To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: Cylinder with length measuring sensor/hand/actuator

Design / Selection

1. Cylinder

CAUTION

■Since SSD-LN and SSD-O-LN series use a non-rotating type, avoid using them in a way that applies rotational torque to the Piston Rod of SSD-LN and SSD-O-LN series. The non-rotating bush will deform, and the service life will be significantly reduced. If you require a standard Piston Rod, please contact us.

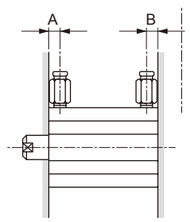
■Use so that the load on the Piston Rod is always applied in the axial direction of the Piston Rod.

■SSD-LN, SSD-O-LNWhen fixing a workpiece onto the tip of the series Piston Rod, retract the Piston Rod to the stroke end and apply a wrench to the section protruding from the rod's parallel section. Tighten so that torque is not applied to the Cylinder Body.

■Please note that usable piping fittings vary depending on the cylinder bore.

• SSD-LN, SSD-O-LN

Item / Bore Size (mm)	Port Size	Port position dimension A	Port position dimension B	Usable Fittings	Fitting outer diameter	Unusable fittings
ø12·16	M5x0.8	5.5	5.5	SC3W-M5-4 SC3W-M5-6 GWS4-M5-S GWS4-M5 GWL4-M5 GWL6-M5	ø11 or less	GWS6-M5
ø20		8	5.5			
ø32	Rc1/8	8	8	SC3W-6-4/6/8 GWS4-6 GWS6-6 GWS8-6 GWL4-6 GWL6-6	ø15 or less	GWS10-6 GWL8-6 GWL10-6
ø50	Rc1/4	10.5	10.5	SC3W-8-6/8/10 GWS4-8 GWS6-8 GWS10-8 GWL4 to 12-8	ø21 or less	GWS-12-8



2. Gripper

CAUTION

■Gripping force varies depending on the length of the fingers included with the gripper, applied pressure, bore diameter, etc., so please determine it according to the workpiece to be gripped.

■The gripping characteristics of BHA, BHG, and BHE are equivalent to the standard type. Refer to "Pneumatic Cylinder ⑤" (No. RJ-006AA). Also, please check the common notes for grippers.

■Avoid outdoor use.

■The most desirable Ambient Temperature range for using the gripper is 5 to 60°C. If this temperature exceeds 60°C, it may cause damage or malfunction, so do not use it. Also, if it is 5°C or less, moisture in the circuit may freeze and cause damage or malfunction, so please take measures to prevent freezing.

■Do not use in an atmosphere where there is a risk of corrosion. Use in such an environment will cause damage or malfunction.

■Clamping operation becomes more accurate by performing it as softly and slowly as possible. Also, repeatability becomes stable.

■Use so as not to apply excessive lateral load to the fingers.

■Model Selection for Mixed Workpiece Sorting Applications

Select the output type according to the difference in workpiece external shape.

Workpiece External Shape Difference ≥ 1 mm + Workpiece Tolerance Variation ... Switch Output Type

Workpiece External Shape Difference ≤ 1 mm + Workpiece Tolerance Variation ... Analog Output Type

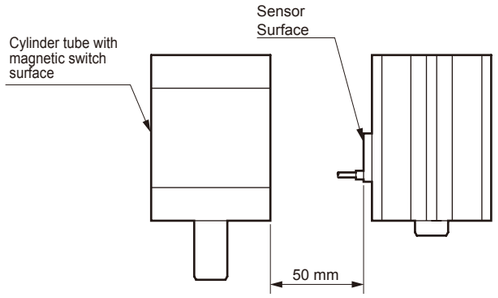
* For the switch output type, the switch output position setting is rough. The above values are guidelines and vary depending on the operating environment. Please contact us for details.

Individual Precautions: Sensor/amplifier/display

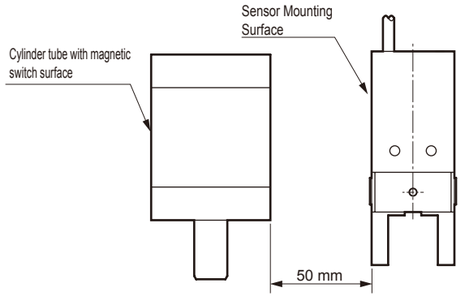
Design / Selection

CAUTION

■This product cannot be used in an environment where strong magnetic fields are generated (spot welding machine, etc.) because the sensor detection accuracy drops markedly. Also, be careful when this cylinder/gripper is close to other cylinders with magnetic switches. As a guideline, if the distance between the sensor surface and the cylinder tube surface is 50 mm or more, as shown in the figure below, there is no problem.



■If the sensor surface (sensor nameplate mounting surface) is covered with a magnetic material such as an iron plate, the magnetism will be disturbed and the sensor will not be able to detect the magnetic field, so please be careful when installing the actuator.



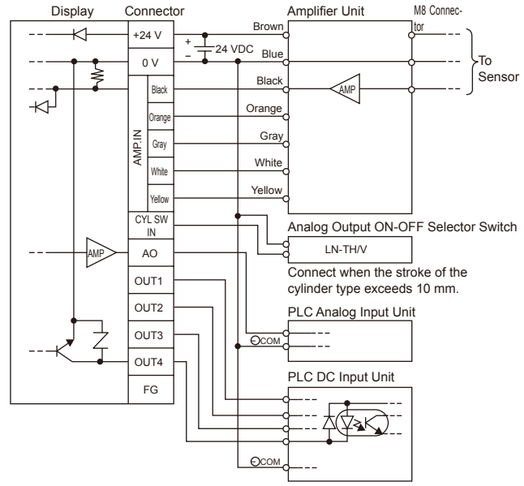
■When mounting the amplifier unit case with separated amplifier using a side through hole, use M3 cross-recessed pan head machine screws, with tightening torque of 0.5 to 0.7 N·m.

■Rubber plugs are attached to devices with the amplifier installed operating points adjustment trimmer and operating range adjustment trimmer section to maintain water resistance. Fit these plugs in after adjusting.

■When mounting the display using a bottom through hole, use M3 cross-recessed pan head machine screws, with tightening torque of 0.5 to 0.7 N·m.

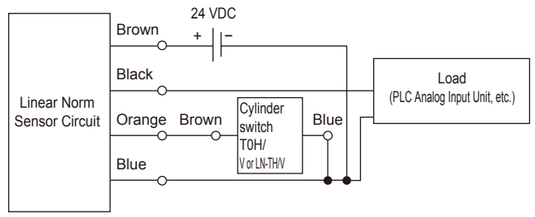
■Connecting the lead wire

● Display Type

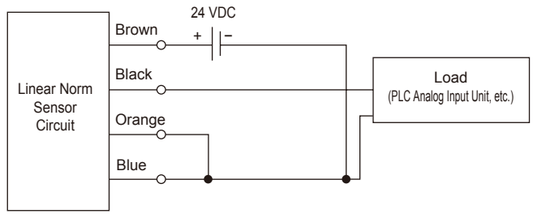


1. Since the indicator is a 2-channel specification, there are two +24 V and 0 V connections each in the connector part, but they are electrically connected inside the indicator, so it will operate with wiring to either one.
2. When connecting only one amplifier unit, the channel of the connector part does not matter.
3. Perform wiring with the power turned off.
4. When connecting wires to the indicator connector part, do so with the female side unplugged.
5. The connectable wire size for the indicator connector part is 0.08 to 1.5 mm^2, and its terminal screw tightening torque is 0.25 N·m.
6. Do not plug or unplug the connector while it is energized.
7. If the stroke of the cylinder type exceeds 10 mm, connect the "Analog Output ON-OFF Selector Switch" to the indicator, connecting its brown wire to the "CYL SW IN" terminal and its blue wire as 0 V.
8. Shielded Wire Processing
   If affected by noise, connect the shielded wire to COM or FG. Normally, connection is not required.

● When Mounting Analog Output Type Cylinder

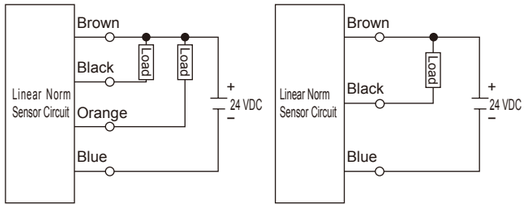


● When Mounting Analog Output Type Gripper



Be sure to connect the orange wire to the blue wire (-).

● Switch Output Type



Separate Amplifier Type　　Amplifier Mounted Type

The output of the switch output type is NPN transistor open collector type.

During Use

1. Common

⚠CAUTION

■Use only a DC safety power supply. Do not connect motors, valves, etc., that generate noise to the power supply used in this device.

■When wiring, be careful not to use the same piping and wiring (multi-core cables, etc.) as the power line of the motor, etc., so that induction noise is not applied to the linear noise sensor. Also, pay attention to the inverter power supply and its wiring. (Ensure the frame ground of the inverter power supply is properly grounded so that noise can escape.)

■Note that noise resistance performance may be adversely affected if the length of the sensor cable or output stage cable lead wire is changed.

■A bend-resistant lead wire is used for the sensor cable and output stage cable. To optimize bend resistant performance, check that the wire is not bent locally and that tension is not applied. Note that compared to the middle section of the load, elasticity drops at the outlet from the sensor case or amplifier unit case and at the M8 connector section because the lead is fixed. Check that repeated bending is not applied to these sections.

■Locations where the operating Ambient Temperature fluctuates suddenly (example: This product cannot be used with localized air conditioning.

■This product cannot be used outdoors or in an atmosphere containing corrosive elements.

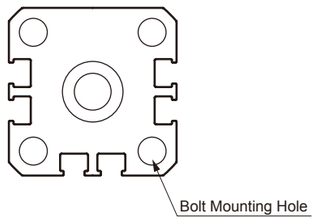
■Select switch output type when conducting rough judgments and analog output type or display when conducting detailed judgments, including length measurement.

2. Analog Output/Indicator Type

⚠CAUTION

■Cylinder equipped

● When fixing the cylinder, use Stainless Steel bolts for cylinder bolt mounting to maintain sensor characteristics. Using iron bolts will cause distortion in the sensor output voltage waveform, increasing the display error of the indicator or reducing the linearity of the analog output voltage. (Although it does not affect repeatability, please check the performance during actual use.) Also, similar phenomena may be observed if a part of the Cylinder Body comes into contact with a magnetic material. Please note that this tendency is particularly noticeable near the LN sensor surface or when an iron plate is shorter than the actuator body.



Ex. SSD-LN, SSD-O-LN Type

● The Linear Norm sensor and the TOH/V (Note) or LN-TH/V switch for analog output voltage ON-OFF switching, or other cylinder switches can be mounted on the same surface if their mounting positions do not interfere with each other.

● Be sure to connect a cylinder switch (TOH/V or LN-TH/V) to extract analog output voltage in an arbitrary 8 mm section (10 mm for indicator type) relative to the cylinder full stroke.

● The sensor tightening torque should be 0.1 to 0.2 N·m, and install so that the sensor mounting screw faces the cylinder head side.

(Note) The switch selected differs depending on the mounted cylinder model, analog output type, and indicator type.

■Hand equipped

● If this gripper is top-mounted using the spigot joint, and the base is a magnetic material such as an iron plate, distortion will occur in the sensor output voltage waveform, increasing the display error of the indicator or reducing the linearity of the analog output voltage. (Although it does not affect repeatability, please check the performance during actual use.) Similar phenomena may be observed if a part of the gripper front/side comes into contact with a magnetic material. Please note that this tendency is particularly noticeable near the LN sensor surface or when an iron plate is shorter than the actuator body. Also, regardless of top, side, or front mounting, use Stainless Steel bolts when fixing the gripper to maintain sensor characteristics.

● The sensor tightening torque should be 0.1 to 0.2 N·m, and install so that the sensor mounting screw faces the finger side.

■Cylinder/hand common items

● For the indicator type, if a load short-circuit current flows to the switch output stage transistor due to wiring mistakes, misconnections, etc., the internal short-circuit protection circuit will operate and cut off the short-circuit current. (At this time, the output indicator lamp (yellow) turns off, and the short-circuit indicator lamp (red) turns on.) To release the short-circuit protection, temporarily cut off the supply current, correct wiring mistakes, etc., and then reapply power. Please note that the protection circuit of this product is effective only against specific incorrect connections and load short circuits, and cannot protect against all incorrect connections.

3. Switch Output Type

⚠CAUTION

■If the operating range is too narrow or if the operating points are incorrectly adjusted when setting the switch output operating position, the output may or may not turn ON. Readjust in this case. It will stabilize by turning the operating range adjustment trimmer clockwise to slightly widen the operating range.

■If load short-circuit current flows to output stage transistors due to wiring errors/connection, the internal short-circuit protection circuit is activated (turns display OFF from ON) and the short-circuit current is cut. To release the short-circuit protection, temporarily cut off the supply power, correct wiring mistakes, etc., and then reapply power. Please note that the protection circuit of this product is effective only against specific incorrect connections and load short circuits, and cannot protect against all incorrect connections.

■Install the sensor at a position where the red lines on the hand and sensor are aligned. Also, the sensor tightening torque should be 0.1 to 0.2 N·m, and ensure the sensor mounting screw faces the finger side.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.