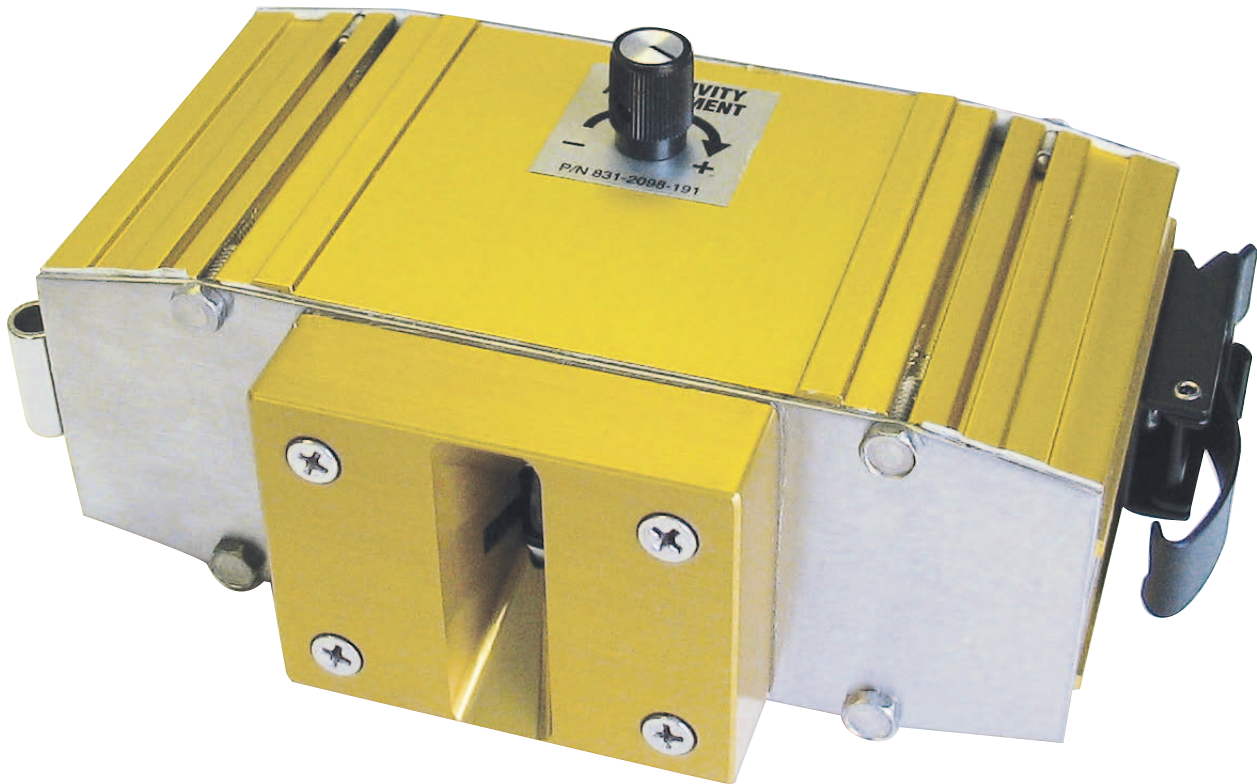


4600 SERIES SOLAR BLIND INFRARED EMBER DETECTORS

Ultimate Protection Against Moving Fires



The 4600 Solar Blind Infrared Ember Detectors are a family of ultra sensitive optical sensors designed to detect, in the presence of ambient light, the radiant energy emitted by minute burning or glowing particles being transported on conveyor belts.

Features:

- Detects Moving Fires in less than 100 milliseconds
- Solar Blind
- Ultra Sensitive
- Extremely Stable
- Rugged Physical Design
- 3 or 4 Wire Models
- Easily Mounted
- Latching or Non-latching

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Performance

The 4600 Solar Blind Infrared Ember Detector is designed to detect a 1 square inch (6.25 square cm.) infrared glowing radiator traveling at speeds between

8 and 20 fps (2.5 and 6 m/s) in daylight under optimum conditions. Even with a layer of dust on the viewing window, the detector remains sensitive.

Principle of Operation

The 4600 Solar Blind Infrared Ember Detector employs a narrow band optical filter with a sapphire lens. This narrow band includes the high peak emissions generated by the formation of CO₂ (4.35 microns) and CO (4.6 microns). Sun light, arc welding and artificial lighting have minimal radiation in this band. This precise filtering combined with extreme amplification and noise

canceling techniques result in a reliable and dependable moving ember detector. When burning or glowing embers enter the cone of vision of a detector, it responds with an alarm signal. The detector latches into alarm unless specially wired in the non-latching mode. In the non-latching mode it responds with a 1 second pulse and returns to the standby state.

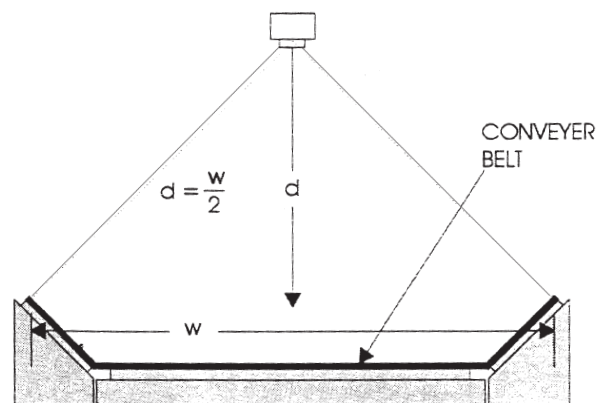
Detector Location

The Half Power Cone of Vision (HPCV) of the detector is 90 degrees and its maximum sensitivity is along its optical axis.

At a height of 3.25 ft (1.0 M), a single detector can cover a belt as wide as 6.5 ft (2.0 M). The detector should ideally be mounted at a height equal to half

the belt width. The exact location of the sensors along the length of the belt will depend on the belt speed, coasting distance and coasting time.

In general, two detectors are recommended for every conveyor; one close to the head pulley and one close to the tail pulley.



Test Lamp

An optional Test Lamp is available to test the sensitivity of the detector. This is a "through the lens test" and it verifies the condition of the lens as well as all circuitry. A failure of "self-test" would

normally indicate a lens is dirty and needs to be cleaned. The test light draws 100 milliamps during testing.

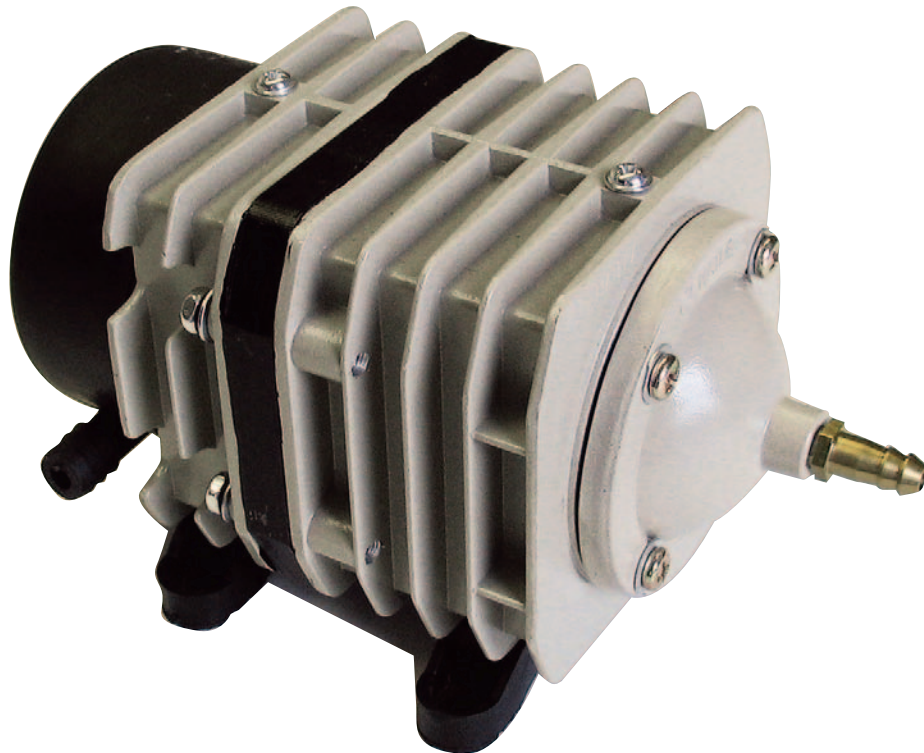
Air Purging

Air Purging provides a stream of air across the viewing window and an increase of air pressure around the viewing window. Air Purging reduces the accumulation of resinous material such as sub-bituminous coals, tobacco, cocoa, and coffee.

Air supply required is approximately 2 cfm/70 Lpm @ 2 psig/.025 mpa.

An optional air compressor/pump is available for either 110 VAC or 220 VAC versions (460-BL-110 or 460-BL-220) and consumes 35 watts. One air compressor/pump is required for each detector that requires air purging.

Alternately, a larger central compressor could be piped to multiple detectors.



Mounting Fixtures

Various mounting fixtures are available to accommodate different conveyor galleries. The standard Hinge and Latch Bracket feature

allows detector mounting directly on belt shrouds and facilitates easy lens cleaning.

Latching/Non-Latching Modes

The field selectable choice between latching and non-latching modes of operation depends on the extinguishment method. For fixed water spray

systems, the belt has to be tripped and the detector should latch. For intermittent water spray, the detector should be in the non-latching pulse mode.

Specifications

- Spectral Response: 3.8 to 4.5 microns
- Spectral Peak: 4.3 microns
- Field of View (HPCV): 90 Degrees
- Response Time: 100 milliseconds
- Sensitivity: 10 microwatts
- System voltage: 24 V DC Nominal
- Current: Standby: 30mA
Alarm: 40 mA
- Temp. Range: (-)40° C to 60° C
- Dimensions: 150 x 75 x 55mm
- Weight: 1.75lb, 0.33kg

Architect and Engineer Specifications for Belt Conveyor Applications

The detection of fire for the specified conveyor belts shall be by the use of the Neola Corporation Series 4600 Infrared Solar Blind Ember Detectors. The detectors shall be blind to direct and reflected solar radiation and those detectors requiring the use of ambient light attenuating shields shall not be acceptable. The detector spectral response should match the emissions from the fluorescence of carbon during the combustion process and should be in the 3.8 to 4.5 micron range with a peak at 4.3 microns. The detector shall have a sensitivity of 10 micro watts and response time of 100 milliseconds. The detector shall be suitable for belt speeds up to 20 fps (6 M/s) for 1 sq. in. (6.25 sq.cm.) embers. The HPCV shall not be less than 90 degrees and not more than one detector shall be required for belts of width up to 6.5 ft. (2.0 M) The detector shall be mounted looking down at the width of the belt so that its field of view is normal to the belt direction. The mounting height shall be equal to half the belt width.

The connection between the detector shall be by shielded cable, factory terminated at the detector end. The detector shall operate on a nominal 24 V DC power supply and shall consume no more than 40 milliamps.

The detector enclosure shall be weatherproof and constructed from corrosion resistant anodized copper free 6063 aluminum and SAE 30303 stainless steel. The detector operating temperature range shall be (-) 40° to 140° F (-40° to 60° C).

The sapphire window shall be provided with an Air Purge if the conveyed material or its dust has a tendency to adhere or cling. The air requirement per detector shall not exceed 100 Lpm.

Latching and Non-latching pulse modes of operation shall be field selectable. Detectors are required for every conveyor; one each, close to the head and tail pulleys. The exact location will be decided at site based on belt speed, coasting time and coasting distance.

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