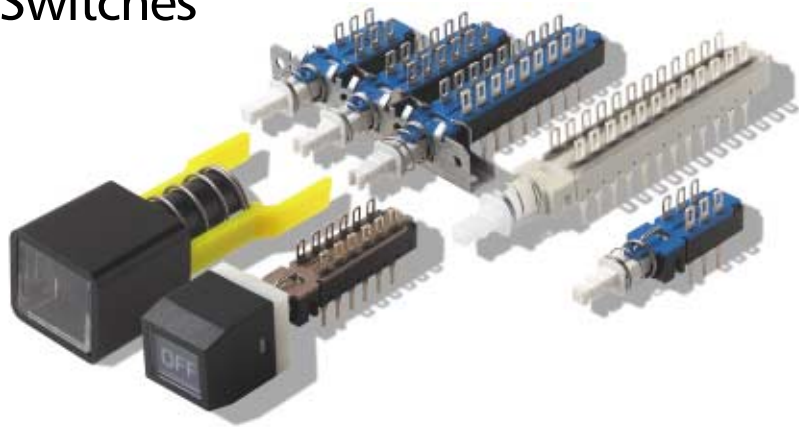


# F and SF Push-Button Switches



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.

<b>Construction</b>			
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	
<b>Electrical data</b>		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 <sup>1)</sup> "OA/EE" (24 V/200 mA)		> $10^5$ operations	
"GR"		> $3.5 \times 10^4$ operations	
Contact resistance	initial	Typical $\leq 10$ m $\Omega$ , max. 20 m $\Omega$	
	after operating life	$\leq 100$ m $\Omega$	
Insulation resistance		$\cong 10^9$ $\Omega$ between open contacts	
		$\cong 10^9$ $\Omega$ between chassis and contacts	
Capacitance at f = 10 kHz		$\cong 0.7$ pF between 2 contacts	
<b>Mechanical data</b>			
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)	
<b>Further data</b>		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	

<sup>1)</sup> 25 – 30 operations/Min.

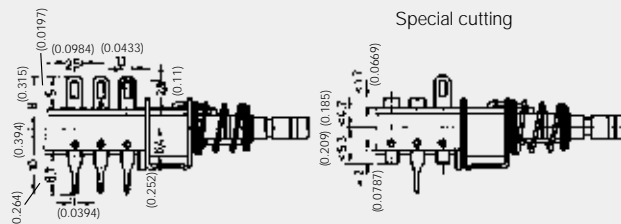
Ordering code: see page C-15.

# F and SF Push-Button Switches

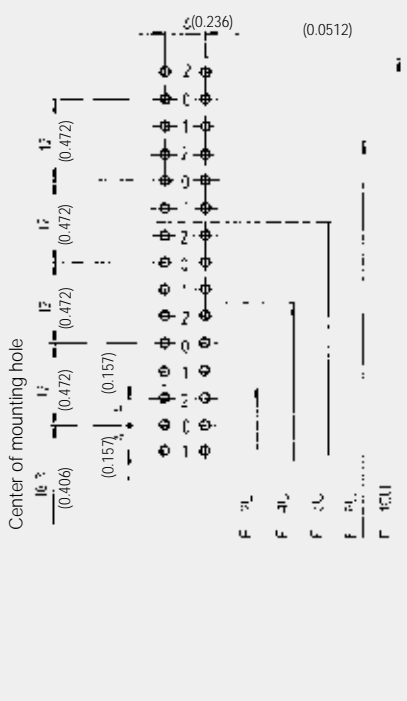
## Contact Styles

### Standard arrangement

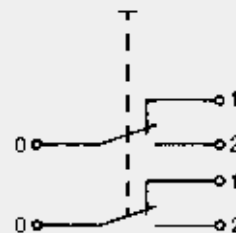
Solder lugs top,  
PC pins bottom



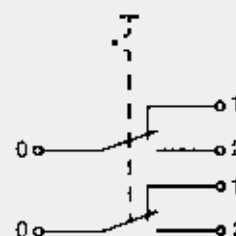
### PC board layout



### Circuit diagram: momentary



### Circuit diagram: push-push



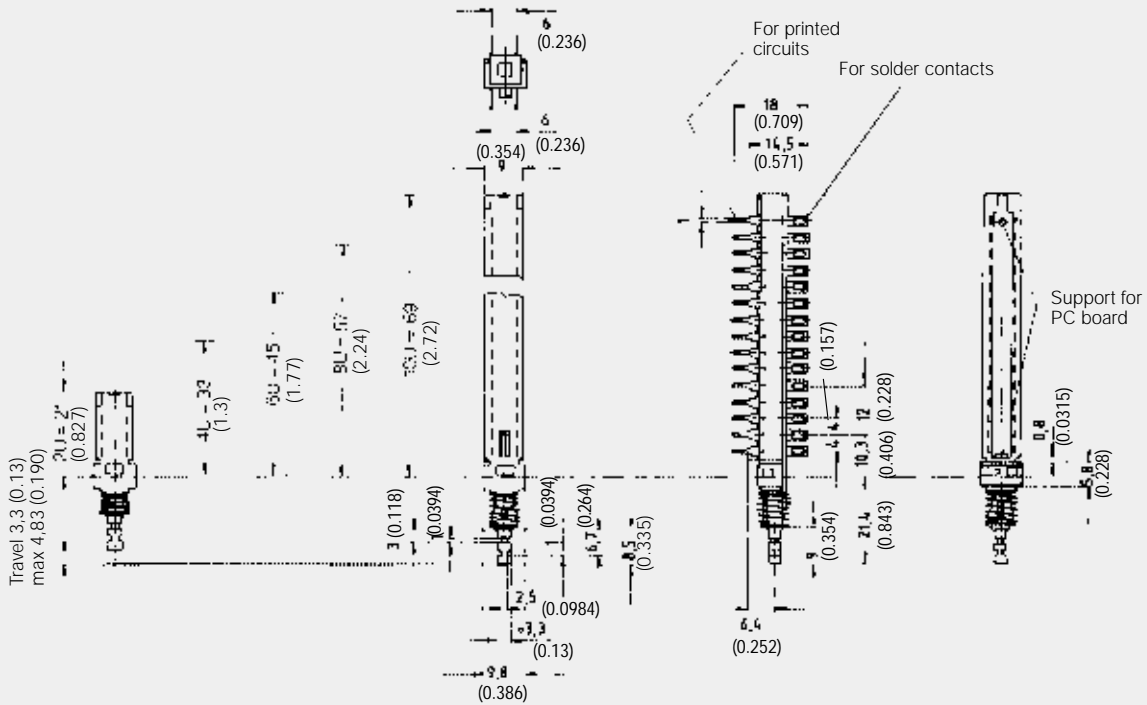
Standard chassis: see page C-15, non-standard chassis: consult factory.

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

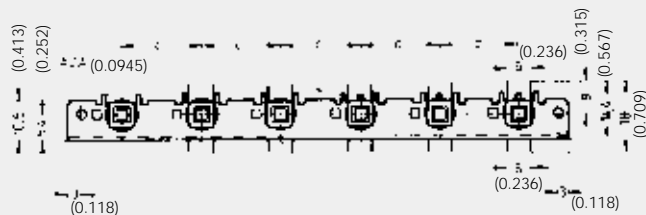
# F Push-Button Switches

## Dimensional Drawings

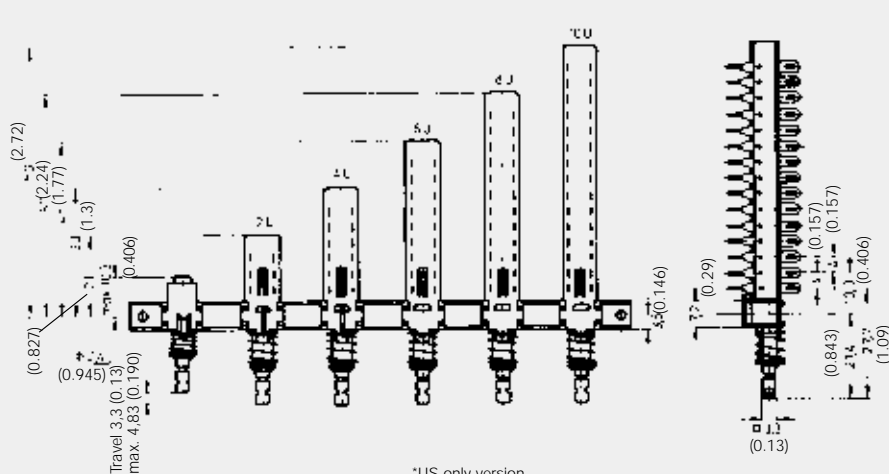
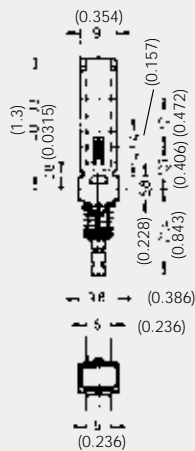
F Push-button switch



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)

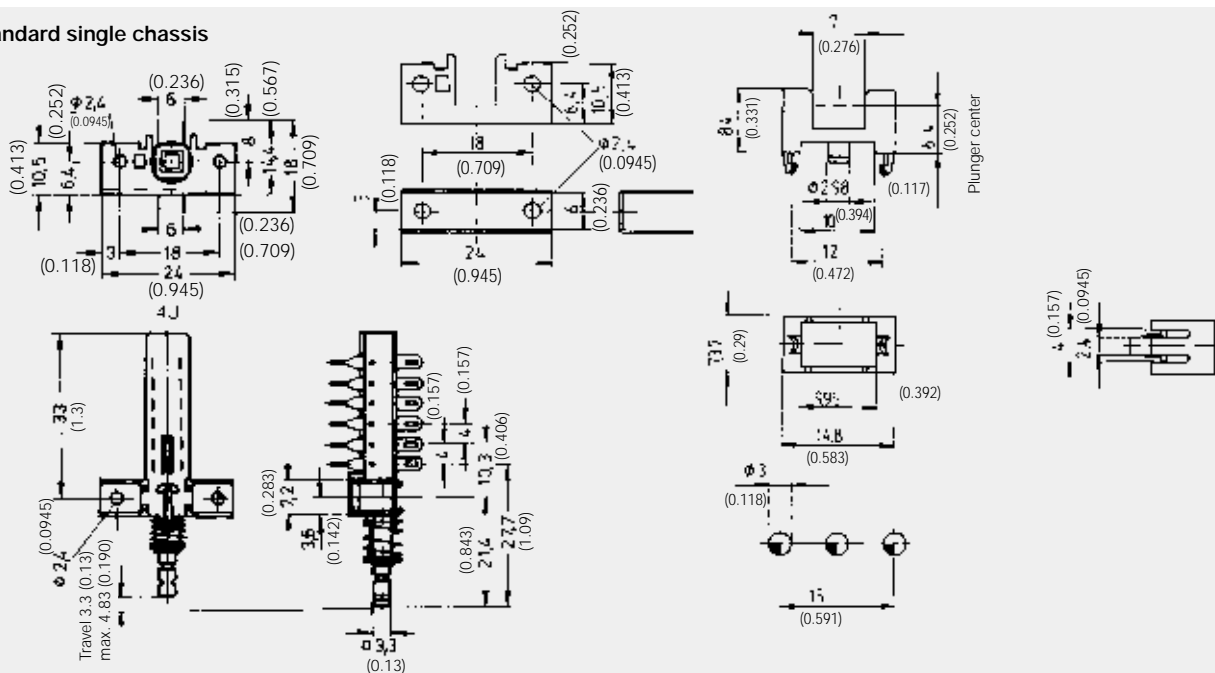


\*US only version

# 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
		<b>Example:</b> 10×F A 17.5 FA110 BK OG 4U 72 EE										
1	<b>Designation:</b> F = module (without chassis), 1 to 23 × F = bank (with chassis)	→	→	→	→	→	→	→	→	→	→	→
2	<b>Indication, illumination:</b> none = without, A = indicating, L1, L2, L3 = lampholder for illuminated button	→	→	→	→	→	→	→	→	→	→	→
3	<b>Spacing:</b> 10, 12.5, 15, 17.5 or 20 mm (0.394, 0.492, 0.591, 0.689 or 0.787 inch)	→	→	→	→	→	→	→	→	→	→	→
4	<b>Button:</b> none = without, FMR, FG, FSC, FSD, FSB, FE, FA, FSA, FSR, FVB, FVRB, FA100, FA101, FA110, FA120, FA201	→	→	→	→	→	→	→	→	→	→	→
5	<b>Color of button housing:</b> BK = black, further colors: see following pages	→	→	→	→	→	→	→	→	→	→	→
6	<b>Color of illuminated button cap:</b> (only illuminated buttons with L1, L2 or L3): RD = red, OG = orange, GN = green, YE = yellow, BU = blue, CL = clear/colorless	→	→	→	→	→	→	→	→	→	→	→
7	<b>Color on ON-position of indicating buttons:</b> RD = red, OG = orange, GN = green, YE = yellow, BU = blue	→	→	→	→	→	→	→	→	→	→	→
8	<b>Contact arrangement (U = changeover):</b> 2U, 4U, 6U, 8U, 10U	→	→	→	→	→	→	→	→	→	→	→
9	<b>Terminal style:</b> 01 = solder lugs top and PC pins bottom, for additional configuration consult factory.	→	→	→	→	→	→	→	→	→	→	→
10	<b>Contact material:</b> none = AG with Ni-junction (standard), P = AU with Ni-junction, Macrolon	→	→	→	→	→	→	→	→	→	→	→
11	<b>Mechanical function:</b> 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	
		<b>Example:</b>	F	17.5	06	4U	EE	TB	F210103	N	01	B	AU	1	01	Station 2 = OA
<b>1</b>	<b>Designation:</b> F, F/LT	→														
<b>2</b>	<b>Spacing</b> (if required for chassis <sup>1)</sup> ): 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)	→														
<b>3</b>	<b>Number of stations:</b> 00 = no chassis, 01 thru 23	→														
<b>4</b>	<b>Number of poles:</b> 2U = 2PDT, 4U = 4PDT, 6U = 6PDT, 8U = 8PDT, 10U = 10PDT	→														
<b>5</b>	<b>Mechanical function:</b> GR = interlock, OA = momentary, EE = push-push, AOR = central release, OA + SP = momentary/lockout, <sup>2)</sup> GR + SP = interlock/lockout, <sup>2)</sup> X = mixed (see page C-12)	→														
<b>6</b>	<b>Terminal sealing:</b> TB = top/bottom, N = none	→														
<b>7</b>	<b>Button style and color:</b> see pages C-18 to C-20 or C-21 for coding	→														
<b>8</b>	<b>Power switches:</b> see page D-13	→														
<b>9</b>	<b>Terminal style:</b> 01 = solder lugs top and PC pins bottom, for additional configuration consult factory.	→														
<b>10</b>	<b>Electrical function:</b> B = BBM	→														
<b>11</b>	<b>Contact material:</b> AU = gold, AG = silver	→														
<b>12</b>	<b>Lamp holder style:</b> see page C-21	→														
<b>13</b>	<b>Lamp type incandescent:</b> 01 = 6 V, 02 = 12 V, 03 = 24 V	→														
<b>14</b>	<b>Special acknowledgements:</b> if all stations are not identical, please state requirements	→														

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