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How To Troubleshoot a Proximity Limit Switch?

Common Problems:

1) Bad connections at limit switch
2) Bad connections at +24 source or input connection
3) Sensor not close enough to articulating component to properly activate switch
4) Limit switch damaged – moved, broken, or bent out of mounting

Proximity Limit Switch:

The proximity switch generates a small radio frequency field. When this field is interrupted by a conductive object moving into the field, the switch will detect this and cause a contact closure or opening (based on the type of proximity switch).

The proximity switch usually has 3 specific wires going to the switch. These wires must be connected correctly to the limit switch or it will not work correctly. One wire is for the +24 volt source, one for +24 volt return, and one for the "switched" voltage back to the input device.

1) Ensure that the activation device which moves into the field of the switch is correct; this can be a lever, bolt, or simple metal flag.
2) As on the mechanical limit, check for constant 24 volts on the 24 volt input. If not present, trace back to source to see if the source is supplying the +24 volts. Check for bad or disconnected connections or broken wiring. Also, check for the 24 volt return/ground for the limit switch.
3) If the 24 volts are present, you can simulate activation of the proximity limit switch by moving a metallic object (wrench, bolt, etc.) near the sensor end of the switch. The proximity switch should activate and "switch" the +24 volts if working correctly.
4) Some proximity switches have built in LED lamps which illuminate when the proximity switch is activated. Look for this on the body of the switch.
5) As on the mechanical switch, check to ensure the "switched voltage" is getting back to the input device.
6) Many proximity switches have a cable attached, which is connected by a twist lock connector. This allows easy change-out of the proximity switch without disconnecting wiring. If possible, substitute a replacement proximity switch and retest.
7) Continuity checks CANNOT be made on the proximity type switches.

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Other Considerations:

In some systems, especially bollards which work in unison, the limit switches may be connected in series. For example, a set of 5 bollards may have all 5 up limit switches wired in series, or may have all 5 down limit switches wired in series. In this case, all 5 up (or down) limit switches must be activated to have the "switched" voltage back to the input device. However, in this configuration the +24 volts which is "switched" is provided to the next switch and then to the next switch and so on in series. In this case, it will be more difficult to troubleshoot if there is a failed limit switch. If the switches are purely mechanical, continuity checks can be made on each switch individually. Voltage checks can be made at each to determine where the +24 volts is no longer present.

There are also some simple magnetic type switches used in systems which work by a magnet being attracted by a ferrous metal activation device. In this case, continuity checks can be made.

Proximity type switches are not generally connected in series, but are individually wired back to the sources and +24 volts, ground, and return and would have to be tested individually.

CONCENTRIC SECURITY
UNIVERSITY

Concentric Security University
7560 Main Street, Sykesville, MD 21784
P 410.552.9950 F 410.552.9939
Website: www.ConcentricU.com
Email: info@ConcentricU.com