

Gem repairs that could be avoided

1. Do not try to tighten ports [quick connect] on the Gems this will twist interior hoses loose
2. Be sure you are in the correct [Field Calibration or Gas Reading] screen before connecting the cal gas bottle if in the wrong screen the solenoid valve will not be open to the exhaust for releasing pressure and this will twist the interior hose
3. Tighten the particulate filter cover [on the back of the Gem] to tight will keep the flow going through correctly and usually causes a flow fail. Make sure the cover is level with the case body.
4. If droplets of moisture are observed in the sample port tubing when taking a gas sample disconnect the sample hose at once. Any type of moisture drawn into the Gem can harm the internal cells.
5. If you are unsure if moisture was pulled into the Gem check the particulate filter in the back of the Gem case. If this filter is saturated then there is a good possibility that the moisture did enter the Gem
6. Be sure you are connecting the correct sample line when taking a sample from a header line with high vacuum. The top port [static/sample port] must be the port used. The bottom port [DP/Impact pressure] can not support the high vacuum reading and may harm the transducer.

Best day to day maintenance

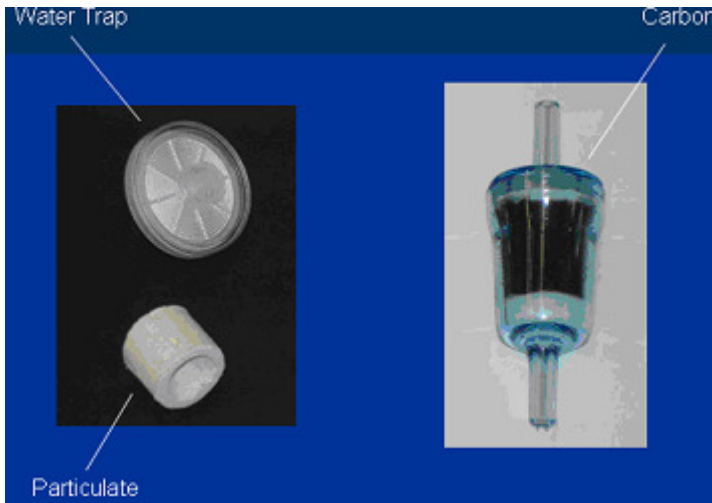
1. Field Calibrate each day the Gem is used and also when there are large temperature changes [+/- 20 degrees].
2. Use factory settings in the calibration menu if the calibration is difficult.
3. Download readings each day and clear readings from the instrument. The analyser's memory can be volatile, although it is retained by a battery back-up system. The memory is not to be used as a permanent storage medium and any data should be transferred to a more permanent storage location [download to the PC software and save your csv file] as soon as possible. The Gem should never be stored for prolonged periods with valuable data in its memory.
4. Although unlikely, sudden shocks, high levels of electromagnetic interference or static discharge may cause memory corruption. Remember a Cold start will clear corruption but this does remove all data in the Gem [IDs and Readings]

Using filters with the Gem

1. If methane seems higher than expected try using the charcoal filter to remove other hydrocarbons that are in the gas sample. These are helpful when known or suspected levels of H₂S, hexane, propane, or other non-methane hydrocarbons exceed one hundred ppm.
2. Keep 2 new water trap filters with you in case you get liquid in the sample line and need to change the filter.
3. Check the particulate filter if there seems to be a flow issue with the gas sample. It is a good practice to check it at least once a month.

DESCRIPTION OF THE GEM 2000 FILTERS

There are four filters used with the instruments, three, which are required and one optional external filter that may be purchased as an accessory. Two of the required filters may be changed in the field, and the third is an internal filter that requires factory replacement. The two field changeable filters are the external water trap filter in the sample tubing and the particulate filter that is located in the back of the Instrument. These filters should be replaced, in tandem, every hundred hours of use. The external water filter should be replaced more often if high levels of moisture are observed to be condensing in the clear tubing.



Filter Access





An external charcoal filter may also be used in series with the external water filter and should be installed on the instrument side of the external water trap filter. The charcoal filter is used when known or suspected levels of H₂S, hexane, propane, or other non-methane hydrocarbons exceeding one hundred ppm. Presence of these gases can affect the methane channel by indicating artificially high concentrations of methane.

The charcoal filter needs to be conditioned with Calibration gas before use.

Condition the charcoal filter before use in the field by using your cal gas. The best way is to put the filter in line when doing the CH₄ calibration although it may take a little longer for the CH₄ to reach the correct % you will know that the filter has been conditioned because the % reading of the cal gas has stabilized in the calibration screen.

After conditioning the filter and it is being used in the field do not use the carbon filter in the calibration tubing since it may have contaminants [hydrocarbons] from the field readings and you do not want them introduced into your calibration. [You should have a separate clean hose for your calibration]

When using the carbon filter for the first time the direction it is placed in the tubing does not matter but keep it in the same direction always after the first sampling event.

Best practice for instrument reliability

Prior to use, it is good practice to check that:

1. All necessary Field IDs from the PC software have been sent to the Gem
2. Check the 'Mode of Operation' is correct. Choose either GEM for gas extraction monitor or GA for landfill gas analyser.
3. The instrument has the correct time and date set.
4. The water trap filter is fitted and is clean and dry.

5. Spare filters are available in case of accidental water blockage. You may also want to have extra tubing incase the sample tubing gets damaged.
6. The battery has a good charge
7. The memory has sufficient space available.
8. The calibration gases are correct with a known concentration of calibration gas and you have a copy of the calibration steps if needed.

Factory Calibration Best Practice

1. Plan your bi annual or 6 month sampling event so you have time for the Gem to be sent in for service and factory calibration.
2. When shipping your Gem it is best to use your hard case with all original foam padding. If there is no hard case, make sure the Gem has enough padding around it to prevent it from shifting inside the box during shipping.