

## Reduction Gas Detector Capabilities

The Trace Analytical™ Reduction Gas Detector (RGD), by AMETEK Process Instruments, has numerous unique characteristics when compared to traditional chromatography detectors. The RGD was originally developed and patented by Trace Analytical as a means to measure minute concentrations, traces, of H<sub>2</sub> and CO in normal air constituents (N<sub>2</sub>, O<sub>2</sub>, CO<sub>2</sub> etc.), inert gases (Ar, He) and saturated hydrocarbons at parts per billion (ppb) concentrations.

Since its commercial introduction in the mid-1980s, the RGD has been tested with numerous chemical species as needed by new applications. The table below lists compounds that are known to be measured by AMETEK's Trace Analytical RGD analyzers. The typical lower detection limits of the RGD range from <0.5 to 25 ppb for each listed compound.

### COMPOUNDS THAT ARE SELECTIVELY DETECTED BY RGD

INORGANICS	HYDROCARBONS	OXYGENATES
Hydrogen	Isoprene	Acetaldehyde
Carbon monoxide	Ethylene oxide	Formaldehyde
Arsine	Ethylene	Methanol
Phosphine	Acetylene	Ethanol
Silane	Propylene	Iso-propanol
Diborane	C <sub>4</sub> -C <sub>6</sub> unsaturates	Acetone
Carbonyl sulfide		Methyl-ethyl-ketone

### How It Works

The basic operating principle of the detector is based upon the strong absorption of UV light by mercury vapor. Compounds eluting through the RGD-equipped analyzer pass through a heated mercuric oxide bed. In this bed, the reducing compounds in the sample (i.e. compounds that can combine with oxygen) react with the mercuric oxide thereby releasing mercury vapor. This vapor is then measured by a photometric cell as a change in the absorption of UV light. The change in absorption is directly proportional to the concentration of the reducing compound within the sample gas.

Our applications group is always ready to consult with you about your specific analytical requirements. Please contact AMETEK Process Instruments or your local AMETEK representative for information on our line of RGD-equipped Trace Analytical gas purity monitors.



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*One of a family of innovative process analyzer solutions from AMETEK Process Instruments.  
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