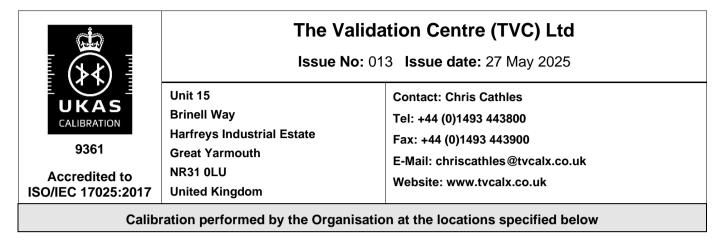
Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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



Laboratory location:

Location details		Activity	Location code
Address Unit 15 Brinell Way Harfreys Industrial Estate Great Yarmouth NR31 0LU United Kingdom	Local contact Mr Chris Cathles Tel: +44 (0)1493 443800 Fax: +44 (0)1493 443900 Email: chriscathles@tvcalx.co.uk Website: www.tvcalx.co.uk	Electrical verification of ultrasonic flaw detection equipment in accordance with the Group 2 tests described in: BS EN 12668-1:2010 BS EN ISO 22232-1:2020 Electrical verification of ultrasonic thickness measuring equipment in accordance with the Group 2 tests described in BS EN 15317:2013. Calibration of TVC Arc Loggers Additional electrical and time measurements	Permanent Laboratory

Site activities performed away from the location listed above:

Location details		Activity	Location code
Calibrations may be performed in suitable areas within the customers' premises. The customers' 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.	Contact as above	Electrical verification of ultrasonic flaw detection equipment in accordance with the Group 2 tests described in: BS EN 12668-1:2010 BS EN ISO 22232-1:2020 Electrical verification of ultrasonic thickness measuring equipment in accordance with the Group 2 tests described in BS EN 15317:2013. Calibration of Arc Loggers Calibration of gas flow and nozzle flow meters Additional electrical and time measurements	Site Calibration

	Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK	
UKAS CALIBRATION	The Validation Centre (TVC) Ltd	
9361 Accredited to ISO/IEC 17025:2017	Issue No: 013 Issue date: 27 May 2025	

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (<i>k</i> = 2)	Remarks	Location code
ELECTRICAL VERIFICATION of MEASURING EQUIPMENT As BS EN 15317:2013 Group 2 tests and including the following calibrations and quantities: ELECTRICAL VERIFICATION of DETECTION EQUIPMENT As BS EN 12668-1:2010 and including the following calibrations and quantities:	 9.6: Battery warning and cut off voltage 9.7: Battery warning and cut off current 9.9: Pulse repetition frequency 9.10: Pulse Voltage V₅₀ 9.10: Pulse Risetime t, 9.10: Pulse Duration t_d 9.12: Maximum and minimum thickness using gauges ULTRASONIC FLAW Stability after warm up (height) Stability after warm up (width) Jitter - screen height Jitter - screen width Stability against voltage 	0.28 % 0.24 % 1.3 % 3.5 % 0.91 ns 1.3 ns 0.20 mm 1.2 % of screen height 1.2 % of screen width 1.2 % of screen height 1.2 % of screen height 1.2 % of screen height 1.2 % of screen height		Permanent Laboratory and Site Calibration
	variation (height) Stability against voltage variation (width) Pulser Voltage Pulser Risetime Pulser Reverberation Pulse duration Frequency response <i>0.2 MHz to 30 MHz</i> Equivalent input noise Calibrated attenuator Vertical Linearity Linearity of timebase	 1.2 % of screen height 1.2 % of screen width 3.5 % 0.91 ns 3.7 % of pulser voltage 1.3 ns 4.1 % at -3 dB point 5.4 x 10⁻⁹ V/√Hz 0.30 dB 1.2 % of screen height 0.39 % of screen width 		Calibration

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9361 Accredited to ISO/IEC 17025:2017				
Cali	ibration performed by the	Organisation at the locations specif	ied	
Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty $(k = 2)$	Remarks	Location code
Pu Pu 0.2		3.5 % 0.91 ns 1.3 ns 4.1 % at -3 dB point	For instruments designed to comply with BS EN 12668-1:2010, the centre frequency f_0 is calculated using $f_0 = \sqrt{(f_u x f_0)}$, otherwise the expression $f_0 = (f_u + f_0)/2$ is used. Using Method A as described in Section 9.4.3.2 of BS EN ISO 22232-1:202 0.	Permanent Laboratory and Site Calibration

1.2% of screen height

0.30 dB 0.27 dB

Calibrated attenuator Gain linearity Vertical Linearity

Using Method B as described in Section

9.4.3.3 of BS EN ISO 22232-1:202

0.

UKAS CALIBRATION 9361	Schedule of Accreditation issued by United Kingdom Accreditation Service 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK The Validation Centre (TVC) Ltd				
Accredited to ISO/IEC 17025:2017	1350	Issue No: 013 Issue date: 27 May 2025			
	Calibration performed by the O	rganisation at the locations speci	fied		
Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (<i>k</i> = 2)	Remarks	Location code	
CALIBRATION OF ARC LOGG	ERS 1 V to 120 V	0.060 %	Other instruments of similar characteristics may also be calibrated.		
DC Current	1 A to 10 A 10 A to 2.5 kA	0.39 % to 0.47 % 0.68 %	Simulated current using multi turn coil.		
Electrical simulation of temperature	-100 °C to +1370 °C	0.42 °C	Type K thermocouple simulation including cold junction compensation.		
AC Voltage at 50 Hz	75 V to 750 V	0.24 %		ק	
AC Current at 50 Hz	1 A to 10 A 10 A to 2.5 kA	0.77 % to 0.97 % 1.7 %	Simulated current using multi turn coil.	ermanent	
DC Energy	50 kJ to 600 kJ	0.48 %	Measured over 50 s interval	Labor	
Velocity	2.5 m/min to 20 m/min	1.5 %	For calibration of fixtures used for wire velocity tests.	Permanent Laboratory and Site Calibration	
Velocity	0.5 m/min to 2 m/min	2.4 %	For calibration of fixtures used for pipe diameter tests.	Site Calibr	
Gas flow				ation	

2.0 l/min

0.30 s

0.12 %

By comparison with a mass flow controller.

Comparison against

For the calibration of the frequency function of clamp on ammeters and similar devices.

reference clock.

Calibration of turbine flow

meters using Argon gas. OTHER ELECTRICAL CALIBRATIONS

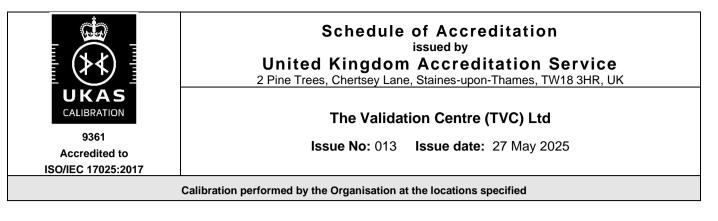
Stopwatch calibration

Frequency calibration

0 l/min to 100 l/min

5 s to 60 s

40 Hz to 2 kHz



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 $1.5 \times 0.01 \times q$, 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] = $[a^2 + b^2]^{1/2}$