

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

Table of Contents

See below.

TABLE OF CONTENTS

Description	Page
Specifications	10-67
Quick Selection	10-70
Push Buttons, Momentary	
Non-Illuminated — Flush, Extended, Guarded.....	10-73
Non-Illuminated — with Two-Color Molded Legend Caps....	10-74
Illuminated — Flush, Extended, Guarded.....	10-75
Push Buttons, Alternate Action	
Non-Illuminated — Flush.....	10-76
Illuminated — Flush.....	10-76
Pilot Light Operators	10-77
Selector Switches	
Non-Illuminated, 2-Position.....	10-78
Illuminated, 2-Position.....	10-79
Non-Illuminated, 3-Position.....	10-80
Illuminated, 3-Position.....	10-81
Non-Illuminated, 4-Position.....	10-82
Key Selector Switches	
2-Position	10-83
3-Position	10-84
Emergency Stop Operators	
Twist-to-Release and Push-Pull Mushroom Operators	
Non-Illuminated	10-85
Illuminated	10-85
Key Release Mushroom Operators	10-85
Push-Pull Mushroom Operator, 3-Position	10-89
Momentary Mushroom Operators	
Non-Illuminated.....	10-90
Illuminated.....	10-91

Description	Page
Multi-Function Operators	
2-Function, Momentary, Non-Illuminated	10-92
2-Function, Momentary, Illuminated	10-93
3-Function, Momentary, Non-Illuminated	10-94
Reset Operators	10-95
Single-Turn Potentiometer Assembly	10-96
Key Operated Selector Switch — SensEject™	10-96
Selector Push Button Operators	10-97
Toggle Switch Operators	10-98
Back-of-Panel Components	
Contact Blocks.....	10-99
Power Modules	10-99
Power Modules with Contact Blocks.....	10-100
Enclosures	10-103
Assembled Stations	10-103
Assembled Stations with DeviceNet	10-105
Pendant Stations	10-106
Accessories	
Miscellaneous	10-107
Guards	10-109
Locking Attachments.....	10-110
Replacement Lamps	10-111
Color Caps, Lenses, Diffusers without Text	10-112
Two-Color Molded Legend Caps.....	10-113
E-Stop Legends.....	10-113
Legend Plates.....	10-114
Custom Laser-Engraved Caps/Diffusers.....	10-115
Legend Text.....	10-116
Approximate Dimensions	10-120

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

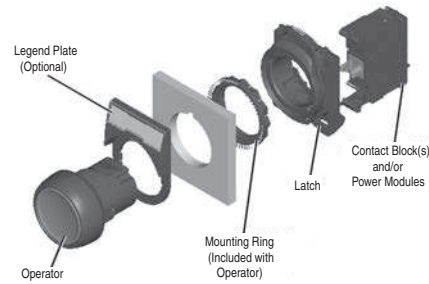


Plastic Latch with Contact Block



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 50/60 Hz DC 50/60 Hz 50/60 Hz		
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

Accessories


Caps, Diffusers, Lenses

Color caps listed below are for completion of devices ordered with color caps omitted.


Accessory Color Caps (without Text)

	Color Caps, Non-Illuminated*				
	Color	Pkg. Quantity	Momentary Extended	Momentary Flush/Guarded	Alternate Action Flush
			Cat. No.	Cat. No.	Cat. No.
	Orange	10	800F-AE0	800F-AF0	800F-AFA0
	White		800F-AE1	800F-AF1	800F-AFA1
	Black		800F-AE2	800F-AF2	800F-AFA2
	Green		800F-AE3	800F-AF3	800F-AFA3
	Red		800F-AE4	800F-AF4	800F-AFA4
	Yellow		800F-AE5	800F-AF5	800F-AFA5
	Blue		800F-AE6	800F-AF6	800F-AFA6
	Grey		—	800F-AF8	—

Accessory Color Caps — Multi-Function Operators (without Text)

	Color Caps, Non-Illuminated*			
	Color	Pkg. Quantity	Flush	Extended
			Cat. No.	Cat. No.
	White	10	800F-AFU1	800F-AEU1
	Black		800F-AFU2	800F-AEU2
	Green		800F-AFU3	800F-AEU3
	Red		800F-AFU4	800F-AEU4
	Yellow		800F-AFU5	800F-AEU5
	Blue		800F-AFU6	800F-AEU6


Accessory Color Lens Caps and Pilot Light Lenses (without Text)

	Color	Pkg. Quantity	Illuminated Color Lens Caps* — Flush, Alternate Action	Illuminated Color Lens Caps* — Extended, Guarded	Pilot Light Lenses* — Standard Lens
			Cat. No.	Cat. No.	Cat. No.
	Amber	10	800F-ALF0	800F-ALE0	800F-AP0
	Green		800F-ALF3	800F-ALE3	800F-AP3
	Red		800F-ALF4	800F-ALE4	800F-AP4
	Yellow		800F-ALF5	800F-ALE5	800F-AP5
	Blue		800F-ALF6	800F-ALE6	800F-AP6
	Clear		800F-ALF7	800F-ALE7	800F-AP7

* Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.

* Includes diffuser.

Operator Diffusers (without Text)

	Diffusers		
	Description	Pkg. Quantity	Cat. No.
 <p>Cat. No. 800F-AD3</p>	Illuminated Push Buttons — Flush	10	800F-AD2
	Pilot Lights		800F-AD3
	Illuminated Push Buttons — Extended, Guarded		800F-AD4

10



Two-Color Molded Legend Caps — Non-Illuminated Push Buttons

800F – AF 3 01
 a *b* *c*



Cat. No. 800F-15YSE112

a

Button Cap Type	
Code	Description
AF	Flush
AE	Extended

b

Color Cap	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue

c

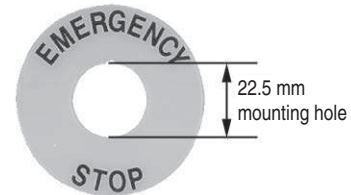
Legend Text*†	
English	
Code	Description
01	START
02	STOP
05	O
06	I
08	→
09	FORWARD*
10	REVERSE*
11	R

* Available in flush only.
 * White and yellow caps have black text. All other color caps have white text.
 † Valid color cap text codes include:

Color	Text	
	Flush Caps	Extended Caps
White	FORWARD, REVERSE, START, I, →, R	→, R
Black	FORWARD, REVERSE, →, R	STOP, O, →, R
Green	FORWARD, REVERSE, START, I, →	→
Red	FORWARD, REVERSE, STOP, O, →	STOP, O, →
Yellow	FORWARD, REVERSE, →	→
Blue	FORWARD, REVERSE, →, R	→, R

Emergency Stop Legend Plates§

800F – 15YS
 a *b*



a

Size/Color (Yellow)	
Code	Description
15Y	60 mm round (30.5 mm mounting hole)
15YS	60 mm round (22.5 mm mounting hole)➤
16Y	90 mm round (22.5 mm mounting hole)➤

b

Text	
Code	Description
Blank	No text
E112	EMERGENCY STOP
F112	ARRÊT D'URGENCE‡
S112	PARADA DE EMERGENCIA
G112	NOT HALT
T112	ARRESTO EMERGENZA
N112	NÖDSTOPP, EMERGENCY STOP‡

b (cont'd)

Text	
Code	Description
W112	NÖDSTOPP, EMERGENCY STOP‡
A112	NÖDSTOP
B112	EMERGENCY STOP, ARRÊT D'URGENCE, PARADA DE EMERGENCIA‡
D112	NOODSTOP‡
M112	NOT HALT, ARRESTO EMERGENZA, ARRÊT D'URGENCE➤
	EMERGENCY STOP, ARRÊT D'URGENCE, NOT HALT❖
L112	NEYDARSTOPP, NEYDARSTOPP‡
H112	NÖD-STOP, HÄTÄ-SEIS, NÖD-STOP‡

§ Sold only multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.
 ➤ Not for use with base mounted contact blocks.
 ‡ Not available on 15YS version.
 ➤ Text printed on the 15Y version only.
 ❖ Text printed on the 15YS & 16Y versions only.

10

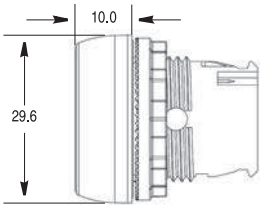
22.5 mm Push Buttons

Approximate Dimensions

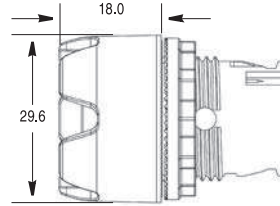
Approximate Dimensions

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

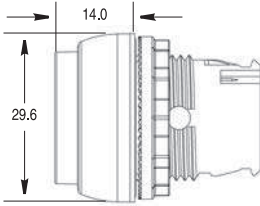
Non-Illuminated and Illuminated Momentary Flush Push Button Operators



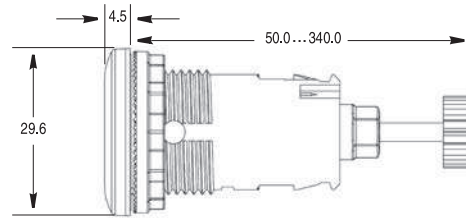
Illuminated Momentary Guarded Push Button Operators



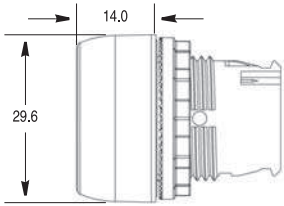
Illuminated and Non-Illuminated Momentary Extended Push Button Operators



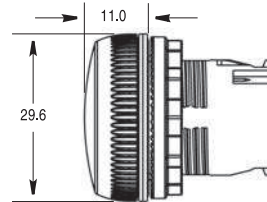
Reset Operators with Reset Rod



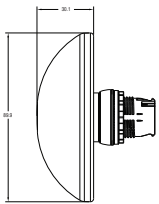
Non-Illuminated Guarded, Illuminated and Non-Illuminated Alternate Action Push Button Operators



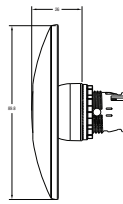
Pilot Light Operators



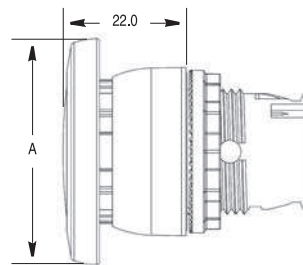
90 mm Half Dome



90 mm Mushroom

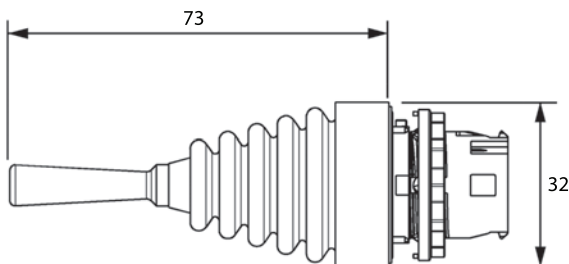


Illuminated and Non-Illuminated Momentary Mushroom Operators 40 mm and 60 mm



Operator	A
40 mm	39.8
60 mm	59.8

Toggle Switch Operators



Selector Jog Operators

