

Mitsubishi Flame Detector New Series "IR-S"

Main-burner flame detectors have been conventionally used in both ultraviolet (UV) type and infrared (IR) type, but along with recent diversification of boiler fuels and low NOx operation, it has now become difficult to detect flames stably with the existing UV or IR system. Against this background, we have developed a new type infrared burner flame detector having flame detecting characteristic of low brightness and a widely expanded dynamic range, which is applicable to various types of fuels.

1. Principle of detection

The furnace light is transmitted to a light guide (optical fiber), intensity and change of infrared ray are picked up by a semiconductor type infrared ray sensor, and burner flame flickering is detected. Using Si photo diode as detecting element, a near-infrared ray region of wavelength from 700 to 1100 nm is detected.

The infrared ray flame detector (IR type) has been

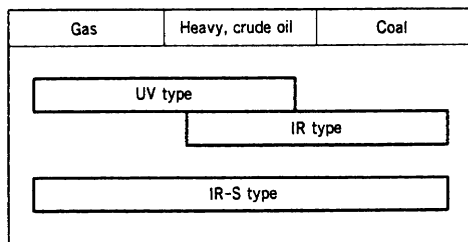


Fig. 1 Applicable fuels by type

developed on the basis of a similar principle of detection. 3 000 sets are already in current use, while the new IR-S has been dramatically improved from the IR type and has been expanded in the application range in fuels.

2. Features

As compared with the IR type, the new sensor has been enhanced in both sensitivity and dynamic range by approximately 100 times, and field adjustment of the sensor becomes unnecessary.

With conventional flame detectors, it is necessary to select either UV type or IR type depending on the type of fuel. However, the IR-S is applicable to all types of fuels, as shown in Fig. 1.

To update existing flame detectors, since the sensors and cables are compatible with existing sensors, the majority of components can be shared. Compatible parts are listed in Table 1.

The signal from the sensor is processed in the detector unit incorporated in the control cabinet, and a flame on/off signal is issued to the automatic burner control system (Fig. 2). The detector unit processes flame detection for two burners (one pair) by unit independently. Up to 20 detector units (covering 40 burners) can be assembled in one control cabinet.

Table 1 List of compatible parts in existing system

Device name	UV	IR
Detector cabinet	New	New
Sensor cable	Compatible	New
Sensor main body	New	New
Guide pipe	Compatible	Compatible
Cooling air piping	Compatible	Compatible
Cooling air fan	Compatible	Compatible

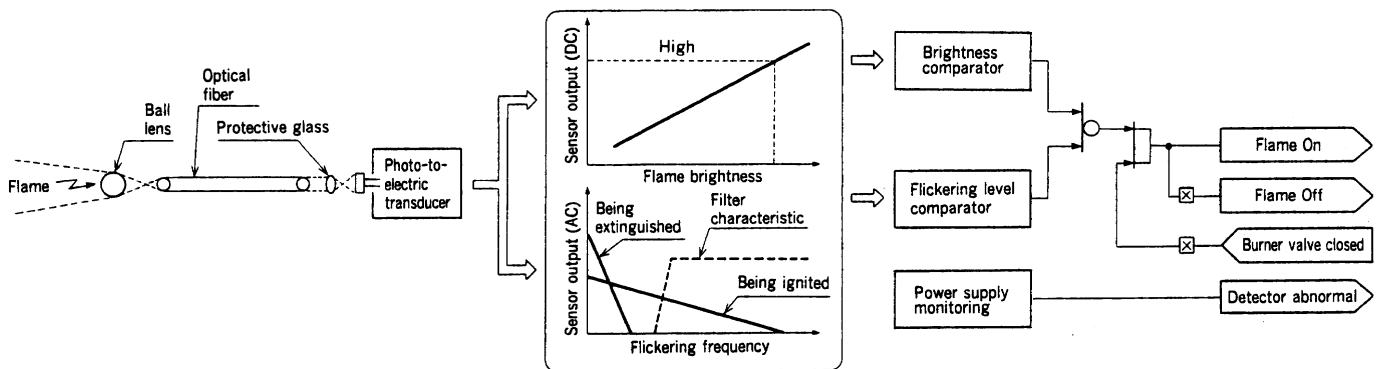


Fig. 2 Signal processing flow in IR-S