

General Specifications

Electrical Capacity (Resistive Load)

Low Level: 100mA maximum @ 12V DC

Other Ratings

Contact Resistance: 200 milliohms maximum

Insulation Resistance: 100 megohms minimum @ 250V DC

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

Mechanical Life: 5,000,000 operations minimum;
1,000,000 operations minimum for Rectangular Switch/Cap Assembly (at center of cap)

Electrical Life: 5,000,000 operations minimum;
1,000,000 operations minimum for Rectangular Switch/Cap Assembly (at center of cap)

Nominal Operating Force: **KP01:** 1.9N maximum for Tactile & Nontactile models (at center of cap)
KP02: 1.6N maximum for Tactile, Nontactile & Tactile/Audible models (at center of cap)

Travel: **KP01:** Pretravel .122" (3.1mm); Overtravel .055" (1.4mm); Total Travel .177" (4.5mm)
KP02: Pretravel .091" (2.3mm); Overtravel .047" (1.2mm); Total Travel .138" (3.5mm)

Materials & Finishes

Plunger/Upper Housing: Polyacetal

Lower Housing: Glass fiber reinforced PBT (UL94V-0)

Movable Contact: Stainless steel with gold plating

Stationary Contacts: Gold over copper alloy

Switch Terminals: Brass with tin plating

Environmental Data

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

Humidity: 90-95% humidity for 240 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: 51G (500m/s²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Installation

Cap Installation Force: 50.0N maximum downward force on actuator

PCB Processing

Soldering: Wave Soldering. Preheat temperature: 140°C @ 60 seconds;
Peak temperature: 270°C @ 11 seconds; Cycles: 2
Manual Soldering. 410°C @ 4 seconds; Cycles: 2

Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

Flammability Standards: UL94V-0 lower housing

The KP Series pushbuttons have not been tested for UL recognition or CSA certification. These switches are designed for use in a low-voltage, low-current, logic-level circuit. When used as intended in a logic-level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

KP series offers a complete switch solution for all control panel needs, including home keys and the rectangular switch/cap assembly.

Distinct, long total travel of .177" (4.5mm) for KP01 or shorter stroke of .138" (3.5mm) for KP02.

Available with super bright RGBP LED. The RGBP LED provides vibrant full color spectrum in unlimited color combinations and is offered with 4-pin terminations.

Unique actuation guide gives positive indication of circuit transfer as well as smooth and silent operation.

Choices of tactile, nontactile or tactile/audible actuation.

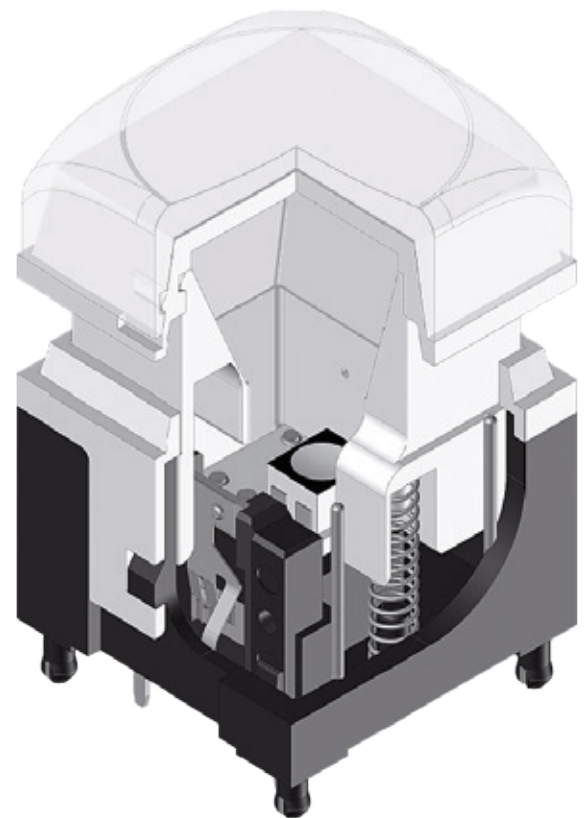
Compact design with height of .906" (23.0mm) from PC board to top of cap (same height as programmable SmartDisplay).

Flat, sculptured or home key square caps in three common sizes for design flexibility in various applications.

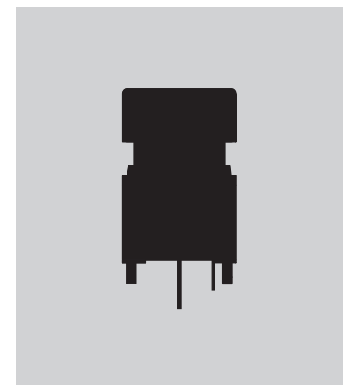
Twin contacts with gold plating assure high reliability and long life of 5,000,000 operations minimum.

Improved profile for soldering specifications.

Custom legends available.



Actual Size



Toggles

Rockers

Pushbuttons

D Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

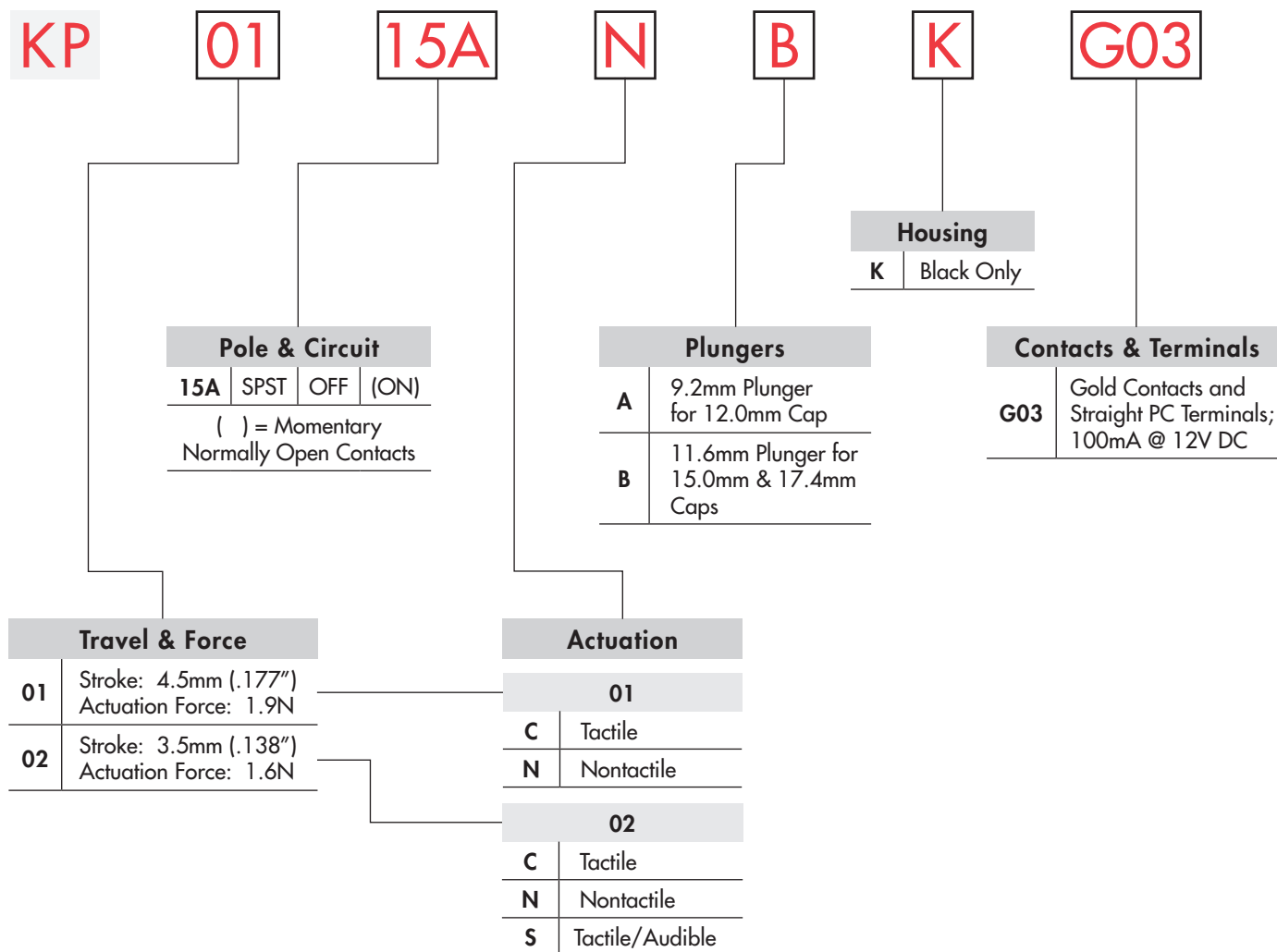
Touch

Indicators

Accessories

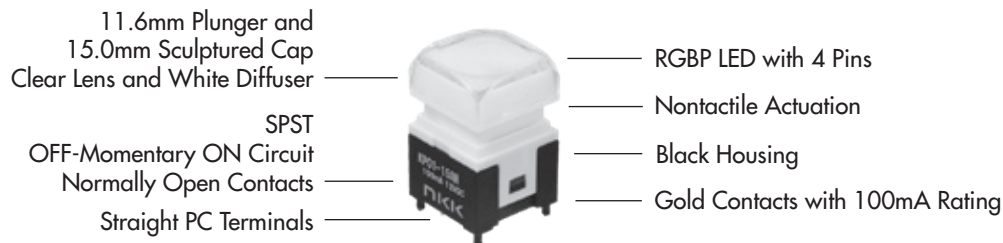
Supplement

TYPICAL SWITCH



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

KP0115ANBKG03RGBP-2SJB



ORDERING EXAMPLE

RGBP

—

2

S

JB






LED	
RGBP	Red/Green/Blue 4-Pin

Cap Sizes	
1	12.0mm Square
2	15.0mm Square
3	17.4mm Square
Note: See page 43 for Rectangular Cap Options	

Cap Types	
F	Flat
S	Sculptured
T	Home Key

Cap Colors	
JB	Clear Lens & White Diffuser

POLE & CIRCUIT

		Plunger Position () = Momentary		Connected Terminals		Throw & Switch Schematic
Pole	Model	Normal	Down	Normal	Down	Note: Switch terminals "1" & "1a" are actually marked on the switch. 
SP	KP0115A KP0215A	OFF 	(ON) 	Normally Open 	1-1a 	

ACTUATION



Tactile

KP01 or KP02



Nontactile

KP01 or KP02



Tactile/Audible

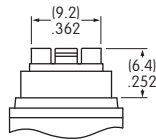
KP02 only

PLUNGERS



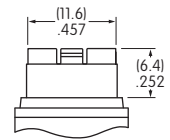
**9.2mm Plunger
for 12.0mm Cap**

9.2mm Plunger is designed with a narrower neck to hold the 12.0mm Cap.



**11.6mm Plunger
for 15.0mm & 17.4mm Caps**

11.6mm Plunger is designed with a wider neck to hold both the 15.0mm and 17.4mm Caps.



HOUSING



Black Only

CONTACTS, TERMINALS, & RATING



Gold Contacts

Straight PC Terminals

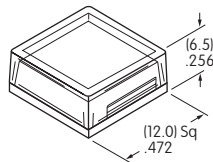
100mA @ 12V DC

CAP TYPES & COLORS

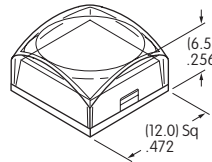
Caps for RGBP

1 12.0mm Square Used on A Plunger

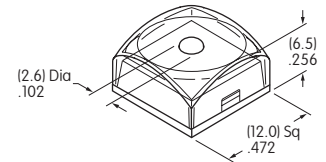
F AT3083 Flat Cap



S AT3078 Sculptured Cap

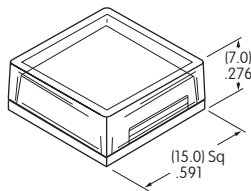


T AT3086 Home Key Cap

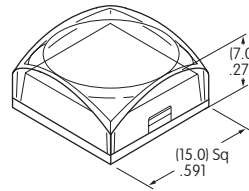


2 15.0mm Square Used on B Plunger

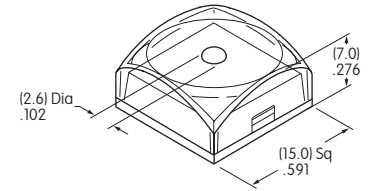
F AT3084 Flat Cap



S AT3079 Sculptured Cap

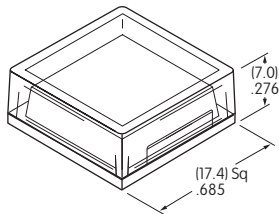


T AT3087 Home Key Cap

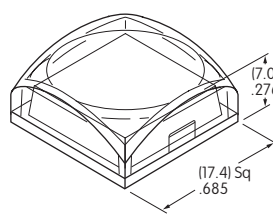


3 17.4mm Square Used on B Plunger

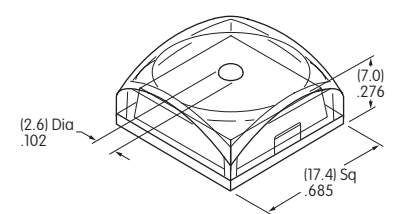
F AT3085 Flat Cap



S AT3080 Sculptured Cap



T AT3088 Home Key Cap



JB Lens & Diffuser Colors Available:

Clear/White

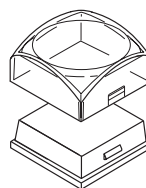
Materials & Finishes:

Lens - Polycarbonate with glossy finish

Diffuser - Polycarbonate with textured finish

Optional Protective Guard AT4170

available; contact factory.



Clear Lens

White Diffuser

Optional Protective Guard



LED SPECIFICATIONS • RGBP with 4 Pins

The electrical specifications shown are determined at a basic temperature of 25°C.

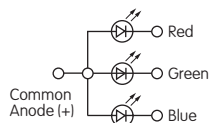
LEDs are an integral part of the switch and are not available separately.

LED circuit is isolated and requires an external power source.

If the source voltage exceeds the rated voltage, a ballast resistor is required.

The resistor value can be calculated by using the formula in the Supplement Section.

Note: For applications that require white illumination, contact factory.



RGBP

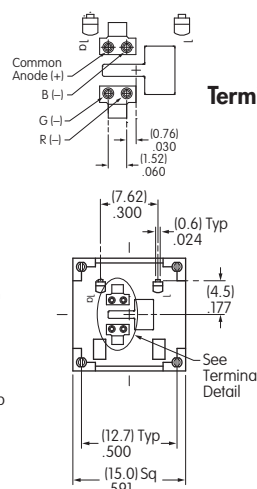
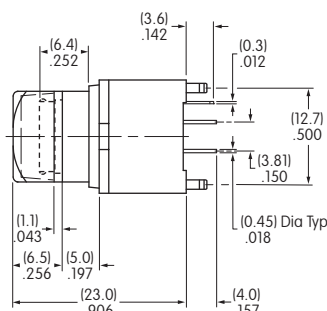
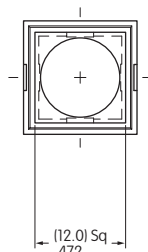
	Color	Red	Green	Blue	Unit
Maximum Forward Current	I_{FM}	50	30	30	mA
Typical Forward Current	I_F	15	16	10	mA
*Forward Voltage	V_F	2.0	2.9	2.9	V
Power Peak Dissipation	P_D	100	80	80	mW
Maximum Reverse Voltage	V_{RM}	5	5	5	V
Dominant Wavelength	λ_d	620	525	467	nm
Current Reduction Rate Above 25°C	Δ_{IF}	0.75	0.25	**0.22	mA/°C
Ambient Temperature Range		-25 ~ +50			°C

*Forward Voltage (V_F) and Dominant Wavelength (λ_d) are Typical Value measured by Typical Forward Current (I_F).

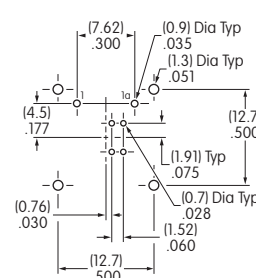
**Current Reduction Rate (Δ_{IF}) Above 40°C

TYPICAL SWITCH DIMENSIONS

12.0mm Square Cap with RGBP LED

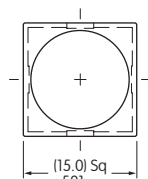


Terminal Detail

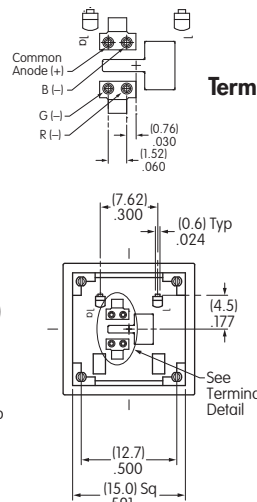
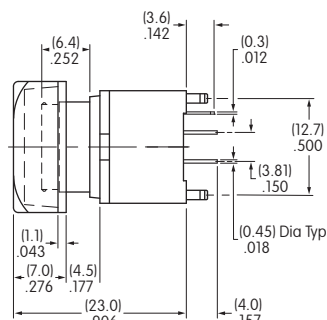


KP0115ACAKG03RGBP-1SJB

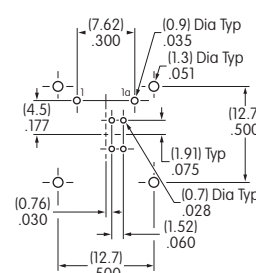
15.0mm & 17.4mm Square Caps with RGBP LEDs



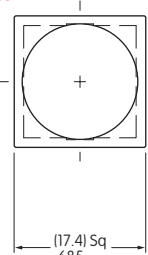
15.0mm Cap



Terminal Detail



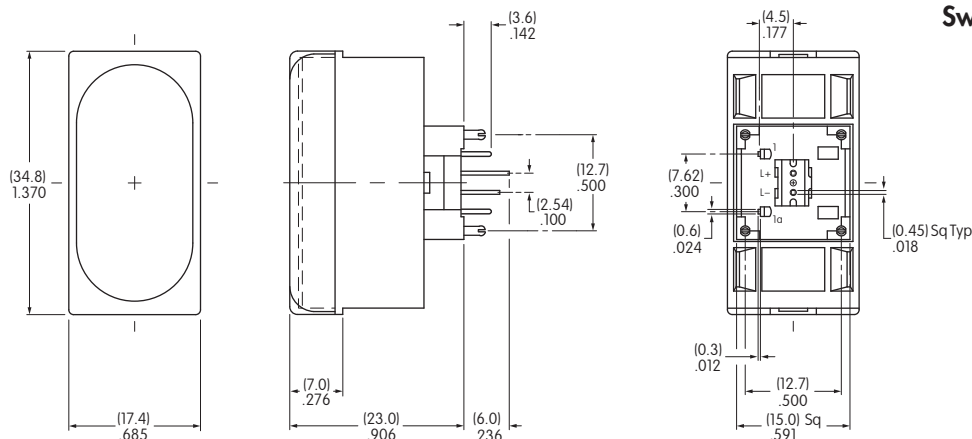
KP0115ANBKG03RGBP-2SJB



17.4mm Cap

KP0115ANBKG03RGBP-3SJB

RECTANGULAR CAP ASSEMBLY CAP ASSEMBLY DIMENSIONS



Switch/Rectangular Cap Assembly



KP0115ACBKG03CJB for Tactile
KP0115ANBKG03CJB for Nontactile

See below for complete assembly of switch, LEDs and LED holders.

LED SPECIFICATIONS

The electrical specifications shown are determined at a basic temperature of 25°C. Center LED is an integral part of the switch. LEDs are not sold separately. LED circuits are isolated and require an external power source. If the source voltage exceeds the rated voltage, a ballast resistor is required. The resistor value can be calculated by using the formula in the Supplement Section.

		Color	Red	Unit
	(+) O — (LED) — O (-)			
Maximum Forward Current	I_{FM}		30	mA
Typical Forward Current	I_F		20	mA
Forward Voltage	V_F		2.0	V
Maximum Reverse Voltage	V_{RM}		4	V
Dominant Wavelength	λ_d		623	nm
Current Reduction Rate Above 25°C	ΔI_F		0.32	mA/°C
Ambient Temperature Range			-25 ~ +50	°C

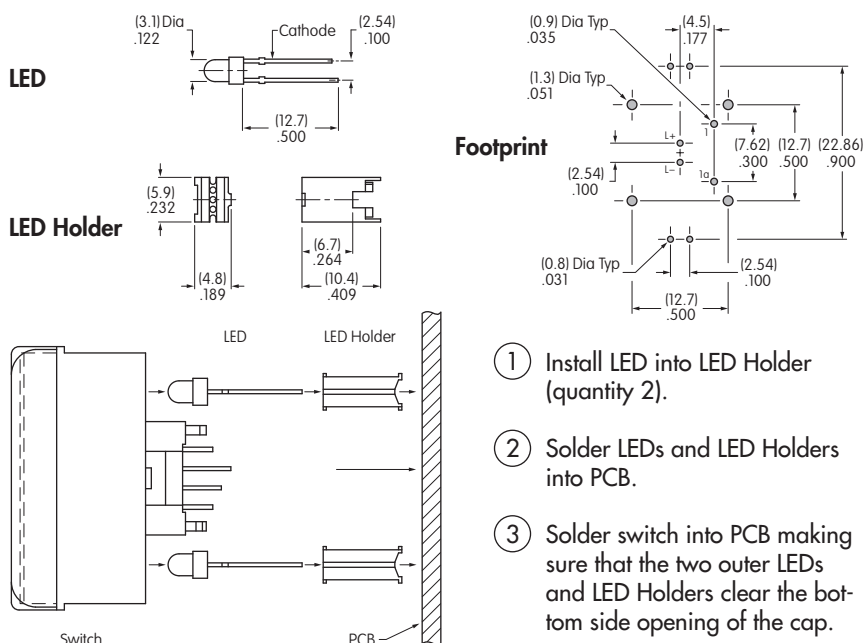
Contact factory for other LED colors.

ASSEMBLY & INSTALLATION INSTRUCTIONS



Switch/Rectangular Cap assembly has 3 LEDs to achieve bright and even illumination.

One LED (in center of switch bottom) is an integral part of the switch; the other 2 LEDs and 2 LED Holders are packaged separately.

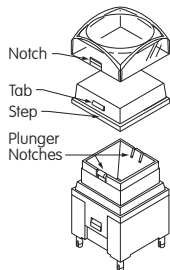


ASSEMBLY INSTRUCTIONS FOR SQUARE CAPS



Cap Orientation

As shown in the accompanying illustration, the cap and plunger are designed with tabs and notches to assure proper orientation of the cap on the switch.

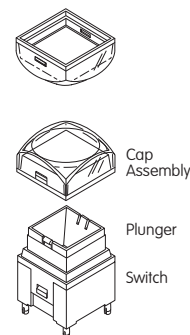


Removal of Cap Assembly & Separation of Lens & Diffuser

Holding the switch tightly, pull the cap off the switch. Once the cap assembly is released from the plunger, the lens and diffuser can be separated. Pry up the lens with fingernail or flat tip screwdriver inserted at the step on the diffuser.

Installation or Replacement of Cap

After aligning notches with tabs, join the lens and diffuser. Hold the switch tightly without touching the terminals. Firmly press the cap onto the plunger by applying pressure from one side to the other until both are snapped together.



LEGENDS

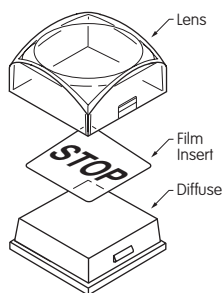
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Areas for KP Lens

Recommended Methods:

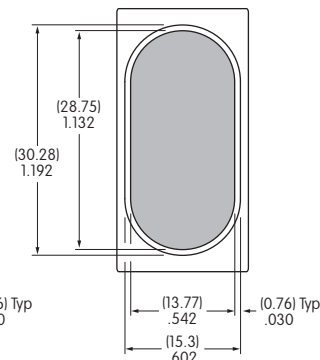
Laser Etch on clear lens, Screen Print, or Pad Print on lens.
Laser Print on film insert.
Epoxy based ink is recommended.

Shaded areas are suggested printable areas for Lens.

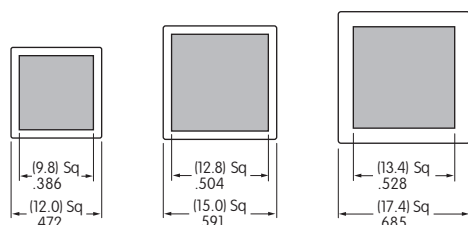


Printing on Diffuser is not advisable.

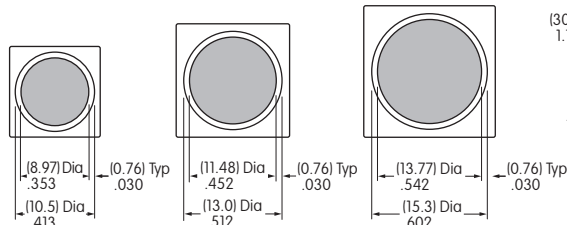
Rectangular Cap Lens



Flat Cap Lens



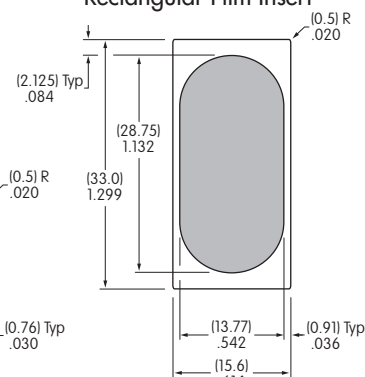
Sculptured Cap Lens



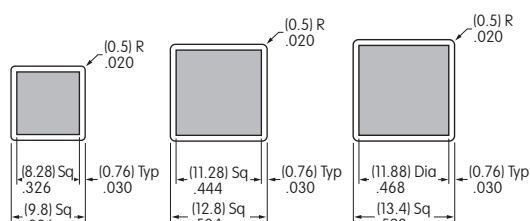
Suggested Printable Areas for KP Film Insert

Shaded areas are suggested printable areas for Film Insert.

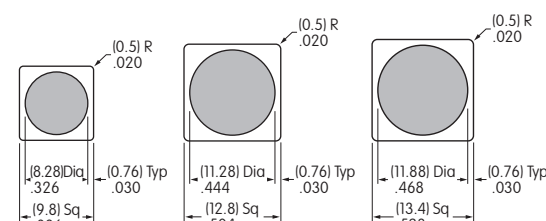
Rectangular Film Insert



Flat Cap Film Inserts



Sculptured or Home Key Cap Film Inserts



Film Insert Material and Thickness: Clear Polyester; 4 mil (100μ) maximum thickness