

Product Application Note: AN0070

Rev. 1.0

Copyright 9/14/2020

Title: Flame Detector Relay Operation

Cognizant: Engineering

Classification: **Unclassified**

1. Overview

The terms used in describing the operation of a relay can be somewhat confusing. This document explains these terms and how they apply to a typical Flame Detector.

2. Fire vs. Fault Relay Operation

2.1. Fire Relay Operation

The “Fire Relay”, also known as the “Alarm Relay” is normally de-energized and only becomes energized when the detector senses and reports a fire. This means that the loss of power will not cause the relay to energize or to declare a fire as required by NFPA standards.

2.2. Fault Relay Operation

The “Fault Relay”, also known as the “Trouble Relay” is normally energized and will become de-energized when the detector is reporting a fault. This causes the detector to declare a fault when the detector is not properly powered.

3. Terms

3.1. Terminal or Contact or Wire

These terms simply refer to relay connections. These connections are Normally Open, Normally Closed and Common. A relay is actually just an electronic switch where the “Common” terminal is toggled between the “Open” and “Closed” contacts of the device.

3.2. Normally

When talking about a relay that is part of a device such as a Flame Detector, then “Normally” refers to the relay’s condition while the device is operating in a normal manner (i.e. for a Fire Relay there the device is powered and there is no fire being reported). This Application Note is only concerned with the relay contact usage as applies to Flame Detectors.

However, it should be noted that “Normally” for an uninstalled relay indicates the condition of the relay contacts for an unpowered relay. For example, this means that a normally closed contact will be electrically connected to the common terminal (this is indicated by 0 ohms resistance between the 2 contacts) for an uninstalled relay.

3.3. Open

“Open” means that there will be no continuity between the open contact and the common contact while the device is operating normally.

3.4. Closed

“Closed” means that there will be continuity between the closed contact and the common contact while the device is operating normally.

3.5. Normally Energized

“Normally Energized” means that when the device is operating normally the relay is energized. This is used by the Fault Relay because the absence of power is a Fault condition and will be reported by the relay when it de-energizes.