



Teltherm Instruments Limited	Client Number 2814
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Telephone 09 633-0040	www.teltherm.co.nz
Authorised Representative Ms Jennie Dingley Laboratory Manager	
Programme Metrology & Calibration Laboratory	
Accreditation Number 644	Initial Accreditation Date 21 April 1997
Conformance Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories	
Laboratory Services Summary	
5.16	Gas Instrumentation
5.42	Differential Pressure Measuring Devices (including Manometers)
5.44	Pressure and Vacuum
5.45	Pressure Equipment Tests
5.61	Temperature Measuring Equipment
Key Technical Personnel	
Ms Jennie Dingley	5.42, 5.44, 5.45
Mr Manuel Junior	5.61
Mrs Liz Li	5.16, 5.42, 5.44, 5.61
Mr Aidan Lindsay	5.16
Mr Jianxin Liu	5.42, 5.44, 5.61

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Calibration and Measurement Capabilities (CMC) are expressed as an expanded uncertainty corresponding to a level of confidence of 95 % ^{Note1}.

Measurement results are traceable to the International System of Units (SI) via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

Unless stated elsewhere in this schedule, calibrations are performed at the premises of the accredited laboratory. Most calibrations of industrial pressure equipment can be carried out on site.

The Teltherm Instruments Laboratory scope of accreditation also covers a limited scope of work which is carried out at Homersham Limited, 3 Homersham Place, PO Box 79085, Burnside, Christchurch (class of test 5.16 only)

Where ppm = parts per million. For example, 1 ppm = 1 µL/L

Measurand/Range	Parameter	CMC Uncertainty
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5.16 Gas Instrumentation

(a) Gas analysers

Calibration of flue gas analysers, portable and fixed gas detectors in accordance with in-house methods based on manufacturer's instructions and AS/NZS 60079.29.2, in the laboratory or on-site. Calibration of flue gas analysers cannot be undertaken at Homersham Limited.

Note: for flue gas analysers; temperature and pressure indicator calibration is covered by Classes of Test 5.44 and 5.61.

Gas/Sensor/Range

CH ₄ (Methane) with catalytic combustion detector or infrared detector 0-5 % by volume or 0-100 %LEL, in laboratory and on-site	0.25 % of reading
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C ₄ H ₈ (Isobutylene) with a PID detector 1-15,000 ppm, in laboratory and on-site	0.61 % of reading
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CO (Carbon Monoxide) with electrochemical detector 0-10,000 ppm, in laboratory and on-site	0.61 % of reading
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H ₂ S (Hydrogen Sulphide) with electrochemical detector 0-100 ppm, in laboratory and on-site	0.48 % of reading
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O ₂ (Oxygen) with electrochemical detector 0-30 %, in laboratory	0.26 % of reading
0-30 %, on-site	1.16 % of reading

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5.42 Differential Pressure Measuring Devices (including Manometers)

- (a) Diaphragm types
- (c) Transducers and transmitters
- (d) Other types

Differential pressure by comparison with a pressure calibrator (line pressure approximately 100 kPa) either in the laboratory or on-site

0 Pa to 60 Pa	0.31 Pa
60 Pa to 124 Pa	0.30 Pa
124 Pa to 250 Pa	0.31 Pa
250 Pa to 500 Pa	0.32 Pa
500 Pa to 2500 Pa	0.66 Pa

5.44 Pressure and Vacuum

- (a) Pressure gauges
- (b) Vacuum gauges
- (c) Pressure transducers
- (d) Pressure recorders

Accuracy classes: 0.1, 0.25, 0.6, 1.0, 1.6, 2.5, 4.0 in accordance with AS 1349:1986 and BS EN 837-1:1998; gauges of accuracy 4A, 3A, 2A, 1A and below as defined in ASME B40.100-2013

By comparison with dead weight tester

Gauge pressure, gas medium

-100 kPa to -3 kPa	0.01 % or 0.001 kPa, whichever is greater
3 kPa to 100 kPa	0.01 % or 0.001 kPa, whichever is greater
100 kPa to 3100 kPa	0.01 % or 0.01 kPa, whichever is greater

Gauge pressure, liquid medium

600 kPa to 140000 kPa	0.008 %
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Absolute pressure

0.3 kPa to 20 kPa	0.039 kPa
20 kPa to 200 kPa	0.034 kPa
200 kPa to 3200 kPa	0.034 kPa or 0.006 % of reading, whichever is greater

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By comparison with an automatic pressure calibrator and/or a digital absolute pressure gauge either in the laboratory or on-site

Gauge pressure

-2 kPa to 2 kPa	0.0027 kPa
-35 kPa to 35 kPa	0.0044 kPa
-70 kPa to 70 kPa	0.0066 kPa
-100 kPa to 100 kPa	0.0093 kPa

Absolute pressure

5 kPa to 200 kPa	0.066 kPa
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By comparison with reference gauges either in the laboratory or on-site

Gauge pressure

-100 kPa to 0 kPa	0.01 kPa or 0.01 %, whichever is greater
0 kPa to 7000 kPa	0.01 kPa or 0.01 %, whichever is greater
7000 kPa to 70000 kPa	1 kPa or 0.017 %, whichever is greater
70000 kPa to 140000 kPa	10 kPa or 0.1 %, whichever is greater

Controllers, indicators, recorders and transmitter systems, wholly or in part, by electrical simulation or measurement using a process calibrator either in the laboratory or on-site for the ranges and CMCs above

4 to 20 mA (measure)	300 ppm
4 to 20 mA (source)	120 ppm

5.45 Pressure Equipment Tests

- (e) Pressure relief valve tests
- (f) Other tests

Pressure relief valves, pressure pipes and fittings and pressure switches up to 140000 kPa, in accordance with in-house methods and manufacturers specifications. In the laboratory only.

5.61 Temperature Measuring Equipment

(including temperature calibration of electronic thermometers)

- (a) Rare metal thermocouples
- (b) Base metal thermocouples
- (c) Platinum (and other metallic) resistance thermometers

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- (e) Thermistors and other semi-conductor thermometers
- (g) Clinical thermometers
- (j) Radiation thermometers
- (k) Vapour pressure thermometers
- (l) Filled metal systems
- (m) Bimetallic systems
- (o) Indicators, recorders and controllers
- (p) Other direct reading temperature measuring equipment

Direct reading thermometers by comparison with reference thermometers (or ice point)

ice point	0.01 °C
-40 °C to 25 °C	0.026 °C
25 °C to 75 °C	0.015 °C
75 °C to 250 °C	0.018 °C
250 °C to 500 °C	0.029 °C

CMC uncertainty is based on the thermometer sensor being immersed to 150 mm. Calculated measurement uncertainty may be greater for shorter probe lengths or large diameter probes.

Radiation pyrometers (infrared thermometers)

By comparison with a reference contact thermometer -30 °C to 140 °C where $\epsilon = 1$	0.3 °C
By comparison with a reference infrared thermometer 45 °C to 600 °C	1.0 °C

Controllers, indicators, recorders and transmitter systems, wholly or in part, by electrical simulation or measurement using a process calibrator either in the laboratory or on-site for the ranges and CMCs above or for the additional sensor types listed below.

Sensor type	Temperature	
Pt100 measure (3W)	-50 °C to 450 °C	0.06 °C
Pt100 source	-50 °C to 450 °C	0.006 °C

Thermocouples (source and measurement)

Type K thermocouple	-200 °C	0.33 °C
	-100 °C	0.18 °C
	-50 °C	0.16 °C
	0 °C to 500 °C	0.13 °C
	1000 °C	0.26 °C
	1370 °C	0.40 °C
Type J thermocouple	-210 °C	0.27 °C

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	-100 °C to -50 °C	0.16 °C
	0 °C to 100 °C	0.11 °C
	200 °C to 500 °C	0.17 °C
	1000 °C to 1190 °C	0.23 °C
Type N thermocouple	-200 °C	0.40 °C
	-150 °C to -50 °C	0.22 °C
	0 °C to 250 °C	0.15 °C
	500 °C to 1300 °C	0.27 °C
Type T thermocouple	-200 °C	0.63 °C
	-150 °C to -75 °C	0.24 °C
	0 °C to 400 °C	0.13 °C
Type R thermocouple	0 °C	0.50 °C
	100 °C	0.48 °C
	500 °C	0.47 °C
	1000 °C to 1750 °C	0.46 °C

Note 1:

Unless stated otherwise the CMC is based on the performance of the best available device and measurement uncertainties achieved for specific calibrations may be greater than the CMC Uncertainty. A laboratory may not report measurement uncertainties lower than its CMC. However, if the device under calibration has a greater accuracy than the device used to calculate the CMC the laboratory may be able to use the calibration data to lower its CMC Uncertainty. Please contact the laboratory to discuss your specific requirements.

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