



EN Operating instructions. . . . .pages 1 to 6  
Original

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**1. About this document**

**1.1 Function**

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the safety switchgear. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

**1.2 Target group: authorised qualified personnel**

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

**1.3 Explanation of the symbols used**



**Information, hint, note:**  
This symbol is used for identifying useful additional information.



**Caution:** Failure to comply with this warning notice could lead to failures or malfunctions.  
**Warning:** Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

**1.4 Appropriate use**

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machine or plant.

The safety switchgear must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

**1.5 General safety instructions**

The user must observe the safety instructions in this operating instructions manual, the country specific installation standards as well as all prevailing safety regulations and accident prevention rules.



Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: [www.schmersal.net](http://www.schmersal.net).

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

### 1.6 Warning about misuse



In case of improper use or manipulation of the safety switchgear, personal hazards or damages to machinery or plant components cannot be excluded. The relevant requirements of the standard ISO 13850 must be observed.

### 1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden; the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

## 2. Product description

### 2.1 Ordering code

This operating instructions manual applies to the following types:

#### BDF 100-①-G-ST with emergency stop

No.	Option	Description
①	NH NHK	Emergency stop pushbutton without protective collar with protective collar

#### Enclosure with yellow cover

#### BDF100-①-②-③-ST

No.	Option	Description
①	20 11	2 NO 1 NO / 1 NC
②	...	Selection of the actuator without indicator lamp
③	G/RD G/GN G/YE G/BU G/WH	Red indicator lamp (not for -LT, -LM) Green indicator lamp (not for -LT, -LM) Yellow indicator lamp (not for -LT, -LM) Blue indicator lamp (not for -LT, -LM) White indicator lamp (not for -LT, -LM)

#### Enclosure with black cover



In accordance with the Machinery Directive, the type plate of safety components is type plate labelled "Safety component".



Only if the information described in this operating instructions manual are realised correctly, the safety function and therefore the compliance with the Machinery Directive is maintained.

### 2.2 Actuator overview

#### Emergency stop pushbutton

- without protective collar ordering suffix **NH**
- with protective collar ordering suffix **NHK**
- Pull to reset
- 1 NO contact / 2 NC contact

#### Illuminated pushbutton LT

- with concave button
- Lamp replacement at the front
- 2 NO contacts or 1 NO contact / 1 NC contact

#### Pushbutton DT

- with concave button
- 2 NO contacts or 1 NO contact / 1 NC contact

#### Illuminated signal LM

- Lamp replacement at the front

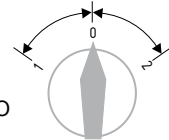
#### Selector switches WS20, SWS20

- 1 latched position
- 2 NO contacts or 1 NO contact / 1 NC contact



#### Selector switches WS30

- 2 latched positions to the left/right of the zero position
- 1 NO contact for each switching position for version -20 or 1 NC contact (position 1) and 1 NO contact (position 2) for version -11



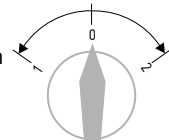
#### WT20, SWT20 (key-operated) selector switches

- 1 touch position and automatic return to the zero position
- 2 NO contacts or 1 NO contact / 1 NC contact



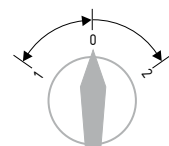
#### Selector switches WT30

- 2 touch positions to the left/right of the zero position and automatic return to the zero position
- 1 NO contact for each switching position for version -20 or 1 NC contact (position 1) and 1 NO contact (position 2) for version -11



#### Selector switches WTS30

- 1 touch position right and automatic return to the zero position and 1 latched position left of the zero position
- 1 NO contact for each switching position for version -20 or 1 NC contact (position 1) and 1 NO contact (position 2) for version -11



### 2.3 Special versions

For special versions, which are not listed in the order code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

### 2.4 Purpose

The modular BDF100 control panel is installed on the safety guard of a machine or plant. It enables the operator to activate for instance the emergency stop, start/stop and reset functions.

The control panels can be cascaded on top of each other (stackwise) or next to each other (juxtaposed).




The user must evaluate and design the safety chain in accordance with the relevant standards and the required safety level.



The entire concept of the control system, in which the safety component is integrated, must be validated to the relevant standards.

### 2.5 Technical data

Standards:	IEC 60947-5-1, IEC 60947-5-5
Material of the enclosure:	glass-fibre reinforced thermo-plastic, self-extinguishing
Protection class:	IP65
Connection:	Connector plug M12, 8-pole,
Ambient temperature:	-25 °C ... 65 °C
Climatic resistance:	to DIN EN 60068 Part 2 - 30
Overvoltage category:	III
Degree of pollution:	3
Material of the contacts:	AgNi 10, gold-plated
Rated operating current/voltage $I_e/U_e$ :	AC-15: 2 A / 24 VAC DC-13: 1 A / 24 VDC
Thermal test current $I_{the}$ :	2 A
Max. fuse rating:	2 A slow blow
Contact system:	Cross-Point system
Contact force:	0.5 N per contact point = 1 N per contact
Switching of low voltages:	min. 5 V / 1 mA
Switching frequency:	1,200 s/h
Rated insulation voltage $U_i$ :	60 V
Rated impulse withstand voltage $U_{imp}$ :	0.8 kV
Bounce duration:	< 2 ms at 100 mm/s actuating speed
Mechanical life:	1 million operations; emergency stop: 100,000 operations
Switch travel:	approx. 3 mm
Resistance to shock:	100 g / 6 ms
Resistance to vibration:	20 g, 10 ... 100 Hz
Wiring configuration:	to IEC 60947-1
Actuating force at stroke end (1 NC/1 NO):	8 N
Lamp socket:	BA5S, LED, max. length 17 mm
LED change:	from front
LED power consumption (operating elements):	16 mA
Power consumption indicator lamp, red:	20 mA

 Adapters providing field wiring means are available from the manufacturer. Refer to manufacturers information. Or equivalent. (See Schmersal online catalogue.) For use in NFPA79, Industrial Machinery, only. The power-source has to be an isolated secondary source limited by a listed fuse rated 3 A min. 24 VAC/DC.

### 2.6 Safety classification emergency stop

Standards:	ISO 13849-1
$B_{10D}$ :	100,000
Service life:	20 years

$$MTTF_D = \frac{B_{10D}}{0,1 \times n_{op}} \quad n_{op} = \frac{d_{op} \times h_{op} \times 3600 \text{ s/h}}{t_{cycle}}$$

(Specifications can vary depending on the application-specific parameters  $h_{op}$ ,  $d_{op}$ ,  $t_{cycle}$  as well as the load.)

## 3. Mounting

### 3.1 General mounting instructions

For the correct fixing of the control panel, the device is provided with two mounting holes for M5 screws are provided. Any mounting position.

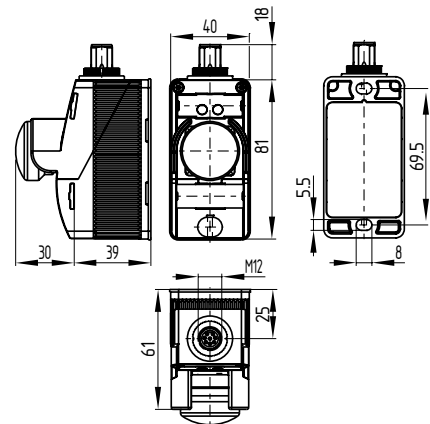


Please observe the relevant requirements of the standards ISO 12100, ISO 14119 and ISO 14120.

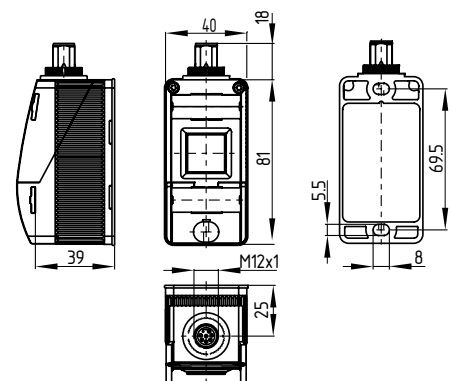
### 3.2 Dimensions

All measurements in mm.

#### BDF100-NH-...



#### BDF100-...-



### 3.3 Fixing

Remove the cover of the enclosure (screws: Torx 10).



When opening the enclosure cover, please avoid damage to the connecting cables.



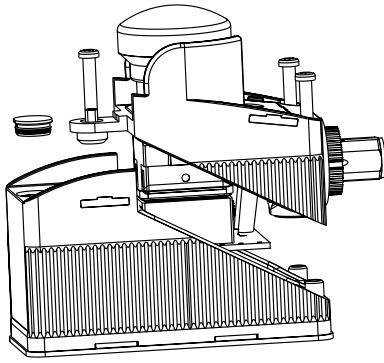
**Caution!**  
Do not touch electrostatically loaded elements.  
Do not touch the printed circuit board.

Use 2 x M5 cylindrical screws ISO 4762 (DIN 912) for the assembly.



When closing the enclosure cover, please observe that the individual cables are not caught between the actuator and the contact element.

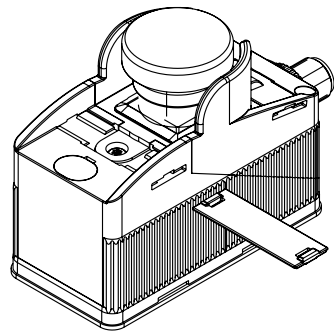
After fitting, the cover screws must be tightened with a tightening torque of 0.7 ... 0.8 Nm.



When closing the enclosure cover, ensure that the emergency stop module is fitted flush with the bottom section and that the cover screws are screwed in as far as they will go. The emergency stop safety function must be checked by an appointed safety technician / safety representative once successfully installed.

### 3.4 Inscription plates

The marking on the inscription plates (included in delivery) is carried out by colour change by laser. The effects of heat may change the colour of the surface.



It must be ensured that the top is inscribed.

## 4. Electrical connection

### 4.1 General information for electrical connection



The electrical connection may only be carried out by authorised personnel in a de-energised condition.

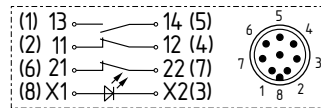
The connection to the operating panel is realised through an M12 connector. The M12 connector plug is A-coded. The operating panel must be wired in accordance with the pin configuration of the connector plug.

### 4.2 Pin configuration

The number in brackets indicates the PIN number of the connector. Control of the integrated or additional indicator lamp is through PIN 3 and PIN 8.

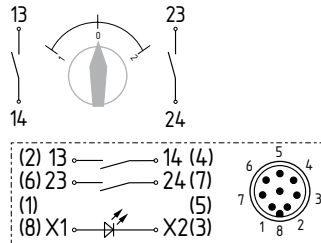
### BDF100-NH...

1 NO contact / 2 NC contacts, contact variant emergency stop



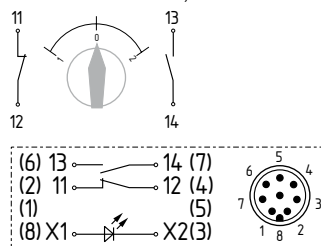
### BDF100-20...

Contact variant -20, 2 NO contacts



### BDF100-11...

Contact variant -11, 1 NO contact / 1 NC contact



Information for selecting the suitable connectors and connector plugs can be found in the Schmersal catalogues or in the online catalogue on the Internet: [www.schmersal.net](http://www.schmersal.net).

## 5. Set-up and maintenance

### 5.1 Functional testing

The function of the component must be tested. The following conditions must be previously checked and met:

1. The installation is executed according to the instructions
2. The connection is executed correctly
3. The cable is correctly executed and connected.

### 5.2 Maintenance

In case of correct installation in accordance with the instructions described above, the component requires little maintenance. For use in extreme conditions, we recommend routine maintenance including the following steps:

1. Check the correct fixing of the control panel
2. Remove particles of dust and soiling
3. Check cable entry and connections

**Damaged or defective components must be replaced.**

## 6. Disassembly and disposal


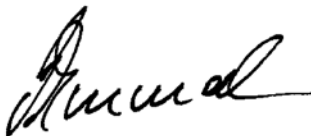
### 6.1 Disassembly

The product must be disassembled in a de-energised condition only.

### 6.2 Disposal

The product must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations.

7. EU Declaration of conformity

EU Declaration of conformity		
Original	K.A. Schmersal GmbH & Co. KG Möddinghofe 30 42279 Wuppertal Germany Internet: www.schmersal.com	
We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.		
<b>Name of the component:</b>	BDF100	
<b>Type:</b>	See ordering code	
<b>Description of the component:</b>	Control panel	
<b>Relevant Directives:</b>	Machinery Directive <sup>1)</sup> RoHS-Directive	2006/42/EG 2011/65/EU
<b>Affixing of the CE conformity mark:</b>	<sup>1)</sup> for safety components, whose type plate is labelled "Safety component"	
<b>Applied standards:</b>	DIN EN 60947-5-1:2010, DIN EN 60947-5-5:2015, DIN EN ISO 13850:2008	
<b>Person authorised for the compilation of the technical documentation:</b>	Oliver Wacker Möddinghofe 30 42279 Wuppertal	
<b>Place and date of issue:</b>	Wuppertal, March 12, 2018	
BDF100-D-EN		
	Authorised signature <b>Philip Schmersal</b> Managing Director	



The currently valid declaration of conformity can be downloaded from the internet at [www.schmersal.net](http://www.schmersal.net).



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