# Infrared Sensor Application Note 6
# Advice for Using Infrared Gas Sensors in Mining Applications

In mining applications it is important to take account of the dusty and humid conditions typically found within that environment. Dust or water inside the sensor cavity or under the pin connection will cause the sensor to operate incorrectly and create problems with drift and false alarms.

The following recommendations will help avoid these problems and ensure reliable sensor operation.

## DUST AVOIDANCE

To ensure dust does not enter the sensor or clog the flame arrestor, it is advisable to use a PTFE type porous membrane filter in an accessible position for easy maintenance and replacement. This filter can be ordered as e2v part number DPP702964BA or order the IRxxxF version of the sensor type.

These filters can also be ordered directly from Mupor at www.porex.com, part number PAD21MLG.

It is also advisable to have an additional coarse replaceable filter on the instrument housing to prevent gross dust entry.

Dust must not be allowed to enter the cage jack connector sockets under the sensor as this can lead to contact problems. To protect the sockets, it is advisable to use an O-ring seal under the sensor or seal the sensor to the PCB with a flexible sealant. The user can also prevent bulk dust entering the instrument case by ensuring it is adequately sealed with an O-ring or a flexible seal.

## WATER AVOIDANCE

It is very important that water does not condense or leak into the sensor. This can be prevented again by the use of a Mupor PTFE filter and ensuring that water spray is not directed on to the sensor. It is also good practice to seal the base of the sensor to the PCB with an O-ring or a water resistant sealant to mask the pin connections. Sealing the first stage amplifier will also help prevent drift due to high humidity. A suitable conformal coating (or potting) can give extra protection.

By design, and to help prevent condensation inside the sensor, the sensor temperature is raised 5 - 6 °C above ambient by the IR source. The user may fit an insulating jacket (e.g. foam sponge) around the sensor body to help maintain this temperature gradient.

Other infrared application notes are available from the e2v technologies website, www.e2v.com.

Infrared Sensor Application Note 1 - Background to NDIR Gas Sensing.

Infrared Sensor Application Note 2 - Signal Processing.

Infrared Sensor Application Note 3 - Software Design.

Infrared Sensor Application Note 4 - Electronics Design.

Infrared Sensor Application Note 5 - Determining Coefficients for Linearisation and Temperature Compensation.



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