Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

0009

Accredited to ISO/IEC 17025: 2017

TUV SUD Limited
Trading as TÜV SÜD National Engineering Laboratory and National Engineering Laboratory

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Napier Building
Scottish Enterprise Technology Park
East Kilbride
Glasgow
G75 0QF

Contact: Ms Sarah Pedley
Tel: +44 (0) 1355 593925
Fax: +44 (0)1355 272999
E-Mail: sales@tuvnel.com
Website:
https://www.tuvsud.com/en-gb/industries/chemical-and-process/flow-measurement

Calibration performed at the above address only

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks
DENSITY			Reference densitometer method: (at atmospheric pressure)
Hydrocarbon	750 kg/m^3 to 890 kg/m^3	0.015 %	Density of oil flowing through test device at viscosities of 1.2 cSt to 30 cSt
	750 kg/m^3 to 890 kg/m^3	0.20 %	Density of oil flowing through test device at viscosities of 30 cSt to 500 cSt
Water	1000 kg/ m^3	0.030 %	Density of water flowing through test device
FLUID FLOW			Gravimetric and Master Meter methods:
Hydrocarbon quantity (mass)	0.1 l/s to 100 l/s	0.020 %	Gravimetric method Conditions: Fluid viscosities between 1.2 cSt to 30 cSt Temperatures 15 °C to 50 °C Pressures 1 bar(g) to 6 bar(g)
Hydrocarbon quantity (mass or flowrate)	0.1 l/s to 200 l/s	0.070 %	Master Meter method Conditions: Fluid viscosities between 1.2 cSt to 30 cSt Temperatures 15 °C to 50 °C Pressures 1 bar(g) to 6 bar(g)
Hydrocarbon quantity (volume)	0.1 l/s to 100 l/s	0.030 %	Gravimetric method Conditions: Fluid viscosities between 1.2 cSt to 30 cSt Temperatures 15 °C to 50 °C Pressures 1 bar(g) to 6 bar(g)
Hydrocarbon quantity (volume or flowrate)	0.1 l/s to 200 l/s	0.080 %	Master Meter method Conditions: Fluid viscosities between 1.2 cSt to 30 cSt Temperatures 15 °C to 50 °C Pressures 1 bar(g) to 6 bar(g)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks
FLUID FLOW (continued)			
Hydrocarbon quantity (mass)	0.1 l/s to 100 l/s	0.050 %	Gravimetric method Conditions: Fluid viscosities between 30 cSt to 600 cSt Temperatures 15 °C to 50 °C Pressures 1 bar(g) to 6 bar(g)
Hydrocarbon quantity (mass, volume or flowrate)	5 l/s to 150 l/s	0.15 %	Master Meter method Conditions: Fluid viscosities between 30 cSt to 600 cSt Temperatures 15 °C to 50 °C Pressures 1 bar(g) to 6 bar(g)
Hydrocarbon quantity (volume)	0.1 l/s to 100 l/s	0.10 %	Gravimetric method Conditions: Fluid viscosities between 30 cSt to 600 cSt Temperatures 15 °C to 50 °C Pressures 1 bar(g) to 6 bar(g)
Hydrocarbons Quantity (mass or volume)	0.5 l/s to 100 l/s	0.080 %	Compact prover and Master Meter method: Conditions: Mineral oil, viscosities between 1.5 cP and 10 cP Temperatures 20 °C to 80 °C Pressures 4 bar(g) to 93 bar(g)
Water Quantity and Flowrate (Mass and volume)	0.1 l/s to 350 l/s	0.15 %	Master Meter method: Reference meter standards 0 bar(g) to 10 bar(g) up to 200 l/s 0 bar(g) to 5 bar(g) 200 l/s to 400 l/s Temperature range 15°C to 35°C
Compact prover base volume	60 litre	0.020 %	Calibration by water draw method with gravimetric reference standard. Volume referenced to 15 °C, 1 bar Not available as a commercial service.
GAS FLOW			
Gas Quantity (Mass and flow rate)			Reference meter method:
	20 m^3/h to 1600 m^3/h	0.35 %	Nitrogen, 10 bar(g) to 60 bar(g)
	300 m^3/h to 1600 m^3/h	0.35 %	Carbon dioxide, 20 bar(g) to 60 bar(g)
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 $1.5 \times 0.01 \times q$, where q is the quantity value.

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