

PW-300STA

Intelligent Point Type Smoke/Heat Multisensor Detector

Description

PW-300STA intelligent point type smoke/heat multisensor detector contains an optical smoke sensor and a thermistor temperature sensor whose outputs are combined to give the final analogue value.

The way in which the signals from the two sensors are combined depends on the response mode selected. The different modes provide response behavior which incorporates pure heat detection, pure smoke detection and a combination of both. The multisensor detector is therefore useful over the widest ranges of applications.

Features

- Ideal for a wide range of applications.
- Enhanced false alarm management.
- Unaffected by wind or atmospheric pressure.
- Well suited to sensitive environments.
- Five approved response modes to GB standards.
- Heat only and optical only modes.
- Remote test feature.

NOTE: For system compatibility and feature support of this device, please refer to your chosen panel manufacturer.

Specifications

Detection Principle: Smoke: Photo-electric detection of light scattered by smoke particles.

Heat: Temperature-dependent resistance.

Sensor: Silicon PIN photodiode.

Emitter: GaAlAs infra-red light emitting diode.

Sampling Frequency: Once per second.

Supply Wiring: Two wire supply, polarity sensitive.

Terminal Functions: L1&L2: Supply in & out connections.

+R: Remote indicator positive connection.

-R: Remote indicator negative connection.

Operating voltage: 17 V – 28 V DC.

Modulation Voltage: 5V – 9V peak to peak.

Quiescent Current: 400µA.



Power-up Surge Current: 1 mA.

Maximum Power-up Time: 10 seconds.

Remote Output Characteristics: Connect to a positive line through 4.5kΩ (5mA maximum).

Alarm Indicator: Two clear viewable light emitting diode (LED) illuminating red in alarm. Optional remote LED.

Alarm Current, LED Illuminated: 1 mA.

Alarm Level Analogue Value: 55.

Operating Temperature: -10°C to +65°C.

Humidity: 0% - 95%RH (non-condensing).

Effect of Atmospheric Pressure: None.

Effect of Temperature on Optical Sensor: Less than 15% change in sensitivity over rated change. Slow changes in ambient conditions will automatically be compensated and will not affect sensitivity.

Effect of Wind Speed: None.

IP Rating: IP34.

Dimension: 99.5mm(D) x 49.5mm(H).

Weight: 100g.

Housing Material: White flame-retardant polycarbonate.

Terminals Material: Nickel plated stainless steel.

Standard: GB4716 & GB4715.

Approvals: CCCF.

CCC-Mark.

Operation

The way in which the signals from the two sensors are combined depends on the response mode selected. The five modes provide response behaviour which incorporates pure heat detection, pure smoke detection and a combination of both. The multisensor detector is therefore useful over the widest range of applications.

The signals from the optical smoke sensing element and the temperature sensor are independent and represent the smoke level and the air temperature respectively in the vicinity of the detector. The detectors micro-controller processes the two signals according to the mode selected.

When the detector is operating as a multisensor (i.e. modes 1, 3 and 4) the temperature signal processing extracts only rate-of-rise information for combination with the optical signal.

A large, sudden change in temperature can, however, cause an alarm without the presence of smoke if sustained for 20 seconds or when the temperature reaches 76°C.

Additional Heat Sensor Information

The Addressable Optical/Heat Multisensor detector includes additional temperature information intended for use in signal processing.

Temperature data can be read separately by the control panel* and used to validate an alarm signalled by the multisensor analogue value. An example of this would be a high multisensor analogue value not accompanied by an increase in heat: this would indicate that an agent other than smoke, e.g. steam, had caused the high analogue value.

Electrical Description

The Addressable Optical/Heat Multisensor Detector is designed to be connected to a two wire loop circuit carrying both data and a 17V to 28V DC supply. The detector is connected to the incoming and outgoing supply via terminals L1 and L2 in the mounting base. A remote LED indicator requiring not more than 4 mA at 5 V may be connected between the +R and -R terminals.

Flashing LED

Addressable Optical/Heat Multisensor Detectors have two integral LED indicators, which can be illuminated at any time by the fire control panel to indicate detectors in alarm. A flashing LED mode can also be programmed to activate each time a detector is polled.

Remote Test Feature

The remote test feature is enabled from the fire control panel. On receipt of the command signal from the fire control panel, the detector is forced electrically into alarm. An analogue value of 85 is returned to the fire control panel to indicate that the detector is working correctly.

Response Modes

Addressable Optical/Heat Multisensor Detectors can be operated in any one of five response modes, which can be selected through the fire control panel. Each mode corresponds to a unique response behaviour, which is related to sensitivity to fire. Mode 1 gives a higher sensitivity to fire than Mode 5.

Multisensor Detector Response Modes

Mode	Smoke Sensitivity (grey smoke)		Temperature Classification	Response Type	Minimum Time to Alarm (seconds)
	%/m	dB/m			
1	1.1	0.06	BR	Multisensor	20
2	2.1	0.12	No response	Optical	30
3	2.8	0.16	BR	Multisensor	20
4	4.2	0.24	BR	Multisensor	20
5	No response		A1R	Heat	15

Characteristics of the Response Modes

The processing algorithms in modes 1 to 4 incorporate drift compensation. The characteristics of the five response modes listed above are summarised as follows:

Mode 1

Mode 1 has very high smoke sensitivity combined with high heat sensitivity. This gives a high overall sensitivity to both smouldering and flaming fires.

Mode 2

Mode 2 has a smoke sensitivity similar to that of a normal optical smoke detector. This mode is therefore equivalent to a standard optical detector. It is suitable for applications in which wide temperature changes occur under normal conditions.

Mode 3

Mode 3 has moderate smoke sensitivity combined with high heat sensitivity. This combination is considered the optimum for most general applications since it offers good response to both flaming and smouldering fires.

Mode 4

Mode 4 has lower than normal smoke sensitivity combined with high heat sensitivity. This makes it suitable for applications in which a certain amount of fumes or smoke is considered normal.

Mode 5

Mode 5 has no smoke sensitivity at all but gives a pure heat detector response meeting the response time requirements for a Class A1R detector according to GB4716-2005 standard. In this mode the detector will respond to slowly changing temperatures and has a 'fixed temperature' alarm threshold at 58 °C. The analogue value in this mode will give the approximate air temperature over the range 15°C to 55°C.

In Mode 5 the smoke sensor is still active though it does not contribute to the analogue signal. As a consequence, if the detector is used in a dirty or smoky environment the optical sensor drift flag may be activated in the heat only mode.