

Ultraviolet Viewer Offers Portable Detection of Invisible Flames

Competitive Advantages

- ☑ Fiber-optic system shows precise size and location of invisible flame.
- ☑ Portable unit requires no camera or electric power.
- ☑ Options include monocular/binocular viewing and optimized waveguiding.
- ☑ Improves safety and security of industrial and military processes.

Hydrogen and other chemicals can produce invisible flames that threaten safety. While equipment is available to detect the UV light emitted by these flames, it is not portable, uses a camera or other actively powered components, and is based on non-imaging methods that provide no information about the size or precise location of the flame.

Now a portable, unpowered optical system can improve industrial safety by displaying a live image of an invisible flame. The unit requires no power and does not use a camera.

Simple Fiber-Optic System

Within the viewer, ultraviolet and visible light pass through a magnifying glass. The image is then displayed on fluorescent-doped optical fibers that convert the UV light to green light. It can then be magnified by an eyepiece.

Multiple Configurations

The system can be modified and enhanced in several ways.

Both monocular and binocular configurations are possible. A monocular viewer would offer lower cost and greater portability, while a binocular viewer would allow better visual tracking of moving objects.

Filters and a choice of doping materials would allow the system to be tuned to a specific light frequency.

Waveguiding could be achieved through a holey arrangement of the bundled optical fibers, through the use of gradient or step changes in the index of refraction, or with a reflective cladding around the fiber bundle that, for optimal results, could be combined with an opaque outer layer to reduce crosstalk between fibers.

Finally, optical zoom and focus capabilities could be added to the system.

Commercialization

The flame detector will be of value in any industrial or military application that uses hydrogen or another chemical capable of producing invisible flames. The reliability, portability, precision, and low cost of the device will enhance safety, reduce liability, and decrease the risk of industrial accidents.

Patent/Licensing Status

Patent pending. Exclusive rights available.

Learn More

Complete description with illustrations
www.uvminnovations.com/graphics/flame_viewer.pdf

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