

22.5 mm Push Buttons

Product Overview



Bulletin 800F Plastic and Metal Operators

- 22.5 mm mounting hole
- IP65/66, Type 4/4X/13
- Internationally rated operators

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See below.

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Bulletin 800FP Plastic Operators

- IP65/66, Type 4/4X/13
- Engineering grade thermoplastics
- Chemical-resistant for harsh environments



Bul. 800FP Plastic Operators

Bulletin 800FM Metal Operators

- IP65/66, Type 4/13
- Die-cast metal construction
- Chrome-plated



Bul. 800FM Die-Cast Metal Operators



Overview, Continued

3-Across x 2-Deep Back-of-Panel (6 Circuits Max.)

- Rugged snap-fit design for plastic or metal latch
- Stackable contact blocks
- Rotating collar for easy one-hand latch removal
- Color-coded contact block plungers for contact identification

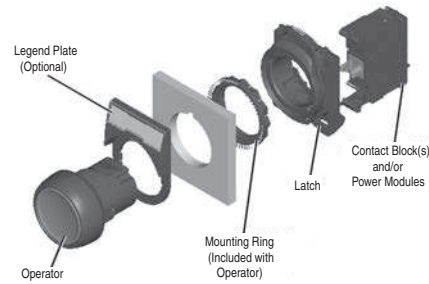


Plastic Latch with Contact Block



Metal Latch with Contact Block

Assembly Overview



Specifications*

Front-of-Panel (Operators)

| Description | | Mechanical Ratings | |
|---|-------------------|---|-----------------------------|
| | | Plastic (Bulletin 800FP) | Metal (Bulletin 800FM) |
| Vibration (assembled to panel) | | Tested at 10...2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. for 3 hr duration, no damage | |
| Shock | | Tested at 1/2 cycle sine wave for 11 ms; no damage at 100 G | |
| Degree of protection* | | IP65/66 (Type 3/3R/4/4X/12/13) | IP65/66 (Type 3/3R/4/12/13) |
| Mechanical durability per EN 60947-5-1 (Annex C) | 10 000 000 Cycles | Momentary push buttons, momentary mushroom | |
| | 1 000 000 Cycles | Multi-function, selector switch, key selector switch, selector jog, SensEject™ key selector switch | |
| | 500 000 Cycles | Non-illuminated push-pull E-stop‡ | |
| | 300 000 Cycles | Twist-to-release E-stop, illuminated push-pull E-stop‡, alternate action push buttons | |
| | 100 000 Cycles | Potentiometer, toggle switch | |
| Operating forces (typical with one contact block) | | Flush/extended = 5 N, E-stop = 36 N Mushroom = 9 N | |
| Operating torque (typical application with one contact block) | | Selector switch = 0.25 N•m (2.2 lb•in) | |
| Mounting torque | Plastic | 1.7 N•m (15 lb•in) | |
| | Metal | 4.4 N•m (40 lb•in) | |
| Environmental | | | |
| Temperature range (operating) | | -25...+70 °C (-13...+158 °F)§ | |
| Temperature range (short term storage) | | -40...+85 °C (-40...+185 °F) | |
| Humidity | | 50...95% RH from 25...60 °C (77...140 °F) | |

* Performance Data — see page Important-3 of the Industrial Controls catalog.

⊛ Momentary mushroom operators are IP65. Plastic keyed operators are IP66, Type 4/13; not Type 4X.

‡ Limit of four contact blocks max. for these devices.

§ Operating temperatures below 0 °C (32 °F) are based on the absence of freezing moisture and liquids, UL Recognized to 55 °C (131 °F) - Incandescent module max. 40 °C (104 °F).

Product Certifications

| | |
|----------------------------------|--|
| Certifications | UR/UL, CSA, CCC, CE |
| Standards Compliance — CE Marked | NEMA ICS-5; UL 508, EN ISO 13850, EN 60947-1, EN 60947-5-1, EN 60947-5-5 |
| Terminal Identification | EN/IEC 60947-1 |
| Shipping Approvals | ABS |
| RoHS | ✓ |

Bulletin 800F
22.5 mm Push Buttons
Specifications

Back-of-Panel Components*

| Electrical Ratings | | | |
|--|---|---|------------------------|
| Standard contact block ratings | A600, Q600 600V AC AC 15, DC 13 to IEC/EN 60947-5-1 and UL 508, 17V, 5 mA min. | | |
| Low voltage contact block ratings* | 5V, 1 mA DC min. C300, R150, AC 15, DC 13 to EN 60947-5-1 and UL 508 | | |
| | Nominal Voltage | Range | Current Draw |
| LED Module Ratings | 24...120V AC/DC | 20...132V AC/DC | 15 mA (AC), 12 mA (DC) |
| | 24V AC | 10...29V AC | 31 mA |
| | 24V DC | 10...30V DC | 24 mA |
| | 120V AC | 102...132V AC | 6 mA |
| | 240V AC | 204...264V AC | 6 mA |
| Frequency | 50/60 Hz, DC | | |
| Thermal current | 10 A max. enclosed (40 °C ambient) to UL508, EN 60947-5-1 | | |
| Insulation voltage (U _i) | Screw terminal = 690V, spring-clamp = 300V | | |
| Wire capacity (screw terminal)‡ | #18...12 AWG (0.75...2.5 mm ²) Max. (2) #14 AWG or (1) #12 AWG | | |
| Wire capacity (spring-clamp terminal) | #18...14 AWG (0.75...1.5 mm ²) One per spring clamp, two spring clamps per terminal | | |
| Recommended tightening torque on screw terminals | 0.7...0.9 N•m (6...8 lb•in) | | |
| Dielectric strength (minimum) | 2500V for one minute | | |
| External short circuit protection | Standard blocks | 10 A type gL/gG cartridge fuse to EN 60269-2-1 or gN (Class J to UL 248-8 or Class C to UL 248-4) | |
| | Low voltage contact blocks | 6 A type gL/gG cartridge fuse to EN 60269-2-1 or gN (Class J to UL 248-8 or Class C to UL 248-4) | |
| Electrical shock protection | Finger-safe conforming to IP2X | | |
| Mechanical Ratings | | | |
| Vibration (assembled to panel) | Tested at 10...2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. 6 hr | | |
| Shock | Tested at 1/2 cycle sine wave for 11 ms and no damage at 100 G max. | | |
| Contact durability per EN 60947-5-1 (Annex C) | 10 000 000 cycles | | |
| Contact operation | N.O. | Slow double make and break | |
| | N.C. & S.M.C.B. | Slow double make and break — positive opening ⊖ | |
| | N.O.E.M. | Double break / double make, early make | |
| | N.C.L.B. | Double break / double make, late break — positive opening ⊖ | |
| | N.C.E.B. | Double break / double make, early break — positive opening ⊖ | |
| Push button travel to change electrical state | N.C. and N.O.E.M. | 1.5 mm (0.060 in.) | |
| | N.O. and N.C.L.B. | 2.5 mm (0.1 in.) | |
| Operating forces (typical) | Single circuit contact block | 3.4 N | |
| | Dual circuit contact block | 5...6.5 N | |
| Illumination | | | |
| LED Dominant Wavelength | Green | 525 nm | |
| | Red | 629 nm | |
| | Yellow | 590 nm | |
| | Blue | 470 nm | |
| | White | — | |
| LED Luminous Intensity | Green | 780 mcd | |
| | Red | 780 mcd | |
| | Yellow | 600 mcd | |
| | Blue | 168 mcd | |
| | White | 360 mcd | |
| Incandescent maximum wattage | 2.6 W | | |
| Materials | | | |
| Springs | Stainless steel and zinc coated music wire | | |
| Electrical contacts | Standard | Silver-nickel | |
| | Low voltage | Gold-plated over silver | |
| Terminals | Screw | Brass | |
| | Spring-clamp | Silver-plated brass | |

* Performance Data — see page Important-3 of the Industrial Controls catalog.

* Low voltage contacts are recommended for applications below 17V, 5 mA.

‡ Wires less than #18 AWG (0.75 mm²) may not hold in terminal securely.



Material Listing

| Component | For Use with | Material Used |
|-------------------------------------|---|---|
| Panel gasket | All operators | Nitrile, TPE |
| Diaphragm seal | Illuminated push button, non-illuminated push button | Automotive industry acceptable silicone |
| K-seal | Selector switch, key selector switch, push/twist-to-release E-stop, key E-stop, push/pull mushroom | Nitrile |
| Diaphragm retainer, return spring I | Illuminated push button, non-illuminated push button, momentary mushroom | Stainless steel |
| Return spring II | Reset, selector switch, key selector switch, alternate action, push/twist-to-release E-stop, key E-stop, push/pull mushroom | Zinc-coated music wire |
| Button cap/mushroom head | Non-illuminated push button, momentary mushroom, reset, push/twist-to-release E-stop, key E-stop, push/pull mushroom, multi-function | PBT/polycarbonate blend |
| 2-color molded button cap | Non-illuminated push button | PBT/polycarbonate blend |
| Lens | Multi-function | Acetal |
| Lens, knob | Illuminated push button, illuminated momentary mushroom, illuminated selector switch | Polyamide |
| Knob | Non-illuminated selector switch | Glass-filled polyamide |
| Plastic bezel/bushing I | Non-illuminated push button, illuminated push button, momentary mushroom, selector switch, key selector switch, push/twist-to-release E-stop, key E-stop, push/pull mushroom, multi-function, reset | Glass-filled polyamide |
| Plastic bezel/bushing II, jam nut | Pilot light, reset jam nut, reset pushers | Glass-filled PBT |
| Metal bezel/bushing | All metal operators | Zinc |
| Diffuser | Illuminated push button, pilot light | Polycarbonate |
| Legend frames | — | Glass-filled polyamide |
| Plastic mounting ring | All plastic operators | Glass-filled polyamide |
| Metal mounting ring | All metal operators | Chromated zinc |
| Plastic latch | — | Glass-filled polyamide |
| Metal latch | — | Chromated zinc + stainless steel |
| Plastic enclosure | — | PBT/polycarbonate blend |
| Metal enclosure | — | Aluminum |
| Terminal screws | LED module, incandescent module, contact blocks | Zinc-plated steel with chromate |
| Terminals | LED module, incandescent module, contact blocks | Brass with silver-nickel contacts |
| Spring clamps | LED module, incandescent module, contact blocks | Stainless steel |
| Lamp socket | Incandescent module | Brass |
| Housing | Incandescent module, LED module | Glass-filled polyamide |
| Low-voltage terminals | Contact blocks | Gold-plated silver-nickel contacts |
| Low-voltage spanner | Contact blocks | Gold-plated silver-nickel contacts |
| Spanner | Contact blocks | Brass with silver-nickel contacts |
| Boot | Toggle Switch, illuminated push button, non-illuminated push button, multi-function illuminated and non-illuminated | Automotive industry acceptable silicone |

Momentary Push Button Operators, Non-Illuminated — Flush, Extended, Guarded



Flush Operator
 Cat. No. 800FP-F3



Extended Operator
 Cat. No. 800FM-E4



Guarded Operator
 Cat. No. 800FP-G6

| Color | Pkg. Quantity | Flush | | Extended | |
|-------|---------------|----------|----------|----------|----------|
| | | Plastic | Metal | Plastic | Metal |
| | | Cat. No. | Cat. No. | Cat. No. | Cat. No. |
| Black | 1 | 800FP-F2 | 800FM-F2 | 800FP-E2 | 800FM-E2 |
| Green | | 800FP-F3 | 800FM-F3 | 800FP-E3 | 800FM-E3 |
| Red | | 800FP-F4 | 800FM-F4 | 800FP-E4 | 800FM-E4 |

800F P - F 3 -
 a b c d

a

| Operator Construction | |
|-----------------------|---|
| Code | Description |
| P | Round plastic operator (IP66, Type 4/4X/13) |
| M | Round metal operator (IP66, Type 4/13) |

c

| Color Cap | |
|-----------|------------------|
| Code | Color |
| 0 | Orange |
| 1 | White |
| 2 | Black |
| 3 | Green |
| 4 | Red |
| 5 | Yellow |
| 6 | Blue |
| 8 | Grey* |
| 9 | No cap |
| X | Assortment pack* |

d

| Packaging | |
|-----------|-----------------|
| Code | Description |
| Blank | 1 per package |
| BP | 10 per package‡ |

b

| Operator Type | |
|---------------|-------------|
| Code | Description |
| F | Flush |
| E | Extended |
| G | Guarded |

* Available in flush only.
 * Assortment pack contains one cap of each color, not available in BP packaging.
 ‡ Only available with no color cap (9 from Table c).

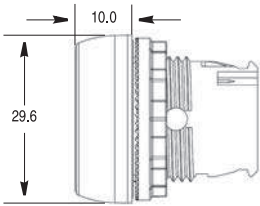
22.5 mm Push Buttons

Approximate Dimensions

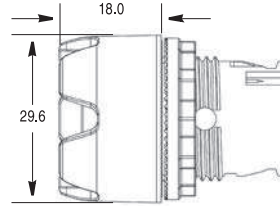
Approximate Dimensions

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes. Refer to RAISE software for additional dimensional information.

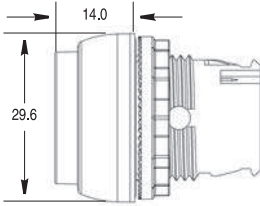
Non-Illuminated and Illuminated Momentary Flush Push Button Operators



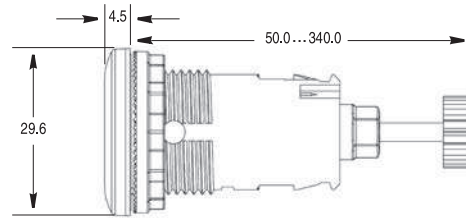
Illuminated Momentary Guarded Push Button Operators



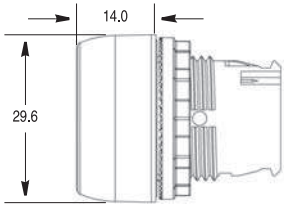
Illuminated and Non-Illuminated Momentary Extended Push Button Operators



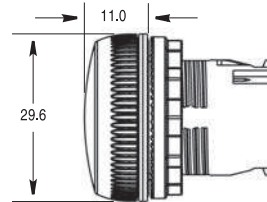
Reset Operators with Reset Rod



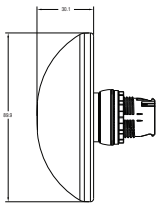
Non-Illuminated Guarded, Illuminated and Non-Illuminated Alternate Action Push Button Operators



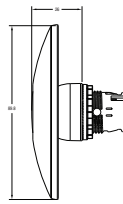
Pilot Light Operators



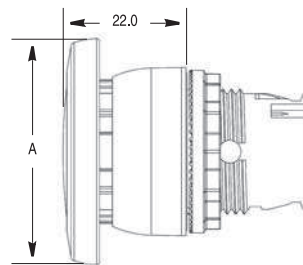
90 mm Half Dome



90 mm Mushroom

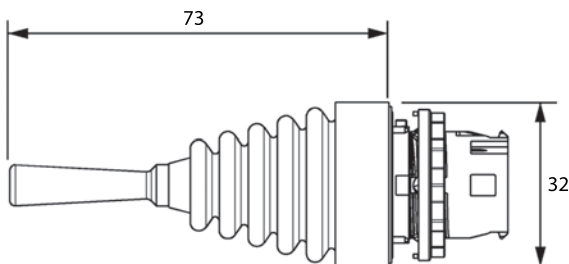


Illuminated and Non-Illuminated Momentary Mushroom Operators 40 mm and 60 mm



| Operator | A |
|----------|------|
| 40 mm | 39.8 |
| 60 mm | 59.8 |

Toggle Switch Operators



Selector Jog Operators

