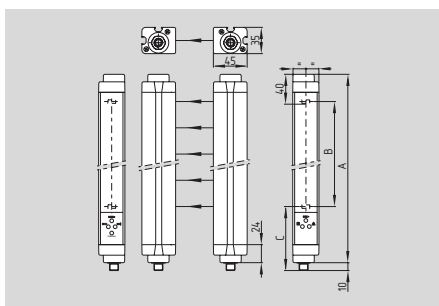


Safety light grids

SLG 210

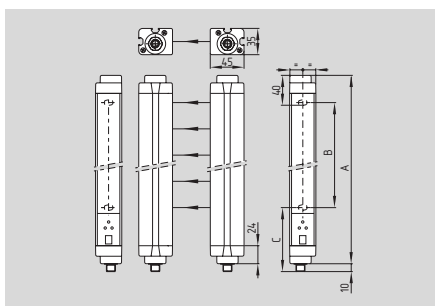


- Control Category 2 to EN 954-1
- Very small enclosure cross-section
- Protection class IP 65
- Range 0 ... 6 m (Standard), 1 ... 16 m (High Range)
- Safe transistor outputs
- Maintenance free
- LED status display
- Optical synchronisation
- Simple flexible mounting and adjustment

Legend

- A: Total length
- B: Distance between outermost beams
- C: 85 mm

SLG 410



- Control Category 4 to EN 954-1
- Very small enclosure cross-section
- Protection class IP 65
- Range 0 ... 18 m
- Safe transistor outputs
- Maintenance free
- LED status display
- Optical synchronisation
- Simple flexible mounting and adjustment

Legend

- A: Total length
- B: Distance between outermost beams
- C: 85 mm

Technical data

Standards:	IEC/EN 61496-1/-2
Control Category:	210: 2 410: 4
Enclosure:	Aluminium
Enclosure dimensions:	45 x 35 mm
Connection:	connector M 12 x 1, five pole
Max. cable length:	100 m
Protection class:	IP 65 to EN 60529
Response time:	6 ms
Resolution:	Beam distance: 2-beam: 500 mm 3-beam: 400 mm 4-beam: 300 mm
Range:	SLG 210: 0 ... 6 m (Standard), 1 ... 16 m (High range); SLG 410: 0 ... 18 m
Start/Restart interlock:	only in combination with safety monitoring module
Contact control:	only in combination with safety monitoring module
Protection field height:	–
Light emission wavelength:	950 nm
U _e :	24 VDC ± 20%
Safety outputs:	2 x PNP, 500 mA
Power consumption:	transmitter 2 W, receiver 3 W
Data interface:	–
LED status indication:	SLG 210: Operating voltage, protection field free - interrupted, advance warning of dirt / adjustment aid, diagnosis SLG 410: Operating voltage, protection field free -interrupted, advance warning of dirt / adjustment aid, 7-segment display for diagnosis
Ambient temperature:	0 °C ... + 55 °C
Storage and transport temperature:	– 20 °C ... + 70 °C

Approvals



Approvals



Ordering details

SLG 210-E/R①-12-②

No.	Replace	Description
①		Distance between outermost beams:
	0500-02	500 mm, 2-beam
	0800-03	800 mm, 3-beam
	0900-04	900 mm, 4-beam
②	H	Range 0 ... 6 m Range 1 ... 16 m High Range

Ordering details

SLG 410-E/R①-12

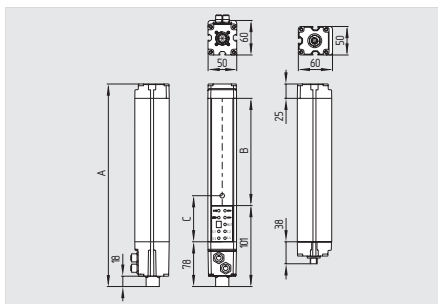
No.	Replace	Description
①		Distance between outermost beams:
	0500-02	500 mm, 2-beam
	0800-03	800 mm, 3-beam
	0900-04	900 mm, 4-beam

Note

A wide range of accessories is available.
For selection, see page 4-15.

Safety light grids

SLG 415I



- Control Category 4 to EN 954-1
- Integrated muting function
- Integrated override function
- Protection class IP 65
- Range 0 ... 16 m
- Safe transistor outputs
- Maintenance free
- LED status display
- Optical synchronisation
- Simple flexible mounting and adjustment

Technical data

Standards:	IEC/EN 61496-1/-2
Control Category:	4
Enclosure:	Aluminium
Enclosure dimensions:	50 x 60 mm
Connection:	Emitter: connector plug M 12, 5-pole; Receiver: connector plug M 23, 19-pole; Muting sensors: 2 x connector plug M 12, 5-pole
Max. cable length:	100 m
Protection class:	IP 65 to EN 60529
Response time:	7 ms
Resolution:	Beam distance: 2-beam: 500 mm 3-beam: 400 mm 4-beam: 300 mm
Range:	0 ... 16 m
Start/Restart interlock:	Can be switched on/off
Contact control:	Can be switched on/off
Light emission wavelength:	950 nm
U _e :	24 VDC ± 20%
Safety outputs:	2 x PNP, 500 mA
Power consumption:	transmitter 3 W, receiver 6 W
LED status indication:	Emitter: function indication, test, error message; Receiver: function indication, infringement of protection zone, override, wait for restart button
Ambient temperature:	0 °C ... + 50 °C
Storage and transport temperature:	- 20 °C ... + 70 °C

Legend

- A: Height of the receiver
- B: Distance between outermost beams
- C: Distance to the first lens

Approvals



Ordering details

SLG 415I-E/R^①-12

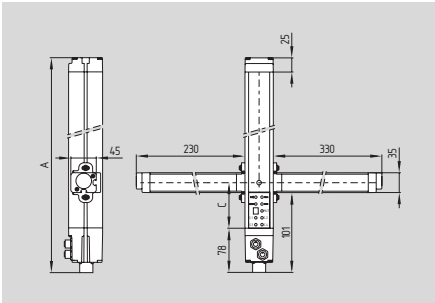
No.	Replace	Description
①		Distance between outermost beams:
	0500-02	500 mm, 2-beam
	0800-03	800 mm, 3-beam
	0900-04	900 mm, 4-beam

Note

A wide range of accessories is available.
For selection, see page 4-15.

Safety light grids

SLG 415T

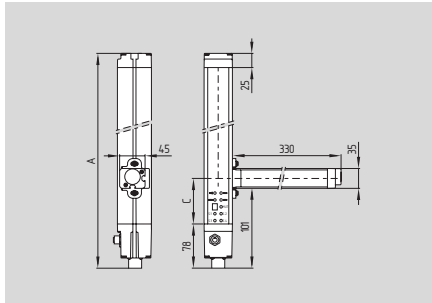


- Control Category 4 to EN 954-1
- Integrated muting function
- Integrated override function
- Protection class IP 65
- Range 1 ... 2.5 m
- Safe transistor outputs
- Maintenance free
- LED status display
- Optical synchronisation
- Simple flexible mounting and adjustment

Legend

A: Height of the receiver
C: Distance to the first lens

SLG 415L



- Control Category 4 to EN 954-1
- Integrated muting function
- Integrated override function
- Protection class IP 65
- Range 1 ... 2.5 m
- Safe transistor outputs
- Maintenance free
- LED status display
- Optical synchronisation
- Simple flexible mounting and adjustment

Legend

A: Height of the receiver
C: Distance to the first lens

Technical data

Standards: IEC/EN 61496-1/-2
 Control Category: 4
 Enclosure: Aluminium
 Enclosure dimensions: Emitter and receiver: 50 x 60 mm
 2 x muting sensor block: 35 x 45 x 330 mm
 2 x muting sensor block: 35 x 45 x 230 mm
 Connection: Emitter: connector plug M 12, 5-pole;
 Receiver: connector plug M 23, 19-pole;
 Muting sensors: 2 x connector plug M 12, 5-pole
 Max. cable length: 100 m
 Protection class: IP 65 to EN 60529
 Response time: 7 ms
 Resolution: Beam distance:
 2-beam: 500 mm
 3-beam: 400 mm
 Range: 1 ... 2.5 m
 Start/Restart interlock: Can be switched on/off
 Contactor control: Can be switched on/off
 Light emission wavelength: 950 nm
 U_e: 24 VDC ± 20%
 Safety outputs: 2 x PNP, 500 mA
 Power consumption: transmitter 3 W, receiver 6 W
 LED status indication: Emitter: function indication, test, error message;
 Receiver: function indication, infringement of protection zone, override, wait for restart button
 Ambient temperature: 0 °C ... + 50 °C
 Storage and transport temperature: - 20 °C ... + 70 °C

Approvals



Approvals



Ordering details

SLG 415T-E/R①-12

No.	Replace	Description
①		Distance between outermost beams:
	0500-02	500 mm, 2-beam
	0800-03	800 mm, 3-beam

Ordering details

SLG 415L-E/R①-12

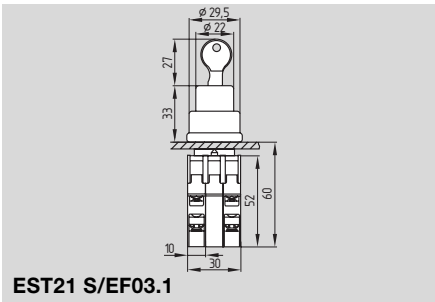
No.	Replace	Description
①		Distance between outermost beams:
	0500-02	500 mm, 2-beam
	0800-03	800 mm, 3-beam

Note

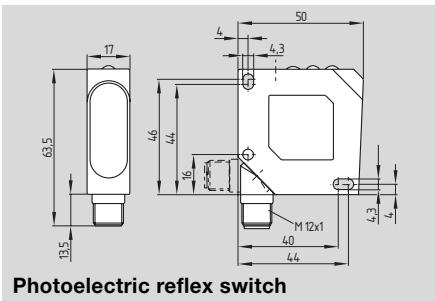
A wide range of accessories is available. For selection, see page 4-15.

Safety light grids

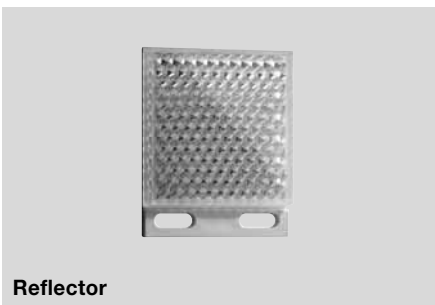
System components



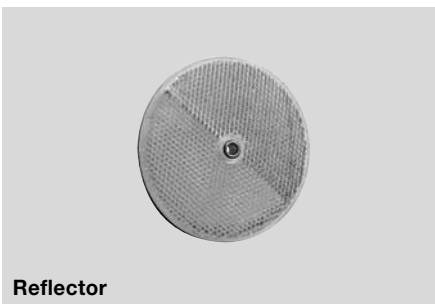
EST21 S/EF03.1



Photoelectric reflex switch



Reflector



Reflector

System components



Connector plug M 12 x 1



Test rods

Ordering details

Accessories for SLC/SLG 415

Key-operated selector switch and contact block for override function

EST21 S/EF03.1

Photoelectric reflex switch for SLC/SLG 415I:

LF 50-11 P

Reflector for LF 50-11 P:

Rectangular

R 51x61

Circular

R D83

Ordering details

Accessories for SLC/SLG 210/410

Connector plug M 12 x 1 for emitter

KD M12-5-5m-S

KD M12-5-15m-S

for emitter/receiver

KD M12-5-S

KD M12-5-R

Accessories for SLC/SLG 415

Connector plug M 23 x 1 for receiver

KDR M23-19-3m-S

KDR M23-19-5m-S

KDR M23-19-10m-S

KDR M23-19-15m-S

KDR M23-19-20m-S

Test rods for light curtain SLC 210/410/415:

with resolution 14 mm

SLC TR-14

with resolution 20 mm

SLC TR-20

with resolution 30 mm

SLC TR-30

with resolution 40 mm

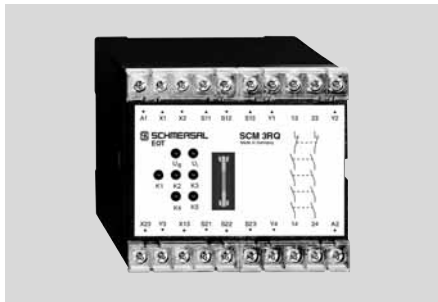
SLC TR-40

with resolution 50 mm

SLC TR-50

Safety light grids

SCM 3R/RQ



- Suitable for signal evaluation of muting sensors
- Connection of 2 to 4 muting sensors
- 2 enabling paths, Stop 0
- Signalling output for the function of the muting lamp / monitoring of the muting lamp
- Signalling output for the monitoring of simultaneous operation
- Optional recognition of cross-wire monitoring
- 7 LEDs to show switching conditions
- Control Category 4 to EN 954-1

Technical data

Standards:	IEC/EN 60204-1, EN 954-1, BG-GS-ET-20
Stop category	2x Stop 0
Control category:	4
Enclosure:	glass-fibre reinforced thermoplastic
Connection:	screw terminals
Cable section:	max. 2.5 mm ² solid or multi-strand lead (incl. conductor ferrules)
U _e :	24 VDC – 15 % / + 20 %, residual ripple max. 10%
I _e :	max. 0.14 A
Protection class:	terminals IP 20 enclosure IP 40 to EN 60529
Power consumption:	3.2 W plus consumption of sensors and muting lamps
Max. fuse rating:	Glass fuse F2, tripping current 1.0 A (internal F1: 1.25 A)
Feedback circuit:	yes
Drive circuits:	S11/S12, S22/S23: max. 28 VDC
Enabling contacts:	2 enabling paths
Utilisation category:	AC-15, DC-13
Switching capacity:	enabling paths: 3 A/230 VAC, 2 A/24 VDC
Fuse rating:	enabling paths: 4 A gG D-fuse
Power supply:	Current load muting indicator: max. 24 V / 2.5 A
Additional outputs:	indication outputs Y2, Y3 max. 250 mA per output
Contact material:	AgNi, AgSnO, self-cleaning, positive action
Contact resistance:	max. 100 mΩ in new condition
Pull-in delay:	≤ 200 ms
Drop-out delay:	≤ 20 ms
Air clearances and creepage distances:	DIN VDE 0110-1 (04.97), 4 kV/2
Overvoltage category:	III to DIN VDE 0110
Degree of pollution:	2 to DIN VDE 0110
Ambient temperature:	– 25 °C ... + 45 °C (Derating curve on request)
Mechanical life:	10 million operations
Function display:	4 LEDs
Weight:	460 g
Dimensions:	90 x 83 x 140 mm

Approvals




Ordering details

SCM 3R^①

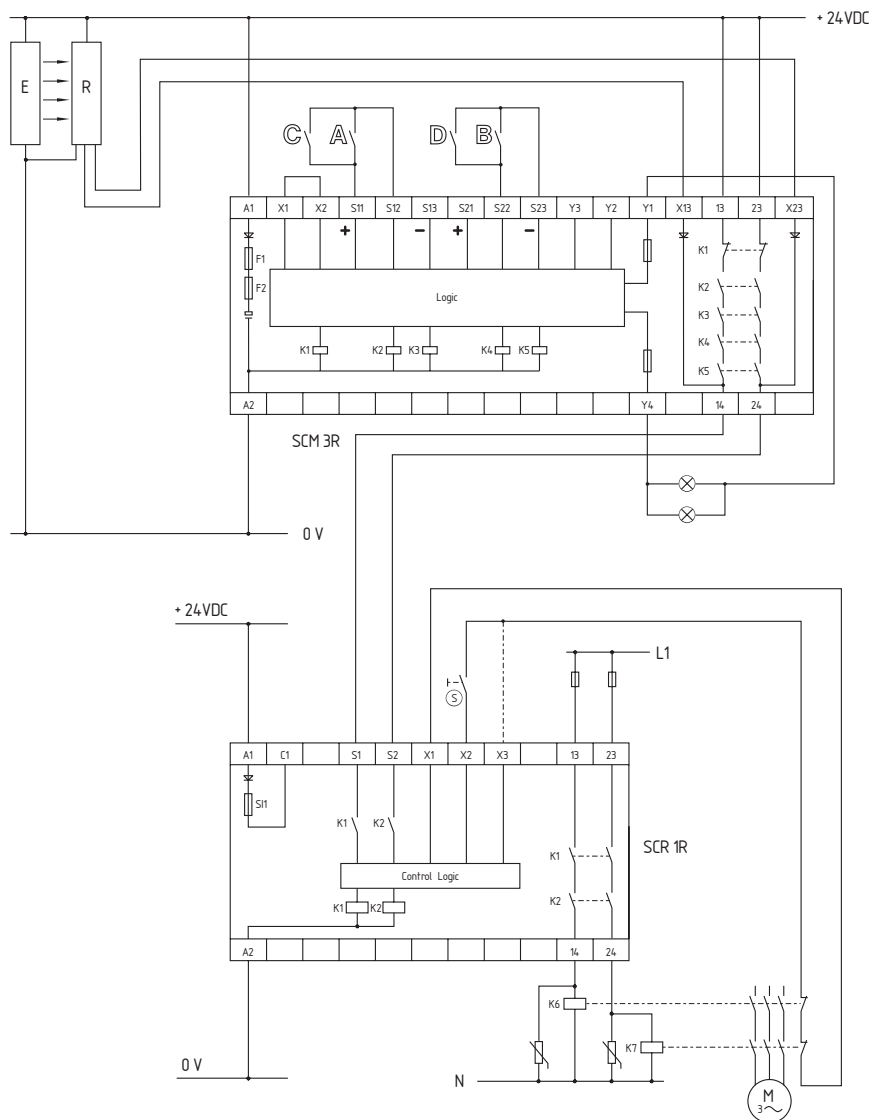
No.	Replace	Description
①	Q	Without cross-wire monitoring With cross-wire monitoring

Safety light grids

Note

- Muting in connection with the safety light grid on an assembly line
 - Suitable muting sensors are SLB 400 safety light barriers, position switches as well as optical and inductive proximity switches.
 - The monitored muting lamp is connected to Y1 and Y4.
- A power consumption of min. 3.6 W and max. 60 W is condition, since this is monitored by the safety circuits. The muting lamp is illuminated to show active muting function.
- The muting sensors (A, C and B, D) are connected to the terminals S11-S12 and S22-S23. The muting sensors must be switched in the following sequences: A; B; C; D or D; C; B; A. There must be a time difference of at least 0.5 s between actuation of the muting sensors and that of the safety light grid.
 - SCR 1R to monitor a feedback circuit for Control Category 4 to EN 954-1
 - Safety light grids/curtains to guard dangerous areas
 - The feedback circuit monitors the positions of the positive-guided NC contacts on the conactors K6 and K7.
 - Start push button 
- A start push button can be connected to the feedback circuit. If no start push button is mounted, the terminals X2 and X3 must be bridged.

Wiring diagram



Note

The wiring diagram is shown for the de-energised condition.

Safety light grids

SCR 1R



- Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
- 1 or 2 channel control
- 2 enabling paths, Stop 0
- Reset with edge detection or automatic start
- 2 LEDs to show operating conditions
- Control Category 4 to EN 954-1

Technical data

Standards:	IEC/EN 60204-1, EN 954-1, BG-GS-ET-20
Stop category	2x Stop 0
Control category:	4
Start conditions:	Reset button with edge detection, auto start
Enclosure:	glass-fibre reinforced thermoplastic
Connection:	screw terminals
Cable section:	max. 2.5 mm ² solid or multi-strand lead (incl. conductor ferrules)
U _e :	24 VDC – 15 % / + 20 %, residual ripple max. 10%
I _e :	max. 0.10 A
Protection class:	terminals IP 20 enclosure IP 40 to EN 60529
Power consumption:	max. 2.6 VA
Max. fuse rating:	Internal electronic trip F1, tripping current > 0.6 A, reset after approx. 1 s
Monitored inputs	1 or 2 channels
Drive circuits:	max. 28 VDC
Enabling contacts:	2 enabling paths
Utilisation category:	AC-15, DC-13
Switching capacity:	enabling paths: 6 A/230 VAC, 6 A/24 VDC
Fuse rating:	enabling paths: 6 A gG D-fuse
Max. switching frequency:	5 Hz
Contact material:	AgNi, AgSnO, self-cleaning, positive action
Contact resistance:	max. 100 mΩ in new condition
Pull-in delay:	≤ 330 ms / ≤ 720 ms (start button / auto start)
Drop-out delay:	≤ 20 ms
Air clearances and creepage distances:	DIN VDE 0110-1 (04.97), 4 kV/2
Overvoltage category:	III to DIN VDE 0110
Degree of pollution:	2 to DIN VDE 0110
Ambient temperature:	– 25 °C ... + 45 °C (Derating curve on request)
Mechanical life:	10 million operations
Function display:	2 LEDs
Weight:	190 g
Dimensions:	22.5 x 82 x 98.8 mm

Approvals



Ordering details


SCR 1R ①

No.	Replace	Description
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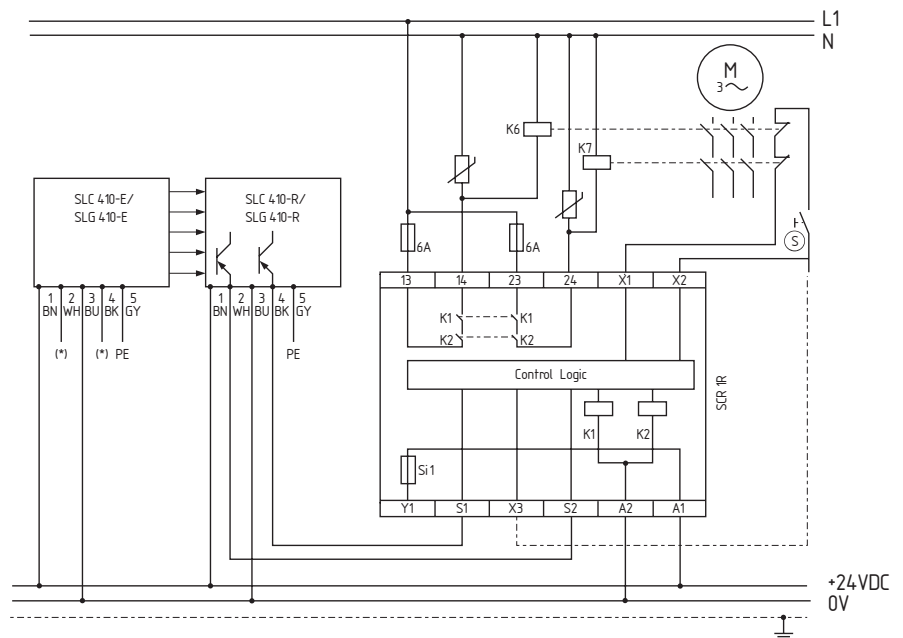
①		24 VDC
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Safety light grids

Note

- Input level: dual-channel control (Example AOPD, with two OSSDs with external start/restart button )
- The control recognises cable break and earth leakages in the monitoring circuit.
- Si1 = electronic fuse
- Relay outputs: Suitable for 2 channel control, for increase in capacity or number of contacts by means of contactors or relays with positive-guided contacts.
- For a 1-channel control, connect NC contact to Y1/S1 and bridge S1/S2
- Connect potential (p-type) outputs of safety light grids/curtains to S1/S2. The devices must have the same reference potential.
- Automatic start:
The automatic start is programmed by connecting the feedback circuit to the terminals X1/X3. If the feedback circuit is not required, establish a bridge

Wiring diagram



LED

Function indication:

The integrated LEDs indicate the following operational states.

- Position relay K1
- Position relay K2

Note

The wiring diagram is shown for the de-energised condition.

Safety light grids

SCR 402R-301



- Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
- 1 or 2 channel control
- 3 enabling paths, Stop 0
- 1 indication contact (NC)
- With hybrid fuse
- Reset with edge detection or automatic start
- 4 LEDs to show operating conditions
- Control Category 4 to EN 954-1
- Plug-in screw terminals

Technical data

Standards:	IEC/EN 60204-1, EN 954-1, BG-GS-ET-20
Stop category	3x Stop 0
Control category:	4
Start conditions:	Reset button with edge detection, auto start
Enclosure:	glass-fibre reinforced thermoplastic, ventilated
Connection:	plug-in, screw terminals
Cable section:	max. 2.5 mm ² solid or multi-strand lead (incl. conductor ferrules)
U _e :	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+10%
Frequency range:	50/60 Hz (on AC operational voltage)
I _e :	max. 0.08 A
Protection class:	terminals IP 20 enclosure IP 40 to EN 60529
Power consumption:	max. 3.8 VA, 2.4 W
Max. fuse rating:	Internal electronic trip F1, tripping current > 0.5 A, reset after disconnection of supply voltage
Monitored inputs	1 or 2 channels
Feedback circuit:	yes
Drive circuits:	S11/S12, S21/S22: max. 28 VDC
Enabling contacts:	3 enabling paths
Utilisation category:	AC-15, DC-13
Switching capacity:	enabling paths: 6 A/230 VAC, 6 A/24 VDC
Max. switching frequency:	5 Hz
Fuse rating:	enabling paths: 6 A gG D-fuse
Signalling contacts:	1 NC contact
Switching capacity:	Indicating contact: 2 A/24 VDC
Contact material:	AgNi, AgSnO, self-cleaning, positive action
Contact resistance:	max. 100 mΩ in new condition
Pull-in delay:	≤ 200 ms
Drop-out delay:	≤ 20 ms
Air clearances and creepage distances:	DIN VDE 0110-1 (04.97), 4 kV/2
Overvoltage category:	III to DIN VDE 0110
Degree of pollution:	2 to DIN VDE 0110
Ambient temperature:	- 25 °C ... + 45 °C (Derating curve on request)
Mechanical life:	10 million operations
Function display:	4 LEDs
Weight:	230 g
Dimensions:	22.5 x 100 x 121 mm

Approvals



Ordering details

SCR 402R-301 ①

No.	Replace	Description
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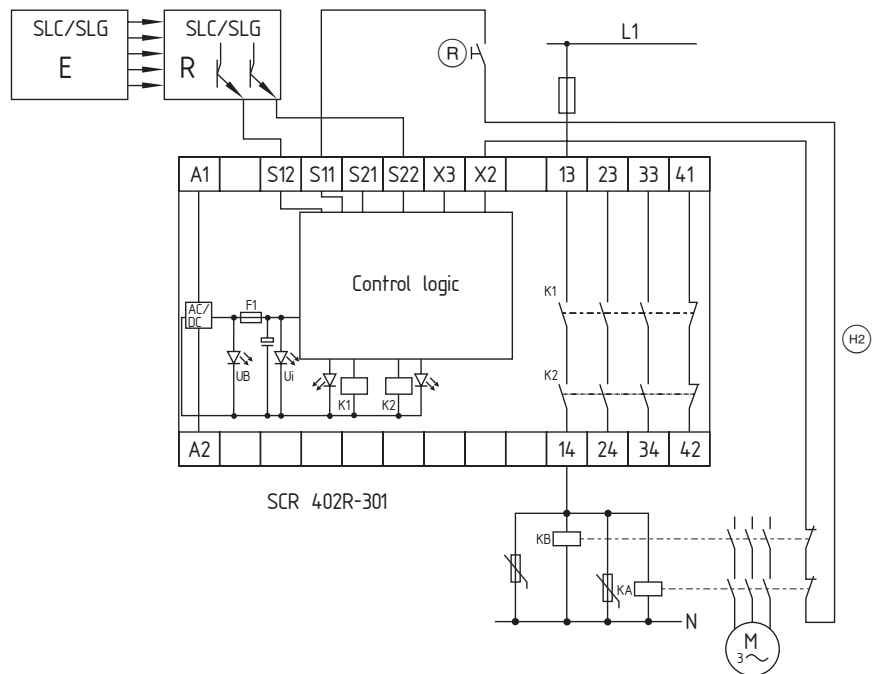
①		24 VAC/DC
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Safety light grids

Note

- Input level: dual-channel control (Example AOPD, with two OSSDs with external start/restart button $\text{\textcircled{R}}$).
- The control recognises cable break and earth leakages in the monitoring circuit.
- F1 = Hybrid fuse
- $\text{\textcircled{H}}$ = Feedback circuit
- Relay outputs: Suitable for 2 channel control, for increase in capacity or number of contacts by means of contactors or relays with positive-guided contacts.
- For 1-channel control, connect NC contact to S11/S12 and bridge S12/S22
- Connect potential p-type outputs of safety light grids/curtains to S12/S22. The devices must have the same reference potential.
- Automatic start:
The automatic start is programmed by connecting the feedback circuit to terminals S12/X3. If no feedback circuit is required, establish a bridge.

Wiring diagram



LED

Function display:

The integrated LEDs indicate the following operational states.

- Position relay K1
- Position relay K2
- Supply voltage U_B
- Internal operating voltage U_i

Note

The wiring diagram is shown with guard doors closed and in de-energised condition.

Safety light grids

AZR 311 TL



- Suitable for signal processing of potential-free outputs, e.g. emergency-stop command devices, interlocking equipment etc..
- Suitable for signal processing of outputs connected to potentials (AOPD's), e.g. safety light grids/curtains
- 1 or 2 channel control
- 4 enabling paths, 1 delayed: 1 ... 30 s
- Acknowledgement output, normally-closed function (potential-free)
- Optionally:
 - Manual reset with edge detection in fail-safe circuit
 - Automatic reset function
- Green LED-indications for relay K2, K3, K4, K5, supply voltage U_B and internal fuse U_i
- Control Category 4 to EN 954-1

Technical data

Standards:	IEC/EN 60204-1, EN 954-1, BG-GS-ET-20
Stop category	3x Stop 0, 1x Stop 1 (1 ... 30 s delayed)
Control category:	4
Start conditions:	Start, reset button (trailing edge), autostart
Enclosure:	glass-fibre reinforced thermoplastic
Connection:	self-opening screw terminals
Cable section:	min. 0.6 mm ² , max. 2.5 mm ² solid or multi-strand lead (incl. conductor ferrules)
U_e :	24 VDC – 15 % / + 20 %, residual ripple max. 10 % 24 VAC – 15 % / + 10 %
Frequency range:	50/60 Hz (on AC operational voltage)
I_e :	max. 0.21 A
Protection class:	terminals IP 20 enclosure IP 40 to EN 60529
Power consumption:	max. 5 W
Max. fuse rating:	Glass fuse F1, tripping current 0,5 A
Monitored inputs	1 or 2 channels
Feedback circuit:	yes
Drive circuits:	S11/S12, S11/S22: max. 28 VDC
Enabling contacts:	4 enabling paths
Utilisation category:	AC-15, DC-13
Switching capacity:	enabling paths: 6 A/230 VAC, 6 A/24 VDC
Fuse rating:	enabling paths: 6 A gG D-fuse
Max. switching frequency:	5 Hz
Auxiliary contacts:	55/56
Switching capacity:	Auxiliary contacts: 2 A/24 VDC
Contact material:	AgNi, AgSnO, self-cleaning, positive action
Contact resistance:	max. 100 mΩ in new condition
Pull-in delay:	≤ 200 ms
Drop-out delay:	≤ 30 ms
Air clearances and creepage distances:	DIN VDE 0110-1 (04.97), 4 kV/2
Overvoltage category:	III to DIN VDE 0110
Degree of pollution:	2 to DIN VDE 0110
Ambient temperature:	– 25 °C ... + 45 °C (Derating curve on request)
Mechanical life:	10 million operations
Function display:	6 LED
Weight:	280 g
Dimensions:	45 x 83 x 140 mm

Approvals



Ordering details

AZR 311 TL ①

No.	Replace	Description
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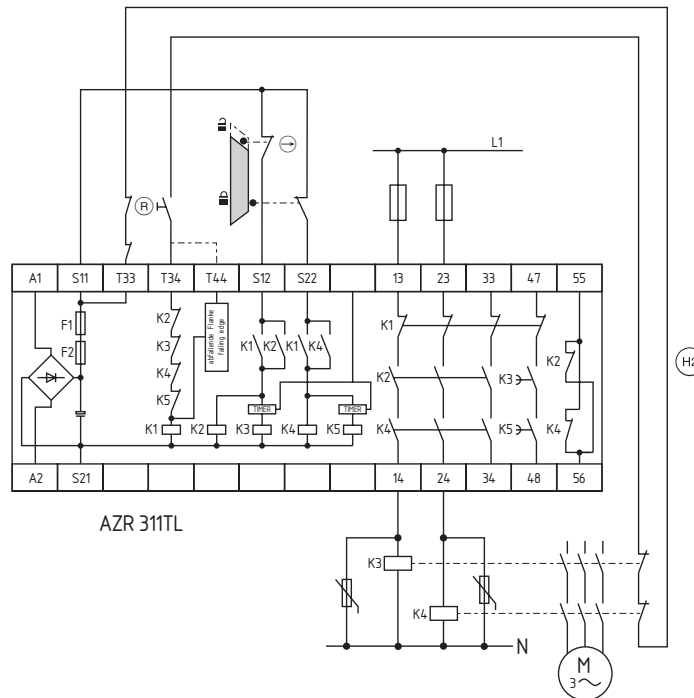
①		24 VAC/DC
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Safety light grids

Note

- Input level: the example shows a 2-channel control of a guard door monitoring with two position switches, whereof one with positive break, external reset button (R) and feedback circuit (H2)
- The control recognises cable break and earth leakages in the monitoring circuit.
- For one channel operation S12 must be bridged with S22.
- For reset with edge detection T34 must be bridged with T44.
- Relay outputs: Suitable for 2 channel control, for increase in capacity or number of contacts by means of contactors or relays with positive-guided contacts.

Wiring diagram



LED

Function display:

The integrated LEDs indicate the following operating states.

- Position relay K2
- Position relay K3
- Position relay K4
- Position relay K5
- Supply voltage U_B
- Internal operating voltage U_i

Note

The wiring diagram is shown with guard doors closed and in de-energised condition.