NK Technologies

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Selecting Current Operated Switches and Relays for Your Application

NK Technologies offers a wide range of current operated switches and relays. Selecting which model will work best requires some knowledge of the specific application.

The first thing to consider is the output action. As a practice, NK Technologies defines the output contact in the "out-of-the-box" or shelf state (without current passing through the sensing window). Does the application require a closed output when the sensed current exceeds the setpoint? That would mean a normally open output is needed. Normally open (NO) outputs will close when the current exceeds setpoint, and normally closed (NC) outputs will open when current exceeds setpoint.

Next, what will the output contact do for you? If it will be used as an input to a programmable logic controller (PLC), the "universal" output (NOU or NCU) would be the best choice. They can control AC or DC powered logic, with a wide range of maximum voltages. If the output will be used to control the coil of a relay or contactor, the control logic will likely be AC, under 240 volts. We recommend using a sensor with higher capacity than the "universal" type, so select a model with NOAC or NCAC. As long as the controlled load operates at less than one amp continuously, this output can handle the load.

Does the application require a delay before the output changes state with current increasing? The ASX and ASXP series have a delay of up to 15 seconds built into the sensor.

Can the monitored circuit conductor be threaded through the sensor opening? Select the solid-core models. If the monitored circuit must remain connected, select the split core models. Also check the outside dimension of the conductor before placing any orders, to be sure that the conductor will fit through the sensing window.

Selecting an NK Technologies Current Operated Switch

Model Prefix	Universal Output	One Amp AC Output	Split- or Solid-Core Case Option	Setpoint Precison (A-B-C)	Time Delay
AS1	X		Both	C	
AS3		X	Both	B	
ASX	X	X	Both	A	X
ASXP	Relay		Solid Only	A	X
AS0		X	Solid Only	A+	

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Application Note

AS1 Series: Provides the low capacity universal output type, with a wider hysteresis at the low end of the single range, narrowing as the set point is adjusted to the high end of the range.

ASX Series: Has an adjustable start-up/delay timer which allows a 0–15 second delay to eliminate nuisance trips from high inrush or short overload conditions, and a very constant hysteresis. The sensor can be ordered with either the universal contact or with the one amp AC output.

ASXP Series: Deviates from the other current switch models in several ways. Models can be selected which are powered from 24 volts (AC or DC) or from 120 volts (AC or DC). This series has very constant hysteresis, the set point adjustment uses a single turn potentiometer with the trip point indicated on the label, time delay on current rise and the electromechanical relay output can switch up to 5 amps AC or DC.

AS0 Series: Requires an external power supply, but the trip point can be adjusted to change state (solid state contact) with current as low as 3 mA.

APMR Series: A unique product. By using external current transformers and comparing the current being used with the system voltage, it provides two independent relays which can be adjusted to change state at an increasing or decreasing wattage magnitude. This product also produces a 4–20 mA signal directly proportional to the watts being consumed. This device is ideal when the monitored load is critical, or in applications where poor power factor reduces the linearity of the current rise.

In addition to these models, NK Technologies has a number of specialized current switches and relays with extra features which may make them perfectly suited for your application. Please visit our web site, send us an email or give us a call. Our support and engineering team willl help select a sensor that will work best for you.

NK Technologies Develops a Solid State Current Operated Switch

In the early 1980's, Maynard Kuljian and Charles Neilsen were designing process control systems in Palo Alto, when a client asked for an easy method to detect if a ventilating fan was not working properly. While there are numerous methods to detect over current conditions, there were few which could detect an under current condition. If a drive belt broke, the fan blades would stop but the motor starter would continue to be engaged and the motor would be rotating.

Together they came up with the basis for NK Technologies' solid state current operated switches. With an adjustable trip point, the sensor could be adjusted so the output contact was closed when current was present over a set magnitude, and opening on current decrease. The output was used as an input to a controller, and automatic verification of proper operation was obtained. Over the years, the engineers at NK Technologies have designed a wide range of sensors based on these early designs.