NKK® SERIES E

SUBMINIATURE/LIGHT DUTY/PANEL MOUNTABLE

A-25-13

DISTINCTIVE FEATURES

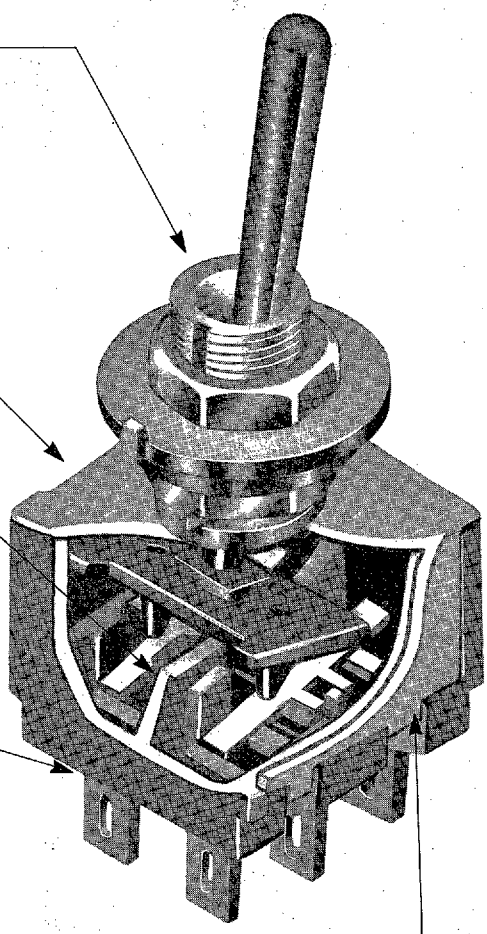
3 amp rating for AC makes E Series devices suited to light duty applications.

The high torque bushing prevents the bushing from rotating or separating from the metal frame during installation.

The stainless steel frame resists corrosion.

Insulating barriers, higher than standard, protect against crossover in multipole devices.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.



Actual Size

1500V dielectric strength between contacts and case is accomplished by clinching the frame away from the terminals.

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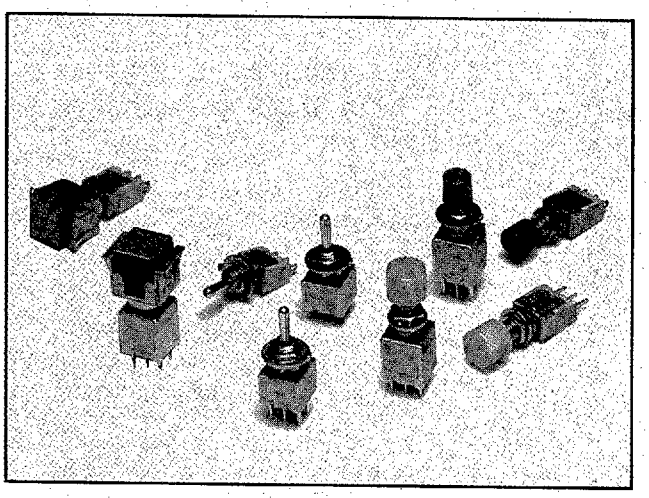
APPLICATIONS

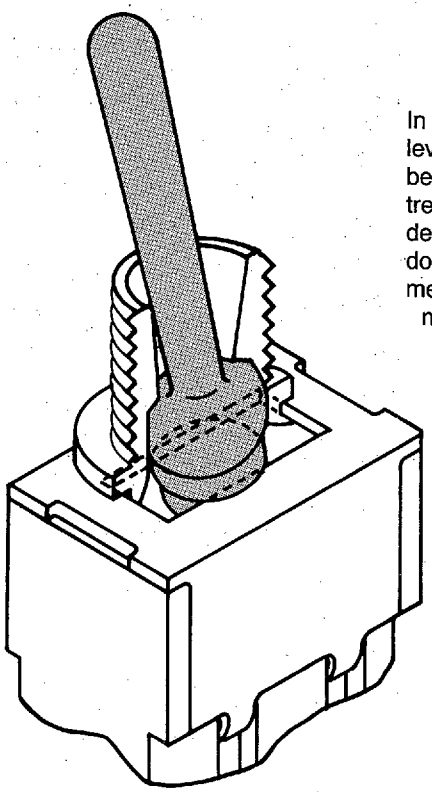
● Toggles ● Pushbuttons

The E Series toggle switches combine maximum performance characteristics with small size and light weight. The small size is ideal for miniaturized equipment with space limitations. The toggles have a slow-make, slow-break contact mechanism and are suited for AC applications. The pushbutton models offer extremely light operation and a variety of decorative accessories.

The majority of circuits in both single and double pole devices have UL recognition. In most circuits of the single pole solder lug devices and the single and double pole PC models, CSA certification applies. For exact model numbers see the UL and CSA tables contained in the supplement at the end of this catalog.



ANTIJAMMING DESIGN



In some applications where a lever may suffer sharp blows or be subjected to other harsh treatment, contacts can be deformed by the transmission of downward force to the contact mechanism. Protection against mechanism damage is designed into the E Series toggle switches.

Beneath the toggle joint is a step which rests against the frame of the switch. When downward force is applied to the lever, the frame and step resist movement of the lever and protect the contact mechanism.

TOGGLES

Internal construction prevents switch failure due to biased lever movement

Solder lug and PC terminals

Single pole and double pole in 5 most widely used circuits

Bat lever and threaded metric bushing only

Minimal contact bounce

PUSHBUTTONS

Extremely light operation with positive detent

Single pole or double pole momentary and alternate action circuits

Bushing or snap-in mounting

Adjustable button height with snap-in mounter

Solder lug and PC terminals

Minimal contact bounce

NKK® SERIES E TOGGLE SWITCHES

SUBMINIATURE/LIGHT DUTY/PANEL MOUNTABLE

GENERAL SPECIFICATIONS

Electrical Capacity: (Resistive Load)	3A @ 125V AC for silver contacts
Contact Resistance:	10 milliohms max for silver
Insulation Resistance:	1,000 megohms minimum @ 500V DC
Dielectric Strength:	1,000V AC minimum between contacts 1,500V AC minimum between contacts & case
Mechanical Life:	100,000 operations minimum
Electrical Life:	20,000 operations minimum for silver
Ambient Temp Range:	-10°C through +85°C (+14°F through +185°F)
Toggle Angle of Throw:	25°

NOMINAL OPERATING FORCE IN GRAMS

	Momentary	Alternate
E2011		160
E2012		170
E2013		460
E2015	390	
E2018	390	
E2019	490	400
E2022		200
E2023		540
E2025	410	
E2028	620	
E2029	510	600

MATERIALS & FINISHES

Toggle	Brass with chrome plating
Bushing	Brass with nickel plating
Case	Diallyphthalate resin
Frame	Stainless steel
Movable Contacts	Copper with silver
Stationary Contacts	Silver with silver plating
Terminals	Copper with silver plating

BIAS GUARD

When the lever is pushed in a diagonal direction instead of the mechanism's direction of operation, the biased movement is transmitted to the actuator block and causes misalignment of the contacts. However, internal construction of the E Series case prevents this biased movement.

DIELECTRIC STRENGTH

The superior dielectric strength found in NKK's miniature switches is an accomplishment supporting the unchanging goal to build switches of the highest quality. The 1500V dielectric strength between contacts and case is achieved by clinching the frame to the case well above the base and terminals.

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NKK SERIES E TOGGLE SWITCHES

SUBMINIATURE/LIGHT DUTY/PANEL MOUNTABLE

TYPICAL SWITCH ORDERING EXAMPLE

E20 2 2 P - C G

POLES	
1	SPST SPDT
2	DPDT

TERMINALS & CONTACT MATERIALS	
NO CODE	Silver Solder Lug 3A @ 125V AC
P	Silver Straight PC 3A @ 125V AC

CIRCUITS			
1	ON	NONE	OFF
2	ON	NONE	ON
3	ON	OFF	ON
5	ON	NONE	(ON)
8	(ON)	OFF	(ON)
9	ON	OFF	(ON)
( ) = Momentary			

CAPS	
B	Bat Lever Cap
C	Bat Lever Conical Cap

COLORS	
A	Black
B	White
C	Red
E	Yellow
F	Green
G	Blue

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE (E2022P-CG)

SERIES E TOGGLE

Blue Bat Lever Conical Cap

DPDT ON-NONE-ON Circuit

Silver Straight PC Terminals

IMPORTANT: Switches are supplied without UL & CSA marking unless specified. See Supplement for instructions.

NKK® SERIES E TOGGLE SWITCHES

SUBMINIATURE/LIGHT DUTY/PANEL MOUNTABLE

POLES AND CIRCUITS

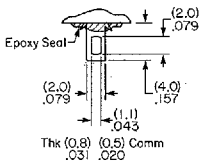
POLE & THROW	MODEL	TOGGLE POSITION & TERMINAL NUMBERS (Momentary) Down	Center	Up
SPST	E2011	ON	NONE	OFF
CONNECTED TERMINALS		2-3	OPEN	OPEN
SCHEMATIC			2 (COMM) •3	
SPDT	E2012	ON	NONE	ON
	E2013	ON	OFF	ON
	E2015	ON	NONE	(ON)
	E2018	(ON)	OFF	(ON)
	E2019	ON	OFF	(ON)
CONNECTED TERMINALS		2-3	OPEN	2-1
SCHEMATIC			1 2 (COMM) •3	
DPDT	E2022	ON	NONE	ON
	E2023	ON	OFF	ON
	E2025	ON	NONE	(ON)
	E2028	(ON)	OFF	(ON)
	E2029	ON	OFF	(ON)
CONNECTED TERMINALS		2-3 5-6	OPEN	2-1 5-4
SCHEMATIC			1 2 (COMM) 5 •3 4 •6	

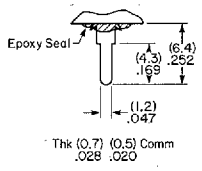
Terminal numbers are not actually on the switch.

TERMINALS & CONTACT MATERIALS

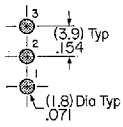
NO CODE Silver Solder Lug 3A @ 125V AC

P Silver Straight PC 3A @ 125V AC

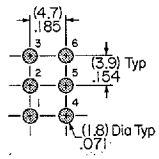




PCB Footprints



Single Pole



Double Pole

Wiring & Soldering

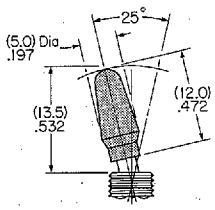
The 0.79" X 0.43" oval hole accommodates 1 solid 18-gauge or 2 solid or stranded 20-gauge wires.

Soldering Limits:
3 seconds @ 350°C
5 seconds @ 270°C.

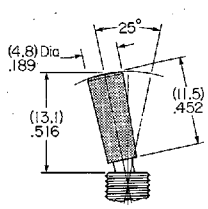
LEVER CAPS

Lever Cap Material: Polyethylene
Colors Available: **A** Black **B** White **C** Red **E** Yellow **F** Green **G** Blue

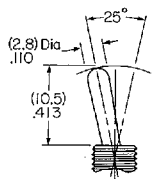
B **AT415**
Bat Lever Cap

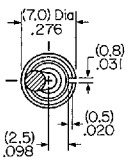


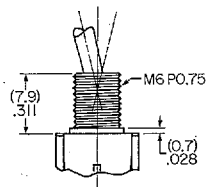
C **AT444**
Bat Lever Conical Cap



STANDARD TOGGLE & METRIC BUSHING







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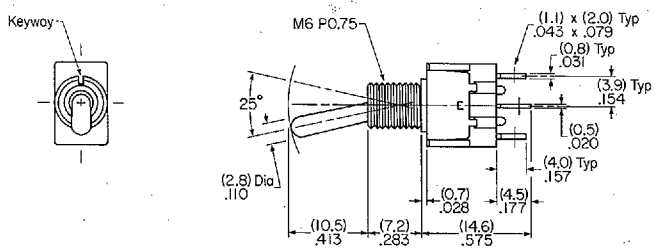
SUBMINIATURE/LIGHT DUTY/PANEL MOUNTABLE

Solder Lug Terminals/Single Pole

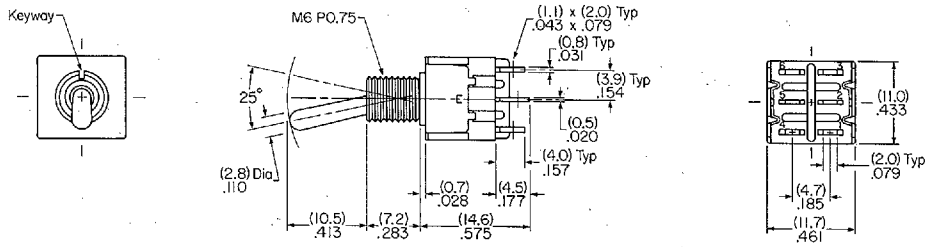
E2012 Model Shown



E2011 model does not have terminal 1.

Solder Lug Terminals/Double Pole

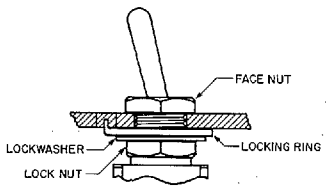
E2022 Model Shown



E2021 model does not have terminals 1 & 4.

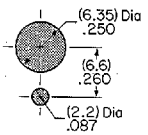
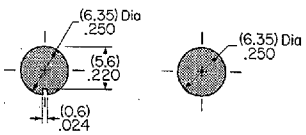
STANDARD HARDWARE

AT513M Metric Hexagon Nut
AT507M Metric Locking Ring
AT509 Internal Tooth Lockwasher



Optional Hardware Available:
Knurled nuts, dress nuts,
ON-OFF plates, & waterproof boot

PANEL THICKNESSES & PANEL CUTOUTS

Hardware:	W/Standard Hardware	Without Locking Ring
Maximum Effective Panel Thickness:	2.2mm (.087")	3.0mm (.118")
Cutout:		
Hardware:	Without Bottom Hex Nut	Without Locking Ring & Bottom Hex Nut
Maximum Effective Panel Thickness:	3.9mm (.154")	4.7mm (.185")