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Diligent
MICRO CONTROLS

DESIGN CONSULTANT & MANUFACTURER

* ELECTRONIC CONTROL SYSTEMS
* IMPORT SUBSTITUION

Diligent "Flameye" Flame Monitors

Heat has always been very useful to man kind. One of the basic and common ways to obtain heat is by burning combustible fuels. However, such combustion must be controlled and safe. Safety of combustion is ensured by monitoring flame. Flame is characterized by emission of wide spectrum of electromagnetic radiation starting from infra red, visible light to ultra-violet radiations. Flame is also known to generate ions in its envelope. Type of fuel and that of burner decides which one of these radiations predominate. For example; flame of coal or oil is usually very bright and yellow in color, flame of light oil like kerosene or that of hydrocarbon gas is light blue and flames of some gases may be even dull reddish. In addition to this, intensity of flame could differ widely depending on the type and size of flame. Hence different techniques have evolved and new are being developed to detect and monitor flames. DILIGENT MICRO CONTROLS has developed wide range of flame monitors "Diligent Flameye". In addition to the basic flame monitor we have developed intelligent versions which provide
Built in delay for flame ON or OFF status change,
Multiple contacts out puts,
Dual flame monitor,
Dual flame monitor with AND logic,
Dual flame monitors with OR logic,
Dual flame monitor with mixed sensor types,
Inverse Mode of operation of control relay,
Weatherproof enclosure flame monitor.

AC power supply of 230V +/- 10 %, 50 Hz, 1ph ac is required for operation of all Standard Flameye models. However, versions suitable to work with other standard AC or DC supplies can be provided on request. One change-over potential free relay contact rated at 4 amps (resistive) at 230 V ac, is provided in all standard units. Multiple potential free contacts can be provided as optional.

Diligent Flameye are classified based upon sensing technique used and these are as described below-

Diligent Flameye PR

Flame produced while burning diesel, furnace oil, HSD, LHSH, etc., is bright and yellow. PhotoResistor type photocell have excellent response to the visible light spectrum and, therefore, is the most reliable and cost effective choice to detect such flame. Diligent Flameye PR provides appropriate bias to the basic PR sensor which generates change in its resistance commensurate with the amount of visible light radiations received by it. This change is received by Flameye which conditions and amplifies it before comparing with preset reference. When signal level crosses the reference, internal relay picks up. This relay goes back to off state as soon as the radiations falling on PR sensors cease. Basic signal from PR sensor is very small and should be transmitted over screened cable to Diligent Flameye and his cable should be preferably laid away from power cable.

Diligent Flameye PV

PhotoVoltaic photocell is another basic sensor which has excellent response over visible portion of electromagnetic radiations. It produces electric dc voltage in mV range in response to the intensity of light falling on it. This small signal from PV sensor is conditioned & amplified by Diligent Flameye PV and then compared with preset reference. When signal level crosses the reference, internal relay picks up. This relay goes back to off state as soon as the radiations falling on PV sensors cease. Basic signal from PV sensor is very small and should be transmitted over screened cable to Diligent Flameye and his cable should be preferably laid away from power cable.

Diligent Flameye UV

PR and PV sensors are excellent choice when the flame is bright yellow. However these sensor hardly respond to a flame which is blue, light blue or nearly invisible like the one that exist while burning of light oil, LPG gas, Natural gas, propane, butane, methane, etc. Such flame is sensed by sensing the radiations in ultra-violet range which are associated with all combustion processes. Gas filled UV photocell or semiconductor type UV photocell is used to receive these radiations from flame. These cells require correct biasing voltage which is provided by Diligent Flameye UV. Tiny signal in micro ampere is generated by UV sensor and is then transmitted over screened cable to Diligent Flameye UV. This cable must be of very good quality having low capacitance and high grade insulation. This small signal from PV sensor is conditioned & amplified by Diligent Flameye UV and then compared with preset reference. When signal level crosses the reference, internal relay picks up. This relay goes back to off state as soon as the radiations falling on PV sensors cease.

Diligent Flameye ION

Ions are produced in the envelope of all types of flames due high temperature in side. This technique picks up these ions under the influence of appropriate bias voltage and generate tiny signal which is then transmitted over screened cable to Diligent Flameye ION. This cable must be of very good quality having low capacitance and high grade insulation. This small signal from ION sensor is conditioned & amplified by Diligent Flameye ION and then compared with preset reference. When signal level crosses the reference, internal relay picks up. This relay goes back to off state as soon as flame extinguishes. This technique relies on collecting of ions in the flame and hence the sensor electrode must always be in good contact with the flame and flame must also be in continuous contact with electrically earthed body. Any violation of this will make the flame signal disappear.

Flame Sensors

All the flame sensor except ION sensor are electronic sensors and hence their operating environment temperature must not exceed 55 deg C. Higher temperature, though may not lead to malfunctions, can severely affect the useful life of the sensor. All of the sensors, therefore, carry any testing warranty and none of these carry conventional warranty. ION sensor is electrode with high grade insulator and high temperature collecting rod. Care is necessary to ensure that the scaling on rod is periodically removed, contamination that could reduce insulation level of rod, should be avoided and cleaned if noticed.

Warranty

Diligent*FLAMEYE carry a warranty for period of 12 months from the date of delivery. During warranty period we undertake repair/replace free of cost part pr full unit found defective at our total discretion provided that such unit is brought to our works for rectification & collected there from after satisfactory inspection by the customer at his total cost & risk and provided that the defect is due to poor material/ workmanship and not due to misuse/mishandling. This warranty is exclusively limited to the unit supplied by us and we shall not be responsible in any ways for any of the consequences arising due to its use/misuse any where. This warranty shall automatically become null & void if our unit is opened/tampered by person not authorized by us.

Due to the operating environment of flame sensor, all types of flame sensor carry only TEST WARRANTY i.e. the operational status of the sensor will be demonstrated while taking delivery from our works.