

Contents Illuminated Pushbuttons

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Rockers

Pushbuttons

Illuminated PB

Programmable

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Supplement



FPO1 Series D4

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



GB Series D8

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



HB Series Illum & Nonillum D12

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



HB2 Series D18

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



KB Series Illum & Nonillum D22

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



KP Series D36

Audio/Video with Silent & Audible Options
100mA Low Level
Bicolor LED & Custom RGB
Custom Rectangular Cap Assembly & Home Keys
PCB Mounting



LB Series Illum & Nonillum D46

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



LB Series Illum & NonillumD57

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



LP01 SeriesD66

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



NEW NPO1 Series Illum & Nonillum....D72

Soft Touch, Smooth Actuation
 0.4VA Logic Level
 Alternating Legend Options
 PCB Mounting



UB Series Illum & NonillumD78

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



UB2 Series Illum & NonillumD88

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 D100

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



NEW YB2 Series Illum & Nonillum D114

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

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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.

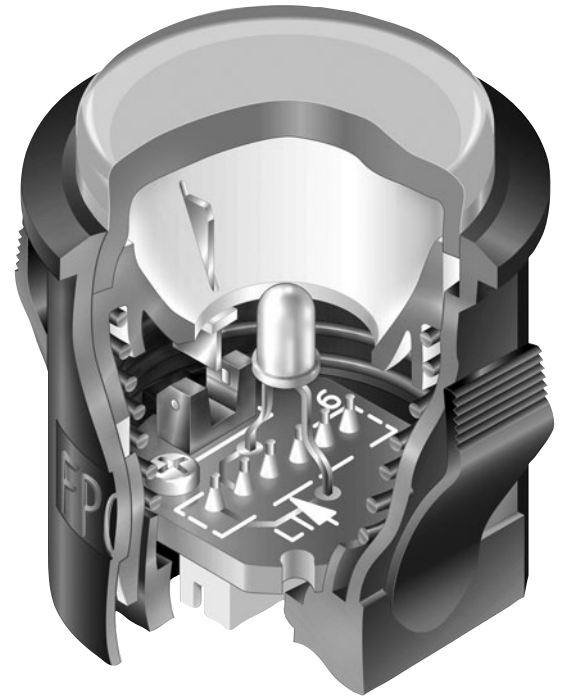
Photo interrupter, rather than contacts, ensures high reliability and long life of 3 million operations minimum.

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.

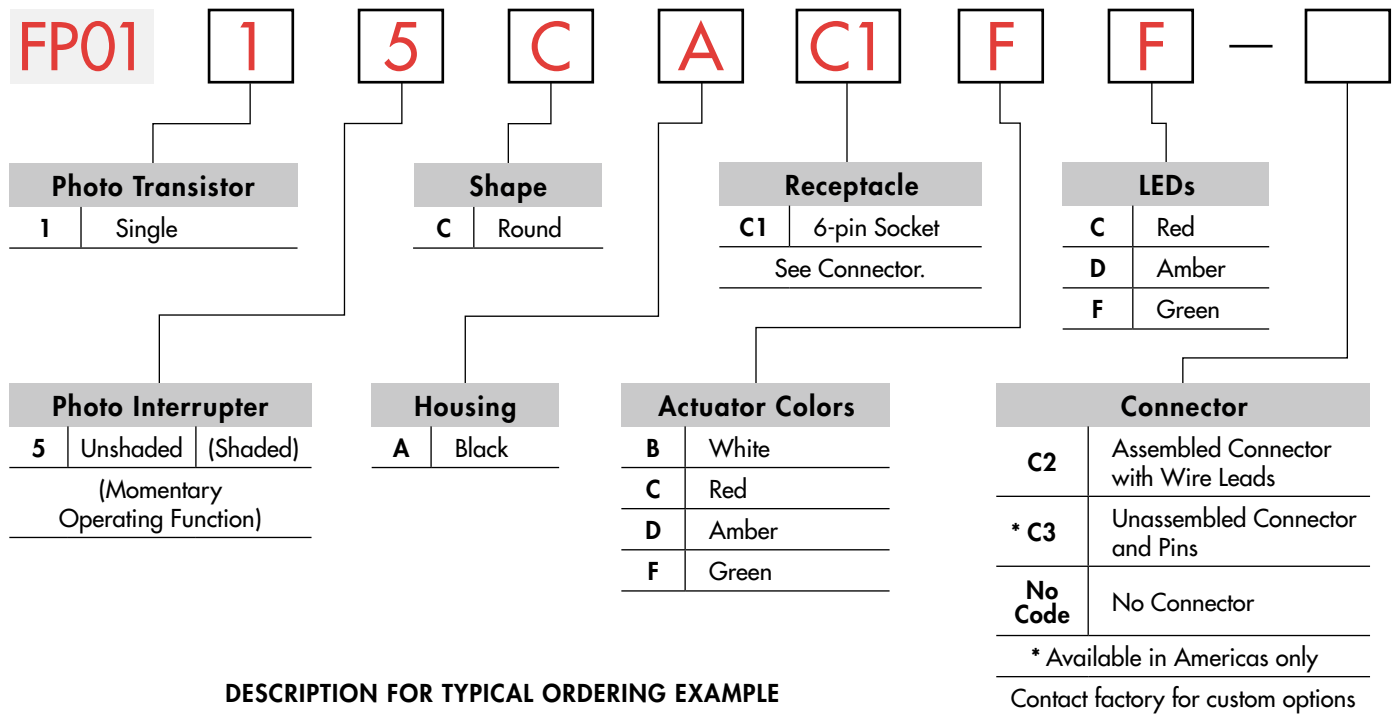
Well suited for gaming and vending machines, as well as equipment exposed to corrosive gases used in environments such as chemical or steel manufacturing plants.



Actual Size



TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

FP0115CAC1FF



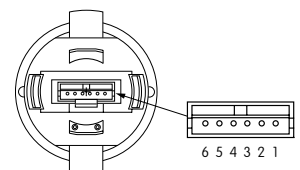
ACTUATOR & INTERRUPTER

		Actuator Position		Photo Interrupter		Schematics
Model	1	Normal 	Down 	Unshaded 5	Shaded Normally Unshaded with Momentary Shaded status	LED connector pins are 5 & 6; interrupter connector pins are 3-4 & 1-2.
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



RECEPTACLE



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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

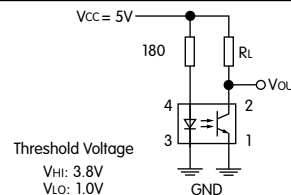
(Temperature @ 25°C)

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	
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

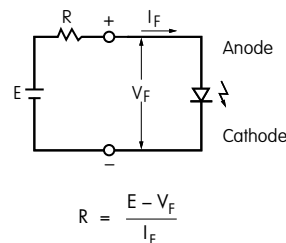
Output of the infrared LED in the photo interrupter decreases approximately 50% after 100,000 hours.

Recommended load resistance (RL) is 40k ~ 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.



$$R = \frac{E - V_F}{I_F}$$

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
Forward Peak Current	I_{FM}	30mA	25mA	25mA
Typical Forward Current	I_F	20mA	20mA	20mA
Forward Voltage	V_F	1.85V	2.0V	2.25V
Reverse Peak 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



White



Red



Amber



Green

CONNECTOR OPTIONS



AT021
Assembled Connector
with Wire Leads

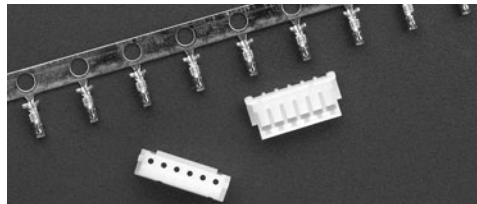
Connector body: JST model ZHR-6
Crimp connector pins: JST model SZH-002T-P0.5
Wire leads: 28-26AWG; 12-inch, unstripped;
Blue for Pin 1



AT022
Unassembled Connector
and Pins

1 connector and 8 crimp connector pins
only (no wire leads provided).

Matching wire leads: 28-26AWG

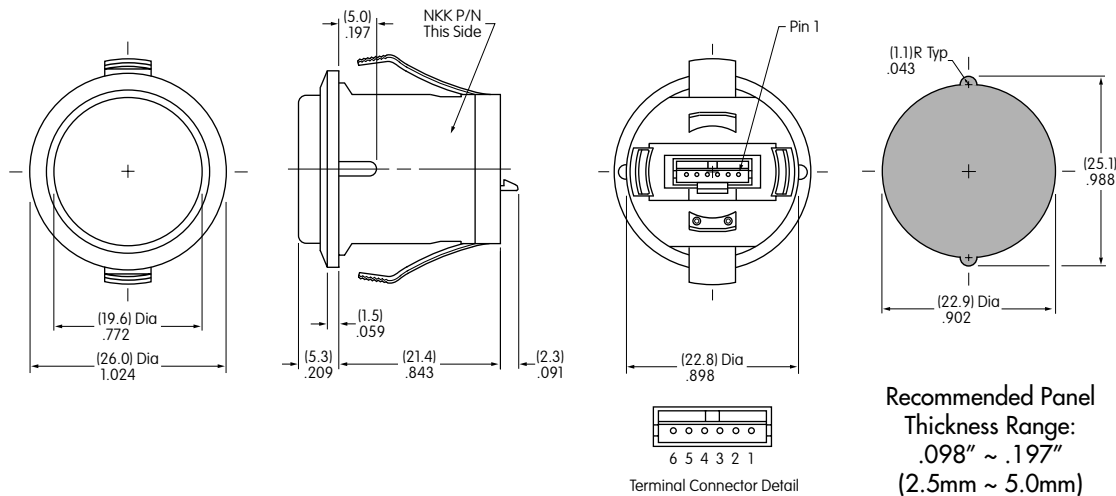


No Connector

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



Recommended Panel
Thickness Range:
.098" ~ .197"
(2.5mm ~ 5.0mm)

FP0115CAC1FF

LEGENDS

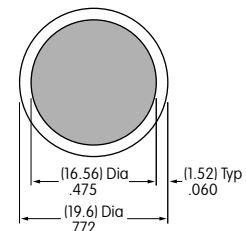
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for FP01 Cap



Recommended Methods:

Screen Print on cap.
Epoxy based ink is recommended.



Shaded area is printable area.