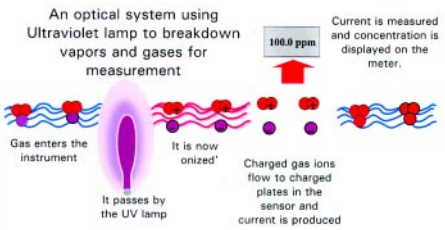
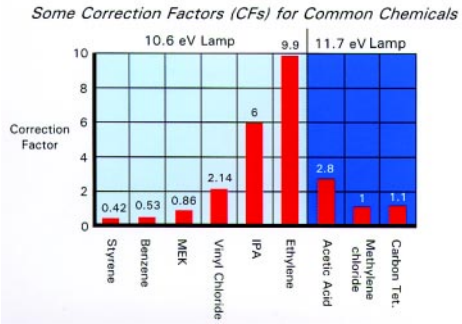
What is a photoionization detector (PID)?

The MultiRAE, ToxiRAE and ppbRAE use an electrodeless 10.6 eV ultraviolet lamp to ionize chemicals with ionization potentials (I.P.) below 10.6 eV and thereby measure their concentrations in parts-per-million. The MultiRAE, ToxiRAE and ppbRAE are best used to detect low levels (0-2000 ppm) of broad band toxics or volatile organic compounds (VOCs). Breakthroughs in lamp and sensor technology allow the MultiRAE, ToxiRAE and ppbRAE to be small, rugged and affordable.





Advantages of a PID Sensor

1. Very sensitive - low ppm readings measured with confidence.
2. Instantaneous display, updated every second, for real time monitoring of toxic chemicals.
3. STEL, TWA and Peak values, updated every minute, accessible to the user at the end of the work shift.
4. Threshold monitoring - visual and audio alarms in real time for STEL, TWA and Peak. Alarm signals vary for each condition.
5. Datalog for compliance and workshift trend analysis.
6. Historically, PIDs were calibrated to isobutylene because the response to this chemical is midpoint compared to a wide range of chemicals. A large table of calibration factors is available, alleviating the need to purchase many calibration gases.

Broad band toxic compound monitoring in the work place. Until now, the only way to get a 'GO' or 'NO GO' reading for broad band toxics or VOCs was through the use of a broad band toxic sensor (MOS type) or a LEL sensor. These are not sensitive enough to provide accurate warnings of most toxic vapors until the permissible exposure levels are greatly exceeded. MOS and LEL sensors are best used in the percentage range, not the ppm range. One percent is 10,000 ppm. Benzenes permissible exposure limit is 1 ppm, due to its highly carcinogenic nature. MOS and LEL sensors neither have the sensitivity nor the resolution to detect these levels. It is like measuring the thickness of a coin with a yard stick or a meter ruler.

"Protection" versus "Detection"

PIDs nave traditionally been considered as "detection" instruments, particularly used by first responders and The entry teams to determine the extent of a spill. MultiRAE and ToxiRAE are "protection" monitors, optimized for ambient air monitoring, alerting workers to potentially hazardous conditions. Other applications include PID ppm monitoring for combustible gases such as Jet fuel, Gasoline and Solvents.

MultiRAE and ToxiRAE can "See" when the permissible exposure levels are exceeded

While effective and proven absorption tubes do not provide real time alarms, if permissible exposure levels are exceeded, personnel could be unaware for days or weeks after the occurrence. The MultiRAE, ToxiRAE and ppbRAE provide instantaneous alarms to indicated when exposure limits have been exceeded foro wide range of chemicals.

When levels are exceeded, the datalogging feature of the MultiRAE, ToxiRAE and ppbRAE allows the individual to "see" which part of the day or night the levels were a problem, whereas a tube cannot indicate if it happened all at once or accumulated throughout the course of the workers' shift.

The MultiRAE, ToxiRAE and ppbRAE data can be instantly accessed from a personal computer. One can immediately ask an individual what happened to create the situation that exceeded the exposure limits while the individual can still recollect what happened. The answer could be as simple as cleaning with solvents or failure of a ventilator. Therefore with instantaneous alarms one datalogging, safety action can be taken much quicker when using the MultiRAE, ToxiRAE and ppbRAE than any other device.

Measuring a "witches brew" of chemicals for a particular toxic.

Many have frequently measured the relative percentage of a particular toxic using specific and quantitative techniques against PID readings, for example, benzene in gasoline vapor. A surrogate method can be extracted from this extensive database, implying that about half the Permissible Exposure Limit (PEL) is not exceeded if the broad band reading is below a certain value. For example, if the total petroleum hydrocarbon reading is below 50 ppm, then benzene is below 0.5 ppm. PID sensors are a broad band sensor ideal for this level of measurement.