D40Z/D40A/G9SX-NS

SpeedSPEC www.sti.com D40

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Compact Non-contact Door Switch/ Flexible Safety Unit

D40Z

- Supports ISO 13849-1 (Safety Category 4/PLe). Can be used on higher risk level applications by connecting to Safety Controllers.
- Supports a wide range of applications in combination with Safety Controller G9SP or G9SX-NS☐.
- Up to 30 units can be connected to a single G9SX (15 units with G9SP) Controller and maintain Cat 4/PLe. Ideal for middle to large scale device applications.
- Troubleshooting is made easy with the switch's two-color diagnostic LED display patterns.
- Photocoupler monitor output allows connection to a general-purpose PLC (NPN type).
- Similar size as the D40A allows standardization of machine design.
- Compact non-contact door switch can be mounted from both sides.
- A Rapid Delivery Product: Select models are available for shipment today or within 3 to 5 days

D40A

- Stable operation reduces controller errors caused by unstable doors
- Connect up to 30 non-contact door switches with LED indicators to one controller
- Reversible switch provides flexibility in installation
- Two-color LED indicator enables easier maintenance by identification of door status and cable disconnections
- Safety category 3 (EN13849-1)
- Both non-contact door switches and conventional key-type safety-door switches can be input to one controller, saving space
- OFF-delay output provided for stop category 1
- Easily construct partial stop and complete stop systems with the logical AND connection function, using G9SX as the controller
- A Rapid Delivery Product: Select models are available for shipment today or within 3 to 5 days

D40Z

D40A

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Specifications

Ratings and Characteristics (Non-Contact Door Switches)

Item	Model	D40Z-1C□	D40A-1C□
Operating characteristics	Operating distance OFF ➔ ON	5 mm min. *1	
	Operating distance ON ➔ OFF	15 mm max. *1	
	Differential travel	Refer to "Detection Ranges"	
	Influence of temperature	Refer to "Detection Ranges"	±20% of operating distance at 23°C, within temperature range of -10 to 55°C
	Repeat accuracy	±10% of operating distance at 23°C	—
	Response time ON ➔ OFF *2	25 ms max.	—
	Operating time OFF ➔ ON *2	100 ms max. (Distance between the switch and actuator is 5 mm)	—
Ambient operating temperature		-10 to 65°C (with no icing or condensation)	-10 to 55°C (no icing or condensation)
Ambient operating humidity		25% to 85%	
Insulation resistance (between charged parts and case)		50 MΩ max. (at 500 VDC)	
Dielectric strength (between charged parts and case)		1,000 VAC for 1 min	
Degree of contamination		3	—
Dielectric strength (between charged parts and case)		—	1,000 VAC for 1 min
Electromagnetic compatibility		IEC/EN 60497-5-3 compliant	—
Vibration resistance		10 to 55 to 10 Hz (single amplitude: 0.75 mm, double amplitude: 1.5 mm)	
Shock resistance		300 m/s² min.	
Degree of protection		IP67	
Material		PBT resin	
Mounting method		M4 screws	
Terminal screw tightening torque		1 N·m	
Power supply voltage		24 VDC +10%/-15%	
Power consumption *3		0.5 W max.	0.6 W max.
Auxiliary monitoring output		Photocoupler output: 24 VDC, load current: 10 mA	24 VDC, 10 mA (PNP open-collector outputs) *4
LED indicators		Actuator not detected (lights in red); error occurred (blinks in red), actuator detected (lights in yellow), actuator detected and Non-contact Door Switch input OFF (blinks in yellow)	Actuator not detected (red); actuator detected (yellow)
Connecting cables		2 m, 5 m	
Number of connectable switches *5		30 max. (wiring length: 100 m max.)	
Weight		Switch: approx. 175 g, actuator: approx. 20 g (D40Z-1C5)	Switch: approx. 145 g, actuator: approx. 20 g (D40A-1C2)

*1. This is the distance where the switch operates from OFF to ON when approaching and the distance where the switch operates from ON to OFF when separating when the switch and actuator target marks are on the same axis, and the sensing surface coincide.

*2. Indicates the value of the non-contact door switch output.

*3. Power to be provided to the load is not included.

*4. Turns ON when the actuator is approaching. The G3R series of the SSR can be driven at an auxiliary output of 10 mA. Contact your Omron representative for details.

*5. For details, contact factory.

Specifications (continued)

Ratings (Non-contact Door Switch Controllers)

Power Inputs

Item	G9SX-NS202-□	G9SX-NSA222-T03-□	G9SX-EX-□
Rated supply voltage	24 V DC		
Operating voltage range	-15% to 10% of rated supply voltage		
Rated power consumption *	3 W max.	4 W max.	2 W max.

* Power consumption of loads not included.

Inputs

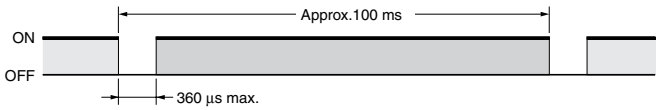
Item	G9SX-NS202-□/G9SX-NSA222-T03-□
Safety input *	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: approx. 2.8 kW
Feedback/reset input	

* Only applies to the G9SX-NSA222-T03-□. Refers to input other than that from the Non-contact Door Switch.

Outputs

Item	G9SX-NS202-□/G9SX-NSA222-T03-□
Instantaneous safety output *1 OFF-delayed safety output *1	P channel MOS FET transistor output Load current: 0.8 A DC max. *2
Auxiliary output	PNP transistor output Load current: 100 mA max.

*1. While safety outputs are in the ON state, the following signal sequence is output continuously for diagnosis.
When using the safety outputs as input signals to control devices (i.e. Programmable Controllers), consider the OFF pulse shown below.



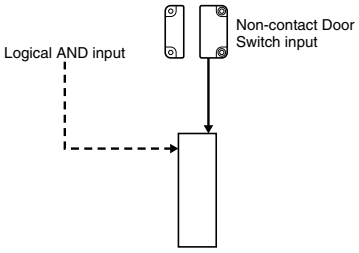
*2. The following derating is required when Units are mounted side-by-side. G9SX-NS202-□/G9SX-NSA222-T03-□: 0.4 A max. load current

Expansion Unit

Item	G9SX-EX-□
Rated load	250 VAC, 3 A/30 VDC, 3 A (resistive load)
Rated carry current	3 A
Maximum switching voltage	250 VAC, 125 VDC

Response Time and Operating Time

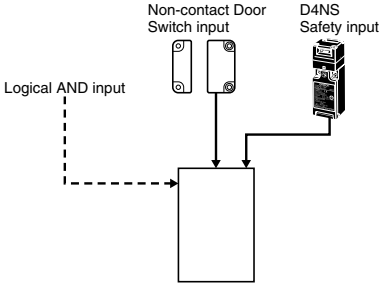
G9SX-NS□



	Max. response time (excluding Expansion Units) *1	Max. operating time (excluding Expansion Units) *2
Non-contact door switch input	45 ms *3	200 ms *4
Logical AND input	15 ms	100 ms

*1. The maximum response time is the time it takes the output to switch from ON to OFF after the input switches from ON to OFF.
*2. The maximum operating time is the time it takes the output to switch from OFF to ON after the input switches from OFF to ON.
*3. The value is the sum of D40Z's response time and G9SX-NS□'s response time.
*4. The value is the sum of D40Z's operating time and G9SX-NS□'s operating time.

G9SX-NSA□



	Max. response time (excluding Expansion Units) *1	Max. operating time (excluding Expansion Units) *2
Non-contact door switch input	45 ms *3	200 ms *4
Safety inputs	15 ms	50 ms
Logical AND input	15 ms	100 ms

*1. The maximum response time is the time it takes the output to switch from ON to OFF after the input switches from ON to OFF.
*2. The maximum operating time is the time it takes the output to switch from OFF to ON after the input switches from OFF to ON.
*3. The value is the sum of D40Z's response time and G9SX-NSA□'s response time.
*4. The value is the sum of D40Z's operating time and G9SX-NSA□'s operating time.

Note: The response time and operating time on the G9SP varies depending on the cycle time. For details, contact factory.

Specifications (continued)

Characteristics

Item		G9SX-NS202-☐	G9SX-NSA222-T03-☐	G9SX-EX-☐
Over-voltage category (IEC/EN 60664-1)		II		II (Relay outputs 13 to 43 and 14 to 44: III)
Operating time (OFF to ON state) *1		100 ms max. (Logical AND connection input ON and Non-contact Door Switch input ON)	50 ms max. (Safety input: ON) *2 100 ms max. (Logical AND connection input ON and Non-contact Door Switch input ON) *3	30 ms max. *4
Response time (ON to OFF state) *1		15 ms max. (Logical AND connection input: OFF) 20 ms max. (Non-contact Door Switch input OFF) *6	15 ms max. (Safety input OFF and logical AND connection input OFF) 20 ms max. (Non-contact Door Switch input: OFF) *6	10 ms max. *4
ON-state residual voltage		3.0 V max. (safety output, auxiliary output)		
OFF-state leakage current		0.1 mA max. (safety output, auxiliary output)		
Maximum wiring length of safety input, logical AND connection input, and Non-contact Door Switch input		100 m max. (External connection impedance: 100 Ω max. and 10 nF max.)		
Reset input time (Reset button pressing time)		100 ms min.		
Accuracy of OFF-delay time *5		---	Within ±5% of the set value	Within ±5% of the set value
Insulation resistance	Between logical AND connection terminals, and power supply input terminals and other input and output terminals connected together	20 MΩ min. (at 100 VDC)		---
	Between all terminals connected together and DIN rail			100 MΩ min. (at 500 VDC)
Dielectric strength	Between logical AND connection terminals, and power supply input terminals and other input and output terminals connected together	500 VAC for 1 min.		---
	Between all terminals connected together and DIN rail			1,200 VAC for 1 min
	Between different poles of outputs	---		
	Between relay outputs connected together and other terminals connected together			2,200 VAC for 1 min
Vibration resistance		10 to 55 to 10 Hz, 0.375 mm single amplitude (0.75 mm double amplitude)		
Shock resistance	Destruction	300 m/s²		
	Malfunction	100 m/s²		
Durability	Electrical	---		100,000 cycles min. rated load, switching frequency: 1,800 cycles/hour)
	Mechanical	---		5,000,000 cycles min. (switching frequency: 7,200 cycles/hour)
Ambient operating temperature		-10 to 55°C (no icing or condensation)		
Ambient operating humidity		25% to 85%		
Terminal tightening torque		0.5 N·m (For the G9SX-NS☐-RT (with screw terminals) only)		
Weight		Approx. 125 g	Approx. 200 g	Approx. 165 g

*1. When two or more Units are connected by logical AND, the operating time and response time are the sum total of the operating times and response times, respectively, of all the Units connected by logical AND.
*2. Represents the operating time when the safety input turns ON with all other conditions set.
*3. Represents the operating time when the logical AND input and the Non-contact Door Switch input turn ON with all other conditions set.
*4. This does not include the operating time or response time of G9SX-NS☐ that are connected.
*5. This does not include the operating time or response time of internal relays in the G9SX-EX-☐.
*6. The failure detection time for 24 V short-circuit failure on the input to Non-contact Door Switches is 35 ms max.
If using the Switch for an application other than as a Door Switch, calculate the safe distance using a failure detection time of 35 ms.

Specifications (continued)

Cable with Connector

Ratings and Characteristics

Rated current	3 A
Rated voltage	For DC 125 VDC, for AC 250 VAC
Contact resistance (Connector)	40 mΩ max. (20 mV max., 100 mA max.)
Insulation resistance	1,000 mΩ min (at 500 VDC)
Dielectric strength (Connector)	1,500 VAC for 1 min (leakage current 1 mA max.)
Degree of protection	IP67 (IEC529)
Insertion tolerance	200 times min.
Assembled fixture strength	Tensile: 98 N/15 s Torsion: 0.98 N m/15 s
Cable holding strength	Cable diameter: 6 mm 98 N/15 s
Ambient operating temp range	Operating: -25°C to 70°C
Ambient humidity range	20% to 80%

Materials and Finish

Item		XS2F/H/W
Contacts	Materials	Phosphor bronze
	Finish	Nickel base, 0.4-µm gold plating
Thread bracket	Materials	Brass
	Finish	Nickel plated
Pin block	Materials	PBT resin (UL94V-0)
	Finish	For DC: light gray; for AC: dark gray
O-ring/rubber bushing		Rubber
Cover		PBT resin (UL94V-0)

Logical AND Connection

Item	G9SX-NS202-☐	G9SX-NSA222-T03-☐	G9SX-EX-☐
Number of Units connected per logical AND output	4 Units max.		---
Total number of Units connected by logical AND *1	20 Units max.		---
Number of Units connected in series by logical AND	5 Units max.		---
Max. number of Expansion Units connected *2	---		5 Units max.
Maximum cable length for logical AND input	100 m max.		---

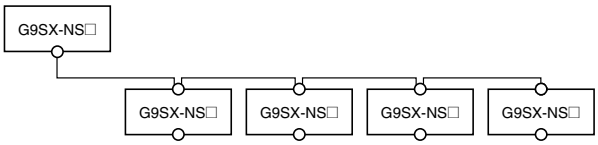
Note: See Logical AND Connection Combinations below for details.

*1. The number of G9SX-EX401-☐ Expansion Units or G9SX-EX041-T-☐ Expansion Units (OFF-delayed Model) not included.

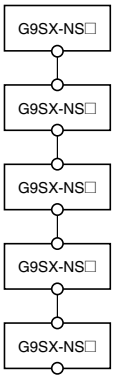
*2. G9SX-EX401-☐ Expansion Units and G9SX-EX041-T-☐ Expansion Units (OFF-delayed Model) can be mixed.

Logical AND Connection Combinations

1. One logical AND connection output from a G9SX-NS☐ Controller can be logical AND connected to up to four Controllers.

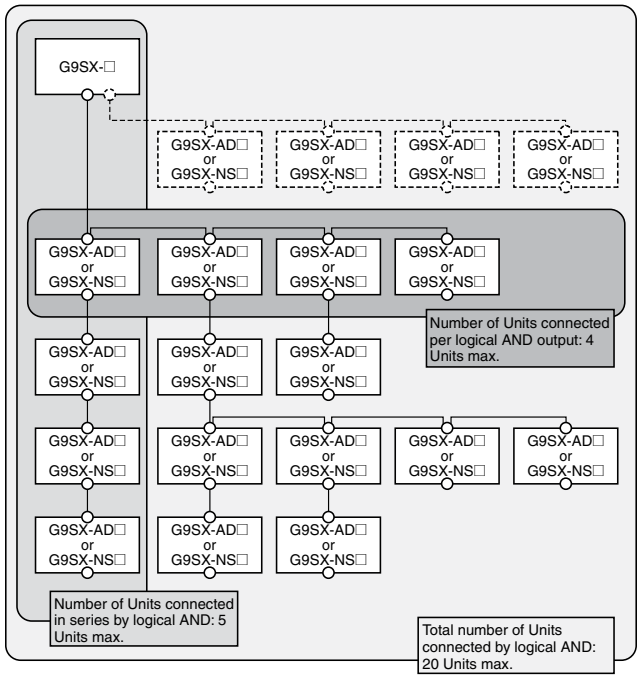


2. Any G9SX-NS☐ Controller that receives a logical AND connection input can be logically connected to other Controllers on up to five layers.



Note: The G9SX-NS☐ in the above diagram can be replaced by the G9SX-AD☐ Advanced Unit.

3. The largest possible system configuration contains a total of 20 G9SX-NS☐ Controllers, G9SX-AD☐ Advanced Units, and G9SX-BC Basic Units. In this configuration, each Controller or Advanced Unit can have up to five Expansion Units.



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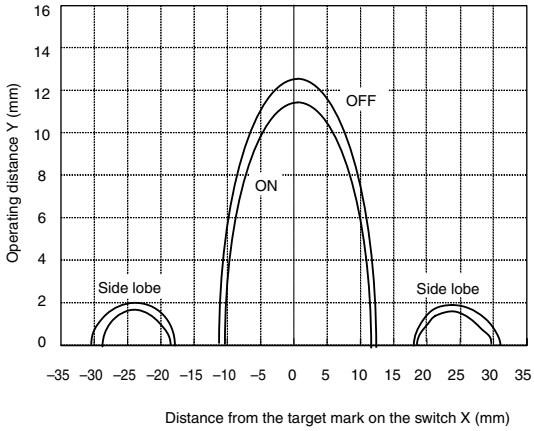
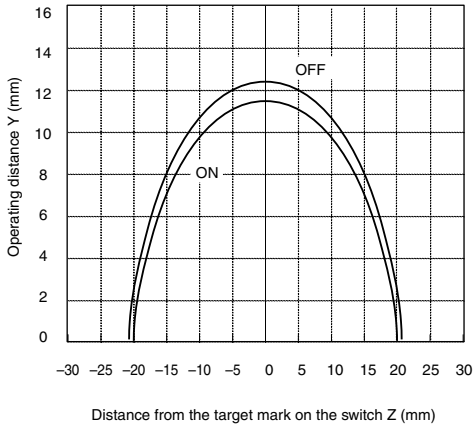
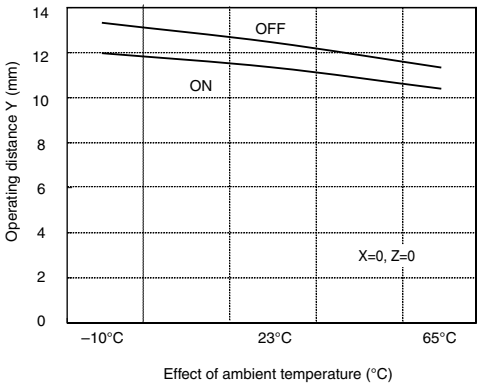
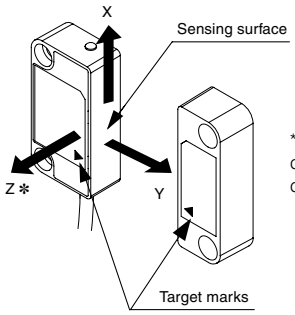
Engineering Data

D40Z Detection Ranges (Typical Characteristics Data)





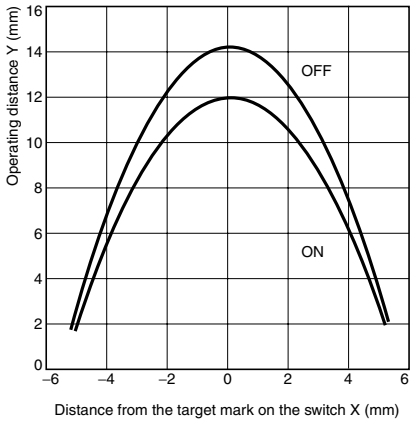


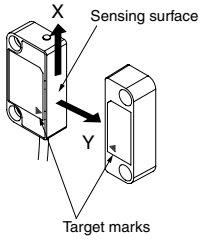


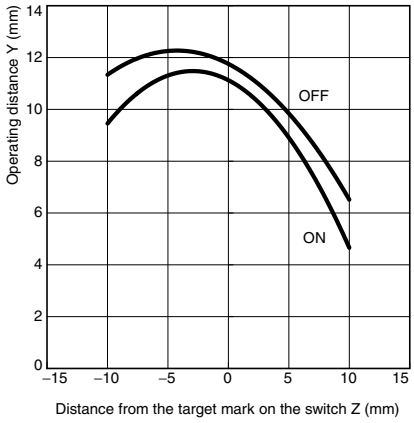
*The movement of the arrow direction indicates the positive direction on the graph.

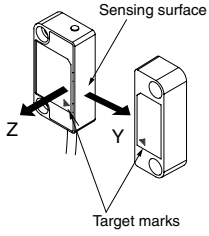
Notes:
1. The operating distance is the distance between the switch and actuator sensing surfaces.
2. Data in the diagram is typical data at an ambient temperature of 23°C. Actual operating values may vary. The operating distance may be affected by ambient metal, magnet catches, and temperature.
3. Detection may occur other than on the detection surfaces of the switch and actuator. Before you use the switch and actuator, refer to manual to set the detection surfaces of the switch and actuator face to face.

D40A Detection Ranges (Typical Characteristics Data)







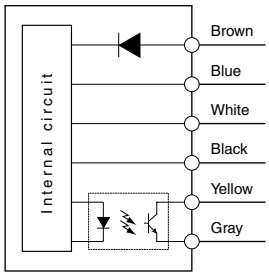


Notes: 1. The operating distance is the distance between the switch and actuator sensing surfaces.
2. Data in the diagram is typical data at an ambient temperature of 23°C. Actual operating values may vary. The operating distance may be affected by ambient metal, magnet catches, and temperature.

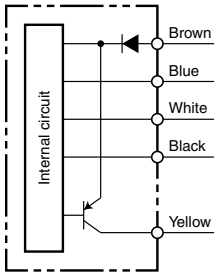
Connections

Internal Connections

D40Z-1C□

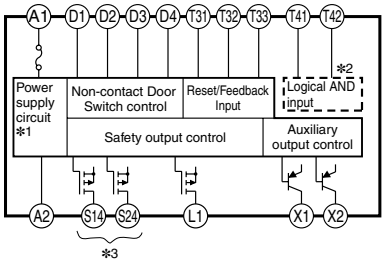


D40A-1C□



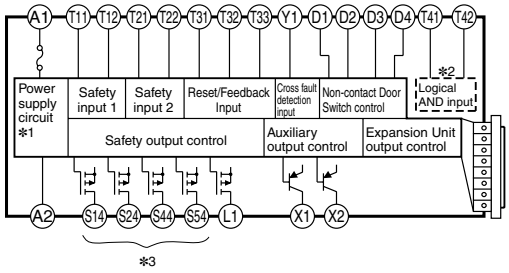
G9SX-NS202-□ (Non-contact Door Switch Controller)

*1. Internal power supply circuit is not isolated.
*2. Logical AND input is isolated.
*3. Outputs S14 to S24 are internally redundant.



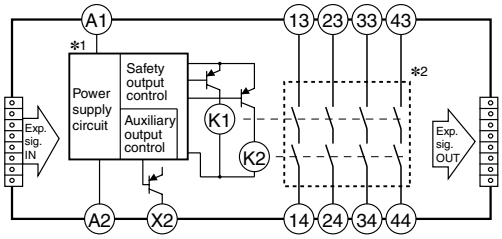
G9SX-NSA222-T03-□
(Non-contact Door Switch Controller)

*1. Internal power supply circuit is not isolated.
*2. Logical AND input is isolated.
*3. Outputs S14 to S54 are internally redundant.



G9SX-EX401-□/G9SX-EX041-T-□
(Expansion Unit/Expansion Unit OFF-delayed Model)

*1. Internal power supply circuit is not isolated.
*2. Relay outputs are isolated.



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D40Z Troubleshooting

LED indicator	Causes and corrective actions *1	
● OFF	Fault in power supply input (brown/blue)	Power supply input may be improperly wired. Check and correct wiring of brown and blue lines.
		Power supply voltage to D40Z may be insufficient. Check the power supply voltage (between brown and blue lines) of D40Z fills ratings.
		The wiring length or size of the wire may not be to the specification. Check the wiring length and size of the wire..
☼ Red continuously blinking	Noise or D40Z failure	There may be excessive noise. Check and correct ambient noise environment.
		There may be a failure in internal circuit. Replace with a new D40Z.
	Fault in power supply input (brown/blue)	Power supply voltage to D40Z may be insufficient.t Check the power supply voltage (between brown and blue cables) of D40Z fills ratings..
		The wiring length or size of the wire may not be to the specification. Check the wiring length and size of the wire.
☼ Red blinks once for 2s	Fault in Non-contact door switch output (black)	Black line may be shorted to other line. Check and correct wiring of black line if the black line is shorted to other lines..
☼ Red blinks twice for 2s	Sensing fault	Invalid actuator may be in a close range to switch. Use the dedicated actuator.
☼ Red blinks thrice for 2s	Fault in Non-contact door switch input (white)	Faulty signal may be input to white line. Check and correct wiring of white line.
☼ Yellow blinking	OFF state of another D40Z	Another D40Z may be in OFF state. Check status of another D40Z connected to the white line and the wiring.
	Fault in Non-contact door switch input (white)	White line may be disconnected. Check and correct wiring of white line..
○ Red Solid-ON *2	Actuator fault	There may be a failure in actuator. Replace with a new D40Z.
○ Yellow Solid-ON *3	Fault in Non-contact door switch input (white)	White line connected to D1 terminal (test output terminal of G9SP) of G9SX-NS☐ may be shorted to other line. Check and correct wiring of white line connected to D1 terminal (test output terminal of G9SP) of G9SX-NS☐ if the white line is shorted to other lines.
	Fault in Non-contact door switch output (black)	Black line connected to D2 terminal (safety input terminal of G9SP) of G9SX-NS☐ may be disconnected. Check and correct wiring of black line connected to D2 terminal (safety input terminal of G9SP) of G9SX-NS☐.

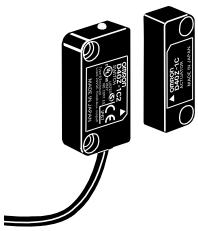
*1. Another possible cause is a failure in internal circuit. In this case, replace with a new D40Z. Yet another possible cause is excessive noise. In this case, check and correct ambient noise environment.
*2. The case where the guard door is closed (Switch detects actuator) is indicated.
*3. The case where the system stops though the guard door is closed (Switch detects actuator) is indicated.

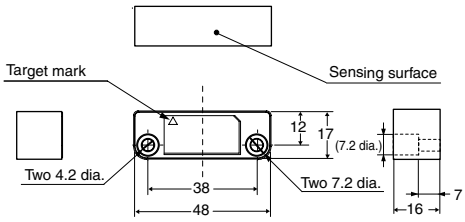
Dimensions and Wiring

(mm)

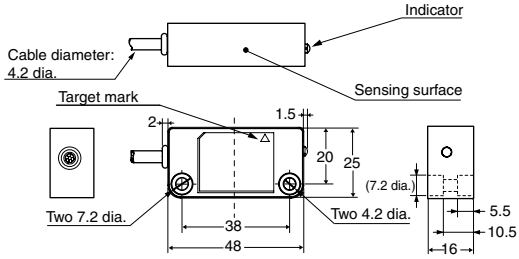
Non-contact Door Switch (Switch/Actuator)

D40Z-1C2
D40Z-1C5





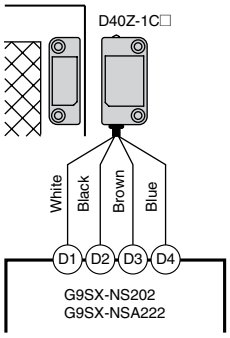
(Actuator)



(Switch)

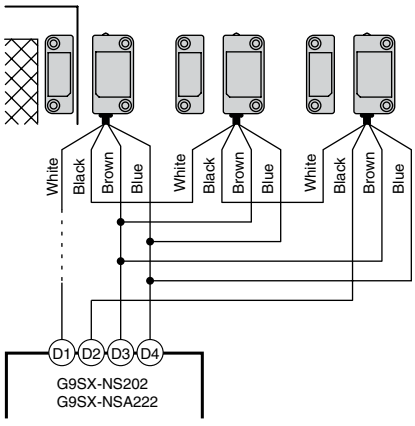
Non-contact Door Switch and Non-contact Door Switch Controller or Safety Controller Wiring

Example of connection to G9SX-NS@ (Single connection)

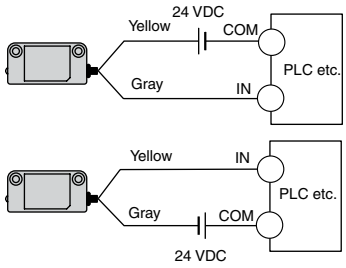


Example of connection to multiple switches

Connect up to 30 non-contact door switches.



Example of auxiliary outputs



Note:
1. The auxiliary output load current must be 10 mA max.
   Wrong connection may lead to a failure of the auxiliary output circuit.
2. For details on other wiring, refer to Application Examples.

Wiring of Inputs and Outputs

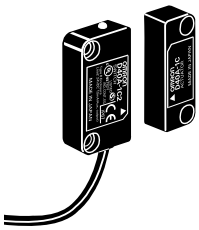
Signal name		Cable color	Description of operation
Non-contact Door Switch power supply input	+	Brown	Supplies power to the D40Z.
	-	Blue	
Non-contact door switch input		White	To set non-contact door switch output in ON state, non-contact door switch signal input must be in ON state.
Non-contact door switch output		Black	Output status depends on statuses of actuator and non-contact door switch signal input.
Auxiliary monitoring output		Yellow	Output status depends on status of actuator. When a fault is detected, turns into OFF state regardless of actuator status.
		Gray	

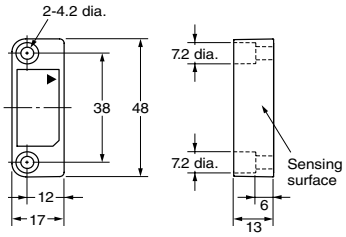
Dimensions and Wiring (continued)

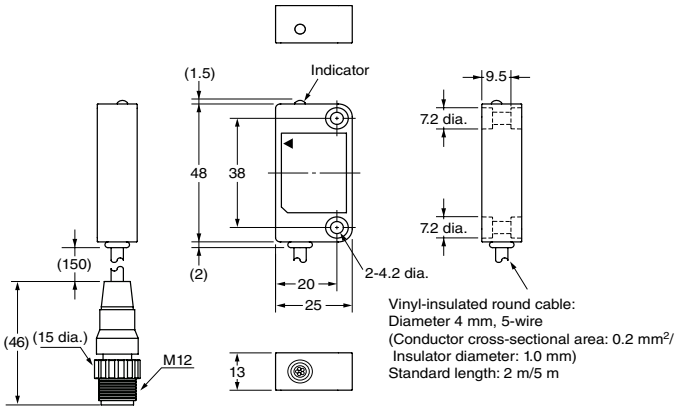
(mm)

Non-contact Door Switch (Switch/Actuator)

D40A-1C2
D40A-1C5
D40A-1C015-F



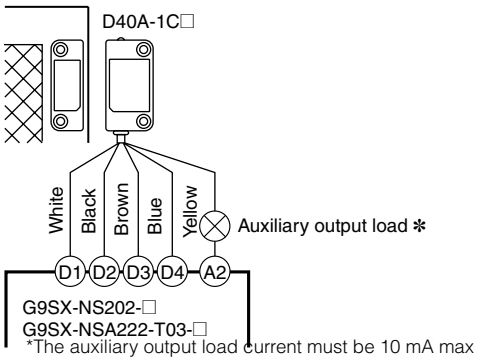




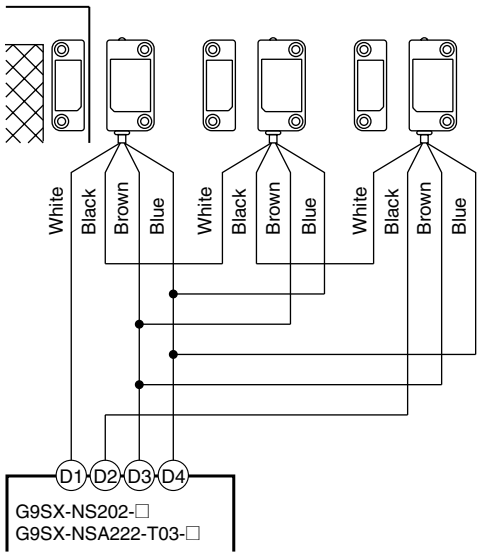
G

Non-contact Door Switch and Non-contact Door Switch Controller Wiring

Example: Wiring a Single Switch

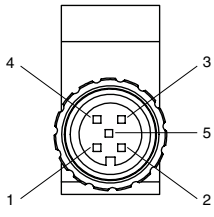


Example: Wiring Multiple Switches



Wiring of Inputs and Outputs

Signal name	Wire color	Pin No.	Description of operation
Non-contact Door Switch power supply input	Brown	1	Supplies power to the D40A. Connect to the D3 and D4 terminal of the G9SX-NS□.
	Blue	3	
Non-contact Door Switch input	White	2	Inputs signals from the G9SX-NS□. The Non-contact Door Switch input must be ON as a required condition for the Non-contact Door Switch output to be ON.
Non-contact Door Switch output	Black	4	Turns ON and OFF according to actuator detection and the status of the Non-contact Door Switch input.
Auxiliary output	Yellow	5	Turns ON when actuator is detected.



Select models are available for Rapid Delivery.

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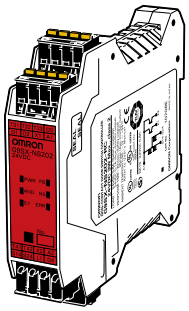
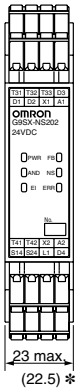
Dimensions and Wiring (continued)

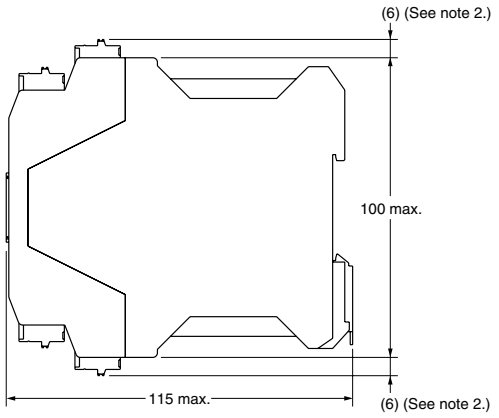
(mm)

Non-contact Door Switch Controller

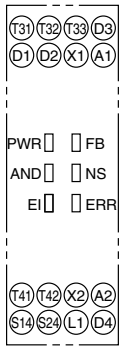
G9SX-NS202-□







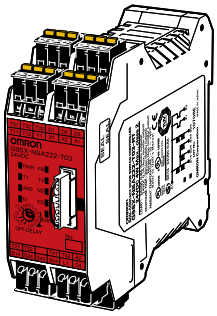
Terminal arrangement

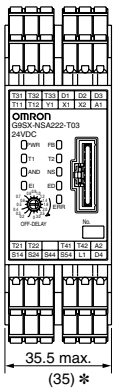


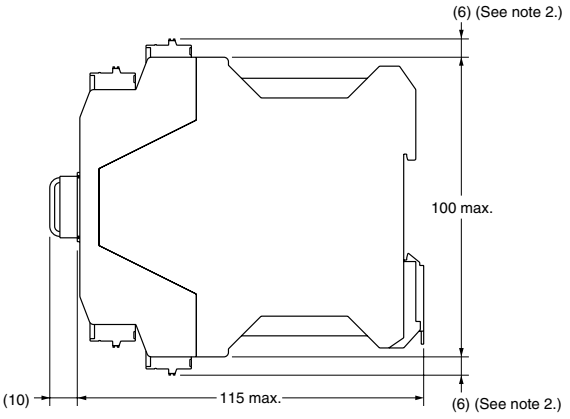
Notes: 1. Above outline drawing is for models with spring-cage terminals (-RC).
2. For models with spring-cage terminals (-RC) only.
*Typical dimension

Non-contact Door Switch Controller

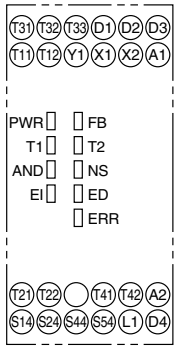
G9SX-NSA222-T03-□







Terminal arrangement



Notes: 1. Above outline drawing is for models with spring-cage terminals (-RC).
2. For models with spring-cage terminals (-RC) only.
*Typical dimension

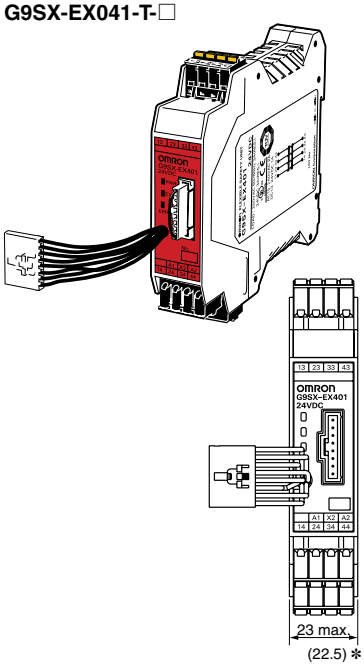
G

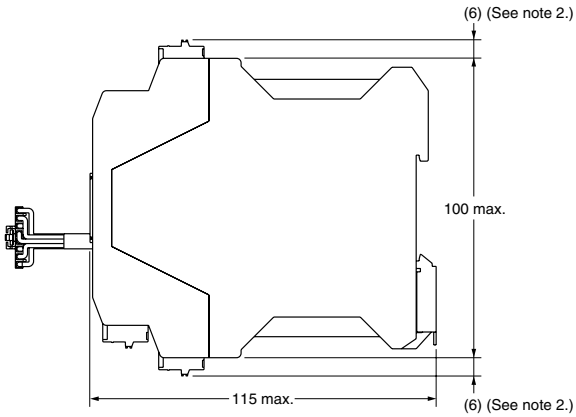
Dimensions and Wiring (continued)

(mm)

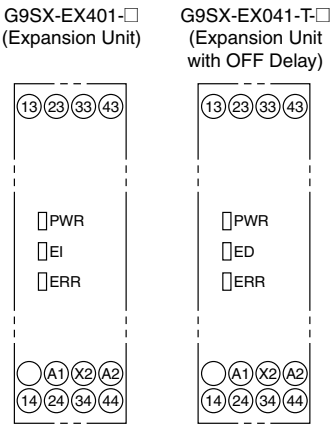
Expansion Unit

G9SX-EX401-□
Expansion Unit (OFF-delayed Model)
G9SX-EX041-T-□





Terminal arrangement

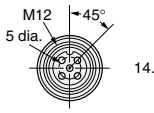


Notes: 1. Above outline drawing is for models with spring-cage terminals (-RC).
2. For models with spring-cage terminals (-RC) only.
*Typical dimension

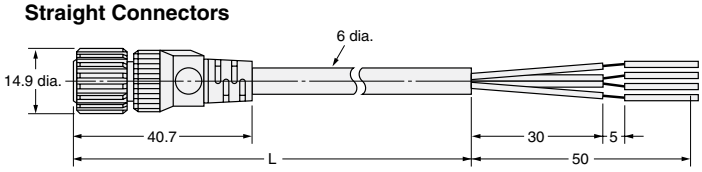
Accessories (sold separately)

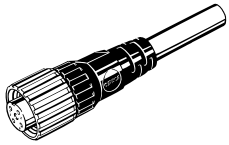
Socket on One Cable End (5-Pole Connectors)

XS2F-D521-DG0-A (L = 2 m)
XS2F-D521-GG0-A (L = 5 m)
XS2F-D521-JG0-A (L = 10 m)
XS2F-D521-KG0-A (L = 15 m)
XS2F-D521-LG0-A (L = 20 m)

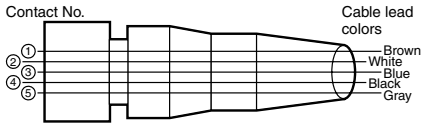


Straight Connectors

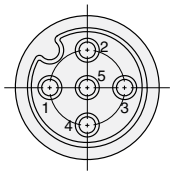




Wiring Diagram

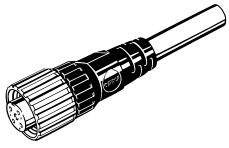


Pin Arrangements (Engagement Side)

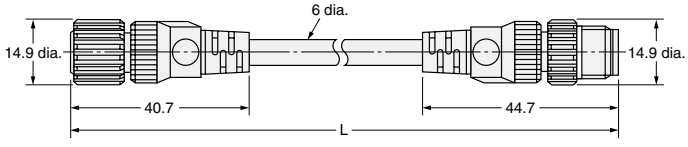


Socket and Plugs on Cable Ends (5-Pole Connectors)

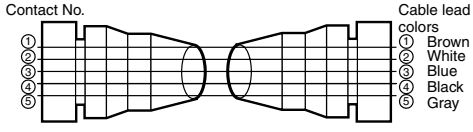
XS2W-D521-DG1-A (L = 2 m)
XS2W-D521-GG1-A (L = 5 m)
XS2W-D521-JG1-A (L = 10 m)
XS2W-D521-KG1-A (L = 15 m)
XS2W-D521-LG1-A (L = 20 m)



Straight/Straight Connectors



Wiring Diagram for 5 Cores



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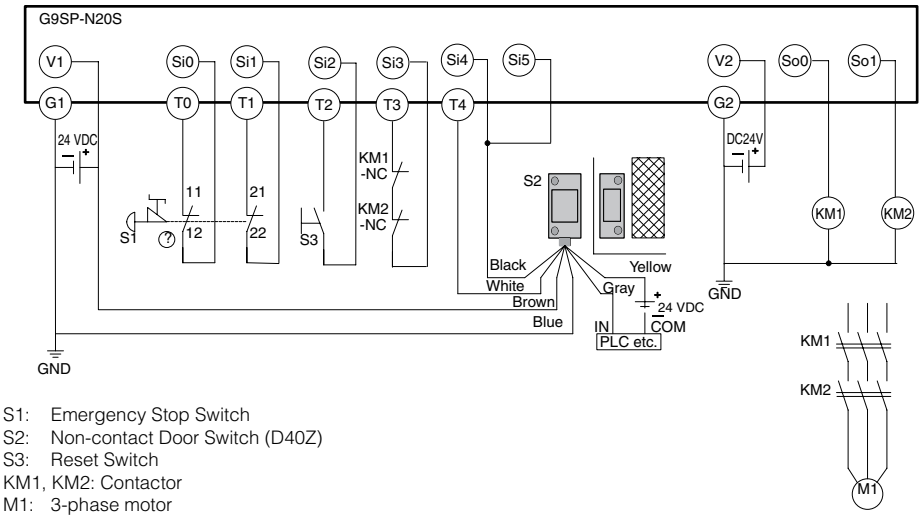
Application Examples

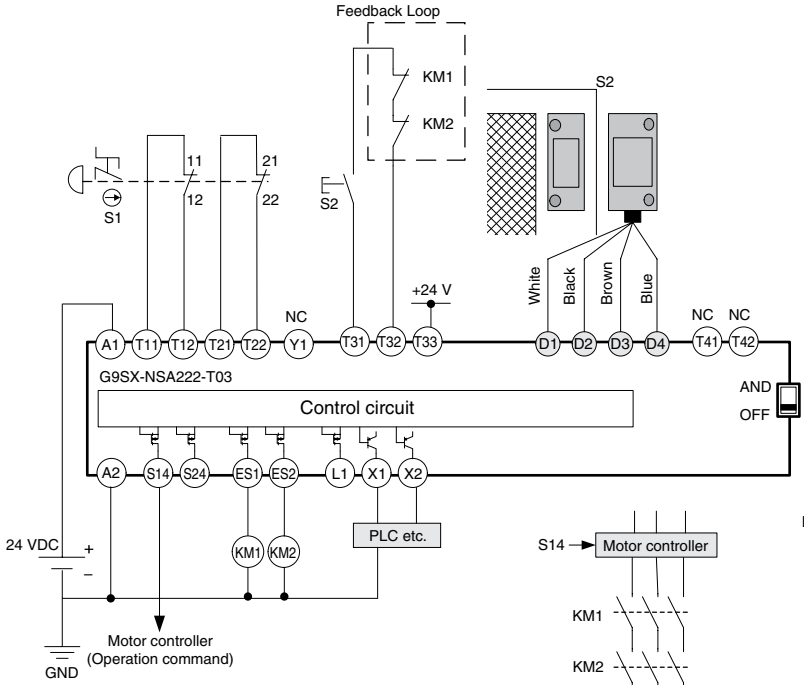
G9SP-N20S (24 VDC)
(2-channel Emergency Stop Switch Inputs + Non-contact Door Switch/Manual Reset)



S1: Emergency Stop Switch
S2: Non-contact Door Switch (D40Z)
S3: Reset Switch
KM1, KM2: Contactor
M1: 3-phase motor

Notes:
1. The PL and category that correspond to this circuit example vary depending on the program configured to the G9SP-N20S. For details, refer to the G9SP Series User's Manual.
2. For details on terminal arrangement, refer to G9SP Series User's Manual.
3. Wire auxiliary outputs correctly. Incorrect wiring may lead to a failure of the auxiliary output circuit.

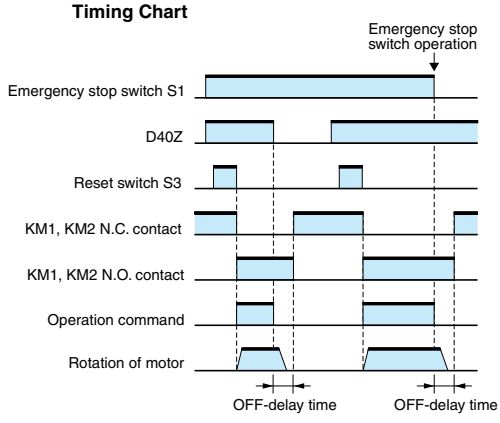
G9SX-NSA222-T03-□ (24 VDC)
(2-channel Emergency Stop Switch Inputs + Non-contact Door Switch/Manual Reset)



S1: Emergency Stop Switch
S2: Non-contact Door Switch (D40Z)
S3: Reset Switch
KM1, KM2: Contactor
M1: 3-phase motor

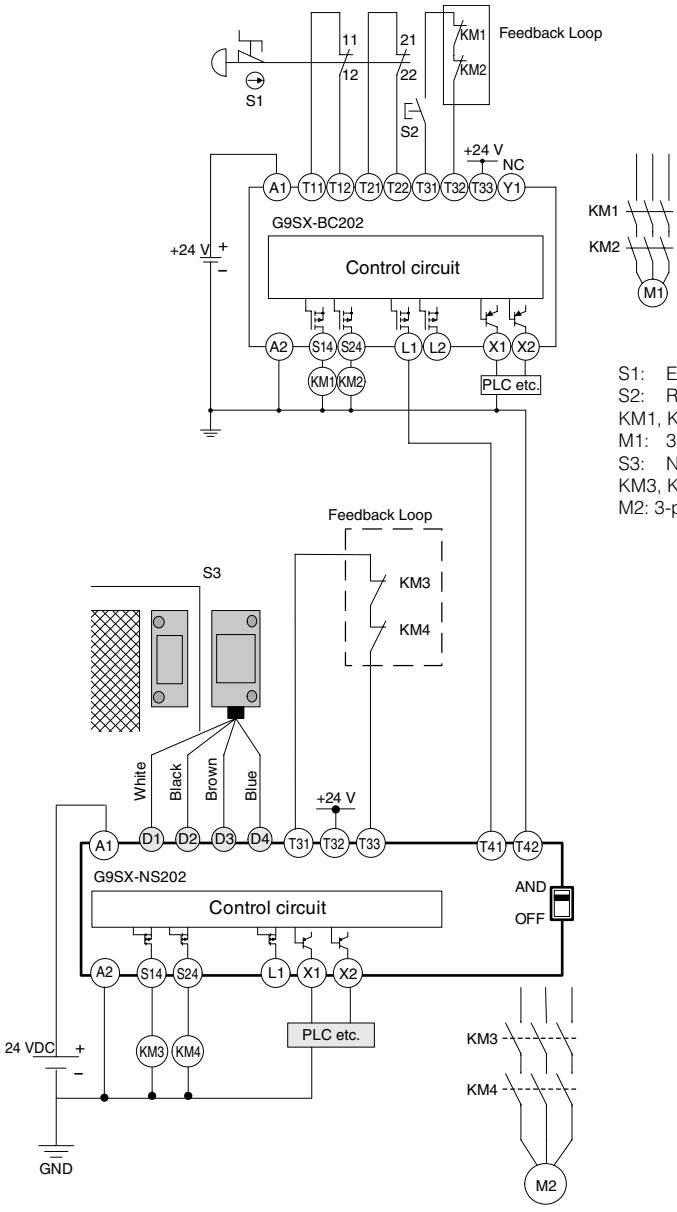
Notes: 1. This example corresponds to category 4.
2. For details, contact factory.

Timing Chart



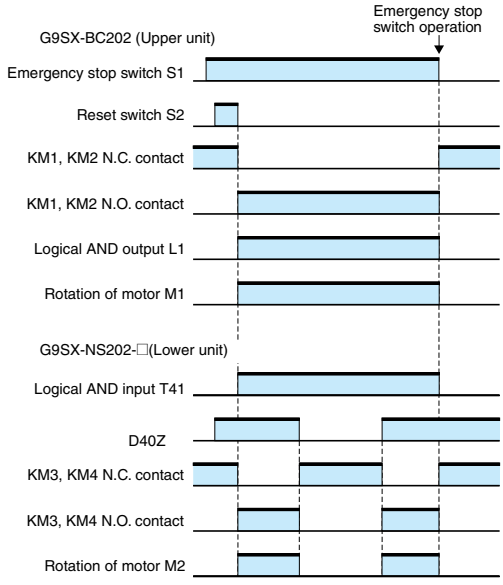
Application Examples (continued)

G9SX-BC202 (24 VDC) (2-channel Emergency Stop Switch Inputs/Manual Reset) + G9SX-NS202-□ (24 VDC) (Non-contact Door Switch/Auto Reset)



S1: Emergency Stop Switch
S2: Reset switch
KM1, KM2: Contactor
M1: 3-phase motor
S3: Non-contact Door Switch (D40Z)
KM3, KM4: Contactor
M2: 3-phase motor

Timing Chart



Notes: 1. This example corresponds to category 4.
2. For details, contact factory.

Ordering

Model Number Structure

D40Z
Non-Contact Door Switch (Switch/Actuator)

D40Z – ☐ ☐ ☐
❶ ❷ ❸

❶ Type
1: Standard model (Switch/Actuator)

❷ Auxiliary Outputs
C: 1 NO (Photocoupler output)

❸ Cable Length
2: 2 m
5: 5 m

Note: Must be used in combination with a G9SP Safety Controller or G9SX-NS☐ Non-Contact Door Switch Controller.

D40A
Non-Contact Door Switch (Switch/Actuator)

D40A – ☐ ☐ ☐
❶ ❷ ❸

❶ Type
1: Standard model

❷ Auxiliary Outputs
C: 1NO (PNP transistor output)

❸ Cable Length
2: 2 m
5: 5 m
015-F: connector (cable length 0.15 m)

G9SX
Non-Contact Door Switch Controller

G9SX – ☐ ☐ ☐ ☐ – ☐ ☐
❶ ❷ ❸ ❹ ❺ ❻

❶ Functions
NS/NSA: D40A Controller
EX: Expansion Unit

❷ Output Configuration (Instantaneous Safety Outputs)
2: 2 outputs
4: 4 outputs

❸ Output Configuration (OFF-delayed Safety Outputs)
0: None
2: 2 outputs

❹ Output Configuration (Auxiliary Outputs)
1: 1 output
2: 2 outputs

❺ Max. OFF-delay Time
D40A Controller
T03: 3 s (variable)
Expansion Unit
Blank: No OFF delay
T: OFF delay

❻ Terminal Block Type
RT: Screw terminals
RC: Spring-cage terminal

For information on the G9SP Safety Controller, see page K4.

G

Ordering (continued)

List of Models

D40Z Non-Contact Door Switches (Switch/Actuator)*1

Classification	Appearance	Auxiliary outputs	Cable length	Model
Standard models		Photocoupler outputs *2	2 m	D40Z-1C2
			5 m	D40Z-1C5
Switch only		---	2 m	D40Z-1C2-S
		---	5 m	D40Z-1C5-S
Actuator only		---	---	D40Z-1CA

Note: Must be used in combination with a G9SP Safety Controller or a G9SX-NS☐ Non-contact Door Switch Contact Controller.

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D40A Non-Contact Door Switches (Switch/Actuator)*3

Classification	Appearance	Auxiliary outputs	Cable length	Model
Standard models *4		Semiconductor outputs *5	2 m	D40A-1C2
			5 m	D40A-1C5
Connector model			0.15 m	D40A-1C015-F

Note: Must be used in combination with a G9SX-NS☐ Non-contact Door Switch Controller or a G9SP safety controller.

Cable with Connector

Connector Type	Cable Length	Model	Packing Unit
Single End	2 m	XS2F-D521-DG0-A	5
	5 m	XS2F-D521-GG0-A	5
	10 m	XS2F-D521-JG0-A	1
	15 m	XS2F-D521-KG0-A	1
	20 m	XS2F-D521-LG0-A	1

Connector Type	Cable Length	Model	Packing Unit
Double End	2 m	XS2W-D521-DG1-A	5
	5 m	XS2W-D521-GG1-A	5
	10 m	XS2W-D521-JG1-A	1
	15 m	XS2W-D521-KG1-A	1
	20 m	XS2W-D521-LG1-A	1

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Ordering (continued)

List of Models (continued)

G9SX-NS□ Series

Safety outputs *6		Auxiliary monitoring output *8	Logical AND connection input	Logical AND connection output	OFF-delayed Max. OFF-delay time *9	Rated voltage	Terminal block type	Model
Instantaneous	OFF-delayed *7							
2 (Semi-conductors)	0	2 (Semi-conductors)	1	1	---	24 VDC	Screw terminals	G9SX-NS202-RT
							Spring-cage terminals	G9SX-NS202-RC
	2 (Semi-conductors)				3.0 s		Screw terminals	G9SX-NSA222-T03-RT
							Spring-cage terminals	G9SX-NSA222-T03-RC

G9SX-EX Expansion Units

Safety outputs		Auxiliary outputs	OFF-delay time	Rated voltage	Terminal block type	Model
Instantaneous	OFF-delayed					
4PST-NO	---	1 (Semi-conductor) *8	---	24 VDC	Screw terminals	G9SX-EX401-RT
					Spring-cage terminals	G9SX-EX401-RC
---	4PST-NO		*10		Screw terminals	G9SX-EX041-T-RT
					Spring-cage terminals	G9SX-EX041-T-RC

G9SP Series

Name	No. of I/O Points				Unit Version	Model
	Safety Inputs	Test Outputs	Safety Outputs	Standard Outputs		
Safety Controller	10	4	Semiconductor outputs: 4	4	Ver. 1.0	G9SP-N10S
	10	6	Semiconductor outputs: 16	—		G9SP-N10D
	20	6	Semiconductor outputs: 8	—		G9SP-N20S

*1. Must be used in combination with a G9SP Safety Controller or a G9SX-NS□ Non-contact Door Switch Contact Controller.
*2. Photocoupler output. Load current: 10 mA
*3. Must be used in combination with a G9SX-NS□ Non-contact Door Switch Controller.
*4. Contact factory for the connector models.
*5. PNP open-collector semiconductor output.
*6. P channel MOS FET transitor output.
*7. The OFF-delayed output becomes an instantaneous output by setting the OFF-delay time to 0 s.
*8. PNP transistor output
*9. The OFF-delay time can be set in 16 steps as follows: 0/0.2/0.3/0.4/0.5/0.6/0.7/0.8/0.9/1.0/1.2/1.4/1.8/2.0/2.5/3.0 s
*10. The OFF-delay time is synchronized to the OFF-delay time setting in the connected Controller (G9SX-NSA222-T03-□).