

PNP fiber optic sensor connection method



Overview

An easy way to remember PNP and NPN sensor wiring There are 2 different types of inductive proximity switches, optical sensors and capacitive switching Prox.

Key Takeaways

NPN sensors "sink" current to ground, while PNP sensors "source" current to the load; proper wiring depends on the sensor type and the PLC input configuration. Wiring Principles

PNP Sensors (Sourcing):

- The sensor connects the load to the negative (0V) line, and when activated, it switches the positive voltage (+V) to the load.
- Current flows from the sensor output through the load to ground, which is why this is called "sourcing" current.
- Typically used with sinking PLC inputs that expect a positive signal to detect activation.
- Standard wire colors: Brown = +V, Blue = 0V, Black = Signal Output.

Common in European automation systems and relay-based controls . NPN Sensors (Sinking):

- The sensor connects the load to the positive supply (+V), and when triggered, it switches the signal to ground (0V).

- Current flows from the load through the sensor to ground, hence "sinking" current.
- Typically paired with sourcing PLC inputs that provide a positive voltage and detect when the sensor completes the path to ground.
- Wire colors are the same: Brown = +V, Blue = 0V, Black = Signal Output.
- More common in certain Asian markets, though usage is declining .

Practical Connection Steps

- Identify Sensor Type: Check the datasheet or label for NPN or PNP designation.
- Match PLC Input Type:
 - Sinking input → use a PNP sensor.
 - Sourcing input → use an NPN sensor.
- Some modern PLCs allow configurable inputs, but consistency is important .
- Connect Power Supply: Provide the correct DC voltage (commonly 24V) to the sensor.
- Wire the Load:
 - For PNP: connect the load between the sensor output (black wire) and 0V.
 - For NPN: connect the load between +V and the sensor output (black wire).
- Verify NO/NC Function: Normally Open (NO) or Normally Closed (NC) is independent of NPN/PNP type; ensure the sensor matches your application .
- Use Proper Protection: Include fuses, flyback diodes for inductive loads, and shielded cables in noisy environments to prevent damage .

Summary

- PNP = Sourcing → load connected to 0V, sensor provides +V when active.
- NPN = Sinking → load connected to +V, sensor connects output to 0V when active.
- Correct wiring ensures PLC compatibility, safe operation, and reliable detection.
- Always consult the sensor and PLC manufacturer documentation for voltage, current ratings, and wiring diagrams to avoid damage. By following these principles, NPN and PNP fiber optic sensors can be integrated safely and effectively into industrial automation systems.

Article Content

Proximity Sensor Fiber Optic Wiring Diagram Guide

Complete guide to proximity sensor fiber optic wiring diagrams, covering components, NPN/PNP outputs, installation

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Fibre Amplifier, M8 Connector Type, PNP

Fibre Amplifier, M8 Connector Type, PNP FS-N15CP *Please note that accessories depicted in the image are for illustrative

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Explore the key differences between PNP and NPN photoelectric sensors and the advantages of fiber optic sensor

Optical Fiber Sensors Guide

An optical fiber sensing system is basically composed of a light source, optical fiber; a sensing element or transducer and a detector

Fiber Sensors

This principle is the sensing method used by Diffuse-reflective Sensors. Polarization of Light Light can be represented as a wave that

Connecting NPN optic sensor to PNP Input PLC

An NPN sensor output makes a connection to the negative line when on. If you connect +24vdc to one side of the

Fiber Optic Sensors: Fundamentals, Principles & Applications

Optical Fiber (Transmission Medium, Sensing Element) Light modulated due to interaction with parameter of interest (Measurand)

How can I cable to the PNP and NPN type outputs for sensors /

PNP and NPN type outputs are available as 3-wire sensors with a DC voltage power supply (the voltage limits are

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