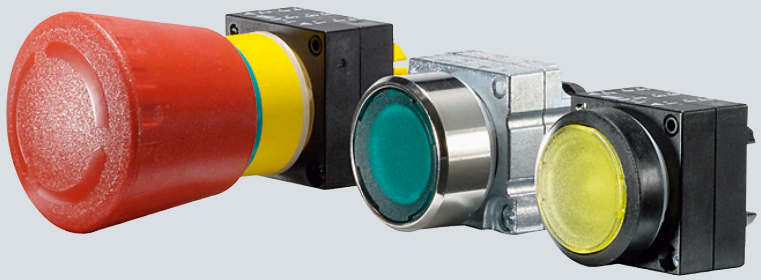
Commanding and Signaling Devices

Pushbuttons and Indicator Lights • Consoles • Switches • Signaling Columns

Reference Manual · April 2009



Low-Voltage Controls and Distribution

SIEMENS

Commanding and Signaling Devices

Introduction

Overview

	3SB2	3SB30, 3SB32	3SB31, 3SB33	3SB35, 3SB36
Pushbuttons and indicator lights				
Designs				
Nominal diameter	16 mm	22 mm	26 mm × 26 mm	22 mm
Version	Plastic, round	Plastic, round	Plastic, square	Metal, round
Actuators				
Pushbuttons and switches	✔[1]	✔	✔	✔
Illuminated pushbuttons and switches	✔[1]	✔	✔	✔
Mushroom pushbuttons	--	✔	--	✔
Push-pull buttons	--	✔	--	✔
EMERGENCY-STOP mushroom pushbuttons	✔	✔	✔	✔
Selector switches	✔	✔	✔	✔
Key-operated switches	✔	✔	✔	✔
Special actuators				
Coordinate switches	--	✔	--	--
Twin pushbuttons	--	✔	--	--
Potentiometer drives	--	✔	--	--
Indicators				
Indicator lights	✔	✔	✔	✔
Acoustic signaling devices	--	✔	--	--
Contact blocks				
Single-pole	✔	✔	✔	✔
Two-pole	✔	✔	✔	✔
Lampholders				
Wedge bases	✔	✔ (with solder connections)	✔ (with solder connections)	✔ (with solder connections)
BA 9s bases	--	✔	✔	✔
With integrated LED	--	✔	✔	✔
Terminals				
Plug-in connection	✔	--	--	--
Screw terminals	--	✔	✔	✔
Spring-type terminals	--	✔	✔	✔
Solder pins	✔	✔	✔	✔
AS-Interface	--	✔	✔	✔

✔ Standard
-- Not available
❑ Optional
[1] Only pushbuttons, no pushbutton switches.

AS-Interface solutions

For AS-Interface solutions, see Catalog IK PI "Industrial Communication".

AS-Interface EMERGENCY-STOP according to ISO 13850

Using a special F adapter, EMERGENCY-STOP devices according to ISO 13850 can be directly connected through the standard AS-Interface with safety-oriented communication.

AS-Interface enclosures and front panel modules

For customized enclosures with connection to AS-Interface, see Catalog IK PI.

For front panel modules with one 4I/4O slave for connection of four 3SB3 control devices, see Catalog IK PI.

	3SB38	3SB38 6	3SE7, 3SF2	3SE29
	Enclosures	**Two-hand oper. consoles**	**Cable-operated switches**	**Foot switches**
Enclosure				
Plastic	✔	✔	--	✔
Metal	✔	✔	✔	✔
Actuators				
Pushbuttons and switches	✔	✔	--	✔
Illuminated pushb. and switches	✔	✔	--	--
Mushroom pushbuttons	✔	✔	--	--
Push-pull buttons	✔	--	--	--
EMERG.-STOP mushroom pushb.	✔	✔	✔	--
Selector switches	✔	--	--	--
Key-operated switches	✔	--	--	--
Bowden wires	--	--	✔	--
Indicators				
Indicator lights	✔	--	✔	--
Acoustic signaling devices	✔	--	--	--
Contact blocks				
Single-pole	✔	✔	--	--
Two-pole	--	✔	✔	✔
Three-pole	--	--	--	✔
Four-pole	--	--	✔	✔
Terminals				
Screw terminals	✔	✔	✔	✔
Spring-type terminals	✔	❑	--	--
Molded cables	--	--	--	✔
Plug-in connection	--	❑	❑	❑
AS-Interface	✔	❑	--	--

	8WD42, 8WD44	8WD53
	Signaling columns	**Integrated signal lamps**
Enclosure		
Plastic	✔	✔
Metal	--	--
Lights		
Incandescent lamps	✔	✔
LEDs	✔	✔
Flashlight	✔	✔
Terminals		
Screw terminals	✔	✔
Spring-type terminals	✔	--
AS-Interface	✔	--

General data

Overview

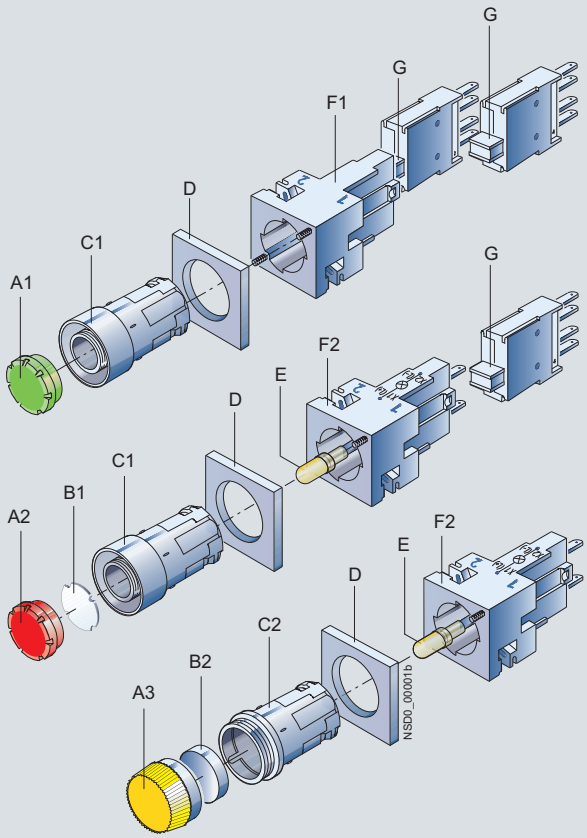
The 3SB2 pushbuttons and indicator lights are provided for front plate mounting and rear connection with flat connectors. For use on printed circuit boards, contact blocks and lampholders with solder pins are also available.

Standards

IEC 60947-5-1, EN 60947-5-1 (VDE 0660 Part 200),

IEC 60947-5-5, EN 60947-5-5 (VDE 0660 Part 210) for EMERGENCY-STOP mushroom pushbuttons.

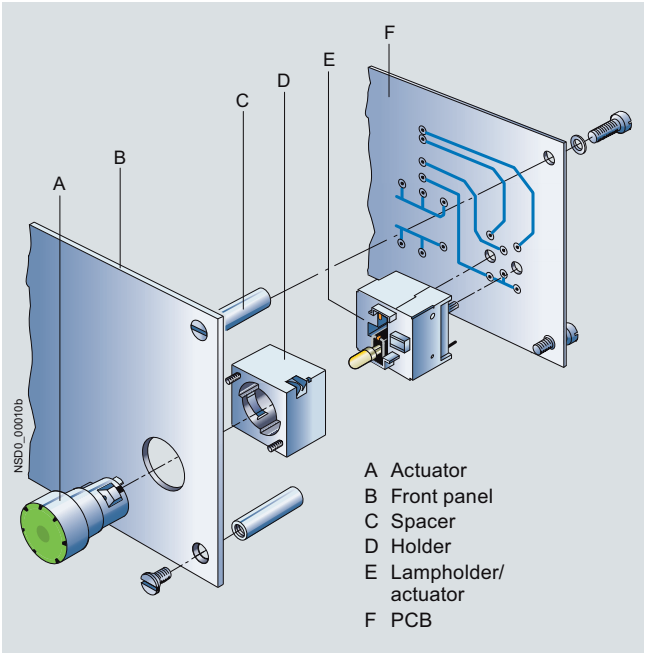
Version with flat connector



A1 Illuminated pushbutton, flat
A2 Pushbutton, flat
A3 Screw lens for indicator light
B1 Insert label for inscription
B2 Insert cap for inscription
C1 Collar with extruded front ring
C2 Collar for indicator light
D Frame for square design
E Wedge-Base lamps W2 x 4.6 d
F1 Holder
F2 Lampholder with holder
G Contact blocks (1 NO or 1 NC) for snapping on to holder and/or lampholder

For PCB mounting

For use on printed circuit boards, special contact blocks and lampholders for soldering into the printed circuit board are available. For this purpose, the blocks are fitted with 0.8 mm × 0.8 mm solder pins of length 3.5 mm.



Design

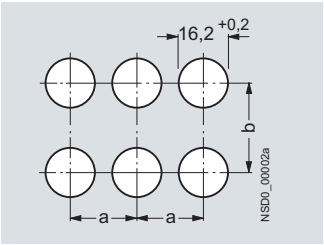
Design versions

Two design versions can be mounted:

- Round design: The 3SB2 pushbuttons and indicator lights are assembled with the modules – actuator, holder, contact block and lampholder. Depending on the specific application, various versions can be assembled. Complete units are offered for the most commonly used applications.
- Square design: With square, black frames the round units can be given a square look. The frames are inserted underneath the round actuators. Further mounting is the same as for the round version.

Mounting and fixing

Mounting dimensions according to EN 50007
(not applicable to EMERGENCY-STOP mushroom pushbuttons):



Minimum spacing	a	b
Round version	19	19
Square version without inscription label	21	21
Round and square version with inscription label	21	32
For 2 selector switches with 3 switch positions, latching, side by side	21	21

For mounting, the actuator or the lens assembly is inserted from the front into the hole in the front plate. Four small nubs ensure a secure fitting in the hole. The holder is plugged on the actuator or the lens assembly from behind and automatically snaps into place. The module is screwed down tightly with 2 screws on the holder and thus levels panel thickness from 1 to 6 mm.

One or two contact blocks can be mounted on the holder. They are inserted into the holder with slide slots and held down with two snap brackets.

If a command position is fitted with an indicator light or illuminated pushbutton, a lamp socket with lampholder must be used instead of a holder. It is suitable for incandescent lamps or LEDs with bases of type W2 × 4.6d.

Terminals

The contact blocks and the lampholder are equipped with flat connectors acc. to IEC 60760 which can also be used as solder connections.

To permit through-connection, all terminals are provided with two tabs.

For PCB mounting

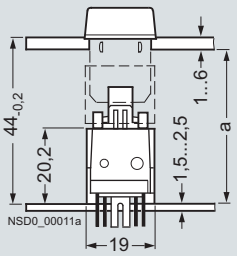
The command position comprises the actuator, e. g. 3SB2 pushbutton, illuminated pushbutton or indicator light , which is mounted in the front plate, and a contact block and a lampholder which are soldered to the PCB. For this purpose, the contact blocks and lampholders are fitted with 0.8 mm × 0.8 mm solder pins of length 3.5 mm.

Mounting and fixing

Mounting dimensions according to EN 50007.

The actuators are mounted in the same way as 3SB2 front plate mounting devices.

The contact blocks and lampholders are plugged into the printed circuit board by means of their solder pins and can be flow-soldered. After soldering, the devices must be flush with the board and perpendicular to it. The printed circuit board must be supported on spacing bolts so that it cannot sag or bend more than 0.1 mm.



Length a of spacing bolts:
$a = 44_{-0.2}$ minus front plate thickness.

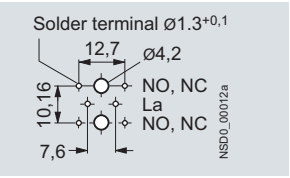
When using name plates, the length a is reduced by 0.8 mm.

Illuminated pushbutton with solder pin connection

To avoid bending the PCB when the pushbuttons are operated, sufficient spacing bolts must be provided as shown in the table below:

PCB thickness	Max. distance between spacing bolts
1.5 mm	80 mm
2.5 mm	150 mm
When using EMERGENCY-STOP pushbuttons	always 50 mm

These details are based on epoxy resin glass fiber mat.



Solder pin spacing

General data

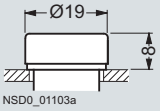
Technical specifications

Type		3SB2
Contact blocks and lampholders		
Standards		IEC 60947-5-1, EN 60947-5-1 IEC 60947-5-5, EN 60947-5-5
Rated insulation voltage U_i	V	250
Conventional thermal current I_{th}	A	10
Rated operational current I_e at rated operational voltage U_e		
• Alternating current AC-12		
- At U_e = 230 V	A	10
• Alternating current AC-15		
- At U_e = 24 V	A	4
- At U_e = 60 V	A	4
- At U_e = 110 V	A	4
- At U_e = 230 V	A	4
• Direct current DC-12		
- At U_e = 24 V	A	6
- At U_e = 60 V	A	5
- At U_e = 110 V	A	2.5
- At U_e = 230 V	A	1
• Direct current DC-13		
- At U_e = 24 V	A	3
- At U_e = 60 V	A	1.5
- At U_e = 110 V	A	0.7
- At U_e = 230 V	A	0.3
Contact stability		
• Test voltage/test current		5 V/1 mA
Lamps		
• Bases		Wedge base W2 × 4.6 d
• Rated voltage	V	6, 12, 24, 30, 48, 60
• Rated power, max.	W	1
Short-circuit protection weld-free acc. to IEC 60947-5-1		
• DIAZED fuse links, operational class gL/gG		10 A TDz, 16 A Dz
• Miniature circuit breaker with C characteristic acc. to IEC 60898		10 A
Electrical endurance		
• For operational class AC-15 with 3RT10 15 to 3RT10 26 contactors		10 × 10^6 operating cycles
Mechanical endurance		10 × 10^6 operating cycles
Degree of protection acc. to IEC 60529		
• Connection of contact blocks and lampholders behind the front panel		IP00
• Contact chambers of the contact blocks behind the front panel		IP40
Finger-safe acc. to EN 50274 and BGV A3		With voltages > 50 V AC or 120 V DC, insulation sleeves must be fitted to the unassigned tab connections.
Connection		
• Plug-in connection with flat connectors for plug-in sleeves acc. to IEC 60760		Flat connector 2 × 2.8/0.8 mm
Data acc. to UL and CSA		
Rated voltage		
• Contact blocks	V	250 AC
• Indicator light (lamp with wedge base W2 × 4.6 d)	V	60; 1 W
Uninterrupted current	A	5
Switching capacity		B 300, R 300
Actuators and indicators		
Mechanical endurance		
• Pushbuttons		10 × 10^6 operating cycles
• Actuators, rotary or latching		3 × 10^5 operating cycles
• Illuminated pushbuttons		3 × 10^6 operating cycles
Climatic withstand capability		Climate-proof; suitable for marine applications
Ambient temperature		
• During operation, non-illuminated devices and complete with LED	°C	–25 ... +70
• During operation, devices with incandescent lamp	°C	–25 ... +60
• During storage, transport	°C	–40 ... +80
Degree of protection acc. to IEC 60529		
• Actuators and indicators		IP65
• Actuators and indicators with protective cap		IP67
Protective measures		
• For mounting in metal front plates and enclosures		The actuators and lens assemblies must not be included in the protective measures.
• For fitting into enclosures with total insulation		The protective measure "Total insulation" is retained.
Shock resistance acc. to IEC 60068-2-27		
• Shock amplitude		≤50 *g*
• Shock duration	ms	11
• Shock form		Half-sine

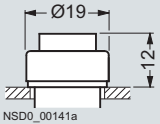
Dimensional drawings

Actuators

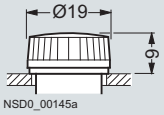
Pushbutton or illuminated pushbutton with flat button



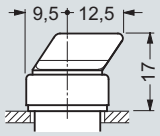
Pushbutton or illuminated pushbutton with raised button



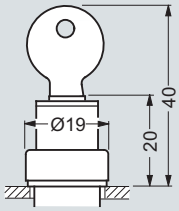
Indicator light



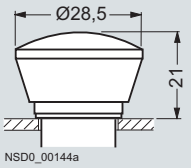
Selector switch



CES key-operated switch

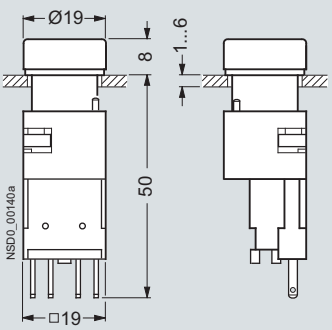


EMERGENCY-STOP mushroom pushbutton acc. to ISO 13850



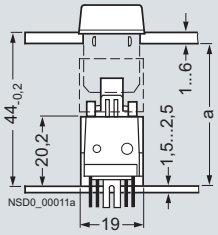
Contact blocks with flat connector

Pushbutton and contact block
with holder for front panel mounting



Contact blocks with solder pins for use on printed circuit boards

Illuminated pushbutton
with contact block and lampholder with solder pins



Length **a** of spacing bolts:
a = $44_{-0,2}$ minus front panel thickness.

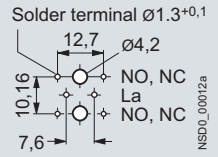
When using name plates, the length **a** is reduced by 0.8 mm.

To avoid bending of the PCB when the actuator is operated, sufficient spacing bolts must be provided spaced as shown in the table below:

PCB thickness	Max. distance between spacing bolts
1.5 mm	80 mm
2.5 mm	150 mm
When using EMERGENCY-STOP pushbuttons	generally 50 mm

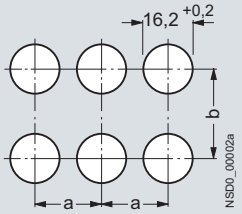
These details are based on epoxy resin glass fiber mat.

Solder pin spacing



Mounting dimensions

Contact blocks and indicator lights
(except EMERGENCY-STOP mushroom pushbuttons)



Minimum spacing	a	b
Round version	19	19
Square version without inscription label	21	21
For round and square versions with inscription label	21	32
For 2 selector switches and 3 switch positions, maintained contact, side by side	21	21

Accessories

Complete plug