Datasheet - SRB 301ST V.2

Guard door monitors and Safety control modules for Emergency Stop applications / General Purpose safety controllers (Series PROTECT SRB) / SRB 301ST



(Minor differences between the printed image and the original product may exist!)

- Suitable for signal processing of potential-free outputs, e.g. emergency stop command devices, position switches and solenoid interlocks
- Suitable for signal processing of outputs connected to potentials (AOPDs), e.g. safety light grids/curtains
- Fit for signal evaluation of outputs of safety magnetic switches
- 3 safety contacts, STOP 0
- 1 Signalling output

Ordering details

Product type description	SRB 301ST
EAN code	

Approval

Approval	BG USA/CAN

Classification

Standards	EN ISO 13849-1, IEC 61508, EN 60947-5-1
PL	up e (STOP 0)
Control category	up 4 (STOP 0)
DC	99% (STOP 0)
CCF	> 65 points
PFH value	≤ 2,0.0 x 10^{-8}/h (STOP 0)
SIL	up 3 (STOP 0)
Mission time	20 Years

- notice	The PFH value is applicable for the combinations listed in the table for contact load (K) (current through enabling paths) and switching cycle number (n-op/y). In case of 365 operating days per year and a 24-hour operation, this results in the specified switching cycle times (t-cycle) for the relay contacts. Diverging applications on request.

Global Properties

Product name	SRB 301ST
Standards	IEC/EN 60204-1, EN 60947-5-1, EN ISO 13849-1, IEC 61508
Compliance with the Directives (Y/N)	Yes
Climatic stress	EN 60068-2-78
Mounting	snaps onto standard DIN rail to EN 60715
Terminal designations	IEC/EN 60947-1
Materials	
- Material of the housings	Plastic, glass-fibre reinforced thermoplastic, ventilated
- Material of the contacts	, self-cleaning, positive action
Weight	240 g
Start conditions	Automatic or Start button (Optional monitored)
Start input (Y/N)	Yes
Feedback circuit (Y/N)	Yes
Start-up test (Y/N)	No
Automatic reset function (Y/N)	Yes
Reset with edge detection (Y/N)	Yes
Pull-in delay	
- ON delay with automatic start	100 ms
- ON delay with reset button	25 ms
Drop-out delay	
- Drop-out delay in case of power failure	100 ms
- Drop-out delay in case of emergency stop	≤ 25 ms

Mechanical data

Connection type	Screw connection
Cable section	
- Min. Cable section	0,25 mm²
- Max. Cable section	2.5 mm²
Pre-wired cable	rigid or flexible
Tightening torque for the terminals	0,6 Nm
Detachable terminals (Y/N)	Yes
Mechanical life	10.000.000 operations
Electrical lifetime	Derating curve available on request
restistance to shock	30 g / 11 ms
Resistance to vibration To EN 60068-2-6	10...55 Hz, Amplitude 0,35 mm

Ambient conditions

Ambient temperature	
- Min. environmental temperature	−25 °C

- Max. environmental temperature	+60 °C
Storage and transport temperature	
- Min. Storage and transport temperature	−40 °C
- Max. Storage and transport temperature	+85 °C
Protection class	
- Protection class-Enclosure	IP40
- Protection class-Terminals	IP20
- Protection class-Clearance	IP54
Air clearances and creepage distances To IEC/EN 60664-1	
- Rated impulse withstand voltage U_{imp}	4 kV
Overvoltage category	II To VDE 0110
- Degree of pollution	2 To VDE 0110

Electromagnetic compatibility (EMC)

EMC rating	conforming to EMC Directive

Electrical data

Rated DC voltage for controls	
- Min. rated DC voltage for controls	20.4 V
- Max. rated DC voltage for controls	28.8 V
Rated AC voltage for controls, 50 Hz	
- Min. rated AC voltage for controls, 50 Hz	20.4 V
- Max. rated AC voltage for controls, 50 Hz	26.4 V
Rated AC voltage for controls, 60 Hz	
- Min. rated AC voltage for controls, 60 Hz	20.4 V
- Max. rated AC voltage for controls, 60 Hz	26.4 V
Contact resistance	max. 100 mΩ
Power consumption	2 W; 4.9 VA
Type of actuation	AC/DC
Switch frequency	max. 5 Hz
Rated operating voltage U_e	24 VDC −15% / +20%, residual ripple max. 10% 24 VAC −15% / +10%
Operating current I_e	0,09 A
Frequency range	50 / 60 Hz
Electronic protection (Y/N)	Yes
Fuse rating for the operating voltage	Internal electronic trip, tripping current F1: > 0,5 A; tripping current (S11, S21): > 50 mA Reset after disconnection of supply voltage
Bridging in case of voltage drops	80 ms

Inputs

Monitored inputs	
- Short-circuit recognition (Y/N)	optional
- Wire breakage detection (Y/N)	Yes
- Earth connection detection (Y/N)	Yes
Number of shutters	0 piece
Number of openers	2 piece
Cable length	1500 m with 1.5 mm²; 2500 m with 2.5 mm²
Conduction resistance	max. 40 Ω

Outputs

Stop category	0
Number of safety contacts	3 piece
Number of auxiliary contacts	1 piece
Number of signalling outputs	0 piece
Switching capacity	
- Switching capacity of the safety contacts	max. 250 VAC, 8 A ohmic (inductive in case of appropriate protective wiring) min. 10 V, 10 mA
- Switching capacity of the auxiliary contacts	24 VDC, 2 A
Fuse rating	
- Protection of the safety contacts	8 A slow blow
- Fuse rating for the auxiliary contacts	2 A slow blow
Utilisation category To EN 60947-5-1	AC-15: 230 V / 6 A DC-13: 24 V / 6 A
Note on the utilisation category	Residual current at ambient temperature up to: - 45°C = 24 A; - 55°C = 18 A; - 60°C = 12 A
Number of undelayed semi-conductor outputs with signaling function	0 piece
Number of undelayed outputs with signaling function (with contact)	1 piece
Number of delayed semi-conductor outputs with signaling function.	0 piece
Number of delayed outputs with signalling function (with contact).	0 piece
Number of secure undelayed semi-conductor outputs with signaling function	0 piece
Number of secure, undelayed outputs with signaling function, with contact.	3 piece
Number of secure, delayed semi-conductor outputs with signaling function	0 piece
Number of secure, delayed outputs with signaling function (with contact).	0 piece

LED switching conditions display

LED switching conditions display (Y/N)	Yes
Number of LED´s	4 piece
LED switching conditions display	
- The integrated LEDs indicate the following operating states.	
- Position relay K2	
- Position relay K1	
- Supply voltage	
- Internal operating voltage U_i	

Miscellaneous data

Applications

 Emergency-Stop button

 Guard system

 Pull-wire emergency stop switches


Safety sensor


Safety light curtain

Dimensions

Dimensions	
- Width	22.5 mm
- Height	100 mm
- Depth	121 mm

notice

Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.

notice - Wiring example

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 cross-short, cable break and earth leakages in the monitoring circuit.

F1 = hybrid 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.

Switch setting: The cross-wire short detection function (factory default) is programmed by means of the switch located underneath the front cover of the module:
Pposition nQS (top):
no cross-wire short protection, suitable for 1-channel applications and applications with outputs with potential in the control circuits.
Position QS (bottom):
cross-wire short protection, suitable for 2-channel applications without outputs with potential in the control circuits.

For 1-channel control, connect NC contact to S11/S12 and bridge S12/S22 (QS-switch = nQS)

Connect potential p-type outputs of safety light grids/curtains to S12/S22. The devices must have the same reference potential. (QS-switch = nQS)

Automatic start: The automatic start is programmed by connecting the feedback circuit to the terminals S12/X3. If the feedback circuit is not required, establish a bridge

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

Documents

Operating instructions and Declaration of conformity (fr) 549 kB, 28.06.2011
Code: mrl_srb_301st_v2_fr

Operating instructions and Declaration of conformity (en) 1 MB, 21.01.2010
Code: mrl_srb_301st_v2_en

Operating instructions and Declaration of conformity (de) 1 MB, 30.06.2010
Code: mrl_srb_301st_v2_de

Operating instructions and Declaration of conformity (jp) 1 MB, 06.09.2010
Code: mrl_srb_301st_v2_jp

Operating instructions and Declaration of conformity (es) 1 MB, 24.06.2010
Code: mrl_srb_301st_v2_es

Code: mrl_srb_301st_v2_nl

Wiring example (99) 20 kB, 04.08.2008
Code: Ksrb3l05

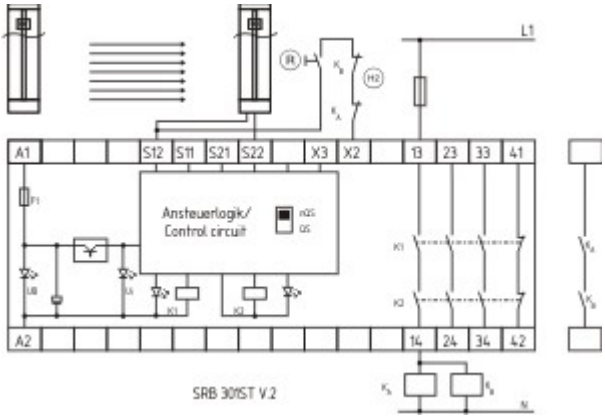
Wiring example (99) 17 kB, 21.07.2010
Code: ksrb3l26

BG-test certificate (de) 36 kB, 28.02.2005
Code: z_s30p01

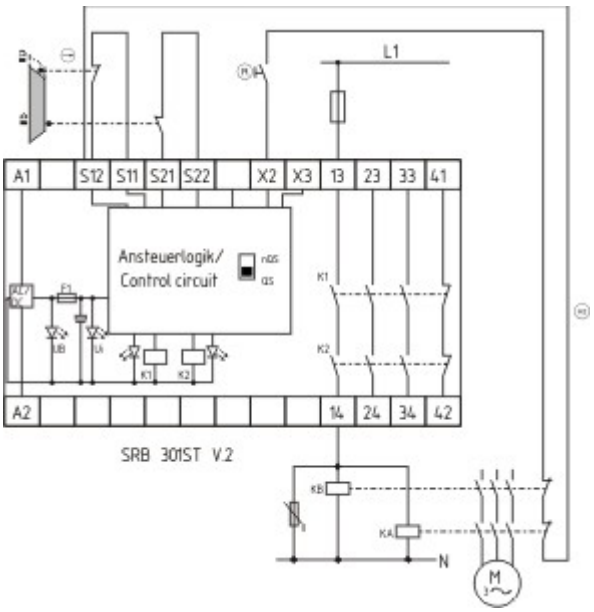
CCC certification (en) 276 kB, 03.05.2011
Code: q_srbp03

CCC certification (cn) 199 kB, 03.05.2011
Code: q_srbp04

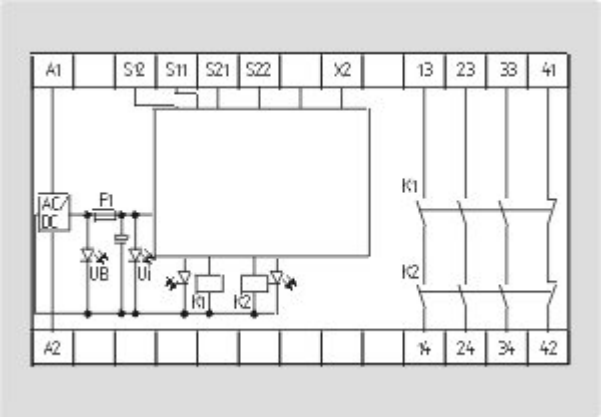
Images



Wiring example



Wiring example



Internal wiring diagram

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The data and values have been checked throroughly. Technical modifications and errors excepted.
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