


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>UKAS CALIBRATION 0604</p> <p>Accredited to ISO/IEC 17025:2005</p>	<p>Young Calibration Limited</p> <p>Issue No: 029 Issue date: 30 June 2017</p>	
	<p>5 Cecil Pashley Way Shoreham Airport Shoreham-by-Sea West Sussex BN43 5FF</p>	<p>Contact: Mr A Young Tel: +44 (0)1273 455572 E-Mail: ay@youngcalibration.co.uk Website: www.youngcalibration.co.uk</p>
<p>Calibration performed by the Organisations at the locations specified below</p>		

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
<p>Address 5 Cecil Pashley Way Shoreham Airport Shoreham-by-Sea West Sussex BN43 5FF</p> <p>Local contact Mr A Young</p>	<p>Pressure Electrical Temperature indicators - Electrical simulation Air velocity Air flow Water flow Hydrocarbon flow</p>	<p>Lab</p>

Site activities performed away from the locations listed above:

Location details	Activity	Location code
<p>The customer's 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</p> <p>Local contact Mr A Young</p>	<p>Pressure Electrical Temperature indicators - Electrical simulation</p>	<p>Site</p>



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DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ($k = 2$)	Remarks	Location Code
FLOW				
Hydrocarbon oils				
Volume flow rate	0.5 l/min to 440 l/min	0.40 %	1. Calibrations are carried out with fluids within the viscosity range 5 to 20cSt at fluid temperatures of up to 60 °C 2. Calibrations are carried out at pressures of up to 10 bar	Lab
Quantity of fluid passed	0.33 l to 361.7 l 361.7 l to 4 400 l (at flow rates of 0.5 l/min to 440 l/min)	0.40 % 1.0 %		
Mass flow rate	0.5 kg/min to 367.4 kg/min	0.40 %		
Mass of fluid passed	0.4 kg to 302 kg 302 kg to 3 674 kg (at flow rates of 0.5 kg/min to 367.4 kg/min)	0.40 % 1.0 %		
Water				
Volume flow rate	1.0 to 2400 cc/hr 1.0 to 2400 cc/hr	0.090 % + 0.001 0 ml/hr 0.55 % + 0.36 ml/hr	Using gravimetric method Coriolis reference meter	Lab
Quantity of fluid passed	0.04 l/min to 1 000 l/min 0.40 l to 801.6 l 801.6 l to 7 000 l (at flow rates of 0.04 l/min to 1 000 l/min)	0.15 % 0.15 % 1.0 %	Calibrations are carried out at pressures of up to 4 bar	
Mass flow rate	1.0 to 2400 cc/hr 1.0 to 2400 cc/hr	0.090 % + 0.001 0 cc/hr 0.55 % + 0.36 cc/hr	Using gravimetric method Coriolis reference meter	
Mass of fluid passed	0.04 kg/min to 998 kg/min 0.4 kg to 800 kg 800 kg to 9 980 kg (at flow rates of 0.04 kg/min to 998 kg/min)	0.15 % 0.15% 1.0 %		
Gas				
Volume flow rate	1 cc/min to 1 300 l/min	0.41 % + 1 cc/min	1. Calibrations are carried out at pressures of up to 8 bar 2. Calibration of flow meters with an electrical or pressure output can be undertaken	Lab
Quantity of gas passed	300 cc to 26 000 l (at flow rates of 1 cc/min to 1 300 l/min)	0.45 % + 1 cc		
Mass flow rate	0.001 2 g/min to 1.56 kg/min	0.41 % + 0.001 g/min		
Mass of gas passed	0.36 g to 31.2 kg (at flow rates of 0.001 2 g/min to 1.56 kg/min)	0.45 % + 0.001 g		



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FLOW (cont'd)				
Volume flow rate	10 l/s to 450 l/s	1.3 % + 0.20 l/s	1. Calibrations are carried out at ambient conditions	
	300 l to 540 kl (at flow rates of 10 l/s to 450 l/s)	1.3 % + 6 l	2. Calibration of flow meters with an electrical or pressure output can be undertaken	
Quantity of gas passed				
Mass flow rate	12 g/s to 0.54 kg/s	1.3 % + 7 g/s		
Mass of gas passed	0.36 kg to 643 kg (at flow rates of 12 g/s to 0.54 kg/s)	1.3 % + 0.071 kg		
Volume flow rate	40 l/s to 1 250 l/s	0.70 % + 0.030 l/s	1. Calibrations are carried out at ambient conditions	Lab
Quantity of gas passed	12 kl to 375 kl (at flow rates of 40 l/s to 1 250 l/s)	0.70 % + 9.0 l 0.7 % + 0.036 g/s	using a laser doppler anemometer	
Mass flow rate	48 g/s to 1.488 kg/s	0.7 % + 11 g	2. Calibration of flow meters with an electrical or pressure output can be undertaken	
Mass of gas passed	14.28 kg to 1 785 kg (at flow rates of 48 g/s to 1.488 kg/s)			
AIR VELOCITY				
Pitot tubes	0.05 m/s to 80 m/s	0.18 % + 0.001 m/s	1) All calibration performed against a laser doppler anemometer.	Lab
Thermal anemometers	0.05 m/s to 80 m/s	0.19 % + 0.001 m/s	2) Pitot tube uncertainty dependant on pitot differential pressure range	
Vane anemometers	0.1 m/s to 40 m/s	0.20 % + 0.001 m/s	3) Air velocity instruments up to 480 x 120 mm diameter (working area); uncertainty is dependent on design of instrument under test.	
Rotating cup anemometers	1.0 m/s to 24 m/s	0.23 %		
PRESSURE				
Gas pressure (absolute)				
Calibration of pressure indicating instruments and gauges	5 kPa to 130 kPa	21 Pa		Lab
Gas pressure (gauge)				



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PRESSURE (con'td)				
Calibration of pressure indicating instruments and gauges	- 90 kPa to 0 Pa 0 Pa to 2.5 kPa 2.5 kPa to 5 kPa 5 kPa to 6.9 kPa 6.9 kPa to 20 kPa 20 kPa to 270 kPa 270 kPa to 2.1 MPa 2.1 MPa to 3.5 MPa	40 Pa 0.046 % + 0.060 Pa 0.045 % + 0.31 Pa 15 Pa 17 Pa 0.028 % 0.022 % 1.3 kPa	Absolute pressure calibrations can be undertaken using gauge pressure generation and the associated barometric pressure with the additional absolute pressure uncertainty as listed	Lab
Hydraulic pressure (gauge)				
Calibration of pressure indicating instruments and gauge	0.55 MPa to 1 MPa 1 MPa to 41 MPa 41 MPa to 110 MPa	0.025 % + 90 Pa 0.0090 % + 90 Pa 0.018 %		Lab
Gas pressure (absolute)				
Calibration of pressure indicating instruments and gauges	5.0 kPa to 130 kPa	21 Pa		Site
Gas pressure (gauge)				
Calibration of pressure indicating instruments and gauges	- 90 kPa to 0 Pa 0 Pa to 2.5 kPa 2.5 kPa to 5.0 kPa 5.0 kPa to 6.9 kPa 6.9 kPa to 34.4 kPa 34.4 kPa to 250 kPa 250 kPa to 2.1 MPa 2.1 MPa to 3.5 MPa	40 Pa 0.046 % + 0.060 Pa 0.045 % + 0.31 Pa 15 Pa 17 Pa 0.13 kPa 0.46 kPa 1.3 kPa		Site
ELECTRICAL				
DC Voltage Generation	0 V to 330 mV 330 mV to 3.3 V 3.3 V to 33 V	0.012 % + 6.0 μ V 0.0070 % + 33 μ V 0.0070 % + 370 μ V		Lab and site
Measurement	0 V to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V	0.0050 % + 7.0 μ V 0.0035 % + 400 μ V 0.0035 % + 1.0 mV 0.0050 % + 2.5 mV		
Mains Voltage Measurement Mains Voltage Frequency	200 V to 300 V Nominal 50 Hz	1.0 % 2.5 %		
DC Current Generation	0 mA to 30 mA	0.014 % + 1.5 μ A		
Measurement	0 mA to 30 mA	0.017 % + 6.0 μ A		



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ELECTRICAL (cont'd)				
DC Resistance	0 Ω to 33 Ω 33 Ω to 330 Ω 330 Ω to 3.3 k Ω	20 m Ω 60 m Ω 500 m Ω		
	3.3 k Ω to 33 k Ω 33 k Ω to 110 k Ω 110 k Ω to 330 k Ω 330 k Ω to 3.3 M Ω 3.3M Ω to 11 M Ω 11 M Ω to 33 M Ω 33 M Ω to 110 M Ω 110 M Ω to 330 M Ω	5.0 Ω 25 Ω 60 Ω 800 Ω 10 k Ω 43 k Ω 800 k Ω 2.2 M Ω		
Measurement	0 Ω to 100 Ω 100 Ω to 1 k Ω 1 k Ω to 10 k Ω 10 k Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 100 M Ω 100 M Ω to 1 G Ω	20 m Ω 150 m Ω 1.5 Ω 15 Ω 140 Ω 5.0 k Ω 1.1 % + 23 k Ω 3.2 % + 7.4 M Ω		
Frequency				Lab and site
Spot values	1 MHz, 5 MHz and 10 MHz	0.12 ppm		
Ranges source and measure	5 Hz to 100 kHz	1.0 ppm + 2.0 μ Hz	Frequency can be expressed in other units, for example RPM, at equivalent uncertainties.	
Source only	250 MHz to 1 GHz	0.13 ppm		
Elapsed time	50 ms to 1 day	0.13 % + 38 ms		
Electrical calibration of temperature indicators				
Ambient	15 $^{\circ}$ C to 30 $^{\circ}$ C	0.41 $^{\circ}$ C	For reporting reference junction temperature	
Base Metal Thermocouples	- 270 $^{\circ}$ C to 0 $^{\circ}$ C 0 $^{\circ}$ C to 1370 $^{\circ}$ C	1.1 $^{\circ}$ C 0.65 $^{\circ}$ C	Including reference junction compensation	
Noble Metal Thermocouples	- 50 $^{\circ}$ C to + 399 $^{\circ}$ C 400 $^{\circ}$ C to 1760 $^{\circ}$ C	1.9 $^{\circ}$ C 1.1 $^{\circ}$ C		
PRTs Generate resistance Pt 100	- 100 $^{\circ}$ C to 850 $^{\circ}$ C	0.43 $^{\circ}$ C		



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ELECTRICAL (cont'd) Measure resistance Pt 100	- 100 °C to 850 °C	0.27 °C		
END				