

## CEMS MAINTENANCE: (A MULTI-PART SERIES)

We continue our series on CEMS maintenance. This issue covers sample pump and sample conditioner maintenance.

### Sample Pumps

Extractive system sample pumps can be very reliable when maintained regularly. As part of good routine maintenance and a QA/QC plan, the pump pressure setting should be checked weekly. On a quarterly basis, the sample pump should be checked for proper operation. The particulate filter connected to the pump should be changed every quarter as well.

Typically, as a pump fails there is an indication in the sample pressure. It's best to check the sample pressure reading every quarter and record it. Drastic changes in the sample pressure are indicative of a failing pump.

Another indication of a failing sample pump can be an insufficient sample supply to the analyzers. In either of these cases, a pump rebuild is the solution. Relatively inexpensive pump rebuild kits are available consisting of new diaphragms and valves.

To insure the maximum uptime of a CEM System, it's a good practice to rebuild the pump once a year. This will usually pre-empt any pump failures that can bring your CEMS down unexpectedly.

Eventually a sample pump's bearings will go bad. When this happens the choice is to either replace the bearings, or simply replace the entire pump.

### Sample Conditioning Systems

The most common sample conditioner used today is the Thermo Electric type,

consisting of impingers (often dual), which act as heat exchangers, and peristaltic pumps, which remove the moisture.

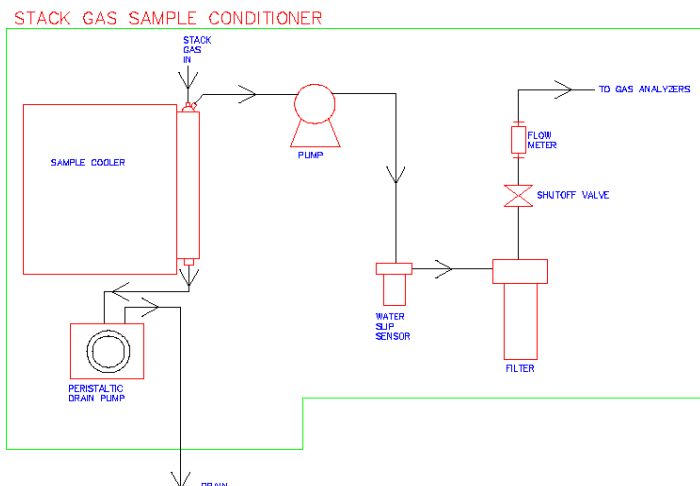
As part of good routine maintenance and QA/QC plan, the sample conditioner temperature reading should be checked weekly. Every quarter, check the moisture slip alarm for correct operation. The contacts on the sensor should be cleaned and then an alarm simulated by shorting them together. There should be a moisture slip indication on the conditioner itself and the DAS when operating properly.

The sample conditioners require very little maintenance. There is one very important item, however, that must be given attention to maintain reliable operation. Every six months, the neoprene tubing in the peristaltic pumps should be replaced.

In the event that the tubing wears out prematurely or gets torn, there is a strong likelihood that moisture will leak into the pump. When this happens, the bearings get attacked and cause the pump to lock up.

In some applications, the impingers in the sample conditioning system may need to be flushed periodically due to a build-up of nasty gas constituents. An indication of this is that the conditioner can't maintain its temperature and/or the moisture slip alarm constantly goes off at the maintained temperature.

*In the next issue: Maintenance of Analyzer Systems...*





922 Baylowell Drive, West Chester, PA 19380  
56 Route 173, Suite B-1, Hampton, NJ 08827  
4440 S. High School Rd., Suite D, Indianapolis, IN 46241

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Part Three: Sample Pumps & Conditioners

##### “Sample Pumps

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