

#### 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 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 and the lift pit inspection, in compliance with the Lifts Standards EN81-20 and EN81-50.

#### 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
- Lift Directive compliance. EN81-20 and EN81-50 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



# References

Type selection

NO safety outputs	Aux NC output	Ordering code
2	0	SMS20
3	1	SMS31



### Further reading

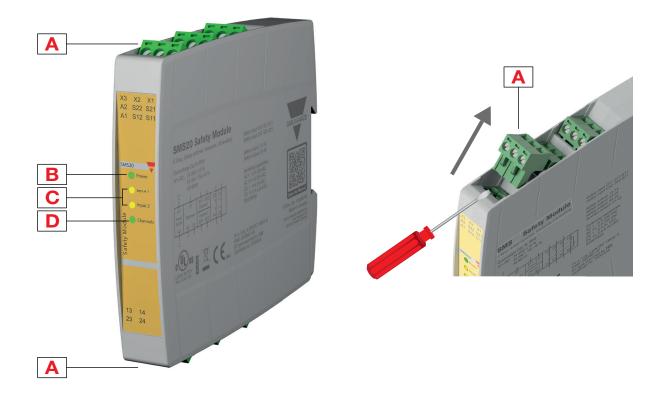
Information	Where to find it	QR
Instruction manual	http://gavazziautomation.com/images/PIM/MANUALS/ENG/SM_ IM.pdf	
Software SISTEMA	http://www.gavazzi-automation.com/nsc/HQ/EN/safety_modules	



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# Structure



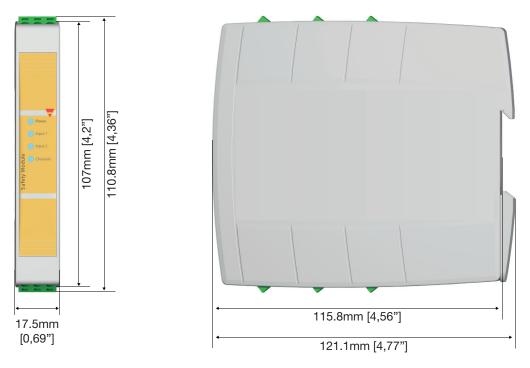
Element	Component	Function	
Α	Pluggable terminal blocks	Power supply, start signal, safety inputs and outputs	
В	LED	Power supply status	
С	LED	Safety inputs status	
D	LED	Safety outputs status	



## **Features**

General

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



Power Supply

Power supply         24Vdc ± 10%; 24Vac -15%/+10%, 50÷60 Hz, C           Overvoltage category III         Short circuit protection internal PTC	24Vdc ± 10%; 24Vac -15%/+10%, 50÷60 Hz, Class 2
	Overvoltage category III
	Short circuit protection internal PTC
	Rated insulation voltage 4 kV

### Inputs

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



## Outputs

	SMS20	SMS31
NO safety outputs	2	3
NC auxiliary output	0	1
Туре	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 ≥100mm: 72A <sup>2</sup> @40°C (104°F) ambient tempera- ture Modules mounted stacked: 26A <sup>2</sup> @25°C (77°F) ambient temperature Please refer to the derating curves in installation manual	
Mechanical life	> 10 <sup>7</sup> operations	
Electrical life AC1 (360 s/h)	AC1 (360 s/h) ~ 10 <sup>5</sup> operations	



### Safety parameters

ISO 13849-1 Safety Category	Cat. 4
ISO 13849-1 Performance Level	PLe
DIN EN 81-20	Certified
DIN EN 81-50	Certified
MTTF <sub>D</sub> [a]	420,8
PFH <sub>p</sub> [1/h]	1,85 E-10
DCavg	99%
ß	5,00 E-02
ß <sub>D</sub>	2,00 E-02



### Compatibility and conformity

	EN 60947-5-1
Low Voltage Directive 2014/35/EU	Low-voltage switchgear and controlgear - Control circuit devices and switch-
	ing elements - Electromechanical control circuit devices
	EN 60947-5-1
EMC Directive 2014/30/EU	Low-voltage switchgear and controlgear - Control circuit devices and switch-
	ing elements - Electromechanical control circuit devices
	EN ISO 13849-1
	Safety of machinery - safety related parts of control systems - General prin-
	ciples for design
	EN 60204-1
Machinery Directive 2006/42/EC	Safety of machinery - Electrical equipment of machines - General require-
EC type examined by TÜV Cert. no. 44 205 15058307	ments E-stop category 0 EN 61326-3-1
Cert. no. 44 205 15058307	
	Electrical equipment for measurement, control and laboratory use. EMC re- quirements. Immunity requirements for safety-related systems and for equip-
	ment intended to perform safety-related functions (functional safety) - General
	industrial applications
	FN 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,
Lift Directive 2014/33/EU	calculations, examinations and tests of lift components
EU type examined by TÜV	EN 12015
Cert. no. 44 208 15058307	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	

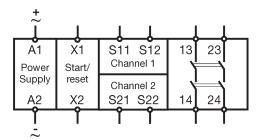
## Environmental

Protection gradeIP40 on frontal part of the housing, IP20 on the terminals. The device holds 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



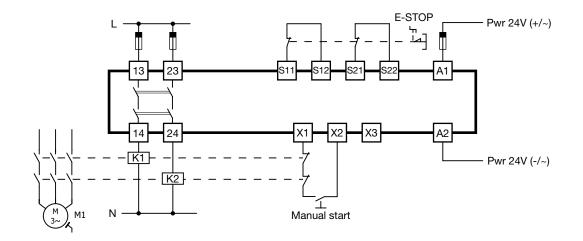
# **Connection Diagrams**

SMS20



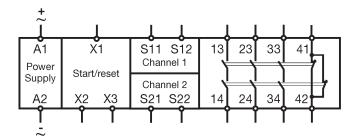
Terminal	Function
A1	power supply 24 Vdc (+)/Vac(~)
A2	power supply 24 Vdc (-)/Vac(~)
S11-S12	channel 1 NO input
S21-S22	channel 2 NO input
X1-X2	manual start / automatic start
X1-X3	monitored manual start
13-14	NO safety output
23-24	NO safety output

#### Double channel mode



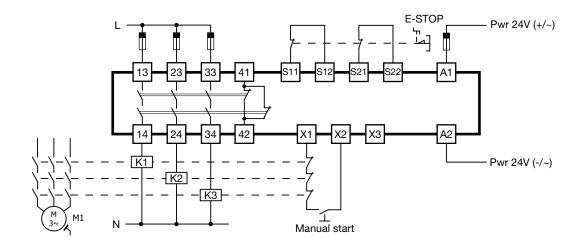


SMS31



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



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