



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

TSI Instruments Limited
Stirling Road, Cressex Business Park
High Wycombe, Buckinghamshire, UK HP12 3ST

Fulfills the requirements of

ISO/IEC 17025:2017

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document. The current scope of accreditation can be verified at www.anab.org.

A handwritten signature in black ink, appearing to read 'R. Douglas Leonard Jr.', is positioned above a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 09 July 2022

Certificate Number: AC-3002



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

TSI Instruments Limited
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CALIBRATION

Valid to: **July 9, 2022**

Certificate Number: **AC-3002**

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Air-born particle size detection and concentration counting efficiencies/ Condensation Particle Counters (CPC/PNC) ¹	Particle Size		Electrometer, 3068B CPC, 3750/3772 ISO 27891:2015
	10 nm	0.09	
	15 nm	0.074	
	23 nm	0.15	
	41 nm	0.1	
	55 nm	0.12	
	Particle Concentration		
	Range @ 55 nm		
	300 counts/cm ³	0.12	
	600 counts/cm ³	0.12	
	1 000 counts/cm ³	0.12	
	2 000 counts/cm ³	0.12	
	4 000 counts/cm ³	0.068	
	6 000 counts/cm ³	0.12	
	8 000 counts/cm ³	0.082	
10 000 counts/cm ³	0.12		
25 000 counts/cm ³	0.062		
50 000 counts/cm ³	0.076		
Linearity (Slope) for 55 nm particles			
(0.90 to 1.1)			
@ 10 000 cm ⁻³	0.032		
@ 50 000 cm ⁻³	0.035		



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Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Gas Analyzers ²	0 ppm CO	1.6 x 10 ⁻⁶ of reading	Reference Gasses Mass Flow Meter
	35 ppm CO	1.6 x 10 ⁻⁶ of reading	
	100 ppm CO	2 x 10 ⁻⁶ of reading	
	200 ppm CO	2.6 x 10 ⁻⁶ of reading	
Gas Analyzers ²	0 ppm CO ²	2.8 x 10 ⁻⁶ of reading	Reference Gasses Mass Flow Meter
	500 ppm CO ²	9 x 10 ⁻⁶ of reading	
	1 000 ppm CO ²	7.6 x 10 ⁻⁶ of reading	
	3 000 ppm CO ²	27 x 10 ⁻⁶ of reading	
	5 000 ppm CO ²	30 x 10 ⁻⁶ of reading	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment	
Air Velocity	Thermal Anemometers		Wind Tunnel, Barometer, Manometers	
	(0.2 to 1.25) m/s	0.47 % of reading + 0.016 m/s		
	(1.26 to 7.5) m/s	1.2 % of reading + 0.036 m/s		
		(7.6 to 50) m/s	1.2 % of reading + 0.088 m/s	Gold Standard Vane Anemometer
	Vane Anemometers			
	0.5 m/s	0.31 % of reading + 0.02 m/s		
	0.75 m/s	0.31 % of reading + 0.024 m/s		
	1.0 m/s	0.31 % of reading + 0.03 m/s		
	2.5 m/s	0.31 % of reading + 0.061 m/s		
	5.0 m/s	0.31 % of reading + 0.085 m/s		
7.5 m/s	0.31 % of reading + 0.12 m/s			
15 m/s	0.31 % of reading + 0.2 m/s			
30 m/s	0.31 % of reading + 0.4 m/s			
Pressure – Gage	(-1 to 4) kPa (4 to 13.33) kPa	0.38 % of reading + 3.7 Pa 1.1 % of reading + 31 Pa	Pressure Transducer	
Pressure – Absolute	(60 to 135) kPa	0.75 % of reading + 1.2 Pa	Barometer	

Thermodynamics

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature – Source	0 °C	0.19 °C	Calibration Baths
	60 °C	0.22 °C	

Thermodynamics

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Relative Humidity	(10 to 90) %RH @ 25 °C	2.5 %RH	Thermohygrometer and Probe, Chamber

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Notes:

1. Unitless linear measure.
2. Parts per million (ppm) refers parts in 10^6 .
3. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-3002.



R. Douglas Leonard Jr., VP, PILR SBU

