

**Safety in system:  
Protection for man and machine**

# **DOOR INTERLOCK SYSTEM MODERN, INTUITIVE, INTERACTIVE**

**NEW**



# DOOR INTERLOCK SYSTEM SYSTEM OVERVIEW

## Control panel BDF40

Control panel with or without emergency stop

## Connection cover

## Safety switchgear

Solenoid interlock AZM40 or safety sensor RSS260

## Connector cover

## Door handle DHS-U1

Door handle with handle surface that can be illuminated in colour and pushbutton caps, also with coloured illumination



## 1. Door handle



**DHS-U1**  
Door handle

## 2. Switchgear



**AZM40**  
Solenoid interlock



**RSS260**  
Safety sensor

## 3. Control Panel



**BDF40**  
Control panel with or without emergency stop

## 4. Accessories



### Accessories

Emergency release, connector covers, lockout tag, emergency-stop protective collars

# DOOR HANDLE DHS-U1

## NEW STANDARDS IN ERGONOMICS, FUNCTIONALITY AND DESIGN



### DOOR HANDLE DHS-U1

- Machine status directly recognisable on the door handle
- Ergonomic door handle for left or right hinged safety guard
- Degree of protection IP66, IP67 (with operating element)  
IP66, IP67, IP69 (without operating element)
- Can be combined with solenoid interlock AZM40 or safety sensor RSS260
- Different versions are available:
  - With door handle illumination, with illuminated pushbutton
  - With door handle illumination, without illuminated pushbutton
  - Without double handle illumination, with illuminated pushbutton
  - Without electrical connection

The innovative DHS-U1 door handle combines the functions of a robust door handle with the signalling of various machine statuses via large-scale illumination of the handle. The RGB technology used makes it possible to illuminate the handle in seven different colours.

A pushbutton is also available, which can be individually adapted to customer requirements using the coloured pushbutton cover caps supplied. The pushbutton can, for example, fulfil the tasks of a reset function or a request to open the safety guard.



### HANDLE COLOURS

The coloured illumination of the door handle surface indicates the current status of the machine on the door handle itself.

The colours white, yellow, green, light blue, blue, violet and red can indicate up to seven different machine statuses.



### BUTTON COLOURS

Button caps can be simply clipped onto the illuminated pushbuttons of the DHS-U1 to provide colour signalling.

This allows the illuminated pushbutton to be adapted to individual requirements and even be used for acknowledgement of machine statuses.



### UNILLUMINATED DOOR HANDLE

The DHS-U1 version without electrical connection complements the range. This allows for uniform machine design whilst also taking cost aspects into consideration. It is available for doors that do not require an additional safety switch or signalling.

# TECHNICAL DATA

## DOOR HANDLE DHS-U1



■ DHS-U1

### Key Features

- Machine status directly recognisable on the door handle
- Optimised for the AZM40 solenoid interlock and the RSS260 safety sensor
- Ergonomic door handle for left or right hinged safety guard

### Technical features

<b>Electrical characteristics</b>	
Operating voltage	24 VDC
Operating current	< 150 mA
Operating current illuminated pushbutton LED	30 mA
<b>Mechanical data</b>	
<b>Housing material</b>	
handle	Glass-fibre reinforced thermoplastic
cover	translucent PMMA
holder	Glass-fibre reinforced thermoplastic
Dimensions (WxHxD)	40 x 202 x 83 mm
Termination	Connecting cable with connector M12, 5-pole, 0.25 m Connecting cable with connector M12, 8-pole, 0.25 m Connecting cable, 5-core, 5 m Connecting cable, 8-core, 5 m
<b>Mechanical lifetime</b>	
illuminated pushbutton / pushbutton	1,000,000 operations
<b>Contact configuration</b>	
illuminated pushbutton / pushbutton	1 NO contact
<b>Ambient conditions</b>	
<b>Ambient temperature</b>	
with electrical connection and illuminated handle	-25 °C ... +45 °C
with electrical connection and unilluminated handle	-25 °C ... +65 °C
without electrical connection	-40 °C ... +75 °C
<b>Degree of protection</b>	
with operating element	IP66, IP67
without operating element	IP66, IP67, IP69

# PRODUCT SELECTION

## DOOR HANDLE DHS-U1

### DOOR HANDLE DHS-U1

DHS-U1 without electrical connection	Termination				Door handle				Type	Material number
	Connecting cable with connector M12		Pre-wired cable		unilluminated	illuminated	with illuminated pushbutton	without operating element		
5-pole, 0.25 m	8-pole, 0.25 m	5-core, 5 m	8-core, 5 m							
■					■			■	DHS-U1-BKWH	103053675
	■				■		■		DHS-U1-BKWH-LST5-0.25-LT	103053676
			■		■		■		DHS-U1-BKWH-L5-5.00-LT	103053688
	■					■		■	DHS-U1-BKWH-LST5-0.25-RGB	103053691
			■			■		■	DHS-U1-BKWH-L5-5.00-RGB	103053692
		■				■	■		DHS-U1-BKWH-LST8-0.25-RGB-LT	103053677
				■		■	■		DHS-U1-BKWH-L8-5.00-RGB-LT	103053689

### ACCESSORIES

Description	Type	Material number
Actuator insert (without integrated actuator)	ACC-DHS-U1-INS	103055437
Actuator insert (incl. RST actuator)	ACC-DHS-U1-INS-RST-U-2	103055438
Pushbutton caps, one of each colour: ▪ for illuminated pushbuttons ▪ for pushbuttons	BDF40-DHS-PBC-LT BDF40-DHS-PBC-DT	103051229 103051694
Pushbutton caps, five of each: ▪ black ▪ blue ▪ green ▪ red ▪ white ▪ yellow	BDF40-DHS-PBC-DT-BK BDF40-DHS-PBC-DT-BU BDF40-DHS-PBC-DT-GN BDF40-DHS-PBC-DT-RD BDF40-DHS-PBC-DT-WH BDF40-DHS-PBC-DT-YE	103052432 103052430 103052429 103052427 103052431 103052428
Illuminated pushbutton caps, five of each: ▪ blue ▪ green ▪ red ▪ white ▪ yellow	BDF40-DHS-PBC-LT-BU BDF40-DHS-PBC-LT-GN BDF40-DHS-PBC-LT-RD BDF40-DHS-PBC-LT-WH BDF40-DHS-PBC-LT-YE	103052436 103052435 103052433 103052437 103052434

# SOLENOID INTERLOCK AZM40

## NO COMPROMISE ON SAFETY, INTUITIVE OPERATION



## SOLENOID INTERLOCK AZM40

- High holding force  
 $F_{zh} = 2,000 \text{ N}$ ,  $F_{max} = 2,600 \text{ N}$
- Latching force 40 N
- Bistable working principle
- High protection against tampering through RFID technology
- Variant with emergency exit
- Suitable for applications up to Cat. 4/PL e/SIL 3
- Degree of protection IP66, IP67, IP69

The combination of AZM40 solenoid interlock and DHS-U1 door handle unites appealing design with reliable functionality.

The AZM40 has a bistable interlock principle. This means that, in the event of a power failure, the interlock maintains its last locking status. The safety door thus remains safely locked in the event of a power failure, preventing access to hazardous areas. The DHS-U1 door handle offers comfortable and intuitive machine operation directly on the safety door itself. The ergonomically shaped handle enables effortless opening and closing.

The illuminated handle surface provides immediate indication of whether the machine is in operation or whether it is safe to open the safety door. The integrated control button allows operators to influence the status of the machine at the safety door itself, helping to save time and ensure efficient operation. Additional functions, such as emergency release, help to boost flexibility and safety.





### EMERGENCY EXIT

An impact button is available as an optional accessory for installation inside the hazardous area. Pressing the pushbutton will allow anyone who has inadvertently been locked inside the hazardous area to leave by releasing the interlock.



### LOCKOUT TAG

For larger, accessible machines and systems, service staff can attach a lock to the lockout tag when entering the hazardous area. In this way, the guard door cannot be closed and an unintentional machine start-up is prevented.

- Attachment of up to six padlocks possible
- Suitable for mounting inside and outside of the hazardous area
- Practical retaining strap with securing chain



### TAMPER PROTECTION

The anti-tampering cover conceals the connector of the AZM40 to protect it from unauthorised tampering, whilst also ensuring a harmonious and consistent design.

# TECHNICAL DATA

## SOLENOID INTERLOCK AZM40



■ AZM40

### Key Features

- Metal / thermoplastic enclosure
- Individual coding possible
- Holding force 2,000 N
- Actuator can approach interlock continuously within a 180 degree angle.
- RFID-technology for needs-based protection against tampering

### Technical features

<b>Holding force <math>F_{Zh}/F_{max}</math></b>	2,000 N / 2,600 N
<b>Operating voltage</b>	24 VDC
<b>Operating current</b>	0.6 A (without load)
<b>Max. switching capacity U/I</b>	24 VDC / 0.25 A
<b>Mechanical data</b>	
<b>Dimensions (WxHxD)</b>	119.5 x 40 x 20 mm
<b>Ambient conditions</b>	
<b>Ambient temperature</b>	-20 °C ... +55 °C
<b>Degree of protection</b>	IP66, IP67, IP69

### Safety classification of the interlocking function

<b>Standards</b>	EN ISO 13849-1, IEC 61508
<b>PL/SIL</b>	e/3
<b>Control category</b>	4
<b>PFH</b>	$1.1 \times 10^{-9}/h$
<b>Certificates</b>	TÜV, cULus

# PRODUCT SELECTION

## SOLENOID INTERLOCK AZM40

### SOLENOID INTERLOCK AZM40

Guard locking monitoring	Actuator monitoring	Standard coding	Individual coding, can be taught once -I1	Individual coding, re-teaching enabled -I2	Enclosure with countersink for countersunk-head screws	Enclosure with flat mounting surface for cylinder-head screws	Type	Material number
■		■			■		AZM40Z-ST-1P2P	103034187
■			■		■		AZM40Z-I1-ST-1P2P	103034188
■				■	■		AZM40Z-I2-ST-1P2P	103034189
■		■				■	AZM40Z-ST-1P2P-PH	103037333
■			■			■	AZM40Z-I1-ST-1P2P-PH	103037334
■				■		■	AZM40Z-I2-ST-1P2P-PH	103037335
	■	■			■		AZM40B-ST-1P2P	103034193
	■		■		■		AZM40B-I1-ST-1P2P	103034194
	■			■	■		AZM40B-I2-ST-1P2P	103034195
	■	■				■	AZM40B-ST-1P2P-PH	103037330
	■		■			■	AZM40B-I1-ST-1P2P-PH	103037331
	■			■		■	AZM40B-I2-ST-1P2P-PH	103037332

### ACTUATOR

Enclosure with countersink for countersunk-head screws	Enclosure with flat mounting surface for cylinder-head screws	Type	Material number
■		AZM40-B1	103034199
	■	AZM40-B1-PH	103037328

### ACCESSORIES

Description	Type	Material number
Emergency exit with pushbutton		
▪ for 40 mm profiles	ACC-AZM40-PT-T-40MM	103054271
▪ for profiles up to 170 mm	ACC-AZM40-PT-T-170MM	103054273
Lockout tag	SZ40	103053182
Tamper-proofing cover		
▪ Hinged on the left	MS-AZM40-L	on request
▪ Hinged on the right	MS-AZM40-R	on request

# SAFETY SENSOR RSS260

## ADDITIONAL INTERFACES AND FUNCTIONS

### SAFETY SENSOR RSS260

- Variant with integrated evaluation logic in the sensor:
  - Feedback circuit monitoring (EDM)
  - Automatic restart or manual restart with/without monitored reset
  - Emergency stop monitoring
- High protection against tampering through RFID technology
- Variant with serial diagnostic function or AS-Interface
- Suitable for applications up to Cat. 4/PL e/SIL 3
- Degree of protection IP65, IP67



In addition to the ability to operate the DHS-U1 door handle with the AZM40 solenoid interlock, there is also the option to use the door handle with the RSS 260 safety sensor. This might be necessary in situations in which no solenoid interlock is required or where other interfaces, such as the serial diagnosis function (SD) or AS-Interface Safety at Work (AS-i) is required.

In the F0 and F1 versions, the RSS260 safety sensor can assume the tasks of a safety relay module. This means that the monitoring of the safety door as well as the contactors directly controlled by the sensor outputs is carried out by the integrated logic in the sensor, so that the use of a separate evaluation unit is not necessary.

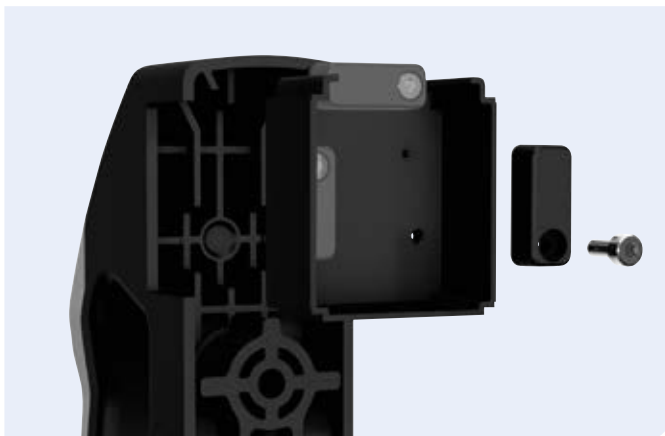
With the F0 variant, the machine restarts automatically as soon as all safety doors are closed. However, an additional "enable button" – without detection of the trailing edge – can be switched into the feedback circuit (EDM – External Device Monitoring).

For machines where the use of an emergency stop button is mandatory, the RSS260..Q with the additional Q function is suitable. In this way, emergency stop switching elements integrated into a series circuit can be monitored by the last sensor in the chain. This eliminates the need to set up a separate safety circuit for the emergency stop buttons.



### INSTALLATION POSITIONS

The RSS260 safety sensor can be mounted on the left, right or even above the door handle, depending on the requisite mounting position.



Here, the actuator is bolted on according to the installation position in the actuator insert.

With use of RFID technology, the safety sensor offers three different coding variants, thereby enabling optional adaptation to the tamper-proofing requirements that apply. The high repeat accuracy of the switching points ensures reliable functionality. In addition, early warning in the hysteresis area informs the user promptly of problems that may occur, such as misalignment of the safety door.

# TECHNICAL DATA

## SAFETY SENSOR RSS260



■ RSS260

### Key Features

- Extremely compact design
- Thermoplastic enclosure
- Optionally with EDM and emergency stop monitoring
- Optional for ASi and serial diagnostics

### Technical features

<b>Operating voltage</b>	24 VDC (PELV)
<b>Operating current</b>	< 0.1 A (without load)
<b>Max. switching capacity U/I</b>	24 VDC / 250 mA
<b>Mechanical data</b>	
<b>Individual coding possible</b>	■
<b>Serial diagnostics</b>	■
<b>Termination</b>	Connector plug, Cable with connector
<b>Cable section</b>	0.14 mm <sup>2</sup>
<b>Dimensions (WxDxH)</b>	47.5 x 18 x 29.5 mm
<b>LED switching conditions display</b>	■
<b>Ambient conditions</b>	
<b>Ambient temperature</b>	-28 °C ... max. +65 °C
<b>Degree of protection</b>	IP65, IP67

### Safety classification

<b>Standards</b>	EN ISO 13849-1, IEC 61508
<b>PL/SIL<sup>1)</sup></b>	e/3
<b>Category<sup>1)</sup></b>	4
<b>PFH</b>	6.8 x 10 <sup>-10</sup> /h
<b>Certificates</b>	TÜV, cULus

<sup>1)</sup> Also with series-wiring

# PRODUCT SELECTION

## SAFETY SENSOR RSS260

### SAFETY SENSOR RSS260

Safety output	Diagnostic	Termination	Standard coding	Individual coding, can be taught once -I1	Individual coding, re-teaching enabled -I2	Type	Material number	
2 p-type, short-circuit proof safety outputs	Conventional	Connector plug	■			RSS260-D-ST	103003602	
				■		RSS260-I1-D-ST	103003606	
					■	RSS260-I2-D-ST	103003607	
	Serial		■			RSS260-SD-ST	103003605	
	Conventional	Cable with connector			■		RSS260-I2-D-LSTM8-8-0,1M	103013301
					■			RSS260-I2-D-LSTM12-8-0,25M

### ACTUATOR INSERT

Description	Type	Material number
Actuator insert incl. RST-U-2 actuator and fixing screw	ACC-DHS-U1-INS-RST-U-2	103055438

# CONTROL PANEL BDF40

## INTUITIVE CONTROL, ELEGANT DESIGN



## CONTROL PANEL BDF40

- Slimline design to match the AZM40 solenoid interlock and the DHS-U1 door handle system
- Flexibility thanks to mountable pushbutton cover caps in 12 colours
- Generous open spaces for easy labelling
- Quick and error-free installation thanks to M12 connector
- Tamper protection with cover caps for the door system

The BDF40 control panel is characterised by its modern and slim design. It is available in two versions, with or without emergency stop function. Freely configurable coloured button caps for illuminated pushbuttons or pushbuttons offer maximum flexibility.

Alternatively, it can also be installed as a stand-alone control panel. The 12-pin M12 connector allows quick and error-free installation.





### EMERGENCY STOP PROTECTIVE COLLAR

A protective collar is also available for versions with emergency stop function, designed to help prevent accidental actuation.

With easy assembly, the collar can also be retrofitted to the emergency stop.



### BUTTON COVER CAPS

The colour of illuminated pushbuttons and other pushbuttons on the BDF40 can be changed by clipping on the button caps included in the delivery, allowing the control panel to be adapted to suit individual requirements.

Kits of five translucent caps each of blue, green, red, white or yellow are also available for the illuminated pushbuttons.

Kits containing five caps each of blue, green, red, white, yellow or black are also available for the pushbuttons.



### TAMPER-PROTECTING AND CONNECTION COVER

When the BDF40 is used as a stand-alone control panel, the tamper protection cover offers additional protection by concealing the connector of the BDF40 to guard against unauthorised tampering.

When the control panel is used in conjunction with the AZM40 solenoid interlock, the optional connection cover can be used instead. This provides protection from tampering whilst also ensuring a harmonious appearance.

# TECHNICAL DATA

## CONTROL PANEL BDF40



■ BDF40



■ BDF40 NH

### Key Features

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>▪ Up to four buttons</li> <li>▪ Slimline design to match the AZM40 solenoid interlock and the DHS-U1 door handle system</li> <li>▪ Flexibility thanks to pushbutton cover caps in 12 colours</li> <li>▪ Generous open spaces for easy labelling</li> <li>▪ Quick and error-free installation thanks to M12 connector</li> </ul> | <ul style="list-style-type: none"> <li>▪ With emergency stop and up to three buttons</li> <li>▪ Can be optionally retrofitted with emergency stop protective collars</li> <li>▪ Slimline design to match the AZM40 solenoid interlock and the DHS-U1 door handle system</li> <li>▪ Flexibility thanks to pushbutton cover caps in 12 colours</li> <li>▪ Generous open spaces for easy labelling</li> <li>▪ Quick and error-free installation thanks to M12 connector</li> </ul> |
|--|---|

### Technical features

Electrical characteristics		
Operating voltage	24 VDC	24 VDC
Operating current	100 mA	100 mA
Power consumption LED	10 mA	10 mA
Mechanical data		
Housing material	Glass-fibre reinforced thermoplastic, self-extinguishing	Glass-fibre reinforced thermoplastic, self-extinguishing
Dimensions (WxHxD)	40 x 217 x 25 mm	40 x 217 x 44 mm
Termination	Connector plug M12, 12-pole	Connector plug M12, 12-pole
Mechanical lifetime		
emergency stop	-	50,000 operations
illuminated pushbutton / pushbutton	1,000,000 operations	1,000,000 operations
Ambient conditions		
Ambient temperature	-25 °C ... +65 °C	-25 °C ... +65 °C
Degree of protection	IP65	IP65

### Safety classification emergency stop

Standards	-	EN ISO 13849-1
B <sub>100</sub> NC contact	-	100,000
Certificates	cULus	cULus

# PRODUCT SELECTION

## CONTROL PANEL BDF40

### CONTROL PANEL BDF40

Emergency stop	Illuminated pushbutton / pushbutton				Indicator light / blanking plug				Type	Material number	
	Position 1	Position 1	Position 2	Position 3	Position 4	Position 1	Position 2	Position 3			Position 4
■		■	■	■						BDF40-ST-10-NH-LT-LT-LT	103052203
	■	■	■	■						BDF40-ST-10-LT-LT-LT-LT	103052204
		■	■	■	■					BDF40-ST-10-LM-LT-LT-LT	on request
	■	■	■						■	BDF40-ST-10-LT-LT-LT-LM	on request
■			■	■		■				BDF40-ST-10-NH-LM-LT-LT	on request
■		■	■						■	BDF40-ST-10-NH-LT-LT-LM	on request
		■	■		■				■	BDF40-ST-10-LM-LT-LT-LM	on request

### ACCESSORIES

Description	Type	Material number
Emergency stop protective collar	MS-BDF40-NHK	on request
Tamper-proofing cover	MS-BDF40	on request
Connection cover AZM40/BDF40 ▪ AZM40 hinged on the left ▪ AZM40 hinged on the right	MS-AZM40-BDF40-L MS-AZM40-BDF40-R	on request on request
Pushbutton caps, one of each colour: ▪ for illuminated pushbuttons ▪ for pushbuttons	BDF40-DHS-PBC-LT BDF40-DHS-PBC-DT	103051229 103051694
Pushbutton caps, five of each: ▪ black ▪ blue ▪ green ▪ red ▪ white ▪ yellow	BDF40-DHS-PBC-DT-BK BDF40-DHS-PBC-DT-BU BDF40-DHS-PBC-DT-GN BDF40-DHS-PBC-DT-RD BDF40-DHS-PBC-DT-WH BDF40-DHS-PBC-DT-YE	103052432 103052430 103052429 103052427 103052431 103052428
Illuminated pushbutton caps, five of each: ▪ blue ▪ green ▪ red ▪ white ▪ yellow	BDF40-DHS-PBC-LT-BU BDF40-DHS-PBC-LT-GN BDF40-DHS-PBC-LT-RD BDF40-DHS-PBC-LT-WH BDF40-DHS-PBC-LT-YE	103052436 103052435 103052433 103052437 103052434

# THE SCHMERSAL GROUP

## PROTECTION FOR MAN AND MACHINE

In the demanding field of machine safety, the owner-managed Schmersal Group is one of the international market leaders. The company, which was founded in 1945, has a workforce of about 2,000 people and seven manufacturing sites on three continents along with its own companies and sales partners in more than 60 nations.

Customers of the Schmersal Group include “Global Players” in mechanical engineering and plant manufacturing and operators of machinery. They benefit from the company’s extensive expertise as a provider of systems and solutions for machine safety. In addition, Schmersal specialises in various areas including intralogistics, foodstuff production, the packaging industry, machine tool industry, lift switchgear, heavy industry and the automotive industry.

A major contribution to the systems and solutions offered by the Schmersal Group is made by tec.nicum with its comprehensive range of services: Certified Functional Safety Engineers advise machinery manufacturers and machinery operators in all aspects relating to machinery and occupational safety – and do so with product and manufacturer neutrality. Furthermore, they design and realise complex solutions for safety around the world in close collaboration with the clients.



### SAFETY PRODUCTS

- Safety switches and sensors, solenoid interlocks
- Safety controllers and safety relay modules, safety bus systems
- Optoelectronic and tactile safety devices
- Automation technology: position switches, proximity switches

### SAFETY SYSTEMS

- Complete solutions for safeguarding hazard areas
- Individual parametrisation and programming of safety controllers
- Tailor-made safety technology – be it for individual machines or a complex production line
- Industry-specific safety solutions

### SAFETY SERVICES

- tec.nicum academy – Seminars and training
- tec.nicum consulting – Consultancy services
- tec.nicum engineering – Design and technical planning
- tec.nicum integration – Execution and installation
- tec.nicum digitalisation – Software solutions and new digital technologies
- tec.nicum outsourcing – Complete solutions



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