

Commanding and Signaling Devices

9



9/2	Introduction	
	3SB2 Pushbuttons and Indicator Lights, 16 mm	
9/4	General data	
9/7	Project planning aids	
	3SB3 Pushbuttons and Indicator Lights, 22 mm	
9/8	General data	
	Enclosures	
9/12	General data	
9/13	Components for AS-Interface enclosures	
9/14	Project planning aids	
	3SB4 Complete Operating and Display Systems	
9/22	Control panels	
	3SB4, 3SF4 LED Indicators	
9/23	Conventional 3SB4 LEDs	
9/23	3SF4 AS-Interface LEDs	
	3SB3 Two-Hand Operation Consoles	
9/24	Molded-plastic and metal enclosures	
	3SE7 Cable-Operated Switches	
9/25	Metal enclosures	
	3SE2, 3SE3 Foot Switches	
9/29	Molded-plastic and metal enclosures	
	8WD4 Signaling Columns	
9/31	General data	
9/33	8WD42 signaling columns, 50 mm diameter	
9/34	8WD44 signaling columns, 70 mm diameter	
	8WD5 Integrated Signal Lamps	
9/35	8WD53 integrated signal lamps, 70 mm diameter	

Commanding and Signaling Devices

Introduction

Overview



Pushbuttons and indicator lights

Designs

Nominal diameter	16 mm	22 mm	22 mm	22 mm
Version	Plastic, round	Plastic, round	Plastic, square	Metal, round

Actuators

Pushbuttons and switches	✓	✓	✓	✓
Illuminated pushbuttons and switches	✓	✓	✓	✓
Mushroom pushbuttons	--	✓	--	✓
Push-pull buttons	--	✓	--	✓
EMERGENCY-STOP mushroom pushbuttons	✓	✓	✓	✓
Selector switches	✓	✓	✓	✓
Key-operated switches	✓	✓	✓	✓

Special actuators

Joystick switches	--	✓	--	--
Twin pushbuttons	--	✓	--	--
Potentiometer operating mechanisms	--	✓	--	--

Indicators

Indicator lights	✓	✓	✓	✓
Acoustic signaling devices	--	✓	--	--

Contact blocks

Single-pole	✓	✓	✓	✓
Two-pole	✓	✓	✓	✓

Lampholders

Wedge bases	✓	✓ (with solder pins)	✓ (with solder pins)	✓ (with solder pins)
BA 9s bases	--	✓	✓	✓
With integrated LEDs	--	✓	✓	✓

Connections

Plug-in connections	✓	--	--	--
Screw terminals	--	✓	✓	✓
Spring-loaded terminals	--	✓	✓	✓
Solder pins	✓	✓	✓	✓
AS-Interface	--	✓	✓	✓

AS-Interface solutions

Commanding and signaling devices of the SIRIUS 3SB3 series can be connected to the AS-Interface communication system quickly and easily by means of various solutions.

For AS-Interface solutions, see [Catalog IK PI "Industrial Communication for Automation & Drives"](#).

AS-Interface EMERGENCY-STOP according to EN 418 (ISO 13850)

Using a special F adapter, EMERGENCY-STOP devices according to EN 418 (ISO 13850) can be directly connected through the standard AS-Interface with safety-oriented communication.

AS-Interface enclosures

For enclosures with connection to AS-Interface, see [Catalog IK PI](#).

AS-Interface front panel modules

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

- ✓ standard
- not available
- optional

Commanding and Signaling Devices



3SB38



3SB38 6



3SE7, 3SF2



3SE29

	Enclosures	Two-hand operation consoles	Cable-operated switches	Foot switches
Enclosures				
Molded plastic	✓	✓	--	✓
Metal	✓	✓	✓	✓
Actuators				
Pushbuttons and switches	✓	✓	--	✓
Illuminated pushbuttons and switches	✓	✓	--	--
Mushroom pushbuttons	✓	✓	--	--
Push-pull buttons	✓	--	--	--
EMERGENCY-STOP mushroom pushbuttons	✓	✓	✓	--
Selector switches	✓	--	--	--
Key-operated switches	✓	--	--	--
Bowden wires	--	--	✓	--
Indicators				
Indicator lights	✓	--	✓	--
Acoustic signaling devices	✓	--	--	--
Contact blocks				
Single-pole	✓	✓	--	--
Two-pole	--	✓	✓	✓
Three-pole	--	--	--	✓
Four-pole	--	--	✓	✓
Connections				
Screw terminals	✓	✓	✓	✓
Spring-loaded terminals	✓	☐	--	--
Molded cables	--	--	☐	✓
Plug-in connections	--	☐	☐	☐
AS-Interface	✓	☐	--	--



8WD42, 8WD44



8WD53

	Signaling columns	Integrated signal lamps
Enclosures		
Molded plastic	✓	✓
Metal	--	--
Lightings		
Filament lamps	✓	✓
LEDs	✓	✓
Flashlights	✓	✓
Connections		
Screw terminals	✓	✓
Spring-loaded terminals	✓	--
AS-Interface	✓	--

3SB2 Pushbuttons and Indicator Lights, 16 mm

General data

Overview

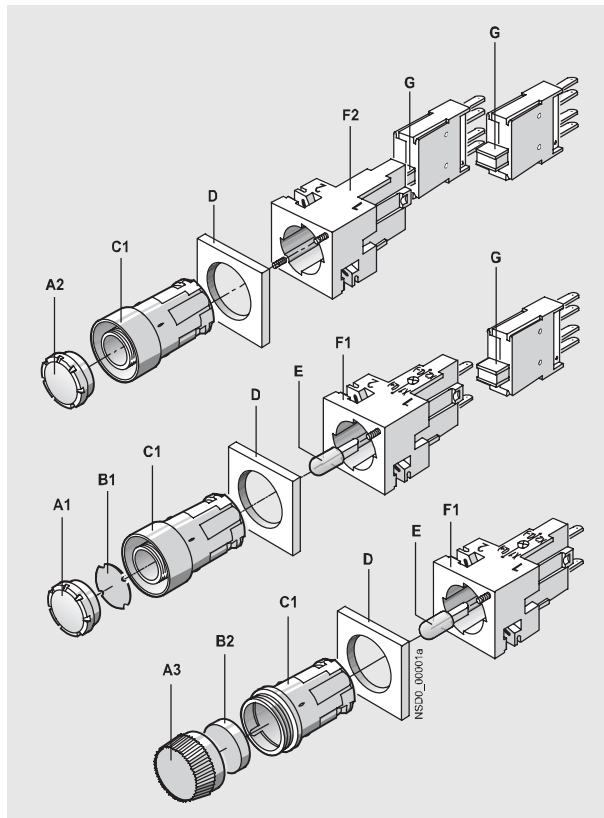
The 3SB2 pushbuttons and indicator lights are provided for front plate mounting and rear connection with flat connectors. For use on printed-circuit boards, contact blocks and lampholders with solder pins are also available.

Standards

IEC 60947-5-1, EN 60947-5-5


IEC 60947-5-5, EN 60947-5-5
for EMERGENCY-STOP mushroom pushbuttons.

Version



- A1 Illuminated pushbutton, flat
- A2 Button, 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 rectangular design
- E Wedge base lamp W2 × 4.6 d
- F1 Lampholder with holder
- F2 Holder
- G Contact blocks (1 NO or 1 NC) for snapping onto holder or lamp holder

Safety circuits

The standards IEC 60947-5-1 and EN 60947-5-1 require positive opening. Hence for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to IEC 60947-5-1 with the symbol .

Category 4 according to EN 954-1 can be attained with the EMERGENCY-STOP mushroom pushbuttons if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching devices from the ASIsafe, SIMATIC or SINUMERIK product ranges.

Design

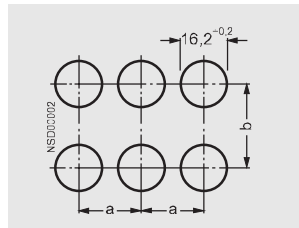
Design variants

Two design variants can be mounted:

- Round design: The 3SB2 pushbuttons and indicator lights are assembled with the elements – 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.



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

For fixing, 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 element 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 point is fitted with an indicator light or illuminated pushbutton, a lamp socket with holder must be used instead of a holder. It is suitable for incandescent lamps or LEDs with sockets of type W2 x 4.6d.

3SB2 Pushbuttons and Indicator Lights, 16 mm

General data

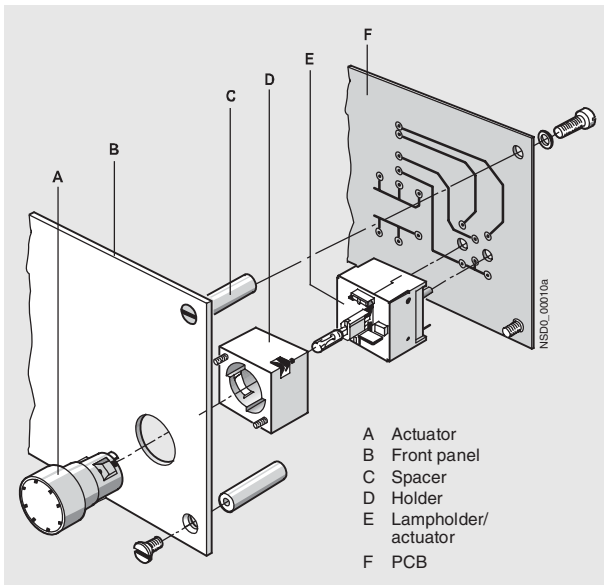
Connections

The contact blocks and the lampholder are equipped with flat connectors according to IEC 60760 which can also be used as solder-pin terminals.

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

For PCB mounting

The command point 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.

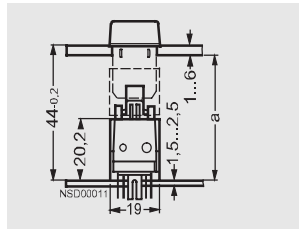


Mounting and fixing

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 plugged into the printed-circuit board by means of their soldering 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 spacers so that it cannot sag or bend more than 0.1 mm.



Illuminated pushbutton with solder pin connection

Length a of spacing bolts:

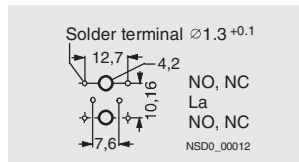
$a = 44^{+0.2}$ minus front panel thickness

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

To avoid bending the PCB when the pushbuttons are operated, sufficient spacers 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

3SB2 Pushbuttons and Indicator Lights, 16 mm

General data

Technical specifications

Contact blocks and lampholders

Type	3SB23, 3SB24
Standards	IEC 60947-5-1, EN 60947-5-1, IEC 60947-5-5, EN 60947-5-5
Rated insulation voltage U_i	250 V
Continuous thermal current I_{th}	10 A
Rated operational current I_e at rated operational voltage U_e	
<ul style="list-style-type: none"> • Alternating current AC-12 <ul style="list-style-type: none"> - at $U_e = 230$ V 	10 A
<ul style="list-style-type: none"> • Alternating current AC-15 <ul style="list-style-type: none"> - at $U_e = 24$ V - at $U_e = 60$ V - at $U_e = 110$ V - at $U_e = 230$ V 	4 A 4 A 4 A 4 A
<ul style="list-style-type: none"> • Direct current DC-12 <ul style="list-style-type: none"> - at $U_e = 24$ V - at $U_e = 60$ V - at $U_e = 110$ V - at $U_e = 230$ V 	6 A 5 A 2.5 A 1 A
<ul style="list-style-type: none"> • Direct current DC-13 <ul style="list-style-type: none"> - at $U_e = 24$ V - at $U_e = 60$ V - at $U_e = 110$ V - at $U_e = 230$ V 	3 A 1.5 A 0.7 A 0.3 A
Contact stability	
Test voltage/test current	5 V/1 mA
Short-circuit protection weld-free according to IEC 60947-5-1	
<ul style="list-style-type: none"> • DIAZED fuse links, utilization category gL/gG • Miniature circuit-breaker with C-characteristic according to IEC 60898 (VDE 0641) 	10 A TDz, 16 A Dz 10 A
Mechanical endurance	
<ul style="list-style-type: none"> • Pushbuttons and contact blocks • Actuators, rotary or latching • Illuminated pushbuttons 	10 × 10 ⁶ operating cycles 3 × 10 ⁵ operating cycles 3 × 10 ⁶ operating cycles
Electrical endurance	
• For operational class AC-15 with 3RT10 15 to 3RT10 26 contactors	10 × 10 ⁶ operating cycles
Climatic withstand capability	Climate-proof; suitable for marine applications
Ambient temperature	
<ul style="list-style-type: none"> • During operation, non-illuminated devices and complete with LED • During operation, devices with incandescent lamp • During storage, transport 	-25 ... +70 °C -25 ... +60 °C -40 ... +80 °C
Degree of protection according to IEC 60529 (VDE 0470 Part 1)	
<ul style="list-style-type: none"> • Connection of contact blocks and lampholders behind the front panel • Contact chambers of the contact blocks behind the front panel • Actuators and indicators • Actuator and indicators with protective cap 	IP00 IP40 IP65 IP67
Lamps	
<ul style="list-style-type: none"> • Bases • Rated voltage 	Wedge base W2 × 4.6 d 6, 12, 24, 30, 48, 60 V; max. 1 W
Connection	
Plug connection with flat connectors for quick-connect terminals according to IEC 60760	Flat connector 2 × 2.8/0.8 mm
Protective measures	
<ul style="list-style-type: none"> • For mounting in metal front plates and enclosures • For fitting into enclosures with total insulation 	The actuators and lens assemblies must not be included in the protective measures. The protective measure "Total insulation" is retained.
Touch protection according to EN 50274 and VBG 4	With voltages > 50 V AC or 120 V DC insulating sleeves must be fitted to the unassigned tab connections.
Shock resistance according to IEC 60068-2-27	
Shock amplitude	≤ 50 g
Shock duration	11 ms
Shock form	Half-sine
Data according to UL and CSA	
Rated voltage	
<ul style="list-style-type: none"> • Contact blocks • Indicator lights 	250 V AC max. Lamp with wedge base W2 × 4.6 d: max. 60 V; 1 W
Uninterrupted current	5 A
Switching capacity	B 300, R 300

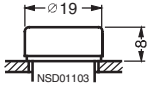
3SB2 Pushbuttons and Indicator Lights, 16 mm

Project planning aids

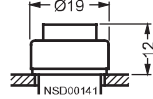
Dimensional drawings

Actuators

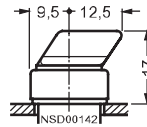
Illuminated pushbutton
with flat button



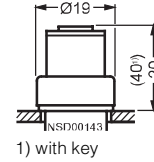
Pushbutton or illuminated pushbutton
with raised button



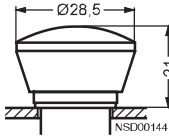
Selector switch



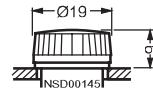
CES key-operated switch



EMERGENCY-STOP mushroom pushbutton
according to ISO 13850 or EN 418

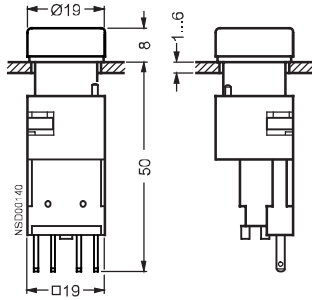


Indicator light



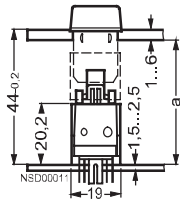
Contact blocks with tab connection

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.

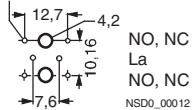
To avoid bending of the PCB when the actuator is operated, sufficient spacers must be provided spaced as shown in the table below:

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

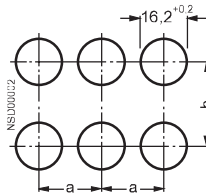
These details are based on epoxy resin glass fiber mat.

Solder pin spacing

Solder terminal $\varnothing 1.3^{+0.1}$



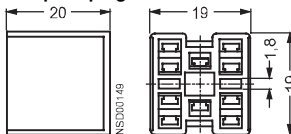
Mounting dimensions



	a	b
Minimum distance		
Round version	19	19
Square version without labeling plate	21	21
For round and square versions with labeling plates	21	32
For 2 selector switches and 3 switch positions, maintained contact, side by side	21	21

Accessories

Complete plug



3SB3 Pushbuttons and Indicator Lights, 22 mm

General data

Overview

The 3SB3 series is a range of plastic and metal commanding devices for front panel mounting and rear wire connection.

3SB3 is of modern industrial design with a very flat construction and can be installed rapidly by a single person. A metallic type with a high degree of protection according to IP67 and NEMA 4 is available in addition for the world market.

Standards

IEC 60947-1, EN 60947-1.

IEC 60947-5-1, EN 60947-5-1,

IEC 60947-5-5, EN 60947-5-5
for EMERGENCY-STOP mushroom pushbuttons.


Design

The 3SB3 series is available:

- Made of molded plastic in flat, round and square version
- Made of metal in round version.

The operating surfaces of the pushbuttons and indicator lights are concave. The lenses of the indicator lights are convex. The flat design makes cleaning easy.

Safety circuits

The standards IEC 60947-5-1 and EN 60947-5-1 require positive opening. Hence for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to IEC 60947-5-1 with the symbol .

Category 4 according to EN 954-1 can be attained with the EMERGENCY-STOP mushroom pushbuttons if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching devices from the ASIsafe, SIMATIC or SINUMERIK product ranges.

Design

One command point comprises an actuating element or lens assembly in front of the control panel as well as a holder for fixing and contact blocks and/or lampholder behind the control panel.



- The holder for the round version can be turned and can therefore be used for control panel depths of 1 to 4 mm or 3 to 6 mm.
- The control panel depth of 1 to 4 mm can be compensated with the holder for the square version.



The normal version can be fitted with two contact blocks.

When three contact blocks or one lampholder and two contact blocks are required, an additional 3SB39 01-0AB holder must be plugged into the operating element. For actuating a central contact block when using a selector switch, key-operated switch and on-off pushbutton, a 3SB39 01-0AC holder with pressure plates is required.

Complete units are offered for the most commonly used applications.

Holder

The holder is set to a switchboard thickness of 1 to 4 mm when delivered and is placed in the direction of the arrow  1–4 mm  on the actuator/indicator from the back. The fixing screw is located underneath, on the right.

For a switchboard thickness of 3 to 6 mm, the holder is reversed and mounted in the direction of the arrow  3–6 mm  and the fixing screw is located on the upper right. In this case, the fixing screw must be rotated anticlockwise to its limit before mounting the holder.

When label holders, protective caps or similar accessories are used, the greatest permissible panel thickness must be reduced by wall thickness of the accessory component.

Contact blocks and lampholders

The contact blocks are fitted with a slow-action contact (1 NO contact or 1 NC contact) with double operating contacts. These ensure a high switching reliability even with small voltages and currents, such as 5 V/1 mA. They are suitable for use in solid-state systems as well as conventional controls.

The switch contacts of the NC contact are positively driven.

For illuminated elements, lampholders with an integrated LED or with a base for replaceable bulbs can be supplied.

Contact blocks and lampholders feature terminal designations in accordance with EN 50013.

Mounting

The 3SB3 devices can be easily and quickly mounted:

- Actuators or indicator lights are positioned in the opening of the front panel from the front
- Position the holder from the rear
- Tighten the screw on the holder
- Snap on the contact block or the lampholder directly onto the operating mechanism from the back

Connection technique

The following devices are available:

- Screw terminal (box terminals)
- Spring-loaded terminals or
- Solder terminals (0.8 mm × 0.8 mm solder pins)

The devices with screw terminals have open terminals, screws that cannot be lost, funnel-shaped wiring openings and screw-driver fed openings, all of which saves time when connecting and enables the use of motorized screwdrivers.

The devices with spring-loaded terminals can be connected quickly and tightly, and when single-pole blocks are used the command points can be butt-mounted.

Inscriptions

Direct inscription using a laser or by means of insert labels or name plates.

For applications requiring less robustness there is the Label Designer software and corresponding labels. The user can use these to create his own inscriptions with text or symbols.

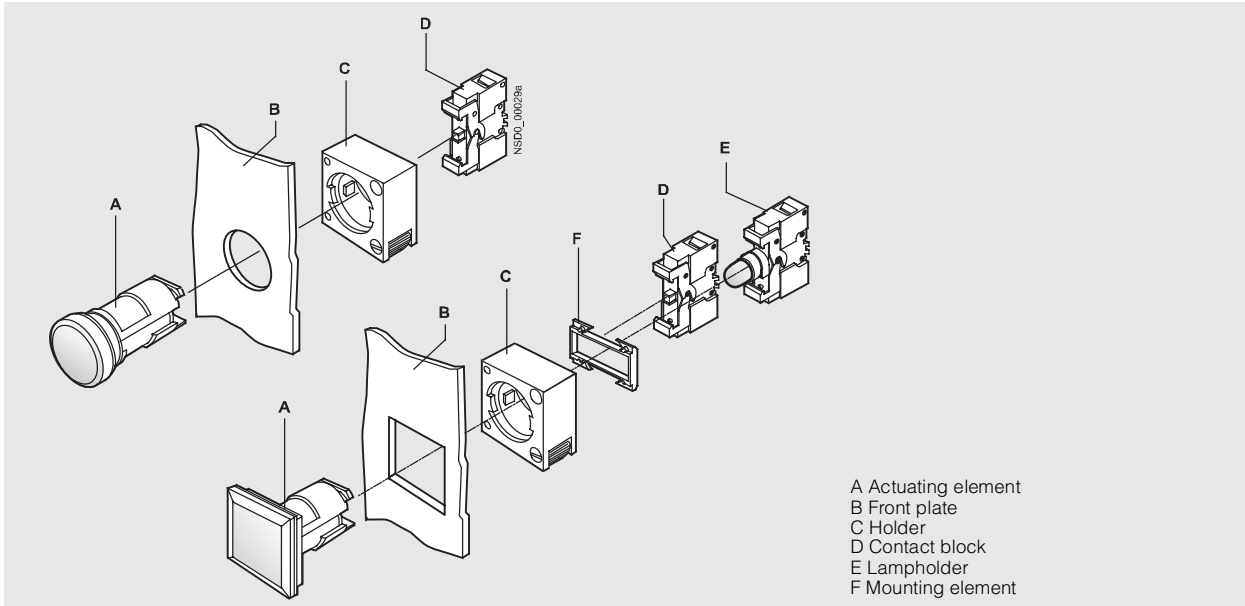
Enclosures

Plastic and metal enclosures with 1, 2, 3, 4 or 6 actuators are available for the round model. Enclosures with more than 6 actuators can be supplied upon request. They are suitable for the round and square models.

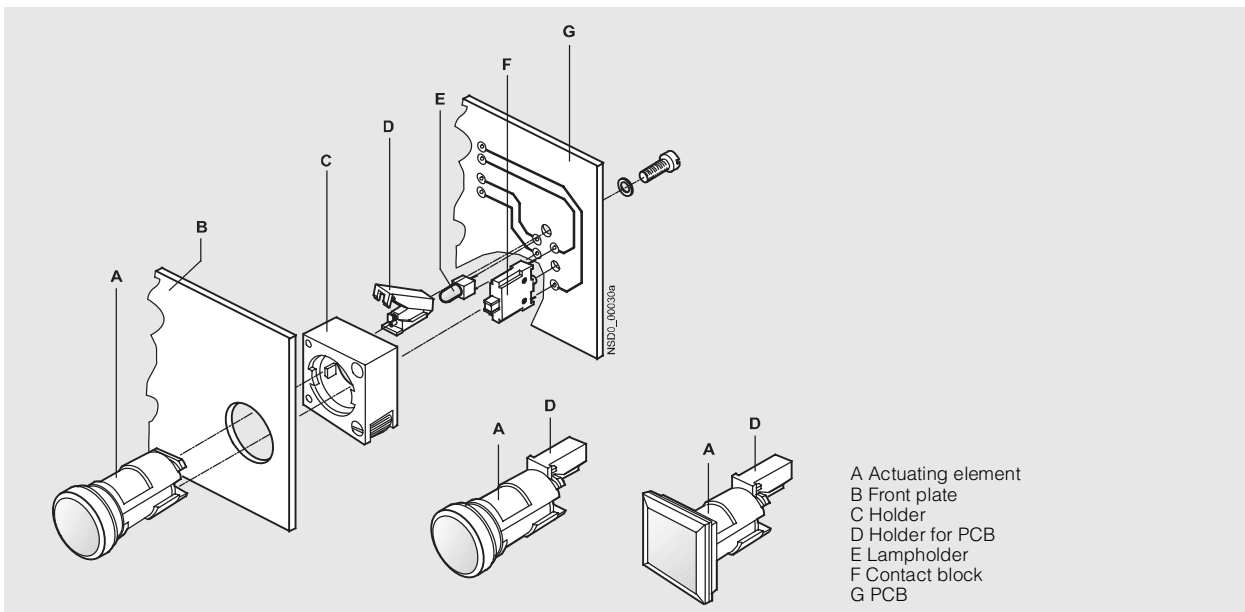
3SB3 Pushbuttons and Indicator Lights, 22 mm

General data

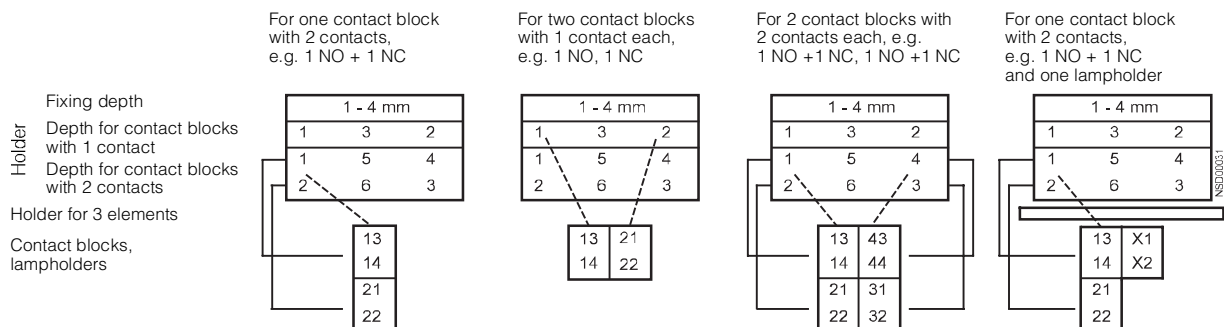
Front plate mounting



Mounting on printed-circuit boards



Contact assignment



3SB3 Pushbuttons and Indicator Lights, 22 mm

General data

Technical specifications

Contact blocks and lampholders

Type		3SB34 00-0, 3SB34 20-0	3SB34 00-1, 3SB34 20-1	3SB34 03-0, 3SB34 23-0	3SB34 03-1, 3SB34 23-1	3SB34 11-0	3SB34 11-1	3SB14 00-0J
Standards		IEC 60947-5-1, IEC 60947-5-5, EN 60947-5-1, EN 60947-5-5						
Connection type		Screw terminals		Spring-loaded terminals		Solder pins		Screw
Rated insulation voltage U_i	V	400		400		250	60	400
For pollution severity acc. to IEC 60947-1		Class 3		Class 3		Class 3	Class 3	Class 3
Rated impulse withstand voltage U_{imp}	kV	4	4	4	4	4	1.5	4
Continuous thermal current I_{th}	A	10	–	10	–	10	–	10
Rated operational current I_e for rated operational voltage U_e								
• Alternating current 50/60 Hz, AC-12								
- at $U_e = 24$ V	A	10	–	10	–	10	–	10
- at $U_e = 48$ V	A	10	–	10	–	10	–	10
- at $U_e = 110$ V	A	10	–	10	–	10	–	10
- at $U_e = 230$ V	A	10	–	10	–	10	–	10
- at $U_e = 400$ V	A	10	–	10	–	–	–	10
• Alternating current 50/60 Hz, AC-15								
- at $U_e = 24$ V	A	6	–	6	–	4	–	6
- at $U_e = 48$ V	A	6	–	6	–	4	–	6
- at $U_e = 110$ V	A	6	–	6	–	4	–	6
- at $U_e = 230$ V	A	6	–	6	–	4	–	6
- at $U_e = 400$ V	A	3	–	3	–	–	–	3
• Direct current DC-12								
- at $U_e = 24$ V	A	10	–	10	–	10	–	10
- at $U_e = 48$ V	A	5	–	5	–	5	–	–
- at $U_e = 110$ V	A	2.5	–	2.5	–	2.5	–	2
- at $U_e = 230$ V	A	1	–	1	–	1	–	0.5
• Direct current DC-13								
- at $U_e = 24$ V	A	3	–	3	–	3	–	5
- at $U_e = 48$ V	A	1.5	–	1.5	–	1.5	–	–
- at $U_e = 110$ V	A	0.7	–	0.7	–	0.7	–	0.5
- at $U_e = 230$ V	A	0.3	–	0.3	–	0.3	–	0.2
Contact stability								
• Test voltage	V	5	–	5	–	5	–	–
• No-damage current	mA	1	–	1	–	1	–	–
Lampholders		–	BA 9s	–	BA 9s	–	Wedge base	–
Lamps		–	Incandescent lamps, glow lamps and LED lamps	–	Incandescent lamps, glow lamps and LED lamps	–	Glow lamps and LED lamps	–
Short-circuit protection, weld-free, acc. to IEC 60947-5-1		10 A TDz or 16 A Dz						
• DIAZED fuse links, utilization category gL/gG		10						
• Miniature circuit-breaker with C-characteristic acc. to IEC 60898 (VDE 0641)	A	10						
Mechanical endurance		10 × 10 ⁶ operating cycles						
Electrical endurance		10 × 10 ⁶ operating cycles						
• For operational class AC-15 with 3RT10 15 to 3RT10 26 contactors	1/h	10 × 10 ⁶ operating cycles						
• With operational class DC-12, DC-13		With direct current the contact endurance depends not only on the breaking current but also on the operating voltage, the circuit inductance and the speed of switching.						
Operating frequency		1000 operating cycles per hour						
Degree of protection acc. to IEC 60529		IP20						
• Connections		IP20						
• Contact chambers		IP40	–	IP40	–	IP40	–	IP40
Touch protection acc. to EN 50274 and BGV A2		Finger-safe	–	Finger-safe	–	–	–	Finger-safe
Conductor cross-sections								
• Finely stranded, without end sleeves	mm ²	–	–	2 × (0.25 ... 1.5)	–	–	–	–
• Finely stranded, with end sleeves acc. to DIN 46228	mm ²	2 × (0.5 ... 1.5)	–	2 × (0.25 ... 0.75)	–	–	–	–
• Solid	mm ²	2 × (1 ... 1.5)	–	2 × (0.25 ... 1.5)	–	–	–	–
• Solid, with end sleeves acc. to DIN 46228	mm ²	2 × (0.5 ... 0.75)	–	–	–	–	–	–
• AWG conductors, solid or stranded		2 × AWG 18 ... 14	–	2 × AWG 24 ... 16	–	–	–	–
Tightening torque, terminal screw	Nm	0.8	–	–	–	–	–	0.8
Solder pins	mm ²	–	–	–	–	0.8 × 0.8	–	–

3SB3 Pushbuttons and Indicator Lights, 22 mm

General data

Data according to UL and CSA

Type		3SB34 00-0, 3SB34 20-0	3SB34 00-1, 3SB34 20-1	3SB34 03-0, 3SB34 23-0	3SB34 03-1, 3SB34 23-1	3SB34 11-0	3SB34 11-1
Standards		UL and CSA					
Rated operational voltage	V AC	300	–	300	–	300	–
Conventional free air thermal current (continuous current)	A	10	–	10	–	10	–
Switching capacity		A 300, R 300, A 600 same polarity					
Rated voltage (lamps)							
• Lamp with BA 9s base	V AC	–	125	–	125	–	–
• Lamp with wedge base	V AC	–	60	–	60	–	60
• Lampholders with integrated LED	V	–	24 AC/DC, 110 AC, 230 AC	–	24 AC/DC, 110 AC, 230 AC	–	–
Rated output (lamps)	W	–	2.5	–	2.5	–	1

Actuators and Indicators

Type		3SB30, 3SB32	3SB31, 3SB33	3SB35, 3SB36
Enclosure material		Molded plastic	Molded plastic	Metal
Design		Round	Square	Round
Terminal designation acc. to EN 50013		Digit on the holder, function digit on the contact block		
Device identification		Snap-on label		
Tightening torques				
• Screw on holder	Nm	max. 1		
• Terminal screws	Nm	0.8		
Mechanical endurance				
• Pushbuttons		10 × 10 ⁶ operating cycles		
• Illuminated pushbuttons		3 × 10 ⁶ operating cycles		
• Actuators, rotary or maintained contact		3 × 10 ⁵ operating cycles		
Operating frequency	1/h	1000 operating cycles		
Climatic withstand capability acc. to DIN 50017		Climate-proof KTW24; suitable for marine applications		
Ambient temperature				
• During operation, non-illuminated and 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, standard		IP66	IP65	IP67 and NEMA Type 4
– with protective caps		IP67	IP67	–
• Key-operated switch with key monitoring		IP54	–	–
• Twin pushbuttons		–	IP65	–
Protective measures		Safety requirements are met automatically when the actuators and lens assemblies are mounted on metal front plates and enclosures. When mounted in insulated enclosures, the "protective insulation" safety requirements are met.		Earthing is necessary for operation with protective extra-low voltage (PELV).
Shock resistance acc. to IEC 60068-2-27 For half-sine shock type, 11 ms shock duration				
• Devices without incandescent lamp		≤ 50 g		
• Devices with incandescent lamp		≤ 30 g		
Vibration resistance acc. to IEC 60068-2-6				
• Acceleration at frequency 20 ... 200 Hz		5 g		

Enclosures

Type		3SB38 0.-0, 3SB38 0.-1	–	3SB38 0.-2, 3SB38 0.-3
Enclosure material		Molded plastic		Metal
Degree of protection acc. to IEC 60529		IP65		IP67 and NEMA Type 4

3SB3 Pushbuttons and Indicator Lights, 22 mm Enclosures

General data

Overview



Enclosed pushbuttons and indicator lights are used as hand operated control devices for separately allocated control units and cabinets. The devices are suitable for use in any climate.

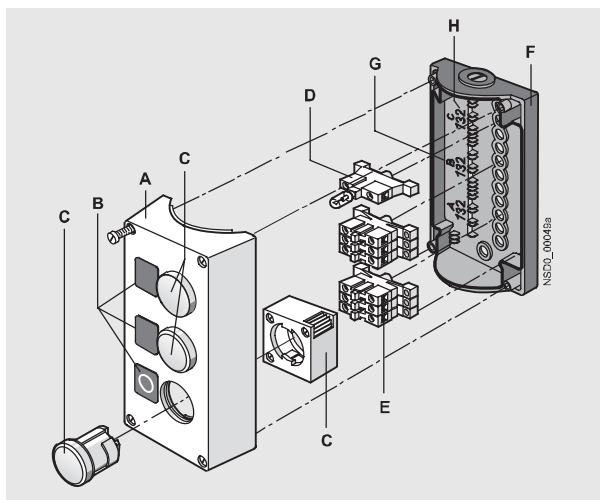
Enclosures with handle are available for suspension (e.g. for crane control units).

The enclosed pushbuttons and indicator lights are available with conventional controls as well as for connection to the AS-Interface bus system.

The following versions are available:

- Enclosure with standard fittings with 1 to 3 command points
- Enclosure with customized equipment with 1 to 6 command points
- Empty enclosures (individual parts must be ordered separately).

Design



- A Top part of enclosure
- B Labeling plates
- C Actuating element with holder
- D Function digit
- E Contact blocks, lampholders for floor mounting
- F Bottom part of enclosure
- G Identification letters for the command points
- H Identification number

Standards

IEC 60947-1, IEC 60947-5-1.

Enclosures

Molded-plastic and metal enclosures with 1, 2, 3, 4 or 6 command points are available. The mounting holes are located external to the terminal compartment.

Cable routing: on the top and bottom narrow ends of the enclosure for an M20 or M25 metric cable gland.

Enclosure color:

- Cover: RAL 7035 (light gray),
- With EMERGENCY-STOP: RAL 1004 (yellow),
- Base: RAL 9005 (black).

The molded-plastic enclosures comply with the "total insulation" specification.

Customer-specific enclosures

On request enclosures with more than 6 command points can also be supplied with AS-Interface connection.

For fully equipped AS-Interface enclosures, see Catalog IK PI.

Actuators

Round actuators and lens assemblies for a mounting diameter of 22 mm can be used.

The actuators are fitted through the hole in the cover of the enclosure and are connected to the holder supplied with the actuator and secured in position.

Molded-plastic enclosures are equipped as standard with actuators and indicators made of plastic; metal enclosures are equipped with actuators and indicators made of metal.

Contact blocks and lampholders

Contact blocks and lampholders for floor mounting are snapped into the bottom part of the enclosure. For each command point, the following components can be fitted:

- 3 contact blocks or
- 2 contact blocks + 1 lampholder or lampholder with integrated voltage reducer.

The contact blocks have moving double-break contacts and therefore a high contact stability, i.e. they are also suitable for operation in solid-state controls. Function numbering is shown on the contact block.

Single-pole contact blocks and lampholders for front plate mounting can also be used.

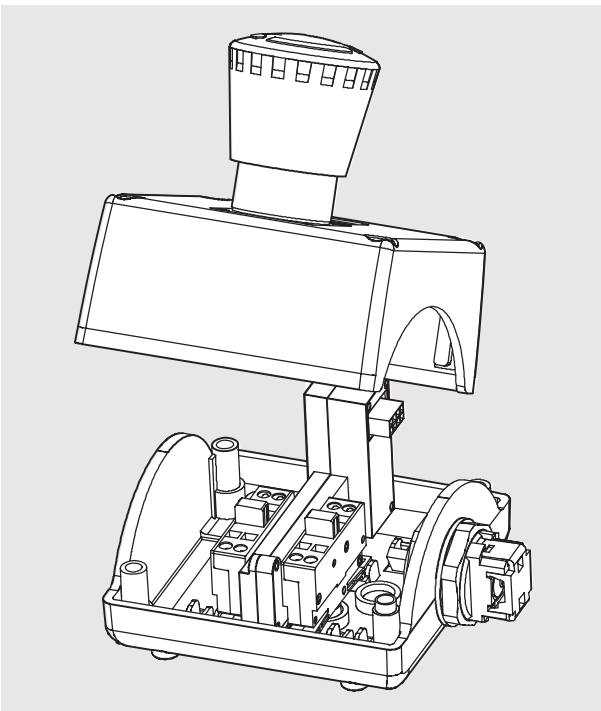
3SB3 Pushbuttons and Indicator Lights, 22 mm Enclosures

Components for AS-Interface enclosures

Overview



Distributed command devices of the 3SB3 series can be quickly connected to the AS-Interface using AS-Interface enclosures. Using suitable components you can make your own enclosures with integrated AS-Interface or flexibly modify existing enclosures.



The enclosures with integrated AS-Interface are equipped with contact blocks and LED lampholders with spring-loaded terminals from the 3SB3 series along with the slave(s) required to connect the contact blocks and lampholders to AS-Interface.

AS-Interface modules, cable sets and a connection element are required in addition to connect the contact blocks and LED lampholders.

AS-Interface slaves

The following slave types are available:

- Slave in A/B technology with 4 inputs and 3 outputs
- Slave with 4 inputs and 4 outputs
- F slave with 2 safe inputs.

The following table shows the maximum number of equipable slaves:

Enclosures for	Number of slaves for enclosures without EMERGENCY-STOP	Number of slaves for enclosures with EMERGENCY-STOP
1 command point	Not available	1 x F slave
2 command points	1 x slave 4I/4O or 4I/3O	Not available
3 command points	1 x slave 4I/4O or 4I/3O	1 x slave 4I/4O or 4I/3O + 1 x F slave
4 command points	2 x slave 4I/4O or 4I/3O ¹⁾	2 x slave 4I/4O or 4I/3O + 1 x F slave ¹⁾
6 command points	2 x slave 4I/4O or 4I/3O	2 x slave 4I/4O or 4I/3O + 1 x F slave

1) For metal enclosures only 1 x slave 4I/4O or 4I/3O is possible.

Design

Connection

One set of links is required in each case to connect a slave to contact blocks, to lampholders and to the connection element.

The connection elements are mounted in the front-end cable glands and are used for connection of the AS-Interface or for bringing unused inputs or outputs out of the enclosure.

For connection to the AS-Interface bus there is a choice of the following options:

- Terminal for shaped AS-Interface cable. The cable is contacted by the insulation displacement method and routed past the enclosure on the outside (possible only with plastic enclosure).
- Cable gland for the shaped AS-Interface cable or round cable. The cable is routed into the enclosure (preferable for metal enclosure).
- Connection using M12 plug.

If less than all inputs/outputs of the installed slaves in an enclosure are used for connecting the command devices, free inputs and outputs can be routed on request to the outside through an M12 socket on the top or bottom side of the enclosure.

To supply inputs with power, the S+ connection of the must be assigned to the socket, for outputs the OUT- connection must be assigned.

Addressing is performed using the AS-Interface connections or the integrated addressing socket. An external power supply is not required.

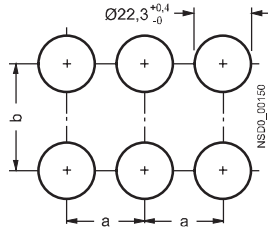
3SB3 Pushbuttons and Indicator Lights, 22 mm

Project planning aids

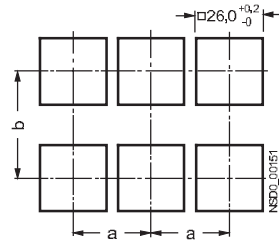
Dimensional drawings

Mounting dimensions

Round version



Square version



Minimum distance	a	b
------------------	---	---

Contact blocks (1 contact) and lampholder

- For front plate mounting, with screw terminals 30¹⁾ 45
- For front plate mounting, with spring-loaded terminals 30¹⁾ 30¹⁾
- For use on PCB, with solder pins 30¹⁾ 30¹⁾

Contact blocks with 2 contacts

- for front plate mounting 30¹⁾ 50

When using holders for labeling plates

- 12.5 mm x 27 mm 30¹⁾ 45²⁾
- 27.0 mm x 27 mm 30¹⁾ 60

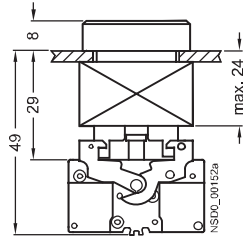
1) For mushroom pushbutton, EMERGENCY-STOP and push-pull button:

Note mushroom diameter $d = 40$ mm or 60 mm.

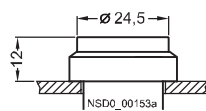
2) 60 mm with contact blocks having two contacts.

Molded-plastic version, round

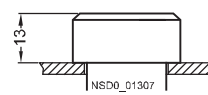
Pushbutton, pressure switch, illuminated pushbutton or illuminated pressure switch
with flat button
and single-pole contact block
(and lampholder)



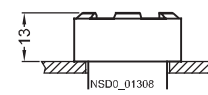
Pushbutton or illuminated pushbutton
with raised button



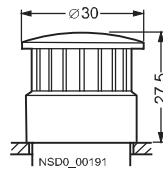
Pushbutton
with raised front ring



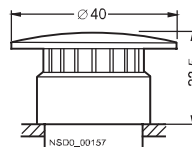
Pushbutton
with raised front ring, castellated



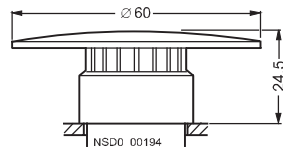
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button,
 $\varnothing 30$ mm



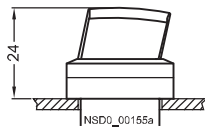
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button,
 $\varnothing 40$ mm



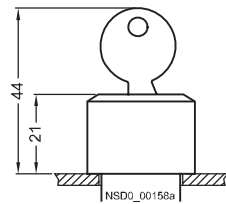
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button,
 $\varnothing 60$ mm



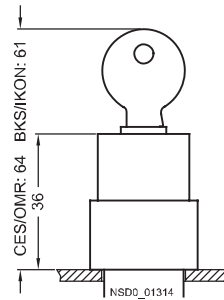
Selector switch or illuminated selector switch



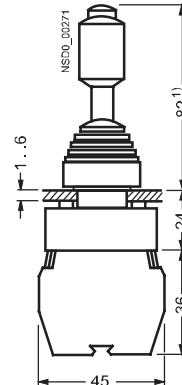
RONIS key-operated switch



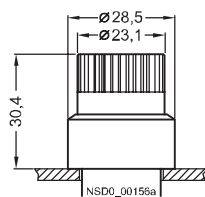
BKS, CES, IKON, O.M.R. key-operated switch



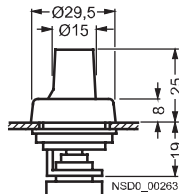
Joystick switch



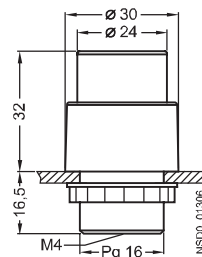
Pushbutton
with raised button, latching



Actuator for potentiometer
with shaft $\varnothing 6$ mm,
30 ... 32 mm long



Pushbutton with extended stroke

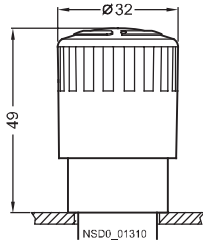


1) 82 with mechanical interlock,
77 without mechanical interlock.

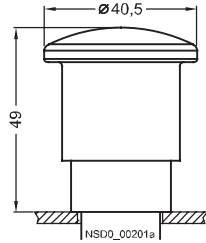
3SB3 Pushbuttons and Indicator Lights, 22 mm

Project planning aids

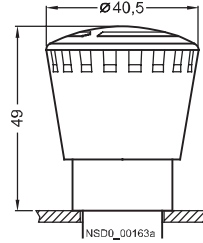
EMERGENCY-STOP mushroom pushbutton, \varnothing 32 mm,
with rotate-to-unlatch mechanism



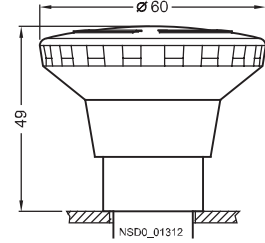
EMERGENCY-STOP mushroom pushbutton, \varnothing 40 mm,
with pull-to-unlatch mechanism



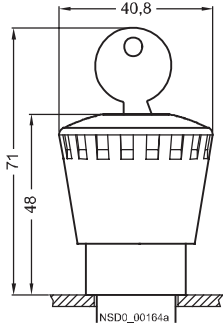
EMERGENCY-STOP mushroom pushbutton, \varnothing 40 mm,
with rotate-to-unlatch mechanism



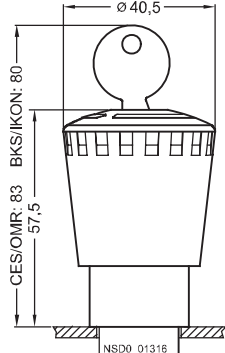
EMERGENCY-STOP mushroom pushbutton, \varnothing 60 mm,
with rotate-to-unlatch mechanism



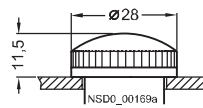
EMERGENCY-STOP mushroom pushbutton
with RONIS key-operated switch



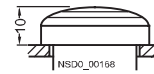
EMERGENCY-STOP mushroom pushbutton
with BKS, CES, IKON, O.M.R.
key-operated switch



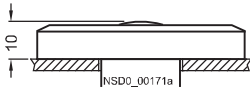
Indicator light



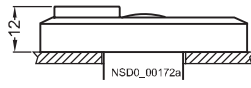
Acoustic signal device



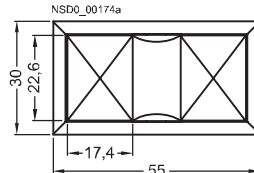
Twin pushbutton,
with flat buttons



Twin pushbutton,
with raised buttons

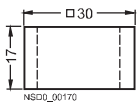


Twin pushbutton
with or without indicator light

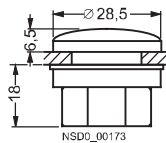


Top view

Holder



Blanking plug

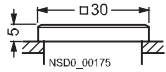


3SB3 Pushbuttons and Indicator Lights, 22 mm

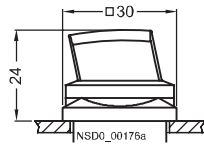
Project planning aids

Plastic version, square

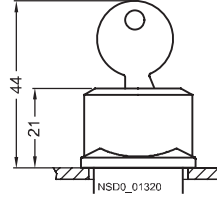
Pushbutton, pressure switch, illuminated pushbutton or illuminated pressure switch with flat button



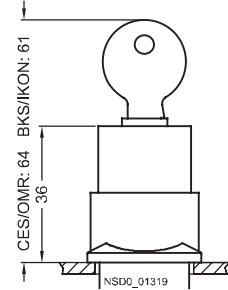
Selector switch or illuminated selector switch



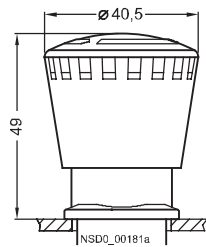
RONIS key-operated switch



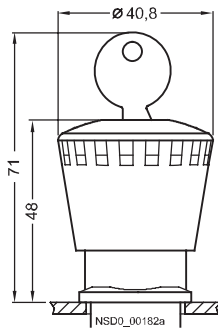
BKS, CES, IKON, O.M.R. key-operated switch



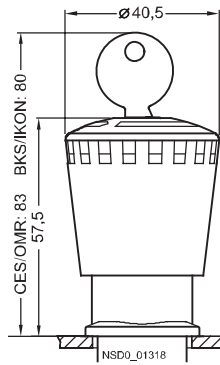
EMERGENCY-STOP mushroom pushbutton
with rotate-to-unlatch mechanism



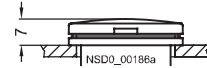
EMERGENCY-STOP mushroom pushbutton
with RONIS key-operated switch



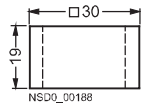
EMERGENCY-STOP mushroom pushbutton with BKS, CES, IKON, O.M.R. key-operated switch



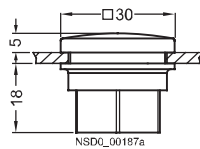
Indicator light



Holder



Blanking plug

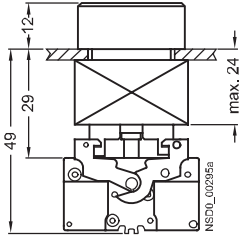


3SB3 Pushbuttons and Indicator Lights, 22 mm

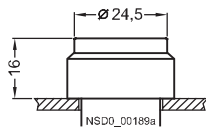
Project planning aids

Metal version, round

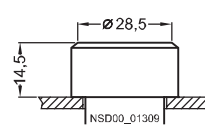
Pushbutton or illuminated pushbutton
with flat button and single-pole contact block (and lampholder)



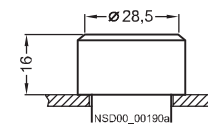
Pushbutton or illuminated pushbutton
with raised button



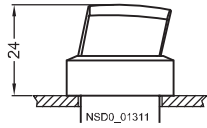
Pushbutton or illuminated pressure switch, latching,
with flat button



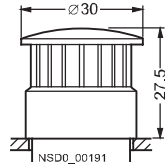
Pushbutton
with raised front ring
with flat button



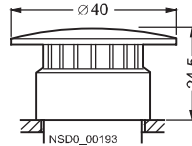
Selector switch or illuminated selector switch,
standard



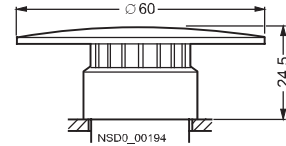
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button, Ø 30 mm



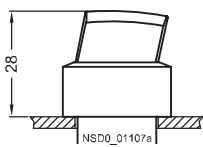
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button, Ø 40 mm



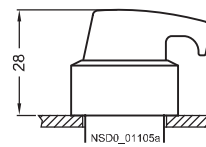
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button, Ø 60 mm



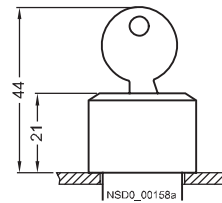
Selector switch or illuminated selector switch,
heavy duty



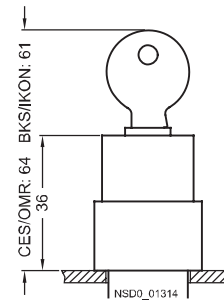
Selector switch or illuminated selector switch,
with long handle



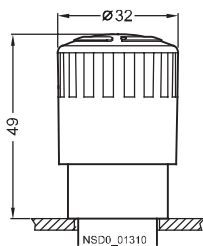
RONIS key-operated switch
with long handle



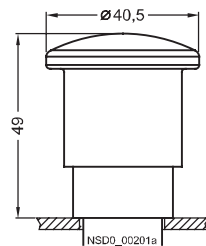
BKS, CES, IKON, O.M.R. key-operated switch



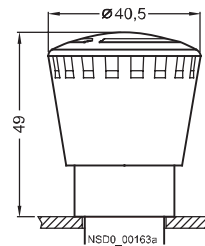
EMERGENCY-STOP mushroom pushbutton, Ø 32 mm,
with rotate-to-unlatch mechanism



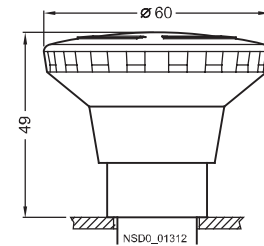
EMERGENCY-STOP mushroom pushbutton, Ø 40 mm,
with pull-to-unlatch mechanism



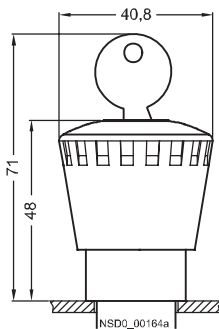
EMERGENCY-STOP mushroom pushbutton, Ø 40 mm,
with rotate-to-unlatch mechanism



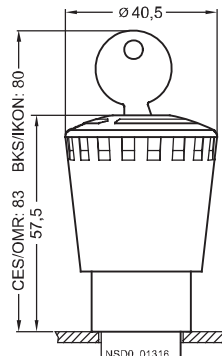
EMERGENCY-STOP mushroom pushbutton, Ø 60 mm,
with rotate-to-unlatch mechanism



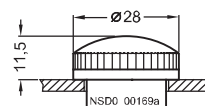
EMERGENCY-STOP mushroom pushbutton
with RONIS key-operated switch



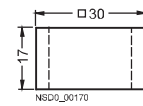
EMERGENCY-STOP mushroom pushbutton with BKS, CES, IKON, O.M.R. key-operated switch



Indicator light



Holder



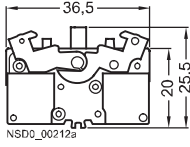
3SB3 Pushbuttons and Indicator Lights, 22 mm

Project planning aids

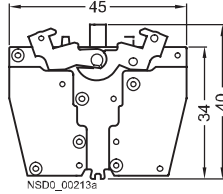
Contact blocks and lampholders

Screw terminal, for front plate mounting

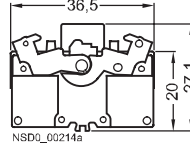
Contact block with 1 contact



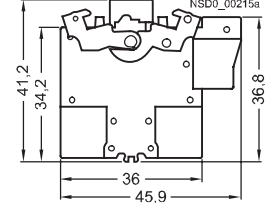
Contact block with 2 contacts, diode element



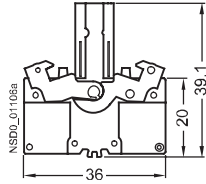
BA 9s lampholder without or with integrated voltage reducer



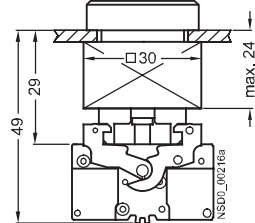
BA 9s lampholder with separate lamp test function



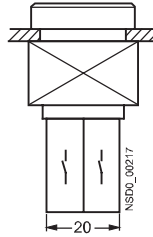
Lampholder with integrated LED



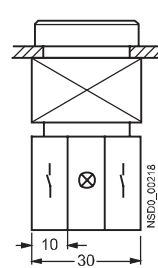
Pushbutton or illuminated pushbutton with contact blocks with 1 contact



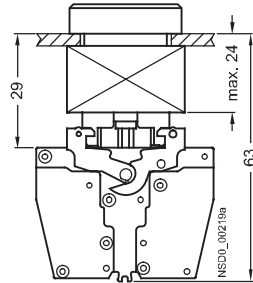
Pushbutton with contact blocks with 1 contact



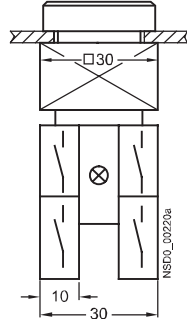
Illuminated pushbutton with contact blocks with 1 contact and lampholder



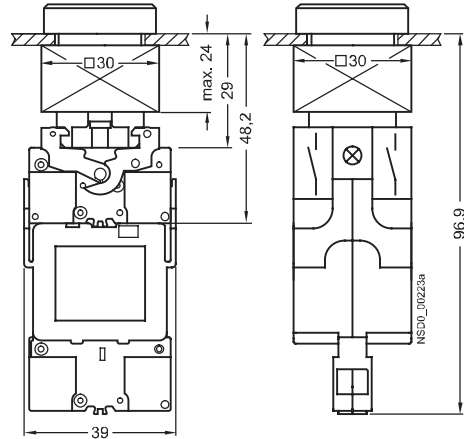
Pushbutton or illuminated pushbutton with contact blocks with 2 contacts



Illuminated pushbutton with contact blocks with 2 contacts and lampholder

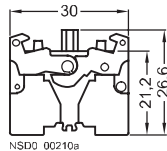


Illuminated pushbutton with contact blocks with 1 contact and lampholder with snapped-on transformer

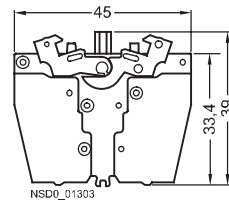


Spring-loaded terminals, for front plate mounting

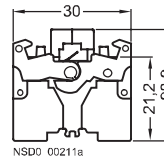
Contact block with 1 contact



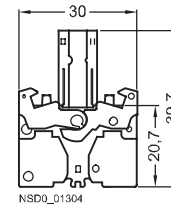
Contact block with 2 contacts



BA 9s lampholder



Lampholder with integrated LED

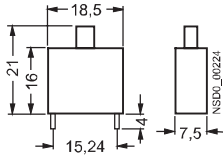


3SB3 Pushbuttons and Indicator Lights, 22 mm

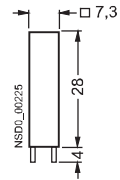
Project planning aids

With solder pins, for use on PCB

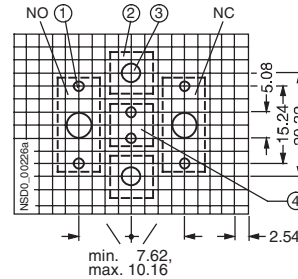
Contact block 1 NO and 1 NC



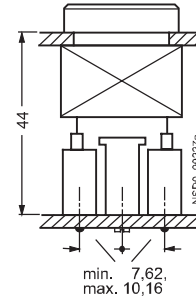
Lampholders



Solder pin spacing



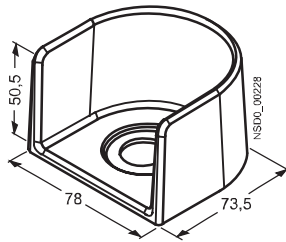
Pushbutton with contact block with 1 contact and PCB holder



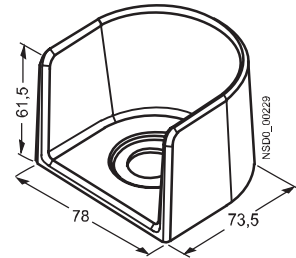
- ① Solder pin $\varnothing 1.3^{+0.1}$
- ② PCB holder
- ③ Centring hole $\varnothing 4.2^{+0.1}$
- ④ Lampholder

Accessories

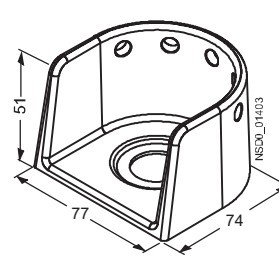
3SB39 21-0AK protective collar for front panel mounting¹⁾, for EMERGENCY-STOP mushroom pushbuttons without key-operated switch



3SB39 21-0AX protective collar for front panel mounting¹⁾, for EMERGENCY-STOP mushroom pushbuttons with key-operated switch



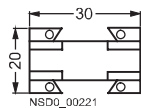
3SB39 21-0CG protective collar for front panel mounting¹⁾, for mushroom pushbuttons, for 5 padlocks



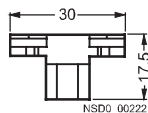
1) Can be used with a front plate thickness up to 4 mm.

Holder for mounting 3 elements

Holder for pushbuttons



Holder for selector switch, key-operated switch and On-Off pushbutton, with pressure plate

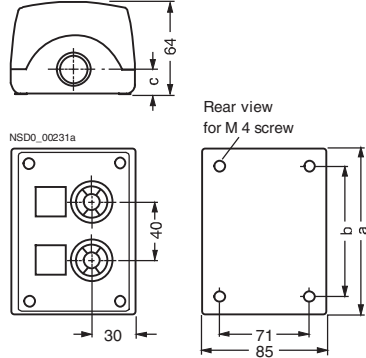


3SB3 Pushbuttons and Indicator Lights, 22 mm

Project planning aids

Enclosures

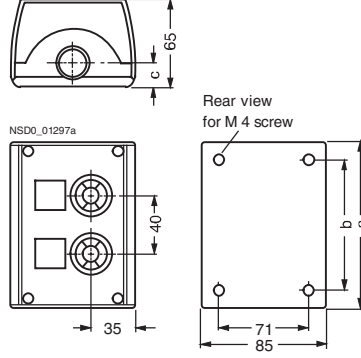
Enclosure without protective collar, molded plastic



Top and bottom with knockouts for one gland each

Number of command points	Length a	Distance b	Distance c
1	85	54	17.5
2	114	83	17.5
3	154	123	17.5
4	194	163	17.5
6	280	249	20.5

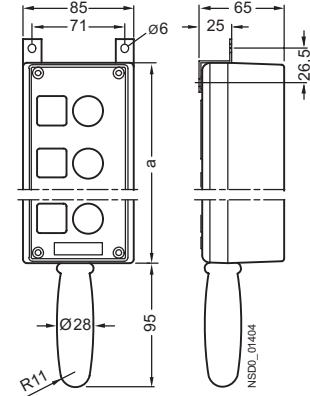
Enclosure without protective collar, metal



Top and bottom with opening for one gland each

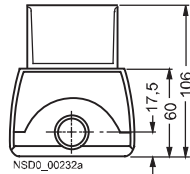
Number of command points	Length a	Distance b	Distance c
1	85	54	21
2	114	83	21
3	154	123	21
4	194	163	21
6	280	249	21

Enclosure with handle, metal



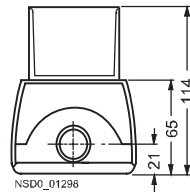
Number of command points	Length a
1	84
2	113
3	154
4	193
6	280

Enclosure with protective collar, molded plastic



Top and bottom with knockouts for one gland each

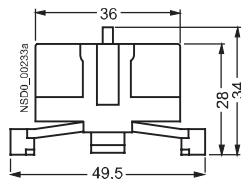
Enclosure with protective collar, metal



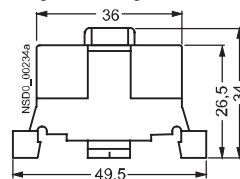
Top and bottom with opening for one gland each

Screw terminal, for floor mounting

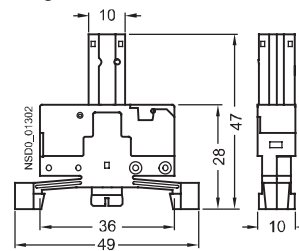
Contact block with 1 contact



BA9s lampholder with or without integrated voltage reducer

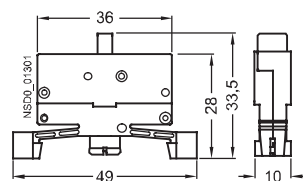


Lampholder with integrated LED

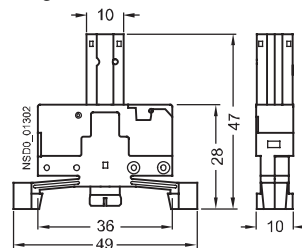


Spring-loaded terminals, for floor mounting

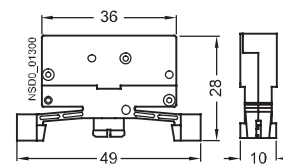
Contact block with 1 contact



Lampholder with integrated LED



Fixpoint terminal

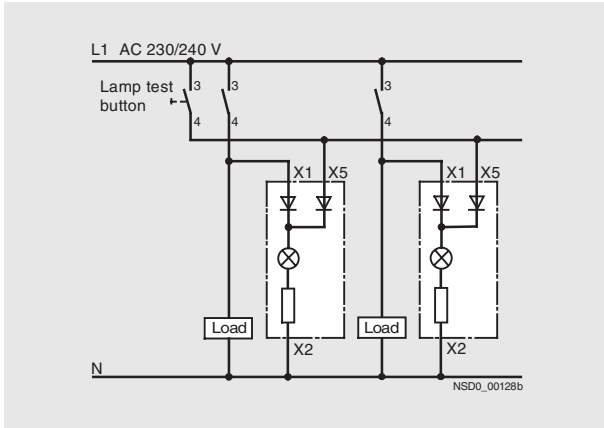


3SB3 Pushbuttons and Indicator Lights, 22 mm

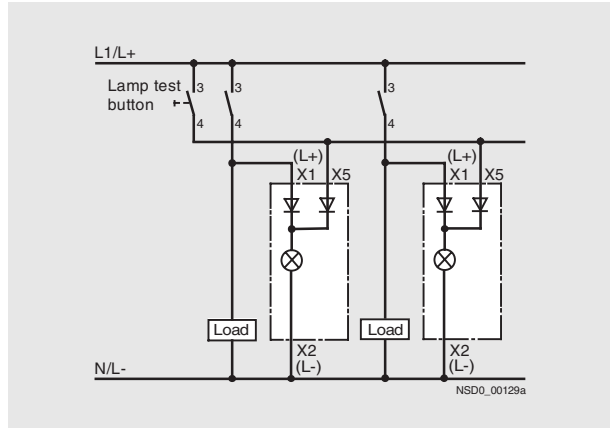
Project planning aids

Schematics

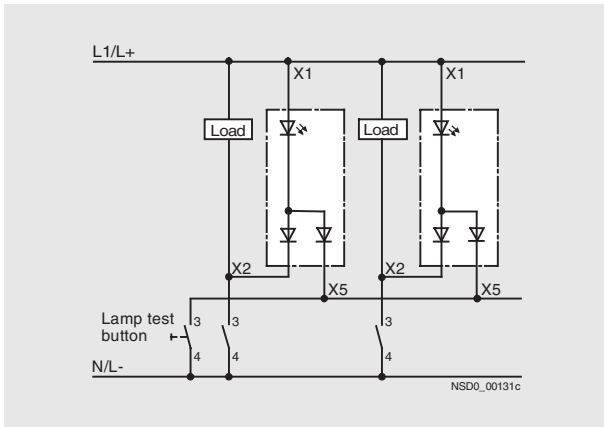
Application examples of test circuits



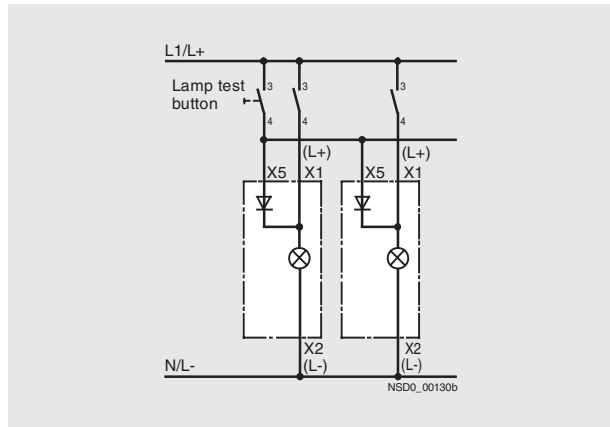
3SB34 00-1F lampholder
incl. 130 V incandescent lamp



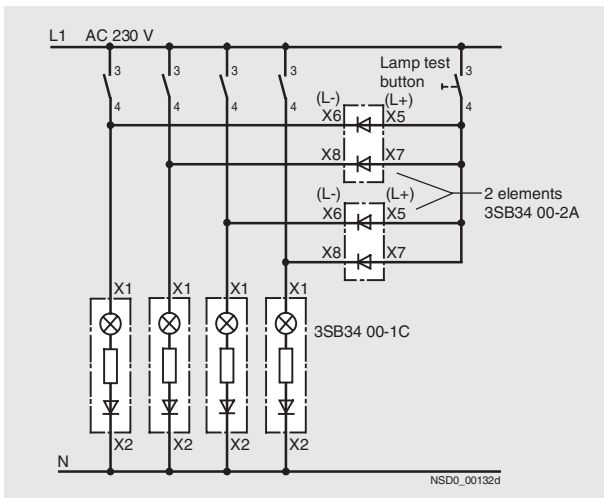
3SB34 00-1G lampholder
for incandescent lamps, maximum 2.6 W or LED lamps, AC/DC



3SB34 00-1L lampholder
for incandescent lamps, maximum 2.6 W or LED lamps, AC or DC



3SB34 00-1H lampholder
for incandescent lamps, maximum 2.6 W or glow lamps, AC



Example for lamp test circuit with 3SB34 00-2A element

Application examples for 3SB34 00-2A diode elements

- Lamp test circuit
- Interference suppression
- Limiting voltage peaks
- Limiting DC coils
- Diode gates
- Rectifier circuits.

The diode element contains two 1N 4007 diodes. The element can be snapped onto the holder as required.

Notes on using the lampholders with separate lamp test function

For connecting inductive loads in parallel (e.g. contactors), overvoltage damping is necessary.

The 3SB34 00-1H element is not suitable for operation with a parallel load.

3SB4 Complete Operating and Display Systems

Control panels

Overview

Delivery options

The control panels can be obtained directly from our partner:

Dyna Systems GmbH
88161 Linderberg

<http://www.dynasystems.de>

All the necessary equipment and services are available here from a single source:

- Advice during conception and configuration
- Design suggestions
- Development and supply of hardware by selection of suitable equipment
- Development and supply of layouts for the printed-circuit boards
- Development and supply of the necessary software (function blocks, GSD files) for interfacing to the PLC
- Preparation of necessary manufacturing and testing equipment
- Manufacturing
- Delivery with documentation (software included in delivery)
- Customer service.

Design options

Front plates

- Any size and shape
- Different materials, e.g. bare or anodized aluminum, sheet-steel, plastic; also film-coated
- Various colors.

Equipment

- Conventional 3SB2 and 3SB3 commanding and signaling devices, round or square version
- Indication and visualization components, e.g. multi-digit 7-segment displays and LED text displays
- Membrane keyboards with and without embossing, with metal spring washers or short-stroke keys, with point illumination or fully-illuminated keypads
- Integration of other flush-mounted devices, e.g. measuring instruments, potentiometer operating mechanisms.

Inscriptions

- Printed on the front plate, anodized
- Direct on the operating surface of the pushbuttons or using insert labels or name plates
- Using foils: printed, with push-in strips.

Connections

On request, all versions can be supplied ready to connect:

- With interfaces for connection to an AS-interface, PROFIBUS DP and other fieldbus systems
- Conventional with screw terminals or with solder connections for assembly on printed-circuit boards.

Enclosures

On request, all versions are available in enclosures

Fieldbus systems

For the AS-Interface and PROFIBUS DP fieldbus systems and further bus systems, standardized solid-state units are available that can be used to link each individually designed control panel into the required bus environment without the need for costly programming work.

This function is available for both membrane keyboards, short-stroke keys and LEDs of the 3SB4 series, and for conventional 3SB3 commanding and signaling devices.

Examples for implementation

The following are available:

- Control panels with membrane keyboard
- Control panels with 3SB3 commanding and signaling devices
- Control panels with membrane keyboard and 3SB3 commanding and signaling devices.



Control panel with 3SB3 commanding and signaling devices

3SB4, 3SF4 LED Indicators

Conventional 3SB4 LEDs,
3SF4 AS-Interface LEDs

Overview



Delivery options

The numeric and alphanumeric LED indicators can be obtained directly from our partner:

microSYST Systemelectronic GmbH
92637 Weiden

Design

- Suitable for mounting in panels
- Numeric indicators, red
- Various character heights
- Conventional LED indicators with A/D converter
- For AS-Interface with 4 additional, electrically isolated, digital inputs.

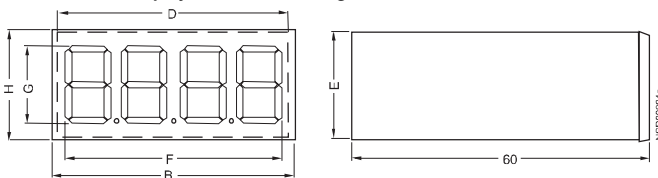
Technical specifications

Displays	Numeric
Type of display	7-segment LED
Luminous color	Red
Operating voltage	24 V DC (through bus for AS-Interface)
Power consumption for digit height	
• 10 mm	0.15 W per digit
• 13 mm	0.15 W per digit
• 20 mm	0.2 W per digit
• 30 mm	0.3 W per digit
Display	
• With A/D converter	0000 ... ±1999
• With AS-Interface	0 ... 9 and A, b, -, blank
Decimal point	
• With A/D converter	Permanently adjustable to specification
Input range	0 ... ±2 V DC, 0 ... ±10 V DC, 0 ... ±20 mA, 4 ... 20 mA

Addresses	1 address per display
• With AS-Interface	After the 15th addressing procedure, the display retains the last address
Enclosure	Flush mounting enclosure according to DIN, metal
• Mounting	Screw clamps according to DIN
• Degree of protection, at the front	IP54, with AS-Interface IP65
Ambient temperature	
• During operation	0 ... +50 °C
• During storage	-25 ... +70 °C
EMC	According to Guideline 89/336/EC (or EMVG)
Emitted interference	Basic Specification IEC 61000-6-4; Product Specification EN 55011, Group1/2, Class A (March 1991 Edition); limit curve identical to EN 55022
Interference immunity	Basic Specification IEC 61000-6-2

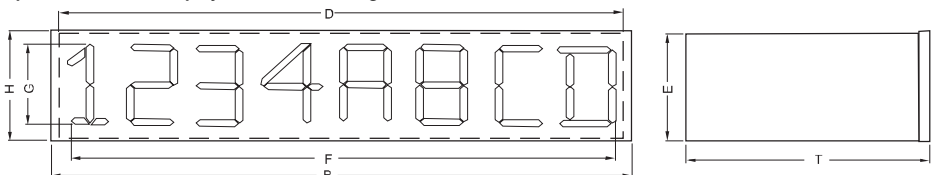
Dimensional drawings

Numerical LED display for flush mounting



Digit height G	B	H	D	E	Switchboard cutout
10	48	24	43.5	20	$45^{+0.6} \times 22.2^{+0.3}$
13	96	24	92	20	$92^{+0.8} \times 22.2^{+0.3}$
20	96	48	92	43	$92^{+0.8} \times 45^{+0.3}$
30	144	48	138	43	$138^{+0.6} \times 45^{+0.6}$

Alphanumeric LED display for flush mounting

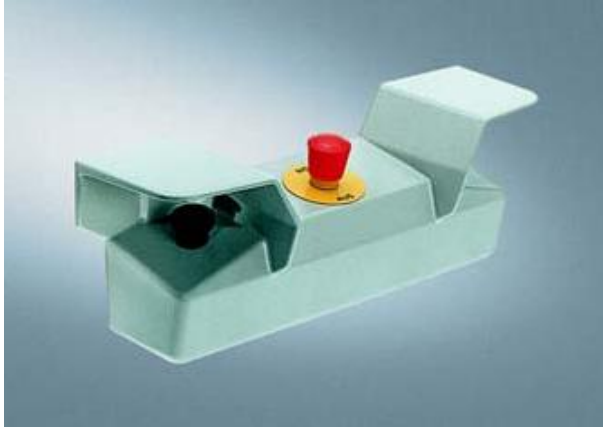


Digit height G	F	B	H	D	E	T	Switchboard cutout
17	139	168	24	158	20	61	$165^{+1} \times 21^{+0.3}$
30	225	264	48	254	40	40	$255^{+1} \times 41^{+0.6}$

3SB3 Two-Hand Operation Consoles

Molded-plastic and metal enclosures

Overview



Two-hand operation console with metal enclosure

The two-hand operation consoles are required for use with machines and systems that have hazardous areas, in order to direct both hands of the operator to one position.

Standards

The two-hand operation consoles comply with the requirements of EN 574.

Design

Equipment

The two-hand operation consoles are pre-equipped with 3SB3 command devices. The standard equipment comprises:

- 2 black mushroom pushbuttons, \varnothing 40 mm, 1 NO + 1 NC, Order No. 3SB30 00-1GA11
- 1 red EMERGENCY-STOP mushroom pushbutton according to ISO 13850 and EN 418, \varnothing 40 mm, with positive latching, 2 NC, Order No. 3SB30 00-1HA20.

The metal version is also available as an unequipped empty enclosure.

The molded-plastic version can be retrofitted with up to 8 customized control points. The surface of the console has premachined breaking points for this purpose.

Mounting

The two-hand operation consoles can be mounted either on the stand available or directly on the machine by means of the holes in the rear panel.

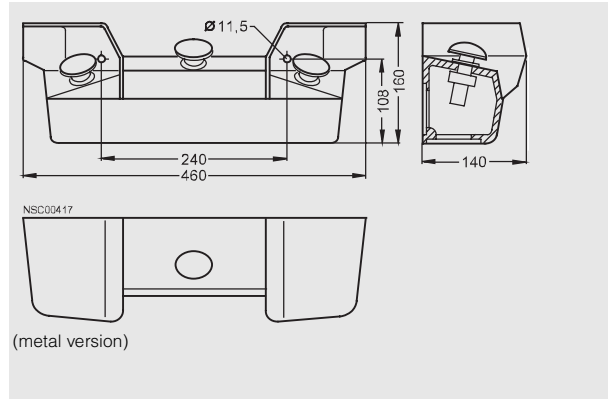
Function

The control command is given by pressing the two mushroom pushbuttons on the sides simultaneously (within 0,5 s of each other) and must be maintained for as long as a hazard exists.

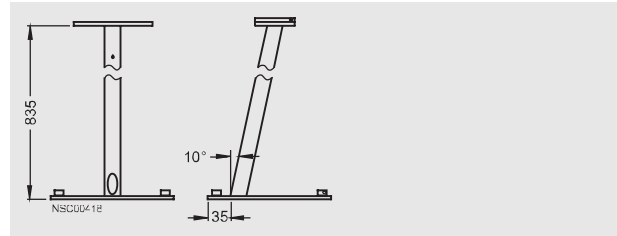
For evaluation of the control commands, the associated 3TK28 34 press control units are offered as two-hand control units and the 3TK28 35 is offered as a slowing-down test apparatus in relay design (see [Safety Relays in chapter 7](#)).

Dimensional drawings

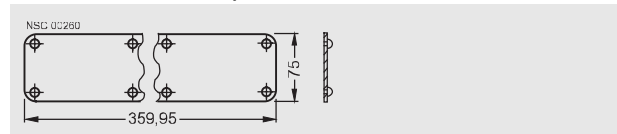
3SB38 63 operation console



3SB39 01-0AQ stand



3SB39 01-0AP metal base plate



3SE7 Cable-Operated Switches

Metal enclosures

Overview



SIRIUS cable-operated switches are used for monitoring or for EMERGENCY-STOP facilities on particularly endangered system sections.

As the effective range of a cable-operated switch is only limited by the length of the pull-rope, large systems can also be protected. Cable-operated switches (requiring pulling at both ends) and conveyor belt unbalance trackers are used primarily for monitoring very long belt systems.

Standards

The switches are equipped with positive latching and positive NC contacts and are thus suitable for operation in EMERGENCY-STOP equipment in accordance with ISO 13850 and EN 418.

Design

The switches for cable lengths up to 50 m are available with 1 NO + 1 NC, 2 NC or 1 NO + 3 NC contacts. The switches for cable lengths of 2 x 50 m and the conveyor belt unbalance trackers are supplied with 2 NO + 2 NC contacts.

The cable operated switch and the conveyor belt unbalance tracker can also be supplied with a factory-fitted LED (red, 24 V DC). This light in innovative on-board chip technology allows the operating status of the switch to be visible at a distance of at least 50 m.

Function

The NC contacts of the cable-operated switch and the conveyor belt unbalance tracker are positive opening.

Cable-operated switches with one-side operation are held in free position by the pre-tension on the turnbuckle.

In the 3SE7 140 and 3SE7 150 cable-operated switches, both switching contacts are available for cable-break/cable-pull signaling. The NO contact can be used, for example, for signaling purposes.

On switches with interlocking, with a pretensioned cable, the locking must be deactivated beforehand in order to return the cable operated switch to its original position.

Technical specifications

Type	3SE7 120	3SE7 150	3SE7 140	3SE7 141	3SE7 160	3SE7 310
Standards	IEC 60947-5-1, EN 60947-5-1; IEC 60204-1, EN 60204-1; EN 418 (ISO 13850)					
Approvals	UL/CSA					
Electrical design	Contacts electrically isolated from each other					
Electrical load						
• At AC-15	400 V AC, 6 A		250 V AC, 2 A		400 V AC, 6 A	
• Min.	24 V AC/DC, 10 mA					
Short-circuit protection	6 A (slow)					
Mechanical endurance	> 1 million operating cycles					
Contact material	Fine silver					
Operation	By pulling or breaking of rope					
Rope length, maximum	10 m	25 m	50 m		2 x 50 m	–
Distance between rope supports, max.	2.5 m	3 m	5 m		5 m	–
Enclosure	GD Al alloy, coated (color), dark black RAL 9005					
Cover	Shock-resistant thermoplastic					
Degree of protection acc. to EN 60529	IP65			IP66		IP65
Ambient temperature	-25 °C ... +70 °C					
Mounting	Designed for M5					
Fixing spacing	30 mm and 40 mm					
Cable entry	2 x (M20 x 1.5)		1 x (M16 x 1.5)	3 x (M16 x 1.5)	2 x (M25 x 1.5)	
Connection type	Screw terminals M3.5, self-lifting terminal clamp					

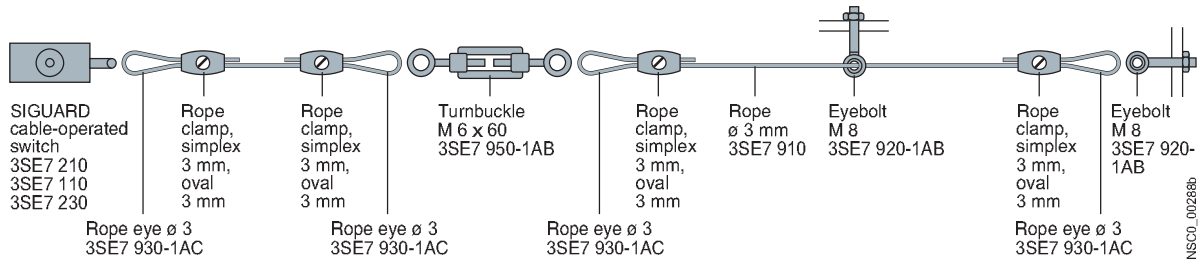
3SE7 Cable-Operated Switches

Metal enclosures

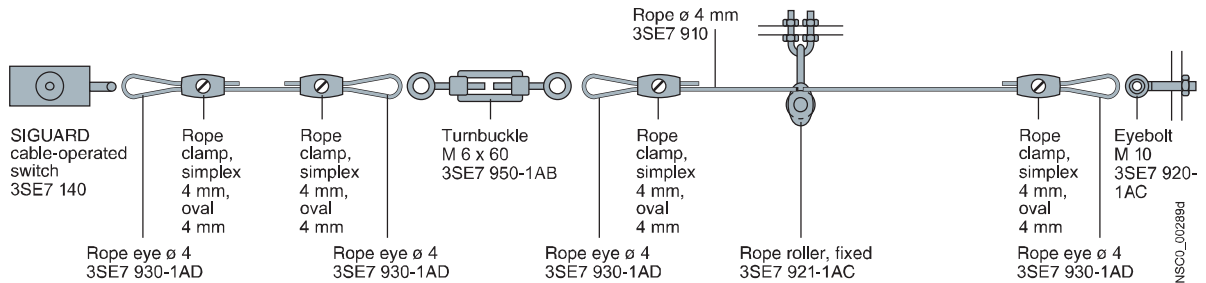
Configuration

Mounting and fixing the cables

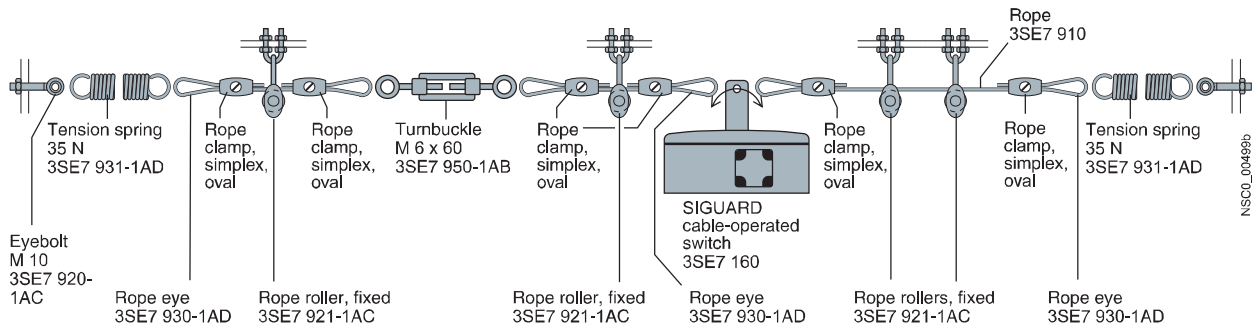
Short lengths of rope up to 25 m



Long lengths of rope up to 50 m



Pulling from both sides up to 2 x 50 m



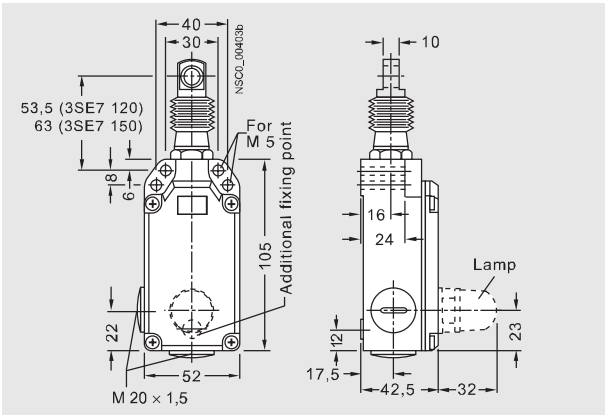
Use of a tension spring is essential for long sections of rope.

3SE7 Cable-Operated Switches

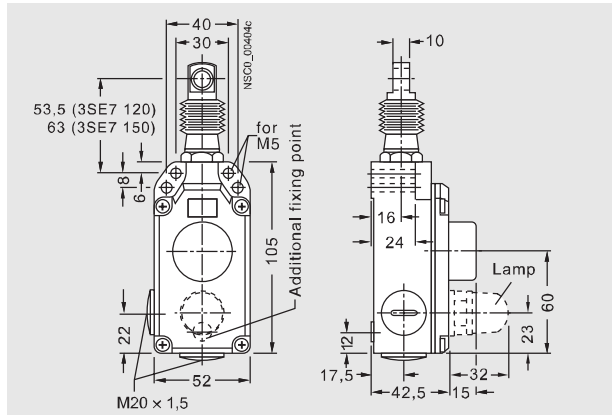
Metal enclosures

Dimensional drawings

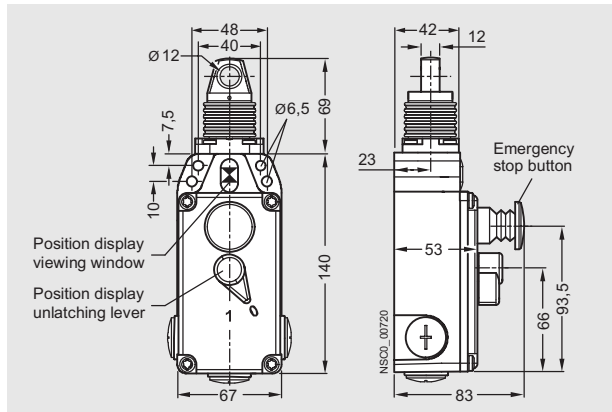
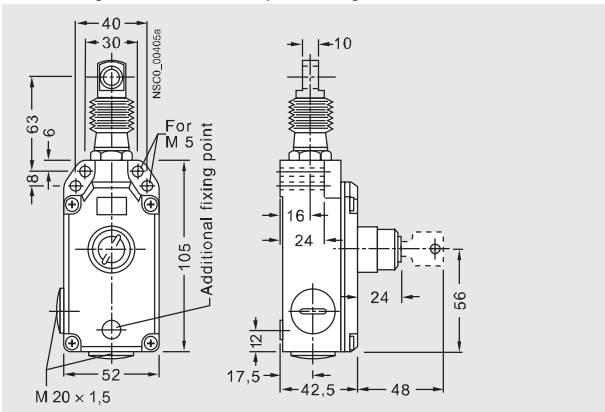
3SE7 120-2DD..., 3SE7 150-2DD..
without latching



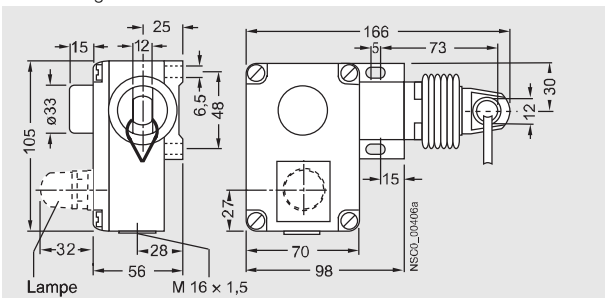
3SE7 120-1B..., 3SE7 150-1B...
with latching and button reset



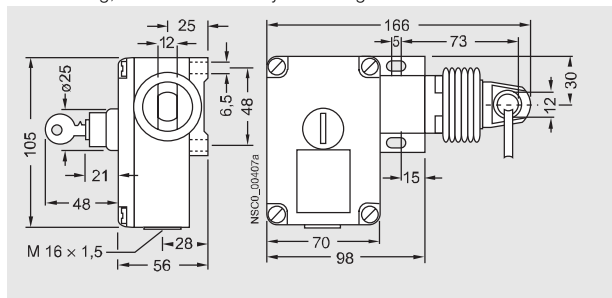
3SE7 150-1CD..
with latching, button reset and key unlatching



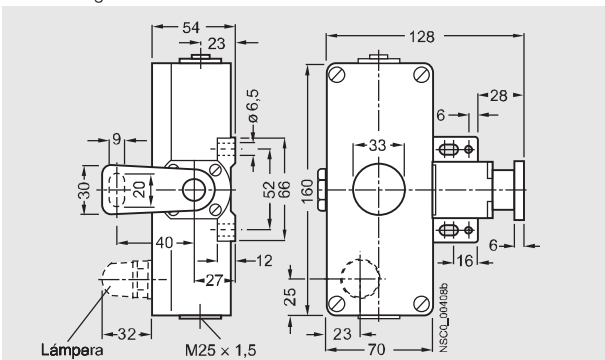
3SE7 140-1B...
with latching and button reset



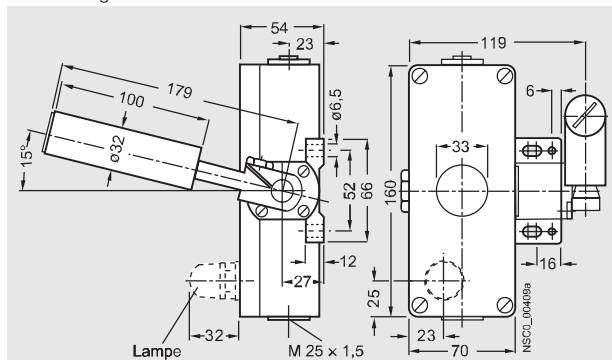
3SE7 140-1CD..
with latching, button reset and key unlatching



3SE7 160-1AE...
with latching and button reset



3SE7 310-1AE... conveyor belt unbalance tracker
with latching and button reset



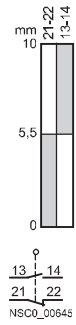
3SE7 Cable-Operated Switches

Metal enclosures

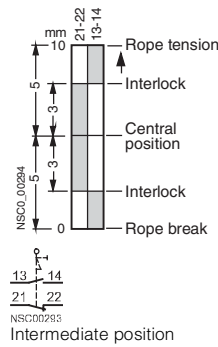
Schematics

Connection diagrams, operating travel diagrams

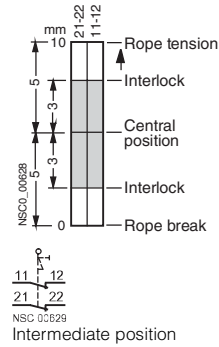
3SE7 120-2DD01



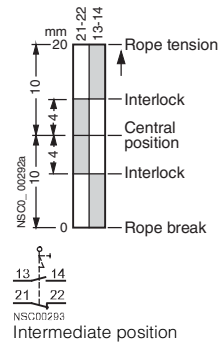
3SE7 150-..D0.



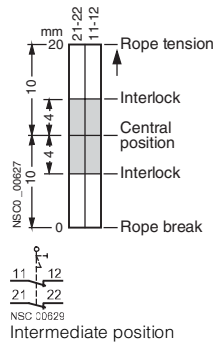
3SE7 120-1BF00, 3SE7 150-1BF00



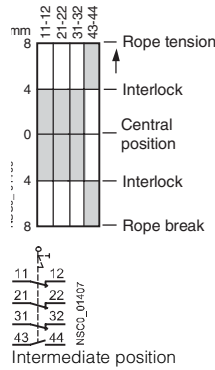
3SE7 140-1.D0.



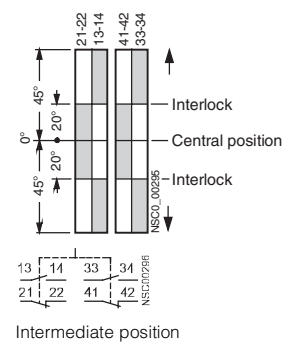
3SE7 140-1.F00



3SE7 141-1EG10



3SE7 160-1AE, 3SE7 310-1AE



3SE2, 3SE3 Foot Switches

Molded-plastic and metal enclosures

Overview



Foot switches with metal enclosures

The 3SE2 9 and 3SE3 9 foot switch range encompasses versions in a metal enclosure for rugged applications as well as versions with molded-plastic enclosure. The devices can be supplied with or without a cover and have fixing holes for them to be screwed to the floor.

Depending on the particular application, the switches can be ordered in latching or momentary-contact versions.

Safety foot switches

The single-pedal safety foot switches according to EN 418 lock on actuation. After eliminating the hazard, the machine can only be restarted after manually releasing the switch. A pushbutton on the top of the enclosure is used for this purpose. The devices are supplied with a cover.

Version with molded-plastic enclosures

For operation in less harsh environments, momentary-contact pedal switches with molded-plastic enclosures are available. They are supplied in single-pedal and two-pedal versions, the single-pedal version is also available with a cover. The momentary-contact pedal switch has one micro switch (changeover contact) per actuating pedal.

Technical specifications

Type		3SE29	3SE39
Standards		IEC 60947-5-1	IEC 60947-5-1
Electrical load			
• At AC-15, 400 V	A	16 6 A for 3SE2903-1....	--
• At 250 V AC	A	--	5
Short-circuit protection	A	16 (slow) 6 (slow) for 3SE2903-1....	5 (slow)
Mechanical endurance		> 10 ⁶ operating cycles	> 10 ⁶ operating cycles
Material			
• Enclosure		Aluminum casting	Impact-resistant thermoplastic, self-extinguishing according to UL 94 VO
• Cover		Thermoplastic	--
• Guard hood		Aluminum casting	Metal
Degree of protection		IP65	IP65
Ambient temperature	°C	-25 ... +80	-10 ... +75
Connection		Cable entry, metric	Cable AWG20, UL Style 2464, length 3 m

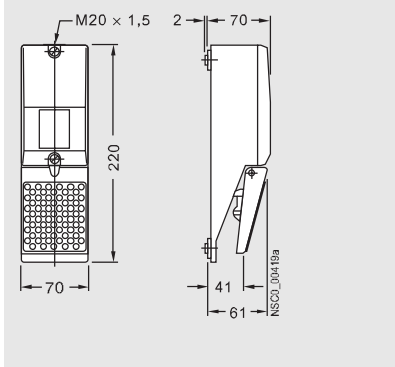
3SE2, 3SE3 Foot Switches

Molded-plastic and metal enclosures

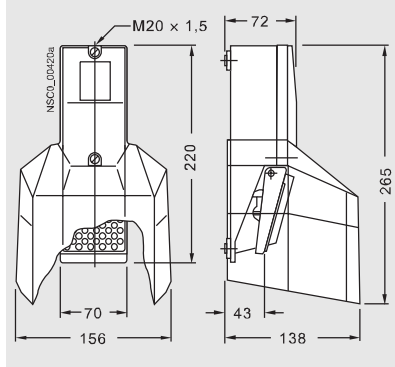
Dimensional drawings

Metal enclosures

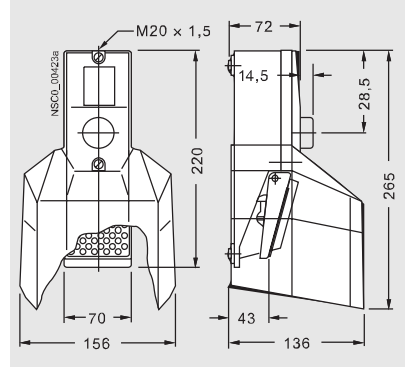
3SE2 902-0AB20, 3SE3 903-1AB20, 3SE2 912-2AB20
momentary contact foot switch/switch, one pedal, without cover



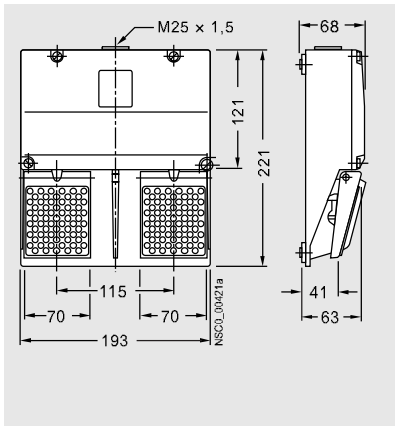
3SE2 902-0AA20, 3SE3 903-1AA20, 3SE2 912-2AA20
momentary contact foot switch/switch, one pedal, with cover



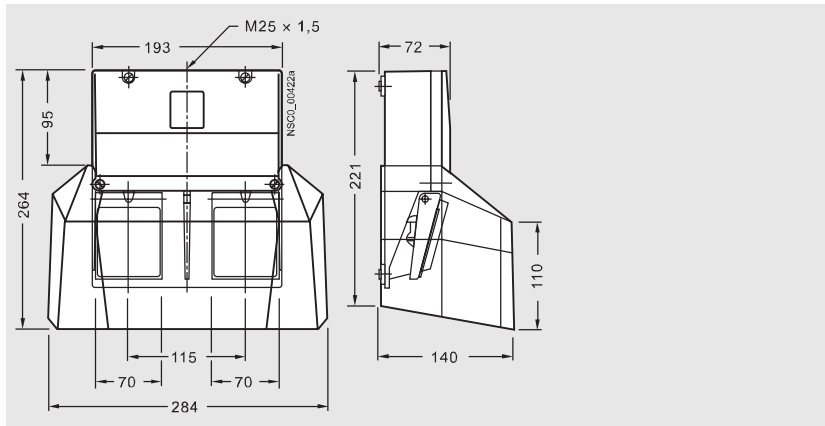
3SE2 924-3AA20
safety foot switch with interlock



3SE2 932-0AB20, 3SE2 932-1AB20
momentary contact foot switch, two pedals, without cover

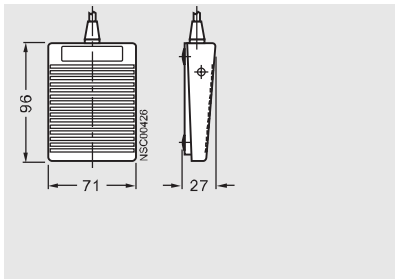


3SE2 932-0AA20, 3SE2 932-1AA20
momentary contact foot switch, two pedals, with cover

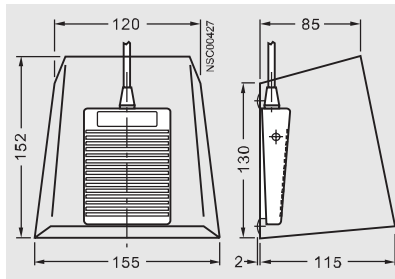


Molded-plastic enclosures

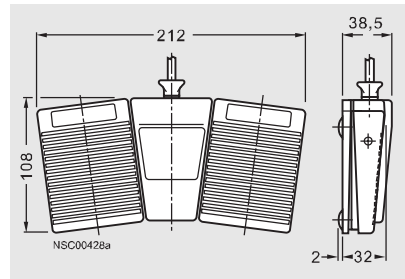
3SE3 902-4CB20
momentary-contact pedal switch, one pedal, without cover



3SE3 902-4CA20
momentary-contact pedal switch, one pedal, with cover



3SE3 934-5CB20
momentary-contact pedal switch, two pedals, without cover



8WD4 Signaling Columns

General data

Overview



Two product series are available:

- 8WD42
 - Thermoplast enclosure, diameter 50 mm
 - Degree of protection IP54
 - Up to 4 elements can be mounted.
- 8WD44
 - Thermoplast enclosure, diameter 70 mm
 - Advanced design and significantly improved illumination
 - Fast and flexible connection using spring-loaded terminals
 - Integrated degree of protection IP65
 - Up to 5 elements can be mounted.

Design

8WD4 signaling columns can be combined as required as modular components and are available in two diameters, 50 mm and 70 mm.

Signaling elements

The separate signaling elements are mechanically joined with a bayonet mechanism for electrical reliability and vibration resistance. Tools are not required. Up to five signaling elements (four in the case of 8WD42) can be connected to one connecting element. The bracket for two-sided mounting permits, in the case of the 8WD44 signaling columns, the installation of two connection elements and therefore up to ten signaling elements in a single location.

Signal elements are available in the following versions:

- Steady-light element (incandescent lamp, LED)
- Blinklight element (incandescent lamp, LED)
- Flashlight element
- Rotating light element (LED)
- Buzzer element
- Siren element.

The tone of the buzzer element can be altered as desired between a pulsating and a continuous tone by means of a jumper in the buzzer element.

The amplification of the siren element can be selected in the 100 dB version via an integrated potentiometer. It is possible to set 8 sounds using a DIP switch.

Mounting

Floor mounting

The 8WD42 signaling columns are mounted on the floor with a 8WD42 08-0DE plastic foot.

The 8WD44 signaling columns can be directly screwed onto the connection element for floor mounting.

Pipe mounting

Pipes are available in various lengths from 150 mm to 1000 mm. A special molded foot is recommended for pipes of more than 500 mm in length to improve stability.

Angle mounting

The supplementary component for fixing at a 90° angle, e.g. to walls, is directly attached to the connection element. A special connection element for angle mounting is required for the 8WD44 signaling columns.

Single-hole mounting

The 8WD42 signaling columns can be fixed using a drilled hole using the adapter for single-hole mounting. It is screwed in place from below.

Magnetic fixing

The adapter with the sideways cable outlet can also be ordered with magnetic fixing as a special version. This offers easy, flexible mounting on metal plates or panels which is also extremely resistant to shocks.

Connection

The signaling elements are wired up using the screw terminals in the connection element, screw terminals on the 8WD42 and spring-loaded terminals on the 8WD44.

Cable outlet

The connecting cables can be guided either downwards or sideways through the cable gland using an adapter that can be screwed under the foot. This makes wiring easier if there is no access from below.

Connection to AS-Interface

The two-wire bus cable is fixed to the screw terminals in the connection element. The adapter element must be the first module to be positioned on the connection element. A maximum of 4 signaling elements can then be mounted on it.

A/B technology enables the connection of up to 62 slaves on one AS-Interface system. The addressing socket provides user-friendly parameterization of the AS-Interface elements.

Function

GSM radio elements

Downtimes can be minimized with the 8WD44 GSM radio element. Errors are signaled within seconds over a mobile phone from any place at any time.

The radio element is integrated below the light elements in the signaling column and can be quickly commissioned and easily operated:

- Insert SIM card in the radio element
- Call the radio element with the receiver's mobile phone
- Start the monitoring.

Each module can have up to three different call numbers. In addition to using the SMS function the receiver can obtain information about the current state of the machines or plants by call, fax or e-mail service (through the provider) or he can perform remote diagnostics by mobile phone.

8WD4 Signaling Columns

General data

The alarm function of the radio element can be switched on or off at any time:

- By calling the radio element
- By sending an SMS with the corresponding commands

- By operating an input in "External Control" mode.

The radio elements can also be connected to an AS-Interface module with an external power supply.

Technical specifications

Type	8WD42	8WD44
Enclosure	Thermoplastic (polyamide), impact-resistant, black	Thermoplastic (polyamide), impact-resistant, black
Light elements, GSM radio element	Thermoplastic (polycarbonate)	Thermoplastic (polycarbonate)
Mounting		
• Horizontal (for mounting on floor, foot with 25 mm Ø pipe)	✓	✓
• Horizontal (single-hole mounting)	✓	--
• Vertical with bracket	✓	✓
Rated voltage, current input		
With incandescent lamp (AC values for 50/60 Hz)		
• Steady light	12 V, 24 V, 115 V, 230 V AC/DC	12 V, 24 V, 115 V, 230 V AC/DC
• Blinklight	24 V AC/DC/125 mA; 115 V AC/20 mA; 230 V AC/15 mA	24 V AC/DC/125 mA; 115 V AC/20 mA; 230 V AC/15 mA
• Flashlights	--	24 V DC/125 mA; 115 V AC/20 mA; 230 V AC/35 mA
• Max. inrush current, blinklight/flashlight	--	500 mA
With integrated LED		
• Steady light	24 V AC/DC/60 mA	24 V AC/DC/45 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA
• Blinklight	--	24 V AC/DC/40 mA
• Rotating light	--	24 V AC/DC/70 mA
Acoustic elements		
• Buzzer element (tone: pulsating or continuous, 85 dB)	24 V AC/DC/25 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA	24 V AC/DC/25 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA
• Siren element (8 tones + amplification can be set, 100 dB)	--	24 V AC/DC/80 mA; 115 V AC/30 mA; 230 V AC/16 mA
• Siren element (108 dB)	--	24 V DC/100 mA
• GSM radio elements	--	24 V DC (controlled ±15%)/50 mA, transient 450 mA
Power consumption		
• Bulbs, base BA 15d	Max. 5 W	7 W
• Flashlights	--	Flash energy 2 Ws
Connection		
• Conductor cross-sections	M3 screw terminal Max 2.5 mm ²	Spring-loaded terminals Max 2.5 mm ²
• Tightening torque	Max. 0.5 Nm	--
Degree of protection		
• Light elements	IP54	IP65 (seal premounted as standard with every module)
• Acoustic elements	IP54	IP65
Operating temperature	-20 °C ... +50 °C	
Approvals	UL, CSA	

AS-Interface adapter element

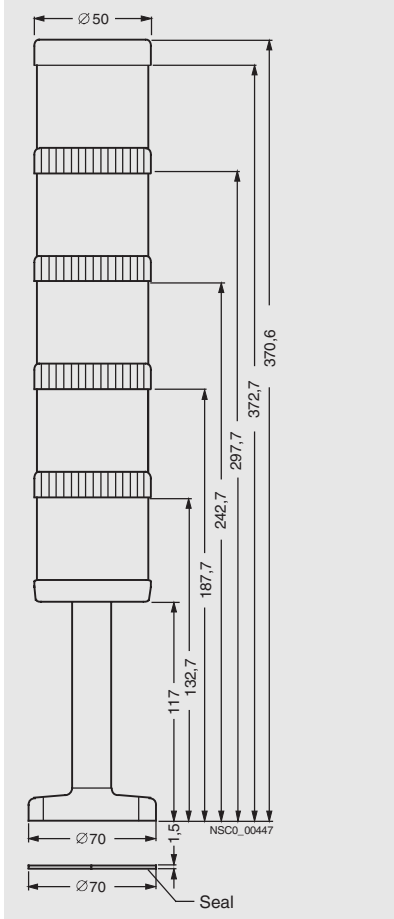
Type	8WD42	8WD44
IO code/ID code	8/F	8/E
Power supply		
• Operating voltage	Through bus cable 18.5 ... 31.6 V	Through bus cable 18.5 ... 31.6 V
• Power consumption I_{max}	50 mA	Max. 100 mA
Protective measures		
• Watchdog	✓	✓
• Short-circuit/overload protection	External upstream fuse M 1.6 A	✓
• Reverse polarity protection	✓	✓
• Induction protection	Does not apply	✓
Outputs		
• Load voltage	4 relay outputs External power supply 0 ... 30 V DC, 0 ... 230 V AC	3 solid-state outputs through bus cable or external auxiliary voltage, switch-selectable
• Current carrying capacity ΣI_{max}		
- with external auxiliary voltage	1.5 A	0.3 A
- without external auxiliary voltage	--	0.2 A
Degree of protection	IP54	IP65
Operating temperature	-20 °C ... +50 °C	-25 °C ... +50 °C

8WD4 Signaling Columns

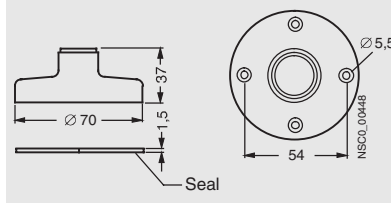
8WD42 signaling columns, 50 mm diameter

Dimensional drawings

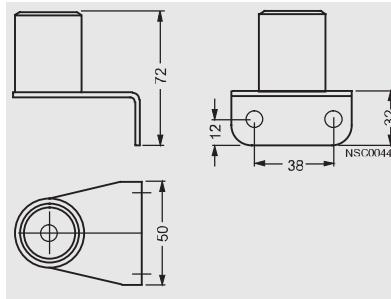
Signaling column (4-tier)



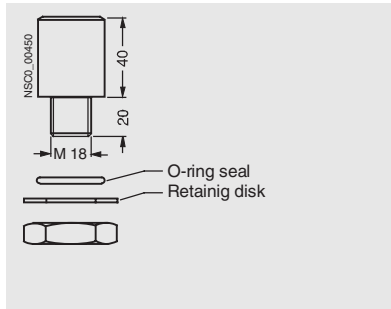
Foot



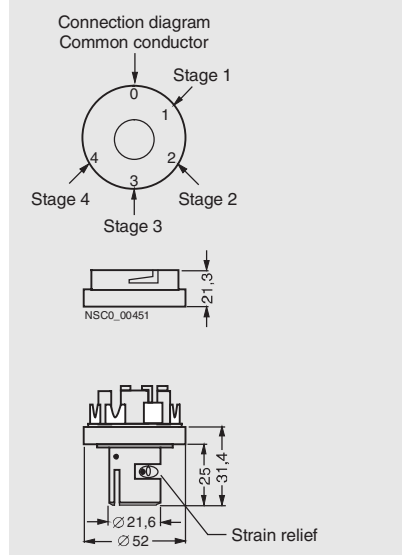
Bracket for wall mounting



Adapters for single-hole mounting



Connection elements



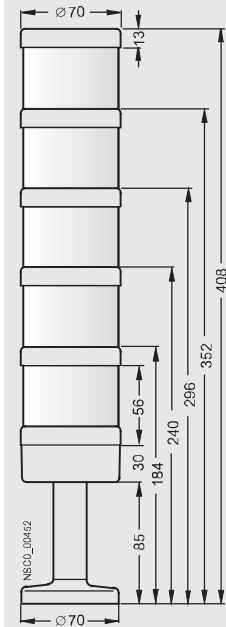
1) For horizontal mounting, only 1 element is recommended.

8WD4 Signaling Columns

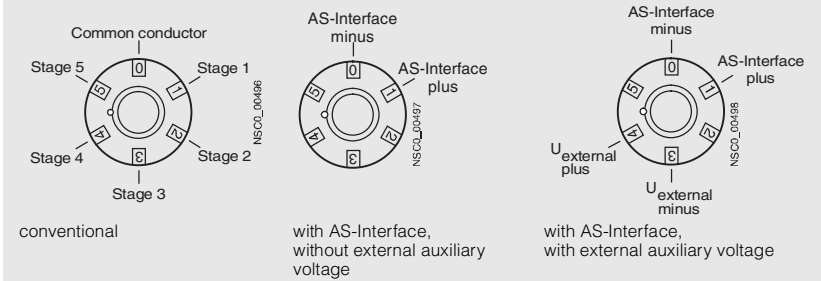
8WD44 signaling columns, 70 mm diameter

Dimensional drawings

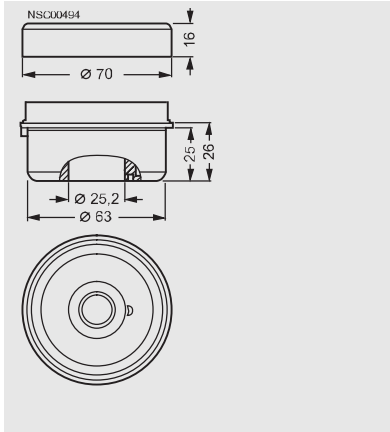
Signaling column (5-tier)



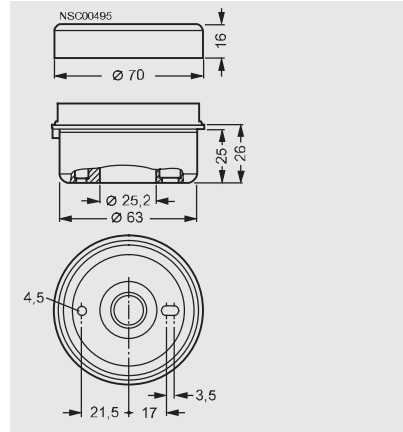
Connection elements



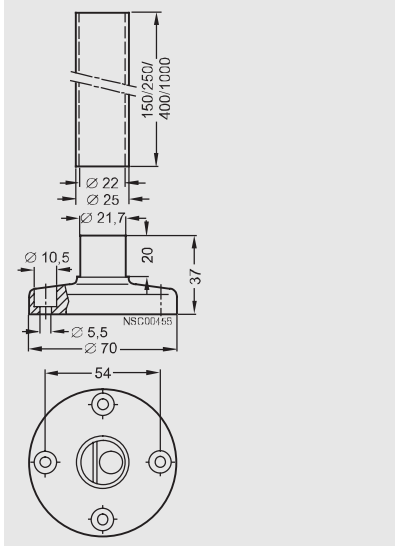
Connection elements with cover for mounting on pipes



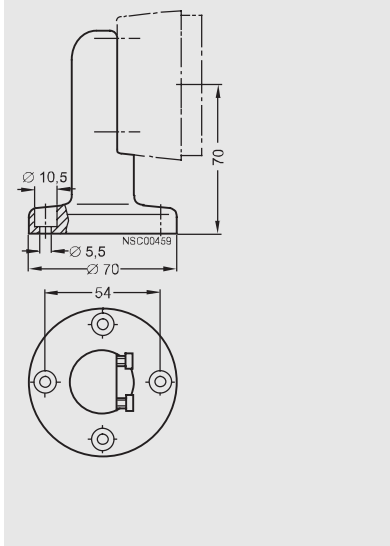
Connection elements with cover for mounting on floor/bracket



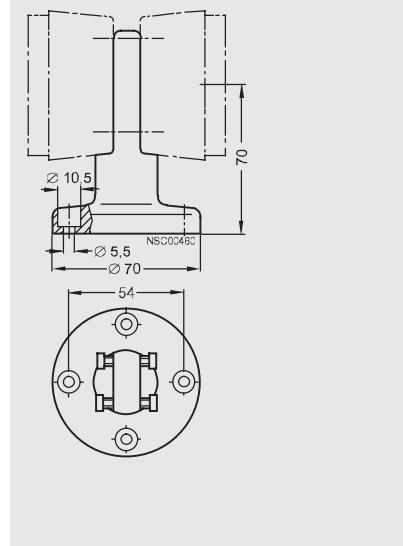
Foot with pipe



Bracket for single-sided mounting



Bracket for double-sided mounting



8WD5 Integrated Signal Lamps

8WD53 integrated signal lamps, 70 mm diameter

Overview



Features:

- Thermoplast enclosure, diameter 70 mm
- Degree of protection IP65
- Rated voltage 24 V, 115 V, 230 V AC/DC.

Design

8WD53 integrated signal lamps can be mounted directly at any point of the machine for the purpose of giving visual signals. They are mounted by means of a Pg 29 screw base with nut.

All integrated signal lamps have a high degree of protection IP65 and are made of a material highly resistant to impact.

The special shape of the integrated signal lamps means that the light is emitted optimally in every direction (to the sides and upwards). Steady lights (with incandescent lamp or LED) and single-flash lights are available in the following colors: red, green, yellow, clear and blue.

The LED versions of the integrated signal lamps offer a considerably longer endurance than the incandescent lamp versions. LED lights are available as a steady light, repeated-flash light and rotating light.

Technical specifications

Type	8WD53
Enclosure	PC/ABS composite impact-resistant, black
Spherical cap	Thermoplast (polycarbonate), impact-resistant up to 20 years
Mounting	Ø 37 mm hole (Pg 29)
Rated voltage (AC values at 50 Hz)	
• Continuous light, BA 15d (incandescent lamp)	24 V, 115 V, 230 V AC/DC; 5 W
• Continuous light, BA 15d (LED)	24 V, 115 V, 230 V AC/DC
• Single-flash lamp	24 V AC/DC/125 mA; 115 V AC/20 mA; 230 V AC/15 mA
• Lights with integrated LED	24 V AC/DC/70 mA
Single-flash power	2 Ws/approx. 1 Hz
LED lamps	
• Blinklight lamp	Flash frequency approx. 1 Hz
• Rotating light	Rotating frequency Approx. 120 min ⁻¹
Making current	
• LED lamp	< 0.5 A
• Single-flash lamp	< 0.5 A
Cable connection	Radial or axial
Degree of protection	IP65
Ambient temperature	
• Steady light (bulb)	-20 ... +60 °C
• Single-flash lamp, LED	-20 ... +50 °C
Approvals	UL, CSA

8WD5 Integrated Signal Lamps

8WD53 integrated signal lamps, 70 mm diameter

Dimensional drawings

