Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

0381 **Accredited to ISO/IEC 17025:2017**	**SERCAL NDT Equipment Ltd** **Issue No:** 027 **Issue date:** 26 May 2023	
	Unit 1 **Littleton Business Park** **Littleton Drive** **Off Cocksparrow Lane** **Huntington** **Cannock** **Staffordshire** **WS12 4TR**	**Contact: Dennis Ball** **Tel: +44 (0)1543 570074** **Fax: +44 (0)1543 570074** **E-Mail: dball@sercal.co.uk** **Website: www.sercal.co.uk**
Calibration performed at the above address only		

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks
ELECTRICAL VERIFICATION of ULTRASONIC FLAW DETECTION EQUIPMENT	As BS EN ISO 22232-1:2020 Group 2 tests and including the following calibrations and quantities:		
	Pulser Voltage V_{50} Pulser Risetime Pulse duration	4.0 % 2.3 ns 2.3 ns	
	Frequency response *0.2 MHz to 30 MHz*	3.0 % at -3 dB point	For instruments designed to comply with BS EN 12668-1:2010, the centre frequency f_0 is calculated using $f_0 = \sqrt{(f_u \times f_l)}$, otherwise the expression $f_0 = (f_u + f_l)/2$ is used.
	Equivalent input noise	5.0 %	Using Method B as described in Section 9.4.3.3 of BS EN ISO 22232-1:2020.
	Calibrated attenuator Gain linearity Vertical Linearity	0.033 dB to 0.48 dB 0.50 % 0.50 % of screen height	
ELECTRICAL VERIFICATION of ULTRASONIC FLAW DETECTION EQUIPMENT	As Electrical Supply Industry Standard ESI 98-9:Issue 1:1985	See Page 2	
ELECTRICAL VERIFICATION of ULTRASONIC THICKNESS MEASURING EQUIPMENT	DIHM based on BS EN 15317:2013	See Page 2	Determination of resolution is conducted using a different method to that described in the standard however the outcome is identical.

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (*k* = 2)	Remarks
ELECTRICAL VERIFICATION of ULTRASONIC PROBES:			
Nominal 0° compression wave probes for contact testing	As Electrical Supply Industry Standard ESI 98-7:Issue 1:1982	See below	
Low frequency single crystal shear wave, angle probes	As Electrical Supply Industry Standard ESI 98-8:Issue 1:1982	See below	
Single and twin crystal probes	As Electrical Supply Industry Standard ESI 98-2:Issue 1:1979	See below	
EVALUATION OF PERFORMANCE CHARACTERISTICS OF ULTRASONIC PULSE-ECHO TESTING INSTRUMENTS WITHOUT THE USE OF ELECTRONIC MEASUREMENT STANDARDS			
	As ASTM E317-11, paragraphs 6.2 to 6.6	See below	
QUANTITIES			
The capabilities above are limited to the following quantities, ranges and uncertainties:			
DC Resistance	10 Ω to 1 kΩ	0.44 %	
DC Current	10 mA to 1 A	1.6 %	
DC Voltage	100 mV to 100 V 100 V to 1000 V	0.46 % 2.5 %	
AC Voltage	100 V to 150 V *at 50 Hz* 150 V to 240 V *at 50 Hz* 240 V to 1000 V *at 50 Hz*	2.6 % 0.51 % 2.6 %	
Frequency	10 Hz to 10 kHz 10 kHz to 20 MHz	2.6 % 1.2 %	
Attenuation	0 dB to 100 dB *at 15 MHz and 20 MHz*	0.68 dB	Using calibrated attenuator
Risetime	3 ns to 60 ns	3.7 ns	Using oscilloscope
Dimensional	70° nominal 1 mm, 25 mm, 50 mm, 90 mm, 100 mm, 150 mm and 200 mm nominal	0.14° 0.032 mm	

Calibration performed at main address only

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks
PHASED ARRAY SETS	As BS EN ISO 18563-1:2022 including the following calibrations and quantities.		Ranges and methods are as defined in BS EN ISO 18563-1:2022
	Pulse Amplitude Pulse Width Pulse risetime	4.0 % of screen height 2.3 ns 2.3 ns	
	Time delay linearity Frequency response *200 kHz to 30 MHz*	1.0 % of screen width 3.0 % at -3 dB point	
	Channel gain variation Equivalent input noise Gain linearity Linearity of vertical display Linearity of time delay	1.0 % 4.0 % 0.51 % 0.50 % of screen height 1.0 % of screen width	
CALIBRATION OF ULTRASONIC TEST BLOCKS			
Linear dimensions	0 mm to 25 mm 25 mm to 200 mm 200 mm to 300 mm 300 mm to 305 mm	6.0 µm 14 µm 30 µm 40 µm	using micrometers using optical projector using height gauge using height gauge
Hole diameter	1.5 mm to 50 mm	19 µm	using optical projector
External radius	10 mm to 100 mm	20 µm	using optical projector
Slot width	1 mm to 8 mm	14 µm	using optical projector

END

Appendix - Calibration and Measurement Capabilities

Introduction

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

Calibration and Measurement Capabilities (CMCs)

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest measurement uncertainty that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors.

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The measurement uncertainty is calculated according to the procedures given in the GUM and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published measurement uncertainty in certificates issued under its accreditation.

Expression of CMCs - symbols and units

It should be noted that the percentage symbol (%) represents the number 0.01. In cases where the measurement uncertainty is stated as a percentage, this is to be interpreted as meaning percentage of the measurand.
Thus, for example, a measurement uncertainty of 1.5 % means 1.5 × 0.01 × *q*, where *q* is the quantity value.

The notation Q[a, b] stands for the root-sum-square of the terms between brackets: $Q[a, b] = [a^2 + b^2]^{1/2}$