





## 22.5 mm Push Buttons

## Product Selection

## Back of Panel Components, Continued

## Other

	Description	Volts	Pkg. Quantity	Cat. No.
 <p><b>Cat. No. 800F-D3C</b></p>	<b>Incandescent Module</b> For use with pilot lights, push buttons, and momentary mushroom operators. <b>Note:</b> Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	No bulb	10	800F-D0C
		6V AC/DC		800F-D1C
		12V AC/DC		800F-D2C
		24V AC/DC		800F-D3C
		48V AC/DC		800F-D4C
		120V AC/DC		800F-D5C
 <p><b>Cat. No. 800F-N3G</b></p>	<b>Integrated LED Module</b> For use with all illuminated devices. For best results, LED should match lens color. For amber operators, use yellow LED. <b>Note:</b> Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	24...120V AC/DC	10	* 800F-NUx
		24V AC/DC		* 800F-N3x
		120V AC		* 800F-N5x
		240V AC		* 800F-N7x
		24V AC/DC spring-clamp		* 800F-Q3x
		120V AC spring-clamp		* 800F-Q5x
		240V AC spring-clamp		* 800F-Q7x
		24V AC/DC ring lug		*† 800F-R3x
	Description	Contact Material	Pkg. Quantity	Cat. No.
 <p><b>Cat. No. 800F-BX01</b></p>	<b>Base Mounted Contact Block</b> Base mounted contact blocks can be used in plastic or metal enclosures. <b>Note:</b> Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	N.O.	10	800F-BX10
		N.C.		800F-BX01
		N.O. low voltage — QuadConnect™		800F-BX10V
		N.C. low voltage — QuadConnect™		800F-BX01V
		N.O.E.M.		800F-BX10E
		N.C.L.B.		800F-BX01L
		N.O. spring-clamp		800F-BQ10
		N.C. spring-clamp		800F-BQ01
	Description	Volts	Pkg. Quantity	Cat. No.
 <p><b>Cat. No. 800F-BN3R</b></p>	<b>Base Mounted Integrated LED Module</b> Base mounted modules can be used in plastic or metal enclosures. For best illumination results, LED should match lens color. <b>Note:</b> Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	24V AC/DC	10	* 800F-BN3x
		120V AC		* 800F-BN5x
		240V AC		* 800F-BN7x

\* To complete the cat. no., replace the x with one of the following letters for the desired color: **Y** = Amber, **R** = Red, **G** = Green, **B** = Blue, **W** = White.

\* Cannot be used in a composite catalog number.

† Replacement screws are available (Cat. No. 800F-ARS1)

# 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
<b>Specifications</b> .....	10-67
<b>Quick Selection</b> .....	10-70
<b>Push Buttons, Momentary</b>	
Non-Illuminated — Flush, Extended, Guarded.....	10-73
Non-Illuminated — with Two-Color Molded Legend Caps....	10-74
Illuminated — Flush, Extended, Guarded.....	10-75
<b>Push Buttons, Alternate Action</b>	
Non-Illuminated — Flush.....	10-76
Illuminated — Flush.....	10-76
<b>Pilot Light Operators</b> .....	10-77
<b>Selector Switches</b>	
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
<b>Key Selector Switches</b>	
2-Position .....	10-83
3-Position .....	10-84
<b>Emergency Stop Operators</b>	
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
<b>Momentary Mushroom Operators</b>	
Non-Illuminated.....	10-90
Illuminated.....	10-91

Description	Page
<b>Multi-Function Operators</b>	
2-Function, Momentary, Non-Illuminated .....	10-92
2-Function, Momentary, Illuminated .....	10-93
3-Function, Momentary, Non-Illuminated .....	10-94
<b>Reset Operators</b> .....	10-95
<b>Single-Turn Potentiometer Assembly</b>	10-96
<b>Key Operated Selector Switch — SensEject™</b> .....	10-96
<b>Selector Push Button Operators</b> .....	10-97
<b>Toggle Switch Operators</b> .....	10-98
<b>Back-of-Panel Components</b>	
Contact Blocks.....	10-99
Power Modules .....	10-99
Power Modules with Contact Blocks.....	10-100
<b>Enclosures</b> .....	10-103
<b>Assembled Stations</b> .....	10-103
<b>Assembled Stations with DeviceNet</b> .....	10-105
<b>Pendant Stations</b> .....	10-106
<b>Accessories</b>	
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
<b>Approximate Dimensions</b> .....	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

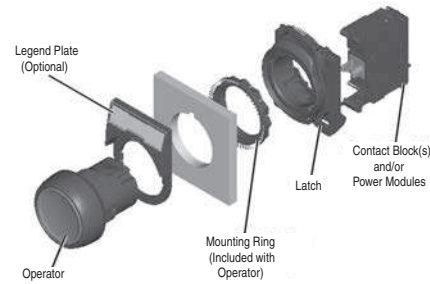


**Plastic Latch with Contact Block**



**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		
	<b>Nominal Voltage</b>	<b>Range</b>	<b>Current Draw</b>
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 <sub>i</sub> )	Screw terminal = 690V, spring-clamp = 300V		
Wire capacity (screw terminal)‡	#18...12 AWG (0.75...2.5 mm <sup>2</sup> ) Max. (2) #14 AWG or (1) #12 AWG		
Wire capacity (spring-clamp terminal)	#18...14 AWG (0.75...1.5 mm <sup>2</sup> ) 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 mm<sup>2</sup>) 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

**Back-of-Panel Components**

**Contact Blocks with Latch — Composite**

800F – P X 0 1 E  
           *a*    *b*    *c*    *d*    *e*



*a*

Style	
Code	Description
P	Plastic latch
M	Metal latch

*c*

N.O. (Normally Open) Circuits	
Code	Description
0	No contact
1	1 N.O.
2	2 N.O.
3	3 N.O.
4	4 N.O.
5	5 N.O.
6	6 N.O.

*d*

N.C. (Normally Closed) Circuits	
Code	Description
0	No contact
1	1 N.C.
2	2 N.C.
3	3 N.C.
4	4 N.C.
5	5 N.C.
6	6 N.C.

*b*

Contact Block(s) Termination Style*	
Code	Description
X	Screw termination
Q	Spring-clamp termination

*e*

Specialty Contact Block(s)	
Code	Description
Blank	Standard blocks
V	Low voltage — QuadCONNECT™
E	N.O. early make
L	N.C. late break
B	N.C. early break
S	N.C. self-monitoring

\* Six circuits maximum allowable.

**Power Modules with Latch — Composite**

800F – M N 3 G  
           *a*    *b*    *c*    *d*



*a*

Style	
Code	Description
P	Plastic latch
M	Metal latch

*c*

Voltage	
Code	Description
0	No bulb♣
1	6V AC/DC♣
2	12V AC/DC♣
3	24V AC/DC
4	48V AC/DC♣
5	120V AC
7	240V AC➤

*d*

Lamp Color⌘	
Code	Description
C	Incandescent
R	Red LED
G	Green LED
Y	Amber LED
W	White LED
B	Blue LED

*b*

Power Module Type‡§	
Code	Description
D	Incandescent module, screw termination
N	Integrated LED module, screw termination
Q	Integrated LED module, spring-clamp termination

‡ LED modules for use with all illuminated operators. Incandescent module for use with pilot lights, momentary push buttons, and momentary mushroom operators only.

§ Four circuits maximum allowable when power module is used. Contact blocks cannot be stacked on power module.

♣ Only available for incandescent module.

➤ Only available for integrated LED module.

⌘ For best illumination results, LED color should match lens color. For yellow operator, select a white LED.

# 22.5 mm Push Buttons

## Product Selection

### Back-of-Panel Components, Continued

#### Power Modules with Contact Blocks and Latch — Composite

800F – P N 5 R X 1 0 E  
*a b c d e f g h*

*a*

Style	
Code	Description
P	Plastic latch
M	Metal latch

*b*

Power Module Type*⊛	
Code	Description
D	Incandescent module, screw termination
N	Integrated LED module, screw termination
Q	Integrated LED module, spring-clamp termination

*c*

Voltage	
Code	Description
0	No bulb‡
1	6V AC/DC‡
2	12V AC/DC‡
3	24V AC/DC
4	48V AC/DC‡
5	120V AC
7	240V AC§

*d*

Lamp Color*	
Code	Description
C	Incandescent
R	Red LED
G	Green LED
Y	Amber LED
W	White LED
B	Blue LED

*e*

Contact Block(s) Termination Style	
Code	Description
X	Screw termination
Q	Spring-clamp termination

*f*

N.O. (Normally Open) Circuits	
Code	Description
0	No contact
1	1 N.O.
2	2 N.O.
3	3 N.O.
4	4 N.O.

*g*

N.C. (Normally Closed) Circuits	
Code	Description
0	No contact
1	1 N.C.
2	2 N.C.
3	3 N.C.
4	4 N.C.

*h*

Specialty Contact Block(s)	
Code	Description
Blank	Standard blocks
V	Low voltage — QuadCONNECT™
E	N.O. early make
L	N.C. late break
B	N.C. early break
S	N.C. self-monitoring

\* Four circuits maximum allowable when power module is used. Contact blocks cannot be stacked on power module.

⊛ LED modules for use with all illuminated operators. Incandescent module for use with pilot lights, push buttons, and momentary mushroom operators only.




‡ Only available for incandescent module.

§ Only available for integrated LED module.

\* For best illuminated results, LED should match lens color. For yellow operator, select a white LED.

Back-of-Panel Components, Continued

Other

	Description	Pkg. Quantity	Cat. No.			
 Cat. No. 800F-ALM	<b>Metal Mounting Latch</b> These are zinc-plated, metal die cast mounting latches. <b>Note:</b> Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.	10	<b>800F-ALM</b>			
	<b>Note:</b> Sold only in multiples of 100. Order (quantity of) 100 to receive one package of 100 pieces.	100	<b>800F-ALM-BP</b>			
 Cat. No. 800F-ALP	<b>Plastic Mounting Latch</b> <b>Note:</b> Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.	10	<b>800F-ALP</b>			
	<b>Note:</b> Sold only in multiples of 100. Order (quantity of) 100 to receive one package of 100 pieces.	100	<b>800F-ALP-BP</b>			
 Cat. No. 800F-X10	<b>Contact Block</b> <b>Note:</b> Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.					
		Description	Contact Type	Pkg. Quantity	Cat. No.	
			N.O.	10	<b>800F-X10</b>	
			N.C.		<b>800F-X01</b>	
			N.O. low voltage — QuadCONNECT™		<b>800F-X10V</b>	
			N.C. low voltage — QuadCONNECT™		<b>800F-X01V</b>	
			N.O.L.M.		‡ <b>800F-X10N</b>	
			N.O.E.M.		<b>800F-X10E</b>	
			N.O.E.E.M.		‡ <b>800F-X10M</b>	
			N.C.L.B.		<b>800F-X01L</b>	
			N.C.E.B.		* <b>800F-X01B</b>	
			Self-Monitoring		* <b>800F-X01S</b>	
			Dual circuit of 2 N.O.		* <b>800F-X20D</b>	
			Dual circuit of 2 N.C.		* <b>800F-X02D</b>	
			Dual circuit of 1 N.O.-1 N.C.		* <b>800F-X11D</b>	
			N.O. with stab terminals		<b>800F-X10T</b>	
			N.C. with stab terminals		<b>800F-X01T</b>	
			N.O. spring-clamp		<b>800F-Q10</b>	
			N.C. spring-clamp		<b>800F-Q01</b>	
			N.O. spring-clamp low-voltage — QuadConnect™		<b>800F-Q10V</b>	
			N.C. spring-clamp low-voltage — QuadConnect™		<b>800F-Q01V</b>	
			N.O.E.M. spring-clamp		<b>800F-Q10E</b>	
			N.C.L.B. spring clamp		<b>800F-Q01L</b>	
			N.C.E.B. spring-clamp		* <b>800F-Q01B</b>	
			Ring lug N.O.		‡§ <b>800F-R10</b>	
			Ring lug N.C.		‡§ <b>800F-R01</b>	
			N.O.		100	<b>800F-X10-BP</b>
			N.C.			<b>800F-X01-BP</b>

- ‡ For use with Cat. No. 800FP-CB\_ and Cat. No. 800FP-CC\_ operators.
- ‡ For use with Cat. No. 800FP-CC\_ operators.
- \* Only for use with 4-position selector switch, 4-position toggle switch, or 3-position push-pull operator.
- \* Cannot stack.
- ‡ Cannot be used in a composite catalog number.
- § Replacement screws are available (Cat. No. 800F-ARS1)