



## Robotic Collision Sensor SR-48 Switch Replacement Manual

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**Engineered Products for Robotic Productivity**

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## 1. Safety

The safety section describes general safety guidelines to be followed with this product, explanation of the notifications found in this manual, and safety precautions that apply to the product. More specific notifications are imbedded within the sections of the manual (where they apply).

### 1.1 Explanation of Notifications

The notifications included here are specific to the product(s) covered by this manual. It is expected that the user heed all notifications from the robot manufacturer and/or the manufacturers of other components used in the installation.



**DANGER:** Notification of information or instructions that if not followed will result in death or serious injury. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.



**WARNING:** Notification of information or instructions that if not followed could result in death or serious injury. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.



**CAUTION:** Notification of information or instructions that if not followed could result in moderate injury or will cause damage to equipment. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.

**NOTICE:** Notification of specific information or instructions about maintenance, operation, installation, or setup of the product that if not followed could result in damage to equipment. The notification can emphasize specific grease types, good operating practices, or maintenance tips.

### 1.2 General Safety Guidelines


The Collision Sensor is not designed for, nor should it be used in, situations involving the safety of humans or animals. The Collision Sensor is designed as a safety device to protect industrial components and machinery from damage resulting from collisions and impacts. In all situations the user is responsible for insuring that applicable safety practices are followed as outlined by the manufacturer of the equipment on which the Collision Sensor is used.


The routing of electrical and pneumatic lines must minimize the possibility of stress, pullout, kinking, rupture, etc. Failure of critical electrical and/or pneumatic lines to function properly may result in injury to personnel and damage to equipment.




**CAUTION:** The customer should lock out and discharge all energy to the work cell prior to working on any Collision Sensor system. Failure to do so may result in damage to equipment or injury to personnel.

### 1.3 Safety Precautions


 **WARNING:** Do not perform maintenance or repair on the Collision Sensor with air pressure applied, current supplied to the sensor, or the robot not in a safe condition. Injury or equipment damage can occur if this is not observed. Always ensure that air pressure has been vented from the unit, that electrical current is not supplied to the Collision Sensor's signal circuit, and that the robot is in a safe, locked-out condition consistent with local and national safety standards before performing maintenance or repair on the Collision Sensor.

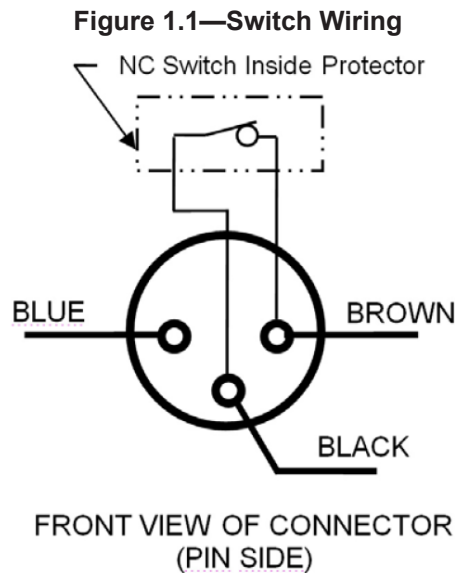
 **WARNING:** The Collision Sensor is only to be used for intended applications and applications approved by the manufacturer. Using the Collision Sensor in applications other than intended will result in damage to Collision Sensor or end-of-arm tooling and could cause injury to personnel.

 **CAUTION:** Do not adjust or remove either of the (2) set screws installed in the wall of the body. Doing so may result in damage to the unit or failure of the switch to operate.

### 1.4 Electrical Connection

The Collision Sensor is connected to the user's control wiring as a normally-closed, dry-contact switch. The following sketch details the connections between the internal switch and the pins in the connector block assembly. Optional mating cables, available from ATI (refer to [10](#)), utilize the brown-black-blue color code indicated.

 **CAUTION:** The user is responsible for connecting the collision sensor to their controls and providing an "electrical load" in series with the collision sensing switch. The switch is rated for instrument level signals of 100mA (max.) at 10–30VDC.



### 1.4.1 Test Switch Functionality

Once the Collision Sensor has been installed and connected as described in the preceding paragraphs, proper electrical operation of the unit may be confirmed.

Supply the Collision Sensor with approximately 15 psi (1 bar) and ensure that the unit is electrically connected to the user's control circuit or to a test box per [Figure 1.1](#). The switch should appear closed.

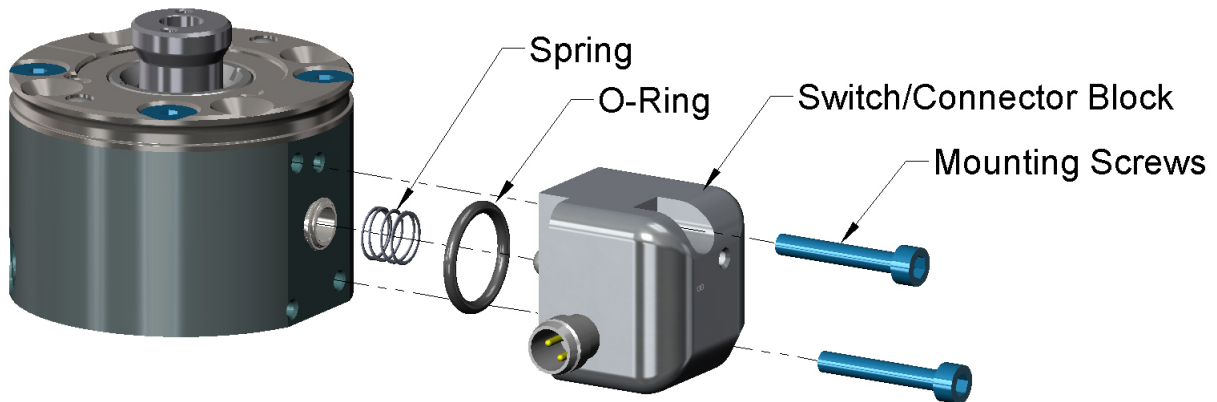
Manually push the Collision Sensor to simulate a collision while observing the switch output. When the collision occurs the switch will open and the test light will turn off.

Release the Collision Sensor and it will return to its working position. The test light will illuminate.

### 1.4.2 Replacement of Switch/Connector Block Assembly

1. Remove the mounting screw using a 2.5 mm hex key (see [Figure 1.2](#)).
2. Remove and discard the entire switch/connector block assembly, including spring and o-ring.

**Figure 1.2—Removal of Switch/Connector Block Assembly from the Collision Sensor**



3. In the new assembly, make certain that the o-ring is in the counterbore in the face of the switch/connector block and that the spring is in the counterbore surrounding the switch.
4. Assemble the switch/connector block to the unit lining up the dowel pins to the holes in the main body.
5. Insert the new socket head cap screws, and tighten to 12 in-lbs (1.356 Nm).



**CAUTION:** If the piston is not up against the dog point screws while screwing in the proximity switch, applying air to the unit could damage the proximity switch. Make sure the Stem is locked into position indicating the piston is against the dog point screws.

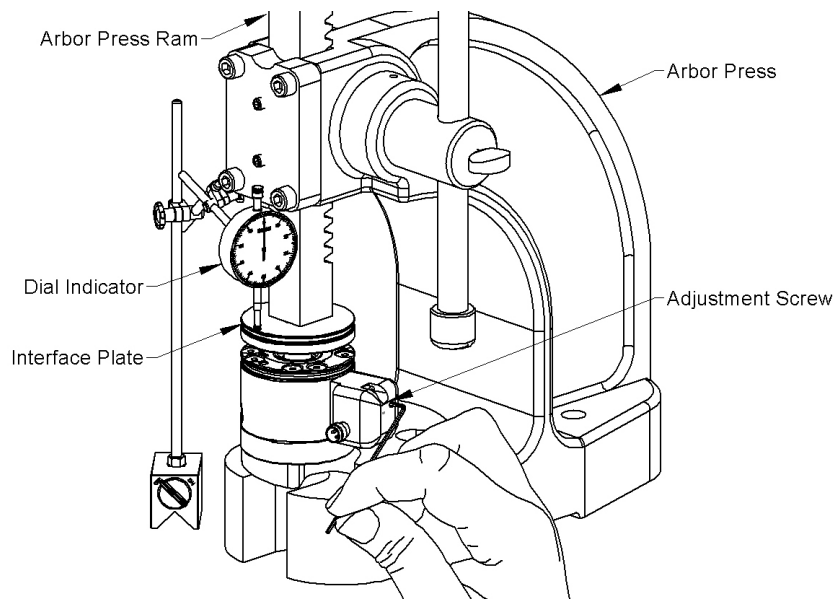
6. Perform switch adjustment per [Section 1.5—Switch Adjustment](#).
7. Press the connector block assembly firmly against the body of the Collision Sensor while tightening the screw. When tightened securely, the connector block assembly should rest parallel to its mounting surface.

## 1.5 Switch Adjustment

Note: The switch is factory adjusted to open after the stem has traveled .025" in the axial direction. Adjustments should only be made if replacing the switch.

1. De-energize all electrical and pneumatic power supplied to the Collision Sensor. Drain all stored air and electric power in compliance with standard (OSHA) safety practices and standards.
2. Disconnect the air lines and signal wires connected to the Collision Sensor.
3. Remove the user-installed mounting hardware from the Collision Sensor and remove the unit. Take the unit to a test bench equipped with a clean working surface and compressed air.
4. Insure that the Collision Sensor returns to its Reset or Working position with the stem fully extended and the alignment mark on the stem in line with the alignment mark on the cover plate (Temporarily supply approx. 15 psi (1 bar) to the unit unless equipped with a preload spring.)
5. Connect a test box per [Figure 1.1](#).
6. Attach an interface plate to the stem of the Collision Sensor.
7. Center the Collision Sensor under the press ram (see [Figure 1.3](#)).
8. Set a dial indicator in contact with the interface plate and adjust it so that the probe is vertical. Set the dial indicator height so that it can read at least .06" (1.5 mm) stroke. Set the dial ring to zero.
9. Push on the press handle until the switch circuit opens and check the distance traveled on the dial indicator.
10. If the distance traveled is greater than desired turn the adjustment screw counterclockwise. If the distance traveled is less turn the proximity switch clockwise.
11. Repeat steps (9) and (10) as necessary to obtain the desired switch setting.

**Figure 1.3—Checking Switch Height Adjustment**



12. Re-install the Collision Sensor using the user-installed mounting hardware.



**CAUTION:** Before putting the Collision Sensor back into operation, confirm that the switch is functioning properly. See [Section 1.4.1—Test Switch Functionality](#).