


Laboratory Accreditation Programmes

Schedule to CERTIFICATE OF ACCREDITATION															
Laboratory	DELTA Utility Services Limited														
Address	PO Box 1404, Dunedin, 9054 10 Halsey Street, Dunedin, 9016														
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URL	www.thinkdelta.co.nz														
Authorised Representative	Mr Rodney Helm Superintendent - Electrical and Testing														
Client No.	4859														
Programme	Metrology & Calibration Laboratory														
Accreditation Number	583														
Initial Accreditation Date	31 October 1995														
Conformance Standard	NZS ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories														
Testing Services Summary	<table border="0"> <tr> <td>3.65</td> <td>Miscellaneous Electrical Tests</td> </tr> <tr> <td>5.82</td> <td>Resistors, Resistance Boxes and Potential Dividers</td> </tr> <tr> <td>5.88</td> <td>Calibrators for Instrumentation</td> </tr> <tr> <td>5.89</td> <td>Indicating Instruments and Recording Instruments</td> </tr> <tr> <td>5.91</td> <td>Frequency Measurement and Time Measurement</td> </tr> </table>	3.65	Miscellaneous Electrical Tests	5.82	Resistors, Resistance Boxes and Potential Dividers	5.88	Calibrators for Instrumentation	5.89	Indicating Instruments and Recording Instruments	5.91	Frequency Measurement and Time Measurement				
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Signatories	<table border="0"> <tr> <td>Mr Stephen Cook</td> <td>5.89(I) excluding Site Certification</td> </tr> <tr> <td>Mr Antony Cuthbertson</td> <td>3.65, 5.82, 5.88, 5.89 [excluding (I)], 5.91</td> </tr> <tr> <td>Mr Greg Gray</td> <td>5.89(I) excluding Site Certification</td> </tr> <tr> <td>Mr Steven Jenkins</td> <td>5.89 [(I) only], Site Certification Cat 1-5</td> </tr> <tr> <td>Mr R L Jones</td> <td>5.89 [(I) only], Site Certification Cat 1-5</td> </tr> <tr> <td>Mr Geoff Simpson</td> <td>5.89</td> </tr> <tr> <td>Mr Alan Michael Woods</td> <td>3.65, 5.82, 5.88, 5.89 [excluding (I)], 5.91</td> </tr> </table>	Mr Stephen Cook	5.89(I) excluding Site Certification	Mr Antony Cuthbertson	3.65, 5.82, 5.88, 5.89 [excluding (I)], 5.91	Mr Greg Gray	5.89(I) excluding Site Certification	Mr Steven Jenkins	5.89 [(I) only], Site Certification Cat 1-5	Mr R L Jones	5.89 [(I) only], Site Certification Cat 1-5	Mr Geoff Simpson	5.89	Mr Alan Michael Woods	3.65, 5.82, 5.88, 5.89 [excluding (I)], 5.91
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Calibration temperature 23 °C ± 2 °C in energy meter laboratory and 23 °C ± 5 °C in the general electrical calibration laboratory.

All measurement uncertainties are based on a level of confidence of at least 95 %.

Calibrations are performed at the premises of the accredited laboratory, apart from metering installation measurements which are carried out on site.

Where term ppm is used it refers to *parts per million*, for example $\mu V/V$ or $\mu\Omega/\Omega$.

3.65 Miscellaneous Electrical Tests

- (a) Insulating gloves and tools
- (b) High voltage operating equipment
- (c) Insulated platform vehicles
- (e) Other tests

In service checks on insulating protective equipment including gloves, sleeves, mats, blankets, poles, jumper leads, platform buckets and other types of miscellaneous equipment in accordance with specifications such as ASTM D120, F478, F479, F496, D1048, D1049, D1050, D1051, F711, F712, EEA Dec 2004 and equivalent IEC standards.

5.82 Resistors, Resistance Boxes and Potential Dividers

- (a) Precision resistors, resistance boxes and conductance boxes

Refer to 5.89 (i) below using calibrator

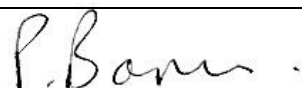
Nominal value	Least uncertainty of measurement
100 K Ω	20 ppm
1 M Ω	35 ppm
10 M Ω	70 ppm
100 M Ω	200 ppm
1 G Ω	0.06 %
10 G Ω	0.06 %
100 G Ω	1.0 %
1 T Ω	2.0 %

Where PPM = parts per million, or $\mu\Omega/\Omega$

5.88 Calibrators for Instrumentation

(a) DC voltage	Least uncertainty of measurement
100 mV	0.0037 % + 0.0035 % of range
1 V	0.0025 % + 0.0007 % of range
10 V	0.0024 % + 0.0005 % of range
100 V	0.0038 % + 0.0006 % of range

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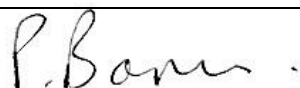
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	1000 V		0.0041 % + 0.001 % of range
	0 V to 10 kV		1 % + 1 digit
	10 kV to 100 kV		1 % + 1 digit
(b)	AC voltage		
	100 mV	10 Hz to 20 kHz	0.06 % + 0.04 % of range
		20 kHz to 50 kHz	0.12 % + 0.05 % of range
		50 kHz to 100 kHz	0.6 % + 0.08 % of range
		100 kHz to 300 kHz	4.0 % + 0.50 % of range
	1 V	10 Hz to 20 kHz	0.06 % + 0.03 % of range
		20 kHz to 50 kHz	0.12 % + 0.05 % of range
		50 kHz to 100 kHz	0.6 % + 0.08 % of range
		100 kHz to 300 kHz	4.0 % + 0.50 % of range
	10 V	10 Hz to 20 kHz	0.06 % + 0.03 % of range
		20 kHz to 50 kHz	0.12 % + 0.05 % of range
		50 kHz to 100 kHz	0.6 % + 0.08 % of range
		100 kHz to 300 kHz	4 % + 0.5 % of range
	100 V	10 Hz to 20 kHz	0.06 % + 0.03 % of range
		20 kHz to 50 kHz	0.12 % + 0.05 % of range
		50 kHz to 100 kHz	0.6 % + 0.08 % of range
		100 kHz to 300 kHz	4 % + 0.5 % of range
	1000 V	10 Hz to 20 kHz	0.06 % + 0.022 % of range
		20 kHz to 50 kHz	0.12 % + 0.037 % of range
		50 kHz to 100 kHz	0.6 % + 0.06 % of range
		100 kHz to 300 kHz	4 % + 0.37 % of range
	0 V to 10 kV		1 % + 1 digit
	10 kV to 100 kV		1 % + 1 digit
(c)	DC current		
	100 µA		0.05 % + 0.025 % of range
	1 mA		0.05 % + 0.005 % of range
	10 mA		0.05 % + 0.02 % of range
	100 mA		0.05 % + 0.005 % of range
	400 mA		0.05 % + 0.005 % of range
	1 A		0.05 % + 0.02 % of range
	3 A		0.1 % + 0.02 % of range
	10 A		0.15 % + 0.008 % of range
(d)	AC current		

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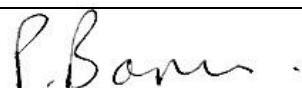
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100 μ A	10 Hz to 5 kHz 5 kHz to 10 kHz	0.15 % + 0.06 % of range 0.35 % + 0.7 % of range
1 mA	10 Hz to 5 kHz 5 kHz to 10 kHz	0.1 % + 0.04 % of range 0.2 % + 0.25 % of range
10 mA	10 Hz to 5 kHz 5 kHz to 10 kHz	0.15 % + 0.06 % of range 0.35 % + 0.7 % of range
100 mA	10 Hz to 5 kHz 5 kHz to 10 kHz	0.1 % + 0.04 % of range 0.2 % + 0.25 % of range
400 mA	10 Hz to 1 kHz 1 kHz to 10 kHz	0.1 % + 0.1 % of range 0.2 % + 0.7 % of range
1 A	10 Hz to 5 kHz 5 kHz to 10 kHz	0.1 % + 0.04 % of range 0.35 % + 0.7 % of range
3 A	10 Hz to 5 kHz 5 kHz to 10 kHz	0.15 % + 0.06 % of range 0.35 % + 0.7 % of range
10 A	10 Hz to 5 kHz 5 kHz to 10 kHz	0.15 % + 0.06 % of range 0.35 % + 0.7 % of range
(e) Resistance		
10 Ω		0.01 % + 0.03 % of range
100 Ω		0.01 % + 0.004 % of range
1 k Ω		0.01 % + 0.001 % of range
10 k Ω		0.01 % + 0.001 % of range
100 k Ω		0.01 % + 0.001 % of range
1 M Ω		0.01 % + 0.001 % of range
10 M Ω		0.04 % + 0.001 % of range
100 M Ω		0.8 % + 0.01 % of range
1 G Ω		2.0 % + 0.01 % of range
(g) Capacitance		
1 nF		2 % + 2.5 % of range
10 nF		1 % + 0.5 % of range
100 nF		1 % + 0.5 % of range
1 μ F		1 % + 0.5 % of range
10 μ F		1 % + 0.5 % of range
100 μ F		1 % + 0.5 % of range
1 mF		1 % + 0.5 % of range
10 mF		1 % + 0.5 % of range
100 mF		4 % + 0.2 % of range

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(i) Other measurement ranges

Power factor meters

Range -1 to 1	10 Hz to 30 kHz	See formula below
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$$Uncertainty(PF) = 100 \left(1 - \frac{\cos(\cos^{-1}(PF_{set}) + \text{phase angle uncertainty})}{PF_{set}} \right)$$

Electrical simulation of temperature signal for calibration of resistance temperature device (RTD) calibrators

-200 °C	0.09 °C
-100 °C	0.08 °C
0 °C	0.06 °C
100 °C	0.08 °C
300 °C	0.12 °C
600 °C	0.22 °C

Frequency (over the range 100 mV to 1000 V)

3 Hz to 5 Hz	0.1 %
5 Hz to 10 Hz	0.05 %
10 Hz to 40 Hz	0.03 %
40 Hz to 300 kHz	0.01 %
300 kHz to 1 MHz	0.01 %

5.89 Indicating Instruments and Recording Instruments

Least uncertainty of measurement

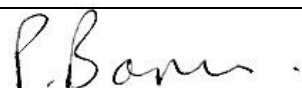
(a) DC voltmeters

0 mV to 330 mV	15 ppm + 0.75 µV
0.33 V to 3.3 V	8.3 ppm + 1.5 µV
3.3 V to 33 V	9.1 ppm + 15 µV
30 V to 330 V	13 ppm + 110 µV
330 V to 1020 V	13 ppm + 1100 µV

(b) AC voltmeters

1.0 mV to 33 mV	10 Hz to 45 Hz	600 ppm + 4.5 µV
	45 Hz to 10 kHz	110 ppm + 4.5 µV
	10 kHz to 20 kHz	150 ppm + 4.5 µV
	20 kHz to 50 kHz	750 ppm + 4.5 µV
	50 kHz to 100 kHz	2600 ppm + 9.1 µV
	100 kHz to 450 kHz	6000 ppm + 37 µV

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33 mV to 330 mV	10 Hz to 45 Hz	220 ppm + 6.0 μ V
	45 Hz to 10 kHz	110 ppm + 6.0 μ V
	10 kHz to 20 kHz	120 ppm + 6.0 μ V
	20 kHz to 50 kHz	260 ppm + 6.0 μ V
	50 kHz to 100 kHz	610 ppm + 24 μ V
0.33 V to 3.3 V	10 Hz to 45 Hz	220 ppm + 37 μ V
	45 Hz to 10 kHz	110 ppm + 45 μ V
	10 kHz to 20 kHz	140 ppm + 45 μ V
	20 kHz to 50 kHz	220 ppm + 37 μ V
	50 kHz to 100 kHz	530 ppm + 95 μ V
3.3 V to 33 V	10 Hz to 45 Hz	220 ppm + 490 μ V
	45 Hz to 10 kHz	110 ppm + 450 μ V
	10 kHz to 20 kHz	180 ppm + 450 μ V
	20 kHz to 50 kHz	260 ppm + 450 μ V
	50 kHz to 90 kHz	680 ppm + 1200 μ V
33 V to 330 V	45 Hz to 1 kHz	140 ppm + 1500 μ V
	1 kHz to 10 kHz	150 ppm + 4500 μ V
	10 kHz to 20 kHz	180 ppm + 4500 μ V
	20 kHz to 50 kHz	1500 ppm + 3700 μ V
330 V to 1020 V	45 Hz to 1 kHz	220 ppm + 7500 μ V
	1 kHz to 5 kHz	180 ppm + 7500 μ V
	5 kHz to 8 kHz	220 ppm + 7500 μ V

(c) DC ammeters including clamp-meters

0 mA to < 330 μ A	110 ppm + 0.015 μ A
0.33 mA to < 3.3 mA	75 ppm + 0.038 μ A
3.3 mA to < 33 mA	75 ppm + 0.19 μ A
33 mA to < 330 mA	75 ppm + 1.9 μ A
0.33 A to < 1.1 A	150 ppm + 30 μ A
1.1 A to < 3.0 A	280 ppm + 30 μ A
3.0 A to < 11.0 A	370 ppm + 370 μ A
11.0 A to 20.5 A	750 ppm + 560 μ A

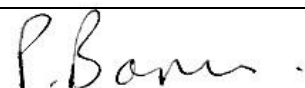
Fluke 5500A coil (non-toroidal)

10 A to 16.5 A	0.38 % of reading + 0.015 A
16.5 A to 150 A	0.38 % of reading + 0.10 A
150 A to 1025 A	0.38 % of reading + 0.38 A

(d) AC ammeters including clamp-meters

0.029 mA to 0.33 mA	10 Hz to 20 Hz	0.15 ppm + 0.076 μ A
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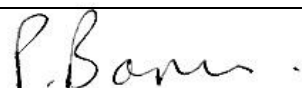
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	20 Hz to 45 Hz	0.11 ppm + 0.076 μ A
	45 Hz to 1 kHz	0.095 ppm + 0.076 μ A
	1 kHz to 5 kHz	0.22 ppm + 0.11 μ A
	5 kHz to 10 kHz	0.60 ppm + 0.15 μ A
	10 kHz to 30 kHz	1.2 ppm + 0.30 μ A
0.33 mA to 3.3 mA	10 Hz to 20 Hz	0.15 ppm + 0.11 μ A
	20 Hz to 45 Hz	0.095 ppm + 0.11 μ A
	45 Hz to 1 kHz	0.076 ppm + 0.11 μ A
	1 kHz to 5 kHz	0.15 ppm + 0.15 μ A
	5 kHz to 10 kHz	0.15 ppm + 0.15 μ A
	10 kHz to 30 kHz	0.76 ppm + 0.45 μ A
3.3 mA to 33 mA	10 Hz to 20 Hz	0.13 ppm + 1.5 μ A
	20 Hz to 45 Hz	0.068 ppm + 1.5 μ A
	45 Hz to 1 kHz	0.03 ppm + 1.5 μ A
	1 kHz to 5 kHz	0.06 ppm + 1.5 μ A
	5 kHz to 10 kHz	0.15 ppm + 2.2 μ A
	10 kHz to 30 kHz	0.30 ppm + 3.0 μ A
33 mA to 330 mA	10 Hz to 20 Hz	0.13 ppm + 15 μ A
	20 Hz to 45 Hz	0.068 ppm + 15 μ A
	45 Hz to 1 kHz	0.03 ppm + 15 μ A
	1 kHz to 5 kHz	0.076 ppm + 37 μ A
	5 kHz to 10 kHz	0.15 ppm + 76 μ A
	10 kHz to 30 kHz	0.30 ppm + 150 μ A
0.33 A to 1.1 A	10 Hz to 45 Hz	0.13 ppm + 76 μ A
	45 Hz to 1 kHz	0.046 ppm + 76 μ A
	1 kHz to 5 kHz	0.45 ppm + 760 μ A
	5 kHz to 10 kHz	1.9 ppm + 3700 μ A
1.1 A to 3.0 A	10 Hz to 45 Hz	0.13 ppm + 76 μ A
	45 Hz to 1 kHz	0.046 ppm + 76 μ A
	1 kHz to 5 kHz	0.46 ppm + 760 μ A
	5 kHz to 10 kHz	1.9 ppm + 3700 μ A
3.0 A to 11 A	45 Hz to 100 Hz	0.046 ppm + 1500 μ A
	100 Hz to 1 kHz	0.076 ppm + 1500 μ A
	1 kHz to 5 kHz	2.2 ppm + 1500 μ A
11 A to 20.5 A	45 Hz to 100 Hz	0.091 ppm + 3700 μ A
	100 Hz to 1 kHz	0.11 ppm + 3700 μ A
	1 kHz to 5 kHz	2.2 ppm + 3700 μ A
Fluke 5500A coil (non-toroidal)		
10 A to 16.5 A	45 Hz to 65 Hz	0.42 % of reading + 0.023 A

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16.5 A to 150 A	45 Hz to 65 Hz	0.42 % of reading + 0.19 A
150 A to 1025 A	45 Hz to 65 Hz	0.42 % of reading + 0.68 A

10 A to 16.5 A	65 Hz to 440 Hz	0.76 % of reading + 0.023 A
16.5 A to 150 A	65 Hz to 440 Hz	0.76 % of reading + 0.19 A
150 A to 1025 A	65 Hz to 440 Hz	0.76 % of reading + 0.68 A

Fluke 5500A coil (toroidal)

10 A to 16.5 A	45 Hz to 65 Hz	0.21 % of reading + 0.0023 A
16.5 A to 150 A	45 Hz to 65 Hz	0.21 % of reading + 0.019 A
150 A to 1025 A	45 Hz to 65 Hz	0.21 % of reading + 0.068 A

10 A to 16.5 A	65 Hz to 440 Hz	0.58 % of reading + 0.0023 A
16.5 A to 150 A	65 Hz to 440 Hz	0.58 % of reading + 0.20 A
150 A to 1025 A	65 Hz to 440 Hz	0.58 % of reading + 0.076 A

(e) **Wattmeters**

Least uncertainty for power (W and VA) is calculated as the root sum of squares of the uncertainties for the appropriate voltage and current values (and power factor, if applicable).

Voltage limitations: 33 mVac to 1000 Vac, or 0 V to 1000 Vdc.

Current limitations: 3.3 mAac to 11 Aac, or 0 A to 11 Adc.

Auxiliary voltage limitations: 10 mVac to 3.3 Vac, or 0 V to 3.3 Vdc.

The range of direct output is from 108.9 μ Wac through to 120 kWac, or 108.9 μ Wdc through to 100 kWdc, and from 108.9 μ VAac through to 120 kVAac, or 108.9 μ Vadc through to 100 kVadc.

Power can be simulated over greater ranges for equipment incorporating current clamps or current transformers. (Maximum output available for the voltage input is 1000 V, and maximum output available for the "current" input is 20 A or 3.3 V).

(f) **Varmeters**

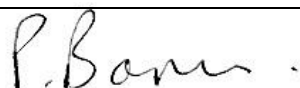
Least uncertainty for reactive power (VAR) is calculated as the root sum of squares of the uncertainties for the appropriate voltage, current, and power factor values.

Voltage and current limitations apply as for Wattmeters above.

(g) **Phase angle indicators**

0° to 179.98°	10 Hz to 65 Hz	0.076°
	65 Hz to 500 Hz	0.19°
	500 Hz to 1 kHz	0.38°
	1 kHz to 5 kHz	1.9°
	5 kHz to 10 kHz	3.8°
	10 kHz to 30 kHz	7.6°

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(i) Ohmmeters and Resistors

0 Ω to 11 Ω	30 ppm + 0.76 mΩ
11 Ω to 33 Ω	22 ppm + 1.1 mΩ
33 Ω to 110 Ω	21 ppm + 1.0 mΩ
110 Ω to 330 Ω	21 ppm + 1.5 mΩ
330 Ω to 1.1 kΩ	21 ppm + 1.5 mΩ
1.1 kΩ to 3.3 kΩ	21 ppm + 1.5 mΩ
3.3 kΩ to 11 kΩ	21 ppm + 1.5 mΩ
11 kΩ to 33 kΩ	21 ppm + 0.15 Ω
33 kΩ to 110 kΩ	21 ppm + 0.15 Ω
110 kΩ to 330 kΩ	24 ppm + 1.5 Ω
330 kΩ to 1.1 MΩ	24 ppm + 1.5 Ω
1.1 MΩ to 3.3 MΩ	45 ppm + 22 Ω
3.3 MΩ to 11 MΩ	98 ppm + 38 Ω
11 MΩ to 33 MΩ	190 ppm + 1.9 kΩ
33 MΩ to 110 MΩ	380 ppm + 2.2 kΩ
110 MΩ to 330 MΩ	2200 ppm + 7.5 kΩ
330 MΩ to 1100 MΩ	11000 ppm + 379 kΩ

(j) LCR meters

Capacitance meters and Capacitors

	Frequency range	
220 pF to 400 pF	10 Hz to 10 kHz	0.38 % + 7.6 pF
0.4 nF to 1.1 nF	0 Hz to 10 kHz	0.38 % + 7.6 pF
1.1 nF to 3.3 nF	10 Hz to 3 kHz	0.38 % + 7.6 pF
3.3 nF to 11 nF	10 Hz to 1 kHz	0.19 % + 7.6 pF
11 nF to 33 nF	10 Hz to 1 kHz	0.19 % + 7.6 pF
33 nF to 110 nF	10 Hz to 1 kHz	0.19 % + 7.6 pF
110 nF to 330 nF	10 Hz to 1 kHz	0.19 % + 0.03 nF
0.33 μF to 1.1 μF	10 Hz to 600 Hz	0.19 % + 0.76 nF
1.1 μF to 3.3 μF	10 Hz to 300 Hz	0.19 % + 2.2 nF
3.3 μF to 11 μF	10 Hz to 150 Hz	0.19 % + 7.6 nF
11 μF to 33 μF	10 Hz to 120 Hz	0.30 % + 22 nF
33 μF to 110 μF	10 Hz to 80 Hz	0.34 % + 76 nF
110 μF to 330 μF	0 Hz to 50 Hz	0.34 % + 220 nF
330 μF to 1.1 mF	0 Hz to 20 Hz	0.34 % + 0.76 μF
1.1 mF to 3.3 mF	0 Hz to 6 Hz	0.34 % + 2.2 μF
3.3 mF to 11 mF	0 Hz to 2 Hz	0.34 % + 7.6 μF
11 mF to 33 mF	0 Hz to 0.6 Hz	0.75 % + 22 μF
33 mF to 110 mF	0 Hz to 0.2 Hz	0.84 % + 76 μF

(l) Energy meters

Calibration of single and multiple phase energy meters to the accuracy requirements of classes

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0.2, 0.5, 1.0 and 2.0 as defined in IEC 61036, 60687, 60521 (or 62053 - 22, 62053 - 21 and 62053 - 11) in accordance with in-house methods and EIPC 2010 Part 10 Metering

Active Meters (units Wh/Vah)

Power factor (PF)

1.0	0.052 %
0.5 lag	0.066 %
0.8 lead	0.072 %

Certification of metering installations in accordance with EIPC 2010 Part 10 Metering Cat 1, 2, 3, 4, and 5

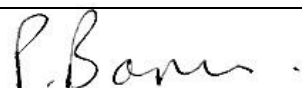
(q) Other specified devices

Voltage simulation of temperature by simulated thermocouple output and thermocouple measurement.

Thermocouple Type

B	600 °C to 800 °C	0.33 °C
	800 °C to 1000 °C	0.25 °C
	1000 °C to 1550 °C	0.22 °C
	1550 °C to 1820 °C	0.25 °C
C	0 °C to 150 °C	0.22 °C
	150 °C to 650 °C	0.19 °C
	650 °C to 1000 °C	0.23 °C
	1000 °C to 1800 °C	0.38 °C
	1800 °C to 2316 °C	0.64 °C
E	-250 °C to -100 °C	0.38 °C
	-100 °C to -25 °C	0.12 °C
	-25 °C to -350 °C	0.10 °C
	350 °C to 650 °C	0.12 °C
	650 °C to 1000 °C	0.15 °C
J	-210 °C to -100 °C	0.20 °C
	-100 °C to -30 °C	0.12 °C
	-30 °C to 150 °C	0.10 °C
	150 °C to 760 °C	0.12 °C
	760 °C to 1200 °C	0.17 °C
K	-200 °C to -100 °C	0.25 °C
	-100 °C to -25 °C	0.13 °C
	-25 °C to 120 °C	0.12 °C
	120 °C to 1000 °C	0.19 °C
	1000 °C to 1372 °C	0.30 °C

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Schedule to

CERTIFICATE OF ACCREDITATION

DELTA Utility Services Limited
 Metrology & Calibration Laboratory
SCOPE OF ACCREDITATION

Accreditation No 583

N	-200 °C to -100 °C	0.30 °C
	-100 °C to -25 °C	0.16 °C
	-25 °C to 120 °C	0.14 °C
	120 °C to 410 °C	0.13 °C
	410 °C to 1300 °C	0.20 °C
R	0 °C to 250 °C	0.43 °C
	250 °C to 400 °C	0.26 °C
	400 °C to 1000 °C	0.25 °C
	1000 °C to 1767 °C	0.30 °C
S	0 °C to 250 °C	0.35 °C
	250 °C to 1000 °C	0.27 °C
	400 °C to 1400 °C	0.28 °C
	1400 °C to 1767 °C	0.34 °C
T	-250 °C to -150 °C	0.47 °C
	-150 °C to 0 °C	0.18 °C
	0 °C to 120 °C	0.12 °C
	120 °C to 400 °C	0.10 °C

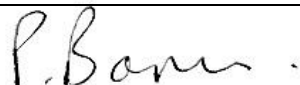
5.91 Frequency Measurement and Time Measurement

(a) Frequency meters

Least uncertainty of measurement

0.01 Hz to 120 Hz	1.9 ppm + 3.8 µHz
120 Hz to 1200 Hz	1.9 ppm + 3.8 µHz
1.2 kHz to 12 kHz	1.9 ppm + 3.8 µHz
12 kHz to 120 kHz	1.9 ppm + 3.8 µHz
120 kHz to 1200 kHz	1.9 ppm + 3.8 µHz
1.2 MHz to 2 MHz	1.9 ppm + 3.8 µHz

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