Application Paper **AP04716001E** Effective March 2009

Control circuit devices wiring guide

M22 IEC 22.5 mm pushbuttons

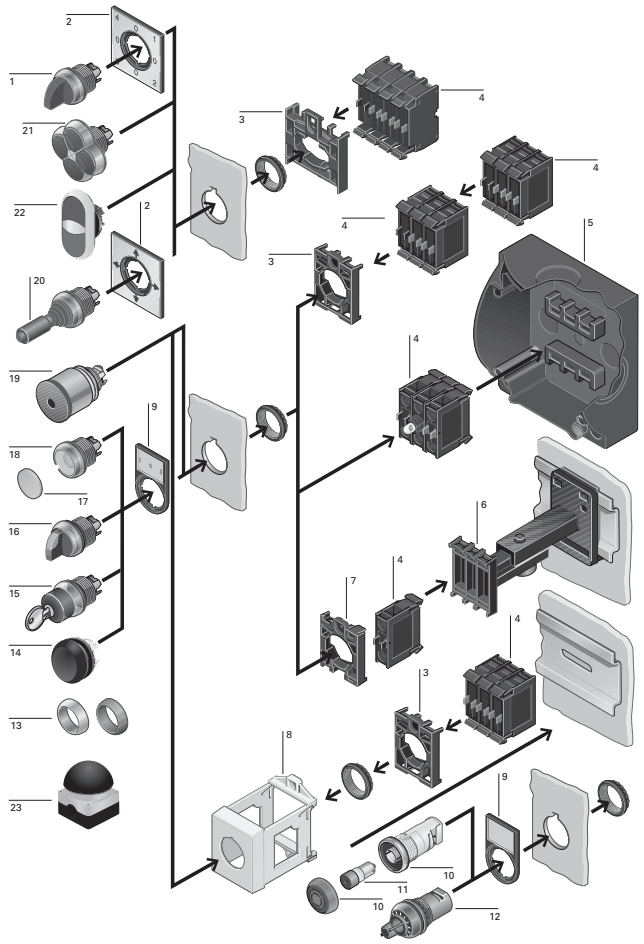
Commands and signals are fundamental functions for controlling machines and processes. The required control signals are produced either manually by control circuit devices or mechanically by position switches. The respective application governs the degree of protection, the shape and the color.

Advanced technology has been used consistently in the development of the new line of M22 IEC pushbuttons. The use of LED elements and laser inscription offers maximum reliability, efficiency and flexibility. This means:

- High-quality optics for a uniform appearance
- Highest degree of protection up to IP67 and IP69K (suitable for steam-jet cleaning)
- Clear contrast using LED element lighting, even in daylight
- 100,000 hours (i.e., machine lifespan)
- Impact and vibration resistant
- LED operating voltage from 12 to 500V
- Low power consumption—only 1/6 of filament lamps
- Expanded operating temperature range –25 to +70˚C, (–13 to 158°F)
- Light-testing circuit
- Built-in safety circuits for highest operational reliability and accessibility
- Abrasion-proof and contrasting laser inscription
- Customer-specific symbols and inscriptions
- Text and symbols can be freely combined
- Screw and spring-cage terminations
- Switching contacts suitable for use with electronic devices to EN 61131-2: 5V/1 mA
- Field-convertible selector switches from momentary to maintained status
- All operators in illuminated and nonilluminated styles
- Emergency-Stop operators with pull and twist-to-release function
- Illuminated Emergency-Stop for active safety
- Contacts switch differing potentials
- For use also in safety-related circuits using positive operation and positively opening contacts
- Complies with industry standard IEC/EN60947

Powering Business Worldwide

M22 product line overview



1. Four-position selector switch
2. Legend plate for four-way selector switch/joystick
3. Mounting adapter
4. Contact block
5. Enclosure
6. Telescopic clip
7. Centering adapter
8. DIN rail mounting adapter
9. Legend plate
10. Acoustic indicator
11. Buzzer
12. Potentiometer
13. Bezel, available in silver or black
14. Indicating light
15. Key operated selector switch
16. Selector switch
17. Button plate/button lens
18. Buttonless operator
19. Emergency-Stop operator
20. Joystick
21. Four-way pushbutton
22. Double pushbutton
23. Palm switch

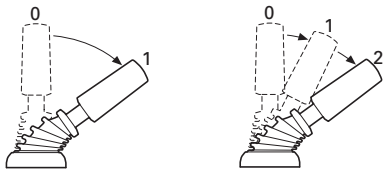
Product innovations

Four-way pushbutton

The four-way pushbutton enables users to control machines and systems in four directions of movement, with each direction of movement being assigned one contact element. The operator has four individual button plates. They can be specifically selected for various applications and can be laser-inscribed to suit the specific requirements.

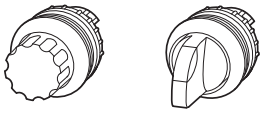
Joystick with double contact

The joystick allows the control of up to four directions of movement on machines. Different variants of the joystick have 2/4 positions and other variants have two settings for each position. This allows, for example, two-speed settings for each direction. For this application, a standard normally open contact and an early-make contact are fitted in series. Momentary contact and latching contact versions are available.



Four-position selector switches

Selector switch operators with four positions are available as either rotary or knob types. One contact block is assigned to each On and each Off position.



Laser inscription

Eaton offers many legend plates for the M22 product line. Common legend plates include:

- Blank
- With direction arrows
- With inscription 0–1–0–2–0–3–0–4 (to be used with four-position selector switches)

Customized inscriptions are also possible. Custom laser inscriptions can be designed and permanently applied to legend plates.

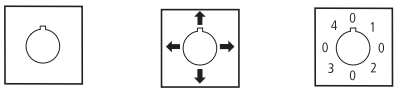
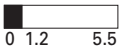
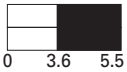
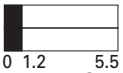
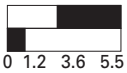


Table 1. Contact versions

Screw Terminals	Spring Cage Terminals	Front Mounting	Base Mounting	Contact	Contact Travel Diagram ①
x	x	x	x		 M22-(C)K(C)10
x	x	x	x		 M22-(C)K(C)01 ②
x	x	x	—		 M22-(C)K01D ②
x	—	x	—		 M22-K10P
—	x	x	—		 M22-CK20
—	x	x	—		 M22-CK02 ②
—	x	x	—		 M22-CK11 ②

① Stroke in connection with front element.

② ⊖ = Positive opening safety function to IEC/EN 60-947-5-1

Figure 1. Terminal markings and function numbers (conventional number/circuit symbol), EN 50013

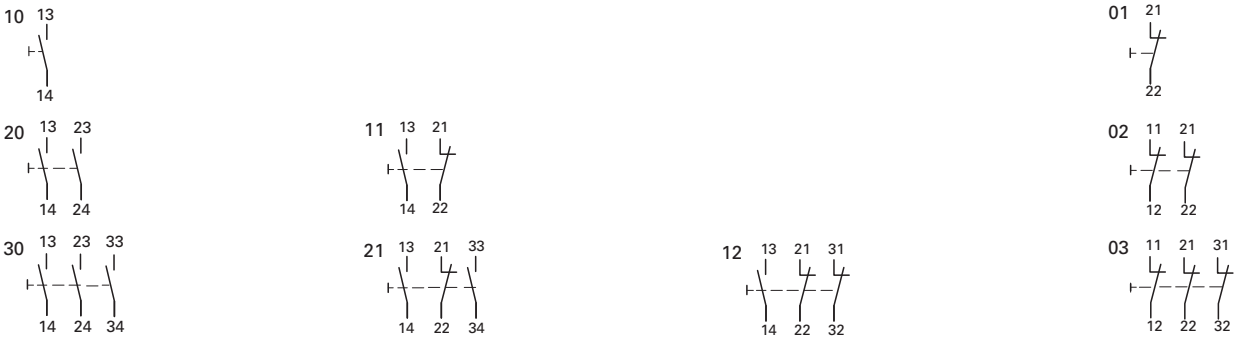
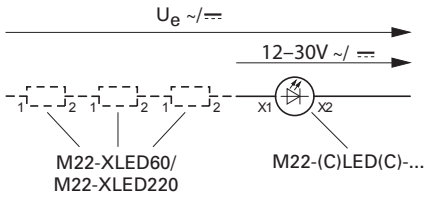
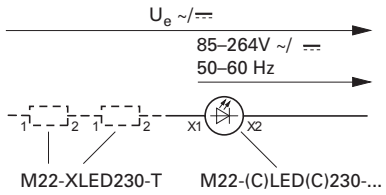


Table 2. Voltage versions with series elements



M22-XLED60 ①	U_e ≤AC/DC
1x	60V
2x	90V
3x	120V
...	...
7x	240V
M22-XLED220	U_e ≤
1 x	220 Vdc



M22-XLED230-T ②	U_e ≤
1x	400V~
2x	500V~

M22-XLED230-T	1 x	2 x
U_e F	400 Vh	500 Vh

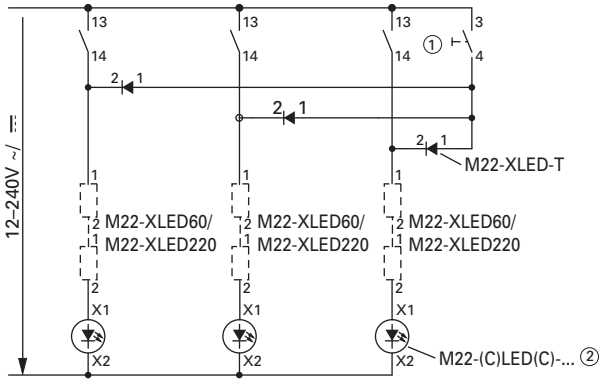
① For increasing the voltage AC/DC.

② AC for increasing the voltage 50/60 Hz.

Circuit for light test

The test button is used to check operation of the indicator lights independently of the respective control state. Decoupling elements prevent voltage feedback.

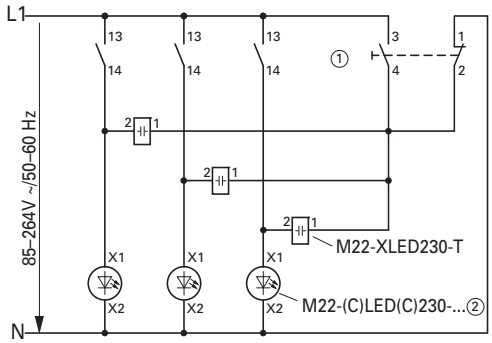
M22-XLED-T for Ue = 12 to 240 Vac/dc



① Test button.

② Only for elements 12 to 30V.

M22-XLED230-T for Ue = 85 to 264 Vac/50–60 Hz



① Test button.

② For elements 85 to 264V.

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