

## Instructions

**Before installing the device, please read the instructions.**

### 1 Summary

#### 1.1 Main application

FM\_E series pushbuttons with complete functions can fully meet the domestic and foreign CNC program control devices needs, which can be widely used in below 220V AC/DC machine tools, textiles, shipping, aviation, automobile, tobacco, electric power, telecommunications medical devices and other fields as control circuits, signals, interlocks and other supporting use.

FM □ E - □□□ - □□□□/□□ - □  
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

- ① Flush design Metal Pushbutton
- ② Mounting cut-outs: Ø12、Ø16、Ø19、Ø22、Ø25、Ø30
- ③ Series: E: standard pushbutton
- ④ Enclosure material: S: stainless steel, A: anodized aluminum(customization)
- ⑤ Shape of head: F: flat round H: high round D: dome
- ⑥ Terminal type: P: plug-in terminal; S: Screw terminal
- ⑦ Contact arrangement: 10:1NO; 11:1NO1NC; 22:2NO2NC
- ⑧ Action Function : Regular : Momentary T: Maintained
- ⑨ LED: D1: Circle D2: Point
- ⑩ Symbol : S0: NO symbol S1: power symbol S99: customization
- ⑪ LED Color: r: red g: green y: yellow b: blue w: white k: black
- ⑫ Voltage code: 21: AC/DC 6V 22: AC/DC 12V 23: AC/DC 24V  
24: AC/DC 36V 25: AC/DC 48V 26: AC/DC 110V 28: AC/DC 220V
- ⑬ Additional code :  
1.No mark: normal  
2.Marked: marked as required. Marked code is composed of 2-10 characters to mark the supply information.

### 2 Installation caution

- 1) We must turn off power before installation and recondition;
- 2) We need to check whether the type meet selection requirement;
- 3) Choose the correct operational voltage.

### 3 Technical feature

#### 3.1 Technical parameters

- 1) Rated insulation voltage (Ui) : 250V;
- 2) Conventional thermal current: (Ith) : 5A;
- 3) Rated impulse withstand voltage (Uimp): 2.5KV;
- 4) Rated insulation voltage: 1500V AC (Valid values) 50Hz, 60s;
- 5) Initial contact resistance: ≤50mΩ
- 6) Dielectric properties: Electrical gap ≥ 1.5mm,  
Creepage distance: ≥ 4mm;
- 7) Mechanical lifetime:  
Momentary: 1000,000 cycles, Maintained : 300,000 cycles;
- 8) Electrical lifetime:  
Momentary : 200,000 cycles, Maintained : 50,000 cycles;
- 9) Type of fuse in test of rated limited short-circuit current: NT00-6A;

- 10) Actuation force ≤ 5 N;
  - 11) Head protection: IP65;
  - 12) Switching capacity: AC-15、DC-13;
- Comparison table of rated operational current Ie (A) and rated operational voltage Ue (V) see table1:

Table 1

Type	Switching capacity	Ue	220V	110V	24V
FM12E	AC-15	Ie	0.5A	1A	2A
	DC-13	Ie	0.1A	0.2A	0.7A
FM16/19/22/25/30E	AC-15	Ie	0.5A	1A	3A
	DC-13	Ie	0.1A	0.2A	0.7A

- 13) The rated working current corresponding to the rated working voltage of the lamp button is shown in Table 2;

Table 2

Power supply	rated voltage	rated current
AC/DC	6V	≤ 15mA
	12V	≤ 15mA
	24V	≤ 15mA
	36V	≤ 15mA
	48V	≤ 15mA
	110V	≤ 15mA
	220V	≤ 15mA

#### 3.2 Work Environment

- 1) Use environment temperature: -25°C ~ +55°C ;
- 2) Air relative humidity: ≤ 90%;
- 3) The altitude is less than 2000m;
- 4) Installation category is II ;
- 5) Pollution degree is 3

### 4 Installation method and Installation dimension

#### 4.1 Installation method

- 1) Insert the operator into the mounting hole from the front of panel.
- 2) Clamping ring from the mounting plate will fit on the back pushbutton on the head, then tighten the nut.

#### 4.2 Installation instructions

The thickness of the mounting panel is shown in Table 3. When installing the fastening nut, all the buttons have their own operating force limit, and it is enough to operate in place when using the nut. Do not overexert yourself, which may lead to short life or damage of parts.

#### 4.3 wiring

##### 4.3.1 Type of terminal

Screw wiring type:

M2.5×4 terminal Screw tightening torque is 0.4N ·m;

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#### 4.3.2 Capacity of terminal to connect wires

Fine stranded wire with end sleeve: 2 x 0.5 ~ 1mm<sup>2</sup>

Bottomless sleeve solid line: 1 x 0.5 ~ 2.5mm<sup>2</sup>

#### 4.4 Mounting cut-outs: See Figure 1 (Unit :mm)

See Table 3 for installation dimensions of each pushbutton

Table 3

Type	Panel thickness (L)	Mounting torque	a	b	D
FM12E	Max3	0.2N·m	Min20	Min20	12.1 <sup>+0.2</sup> <sub>0</sub>
FM16E	Max6	0.4N·m	Min25	Min25	16.2 <sup>+0.2</sup> <sub>0</sub>
FM19E	Max6	0.4N·m	Min30	Min40	19.3 <sup>+0.3</sup> <sub>0</sub>
FM22E	Max6	0.8N·m	Min50	Min50	22.4 <sup>+0.4</sup> <sub>0</sub>
FM25E	Max6	1.2N·m	Min40	Min55	25.5 <sup>+0.5</sup> <sub>0</sub>
FM30E	Max6	1.2N·m	Min50	Min65	30.5 <sup>+0.5</sup> <sub>0</sub>

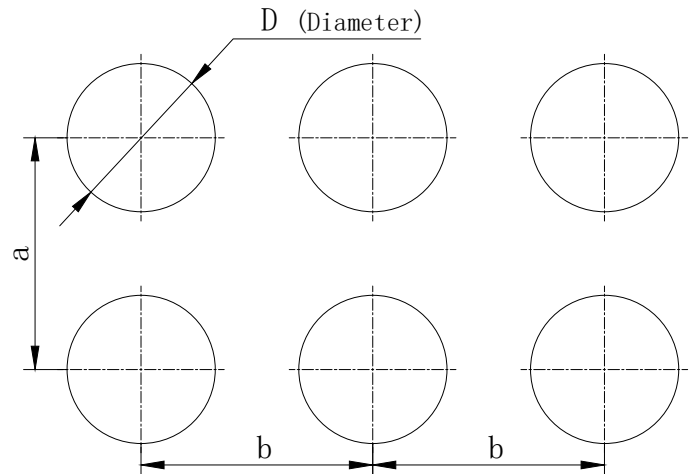


Figure1:mounting cut-outs

#### 4.4 Outlines dimensions as shown in Figure 2 and Figure 3 (unit :mm)

See Table 4 for the overall dimensions of each type of pushbutton

Table 4

Type	Diameter (D)	Thread diameter (d)	h	f
FM12E□DP	17.5	12	Max22	7.2
FM12E□DS	17.5	12	Max22	7.2
FM16E□DP	17.6	16	Max25	2.5
FM16E□DS	17.6	16	Max25	2.5
FM16E□FP	17.6	16	Max25	2
FM16E□FS	17.6	16	Max25	2
FM16E□HP	17.6	16	Max25	3.5
FM16E□HS	17.6	16	Max25	3.5
FM19E□DP	21.9	19	Max36	3.2
FM19E□DS	21.9	19	Max36	3.2
FM19E□FP	21.9	19	Max36	2
FM19E□FS	21.9	19	Max36	2
FM19E□HP	21.9	19	Max36	3.5
FM19E□HS	21.9	19	Max36	3.5
FM22E□DP	25	22	Max45	4
FM22E□DS	25	22	Max45	3.7
FM22E□FP	25	22	Max45	2
FM22E□FS	25	22	Max45	2
FM22E□HP	25	22	Max45	5
FM22E□HS	25	22	Max45	5
FM25E□DP	27.8	25	Max45	4.6
FM25E□FP	27.8	25	Max45	2
FM25E□HP	27.8	25	Max45	5
FM30E□DP	33.8	30	Max45	5
FM30E□FP	33.8	30	Max45	2
FM30E□HP	33.8	30	Max45	5

#### 4.5 Product installation steps are shown in Figure 4

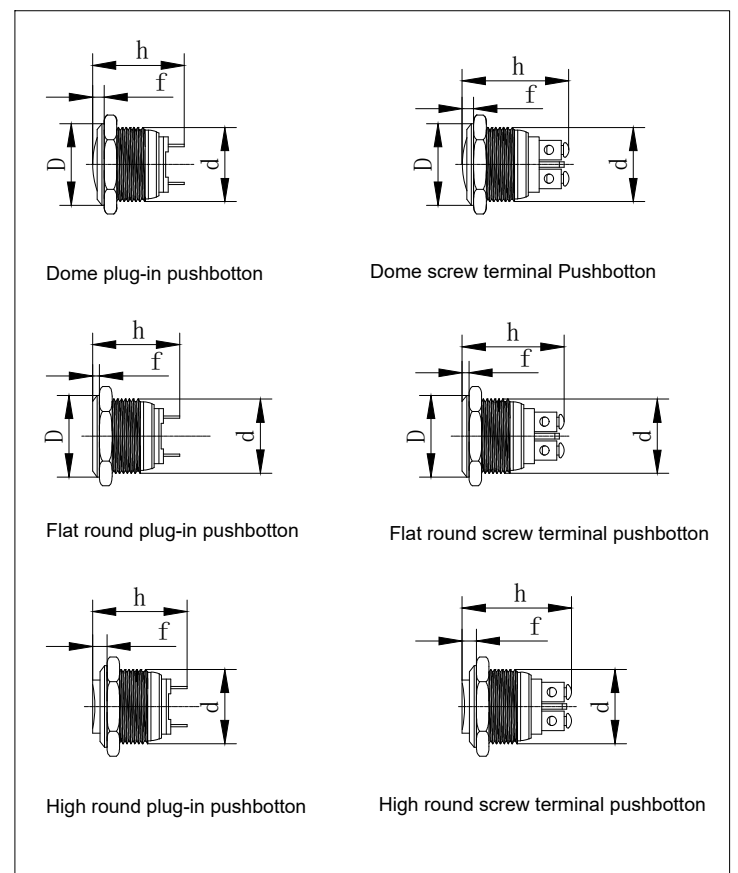


Figure 2: Outline demension of FM12/16/19E series product

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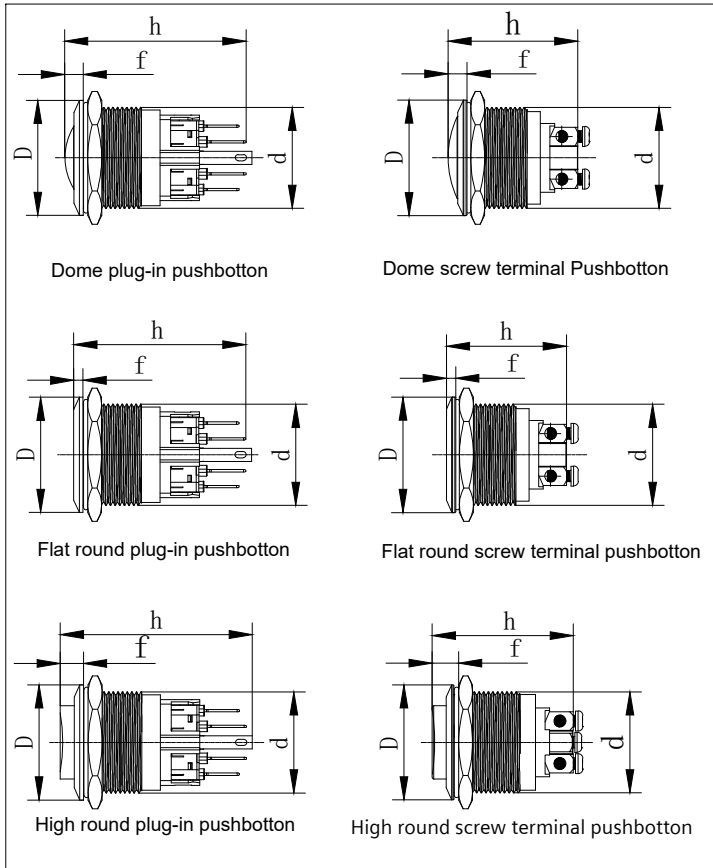


Figure 3:  
Outline dimension of FM22/25/30E series product

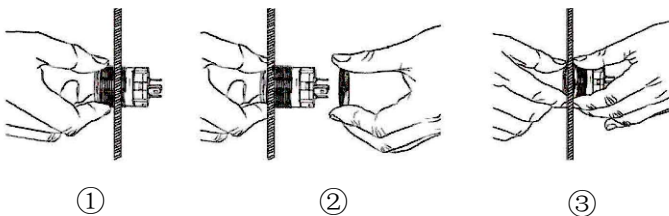


Figure 4: Product installation steps