

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 Typ-Nr.	Component layout	Mounting dimensions	Technical drawing	Circuit drawing	
Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete Position indication ring black Twist to unlock clockwise	IP 65	MA	Plastic red	without	FR	1 NC	84-5020.0040	2	2	17	8	0.036
						1 NC + 1 NO	84-5030.0040	2	2	17	9	0.036
						2 NC	84-5040.0040	2	2	17	10	0.036
					PT 2.8 s	1 NC	84-5020.0020	1	2	17	8	0.028
						1 NC + 1 NO	84-5030.0020	1	2	17	9	0.028
						2 NC	84-5040.0020	1	2	17	10	0.028
Position indication ring black Twist to unlock clockwise LED operating voltage: 5 ... 30 VDC Current consumption: 9.7 ... 12.4 mA	IP 65	MA	Plastic red	LED red	FR	1 NC	84-5021.2B40	2	2	17	11	0.036
						1 NC + 1 NO	84-5031.2B40	2	2	17	12	0.036
						2 NC	84-5041.2B40	2	2	17	13	0.036
					PT 2.8 s	1 NC	84-5021.2B20	1	2	17	11	0.028
						1 NC + 1 NO	84-5031.2B20	1	2	17	12	0.028
						2 NC	84-5041.2B20	1	2	17	13	0.028
Position indication ring green Twist to unlock clockwise	IP 65	MA	Plastic red	without	FR	1 NC	84-5120.0040	2	2	17	8	0.036
						1 NC + 1 NO	84-5130.0040	2	2	17	9	0.036
						2 NC	84-5140.0040	2	2	17	10	0.036
					PT 2.8 s	1 NC	84-5120.0020	1	2	17	8	0.028
						1 NC + 1 NO	84-5130.0020	1	2	17	9	0.028
						2 NC	84-5140.0020	1	2	17	10	0.028
Position indication ring green Twist to unlock clockwise LED operating voltage: 5 ... 30 VDC Current consumption: 9.7 ... 12.4 mA	IP 65	MA	Plastic red	LED red	FR	1 NC	84-5121.2B40	2	2	17	11	0.036
						1 NC + 1 NO	84-5131.2B40	2	2	17	12	0.036
						2 NC	84-5141.2B40	2	2	17	13	0.036
					PT 2.8 s	1 NC	84-5121.2B20	1	2	17	10	0.028
						1 NC + 1 NO	84-5131.2B20	1	2	17	12	0.028
						2 NC	84-5141.2B20	1	2	17	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 31, Mounting dimensions from page 34, Technical drawing from page 35, Circuit drawing from page 43

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 mm² (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

>10¹¹ 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 _{Plug}	5 A	4 A	2.1 A	1.7 A	0.55 A	0.27 A
Current _{Cable}	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

Shock resistance

(semi-sinusoidal)
max. 150 m/s², pulse width 11 ms, 3-axis, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)
max. 50 m/s² 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

Approvals

Approbations

SEV
UL

Declaration of conformity

CE

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 mm²
PCB terminal

Actuating force

4.0 N ±0.2 N (measured at the lens)

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

Back protection:
IP 40, standard version
IP 67, fully sealed version, with mounted actuator only.

Shock resistance

(semi-sinusoidal)

max. 100 m/s², pulse width 11 ms, 3-axis, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)

max. 50 m/s² at 10 Hz ... 500 Hz, 10 cycles, 3-axis, as per EN IEC 60068-2-6

Actuator

Material

Lens

Polycarbonate (PC), as per UL 94 V2 or Aluminium anodised

Actuator housing

Polyetherimid (PEI), as per UL 94 V0 or Aluminium anodised

Mechanical characteristics

Mounting hole

22.5 mm dia. and 30.5 mm dia.

Tightening torque

Fixing nut max. 80 Ncm

Actuating force

4.0 N ±0.2 N (measured at the lens)

Actuating travel

Total switching travel 1.2 mm

Mechanical lifetime

≥1 million cycles of operations

Electrical characteristics

Electrostatic breakdown value

Plastic case ≥15 kV

Aluminium case ≥5 kV

as per IEC 61000-4-2, mounted in plastic front panel

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +70 °C

Front protection

IP 67 and IP40, as per EN IEC 60529

Climate resistance

Damp heat, cyclic

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

Damp heat, state

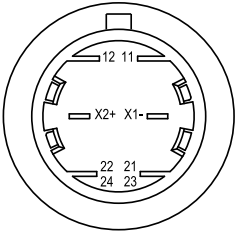
56 days, +40 °C / 93 % relative humidity, as per EN IEC 60068-2-78

Rapid change of temperature

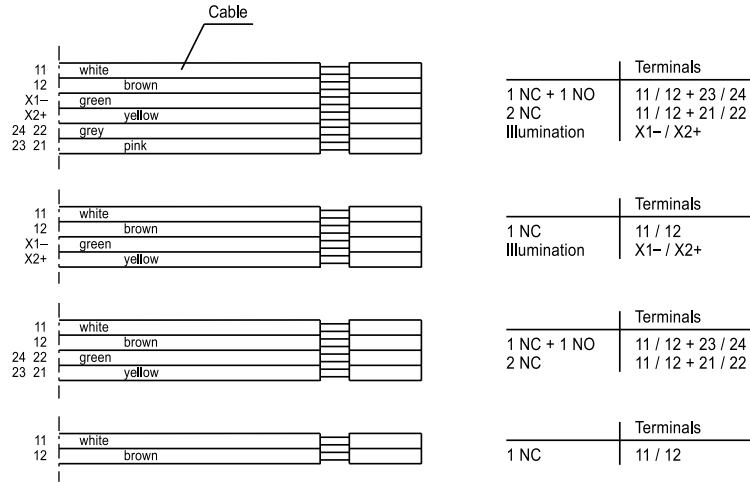
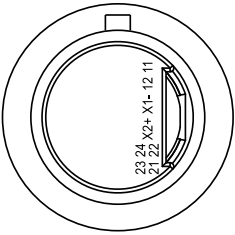
100 cycles, -40 °C ... +80 °C, as per EN IEC 60068-2-14

Component layout

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

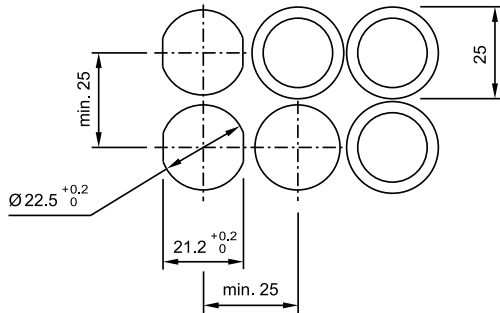


2 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



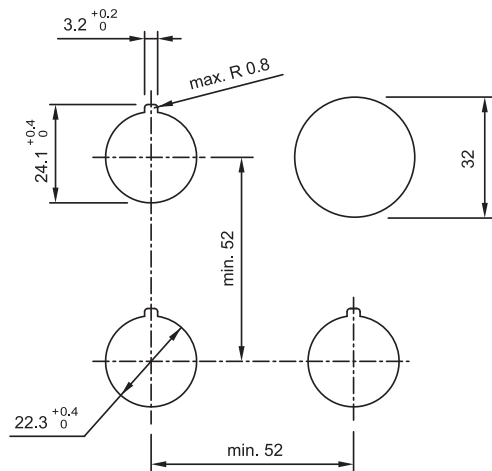
Mounting dimensions

1 Indicator actuator page 9 | Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10 | Indicator actuator with ring illumination (illuminated bezel) page 10 | Pushbutton actuator with ring illumination (illuminated bezel) page 11 | Indicator actuator with ring illumination (illuminated multi-colour bezel) page 11 | Pushbutton actuator with ring illumination (illuminated multi-colour bezel) page 12

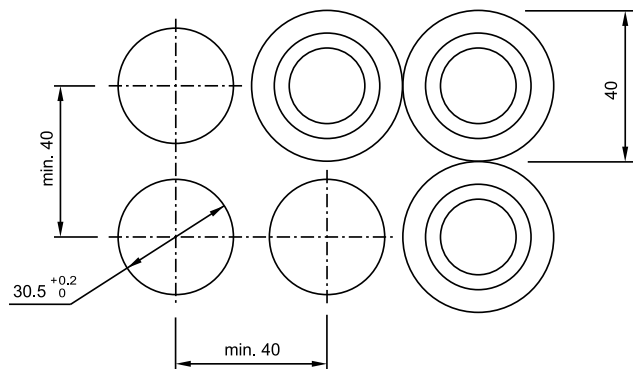


Hole spacing 31 mm min. by using blind plug 704.960.4

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

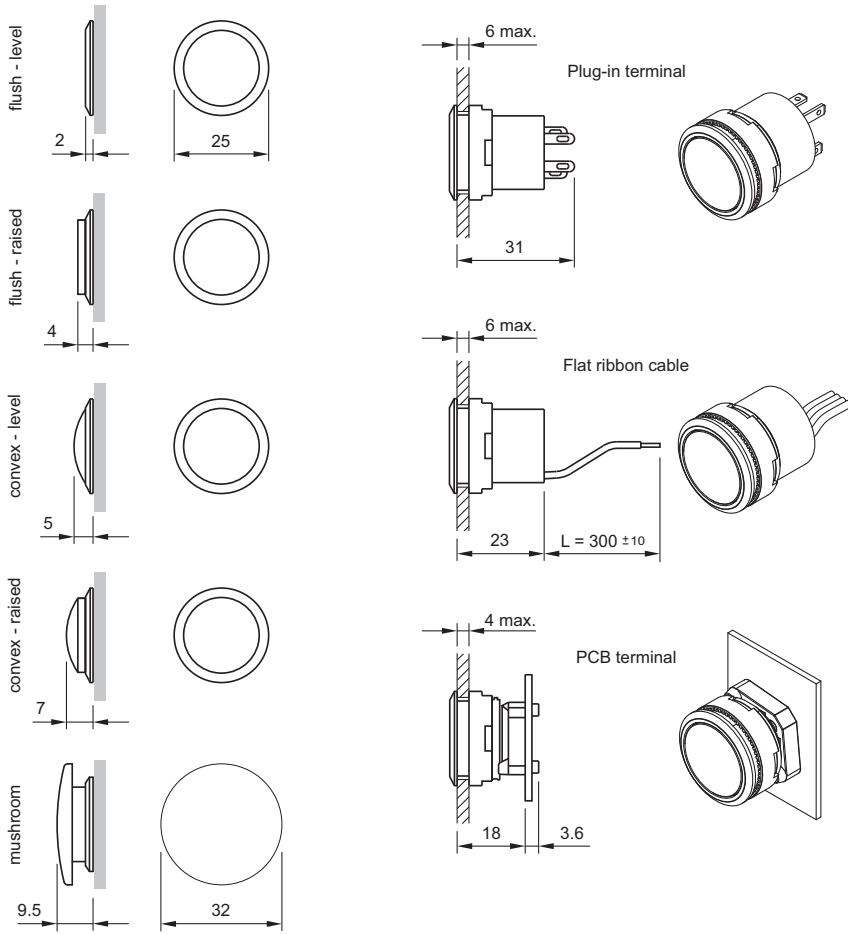


3 Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10

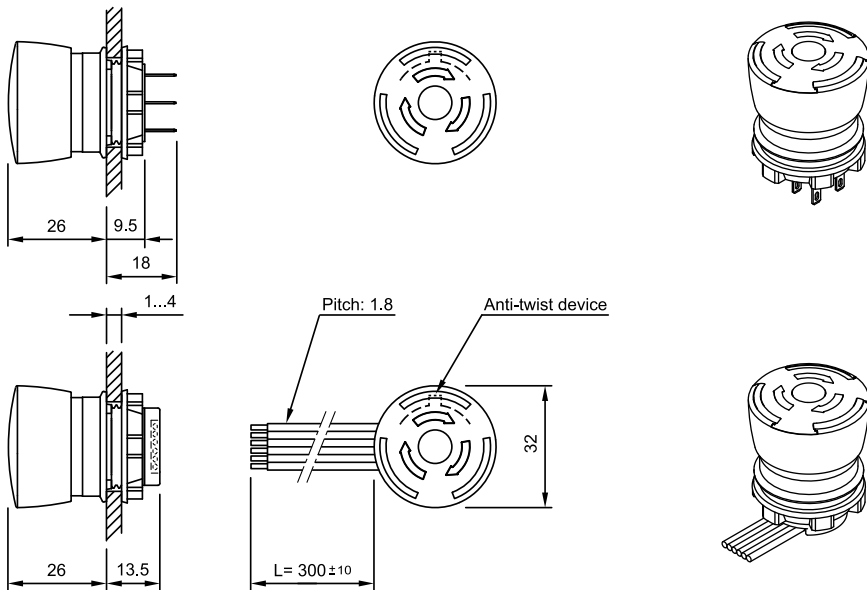


16 Indicator actuator page 9 | Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10 | Indicator actuator with ring illumination (illuminated bezel) page 10 | Pushbutton actuator with ring illumination (illuminated bezel) page 11 | Indicator actuator with ring illumination (illuminated multi-colour bezel) page 11 | Pushbutton actuator with ring illumination (illuminated multi-colour bezel) page 12

Lenses

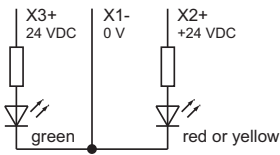


17 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8

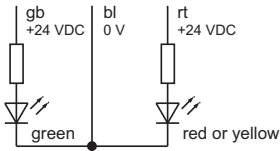


Circuit drawing

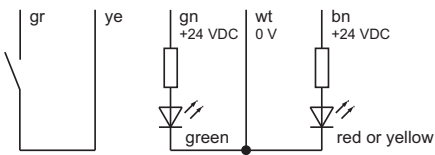
1 Illumination element with Bi-colour illumination page 18



2 Illumination element with Bi-colour illumination page 18



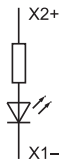
3 Switching element with Bi-colour illumination page 20



4 Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10 | Pushbutton actuator with ring illumination (illuminated bezel) page 11 | Pushbutton actuator with ring illumination (illuminated multi-colour bezel) page 12



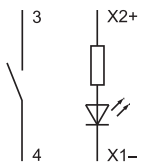
5 Illumination element page 17



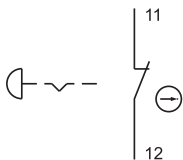
6 Switching element non-illuminated page 20



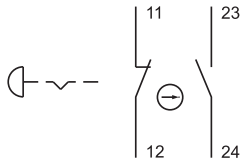
7 Switching element illuminated page 19



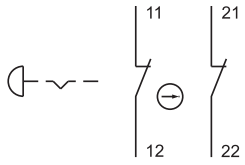
8 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



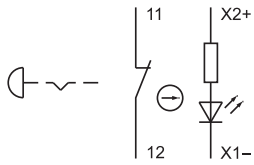
9 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



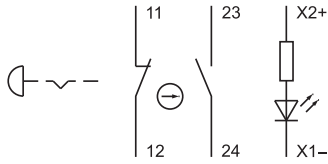
10 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



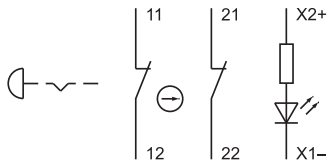
11 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



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



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



14 Switching element PCB mounting illuminative page 21

