

Portable Combustion Gas Analyzers

Lisa Middleton, Supervising Air Quality
Inspector

San Joaquin Valley APCD

lisa.middleton@valleyair.org



Purpose of Program

- Determine compliance with permitted emission limits for fired equipment
- Document exceedances of permitted emission limits



Basics

- Portable analyzer checks are not source tests
- May mimic required stack monitoring, but not intended to replace
- Use of portable analyzers during inspections has encouraged permitted sources to more closely monitor stack conditions



Special Concerns

- Safety first
- Sample port considerations
- High H₂S flue gas
- Start-up/shut-down conditions
- Cyclic units



Analyzers

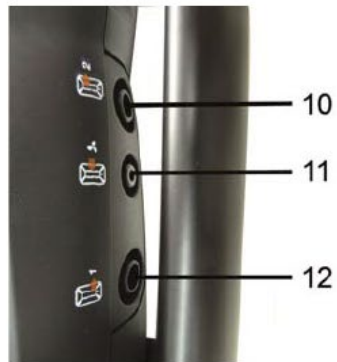
- San Joaquin uses Testo 350 and Lancom III/IV combustion gas analyzers
- Calibrated to EPA protocol gases at least once per month
- Leak checked using low concentration EPA protocol reference gas prior to use
- If there is a possible violation, unit is leak-checked and challenged against EPA protocol gases after use

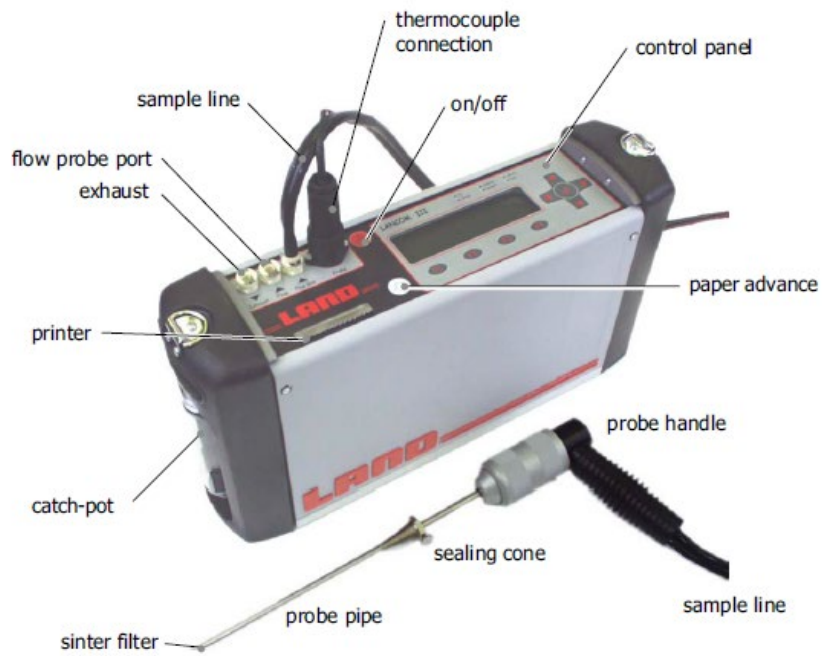


How It All Works

- Similar theory of operation for both units
 - Pumping unit pulls flue gas sample in through probe at 1 L/min
 - Condensate is knocked out
 - Particulates are filtered out
 - Sample passes through sensors, aka cells
 - Output is displayed on unit

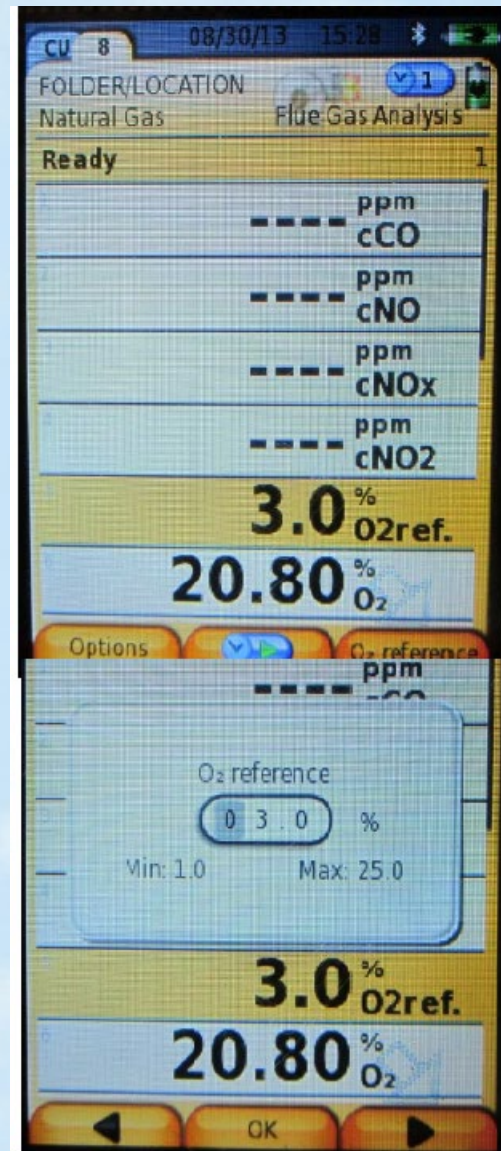






Cells

- Cells have upper limits
- Use dilution if necessary
- Set an O₂ reference if necessary



Using the Analyzers

- Prior to taking the unit in the field, it is leak-checked using EPA protocol low concentration gas
- Verify that the battery voltage is adequate
- Set run length, resolution, O₂ reference, rinse time



In the Field

Always consider safety first!!

- On site, start up the unit in ambient conditions, away from known sources of pollution
- Locate an appropriate sample location to insert the probe
- Run the program so that flue gas is monitored for 5-15 minutes
- When complete, remove the probe from the stack while the unit goes through a rinse cycle.



Overview

- Calibrate once per month
- Leak check prior to use
- Use in field
 - Generally conduct a 5-15 minute run with a 15 second resolution
- Possible violation?
 - Post-leak check
 - Challenge against known concentration gas
- If leak check and challenge pass, download data from unit and proceed with enforcement action

