Application Bulletin

Sensor Solutions

Sensor Output Components Protection
Practical Example of Product Application

Purpose

This bulletin is intended for all solid-state sensor users.

Introduction

This bulletin describes the recommended methods of protecting sensor output components when switching inductive loads (relay coils, contactors, solenoids, etc.).

The Problem

Sensors can be permanently damaged if connected to inductive loads without protection. An overvoltage condition known as an “inductive kick” can occur and be ten-times greater than the applied voltage.

The Solution

Placing a protective component across (i.e., in parallel with) the coil of the load device protects the sensor from overvoltage condition. These components can be purchased as accessories for the coils or purchased separately as discrete components. Three types of protection are described below.

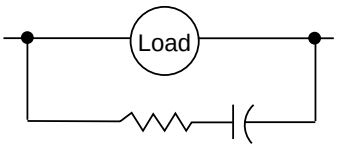

Figure 1: R.C. Snubber

Resistor-Capacitor Circuit (R.C. “Snubber”)

R.C. snubbers, suitable for AC only, limit overvoltage to roughly three-times the nominal voltage and the oscillating frequency to 400 Hz maximum, and increase the dropout time of the load device from 1.2 to 2 times the normal dropout time. (Refer to Figure 1.)

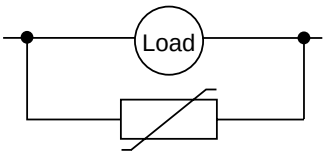

Figure 2: Varistor

Varistor (Peak-Limiting)

Varistors, suitable for both AC and DC, limit the overvoltage to a maximum of twice the nominal voltage, and increase the dropout time of the load device from 1.1 to 1.5 times the normal dropout time. (Refer to Figure 2.)

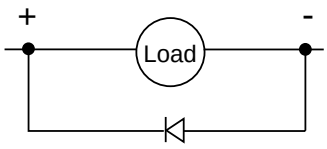

Figure 3: Freewheel Diode

Diode (“Freewheeling” Diode)

Diodes, suitable for DC only, prevent overvoltages, and must be wired according to polarity. They increase the dropout time of the load to 6 to 10 times the normal dropout time. (Refer to Figure 3.)

Square D Company
8001 Hwy 64 East
Knightale, NC 27545 USA
(919) 266-3671

Bulletin No. 9006HO9702 September 1997

SQUARE D
GROUPE SCHNEIDER