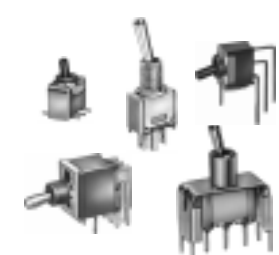


Index by Switch Series ..... VI  
 Index by Switch Type ..... VII  
 Agency Approvals, Technical Information ..... VIII thru X



### SECTION A—TOGGLE SWITCHES

7000 Series .. Toggle Switches ..... A-2 thru A-18  
 9000 Series .. Power Toggle Switches ..... A-19 thru A-25  
 E Series ..... Sealed Toggle Switches ..... A-26 thru A-37  
 ET Series ..... Sealed Tiny Toggle Switches ..... A-38 thru A-44  
 ET Series ..... Sealed Surface Mount Tiny Toggle Switches ..... A-45 thru A-46  
 GT Series ... Sealed Ultra-Miniature Toggle Switches ..... A-47 thru A-50  
 GT Series ... Sealed Ultra-Miniature Surface Mount Toggle Switches ..... A-51 thru A-53  
 T Series ..... Tiny Toggle Switches ..... A-54 thru A-60



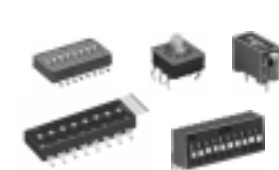
### SECTION B—ROCKER AND LEVER HANDLE SWITCHES

7000 Series .. Rocker and Lever Handle Switches ..... B-2 thru B-23  
 9000 Series .. Power Rocker and Lever Handle Switches ..... B-24 thru B-30  
 E Series ..... Sealed Anti-Static Rocker and Lever Handle Switches ..... B-31 thru B-45  
 ET Series ..... Sealed Tiny Rocker Switches ..... B-46 thru B-50  
 T Series ..... Tiny Rocker Switches ..... B-51 thru B-55



### SECTION C—PUSHBUTTON SWITCHES

8020 Series .. Snap-Acting Momentary Pushbutton Switches ..... C-2 thru C-17  
 8060 Series .. Alternate Action and Momentary Pushbutton Switches ..... C-18 thru C-27  
 8500 Series .. Subminiature Pushbutton Switches ..... C-28 thru C-31  
 8600 Series .. Microminiature Pushbutton Switches ..... C-32 thru C-34  
 E010 Series .. Sealed Momentary Pushbutton Switches ..... C-35 thru C-40  
 E020 Series .. Sealed Snap-Acting Momentary Pushbutton Switches ..... C-41 thru C-48  
 EP Series ... Sealed Tiny Pushbutton Switches ..... C-49 thru C-54  
 EP Series ... Sealed Surface Mount Tiny Pushbutton Switches ..... C-55 thru C-56  
 GP Series ... Sealed Ultra-Miniature Pushbutton Switches ..... C-57 thru C-59  
 GP Series ... Sealed Ultra-Miniature Surface Mount Pushbutton Switches ..... C-60 thru C-62  
 KA Series\* ... Sealed Half-Inch Dome Pushbutton Switches ..... C-63 thru C-64  
 KS Series\* ... Pushbutton Key Switches ..... C-65 thru C-67  
 KT Series ..... Sealed Miniature Key Switches ..... C-68 thru C-69  
 KT Series ..... Sealed Surface Mount Miniature Key Switches ..... C-70 thru C-73  
 TP Series ..... Tiny Pushbutton Switches ..... C-74 thru C-80



### SECTION D—DIP SWITCHES

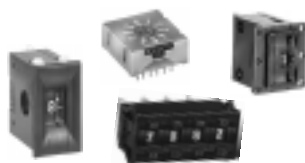
BD Series\* ... Washable DIP Switches ..... D-2 thru D-4  
 BP Series\* ... Side Actuated DIP Switches ..... D-5 thru D-7  
**NEW** CD Series ... Ultra-Miniature DIP Coded Rotary Switches ..... D-8 thru D-11  
**NEW** SD Series ... Low Profile DIP Switches ..... D-12 thru D-13  
**NEW** SD Series ... Low Profile Surface Mount DIP Switches ..... D-14 thru D-15  
**NEW** TD Series ... Ultra-Miniature Surface Mount Half-Pitch DIP Switches ..... D-16 thru D-17

\* Some models may not be produced in an ISO 9001 registered facility.



## SECTION E—SLIDE SWITCHES

1000 Series . . .	Miniature Slide Switches . . . . .	E-2 thru E-8
GS Series . . .	Ultra-Miniature Slide Switches . . . . .	E-9 thru E-10
GS Series . . .	Ultra-Miniature Surface Mount Slide Switches . . . . .	E-11 thru E-13
TS Series . . . .	Tiny Slide Switches . . . . .	E-14 thru E-16



## SECTION F—THUMBWHEEL AND PUSHWHEEL SWITCHES

3 Series . . . . .	Thumbwheel Switches . . . . .	F-2 thru F-14
3M Series* . . .	Minithumbwheel Switches . . . . .	F-15 thru F-17
3P Series* . . .	Miniature Pushwheel Switches . . . . .	F-18 thru F-23
3U Series* . . .	Tiny Pushwheel Switches . . . . .	F-24 thru F-28
SF/SR Series	Thumbwheel Switches . . . . .	F-29 thru F-39
S2 Series . . . .	Subminiature Thumbwheel Switches . . . . .	F-40 thru F-45



## SECTION G—MEMBRANE AND FRONT PANEL SWITCHES

4000 Series . . .	Membrane Keypads . . . . .	G-2 thru G-3
<b>NEW</b> 4200 Series . . .	Insertable Legend Keypads . . . . .	G-4 thru G-7
<b>NEW</b> 4800 Series . . .	Vandal Resistant Keypads . . . . .	G-8 thru G-10
KP Series . . . .	Piezo Pulse Momentary Pushbutton Switches . . . . .	G-11 thru G-14



## SECTION H—ROTARY SWITCHES

M Series . . . .	Half-Inch Rotary Switches . . . . .	H-2 thru H-8
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## SECTION J—SEALED TRIMMING POTENTIOMETERS

TR Series . . . .	Surface Mount, Single-Turn, Multi-Turn . . . . .	J-2 thru J-22
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## SECTION K—HARDWARE AND ACCESSORIES

Hardware—Panel Mounted Switches . . . . .	K-2 thru K-6
Actuators—Rocker and Lever Handle Switches . . . . .	K-6 thru K-8
Frames—Rocker, Lever Handle, Pushbutton Switches . . . . .	K-9 thru K-10
Caps—Pushbutton Switches . . . . .	K-11 thru K-12
Endplates, Spacers, Blank Sections, Hardware—Coded Switches . . . . .	K-13 thru K-17
Miscellaneous . . . . .	K-18



## SURFACE MOUNT SWITCHES

<b>NEW</b> CD Series . . .	Ultra-Miniature DIP Coded Rotary Switches . . . . .	D-8 thru D-11
EP Series . . . .	Sealed Surface Mount Tiny Pushbutton Switches . . . . .	C-55 thru C-56
ET Series . . . .	Sealed Surface Mount Tiny Toggle Switches . . . . .	A-45 thru A-46
GP Series . . . .	Sealed Ultra-Miniature Surface Mount Pushbutton Switches . . . . .	C-60 thru C-62
GS Series . . . .	Ultra-Miniature Surface Mount Slide Switches . . . . .	E-11 thru E-13
GT Series . . . .	Sealed Ultra-Miniature Surface Mount Toggle Switches . . . . .	A-51 thru A-53
KT Series . . . .	Sealed Surface Mount Miniature Key Switches . . . . .	C-70 thru C-73
<b>NEW</b> SD Series . . . .	Sealed Low Profile Surface Mount DIP Switches . . . . .	D-14 thru D-15
<b>NEW</b> TD Series . . . .	Ultra-Miniature Surface Mount Half-Pitch DIP Switches . . . . .	D-16 thru D-17

Distributors—United States . . . . .	XI thru XVI
Distributors—Canada . . . . .	XVII
Distributors—International . . . . .	XVIII and XIX
Sales Representatives . . . . .	XX and XXII
Limited Warranty . . . . .	XXIII
Other C&K Products . . . . .	XXIV (See also insert and reply cards inside back cover)

\* Some models may not be produced in an ISO 9001 registered facility.



# Index By Switch Series

SERIES	SWITCH TYPE	PAGES	SERIES	SWITCH TYPE	PAGES
<b>BD</b>	Washable DIP Switches	D-2 thru D-4	<b>S2</b>	Subminiature Thumbwheel Switches	F-40 thru F-45
<b>BP</b>	Side Actuated DIP Switches	D-5 thru D-7	<b>SD</b>	Low Profile DIP Switches	D-12 thru D-13
<b>CD</b>	Ultra-Miniature Dip Coded Rotary Switches	D-8 thru D-11		Low Profile Surface Mount DIP Switches	D-14 thru D-15
<b>E</b>	Sealed Toggle Switches	A-26 thru A-37	<b>SF/SR</b>	Thumbwheel Switches	F-29 thru F-39
	Sealed Anti-Static Rocker & Lever Handle Switches	B-31 thru B-45	<b>T</b>	Tiny Toggle Switches	A-54 thru A-60
<b>E010</b>	Sealed Momentary Pushbutton Switches	C-35 thru C-40		Tiny Rocker Switches	B-51 thru B-55
<b>E020</b>	Sealed Snap-Acting Momentary Pushbutton Switches	C-41 thru C-48	<b>TD</b>	Ultra-Miniature Surface Mount Half-Pitch DIP Switches	D-16 thru D-17
<b>EP</b>	Sealed Tiny Pushbutton Switches	C-49 thru C-54	<b>TR</b>	Sealed Trimming Potentiometers	J-2 thru J-22
	Sealed Surface Mount Tiny Pushbutton Switches	C-55 thru C-56	<b>TP</b>	Tiny Pushbutton Switches	C-74 thru C-80
<b>ET</b>	Sealed Tiny Toggle Switches	A-38 thru A-44	<b>TS</b>	Tiny Slide Switches	E-14 thru E-16
	Sealed Surface Mount Tiny Toggle Switches	A-45 thru A-46	<b>1000</b>	Miniature Slide Switches	E-2 thru E-8
	Sealed Tiny Rocker Switches	B-46 thru B-50	<b>3</b>	Thumbwheel Switches	F-2 thru F-14
<b>GP</b>	Sealed Ultra-Miniature Pushbutton Switches	C-57 thru C-59	<b>3M</b>	Minithumbwheel Switches	F-15 thru F-17
	Sealed Ultra-Miniature Surface Mount Pushbutton Switches	C-60 thru C-62	<b>3P</b>	Miniature Pushwheel Switches	F-18 thru F-23
<b>GS</b>	Ultra-Miniature Slide Switches	E-9 thru E-10	<b>3U</b>	Tiny Pushwheel Switches	F-24 thru F-28
	Ultra-Miniature Surface Mount Slide Switches	E-11 thru E-13	<b>4000</b>	Membrane Keypads	G-2 thru G-3
<b>GT</b>	Sealed Ultra-Miniature Toggle Switches	A-47 thru A-50	<b>4200</b>	Insertable Legend Keypads	G-4 thru G-7
	Sealed Ultra-Miniature Surface Mount Toggle Switches	A-51 thru A-53	<b>4800</b>	Vandal Resistant Keypads	G-8 thru G-10
<b>KA</b>	Sealed Half-Inch Dome Pushbutton Switches	C-63 thru C-64	<b>7000 &amp; U</b>	Toggle Switches	A-2 thru A-18
<b>KP</b>	Piezo Pulse Momentary Pushbutton Switches	G-11 thru G-14		Rocker & Lever Handle Switches	B-2 thru B-23
<b>KS</b>	Pushbutton Key Switches	C-65 thru C-67	<b>8020 &amp; U</b>	Snap-Acting Momentary Pushbutton Switches	C-2 thru C-17
<b>KT</b>	Sealed Miniature Key Switches	C-68 thru C-69	<b>8060</b>	Alternate Action & Momentary Pushbutton Switches	C-18 thru C-27
	Sealed Surface Mount Miniature Key Switches	C-70 thru C-73	<b>8500</b>	Subminiature Pushbutton Switches	C-28 thru C-31
<b>M</b>	Half-Inch Rotary Switches	H-2 thru H-8	<b>8600</b>	Microminiature Pushbutton Switches	C-32 thru C-34
			<b>9000</b>	Power Toggle Switches	A-19 thru A-25
				Power Rocker & Lever Handle Switches	B-24 thru B-30



# Index By Switch Type

SWITCH TYPE	SERIES	PAGES	SWITCH TYPE	SERIES	PAGES
<b>Anti-Static Switches</b>	E	B-31 thru B-45	<b>Sealed Switches</b>	E010 E020 GP GS GT KA KT TD	C-35 thru C-40 C-41 thru C-48 C-57 thru C-62 E-9 thru E-13 A-47 thru A-53 C-63 thru C-64 C-68 thru C-73 D-16 thru D-17
<b>DIP Switches</b>	BD BP CD SD TD	D-2 thru D-4 D-5 thru D-7 D-8 thru D-11 D-12 thru D-15 D-16 thru D-17	<b>Slide Switches</b>	1000 GS TS	E-2 thru E-8 E-9 thru E-13 E-14 thru E-16
<b>Lever Handle Switches</b>	7000 & U 9000 E	B-2 thru B-23 B-24 thru B-30 B-31 thru B-45	<b>Surface Mount Switches</b>	EP ET GP GS GT KT SD TD TR	C-55 thru C-56 A-45 thru A-46 C-60 thru C-62 E-11 thru E-13 A-51 thru A-53 C-70 thru C-73 D-14 thru D-15 D-16 thru D-17 J-2 thru J-8
<b>Membrane Switches</b>	4000 4200 4800	G-2 thru G-3 G-4 thru G-7 G-8 thru G-10	<b>Thumbwheel Switches</b>	3 3M SF/SR S2	F-2 thru F-14 F-15 thru F-17 F-29 thru F-39 F-40 thru F-45
<b>Power Switches</b>	9000	A-19 thru A-25	<b>Tiny Switches</b>	EP ET T TP TS	C-49 thru C-56 A-38 thru A-46 B-46 thru B-50 A-54 thru B-55 B-51 thru B-55 C-74 thru C-80 E-14 thru E-16
<b>Pushbutton Switches</b>	8020 & U 8060 8500 8600 EP E010 E020 GP KA KP KS KT TP	C-2 thru C-17 C-18 thru C-27 C-28 thru C-31 C-32 thru C-34 C-49 thru C-54 C-35 thru C-40 C-41 thru C-48 C-57 thru C-59 C-63 thru C-64 G-11 thru G-14 C-65 thru C-67 C-68 thru C-69 C-74 thru C-80	<b>Toggle Switches</b>	7000 & U 9000 E ET GT T	A-2 thru A-18 A-19 thru A-25 A-26 thru A-37 A-38 thru A-46 A-47 thru A-53 A-54 thru A-60
<b>Pushwheel Switches</b>	3P 3U	F-18 thru F-23 F-24 thru F-28	<b>Trimming Potentiometers</b>	TR	J-2 thru J-22
<b>Rocker Switches</b>	7000 & U 9000 E ET T	B-2 thru B-23 B-24 thru B-30 B-31 thru B-45 B-46 thru B-50 B-51 thru B-55	<b>Ultra-Miniature Switches</b>	CD GP GS GT TD	D-8 thru D-11 C-57 thru C-62 E-9 thru E-13 A-47 thru A-53 D-16 thru D-17
<b>Rotary Switches</b>	CD M	D-8 thru D-11 H-2 thru H-8			
<b>Sealed Switches</b>	CD E EP ET	D-8 thru D-11 A-26 thru A-37 B-31 thru B-45 C-49 thru C-56 A-38 thru A-46 B-46 thru B-50			



# Technical Information

## INTRODUCTION






WELCOME to C&K's newest NEWTON DIVISION SWITCH CATALOG. C&K manufactures the most complete line of miniature, subminiature and ultra-miniature toggle, rocker, lever handle, pushbutton, illuminated, slide, rotary, coded, DIP, membrane, sealed/process compatible and surface mounted switches. We are *The Primary Source Worldwide* for switches with unmatched quality and consistently superior performance.

Millions of switch models and option combinations can be ordered from this catalog. Each switch section has either a selection of complete switch part numbers, or a listing of option choices easily combined to build a part number (BUILD-A-SWITCH). Complete HOW TO ORDER information is provided in each switch section, and our Sales Engineers are always ready to assist you with special needs.

All dimensions, operating characteristics, specifications and materials shown in this catalog are for reference only and are subject to change without notice. C&K switches shown in this catalog are not designed to be used as safety switches. C&K assumes no liability resulting from misapplication of its products.

## AGENCY APPROVALS

Most C&K switch series offer models that are suitable for power switching, and are available with approvals by one or more of the following listing agencies:

-  **UL** . . . . . File No. E42363. Recognized under the component program of Underwriters Laboratories, Inc.
-  **CSA** . . . . . File Nos. LR29210 (Newton, MA-USA)  
LR49546 (Clayton, NC-USA)  
LR47724 (England)  
LR47725 (Hong Kong)
-  **VDE** . . . . . File No. 8869-4401
-  **SEV** . . . . . File No. 81.1162.01
-  **SEMKO** . . . File No. 43-63118/1-6

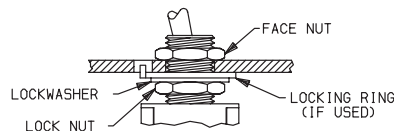
Some switches are supplied with agency approvals automatically when ordered with the appropriate contact materials (i.e.: E Series, 8500 Series). In some series, switches have agency approvals only when specific model numbers are selected (7000 Series, 8020 Series). Otherwise, no approvals appear on the switches. See the appropriate switch section for ratings, agency approvals and other specifications. Also see CONTACT MATERIAL & APPLICATION RECOMMENDATIONS, page X.

At C&K, we are continuously upgrading our agency certifications by adding new models and options. If you have additional approval requirements that do not appear in this catalog, consult our factory.

**Note:** 'G' and 'L' contact materials are electrically equivalent to 'B, Q, K and M' contact materials and can be used where either dry circuit\* or power conditions are encountered. When the dry circuit rating is exceeded, the gold plating is removed from the contact interface and the switch cannot then be used in dry circuits. 'G' or 'L' contact material should be specified where UL approval is required on a switch used in a dry circuit application.

\* Dry Circuit: Conditions where no arcing occurs during switching (i.e., 0.4 VA max. @ 20 V AC or DC max.)

## PANEL MOUNT ASSEMBLY



TYPICAL ASSEMBLY WITH LOCKING RING

**NOTE:** We recommend that locknut always be used with non-flanged bushings.

**CAUTION:** To avoid damaging panel front, always tighten locknut at back of panel. Overtightening mounting nut may cause K-K18 actuators to bind.





# Technical Information

## LED INFORMATION

SWITCHES WITH LED SUPPLIED: J85, J86, J95, J96 OPTIONS:

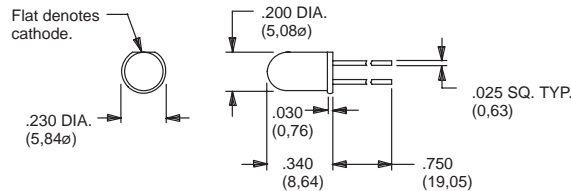
Rectangular LED's are supplied on 8020 Series pushbutton switches with J85 and J95 options; 8060 Series pushbutton switches with J86 and J96 options. These LED's are factory installed and are not replaceable. The following specifications apply:

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

**Process Information:** Soldering to LED leads must be completed within 5 seconds at 500° F (260°C) maximum.  
**Caution:** Circuit elements must limit forward current of LED to 50mA max. continuous.  
\* Extra-bright red LED available (typ. intensity 4.5 mcd), consult factory.

SWITCHES NOT SUPPLIED WITH LED: J52, J62, J82, J84, J92 OPTIONS:

LED's are not supplied with J52, J62, J82, J84 and J92 options, see 7000 Series Rocker and Lever Handle Switches, 8020, 8060, 8600 and TP Series Pushbutton Switches. LED snaps into switch frame surrounding actuator and is wired externally. See recommended dimensions and ratings below.



## SEALED/PROCESS COMPATIBLE SWITCHES

C&K has responded to the industry by developing a large family of sealed, washable, process compatible switches that are able to withstand today's most common machine soldering and cleaning processes. These switches are available in miniature, sub-miniature and the newest ultra-miniature package sizes, and include both thru-hole and surface mount terminal styles. They withstand temperatures associated with the latest vapor phase and infrared reflow techniques. Flux and aqueous or solvent cleaning solutions are not allowed to enter the contacts during cleaning, therefore the switches can be installed on PC boards along with other components. No special handling is required.

High temperature housing, terminal sealing materials and ultrasonically welded assemblies are employed, along with actuator o-ring seals (disposable splashproof boots or tape seal on some models). Other manufacturers claim to build sealed products, C&K delivers time after time! A complete listing of C&K sealed/process compatible switches is listed below.

<u>Surface Mount Models</u> .....	<u>Page</u>	<u>Thru Hole Models</u> .....	<u>Page</u>
CD Series .....	D-8	BD Series (Unsealed—washable) ....	D-2
EP Series .....	C-55	CD Series .....	D-8
ET Series .....	A-38	E Series .....	A-26, B-31
GP Series .....	C-57	EP Series .....	C-49
GT Series .....	A-47	ET Series .....	A-38, B-46
KT Series .....	C-70	E010 Series .....	C-35
SD Series .....	D-14	E020 Series .....	C-41
TD Series .....	D-16	GP Series .....	C-57
TR Series .....	J-2	GT Series .....	A-47
		KA Series .....	C-63
		KT Series .....	C-68
		SD Series .....	D-12
		TR Series .....	J-2

## UNSEALED SWITCHES—SOLDERING AND CLEANING

Many manually actuated switches are *not* totally sealed components. Most manufacturing and field problems experienced by users of unsealed miniature switches are caused by contamination of the internal switch contacts during assembly, i.e., during soldering and cleaning processes. Switches may become intermittent, especially in low power applications, and may become apparent during factory testing or later in the field. These failures may not be immediately recognized as a process problem, but are assumed to be a product deficiency. Care during soldering and cleaning can prevent most process contamination problems encountered.

Contamination can occur in both hand soldering and machine soldering processes. Hand soldering and cleaning are acceptable with properly trained personnel, small diameter solder (.030-.040 in.) and low wattage soldering irons (25-40 watts max.). *Do not* immerse or spray the unsealed areas of the switches with cleaners during flux removal.

Most C&K switches have epoxy terminal sealing, standard and are compatible with 'bottom-wash' PC board cleaning methods. Other techniques such as vapor phase and infrared reflow are recommended for sealed/process compatible switches only. These products have the required temperature and contamination resistance.

## CONTACT MATERIAL & APPLICATION RECOMMENDATIONS

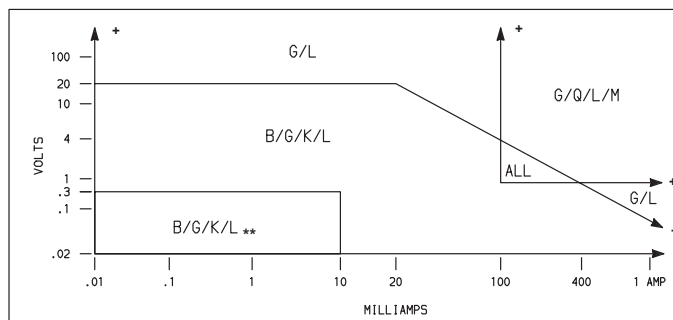
Most C&K switches offer three contact material options: gold, silver, and gold over silver. Switch terminal plating may be gold, silver, or tin-lead. See desired switch section for availability of specific options. Also see AGENCY APPROVALS, page VIII. Figures 1 & 2 below provide contact material vs. rating recommendations. For special requirements or assistance, consult factory.

CONTACT MATERIAL	CHARACTERISTICS
<b>B &amp; K</b>	LOW LEVEL OR DRY CIRCUIT RATED: 0.4 VA max. @ 20 V AC or DC max. Contact material: Gold.
<b>Q &amp; M</b>	POWER RATED: Ratings from 100mA to 10 AMPS @ 125 V AC are available. See switch sections for applicable ratings and available agency approvals. Contact material: Silver.
<b>G &amp; L</b>	POWER OR LOW LEVEL / DRY CIRCUIT RATED: Electrically equivalent to 'B, Q, K and M' contact materials and can be used where either low level / dry circuit* or power conditions are encountered. When the dry circuit rating is exceeded, the gold plating is removed from the contact interface and the switch cannot then be used in dry circuits. 'G' or 'L' contact material should be specified where agency approvals are required on a switch used in a dry circuit application. Contact material: Gold over silver.

\* Dry Circuit: Conditions where no arcing occurs during switching, i.e. 0.4 VA max. @ 20 V AC or DC max.

Fig. 1

RECOMMENDED CONTACT MATERIALS VS. VOLTAGE AND CURRENT

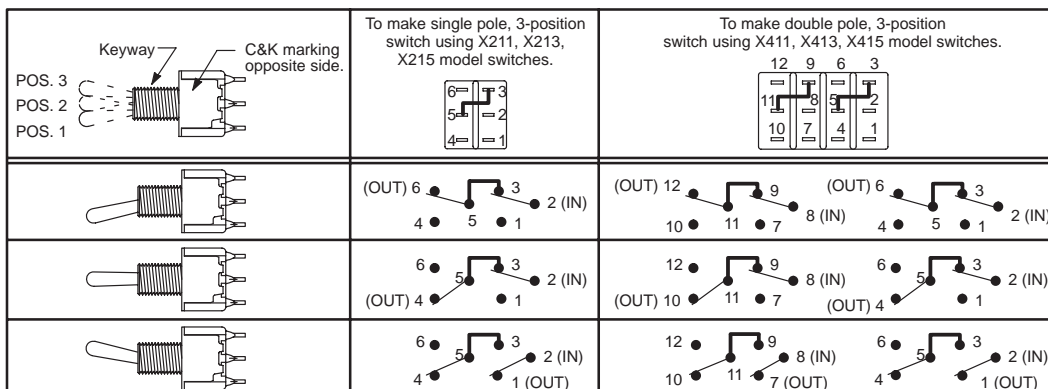


\* To maximum switch rating.  
\*\* For high reliability at these low levels, extra gold plating recommended, consult factory.

Fig. 2

## WIRING FOR 3-WAY SWITCHES

3-Position toggle and rocker switches with ON-ON-ON switch functions may be externally wired for '3-way' function. See wiring diagram and schematics below. **Note:** Jumpers are added by customer.



These switch series have one or more models that may be wired to achieve SP3T or DP3T functions:

- 7000 and U Series
- E Series
- ET Series
- T Series