

NHV_{CZ}



Big 3



Gas Chromatograph



**Residual Oxygen
Calorimeter**



Mass Spectrometer

Plus 2



Absorption Spectrometer



**Open Flame
Calorimeter**

Res-Ox Calorimeters are fast...

63.670 Requirements for flare control devices.

- Compliance Means Control
- Composition & Flow Change Fast
- Faster NHV Improves Control

“Alternatively... Install ... Calorimeter”

Visible Emissions

Flare Tip Velocity

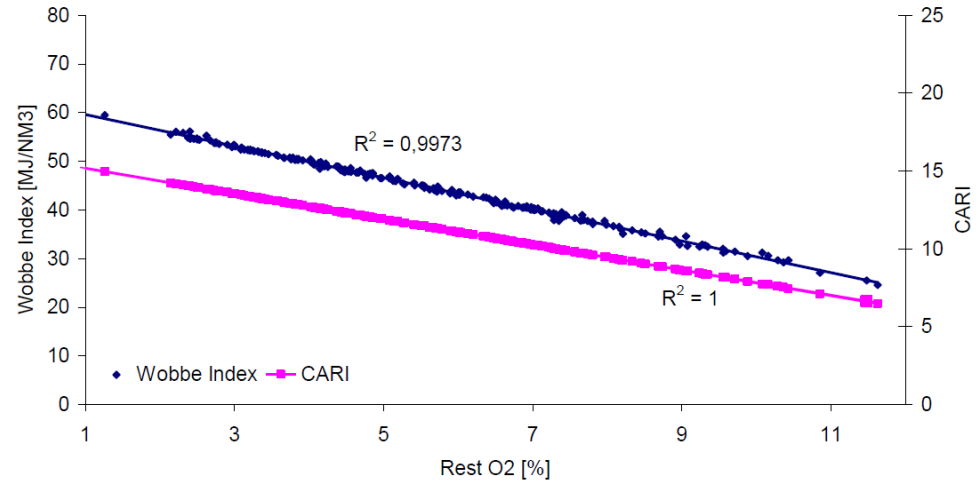
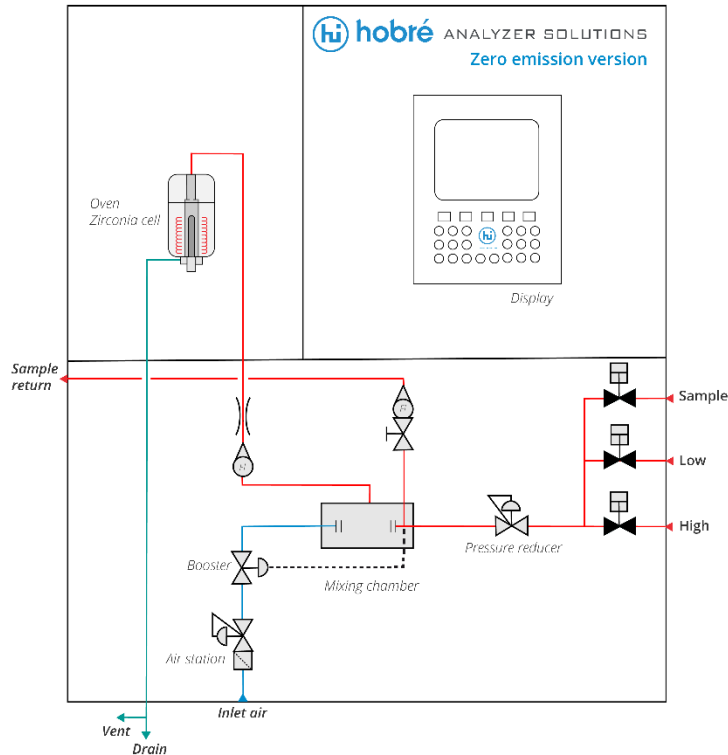
NHV_{cz}

Dilution Limits

NHV_{vg}

...and not picky about the stream

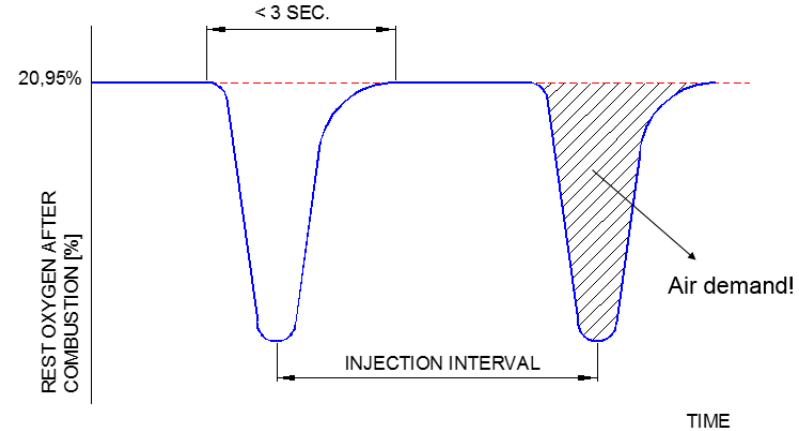
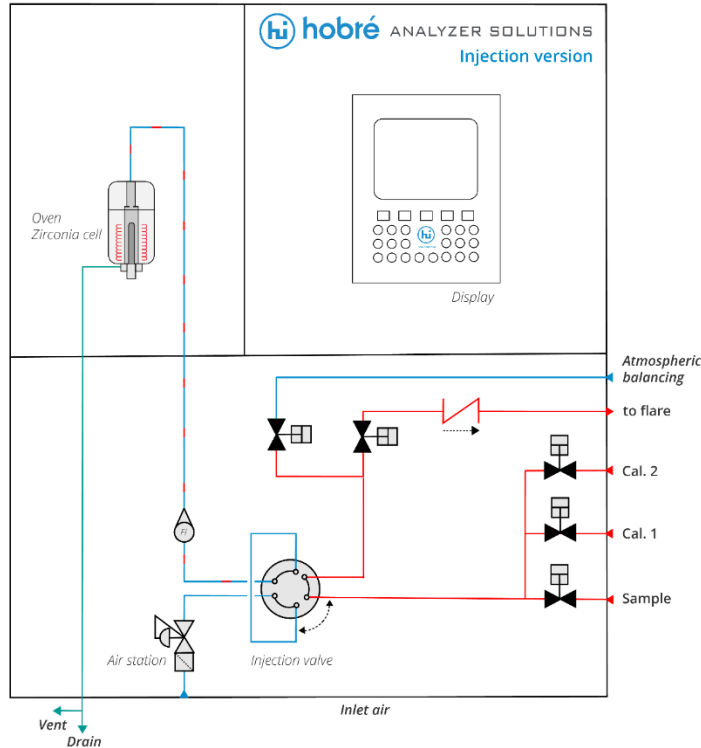
Continuous Style



$$\text{Wobbe index} = \frac{\text{Heating Value}}{\sqrt{\text{Specific Gravity}}}$$

3000 BTU Measuring Range
5 Second T90 Response
+/- 1% Accuracy

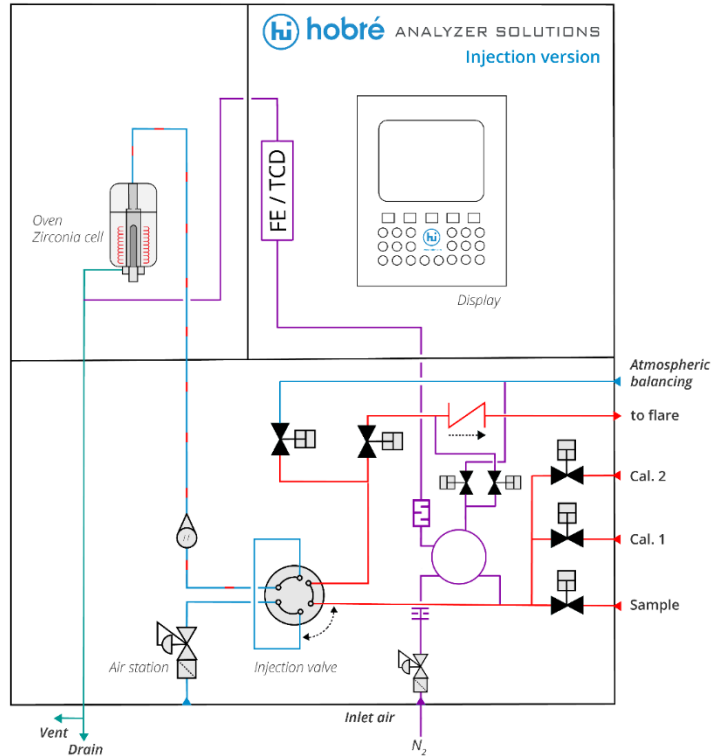
Inject Style



Solves problems related to...

- H_2S
- Dew Point
- Sample Return

Integrated H₂ Measurement



0-100% H₂ Measuring Range
30 Second Cycle Time
NHV Adjusted for H₂ Credit

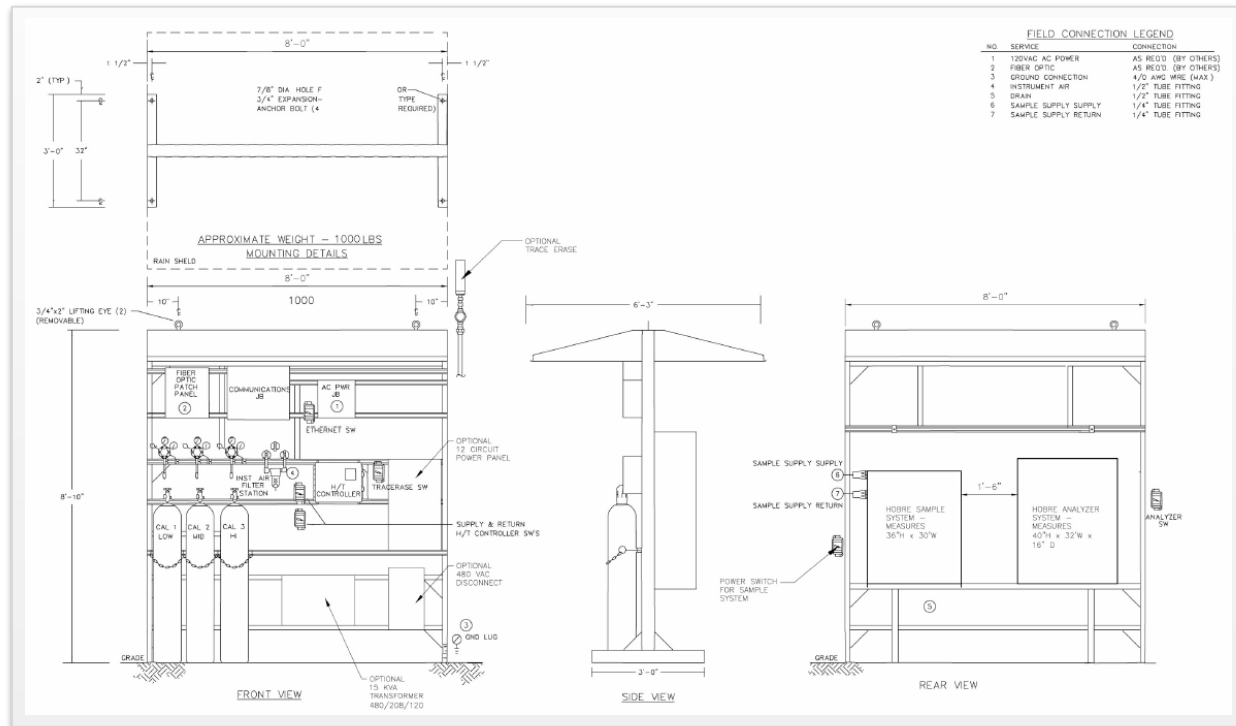
Typical Installation

Sheltered
Rack

Sample
System

Integrated
Val/Cal

Experienced
Integrators



Validation & Maintenance

Hobre recommends monthly two point validation. Simple binary mixtures are usually suitable.

Periodic filter checks. 6-12 Month service for the inject valve. Annually check Zirconium Oxide cell which has a 3-5 year life.



The Gulf Coast Combo

HRVOC Reporting

NHV_{vg} Based Control



Gas Chromatograph

Residual Oxygen
Calorimeter

FTO – Flameless Thermal Oxidizer



“Depending on the waste composition, dilution air and fuel are trimmed so the mixture never exceeds 85% of the lower flammability limit (LFL). This also ensures that the velocity of the gases flowing through the matrix equals the velocity of the reaction to maintain a stable reaction zone in the matrix.”

CSR Clues

- TCEQ Flare Study
- Refinery Sector Rule
- Settlements & Consent Decrees

Blair Sullivan
Vector Controls
713-398-3033

blairsullivan@vectorcag.com



schroeter-ht.de