

Received 2015-05-21

Certificate report no. H40-15210003

CALIBRATION CERTIFICATE

Instrument GMP221 Carbon dioxide probe
Serial number L2058003
Manufacturer Vaisala Oyj, Finland
Calibration date 15th May 2015

The carbon dioxide probe was calibrated against accurate gas concentrations. Gas concentrations were made by mixing pure carbon dioxide and nitrogen gases with mass flow controller factory working standards. Communication with the probe was achieved via a Vaisala GMB220ACB module. Pressure and temperature compensation was made by using the compensation parameters of a non-volatile memory in the probe and by using actual ambient pressure and temperature values read from a Vaisala transmitter. At the time of shipment, the probe met its operating specifications.

The mass flow controller factory working standards have been calibrated at Vaisala Measurement Standards Laboratory (MSL) by using Vaisala's mass flow primary standards. The mass flow primary standards are traceable to the National Institute of Standards and Technology (NIST). The pressure and temperature readings of the Vaisala transmitter have been calibrated at an ISO/IEC 17025 accredited calibration laboratory (FINAS), MSL by using working standards traceable to NIST.

Calibration results

| Reference % CO ₂ | Observed* % CO ₂ | Difference % CO ₂ | Permissible difference % CO ₂ |
|--------------------------------|--------------------------------|---------------------------------|---|
| 0.000 | -0.002 | -0.002 | ± 0.045 |
| 3.000 | 2.995 | -0.005 | ± 0.105 |

*Reading after pressure and temperature compensation.

Ambient conditions / Humidity 31 ± 5 %RH, Temperature 23.3 ± 1 °C, Pressure 1004 ± 1 hPa.

Equipment used in calibration

| Type | Serial number | Calibration date | Certificate number |
|-------------|---------------|------------------|--------------------|
| SEC-Z512MGX | 3444909986 | 2014-07-24 | X01420 |
| SEC-Z512MGX | 3470356183 | 2014-07-21 | X01422 |
| PTU30T | C2050002 | 2014-05-06 | K008-X00984 |
| GMB 220 ACB | D2810038 | 2014-12-03 | H40-14490062 |

Gas cylinders used in calibration

| Type | Purity classification | Cylinder number | Reference number |
|---------------------------|-----------------------|-----------------|------------------|
| Scientific nitrogen | 6.0 | 7523010189392 | 100368816 |
| Scientific carbon dioxide | 5.2 | 2364719 | 103000357648 |


 Technician