Safety modules

Applications

Safety devices MS series are modules for emergency stop which have been developed for safety applications up to SIL 3 (EN 62061) and up to PLe (EN ISO 13849-1). They are suitable for the control of limit switches for safety gates and of safety magnetic sensors.

- 1 or 2 channels input
- Manual / Automatic Start
- 3NO safety contacts + 1NC contact for signalling
- Suitable for use with electromecanic devices (limit switches and safety sensors) and with optical barriers

They comply with the requirements of European Directives (Low Voltage, Machines and Electromagnetic Compatibility) and are conform to European and international standards.

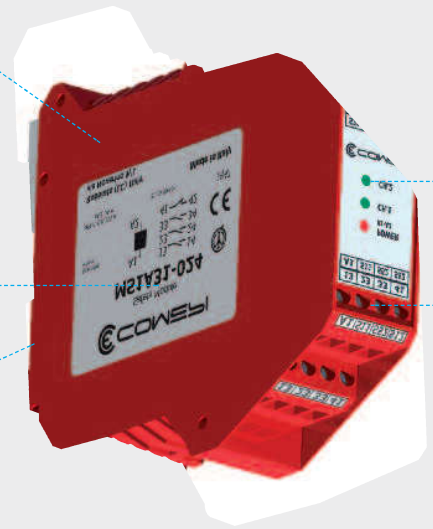
Description

The polymeric housing for DIN rail mounting has a degree of protection IP40 (IP20 on terminal blocks) and it has standard dimensions 22.5 x 114 mm.

Casing
- Technopolymer IP40 (IP20 on terminal blocks)
- Standard dimension 22,5 x 114 mm.

Output contacts
- 3NO safety contacts +1NC signalling contact

DIN rail mounting



Electrical connection:
- IP20 terminal blocks
- 1 or 2 x 0,75... 1,5 mm²

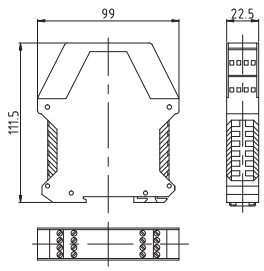
LED indicators for status, supply and diagnostic
- Power
- Channel 1
- Channel 2

Symbols

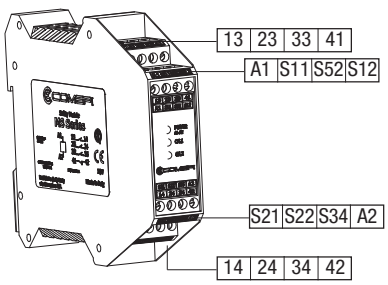
Example:	MS1A31	–	024
Structure:	MS1A31	–	

Tensione di alimentazione:
024: 24V AC/DC
120: 120V AC
230: 230V AC

Dimensions (mm)



Electrical connection



A1-A2: Supply voltage
S11: +24 V output
S12: Input Channel 1 (to S11 or +24V)
S22: Input channel 2 (to S21 or GND)
S52: Input Channel 2 (to S11 or +24V)
S21: GND
S34: Manual/automatic start input
13-14: Safety NO output contact
23-24: Safety NO output contact
33-34: Safety NO output contact
41-42: NC output contact for signalling

Cross section of the conductors: 0,2...2,5 mm² (24...12 AWG)
Torque: 0,5 Nm (0,6 Nm max)

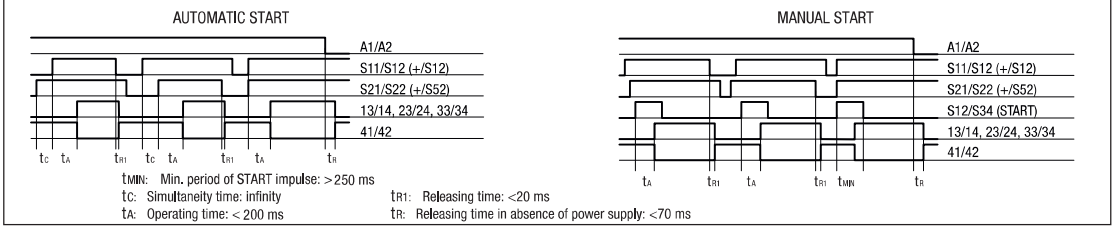
Safety modules - Technical Data

		MS Series
Standards		EN60947-1, EN60947-5-1, EN61000-6-2, EN61000-4, EN61326-3-1, EN60204-1, EN ISO 13849-1, EN ISO 12100-1, EN ISO 12100-2 EN62061, EN1037, EN60664-1, EN60529
Directives		2006/95/CE low voltage 2006/42/CE machinery 2004/108/CE electromagnetic
Certifications - Approvals		CE - IMQ
Air temperature near the device		
– during operation	°C	– 25 ... + 55
– for storage	°C	– 25 ... + 55
Protection against electrical shocks (acc. to IEC 60536)		Class II
Degree of protection (according to IEC 60529 and EN 60529)		Casing IP40 - Terminal blocks IP20
Pollution degree		3 external, 2 internal
Safety integrity level (Sil CL) (according to EN IEC 62061)		Up to Sil 3
Performance level (PL) (according to EN ISO 13849-1)		Up to PLe
Safety category (according to EN ISO 13849-1)		Up to Cat 4
Mechanical durability		10 millions of operations
Electrical durability		100.000 operations
MTTFd		218 (for 24 Vac/dc) / 147 (for 120 Vac and 230 Vac)
Diagnostic coverage		H
PFHd		4,58 E^{-10} (for 24 Vac/dc) / 6,61 E^{-10} (for 120 Vac and 230 Vac)

Electrical Data

Rated insulation voltage U_i (acc. to IEC/EN 60947-1)		250 V (degree of pollution 3)
Rated impulse withstand voltage U_{imp} (acc. to IEC/EN 60947-1)		4 kV
Power supply		
Rated operating voltage U_N (±15%)		24 Vac/dc (10% max residual riple in DC) - 120 Vac - 230 Vac
Rated power consumption		max 5 VA (ac) - max 2 W (dc)
Control circuit		
Protection against short circuits		Resistance PTC with intervention operating time >100ms, reset time >3s - Ih=0,5A
Input max resistance		50Ω
Input max current		30mA

FUNCTIONAL DIAGRAMS

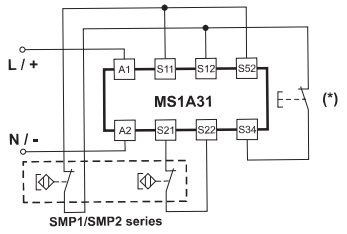


t_{MIN}: Min. period of START impulse: >250 ms
t_C: Simultaneity time: infinity
t_A: Operating time: < 200 ms
t_{R1}: Releasing time: <20 ms
t_R: Releasing time in absence of power supply: <70 ms

Output circuit		
Utilization categories (according to EN 60947-1)		AC 15, Ue = 230 V, Ie = 3 A / DC 13, Ue = 24 V, Ie = 6 A (6 oper/minute)
Max switching voltage		240 Vac / 300 Vdc
Switching current range (per contact)		min 10 mA - max 6A (external protection fuse 6A F type)
Conventional free air thermal current I_{th}		6A (max current sum: 64A^2)
Max contact resistance		100 mΩ

Example of connection with safety magnetic sensors

2 channels configuration and manual start
PL e / SIL 3 / Category 4



SMP1/SMP2 series

(*) If between S12 and S34 it is connected a jumper instead of the button you get the 2-channel configuration with automatic start.