Ingress Protection Rating

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

Coarse environments and their elements can present a challenge to electromechanical switches, and NKK's switches are the best defense. Designed specifically for the hazards of heat, cold, humidity and exposure to elements, NKK has an extensive selection of environmentally sealed switches. When applications demand fierce quality and reliability, look to NKK as the dependable source. Toggles, rockers, pushbuttons (including emergency stop devices), programmables, and rotaries are included in the IP rated group, many of which have accessory options to further enhance performance.

Toggles				
	Series	**Size / Specifications**	**Features**	**Rating**
	B Series Process Sealed Antistatic	Subminiature 0.4VA @ 28V AC/DC	6mm diameter threaded bushing for panel seal mounting. Straight PC terminals Totally sealed body construction Operating temperature –30°C ~ +85°C	**IP65** front panel
	M Series Dual Seal	Miniature 6A @ 125V AC 3A @ 250V AC 0.4VA @ 28V AC/DC	12mm diameter threaded D-flat bushing Internal o-ring & external rubber washer Waterproof boot at base of toggle Operating temperature –30°C ~ +85°C	**IP68** front panel
	M Series Splashproof Boots	Miniature 6A @ 125V AC 3A @ 250V AC 0.4VA @ 28V AC/DC	Small bushings ¼-40 or 6mm; large bushing 12mm; locking levers ¼-40 or 6mm (all threaded splashproof with D flat) Operating temperature –30°C ~ +85°C	**IP67** front panel with boots AT401, AT402S, AT428 or AT4181
	S Series Quick Connect Terminals	Standard 15 ~ 20A @ 125V AC 6 ~ 20A @ 250V AC	Medium capacity; quick connect terminals 12mm diameter threaded bushing Optional splashproof boot assemblies Operating temperature –10°C ~ +70°C	**IP65** front panel with boots AT401 or AT402
	S Series Panel Seal with AW Bushing	Standard 15 ~ 20A @ 125V AC 6 ~ 15A @ 250V AC	Medium capacity; solder lug terminals 12mm diameter threaded D-flat bushing Optional splashproof boot assemblies Operating temperature –30°C ~ +70°C	**IP67** front panel with boots AT401 or AT4181
	S Series Locking Lever & Panel Seal	Standard 15 ~ 20A @ 125V AC 6 ~ 15A @ 250V AC	Medium capacity; solder lug terminals 12mm diameter threaded D-flat bushing Includes AT537 o-ring Operating temperature –30°C ~ +70°C	**IP67** front panel

Toggles

Series	Size / Specifications	Features	Rating
S Series Dual Seal	Standard 15A @ 125V AC 6A ~ 15A @ 250V AC 15 ~ 20A @ 30V DC	12mm diameter threaded D-flat bushing Internal o-ring & external rubber washer Waterproof boot at base of toggle Operating temperature –30°C ~ +70°C	**IP68** front panel
S Series High Capacity	Standard 30A @ 125V AC 30A @ 250V AC	12mm diameter threaded bushing Screw lug terminals Optional splashproof boot assembly Operating temperature –10°C ~ +70°C	**IP65** front panel with boot AT401
WT Series Solder Lug & Screw Lug Terminals	Standard 10A @ 125V AC 6A @ 250V AC 10A @ 30V DC	Environmentally sealed 12mm diameter D-flat threaded bushing Includes AT401P o-ring Operating temperature –30°C ~ +70°C	**IP67** front panel **IP60** back panel
WT Series Wire Leads	Standard 10A @ 125V AC 6A @ 250V AC 10A @ 30V DC	Environmentally sealed 12mm diameter D-flat threaded bushing Includes AT401P o-ring Operating temperature –30°C ~ +70°C	**IP67** front & back panel

Rockers

Series	Size / Specifications	Features	Rating
JW Series High Inrush 10A	Standard JWMW Model 10A @ 125/250V AC 10A @ 30V DC	Panel seal; handles large inrush current Increased electrical life; less contact bounce Solder lug/quick connect terminals Operating temperature –25°C ~ +85°C	**IP67** front panel
JW Series High Inrush 16A	Standard JWLW Model 16A @ 125/250V AC 5A @ 72V DC	Panel seal; handles large inrush current Increased electrical life; less contact bounce Solder lug/quick connect terminals Operating temperature –25°C ~ +85°C	**IP67** front panel
WR Series Solder Lug, Screw Lug, Quick Connect Terminals	Standard 15A @ 125/250V AC 15A @ 30V DC	Environmentally sealed; high arc resistant Minimal contact bounce UL94-V0 flammability standard for housing Operating temperature –25°C ~ +85°C	**IP67** front panel **IP60** back panel
WR Series Wire Leads	Standard 15A @ 125/250V AC 15A @ 30V DC	Environmentally sealed; high arc resistant Minimal contact bounce UL94-V0 flammability standard for housing Operating temperature –25°C ~ +85°C	**IP67** front & back panel

Emergency Stop Pushbuttons

	Series	Size / Specifications	Features	Rating
	FF01 Series Emergency Stop	Standard 0.5A @ 24V DC	Low profile, short behind panel depth 16mm bushing. Accessories with legends Insert-molded solder lug terminals Operating temperature –25°C ~ +60°C	**IP65** front panel *(Designed for indoor use)*

Pushbuttons

	Series	Size / Specifications	Features	Rating
	LB Series Front Panel Relamping	Standard 3A @ 125/250V AC 3A @ 30V DC	Panel seal; Illumination in several options 22mm diameter threaded bushing Solder lug/quick connect terminals Operating temperature –25°C ~ +50°C	**IP65** front panel
	MBN Series Splashproof Bushings	Miniature 6A @ 125V AC 3A @ 250V AC 0.4VA @ 28V AC/DC	Small (D3, 1/4-40 thread) or large (B3, 12mm thread) splashproof bushings AT516 or AT401P o-rings included Operating temperature –30°C ~ +85°C	**IP67** front panel
	MBN Series Splashproof Boot	Miniature 6A @ 125V AC 3A @ 250V AC 0.4VA @ 28V AC/DC	12mm diameter threaded bushing B1 No cap needed with optional splashproof boot Several terminal options Operating temperature –30°C ~ +85°C	**IP65** front panel with boot AT4043
	WB Series Solder Lug & Screw Lug Terminals	Standard 6A @ 125V AC 3A @ 250V AC 6A @ 30V DC	Environmentally sealed 12mm diameter D-flat threaded bushing Housing meets UL94V-0 standards Operating temperature –30°C ~ +70°C	**IP67** front panel **IP60** back panel
	WB Series Wire Leads	Standard 6A @ 125V AC 3A @ 250V AC 6A @ 30V DC	Environmentally sealed 12mm diameter D-flat threaded bushing Housing meets UL94V-0 standards Operating temperature –30°C ~ +70°C	**IP67** front & back panel
	YB Series Full Face Illumination	Miniature 3A @ 125V AC 3A @ 250V AC 0.4VA @ 28V AC/DC	Panel seal, illuminated, 16mm diameter threaded bushing; solder lug/quick connect Includes mounting nut & AT089 o-ring Operating temperature –25°C ~ +50°C	**IP65** front panel
	YB2 Series Tamper Resistant Actuators	Standard 3A @ 125V AC 3A @ 250V AC 0.4VA @ 28V AC/DC	Panel seal, illuminated, 16mm diameter threaded bushing; solder lug/quick connect Includes 2 o-rings Operating temperature –25°C ~ +50°C	**IP65** front panel

Programmable

Series	Size / Specifications	Features	Rating
IS Series SmartDisplay OLED Rocker	Standard 3VA @ 24V DC Applicable Range 10mA ~125mA@0.1V~24V DC	Snap-in panel mount rocker/pushbutton Three-switch functionality; monochrome 96 x 64 pixel format. Low profile Operating temperature –20°C ~ +70°C	**IP64** front panel

Rotaries

Series	Size / Specifications	Features	Rating
MR Series Metal Bushing & Housing	Miniature MRK Model 0.4VA @ 28V AC/DC	6mm diameter double flat threaded bushing Shaft actuated. Includes AT535 o- ring Process sealed; PC terminals; 30° step size Operating temperature –10°C ~ +70°C	**IP67** front panel
MRB Series Sealed Construction	Miniature 0.4VA @ 28V AC/DC	6mm diameter double flat threaded bushing Panel seal with optional AT535 o-ring Bracket, PC terminals; 45° & 90° step sizes Operating temperature –10°C ~ +70°C	**IP67** front panel

NKK's selection of accessories and hardware offers added protection or customization for switches. Panel seal qualities are enhanced with use of protective rubber boots for toggles or pushbuttons, and the boots offer extended defense against environmental elements. Additional security for pushbuttons or rockers is provided by NKK's line of protective guards and covers.

Panel Seal Boots

The splashproof boots seal switches to achieve IP65 rating or greater at the front panel.

Part Number	AT401 Half Boot	AT402 & AT402S Full Boots	AT428 Full Boot	AT4041 & AT4042 Full Boots	AT4043 Full Boot	AT4181 Full Boot
IP65 or Greater						
Material	**AT401A for Oil Resistance:** Nitrile Butadiene Rubber **AT401H for Dust & Ozone Resistance:** Ethylene Propylene Rubber **AT401S for Flexibility, Resilience, Tensile Strength over Wide Temp Range:** Silicone Rubber	**AT402:** Silicone Rubber for Black, Red, Yellow or Green Ethylene Propylene Rubber for Gray **AT402S:** Silicone Rubber	Silicone Rubber	**AT4041:** For Momentary **AT4042:** For Alternate Silicone Rubber	Silicone Rubber	Silicone Rubber
Color	**AT401A:** Black **AT401H:** Gray **AT401S:** Black	**AT402:** Black, Red, Yellow, Green or Gray **AT402S:** Black	Black	Black	Black	Black
Bushing	12mm	12mm	M6 or 1/4–40 Thd	M6 or 1/4–40 Thd	12mm	12mm
Series	MN S WT	**AT402:** MN S **AT402S:** MN	D2 MN	MBN	MBN SB WB	MN S WT

SmartDisplay™ Splashproof Overlay

IP65 Rated Protection for Programmable Switches

IP65	Part Number	IS-SPA4X4A	IS-SPA2X2A	IS-SPA1X2A	IS-SPA1X1A
Number of Switches	Rows	4	2	1	1
	Columns	4	2	2	1
Dimensions	Width	125mm	80mm	80mm	55mm
	Height	115mm	74mm	53mm	53mm

The SmartDisplay overlay provides increased protection for SmartDisplay or any products where additional safeguarding is required. Installing over the switch cutout opening is sufficient to make the cutout splashproof. To achieve an IP65 rating, a supporting bezel is ideally used to reinforce the adhesive tape.

Products come in a package of two individual overlays in several standard sizes that cover typical size configurations of the SmartDisplay.

For custom sizes, contact engineering@nkkswitches.com.

Protective Guards & Covers

Part Number	AT499 Protective Guard	AT4001 Dust Cover	AT4002 Dust Cover	AT4072 Protective Guard
Material	Cover: Polycarbonate Base: Polyamide	Lid: Polyvinyl Chloride Gasket: Polyethylene	Lid: Polyvinyl Chloride Gasket: Polyethylene	Cover: Polycarbonate Base: Glass Fiber Reinforced Polycarbonate
Notes	Opens 90°, Closes Manually. Reduces Depth of Switch Behind Panel by .020" (0.5mm)	Reduces Depth of Switch Behind Panel by .020" (0.5mm)	Reduces Depth of Switch Behind Panel by .020" (0.5mm)	Opens 90°, Closes Manually. Reduces Depth of Switch Behind Panel by .047" (1.2mm)
Series	LB	LB UB	LB	YB

Part Number	AT4115 Dust/Splash Cover	AT4126 Dust Cover	AT4173 Protective Guard	AT9410 Splash Cover
Material	Lid: Polyvinyl Chloride Base: Polyamide	Lid: Polyvinyl Chloride Base: Polyamide	Cover: Polycarbonate Base: Polyamide Coil Spring: Stainless Steel	Lid: Polyvinyl Chloride Base: Polyethylene O-ring: Nitrile Butadiene Rubber
Notes	For Snap-in or Bushing Mount. Reduces Depth of Switch Behind Panel by .047" (1.2mm)	Rocker is Operable with Dust Cover in Place. Reduces Depth of Switch Behind Panel by .024" (0.6mm)	For Snap-in Model. Opens 180°, Closes Automatically	Reduces Depth of Switch Behind Panel by .020" (0.5mm)
Series	YB	JWL	UB	LB Panel Seal

Part Number	AT4142 Protective Guard	AT4145 Dust Cover	AT4172 Protective Guard	AT4175 Protective Guard
Material	Cover: Polycarbonate Base: GFR Polyamide Coil Spring: Stainless Steel	Lid: Polyvinyl Chloride Gasket: Polyethylene	Cover: Polycarbonate Base: GFR Polyamide Coil Spring: Stainless Steel	Cover: Polycarbonate Base: GFR Polyamide Coil Spring: Stainless Steel
Notes	For Snap-in Model. Opens 180°, Closes Automatically. Reduces Depth of Switch Behind Panel by .020" (0.5mm)	Not for Use with Barriers. Reduces Depth of Switch Behind Panel by .028" (0.7mm)	For Snap-in Model. Opens 180°, Closes Automatically. Reduces Depth of Switch Behind Panel by .020" (0.5mm)	Opens 180°, Closes Automatically. Reduces Depth of Switch Behind Panel by .047" (1.2mm)
Series	UB2	UB2	LB UB	YB