Schedule of Accreditation

issued by

United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

0060

Accredited to ISO/IEC 17025:2005

Sira Test & Certification Ltd

Issue No: 050 **Issue date:** 01 January 2011

12 Acorn Industrial Park
Crayford Road
Crayford
Dartford
Kent
DA1 4AL

Contact: Mr R Cooper
Tel: +44 (0)1322 520500
Fax: +44 (0)1322 520501
E-Mail: bob.cooper@siracertification.com
Website: www.siracertification.com

Calibration performed by the Organisations at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
Address 12 Acorn Industrial Park Crayford Road Crayford Dartford Kent DA1 4AL **Local contact** Mr R Cooper Tel: +44 (0)1322 520500 Fax: +44 (0)1322 520501 Email: bob.cooper@siracertification.com Website: www.siracertification.com	Acceleration Transducers - Sinusoidal Acceleration Transducers - Shock Charge Amplifiers Portable Calibrators Gas Detectors Optical Measurements	P

Site activities performed away from the locations listed above:

Location details	Activity	Location code
Customer Premises, e.g. MoT Test Centres, Garages, and Repair/Service Facilities (including those of Sira). The customers' site or premises must be suitable for the nature of the particular calibrations undertaken and will be the subject of contract review arrangements between the laboratory and the customer.	Vehicle Exhaust Analyser (VEGA/DSM) Calibration	S

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ($k = 2$)	Remarks	Location Code
ACCELERATION TRANSDUCERS - Sinusoidal				
Reference (precision) grades				P
Piezoelectric type				
Transducer at 20 °C:	Nominal peak acceleration 10 ms^{-2} to 60 ms^{-2}		Calibration of charge sensitivity by comparison with a single ended (precision grade) transducer	
High frequency test	Transducer mass 0 grams to 80 grams Charge sensitivity 0.08 pC/ms^{-2} to 0.30 pC/ms^{-2}			
	20 Hz to 10 000 Hz	0.60 %		
	Transducer mass 80 grams to 600 grams Charge sensitivity 0.30 pC/ms^{-2} to 2.0 pC/ms^{-2}			
	20 Hz to 10 000 Hz	1.0 %		
Low frequency test	Charge sensitivity > 0.08 pC/ms^{-2}			
	2 Hz to 20 Hz	1.5 %		
Transducer and associated signal conditioner at 20 °C:			Calibration of transducer and signal conditioner systems can also be undertaken	
High frequency test	Transducer mass 0 grams to 80 grams Voltage sensitivity 8 mV/ms^{-2} to 150 mV/ms^{-2}			
	20 Hz to 10 000 Hz	0.70 %		
	Transducer mass 80 grams to 600 grams Voltage sensitivity 8 mV/ms^{-2} to 150 mV/ms^{-2}			
	20 Hz to 5000 Hz	1.0 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ACCELERATION TRANSDUCERS - Sinusoidal (cont'd)				P
Integral electronics type				
Transducer at 20 °C:				
Low frequency test	Sensitivity 3.0 mV/ms^{-2} to 150 mV/ms^{-2}			
	1 Hz to 20 Hz	2.0 %		
High frequency test	Transducer voltage sensitivity 0.12 mV/ms^{-2} to 150 mV/ms^{-2}			
	20 Hz to 5 kHz *6.3 kHz to 10 kHz*	0.70 % 2.0 %		
Working (non-precision) grades				
Piezoelectric type			Calibration of charge sensitivity by comparison with a reference (precision grade) transducer. System calibrations comprising transducer (tx), signal conditioner and power supply can be undertaken within the quoted uncertainties.	
Transducer at 20 °C:	Nominal peak acceleration 1 ms^{-2} to 350 ms^{-2}			
High frequency test	Sensitivity (tx) or (system) 0.01 pC/ms^{-2} to 1000 pC/ms^{-2} (tx), 1.2 mV/ms^{-2} to 1000 mV/ms^{-2} (system)			
	20 Hz to 5000 Hz	1.5 %		
Low Frequency Test	Nominal peak acceleration 1 Hz: 1 ms^{-2} to 1.5 ms^{-2}			
	2 Hz to 4 Hz: 1 ms^{-2} to 5.0 ms^{-2}			
	5 Hz to 20 Hz: 1 ms^{-2} to 20 ms^{-2}			
	Sensitivity (tx)			
	0.300 pC/ms^{-2} to 1000 pC/ms^{-2} *1 Hz*	2.0 %		
	0.085 pC/ms^{-2} to 1000 pC/ms^{-2} *2 Hz to 4 Hz*	1.5 %		
	0.025 pC/ms^{-2} to 1000 pC/ms^{-2} *5 Hz to 20 Hz*	1.5 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ACCELERATION TRANSDUCERS - Sinusoidal (cont'd)				P
Working (non-precision) grades (cont'd)				
Low Frequency Test (cont'd)	Sensitivity (system)			
	30 mV/ms^{-2} to 1000 mV/ms^{-2} *1 Hz*	2.0 %		
	8.5 mV/ms^{-2} to 1000 mV/ms^{-2} *2 Hz to 4 Hz*	1.5 %		
	2.5 mV/ms^{-2} to 1000 mV/ms^{-2} *5 Hz to 20 Hz*	1.5 %		
Transducer at any temperature from - 50 °C to + 200 °C:	Nominal peak acceleration 1 ms^{-2} to 40 ms^{-2}			P
	Sensitivity (tx) or (system) 0.01 pC/ms^{-2} to 1000 pC/ms^{-2} (tx), 1.2 mV/ms^{-2} to 1000 mV/ms^{-2} (system)			
	20 Hz to 630 Hz	2.0 %		
Piezoresistive or strain-gauge type			Calibration of voltage sensitivity by comparison with a reference (precision grade) transducer. System calibrations comprising transducer (tx), signal conditioner and power supply can be undertaken within the quoted uncertainties.	
Transducer at 20 °C:				
High frequency test	Nominal peak acceleration 1 ms^{-2} to 350 ms^{-2}			
	Sensitivity (tx) or (system) 0.02 pC/ms^{-2} to 1000 pC/ms^{-2} (tx), 1.2 mV/ms^{-2} to 1000 mV/ms^{-2} (system)			
	20 Hz to 5000 Hz	2.0 %		
Low frequency test	Nominal peak acceleration 1 Hz: 1 ms^{-2} to 1.5 ms^{-2}			
	2 Hz to 4 Hz: 1 ms^{-2} to 5.0 ms^{-2}			
	5 Hz to 20 Hz: 1 ms^{-2} to 20 ms^{-2}			

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ACCELERATION TRANSDUCERS - Sinusoidal (cont'd)				P
Working (non-precision) grades (cont'd)				
Low frequency test (cont'd)	Sensitivity (tx)			
	0.60 pC/ms^{-2} to 1000 pC/ms^{-2} *1 Hz*	2.0 %		
	0.17 pC/ms^{-2} to 1000 pC/ms^{-2} *2 Hz to 4 Hz*	2.0 %		
	0.05 pC/ms^{-2} to 1000 pC/ms^{-2} *5 Hz to 20 Hz*	2.0 %		
	Sensitivity (system)			
	30 mV/ms^{-2} to 1000 mV/ms^{-2} *1 Hz*	2.0 %		
	8.5 mV/ms^{-2} to 1000 mV/ms^{-2} *2 Hz to 4 Hz*	2.0 %		
	2.5 mV/ms^{-2} to 1000 mV/ms^{-2} *5 Hz to 20 Hz*	2.0 %		
Transducer at any temperature from - 50 °C to + 200 °C:	Nominal peak acceleration 1 ms^{-2} to 40 ms^{-2}			
	Sensitivity (tx) or (system) 0.02 pC/ms^{-2} to 1000 pC/ms^{-2} (tx) 1.2 mV/ms^{-2} to 1000 mV/ms^{-2} (system)			
	20 Hz to 630 Hz	2.5 %		
Integral electronics type			Calibration of voltage sensitivity by comparison with a reference (precision grade) transducer. System calibrations comprising transducer (tx), signal conditioner and power supply can be undertaken within the stated CMCs.	
Transducer at 20 °C:				
High frequency test	Nominal peak acceleration 1 ms^{-2} to 350 ms^{-2}			
	Sensitivity (tx) or (system) 0.12 pC/ms^{-2} to 1000 pC/ms^{-2} (tx), 1.2 mV/ms^{-2} to 1000 mV/ms^{-2} (system)			
	20 Hz to 5000 Hz	2.0 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ACCELERATION TRANSDUCERS - Sinusoidal (cont'd) Working (non-precision) grades (cont'd)				P
Low frequency test	Nominal peak acceleration 1 Hz: 1 ms^{-2} to 1.5 ms^{-2} 2 Hz to 4 Hz: 1 ms^{-2} to 5.0 ms^{-2} 5 Hz to 20 Hz: 1 ms^{-2} to 20 ms^{-2}			
	Sensitivity (tx)			
	3.0 pC/ms^{-2} to 1000 pC/ms^{-2} *1 Hz*	2.0 %		
	0.85 pC/ms^{-2} to 1000 pC/ms^{-2} *2 Hz to 4 Hz*	2.0 %		
	0.25 pC/ms^{-2} to 1000 pC/ms^{-2} *5 Hz to 20 Hz*	2.0 %		
	Sensitivity (system)			
	30 mV/ms^{-2} to 1000 mV/ms^{-2} *1 Hz*	2.0 %		
	8.5 mV/ms^{-2} to 1000 mV/ms^{-2} *2 Hz to 4 Hz*	2.0 %		
	2.5 mV/ms^{-2} to 1000 mV/ms^{-2} *5 Hz to 20 Hz*	2.0 %		
Transducer at any temperature from - 50 °C to + 200 °C:	Nominal peak acceleration 1 ms^{-2} to 40 ms^{-2} Sensitivity 0.12 pC/ms^{-2} to 1000 pC/ms^{-2} (tx), 1.2 mV/ms^{-2} to 1000 mV/ms^{-2} (system) *20 Hz to 630 Hz*	2.5 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ACCELERATION TRANSDUCERS - SHOCK CALIBRATION				P
Working (non-precision) grades			The transducer to be calibrated must have a mass of no more than 40 grams	
<u>Piezoelectric type</u>			Calibration of charge sensitivity by comparison with a reference (precision grade) transducer	
Transducer at 20 °C:	Sensitivity 0.0001 pC/ms^{-2} to 100 pC/ms^{-2}			
	200 ms^{-2} to 5000 ms^{-2} 5000 ms^{-2} to 50000 ms^{-2}	2.0 % 2.8 %		
	200 ms^{-2} to 5000 ms^{-2} 5000 ms^{-2} to 50000 ms^{-2}	2.0 % 2.8 %	The upper limit for the calibrated acceleration level is subject to a maximum charge output of 10 nC, e.g. for a device sensitivity of 1 pC/ms^{-2} the maximum acceleration level for calibration would be: 10 nC / 1 pC/ms^{-2} = 10000 ms^{-2}	
<u>Piezoresistive type</u>				
Transducer at 20 °C:	Sensitivity 0.0001 mV/ms^{-2} to 100 mV/ms^{-2}		The upper limit for the calibrated acceleration level is subject to a maximum voltage output of 10 V, e.g. for a device sensitivity of 1 mV/ms^{-2} the maximum acceleration level for calibration would be: 10 V / 1 mV/ms^{-2} = 10000 ms^{-2}	
	200 ms^{-2} to 5000 ms^{-2} 5000 ms^{-2} to 50000 ms^{-2}	2.0 % 2.8 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ACCELERATION TRANSDUCERS - SHOCK CALIBRATION (cont'd)				P
Working (non-precision) grades (cont'd)				
Integral electronics type				
Transducer at 20 °C:	Sensitivity 0.0001 mV/ms^{-2} to 100 mV/ms^{-2}			
	200 ms^{-2} to 5000 ms^{-2} 5000 ms^{-2} to 50000 ms^{-2}	2.0 % 2.8 %	Calibration of voltage sensitivity by comparison with a reference (precision grade) transducer. The upper limit for the calibrated acceleration level is subject to a maximum voltage output of 10 V, e.g. for a device sensitivity of 1 mV/ms^{-2} the maximum acceleration level for calibration would be: 10 V / 1 mV/ms^{-2} = 10000 ms^{-2}	
System			Calibration of system voltage sensitivity by comparison with a reference (precision grade) transducer. System calibrations comprising transducer, signal conditioner and power supply can be undertaken.	
System components at 20 °C:	Sensitivity 0.0001 mV/ms^{-2} to 100 mV/ms^{-2}			
	200 ms^{-2} to 5000 ms^{-2} 5000 ms^{-2} to 50000 ms^{-2}	2.0 % 2.8 %	The upper limit for the calibrated acceleration level is dependant on the system conditioner configuration and output.	
CHARGE AMPLIFIERS				P
Precision and working grade types for use with transducers	Calibration of voltage output per picocoulomb or millivolt input *1 Hz* *2 Hz to 100 kHz*	 1.5 % 1.0 %	 Minimum input 1 pC or 10 mV	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
PORTABLE CALIBRATORS	20 Hz to 2 kHz	2.0 %	Calibration of portable calibrators by comparison methods	P
GAS ANALYSERS				
Instruments approved by the VOSA on behalf of the Department for Transport for the measurement of vehicle exhaust emissions	As per Vehicle Inspectorate requirements VPB/07/24/20/CAL dated May 1995 (1st revision August 1995)	1.2 % of reading	A list of individual approved signatories and the type of approved instruments they may calibrate is held by the laboratory and by UKAS.	S
Instruments approved by the VOSA on behalf of the Department for Transport for the measurement of free acceleration smoke	As per Vehicle Inspectorate requirements MOT/08/19/01 dated October 2001 (3rd revision January 2007)	Smoke Obscuration Coefficient 0.12 m^{-1}		S
GAS DETECTORS	0 % to 100 % Methane in air or Nitrogen	1.5 % relative + 1.0 ppm		P
	0 % to 100 % Propane in air or Nitrogen			
	0 % to 100 % Butane in air or Nitrogen			
	0 % to 25 % Oxygen in Nitrogen			
	0 % to 10 % Carbon Monoxide in air or Nitrogen			
	0 % to 20 % Carbon Dioxide in air or Nitrogen			
OPTICAL MEASUREMENTS				P
Optical Transmission at 565 nm	1 % to 100 %	0.33 % of optical transmission		
Derived Smoke Obscuration Coefficient	1 m^{-1} to 4 m^{-1} (Optical path length 98 mm to 690 mm)	0.050 m^{-1}		
END				