OMRON

Safety Relay Unit

G9SA-300-SC

Less Wiring Required with Safety Light Curtain

- Sensor connector model added to G9SA Series.
- Allows direct connection to OMRON F3S-A□□□P Safety Light Curtain using sensor connector.
- Reduces wiring and prevents incorrect connection.
- Connection to emergency stop switch also supported.
- DIN track mounting possible.
- EN standards (TÜV approval) pending.
- UL, CSA approval pending.
- CE marking.

Ordering Information

■ Safety Relay Unit

Emergency-stop Unit with Sensor Connector

Main contact	Auxiliary contact	Number of input channels	Rated voltage	Model
3PST-NO	None	1 channel or 2 channels possible	24 VDC	G9SA-300-SC

Note: Connect to the sensor connector using a dedicated OMRON F3S-A□□□P Safety Light Curtain Connection Cord. For details, refer to the information on accessories given below.

Model Number Legend:

G9SA-□□□□□□-□□

1 2 3 4 5 6

1. **Function**
   None: Emergency stop
2. **Contact Configuration (Safety Output)**
   3: 3PST-NO
3. **Contact Configuration (OFF-delay Output)**
   0: None
4. **Contact Configuration (Auxiliary Output)**
   0: None
5. **Input Configuration**
   None: 1-channel or 2-channel input possible
6. **Terminal**
   SC: Connector terminals

■ Accessories (Order Separately)

Connection Cords (for F3S-A□□□P)

Appearance	Cord length	Model	Quantity
	3 m	F39-JA1D	One each for emitter and receiver (2 in total)
	7 m	F39-JA2D	
	10 m	F39-JA3D	

Specifications

■ Ratings

Power Input

Item	G9SA-300-SC
Power supply voltage	24 VDC
Operating voltage range	85% to 110% of rated power supply voltage
Power consumption	24 VDC: 0.7 W max.

Contacts

Item	G9SA-300-SC
	Resistive load (cos ϕ =1)
Rated load	250 VAC, 5 A
Rated carry current	5 A

Inputs

Item	G9SA-300-SC
Input current	40 mA max.

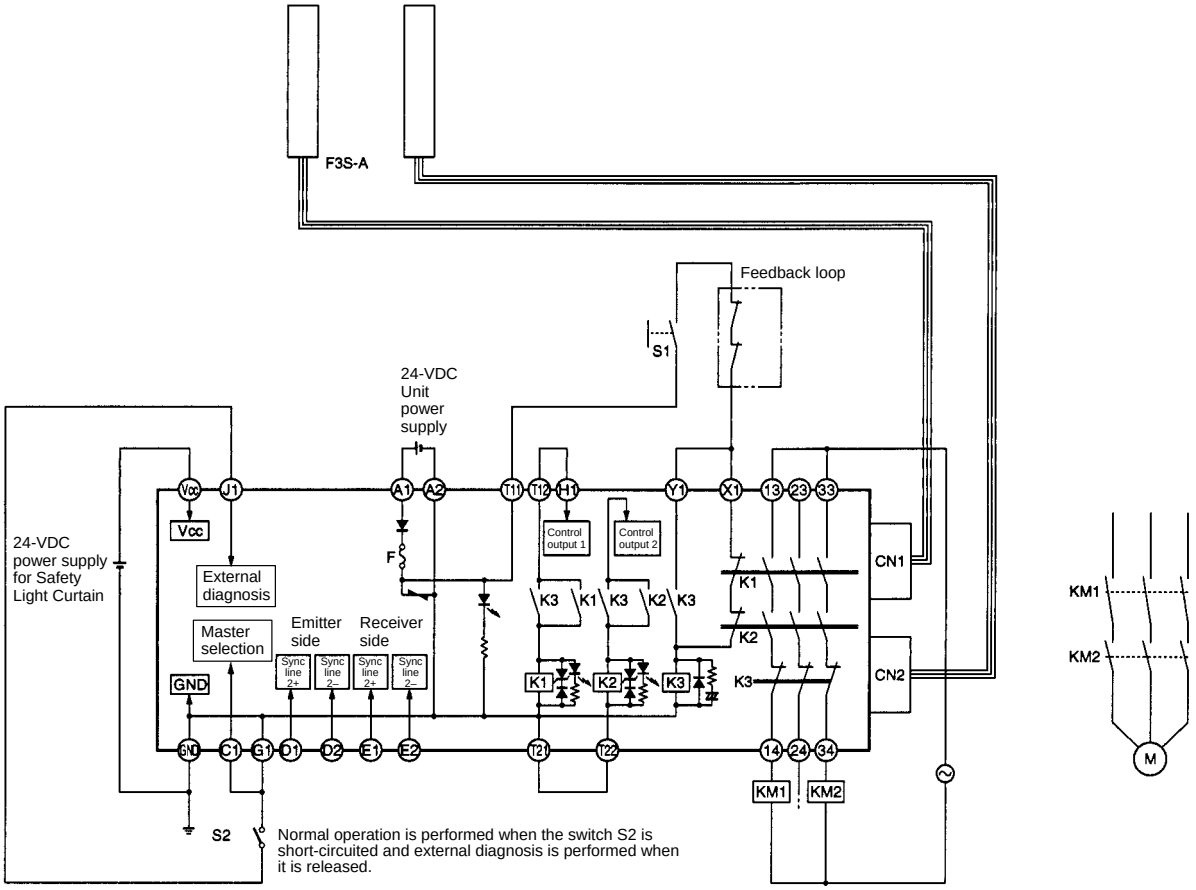
■ Characteristics

Item		G9SA-300-SC
Contact resistance (see note 1)		100 mΩ
Operating time		300 ms max. (not including bounce time)
Response time (see note 2)		10 ms max. (not including bounce time)
Insulation resistance (see note 3)		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 Hz, 0.75-mm double amplitude
Shock resistance	**Destruction**	300 m/s^2
	Malfunction	100 m/s^2
Life expectancy	**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°C to 55°C (with no icing or condensation)
Ambient operating humidity		35% to 85%
Terminal tightening torque		0.98 N•m
Standards (pending)		EN954-1, EN60204-1, UL508, CSA C22.2 No. 14
EMC (pending)		EMI: EN55011 group 1 class A EMS: EN50082-2
Weight		Approx. 300 g

Note: 1. The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.
2. The response time is the time it takes for the main contact to turn OFF after the input is turned OFF.
3. The insulation resistance was measured with 500 VDC at the same places that the dielectric strength was checked.

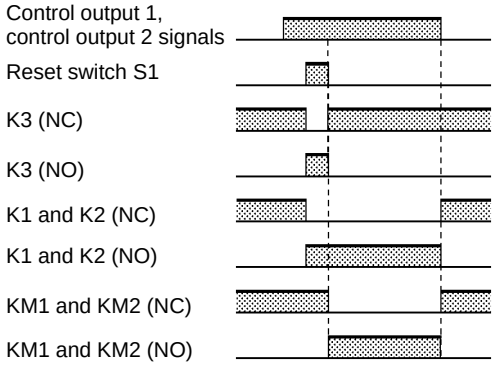
Application Examples

Connection to Safety Light Curtain Only

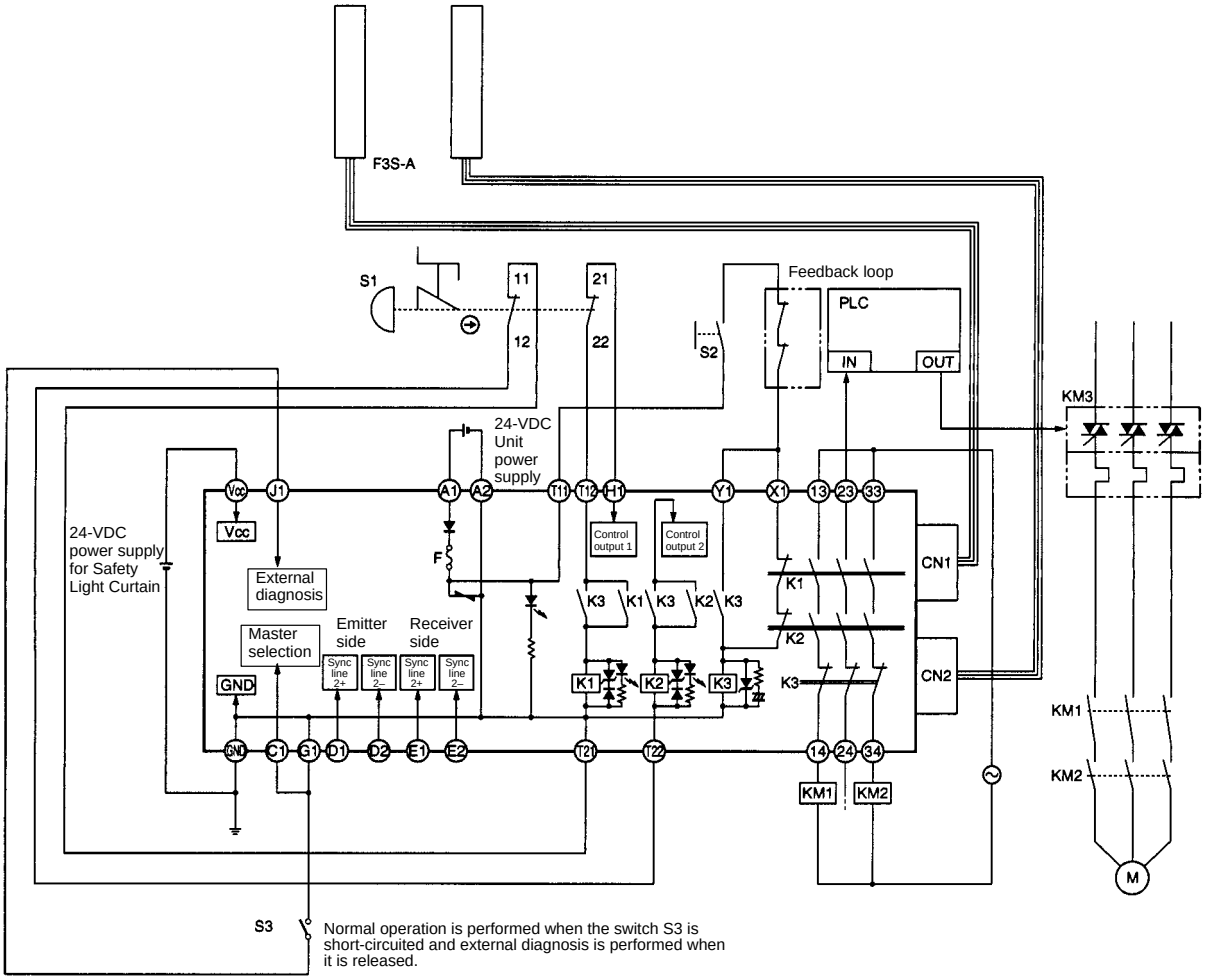


F3S-A:	Safety Light Curtain
S1:	Reset switch (momentary action switch)
KM1 and KM2:	Magnetic Contactor
M:	3-phase motor

Timing Chart

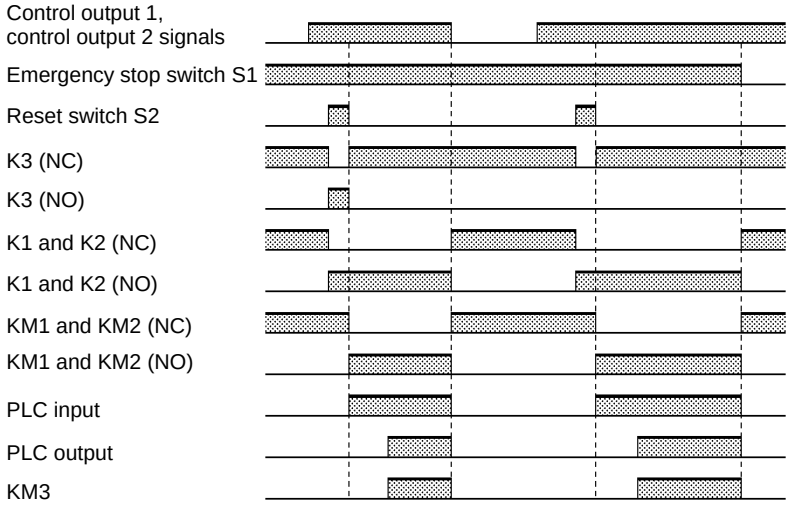


Connection to Safety Light Curtain and Emergency Stop Switch Input (2 Channels)

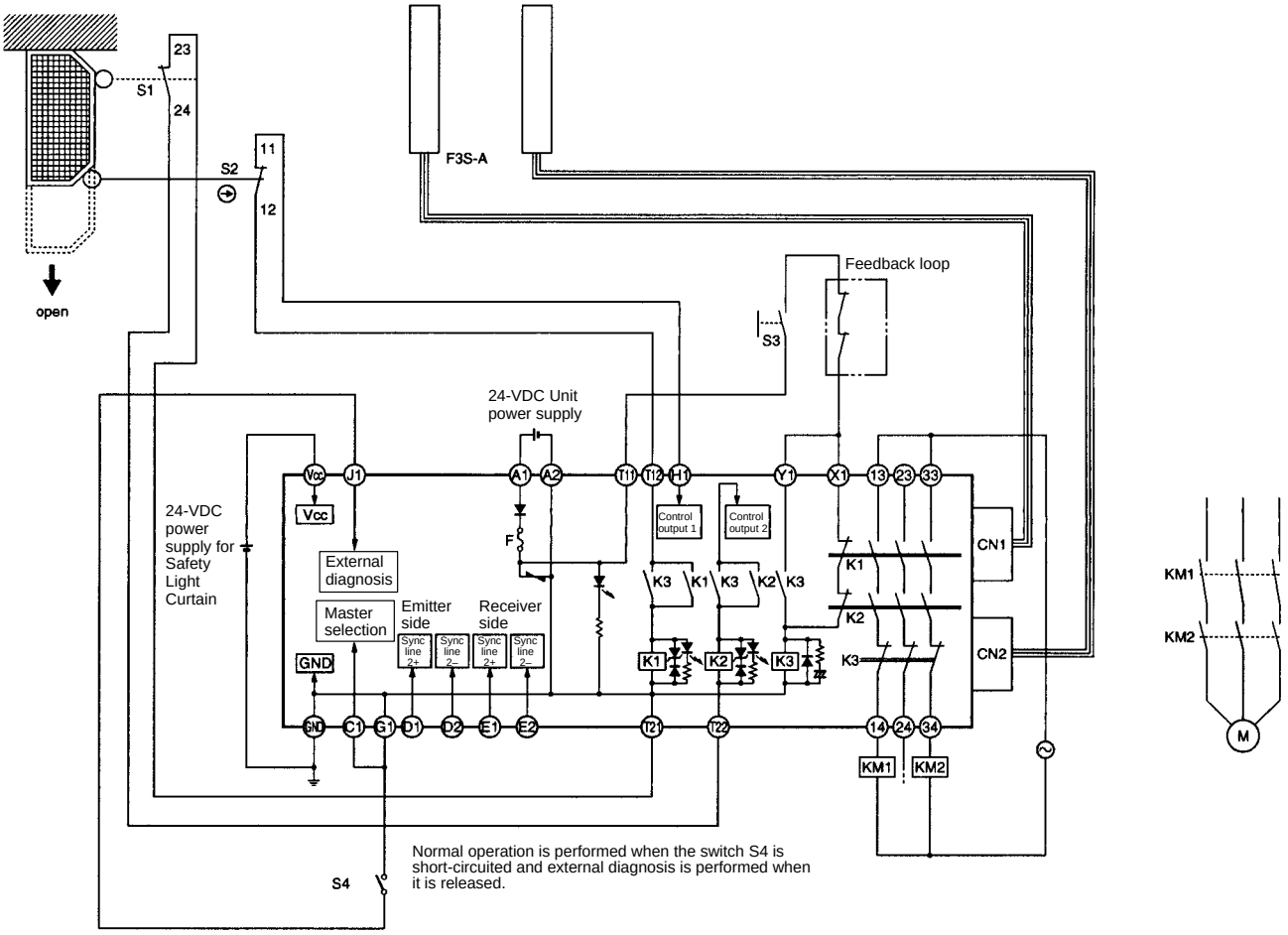


F3S-A:	Safety Light Curtain
S1:	Emergency stop switch ⊖
S2:	Reset switch (momentary operation switch)
S3:	External diagnosis switch (for Safety Light Curtain)
KM1 and KM2:	Magnetic Contactor
KM3:	G3J Solid-state Contactor
M:	3-phase motor

Timing Chart

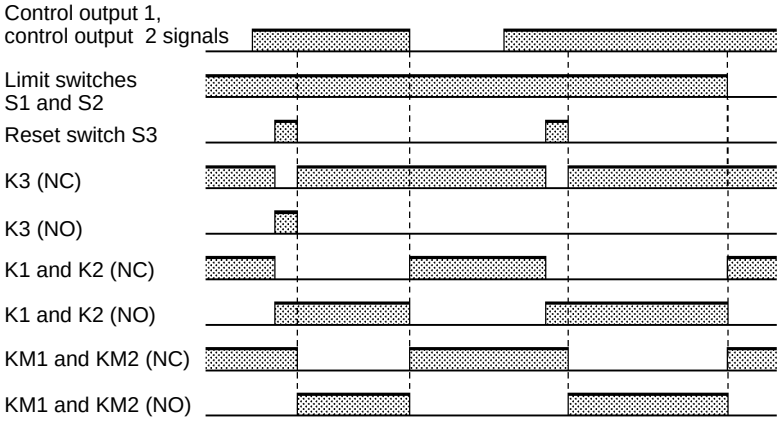


Connection to Safety Light Curtain and Limit Switch Input (2 Channels)



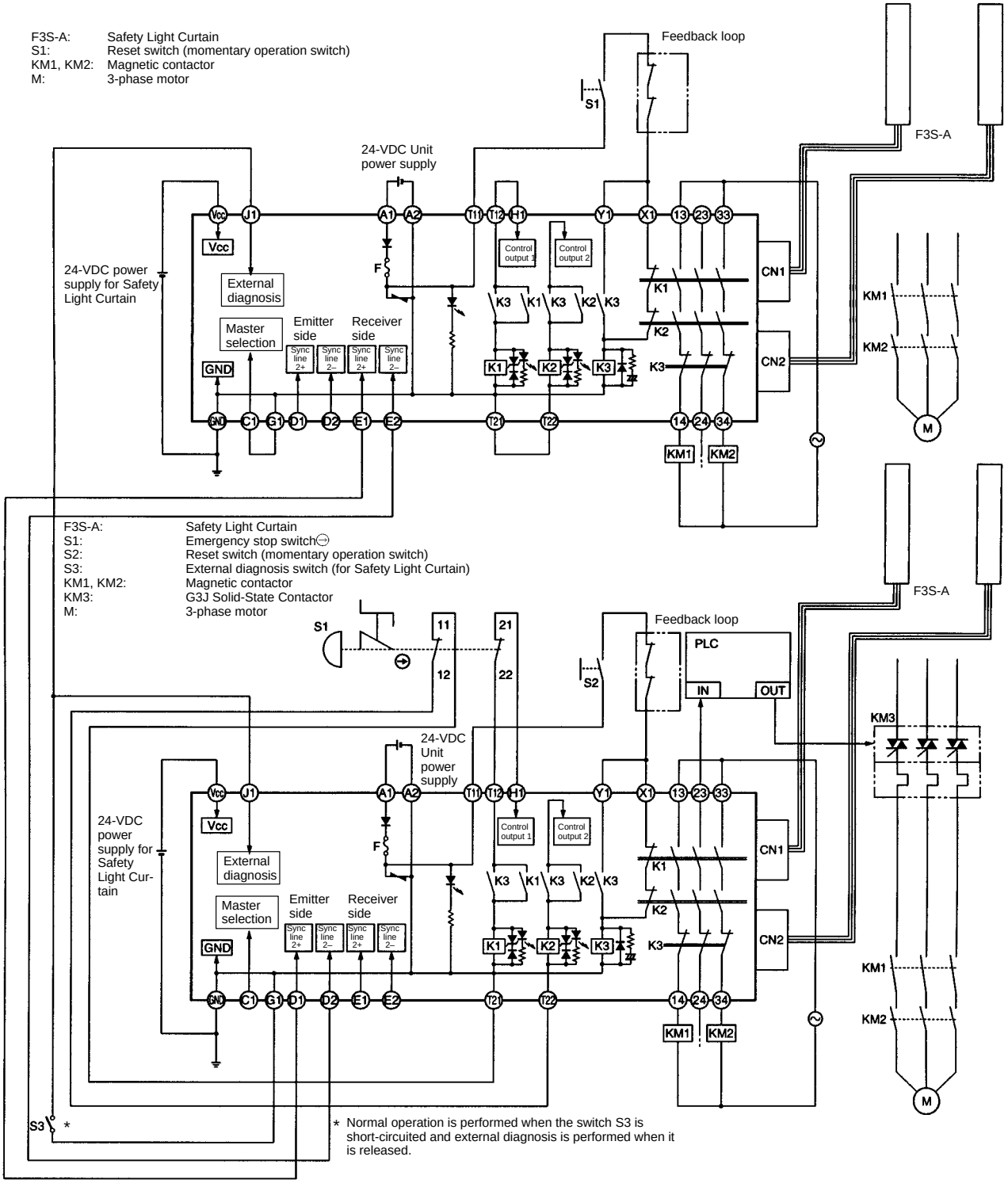
F3S-A: Safety Light Curtain
S1: Limit switch
S2: Safety Limit Switch with positive opening mechanism (D4D or D4B) ⊖
S3: Reset switch (momentary operation switch)
S4: External diagnosis switch (for Safety Light Curtain)
KM1 and KM2: Magnetic Contactor
M: 3-phase motor

Timing Chart



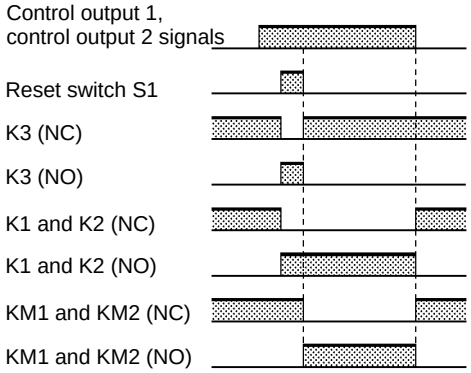
Safety Light Curtains Connected in Parallel

Note: Wire as shown below to prevent mutual interference between the two Safety Light Curtains.

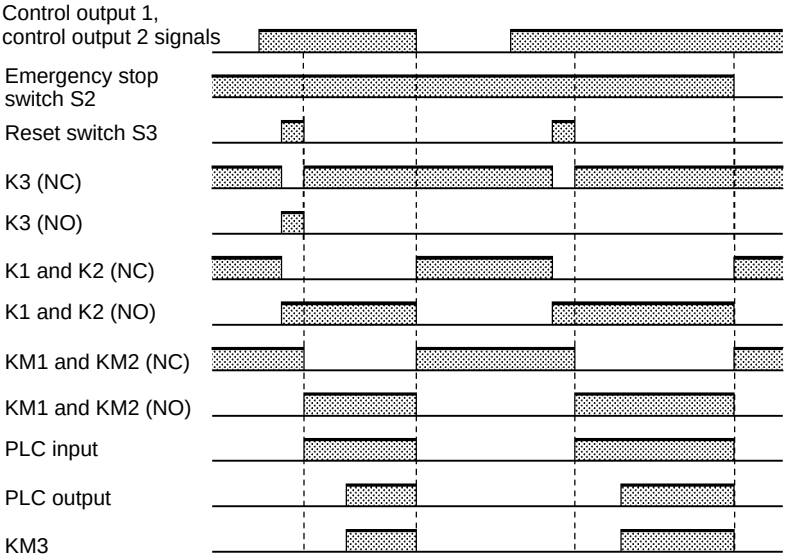


Safety Light Curtains Connected in Parallel

Timing Charts



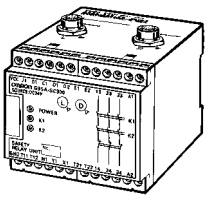
Connected to Emergency Stop Switch

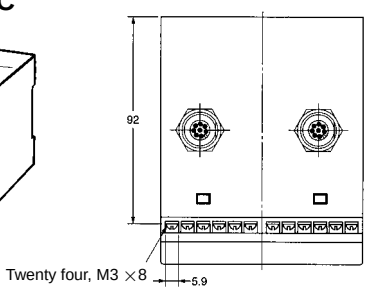


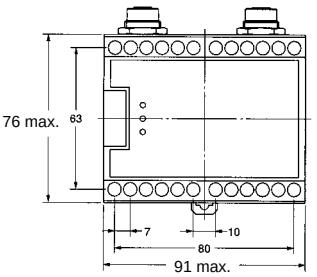
Dimensions

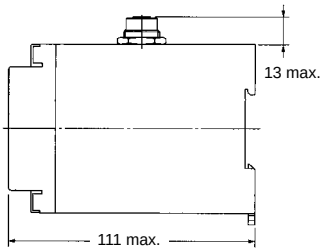
Note: All units are in millimeters unless otherwise indicated.

G9SA-300-SC



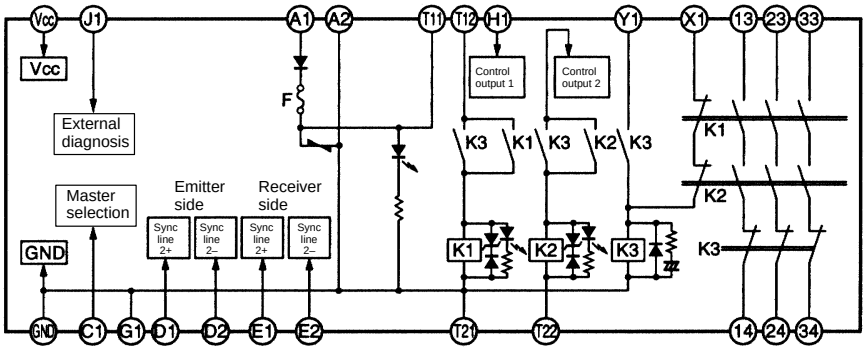






Installation

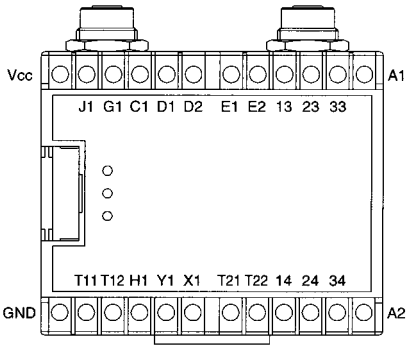
■ Internal Connections



■ Terminal Arrangement

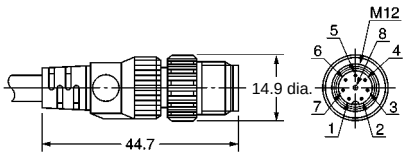
Emitter Connector
F3S-A□□□P-L

Receiver Connector
F3S-A□□□P-D



The pin arrangement at the Sensor is shown below.

Connector (Sensor End)



Signal number	Signal name	
	Receiver	Emitter
1	0 V	0 V
2	+24 V	+24 V
3	Sync line 2 (+)	Sync line 2 (+)
4	Sync line 2 (–)	Sync line 2 (–)
5	Control output 2	Master selection input
6	Control output 1	External diagnosis input
7	Sync line 1 (+)	Sync line 1 (+)
8	Sync line 1 (–)	Sync line 1 (–)

Precautions

Wiring

Turn OFF the G9SA before wiring the G9SA. Do not touch the terminals of the G9SA while the power is turned ON, because the terminals are charged and may cause an electric shock.

Use the following to wire the G9SA.
Stranded wire: 0.75 to 1.5 mm^2
Solid wire: 1.0 to 1.5 mm^2

Tighten each screw to a torque of 0.78 to 1.18 N • m, or the G9SA may malfunction or generate heat.

External inputs connected to H1 and T12 or T21 and T22 of the G9SA must be no-voltage contact inputs.

GND is a ground terminal.

When a machine is grounded at the positive, the GND terminal should not be grounded.

Power supplies for the Safety Light Curtains must satisfy all the conditions below.

- The power supply is connected to the F3S-A only and not to other devices or equipment.
- The power supply conforms to EMC directive (industrial environment).
- The power supply conforms to the Low-voltage Directive.
- The power supply uses double or reinforced insulation between the primary and secondary circuits.
- The power supply automatically resets overcurrent protection characteristics (voltage drop).
- The power supply maintains an output holding time of at least 20 ms.
- Use one of the following wiring configurations to reduce noise terminal voltage to the primary side or the power supply:
  - Connect the 0V line to PE (protective earth).
  - Mount a capacitor (e.g., metallized polyester capacitor) with a minimum 47-nF capacity and minimum 630-V voltage rating between the 0V line and PE.
- Recommended Power Supplies: S82K, S82J, S82F or S82F-P made by OMRON. For details refer to *Power Supply Selection Guide* (Cat. No. Y102).

Do not connect any device other than the F3S-A□□□P.

Be sure to mount both the emitter and the receiver in the correct position. (The Sensor will not operate it they are mounting in reverse.)

For further details on F3S-A installation, refer to *F3S-A Safety Light Curtain* (Cat. No. D081).

Applicable Safety Category (EN954-1)

The G9SA-300-SC meets the requirements of Safety Category 4 of the EN954-1 standards when it is used as shown in the examples provided by OMRON. The Relays may not meet the standards in some operating conditions.

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

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. J123-E1-1 **In the interest of product improvement, specifications are subject to change without notice.**

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