

CERTIFICATE of CALIBRATION



Issued By
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Date of Issue **08/06/2010**

Certificate No. **69433**

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Accreditation Category **A**

Client	SCS	Manufacturer	ISO-TECH
Address	22 FOX PARK, FINNSTOWN ABBEY, LUCAN, CO DUBLIN	Type	IDM91E
		Description	Digital multimeter 3.5 digits
		Serial No.	81300206
		Asset No.	None
Purchase Order No.	TBA	Date In	04/06/2010
		Calibration Date	08/06/2010
		Calibration Due	08/06/2011

This certificate is issued in accordance with the conditions of accreditation laid down by the Irish National Accreditation Board which has assessed the measurement capability of the laboratory. The reported results are traceable to recognised National and International Standards. The results refer to the 'as received' condition of the equipment prior to any adjustments. If so adjusted then the post adjustment results are also recorded and noted as such.

The reported expanded uncertainties of measurement is stated as the standard uncertainty of measurement multiplied by a coverage factor $k=2$, calculated from a normal distribution to give a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA-4/02. The long term stability of the object has not been taken into account.

Authorised Signatory/code
David Urquhart
426226.416
David Urquhart

- Mr. Aaron Joyce Head of Laboratory
- Mr. Robin Woods Technical Manager
- Mr. David Urquhart Quality Manager
- Mr. James Sheehy Senior Engineer



The results recorded relate only to the item specified above
This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

CONFIDENTIAL REPORT

Client **SCS**
 Manufacturer **Isotech**
 Model No. **IDM91E**
 Serial No. **81300206**
 Control No. **None**
 Description **3.5 Digit DMM**
 Location **Transtest Cal Lab**
 Environment **23 °C ± 2 °C, rh = (50 ± 10) %**

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 Calibration Date **08-Jun-10**
 Calibrated By **M.Lee**

Calibration File No. **isoIDM91E-5500A-1y-Auto-Rev10_1**

DC Volts Accuracy :- (Including Range Linearity)

Method used CTM 101

Range Tested	Units	Display Reading	Input Voltage	Specification ±	Display Error	Pass/Fail Code	Uncert. ±
200	mV	189.9	190.00	1.05E+00	-1.00E-01	Pass	6.03E-02
2	V	-0.199	-0.2000	2.00E-03	1.00E-03	Pass	5.78E-04
2	V	0.199	0.2000	2.00E-03	-1.00E-03	Pass	5.78E-04
2	V	0.599	0.6000	4.00E-03	-1.00E-03	Pass	5.79E-04
2	V	0.899	0.9000	5.50E-03	-1.00E-03	Pass	5.80E-04
2	V	1.199	1.2000	7.00E-03	-1.00E-03	Pass	5.82E-04
2	V	1.499	1.5000	8.50E-03	-1.00E-03	Pass	5.85E-04
2	V	1.798	1.8000	1.00E-02	-2.00E-03	Pass	5.88E-04
2	V	1.898	1.9000	1.05E-02	-2.00E-03	Pass	5.89E-04
2	V	-1.898	-1.9000	-8.50E-03	2.00E-03	Pass	5.89E-04
20	V	18.96	19.000	1.05E-01	-4.00E-02	Pass	5.90E-03
200	V	189.8	190.00	1.05E+00	-2.00E-01	Pass	5.92E-02
600	V	589	590.00	3.95E+00	-1.00E+00	Pass	5.79E-01

AC Volts Accuracy :- (Including Frequency Response)

Method used CTM 101

Range Tested	Units	Display Reading	Input Voltage	Specification ±	Display Error	Pass/Fail Code	Uncert. ±
200mv	mV , 400 Hz	190.0	190.00	2.78E+00	0.00E+00	Pass	1.39E-01
2	V , 50 Hz	1.900	1.9000	2.78E-02	0.00E+00	Pass	9.31E-04
20	V , 50 Hz	18.93	19.000	2.42E-01	-7.00E-02	Pass	1.11E-02
20	V , 500 Hz	18.91	19.000	2.42E-01	-9.00E-02	Pass	1.11E-02
200	V , 50 Hz	190.1	190.00	2.78E+00	1.00E-01	Pass	2.01E-01
600	V , 50 Hz	588	590.00	1.14E+01	-2.00E+00	Pass	7.36E-01

DC Current Accuracy :-

Method used CTM 105

Range Tested	Units	Display Reading	Input Current	Specification ±	Display Error	Pass/Fail Code	Uncert. ±
200	uA	190.1	190.00	2.00E+00	1.00E-01	Pass	1.04E-01
2	mA	1.901	1.9000	2.00E-02	1.00E-03	Pass	6.73E-04
20	mA	19.01	19.000	2.00E-01	1.00E-02	Pass	6.30E-03
200	mA	189.8	190.00	2.00E+00	-2.00E-01	Pass	6.34E-02
10	A	0.99	1.000	5.00E-02	-1.00E-02	Pass	5.79E-03
10	A	8.99	9.000	2.10E-01	-1.00E-02	Pass	8.78E-03

AC Current Accuracy :-

Method used CTM 105

Range Tested	Units	Display Reading	Input Current	Specification ±	Display Error	Pass/Fail Code	Uncert. ±
200	uA, 50 Hz	189.5	190.00	3.15E+00	-5.00E-01	Pass	5.66E-01
2	mA, 50 Hz	1.901	1.9000	3.15E-02	1.00E-03	Pass	2.61E-03
20	mA, 50 Hz	19.00	19.000	3.15E-01	0.00E+00	Pass	2.61E-02
200	mA, 50 Hz	189.9	190.00	3.15E+00	-1.00E-01	Pass	2.61E-01
10	A, 50 Hz	0.98	1.000	5.50E-02	-2.00E-02	Pass	5.97E-03
10	A, 50 Hz	8.98	9.000	2.55E-01	-2.00E-02	Pass	1.03E-02

End of Section

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Resistance Measurement Accuracy :

Method used CTM 110

Range Tested	Units	Display Reading	Applied Resistance	Specification ±	Display Error	Pass/Fail Code	Uncert. ±
200	Ohm	0.1	0.0000				6.41E-02
200	Ohm	190.6	190.0000	1.83E+00	6.00E-01	Pass	6.41E-02
2	kOhm	1.898	1.900000	1.53E-02	-2.00E-03	Pass	6.03E-04
20	kOhm	18.98	19.000000	1.53E-01	-2.00E-02	Pass	6.03E-03
200	kOhm	190.0	190.0000	1.53E+00	0.00E+00	Pass	6.10E-02
2	MOhm	1.899	1.900000	1.53E-02	-1.00E-03	Pass	6.03E-04
20	MOhm	19.05	19.000000	3.25E-01	5.00E-02	Pass	6.03E-03

CALIBRATION INFORMATION

Test Specification Used : -

The Manufacturers Specifications from the manufacturers web site 29/6/06

Summary : -

The Instrument meets or exceeds the Test Specification at the measured points, except where indicated.
Pass Codes : 'Pass' = less than 50 %, 'Pass' = greater than 50 %, of specification
Where the Pass/Fail code is '#' the measurement uncertainty may influence the result.
The Calibration Data carries no implication regarding the Instrument's ability to maintain it's Calibration, nor to it's long term stability.

Method : -

Precisely known values of Voltage, Current and Resistance were applied to the Input Terminals. The resultant readings were recorded from the display and compared with the test specifications. Transtest's Common Test Methods manuals (CTM) details equipment, connection details and procedures.

Test Equipment Used : -

Asset no.	Manuf.	Type	Cal date
173	Fuke	5500A	03/03/2010

The above measurements are traceable via standards maintained by Butler Transtest Ltd Calibration Laboratory, via the National Metrology Laboratory, (Rep. of Ireland), or other approved accredited routes, to the National Physical Laboratory, (U.K.), or The Bureau International des Poids et Mesures, (France).

End Of Report