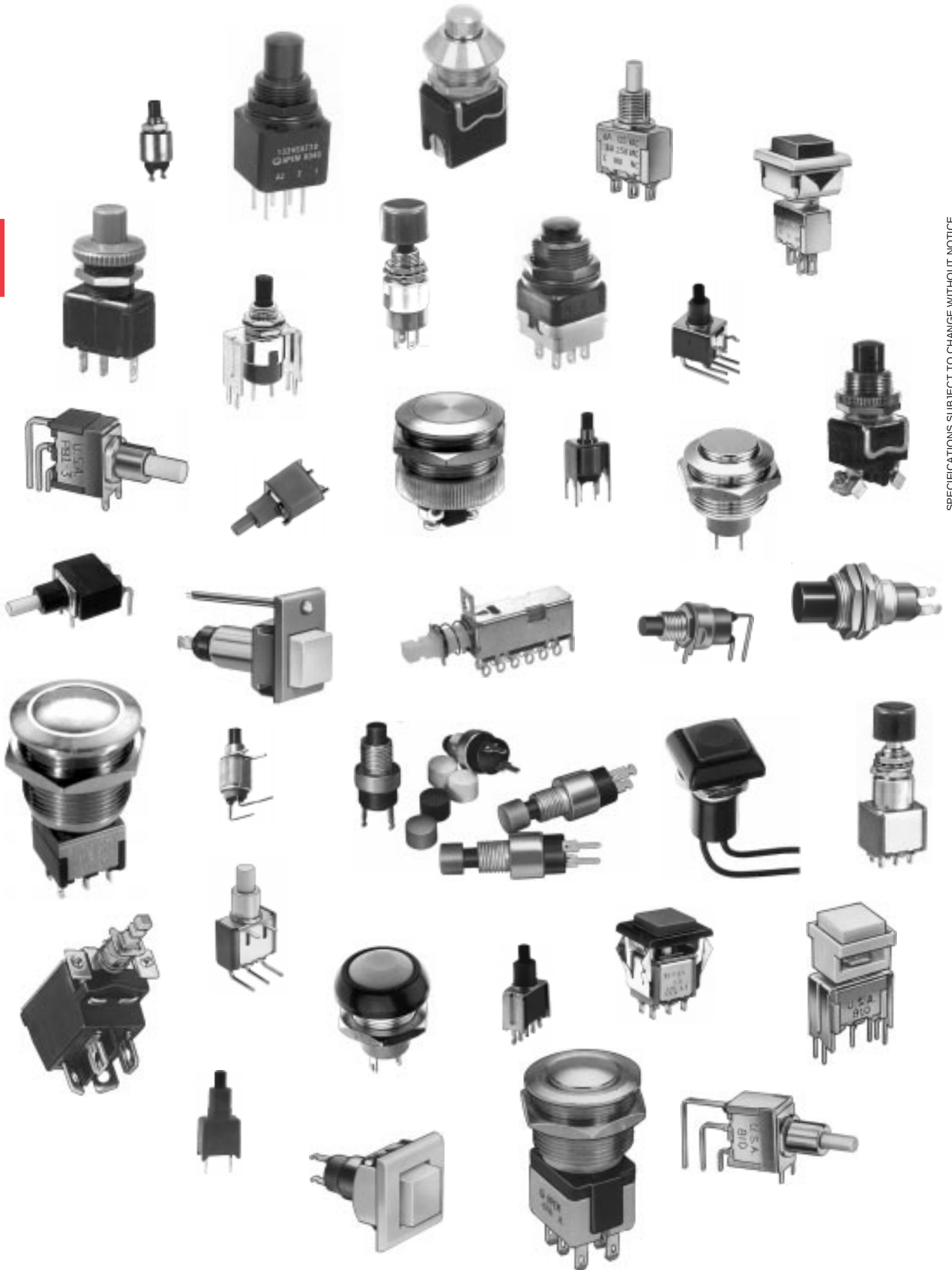




PUSHBUTTON SWITCHES

PUSHBUTTON SWITCH SELECTION GUIDE: This catalog contains an extensive variety of pushbutton switches with numerous options and accessories. To facilitate easy selection of the desired switch for your application, this guide lists the various Series with some key selection parameters.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SERIES	SIZE	RATINGS (Max. in bold)	POLES	ILLUMINATED	SMT MOUNT	PANEL MOUNT	P. C. MOUNT	UL	CSA	VDE	WASHABLE	ESD PROTECTION	PAGE(S)
TP	TINY	0.4VA 20V	SP		X						X	X	C2-C5
TP	TINY	500mA 48V 0.4VA 20V	SP,DP				X				X		C6-C9
9000	SUB-MINI.	100mA 30VDC	SP			X	X						C10-C14
9000	MINIATURE	.6-1A 125VAC 1A 30VDC .3-.5A 250VAC	SP				X						C15-C18
10400	MINIATURE	3 A 110VAC or 24VDC 2A 220VAC	SP,DP			X							C19-C20
300 & 400	MINIATURE	3A 125VAC or 28VDC 1.5A 250VAC 0.4VA 20V	SP	X		X	X	X					C21-C27
MPB	MINIATURE	300mA 125VAC	SP			X							C28
IP	MINIATURE	500mA 48VAC 200mA 50VDC or 250VAC	SP			X					X		C29-C31
SP	MINIATURE	1A 120VAC or 30VDC	SP			X	X					X	C32-C35
18000	MINIATURE	1A 120VAC or 30VDC	SP,DP			X	X						C36-C42
8000	MINIATURE	6A 125VAC 3A 250VAC 4A 30VDC 0.4VA 20V	SP,DP			X	X	X					C43-C46
800	MINIATURE	6A 125VAC 3A 250VAC 7A 30VDC 0.4VA 20V	SP,DP	X		X	X	X	X				C47-C56
PB	MINIATURE	6A 125VAC 3A 250VAC 7A 30VDC 0.4VA 20V	SP	X		X	X	X	X				C57-C65
13000	MINIATURE	4A 125VAC 2A 250VAC 4A 30VDC 100mA 30V	SP,DP			X	X						C66-C69
13000X778	MINIATURE	4A 125VAC 2A 250VAC 4A 28VDC 300mA 30VDC	DP			X	X						C70-C72
1200	STANDARD	8A 125VAC 4A 250VAC 4A 24VDC	SP			X		X	X	X			C73-C75
1200M&MR	STANDARD	8A 125VAC 4A 250VAC 4A 24VDC	SP			X		X	X				C76-C77
4700&4800	STANDARD	6A 125VAC 3A 250VAC	SP,DP			X		X	X	X			C78-C79
MD	STANDARD	200mA 30VDC	SP,DP,4P			X	X						C80-C82
MD1	STANDARD	7.5A 125/250VAC TV5&8 10A 125/250VAC TV5&8 8A/128A 250VAC μ T85	DP			X							C83
MD2	STANDARD	15A 125VAC 10A 250VAC TV-5	SP			X							C84
AV	STANDARD	SEE TABULATION BOX ON PAGE C86 FOR AV SERIES PUSHBUTTON SWITCHES. C85-C99											

C

New! TP SERIES - SMT WASHABLE TINY PUSHBUTTON SWITCHES

DESIGNED EXCLUSIVELY FOR SURFACE MOUNTING

SMT TP Series switches incorporate many desirable features that include:

- **Tape & reel packaging**
This type of packaging is recommended for:
 - economy
 - suitability for automated placement
 - handling of large quantities of components per packaging unit
 - positive component positioning
 - protection of terminals against damage during handling
 - high static resistance
- **Reflow solderable**
 - High temperature plastic materials
 - Tin plated grounding brackets
 - Tin-lead alloy over nickel terminal plating
 - Terminals turned outward to prevent the shadow effect in infrared soldering and to permit visual inspection of the solder joints
 - .021" (0.55mm) air gap between p.c. board and switch case
 - End stackable with .400" (10.16mm) pitch
 - Available with positioning pins to assure correct switch orientation during the reflow process and provide additional mechanical integrity
- **Protected against electrostatic discharges (ESD) up to 10 KV.**
- **Washable**
Switches are designed to withstand cleaning processes, including hot water under pressure.

Surface mount devices (SMD) are subject to more stringent constraints of temperature, solderability, sealing and space savings than through-hole components.

To meet these requirements, APEM has designed a family of tiny surface mount switches that include TP Series pushbutton switches, TG Series slide switches and TL Series toggle switches. See Slide & Toggle switch sections of catalog for TG & TL Series respectively.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

New! TP SERIES - SMT WASHABLE TINY PUSHBUTTON SWITCHES

ELECTRICAL SPECIFICATIONS

Contact ratings (resistive lds.):	0.4 VA at 20 V max. (AC or DC)
Minimum load:	10 mA at 50 mV or 10µA at 5 VD
Initial contact resistance:	50 milliohms maximum
Insulation resistance:	1000 MΩ min. at 500 VDC
Dielectric strength:	1000 V rms between terminals & frame. 500 V rms between terminals
Electrical life (at full load):	60,000 cycles
Static resistance:	10 KV (Schaffner equipment)

GENERAL SPECIFICATIONS

Travel:	ON-MOM .039" (1mm), OFF-MOM. .031" (0.8mm)
Operating temperature range:	-40°C to +85°C
Moisture resistance:	21 days per IEC 512-6 test 11c
Vibration resistance:	10-500 Hz/10g per IEC 512-4 test 6d
Shock resistance:	50 g per IEC 512-4 test 6c

MATERIALS

Case:	High temperature plastic UL94V-0
Actuator:	High temperature plastic UL94V-0
Grounding brackets:	Tin plated steel (includes positioning pins)
Contacts:	Gold plated brass
Terminals:	Brass with tin-lead alloy over nickel plate

SOLDERING AND CLEANING

Reflow soldering:	Infrared, vapor phase and infrared convection
Washable:	Per IEA-RS448-2: water and detergent - preferred. Solvents.

PACKAGING

Standard packaging unit:
700 pieces
Tape meeting international standard IEC Publication 286-3 (EIA481A)
Start leader: 15.7" (400mm) min.
Dimension 'A': 1.748" (44.40mm)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

New! TP SERIES - SMT WASHABLE TINY PUSHBUTTON SWITCHES

Single pole momentary pushbutton switches



MODEL NO.	CIRCUIT	
TP32WS83500	ON	MOM
TP33WS83500	OFF	MOM
Handle position:		

Function 2 shown

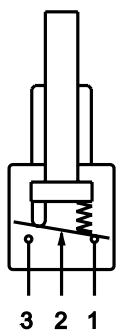
Single pole momentary pushbutton switches with positioning pins



MODEL NO.	CIRCUIT	
TP32WS83565	ON	MOM
TP33WS83565	OFF	MOM
Handle position:		

Function 2 shown

SWITCH ACTION



P.C. BOARD DIMENSIONS

3

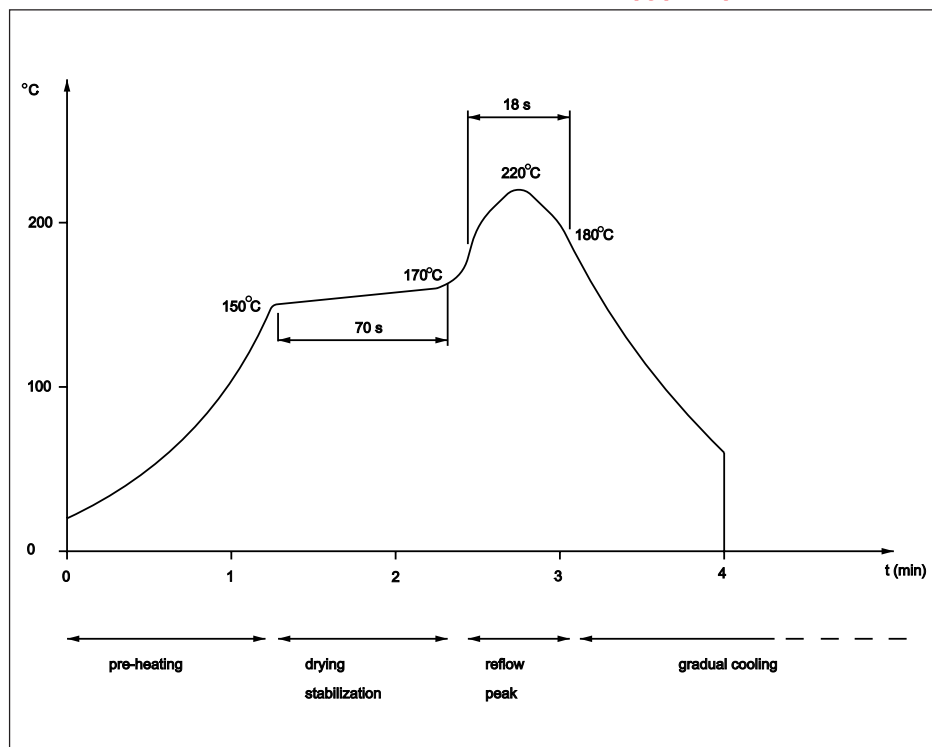
New! TP SERIES - SMT WASHABLE TINY PUSHBUTTON SWITCHES

REFLOW SOLDERING - STANDARD PROFILE

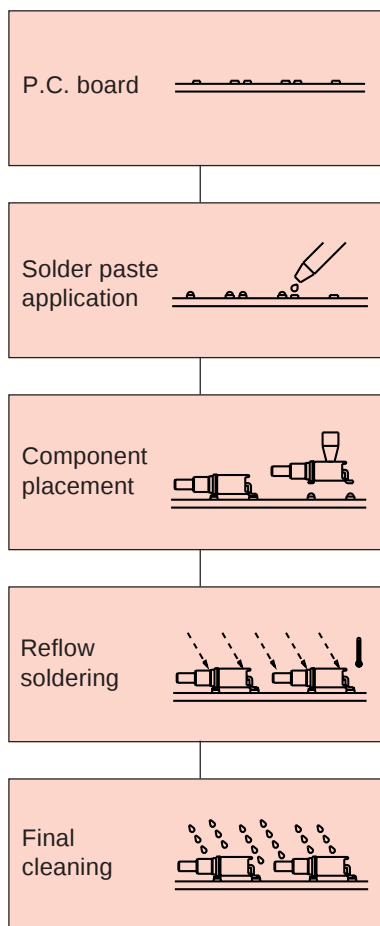
The printed circuit board, carried by a conveyor belt, travels through the reflow soldering oven and experiences the following programmed cycles:

- pre-heat to a maximum of 200°C for 30 seconds
- reflow at a maximum of 245°C for 10 seconds
- final cleaning

TEMPERATURE/TIME PROFILE (typical)

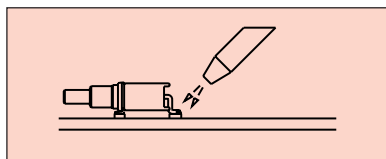


PROCESSING STEPS



P.C. BOARD REWORK RECOMMENDATIONS

Hot air reflow technique is preferred. Avoid the use of a soldering iron.



Caution: Excessive and/or repeated high temperature exposure may affect switch performance & reliability.

TP SERIES - WASHABLE SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES



FEATURES

- Wave solderable.
- Fully sealed for process compatibility.
- Ultra-compact case size.
- Case color options - blue or black (with black actuator).
- SPST, SPDT, DPST & DPDT p.c. mounting models.

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass: 0.4 Volt-Amps max. at 20 V max. Silver plated brass: 0.5 Amps at 48 V max.
Minimum load:	10 mA at 50 mV - 10µA at 5 VDC
Initial contact resistance:	50 milliohms maximum
Insulation resistance:	1000 megohms minimum at 500 VDC
Dielectric strength:	1000 V rms min. between terminals and frame. 500 V rms between terminals.
Electrical life:	60,000 cycles minimum at full load.
Operating temperature range:	-30°C to +85°C
Plunger travel:	'ON MOM' - .039" (1mm) 'OFF MOM' - .031" (0.8mm)
Washing:	Permissible with water, detergents and solvents.

MATERIALS

Contacts & Terminals:	Gold or silver plated brass
Actuator:	Polyamide (UL94V-O), glass filled
Bracket:	Tin plated steel
Case:	PBT (UL94V-O)
Terminal seal:	Epoxy

AGENCY LISTINGS

GAM T1 (military). Availability: consult factory for details of listed models.

Note: drawings show switches with 3 terminals (function 2). Function 3 switches have only 2 terminals. See switch cross-sections at end of section.

Straight p.c. terminals - gold plated brass contacts



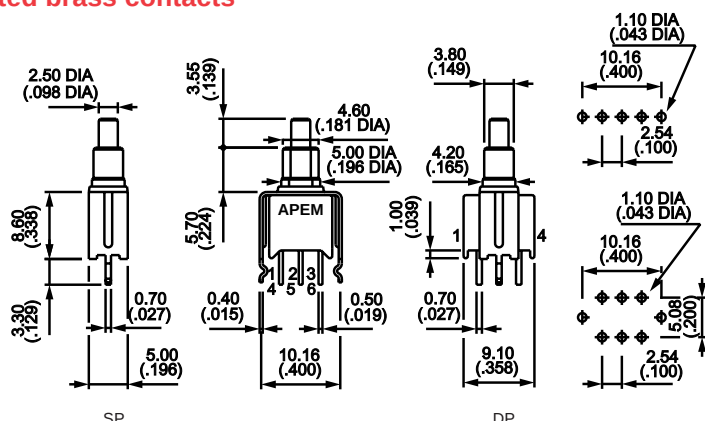
SINGLE POLE	
MODEL NO.	CIRCUIT
TP32P003000	ON MOM
TP33P003000	OFF MOM
DOUBLE POLE	
MODEL NO.	CIRCUIT
TP42P003000	ON MOM
TP43P003000	OFF MOM
Handle position:	

TP SERIES - WASHABLE SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

Straight p.c. terminals - bracket mounting - gold plated brass contacts



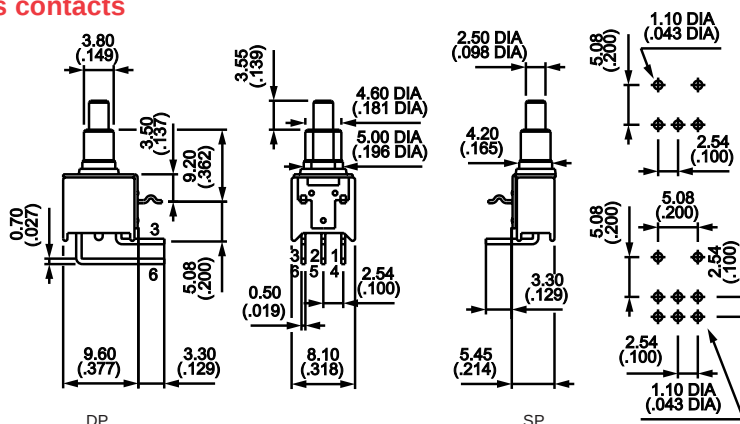
SINGLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
TP32Y003050		ON	MOM
TP33Y003050		OFF	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
TP42Y003050		ON	MOM
TP43Y003050		OFF	MOM
Handle position:			



Horizontal right angle terminals - gold plated brass contacts



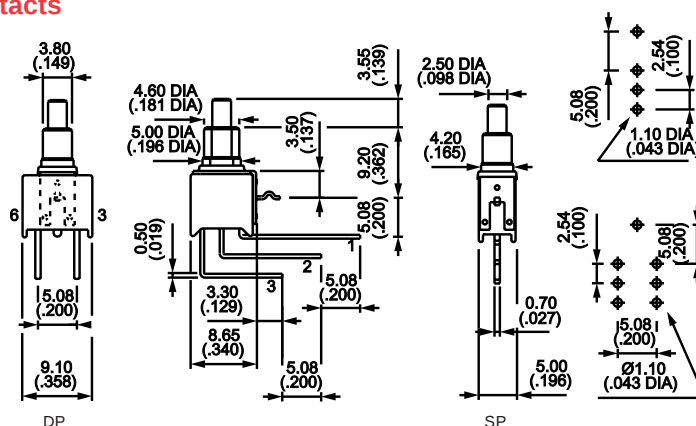
SINGLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
TP32W003050		ON	MOM
TP33W003050		OFF	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
TP42W003050		ON	MOM
TP43W003050		OFF	MOM
Handle position:			



Vertical right angle terminals - gold plated brass contacts



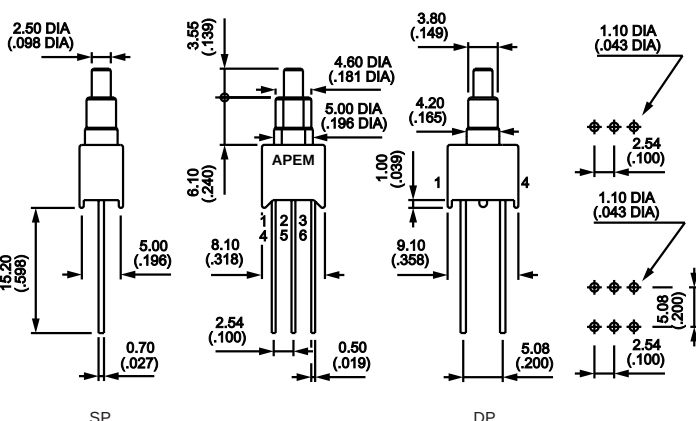
SINGLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
TP32WW03050		ON	MOM
TP33WW03050		OFF	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
TP42WW03050		ON	MOM
TP43WW03050		OFF	MOM
Handle position:			



Wire-wrap terminals - gold plated brass contacts



SINGLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
TP32MW03000		ON	MOM
TP33MW03000		OFF	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
TP42MW03000		ON	MOM
TP43MW03000		OFF	MOM
Handle position:			



TP SERIES - WASHABLE SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.
(Allowable options are shown under each respective box).

Model Structure:

Series	Number of poles	Electrical functions	Terminals
T P			
	3 Single pole	2 ON MOM	P 0 Straight p.c.
	4 Double pole	3 OFF MOM	Y 0 Straight p.c.with bracket
			W 0 Horizontal right angle
			W W Vertical right angle
			M W Wire-wrap

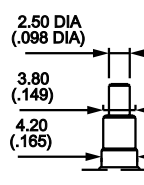
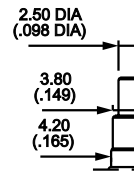
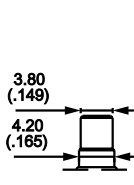
Options:

Contact & terminal mat'ls.	Actuators & case colors	Miscellaneous	Caps
0 Brass, gold plated	Specify 30, 35, 80, 82, or 85	0 0 No special requirement	1 0*
1 Brass, silver plated	See drawings with specifications and dimensions.	5 0 Crimped bracket terminals - specify for models with brackets. See additional listings on following page.	2 0*
3 Brass, gold plated - (1.27 microns gold)			3 0*
8 Brass, gold plated contacts with tin plated terminals			4 0*
9 Contacts brass, gold plated (1.27 microns gold) and tin plated terminals			* - Specify color - see caps below.

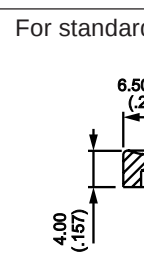
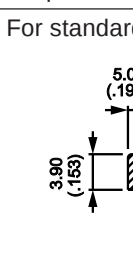
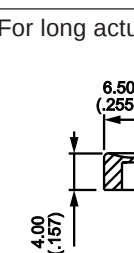
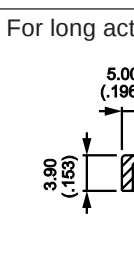
Example of completely specified model number: **TP32Y00305025**

OPTION DRAWINGS

Actuators & case colors

 2.50 DIA (.098 DIA) 3.80 (.149) 4.20 (.165) Blue case 30 Black case 80 Short (standard) 30 80	 2.50 DIA (.098 DIA) 3.80 (.149) 4.20 (.165) Blue case 35 Black case 85 Long 35 85	 2.50 DIA (.098 DIA) 3.80 (.149) 4.20 (.165) Black case 82 Flush 82
---	---	---

CAPS Note: replace last '0' in part numbers with color code.

For standard actuator	For standard actuator	For long actuator only	For long actuator only	Colors
 6.50 DIA (.255) 4.00 (.157) 1.80 (.070) 10 U570 If ordered separately	 5.00 DIA (.196 DIA) 3.90 (.153) 1.80 (.070) 20 U3600 If ordered separately	 6.50 DIA (.255 DIA) 4.00 (.157) 3.00 (.118) 30 U4310 If ordered separately	 5.00 DIA (.196 DIA) 3.90 (.153) 3.00 (.118) 40 U4320 If ordered separately	Colors 1 blue 2 black 3 green 4 grey 5 yellow 6 red 7/1 white 9 orange

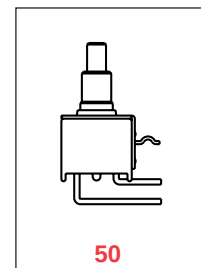
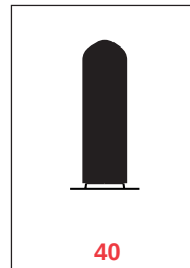
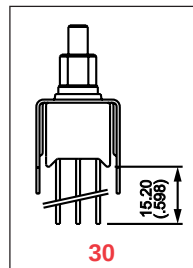
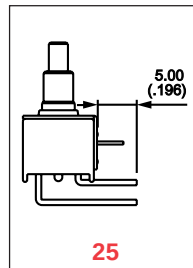
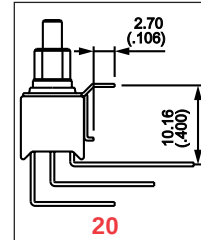
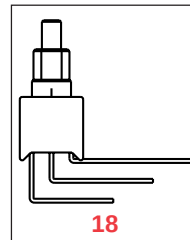
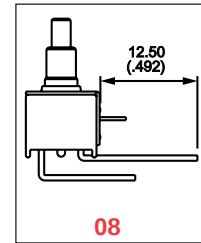
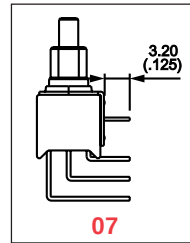
Note: Caps U4310 and U4320 (for long actuators) offer better resistance to vibration.

TP SERIES - WASHABLE SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

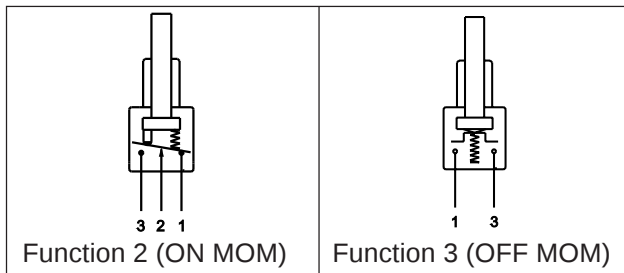
SPECIAL OPTIONS & MISCELLANEOUS

SPECIAL OPTIONS

- 00** No special requirement.
- 07** Trimmed terminals for **WW** models only - .125" (3.2mm).
- 08** Extended terminals for **W0** models only.
- 18** **WW** models without mounting bracket.
- 20** **WW** models with mounting bracket and p.c. board spacer tab.
- 25** Trimmed terminals for all models except **WW** - .196" (5mm).
- 30** Wire-wrap terminals on models with **Y** bracket.
- 40** With cap **U3500** mounted over plunger and bushing.
Provides additional protection during soldering & cleaning.
- 50** Crimped bracket terminals (retains switch on p.c. board during assembly and soldering). For models with **W0**, **WW** & **Y0** terminals.



Switch cross-sections



9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES



FEATURES

- Single pole panel and p.c. mounting models.
- Normally open (NO) & normally closed (NC) electrical functions.
- Self-cleaning or butt action contacts.
- Ultra-compact case size.

SPECIFICATIONS

Contact ratings (resistive loads): 100 mA at 30 VDC
Initial contact resistance: 30 milliohms maximum
Insulation resistance: 1000 megohms minimum at 500 VDC
Dielectric strength: 500 V rms min. between terminals. 1000 V rms between terminals & case
Electrical life: 9100, 9200N & 9500N: 250,000 cycles min. 9200 & 9500: 100,000 cycles min.
Operating temperature range: -30°C to +65°C

Travel	9533 & 9233	9532 & 9232	9533N, 9233N & 9133
Total	.062" (1.60mm)	.070" (1.80mm)	.035" (0.9mm)
Pre-	.029" (0.75mm)	.039" (1.00mm)	-
Over-	.027" (0.70mm)	.029" (0.75mm)	-

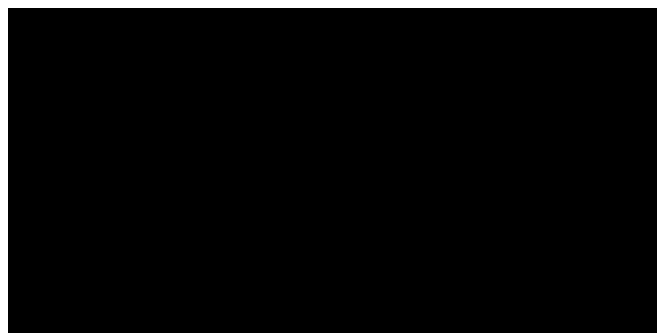
MATERIALS

Contacts & Terminals: Gold plated brass
Actuator: Polyamide, glass filled
Bracket: Tin plated steel
Case: PPS
Bushing: Nickel plated brass
Terminal seal: Epoxy
Hardware: Threaded bushing models supplied with 1 Hex Nut p/n U544. See drawing - end of section.

Solder lug terminals - threaded bushing - self-cleaning contacts



9532CD  Normally closed
9533CD  Normally open



9232WWCD  Normally closed

9233WWCD  Normally open

Solder lug terminals - threaded bushing - butt action contacts

9533NCD  Normally open

9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

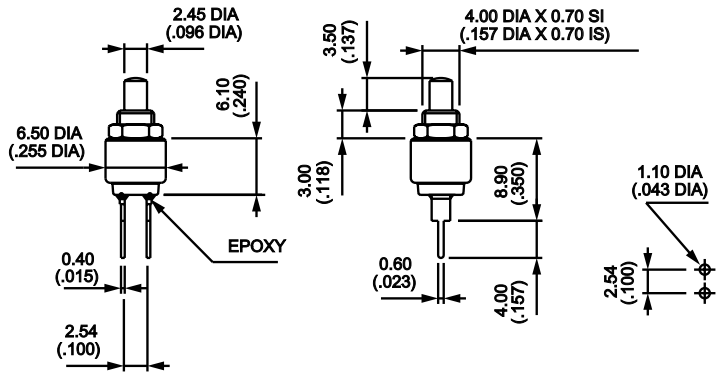
Straight p.c. terminals - threaded bushing - .350" (8.9mm) p.c. to panel - butt action contacts



9233NCD



Normally open



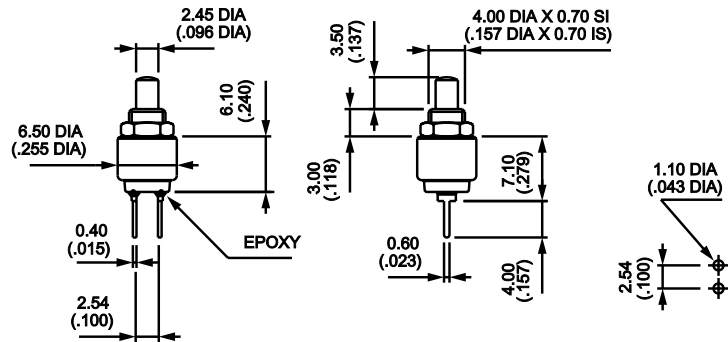
Straight p.c. terminals - threaded bushing - .279" (7.1mm) p.c. to panel - butt action contacts



9133CD



Normally open



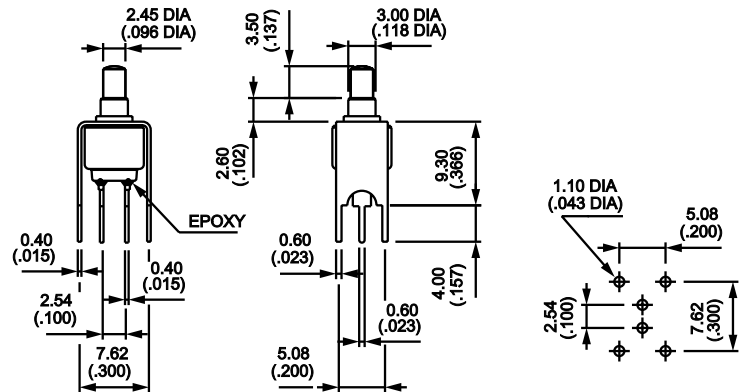
Straight p.c. terminals - tall bracket mounting - butt action contacts



9233NYCD



Normally open



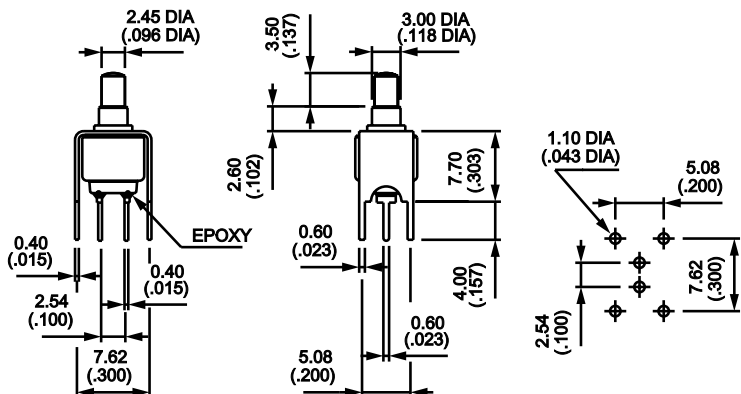
Straight p.c. terminals - short bracket mounting - butt action contacts



9133YCD



Normally open



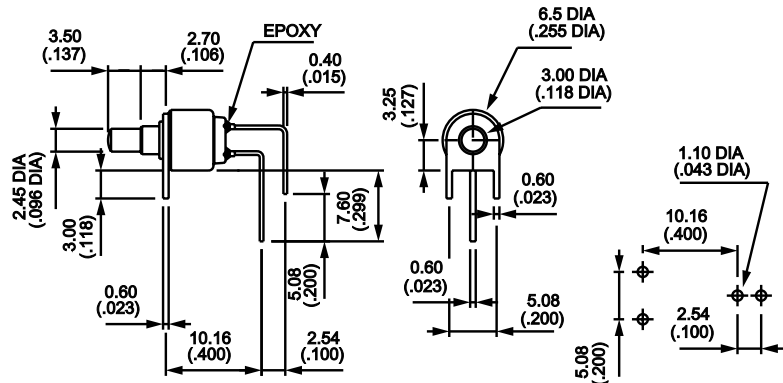
9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

Right angle p.c. terminals - butt action contacts



9133WWCD

Normally open



Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

(Allowable options are shown under each respective box).

Note: 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals case height	Number of poles	Electrical function	Bracket/ terminals
9		3		
		Single pole	2 Normally closed (NC) 3 Normally open (NO)	
Case height: .314" (8mm) 2.....Straight p.c. terminals, threaded bushing.....(NONE) 2.....Straight p.c. terminals, tall bracket, smooth bushing.....Y 2.....Right angle p.c. terminals, bracket, smooth bushing.....W W 5.....Solder lug terminals, threaded bushing.....(NONE) Case height .240" (6.1mm) 1.....Straight p.c. terminals, threaded bushing .279" (7.1mm) to panel.....(NONE) 1.....Straight p.c. terminals, short bracket, smooth bushing.....Y 1.....Right angle p.c. terminals, bracket, smooth bushing.....W W 2.....Straight p.c. terminals, threaded bushing, .350" (8.9mm) to panel...N 2.....Straight p.c. terminals, tall bracket, smooth bushing.....N Y 5.....Solder lug terminals, threaded bushing.....N				

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

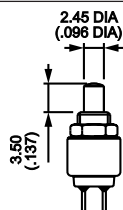
Options:

Contact materials	Sealing	Actuator
C D		
Gold plated brass (standard)	(NONE) Epoxy sealed terminals (standard) K Front panel sealing with two 'o'-rings	(NONE) Standard 0 Flush 4 Long

Caps available separately - see option drawings

Example of completely specified model number: **9233YCD**

ACTUATOR OPTIONS



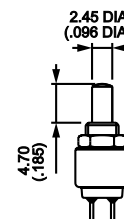
(NONE) Standard



0 Flush



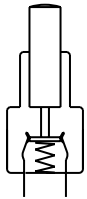
4 Long



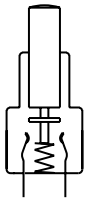
9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

MISCELLANEOUS

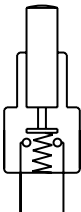
SWITCH ACTION



Function 2
(NC)



Function 3
(NO)

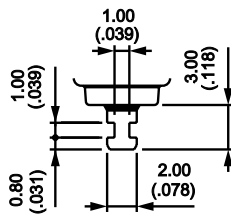


Function 3
(NO)

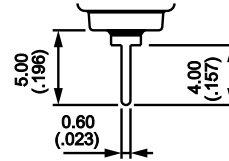
Self-cleaning contacts

butt action contacts

TERMINAL OUTLINES

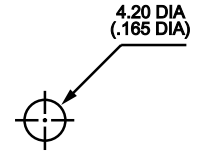


Solder lug



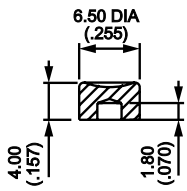
Straight p.c.

PANEL CUT-OUT

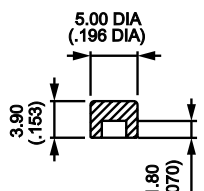


OPTION DRAWINGS

CAPS Note: replace last '0' in p/n with color code. (order separately)

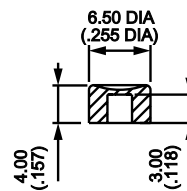


U570 Standard
For standard actuator

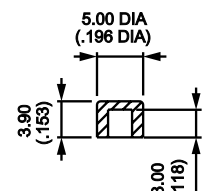


U3600
For standard actuator

Below caps have deeper engagement and provide better retention



U4310
For 4 actuator only



U4320
For 4 actuator only

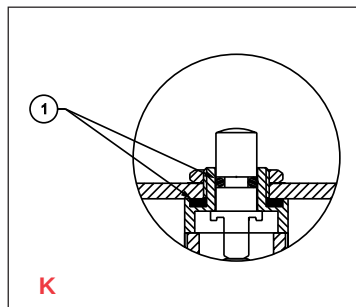
Colors

- | | |
|-----|--------|
| 1 | blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7/1 | white |
| 9 | orange |

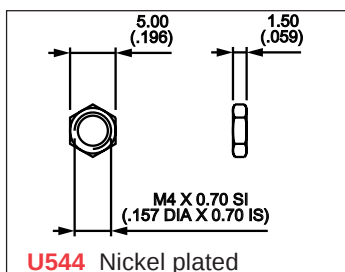
SEALING OPTIONS

(NONE) Epoxy sealed terminals standard.

K Front panel sealing with 2 'O'-rings (1) provides protection against water and dust.
Panel seal withstands 0.1bar pressure



HEX NUT Supplied with threaded bushing models



U544 Nickel plated

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

9000 SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES



FEATURES

- Single pole panel mounting models.
- NO, NC & NC/NO combined electrical functions.
- Solder lug & straight p.c. terminals.
- Compact case size.
- Supplied with 2 Hex Nuts & Lockwasher.

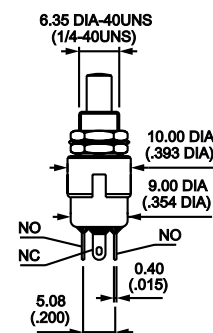
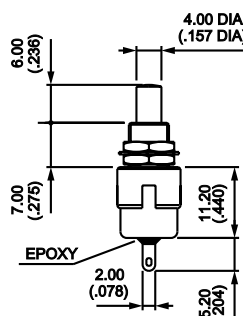
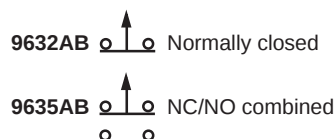
SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass: 100 mA at 30 VDC Silver: 0.3 Amps at 250 VAC, 0.6 Amps at 125 VAC or 1 Amp at 30 VDC
Initial contact resistance:	50 milliohms maximum
Insulation resistance:	1000 megohms minimum at 500 VDC
Dielectric strength:	1000 V rms min. between terminals. 1500 V rms between terminals & case
Electrical life:	250,000 cycles minimum
Operating temperature range:	-30°C to +65°C
Travel:	9600, 9400 & 9400Y models - .051" (1.3mm) 9600N & 9400N models - .035" (0.9mm)

MATERIALS

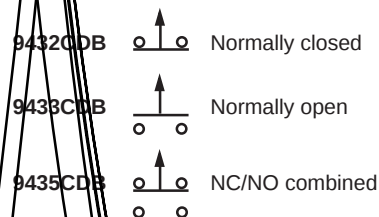
Contacts & Terminals:	Gold plated brass or silver
Actuator:	Polyamide, glass filled or nickel plated brass (with K option)
Bracket:	Tin plated steel
Case:	Diallyl phthalate
Bushing:	Nickel plated brass
Terminal seal:	Epoxy
Hardware:	Supplied with 2 Hex Nuts .314" (8mm) across flats & 1 Lockwasher See hardware section of catalog.

Solder lug terminals - case length .440" (11.2mm) - silver contacts

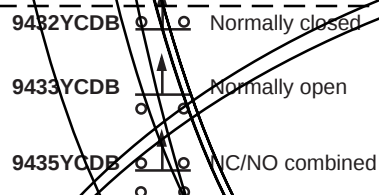


9000 SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

Straight p.c. terminals - case length .440" (11.2mm) - gold plated brass contacts



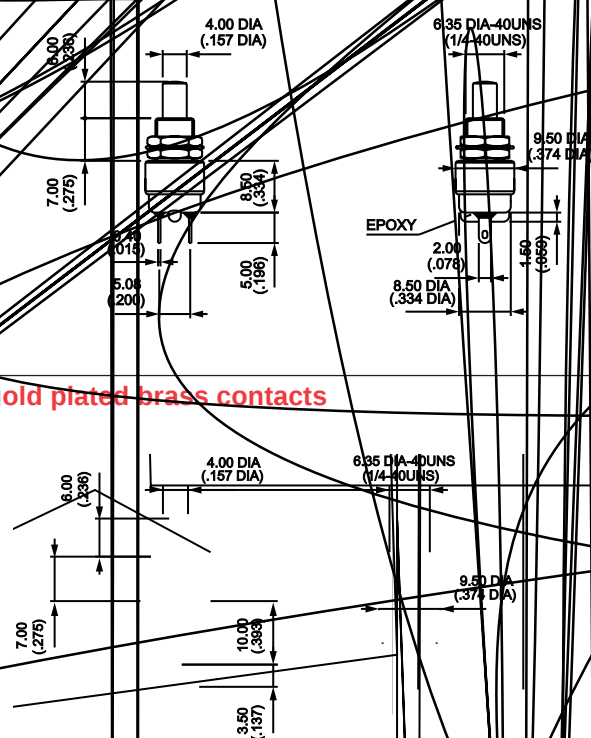
Bracket mounting w/straight p.c. terminals - case length .440" (11.2mm) - gold plated brass contacts



Solder lug terminals - case length .334" (8.5mm) - silver contacts



Straight p.c. terminals - case length .334" (8.5mm) - gold plated brass contacts



SPECIFICATIONS SUBJECT TO

9000 SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

Solder lug terminals - .630" dia. (16mm) bushing - metal button - silver contacts



Silver contacts

9633AX1146



Normally open

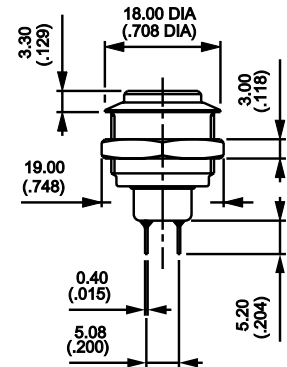
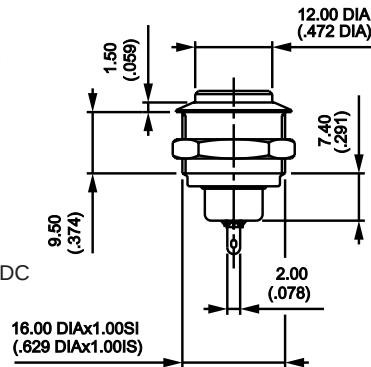
Gold plated
silver contacts

9633ADX1146



Normally open

Panel cut-out: .637" dia. (16.2mm)
Maximum rating: 0.3A 250VAC or 1A 30VDC
Epoxy sealed terminals.
Other options not applicable for this configuration



Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.
(Allowable options are shown under each respective box).

Note: 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals/case length	Number of poles	Electrical function	Bracket/case length
9		3		
	4 Straight pc terms., case length .440" (11.2mm) 6 Solder lug terms., case length .440" (11.2mm) 4 Straight pc terms. with optional case length/brkt. - select N or Y from 'brkt/case length' box 6 Solder lug terms. with optional case length - indicate N in 'brkt/case length' box	Single pole	2 Normally closed (NC) 3 Normally open (NO) 5 NC/NO combined	(NONE) N Case length - .334" (8.5mm) Y Brkt. mounting, case length - .456" (11.6mm)

Options:

Contact materials

- A** Silver
C D Brass, gold plated

Sealing

- (NONE)** No sealing
B Epoxy sealed terminals
K Front panel sealing with
 two 'o'-rings & metal
 actuator

Special options

- (NONE)**
F Tin plated terminals
 (for p.c. terms. only)
X 6 0 1 Special
 contact w/ lower rating

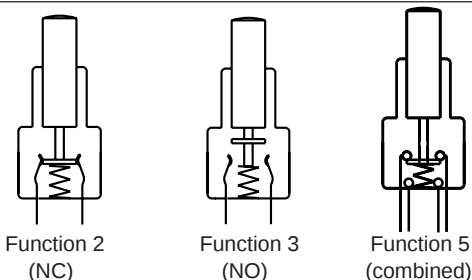
Example of completely specified
model number: **9432YCDBF**

Caps available separately -
see option drawings.

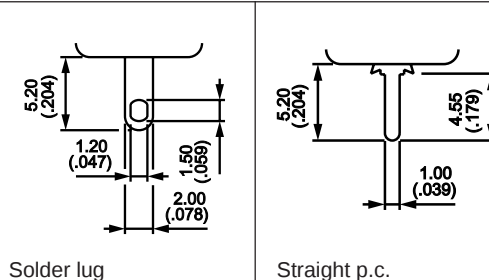
Although most combinations of options are available, some may
result in incompatibilities. Consult factory if there is any question.

MISCELLANEOUS

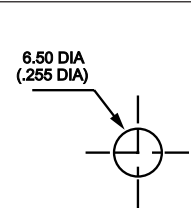
SWITCH ACTION



TERMINAL OUTLINES



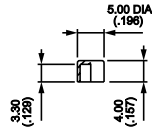
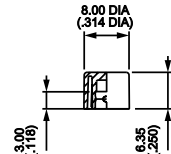
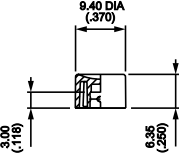
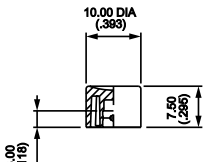
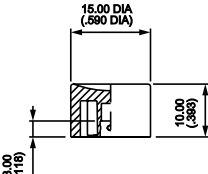
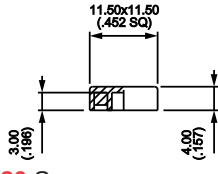
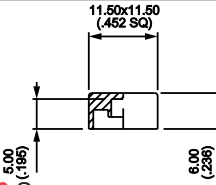
PANEL CUT-OUT



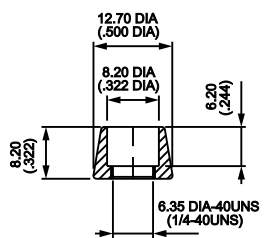
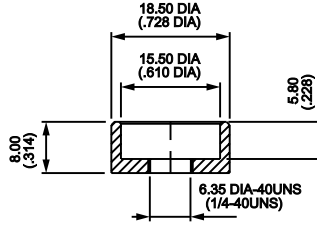
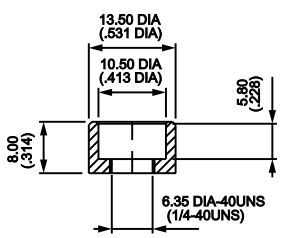
9000 SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

OPTION DRAWINGS & SPECIAL OPTIONS

CAPS Note: replace last '0' in p/n with color code. (order separately)

 U900	 U1140	 U1720	 U480 Standard																		
 U630	 U2430 Square	 U2020 Square	<table><tr><th colspan="2">Colors</th></tr><tr><td>1</td><td>blue</td></tr><tr><td>2</td><td>black</td></tr><tr><td>3</td><td>green</td></tr><tr><td>4</td><td>grey</td></tr><tr><td>5</td><td>yellow</td></tr><tr><td>6</td><td>red</td></tr><tr><td>7/1</td><td>white</td></tr><tr><td>9</td><td>orange</td></tr></table>	Colors		1	blue	2	black	3	green	4	grey	5	yellow	6	red	7/1	white	9	orange
Colors																					
1	blue																				
2	black																				
3	green																				
4	grey																				
5	yellow																				
6	red																				
7/1	white																				
9	orange																				

DRESS NUTS Chrome plated. Order separately.

 U1636 (for cap U1140)	 U825 (for cap U630)	 U840 (for cap U480)
--	--	---

SPECIAL OPTIONS

F Tin plated terminals (for p.c. terminals only).

X601 Silver plated brass contacts
 Contact ratings: 0.2A 250VAC, 0.4A 125VAC or 0.5A 30VDC
 Electric life: 20,000 cycles minimum.
 Minimum quantity: 5,000 pieces.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

10400 SERIES - PROFESSIONAL MINIATURE MOMENTARY PUSHBUTTON SWITCHES



FEATURES

- Single and double pole panel mounting models with optional matte black finish.
- ON - MOM electrical functions.
- Solder lug terminals.
- Compact case size with 10mm (.393") diameter threaded bushing.
- Epoxy terminal sealing standard.

SPECIFICATIONS

Contact ratings & life: (resistive loads)	Silver or gold plated silver: 3 Amps at 110 VAC, 2 Amps at 220 VAC or 3 Amps at 24 VDC.
Initial contact resistance:	10 mΩ max.
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. between terminals of the same pole 2000 V rms min. between terminals and frame 2000 V rms min. between terminals of adjacent poles
Electric life:	50,000 cycles min.
Torque:	1.106 Ft-lbs. (1.50 Nm) max. applied to nut
Operating temp. range:	-40°C to +85°C

MATERIALS

Contacts & Terminals:	Silver or gold plated silver
Actuator:	Chrome plated brass
Case:	Diallyl phthalate
Housing:	Nickel plated brass
Bushing:	Nickel plated brass
Terminal seal:	Epoxy

AGENCY LISTINGS

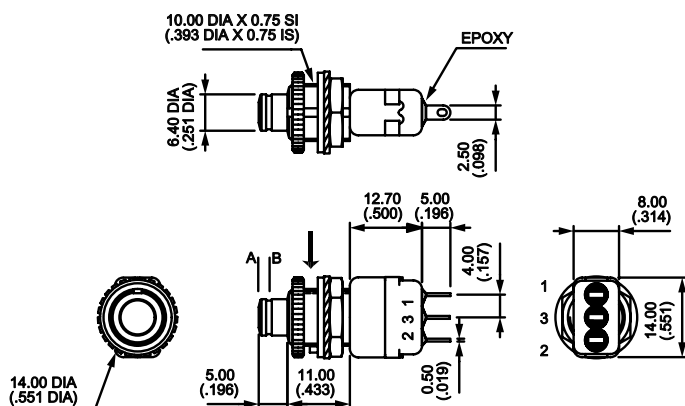
CECC 96401-001	Availability: Consult factory for details of approved models. Marking: To order switches marked CECC, add 'CECC' to model number.
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10400 SERIES - PROFESSIONAL MINIATURE MOMENTARY PUSHBUTTON SWITCHES

Single pole - solder lug terminals



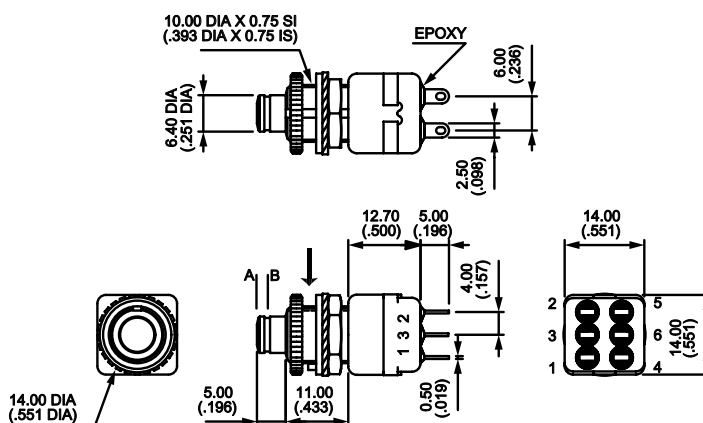
	A	B
	1-2	1-3
Silver contacts		
104350003	ON	- MOM
Gold plated silver contacts		
104350108	ON	- MOM
Standard hardware supplied:		
1 Knurled nut, 1 hex nut,		
1 locking ring and 1 lockwasher		



Double pole - solder lug terminals

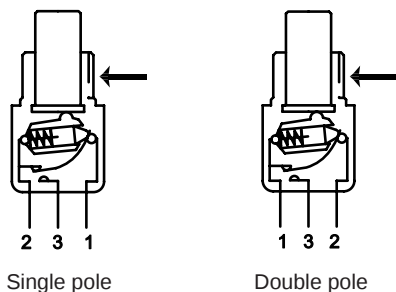


	A	B
	2-1	2-3
	5-4	5-6
Silver contacts		
104450003	ON	- MOM
Gold plated silver contacts		
104450108	ON	- MOM
Standard hardware supplied:		
1 Knurled nut, 1 hex nut,		
1 locking ring and 1 lockwasher		

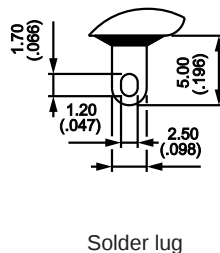


MISCELLANEOUS

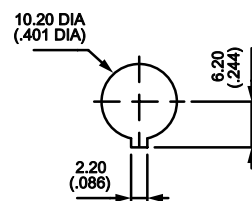
SWITCH ACTION



TERMINAL OUTLINE



PANEL CUT-OUT



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES



FEATURES

- Dry circuit through power ratings .
- Compact size SPST momentary and alternate action models with numerous options.
- Panel, panel & p.c. and p.c. mounting models, lighted and unlighted.

SPECIFICATIONS

Contact ratings & life:

(Q) power models - coin silver: 1 Amp at 125 VAC or 28 VDC or 0.5 Amps at 250 VAC - electric life 250,000 cycles min. 3 Amps at 125 VAC or 28 VDC, or 1.5 Amps at 250 VAC - electric life 10,000 cycles min. (All previous loads are resistive).

(B) dry circuit models - gold over nickel over brass: 0.4 VA max. at 20 V max. - electric life 250,000 cycles min.

UL models - coin silver: 1 Amp at 125 VAC or 0.5 Amps at 250 VAC (75% power factor). UL file no. E66367.

Initial contact resistance:

10 milliohms max. at 3 VDC, 0.1 Amp.

Insulation resistance:

Greater than 10,000 megohms.

Dielectric strength:

1000 Volts RMS min. at sea level.

Operating temperature range:

-30°C to +85°C

MATERIALS

Contacts:

Coin silver for power & UL models. Gold over nickel over brass for dry circuit models.

Actuator:

Nylon. Black color is standard for 300 Series. White is standard for 400 Series.

Bushing:

Nickel plated brass

Base:

Melamine phenolic, color red.

Terminal seal:

Epoxy (standard)

Support bracket:

Brass or steel, tin plated

Spring mounting bracket:

Stainless steel

Bezel & cap:

Nylon. Available in black, red or white. Consult factory for other colors.

Hardware:

See Miscellaneous section.

LED:

Intensity: 2.0 mcd at 10 mA. Forward voltage: 2.0V (3.0V max.). Max. continuous forward current: 30 mA at 25°C. Red standard - yellow & green are optional. Specifications are subject to change without notice - consult factory.

AGENCY RECOGNITION



UL Marking: Switches ordered with 'UL' added at end of model no. are supplied with recognized mark.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models & options
- 'build your own switch' order format
- Additional options & panel cut-outs

300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

300 SERIES SPST Momentary (Normally open or normally closed)

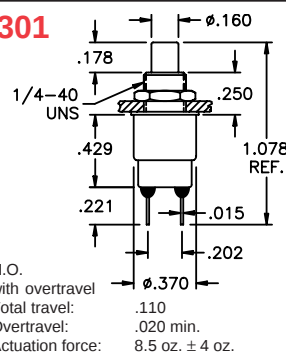


White actuator optional - black is standard

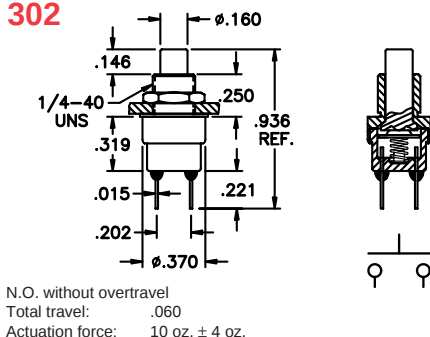
(Q) Power Model No.	(B) Dry ckt. Model No.	UL Model No.
301ZQE	301ZBE	301ZQE/UL
302ZQE	302ZBE	302ZQE/UL
303ZQE	303ZBE	303ZQE/UL
304ZQE	304ZBE	304ZQE/UL
305ZQE	305ZBE	305ZQE/UL
306ZQE	306ZBE	306ZQE/UL

Switch caps optional - see Hardware section of catalog.

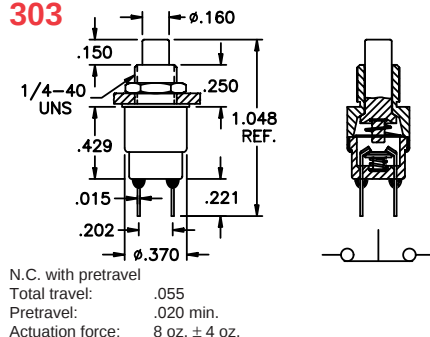
301



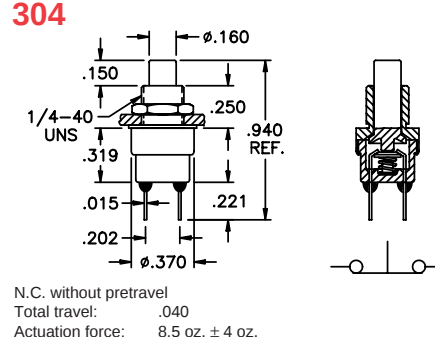
302



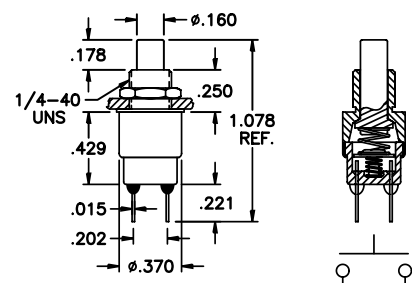
303



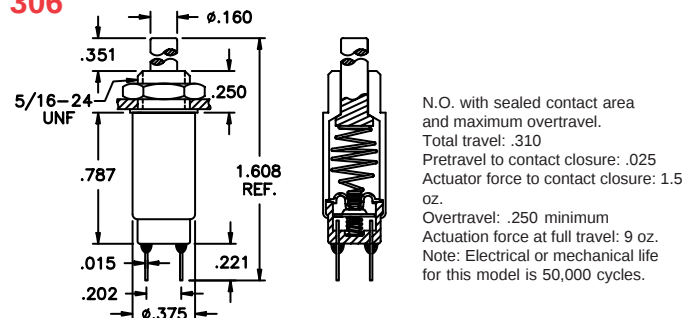
304



305



306



400 SERIES (401 Push on/ push off, 402 N.O. momentary)

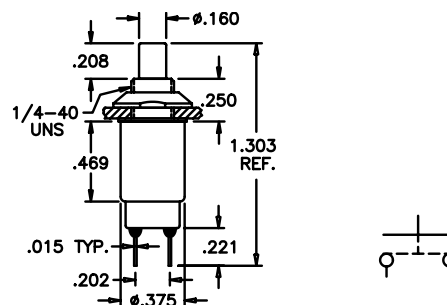


Black actuator optional - white is standard

(Q) Power Model No.	(B) Dry ckt. Model No.	UL Model No.
401ZQE	401ZBE	401ZQE/UL
402ZQE	402ZBE	402ZQE/UL

SNAP-ACTION MECHANISM

Pretravel to contact closure: .026
Travel to actuate switch: .106
Total travel: .137
Force to actuate switch: 22 oz.
Force at maximum travel: 35 oz.
Mechanical life: 1,000,000 cycles minimum



United States Patent 4,319,106

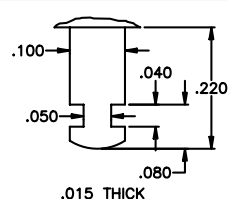
Switchcaps optional - see Hardware section of catalog.

OPTIONS

Colored operating actuator

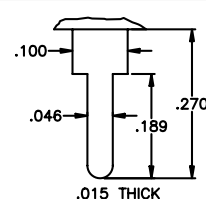
Available in dyed nylon. To specify, add digit at end of model number - 1 blue, 2 black, 3 green, 5 yellow, 6 red, 7/1 white or 9 orange. Black is standard for 300 Series. White is standard for 400 Series.

Z



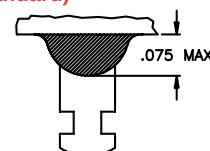
Solder lug terminal

C



Printed circuit terminal

E (standard)



Epoxy seal

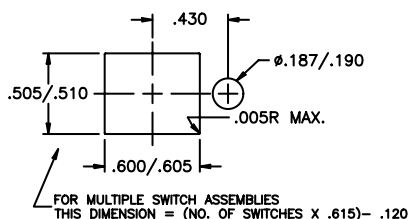
300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

Solder lug terminals - snap-in bezel with outboard LED



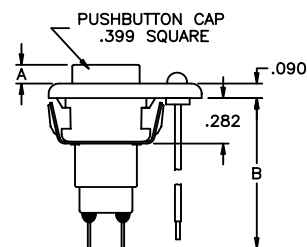
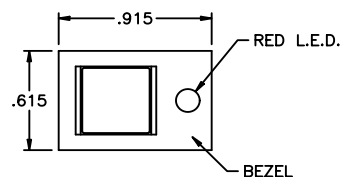
401SZQEJ6168

RECOMMENDED PANEL CUTOUT
Panel thickness range - .047-.125



MODEL NO.	DIM. A	DIM. B
301	.108	.929
302	.085	.817
303	.085	.929
304	.085	.817
305	.108	.929
401	.145	1.142
402	.145	1.142

LED leads - 31/32" min. long
Anode (front) - white
Cathode (back) - black



Solder lug terminals - snap-in bezel

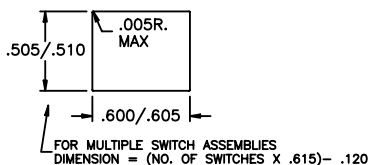


302SZQEJ8168

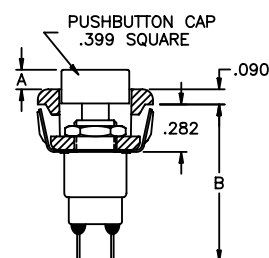
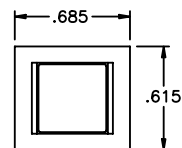


401SZQEJ8188

RECOMMENDED PANEL CUTOUT
Panel thickness range - .047-.125



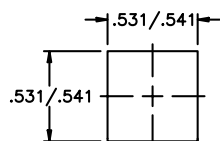
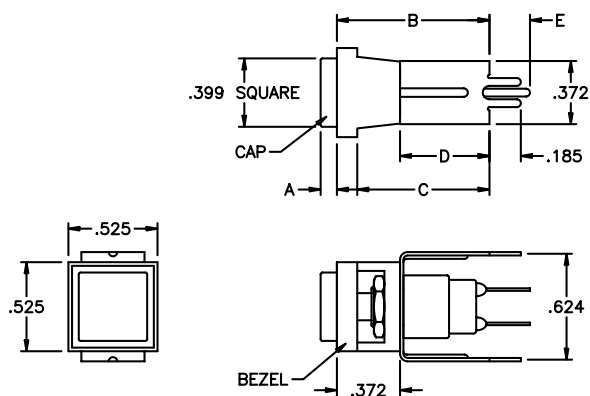
MODEL NO.	DIM. A	DIM. B
301	.108	.929
302	.085	.817
303	.085	.929
304	.085	.817
305	.108	.929
401	.145	1.142
402	.145	1.142



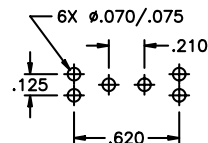
C

DRY CKT. MODEL NO.	ELECTRICAL FUNCTION
301SV30BEJ8488	MOM. S.P N.O. w/overtravel
302SV30BEJ8488	MOM. S.P N.O. no overtravel
305SV30BEJ8488	MOM. S.P N.O. w/added overtravel

MODEL NO.	OPTION	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E
301S	V30	.100	.900	.780	.527	.237
301S	V40	.100	1.020	.900	.647	.118
302S	V30	.070	.900	.780	.527	.125
302S	V40	.070	1.020	.900	.647	.357
305S	V30	.100	.900	.780	.527	.237
305S	V40	.100	1.020	.900	.647	.118



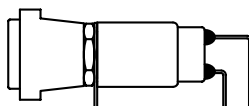
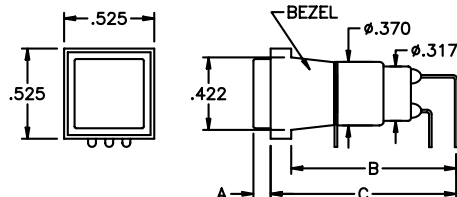
PANEL CUTOUT



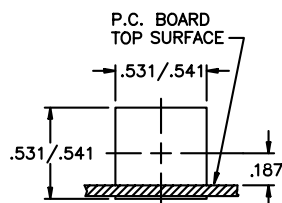
P.C. LAYOUT

DRY CKT. MODEL NO.	ELECTRICAL FUNCTION
301SV-1BEJ8488	MOM. S.P.N.O. w/overtravel
302SV-1BEJ8488	MOM. S.P.N.O. no overtravel
305SV-1BEJ8488	MOM. S.P.N.O. w/added overtravel
401SV-1BEJ8488	S.P Alternate action w/ tactile response
402SV-1BEJ8488	MOM. S.P.N.O. w/ tactile response

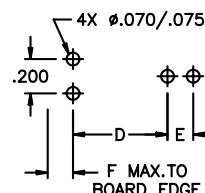
MODEL NO.	OPTION	DIM. A	DIM. B	DIM C.	DIM D.	DIM. E	DIM. F
301S	V	.100	.960	1.080	.550	.150	.250
301S	V-1	.100	.910	1.030	.550	.100	.250
302S	V	.070	.860	.980	.450	.150	.250
302S	V-1	.070	.810	.930	.450	.100	.250
305S	V	.100	.960	1.080	.550	.150	.250
305S	V-1	.100	.910	1.030	.550	.100	.250
401S & 402S	V	.130	1.222	1.342	.750	.150	.310
401S & 402S	V-1	.130	1.172	1.292	.750	.100	.310



401 & 402 ONLY



PANEL CUTOUT



P.C. LAYOUT

300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

Snap-in bezel for round hole mounting

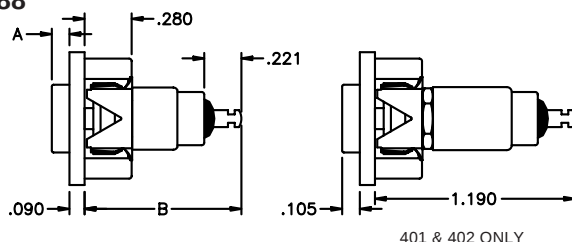
Self-keying against rotation



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.	UL MODEL NO.	ELECTRICAL FUNCTION
301SZQEJ9688	301SZBEJ9688	301SZQEJ9688/UL	MOM. S.P N.O. w/overtravel
302SZQEJ9688	302SZBEJ9688	302SZQEJ9688/UL	MOM. S.P N.O. no overtravel
303SZQEJ9688	303SZBEJ9688	303SZQEJ9688/UL	MOM. S.P N.C. w/pretravel
304SZQEJ9688	304SZBEJ9688	304SZQEJ9688/UL	MOM. S.P N.C. no pretravel
305SZQEJ9688	305SZBEJ9688	305SZQEJ9688/UL	MOM. S.P N.O. w/overtravel
401SZQEJ9688	401SZBEJ9688	401SZQEJ9688/UL	S.P Alternate snap-action
402SZQEJ9688	402SZBEJ9688	402SZQEJ9688/UL	MOM. S.P N.O. (snap-action)

302SZQEJ9688

MODEL NO.	DIM. A	DIM. B
301	.108	.929
302	.085	.817
303	.085	.929
304	.085	.817
305	.108	.929
401 & 402	AS SHOWN	



301, 302
305, 402

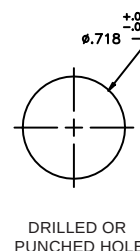
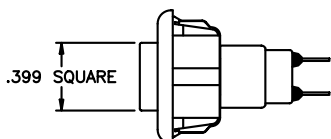
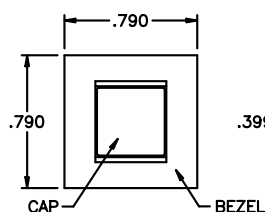
303, 304

401

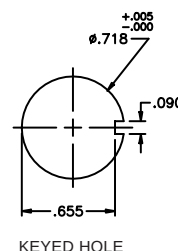


RECOMMENDED PANEL CUTOUTS

Panel thickness range - .047 - .125



DRILLED OR
PUNCHED HOLE

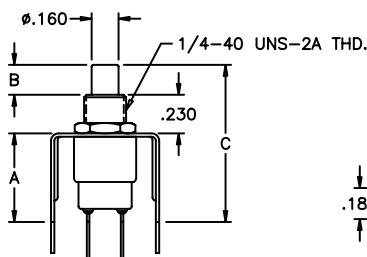
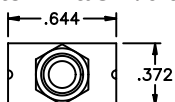


KEYED HOLE

OPTIONS FOR SELECTIVE MODELS ONLY

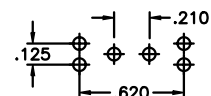
Options V30 & V40 Straight p.c. terminals w/bracket

For models 301, 302 & 305 only



MODEL NO.	OPTION	DIM. A	DIM. B	DIM. C	DIM. D
301,305	V30	.527	.173	.933	.237
301,305	V40	.647	.173	1.053	.118
302	V30	.527	.150	.910	.125
302	V40	.647	.150	1.030	.357

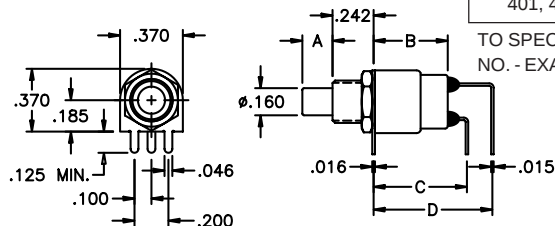
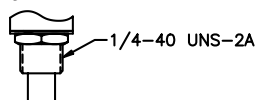
TO SPECIFY, ADD OPTION FROM BOX TO SWITCH MODEL NO. - EXAMPLE: 302V30BE



P.C. BOARD LAYOUT

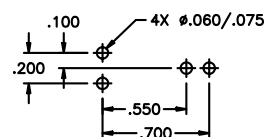
Options V & V-1 Right angle terminals w/bracket

For models 301, 302, 305, 401 & 402 only



MODEL NO.	OPTION	DIM. A	DIM. B	DIM. C	DIM. D
301, 305	V	.173	.439	.550	.700
301, 305	V-1	.173	.439	.550	.650
302	V	.150	.327	.450	.600
302	V-1	.150	.327	.450	.550
401, 402	V	.210	.653	.750	.900
401, 402	V-1	.210	.653	.750	.850

TO SPECIFY, ADD OPTION FROM BOX TO SWITCH MODEL NO. - EXAMPLE: 301V-1BE



P.C. BOARD LAYOUT

Support Bracket is Brass, Solder Coated.
Available with B, N, or T Contact Materials.
(See pg. C27)

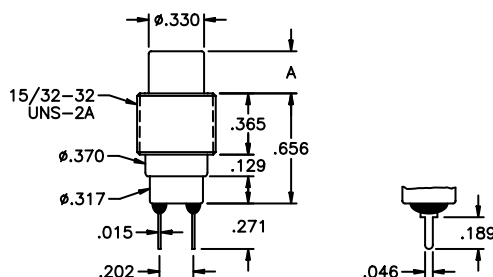
Supplied with Epoxy Sealed Terminals.

Note: Terminals are not fully bent, to facilitate spring retention in p.c. board.

300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

OPTIONS FOR SELECTIVE MODELS ONLY

Option T1 15/32" bushing mounts from front or rear of panel
For models 301, 303 & 305 only



MODEL NO.	A
301,305	.250
303	.225

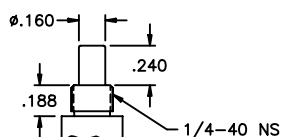
TO SPECIFY, ADD 'T1' TO SWITCH MODEL NO. - EXAMPLE: 301T1CQE6

Threaded bushing: Brass, nickel plated
Actuator button: Nylon. Specify color - see order format.

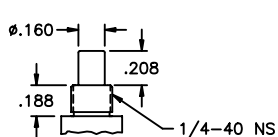
Supplied with 2 Hex Nuts, p/n A465 & 1 Lockwasher, p/n A466 (see Hardware section of catalog).

Printed circuit or solder lug terminals available.

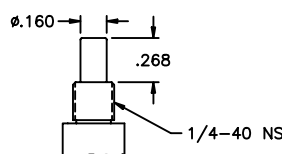
Option S Long actuator
For models 301, 302, 303, 304, 305, 401 & 402 only



301 & 305



302, 303 & 304



401 & 402

TO SPECIFY, ADD 'S' TO SWITCH MODEL NO. - EXAMPLE: 301SCQE

Actuator: Nylon

Color: Black standard for 300 Series

White standard for 400 Series.

Other colors available - see options.

Additional ordering information: Commonly ordered models are shown above and on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box with brief description - see option dwgs. & info. following.

Notes: 'NONE' indicates box may be left empty. Not all combinations can be made - see other pages of Series.

Model Structure:

Series	Actuators	Bushings	Terminations	Contact materials	Sealing
3 0 1	(NONE)	(NONE)	Z Solder lug	B Gold	Epoxy
3 0 2	S Long	T 1 15/32" thd'd.	C Printed circuit	Q Coin silver	terminal
3 0 3	(see dwg. -	(see dwg. -	V Right angle p.c. term-	N Economy	seal is
3 0 4	specify for all	for 301,	V - 1 inals for 301, 302, 305,	gold	standard
3 0 5	models with	303 & 305	only).	T Economy	
3 0 6	bezels- not	only).		silver	
4 0 1	available		V 3 0 Straight p.c. terminals with		
4 0 2	for 306).		V 4 0 bracket for 301, 302 & 305		
			only (see dwg.).		

Options:

Bezel& cap	Bezel color	Cap color	Recognitions
(NONE)	(NONE)	(NONE)	(NONE)
J 6 1 Snap-in w/LED	2 Black	2 Black	/U L
J 8 1 Snap-in no LED	6 Red	6 Red	
J 8 4 P.C. style	8 White	8 White	
J 9 6 Snap-in (round	Other Colors	Other Colors	
hole)	Available	Available	

Switch caps for switches without bezels also available - see Hardware section of catalog.

Example of completely specified model number:
301SZQEJ8122/UL

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

CONTACT MATERIAL OPTIONS

- B** Dry circuit - gold over nickel over brass.
RATING: 0.4 Volt-Amps (VA) max. at 20 V max.
ELECTRIC LIFE: 250,000 cycles minimum.
- Q** Power circuit - coin silver.
RATING: 1 Amp at 120 VAC or 28 VDC or 0.5 Amps at 250 VAC. ELECTRIC LIFE: 250,000 cycles minimum at full load.
Also - 3 Amps at 120 VAC or 28 VDC or 1.5 Amps at 250 VAC. ELECTRIC LIFE: 10,000 cycles minimum at full load.
Dry circuit or power circuit - gold over nickel over coin silver.
- G** Dry circuit - gold over nickel over coin silver.
RATINGS & ELECTRIC LIFE: Same as B & Q above -i.e.- can be used in either dry circuit or power circuit, however once used in power circuit, switch cannot be re-used in dry circuit. This option permits customers to inventory one switch to satisfy either application,
- N** RATING: 0.4 Volt-Amps (VA) max. at 20 V max. Note- less gold than B option.
ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.
- T** Power circuit - Silver plate over brass.
RATING: 0.5 Amps at 120 VAC or 0.25 Amps at 250 VAC (resistive loads).
ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.

Solder dipped terminals and custom
contact plating available - contact factory.

UL OPTION

- /UL** For power circuits - coin silver
RATING: 1 Amp at 125 VAC or 0.25 Amps at 250 VAC (75% power factor).

MPB SERIES PUSHBUTTON SWITCHES

FEATURES

- Single pole single throw momentary action.
- Normally open and normally closed models.
- Permanent cap is standard.
- Single hole mounting w/mtg. nut & lk'wshr supplied.

MATERIALS

Base: PBT thermoplastic, color black
 Bushing: Brass, nickel plated
 Actuator: ABS thermoplastic
 Terminals: Brass, silver plated
 Shorting Contact: Brass or phos. brz., silver plated

GENERAL SPECIFICATIONS

ELECTRICALS

Contact rating: 300 mA @ 125 VDC
 Insulation resistance: 100 megohms min. (500 VDC)
 Dielectric withstanding voltage: 500 VAC for 1 minute
 Contact resistance: 25 milliohms max. at 1 amp, 5 VDC
 Electrical/Mechanical life: 10,000 cycles min.
 Contact bounce: less than 10 milliseconds

MECHANICALS, THERMALS

Plunger travel: MPB1110: .063" (1.6mm) MPB1140: .078" (2mm)
 Actuation force: 300 grams $\pm$ 150 grams
 Operating temperature range: -20 °C to +60 °C

SOLDERING

Wave or hand soldering: 235°C max. for 5 seconds max.
 Solvent washing: Non-washable. Do not apply flux to terminals or switch mtg. surface

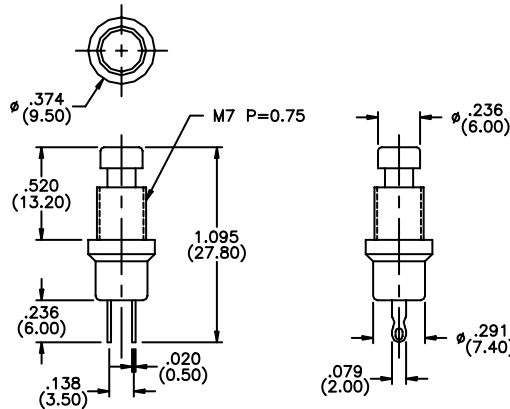
MPB1110



NORMALLY OPEN

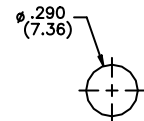


SCHEMATIC



MECHANICAL OUTLINE

Model No.	Cap Color
MPB11102	Black
MPB11106	Red



TOLERANCE FOR PANEL
 MTG. HOLE: $\begin{matrix} +.005 & (0.13) \\ -.000 & (0.00) \end{matrix}$

PANEL MTG. HOLE

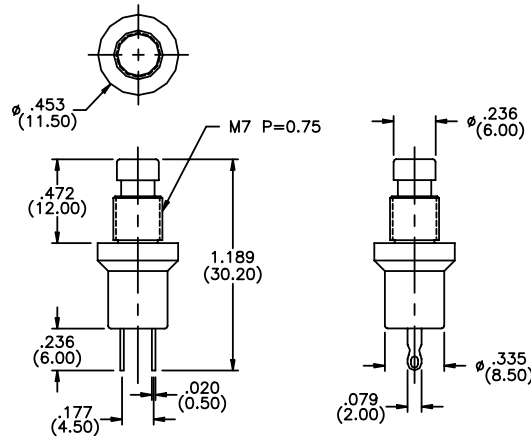
MPB1140



NORMALLY CLOSED

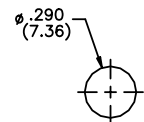


SCHEMATIC



MECHANICAL OUTLINE

Model No.	Cap Color
MPB11402	Black
MPB11406	Red



TOLERANCE FOR PANEL
 MTG. HOLE: $\begin{matrix} +.005 & (0.13) \\ -.000 & (0.00) \end{matrix}$

PANEL MTG. HOLE

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

New! IP SERIES - PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS



FEATURES

- Single pole NO momentary action with double break.
- Totally sealed compact construction.
- Ergonomically sculptured bezels with colorful actuator selections.
- Excellent tactile feedback with precise actuation

ELECTRICAL AND GENERAL SPECIFICATIONS

Contact ratings (resistive loads):	500 mA at 48 VAC, 200 mA at 50 VDC or 200 mA at 250 VAC
Initial contact resistance:	50 milliohms maximum
Insulation resistance:	1 gigohm min. at 500 VDC
Dielectric strength:	1500 V rms min.
Electrical life:	500,000 cycles min. at full load
Mechanical life:	1,000,000 cycles min.
Total Travel:	.059" (1.5mm)
Operating force:	14 ±4 oz. (4±1 N)
Contact bounce:	1 millisecond

ENVIRONMENTAL SPECIFICATIONS

Degree of protection:	IP 67
Shock resistance:	100g per IEC 512-4, test 6c
Vibration resistance:	10-500 Hz, 10g per IEC 512-4, test 6d
Salt spray:	Per IEC 512-6, test 11f
Strength of mechanism:	IK06 per EN 50101, 1 joule (1 Nm)
Operating temperature range:	-40°C to +125°C

MATERIALS

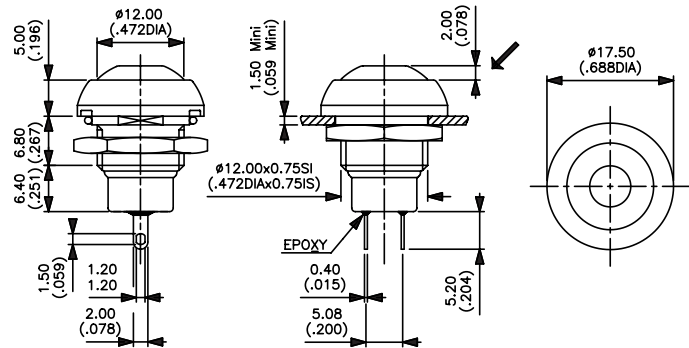
Contacts :	Gold plated silver
Actuator:	Polyamide 6/6
Bushing/bezel:	Zamac (with black finish on bezel)
Case:	PBT UL94V-0
Wire leads (F models):	Stranded, 20 AWG, UL approved
Hardware:	Supplied with 1 Hex Nut .629" (16mm) across flats and 1 'o'ring

New! IP SERIES - PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS

Round - solder lug terminals



MODEL NO.	ACT. COLOR
IPR3SAD1	BLUE
IPR3SAD2	BLACK
IPR3SAD3	GREEN
IPR3SAD5	YELLOW
IPR3SAD6	RED
IPR3SAD7/1	WHITE
IPR3SAD9	ORANGE

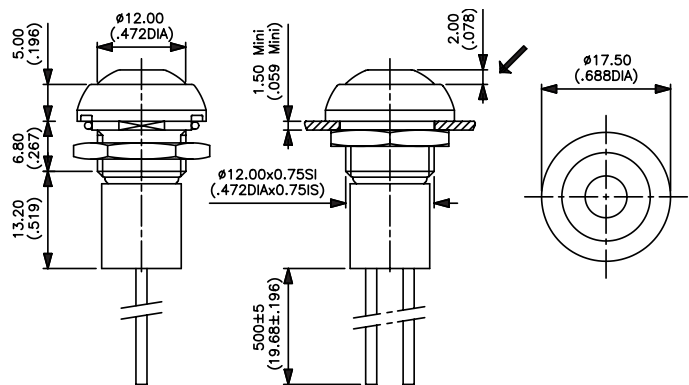


→ Flat

Round - stranded 20 AWG wire leads



MODEL NO.	ACT. COLOR
IPR3FAD1	BLUE
IPR3FAD2	BLACK
IPR3FAD3	GREEN
IPR3FAD5	YELLOW
IPR3FAD6	RED
IPR3FAD7/1	WHITE
IPR3FAD9	ORANGE

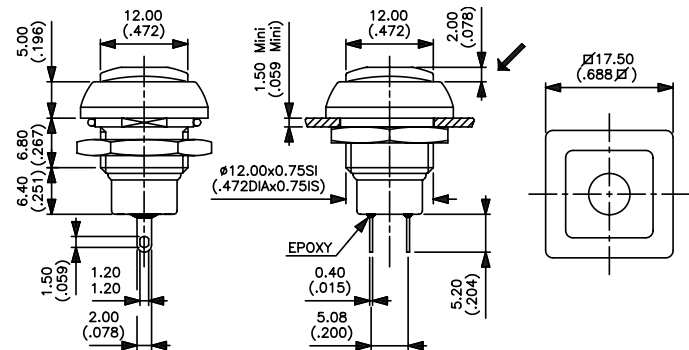


→ Flat

Square - solder lug terminals



MODEL NO.	ACT. COLOR
IPC3SAD1	BLUE
IPC3SAD2	BLACK
IPC3SAD3	GREEN
IPC3SAD5	YELLOW
IPC3SAD6	RED
IPC3SAD7/1	WHITE
IPC3SAD9	ORANGE

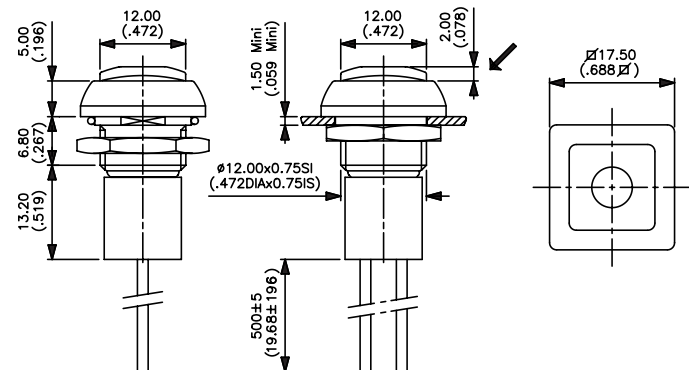


→ Flat

Square - stranded 20 AWG wire leads



MODEL NO.	ACT. COLOR
IPC3FAD1	BLUE
IPC3FAD2	BLACK
IPC3FAD3	GREEN
IPC3FAD5	YELLOW
IPC3FAD6	RED
IPC3FAD7/1	WHITE
IPC3FAD9	ORANGE



→ Flat

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

New! IP SERIES - PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS

Additional ordering information: Commonly ordered models are shown on prior page with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

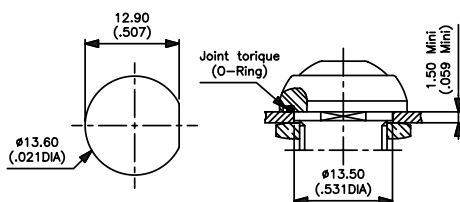
'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with allowable options shown below each respective box.

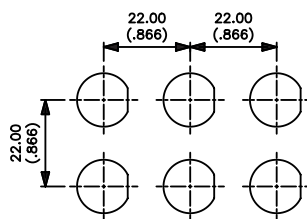
Series	Bezel shape	Electrical function	Terminals	Contacts	Actuator color
I P	☐	3	☐	A D	☐ ☐ ☐
	R Round C Square	Normally open (NO)	S Solder lugs F Stranded wire leads	Gold plated silver	1 Blue 2 Black 3 Green 5 Yellow 6 Red 7 / 1 White 9 Orange

MOUNTING

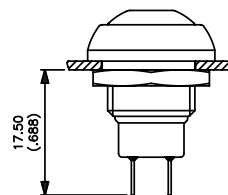
Panel cut-out



Matrix mounting

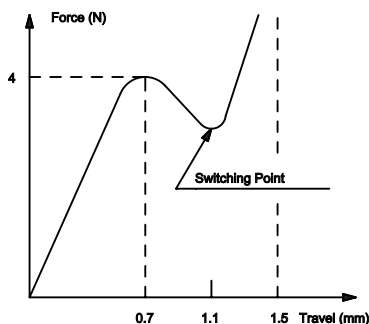


Back of panel space requirement

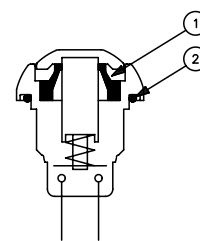


TACTILE FEEDBACK

Operating force vs. travel diagram



Switch cross section



SEALING

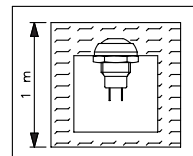
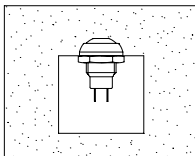
Per IP 67. Degree of protection provided by the enclosures of electric appliances according to IEC 529, DIN 40050 & NFC 20-010 shown below:

IP
(ingress protection)

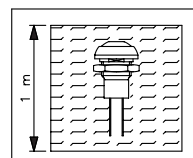
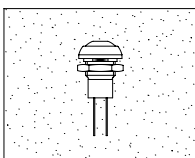
6
Totally protected against dust

7
Protected against the effects of immersion up to 1 meter of water (30 mins.)

SOLDER LUG VERSION



WIRE LEADS VERSION



SP SERIES - WASHABLE MINIATURE SNAP-ACTION PUSHBUTTON SWITCHES



FEATURES

- Wave solderable.
- Compact case size & fully sealed for process compatibility.
- SPDT & DPDT momentary p.c. & panel mounting models.
- Models available with ESD protection up to 12 KV.

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass: 100 mA at 30 VDC Silver or gold plated silver: 1 Amp at 120 VAC or 30 VDC
Initial contact resistance:	50 milliohms maximum
Insulation resistance:	1000 megohms minimum
Dielectric strength:	1000 V rms minimum
Electrical life:	60,000 cycles minimum
Operating temperature range:	-20°C to +85°C
Washing:	Permissible with water, detergents and solvents.

MATERIALS

Contacts & Terminals:	Gold plated brass, silver or gold plated silver
Actuator:	UL94V-0 polyamide, glass filled
Bracket:	Tin plated steel
Case:	UL94V-0 polyamide, glass filled or PES
Terminal seal:	Epoxy
Hardware:	1/4" threaded bushing models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

AGENCY RECOGNITION

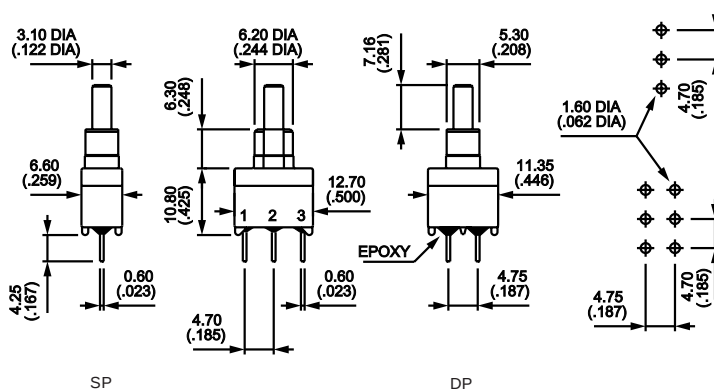


Available with all models with silver or gold plated silver contacts and terminals, standard actuator and smooth bushing. UL marking supplied when specified - see Order Format.

Plain bushing - straight p.c. terminals - gold plated brass contacts



SINGLE POLE MODEL NO. SP35P000000	CIRCUIT ON MOM
DOUBLE POLE MODEL NO. SP45P000000	CIRCUIT ON MOM
Button position:	 
Terminals connected:	1-3 1-2



SP

DP

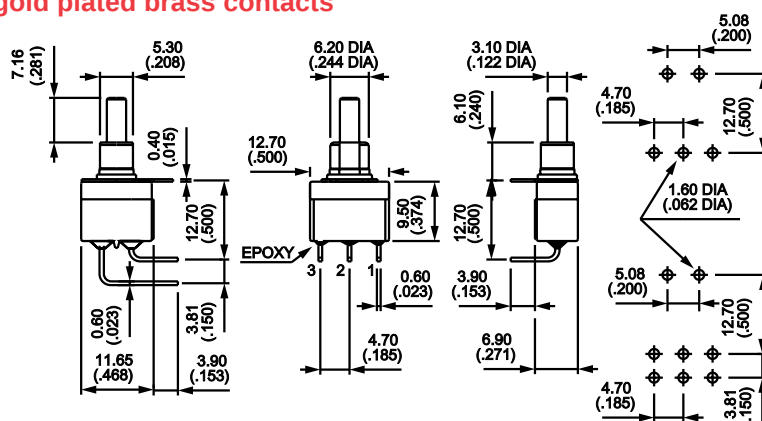
C

Plain bushing - bracket mounting - gold plated brass contacts

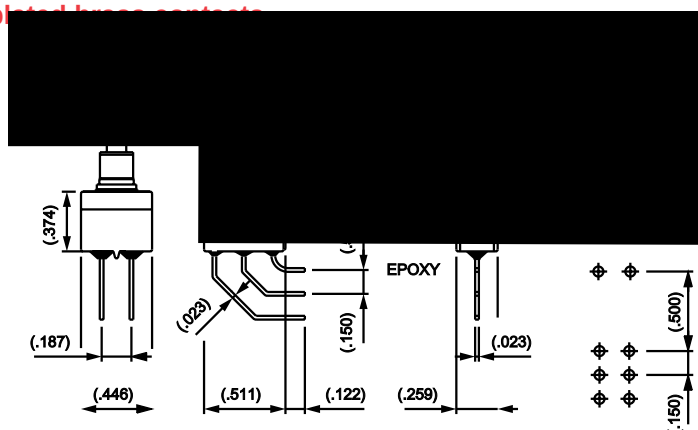
SP

DP

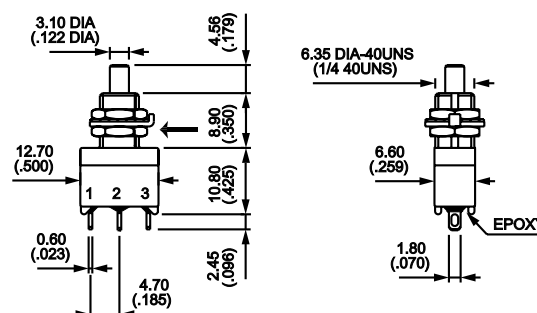
SINGLE POLE	
MODEL NO.	CIRCUIT
SP35W000000	ON MOM
DOUBLE POLE	
MODEL NO.	CIRCUIT
SP45W000000	ON MOM
Button position:	
Terminals connected:	1-3 1-2



SINGLE POLE	
MODEL NO.	CIRCUIT
SP35WW00000	ON MOM
DOUBLE POLE	
MODEL NO.	CIRCUIT
SP45WW00000	ON MOM
Button position:	
Terminals connected:	1-3 1-2



SINGLE POLE	
MODEL NO.	CIRCUIT
SP35S000077	ON MOM
Button position:	
Terminals connected:	1-3 1-2

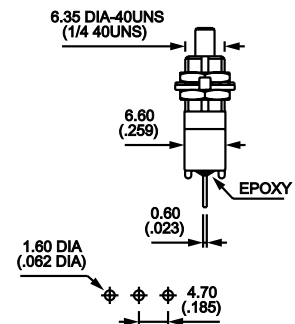
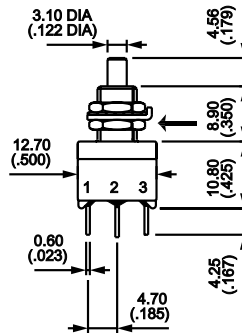


SP SERIES - WASHABLE MINIATURE SNAP-ACTION PUSHBUTTON SWITCHES

Threaded bushing - straight p.c. terminals - gold plated brass contacts



SINGLE POLE	
MODEL NO.	CIRCUIT
SP35P000077	ON MOM
Button position:	 
Terminals connected:	1-3 1-2



→ Keyway

Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.
(Allowable options are shown under each respective box).

Model Structure:

Series	Number of poles	Electrical function	Terminals
S P	3 4	5 ON MOM	P 0 S 0 Y 0 W 0 W W
	3 Single pole 4 Double pole		P 0 Straight pc S 0 Solder lug Y 0 Straight pc with mounting bracket W 0 Horizontal right angle mounting W W Vertical right angle mounting

Options:

Contact & terminal materials Actuators and bushings

0 1 2 8	0 0 0 0 0 0 0 1 0 0 7 7 0 2 7 6	Standard actuator w/smooth bushing Standard actuator w/smooth bushing & UL marking (UL available with silver or gold plated silver contacts & terminals only) Standard actuator w/threaded bushing Short actuator w/short smooth bushing (See actuator/ bushing drawings at bottom of this page)
0 Brass, gold plated 1 Silver 2 Silver, gold plated 8 Brass, gold plated, with, tin plated terminals		

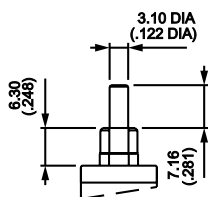
Example of completely specified model number: **SP35Y080000**

Caps available separately - see option drawings on next page.

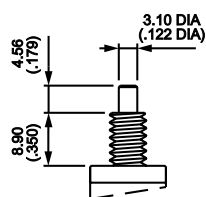
OPTION DRAWINGS

ACTUATOR/BUSHING DRAWINGS

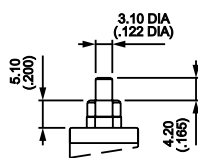
TERMINAL OUTLINES



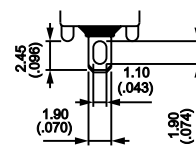
0000 Standard actuator w/smooth bushing



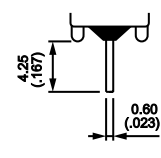
0077 Standard actuator w/threaded bushing



0276 Short actuator with short smooth bushing



S0 Solder lug

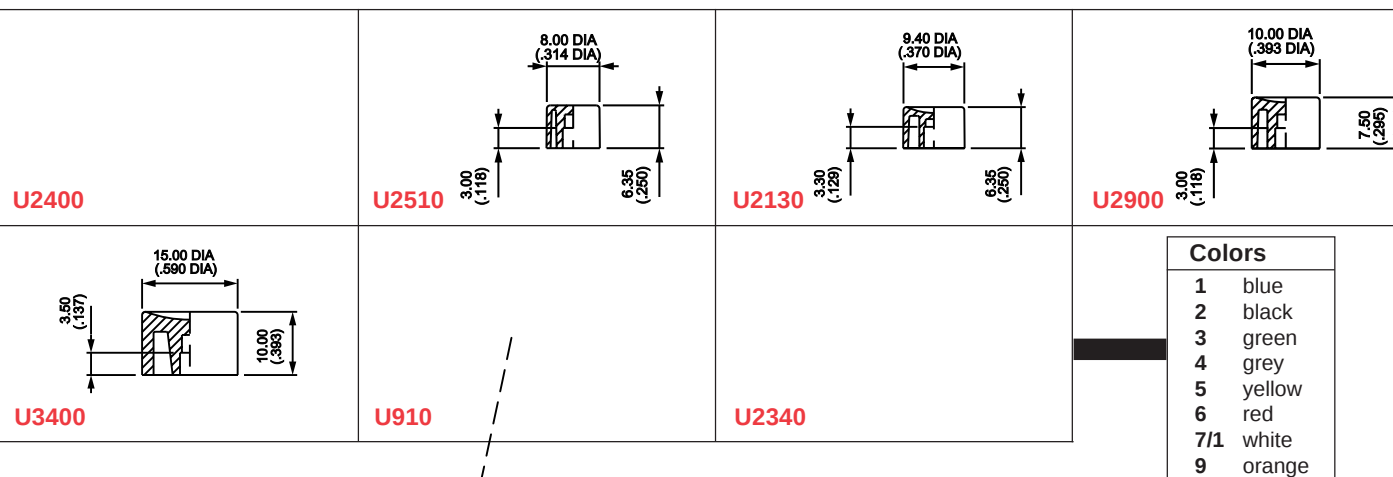


P0 Straight printed circuit

SP SERIES - WASHABLE MINIATURE SNAP-ACTION PUSHBUTTON SWITCHES

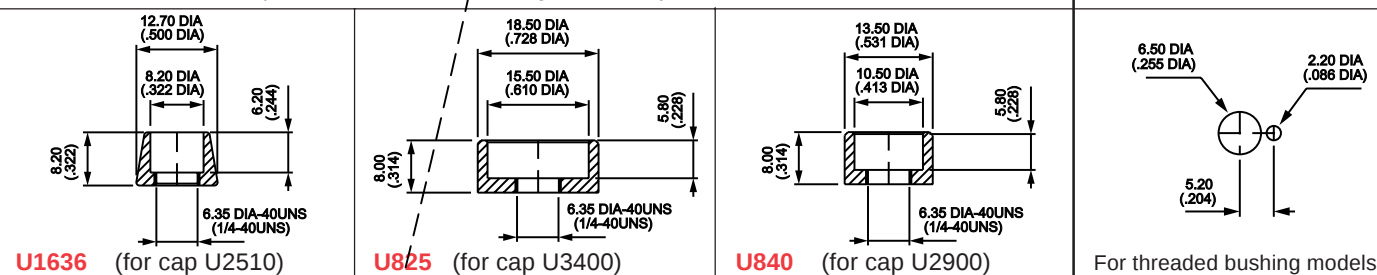
OPTION DRAWINGS & MISCELLANEOUS

CAPS Note: replace last '0' in p/n with color code.



DRESS NUTS Chrome plated For threaded bushing models only.

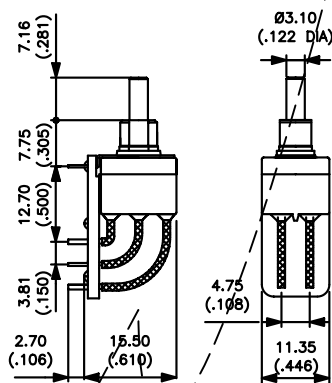
PANEL CUT-OUT



ELECTROSTATIC PUSHBUTTON SWITCHES

INSULATED

Protects against electrostatic discharges (ESD) up to 12 KV.



X978 - Consult factory

18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES



FEATURES

- Single pole-double throw & double pole-double throw models with ON-MOM ON action.
- Epoxy terminal sealing standard.
- Panel and p.c. mounting models with compact miniature case size.

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass: 100 mA at 30 VDC Gold plated silver: 1A at 120VAC or 30VDC
Initial contact resistance:	50 milliohms maximum
Insulation resistance:	1000 megohms minimum
Dielectric strength:	1000 V rms minimum
Electrical life:	60,000 cycles minimum at full load.
Operating temperature range:	-30°C to +65°C
Total travel:	.019" (0.5mm)

MATERIALS

Contacts & Terminals:	Gold plated brass or gold plated silver
Actuator:	Polyamide, glass filled
Bushing:	Nickel plated brass
Housing:	Stainless steel
Case:	Diallyl phthalate
Bracket:	Tin plated steel
Terminal seal:	Epoxy
Hardware:	1/4" threaded bushing models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

ABOUT THIS SERIES

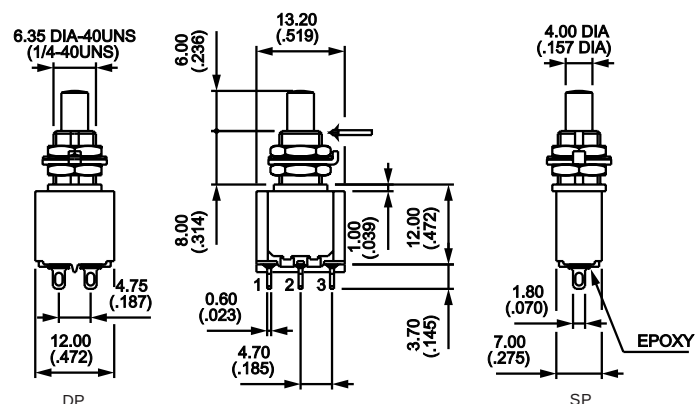
- The material is organized in the following sequence:
- completely specified switch models.
 - 'Build your own switch' order format.
 - Options & miscellaneous

Solder lug terminals - 1/4" (6.35mm) bushing - gold plated silver contacts



SINGLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
18535AD		ON	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
18545AD		ON	MOM
Handle position:			
Terms. connected:		1-3 4-6	1-2 4-5

→ Keyway



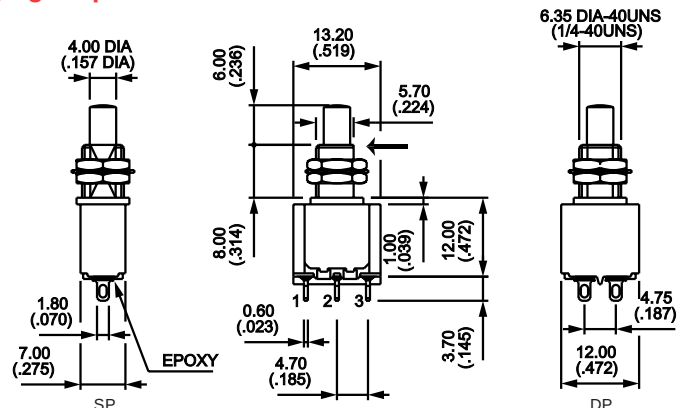
18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

Solder lug terminals - 1/4" (6.35mm) flatted bushing - gold plated silver contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18735AD	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
18745AD	ON	MOM
Handle position:		
Terms. connected:		
	1-3	1-2
	4-6	4-5

→ 'D' flat

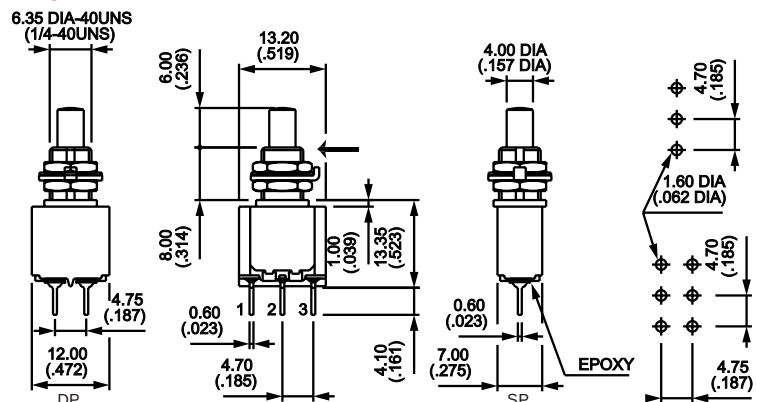


Straight p.c. terminals - 1/4" (6.35mm) bushing - gold plated silver contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18235AD	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
18245AD	ON	MOM
Handle position:		
Terms. connected:		
	1-3	1-2
	4-6	4-5

→ Keyway

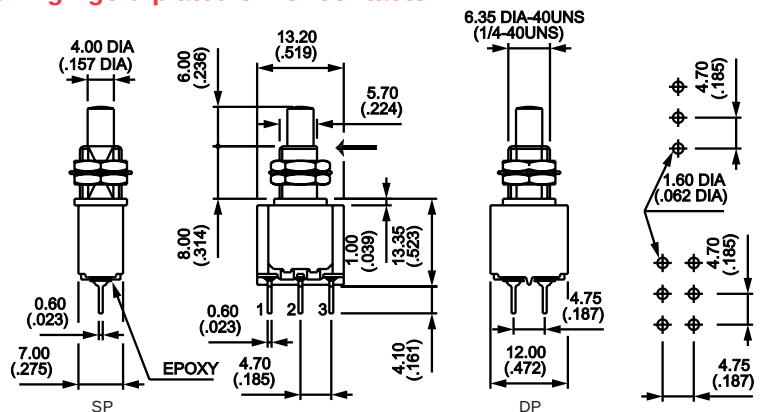


Straight p.c. terminals - 1/4" (6.35mm) flatted bushing - gold plated silver contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18935AD	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
18945AD	ON	MOM
Handle position:		
Terms. connected:		
	1-3	1-2
	4-6	4-5

→ 'D' flat

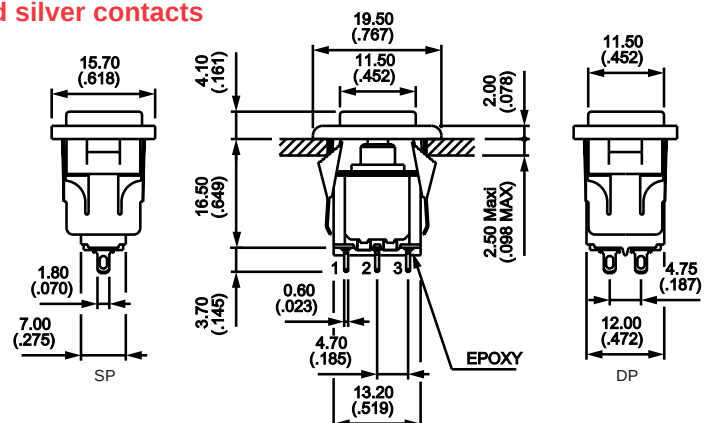


Solder lug terminals - snap-in mounting - gold plated silver contacts



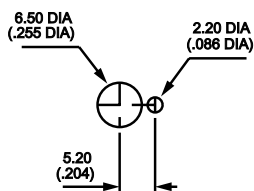
SINGLE POLE MODEL NO.	CIRCUIT	
18835AD+U912+U1202	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
18845AD+U912+U1202	ON	MOM
Handle position:		
Terms. connected:		
	1-3	1-2
	4-6	4-5

Above models have back bezel & cap

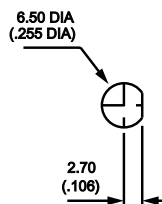


18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

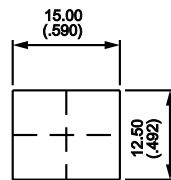
PANEL CUT-OUTS for models shown above



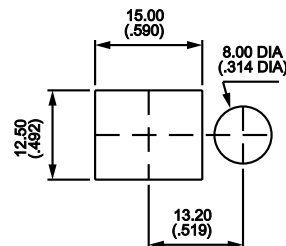
1/4" (6.35mm) bushing



1/4" (6.35mm) flatted bush.



Bezel U1200

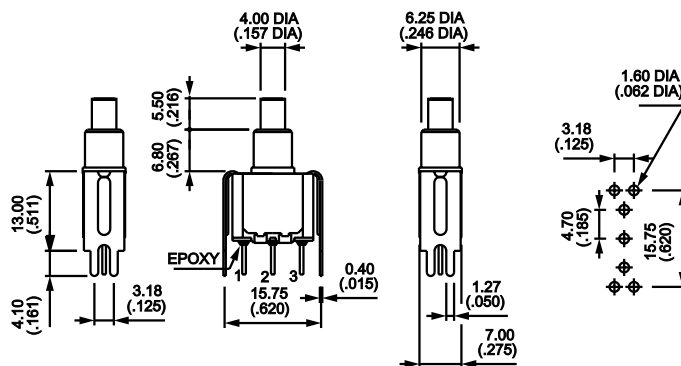


Bezel U1210 w/LED

Single pole - straight p.c. terminals - bracket mounting - gold plated brass contacts



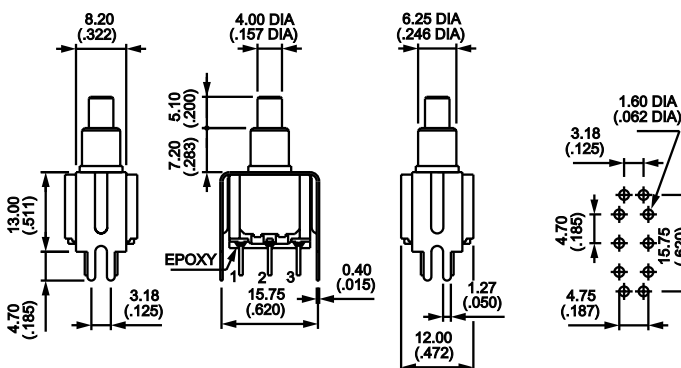
SINGLE POLE MODEL NO.	CIRCUIT	
18235YCD3	ON	MOM
Handle position:		
Terms. connected:	1-3	1-2



Double pole - straight p.c. terminals - bracket mounting - gold plated brass contacts



DOUBLE POLE MODEL NO.	CIRCUIT	
18245YCD3	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5

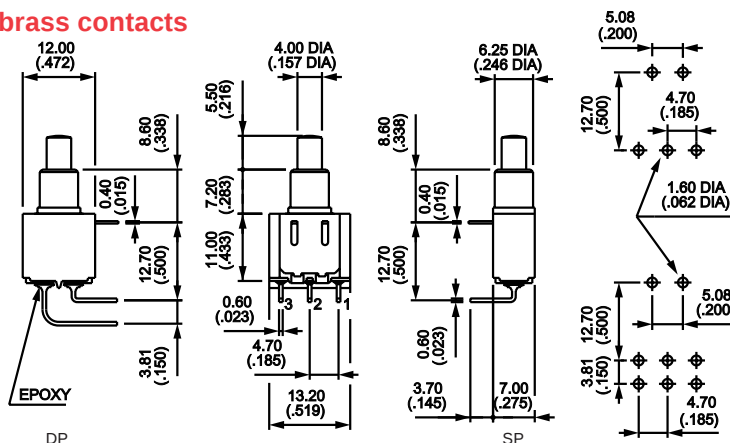


Horizontal right angle p.c. terminals - gold plated brass contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18235WCD3	ON	MOM
Handle position:		
Terms. connected:	1-3	1-2

DOUBLE POLE MODEL NO.	CIRCUIT	
18245WCD3	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5



18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

SPECIAL OPTIONS

Special option X624 - straight p.c. terminals - short bushing & actuator - gold plated brass contacts

SINGLE POLE		
MODEL NO.	CIRCUIT	
18235YCD2X624	ON	MOM
DOUBLE POLE		
MODEL NO.	CIRCUIT	
18245YCD2X624	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5

Special option X662 - straight p.c. terminals - snap-in mounting - gold plated brass contacts

SINGLE POLE		
MODEL NO.	CIRCUIT	
18835CDX662+U910+U1200	ON	MOM
DOUBLE POLE		
MODEL NO.	CIRCUIT	
18845CDX662+U910+U1200	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5

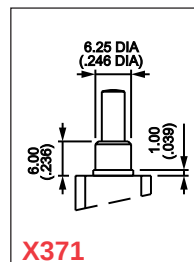
F Tin plated terminals (for p.c. terminals only).

X371 .246" (6.25mm) smooth bushing in place of standard threaded bushing.

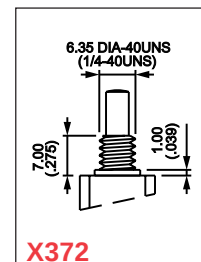
X372 Short 1/4" (6.35mm) threaded bushing, .274" (7mm) long.

X386 1/4" (6.35mm) threaded bushing in place of smooth bushing on models with W, WW & Y options.

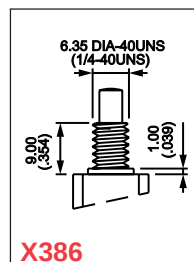
X438 .246" (6.25mm) smooth bushing without shoulder, .283" (7.2mm) long.



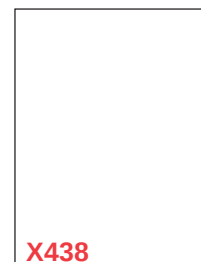
X371



X372



X386



X438

18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.
(Allowable options are shown under each respective box).
Note: 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals & bushings	Number of poles	Electrical function	Terminals
1 8			5	
	2 Straight p.c. terminals with 1/4" (6.35mm) threaded bushing. Straight p.c. terms. + bracket or right angle p.c. terms. with smooth bushing 5 Solder lug terminals with 1/4" (6.35mm) threaded bushing 7 Solder lug terminals with 1/4" (6.35mm) flatted bushing 8 Solder lug terminals, snap-in mounting 9 Straight p.c. terminals with 1/4" (6.35mm) flatted bushing	3 Single pole 4 Double pole	ON - MOM	(NONE) Solder lug or straight p.c. W Horizontal right angle p.c. W W Vertical right angle p.c. Y Bracket mounting

Example of completely specified model number: **18245AD**

Caps available separately - see option drawings.

Options:

Contact materials	Actuators	Special options
A D Silver, gold plated C D Brass, gold plated	(NONE) .157" (4mm) dia. x .236" (6mm) long (standard) with threaded bushing 6 .122" (3.1mm) dia. x .230" (5.85mm) with threaded bushing 3 .157" (4mm) dia. x .216" (5.5mm) long (standard) with smooth bushing 5 .122" (3.1mm) dia. x .248" (6.3mm) long	(NONE) F Tin plated terminals- for p.c. terms. only X 6 2 4 Shorter bushing & actuator X 6 6 2 Snap-in mounting & straight p.c. terminals Others listed - see Special Option page

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

ACTUATOR OPTIONS

(NONE) Standard with threaded bushing	6	3 Standard with smooth bushing
5	SWITCH ACTION Arrow indicates keyway	TERMINALS Solder lug Straight p.c.

18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

CAPS

FOR .157" (4mm) DIA. ACTUATORS (13 & 3)

Note: replace last '0' in p/n with color code.

U900

U1140

U1720

U480

U630

U2430 Square

U2020 Square

FOR .122" (3.1mm) DIA. ACTUATORS (5 & 6)

Note: replace last '0' in p/n with color code.

U2400

U2510

U2130

U2900

U3400

U910 Square

U2340 Square

FOR 188.. & 188..X662 MODELS

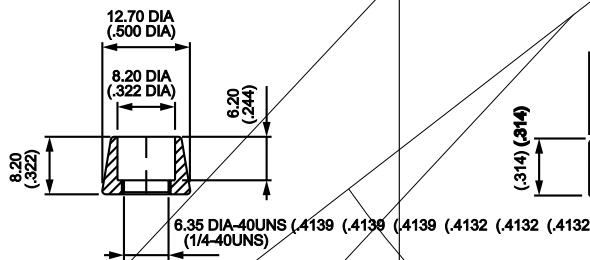
Note: replace '0' in p/n with color code.

U910 Square

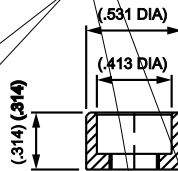
U2340 Square

DRESS NUTS

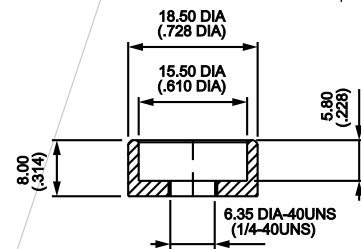
Chrome plated For models with threaded bushings (182..., 185..., 187..., & 189...) (Order separately)



U1636 For caps U1140 & U2510



U840 For caps U480 & U2900



U825 For caps U630 & U3400

Colors

- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7 ivory
- 7/1 white
- 9 orange

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

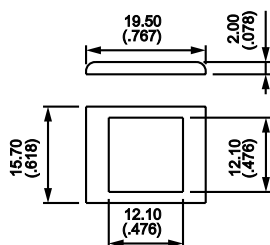
C

18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

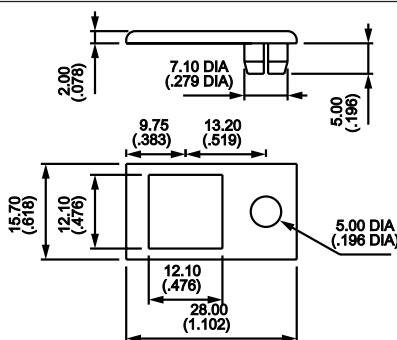
BEZELS Note: replace last '0' in p/n with color code

For snap-in models (188.. & 188..X662)

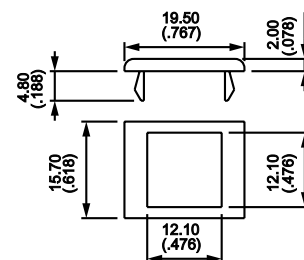
For bracket mtg. models (182..Y & 182..YX624)



U1200



U1210 For LED (not supplied)



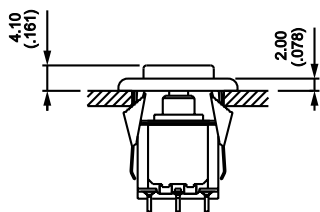
U3200

Colors

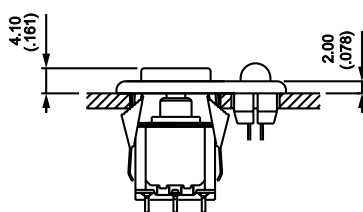
- | | |
|-----|--------|
| 1 | blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7 | ivory |
| 7/1 | white |
| 9 | orange |

STANDARD PANEL MOUNTING FOR BEZELS

Panel thicknesses: .039" (1mm) to .098" (2.5mm)



188.. + U910 + U1200



188.. + U910 + U1210

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

8000 SERIES - MINI. MOMENTARY OR ALTERNATE ACTION PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C



FEATURES

- Single pole-double throw & double pole-double throw models.
- ON-MOM and ON-ON alternate actions 8.3s I 283)

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass: 0.4 Volt-Amps max. at 20 V (AC or DC) Silver: 3A 250VAC, 6A 125VAC or 4A 30VDC
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms minimum at 500 VDC
Dielectric strength:	2000 V rms min. between terminals and frame. 1000 V rms between terminals.
Electrical life:	30,000 cycles minimum at full load.
Operating temperature range:	-40°C to +85°C
Travel:	Pre-travel - .086" (2.2mm) Over-travel - .019" (0.5mm) Total-travel - .106" (2.7mm)

MATERIALS

Contacts & Terminals:	Gold plated brass or gold plated silver
Actuator:	Nickel plated brass
Bushing:	Nickel plated brass
Housing:	Stainless steel
Case:	Diallyl phthalate
Terminal seal:	Epoxy
Hardware:	1/4" threaded bushing models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

AGENCY LISTINGS



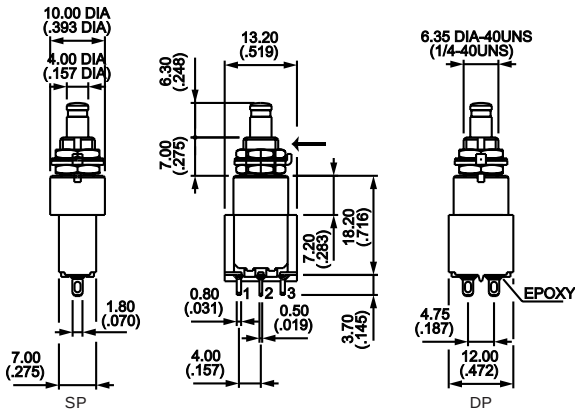
To order switches marked UL, specify in approvals box of Order Format.

Solder lug terminals - 1/4" (6.35mm) bushing - silver contacts



SINGLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
8632AB		ON	ON
8636AB		ON	ON
DOUBLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
8642AB		ON	ON
8646AB		ON	ON
Actuator position:			
Terms. connected:	2-3 1-2		
	5-6 4-5		

→ Keyway



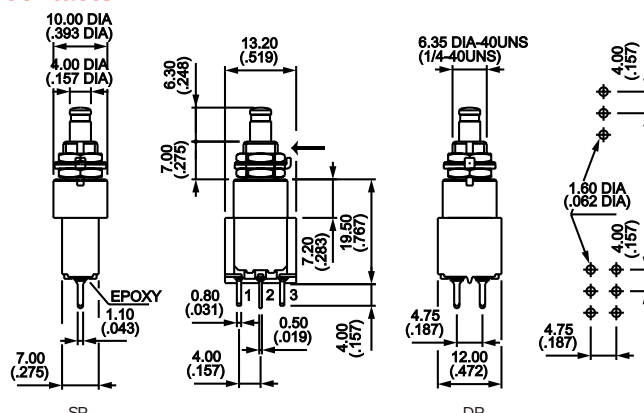
8000 SERIES - MINI. MOMENTARY OR ALTERNATE ACTION PUSHBUTTON SWITCHES

Straight p.c. terminals - 1/4" (6.35mm) bushing - silver contacts



SINGLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
8432AB		ON	MOM
8436AB		ON	ON
DOUBLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
8442AB		ON	MOM
8446AB		ON	ON
Actuator position: 			
Terms. connected:		2-3	1-2
		5-6	4-5

→ Keyway

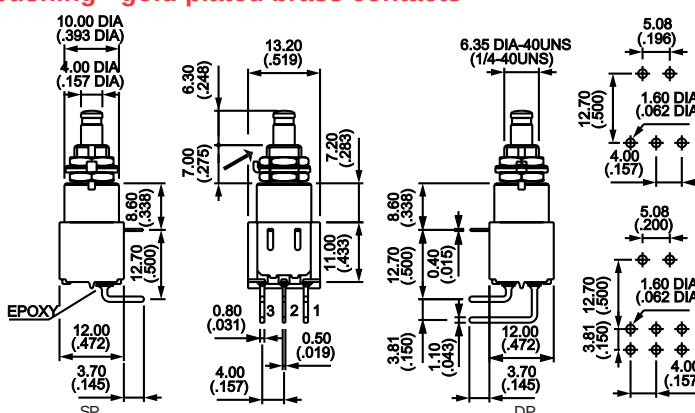


Horizontal right angle p.c. terminals - 1/4" (6.35mm) bushing - gold plated brass contacts



SINGLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
8432WCDB		ON	MOM
8436WCDB		ON	ON
DOUBLE POLE		CIRCUIT	
MODEL NO.		ON	MOM
8442WCDB		ON	MOM
8446WCDB		ON	ON
Actuator position: 			
Terms. connected:		2-3	1-2
		5-6	4-5

→ Keyway



Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.
(Allowable options are shown under each respective box).
Note: 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals	Number of poles	Electrical functions	Terminals
8				
	4 Straight p.c. or right angle terminals 6 Solder lug terminals	3 Single pole 4 Double pole	2 ON - MOM 6 ON - ON	(NONE) Solder lug or straight p.c. W Right angle p.c.

Options:

Contact materials	Actuators	Sealing	Special options	
A Silver A D Silver, gold plated C D Brass, gold plated	For 1/4" (6.35mm) bushings (NONE) Height .248" (6.3mm) 9 Height .346" (8.8mm) For 15/32" (11.9mm) bushings (NONE) Height .338" (8.6mm) 6 Height .275" (7mm)	(NONE) No sealing B Epoxy sealed terminals K Front panel sealing with 'o'-ring & gasket	(NONE) X 7 1 8 15/32" (11.9mm) bushing X 9 3 4 15/32" (11.9mm) bushing & front panel sealing	(NONE) U L

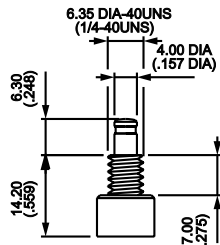
Example of completely specified model number: **8432WCDB**

Caps available separately - see option drawings.

8000 SERIES - MINI. MOMENTARY OR ALTERNATE ACTION PUSHBUTTON SWITCHES

ACTUATOR OPTIONS

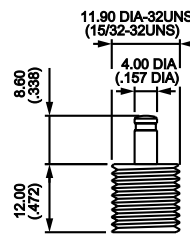
For 1/4" (6.35mm) bushing



(NONE) Standard

9

For 15/32" (11.9mm) bushing



(NONE) Standard

6

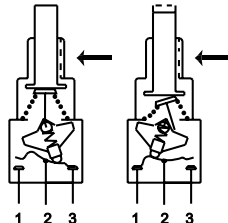
MISCELLANEOUS

SWITCH ACTION

Arrow indicates keyway

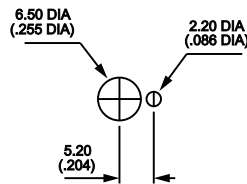


Function 6
(ON-ON)

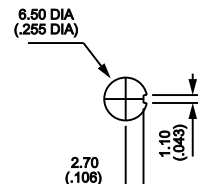


Function 2
(ON-MOM)

PANEL CUT-OUTS



1/4" (6.35mm)
Standard (With locking ring)

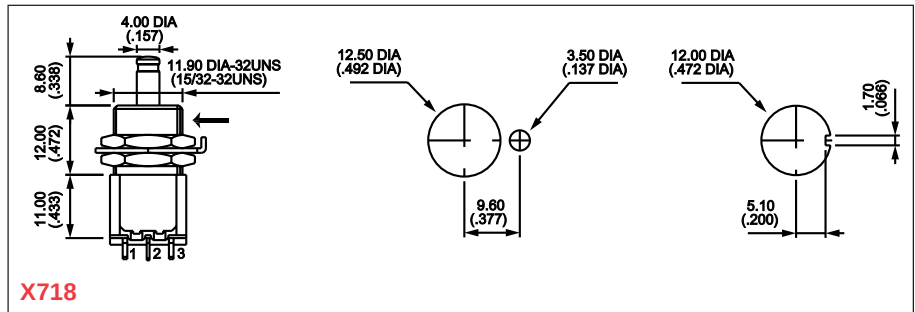


1/4" (6.35mm)
with K option

SPECIAL OPTIONS

- F** Tin plated terminals (for p.c. terminals only).
- X601** Silver plated brass contacts. Contact ratings: 0.2A 250VAC, 0.4A 125VAC or 0.5A 30VDC. Electric life: 20,000 cycles min. Minimum quantity: 5,000 pieces.
- X718** Bushing 15/32" (11.9mm). For all basic models (solder lug, straight p.c. or right angle p.c. terminals). Available with actuators **13** & **6**. Sealing option **K** available.
- X934** Flatted 15/32" (11.9mm) bushing and front panel sealing with 2 'o'-rings.

X934



X718

SEALING OPTIONS

- (NONE)** No sealing.
- B** Epoxy sealed terminals.
- K** Front panel sealing with 'o'-ring and gasket. Protects against water and dust. Withstands 1 bar pressure when switch is operated.
- KB** Combined sealings (above).

K

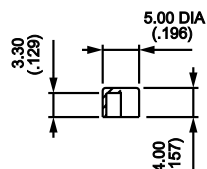
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

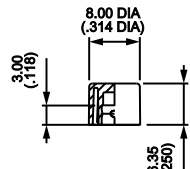
8000 SERIES - MINI. MOMENTARY OR ALTERNATE ACTION PUSHBUTTON SWITCHES

CAPS

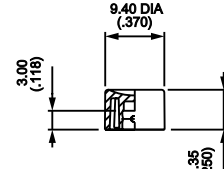
Note: replace last '0' in p/n with color code.



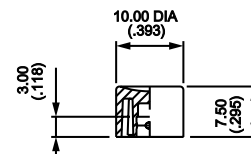
U900



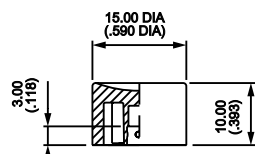
U1140



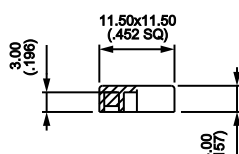
U1720



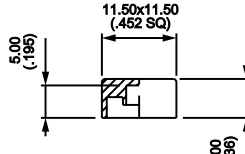
U480 Standard



U630



U2430 Square

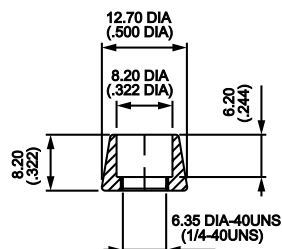


U2020 Square

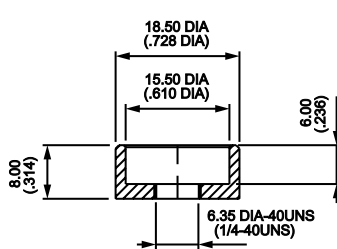
Colors

- | | |
|-----|--------|
| 1 | blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7/1 | white |
| 9 | orange |

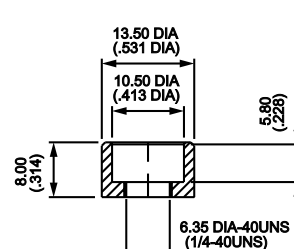
DRESS NUTS (chrome plated)



U1636 For cap U1140



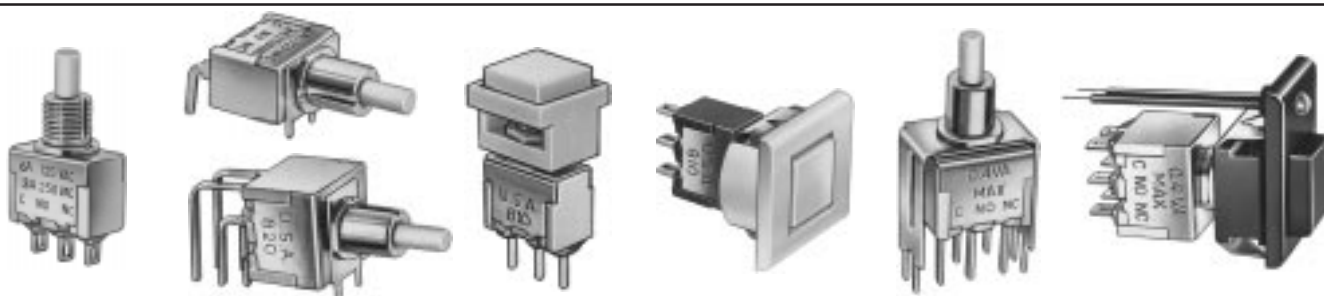
U825 For cap U630



U840 For cap U480

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES



FEATURES

- Dry circuit through power ratings .
- Ultra-rugged construction SPDT & DPDT momentary models with numerous options.
- Panel, panel & p.c. and p.c. mounting models, lighted and unlighted.

SPECIFICATIONS

Contact ratings (resistive loads):	(Q) power models - coin silver: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC. (B) dry circuit models - gold over nickel over brass: 0.4 VA max. at 20 V max. UL models - coin silver: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). UL file no. E66367. CSA models - coin silver: same ratings as UL models. CSA file no. LR54592-1. 20 milliohms max. at 3 VDC, 0.1 Amp. Greater than 200,000 megohms between terminals & case ground. Greater than 1500 VAC for 1 minute between terminals & case ground. 60,000 cycles min. at full load. -30°C to +85°C .035" (0.9mm) approx. Single pole: 290 ± 75 grams Double pole: 550 ± 75 grams
Also see economy ratings N & T in options section.	
Initial contact resistance:	
Insulation resistance:	
Dielectric strength:	
Electrical life (resistive loads):	
Operating temperature range:	
Total travel:	
Actuation force:	

MATERIALS

Contacts:	Coin silver for power, UL & CSA models. Gold over nickel over brass for dry circuit models.
Actuator:	Glass filled polyester, color white
Bushing:	Nickel plated brass
Strap:	Stainless steel
Case:	Melamine phenolic, color red
Terminal seal:	Epoxy (standard)
Support bracket:	Brass or steel, tin plated
Spring mounting bracket:	Stainless steel
Bezel & cap:	Nylon. Available in black, red & white. Consult factory for other colors.
Hardware:	See 'Miscellaneous' section.
LED:	Intensity: 2.0 mcd at 10 mA. Forward voltage: 2.0V (3.0V max.). Max. continuous forward current: 15 mA for red, 30 mA for green & 20 mA for yellow. Red is standard. Yellow & green are optional. Specifications are subject to change without notice - consult factory.

AGENCY RECOGNITION	UL, & CSA. Marking: Switches ordered with '/UL' added at end of model no. are supplied with recognition marked. Switches ordered with '/CSA' added at end of model no. are supplied with recognition marked.
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ABOUT THIS SERIES

The material in this series is organized in the following sequence:

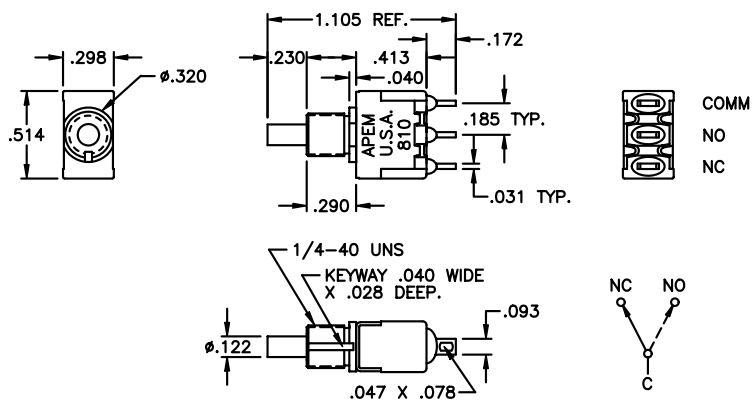
- Completely specified switch models
- 'build your own switch' order format
- Miscellaneous
- Option drawings & information
- Panel cut-outs

800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

Solder lug terminals - panel mounting

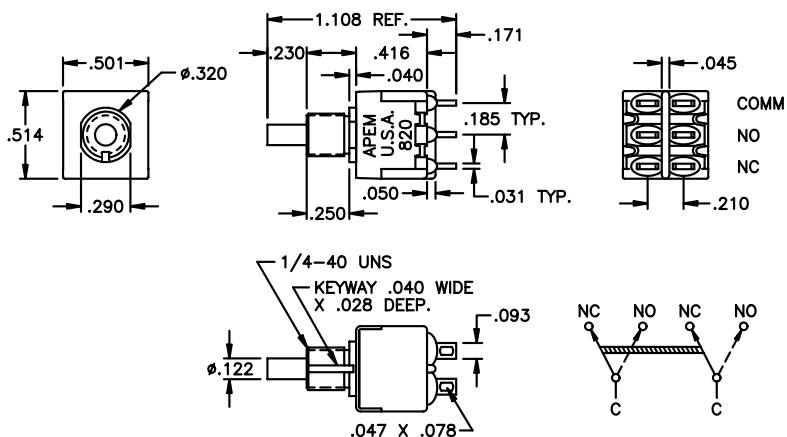
SINGLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.
810KMZQ	810KMZQ/UL



DOUBLE POLE

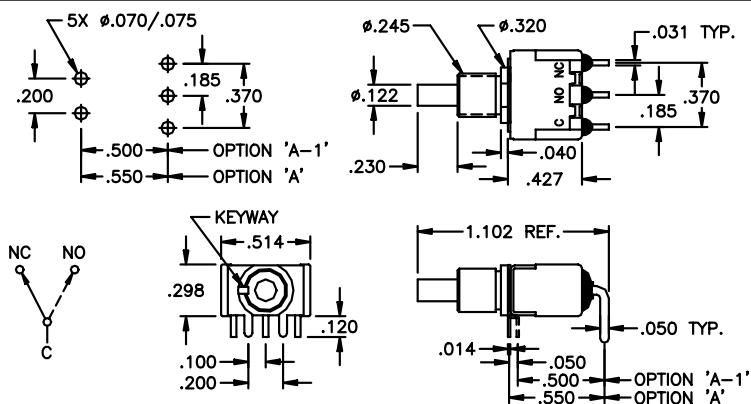
POWER CKT. MODEL NO.	UL MODEL NO.
820KMZQ	820KMZQ/UL



Horizontal right angle p.c. terminals - p.c. mounting

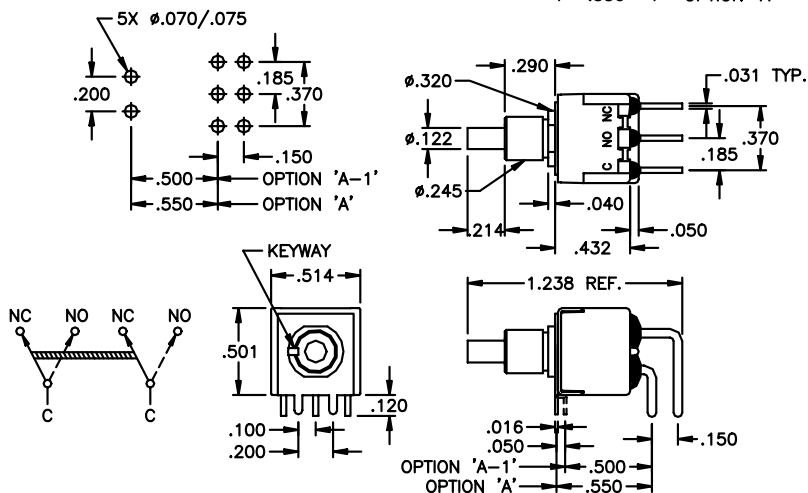
SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
810KSAB	810KSAQ/UL
810KSA-1B	810KSA-1Q/UL



DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
820KSAB	820KSAQ/UL
820KSA-1B	820KSA-1Q/UL



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

Vertical right angle p.c. terminals - p.c. mounting

SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
810KSVB	810KSVQ/UL
810KSV-1B	810KSV-1Q/UL
810KSV-2B	810KSV-2Q/UL



DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
820KSVB	820KSVQ/UL
820KSV-1B	820KSV-1Q/UL
820KSV-2B	820KSV-2 Q/UL

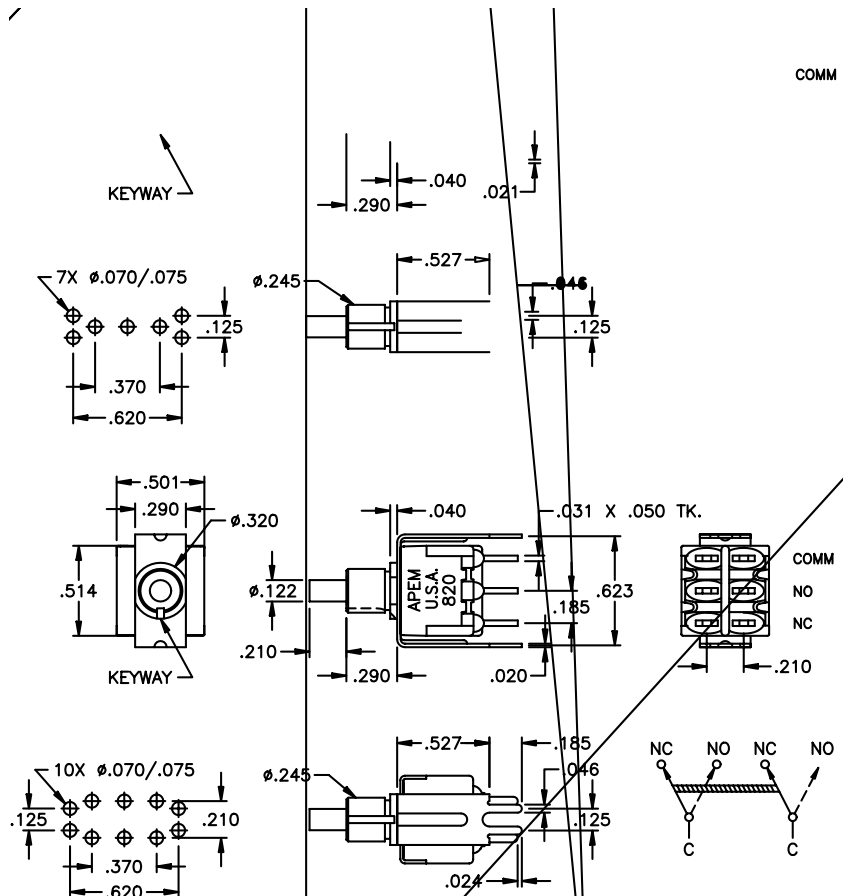


Straight p.c. terminals with bracket



DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
820KSV30B	820KSV30Q/UL
820KSV40B	820KSV40Q/UL



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

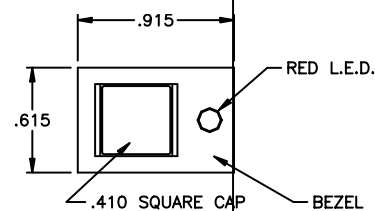
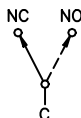
800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

Solder lug terminals - snap-in bezel with outboard LED

SINGLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1ZQJ6122	810K2M1ZQJ6122/UL	.100
810K1M1ZQJ6122	810K1M1ZQJ6122/UL	.010

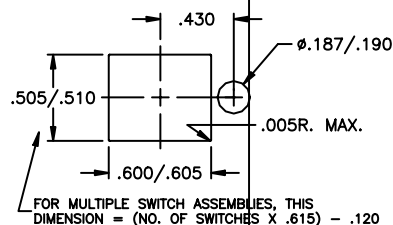
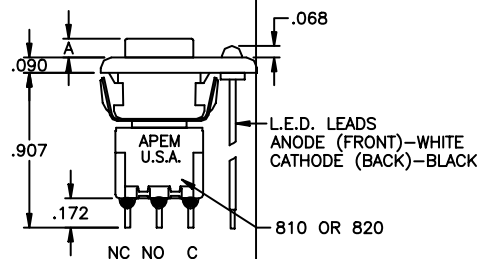
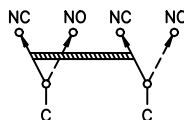
Models listed above have black bezel and cap.



DOUBLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1ZQJ6122	820K2M1ZQJ6122/UL	.100
820K1M1ZQJ6122	820K1M1ZQJ6122/UL	.010

Models listed above have black bezel and cap.

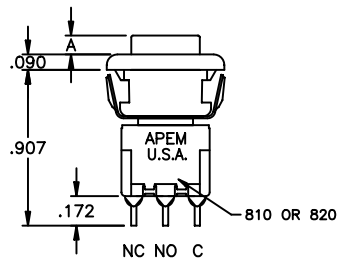
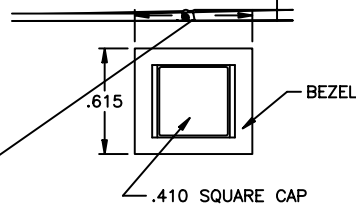


Solder lug terminals - snap-in bezel

SINGLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1ZQJ8122	810K2M1ZQJ8122/UL	.100
810K1M1ZQJ8122	810K1M1ZQJ8122/UL	.010

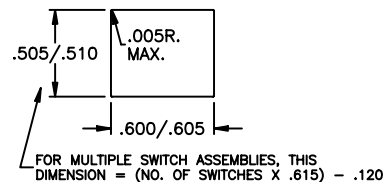
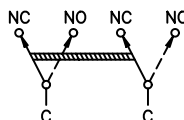
Models listed above have black bezel and cap.



DOUBLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1ZQJ8122	820K2M1ZQJ8122/UL	.100
820K1M1ZQJ8122	820K1M1ZQJ8122/UL	.010

Models listed above have black bezel and cap.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

Straight p.c. terminals - p.c. mounting bezel

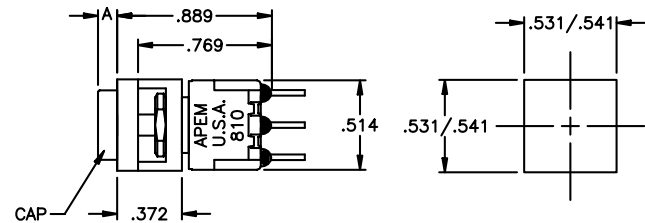
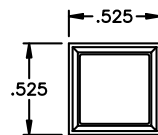
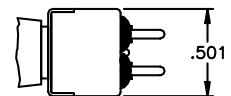
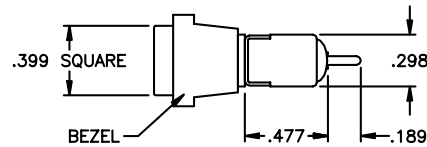
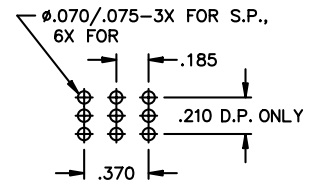
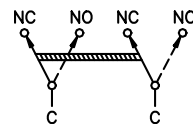
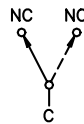
SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1CBJ8422	810K2M1CQJ8422/UL	.100
810K1M1CBJ8422	810K1M1CQJ8422/UL	.010

DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1CBJ8422	820K2M1CQJ8422/UL	.100
820K1M1CBJ8422	820K1M1CQJ8422/UL	.010

Models listed above have black bezel and cap.



Straight p.c. terminals w/bracket - p.c. mounting bezel

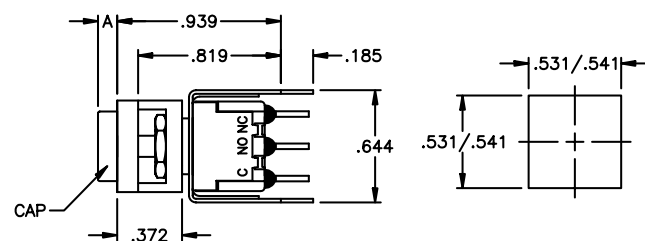
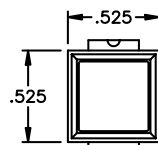
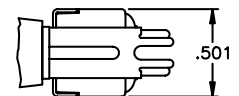
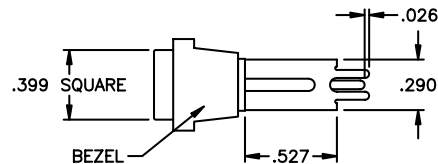
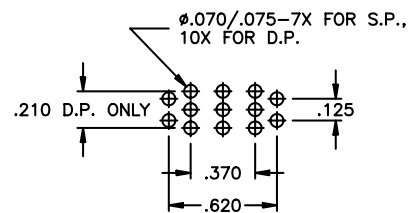
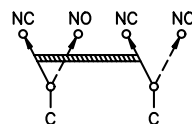
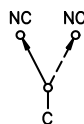
SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1V30BJ8422	810K2M1V30QJ8422/UL	.100
810K1M1V30BJ8422	810K1M1V30QJ8422/UL	.010

DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1V30BJ8422	820K2M1V30QJ8422/UL	.100
820K1M1V30BJ8422	820K1M1V30QJ8422/UL	.010

Models listed above have black bezel and cap.

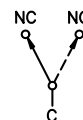
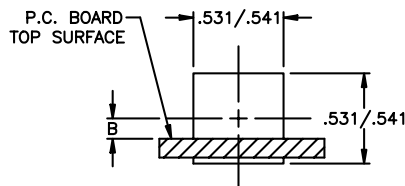


800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

Horizontal right angle p.c. terminals - p.c. mounting bezel

SINGLE POLE

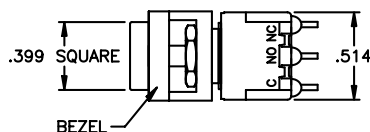
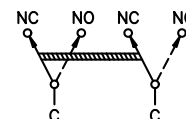
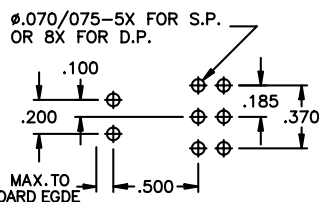
DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1ABJ8422	810K2M1AQJ8422/UL	.100
810K1M1ABJ8422	810K1M1AQJ8422/UL	.010



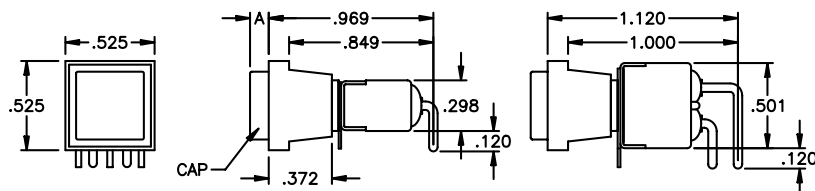
DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1ABJ8422	820K2M1AQJ8422/UL	.100
820K1M1ABJ8422	820K1M1AQJ8422/UL	.010

Models listed above have black bezel and cap.



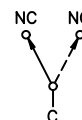
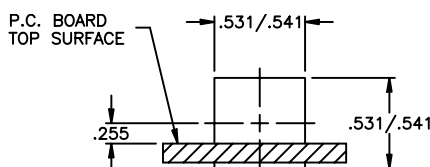
Poles	Option	Dim. B	Dim. C
SP	A	.148	.045 max.
SP	A-1	.164	.095 max.
DP	A	.250	.300 max.
DP	A-1	.266	.350 max.



Vertical right angle p.c. terminals - p.c. mounting bezel

SINGLE POLE

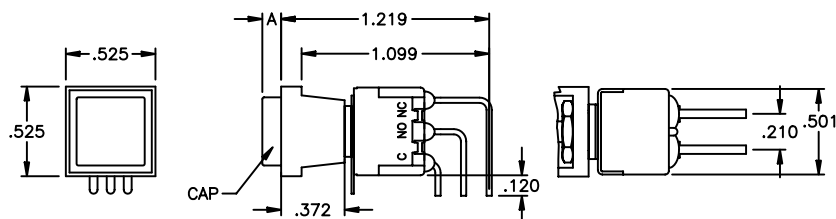
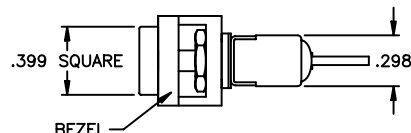
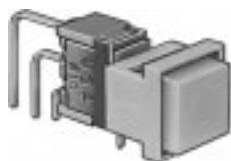
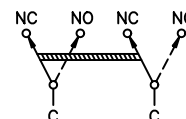
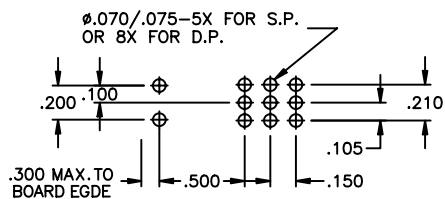
DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1V-1BJ8422	810K2M1V-1QJ8422/UL	.100
810K1M1V-1BJ8422	810K1M1V-1QJ8422/UL	.010



DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1V-1BJ8422	820K2M1V-1QJ8422/UL	.100
820K1M1V-1BJ8422	820K1M1V-1QJ8422/UL	.010

Models listed above have black bezel and cap.



800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

Snap-in bezel for round hole mounting

Self-keying against rotation

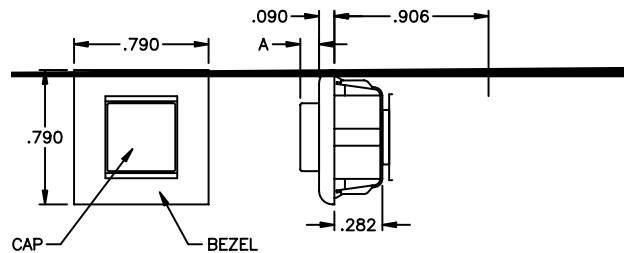
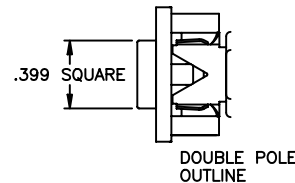
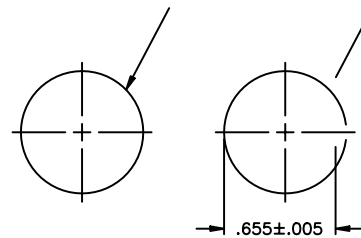
SINGLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1ZQJ9622	810K2M1ZQJ9622/UL	.100
810K1M1ZQJ9622	810K1M1ZQJ9622/UL	.010

DOUBLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1ZQJ9622	820K2M1ZQJ9622/UL	.100
820K1M1ZQJ9622	820K1M1ZQJ9622/UL	.010

Models listed above have black bezel and cap.



Additional ordering information: Commonly ordered models are shown above and on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number. Allowable options are shown below each respective box with brief description - see option dwgs. & info. following.

Note: 'NONE' indicates box may be left empty.

Model Structure:

Series	Actuators	Bushings	Terminations	Contact materials
Single pole: 8 1 0	K Standard K 1 Short	M Standard 1/4" thd'd. M 1 Short 1/4" thd'd.	Z Solder lug C Printed circuit W Wirewrap	B Gold Q Coin silver G Gold over coin silver
Double pole: 8 2 0	K 2 Medium	D 1/4" thd'd. w/'D' flat S Non-threaded	W 1 Lg. wirewrap W 3 Sht. wirewrap X Extra lg. wirewrap	N Economy gold T Economy silver

Notes:
When bezel is specified and flush cap is desired, specify K1 actuator and M1 bushing.
When bezel is specified and raised cap is desired, specify K2 actuator and M1 bushing.
Epoxy terminal seal is standard on 800 Series.

Options:

Bezel& cap	Bezel color	Cap color	Approvals
(NONE) J 6 1 Snap-in w/LED J 8 1 Snap-in no LED J 8 4 P.C. style J 9 6 Snap-in (round hole)	(NONE) 2 Black 6 Red 8 White	(NONE) 2 Black 6 Red 8 White	(NONE) / U L / C S A

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

Horizontal right angle p.c. terminals:
A
A - 1
Vertical right angle p.c. terminals:
V
V - 1
V - 2
Straight p.c. terminals w/brkt.:
V 3 0 or V 3 1
V 4 0 or V 4 1
V 7 0
V 8 0
V 7 1
V 8 1

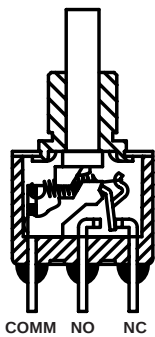
Example of completely specified model number:
820K1M1ZQJ8126/UL/CSA

800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

C

MISCELLANEOUS

TYPICAL
SWITCH
CROSS
SECTION



HARDWARE SUPPLIED
(See Hardware section of catalog)

Switches with M option bushings are supplied with (2) A112 Hex Nuts, (1) A115 Lockwasher and (1) A107 Anti-rotate Ring.

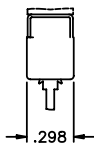
Switches with D option bushings are supplied with (2) A112 Hex Nuts and (1) A115 Lockwasher.

Switches with M1 option bushings are supplied with (1) A112 Hex Nut and (1) A115 Lockwasher.

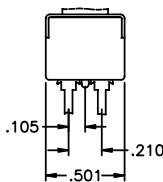
Note: Switches with non-threaded bushings or bezels supplied without hardware.

SWITCH BODY
SIZES WITH
TERMINAL
LOCATION
DIMENSIONS

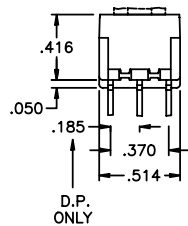
SIDE VIEW
SINGLE POLE



SIDE VIEW
DOUBLE POLE



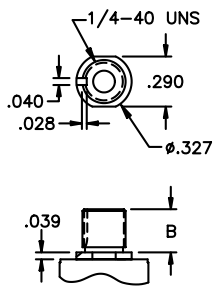
FRONT VIEW
SINGLE AND
DOUBLE POLE



BUSHING OPTIONS

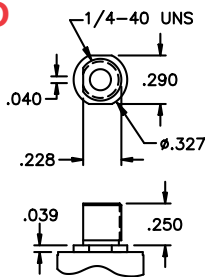
NOTE:
BUSHING M AND
ACTUATOR K
ARE STANDARD.

M & M1



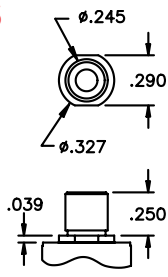
THREADED

D



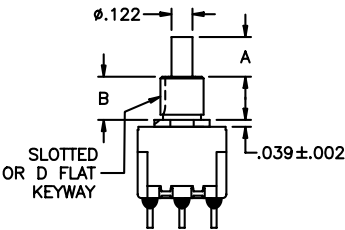
THREADED

S



NON-THREADED

ACTUATOR/BUSHING OPTIONS



BUSHING OPTION	DIM. B	DIMENSION A ACTUATOR OPTION		
		K	K1	K2
M or D	.250	.230	.069	.168
S	.250	.230	.069	.168
M1	.154	.322	.165	.264

All bushings have 1/4-40 UNS-2A thread except S which is non-threaded.

Switch caps for switches without bezels also available - see Hardware section of catalog.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

TERMINATION OPTIONS

A

SINGLE POLE HORIZONTAL P.C. MOUNTING

A-1

SINGLE POLE HORIZONTAL P.C. MOUNTING

A

DOUBLE POLE HORIZONTAL P.C. MOUNTING

A-1

DOUBLE POLE HORIZONTAL P.C. MOUNTING

V, V-1 & V-2

FRONT VIEW
SINGLE POLE

FRONT VIEW

VERTICAL P.C. MOUNTING

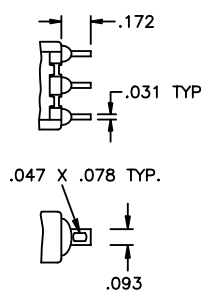
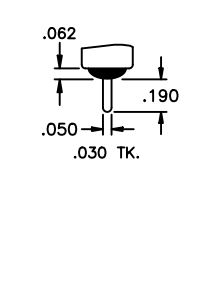
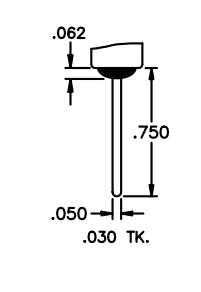
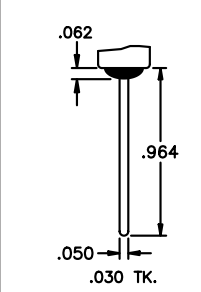
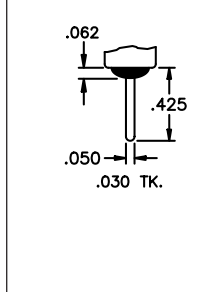
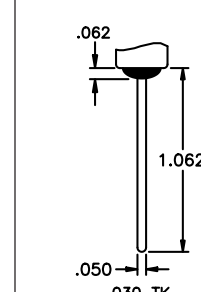
V30, V40, V70, V80, V31, V41,
V71 & V81

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

TERMINATION OPTIONS (CONT'D.)

Z	C	W	W1	W3	X
 SOLDER LUG	 PRINTED CIRCUIT	 WIREWRAP	 LONG WIREWRAP	 SHORT WIREWRAP	 EXTRA LG. WIREWRAP

CONTACT MATERIAL OPTIONS

B	Dry circuit - gold over nickel over brass. RATING: 0.4 Volt-Amps (VA) max. at 20 V max. ELECTRIC LIFE: 60,000 cycles minimum. MECHANICAL LIFE: 500,000 cycles minimum.
Q	Power circuit - coin silver. RATING: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC (resistive loads). ELECTRIC LIFE: 60,000 cycles minimum at full load.
G	Dry circuit or power circuit - gold over nickel over coin silver. RATINGS & ELECTRIC LIFE: Same as B & Q above - i.e. - can be used in either dry circuit or power circuit, however once used in power circuit, switch cannot be re-used in dry circuit. This option satisfies those customers who have both dry circuit and power circuit requirements, but prefer to inventory only one switch for both.
N	Dry circuit - gold over nickel over brass. Note- less gold than B option. RATING: 0.4 Volt-Amps (VA) max. at 20 V max. ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.
T	Power circuit - Silver plate over brass. RATING: 1 Amp at 125 VAC or 0.5 Amps at 250 VAC (resistive loads). ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.

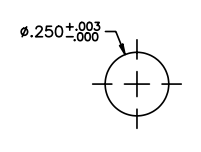
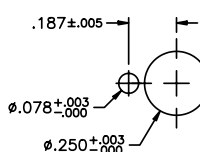
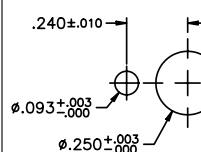
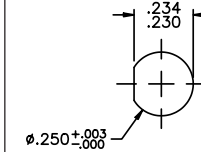
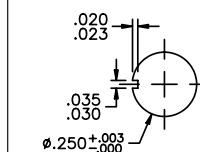
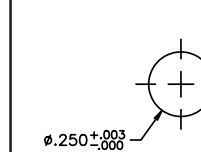
Solder dipped terminals and custom contact plating available - contact factory.

UL & CSA OPTIONS

UL	For power circuits - coin silver RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). Underwriter Laboratories file no. E66367. Note - applicable only to terminations with coin silver contacts (Q or G options).
CSA	For power circuits - coin silver RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). Canadian Standards Association file no. LR54592-1. Note - applicable only to terminations with coin silver contacts (Q or G options) as CSA recognizes switches for power applications only. Note- Double pole switches with solder lug terminals are not CSA recognized.

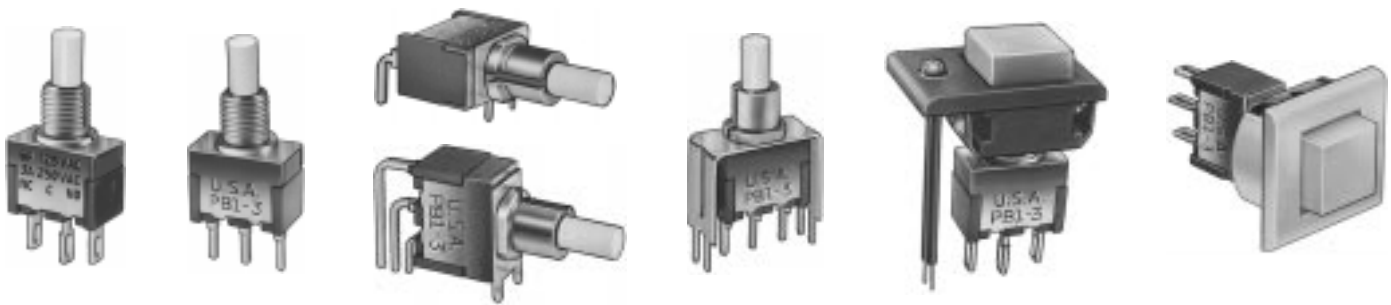
PANEL CUT-OUTS

Cut-outs that accept all 1/4-40 threaded bushings:

 Without keying	 With A107 anti-rotate ring	 With A158 anti-rotate ring	 With D bushing	 With slotted keyway bushings	 Accepts all 1/4" non-threaded bushings
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SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES



FEATURES

- Dry circuit through power ratings .
- Rugged construction SPDT momentary models with numerous options.
- Panel, panel & p.c. and p.c. mounting models, lighted and unlighted.

SPECIFICATIONS

Contact ratings (resistive loads):	(Q) power models - coin silver: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC. (B) dry circuit models - gold over nickel over brass: 0.4 VA max. at 20 V max. UL models - coin silver: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). UL file no. E66367. CSA models - coin silver: same ratings as UL models. CSA file no. LR54592-1.
Initial contact resistance:	5 milliohms max. at 3 VDC, 0.1 Amp.
Insulation resistance:	Greater than 200,000 megohms between terminals & case ground.
Dielectric strength:	Greater than 2000 VAC for 1 minute between terminals & case ground.
Electrical life (resistive loads):	100,000 cycles min. at full load.
Operating temperature range:	-30°C to +85°C
Total travel & operating force:	.065" (1.6mm) & 19 oz. (approximate values).

MATERIALS

Contacts:	Coin silver for power, UL & CSA models. Gold over nickel over brass for dry circuit models.
Actuator:	Glass filled polyester, color white
Bushing:	Nickel plated brass
Strap:	Stainless steel
Case:	Melamine phenolic, color red
Terminal seal:	Epoxy (optional)
Support bracket:	Brass or steel, tin plated
Spring mounting bracket:	Stainless steel
Bezel & cap:	Nylon. Available in black, red or white. Consult factory for other colors.
Hardware:	See 'Miscellaneous' section.
LED:	Intensity: 2.0 mcd at 10 mA. Forward voltage: 2.0V (3.0V max.). Max. continuous forward current: 15 mA for red, 30 mA for green & 20 mA for yellow. Red is standard. Yellow & green are optional. Specifications are subject to change without notice - consult factory.

AGENCY RECOGNITION



UL, & CSA. Marking: Switches ordered with 'UL' added at end of model no. are supplied with recognition marked. Switches ordered with 'CSA' added at end of model no. are supplied with recognition marked.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

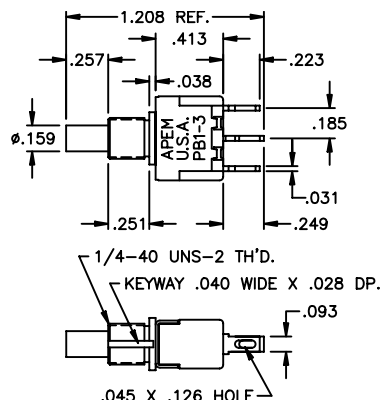
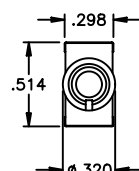
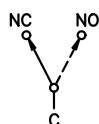
- Completely specified switch models
- 'build your own switch' order format
- Miscellaneous
- Option drawings & information
- Panel cut-outs & miscellaneous

PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

Solder lug terminals - panel mounting



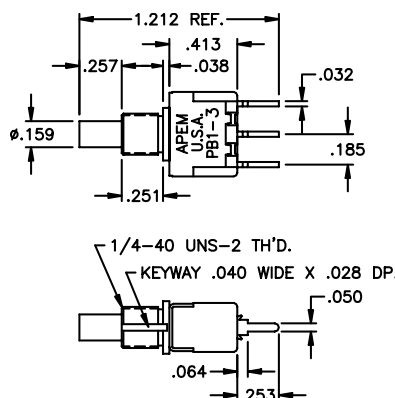
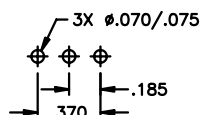
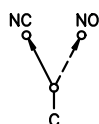
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1ZQ	PB1-3P2Y1ZB



P.C. or wirewrap terminals - panel or p.c. mounting



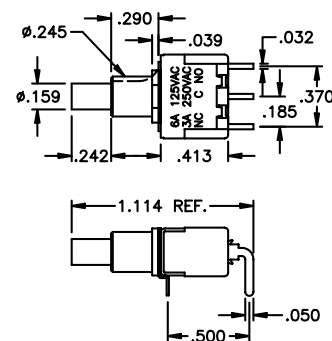
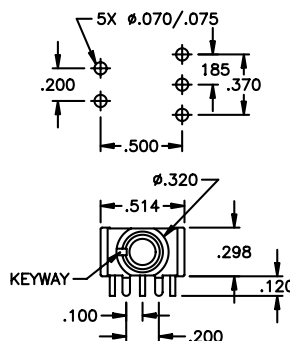
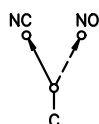
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1CQ	PB1-3P2Y1CB



Horizontal right angle p.c. terminals - p.c. mounting



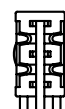
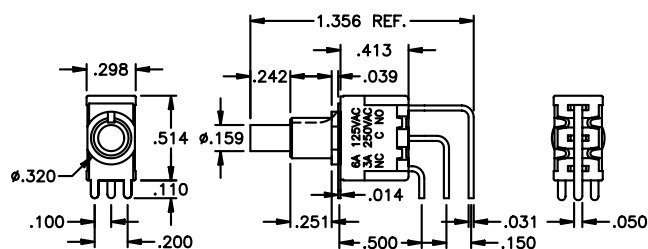
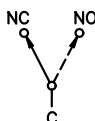
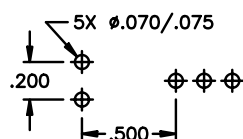
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y2A-1Q	PB1-3P2Y2A-1B



Vertical right angle p.c. terminals - p.c. mounting



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y2V-1Q	PB1-3P2Y2V-1B

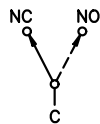


SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

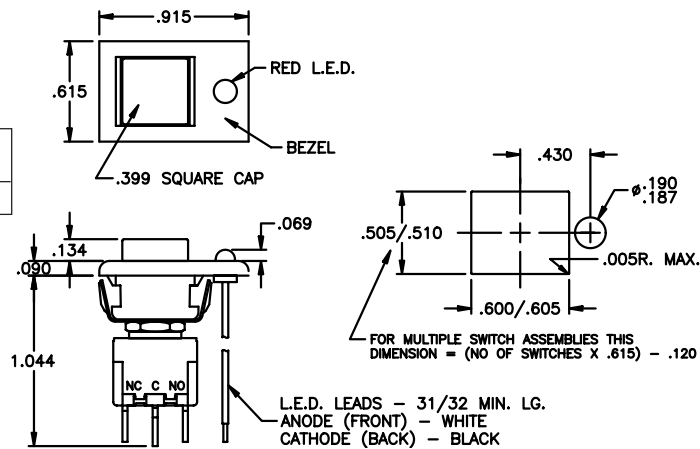
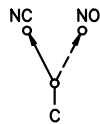
Straight p.c. terminals with bracket - p.c. mounting

POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y2V30Q	PB1-3P2Y2V30B



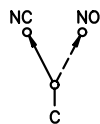
Solder lug terminals - snap-in bezel with LED

POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1ZQJ6168	PB1-3P2Y1ZBJ6168



Solder lug terminals - snap-in bezel

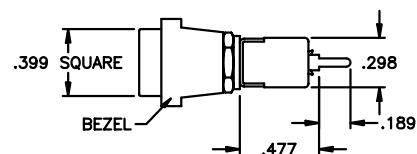
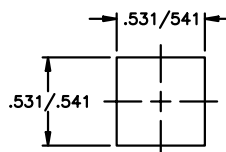
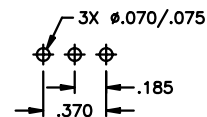
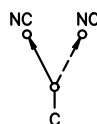
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1ZQJ8182	PB1-3P2Y1ZBJ8182



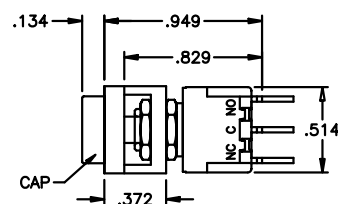
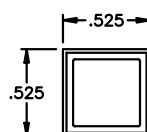
FOR MULTIPLE SWITCH ASSEMBLIES THIS DIMENSION = (NO OF SWITCHES X .615) - .120

PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

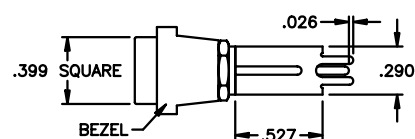
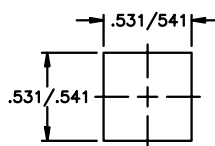
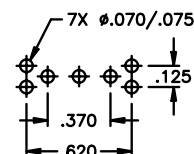
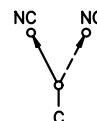
Straight p.c. terminals - p.c. mounting bezel



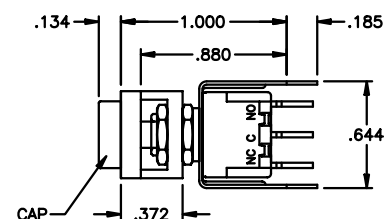
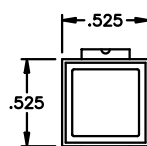
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1CQJ8488	PB1-3P2Y1CBJ8488



Straight p.c. terminals with bracket - p.c. mounting bezel



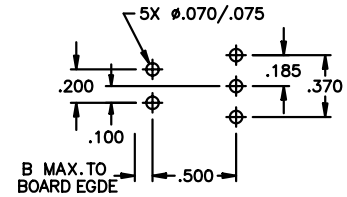
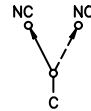
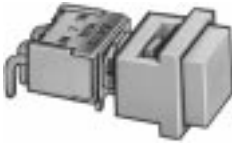
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1V30QJ8488	PB1-3P2Y1V30BJ8488



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

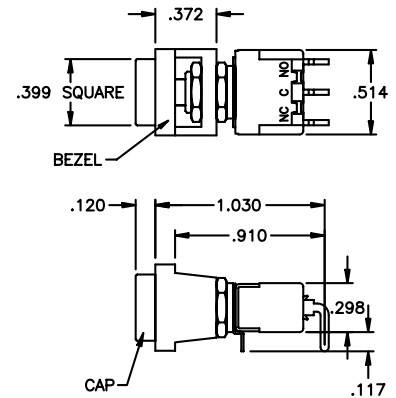
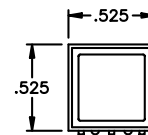
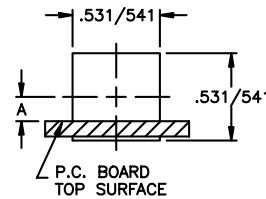
PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

Horizontal right angle p.c. terminals - p.c. mounting bezel

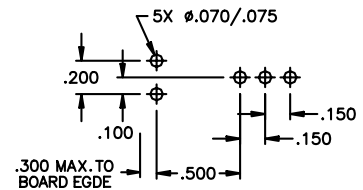
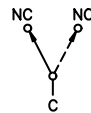
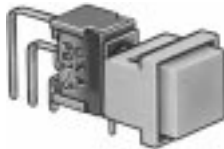


POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1A-1QJ8488	PB1-3P2Y1A-1BJ8488

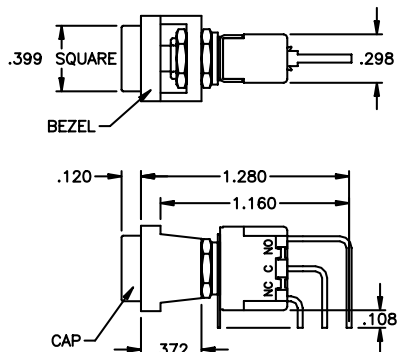
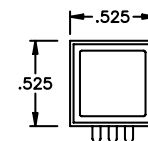
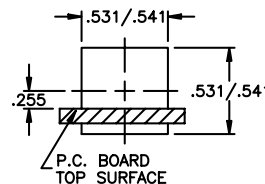
Option	Dim. A	Dim. B
A	.148	.045 max.
A-1	.164	.095 max.



Vertical right angle p.c. terminals - p.c. mounting bezel



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1V-1QJ8488	PB1-3P2Y1V-1BJ8488



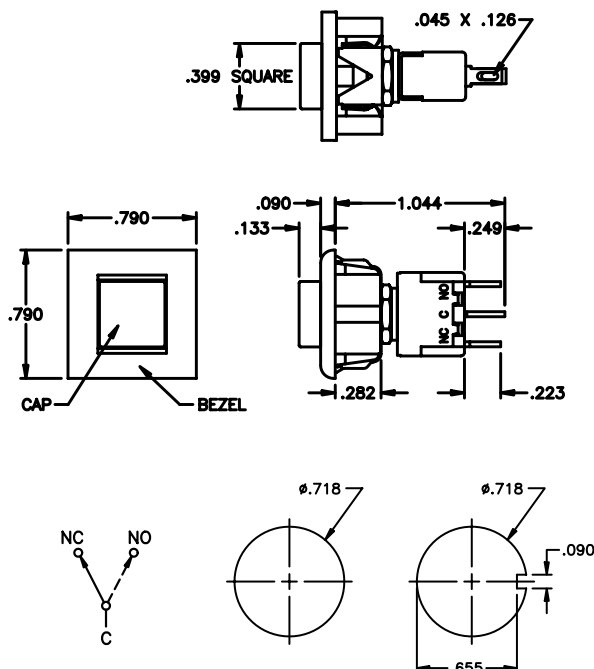
PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

Solder lug terminals - snap-in bezel for round hole mounting

Self-keying against rotation



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1ZQJ9688	PB1-3P2Y1ZBJ9688



Additional ordering information: Commonly ordered models are shown above and on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number. Allowable options are shown below each respective box with brief description - see option dwgs. & info. following.

Note: 'NONE' indicates box may be left empty.

Model Structure:

Series	Actuators	Bushings	Terminations	Contact materials
P B 1 - 3				
Note: When bezel is specified, specify P2 actuator and Y1 bushing.	P Long P 2 Short (standard)	Y 1/4" thd'd. Y 1 Short 1/4" thd'd. (standard) D 1/4" thd'd. w/'D' flat Y 2 Non-threaded	Z Solder lug C Printed circuit W Wirewrap W 1 Lg. wirewrap W 3 Sht. wirewrap X Extra lg. wirewrap Horiz. right angle p.c. terminals: A A - 1 Vertical right angle p.c. terminals: V V - 1 V - 2 Straight p.c. terminals w/brkt.: V 3 0 or V 4 1 V 4 0 or V 4 1 V 7 0 V 8 0 V 7 1 V 8 1	B Gold Q Coin silver G Gold over coin silver N Economy gold T Economy silver

Options:

Bezel & cap	Bezel color	cap color	Approvals
(NONE) J 6 1 Snap-in w/LED J 8 1 Snap-in no LED J 8 4 P.C. style J 9 6 Snap-in (round hole)	(NONE) 2 Black 6 Red 8 White	(NONE) 2 Black 6 Red 8 White	(NONE) / U L / C S A

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

Example of completely specified
model number:
PB1-3P2Y1ZQJ9622/UL/CSA

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

MISCELLANEOUS

HARDWARE SUPPLIED

(See Hardware section of catalog)

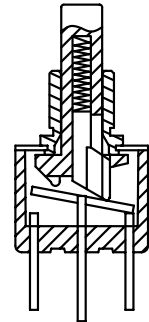
Switches with Y option bushings are supplied with (2) A112 Hex Nuts, (1) A115 Lockwasher and (1) A107 Anti-rotate Ring.

Switches with D option bushings are supplied with (2) A112 Hex Nuts and (1) A115 Lockwasher.

Switches with Y1 option bushings are supplied with (1) A112 Hex Nut and (1) A115 Lockwasher.

Note: Switches with non-threaded bushings or bezels supplied without hardware.

TYPICAL
SWITCH
CROSS
SECTION

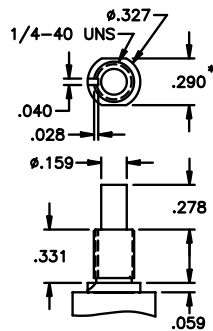


ACTUATOR/BUSHING OPTIONS

Drawings reflect allowable actuator/bushing combinations.

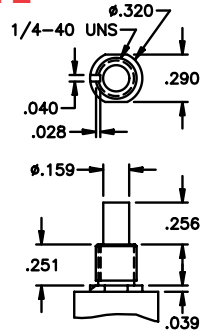
Note for drawings P2Y1 & P2Y2:
Asterisk indicates .290 flats are supplied with options A, V, V30, V40, V70, V71, V80 & V81.
For other options, .320 Dia. with no flats may be supplied

PY



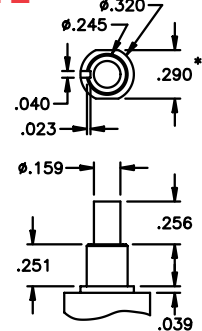
THREADED

P2Y1



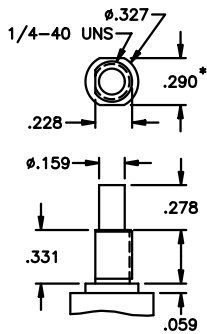
THREADED

P2Y2



NON-THREADED

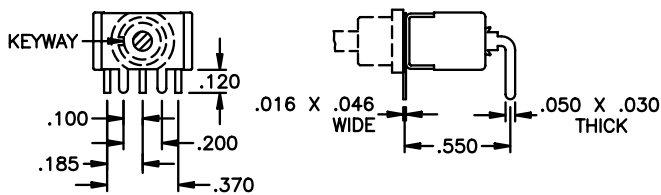
PD



THREADED

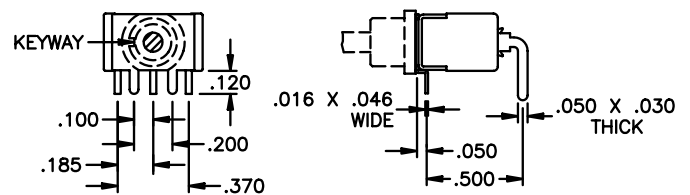
TERMINATION OPTIONS

A



HORIZONTAL P.C. MOUNTING

A-1



HORIZONTAL P.C. MOUNTING

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

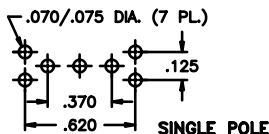
TERMINATION OPTIONS (CONT'D.)

V, V-1 & V-2

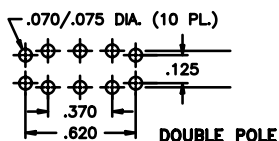
Option	Dim. A	Dim. B
V	.550	.150
V-1	.500	.150
V-2	.500	.100

VERTICAL P.C. MOUNTING

V30, V40, V70, V80, V31, V41, V71 & V81

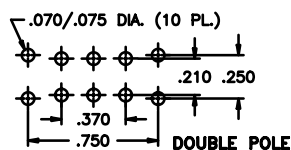
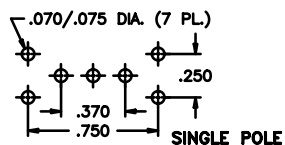


Option	Dim. A	Dim. B
V30-V31	.527	.024
V40-V41	.647	.048

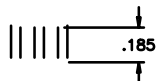


PANEL LAYOUT V70, V71, V80 & V81

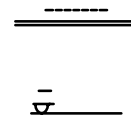
Option	Dim. A
V70-V71	.630
V80-V81	.953



FRONT VIEW DOUBLE POLE



PRINTED CIRCUIT MOUNTING



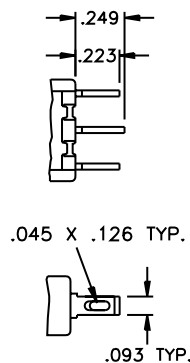
PRINTED CIRCUIT MOUNTING



V31, V41, V71 & V81 ARE THE SAME AS V30, V40, V70 & V80 RESPECTIVELY, EXCEPT WITH CRIMPED LEG DESIGN FOR P.C. BOARD RETENTION, AS SHOWN TO RIGHT.

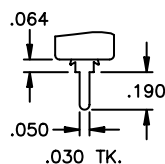


Z



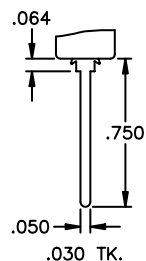
SOLDER LUG

C



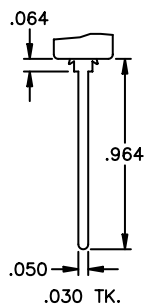
PRINTED CIRCUIT

W



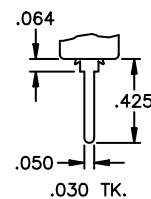
WIREWRAP

W1



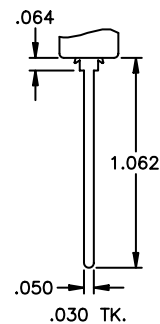
LONG WIREWRAP

W3



SHORT WIREWRAP

X



EXTRA LG. WIREWRAP

PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

CONTACT MATERIAL OPTIONS

B	Dry circuit - gold over nickel over brass. RATING: 0.4 Volt-Amps (VA) max. at 20 V max. ELECTRIC LIFE: 60,000 cycles minimum. MECHANICAL LIFE: 500,000 cycles minimum.
Q	Power circuit - coin silver. RATING: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC (resistive loads). ELECTRIC LIFE: 60,000 cycles minimum at full load.
G	Dry circuit or power circuit - gold over nickel over coin silver. RATINGS & ELECTRIC LIFE: Same as B & Q above - i.e. - can be used in either dry circuit or power circuit, however once used in power circuit, switch cannot be re-used in dry circuit. This option satisfies those customers who have both dry circuit and power circuit requirements, but prefer to inventory only one switch for both.
N	Dry circuit - gold over nickel over brass. Note- less gold than B option. RATING: 0.4 Volt-Amps (VA) max. at 20 V max. ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.
T	Power circuit - Silver plate over brass. RATING: 1 Amp at 125 VAC or 0.5 Amps at 250 VAC (resistive loads). ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.

Solder dipped terminals and custom contact plating available - contact factory.

UL & CSA OPTIONS

UL	For power circuits - coin silver RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). Underwriter Laboratories file no. E66367. Note - applicable only to terminations with coin silver contacts (Q or G options).
CSA	For power circuits - coin silver RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). Canadian Standards Association file no. LR54592-1. Note - applicable only to terminations with coin silver contacts (Q or G options) as CSA recognizes switches for power applications only.

EPOXY SEALING OPTION

E	Space between terminals and case hole is completely epoxy sealed to prevent flux and contaminant entry.
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REVERSE ACTION OPTION

/R	To reverse the NO and NC terminals, add /R to the switch model number.
-----------	---

PANEL CUT-OUTS

Cut-outs that accept all 1/4-40 threaded bushings:

Without keying	With A107 anti-rotate ring	With A158 anti-rotate ring	With D bushing	With slotted keyway bushings	Accepts all 1/4" non-threaded bushings

MISCELLANEOUS

QUICK-CONNECT RECEPTACLES that are compatible with solder lug or p.c. terminals are commercially available. Consult factory.

FRONT PANEL SEAL: Silicone rubber boots for front panel sealing of the switch against high pressure water or other contaminants are available. See Waterproof Switch Sealing Boots section in catalog.

SWITCH CAPS for switches without bezels also available - see Hardware section of catalog

13000 SERIES - PROFESSIONAL PUSHBUTTON SWITCHES



FEATURES

- Quick break momentary action.
- SPDT & DPDT models with 1/4" threaded bushing (also see optional 15/32" bushing).
- Models for panel and p.c. mounting.
- Bright chrome or matte black finish on bushing, actuator & hardware.

SPECIFICATIONS

Contact ratings (resistive loads):	Silver & gold plated silver; 2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 30 VDC. (300 mA 30 VDC max. to prevent damage to gold plating.) Gold plated brass; 100 mA at 30 V max.
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. - between terminals 2000 V rms min. - between poles and terminals and frame
Electrical life:	Silver: 50,000 cycles min. Gold plated silver: 20,000 cycles min. Gold plated brass: 50,000 cycles min.
Low level or mechanical life:	150,000 cycles min.
Total Travel:	.078" (2mm)
Operating temperature range:	-40°C to +85°C

MATERIALS

Contacts :	Silver, gold plated silver or gold plated brass
Actuator:	Chrome plated brass
Bushing:	Nickel plated brass
Housing:	Nickel plated brass
Case:	Diallyl phthalate (DAP)
Terminal seal:	Epoxy
Hardware:	1/4" threaded bushing models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

AGENCY RECOGNITION

CECC, LN2, GAM T1, QPL (Europe), MUAHAG

Availability: Consult factory for details of recognized models.

Marking: To order switches marked CECC, complete the appropriate box of the ordering format. Other listings do not appear on the switches.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- a. Completely specified switch models
- b. 'build your own switch' order format
- c. Option drawings

13000 SERIES - PROFESSIONAL PUSHBUTTON SWITCHES

Solder lug terminals - silver contacts

SINGLE POLE MODEL NO.	CIRCUIT	
13435A	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
13445A	ON	MOM
Handle position:		
		
Terms. connected:		
	1-3	1-2
	4-6	4-5

Straight p.c. terminals - silver contacts

SINGLE POLE MODEL NO.	CIRCUIT	
13235A	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
13245A	ON	MOM
Handle position:		
		
Terms. connected:		
	1-3	1-2
	4-6	4-5

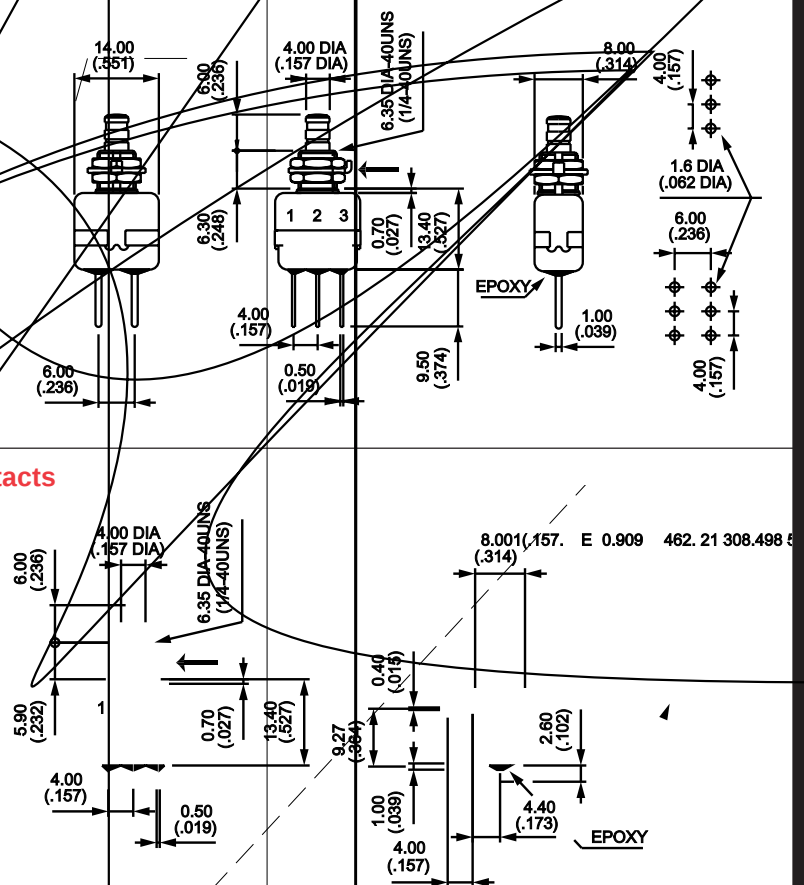
Horizontal right angle p.c. terminals - silver contacts

SINGLE POLE MODEL NO.	CIRCUIT	
13435WA	ON	MOM
Handle position:		
		
Terms. connected:		
	1-3	1-2

X768 - Sealed double pole with 15/32" (11.9mm) flatted bushing

With short actuator		
MODEL NO.	CIRCUIT	
13445A4X768	ON	MOM
With long actuator		
MODEL NO.	CIRCUIT	
13445A9X768	ON	MOM
Handle position:		
		
Terms. connected:		
	1-3	1-2
	4-6	4-5

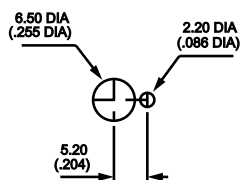
Contact and finish options available.



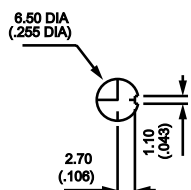
13000 SERIES - PROFESSIONAL PUSHBUTTON SWITCHES

PANEL CUT-OUTS

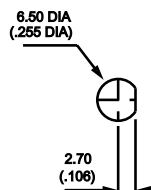
TERMINALS



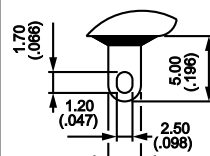
Standard



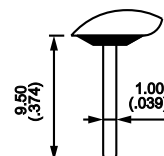
with K sealing option



with X640 sealing option
(see Special Options)



Solder Lug



Straight p.c.

Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals & bushings	Number of poles	Electrical functions	Terminals	Contact materials
1 3					
	2 Straight p.c. terminals, 1/4" (6.35mm) bushing 4 Solder lugs, 1/4" (6.35mm) or 15/32" (11.9mm) bushing. Right angle terminals, 1/4" (6.35mm) bushing	3 Single pole 4 Double pole	5 ON - MOM	(NONE) Solder lugs or straight p.c. W Horizontal right angle p.c.	A Silver A D 2 Gold plated silver (2 microns) C D Gold plated brass

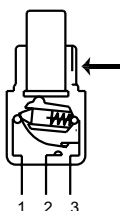
Options:

Actuators	Finish	Sealing	Special options	Approvals/listings
(NONE) Standard for 1/4" bushing 4 .157" (4mm) long for 15/32" (11.9mm) bushing (X768) 9 .354" (9mm) long for 15/32" (11.9mm) bushing (X758)	(NONE) Bright chrome finish G Matte black finish on bushing, actuator & hardware.	(NONE) Epoxy sealed terminals std'd. K Front panel sealing with o-ring & gasket.	(NONE) F Tin plated terminals (p.c. only) X 7 6 8 15/32" (11.9mm) bushing + front panel sealing (Double pole only).	(NONE) C E C C (consult factory for details of approved models). Caps available separately - see option drawings.

Example of completely specified model number:
13235AGKFCECC

SWITCH ACTION

Arrow indicates keyway



13000 SERIES - PROFESSIONAL PUSHBUTTON SWITCHES

- F

Tin plated terminals (for p.c. terminals only).
- K

Front panel sealing with 'o'-ring (1) & sealing gasket (2). Protects switch against water & dust. Panel seal withstands 1 bar pressure even when switch is operated.
- X640

Front panel sealing with 3 'o'-rings (1) & flatted bushing. Protects switch against water & dust. Panel seal withstands 1 bar pressure even when switch is operated. (Available with 1/4" (6.35mm) bushing only).

CAPS

Note: replace last '0' in p/n with color code.

U900	U1140	U1720	U480 Standard
U630	U2020 Square	U2430 Square	

Colors	
1	blue
2	black
3	green
4	grey
5	yellow
6	red
7	ivory
7/1	white
9	orange

13000X778 SERIES - HIGH PERFORMANCE PUSHBUTTON SWITCHES



FEATURES

- Designed for high reliability environments.
- Double shell case for high mechanical strength & high electrical insulation.
- Quick break momentary action DPDT models with 15/32" (11.9mm) threaded bushing.
- Panel sealed to IP67 and fully sealed switch body.
- Highly reliable for low level or power applications.
- Matte black finish on body, bushing, actuator and hardware.

SPECIFICATIONS

Contact ratings (resistive loads):	Silver & gold plated silver; 2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 28 VDC. (300 mA 30 VDC max. to prevent damage to gold plating.) Minimum load - 10 mA at 50 mV, 10µA at 5 VDC
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. - between terminals 2000 V rms min. - between poles and between terminals and frame
Electrical life:	At 2A 250VAC or 4A 28VDC - 10,000 cycles. At low level (50mV at 10mA) - 20,000 cycles
Total Travel:	.078" (2mm)
Operating temperature range:	-40°C to +85°C
Environmental:	Shock: 50g - 11ms (IEC 68-2-27). Vibration: 10-500 Hz - 10g (IEC68-2-6) Salt spray: 96 hrs. (IEC68-2-11). Humidity: 56 days, 93% R.H., 40°C (IEC68-2-3)

MATERIALS

Contacts :	Silver inlay - gold plated over nickel barrier
Actuator:	Black chrome plated brass
Bushing:	Black chrome plated brass
Case:	Diallyl phthalate (DAP) with PBT external shell, epoxy sealed
Hardware:	Supplied with 1 Hex Nut with black finish p/n U41. See drawing at end of section.

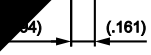
AGENCY RECOGNITION

CECC, GAM, QPL (Europe), MUAHAG & DAT (French defense military). Marking: Many models have full CECC recognition and are marked CECC. Consult factory for list of recognized models.

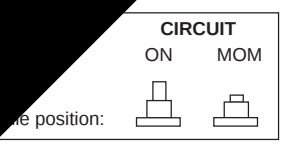
ABOUT THIS SERIES

The material in this series is organized in the following sequence:

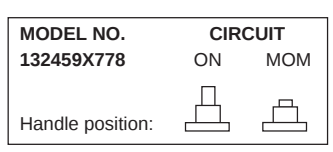
- a. Completely specified switch models
- b. 'build your own switch' order format
- c. Miscellaneous



(4mm) actuator



pole - straight p.c. terminals - .354" (9mm) actuator



13000X778 SERIES - HIGH PERFORMANCE PUSHBUTTON SWITCHES

Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals & bushing	Number of poles	Electrical function	Actuator	Special options
1 3					X 7 7 8
	2 Straight p.c. terminals, 15/32" (11.9mm) threaded bushing 4 Solder lug terminals, 15/32" (11.9mm) threaded bushing.	4 Double pole	5 ON - MOM	4 .157" (4mm) long 9 .354" (9mm) long	High performance fully sealed matte black switch

Options:

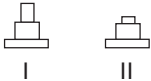
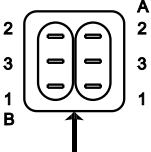
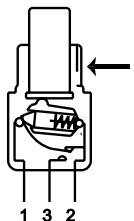
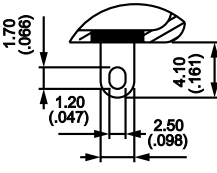
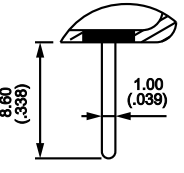
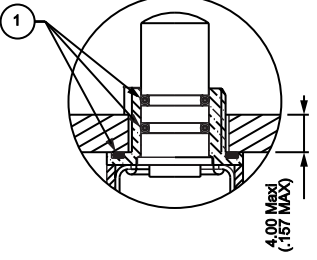
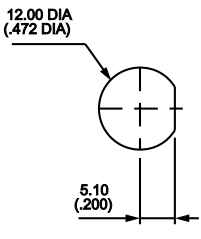
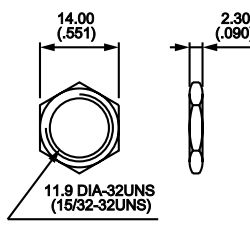
Approvals/listings

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(NONE)

C E C C (consult factory for details of approved models).

Example of completely specified model number:
132454X778CECC

POSITIONS AND CONNECTIONS		SWITCH ACTION	TERMINALS	
Button position  Connections ON MOM A 1-2 A 1-3 B 1-2 B 1-3	Terminal identification Arrow indicates flat 	Arrow indicates flat 	 Solder lug	 Straight p.c.
SEALING		PANEL CUT-OUT	HARDWARE	
Standard on all models: 3 'o'-rings (1) seal front panel and withstand 1 bar pressure, even when switch is operated. Epoxy sealed terminals. Splash-proof case. 		 Panel thickness: .196" (5mm) max.	 U41 matte black Hex Nut	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

1200 SERIES - MOMENTARY PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

FEATURES

- Single pole panel mounting models.
- NC & NO electrical functions with double break.
- Solder lug, screw, screw with clamp and right angle screw with clamp terminals.
- 4 optional actuator colors.

SPECIFICATIONS

Contact ratings (resistive loads):	4 Amps at 250 VAC, 8 Amps at 125 VAC or 4 Amps at 24 VDC
Initial contact resistance:	10 milliohms max. at 1A 2VDC
Insulation resistance:	1000 megohms minimum at 500 VDC
Dielectric strength:	2000 V rms min. between terminals. 3000 V rms between terminals & frame
Electrical life:	10,000 cycles at full load
Operating temperature range:	-20°C to +55°C
Total travel:	NO: .177" (4.5mm) ± .011" (0.3mm) NC: .137" (3.5mm) ± .011" (0.3mm)

MATERIALS

Contacts:	Silver
Actuator:	Polyamide
Case:	Polyamide
Bushing:	Nickel plated brass
Hardware:	Supplied with 1 Hex Nut p/n U166 & 1 Knurled Nut p/n U411. See hardware section of catalog.

AGENCY RECOGNITION



Model no's. with 'UU' are UL & CSA recognized.
Models 1233X209 & 1233X209L are VDE recognized.
Marking: Switches are supplied with recognitions marked.

Solder lug/quick-connect terminals

1212A2



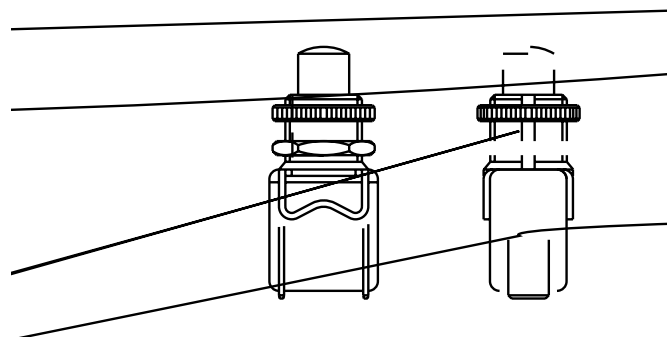
Normally Closed

1213A2UU



Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.



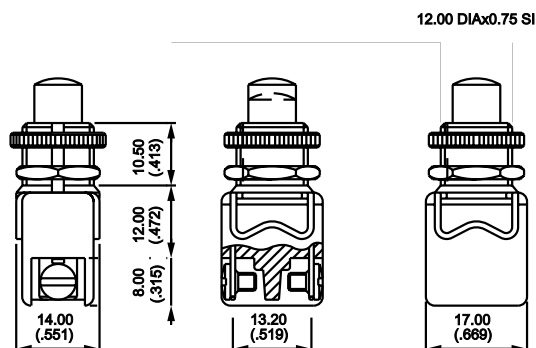
1200 SERIES - MOMENTARY PUSHBUTTON SWITCHES

Screw terminals

1222A2  Normally Closed

1223A2UU  Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.



Straight screw terminals and clamp

1202A2  Normally Closed

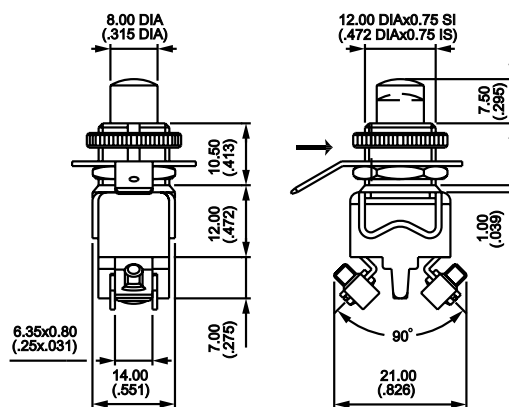
1203A2UU  Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.

Right angle screw terminals and clamp

12037A2UU  Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.

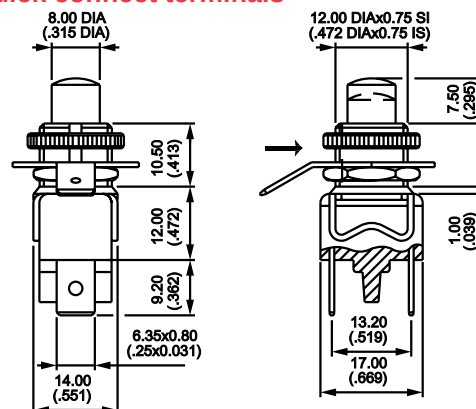


X209 - UL, CSA, VDE, SEMCO & NF-USE approved - solder lug/quick connect terminals

(Note- U187 ground connector ring required if panel is not metallic or not connected to ground. Order separately).

1233A2X209UU  Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.



1200 SERIES - MOMENTARY PUSHBUTTON SWITCHES

X209 - UL, CSA, VDE, SEMCO & NF-USE approved - solder lug/quick connect terminals

(Note- U187 ground connector ring required if panel is not metallic or not connected to ground. Order separately).

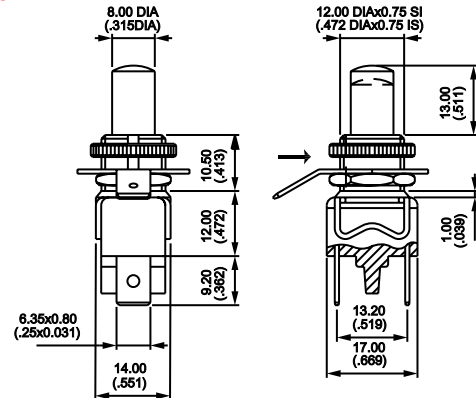


1233A2X209LUU



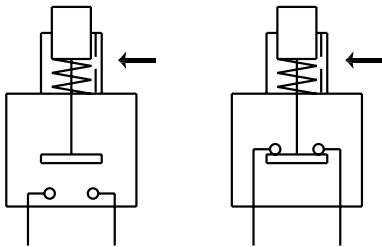
Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.

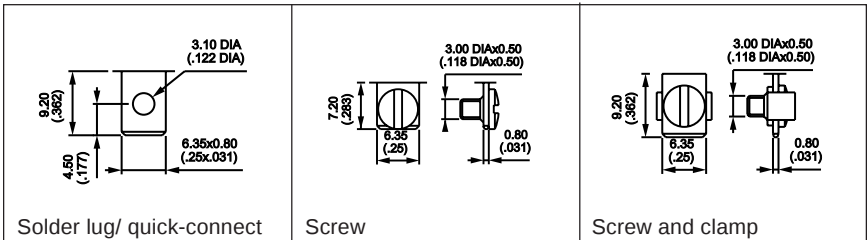


SWITCH ACTION

Arrow indicates keyway

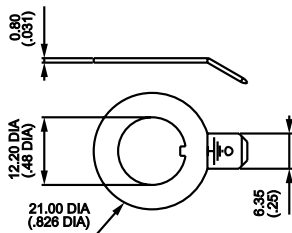


TERMINALS



PANEL CUT-OUT: .480" (12.2mm) dia.

GROUND CONNECTOR RING U187



1200M & 1200MR SERIES - MOMENTARY PUSHBUTTON SWITCHES



FEATURES

- Single pole panel mounting models.
- NC & NO electrical functions with double break.
- Solder lug, screw and screw with clamp terminals.
- Chrome plated domed or flat metal actuators .

SPECIFICATIONS

Contact ratings (resistive loads):	4 Amps at 250 VAC, 8 Amps at 125 VAC or 4 Amps at 24 VDC
Initial contact resistance:	10 milliohms max. at 1A 2VDC
Insulation resistance:	1000 megohms minimum at 500 VDC
Dielectric strength:	2000 V rms min. between terminals. 3000 V rms between terminals & frame
Electrical life:	10,000 cycles at full load
Operating temperature range:	-20°C to +55°C
Total travel:	NO: .177" (4.5mm) ± .011" (0.3mm) NC: .137" (3.5mm) ± .011" (0.3mm)

MATERIALS

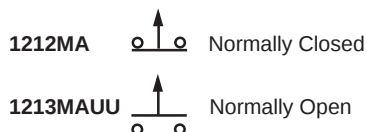
Contacts:	Silver
Actuator:	Chrome plated brass on polyamide base
Case:	Polyamide
Bushing:	Nickel plated brass
Hardware:	Supplied with 1 Hex Nut p/n U166 & 1 Panel Dress Nut U1868. See hardware section of catalog.

AGENCY RECOGNITION



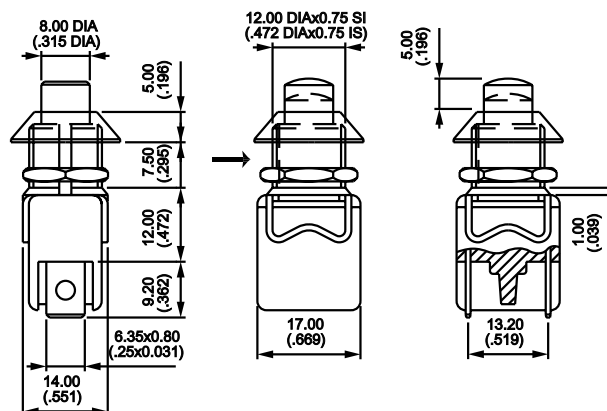
Model no's. with 'UU' are UL & CSA recognized.
Marking: Switches are supplied with recognized marks.

Solder lug/quick-connect terminals



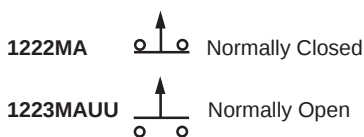
The 'M' in model no. indicates flat actuator.
Substitute 'MR' for domed actuator, if desired.

→ Keyway

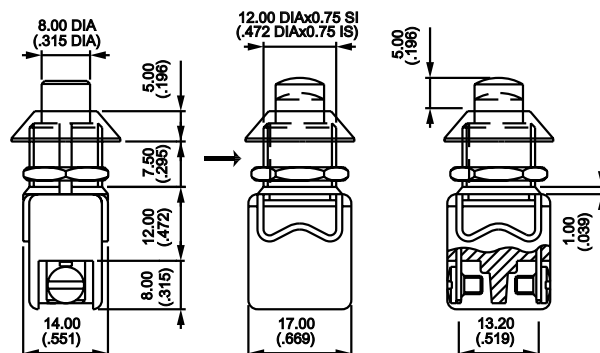


1200M & 1200MR SERIES - MOMENTARY PUSHBUTTON SWITCHES

Screw terminals

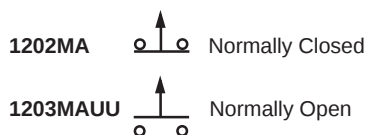


The 'M' in model no. indicates flat actuator.
Substitute 'MR' for domed actuator, if desired.

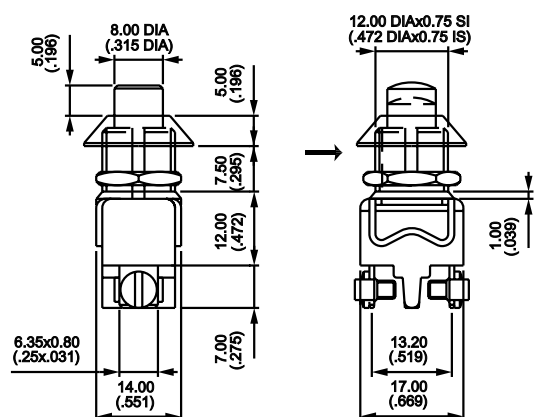


→ Keyway

Straight screw terminals and clamp



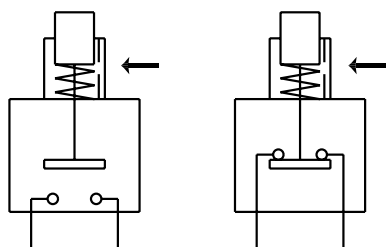
The 'M' in model no. indicates flat actuator.
Substitute 'MR' for domed actuator, if desired.



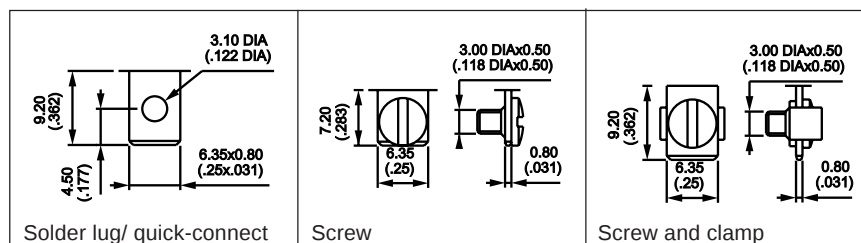
→ Keyway

SWITCH ACTION

Arrow indicates keyway

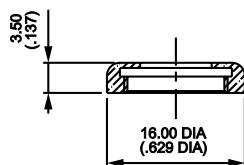


TERMINALS



PANEL CUT-OUT: .480" (12.2mm) dia.

SPECIAL CAP NUT



U1874 Chrome plated cap nut, flat & plain
May be ordered in place of panel dress nut.
Order separately.

4700 & 4800 SERIES - ALTERNATE ACTION PUSHBUTTON SWITCHES



FEATURES

- Single and double pole panel mounting models.
- ON-OFF and ON-ON electrical functions.
- Solder lug, straight p.c. and quick-connect terminals.
- 7 optional actuator colors with matching knurled mounting nut.

SPECIFICATIONS

Contact ratings (resistive loads):	3 Amps at 250 VAC or 6 Amps at 125 VAC
Initial contact resistance:	10 milliohms max. at 1A 2VDC
Insulation resistance:	1000 megohms minimum at 500 VDC
Dielectric strength:	2000 V rms min. between terminals. 3000 V rms between terminals & frame
Electrical life:	10,000 cycles at full load
Operating temperature range:	-20°C to +65°C
Total travel:	.177" (4.5mm) ± .019" (0.5mm)

MATERIALS

Contacts:	Silver
Actuator:	Polyamide
Case:	Melamine-phenolic
Bushing:	Nickel plated brass
Hardware:	Supplied with 1 Hex Nut p/n U166 and 1 insulating Knurled Nut p/n U520. Knurled Nut supplied same color as actuator. See hardware section of catalog.

AGENCY RECOGNITION



Models 4731AUU, 4736AUU, 4741AUU & 4746AUU are UL, CSA and VDE recognized.
Models 4831A, 4836A, 4841A & 4846A are VDE recognized.
Marking: Switches are supplied with recognitions marked.

ORDER FORMAT

Fill in boxes below, for complete model number. Note: 'NONE' indicates box may be left empty.

Model Number **Actuator & knurled nut color**

Select model
number from
those shown
on next page.

0	1	blue
0	2	black
0	3	green
0	5	yellow
0	6	red
0	7 / 1	white
0	9	orange

4700 & 4800 SERIES - ALTERNATE ACTION PUSHBUTTON SWITCHES

Solder lug/quick-connect terminals

SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT
4731AUU	4741AUU	ON - OFF
4736AUU	4746AUU	ON - ON

Note: add color to model number -
see Order Format, prior page.

Straight p.c. terminals

SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT
4831A	4841A	ON - OFF
4836A	4846A	ON - ON

Note: add color to model number -
see Order Format, prior page.

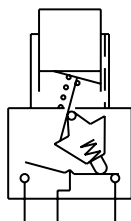
Quick-connect terminals - .185" x .031" (4.7mm x 0.8mm)

SINGLE POLE MODEL NO.	CIRCUIT
47318A	ON - OFF
47368A	ON - ON

Note: add color to model number -
see Order Format, prior page.

SWITCH ACTION

Arrow indicates keyway



TERMINALS

Solder lug/ quick-connect

Straight p.c.

Quick-connect .185" x .031"
(4.7mm x 0.8mm)

PANEL CUT-OUT: .480" (12.2mm) dia.

New! MD SERIES PUSHBUTTON SWITCHES

FEATURES

- Momentary or maintained actions.
- 1, 2 & 4 pole 2 throw models.
- Printed circuit & panel mounting models.
- Self-cleaning bifurcated contacts.

SPECIFICATIONS

Contact ratings (resistive loads):	200 mA at 30 VDC
Initial contact resistance:	20 milliohms maximum
Insulation resistance:	100 megohms minimum at 500 VDC
Dielectric strength:	Type 5: 500 VAC for 1 minute. Type 8: 250 VAC for 1 minute.
Electrical life:	10,000 cycles minimum
Operating temperature range:	-20°C to +85°C
Operating force:	Type 5: 300g ± 150g Type 8: 330g ± 150g

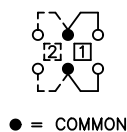
MATERIALS

Terminals:	Silver plated brass
Actuator:	Polyacetal
Frame:	Steel with tin plating
Base:	Phenolic laminated sheet
Sliding contact:	Silver plated phosphor bronze

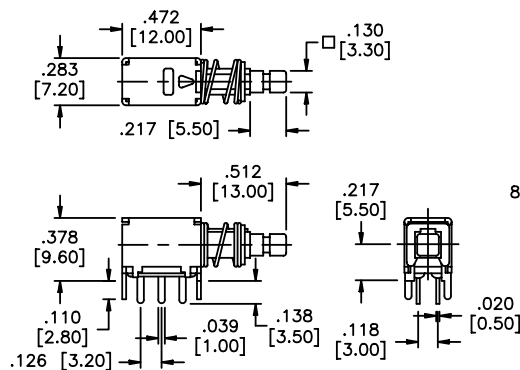
MDPS522PN (MOMENTARY)
MDPA522PN (MAINTAINED)



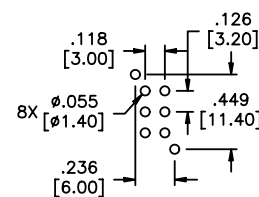
2P2T P.C. MOUNTING



SCHEMATIC



MECHANICAL OUTLINE



P.C. BOARD LAYOUT

New! MD SERIES PUSHBUTTON SWITCHES

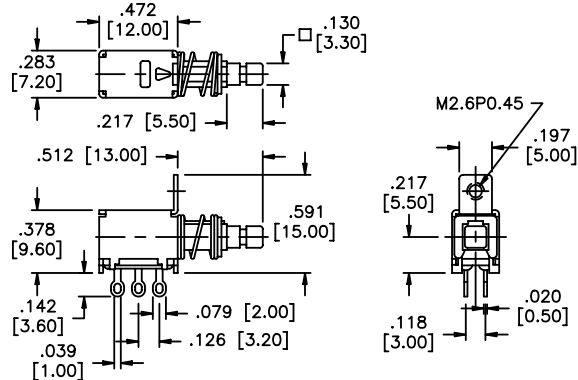
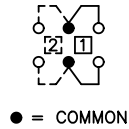
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

MDPS522WN (MOMENTARY)
MDPA522WN (MAINTAINED)



2P2T PANEL MOUNTING



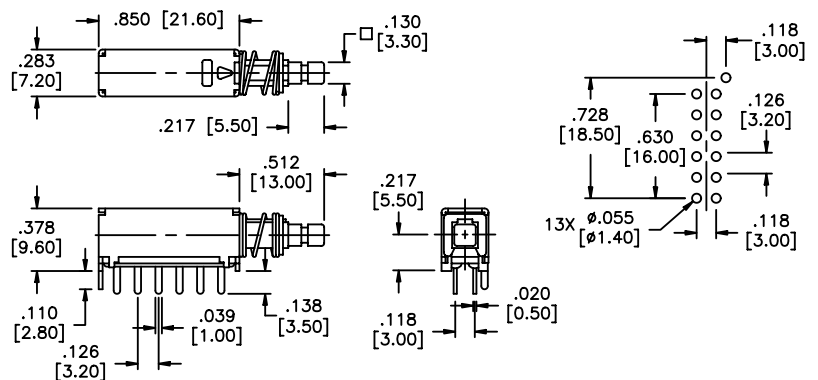
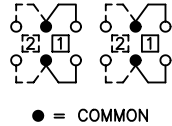
SCHEMATIC

MECHANICAL OUTLINE

MDPS542PN (MOMENTARY)
MDPA542PN (MAINTAINED)



4P2T P.C. MOUNTING

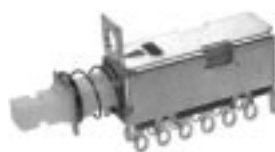


SCHEMATIC

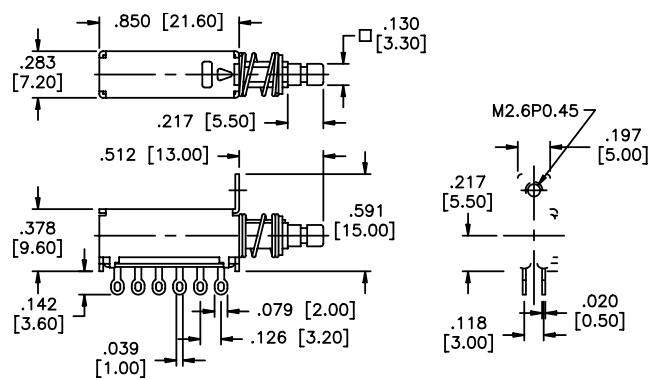
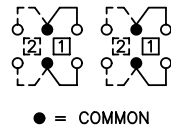
MECHANICAL OUTLINE

P.C. BOARD LAYOUT

MDPS542WN (MOMENTARY)
MDPA542WN (MAINTAINED)



4P2T PANEL MOUNTING



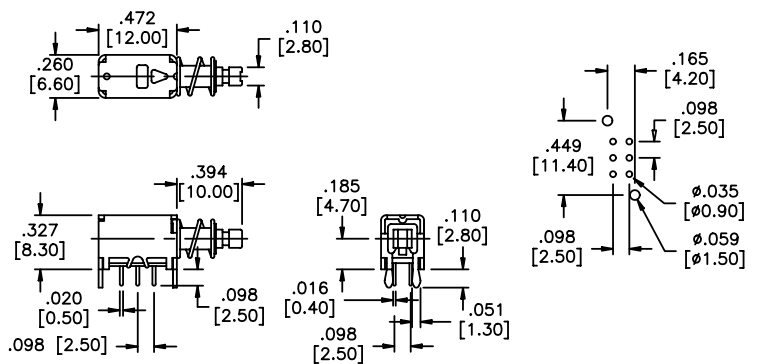
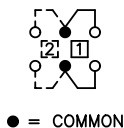
SCHEMATIC

MECHANICAL OUTLINE

MDPS822PN (MOMENTARY)
MDPA822PN (MAINTAINED)



2P2T P.C. MOUNTING



SCHEMATIC

MECHANICAL OUTLINE

P.C. BOARD LAYOUT

New! MD SERIES PUSHBUTTON SWITCHES

Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for complete model number.
(Allowable options are shown under each respective box).

TYPE 5:

Series	Action	Type	No. of Poles	Throws	Terminals	Contacts
M D	☐ ☐	5	☐	2	☐	N
	P S Momentary P A Maintained		2 2 pole 4 4 pole		P p.c. W solder lug	Non-shorting *

TYPE 8:

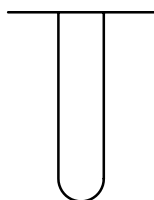
Series	Action	Type	No. of Poles	Throws	Terminals	Contacts
M D	☐ ☐	8	☐	2	P	N
	P S Momentary P A Maintained		1 1 pole 2 2 pole		Printed circuit	Non-shorting *

*Shorting available-consult factory.

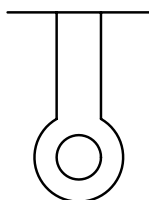
Example of completely specified model number: **MDPS542WN**

TERMINAL CONFIGURATIONS

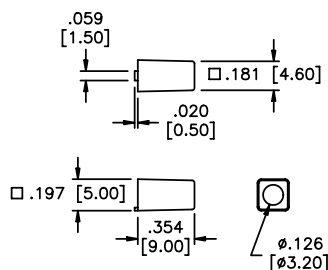
COLOR KNOBS FOR TYPE 8 MODELS



PRINTED CIRCUIT



SOLDER LUG



MODEL NO.	COLOR
C152	Black
C154	Gray
C156	Red

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

MD1 SERIES PUSHBUTTON SWITCHES

FEATURES

- Power ratings include TV-5 & TV-8 (TV-5 rating shown)
- Double pole single throw alternate action.
- TV-5 & TV-8 ratings are UL, CSA, VDE & SEMKO recognized. TV-8 ratings are also NEMKO, DEMCO, SETI and SEV recognized.
- Panel mounting with threaded mounting holes.

MATERIALS

Base: Phenolic, UL94V-O
 Frame: Zinc plated steel
 Actuator: 30% glass fiber PBT, color gray
 Terminals: Silver plated copper alloy
 Contacts: Silver copper alloy

GENERAL SPECIFICATIONS

ELECTRICALS

Contact ratings:	UL: 7.5 amps @ 125/250 VAC, TV5&8 CSA:10 amps @ 125/250 VAC,TV5&8 VDE, SEMCO, NEMCO, SETI, DEMCO & SEV: 8A/128A @ 250 VAC μ T85
Insulation resistance:	100 megohms min. (500 VDC)
Dielectric withstanding voltage:	1000 VAC for 1 minute
Contact resistance:	20 milliohms max.
Electrical life:	25,000 cycles min.
Mechanical life:	30,000 cycles min.

MECHANICALS, THERMALS

Actuation force:	500 grams $\pm$ 200 grams	Travel:	.098" (2.5mm)
Operating temperature range:	-10 °C to +85 °C		

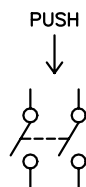
SOLDERING

Solder heat resistance:	230°C max. for 3 $\pm$ 0.5 seconds
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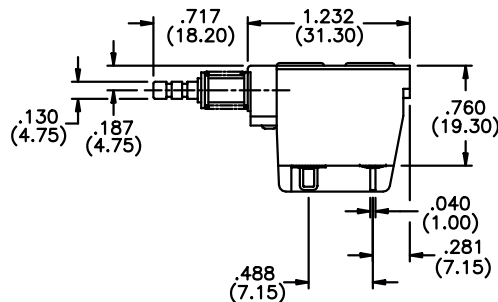
MD12T5



SOLDER LUG TERMS.



SCHEMATIC

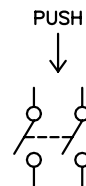


MECHANICAL OUTLINE

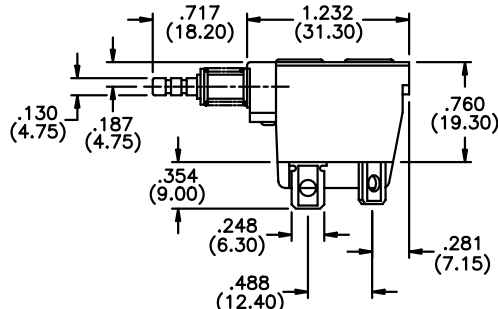
MD12L5



QUICK CONNECT TERMS.



SCHEMATIC



MECHANICAL OUTLINE

MD2 SERIES PUSHBUTTON SWITCHES

FEATURES

- Power ratings include TV-5
- Single pole single throw alternate action.
- UL, CSA, VDE and SEMKO recognized.
- Panel mounting with threaded mounting holes and p.c. mounting with restraining bracket.

MATERIALS

Base: Phenolic, UL94V-O
 Frame: Zinc plated steel (panel mtg. models)
 Tin plated steel (p.c. mtg. models)
 Actuator: PBT, nylon 66, UL94V-2 min.
 Terminals: Silver plated copper alloy
 Contacts: Silver copper alloy

GENERAL SPECIFICATIONS

ELECTRICALS

Contact ratings:	UL & CSA: 15 amps @ 125 VAC, 10 amps @ 250 VAC, TV-5 VDE & SEMCO: 5A/80A @ 250 VAC μ T85
Insulation resistance:	100 megohms min. (500 VDC)
Dielectric withstanding voltage:	1000 VAC for 1 minute
Contact resistance:	20 milliohms max.
Electrical life:	10,000 cycles min.
Mechanical life:	30,000 cycles min.

MECHANICALS, THERMALS

Actuation force:	400 grams $\pm$ 200 grams
Operating temperature range:	-10 °C to +85 °C

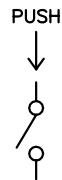
SOLDERING

Solder heat resistance:	230°C max. for 3 $\pm$ 0.5 seconds
-------------------------	------------------------------------

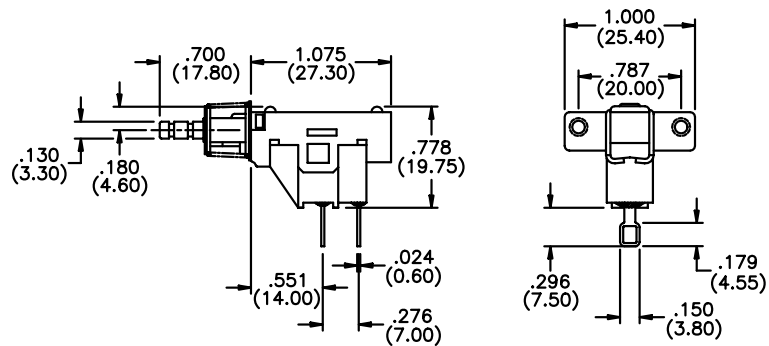
MD2BM4T1



PANEL MOUNTING WITH
SOLDER LUG TERMS.



SCHEMATIC

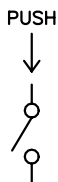


MECHANICAL OUTLINE

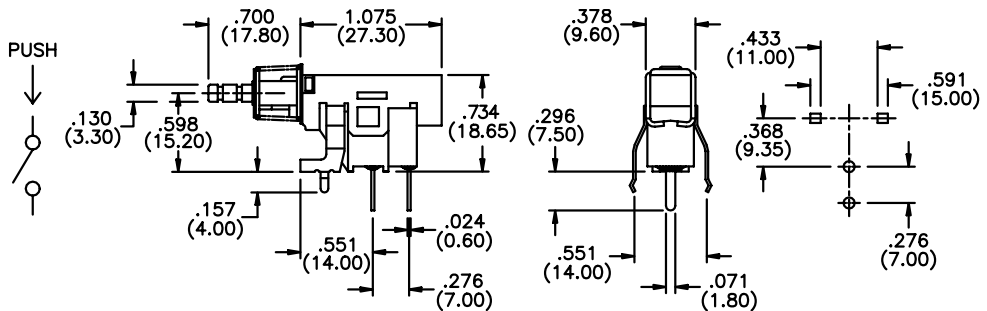
MD2CP4T3



P.C. MOUNTING



SCHEMATIC



MECHANICAL OUTLINE

P.C. BOARD LAYOUT

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

AV SERIES PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Designed to meet stringent security requirements, all AV Series models are rugged, durable and cosmetically attractive.

All models feature:

- Long life.
- Anti-jamming construction.
- Minimum clearance between actuator and bushing, to prevent willful damage by means of insertion of foreign parts or matter.
- Protection against crushing of contacts and switch mechanism.



In addition, all standard models are sealed to Specification IP54. IP54 specifies that the switch enclosure must be dust-protected (no harmful penetration) as well as resistant to splashing water. Optional sealing to IP65 is also available on all models, and is provided with a front panel sealing gasket as well. IP65 specifies that the switch enclosure must be dust-tight (no penetration) as well as resistant to jets of water from any direction.

The AV Series consists of 3 categories of pushbutton switches designated **Anti-Vandal**, **Security** and **Snap-Action Security**. The distinctive features are:

Anti-Vandal - Highest impact resistance provided by a mechanical stop and added ruggedness provided by a stainless steel actuator and bushing. The 19mm models meet IP..7 which specifies the switch must withstand a hammer blow to the actuator with a striking energy of 6 joules, while the 22mm models meet IP..9 which specifies the switch must similarly withstand 20 joules of energy. In both of these cases, no resulting damage is permissible per the specification. (Continued).

AV SERIES PUSHBUTTON SWITCHES

Security - High impact resistance and ruggedness with a large variety of options, including actuator shapes, electrical functions, connections, finish and marking options.

Snap-Action Security - High impact resistance and ruggedness. All of these models feature tactile response and optional illumination and marking.

AV Series switches are shown on the following pages in order of the above categories. For ease in selecting the correct model for your application, the following table lists key parameters by switch category in order of ascending ratings.

CATEGORY	RATING(S) (RESISTIVE)	ELECTRICAL . CONFIGURATION	SIZE (mm)	ADD'L. SPECS. SEE ALSO	PAGE
ANTI-VANDAL	2 A 48 VDC 2 A 48 VDC	SPST NO Momentary SPST NO Momentary	19 22	- -	C87 C88
SECURITY	1 A 30 V	SPST NO & NC Mom	19	9000 Series	C89
	2 A 48 VDC	SPST NO Momentary	19	-	C90
	2 A 48 VDC	SPST NO Momentary	22	-	C91
New!	3 A 120 VAC or 28 VDC, 1.5 A 250 VAC & Dry Circuit	SPST NO Momentary	19	300 Series	C92
	3 A 125 VAC, 2 A 250 VAC, 2.5 A 24 VDC	SPST NC Momentary	22	1200 Series	C93
	6 A 125 VAC, 3 A 250 VAC, 3 A 24 VDC	DPDT ON-ON Alternate	22	4700 Series	C94
New!	6 A 125 VAC, 3 A 250 VAC, 7 A 30 VDC & Dry Circuit	SPDT NO & NC Mom.	19	PB Series	C95
SNAP-ACTION SECURITY	50 mA 24 VDC	SPST NO Momentary	19	-	C96
	50 mA 24 VDC	SPST NO Mom. (lighted)	19	-	C97
New!	3A 120 VAC or 28 VDC. 1.5 A 250 VAC & Dry Circuit	SPST ON-OFF Alternate	19	400 Series	C98
New!	6 A 125 VAC, 3 A 250 VAC, 7 A 30 VDC & Dry Circuit	SPDT & DPDT, NO & NC Mom.	19	800 Series	C99

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

AV SERIES ANTI-VANDAL PUSHBUTTON SWITCHES

SPECIFICATIONS

Contact ratings: 2 A at 48 VDC max. (resistive load)
Initial contact resistance: 10 milliohms max. at 1 A, 2 V
Insulation resistance: 1000 megohms min. at 500 VDC
Dielectric strength: 3000 V rms min. between terminals and frame and between terminals
Electrical life: 10,000 cycles min. at full load
Mechanical life: 1,000,000 cycles min.
Operating temperature range: -20°C to +55°C
Solder heat resistance: 300°C max. for 5 seconds
Washing not recommended

FEATURES

- .755" (19 mm) dia. and .866" (22 mm) dia. models.
- Single pole NO momentary action.
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

MATERIALS

Contacts & terminals: Silver plated brass
Bushing & Actuator: Stainless steel
Case: PBT **Hex. Mounting Nut:** Nickel plated brass

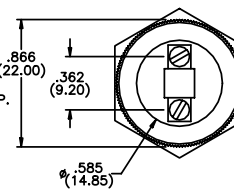
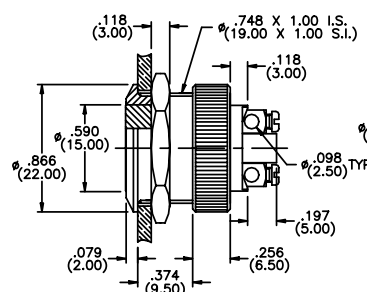
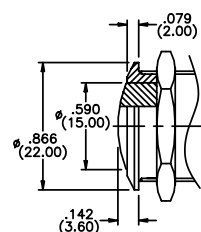
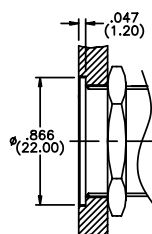
ORDER FORMAT: For complete model no., fill in 2 empty boxes with selected options shown below.
 Example of complete model no. -
AV191003C940N

Series	Bush./Act. Config.	Body Style	Function	Cont.Matl.	Term.Type	Bush./Act. Matl.	Sealing
AV		100	3	C	9	40	
	09 19 9D						N R T

19mm

Bushing/Actuator configurations

Screw terminals



9D flat Act. w/flush mount Bush. **19** curved Act. & Bush.

09 flat Act. & curved Bush.

Rear view all models

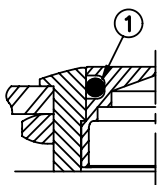


AV091003C940N
(Model shown)

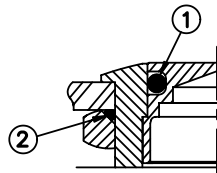


Schematic

N - no sealing (std'd)



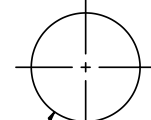
R ① Internal seal meets IP65



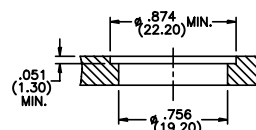
T ① Internal seal & ② front panel seals meet IP65

Sealing

For **09** & **19** Bush/Act



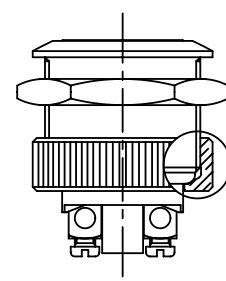
For **9D** Bush/Act



Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).

Mounting Holes

R and **T** sealing options also feature increased impact resistance provided by knurled nut as shown below.



AV SERIES ANTI-VANDAL PUSHBUTTON SWITCHES

ORDER FORMAT: For complete model no., fill in 2 empty boxes with selected options shown below. Example of complete model no. -

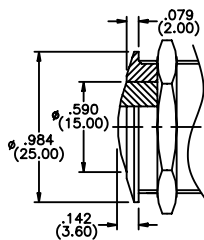
Series	Bush./Act. Config.	Body Style	Function	Cont.Matl.	Term.Type	Bush./Act. Matl.	Sealing
AV		100	3	C	9	40	
	02 03 M2 M3						N R T

AV021003C940N

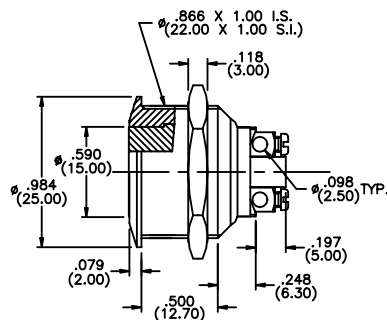
22mm

Bushing/Actuator configurations

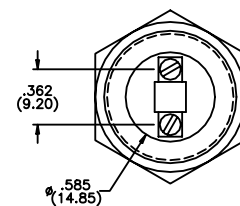
Screw terminals



02 curved Act. & Bush.



03 flat Act. & curved Bush.

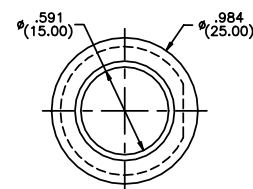


Rear view all models

M2 curved Actuator & curved Bushing with 'D' flat on Bushing

or

M3 flat Actuator & curved Bushing with 'D' flat on Bushing

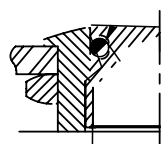


AV021003C940N
(Model shown)



Schematic

N - no sealing (std'd)

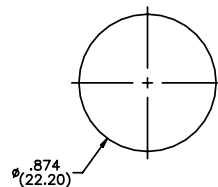


R ① Internal seal meets IP65

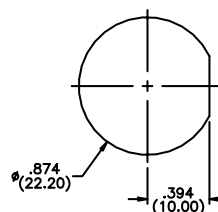
T ① Internal seal & ② front panel seals meet IP65

Sealing

For 02 & 03 Bush/Act



For M2 & M3 Bush/Act



Min. dimensions for matrix mounting: 1.181" (30mm) x 1.181" (30mm).

Mounting Holes

R and T sealing options also feature increased impact resistance provided by an internal ring as shown below.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

AV SERIES SECURITY PUSHBUTTON SWITCH

SPECIFICATIONS

Contact ratings: 1 A at 30 V max. (resistive load)
10 μ A at 5 V min.
Note: current above 100 mA damages the gold plating.
Initial contact resistance: 10 milliohms max. at 1 A, 2 V
Insulation resistance: 1000 megohms min. at 500 VDC
Dielectric strength: 2000 V rms min. between terms. & frame. 1000 V rms min. between terminals
Electrical life: 250,000 cycles min. at full load
Mechanical life: 1,000,000 cycles min.
Operating temperature range: -20°C to +55°C
Solder heat resistance: 300°C max. for 5 seconds
Washing not recommended

FEATURES

- .755" (19 mm) dia. models.
- Combined single pole NO & NC
- Standard - sealing protection
- Optional - sealing protection
- Extremely rugged and durable

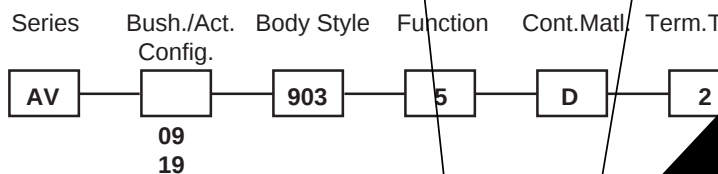
MATERIALS

Contacts: Gold plated silver
Bushing & Actuator: Nickel plated brass
Case: PBT **Hex. Mounting Nut:** Ni

ORDER FORMAT: For complete model no., fill in 2 empty boxes with selected options shown below.

Example of complete model no. -

AV199035D200

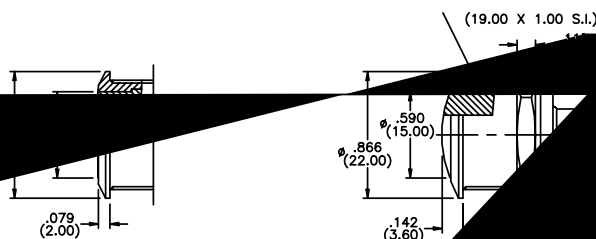


Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator

19mm

Bushing/Actuator configurations

Solder



09 flat Act. & curved Bush.

Blank - no sealing



AV199035D200
(Model)

AV SERIES SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS

Contact ratings: 2 A at 48 VDC max. (resistive load)
Initial contact resistance: 10 milliohms max. at 1 A, 2 V
Insulation resistance: 1000 megohms min. at 500 VDC
Dielectric strength: 3000 V rms min. between terms. & frame and between terminals
Electrical life: 10,000 cycles min. at full load
Mechanical life: 1,000,000 cycles min.
Operating temperature range: -20°C to +55°C
Solder heat resistance: 300°C max. for 5 seconds
Washing not recommended

FEATURES

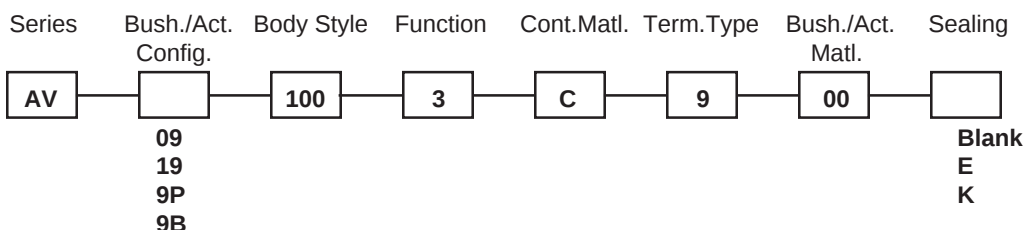
- .755" (19 mm) dia. and .866" (22 mm) dia. models.
- Single pole NO momentary action.
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

MATERIALS

Contacts & terminals: Silver plated brass
Bushing & Actuator: Nickel plated brass (std'd)
Case: PBT **Hex. Mounting Nut:** Nickel plated brass

ORDER FORMAT: For complete model no., fill in 2 empty boxes with selected options shown below.

Example of complete model no. -
AV191003C900

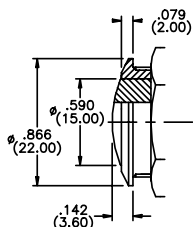


Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.

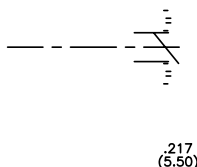
19mm

Bushing/Actuator configurations

Screw terminals



19 curved Act. & Bush.



09 flat Act. & curved Bush.

Rear view all models

9B curved Act. & Bush. with knurled nut for closer matrix mtg.

9P flat Act. & curved Bush. with knurled nut for closer matrix mtg.

Min. dimensions for matrix mtg. for options **9B** & **9P**: .984" (25mm) x .984" (25mm). Order wrench p/n U1929 for knurled nut.



AV191003C900
(Model shown)

Blank - no sealing (std'd)

E ① Internal seal meets IP65

K ① Internal seal & ② front panel seals meet IP65

Sealing

Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).

Mounting Hole

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

AV SERIES SECURITY PUSHBUTTON SWITCHES

ORDER FORMAT: For complete model no., fill in 2 empty boxes with selected options shown below.
Example of complete model no. -

AV021003C900

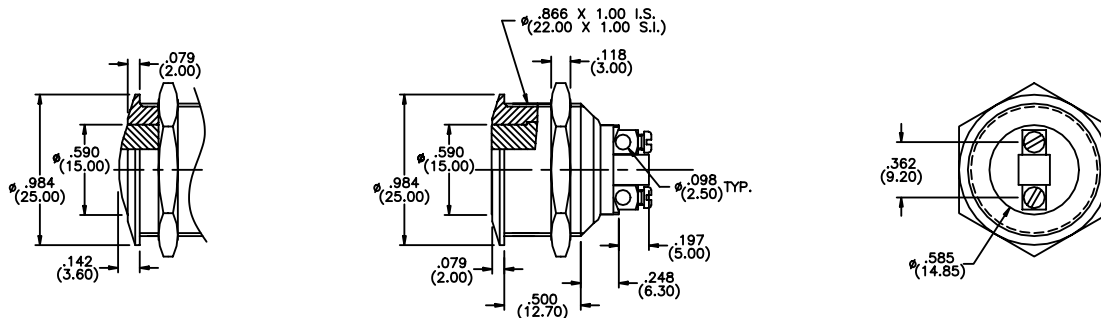
Series	Bush./Act. Config.	Body Style	Function	Cont.Matl.	Term.Type	Bush./Act. Matl.	Sealing
AV	02 03 M2 M3	100	3	C	9	00	Blank E K

Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.

22mm

Bushing/Actuator configurations

Screw terminals



02 curved Act. & Bush.

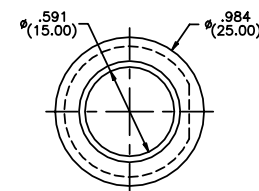
03 flat Act. & curved Bush.

Rear view all models

M2 curved Actuator & curved Bushing with 'D' flat on Bushing

or

M3 flat Actuator & curved Bushing with 'D' flat on Bushing

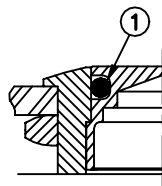


**AV021003C900
(Model shown)**

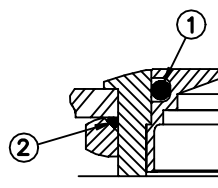


Schematic

Blank - no sealing (std'd)



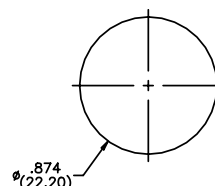
E ① Internal seal meets IP65



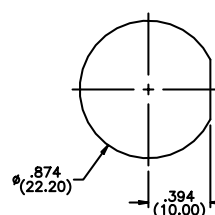
K ① Internal seal & ② front panel seals meet IP65

Sealing

For **02** & **03** Bush/Act



For **M2** & **M3** Bush/Act



Min. dimensions for matrix mounting: 1.181" (30mm) x 1.181" (30mm).

Mounting Holes

C

AV SERIES
SECURITY PUSHBUTTON SWITCHES

	FEATURES



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

AV SERIES SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS

Contact ratings: Max. resistive loads: , 3 A 125 VAC,
2 A 250 VAC & 2.5 A 24 VDC
Initial contact resistance: 10 milliohms max. at 1 A, 2 V
Insulation resistance: 1000 megohms min. at 500 VDC
Dielectric strength: 2000 V rms min. between terms. &
frame. 2000 V rms min. between terminals
Electrical life: 10,000 cycles at 0.3 A 24 V
Mechanical life: 1,000,000 cycles min.
Operating temperature range: -20°C to +55°C
Solder heat resistance: 300°C max. for 5 seconds
Washing not recommended

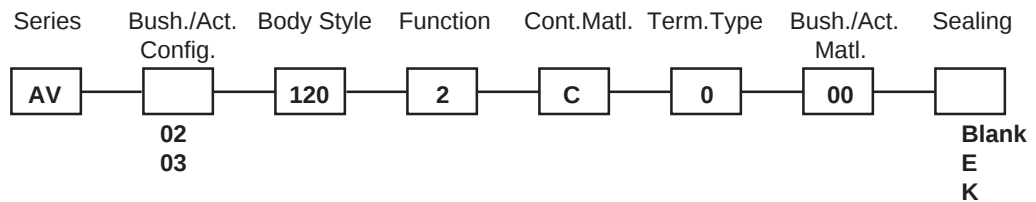
FEATURES

- .866" (22 mm) dia. models.
- Single pole NC momentary action.
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

MATERIALS

Contacts & terminals: Silver plated brass
Bushing & Actuator: Nickel plated brass (std'd)
Case: PBT **Hex. Mounting Nut:** Nickel plated brass

ORDER FORMAT: For complete model no., fill in 2 empty boxes with selected options shown below.
Example of complete model no. -
AV021202C000

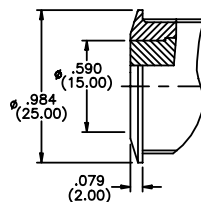


Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.

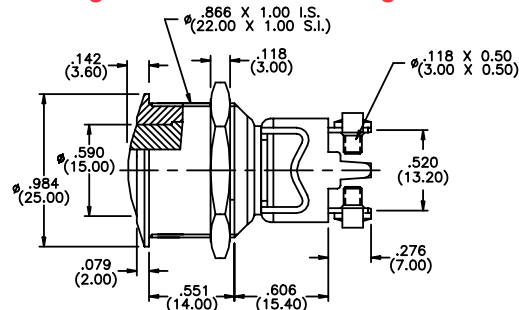
22mm

Bushing/Actuator configurations

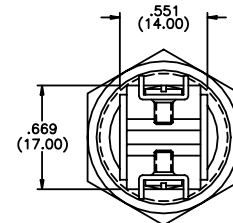
Straight screw terminals w/clamp



03 flat Act. & curved Bush.



02 curved Act.& Bush.



Rear view all models

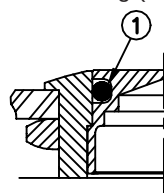


AV021202C000
(Model shown)

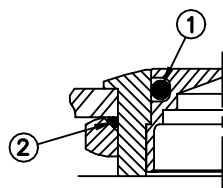


Schematic

Blank - no sealing (std'd)



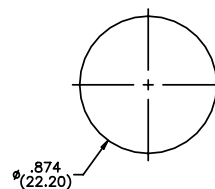
E ① Internal seal meets IP65



K ① Internal seal & ② front panel seals meet IP65

Sealing

Min. dimensions for matrix mounting: 1.181" (30mm) x 1.181" (30mm).



Mounting Hole

Note: Models on this page are VDE recognized and marked.

AV SERIES SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS

Contact ratings: Max.resistive loads: 6 A 125 VAC, 3 A 250 VAC, & 3 A 24 VAC or VDC
Initial contact resistance: 10 milliohms max. at 1 A, 2 V
Insulation resistance: 1000 megohms min. at 500 VDC
Dielectric strength: 3000 V rms min. between terms. & frame
Electrical life: 10,000 cycles at full load, 50,000 cycles min. at 1 A 24 VAC of VDC
Mechanical life: 50,000 cycles min.
Operating temperature range: -20°C to +55°C
Solder heat resistance: 300°C max. for 5 seconds

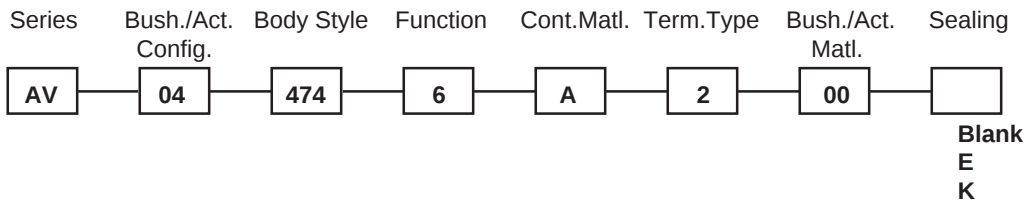
FEATURES

- .866" (22 mm) dia. models.
- Double pole alternate action (ON - ON).
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

MATERIALS

Contacts: Silver
Bushing & Actuator: Nickel plated brass (std'd)
Case: PBT **Hex. Mounting Nut:** Nickel plated brass

ORDER FORMAT: For complete model no., fill in empty box with selected options shown below.
 Example of complete model no. -
AV044746A200

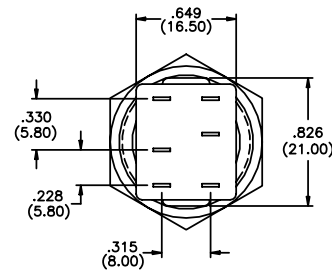
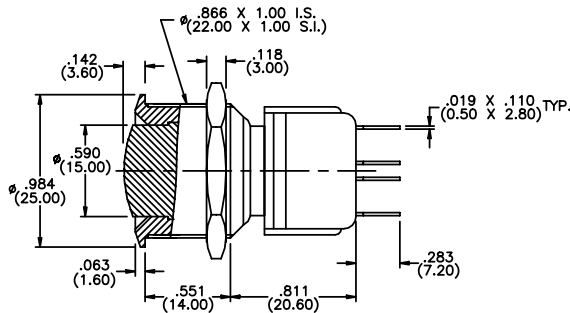


Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.

22mm

Bushing/Actuator configurations

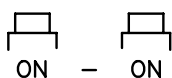
Solder lug/quick connect terminals



04 curved Act. & Bush.

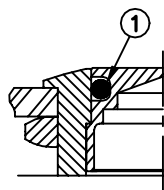


AV044746A200
(Model shown)

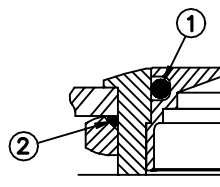


Schematic

Blank - no sealing (std'd)



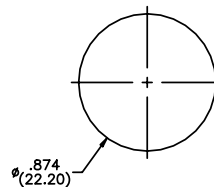
E ① Internal seal meets IP65



K ① Internal seal & ② front panel seals meet IP65

Sealing

Min. dimensions for matrix mounting: 1.181" (30mm) x 1.181" (30mm).



Mounting Hole

New!

AV SERIES SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

C

SPECIFICATIONS

Contact ratings: Max. resistive loads: **Q** - 6 A 125 VAC, 3 A 250 VAC or 7 A 30 VDC.
B - 0.4 Volt-Amps max at 20 V max.
Initial contact resistance: 5 mΩ max. at 3 VDC, 0.1 A
Insulation resistance: 200,000 megohms minimum between terminals & case ground.
Dielectric strength: 2000 VAC min. between terminals and case ground.
Electrical life: 100,000 cycles min.
Operating temperature range: -30°C to +85°C
For additional specifications: See PB Series switches

FEATURES

- .755" (19 mm) dia. models.
- Single pole double throw NO & NC momentary action.
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

MATERIALS

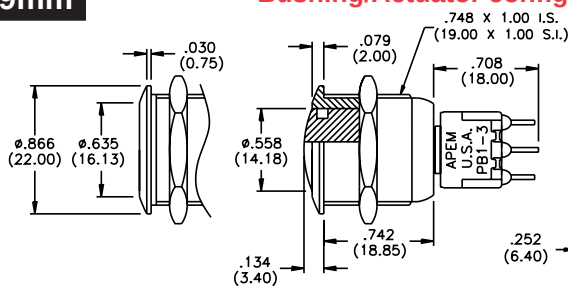
Contacts: **Q** - Coin silver for power & UL models. **B** - Gold over nickel over brass for dry circuit models.
Bushing & Actuator: Nickel plated brass (std'd)
Case: Diallyl Phthalate **Hex. Mounting Nut:** Nickel plated brass

ORDER FORMAT: For complete model no., fill in boxes with selected options shown below. Example of complete model no. -
AV19PB1-3P2Y1ZQE/UL

Series	Bush./Act. Config.	Body Style	Term. Type	Cont. Matl.	Term. Seal	Sealing	Agency Recognition
AV	19 09 19 29 39 49	PB1-3P2Y1	Z	B Q	E	Blank K	Blank UL

19mm

Bushing/Actuator configuration



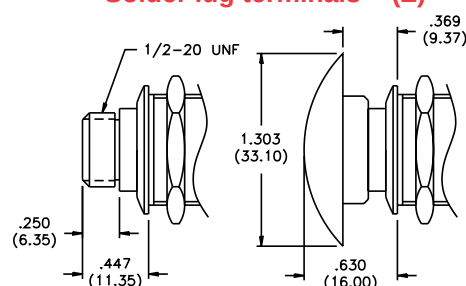
09 flat Act. & curved Bushing

19 curved Act. & Bushing (standard)

29 extended Act. & curved bushing

39 threaded Act. & curved bushing

Solder lug terminals - (Z)

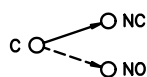


49 thd'd Act. with mushroom cap & curved bushing

Rear view all models

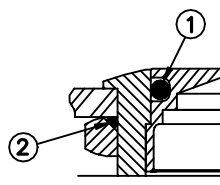


AV19PB1-3P2Y1ZQE
(Model shown)



Schematic

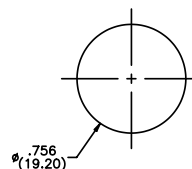
Blank - no sealing (std'd)



K ① Internal seal & ② front panel seals meet IP65

Sealing

Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).



Mounting Hole

Notes to Order Format:

UL option available only with Q option. UL rating: 6 A 125 VAC or 3 A 250 VAC (75% power factor). UL file E66367.

E option is epoxy terminal seal - standard.

AV SERIES

SNAP-ACTION SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS

Contact ratings: Max.resistive load: 50mA at 24 VDC
Initial contact resistance: 100 milliohms max.
Insulation resistance: 1000 megohms min. at 500 VDC
Dielectric strength: 500 V rms min. between terms.
 2000 V rms between terms & bushing
Electrical life: 1,000,000 cycles at full load
Operating force: 25 oz. $\pm$ 7 oz.
Travel: .027" (0.7mm) $\pm$.003" (0.1mm)
Panel thickness: .039" (1mm) to .433" (11mm)
Operating temperature range: -30°C to +70°C
Solder heat resistance: 270 °C max. for 3 seconds

FEATURES

- .755" (19 mm) dia. models.
- Single pole NO momentary action.
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

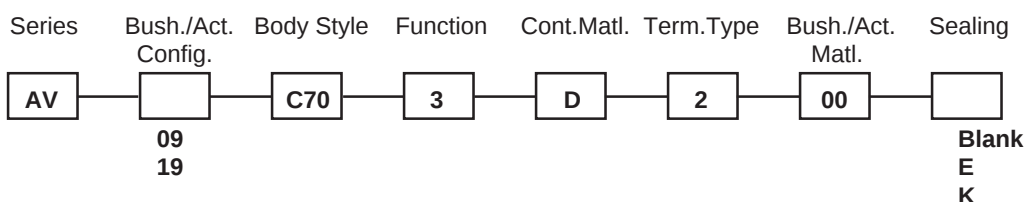
MATERIALS

Contacts: Gold plated dome **Terminals:** Gold plated brass
Bushing & Actuator: Nickel plated brass (std'd)
Case: PBT **Hex. Mounting Nut:** Nickel plated brass

ORDER FORMAT: For complete model no., fill in empty boxes with selected options shown below. Example of complete model no. -

AV19C703D200

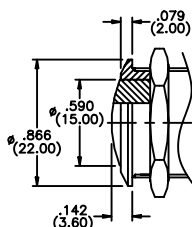
Other Bushing/Actuator materials available - consult factory.



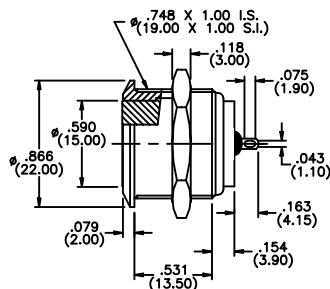
19mm

Bushing/Actuator configurations

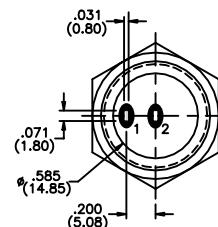
Solder lug terminals



19 curved Act. & Bush.



09 flat Act.& curved Bush.



Rear view all models

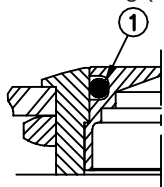


AV09C703D200
(Model shown)

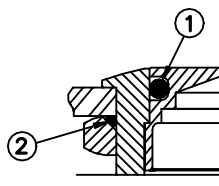


Schematic

Blank - no sealing (std'd)



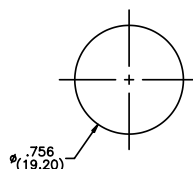
E ① Internal seal meets IP65



K ① Internal seal & ② front panel seals meet IP65

Sealing

Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).



Mounting Hole

C

New!

AV SERIES SNAP-ACTION SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS

Contact ratings: Max. resistive loads: **Q** - 3 A 120 VAC (and life) or 28 VDC, 1.5 A 250 VAC - 10,000 cycles min. Also 1 A 120 VAC or 28 VDC, 0.5 A 250 VAC - 250,000 cycles min. **B** - 0.4 Volt-Amps max at 20 V max. - 250,000 cycles min.

Initial contact resistance: 10 mΩ max. at 3 V, 0.1 A

Insulation resistance: 10,000 megohms min.

Dielectric strength: 1000 V rms min.

Operating temperature range: -30°C to +85°C

For additional specifications: See 400 Series switches

FEATURES

- .755" (19 mm) dia. models.
- Single pole ON-OFF alternate & momentary actions.
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

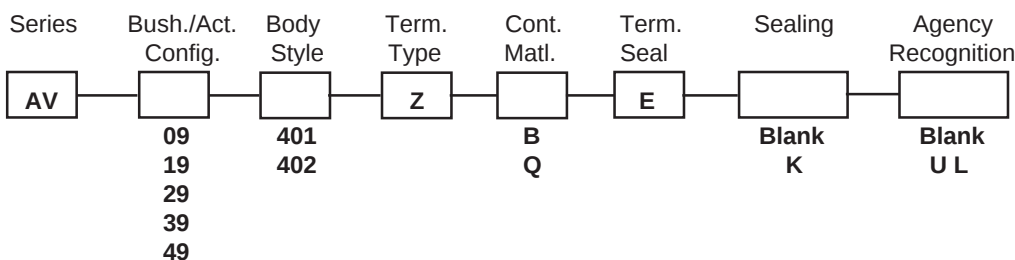
MATERIALS

Contacts: **Q** - Coin silver for power & UL models. **B** - Gold over nickel over brass for dry circuit models.

Bushing & Actuator: Nickel plated brass (std'd)

Case: Diallyl Phthalate **Hex. Mounting Nut:** Nickel plated brass

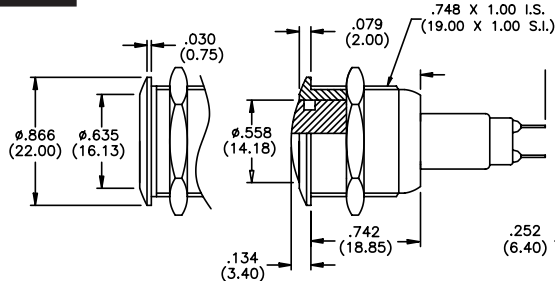
ORDER FORMAT: For complete model no., fill in boxes with selected options shown below.
Example of complete model no. -
AV19401ZQE/UL



19mm

Bushing/Actuator configuration

Solder lug terminals - (Z)



09 flat Act. & curved Bushing

19 curved Act. & Bushing (standard)

29 extended Act. & curved bushing

39 threaded Act. & curved bushing

49 thd'd Act. with mushroom cap & curved bushing

Rear view all models

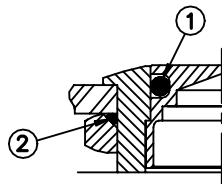


AV19401ZQE/UL
(Model shown)



Schematic

Blank - no sealing (std'd)



K ① Internal seal & ② front panel seals meet IP65

Sealing

Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).

Mounting Hole

Notes to Order Format:

401 is alternate action.
402 is momentary action.

401 models have .026" (0.7mm) to contact closure, .106" (2.7mm) travel to activate switch and .137" (3.5mm) total travel.

UL option available only with **Q** option. UL rating: 1 A 125 VAC or 0.5 A 250 VAC (75% power factor). UL file E66367.

E option is epoxy terminal seal - standard.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

New!

AV SERIES SNAP-ACTION SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

C

SPECIFICATIONS

Contact ratings: Max. resistive loads: **Q** - 6 A 125 VAC, 3 A 250 VAC or 7 A 30 VDC.
B - 0.4 Volt-Amps max at 20 V max.
Initial contact resistance: 20 mΩ max. at 3 VDC, 0.1 A
Insulation resistance: 200,000 megohms minimum between terminals & case ground.
Dielectric strength: 1500 VAC min. between terminals and case ground.
Electrical life: 60,000 cycles min.
Operating temperature range: -30°C to +85°C
For additional specifications: See 800 Series switches

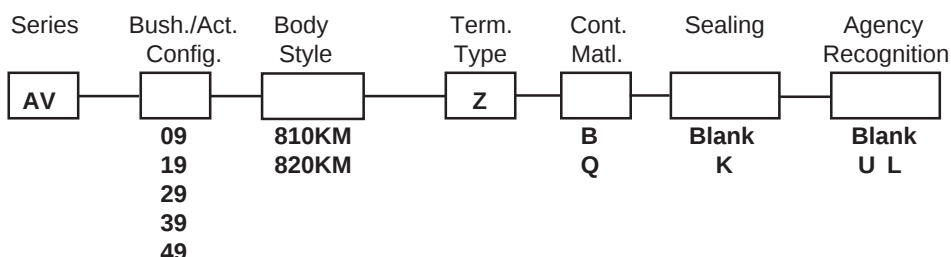
FEATURES

- .755" (19 mm) dia. models.
- SPDT and DPDT with NO & NC momentary action.
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

MATERIALS

Contacts: **Q** - Coin silver for power & UL models. **B** - Gold over nickel over brass for dry circuit models.
Bushing & Actuator: Nickel plated brass (std'd)
Case: Diallyl Phthalate **Hex. Mounting Nut:** Nickel plated brass

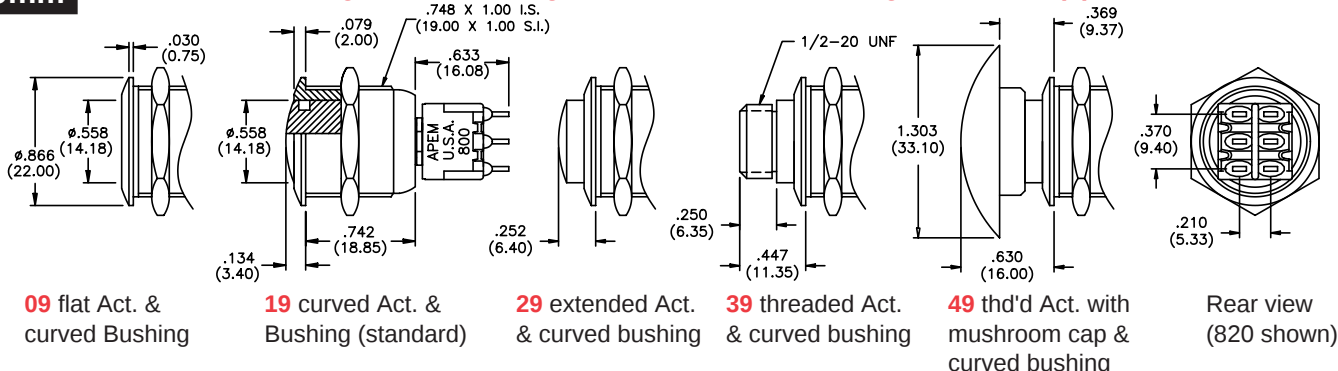
ORDER FORMAT: For complete model no., fill in boxes with selected options shown below.
 Example of complete model no. -
AV19810KMZQK/UL



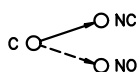
19mm

Bushing/Actuator configuration

Solder lug terminals - (Z)

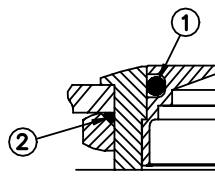


AV19820KMZQ/UL
(Model shown)



Schematic

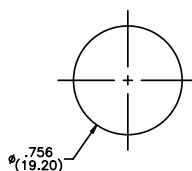
Blank - no sealing (std'd)



K ① Internal seal & ② front panel seals meet IP65

Sealing

Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).



Mounting Hole

Notes to Order Format:

810KM is SPDT

820KM is DPDT

UL option available only with Q option. UL rating: 6 A 125 VAC or 3 A 250 VAC (75% power factor). UL file E66367.

Epoxy terminal seal is standard on all models.