

Model 3400-COND - Mercury CEM Sample Conditioner

Rev. 120221



The patented Tekran[®] Model 3400-COND Mercury CEM Sample Conditioner is the most critical component for accurate, long-lasting and maintenance free measurement of total mercury in complex combustion gas.

The Model 3400-COND uses a patented, high temperature, dry thermal converter followed by water injection and a chilled coalescing filter to prepare an interference free, total elemental mercury gas sample for the 3400-ANLZ unit to analysis by atomic fluorescence (AF). The use of AF provides an extremely low detection limit with wide dynamic range, with interference-free results. Unlike CEM systems using conventional analytical techniques, the system is immune to even the highest levels of potential interferents present in a combustion sample stream.

Product Highlights

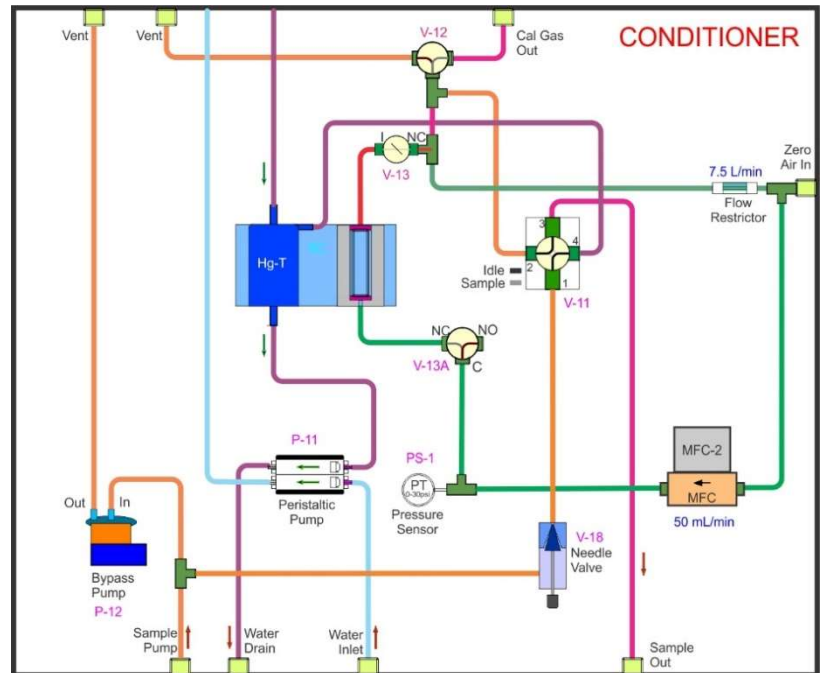
- Measurement range¹: 0.05 - 1500 $\mu\text{g}/\text{m}^3$
- Very low maintenance requirement
- No chemical reagents
- Direct determination of total Hg
- Update rate: 90 seconds
- No consumable solid absorbers

Applications

- Coal fired power plants
- Bench scale testing
- Mercury removal process monitoring
- Waste incinerators
- Other industrial sources

Principles of Operation

Sample gas from the dilution probe enters the 3400-COND via a rear panel heated line connection. The sample gas flows into a thermal converter unit that reduces all mercury forms to elemental Hg, yielding a total mercury result. An acid gas scrubber prevents recombination, conditioning the gas for analysis. The sample stream is sent to the 3400-ANLZ for quantification. The system contains a saturated mercury gas source for generating a NIST traceable calibration gas used to maintain instrumental accuracy. This analyzer is immune to false positives caused by SO₂, NO_x or other combustion by-products that may be present in the sample gas stream.



Product Features

- All temperatures controlled by PID controllers
- Low water consumption.
 - ▲ Approx. 3 L/day
 - ▲ Supplied by 3400-WTR
- Condensate recirculated back to 3400-WTR
- Low sample flow requirement (< 1 L/m)
- Solenoid valves provide sample and calibration gas switching functions
- Saturated Hg Source
 - ▲ System Calibration
 - ▲ Dilution Ratio Check
 - ▲ System QA checks.

System Control

Controlled via 3400-ANLZ module

- Industry standard RS-485 Modbus-RTU protocol - Optional
- Readout of all current temperatures and flows
- Full control of all temperatures, flows and other setpoints
- Automated single or multi-point calibrations
- System alarms
- Reporting

Notes:

- 1 The measurement range given assumes a dilution ratio of approximately 30:1. The upper limit of measurement is unlimited since a higher dilution ratio can easily be substituted to reduce mercury levels sent to the conditioner.

Due to ongoing development, all listed specifications are subject to change.