

CERTIFICATE of CALIBRATION



Issued By
Butler Transtest Ltd.
G14, Maynooth Business Campus,
Maynooth, Co. Kildare,
Ireland

Tel. 353 1 6016260
Fax. 353 1 6016265
Web www.transtest.ie

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

Certificate No. **69432**

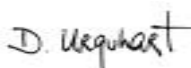
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Accreditation Category **A**

Client	SCS	Manufacturer	Rs
Address	22 FOX PARK, FINNSTOWN ABBEY, LUCAN, CO DUBLIN	Type	163-5348
		Description	Tachometer
		Serial No.	AB.40026
		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

426220.277
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
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CONFIDENTIAL REPORT

Client **SCS**
Manufacturer **RS**
Model No. **163-5348**
Serial No. **AB.40026**
Control No. **None**
Description **Tachometer**
Location **Transtest Calibration Laboratory**
Environment **23 °C ± 2 °C, rh = (50 ± 10) %**

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

Calibration File No. **Tachometer-5500A-1y-Rev10_1**

RPM Measurement Accuracy :

Method Used : CTM 304

Range Tested	Input Frequency (Hz)	Calculated rpm	Display Reading	Specification ± rpm	Display Error (rpm)	Pass/Fail Code	Uncertainty ± rpm
rpm	0.1	6	6.0	0.10	0.0	Pass	5.8E-02
	1	60	60.0	0.13	0.0	Pass	5.8E-02
	2	120	120.0	0.16	0.0	Pass	5.8E-02
	5	300	300.0	0.25	0.0	Pass	5.8E-02
	10	600	600.0	0.4	0.0	Pass	5.8E-02
	20	1200	1200	1.6	0.0	Pass	5.8E-01
	50	3000	3000	2.5	0.0	Pass	5.8E-01
	100	6000	6000	4	0.0	Pass	5.8E-01
	200	12000	12000	7	0.0	Pass	5.8E-01
	500	30000	30000	16	0.0	Pass	5.9E-01
	1000	60000	60000	31	0.0	Pass	6.3E-01

Uncertainties include a contribution from the UUT of ± 1/2 LSD.

CALIBRATION INFORMATION

Test Specification Used :-

The Manufacturers Specifications were taken from the Operating Manual

Extent of Calibration :-

RPM accuracy over the full range

Exclusions :-

None

Summary :-

The Instrument meets or exceeds the Test Specification at the measured points, except where indicated.

- Pass Where instrument error is less than 50 % of the test specification
- Pass' Where instrument error is greater than 50 % of the test specification
- # Where the Pass/Fail code is # the measurement uncertainty may have an effect on the result
- Fail Where instrument error minus uncertainty is greater than the test specification

Method :-

After a suitable Temperature Stabilization Period, Light Pulses Precisely Known periods were applied to the optical input, the display was recorded 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	Fluke	5500A	03/03/2010

Traceability :-

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