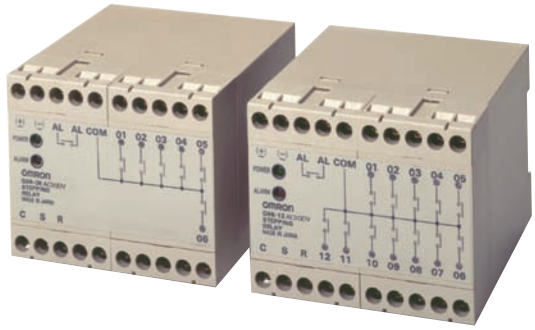
Stepping Relay Unit

G9B

CSM_G9B_DS_E_4_1

Ideal for Controlling Pumps and Production Lines with Six or Twelve Stepping Circuits



- Built-in relays switch 2 A at 250 VAC or 30 VDC.
- Initialization of stepping with reset input.
- Uses memory that stores setting status for 10 days without power. All internal contacts are released when no power is supplied.
- Detects an internal element malfunction caused by external noise, indicates the malfunction with an alarm indicator, and turns the relay alarm output ON. (An internal relay malfunction or internal relay contact weld cannot be detected.)
- With safety-design terminals which prevent electric shock accidents.
- With easy-to-see indicators which display the stepping status.

Refer to *Safety Precautions for All Relays*.

Ordering Information

When your order, specify the rated voltage.

No. of steps	Model	Rated voltage
6	G9B-06	24 VDC
		100 VAC
		200 VAC
12	G9B-12	24 VDC
		100 VAC
		200 VAC

Note: When ordering specify the voltage.
Example: G9B-06 24 VDC
Rated voltage

Model Number Legend

G9B-□
1

1. No. of steps
06: 6 steps
12: 12 steps

Specifications

■ Contact Ratings

Load	Resistive load (cosϕ = 1)
Rated load	2 A at 250 VAC/30 VDC
Rated carry current	2 A
Max. switching voltage	250 VAC, 30 VDC
Max. switching current	2 A

■ Characteristics

Operating voltage range	85% to 110% of rated voltage
Power consumption	24 VDC:90 mA max. 100 or 200 VAC:120 mA max.
Contact resistance (See note 2.)	100 mΩ max.
Operate time (See note 3.)	50 ms max.
Release time (See note 3.)	50 ms max.
Min. pulse time (See note 4.)	100 ms max.
Error detecting time	100 ms max.
Insulation resistance (at 500 VDC)	100 MΩ min. between the power supply, control, output, and R terminals 100 MΩ min. between the terminals, except the alarm output terminals and power output terminals
Dielectric strength	1,500 V, 50/60 Hz for 1 min between the power supply, control, output, and R and other terminals 1,500 V, 50/60 Hz for 1 min between the terminals, except the alarm output terminals and power output terminals
Noise immunity	Noise level: 1.5 kV, pulse width: 50 ns/1 µs (600 V for 24-VDC model)
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5 mm double amplitude) Malfunction: 10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5 mm double amplitude)
Shock resistance	Destruction: 500 m/s^2 Malfunction: 200 m/s^2
Endurance	Mechanical: 10,000,000 steps min. Electrical: 300,000 steps min. (See note 5.)
Error rate (See note 6.)	10 mA at 5 VDC
Ambient temperature	Operating: –25°C to 55°C (with no icing or condensation)
Ambient humidity	Operating: 5% to 85%
Terminal strength	Tightening torque: 0.98 N·m Tensile strength: 49 N
Weight	Twelve-step model: approx. 450 g; Six-step model: approx. 400 g

Note: 1. The data shown above are initial values.

2. The contact resistance was measured with 0.1 A at 5 VDC using the fall-of-potential method.

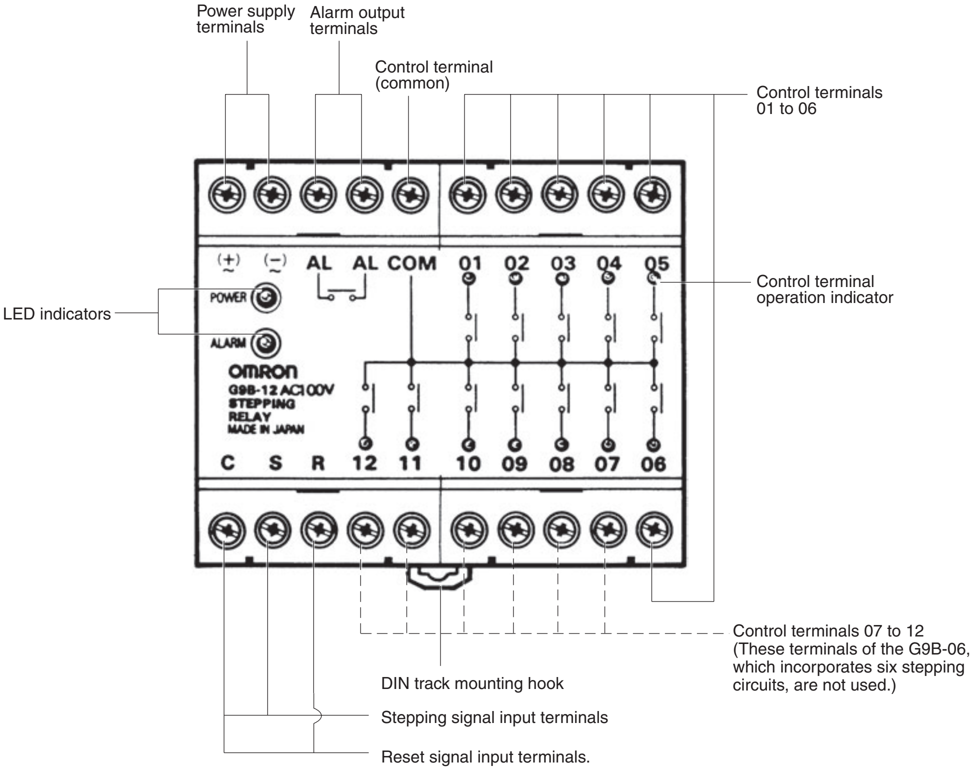
3. The operate time and release time was measured with the rated voltage imposed with any contact bounce ignored at an ambient temperature of 23°C.

4. For the step signal, set a minimum pulse time of 100 ms for both the ON time and OFF time.

5. The electrical endurance was measured at an ambient temperature of 23°C.

6. This value was measured at a switching frequency of 120 operations per minute.

Nomenclature

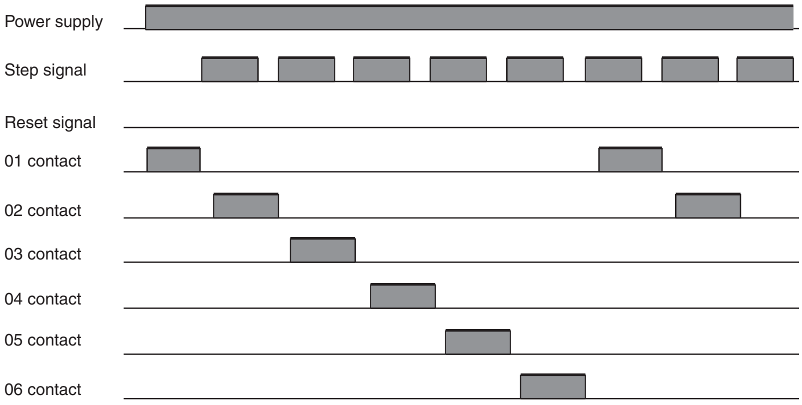


Display		Description
POWER	Lit	Lit when power is supplied to the G9B and the G9B is ready to operate or in operation.
	Not lit	Not lit when power is not supplied to the G9B.
ALARM	Lit	Lit when there is a control contact error (i.e., when a built-in relay driving element is malfunctioning).
	Not lit	Lit when the G9B is in normal operation.

Operation

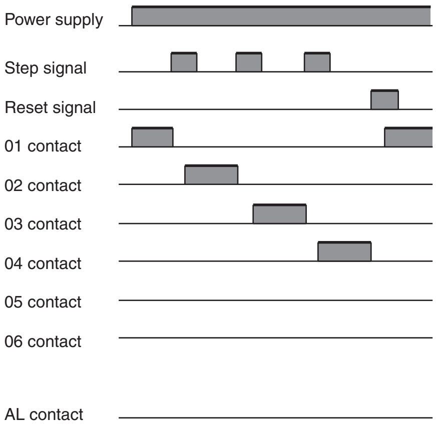
■ Timing Chart

Normal Operation with No Reset Signal



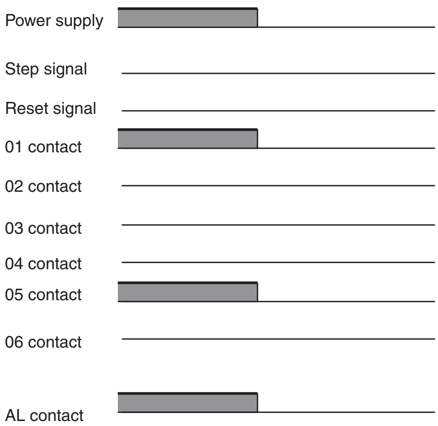
A different contact is selected in numerical order per step signal pulse. When the contact currently selected is 06, 01 will be selected with the next step signal input.

Normal Operation with Reset Signal



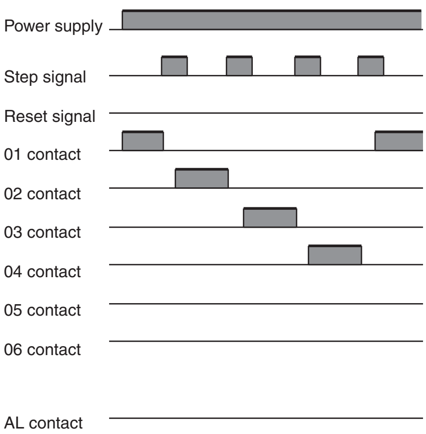
The G9B switches an active control terminal over to another control terminal and makes it active whenever the G9B receives a single step input pulse. If a reset signal is input to a control terminal of the G9B when the G9B is in stepping operation, terminal 1 of the G9B will become active.

Emergency Case (ON Error)



If an internal contact of the G9B is incorrectly turned ON by the internal relay driving element that drives the internal contact due to external noise, the G9B will reset itself to its default status (i.e., contact 01 of the G9B will be turned ON) and turn its alarm contact ON so that the ALARM indicator of the G9B will become lit. When the G9B is turned OFF, the alarm contact will turn OFF and the ALARM indicator will not be lit. In this example, contact 05 is incorrectly turned ON.

Emergency Case (ON Error)

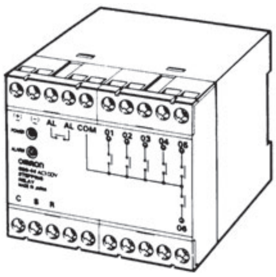


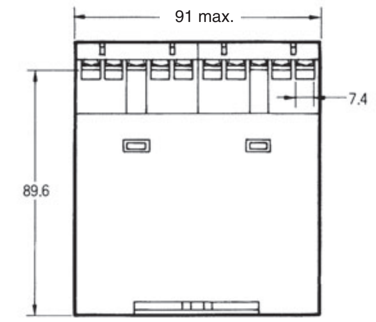
If an internal contact of the G9B is incorrectly turned OFF by the internal relay driving element that drives the internal contact due to external noise, the G9B will reset itself to its default status (i.e., contact 01 of the G9B will be turned ON) when the internal contact incorrectly turned OFF becomes active. In this example, contact 05 is incorrectly turned OFF.

Dimensions

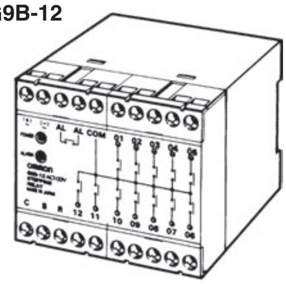
Note: All units are in millimeters unless otherwise indicated.

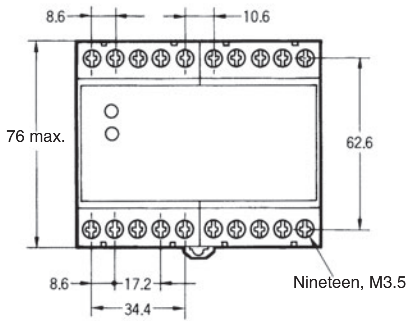
G9B-06

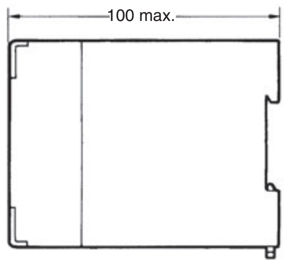




G9B-12

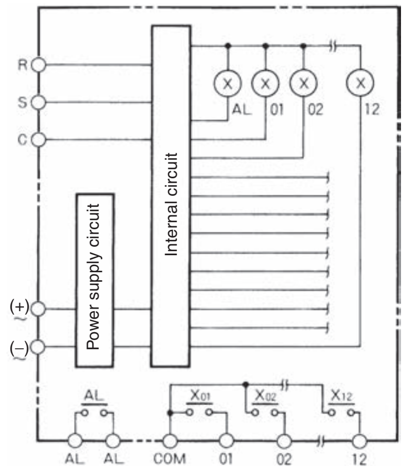






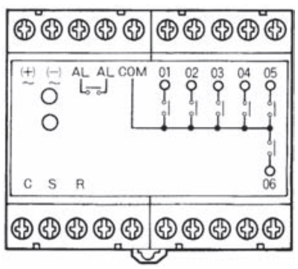
Installation

■ Internal Circuit

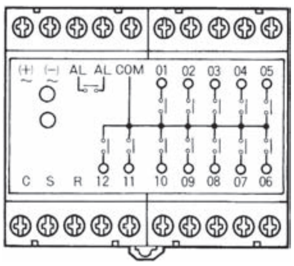


■ Terminal Arrangement

G9B-06



G9B-12

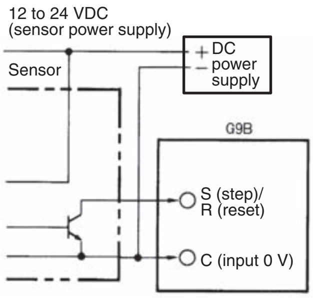


■ Input Connections

The inputs of the G9B are no-voltage (short-circuited or open) inputs.

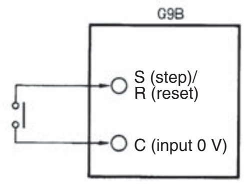
No-contact Input

(Connection to NPN open collector output sensor.)



Operates with transistor ON

Contact Input



Operates with relay ON

No-voltage Input Signal Level

No-contact input	**1.** Short-circuit Level (transistor ON) Residual voltage:1 V max. Impedance when ON:1 kΩ max.
	2. Open Level (transistor OFF) Impedance when OFF: 100 kΩ max.
Contact input	Use contacts which can adequately switch 3 mA at 24 VDC

Note: 1. Two-wire sensors cannot be used.

2. When using three-wire sensors, only NPN open-collector models can be used.

Safety Precautions

Refer to *Safety Precautions for All Relays*.

■ Memory Backup Function

The G9B has a built-in memory that stores the setting status for 10 days without power. All contacts are released when no power is supplied. When the G9B is turned ON again, the internal contacts will be set to the previous setting status.

When power is not supplied, the output contacts will turn OFF. If a reset signal is input while power is not being supplied, the next step will be step 01 when power is restored.

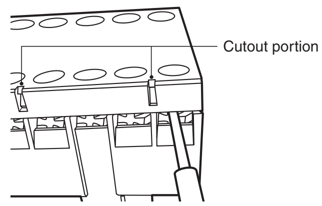
When 24 VDC is supplied to the G9B, make sure that the polarity of the power is correct.

■ Terminal Cover

- There is no need to remove the terminal cover when using any type of terminal other than round terminals. With the terminal cover attached, insert the tip of a screwdriver into the front holes to loosen the screws. Insert the terminal from the gap on the back side of the terminal cover and tighten the screws.
- The terminal cover must be removed and wiring must be performed when using round terminals.

Removing the terminal cover

All together there are four terminal covers, two on both top and bottom. Insert the screwdriver into the gap on the back of each of the two cutout portions on each terminal cover and lift up on the terminal cover little by little to release the tab from the cutout. Lift up on the terminal cover as it begins to rise to remove it.



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

In the interest of product improvement, specifications are subject to change without notice.

Terms and Conditions Agreement

Read and understand this catalog.
Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.
(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.
(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE
PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.
Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.
See http://www.omron.com/global/ or contact your Omron representative for published information.

Limitation on Liability; Etc.
OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.
Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.
Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.
NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.
Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.
Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.
Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.
Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

2017.4

In the interest of product improvement, specifications are subject to change without notice.

OMRON Corporation
Industrial Automation Company

http://www.ia.omron.com/