Distinctive Characteristics

Antirotation design, standard on noncylindrical levers, mates toggle and bushing; bottom of toggle has two flatted sides which fit into a complementary opening inside bushing.

Antijamming design protects contacts from damage due to excessive downward force on actuator.

High torque bushing construction prevents rotation or separation from frame during installation.

High insulating barriers increase isolation of circuits in multipole devices and provide added protection to contact points.

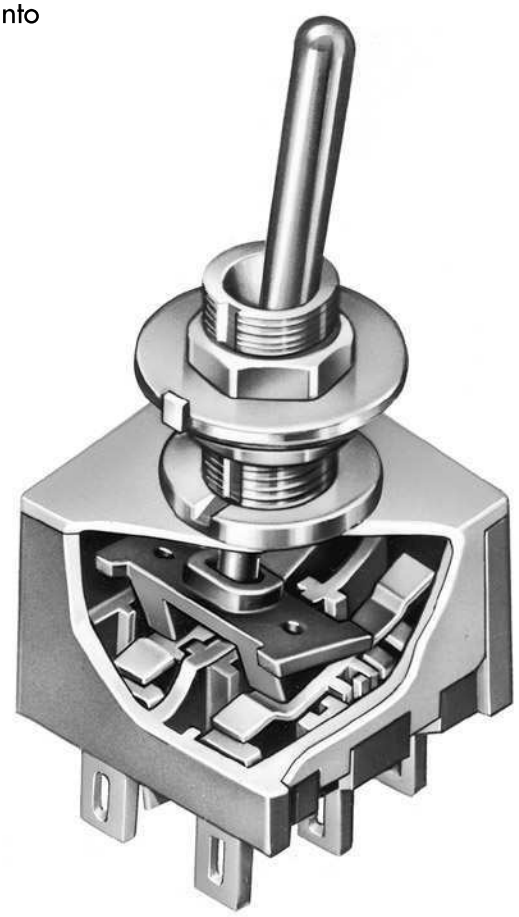
Molded diallyl phthalate case has a UL flammability rating of 94V-0.

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

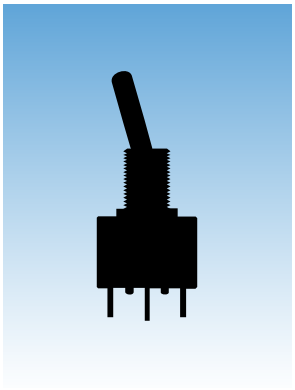
Prominent external insulating barriers increase insulation resistance and dielectric strength.

Interlocked actuator block, lever, and interior guide prevent switch failure due to biased lever movement.

Clinching of frame to case well above base and terminals provides 1,500V dielectric strength.



Actual Size



Downloaded from Datasheet.su

General Specifications

Electrical Capacity (Resistive Load)

Power Level (code W): 6A @ 125V AC & 3A @ 250V AC
4A @ 30V DC for On-None-On & On-None-Off; 3A @ 30V DC for all other circuits
Logic Level (code G): 0.4VA maximum @ 28V AC/DC maximum (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
Logic/Power Level (code A): Combines W & G ratings
Note: Find additional explanation of dual rating & operating range in Supplement section.

Other Ratings

Contact Resistance: 10 milliohms maximum for silver; 20 milliohms maximum for gold
Insulation Resistance: 1,000 megohms minimum @ 500V DC
Dielectric Strength: 1,000V AC minimum between contacts for 1 minute minimum;
1,500V AC minimum between contacts and case for 1 minute minimum
Mechanical Life: 100,000 operations minimum; 50,000 operations minimum for flat, locking, & splashproof devices
Electrical Life: 25,000 operations minimum for silver; 50,000 operations minimum for gold;
50,000 operations minimum for silver at 3A @ 125V AC
Nominal Operating Force: 3.92N for Single Pole; 4.41N for Double Pole; 6.86N for Three Pole; 7.85N for Four Pole
Angle of Throw: 25°

Materials & Finishes

Toggle: Brass with chrome plating
Bushing: Brass with nickel plating
Case: Diallyl phthalate resin (UL94V–0)
Frame: Stainless steel
Support Bracket: Steel with tin plating
Movable Contactor: Phosphor bronze with silver or gold plating
Movable Contacts: Silver alloy (code W); copper with gold plating (code G); or silver alloy with gold plating (code A)
Stationary Contacts: Silver with silver plating (code W); copper or brass with gold plating (code G);
or silver with gold plating (code A)
Terminals: Copper or brass with silver plating; or copper or brass with gold plating

Environmental Data

Operating Temp Range: –30°C through +85°C (–22°F through +185°F)
Humidity: 90 ~ 95% humidity for 96 hours @ 40°C (104°F)
Vibration: 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range
& returning in 1 minute; 3 right angled directions for 2 hours
Shock: 50G (490m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)
Sealing: Panel seal bushing options B3 & D3 meet IP67 of IEC60529 Standards.

Installation

Mounting Torque: 3.0Nm (26.55 lb•in) double nut for large bushing;
1.5Nm (13 lb•in) double nut & 0.7Nm (6 lb•in) single nut for all other bushings

Processing

Soldering: For all Gold Contacts & Circuits 1, 3, 8, & 9, see Wave Soldering Profile A in Supplement section.
Manual Soldering: 4 seconds max. @ 410°C max. Note: Lever must be in OFF (center) position.
For Silver Contact Circuits 2 & 4 through 7: Wave Soldering: 5 seconds maximum @ 270°C maximum.
Manual Soldering: 3 seconds max. @ 350°C max.
Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.
See Cleaning Specifications in Supplement section.

Standards & Certifications

Flammability Standards: UL94V–0 for case
UL Recognized: All models recognized at 6A @ 125V AC or 3A @ 250V AC or
0.4VA maximum @ 28V DC maximum; UL File No. WOYR2.E44145;
add "/U" to end of part number to order UL mark on switch.
CSA Certified: All models recognized at 6A @ 125V AC or 3A @ 250V AC or
0.4VA maximum @ 28V maximum; CSA File No. 023535-0-000;
add "/C" to end of part number to order CSA mark on switch.

Downloaded from Datasheet.su

TYPICAL SWITCH ORDERING EXAMPLE

NKK Switches • email: sales@nkkswitches.com • Phone (480) 991-0942 • Fax (480) 998-1435 • www.nkkswitches.com

POLES & CIRCUITS

		Toggle Position ( ) = Momentary			Connected Terminals			Throw & Schematics
Pole	Model	Down	Center	Up	Down	Center	Up	Note: Terminal numbers are not actually on the switch. * Reverse circuits available upon request.
SP	M2011	ON	NONE	OFF	2-3	OPEN	OPEN	SPST
SP	M2012 M2013 *M2015 M2018 *M2019	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3	OPEN	2-1	SPDT
DP	M2021	ON	NONE	OFF	2-3 5-6	OPEN	OPEN	DPST
DP	M2022 M2023 *M2025 M2028 *M2029	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6	OPEN	2-1 5-4	DPDT
3P	M2032 M2033 M2035 M2038 M2039	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6 8-9	OPEN	2-1 5-4 8-7	3PDT
4P	M2042 M2043 M2045 M2048 M2049	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6 8-9 11-12	OPEN	2-1 5-4 8-7 11-10	4PDT

Downloaded from Datasheet.su

SMALL TOGGLES

Downloaded from Datasheet.su

SMALL BUSHINGS

.350" (8.9mm)
Smooth with Keyway

.350" (8.9mm)
Threaded with D Flat

Downloaded from Datasheet.su

LARGE TOGGLES

Downloaded from Datasheet.su

LOCKING LEVER & BUSHINGS

Smooth with Keyway

Downloaded from Datasheet.su

TERMINALS

Downloaded from Datasheet.su