

## IMPROVING SAMPLE MOISTURE REMOVAL

A typical extraction CEMS uses a thermo-electric (TE) type sample conditioning system for removing sample moisture prior to introduction into the analyzers. An aging system and/or changing stack conditions can sometimes lead to problems with moisture removal. Following are a few things that can be done to increase the efficiency of a TE moisture removal system.

In the most common system, two sample impingers are used to lower the sample temperature and remove the moisture. The first impinger (passive) cools the sample to ambient temperatures and the second impinger cooled by a Peltier Cooler (active) cools the sample to lower temperatures (typ. 4°F) removing the remaining moisture.

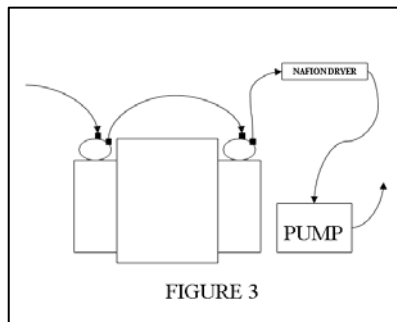
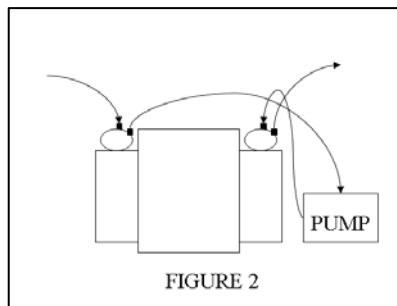
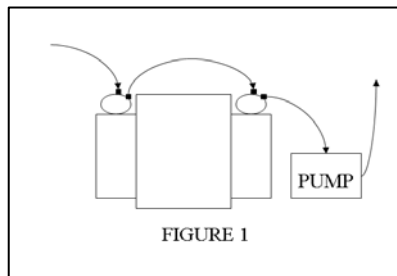
The CEMS sample pump draws the sample through the sample conditioner first so that the sample is dried before entering the pump (thereby protecting it from damage). The common method for plumbing this is shown in diagram 1 where the sample is drawn first through each impinger in series.

In order to increase moisture removal, the system can be replumbed to draw the sample through the first impinger, then the sample pump, and then the second impinger (diagram 2). This serves to "push" the sample through the active impinger increasing its moisture removing ability.

If implementing this plumbing scheme, the moisture level must not be too high

or the passive first impinger will allow too much moisture into the pump which could cause damage. In this case consider adding a PermaPure Nafion drier system in line shown in figure 3.

Figure 3 details a plumbing method which adds an additional dryer after the second stage of the impinger. This is an excellent way to maximize the moisture removing ability of a sampling system.



## HAPPY HOLIDAYS AND BEST WISHES FOR THE NEW YEAR FROM MONITORING SOLUTIONS!

2008 is right around the corner. If you have any CEMS projects coming up next year, please keep Monitoring Solutions in mind.

We offer solutions for anything CEMS related from:

- CEMS Upgrades/Replacements
- DAS Upgrades/Replacements
- Opacity
- Flow
- Oxygen Monitoring
- Service Contracts
- Repairs and Parts
- Component Replacements:
  - Probes
  - Umbilicals
  - Sample Conditioners
  - Analyzers
  - And more...

Let us help you in 2008. With our engineering expertise and outstanding service capabilities, we guarantee to meet and exceed your expectations!

## CEMS NEWSLETTER

**“Devoted to helping engineers and users  
better understand CEMS”**

If there is someone else who should be,  
or would like to be on our CEMS Newsletter mailing list,  
please contact Jim Nowak at:

888-380-5226

908-500-4010

<http://monsol.com/>

### IN THIS ISSUE:

#### IMPROVING SAMPLE MOISTURE REMOVAL

A typical extraction CEMS uses a thermo-electric (TE) type sample conditioning system for removing sample moisture prior to introduction into the analyzers. An aging system and/or changing stack conditions can sometimes lead to problems with moisture removal.

### THE COMPLETE SOURCE FOR ALL YOUR CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS) NEEDS:

- Both Dilution and Extractive Type Systems
- Data Acquisition Systems (DAS)
- Opacity & Flow Monitoring
- Oxygen Monitoring Systems
- Ambient & Meteorological Monitoring
- Process Monitoring Systems
- Complete Service and Support of all CEMS including:
  - ◆ RATA's ◆ Quarterly Preventative Maintenance ◆ Quarterly Audits ◆
  - ◆ Opacity Performance Audits ◆ Training ◆ Spare Parts ◆ Repairs ◆ Contracts

