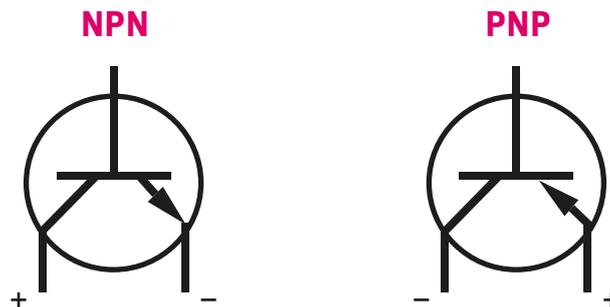


### DIFFERENCES BETWEEN PNP AND NPN

The concept PNP and NPN is something that we will find throughout our professional life in many occasions, when we have to select a detector or three-wire photocell, when selecting a PLC, and especially at the time of design schemes and wiring.

This concept is not always very clear, especially at the beginning of the professional career, over time by hearing these words your mind already visualizes the wiring for each element.

The difference between the two is marked by the design of its internal circuit and the type of transistor used.



The selection of a PNP sensor relative to an NPN sensor is determined by the nature of the circuit the device is to be used in. When used in a traditional relay type control circuit, it is normally possible to use either the PNP or NPN type. PNP sensors tend to be more commonly used.

The relevant difference is output. For example, with a sensor, in the following graph:

**Red Cable:** Power supply + 24V

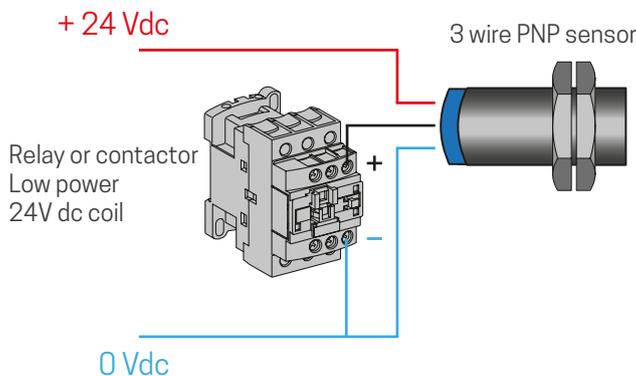
**Blue Cable:** Power supply - 0V

**Black Cable:** Output

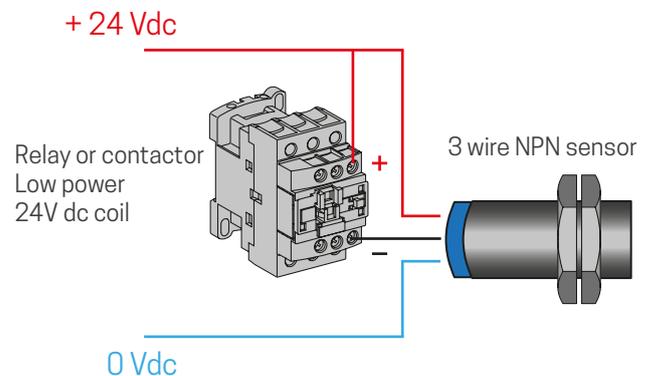
PNP - Positive Output +

NPN - Negative Output -

#### 3 wire PNP wiring



#### 3 wire NPN wiring



### When using PNP or NPN

There are several factors that can influence what type of output to use, but none is determinant, in the market there are sensors of both types as well as PLC cards.

In Europe it is more common to use PNP, whereas in Asia it is more common to find NPN.

An important aspect is the available stock, as in Europe it is more common to use PNP it is always easier to find a larger stock of PNP.

It is important before making a modification, expansion or installation of a machine to be clear what kind of inputs have.

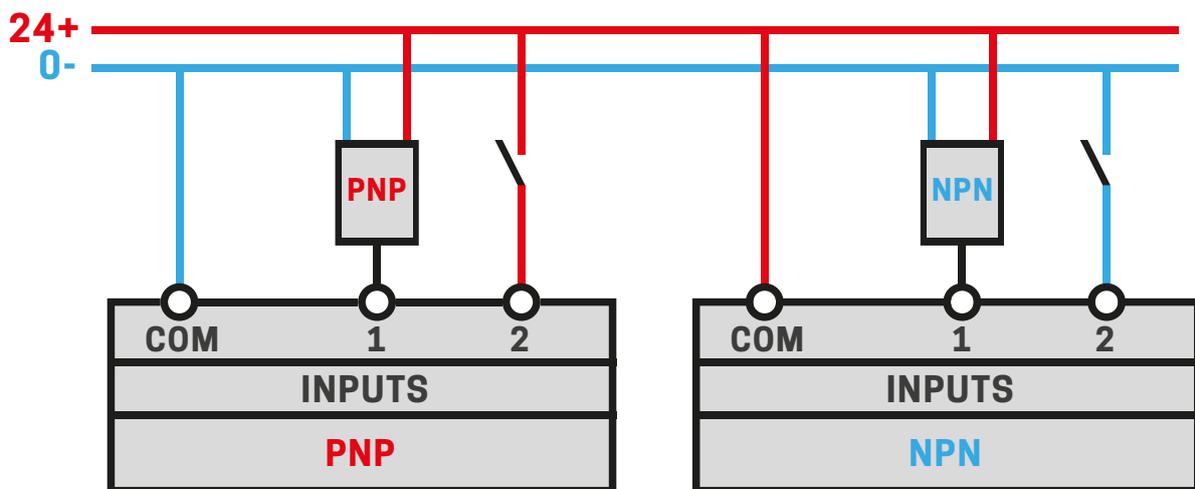
As for the advantages seems to be that the NPN is faster in switching, since it works with reference 0V, has less noise immunity and less voltage drop.

### Automata Inputs and Outputs Wiring

Generally the PLC input cards are compatible for both PNP and NPN, as it will depend on how we wiring the common.

For this we have a common (COM) in the input card.

Depending on whether we use PNP (COM -) or NPN (COM +) sensors we will have to power supply the common in a certain way.



In the outputs we must specify if we want PNP or NPN, unless the output is to relay.

