Honeywell

Technical Note

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 the 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.

Technical Note

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).

Technical Note

Find out more:

www.honeywellanalytics.com

www.raesystems.com

Contact Honeywell Analytics:

Europe, Middle East, Africa

Life Safety Distribution GmbH
Javastrasse 2
8604 Hegnau
Switzerland
Tel: +41 (0)44 943 4300
Fax: +41 (0)44 943 4398
gasdetection@honeywell.com
Customer Service:
Tel: 00800 333 222 44 (Freephone number)
Tel: +41 44 943 4380 (Alternative number)
Fax: 00800 333 222 55
Middle East Tel: +971 4 450 5800 (Fixed Gas Detection)
Middle East Tel: +971 4 450 5852 (Portable Gas Detection)

Americas

Honeywell Analytics Distribution Inc.
405 Barclay Blvd.
Lincolnshire, IL 60069
USA
Tel: +1 847 955 8200
Toll free: +1 800 538 0363
Fax: +1 847 955 8210
detectgas@honeywell.com

RAE Systems by Honeywell
Phone: 408.952.8200
Toll Free: 1.888.723.4800
Fax: 408.952.8480

Asia Pacific

Honeywell Industrial Safety
7F SangAm IT Tower,
434, Worldcupbuk-ro, Mapo-gu,
Seoul 03922,
Korea
Tel: +82 (0) 2 6909 0300
Fax: +82 (0) 2 2025 0328
India Tel: +91 124 4752700
China Tel: +86 10 5885 8788 3000
analytics.ap@honeywell.com
Technical Services
EMEA: HAexpert@honeywell.com
US: ha.us.service@honeywell.com
AP: ha.ap.service@honeywell.com

Technical Services
ha.us.service@honeywell.com

Technical Note 1998-1020