

Toggle



FP01 Series D4

Photo Interrupter
3 Million Actuations
6-pin Connector
Snap-in Mount

Rockers

Pushbuttons



GB Series D8

Ultra-miniature Fully Illuminated Plunger
0.4VA Logic Level
Process Sealed; Straight, Right Angle & Vertical PC

Illuminated PB

Programmable



HB Series Illum & Nonillum D12

0.1A Power Level; Full Face & Spot Illumination
Solder Lug
Rear Panel Threaded Mounting

Keylocks

Rotaries



HB2 Series D18

Audio/Video Quiet Actuation; 0.4VA Logic Level
Bicolor LED
PCB Mounting

Slides

Tactiles



KB Series Illum & Nonillum D22

1A Power Level & 0.4VA Logic Level
Full Face & Spot Illumination
Solder Lug; Bushing & Snap-in Mount

Tilt

Touch



KP Series D36

Audio/Video with Silent & Audible Options
100mA Low Level
Bicolor & RGB LEDs; Alternating Legends
Rectangular Cap Assembly & Home Keys
PCB Mounting

Indicators

Accessories



LB Series Illum & Nonillum D48

Snap-in Mount
3A Power Level & 0.4VA Logic Level
Full Face & Spot Illumination; Super Bright & Bright LEDs
Solder Lug/Quick Connect

Supplement



LB Series Illum & NonillumD59

Panel Seal
 3A Power Level & 0.4VA Logic Level
 Full Face & Spot Illumination; Super Bright & Bright LEDs
 Solder Lug/Quick Connect



LP01 SeriesD68

Secured Cap Design; 3A Power Level
 Full Face Illumination, Spot Illumination
 Solder Lug/Quick Connect



NPO1 Series Illum & Nonillum....D74

Soft Touch, Smooth Actuation
 0.4VA Logic Level
 Bicolor Alternating Legends
 PCB Mounting



UB Series Illum & NonillumD80

5A Power Level & 0.4VA Logic Level
 Full Face & Spot Illumination; Bicolor Alternating Legends
 Solder Lug & Straight PC
 PCB & Snap-in Mount



UB2 Series Illum & NonillumD92

5A Power Level & 0.4VA Logic Level
 Variety of Illumination Effects; Alternating Legends
 Bright, Super Bright, & Bicolor LEDs
 Solder Lug & Straight PC; PCB & Snap-in Mount



YB Series Illum & Nonillum D104

3A Power Level & 0.4VA Logic Level
 Full Face & Spot Illumination
 Incandescent & Multi-element LEDs
 Solder Lug/Quick Connect & Straight PC
 Bushing & Snap-in Mount



YB2 Series Illum & Nonillum D118

22mm Flush Mount Panel Seal
 3A Power Level & 0.4VA Logic Level
 Cap Option with Illumination Ring
 Solder Lug/Quick Connect

Toggle

Rockers

Pushbuttons

D Illuminated PB

Programmable

Keylocks

Rotaries

Slides

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Supplement
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Illuminated PB
Pushbuttons
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Toggles

Distinctive Characteristics

Brilliant illumination for highly visible status indication with LEDs and caps in red, green, or amber; subdued illumination for low light requirements with white cap over red, green, or amber LEDs.

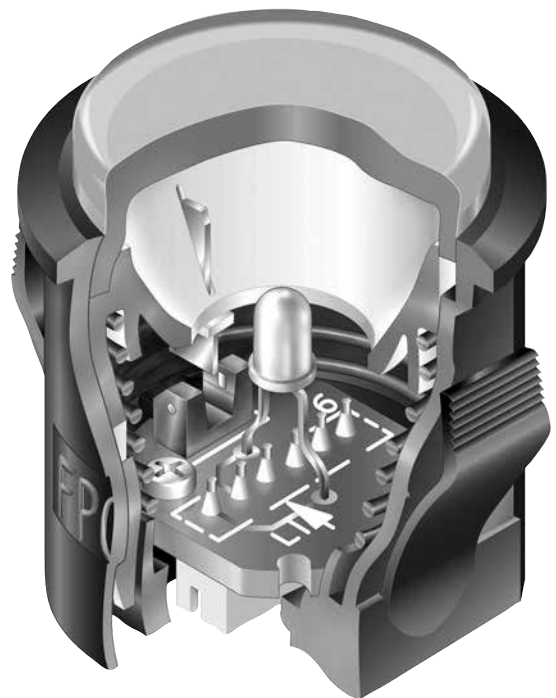
Photo interrupter, rather than contacts, ensures high reliability and long life of 3 million operations minimum.

Rugged construction and smooth actuation allow repeated, rapid actuation force anywhere on cap surface.

Snap-in mounting for easy installation.

Connector socket with 6 pins for simple connection.

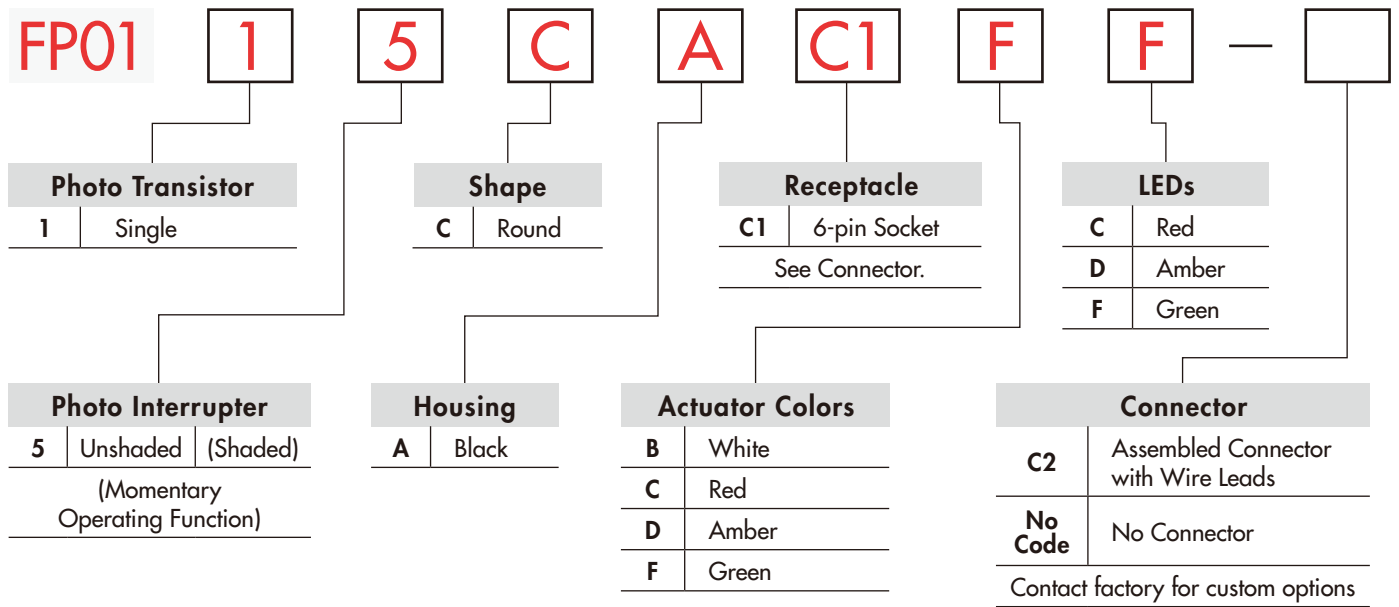
Well suited for gaming and vending machines, as well as equipment exposed to corrosive gases used in environments such as chemical or steel manufacturing plants.



Actual Size



TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

FP0115CAC1FF



ACTUATOR & INTERRUPTER

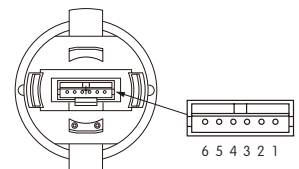
		Actuator Position		Photo Interrupter		Schematics
Model	1	Normal	Down	Unshaded	Shaded	LED connector pins are 5 & 6; interrupter connector pins are 3-4 & 1-2.
				5	Normally Unshaded with Momentary Shaded status	
FP0115	Single Photo Transistor	When shaded, the photo transistor momentarily activates electrical function which signals the external device to change its state.				

HOUSING SHAPE & COLOR

C Round Shape **A** Black Housing

RECEPTACLE

C1 6-pin Socket



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SWITCH SPECIFICATIONS

	Actuator Up	Actuator Down
Status of Photo Interrupter:	Unshaded	Shaded
Collector Current I_C :	0.8mA minimum	10 μ A maximum
Status of Photo Transistor:	On	Off
Output Condition of Photo Transistor:	$I_F = 20\text{mA}$ & $V_{CE} = 5\text{V}$	

MECHANICAL SPECIFICATIONS

Total Travel:	.079" (2.0mm)
Operating Force:	0.75 N (.169 lbf)
Mechanical Life:	3,000,000 operations minimum
Operating Temperature Range:	-25°C through +50°C (-13°F through +122°F)

MATERIALS

Actuator: Polyacetal Housing: Polyamide

PHOTO INTERRUPTER SPECIFICATIONS

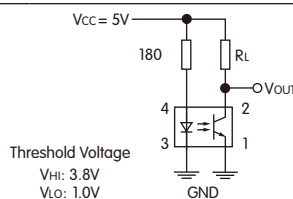
(Temperature @ 25°C)

Electrical & Optical Characteristics	Typical	Maximum	Condition
Input			
Forward Voltage V_F :	1.3V	1.6V	$I_F = 50\text{mA}$
Reverse Current I_R :		10 μ A	$F_R = 5\text{V}$
Transmission			
Collector-Emitter Saturation Voltage $V_{CE\text{ sat}}$:		0.4V	$I_F = 20\text{mA}$ & $I_C = 0.1\text{mA}$
Absolute Maximum Ratings			
Input LED		Output Photo Transistor	
Typical Forward Current I_F :	50mA	Collector-Emitter Voltage V_{CEO} :	30V
Reverse Voltage V_R :	5V	Emitter-Collector Voltage V_{ECO} :	4.5V
Power Dissipation P_D :	80mW	Collector Current I_C :	30mA
		Collector Dissipation P_C :	80mW

Circuit Design Considerations

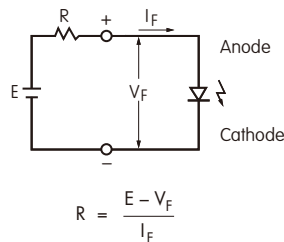
Output of the infrared LED in the photo interrupter decreases approximately 50% after 100,000 hours.

Recommended load resistance (R_L) is 10k ~ 120k Ω for the illustrated circuit.



LED COLORS & SPECIFICATIONS

LEDs are an integral part of the switch and not available separately. The electrical specifications shown are determined at a basic temperature of 25°C.



Where: R = Resistor Value (Ohms)
E = Source Voltage (V)
 V_F = Forward Voltage (V)
 I_F = Forward Current (A)

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

Single Element LED	Color	C Red	D Amber	F Green
Maximum Forward Current	I_{FM}	30mA	25mA	25mA
Typical Forward Current	I_F	20mA	20mA	20mA
Forward Voltage	V_F	1.85V	2.0V	2.25V
Maximum Reverse Voltage	V_{RM}	5V	5V	5V
Current Reduction Rate Above 25°C	ΔI_F	0.38mA /°C	0.28mA /°C	0.40mA /°C
Ambient Temperature Range		-25° ~ +50°C		

ACTUATOR COLORS

B White

C Red

D Amber

F Green

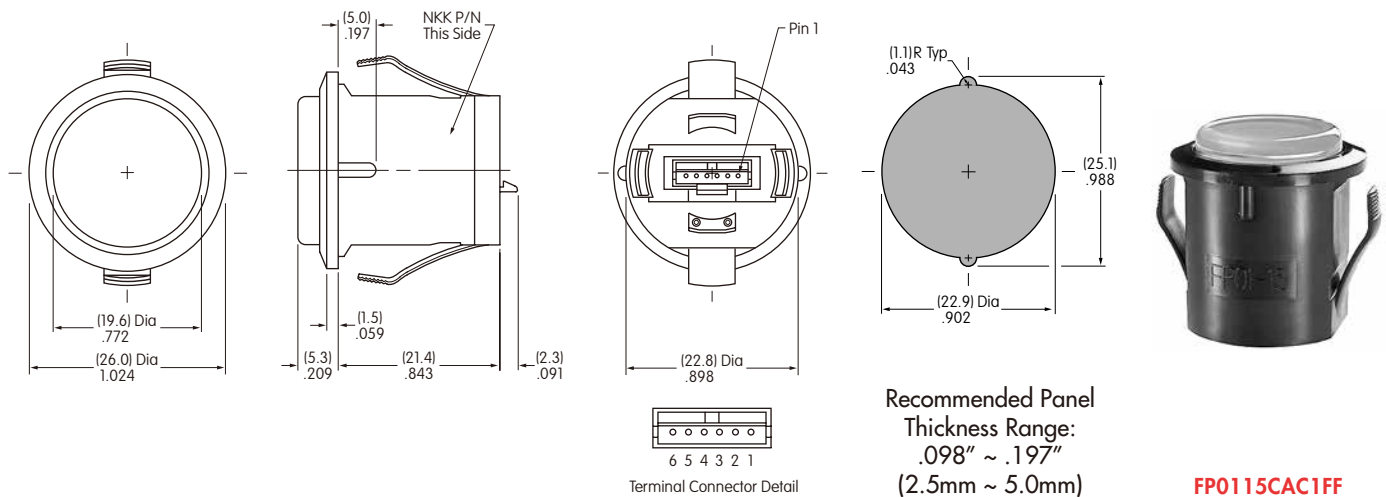
CONNECTOR OPTIONS

No Code No Connector

Recommended connector for assembly:
JST model number ZHR-6

Recommended crimp connector pins:
JST model SZH-002T-P0.5 for 28-26AWG wire leads or SZH-003T-P0.5 for 32-28AWG wire leads.

TYPICAL SWITCH DIMENSIONS



LEGENDS

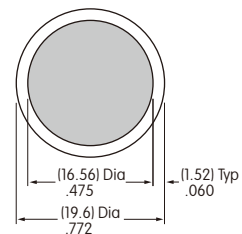
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for FP01 Cap



Recommended Methods:

Screen Print on cap.
Epoxy based ink is recommended.



Shaded area is printable area.

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