Safety Precautions

Be sure to read this section before use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.
It is important to select, use, handle and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience.

2 Use this product in accordance with specifications.

This product must be used within its stated specifications. In addition, never modify or additionally machine this product.
This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments.
(Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)

❶ Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
❷ Use for applications where life or assets could be significantly affected, and special safety measures are required.

3 Observe organization standards and regulations, etc., related to the safety of device design and control, etc.

ISO4414, JIS B 8370 (Pneumatics fluid power - General rules and safety requirements for systems and their components)
JFPS2008 (Principles for pneumatic cylinder selection and use)
Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

❶ Inspect and service the machine and devices after confirming safety of all systems related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility.Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions in the following pages to prevent accidents.

■ The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

⚠ DANGER:	When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, and when there is a high degree of emergency to a warning.
⚠ WARNING:	If handled incorrectly, a dangerous situation may occur, resulting in death or serious injury.
⚠ CAUTION:	When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation.
Every item provides important information and must be observed.

Warranty

1 Warranty period

The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.

2 Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.
However, following failures are excluded from this warranty:

1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
3) Failure not caused by the product.
4) Failure caused by use not intended for the product.
5) Failure caused by modifications/alterations or repairs not carried out by CKD.
6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
7) Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.
Note: For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility check

The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Safety Precautions

Be sure to read this section before use.
Refer to "Pneumatic Valves" (No. CB-023SA)" and "Pneumatic, Vacuum and Auxiliary Components (No. CB-024SA-9)" for general precautions.

Product-specific cautions: Residual Pressure Exhaust Valve with Spool Position Detection SNS Series

Design/selection

Continuous energizing

⚠CAUTION

■ In the following cases, to prevent deterioration of valve performance, enable heat dissipation when installing, so that the ambient temperature remains within the specification range.

- When the energized time exceeds non-energized time in intermittent energizing
- When one energizing session exceeds 30 minutes in intermittent energizing

Working pressure

The pressure must be 0.2 MPa and over to operate the SNS Series. If the piping cross-section area on the fluid inlet is reduced, the operation may become unstable due to a pressure drop during valve operation which causes the pressure inside the valve to drop.

Mounting, installation and adjustment

DIN terminal box

⚠WARNING

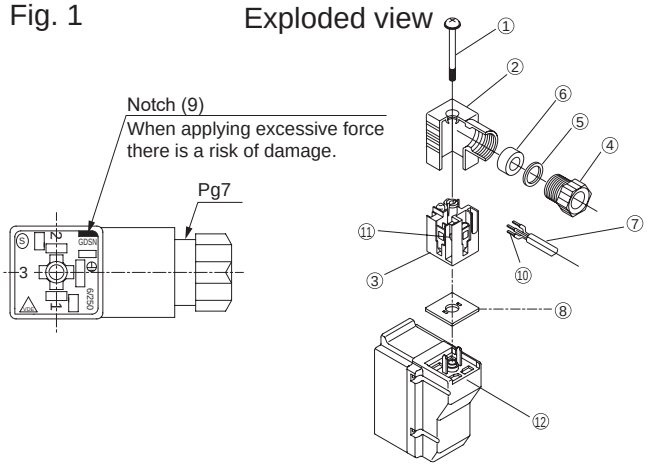
■ As there is a risk of electric shock when assembling or disassembling the terminal box, perform the assembly and/or disassembly after turning OFF the power supply.

⚠CAUTION

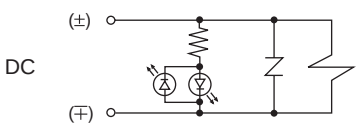
■ Disassembly

- Loosen screw (1) and pull cover (2) in the direction of screw (1) to remove the connector from coil assembly (12).
- Pull out screw (1) from cover (2).
- Notch (9) (next to the GDSN mark) can be found at the bottom of terminal block (3). Insert a compact flathead screwdriver in the gap between housing (2) and terminal block (3) and pry to remove terminal block (3) from cover (2) (Refer to Fig. 1).Remove without applying excessive force, which may cause damage.
- Remove cable gland (4) and take out washer (5) and rubber packing (6).

Fig. 1 Exploded view



■ Electrical connection circuit diagram



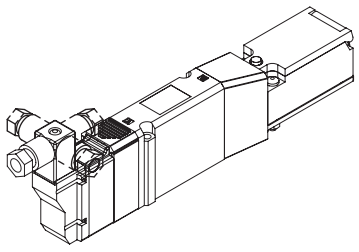
■ Wiring

- Wiring preparation
  - · The dimensions for cable (7) are the VCTF2(3) core (ø3.5 to 7) defined in JIS C3306.
  - · The length of the lead wire stripping of cable (7) is 10 mm.
  - · Both stranded wires and solid wires can be used for wiring.
  - · When using a stranded wire, avoid connecting a pre-soldered wire.
  - · When using a crimp sleeve (10) at the end of the twisted wire, select H0.5/6 (0.3 to 0.5 mm^2) or H0.75/6 (0.75 mm^2) made by Weidmüller Japan, or an equivalent product. Crimp sleeves are not included.
- Wiring
  - · Pass cable (7) through cable gland (4), washer (5), and rubber packing (6) in this order, and insert it into cover (2).
  - · Connect it to terminals 1 and 2. There is no polarity.
  - · The recommended tightening torque is 0.2 to 0.25 N·m.

■ Assembly

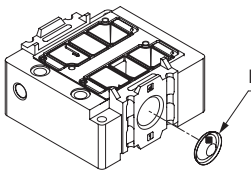
- Set the wired terminal block (3) on cover (2). (Push in until it clicks.)
  * The terminal block can be set in any of the four different directions (Fig.2).
- Insert rubber packing (6) and washer (5) in this order into the cable through hole in cover (2), and securely tighten cable gland (4).
  Remarks: The recommended tightening torque for the cable gland is 1.0 to 1.5 N·m.
  Pull the cable to check that it does not become loose.
- Place gasket (8) between the bottom part of terminal block (3) and the plug of coil assembly (12), insert the connector, insert screw (1) from over cover (2) and tighten it.
  Remarks: The recommended tightening torque for screws is 0.4 to 0.45 N·m.

Fig. 2



Port filter

The port filter prevents the entry of foreign matter, and prevents problems from occurring in the valve. This product does not improve compressed air quality. Do not detach or press down the port filter forcibly. The filter could deform, causing problems. If contaminants and foreign matter are found on the filter surface, blow them off lightly, or remove them with tweezers, etc.



Port filter (standard) example of embedding

How to connect limit switch

Applicable to products with the limit switch option code "L" and "M".

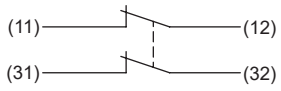
For the limit switch option code "L"

⚠ CAUTION

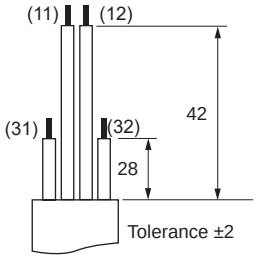
- Do not push a crimp terminal or the like into the gap of the case, as it may cause the case to be damaged or deformed.
- Be sure to use the crimp terminal with the thickness of 0.5 mm or less to avoid interference with the inside of the switch case.

- When connecting to the terminal via insulating tube and M3.5 crimp terminal, place the crimp terminals as shown in the figure below so as not to ride over the case or cover.
- The applicable lead wire size is AWG 20 to 18 (0.5 to 0.75 mm^2). The lead wire should be processed in accordance with the length in the figure below. The excess lead wire may come into contact with the cover and cause it to be lifted.
- When mounting a connector to the conduit port, be sure to use a connector with the thread length of 9 mm or less so as not to interfere with the built-in switch.
  Recommended connector: ST-13.5 5301-5030 (LAPP)
  Recommended seal packing: JPK-16, GP-13.5 or GPM20

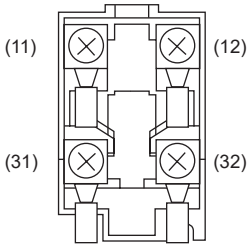
Electrical connection circuit diagram



Lead wire processing drawing

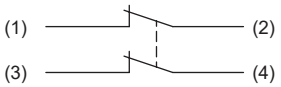


Crimp terminal layout drawing

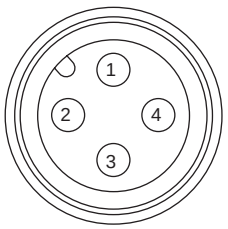


For the limit switch option code "M"

Electrical connection circuit diagram



Connector pin No.



Limit switch

- For the tightening torque of each part, please refer to the table below.

Screw tightening point	Recommended tightening torque values
Terminal thread	0.6 to 0.8 [N·m]
Cover mounting screw	0.5 to 0.7 [N·m]
Connector	1.8 to 2.2 [N·m]

- For switching at normal load (250 VAC, 3 A), do not use two or more circuits at once. There is a risk of decreased insulation function.
- OMRON D4N-1B31 (option code L) or D4N-9B31 (option code M) limit switch is used. Refer to the manufacturer's catalog for details.

Operational explanation

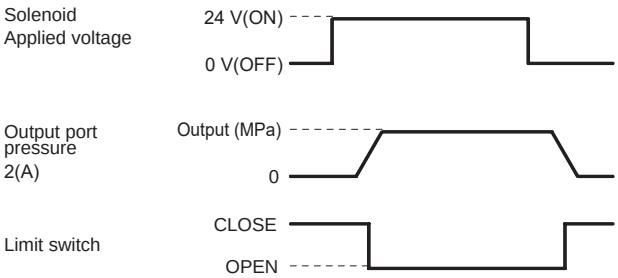
Category 2 compliant product (SNS-1...)

To handle safety function checks, the exhaust valve body is equipped with a limit switch which carries out spool valve position detection.

Category 3, 4 compliant product (SNS-2...)

In addition to the above, two exhaust valves are connected serially, enabling redundancy. Even if one should malfunction, the switching operation of the other will discharge compressed air from the output port to the discharge port.

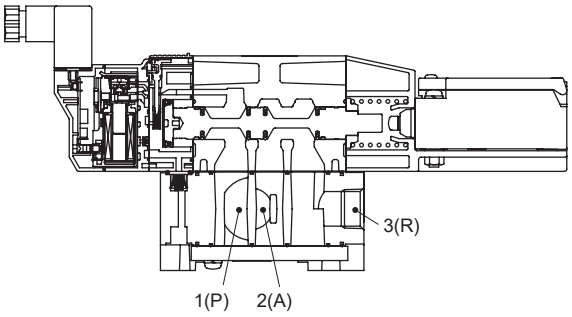
The limit switch used is a safety limit switch with direct open circuit operation. When compressed air is output from output port 2(A), the limit switch electrical contact is OPEN; when the output port 2(A) compressed air is discharged to the outside from discharge port 3(R), the limit switch electrical contact is CLOSED.



When not energized (Refer to the figure below)

Flow path: 2(A) and 3(R) are connected.
(Residual pressure removal status)

Limit switch: CLOSE



When energized (Refer to the figure below)

Flow path: 1(P) and 2(A) are connected.

Limit switch: OPEN