

Safety modules SMS20, SMS31



Original datasheet - For emergency stop, safety gates, magnetic switches, safety limit switches



Description

The SMS20 and SMS31 safety modules are designed in Category 4, Performance Level e in accordance with the Machine Directive and EN ISO 13849-1 to monitor and control safely the safety circuits in applications with emergency stops, safety gates, safety magnetic switches, safety limit switches and electromechanical interlocks. They are also used to control safely the safety circuits of the lift car levelling, unintended car movement and the lift pit inspection, in compliance with the Lifts Standards EN 81-20 and EN 81-50.

Main features

- **Multiple types inputs.** The safety modules can monitor the safety state of several types of inputs: E-stop, E-gate, limit switches, non-contact switches
- **Machinery Directive compliance.** Cat. 4, PL e in accordance with EN ISO 13849-1
- **Lifts Directive compliance.** EN 81-20 and EN 81-50 standards
- **Multiple operating modes.** The modules can operate with automatic, manual or monitored manual start/reset
- **Safety outputs.** Electromechanical forcibly guided safety relays with 3NO+1NC aux outputs (SMS31) or 2NO outputs (SMS20)
- **Flexible wiring.** The modules are equipped with detachable screw terminals for easy wiring and product maintenance; the terminal blocks are coded so to avoid wiring mistakes
- **Diagnostic.** LED indications for power supply, state of the safety inputs and state of the safety outputs
- **Compact.** 1-DIN, W x H x D: 17,5 x 110,8 x 121,1mm
- **Approval** by TÜV. CE, cULus

Main functions

- Monitoring of safety circuits in applications with emergency stop buttons, emergency gates with electromechanical or non-contact safety switches, safety accesses with safety magnetic switches and interlocks
- Monitoring of safety circuits with magnetic or electromechanical safety switches in Lifts to control the lift car levelling
- Double or single safety channel operation
- Control of up to 3 NO safety outputs with electromechanical safety relays
- Selectable start/reset operating mode Manual, Automatic or Monitored Manual Start
- Diagnostic of the safety circuit through on-board LED indications for power supply, status of safety channels and status of safety outputs
- 1 NC auxiliary output (SMS31) that can be used for external status indication

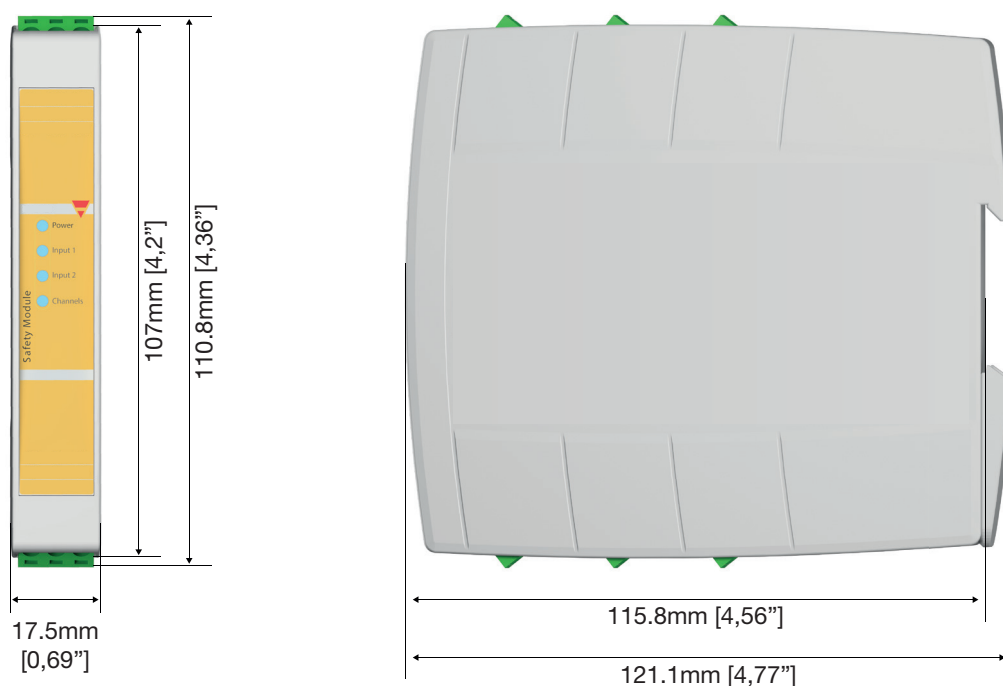
The image shows two views of the SMS20 Safety Module. The left view is a front-facing perspective of the module, which is a grey rectangular unit with a yellow label on the left side. The label contains the following text: "SMS20 Safety Module", "E-Stop: Safety switches, Interlocks, Lift lowering", "Overvoltage Cat III, IP20", "A1+A2 24 VDC +10 %", "S1-S2 24 VDC +10 %", "S3-S4 24 VDC +10 %", "S5-S6 24 VDC +10 %", "S7-S8 24 VDC +10 %", "S9-S10 24 VDC +10 %", "S11-S12 24 VDC +10 %", "S13-S14 24 VDC +10 %", "S15-S16 24 VDC +10 %", "S17-S18 24 VDC +10 %", "S19-S20 24 VDC +10 %", "S21-S22 24 VDC +10 %", "S23-S24 24 VDC +10 %", "S25-S26 24 VDC +10 %", "S27-S28 24 VDC +10 %", "S29-S30 24 VDC +10 %", "S31-S32 24 VDC +10 %", "S33-S34 24 VDC +10 %", "S35-S36 24 VDC +10 %", "S37-S38 24 VDC +10 %", "S39-S40 24 VDC +10 %", "S41-S42 24 VDC +10 %", "S43-S44 24 VDC +10 %", "S45-S46 24 VDC +10 %", "S47-S48 24 VDC +10 %", "S49-S50 24 VDC +10 %", "S51-S52 24 VDC +10 %", "S53-S54 24 VDC +10 %", "S55-S56 24 VDC +10 %", "S57-S58 24 VDC +10 %", "S59-S60 24 VDC +10 %", "S61-S62 24 VDC +10 %", "S63-S64 24 VDC +10 %", "S65-S66 24 VDC +10 %", "S67-S68 24 VDC +10 %", "S69-S70 24 VDC +10 %", 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Element	Component	Function
A	Pluggable terminal blocks	Power supply, start signal, safety inputs and outputs
B	LED	Power supply status
C	LED	Safety inputs status
D	LED	Safety outputs status

Features

General

	SMS20	SMS31
Material	PA-GF, self-extinguishing: UL 94 V-0	
Weight	209g	239g
Assembly	DIN rail mounting (According to EN 50022)	



Electrical data

Supply voltage	24Vdc \pm 10%; 24Vac -15%/+10%, 50...60 Hz, Class 2
	Overvoltage category III
	Short circuit protection internal PTC
Rated insulation	4 kV coil to contacts
	4 kV contact to contact

Inputs

Number of safety channels	2
Safety inputs (contact inputs)	S11-S12 and S21-S22
Loop resistance	Max. 1 k Ω
Input current	Typical 5 mA




Outputs

	SMS20	SMS31
NO safety outputs	2	3
NC auxiliary output	0	1
Type	Voltage free contact output, relays with forcibly guided contacts	
Max current rating - single output	@ 60°C (140°F) operating temperature: AC 1: 250V / 6A / 2000 VA - AC 15: 230V / 3A DC 1: 24V / 6A - DC 13: 24V / 2.5A / 0.1 Hz UL508, pilot duty: B300 / R300	
Max quadratic current	Spacing between modules $\geq 100\text{mm}$: 72A^2 @40°C (104°F) ambient temperature Modules mounted stacked: 26A^2 @25°C (77°F) ambient temperature Please refer to the derating curves in installation manual	
Mechanical life	$> 10^7$ operations	
Electrical life AC1 (360 s/h)	$\sim 10^5$ operations	

Safety parameters

ISO 13849-1 Safety Category	Cat. 4
ISO 13849-1 Performance Level	PL e
EN 81-20	Certified
EN 81-50	Certified
MTTF _d [a]	420,8
PFH _d [1/h]	1,85 E-10
DCavg	99%
β	5,00 E-02
β_d	2,00 E-02
Mission time	20 years

Compatibility and conformity

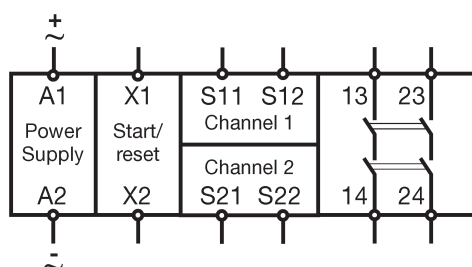
Low Voltage Directive 2014/35/EU	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
EMC Directive 2014/30/EU	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
Machinery Directive 2006/42/EC EC type examined by TÜV Rheinland Cert. no. 01/205/6003.00/25	EN ISO 13849-1 Safety of machinery - safety related parts of control systems - General principles for design EN 60204-1 Safety of machinery - Electrical equipment of machines - General requirements E-stop category 0 EN 61326-3-1 Electrical equipment for measurement, control and laboratory use. EMC requirements. Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) - General industrial applications
Lifts Directive 2014/33/EU EU type examined by TÜV Rheinland Cert. no. 01/208/4A/6149.00/25	EN 81-20 Safety rules for the construction and installation of lifts. Part 20: passenger and goods passenger lifts EN 81-50 Safety rules for the construction and installation of lifts. Part 50: design rules, calculations, examinations and tests of lift components EN 12015 Electromagnetic compatibility. Product family standard for lifts, escalators and passenger. Emission EN 12016 Electromagnetic compatibility. Product family standard for lifts, escalators and passenger. Immunity
Approvals	  

Environmental

Protection grade	IP40 on frontal part of the housing, IP20 on the terminals. The device has to be installed in a cabinet with protection degree of IP54.
Pollution degree	2
Operating Temperature	-25...+60°C (-13...140°F), UL: +40°C (104°F); tested @ temp 65°C (149 °F) as per lift norm
Storage Temperature	-30...+70°C (-22...158°F)
Ambient humidity range	R.H. ≤95% non condensing

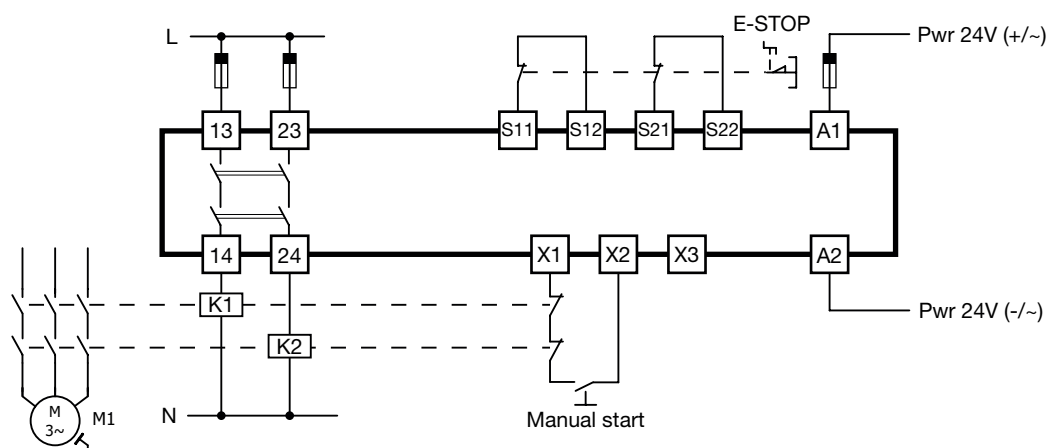
Connection Diagrams

SMS20

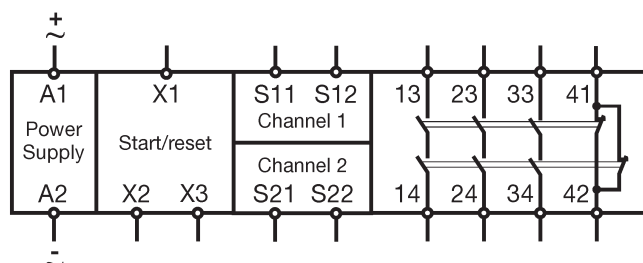


Terminal	Function
A1	power supply 24 Vdc (+)/Vac(~)
A2	power supply 24 Vdc (-)/Vac(~)
S11-S12	channel 1 NO input
S21-S22	channel 2 NO input
X1-X2	manual start / automatic start
X1-X3	monitored manual start
13-14	NO safety output
23-24	NO safety output

Double channel mode



SMS31



Terminal	Function
A1	power supply 24 Vdc (+)/Vac(~)
A2	power supply 24 Vdc (-)/Vac(~)
S11-S12	channel 1 NO input
S21-S22	channel 2 NO input
X1-X2	manual start / automatic start
X1-X3	monitored manual start
13-14	NO safety output
23-24	NO safety output
33-34	NO safety output
41-42	NC auxiliary output

Double channel mode

