FireBus

Model FB-7254G
Smoke & Heat Detectors
Addressable FB-AP Series®
Product Family Overview

Overview

The FireBus-AP Series (**FB-AP Series®**) is a family of high-specification, intelligent fire detectors designed for use with a variety of Fire Alarm Control Panel (FACP) platforms including the FireBus Fire Protection Interface (FPI) products for industrial controllers and the **FB-MESH/IP Series®** networkable fire panels.

The **FB-AP Series®** of products provide engineers with an additional dimension in fire protection capability.

Due to the advanced features found in the **FB-AP Series®** we recommend that engineers familiarise themselves thoroughly with the range by reading this product guide carefully.

In addition to the familiar smoke (ionization and optical) and heat detectors, the **FB-AP Series®** includes a multi-sensor detector. The multisensor detector matches the strengths of both ionization and optical detectors, and can, in most installations be used instead of an ionization detector.

Communications

FB-AP Series® products use a digital communications protocol which has been developed to operate in three different modes: Normal, Read and Write. This "modal" communications is required because the AP Series devices require a more extensive exchange of information than previous analog addressable products.

In addition, **FB-AP Series®** products can store data in their onboard non-volatile memory.

The Normal mode is for communicating the detector status along with a drift warning flag.

The Read mode is used to check information stored in the nonvolatile memory of each detector.

In Write mode the Fire Alarm Control Panel (FACP) is

able to write information to the detector by extending the communication method in the same way as in Read mode. The detector does not return its analog value during Read or Write modes, but, in the event of the detector calculating an alarm value during this time, it can use the alarm flag and alarm address mechanism to alert the FACP to its status.

FireBus-AP Series®

· **Ionization smoke detector**

· **Optical smoke detector**

· **Heat detector**

· **Multisensor detector**

· **Manual call point**

Key features

· **Rejection of transient signals**

· **Flashing LED option**

· **Five response modes for ease of optimization to changing environments.**

· **Drift compensation to ensure constant sensitivity.**

· **Non-volatile memory for user data.**

· **Alarm flag for fast alarm reporting.**

· **Conventional alarm facility during CIE processor fault.**

· **360° visibility in alarm**

FB-AP Series®
SMOKE AND HEAT DETECTORS

Response settings:

Each detector can operate in one of five response modes, any of which can be selected from the FACP. Each mode corresponds to a unique response behavior, which can be broadly related to sensitivity to fire. Whatever the type of detector, Mode 1 will give a higher sensitivity to fire than Mode 5. The selection of the most suitable mode depends on the application.

For ionization and optical smoke detectors, the modes relate to different combinations of smoke response threshold and response time. For the heat detector, the mode relates to the fixed temperature setting and the sensitivity to rate-of-rise of temperature. For the multi-sensor, the mode relates to the levels of smoke and heat sensitivity and to the way in which the responses of the two sensors are combined.

The response characteristics of the detectors have been carefully set so that detectors will comply with the requirements of the relevant NFPA requirements in all response modes.

The internal signal processing of the detectors is designed so that the analog value reported is always close to 25 for a normal condition. The alarm threshold is 55, regardless of the response mode selected. Similarly, the alarm flag in the protocol is always set when the analog value exceeds 55, regardless of mode. This simplifies the switching between response modes since the alarm threshold in the FACP can remain fixed at 55 and the alarm flag is valid in all modes.

The response mode, which is selected through the protocol, is stored in non-volatile memory and will therefore be retained when the detector is powered down. All FB-AP Series® detectors are factory set to mode 3 before shipping. Response modes are defined more fully in the individual detector descriptions.

Local Indication:

All FB-AP Series® detectors have two integral LED indicators, which can be illuminated at any time by the FPI to indicate devices in alarm. When activated, the LEDs will draw an extra 3mA from the loop. In addition to this mode of operation it is possible to enable a flashing LED mode via software. In this mode the LEDs will flash each time the device is polled. The device does not draw extra current in this mode since the LED current is part of the normal current pulse reply from the device. All FB-AP Series® devices are factory set to non-flashing mode.

Rejection of transient signals:

All FB-AP Series® detector algorithms are designed to give low sensitivity to very rapid changes in the sensor output, since these are unlikely to be caused by real fire conditions. This is achieved by digital low-pass filtering of the sensor values which optimizes the rejection of false alarm sources while maintaining the response to fire. The filter parameters depend on the mode selected and for some modes the filtering is minimal. The filtering has no significant effect on the response to fires but does affect the way in which detectors respond to transients and to step changes of smoke or heat. This is seen in the "minimum time to alarm" given in individual detector specifications. These times represent the time taken by the detector to reach the alarm condition when responding to a large step change in input.

FB-AP Series® FEATURES
SMOKE DETECTORS

Drift compensation:

All FB-AP Series® smoke detectors include compensation for sensor drift as part of the internal signal-processing algorithm. The algorithm will compensate for changes in sensor output caused, for example, by dust in the chamber, and will therefore hold the sensitivity at a constant level even with severe chamber contamination. This increased stability is achieved without significantly affecting the detector's sensitivity to fire.

The compensation level is stored in the detector's memory as a single value between 0 and 31. The normal level, that is, with no compensation applied, is 16. Values above or below this indicate drift towards alarm or away from alarm respectively.

For compensation values in the range 4 to 30 the detector is working within its allowable range. A value which is less than 4 or greater than 30 results in a warning flag. A value of zero results in a fault signal. The maximum compensation that can be applied is 31. If further drift occurs, the analog values will simply track the drift and the detector will become more sensitive. Compensation values are stored in nonvolatile memory and will be retained even if detectors are disconnected. It is possible to use software through the FACP to ascertain the level of compensation applied at any time.

It is possible, through the protocol, to carry out a normalization procedure which rapidly "updates" the drift compensation. This facility may be useful during commissioning when detectors can be quickly acclimatized to the prevailing ambient conditions, or after a compensated detector has been cleaned.

Ordering Information:
7254-FBD-8450 Heat Detector, FB-AP
7254-FBD-8550 Ionization Heat Detector, FB-AP
7254-FBD-8650 Optical Heat Detector, FB-AP
7254-FBD-8750 Multisensor Detector, FB-AP