

FF01 Series

**Low Profile E-Stop Switches  
with Ø 16mm Bodies**

**Shortest Behind Panel Depth in Class: 13.6mm  
Twist or Pull Release**



**Ø 25mm & 30mm Caps • IP65 Rated**

## General Specifications

### Electrical Capacity

**Resistive Load:** 0.5A @ 24V DC

### Other Ratings

**Rated Insulation Voltage:** 36V DC  
**Impulse Withstand Voltage:** 2.5kV  
**Contact Resistance:** 50 milliohms maximum  
**Insulation Resistance:** 100 megohms minimum @ 500V DC  
**Mechanical Life:** 100,000 operations minimum  
**Electrical Life:** 100,000 operations minimum  
**Operating Force:** Push to lock 10.8N; Pull to reset 8.5N; Turn to reset 0.13N·m  
**Minimum Direct Operating Force:** 15N  
**Short Circuit Protection:** gG10A  
**Conditional Short Circuit Current:** 1000A  
**Total Travel:** .177" (4.5mm)  
**Operation Frequency:** 10 times per minute  
**Overvoltage Category:** II

### Materials & Finishes

**Actuator:** Glass fiber reinforced polyester (PBT)  
**Housing:** Glass fiber reinforced polyamide  
**Movable Contacts:** Silver alloy copper with gold plating  
**Stationary Contacts:** Silver alloy copper with gold plating  
**Terminals:** Brass with tin plating



### Environmental Data

**Operating Temperature Range:** -25°C through +60°C (-13°F through +140°F)  
**Storage Temperature Range:** -45°C through +80°C (-49°F through +176°F)  
**Humidity:** 90 ~ 95% humidity for 240 hours @ +40°C (+104°F)  
**Vibration:** 10 ~ 500Hz, amplitude 0.35mm. Acceleration 50m/s<sup>2</sup>  
**Shock:** Durability: 1,000m/s<sup>2</sup>; Malfunction: 150m/s<sup>2</sup>  
**Pollution Degree:** 3  
**Sealing:** Meets IP65 of IEC 60529 Standards at front panel

### Installation

**Mounting Torque:** 785mN·m  
**Soldering Time & Temperature:** Manual Soldering: 390°C maximum for 4 seconds maximum, 2 cycles

### Standards & Certifications

UL, C-UL (UL508)  

EN 60947-5-1, EN 60947-5-5 



# Distinctive Characteristics

Low profile housing and shortest behind panel depth in its class (.535"/13.6mm) facilitate high density panel layouts.

Two methods of resetting by pulling and/or twisting.

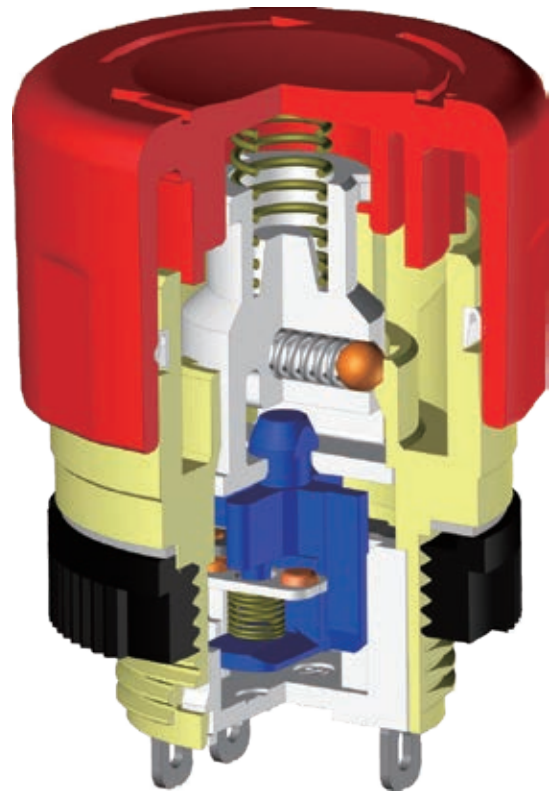
Achieves IP65 of IEC 60529 Standards (dust tight and protected against water jets from any direction), at front panel.

Unique sliding latch mechanism maintains the OFF state of the contacts, ensuring highest safety and reliability factors. Excellent shock and vibration resistant properties amidst chattering due to rugged vibration or impact.

Actuators in 25 and 30mm diameters enable space-conserving installation on panel.

Insert-molded solder lug terminals contribute protection for automated processing techniques.

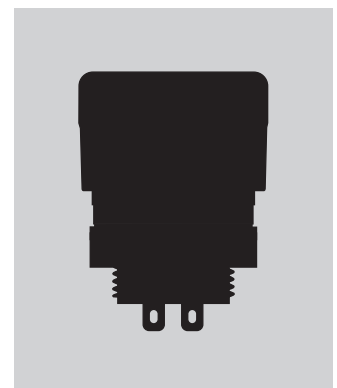
Accessories available, including switch guard and nameplates (with or without legend), interchangeable with both 25mm and 30mm caps.



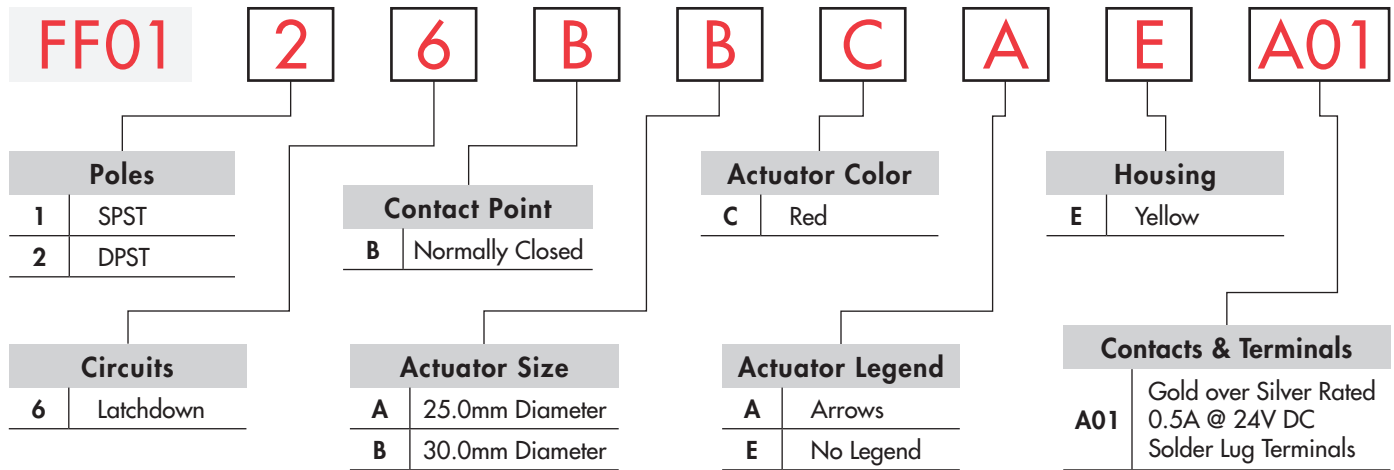
## Applications

- Operation controllers such as teach pendants
- Factory automation equipment
- Fluid dispensers
- Laser measurement devices

## Actual Size



### TYPICAL SWITCH ORDERING EXAMPLE


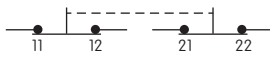


### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**FF0126BBCAEA01**



### POLE & CIRCUITS

Pole	Model	Plunger Position		Connected Terminals		Throw & Switch Schematics
		Normal	Down	Normal	Down	
SP	FF0116	ON	OFF	11-12	OPEN	SPST NC 
DP	FF0126	ON	OFF	11-12 21-22	OPEN	DPST NC 

Note: Terminal numbers are on the switch.

### ACTUATOR SIZES, COLOR & LEGEND

#### Actuator Sizes:

- A** 25.0mm (.984")
- B** 30.0mm (1.181")

#### Actuator Color:

- C** Red

#### Actuator Legend:

- A** Arrows
- E** No Legend



Material: Glass fiber reinforced PBT  
Actuators are not available separately.

Finish: Matte

## HOUSING

**E**

Yellow

Housing available in yellow with a matte finish.

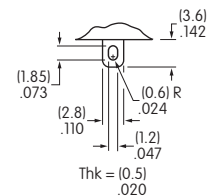
## CONTACT MATERIALS, RATINGS & TERMINALS

**A01**

Gold over Silver

Power Level  
0.5A @ 24V DC

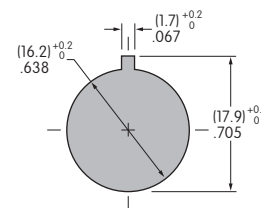
Solder Lug Terminals



## PANEL THICKNESS & CUTOUT

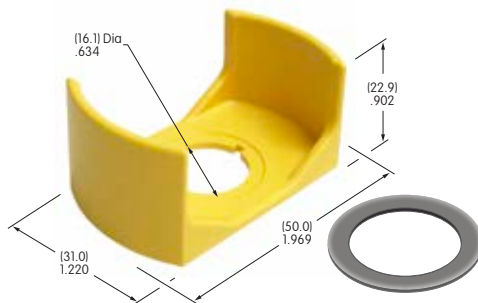
### Panel Thickness

Recommended Panel Thickness:  
.031" ~ .177"  
(0.8mm ~ 4.5mm)



## OPTIONAL ACCESSORIES

### AT220 Protective Guard

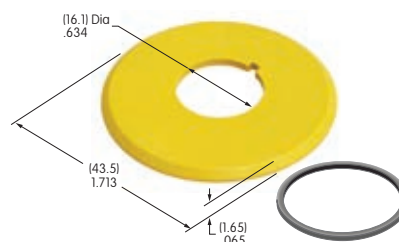


One o-ring provided with each protective guard

#### Materials & Colors:

Guard: Glass fiber reinforced polyamide  
O-ring: Chloroprene rubber  
Guard: Yellow  
O-ring: Black

### AT221 Nameplate without Legend



One o-ring provided with each nameplate

#### Materials & Colors:

Nameplate: Glass fiber reinforced polyamide  
O-ring: Chloroprene rubber  
Nameplate: Yellow  
O-ring: Black

### AT222 Nameplate with Emergency Stop Legend



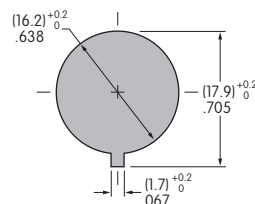
One o-ring provided with each nameplate

#### Materials & Colors:

Nameplate: Glass fiber reinforced polyamide  
O-ring: Chloroprene rubber  
Nameplate: Yellow with black letters  
O-ring: Black

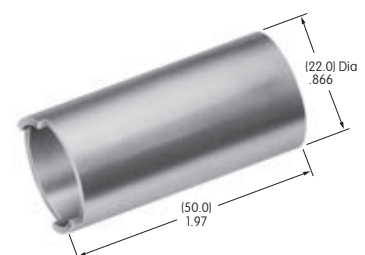
### Panel Thickness & Cutout for Protective Guard or Nameplates

Recommended Panel Thickness:  
.020" ~ .118"  
(0.5mm ~ 3.0mm)



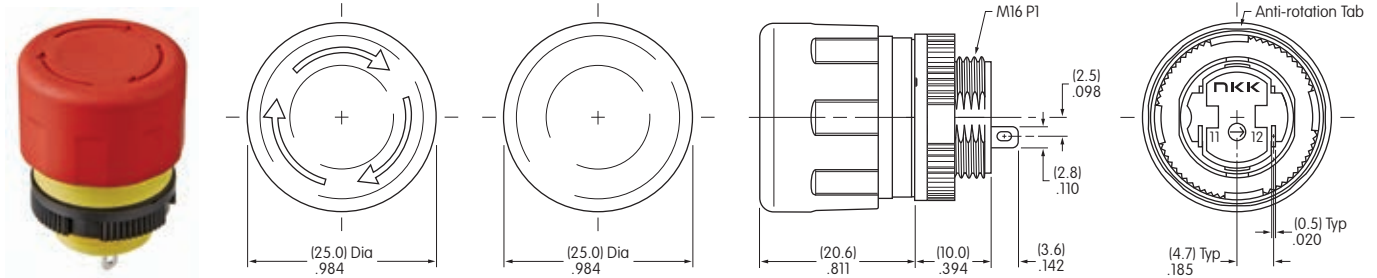
### AT119 Socket Wrench

Material:  
Brass with nickel plating  
Use to tighten switch nut  
in installation



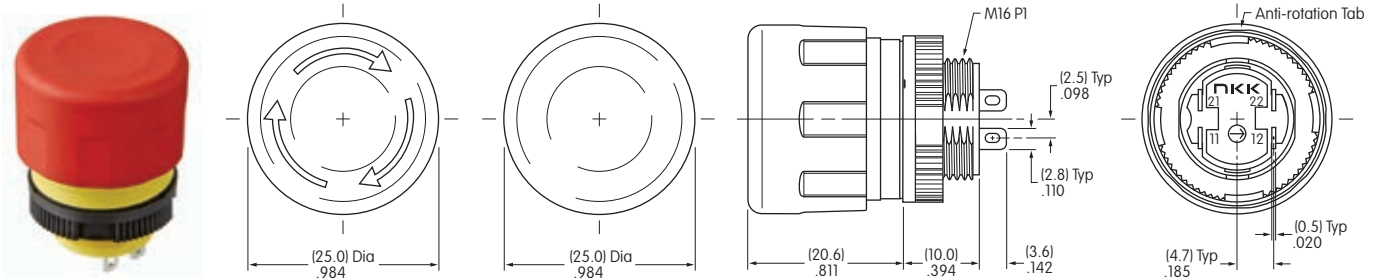
## TYPICAL SWITCH DIMENSIONS

### 25.0mm Cap With or Without Actuator Legend • SPST



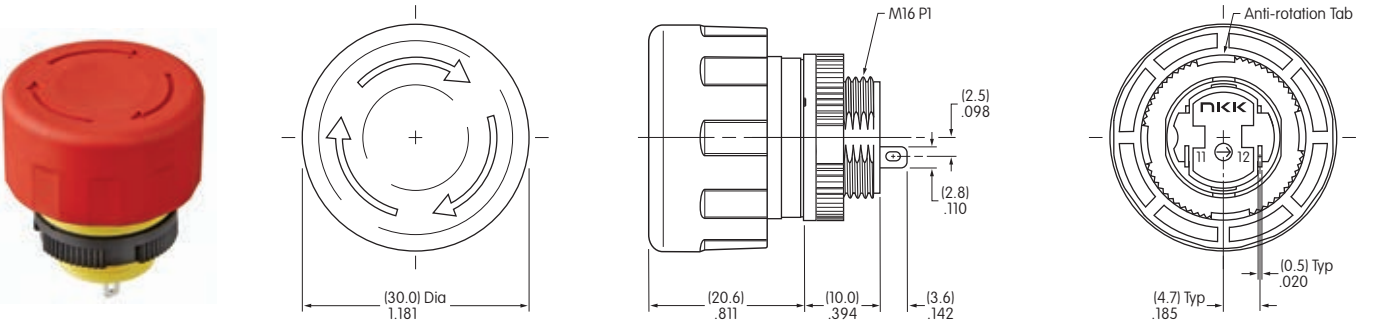
FF0116BACAEA01

### 25.0mm Cap With or Without Actuator Legend • DPST



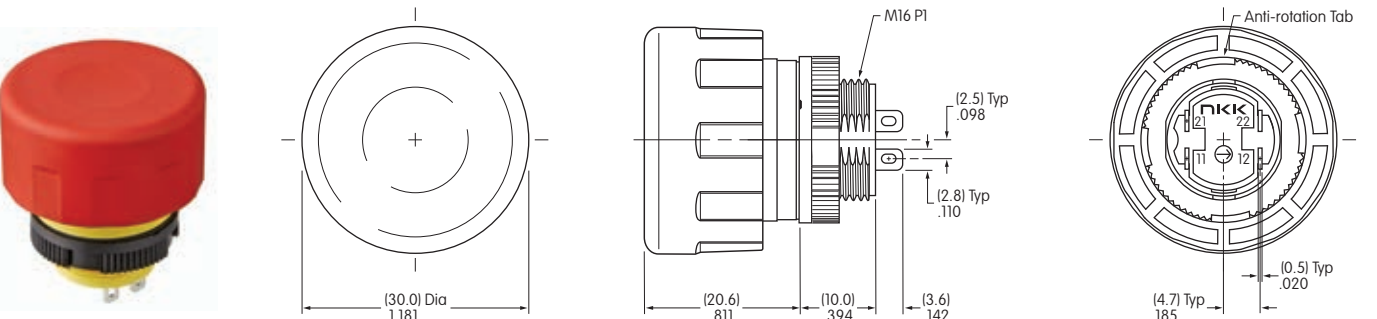
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### 30.0mm Cap With or Without Actuator Legend • SPST



FF0116BBCAEA01

### 30.0mm Cap With or Without Actuator Legend • DPST



FF0126BBCEEA01



## SAFETY PRECAUTIONS & INSTALLATION INSTRUCTIONS

### Installation of Switch & AT220 Protective Guard

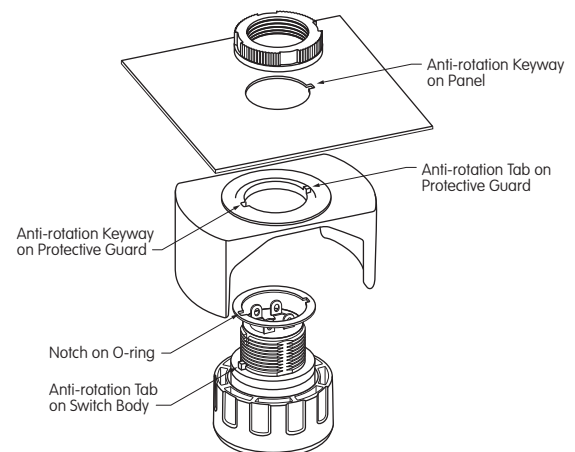
\* The protective guard complies with international standards. Read carefully to ensure the product will be used properly.

#### Safety Precautions

- The protective guard is made exclusively for use with NKK's FF01 Series and should not be used with other types of products.
- Read the FF01 Series Instruction Manual before switch installation, cable connection, operation, maintenance or inspection.
- Confirm power is off before installation, cable connection, maintenance, etc.
- When installing product on other equipment, be sure usage is in compliance with standards and regulations of your country or region, as required for your system, equipment or facility.

#### Installation of Switch & Guard into Panel

1. Remove the nut from the switch body.
2. Insert the switch body into the protective guard from the front of the guard, aligning notch on the o-ring with the anti-rotation tab on the switch body. Align the anti-rotation tab on the switch body with the keyway on the guard.
3. Align the anti-rotation tab on the back of guard with the anti-rotation keyway on the panel.
4. Using the AT119 Socket Wrench, tighten the nut from the back of the panel (recommended torque 785mN\*m).

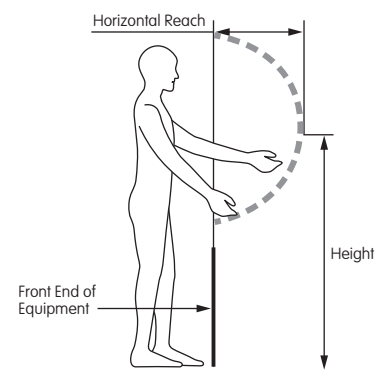


#### Installation Height

- To install the switch with the protective guard onto semiconductor manufacturing equipment, the mounting height range should be 33.0 inches to 64.5 inches (838mm to 1,638mm). The maximum horizontal reach should be between 7.0 inches and 10.0 inches (178mm to 254mm) (SEMI S8).
- The switch must be installed within 118.0 inches (3.0 meters) from the working position (SEMI S2).
- To install the switch with the protective guard on equipment such as machine tools or processing equipment, the recommended height range is between 23.5 and 67.0 inches (600mm and 1,700mm) from the floor or platform level (ISO 13850).  
Note: To confirm that the switch and protective guard mounted on a device are ISO compliant, see requirements of ISO 13850.

\* To comply with the SEMI Standard, it is necessary that "EMO" (Emergency Off) is printed on the switch or on the inside of the protective guard. Contact NKK Switches for more information.

Height		Horizontal Reach (Maximum)	
Inches	Millimeters	Inches	Millimeters
64.5	1,638	10.0	254
60.0	1,524	14.5	368
56.0	1,422	17.0	432
52.0	1,321	18.5	470
48.0	1,219	19.0	483
44.0	1,118	18.5	470
40.0	1,016	15.5	394
36.0	914	11.5	292
33.0	838	7.0	178



The table and illustration show the mounting range for the assembled emergency stop switch and protective guard. The height and horizontal reach are determined according to SEMI S8.

### SAFETY PRECAUTIONS & INSTALLATION INSTRUCTIONS

#### Installation of Switch

##### Safety Precautions

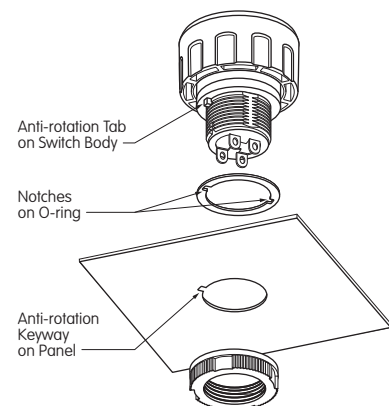
- Read the FF01 Series Instruction Manual before switch installation, cable connection, operation, maintenance or inspection.
- Confirm power is off before installation, cable connection, maintenance, etc.
- When installing product on other equipment, be sure usage is in compliance with standards and regulations of your country or region, as required for your system, equipment or facility.
- Use the switch at the voltage and current recommendations in the specifications. Exceeding these may cause overheating.
- Use wiring with the appropriate rating.
- Follow recommended panel cutout dimensions and mounting instructions or switch may not operate properly.
- Remove dirt and dust from switch mounting surface of the panel before beginning installation.
- Do not disassemble the product, as it may cause malfunction, electric shock or fire.
- Operate switch by hand only; do not operate using foot, tool or other object.
- Bouncing may occur during a reset operation (pull or turn to reset). If switch-mounted equipment is subjected to shock or vibration, it may cause chattering. Take appropriate measures to prevent bouncing and chattering on the equipment side.
- Do not drop the switch or apply excessive shock or vibration. Deformation or damage may cause malfunction or performance degradation.
- After inserting the lead wire into the terminal hole, use a soldering iron to ensure a secure connection.
- If soldering is executed with terminals facing up, avoid allowing the flux to enter the interior of the switch.
- Soldering temperature is 390°C maximum within four seconds.

##### Usage Environment

- This product is designed for indoor use.
- Avoid using the switch in environments where there is frequent splashing water.
- If the switch becomes wet, wipe off with a dry cloth. Using a switch exposed to water may result in water entering inside. If the water freezes inside the switch, it may not function properly.
- In an environment where dust and dirt may accumulate, remove deposits around switch before use. When necessary, a cloth dampened with a small amount of neutral detergent may be used. Follow using a dry cloth.

##### Installation of Switch into Panel

1. Remove the nut from the switch body.
2. Insert the switch body into the panel, aligning notch on the o-ring with the anti-rotation tab on the switch body. Align the anti-rotation tab on the switch body with the anti-rotation keyway on the panel.
3. Using the AT119 Socket Wrench, tighten the nut from back of panel (recommended torque 785mN•m).



**Effective Date** May 2020

**NKK**  
SWITCHES

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