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.

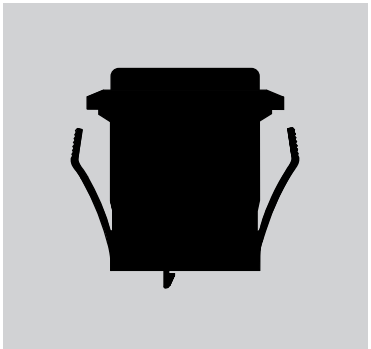
Rugged construction and smooth actuation allow repeated, rapid actuation force anywhere on cap surface.

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] — [ ]

Photo Transistor

1	Single

Shape

C	Round

Receptacle

C1	6-pin Socket
See Connector	

LEDs

C	Red
D	Amber
F	Green

Photo Interrupter

5	Unshaded	(Shaded)
(Momentary Operating Function)		

Housing

A	Black

Actuator Colors

B	White
C	Red
D	Amber
F	Green

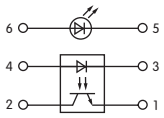
Connector

C2	Assembled Connector with Wire Leads
C3	Unassembled Connector and Pins
No Code	No Connector
Contact factory for custom options	

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

FP0115CAC1FF

ACTUATOR & 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.			

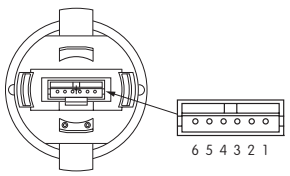
HOUSING SHAPE & COLOR

[C] **Round Shape**

[A] **Black Housing**

RECEPTACLE

[C1] **6-pin Socket**



SWITCH SPECIFICATIONS

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

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 = 50mA
Reverse Current I_R:		10µA	F_R = 5V
Transmission			
Collector-Emitter Saturation Voltage V_{CE} sat:		0.4V	I_F = 20mA & I_C = 0.1mA

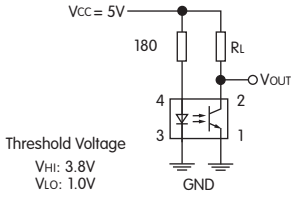
Absolute Maximum Ratings

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.

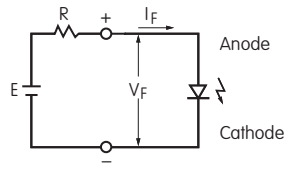
Recommended load resistance (RL) is 40k ~ 120kΩ for the illustrated circuit.



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.

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



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

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

Single Element LED / Color	I_{FM} / V_F / V_{RM} / ΔI_F	C Red	D Amber	F Green
Maximum Forward Current	I_{FM}	30mA	25mA	30mA
Typical Forward Current	I_F	20mA	20mA	20mA
Forward Voltage	V_F	1.85V	2.0V	2.1V
Maximum Reverse Voltage	V_{RM}	5V	5V	10V
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

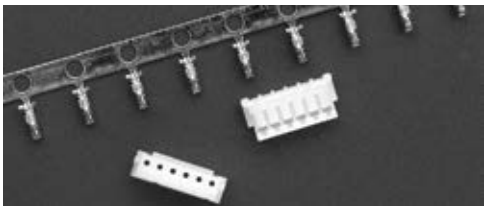
C2 **AT021**
Assembled Connector with Wire Leads

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



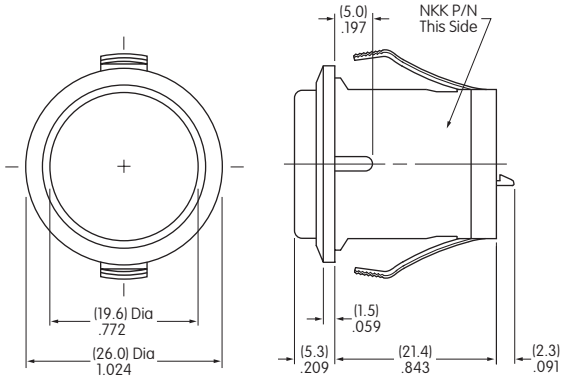
No Code

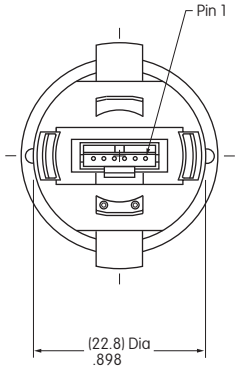
No Connector

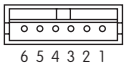
Recommended connector for assembly:
JST model number ZHR-6

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.

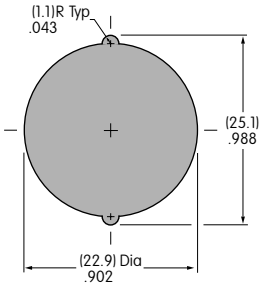
TYPICAL SWITCH DIMENSIONS







Terminal Connector Detail



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

FP0115CAC1FF

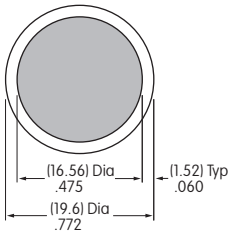
LEGENDS

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:

FP0115CAC1BC-C2 FP0115CAC1BD FP0115CAC1BF FP0115CAC1FF FP0115CAC1BC-C3 FP0115CAC1CC FP0115CAC1DD FP0115CAC1BC FP0115CAC1BD-C3 FP0115CAC1BD-C2 FP0115CAC1BF-C3 FP0115CAC1BF-C2 FP0115CAC1FF-C3 FP0115CAC1FF-C2 FP0115CAC1DD-C3 FP0115CAC1DD-C2 FP0115CAC1CC-C2 FP0115CAC1CC-C3