



Laboratory Management System Procedure
Available Through TSI High Wycombe Service
Centre in the UK

Procedure Name	ADDITIONAL ISO17025 ACCREDITED CALIBRATION INFORMATION
Procedure Number	LMP010
Procedure Date	July 2021: ISSUE 8
ISO Reference 17025:2017	

Owner	LABORATORY MANAGER
Author	QUALITY MANAGER
Approval	OPERATIONS DIRECTOR

1.0 PURPOSE AND SCOPE

- 1.1 This procedure describes the additional calibration information that is available to the customer via a link on the TSI RMA web page rma.tsi.com
- 1.2 Annual calibration points may vary slightly on the calibration certificate due to the exact values achieved by the calibration equipment on the day.
- 1.3 Custom calibration points are not available for ISO17025 accredited calibrations.

2.0 DEFINITIONS

- 2.1 The following terms are applicable to this procedure.

ISO.IEC GUIDE 99	
ISO17025	

3.0 REFERENCE DOCUMENTS/FORMS/RECORDS

4.0 PROCEDURE

4.1 Rotating Vane Anemometers

- 4.1.1 Method Reference: LCA301a
- 4.1.2 Method Summary: Calibration is performed using a multi orifice open jet wind tunnel utilizing pressure differential methods.
- 4.1.3 Calibration Points: The following calibration points apply;
 - 0.5 m/s
 - 0.75 m/s
 - 1 m/s
 - 2.5 m/s
 - 5 m/s
 - 7.5 m/s
 - 15 m/s
 - 30 m/s

4.2 Thermal Anemometers

- 4.2.1 Method Reference: 10000006237
- 4.2.2 Method Summary: Calibration is performed using a multi orifice closed

environment wind tunnel utilizing pressure differential methods.

4.2.3 The following calibration points apply:

- 0 m/s
- 0.18 m/s
- 0.33 m/s
- 0.8 m/s
- 1.67 m/s
- 3.27 m/s
- 5 m/s
- 7.5 m/s
- 12.75 m/s
- 22.5 m/s
- 30 m/s

4.3 Temperature

4.3.1 Method Reference: 10000006234

4.3.2 Method Summary: Calibration is performed using two controlled temperature baths. Probes are inserted into blocks permanently immersed in the bath and allowed to stabilize for 20 minutes before measurements.

4.3.3 Uncertainty values only valid at calibration points.

4.3.4 The following calibration points apply:

- 0 degrees C
- 60 degrees C

4.4 Gas Concentration

4.4.1 Method Reference: 10000006235

4.4.2 Method Summary: Calibration is performed using gases with controlled concentrations from accredited suppliers. Calibration is performed at 0 ppm and at gas bottle concentration. Intermediate checks are made in between these points using controlled gas mixing.

4.4.3 The following calibration points apply for carbon monoxide:

- 0 ppm (not on calibration certificate)
- 35 ppm
- 100 ppm
- 200 ppm (or gas bottle concentration, not on calibration certificate)

4.4.4 The following calibration points apply for carbon dioxide:

- 0 ppm
- 500 ppm
- 1000 ppm
- 3000 ppm
- 5000 ppm or gas bottle concentration)

4.5 Relative Humidity

4.5.1 Method Reference: 10000006233

4.5.2 Method Summary: Calibration is performed using a Thunder Chamber model number 2500.

4.5.3 Calibration performed at 25 degrees C

4.5.4 The following calibration points apply:

- 10% RH
- 30% RH
- 50% RH
- 70% RH
- 90% RH

4.6 Differential Pressure

4.6.1 Method Reference: 14490548

4.6.2 Method Summary: Calibration is performed using pistons to create the pressure and capacitance manometers to measure the various pressures.

4.6.3 The following calibration points apply:

- -1000 Pa
- 500 Pa
- 2000 Pa
- 3500 Pa

4.7 Barometric Pressure

4.7.1 Method Reference: 14490548

4.7.2 Method Summary: Calibration is performed using pistons to create the pressure and capacitance manometers to measure the various pressures.

4.7.3 The following calibration points apply:

- 670 Pa
- 1000 Pa
- 1160 Pa

4.8 Firmware Upgrades

4.8.1 Unless specifically requested by the customer, units will be updated to the latest available firmware for that model.

4.9 Environmental Conditions

4.9.1 Reference Document: UK Site – LMP003

4.9.2 Environmental conditions in the UK test and calibration areas are maintained as below:

- Ambient temperature 21.1 degrees C +/- 2 degrees C
- Relative humidity 45 +/- 25%

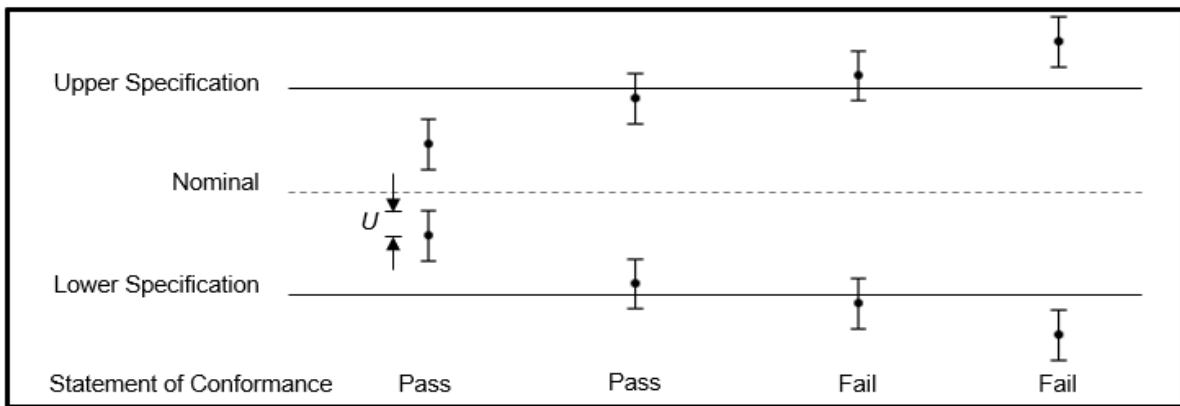
4.10 User or field calibrations

4.10.1 It should be noted that if a user or field calibration is performed on the unit the ISO17025 calibration will then no longer be valid.

4.11 Decision Rules

4.11.1 For handheld ventilation and air quality products “In Tolerance” indicates the instrument conforms with the allowable range and the measurement uncertainty is less than the allowable range

This is in accordance with ILAC G8:09/2019 “Guidelines on Decision Rules and Statements of Conformity” and follows the guidelines in section 4.2.1 “Binary Statement for Simple Acceptance Rule”. Illustrated below (from ILAC G8).



U = 95% expanded measurement uncertainty

It should be noted that the closer the uncertainty budget (U) is to the allowable range the greater the risk of the error bars being outside the allowable range. Please refer to UKAS document LAB 48 Appendix C for further details how to calculate this risk.

4.11.2 **Current measurement uncertainties are included on the Scope of Accreditation which can be found via the link below:**

https://search.anab.org/public/organization_files/TSI-Instruments-Limited-UK-Cert-and-Scope-File-07-09-2021_1625858214.pdf

REVISION HISTORY

Revision	Revision Date	Revision Description
1	JAN 2020	Initial issue
2	MAR 2020	Remove Decision Rules sec 4.8; add text “or gas bottle concentrations” to sec 4.4.3 and 4.4.4; add reference to RMA web address sec 1.1
3	APR 2020	Put decision rules back as sec 4.10; change RH to +/-25%
4	DEC 2020	Corrected some minor typos. Updated section 4.10 Decision Rules to include reference to ILAC G8 4.2.1 following UKAS assessment. Added 4.10.2 to reference schedule of accreditation and uncertainties.
5	25 th January 2021	Insertion of section 4.10 regarding field or user calibrations. Addition of comment regarding uncertainty budgets.
6	17 th Feb 2021	Addition of reference to LAB 48 in 4.11.1
7	12 th April 2021	Added section 4.3.3 referring to temperature calibration points Added section 4.5.3 to specify humidity calibration temperature.
8	20 th July 2021	Paragraph 4.11.2, changed: <i>Current measurement uncertainties are included on the Schedule of Accreditation which can be found at ukas.org by searching for “TSI Instruments”</i> to <i>Current measurement uncertainties are included on the Scope of Accreditation which can be found via the link below: https://search.anab.org/public/organization_files/TSI-Instruments-Limited-UK-Cert-and-Scope-File-07-09-2021_1625858214.pdf</i>