

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
Minimum Positive Opening Travel: .118" (3.0mm)
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/s²
Shock: Durability: 1,000m/s²; Malfunction: 150m/s²
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.

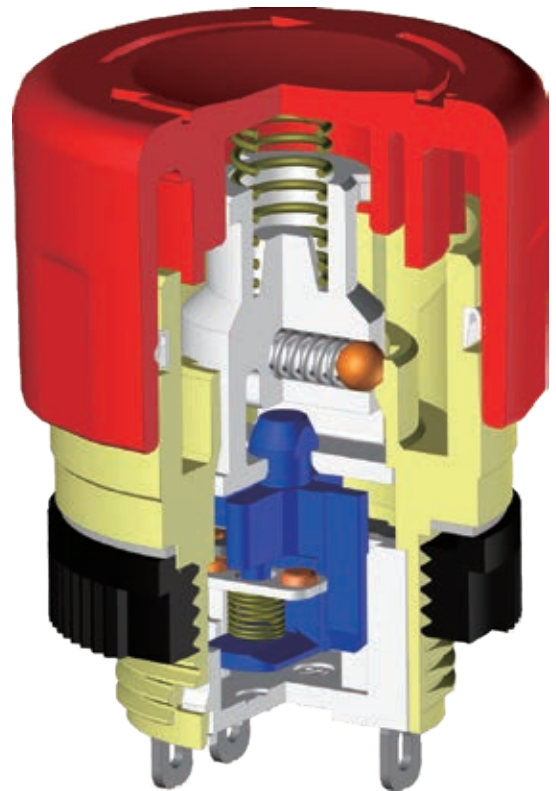
Achieves IP65 of IEC 60529 Standards (dust tight and protected against water jets from any direction), at front panel.

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.

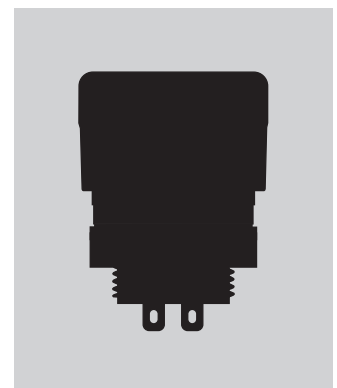
Accessories available, including switch guard and nameplates (with or without legend), interchangeable with both 25mm and 30mm caps.



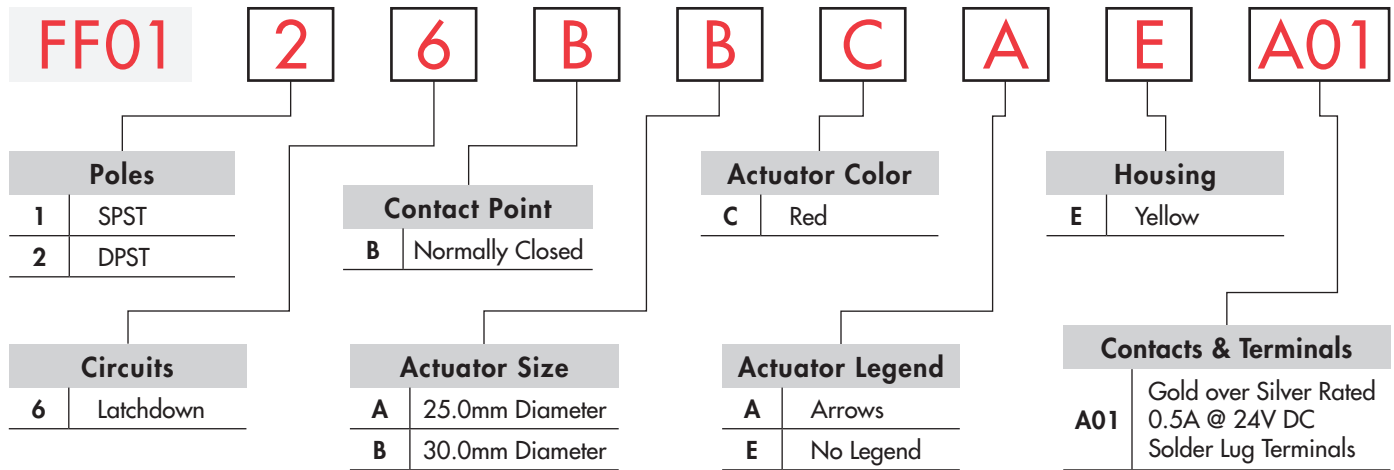
Applications

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

Actual Size



TYPICAL SWITCH ORDERING EXAMPLE


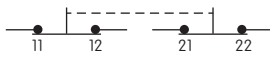


DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

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.

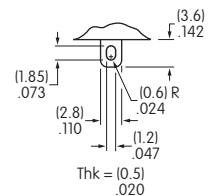
CONTACT MATERIALS, RATINGS & TERMINALS

A01

Gold over Silver

Power Level
0.5A @ 24V DC

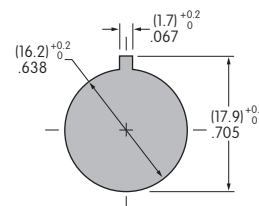
Solder Lug Terminals



PANEL THICKNESS & CUTOUT

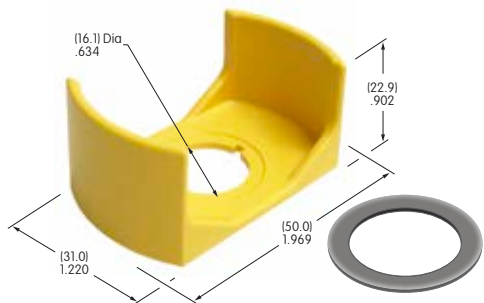
Panel Thickness

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



OPTIONAL ACCESSORIES

AT220 Protective Guard

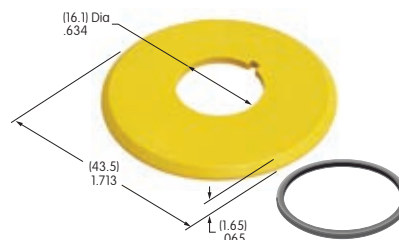


One o-ring provided with each protective guard

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



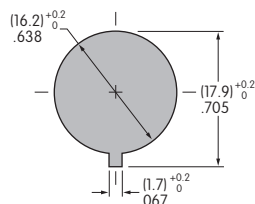
One o-ring provided with each nameplate

Materials & Colors:

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

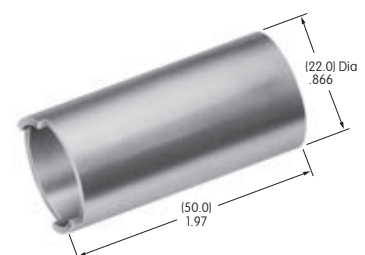
Panel Thickness & Cutout for Protective Guard or Nameplates

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



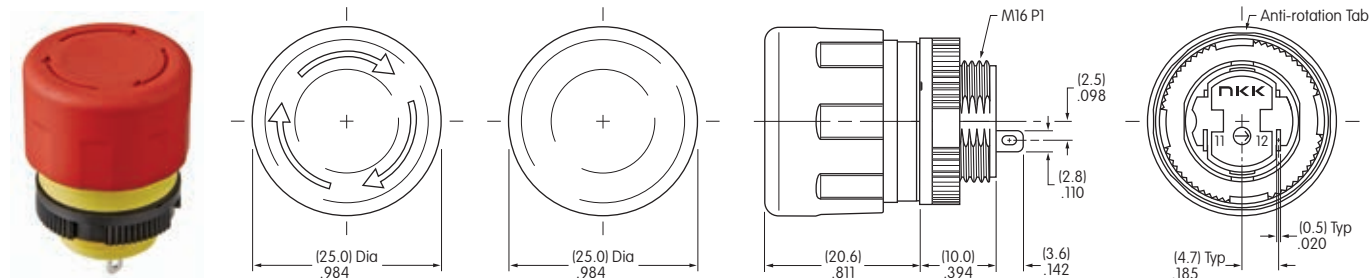
AT119 Socket Wrench

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



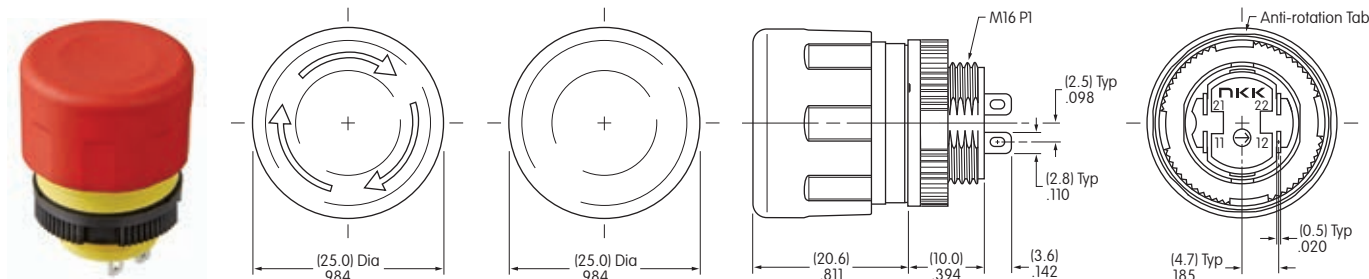
TYPICAL SWITCH DIMENSIONS

25.0mm Cap With or Without Actuator Legend • SPST



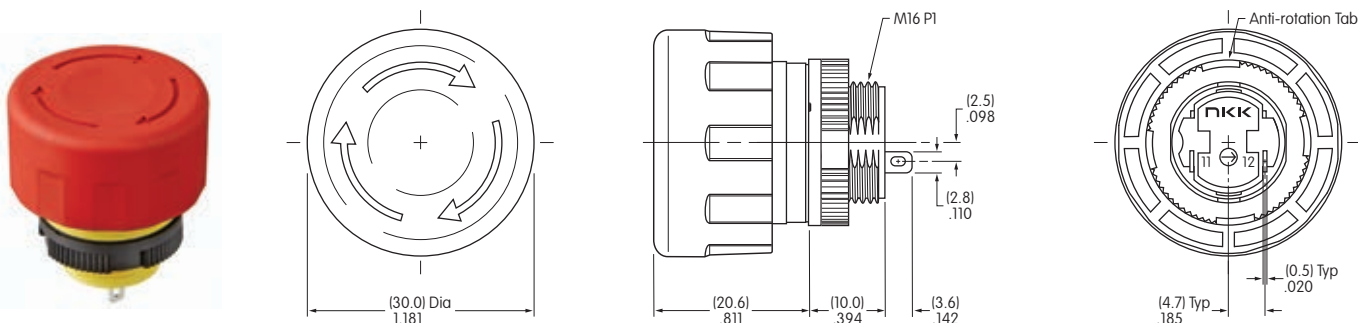
FF0116BACAEA01

25.0mm Cap With or Without Actuator Legend • DPST



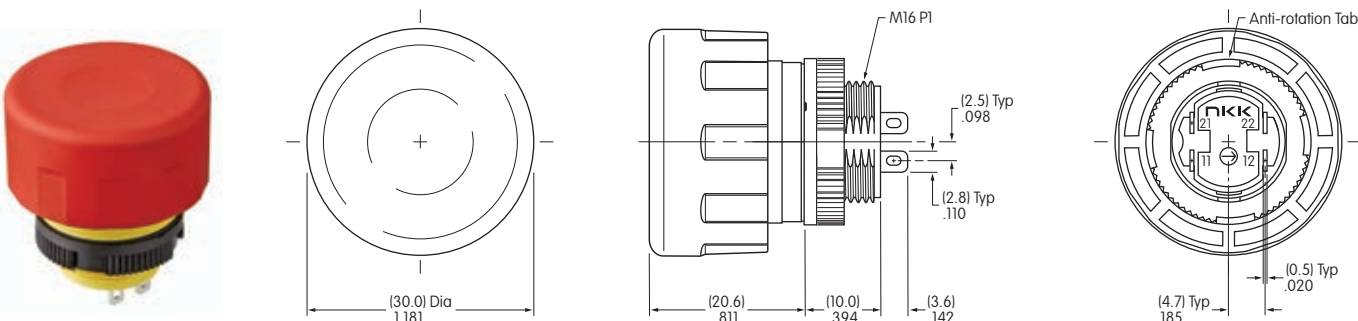
FF0126BACEEA01

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

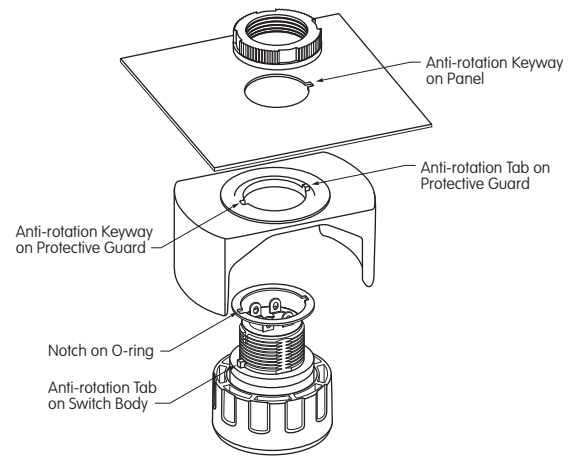
* The protective guard complies with international standards. Read carefully to ensure the product will be used properly.

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).

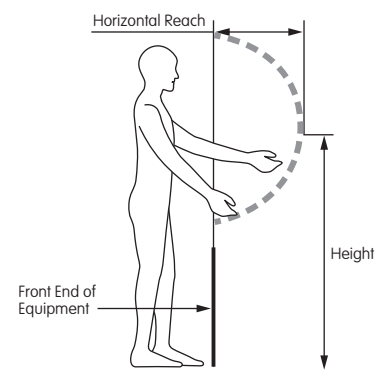


Installation Height

- 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

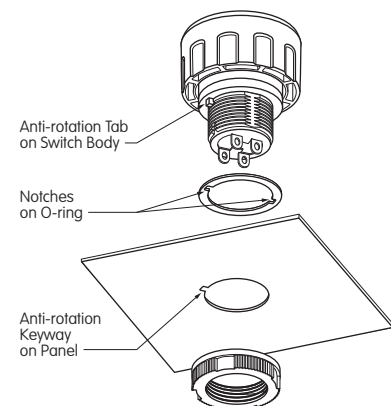
- Read the FF01 Series Instruction Manual before switch installation, cable connection, operation, maintenance or inspection.
- Confirm power is off before installation, cable connection, maintenance, etc.
- When installing product on other equipment, be sure usage is in compliance with standards and 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).



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NKK
SWITCHES

www.nkkswitches.com • 1.877.2BUYNKK (228.9655)
7850 East Gelding Drive • Scottsdale, AZ 85260 • Telephone 480.991.0942 • Fax 480.998.1435