

## ***Technical Note***

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### ***Automatic Self-Test for Optical Flame Detectors*** 1998-1020 Rev 1 12/18

Electro-optical flame detectors are Life Safety instruments that use one or more line-of-sight sensors to detect the presence of radiant energy from the flames emitted by fires, within the detector's field of view. Many of these instruments incorporate one or more methods of ensuring that the optics are not contaminated and that the sensor array is functioning properly.

#### What is "Automatic Self-Test"?

The Automatic Self-Test function on many electro-optical flame detectors, will ensure that the sensor array will respond to radiant energy by periodically verifying the optical window is clean and that the sensor array is functioning properly, along with its associated electronic circuitry.

#### Which Honeywell flame detectors have "Automatic Self-Test"?

The following Honeywell Analytics flame detectors perform an Automatic Self-Test:

- All SS2\* Detectors
- All SS4 Detectors
- All FS10 Detectors
- All FS7\* Detectors
- All FS20X Detectors
- All FS24X Detectors

\* FS7 and SS2 Detectors do not verify optical window cleanliness

#### How does "Automatic Self-Test" work?

Advanced electro-optical flame detectors use microprocessor (CPU) based electronics to accomplish most of their functions, including the Automatic Self-Test function. The CPU activates one or more on-board test sources and the energy from the source(s) is directed or redirected onto the sensor array, usually through an optical window or lens. The CPU then verifies that all the tested sensors respond to the source energy. In that way, window cleanliness and correct operation of the sensor circuitry are verified or confirmed.

#### What will cause an "Automatic Self-Test" failure?

There are a variety of causes that can initiate an Automatic Self-Test Failure. The most common cause is a dirty or contaminated optical surface (and/or reflector). Many detectors reflect the energy from the source back onto the sensor array through the optical window. Detectors using this method will generally monitor the signal strength of the energy and when it drops below a certain threshold, the Detector will indicate a Self-Test Failure or Fault. In some cases, the CPU doesn't receive the proper levels of response, even though the optics (and/or reflector) are not dirty or contaminated. This generally is an indication that there is a hardware or software issue that needs to be fixed, and the unit will need to be returned to the factory for repair.

#### How do we remedy a failed "Automatic Self-Test"?

The best way to remedy an Automatic Self-Test Failure is to clean the optics and any surfaces used to reflect the energy back on to the sensor array. If this does not remedy the failure, return the unit for factory repair.

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## How can we mitigate against “Automatic Self-Test” failures?

During installation, mount the detector using a downward angle. This orientation will prevent naturally airborne dirt, dust, and debris from collecting on the optics. In many industrial applications, the dirt, dust, and debris may have an oily component that enables it to adhere to the optics. In these cases, the use of an air shield may be beneficial. An air shield is an accessory that mounts to the face of the detector and applies positive air pressure in front of the optics that it will repel airborne dirt, dust, and debris. It is important that the supply of air be clean and dry (free from oils and moisture).

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