

## Switches with Ingress Protection Rating

NKK's impressive lineup of sealed switches fulfills a variety of applications. When an optimal solution for environmental challenges of water, oil and dust is required, NKK is a step ahead in the design and construction of IP rated devices. Our products withstand rugged environmental elements of humidity, exposure and harsh temperatures while retaining excellence in quality and performance.

Our selected presentation of IP rated switches in this kit is only a partial sampling of our diverse line. We invite you to contact our skilled engineers and discover multiple solutions and support available to our customers.

The IP code, IEC 60529 Standard (EN 60529), rates the degree of protection against solid objects or materials (e.g., fingers and dust) and is designated by the first number. The second number indicates the level of liquid (water) protection.

IP Ratings	
<b>IP50</b>	Dust protected but not against water
<b>IP60</b>	Dust tight but not protected against water
<b>IP64</b>	Dust tight and protected against splashing water from any direction
<b>IP65</b>	Dust tight and protected against water jets from any direction
<b>IP67</b>	Dust tight and protected against effects of temporary immersion
<b>IP68</b>	Dust tight and protected against effects of immersion in water under pressure for long periods

### M2012WBW01 DUAL SEAL TOGGLE

## Characteristics & Specifications

#### M Series Waterproof Toggle with IP68 Rating

- Dust tight and water protected against temporary immersion, meeting IP68 of IEC 60529 Standards
- Inner o-ring and external rubber washer seal the front panel
- Waterproof boot at base of toggle lends additional protection
- Smooth, sturdy tactile actuation
- Large 12mm threaded bushing with D flat
- Superb quality and construction design prohibit entry of harmful particles that may otherwise compromise lever operation

Power Level: 6A @ 125V AC or 3A @ 250V AC

Contact Resistance: 10 milliohms max

Insulation Resistance: 1,000 megohms min @ 500V DC

Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min

Mechanical Life: 50,000 operations min

Electrical Life: 50,000 operations min for 3A @ 250V AC; 25,000 operations min for 6A @ 125V AC

Angle of Throw: 25°

Operating Temperature Range: -30°C ~ +85°C (-22°F ~ +185°F)

### S3AWB DUAL SEAL TOGGLE

## Characteristics & Specifications

#### S Series Waterproof Toggle with IP68 Rating

- O-ring and rubber washer seal switch to achieve IP68 of IEC 60529 Standards (dust tight and protected against water immersion for up to 30 minutes in 1.5 meters of water)
- Additional panel seal security provided by waterproof boot at base of toggle
- Fluid actuation delivered in smooth, sturdy tactile feel
- Large 12mm threaded bushing with D flat
- Exceptional design prohibits entry of foreign particles that may compromise lever operation

Power Level: 15A @ 125V AC or 6A @ 250V AC

Contact Resistance: 10 milliohms max

Insulation Resistance: 1,000 megohms min @ 500V DC

Dielectric Strength: 2,000V AC min for 1 minute min

Mechanical Life: 50,000 operations min

Electrical Life: 25,000 operations min

Angle of Throw: 24° ± 4°

Operating Temperature Range: -30°C ~ +70°C (-22°F ~ +158°F)

## TL22DNAW016G-AT401P FULLY ILLUMINATED TOGGLE

### Characteristics & Specifications

#### TL Series Illuminated Toggle with Panel Seal O-ring

- Conforms to IP65 of IEC 60529 Standards
- Panel seal attained with AT401P o-ring, plus interior o-ring, protecting from oil, dust, water and other contaminants
- Translucent lever with super bright blue LED
- Silver contacts and solder lug terminals
- Antistatic toggle withstands 20 kilovolts electrostatic discharge
- Front panel appearance enhanced by black face nut
- High insulating barriers guard against crossover
- Lever options in two lengths and multiple colors

Power Level: 6A @ 125V AC or 3A @ 250V AC

Contact Resistance: 10 milliohms max

Insulation Resistance: 1,000 megohms min @ 500V DC

Dielectric Strength: 1,000V AC min between contacts for 1 minute min;  
1,500V AC min between contacts & case for 1 minute min

Mechanical Life: 50,000 operations min

Electrical Life: 25,000 operations min

Nominal Operating Force: 1.9N

Angle of Throw: 25°

Operating Temperature Range: -10°C ~ +55°C (+14°F ~ +131°F)

## JWMW21RA2A/CUL HIGH INRUSH ROCKER

### Characteristics & Specifications

#### JW Series 10A Rocker

- Panel seal meets IP67 of IEC 60529 Standards
- Designed to manage large inrush current with high electrical capacity of 10 amps
- Dust resistant construction features interior cover between actuator and contact area
- Prominent external insulating barriers increase insulation resistance and dielectric strength
- Solder lug/quick connect terminals molded in and epoxy sealed to prohibit entry of flux, dust and contaminants
- Cap color and inscription options available

Power Level: 10A @ 125/250V AC

Contact Resistance: 10 milliohms max

Insulation Resistance: 1,000 megohms min @ 500V DC

Dielectric Strength: 2,000V AC min between contacts for 1 minute min;  
4,000V AC min between contacts & case for 1 minute min

Mechanical Life: 25,000 operations min

Electrical Life: 25,000 operations min

Nominal Operating Force: 7.84N

Angle of Throw: 26°

Operating Temperature Range: -25°C ~ +85°C (-13°F ~ +185°F)

## WR13AL/CUL ENVIRONMENTALLY SEALED ROCKER

### Characteristics & Specifications

#### WR Series Rocker with Wire Leads Conforms to IP67

- Fully complies with IEC 60529 Standards to IP67 at both front and behind panel (dust tight and water protected for temporary immersion)
- Further protection from environmental elements enhanced by single unit construction of flange and outer housing
- Contact mechanism designed for breaking light welds
- Minimal contact bounce accomplished with interlocked switching mechanism
- UL94V-0 flammability standards met with heat resistant resin for outer housing, inner case and outer cover

Power Level: 15A @ 125/250V AC or 15A @ 30V DC

Contact Resistance: 30 milliohms max

Insulation Resistance: 200 megohms min @ 500V DC

Dielectric Strength: 1,250V AC min between contacts for 1 minute min;  
3,750V AC min between contacts and case for 1 minute min

Mechanical Life: 30,000 operations min

Electrical Life: 10,000 operations min

Angle of Throw: 24°

Operating Temperature Range: -25°C ~ +85°C (-13°F ~ +185°F)

## FF0116BACAEA01 EMERGENCY STOP PUSHBUTTON

### Characteristics & Specifications

#### FF01 Series E-Stop Pushbutton with IP65 Rating

- Front panel rating IP65 of IEC 60529 Standards, dust tight and protected against water jets from any direction
- Shortest behind panel depth in its class at 13.6mm
- Low profile housing with 16mm diameter body
- 25mm diameter actuator with arrows legend accommodates optional protective guard and nameplate accessories
- Resetting options of pulling and/or twisting
- Reliability safeguarded by sliding latch mechanism, maintaining OFF state of contacts; shock and vibration resistant
- Insert-molded terminals contribute protection for automated processing techniques
- Designed for indoor use

Resistive Load: 0.5A @ 24V DC
Rated Insulation Voltage: 36V DC
Impulse Withstand Voltage: 2.5kV
Contact Resistance: 50 milliohms max
Insulation Resistance: 100 megohms min @ 500V DC
Mechanical Life: 100,000 operations min
Electrical Life: 100,000 operations min
Operating Force: Push to lock 10.8N; Pull to reset 8.5N; Turn to reset 0.13N·m
Minimum Direct Operating Force: 15N
Total Travel: .177" (4.5mm)
Operating Temperature Range: -25°C ~ +60°C (-13°F ~ +140°F)

## MB2061SD3W01-AT4041H MINIATURE PUSHBUTTON

### Characteristics & Specifications

#### MB2000 Series Pushbutton Meets IP65 of IEC 60529 Standards

- Bushing mount toggle has IP65 front panel rating
- Splashproof boot of silicone rubber accompanied by threaded adaptor, extending length of plunger
- O-ring within 1/4-40 threaded splashproof bushing, plus o-ring beneath face nut, protect from sprayed or spilled liquids
- Prominent external insulating barriers increase insulation resistance and dielectric strength
- Rotation or separation from frame during installation prevented by high torque bushing construction
- Epoxy sealed solder lug terminals prevent entry of flux and other contaminants

Power Level: 6A @ 125V AC or 3A @ 250V AC
Contact Resistance: 10 milliohms max
Insulation Resistance: 1,000 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 50,000 operations min
Electrical Life: 25,000 operations min for 6A @ 125V AC; 50,000 operations min for 3A @ 125V AC
Nominal Operating Force: 16.18N
Operating Temperature Range: -30°C ~ +85°C (-22°F ~ +185°F)

## MB2011SB1G02-AT4043 MINIATURE PUSHBUTTON

### Characteristics & Specifications

#### MB2000 Series Pushbutton with 12mm Diameter Bushing

- Front panel rating of IP65 of IEC 60529 Standards
- Silicone rubber splashproof boot used in place of cap
- .472" (12.0mm) diameter threaded bushing with keyway
- Guide interlocked with actuator block prevents window locking and maintains correct plunger alignment
- Over-center actuator mechanism diminishes sparking and increases operating life in AC circuits
- High torque bushing construction prevents rotation or separation from frame during installation
- Epoxy sealed quick connect terminals lock out flux, dust and other contaminants

Logic Level: 0.4VA max @ 28V AC/DC max (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
Contact Resistance: 20 milliohms max
Insulation Resistance: 1,000 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 50,000 operations min
Electrical Life: 50,000 operations min
Nominal Operating Force: 9.32N
Operating Temperature Range: -30°C ~ +85°C (-22°F ~ +185°F)

## YB26WSKW01-2CF12-JB SHORT BODY PUSHBUTTON

### Characteristics & Specifications

#### YB Series Illuminated Pushbutton with Panel Seal

- Splashproof plus dust and oil tight panel seal qualifies to IP65 of IEC 60529 Standards
- Supplied with mounting nut and o-ring AT089
- Red/green bicolor LED with clear lens and white insert
- Square actuator with bezel-barrier combination aids in prevention of accidental actuation
- Conservative behind panel depth of less than one inch
- Additional protection furnished by thermoplastic elastomer seal inside cap, and rolled sleeve of nitrile butadiene rubber at joining of housing and inner case
- Solder lug/.110" (2.8mm) quick connect terminals

Power Level: 3A @ 125V AC or 3A @ 250V AC

Contact Resistance: 50 milliohms max

Insulation Resistance: 200 megohms min @ 500V DC

Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min

Mechanical Life: 200,000 operations min

Electrical Life: 100,000 operations min

Nominal Operating Force: 2.94N


Travel: Pretravel .059" (1.5mm); Overtravel .059" (1.5mm); Total Travel .118" (3.0mm)

Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## YB215CWCPW01-6B-HB-001 PANEL SEAL PUSHBUTTON

### Characteristics & Specifications

#### YB2 Series Illuminated Pushbutton with Panel Seal

- Meets IP65 of IEC 60529 Standards, delivering dust tight and splashproof panel seal protection
- Tamper resistant 19mm diameter actuator with brushed chrome bezel
- White super bright LED and cap with unbrushed chrome lens and white diffuser; displays standby symbol when lit 
- Short body of .965" (24.5mm) conserves behind-panel space
- Distinctive long stroke and light touch actuation for clear indication of circuit status
- Solder lug/.110" (2.8mm) quick connect terminals

Power Level: 3A @ 125V AC or 3A @ 250V AC

Contact Resistance: 50 milliohms max

Insulation Resistance: 200 megohms min @ 500V DC

Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min

Mechanical Life: 1,000,000 operations min

Electrical Life: 100,000 operations min

Nominal Operating Force: 1.5N

Travel: Pretravel .059" (1.5mm); Overtravel .059" (1.5mm); Total Travel .118" (3.0mm)

Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## MRK206-A PROCESS SEALED ROTARY

### Characteristics & Specifications

#### MR Series Half-Inch Diameter Rotary

- Meets IP67 of IEC 60529 Standards
- Interior housing seal and molded-in PC terminals, plus shaft rubber o-ring, allow cleaning after automated soldering
- Low profile and shaft actuated, with plain black knob
- Double pole switch with 2 – 6 adjustable positions
- Positive detent mechanism for distinct feel and audible feedback
- Metal bushing and housing construction increases durability
- High contact reliability as a result of self-cleaning contact mechanism

Logic Level: 0.4VA max @ 28V AC/DC max (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

Contact Resistance: 50 milliohms max

Insulation Resistance: 100 megohms min @ 500V DC

Dielectric Strength: 500V AC min for 1 minute min

Mechanical Life: 30,000 operations min

Electrical Life: 10,000 operations min

Range of Operating Torque: 0.005 ~ 0.02Nm

Indexing: 30°

Operating Temperature Range: -10°C ~ +70°C (+14°F ~ +158°F)