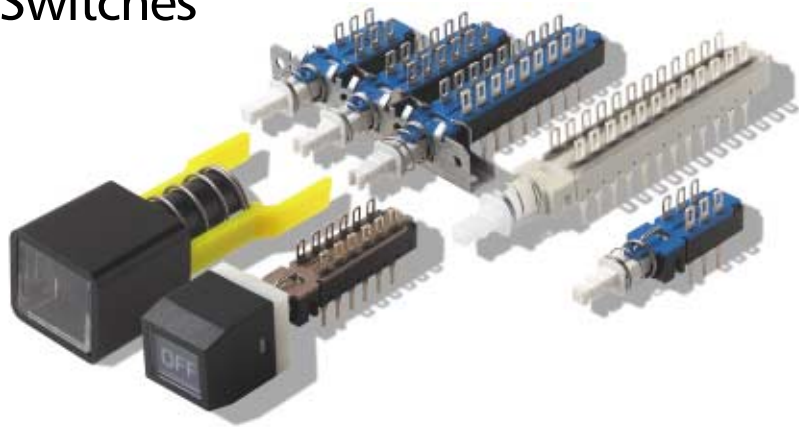


F and SF Push-Button Switches



The essential features of the F and SF push-button switch are the bridge contact and the many mechanical functions. The contact bridge is spring loaded which guarantees a constant pressure on the contacts.

- Up to 10 poles per module
- Various contact terminals
- Standard mounting frame with max. 23 positions
- Spacing optionally 10, 12.5, 15, 17.5 or 20 mm
- Independent interlocking groups in one bank possible
- Mechanical indicator buttons
- Configurations with illuminated push-buttons

Mechanical functions

- OA** Momentary returning to normal "OFF" position
- EE** Push-push function
- GR** Interlocking
- GR1+ GR2** Two independent interlocking groups in one bank
- AOR** Release push-button for a bank, not latching

Button Removal

A button of a push-push button switch is only allowed to be removed in "OFF" (non-latching) position.

Construction			
Function		Momentary (OA), push-push (EE), further functions: see table to the left	
Number of buttons		1 up to 23	
Contact arrangement (U = changeover contact)		Series F: 2U, 4U, 6U, 8U, 10U Series SF: 2U, 4U, 6U, 8U	
Mode of switching		Non-shorting	
Illumination		See: indicator and illuminated push-buttons	
Spacing		10, 12.5, 15, 17.5 or 20 mm (0.394, 0.492, 0.591, 0.689 or 0.787 inch)	
Terminals (see next page)		PC pins and soldering lugs or only PC pins	
Electrical data		F-Silver	F-Gold
Switching power	F module max. AC/DC	50 VA/15 W	1 VA/300 mW
Switching voltage	F module max. AC/DC	125/30 V	50/30 V
Switching current	F module max. AC/DC	0.5/0.5 A	0.04 A/0.01 A
Carrying current max. at $\delta u = 20^\circ\text{C}$		< 2 A	< 0.5 A
Dielectric strength (50 Hz, 1 Min.)	Chassis/contact	$\cong 1500$ V	$\cong 1500$ V
	Between contacts	$\cong 1500$ V	$\cong 1500$ V
Operating life ¹⁾ "OA/EE" (24 V/200 mA)		> 10^5 operations	
"GR"		> 3.5×10^4 operations	
Contact resistance	initial	Typical ≤ 10 m Ω , max. 20 m Ω	
	after operating life	≤ 100 m Ω	
Insulation resistance		$\cong 10^9$ Ω between open contacts	
		$\cong 10^9$ Ω between chassis and contacts	
Capacitance at f = 10 kHz		$\cong 0.7$ pF between 2 contacts	
Mechanical data			
Total travel/latching travel		4.7 mm/3.3 mm (0.185 inch/0.130 inch)	
Typical F Operating Force		2U = 6.5N (650 grams) 4U = 6.5N (650 grams) 6U = 7.5N (750 grams) 8U = 9.0N (900 grams) 10U = 9.0N (900 grams)	
European Typical SF Operating Force		2U = 3.5N \pm 0.5N (350 grams \pm 50 grams) 4U = 5N \pm 1N (500 grams \pm 100 grams) 6U = 6.5N \pm 1N (650 grams \pm 100 grams) 8U = 9N \pm 1N (900 grams \pm 100 grams)	
Further data		Contacts	Housing
Contact and insulation material		Silver with Ni-junction Gold with Ni-junction	Thermoplastic Thermoplastic
Max. soldering time and temperature		5 s at 260°C · hand soldering 3 s at 350°C	
Operating temperature		- 40°C to + 70°C	

¹⁾ 25 – 30 operations/Min.

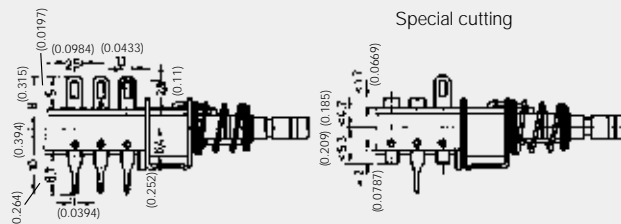
Ordering code: see page C-15.

F and SF Push-Button Switches

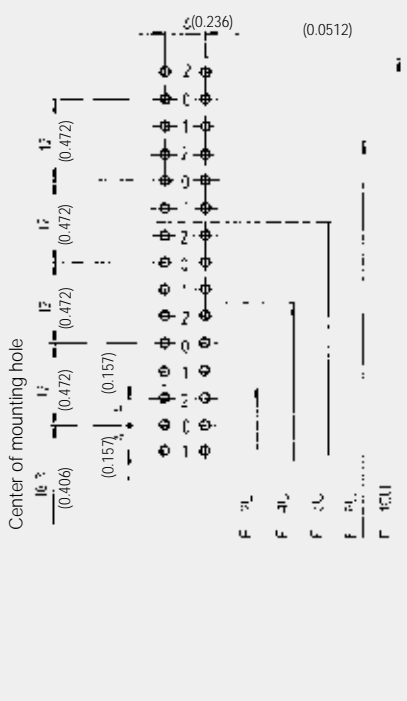
Contact Styles

Standard arrangement

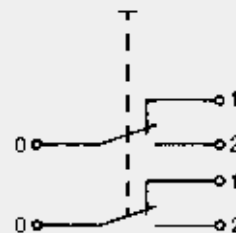
Solder lugs top,
PC pins bottom



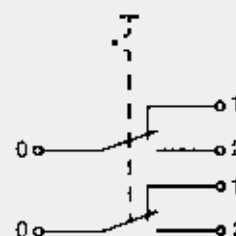
PC board layout



Circuit diagram: momentary



Circuit diagram: push-push



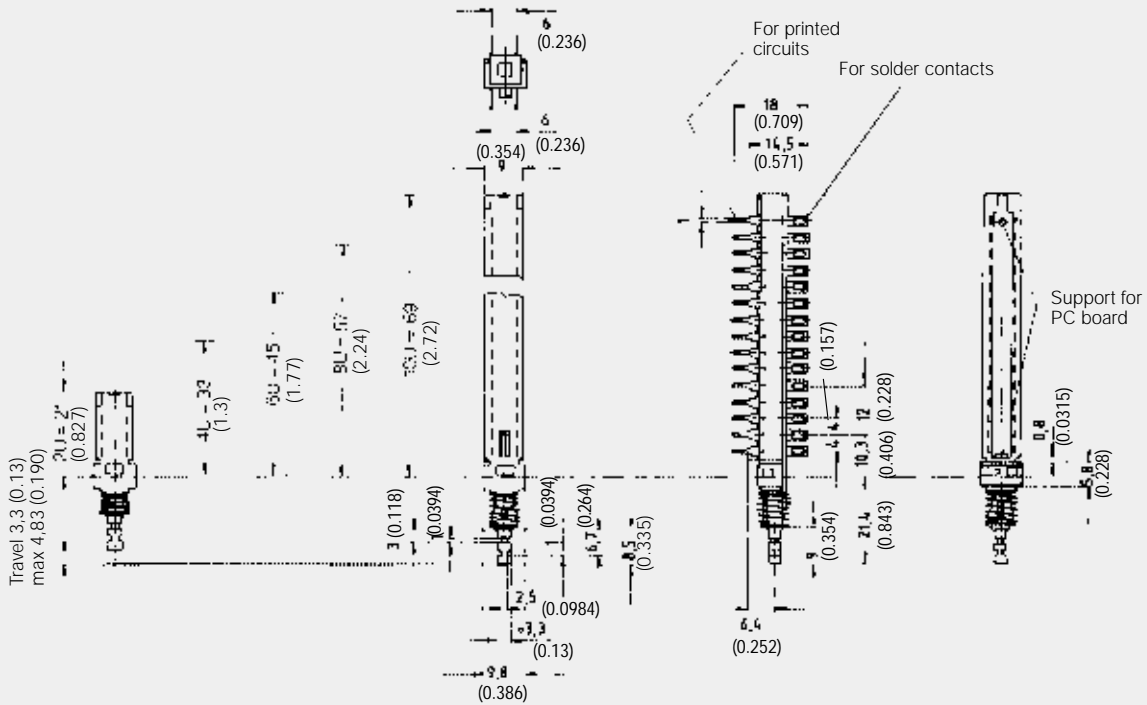
Standard chassis: see page C-15, non-standard chassis: consult factory.

Terminal Code	US	Europe
Solder Lug & P.C. Pins (standard)	01	
Cut Solder Lugs	01A	P
Cut PC Pins	01B	L

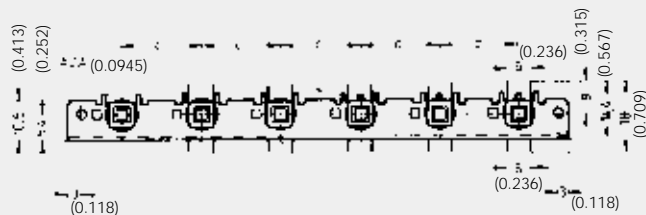
F Push-Button Switches

Dimensional Drawings

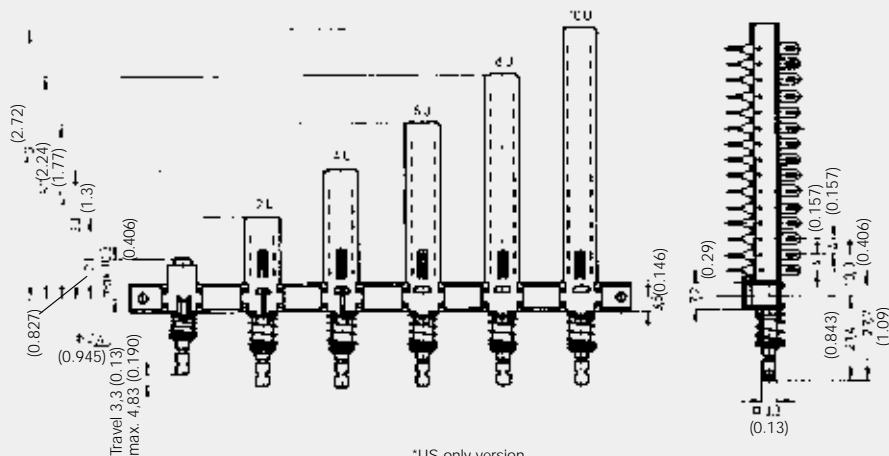
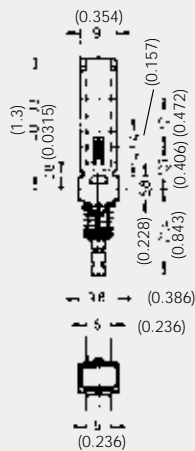
F Push-button switch



F Push-button switch



spacing c: 10; 12.5;
15; 17.5 or 20 mm
(0.394; 0.492; 0.591;
0.689 or 0.787 inch)

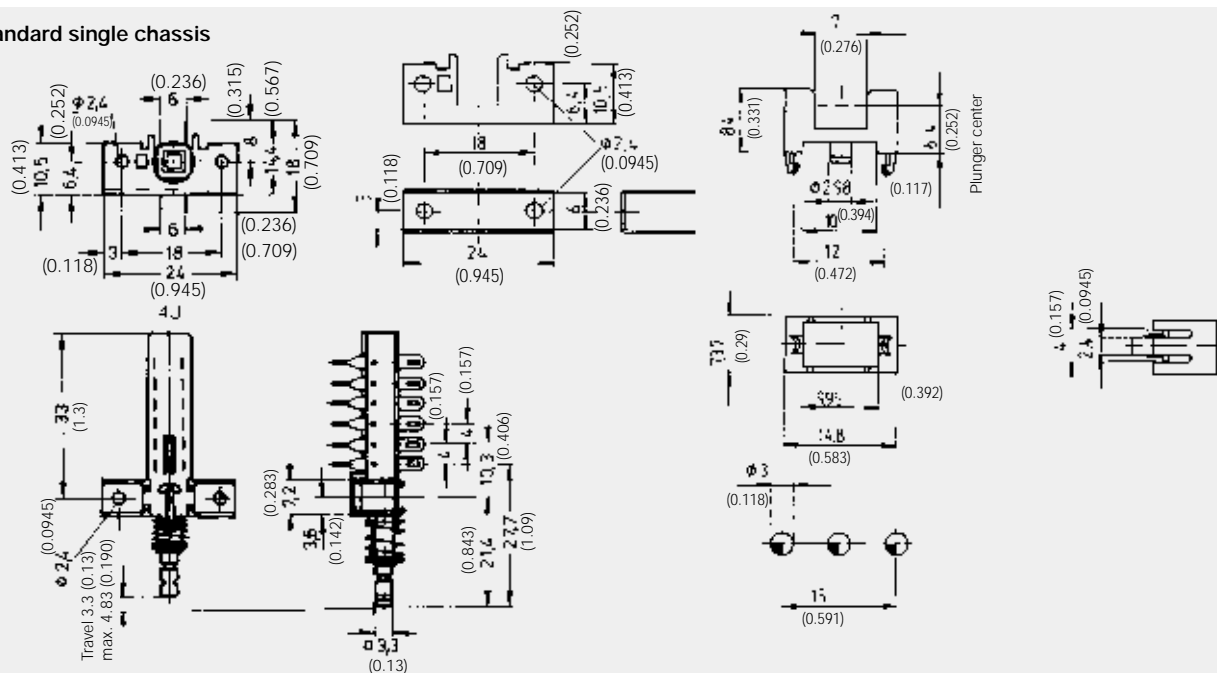


*US only version

Chassis for F Push-Button Switches, NE18 and NE18CTII Mains Switches

Dimensional Drawings

Standard single chassis



Ordering code - Europe		1	2	3	4	5	6	7	8	9	10	11
Example:		10×F	A	17.5	FA110	BK	OG		4U	72		EE
1	Designation: F = module (without chassis), 1 to 23 × F = bank (with chassis)	→	→	→	→	→	→	→	→	→	→	→
2	Indication, illumination: none = without, A = indicating, L1, L2, L3 = lampholder for illuminated button	→	→	→	→	→	→	→	→	→	→	→
3	Spacing: 10, 12.5, 15, 17.5 or 20 mm (0.394, 0.492, 0.591, 0.689 or 0.787 inch)	→	→	→	→	→	→	→	→	→	→	→
4	Button: none = without, FMR, FG, FSC, FSD, FSB, FE, FA, FSA, FSR, FVB, FVRB, FA100, FA101, FA110, FA120, FA201	→	→	→	→	→	→	→	→	→	→	→
5	Color of button housing: BK = black, further colors: see following pages	→	→	→	→	→	→	→	→	→	→	→
6	Color of illuminated button cap: (only illuminated buttons with L1, L2 or L3): RD = red, OG = orange, GN = green, YE = yellow, BU = blue, CL = clear/colorless	→	→	→	→	→	→	→	→	→	→	→
7	Color on ON-position of indicating buttons: RD = red, OG = orange, GN = green, YE = yellow, BU = blue	→	→	→	→	→	→	→	→	→	→	→
8	Contact arrangement (U = changeover): 2U, 4U, 6U, 8U, 10U	→	→	→	→	→	→	→	→	→	→	→
9	Terminal style: 01 = solder lugs top and PC pins bottom, for additional configuration consult factory.	→	→	→	→	→	→	→	→	→	→	→
10	Contact material: none = AG with Ni-junction (standard), P = AU with Ni-junction, Macrolon	→	→	→	→	→	→	→	→	→	→	→
11	Mechanical function: OA = momentary, EE = push-push, GR = interlocking, GR + Sp = interlocking with blocking	→	→	→	→	→	→	→	→	→	→	→

Note: Ordering of not mounted F buttons: ordered separately and delivered separately.

NE18 and NE18CTII Mains Switches

Ordering code - USA		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
		Example:	F	17.5	06	4U	EE	TB	F210103	N	01	B	AU	1	01	Station 2 = OA
1	Designation: F, F/LT	→														
2	Spacing (if required for chassis ¹⁾): 10 = 10 mm (0.394 inch), 12.5 = 12.5 mm (0.492 inch), 15 = 15 mm (0.590 inch), 17.5 = 17.5 mm (0.689 inch), 20 = 20 mm (0.787 inch)	→														
3	Number of stations: 00 = no chassis, 01 thru 23	→														
4	Number of poles: 2U = 2PDT, 4U = 4PDT, 6U = 6PDT, 8U = 8PDT, 10U = 10PDT	→														
5	Mechanical function: GR = interlock, OA = momentary, EE = push-push, AOR = central release, OA + SP = momentary/lockout, ²⁾ GR + SP = interlock/lockout, ²⁾ X = mixed (see page C-12)	→														
6	Terminal sealing: TB = top/bottom, N = none	→														
7	Button style and color: see pages C-18 to C-20 or C-21 for coding	→														
8	Power switches: see page D-13	→														
9	Terminal style: 01 = solder lugs top and PC pins bottom, for additional configuration consult factory.	→														
10	Electrical function: B = BBM	→														
11	Contact material: AU = gold, AG = silver	→														
12	Lamp holder style: see page C-21	→														
13	Lamp type incandescent: 01 = 6 V, 02 = 12 V, 03 = 24 V	→														
14	Special acknowledgements: if all stations are not identical, please state requirements	→														

¹⁾ If option not required: fill in with an N ²⁾ lockout available with 10,15 and 17.5 mm spacing. ³⁾ Switch Orientation: Plunger toward you, solder lugs up, station #1 far left.