

**We call it gas effect;  
You can call it a problem.**

**Gas Effect Breakout Box  
BJBGE-100B**

It is a problem when you have pumps in a gas extraction well, leachate collection sump (riser), or condensate sump operating under a positive pressure, as gas is being created, or negative pressure, if a vacuum is being applied to collect the gas.

The positive gas pressure will help push liquid into the pump while the negative pressure is going to add to the system head loss that the pump must overcome.

Both positive and negative gas pressures have an adverse effect on a submersible level sensor (transducer or transmitter). The level sensor measures the differential pressure across a diaphragm. One side of the diaphragm is exposed to the liquid while the back side is typically vented to atmosphere. In a closed system, if the sensor is vented to atmosphere, inaccurate readings will result.

For example: if the sensor is in a sump with 24" of liquid above the sensor, its display meter will read 24". If this same sump has 35" of positive gas pressure as well as 24" of liquid, then the meter will read 59".

In addition, if you have set the meter to start at 55" and to stop at 12", the pump will start when you have 20" of liquid in the sump but will not stop because the meter will not drop below 35".

The pump will pump down until there is no more liquid to pump and then run dry, which will cause a reduction in pump and motor life.

If you have the same liquid level start and stop settings, but now the sump is under a vacuum of 35", your pump will not start until the level reaches 90" of liquid depth and then shut off at 47". This error can easily put you out of compliance.

If the system switches from pressure to vacuum gas effect then the pumps will behave erratically, causing excessive wear and early failure.

If the pump is installed in a condensate sump, it will become very difficult to dewater the sump, which would allow slugs of water to move downstream in the gas header. This may cause pressure pulsations and other damage to the system, and may reduce the gas collection efficiency.

There is a simple solution to eliminate the gas effect; expose both sides of the submersible level sensor to the same gas pressure or vacuum.

EPG has designed and tested a breakout junction box, which when mounted directly to the riser, well or sump and connected properly, assures that the inside of the junction box feels the same gas effect as the inside of the riser or sump. Thus both sides of the level sensor are exposed to the same gas effect, resulting in accurate level readings.

This new junction box was designed and tested to withstand 100" of water column pressure or vacuum. It is a powder coated steel (stainless steel optional) enclosure with clamps on all four sides to create a positive seal between the cover and box. Special fittings are provided to allow a gas tight connection between sump, well, or riser and the breakout junction box. A gas tight seal-off must be installed between the breakout junction box and control panel.



Inside of the box is a desiccant dryer and equalizing bellows to protect the back side of the sensor from moisture and landfill gas. In addition, water-proof wire connectors are provided to prevent corrosion.

Please be aware that standard junction boxes will not hold a pressure or vacuum over two to five inches of water column.

If the junction boxes leak when under a vacuum, it will contaminate the landfill gas. If under pressure, then they become a source of fugitive landfill gas.

Note: When using screwed electrical fittings at a landfill, you should use Teflon® sealing tape on all of the thread joints to create a liquid and vapor tight seal. This tape will eliminate the conduit as a ground. This procedure requires you to pull a separate ground wire to maintain a good ground.