

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

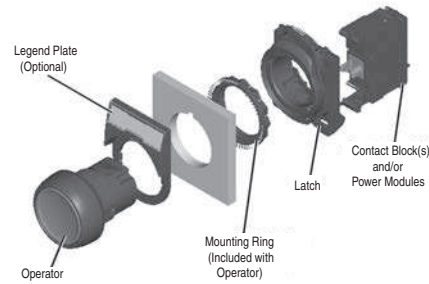


Plastic Latch with Contact Block



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		
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

3-Position Push-Pull Operators, Illuminated & Non-Illuminated — Mushroom*



Illuminated 3-Position Push-Pull
 Cat. No. 800FM-LMP44E3

Target Table and Operator Position*			
Contact Type†			
	Out	Center	In
N.O.	O	O	X
N.C.E.B.	X	O	O
N.C.L.B.	X	X	O

Note: X = Closed/O = Open

† Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

Operator Function	Operator Type	Color	Pkg. Quantity	Cat. No.
Momentary Out, Maintained Center, Momentary In	Non-Illuminated	Black§	1	800FM-MM42E3
		Green		800FM-MM43E3
		Red➤		800FM-MM44E3
	Illuminated*	Amber‡		800FM-LMM40E3
		Green		800FM-LMM43E3
		Red		800FM-LMM44E3
		Blue‡		800FM-LMM46E3
		Clear‡		800FM-LMM47E3
Momentary Out, Maintained Center, Maintained In	Non-Illuminated	Black§	1	800FM-MP42E3
		Green		800FM-MP43E3
		Red➤		800FM-MP44E3
	Illuminated*	Amber‡		800FM-LMP40E3
		Green		800FM-LMP43E3
		Red		800FM-LMP44E3
		Blue‡		800FM-LMP46E3
		Clear‡		800FM-LMP47E3

800F **M** - **L** **MM** **4** **4** **E3**
 a **b** **c** **d** **e** **f**

a

Operator Construction	
Code	Description
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
Blank	Non-illuminated
L	Illuminated*

c

Operator Function	
Code	Description
MM	Momentary out, Maintained center, Momentary in
MP	Momentary out, Maintained center, Maintained in

d

Cap Size	
Code	Description
4	40 mm plastic

e

Cap Color	
Code	Description
0	Amber‡‡
2	Black§
3	Green
4	Red
6	Blue‡‡
7	Clear‡‡

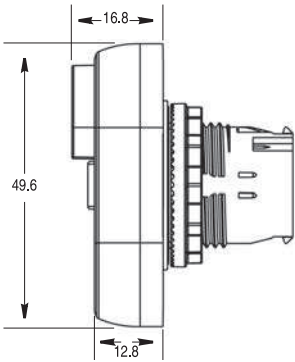
f

Positions	
Code	Description
E3	3-position

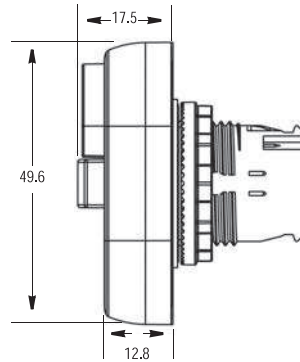
- ‡ Sold as stand-alone operator only. Not available as a composite catalog number.
- * Must use N.O., N.C.E.B., or N.C.L.B. contact blocks only. Cannot use N.C. or N.O.E.M. contact blocks with 3-position push-pull operators.
- ‡ LED module required for illumination. Cannot use incandescent module.
- ‡ Available in illuminated only.
- ‡ Use of white LED is recommended.
- § Available in non-illuminated only.
- Replacement caps are available for this device. Order Cat. No. 800F-AMP4.

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes.

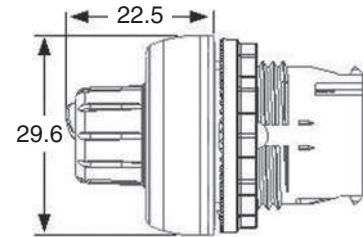
Illuminated and Non-Illuminated 2-Position Multi-Function Operators



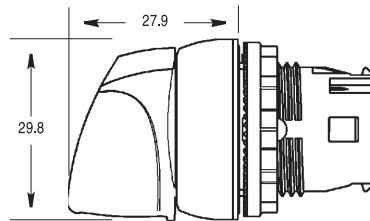
Non-Illuminated 3-Position Multi-Function Operators



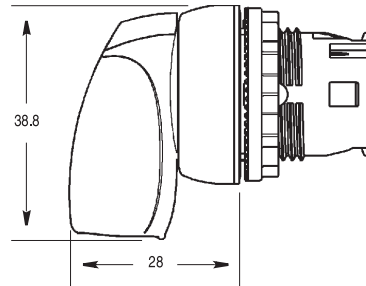
Potentiometer Operator



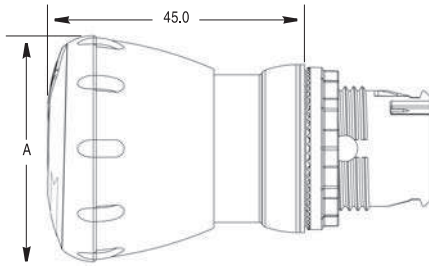
Illuminated and Non-Illuminated Knob Selector Switch Operators



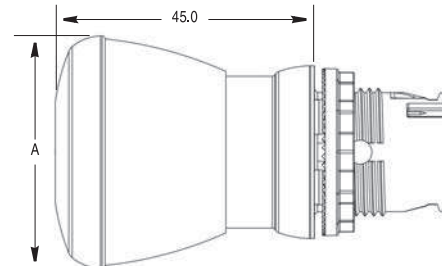
Non-Illuminated Knob Lever Selector Switch Operators



Illuminated and Non-Illuminated Twist-to-Release Operators 30 mm, 40 mm, and 60 mm

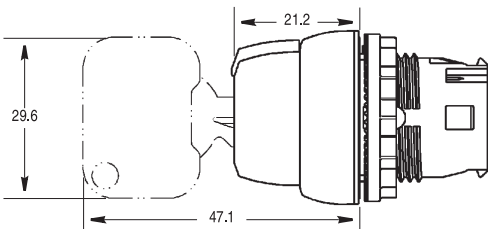


Illuminated and Non-Illuminated Push-Pull Mushroom Operators 30 mm, 40 mm, and 60 mm



Operator	A
30 mm	30.0
40 mm	40.0
60 mm	60.0

Key Selector Switch and Key Ejected SensEject Operators



Mushroom Key Release Operator 40 mm

