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## The Cost of Trapped Pipeline Air

**A**ir lock, line surges, low or no liquid flow, sudden and rapid changes in velocity, rapid flow reversal, water hammer, corrosion, and equipment failure – these are just a few possible problems found in liquid pipeline systems when air accumulates. If not removed, the effects of trapped air can lead to equipment damage and increased operating costs.

If air is trapped in your pipeline, your pumps are working harder to overcome air pockets and move the liquid. For example, if your system accumulated air last year that increased head pressure by 15%, your pumps were forced to work 15% harder (extended pumping cycles) drawing 15% more electricity. If you spent \$250,000 on electricity to power your pumps, you could have saved \$37,500 on electricity alone by just eliminating the air in the system.

Before we focus on how to eliminate trapped air in liquid pipeline systems, let us outline some ways air enters the system and what happens when it does.

Air can enter the pipeline through:

- Pipeline leaks
- Pump seal leaks
- Damaged joint seals
- Leaking valve packings
- Loose or leaking flange connections
- Pressure or vacuum changes
- Vortex actions of pumps
- Velocity changes
- Poorly controlled or unexpected negative pressure events
- Turbulence or eddy effects at bends, valves or fittings
- Equipment maintenance or installations
- Chemical reactions
- Temperature changes

When air enters the system, it accumulates into air pockets. Without preventative measures, these air pockets create air lock, line surges and other adverse conditions leading to increased maintenance, repair and/or excessive operating expenses.

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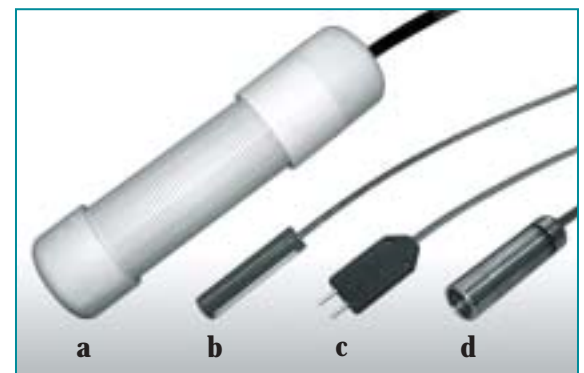
## New Sensors for Bioreactors

### *New Landfill Sensors Need No Field Calibration!*

Research has shown that municipal solid waste can be rapidly degraded and made less hazardous by monitoring and controlling the moisture content within bioreactor landfills under aerobic and/or anaerobic conditions.

To help enhance that process, EPG has developed new sensors designed specifically to monitor and detect the moisture (a) content as well as the temperature (b), leaks (c) and pressure (d) in bioreactor landfills. These sensors are easy to install, and unlike other sensors on the market, require no field calibration. EPG bioreactor

landfill sensors - just another reason why EPG has, for over 20 years, been the solutions provider for thousands of landfill professionals.



If you would like more information about EPG products, services and/or capabilities, please call us at 1-800-443-7426, visit our web site at [www.epgco.com](http://www.epgco.com) or e-mail us at [info1@epgco.com](mailto:info1@epgco.com).