

# Devices raised mounting

## Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete

Application as per DIN EN ISO 13850 and EN 60204-1



|                                                                                                                                            | Front protection | Switching action | Mushroom had cap | Illumination | Terminals | Contacts    | Ø 32 mm<br>Typ-Nr.  | Component layout | Mounting dimensions | Technical drawing | Circuit drawing |       |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|------------------|--------------|-----------|-------------|---------------------|------------------|---------------------|-------------------|-----------------|-------|
| <b>Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete</b><br>Position indication ring black<br>Twist to unlock clockwise      | IP 65            | MA               | Plastic red      | without      | FR        | 1 NC        | <b>84-5020.0040</b> | 2                | 2                   | 15                | 8               | 0.036 |
|                                                                                                                                            |                  |                  |                  |              |           | 1 NC + 1 NO | <b>84-5030.0040</b> | 2                | 2                   | 15                | 9               | 0.036 |
|                                                                                                                                            |                  |                  |                  |              |           | 2 NC        | <b>84-5040.0040</b> | 2                | 2                   | 15                | 10              | 0.036 |
|                                                                                                                                            |                  |                  |                  |              | PT 2.8 s  | 1 NC        | <b>84-5020.0020</b> | 1                | 2                   | 15                | 8               | 0.028 |
|                                                                                                                                            |                  |                  |                  |              |           | 1 NC + 1 NO | <b>84-5030.0020</b> | 1                | 2                   | 15                | 9               | 0.028 |
|                                                                                                                                            |                  |                  |                  |              |           | 2 NC        | <b>84-5040.0020</b> | 1                | 2                   | 15                | 10              | 0.028 |
| Position indication ring black<br>Twist to unlock clockwise<br>LED operating voltage: 5 ... 30 VDC<br>Current consumption: 9.7 ... 12.4 mA | IP 65            | MA               | Plastic red      | LED red      | FR        | 1 NC        | <b>84-5021.2B40</b> | 2                | 2                   | 15                | 11              | 0.036 |
|                                                                                                                                            |                  |                  |                  |              |           | 1 NC + 1 NO | <b>84-5031.2B40</b> | 2                | 2                   | 15                | 12              | 0.036 |
|                                                                                                                                            |                  |                  |                  |              |           | 2 NC        | <b>84-5041.2B40</b> | 2                | 2                   | 15                | 13              | 0.036 |
|                                                                                                                                            |                  |                  |                  |              | PT 2.8 s  | 1 NC        | <b>84-5021.2B20</b> | 1                | 2                   | 15                | 11              | 0.028 |
|                                                                                                                                            |                  |                  |                  |              |           | 1 NC + 1 NO | <b>84-5031.2B20</b> | 1                | 2                   | 15                | 12              | 0.028 |
|                                                                                                                                            |                  |                  |                  |              |           | 2 NC        | <b>84-5041.2B20</b> | 1                | 2                   | 15                | 13              | 0.028 |
| Position indication ring green<br>Twist to unlock clockwise                                                                                | IP 65            | MA               | Plastic red      | without      | FR        | 1 NC        | <b>84-5120.0040</b> | 2                | 2                   | 15                | 8               | 0.036 |
|                                                                                                                                            |                  |                  |                  |              |           | 1 NC + 1 NO | <b>84-5130.0040</b> | 2                | 2                   | 15                | 9               | 0.036 |
|                                                                                                                                            |                  |                  |                  |              |           | 2 NC        | <b>84-5140.0040</b> | 2                | 2                   | 15                | 10              | 0.036 |
|                                                                                                                                            |                  |                  |                  |              | PT 2.8 s  | 1 NC        | <b>84-5120.0020</b> | 1                | 2                   | 15                | 8               | 0.028 |
|                                                                                                                                            |                  |                  |                  |              |           | 1 NC + 1 NO | <b>84-5130.0020</b> | 1                | 2                   | 15                | 9               | 0.028 |
|                                                                                                                                            |                  |                  |                  |              |           | 2 NC        | <b>84-5140.0020</b> | 1                | 2                   | 15                | 10              | 0.028 |
| Position indication ring green<br>Twist to unlock clockwise<br>LED operating voltage: 5 ... 30 VDC<br>Current consumption: 9.7 ... 12.4 mA | IP 65            | MA               | Plastic red      | LED red      | FR        | 1 NC        | <b>84-5121.2B40</b> | 2                | 2                   | 15                | 11              | 0.036 |
|                                                                                                                                            |                  |                  |                  |              |           | 1 NC + 1 NO | <b>84-5131.2B40</b> | 2                | 2                   | 15                | 12              | 0.036 |
|                                                                                                                                            |                  |                  |                  |              |           | 2 NC        | <b>84-5141.2B40</b> | 2                | 2                   | 15                | 13              | 0.036 |
|                                                                                                                                            |                  |                  |                  |              | PT 2.8 s  | 1 NC        | <b>84-5121.2B20</b> | 1                | 2                   | 15                | 10              | 0.028 |
|                                                                                                                                            |                  |                  |                  |              |           | 1 NC + 1 NO | <b>84-5131.2B20</b> | 1                | 2                   | 15                | 12              | 0.028 |
|                                                                                                                                            |                  |                  |                  |              |           | 2 NC        | <b>84-5141.2B20</b> | 1                | 2                   | 15                | 13              | 0.028 |

Standard version:

Flat ribbon-cable length 300 mm; Plug-in terminal 2.8 x 0.5 mm.

Other options on request:

Customisation of flat ribbon-cable and connectors.

Switching action: MA = Maintained action

Terminals: FR = Flat ribbon cable, PT 2.8 s = Plug-in terminal 2.8 mm (solderable)

Contacts: NC = Normally closed, NO = Normally open

Component layout from page 28, Mounting dimensions from page 29, Technical drawing from page 30, Circuit drawing from page 37

# Technical Data

## Emergency-stop

### Switching system

The double-break switching system can be supplied for the following switching functions:

1 Normally closed, 2 Normally closed, 1 Normally closed + 1 Normally open.

The Normally closed contacts have forced opening according to EN IEC 60947-5-1

### Material

#### Connection cable

Polyvinylchloride (PVC), operating temperature up to +65 °C

#### Mushroom-head cap

Polybutylenterephthalate (PBT), as per UL 94 V0 (red items)

#### Actuator housing

Polyamide (PA 66), as per UL 94 V0, Flat ribbon cable-cover  
Polyamide (PA 6.6), as per UL 94 V0

#### Material of contact

Silver alloy gold plated

### Mechanical characteristics

#### Front panel thickness

Standard 1 ... 4 mm  
with E-stop protective shroud Typ-Nr. 84-902 1 ... 3 mm

#### Mounting hole

22.5 mm dia. as per EN IEC 60947-5-1 with anti-twist device

#### Terminals

Soldering terminals 2.8 x 0.5 mm (solderable), CuSn6 tin-plated  
Flat ribbon cable 2-, 4-, or 6-poles 0.35 mm<sup>2</sup> (AWG 22)

#### Tightening torque

Fixing nut 80 Ncm

#### Actuating force

22 N ±4 N

#### Actuating travel

approx. 4 mm to release the internal operation part

#### Mechanical lifetime

≥50.000 cycles of operations

### Electrical characteristics

#### Standards

The devices comply with : EN IEC 60947-5-1, EN IEC 60947-5-5 (Emergency-stop), DIN EN ISO 13850, EN IEC 60204

#### Illumination

LED red with pole reversal, constant current source

Operation Voltage 5 VDC ... 30 VDC  
Current consumption 9.7 mA ... 12.4 mA

#### Rated Operational Voltage $U_e$

250 VAC, as per EN IEC 60947-1

#### Rated Insulation Voltage $U_i$

250 V, as per EN IEC 60947-1

#### Rated Impulse Withstand Voltage $U_{imp}$

2.5 kV, as per EN IEC 60947-1

#### Contact resistance

New state ≤ 50 mΩ, as per DIN IEC 60512-2-3

#### Isolation resistance

>10<sup>11</sup> Ω between the open contacts at 500 VDC, as per DIN IEC 60512-2-10

#### Electrical life

≥50 000 cycles of operations (inductive cosφ 0.4), as per EN IEC 60947-5-1

|         |         |         |         |         |
|---------|---------|---------|---------|---------|
| Voltage | 120 VAC | 240 VAC | 125 VDC | 250 VDC |
| Current | 3 A     | 1.5 A   | 0.55 A  | 0.27 A  |

Reduced load ≥50'000 cycles of operations (resistive)

|         |          |           |
|---------|----------|-----------|
| Voltage | 1 VAC/DC | 42 VAC/DC |
| Current | 100 mA   | 200 mA    |

#### Conventional free air thermal current $I_{th}$

5 A, as per EN IEC 60947-5-1

the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

#### Switch rating

Switch rating AC with silver contact (gold plated), service category AC-15, as per EN IEC 60947-5-1

|         |         |         |
|---------|---------|---------|
| Voltage | 120 VAC | 240 VAC |
| Current | 3 A     | 1.5 A   |

Switch rating DC for silver contact (gold plated), service category DC-13, as per EN IEC 60947-5-1 (inductive)

|                          |        |        |        |        |         |         |
|--------------------------|--------|--------|--------|--------|---------|---------|
| Voltage                  | 12 VDC | 24 VDC | 48 VDC | 60 VDC | 125 VDC | 250 VDC |
| Current <sub>Plug</sub>  | 5 A    | 4 A    | 2.1 A  | 1.7 A  | 0.55 A  | 0.27 A  |
| Current <sub>Cable</sub> | 3 A    | 3 A    | 2.1 A  | 1.7 A  | 0.55 A  | 0.27 A  |

#### Recommended minimum operational data

Silver contacts (gold plated)

|         |          |
|---------|----------|
| Voltage | 1 VAC/DC |
| Current | 1 mA     |

#### Electric strength

500 VAC, 50 Hz, 1 min, as per DIN IEC 60512-2

#### Rated conditional short-circuit current

1000 A, type of short-circuit unit 6 A gG, as per EN IEC 60947-5-1

#### Protection class

Class II, as per EN IEC 60947-5

#### Overvoltage category

II, as per EN IEC 60947-1

#### Degree of pollution

3, as per EN IEC 60947-1

### Environmental conditions

#### Storage temperature

-25 °C ... +80 °C

#### Operating temperature

-25 °C ... +65 °C

#### Front protection

IP 65, as per EN IEC 60529

# Technical Data

### Shock resistance

(semi-sinusoidal)  
max. 150 m/s<sup>2</sup>, pulse width 11 ms, 3-axis, as per EN IEC 60068-2-27

### Vibration resistance

(sinusoidal)  
max. 50 m/s<sup>2</sup> at 10 Hz ... 500 Hz, 10 cycles, 3-axis, as per EN IEC 60068-2-6

### Climate resistance

Damp heat, cyclic  
96 hours, +25 °C / 97 % , +55 °C / 93 % relative humidity, as per EN IEC 60068-2-30

Damp heat, steady  
56 days, +40 °C / 93 % relative humidity, as per EN IEC 60068-2-78

Dry heat  
96 hours, +70 °C, as per EN IEC 60068-2-2

Low temperature  
96 hours, -40 °C, as per EN IEC 60068-2-1

Saline mist  
96 Stunden, +35 °C in chemical solution NaCl, as per EN IEC 60068-2-11

### Actuating travel

~0.5 mm

### Rebound time

≤1 ms

### Resistance to heat of soldering

260 °C, 5 s (PCB assembly)  
350 °C, 10 s (when using a soldering iron)  
as per EN IEC 60068-2-20

### Mechanical lifetime

≥1 million cycles of operations

## Electrical characteristics

### Illumination

Single-Chip or Multi-Chip LED, green, orange, red, yellow, white and blue

|                     |        |        |
|---------------------|--------|--------|
| Operation Voltage   | 12 VDC | 24 VDC |
| Current consumption | 40 mA  | 20 mA  |

### Contact resistance

Starting value (initial) ≤100 mΩ, as per DIN IEC 60512-2

### Isolation resistance

≥1 G Ω between all terminals at 100 VDC, as per DIN IEC 60512-2

### Electrical life

as per EN IEC 60512-5

|           |                     |                              |
|-----------|---------------------|------------------------------|
| 5 million | cycles of operation | 24 VAC, 50 mA at 480 Ω       |
| 5 million | cycles of operation | 24 VAC, 100 mA at 240 Ω      |
| 2 million | cycles of operation | 42 VAC, 50 mA at 840 Ω       |
| 2 million | cycles of operation | 42 VAC, 100 mA at 420 Ω      |
| 300 000   | cycles of operation | 42 VAC, 100 mA at cosφ 0,4   |
| 250 000   | cycles of operation | 42 VAC, 200 mA at cosφ 0,395 |

|             |                     |                         |
|-------------|---------------------|-------------------------|
| 1 million   | cycles of operation | 12 VDC, 250 mA at 48 Ω  |
| 1 million   | cycles of operation | 24 VDC, 50 mA at 480 Ω  |
| 1 million   | cycles of operation | 24 VDC, 100 mA at 240 Ω |
| 5 million   | cycles of operation | 42 VDC, 25 mA at 1680 Ω |
| 1.5 million | cycles of operation | 42 VDC, 50 mA at 840 Ω  |
| 100 000     | cycles of operation | 42 VDC, 100 mA at 420 Ω |

|         |                     |                             |
|---------|---------------------|-----------------------------|
| 500 000 | cycles of operation | 24 VDC, 200 mA at L/R=30 ms |
| 300 000 | cycles of operation | 42 VDC, 100 mA at L/R=30 ms |
| 100 000 | cycles of operation | 42 VDC, 200 mA at L/R=30 ms |

### Switch rating

|         |                          |
|---------|--------------------------|
| Voltage | 50 mVAC/DC ... 42 VAC/DC |
| Current | 10 uA ... 100 mA         |
| Power   | max. 2 W                 |

### Electric strength

500 VAC, 50 Hz, 1 min, as per DIN IEC 60512-2

## Environmental conditions

### Storage temperature

-40 °C ... +85 °C

### Operating temperature

-25 °C ... +70 °C

### Protection degree

For IP 67 back protection, cable version only, use Plug Typ-Nr. 84-900

## Approvals

### Approbations

SEV  
UL

### Declaration of conformity

CE  
RoHS

## Switching element illuminated pushbutton

## Switching system

Short-travel switching system with 2 independent contact points and tactile operation.  
Guarantees reliable switching even of very light loads.  
Fitted with 1 normally open contact.

## Material

### Connection cable

Polyvinylchloride (PVC), short-time heat-resistant up to 105 °C

### Material of contact

Silver alloy gold plated

### Switching element

Thermoplastic polyester (PET, PBT), as per UL 94 V0 and Polyacetale (POM), as per UL 94 HB

## Mechanical characteristics

### Terminals

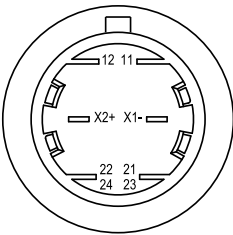
Plug-in terminals 2.8 x 0.8 mm (solderable)  
Flat ribbon cable 0.5 mm<sup>2</sup>  
PCB terminal

### Actuating force

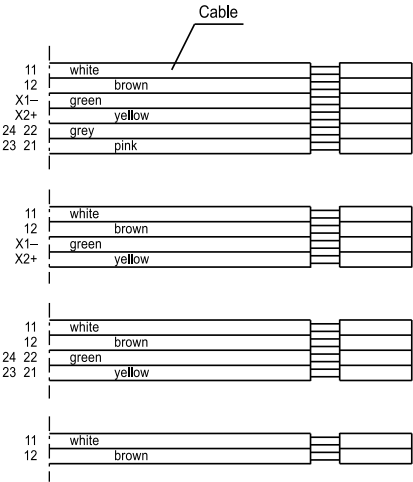
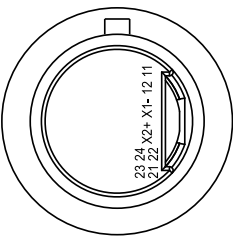
4.0 N ±0.2 N (measured at the lens)

Component layout

1 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



2 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



|              | Terminals         |
|--------------|-------------------|
| 1 NC + 1 NO  | 11 / 12 + 23 / 24 |
| 2 NC         | 11 / 12 + 21 / 22 |
| Illumination | X1- / X2+         |

|              | Terminals |
|--------------|-----------|
| 1 NC         | 11 / 12   |
| Illumination | X1- / X2+ |

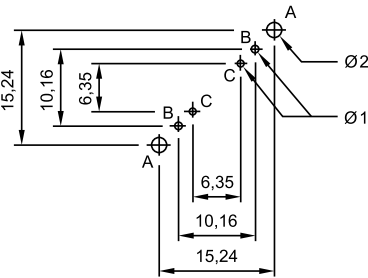
|             | Terminals         |
|-------------|-------------------|
| 1 NC + 1 NO | 11 / 12 + 23 / 24 |
| 2 NC        | 11 / 12 + 21 / 22 |

|      | Terminals |
|------|-----------|
| 1 NC | 11 / 12   |

3 Illumination element with PCB terminal page 19

Drilling plan (Elementside)

- A Fixing holes for mounting flange
- B Holes for LED
- C Holes for centering pins



# Drawings

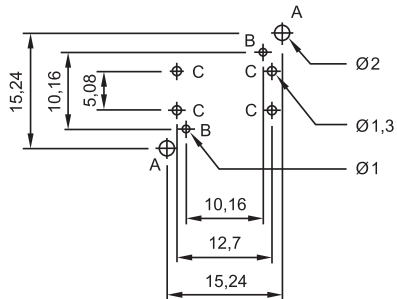
## 4 Switching element illuminative with PCB terminal page 18

Drilling plan (Elementside)

A Fixing holes for mounting flange

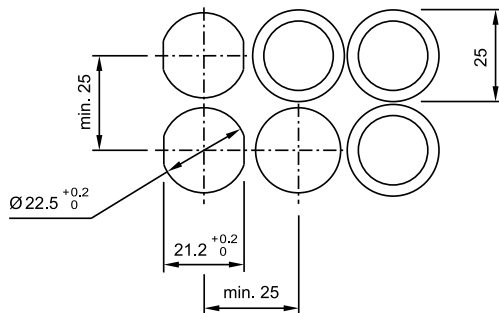
B Fixing holes for LED

C Holes for contact pins  
pad max. 2.5 mm dia.  
through-connection recommended



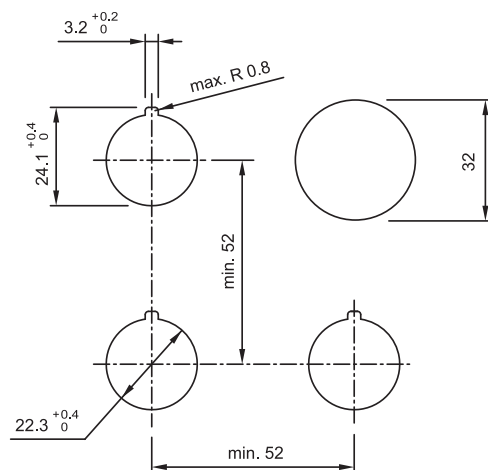
## Mounting dimensions

1 Indicator actuator, flush mounting page 9 | Illuminated pushbutton actuator, flush mounting page 10



Hole spacing 31 mm min. by using blind plug 704.960.4

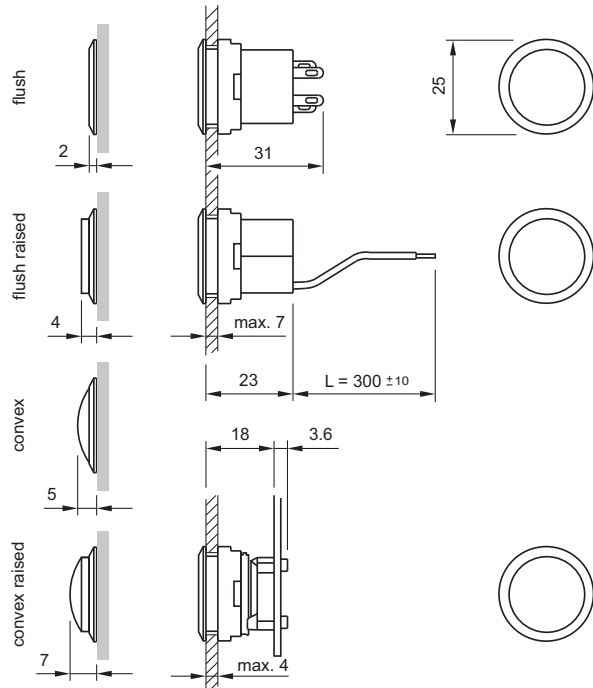
2 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



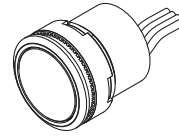
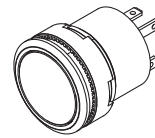
# Drawings

## 14 Indicator actuator, flush mounting page 9 | Illuminated pushbutton actuator, flush mounting page 10

Lenses

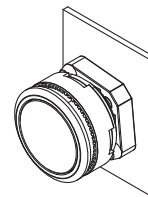


Plug-in terminal



Flat ribbon cable

PCB terminal



## 15 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8

