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CEMS NEWSLETTER

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IMPROVING SAMPLE MOISTURE REMOVAL

A typical extraction CEMS uses a thermo-electric (TE) type sample conditioning system for removing sample moisture prior to introdcution 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 tempeartures (typ. 4°F) removing the reamining 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 it's 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.

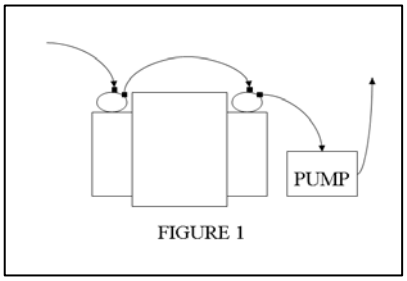

FIGURE 1

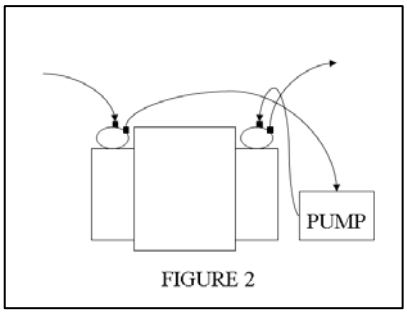

FIGURE 2

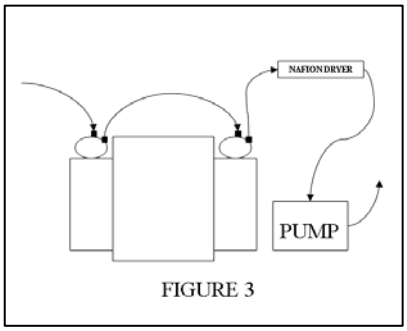

FIGURE 3

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.

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