

# 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.

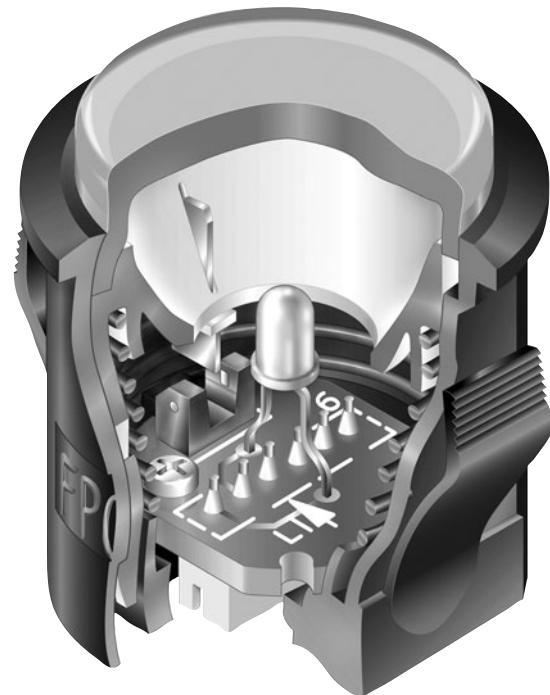
Photo interrupter, rather than contacts, ensures high reliability and long life of 3 million operations minimum.

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

FP01	1	5	C	A	C1	F	F	—	
<b>Photo Transistor</b>		<b>Shape</b>		<b>Receptacle</b>		<b>LEDs</b>			
1   Single		C   Round		C1   6-pin Socket		C   Red			
				See Connector.		D   Amber			
						F   Green			
<b>Photo Interrupter</b>		<b>Housing</b>		<b>Actuator Colors</b>		<b>Connector</b>			
5   Unshaded   (Shaded)		A   Black		B   White		C2   Assembled Connector with Wire Leads			
(Momentary Operating Function)				C   Red		* C3   Unassembled Connector and Pins			
				D   Amber		No Code   No Connector			
				F   Green					

## DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

FP0115CAC1FF



## ACTUATOR &amp; INTERRUPTER

		Actuator Position		Photo Interrupter		Schematics
Model	1	Normal	Down	Unshaded	Shaded	
				5	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.				

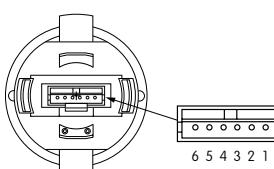
## HOUSING SHAPE &amp; COLOR

**C** Round Shape

**A** Black Housing

**C1** 6-pin Socket

## RECEPTACLE



Toggles

Rockers

Pushbuttons

D

Illuminated PB

Programmable

Keylocks

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

## SWITCH SPECIFICATIONS

	Actuator Up	Actuator Down
<b>Status of Photo Interrupter:</b>	Unshaded	Shaded
<b>Collector Current <math>I_c</math>:</b>	0.8mA minimum	10 $\mu$ A maximum
<b>Status of Photo Transistor:</b>	On	Off
<b>Output Condition of Photo Transistor:</b>	$I_F = 20mA$ & $V_{CE} = 5V$	

## MECHANICAL SPECIFICATIONS

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

## MATERIALS

Actuator: Polyacetal Housing: Polyamide

## PHOTO INTERRUPTER SPECIFICATIONS

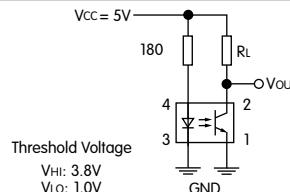
(Temperature @ 25°C)

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

## Circuit Design Considerations

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

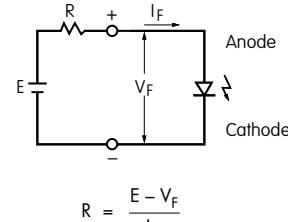
Recommended load resistance (RL) is 40k ~ 120k $\Omega$  for the illustrated circuit.



## LED COLORS &amp; 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.

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



Where: R = Resistor Value (Ohms)  
E = Source Voltage (V)  
V\_F = Forward Voltage (V)  
I\_F = Forward Current (A)

Single Element LED	Color	C	D	F
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 $\Delta I_F$	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

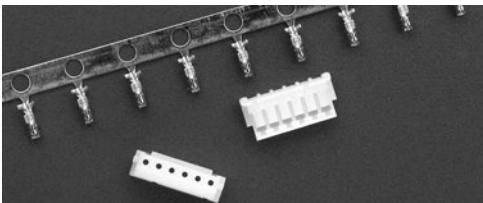
**C2** AT021  
Assembled Connector  
with Wire Leads

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

**C3** AT022  
Unassembled Connector  
and Pins

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

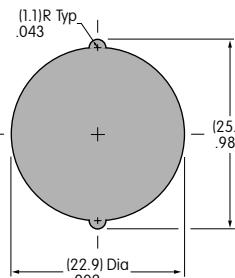
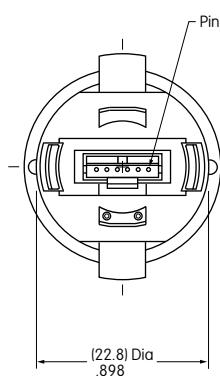
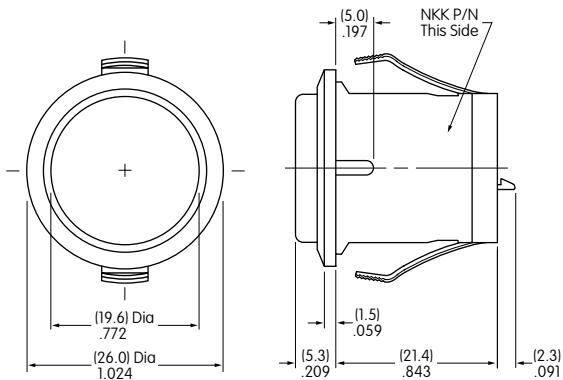
Matching wire leads: 28-26AWG

**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



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

**FP0115CAC1FF**

## LEGENDS

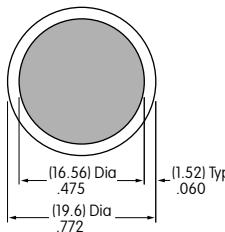
NKK Switches can provide custom legends for caps. Contact factory for more information.

## Suggested Printable Area for FP01 Cap



## Recommended Methods:

Screen Print on cap.  
 Epoxy based ink is recommended.



Shaded area is printable area.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[NKK Switches:](#)

[FP0115CAC1CC-C2-RO](#) [FP0115CAC1DD-C2-RO](#) [FP0115CAC1FF-RO](#)