



Thermo 42i NO2 Converter Efficiency

First, set the NO₂ coefficient to 1.000 from the Calibration Factors screen. Next, generate an NO calibration point that is at least equal to 80% of the URL. For example, if you are operating the analyzer on a 0 – 500 ppb range, generate 400 ppb NO. Once the readings have stabilized, record the NO and NO_x (initial). Then generate the same span point, but with enough ozone added to reduce the NO by at least 75%. For example, if you generated 400 ppb NO initially, then the NO should drop to between 100 and 50 ppb. Once the readings have stabilized, record the NO and NO_x readings (final).

Calculate converter efficiency (CE) by using the following formula:

$$\text{C.E.} = 100\% (1 - (\text{NO}_{\text{xi}} - \text{NO}_{\text{xf}}) / (\text{NO}_{\text{i}} - \text{NO}_{\text{f}}))$$

In this example, let's assume that initially NO and NO_x were exactly 400 ppb. When the ozone was added, the NO dropped to 100 ppb and the NO_x dropped to 397 ppb.

$$\text{C.E.} = 100\% (1 - (400 - 397) / (400 - 100))$$

$$\text{C.E.} = 100\% (1 - (3/300))$$

$$\text{C.E.} = 100\% (1 - .01)$$

$$\text{C.E.} = 100\% (0.99)$$

$$\text{C.E.} = 99\%$$

While the readings are still stable, from the Calibration Menu, select "Cal NO₂ Coeff" and enter the change in NO (300 ppb) as the new NO₂ span concentration. If the converter efficiency is less than 96%, it indicates that the converter is failing, and it should be replaced.