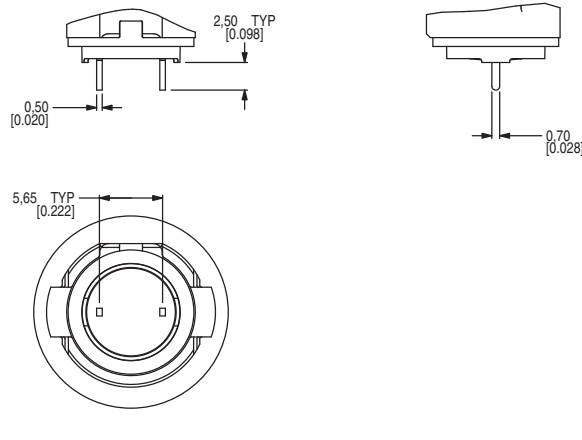


Z SOLDER LUG

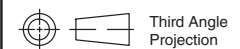
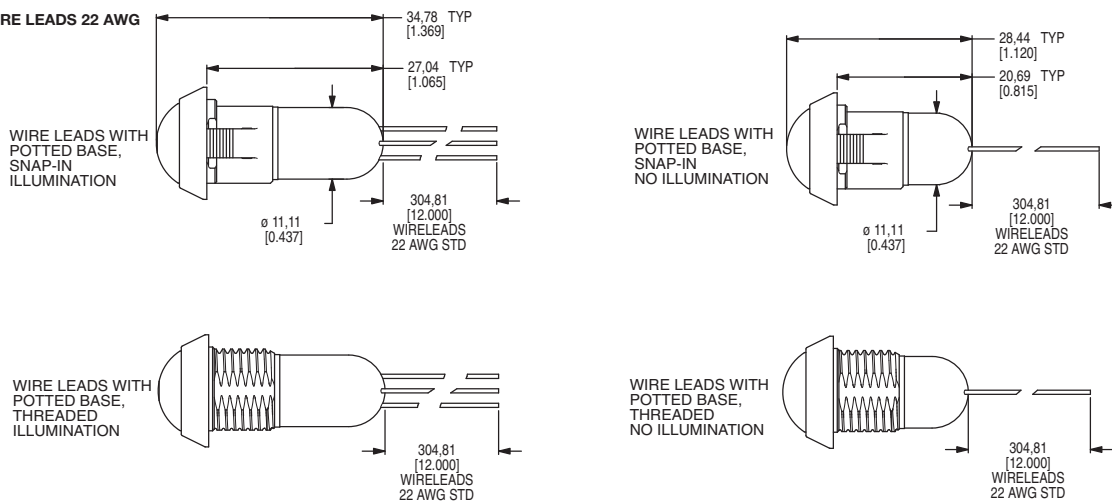


C PC TERMINALS

**** Illumination not available with PC Terminals



W 12" WIRE LEADS 22 AWG



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





AP Series Industrial Pushbutton Switch **NEW!**

A

Pushbutton

CONTACT MATERIAL



B GOLD

OPTION CODE	CONTACT MATERIAL
B	Gold

TERMINAL SEAL



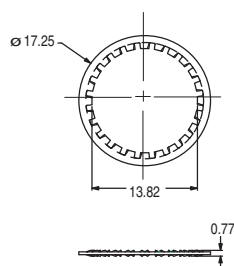
E EPOXY

All models are epoxy sealed

HARDWARE

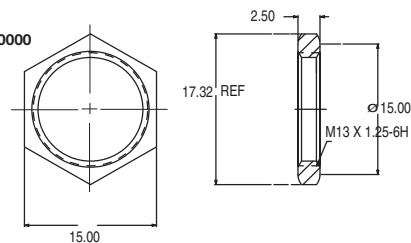
LOCK WASHER

Part Number 647D00000



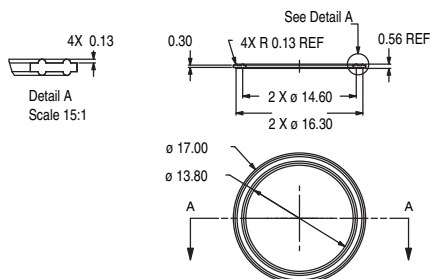
HEX NUT

Part number 515D00000

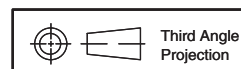


PANEL SEAL

Part Number 655D00000



Caps available on next page



Third Angle
Projection

C&K

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

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NEW!

AP Series Industrial Pushbutton Switch



A

Pushbutton

AVAILABLE CAPS

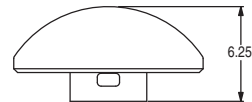
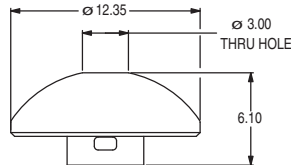


481 X XX 00X
Cap ———
Actuator Style ———
Cap Color ——— Hole / No Hole

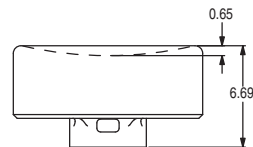
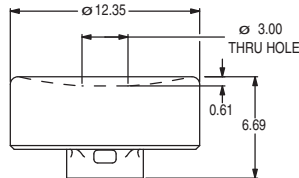
OPTION	CAP COLOR
02	BLACK
03	RED
04	ORANGE
05	YELLOW
06	GREEN

PART NUMBER	HOLE	ACTUATOR STYLE
481DXX000	NO	DOME
481DXX001	YES	DOME
481CXX000	NO	CONCAVE
481CXX001	YES	CONCAVE
481EXX000	NO	EXTENDED DOME
481EXX001	YES	EXTENDED DOME

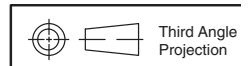
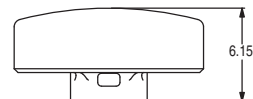
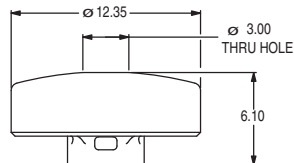
D DOME



C CONCAVE



E EXTENDED DOME



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

www.ck-components.com



HP Series Hall Effect Pushbutton Switch

NEW!

Features/Benefits

- IP68 sealed
- 10,000,000 life cycle
- Multiple colored caps
- Redundant output available

Typical Applications

- Harsh environments
- Off-Road
- Industrial
- Medical
- Transportation
- Joystick control modules
- Gaming
- Military



Specifications

FUNCTION: Linear output (See chart on next page)
MOUNTING TYPE: Front mount, Rear mount

Mechanical

MECHANICAL TRAVEL: 0.150 (3.81mm)
SHOCK: 60g 11ms sawtooth wave
VIBRATION: 10-500Hz 10g max.

Electrical

SUPPLY VOLTAGE: 5 ± 0.5 VDC
SUPPLY CURRENT: 10mA max.
OUTPUT CURRENT: 1mA max.
OUTPUT VOLTAGE: Programable from 0.5 -4.5V
ESD PROTECTION: 16kV per EIA-545

Materials

CASE / BUSHING: Anodized Aluminum
INSIDE HOUSING: PBT
CAP: PBT
ACTUATOR: PBT

Operating Environment

OPERATING TEMPERATURE: -40°C to 85°C
OPERATING LIFE: 10,000,000 cycles
SEALING: IP68S

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

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

Designation _____		Hardware	
HP HP Series		0 No hardware	
Bushing / Mounting Style		1 Plated hardware (STD)	
1 Front mount, 5/8-24 thread		2 Stainless hardware	
2 Rear mount, 5/8-24 thread		Bushing Finish	
3 Rear mount, 15/32-32 thread		1 Clear anodize	
Cap Style		2 Black anodize (STD)	
1 \varnothing .625 Dome (front mount only)		Cap Color	
2 \varnothing .370 Flat		1 White	
Sensor Configuration		2 Black (STD)	
S Single Output		3 Red	
D Dual Output, Output 2 mirrors Output 1 (see figure 1)		4 Orange	
Output Voltage Code		5 Yellow	
1 V1= 1.0V, V2= 4.0V		Termination Style	
2 V1= 4.0V, V2= 1.0V		W 12" wire leads, 22 AWG XLPE (26 AWG for Dual Output)	
3 V1= 0.5V, V2= 4.5V		Actuation Force	
4 V1= 4.5V, V2= 0.5V		S 2.7lb (12N)	

Please contact Customer Service for additional options.

NEW!

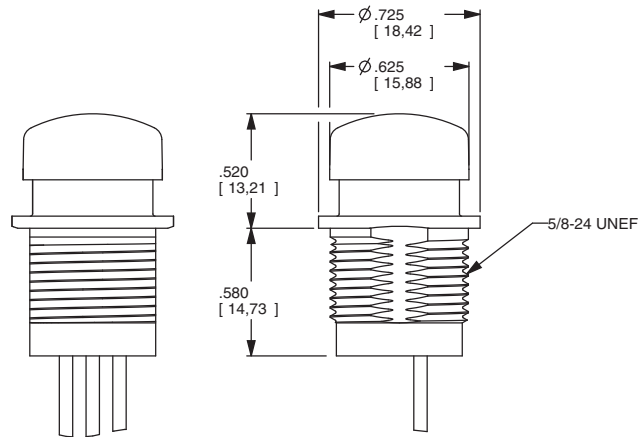
HP Series Hall Effect Pushbutton Switch



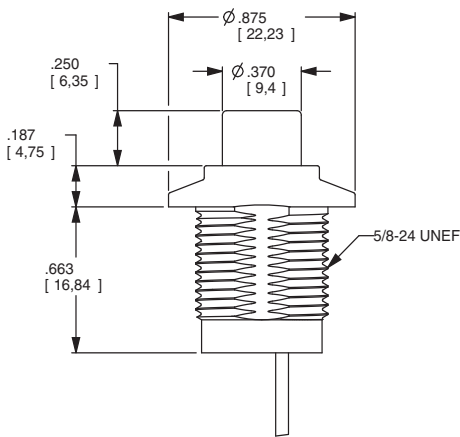
A

Pushbutton

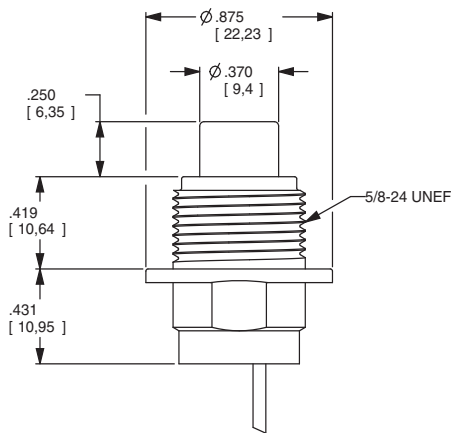
STANDARD VIEW



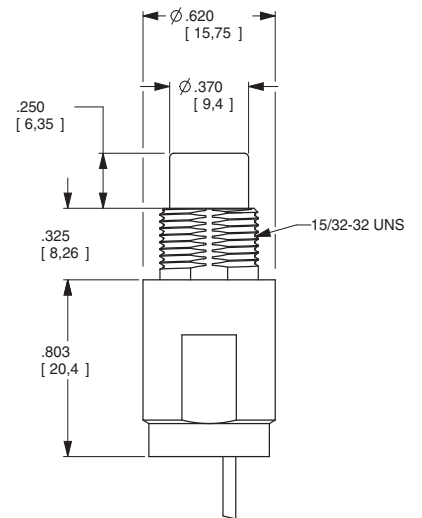
HP11



HP12



HP22



HP32

FIGURE 1: OUTPUT VOLTAGE

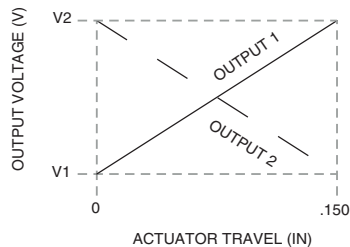
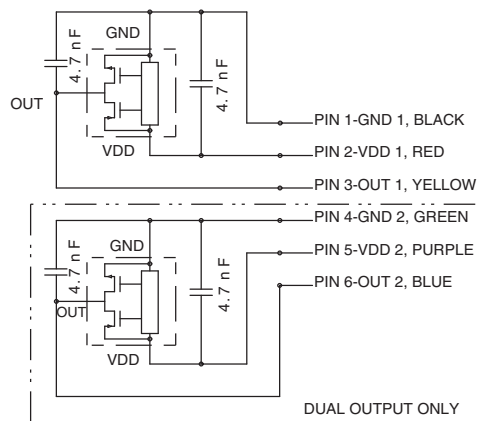


FIGURE 2- SCHEMATIC



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

www.ck-components.com



NP Series Sealed Industrial Pushbutton Switch

NEW!

Features/Benefits

- IP68 sealed
- 1,000,000 life cycle
- Multiple housing styles
- Capable of up to 5A resistive load
- Wirelead options available
- RoHS compliant

Typical Applications

- Harsh environments
- Off-Road
- Industrial
- Transportation
- Military



Specifications

FUNCTION: SPDT Double Break (Form Z) Momentary
CONTACT ARRANGEMENT: N.O. and N.C.
MOUNTING TYPE: Threaded front or rear mount and slot mount

Mechanical

OPERATING LIFE: 1,000,000 cycles
TOTAL TRAVEL: 1.6 ± 0.15 mm
OPERATING POINT 0.9 ± 0.25 mm
OVER TRAVEL: 0.45 min.
OPERATING FORCE: $8N \pm 1N$
VIBRATION: 10-500 Hz 10g Max
SHOCK: 50g 11ms sawtooth wave

Electrical

CONTACT RATING:

- Option G - Gold over Silver
10mA/5 VDC (1,000,000 cycles)
- Option Q - Silver
1A/28 VDC resistive (1,000,000 cycles)
5A/28 VDC resistive (25,000 cycles)
3A/28 VDC inductive (25,000 cycles)

DIELECTRIC STRENGTH: 1000 V AC for 1 min.

INSULATION RESISTANCE: $1 G \Omega$ @ 500 VDC

INITIAL CONTACT RESISTANCE 50 m Ω max (without wire leads)

BOUNCE TIME: <5 ms

Materials

HOUSING: 6061-T6 Aluminum, black or clear anodized
BASE: PBT
CAP: PBT
ACTUATOR: PBT
INTERNAL SEAL: Silicone rubber
TERMINALS: Copper with silver nickel inlay, silver plating
MOVABLE CONTACT: Copper alloy, gold over silver plating
TERMINAL SEAL: Epoxy

Operating Environment

OPERATING TEMPERATURE: -55°C to +105°C
ESD PROTECTION: 15KV min.

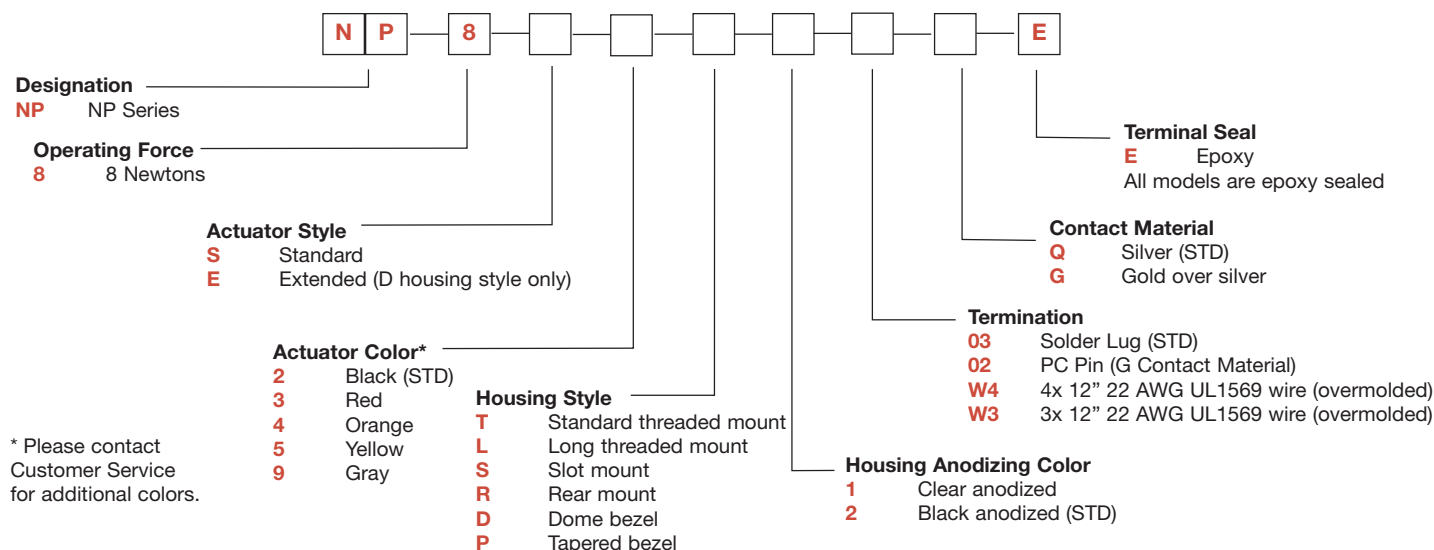
Process Environment

SEALING: IP68

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

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.



Specifications and dimensions subject to change

NEW!

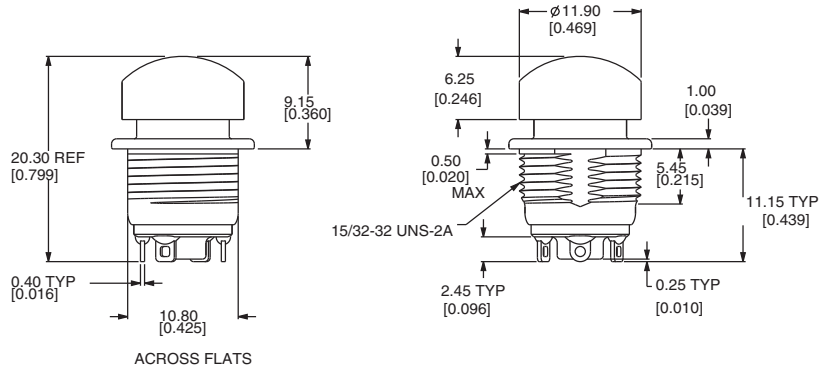
NP Series Sealed Industrial Pushbutton Switch



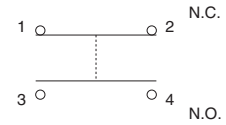
A

Pushbutton

STANDARD VIEW



ELECTRICAL SCHEMATIC



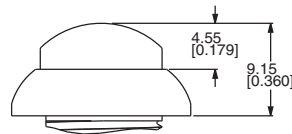
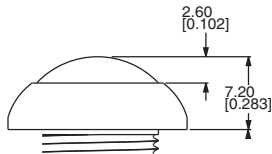
OPERATING FORCE

OPTION CODE	OPERATING FORCE
8	8 N

ACTUATOR STYLE

S STANDARD

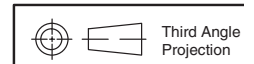
E EXTENDED (D HOUSING STYLE ONLY)



ACTUATOR COLOR

OPTION CODE	ACTUATOR COLOR
2	Black
3	Red
4	Orange
5	Yellow
9	Gray

For additional colors please contact Customer Service.



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

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A

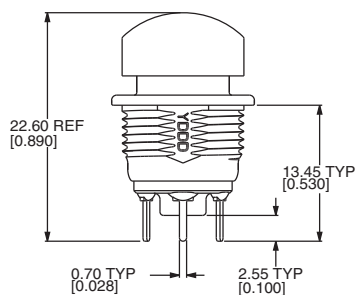
Pushbutton

NP Series Sealed Industrial Pushbutton Switch

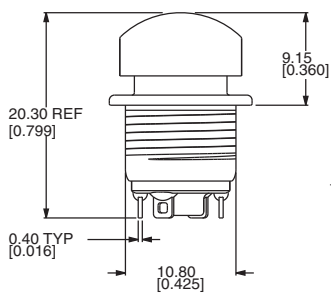
NEW!

HOUSING STYLE

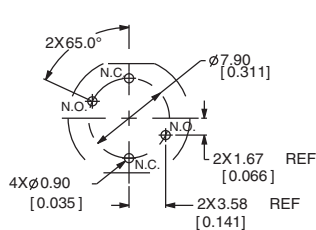
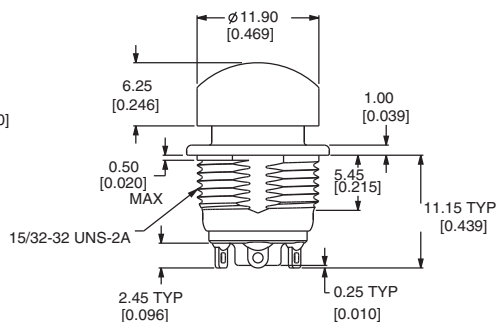
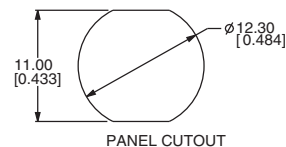
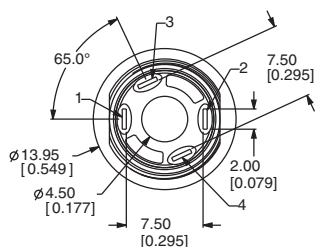
T STANDARD THREADED MOUNT



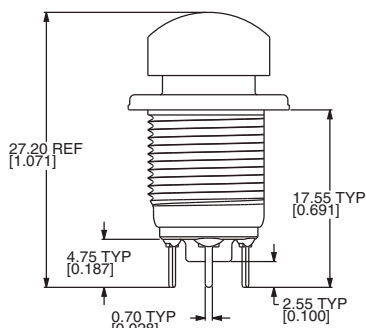
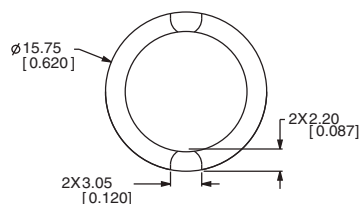
PC TERMINALS



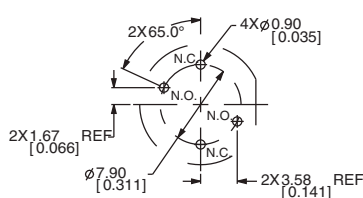
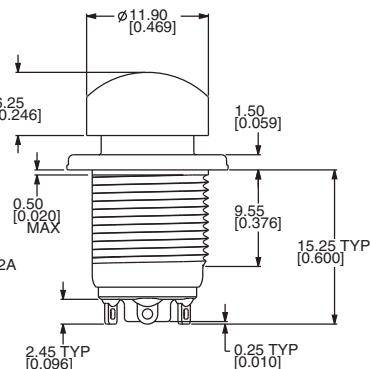
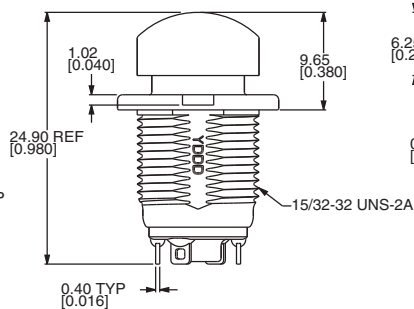
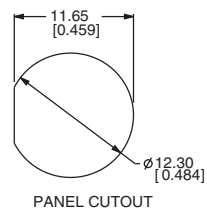
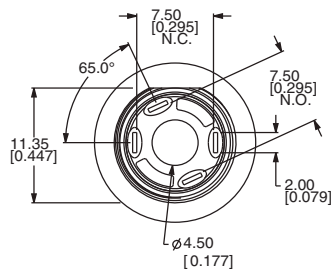
ACROSS FLATS

PC HOLE PATTERN
BOARD VIEW

L LONG THREADED MOUNT



PC TERMINALS

PC HOLE PATTERN
BOARD VIEWThird Angle
Projection

C&K

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

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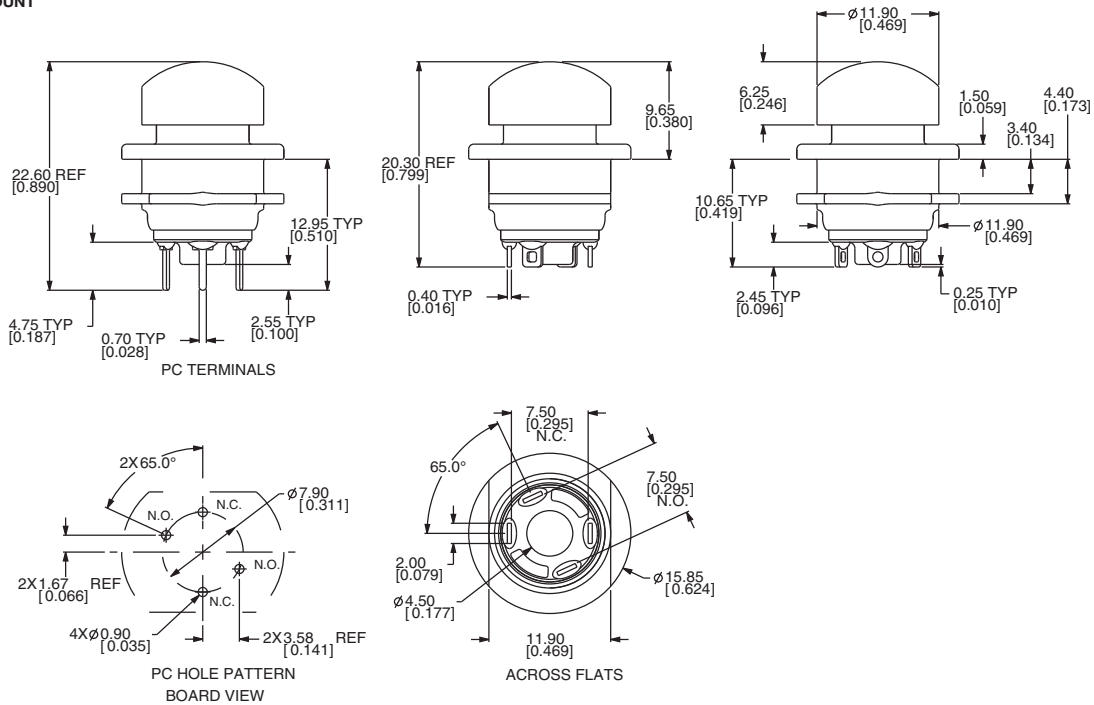
NEW!

NP Series Sealed Industrial Pushbutton Switch

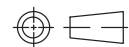
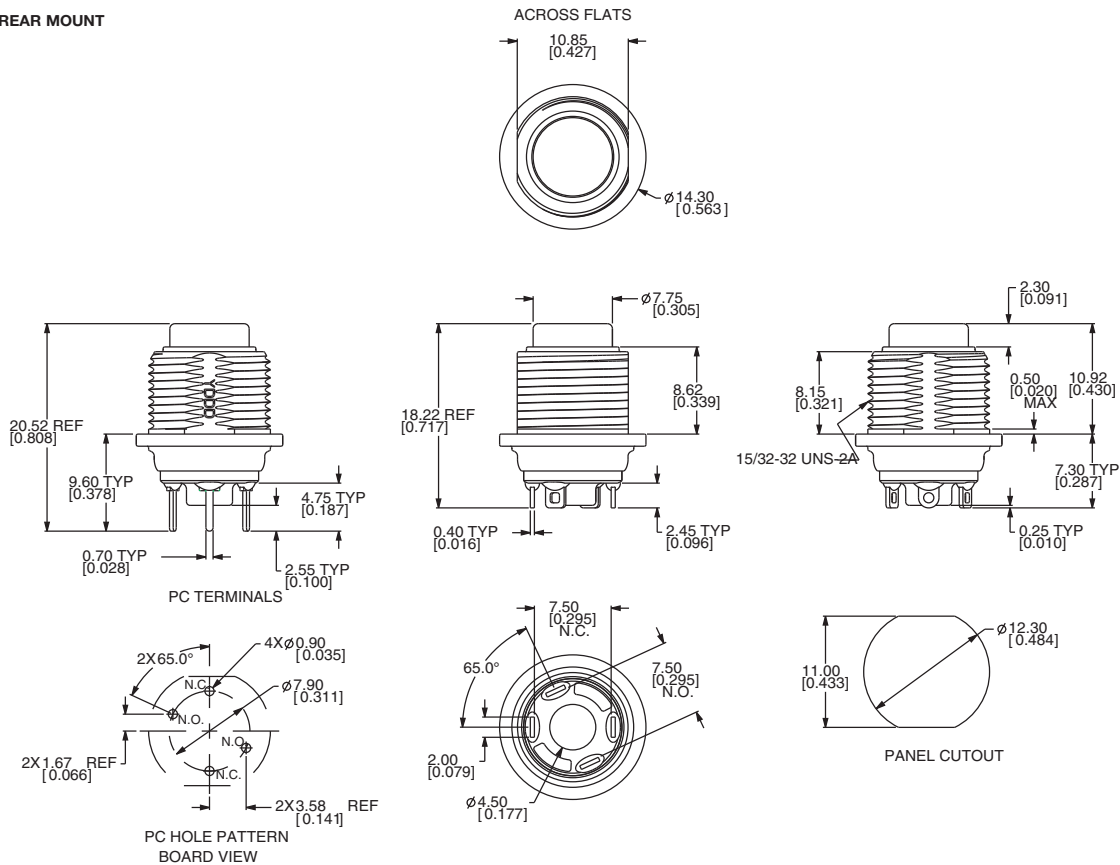
**A****Pushbutton**

HOUSING STYLE

S SLOT MOUNT



R REAR MOUNT

Third Angle
Projection**C&K**

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

www.ck-components.com

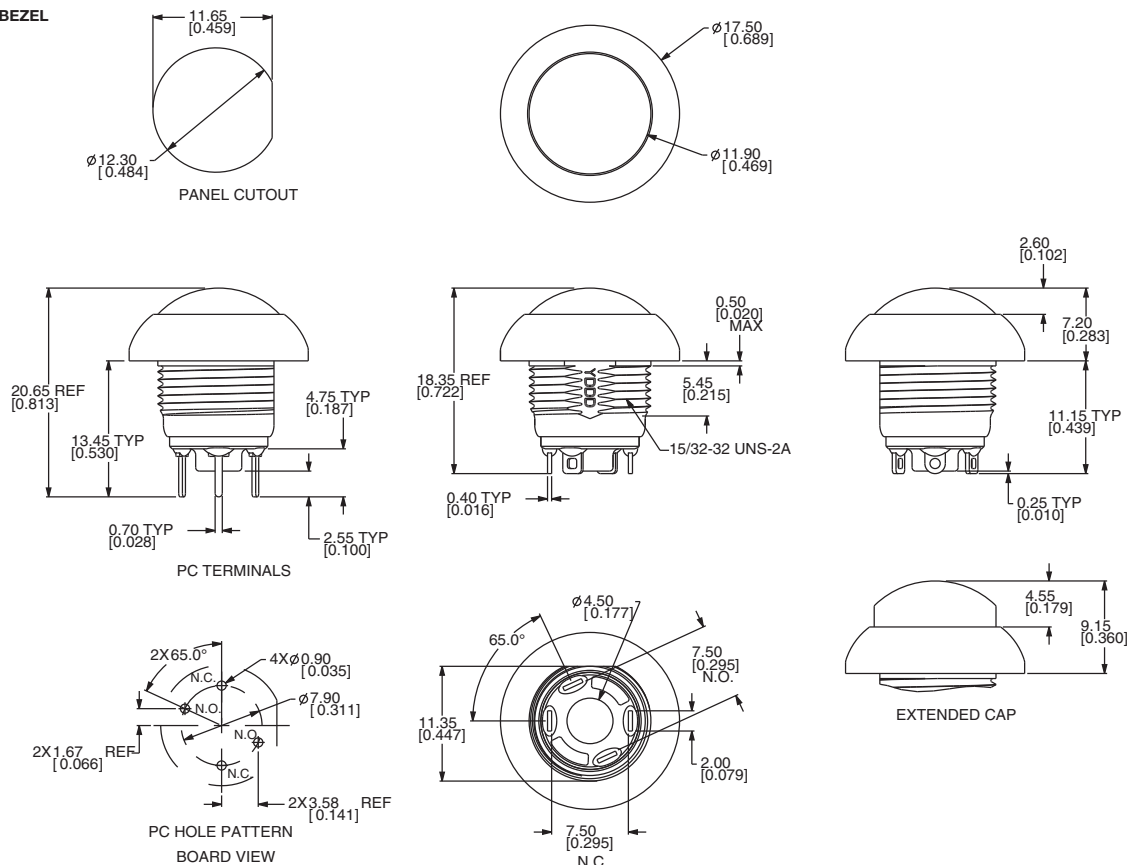
**A****Pushbutton**

NP Series Sealed Industrial Pushbutton Switch

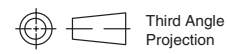
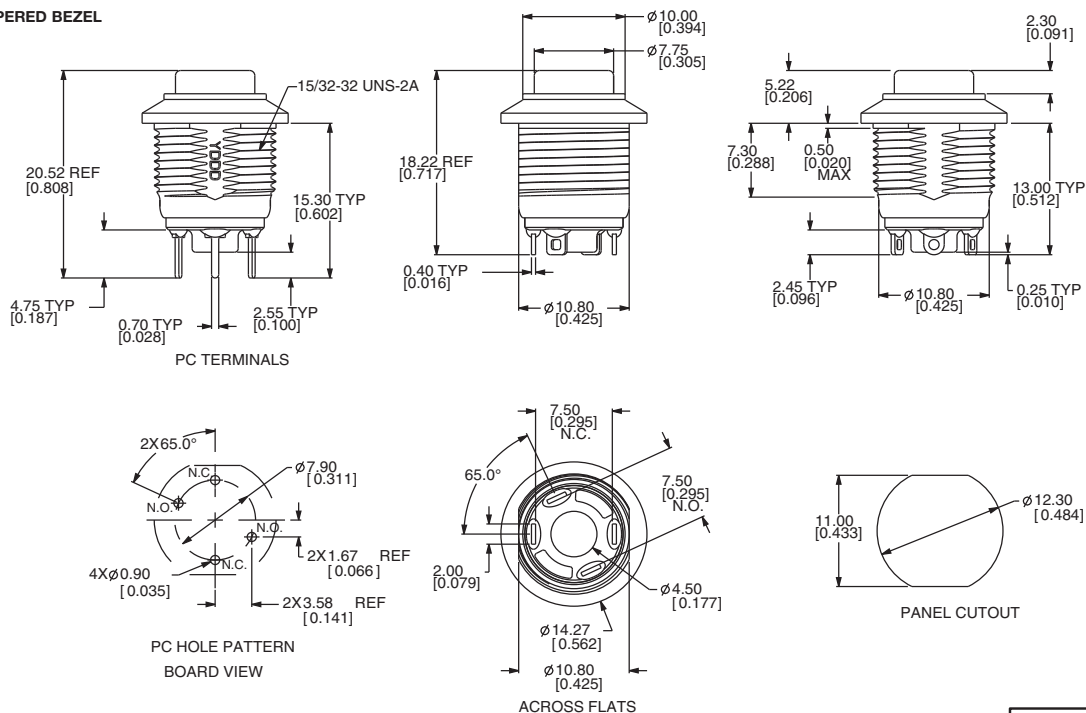
NEW!

HOUSING STYLE

D DOME BEZEL



P TAPERED BEZEL

Third Angle
Projection**C&K**Dimensions are shown: mm (inches)
Specifications and dimensions subject to change

NEW!

NP Series Sealed Industrial Pushbutton Switch



A

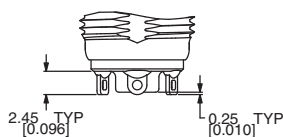
Pushbutton

HOUSING ANODIZING COLOR

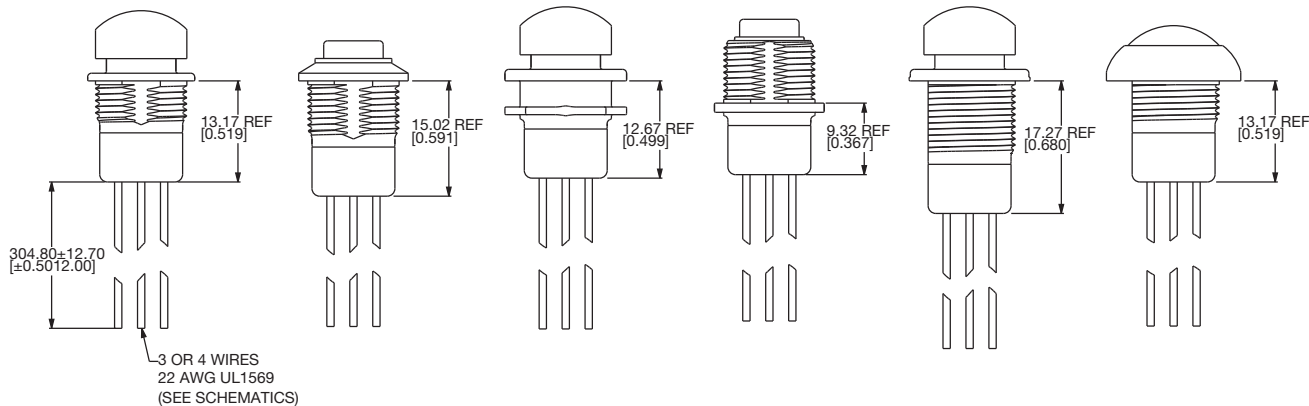
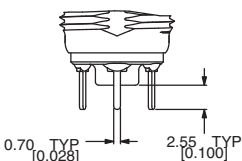
OPTION CODE	ANODIZING COLOR
1	Clear anodized
2	Black anodized (STD)

TERMINATION

03 SOLDER LUG (STD)

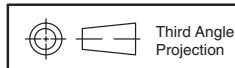
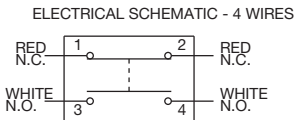
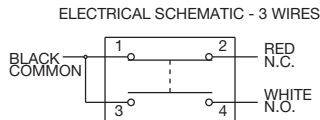


02 PC PIN (G CONTACT MATERIAL)



W3 3X 12" 22 AWG UL1569 WIRE (OVERMOLDED)

W4 4X 12" 22 AWG UL1569 WIRE (OVERMOLDED)



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

**A**

Pushbutton

NP Series Sealed Industrial Pushbutton Switch

NEW!

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL
Q	Silver (STD)
G	Gold over Silver

TERMINAL SEAL

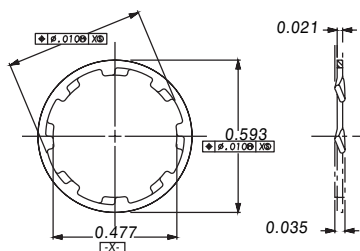
E EPOXY

All models are epoxy sealed

HARDWARE

LOCKWASHER

700302202

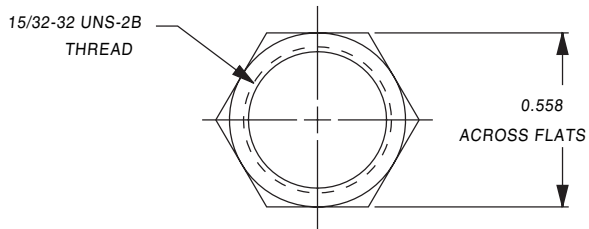


HEX NUT

707100A56 Black

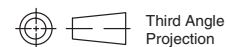
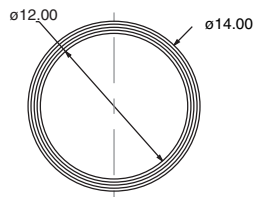
707100201 Nickel-plated

707100215 Satin Chrome



PANEL GASKET

851D020000



Third Angle
Projection

C&K

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

www.ck-components.com

Features/Benefits

- **Illuminated display**
- **Small size**
- **Cold lighting**
- **Tactile feed back**

Typical Applications

- **Avionic**



Mechanical

ACTUATION FORCE: 5,5 N \pm 0,5 N
 MAXIMUM FORCE: 80 N
 TRAVEL TO CONTACT: 1,2 \pm 0,1 mm
 OVERTRAVEL: >0,3 mm
 TOTAL TRAVEL: 1,5 \pm 0,1 mm
 LIFE EXPECTANCY: 10⁶ operations 28 V - 10 mA
 WEIGHT: 2 grams
 VIBRATION: \pm 0,45mm from 33 Hz to 75 Hz
 ACCELERATION: 10 g max

Electrical

CONTACTS: Gold plated
 VOLTAGE: Max 100 V - Min 20 mV DC
 CARRYING CURRENT: Max 250 mA - Min 50 μ A
 SWITCHING CURRENT: Max 50 mA - Min 50 μ A
 MAX SWITCHING POWER: 1 W
 CONTACT RESISTANCE: < 50 Ω
 DIELECTRIC STRENGTH: 500 V rms
 INSULATION RESISTANCE (100 V): > 5000 M Ω
 BOUNCE: < 3 ms
 SWITCHING OF 2 POLES MATCHING: < 10 ms

Environmental Data

STORAGE TEMPERATURE: -55°C TO 85°C
 OPERATING TEMPERATURE: -30°C TO 85°C
 TEMPERATURE OF KEY TO CAP: < Ambient +25°C
 HUMIDITY TEST: 21 days (-40°C - 93% HR)
 ALTITUDE PRESSURE: From 20 hPa to 1070 hPa

Soldering Data

WAVE SOLDERING: 260°C / 5s
 MANUAL SOLDERING: 350°C / 2s
 SEALING: According to IP64

Plastic Material

Housing and Cap: UL-94 VO

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

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

Designation PBA PBA Series		Size 1 9,5 x 14 2 11,5 x 14 3 14 x 14		Marking Location H High M Middle L Low		Type of Marking T Text / Legend S Status Indicator		LED Color 0 White λ 1 Green λ 560 nm 2 Yellow Green λ 568 nm 3 Amber λ 590 nm 4 Red λ 660 nm 5 Other λ		Display Type <table border="1"> <thead> <tr> <th></th> <th></th> <th>LED Non-Illuminated</th> <th>LED Illuminated</th> </tr> </thead> <tbody> <tr> <td rowspan="2">N</td> <td>Text Marking</td> <td>White</td> <td>LED Color</td> </tr> <tr> <td>Background</td> <td>Black</td> <td>Black</td> </tr> <tr> <td rowspan="2">S</td> <td>Text Marking</td> <td>Not visible</td> <td>LED Color</td> </tr> <tr> <td>Background</td> <td>Black</td> <td>Black</td> </tr> <tr> <td rowspan="2">R</td> <td>Text Marking</td> <td>White</td> <td>LED Color</td> </tr> <tr> <td>Background</td> <td>Red</td> <td>Red</td> </tr> <tr> <td rowspan="2">G</td> <td>Text Marking</td> <td>Green</td> <td>Green</td> </tr> <tr> <td>Background</td> <td>Black</td> <td>Black</td> </tr> </tbody> </table>				LED Non-Illuminated	LED Illuminated	N	Text Marking	White	LED Color	Background	Black	Black	S	Text Marking	Not visible	LED Color	Background	Black	Black	R	Text Marking	White	LED Color	Background	Red	Red	G	Text Marking	Green	Green	Background	Black	Black	LED Supply or Type AC Alternative DC Direct XX for each marking 1:6 LEDs in parallel for direct current	
		LED Non-Illuminated	LED Illuminated																																										
N	Text Marking	White	LED Color																																										
	Background	Black	Black																																										
S	Text Marking	Not visible	LED Color																																										
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G	Text Marking	Green	Green																																										
	Background	Black	Black																																										



A

Pushbutton

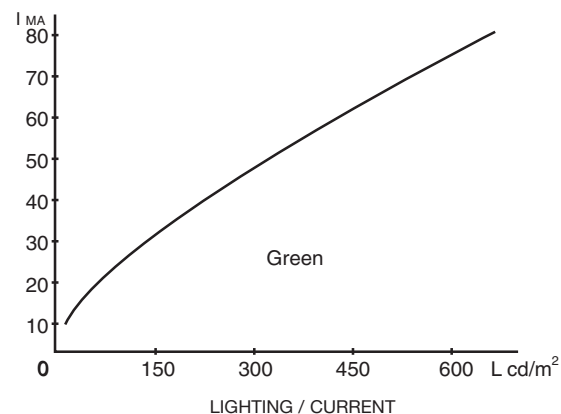
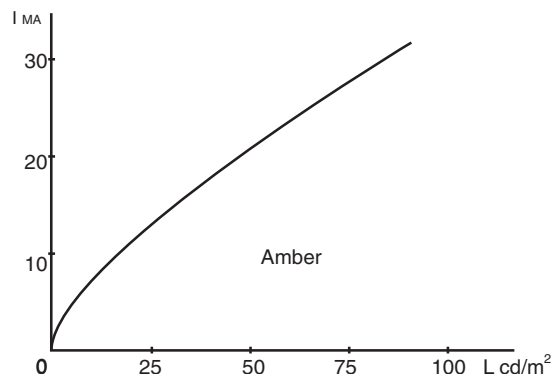
PBA Series Illuminated Pushbutton

LIGHTING DATA

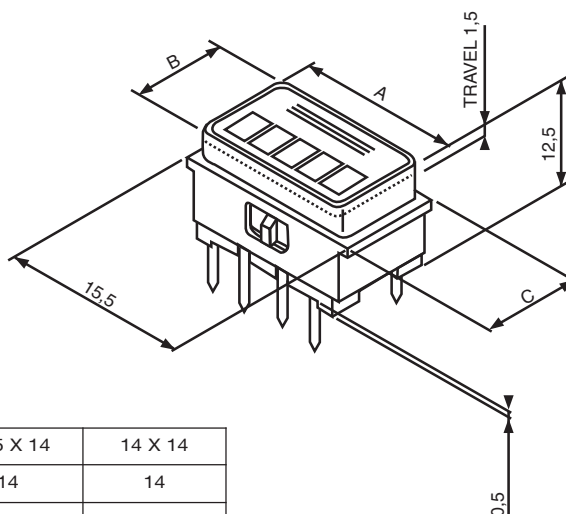
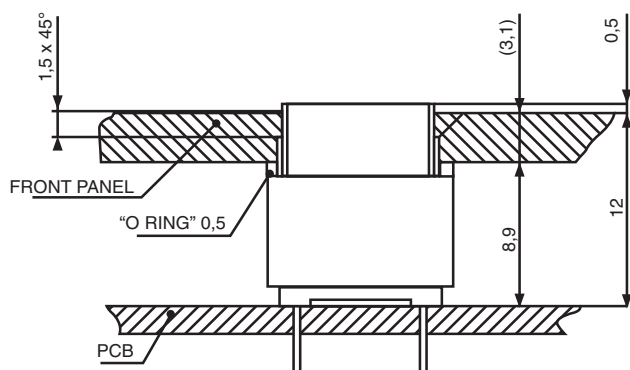
The legends of function and the status indicator can be illuminated separately.

Color	Amber	Green
Wave Length	$586 < \lambda < 592$	$555 < \lambda < 560$
Current Max	80 mA	80 mA
Chromaticity	X Y	$0,30 < X < 0,40$ $0,6 < Y$
Contrast Min.	1,2	0,85

For other colors and displays, please contact Customer Service.



DIMENSIONS (applicable for any size)



Tolerance: $\pm 0,1$ mm

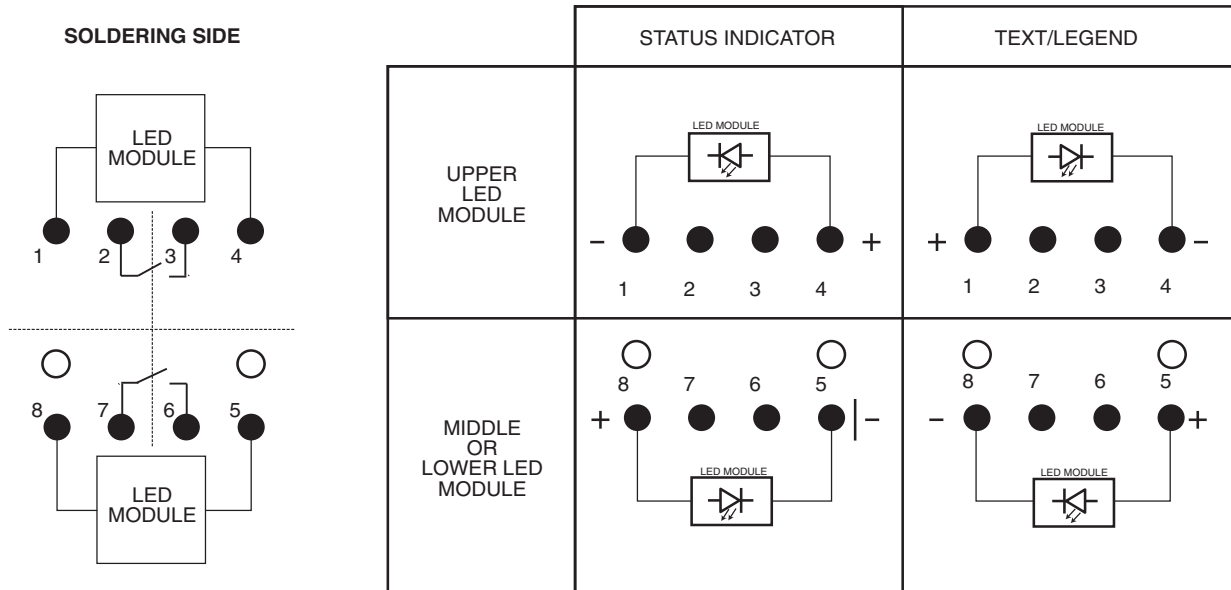
	9,5 X 14	11,5 X 14	14 X 14
A	14	14	14
B	9,5	11,5	14
C	11	11,5	15,5



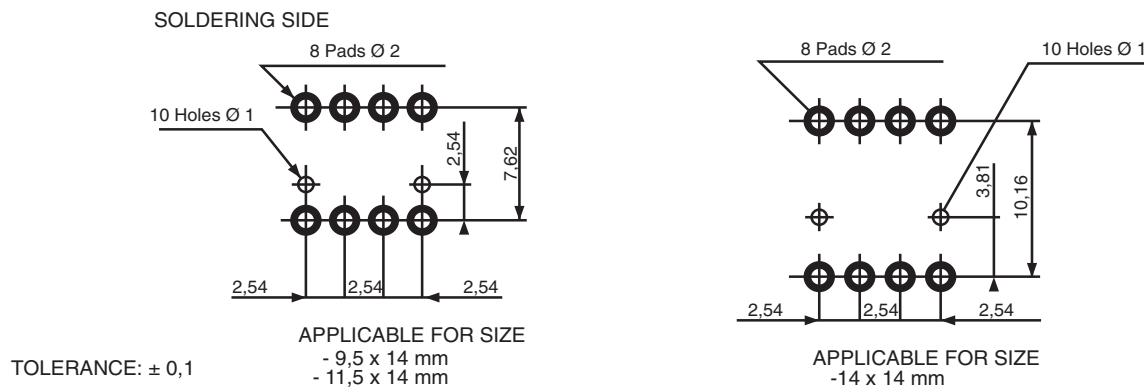
Dimensions are shown: mm
Specifications and dimensions subject to change



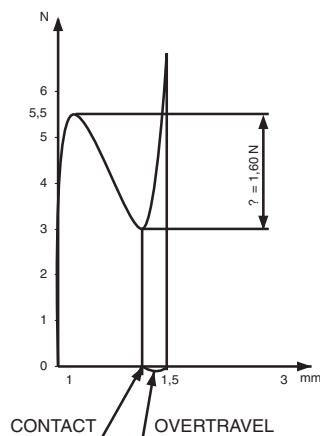
LED MODULE LAYOUT



PCB Layout



TACTILE EFFECT



TRAVEL

- TRAVEL TO CONTACT: $1,2 \pm 0,1$ mm
- OVERTRAVEL: $> 0,3$ mm
- TOTAL TRAVEL: $1,5 \pm 0,1$ mm

FORCE

- ACTUATOR FORCE: $5,5 \text{ N} \pm 0,5 \text{ N}$
- TACTILE FEELING: $1,6 \text{ N}$

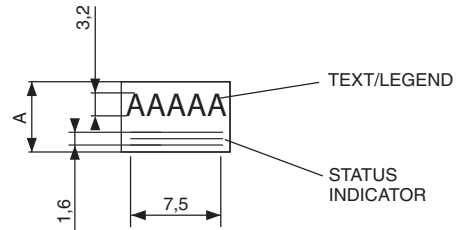
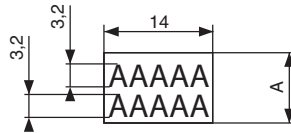
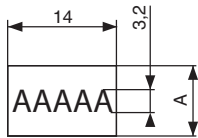


PBA Series Illuminated Pushbutton

A

Pushbutton

1 or 2 markings are available in any combination of text / legend or status indicator.



A = 9,5 or 11,5 or 14mm



A

Pushbutton

Features/Benefits

- Movable contact with redundant high power contact points to form a momentary, SPST, double break switch
- Rubber actuator provides sealing and tactile feel.
- Small SMT packaging allows applications to integrate power and signal switch on same PCB
- RoHS compliant and compatible
- IP65

Typical Applications

- Computers and peripherals
- Automotive power function
- White goods and appliances
- Industrial power applications



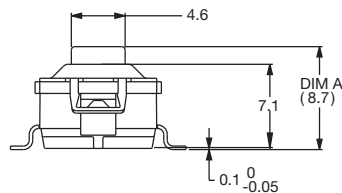
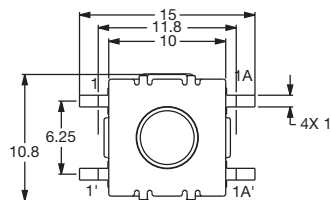
Specifications

OPERATING FORCE: 5N (average)
TRAVEL TO "ON" POSITION/PRE-TRAVEL: 1.0mm
"ON" STARTING POSITION:
(measured from reference plane) 7.7mm
TOTAL TRAVEL POSITION:
(measured from reference plane) 7.1mm
MECHANICAL TRAVEL: 1.6mm
OPERATING LIFE: 14,000 cycles
EUROPE: 200-240V AC @1A (7A inrush)
USA: 100-127V AC @2A (4A inrush)
MIN/MAX VOLTAGE: 20-250 VAC
MIN/MAX CURRENT: 10mA - 2A (7A Inrush)
CONTACT RESISTANCE: 100mΩmax.
DIELECTRIC STRENGTH: 1500 VRMS min.
INSULATION RESISTANCE: 100 Mega-ohms min.
BOUNCE TIME: 20 milliseconds max.
OPERATING TEMPERATURE: 0°C to 85°C
PACKAGING: Tape & Reel

Materials

MOVABLE CONTACTS: Base metal
FIXED CONTACTS/TERMINALS: Base metal
BASE: PPS
FRAME: Stainless steel
ACTUATOR: Stainless steel

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



PCB LAYOUT AND SCHEMATIC

