

Safety Relay Unit

Ultra Slim Safety Relay Unit

- 17.5 mm wide models available with 2 or 3 poles.
22.5 mm wide 3 pole models also available
- EN Standards (TÜV approval)
- DIN-track mounting possible



Ordering Information

Main contacts	Auxiliary contact	Number of input channels	Reset mode	Input type	Rated voltage	Category	Part number
DPST-NO	None	2 channels	Auto-reset	Inverse (+/-)	24 VAC/VDC	4	G9SB-2002-A
		1 channel or 2 channels		+ common			G9SB-200-B
		2 channels	Manual-reset	Inverse (+/-)	G9SB-2002-C		
		1 channel or 2 channels		+ common	G9SB-200-D		
3PST-NO	SPST-NC	None (direct breaking)	Auto-reset	---	24 VDC	3	G9SB-3010
		2 channels		Inverse (+/-)	24 VAC/VDC		4
		1 channel or 2 channels	+ common			G9SB-301-B	
		2 channels	Manual-reset	Inverse (+/-)	+ common	G9SB-3012-C	
		1 channel or 2 channels				G9SB-301-D	

Model Number Legend

G9SB-□□□□□
1 2 3 4 5

1. Contact Configuration (Safety Output)

- 2: DPST-NO
- 3: 3PST-NO

2. Contact Configuration (OFF-delay Output)

- 0: None

3. Contact Configuration (Auxiliary Output)

- 0: None
- 1: SPST-NC

4. Input Configuration

- None: 1-channel or 2-channel input possible
- 0: None (direct breaking)
- 2: 2-channel input

5. Miscellaneous

- A: Auto-reset, inverse (+/-) input
- B: Auto-reset, + common input
- C: Manual-reset, inverse (+/-) input
- D: Manual-reset, + common input

Specifications

■ Ratings

Power Input

Item	G9SB-200□-□	G9SB-3010	G9SB-301□-□
Power supply voltage	24 VAC/VDC: 24 VAC, 50/60 Hz, or 24VDC 24 VDC: 24 VDC		
Operating voltage range	85% to 110% of rated power supply voltage		
Power consumption	1.4 VA/1.4 W max.	1.7 W max.	1.7 VA/1.7 W max.

Inputs

Item	G9SB-200□-□	G9SB-3010	G9SB-301□-□
Input current	25 mA max.	60 mA max. (See Note.)	30 mA max.

Note: Indicates the current between terminals A1 and A2.

Contacts

Item	G9SB-200□-□	G9SB-3010	G9SB-301□-□
	Resistive load ($\cos \theta = 1$)		
Rated load	250 VAC, 5 A		
Rated carry current	5 A		

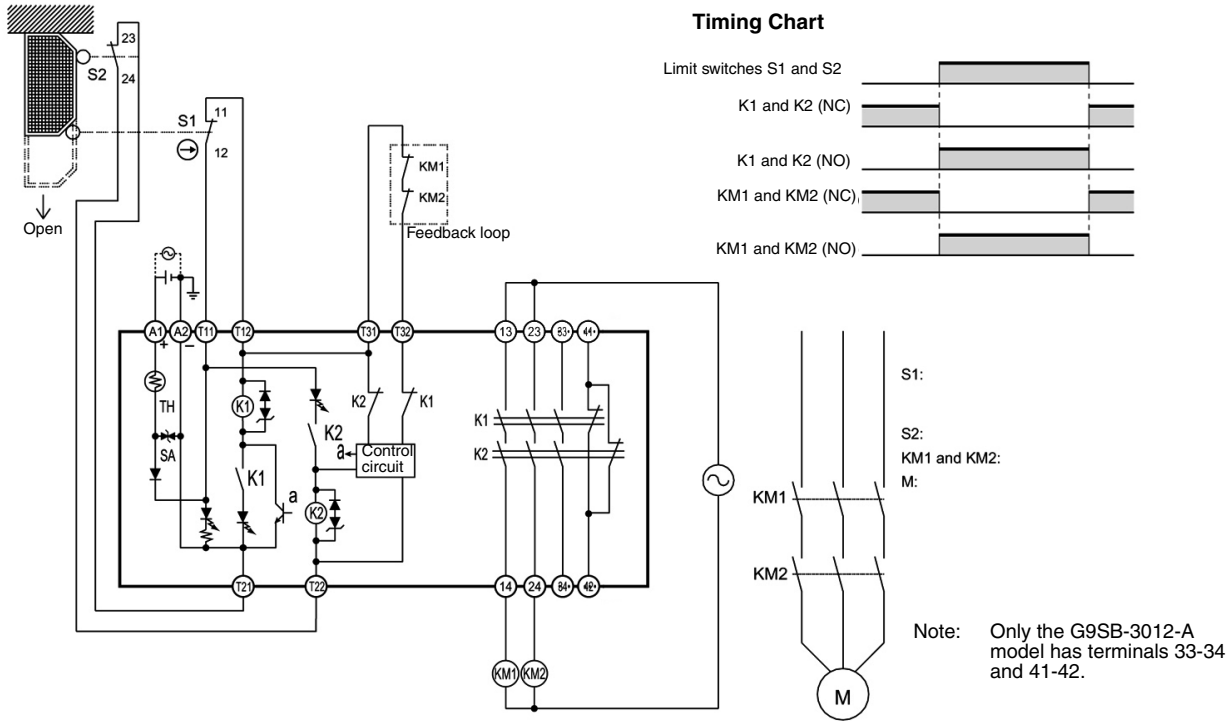
■ Characteristics

Item	G9SB-200□-□	G9SB-3010	G9SB-301□-□
Contact resistance (See Note 1.)	100 mΩ		
Operating time (See Note 2.)	30 ms max.		
Response time (See Notes 2 and 3.)	10 ms max.		
Insulation resistance (See Note 4.)	100 MΩ min. (at 500 VDC)		
Dielectric strength	Between different outputs	2,500 VAC, 50/60 Hz for 1 min	
	Between inputs and outputs		
	Between power inputs and outputs		
Vibration resistance	10 to 55 to 10 Hz, 0.375-mm single amplitude (0.75-mm double amplitude)		
Shock resistance	Destruction	300 m/s ²	
	Malfunction	100 m/s ²	
Durability	Mechanical	5,000,000 operations min. (at approx. 7,200 operations/hr)	
	Electrical	100,000 operations min. (at approx. 1,800 operations/hr)	
Error rate, p-level (reference value)	5 VDC, 1 mA		
Ambient operating temperature	-25 to 55°C (with no icing or condensation)		
Ambient operating humidity	35% to 85% RH		
Terminal tightening torque	0.5 N·m		
Weight	Approx. 115 g	Approx. 135 g	Approx. 120 g
Approved standards (pending)	EN954-1, EN60204-1, UL508, CSA C22.2 No. 14		
EMC (pending)	EMI: EN55011 group 1 class A EMS: EN50082-2		

- Note:
1. The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.
 2. The bounce time is not included in the figure for operating time.
 3. The response time is the time it takes for the main contact to open after the input is turned OFF.
 4. The insulation resistance was measured with 500 VDC at the same places that the dielectric strength was checked.

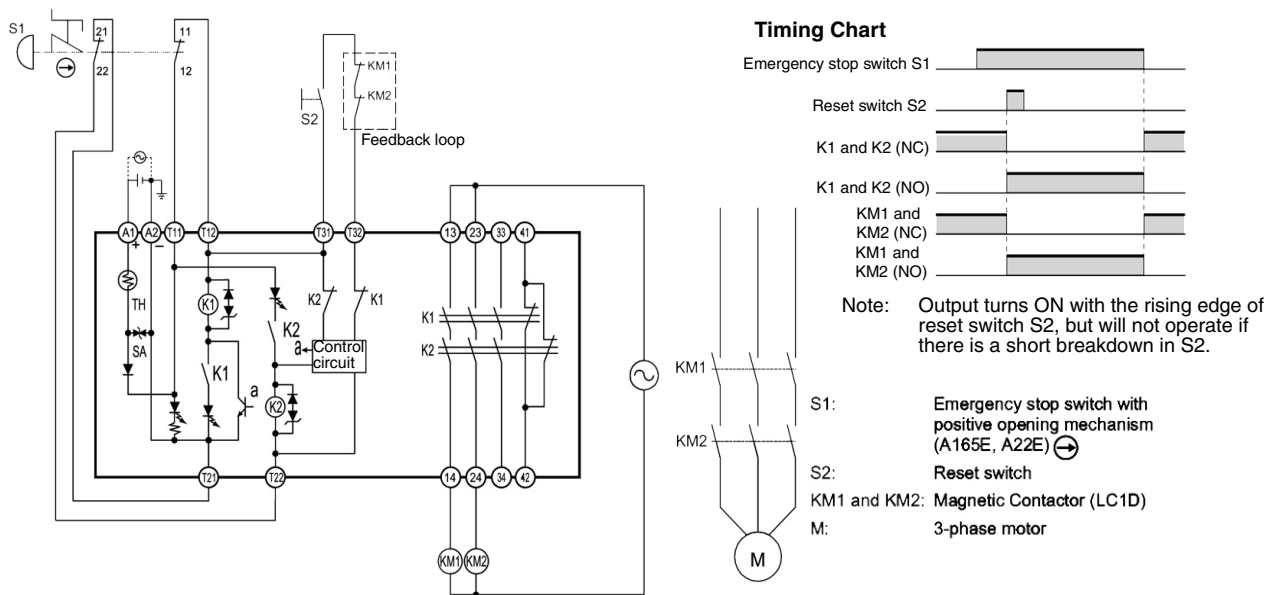
Operation

■ G9SB-2002-A (24 VAC/VDC) or G9SB-3012-A (24 VAC/VDC) with 2-Channel Limit Switch Input/Auto-reset



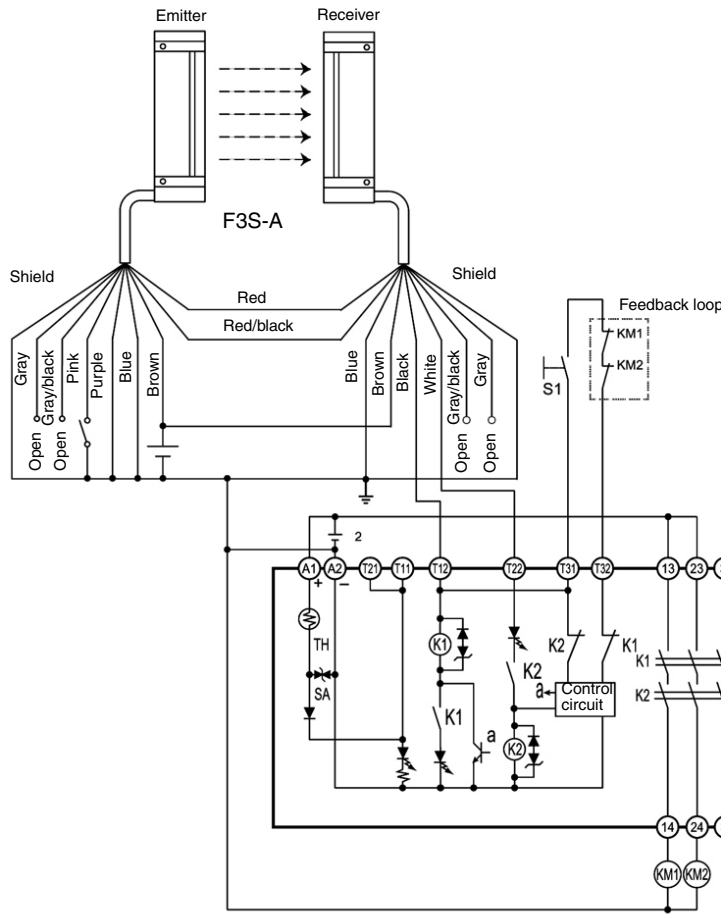
Note: External connections and timing charts for G9SB-200-B/301-B models are the same as those for G9SB-2002-A/3012-A models.

■ G9SB-2002-C (24 VAC/VDC) or G9SB-3012-C (24 VAC/VDC) with 2-Channel Emergency Stop Switch Input/Manual-reset

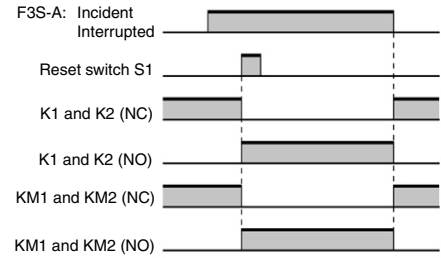


Note: External connections and timing charts for G9SB-200-D/301-D models are the same as those for G9SB-2002-C/3012-D models.

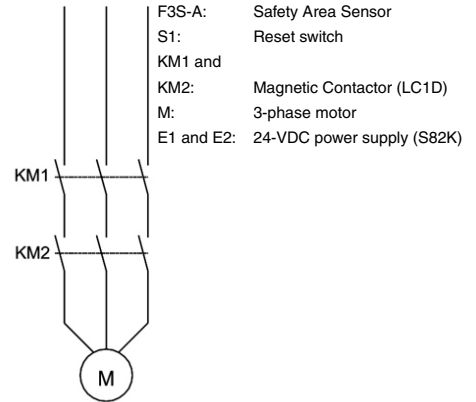
■ G9SB-200-D (24 VAC/VDC) or G9SB-301-D (24 VAC/VDC) with 2-Channel Safety Area Sensor/Manual-reset



Timing Chart

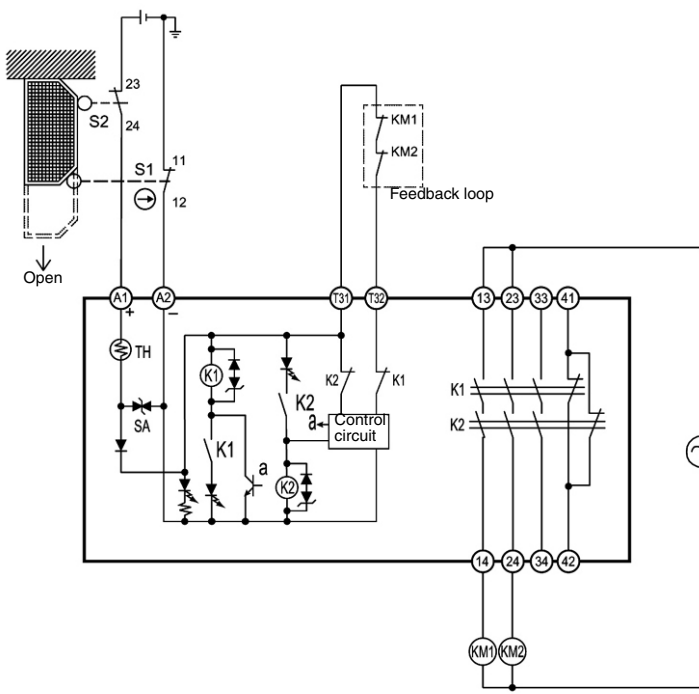


Note: Output turns ON with the rising edge of reset switch S1, but will not operate if there is a short breakdown in S1.

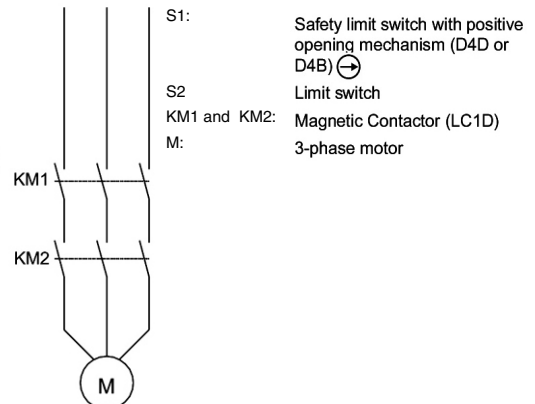
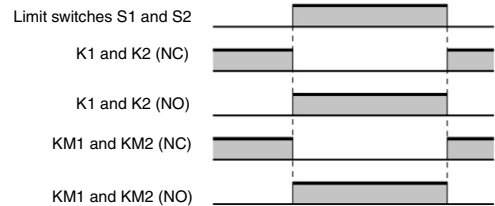


- Note: 1. Connect E1 to model other than the F3S-A.
2. Only the G9SB-301-D model has terminals 33-34 and 41-42.

■ G9SB-3010 (24 VDC) with 2-Channel Limit Switch Input/Auto-reset



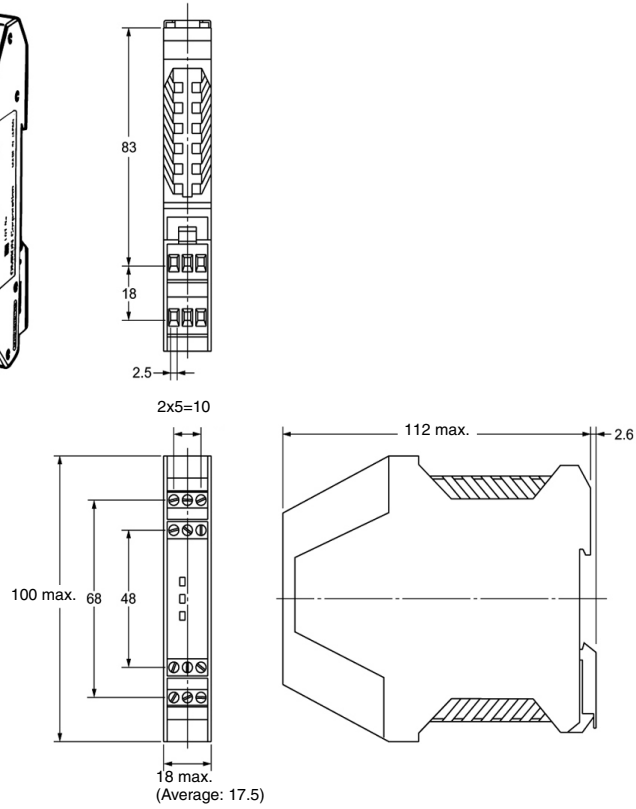
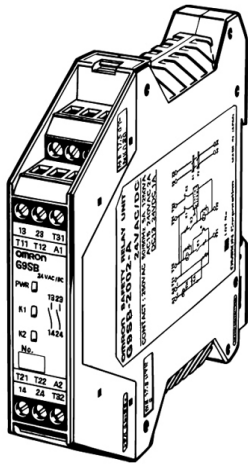
Timing Chart



Dimensions

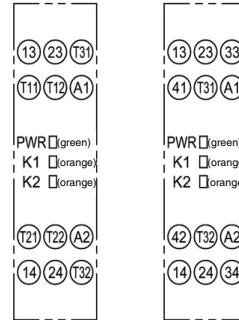
Unit: mm

■ G9SB-200□-□ G9SB-3010

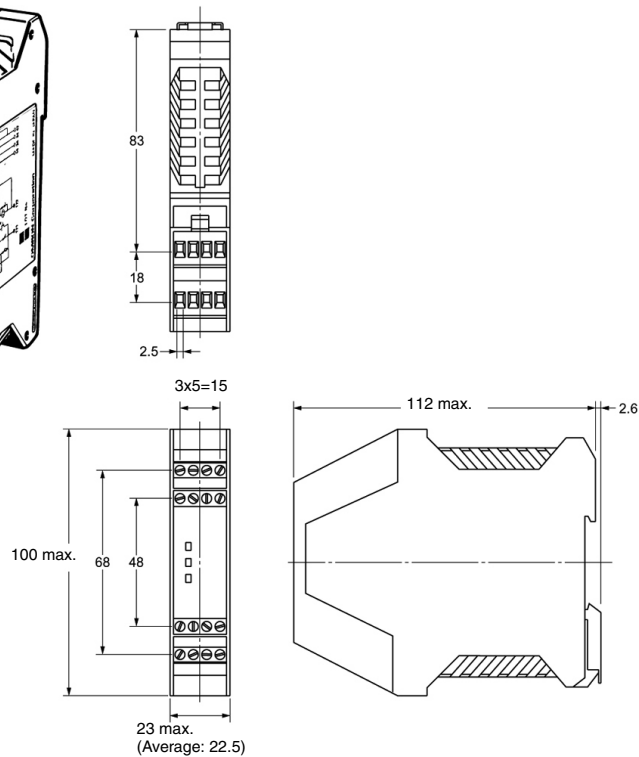
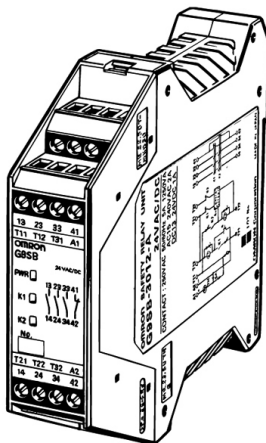


Terminal Arrangement

G9SB-200□-□ G9SB-3010

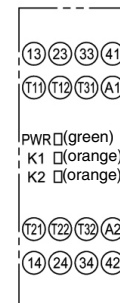


■ G9SB-301-□



Terminal Arrangement

G9SB-200□-□

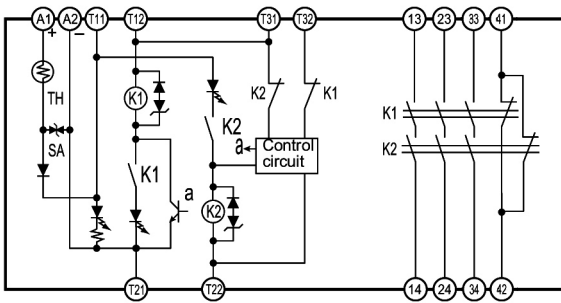


Installation

■ Internal Connections

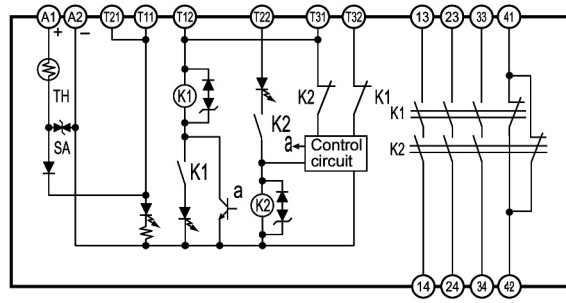
G9SB-2002-A/C (24 VAC/VDC)

G9SB-3012-A/C (24 VAC/VDC)

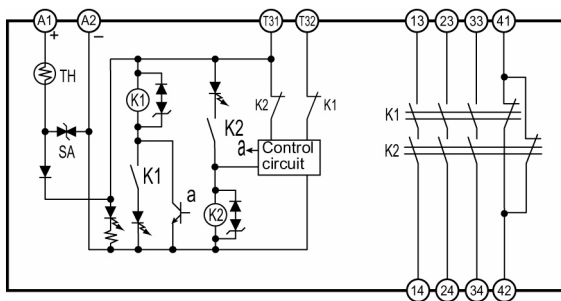


G9SB-200-B/D (24 VAC/VDC)

G9SB-301-B/D (24 VAC/VDC)



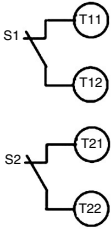
G9SB-3010 (24 VDC)



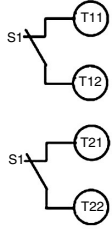
- Note:
1. For 1-channel input with G9SB-□□□-B/D models, short terminals T12 and T22. It is not possible to wire G9SB-□□□2-A/C models for 1-channel input.
 2. Only G9SB-301□-□ models have terminals 33-34 and 41-42.

External Connections

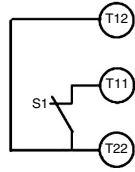
G9SB- 2-A/C
2 Channel Input
(1 +ve and 1 -ve)



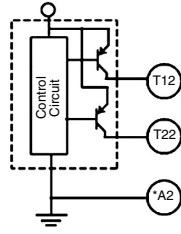
G9SB- -B
2 Channel Input
(2 +ve)



G9SB- -B/D
1 Channel Input
(1 +ve)

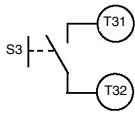


G9SB- -B/D
2 Channel Input
(2 PNP, Solid State)

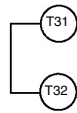


*DC models only

Manual Reset*

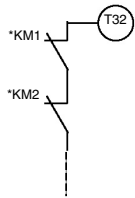


Auto Reset*



*Auto and Manual reset is model specific

External Device Monitoring



*Add N.C. contacts of external devices in series with T32

Precautions

■ Wiring

Turn OFF the G9SB before wiring. Do not touch the terminals of the G9SB while the power is turned ON because the terminals are charged and may cause an electric shock.

Use the following to wire the G9SB.

Stranded wire: 0.2 to 2.5 mm²

Solid wire: 0.2 to 2.5 mm²

Tighten each screw to a torque of 0.5 to 0.6 N·m, or the G9SB may malfunction or generate heat.

External inputs connected to T11 and T12 or T21 and T22 of the G9SB must be no-voltage contact inputs.

■ Applicable Safety Category

All G9SB Relays meet the requirements of Safety Category 4 of the EN954-1 standards when they are used as shown in the examples provided by OMRON. Relays may not meet the standards in some operating conditions. The G9SB-3010 can be applied to Safety Category 3 of the EN954-1 using double breaking.

The applicable safety category is determined from the whole safety control system. Make sure that the whole safety control system meets EN954-1 requirements.

■ Mounting Multiple Units

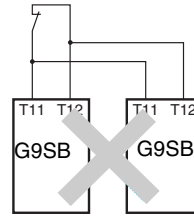
When mounting multiple Units close to each other, the rated current will be 3 A. Do not apply a current higher than 3 A.

■ Manual/Auto Reset Operation

Please note that auto-reset units cannot be used for manual reset operation. For manual reset units NO switches must be used for correct operation.

■ Connecting Inputs

If using multiple G9SB models, inputs cannot be made using the same switch. This is also true for other input terminals.



■ Earth Short

A positive thermistor is built into the G9SB circuits, so you can detect earth short breakdowns and breakdown shorts between channel 1 and channel 2. (Detection of breakdown shorts between channel 1 and channel 2 is supported for G9SB-2002-□/3012-□ models only.)

Note: In order to detect earth short breakdowns, connect the minus side of the power supply to ground.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters into inches, divide by 25.4

OMRON

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