



# CERTIFICATE OF ACCREDITATION

*This is to attest that*

## **KUWAIT AIRWAYS**

KUWAIT INTERNATIONAL AIRPORT, PO BOX 528  
SAFAT, 13006, STATE OF KUWAIT

### **Calibration Laboratory CL-249**

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date January 5, 2022

Expiration Date February 1, 2023



A handwritten signature in black ink, reading "Raj Nathan".

**President**

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

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## KUWAIT AIRWAYS

**Contact Name** Faleh Al Hajri

**Contact Phone** +965-24345555

*Accredited to ISO/IEC 17025:2017*

*Effective Date January 5, 2022*

### CALIBRATION AND MEASUREMENT CAPABILITY (CMC)\*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY <sup>1,2</sup> ( $\pm$ )	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
<b>Dimensional</b>			
Micrometer	0 in to 1 in 1 in to 2 in 2 in to 3 in 3 in to 4 in 4 in to 5 in 5 in to 6 in	0.0005 in 0.00029 in 0.0004 in 0.00029 in 0.0001 in 0.00013 in	BS EN ISO 3611:2010 Gauge Block Set
Vernier Caliper	0 mm to 200 mm	15 $\mu$ m	BS EN ISO 13385-1:2011 Gauge Block Set
<b>Mechanical</b>			
Torque Wrench (Click and Indicating Type)	0.2 N·m to 10 N·m	See footnote 6	ISO 6789-2 (First Edition 2017-02)
Clockwise	0.20 N·m 1.00 N·m 2.00 N·m 6.00 N·m 10.00 N·m	1.2 % 0.3 % 0.2 % 0.1 % 0.1 %	STAHLWILLE Torque Transducers Model: TYPE7721 (Sensotork 7721)
Counterclockwise	-0.20 N·m -1.00 N·m -2.00 N·m -6.00 N·m -10.00 N·m	0.7 % 0.3 % 0.1 % 0.1 % 0.1 %	

\* If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.

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Torque Wrench (Click and Indicating Type) Clockwise	2 N·m to 100 N·m 2.00 N·m 10.00 N·m 20.00 N·m 60.00 N·m 100.00 N·m	See footnote 6 0.4 % 0.1 % 0.3 % 0.1 % 0.1 %	ISO 6789-2 (First Edition 2017-02)  STAHLWILLE Torque Transducers Model: TYPE7722 (Sensotork 7722)
Counterclockwise	-2.00 N·m -10.00 N·m -20.00 N·m -60.00 N·m -100.00 N·m	0.7 % 0.3 % 0.2 % 0.3 % 0.3 %	
Torque Wrench (Click and Indicating Type) Clockwise	100 N·m to 1000 N·m 100.00 N·m 200.00 N·m 500.00 N·m 750.00 N·m 1000.00 N·m	See footnote 6 0.4 % 0.4 % 0.1 % 0.1 % 0.1 %	ISO 6789-2 (First Edition 2017-02)  STAHLWILLE Torque Transducers Model: 7727-100 (Sensotork 7727-100)
Counterclockwise	-100.00 N·m -200.00 N·m -500.00 N·m -750.00 N·m -1000.00 N·m	0.2 % 0.6 % 0.3 % 0.1 % 0.1 %	
Torque Wrench (Click and Indicating Type) Clockwise	220 N·m to 1100 N·m 219.19 N·m 440.64 N·m 659.83 N·m 881.28 N·m 1098.2 N·m	See footnote 6 0.50 % 0.50 % 0.50 % 0.50 % 0.50 %	ISO 6789-2 (First Edition 2017-02)  STAHLWILLE Torque Transducers Model: 7707N3W (Indicator Sensotork 7750)
Counterclockwise	-219.19 N·m -440.64 N·m -659.83 N·m -881.28 N·m -1098.2 N·m	0.50 % 0.50 % 0.50 % 0.50 % 0.50 %	

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Torque Wrench (Click and Indicating Type) Clockwise  Counterclockwise	1.0 N·m to 10 N·m  1.00 N·m 2.00 N·m 5.00 N·m 7.50 N·m 10.00 N·m  -1.00 N·m -2.00 N·m -5.00 N·m -7.50 N·m -10.00 N·m	See footnote 6  0.3 % 0.2 % 0.1 % 0.1 % 0.1 %  0.1 % 0.1 % 0.1 % 0.1 % 0.1 %	ISO 6789-2 (First Edition 2017-02)  STAHLWILLE Torque Transducers Model: 7727-1
Torque Wrench (Click and Indicating Type) Clockwise  Counterclockwise	6.0 N·m to 60 N·m  6.00 N·m 12.00 N·m 30.00 N·m 45.00 N·m 60.00 N·m  -6.00 N·m -12.00 N·m -30.00 N·m -45.00 N·m -60.00 N·m	See footnote 6  0.2 % 0.1 % 0.1 % 0.1 % 0.1 %  0.4 % 0.2 % 0.1 % 0.1 % 0.1 %	ISO 6789-2 (First Edition 2017-02)  STAHLWILLE Torque Transducers Model: 7727-6
Torque Wrench (Click and Indicating Type) Clockwise  Counterclockwise	40 N·m to 400 N·m  40.00 N·m 80.00 N·m 200.00 N·m 300.00 N·m 400.00 N·m  -40.00 N·m -80.00 N·m -200.00 N·m -300.00 N·m -400.00 N·m	See footnote 6  0.2 % 0.3 % 0.3 % 0.2 % 0.2 %  0.2 % 0.3 % 0.3 % 0.2 % 0.2 %	ISO 6789-2 (First Edition 2017-02)  STAHLWILLE Torque Transducers Model: 7727-40

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Torque Wrench (Click and Indicating Type) Clockwise  Counterclockwise	30 lbf-in to 150 lbf-in	See footnote 6	ISO 6789-2 (First Edition 2017-02)  SNAPON Torque Transducer Model: TbTT12
	30 lbf-in	0.50 %	
	60 lbf-in	0.50 %	
	90 lbf-in	0.50 %	
	120 lbf-in	0.50 %	
	150 lbf-in	0.50 %	
	30 lbf-in	0.50 %	
	60 lbf-in	0.50 %	
	90 lbf-in	0.50 %	
	120 lbf-in	0.50 %	
150 lbf-in	0.50 %		
Torque Wrench (Click and Indicating Type) Clockwise  Counterclockwise	20 lbf-ft to 100 bf-ft	See footnote 6	ISO 6789-2 (First Edition 2017-02)  SNAPON Torque Transducer Model: TbTT100
	20 lbf-ft	0.50 %	
	40 lbf-ft	0.50 %	
	60 lbf-ft	0.50 %	
	80 lbf-ft	0.50 %	
	100 lbf-ft	0.50 %	
	20 lbf-ft	0.50 %	
	40 lbf-ft	0.50 %	
	60 lbf-ft	0.50 %	
	80 lbf-ft	0.50 %	
100 lbf-ft	0.50 %		
Torque Wrench (Click and Indicating Type) Clockwise  Counterclockwise	120 lbf-ft to 600 lbf-ft	See footnote 6	ISO 6789-2 (First Edition 2017-02)  SNAPON Torque Transducer Model: TBTT600
	120 lbf-ft	0.50 %	
	240 lbf-ft	0.50 %	
	360 lbf-ft	0.50 %	
	480 lbf-ft	0.50 %	
	600 lbf-ft	0.50 %	
	120 lbf-ft	0.50 %	
	240 lbf-ft	0.50 %	
	360 lbf-ft	0.50 %	
	480 lbf-ft	0.50 %	
600 lbf-ft	0.50 %		

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Pressure Instruments (Hydraulic and Pneumatic)	0 lbf/in <sup>2</sup> to 100 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 211 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 350 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 500 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 650 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 800 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 1000 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 4220 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 7000 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 10000 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 13000 lbf/in <sup>2</sup> 0 lbf/in <sup>2</sup> to 16000 lbf/in <sup>2</sup>	0.015 lbf/in <sup>2</sup> 0.032 lbf/in <sup>2</sup> 0.053 lbf/in <sup>2</sup> 0.075 lbf/in <sup>2</sup> 0.098 lbf/in <sup>2</sup> 0.12 lbf/in <sup>2</sup> 0.15 lbf/in <sup>2</sup> 0.63 lbf/in <sup>2</sup> 1.1 lbf/in <sup>2</sup> 1.6 lbf/in <sup>2</sup> 2.0 lbf/in <sup>2</sup> 2.4 lbf/in <sup>2</sup>	DKD-R 6-1 (Edition 03/2014) Dead-Weight Tester (Budenberg)
Analytical Balance	Max 32000 g	200 mg	EURAMET CG-18 Version 4.0(11/2015) & ASTM E898-88 (Reapproved 2013), Ohaus
<b>Electrical – DC/LF</b>			
Electrical DC Voltage - Generate <sup>3</sup>	0 mV to 329.9999 mV 0 V to 3.299999 V 0 V to 32.99999 V 30 V to 329.9999 V 100 V to 1020.000 V	0.01 % + 3.7 μV 0.01 % + 6.0 μV 0.01 % + 58 μV 0.01 % + 0.58 mV 0.01 % + 1.8 mV	Fluke 5500A Multi-Product Calibrator (EURAMET cg-15 ver 3.0)
Electrical DC Current - Generate <sup>3</sup>	0 mA to 3.29999 mA 0 mA to 32.9999 mA 0 mA to 329.999 mA 0 A to 2.19999 A 0 A to 11 A	0.02 % + 0.06 μA 0.01 % + 0.29 μA 0.02 % + 3.9 μA 0.03 % + 51 μA 0.07 % + 0.39 mA	Fluke 5500A Multi-Product Calibrator (EURAMET cg-15 ver 3.0)
Electrical AC Voltage – Generate <sup>3</sup>	33 mV to 329.999 mV (10 Hz to 45 Hz) (45 Hz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz)  0.33 V to 3.29999 V (10 Hz to 45 Hz) (45 Hz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz)	0.29 % + 58 μV 0.06 % + 23 μV 0.12 % + 23 μV 0.19 % + 46 μV 0.28 % + 0.20 mV 0.81 % + 0.39 mV  0.17 % + 0.29 mV 0.03 % + 70 μV 0.09 % + 70 μV 0.16 % + 0.35 mV 0.28 % + 2.0 mV 0.58 % + 3.8 mV	Fluke 5500A Multi-Product Calibrator (EURAMET cg-15 ver 3.0)

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Electrical AC Voltage – Generate <sup>3</sup> continued	3.3 V to 32.9999 V (10 Hz to 45 Hz) (45 Hz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)	0.17 % + 2.9 mV 0.05 % + 0.70 mV 0.09 % + 3.0 mV 0.22 % + 5.8 mV 0.28 % + 20 mV	Fluke 5500A Multi-Product Calibrator (EURAMET cg-15 ver 3.0)
	33 V to 329.999 V (45 Hz to 1 kHz) (1 kHz to 10 kHz) (10 kHz to 20 kHz)	0.06 % + 7.6 $\mu$ V 0.09 % + 17 $\mu$ V 0.10 % + 38 $\mu$ V	
	330 V to 1000 V (45 Hz to 1 kHz) (1 kHz to 10 kHz)	0.06 % + 93 $\mu$ V 0.23 % + 5.8 mV	
Electrical AC Current – Generate <sup>3</sup>	0.029 mA to 0.32999 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	0.29 % + 0.17 $\mu$ A 0.15 % + 0.17 $\mu$ A 0.15 % + 0.29 $\mu$ A 0.46 % + 0.17 $\mu$ A 1.4 % + 0.17 $\mu$ A	Fluke 5500A Multi-Product Calibrator (EURAMET cg-15 ver 3.0)
	0.33 mA to 3.2999 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	0.23 % + 0.35 $\mu$ A 0.12 % + 0.35 $\mu$ A 0.12 % + 0.35 $\mu$ A 0.23 % + 0.35 $\mu$ A 0.69 % + 0.35 $\mu$ A	
	3.3 mA to 32.999 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	0.23 % + 3.5 $\mu$ A 0.12 % + 3.5 $\mu$ A 0.10 % + 3.5 $\mu$ A 0.23 % + 3.5 $\mu$ A 0.69 % + 3.5 $\mu$ A	
	33 mA to 329.99 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	0.23 % + 35 $\mu$ A 0.12 % + 35 $\mu$ A 0.10 % + 35 $\mu$ A 0.23 % + 35 $\mu$ A 0.69 % + 35 $\mu$ A	
	0.33 A to 2.19999 A (10 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz)	0.23 % + 0.35 mA 0.12 % + 0.35 mA 0.87 % + 0.35 mA	

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Electrical AC Current – Generate <sup>3</sup> continued	2.2 A to 10 A (45 Hz to 65 Hz) (65 Hz to 500 Hz) (500 Hz to 1 kHz)	0.08 % + 2.3 mA 0.12 % + 2.3 mA 0.39 % + 2.3 mA	Fluke 5500A Multi-Product Calibrator (EURAMET cg-15 ver 3.0)
DC Resistance – Generate <sup>3</sup> (4 wire)	0 Ω to 10.99 Ω 11 Ω to 32.999 Ω 33 Ω to 109.999 Ω 110 Ω to 329.999 Ω 330 Ω to 1.09999 kΩ 1.1 kΩ to 3.29999 kΩ 3.3 kΩ to 10.9999 kΩ 11 kΩ to 32.9999 kΩ 33 kΩ to 109.999 kΩ	0.02 % + 0.01 Ω 0.02 % + 0.02 Ω 0.01 % + 0.02 Ω 0.01 % + 0.02 Ω 0.01 % + 0.69 Ω 0.01 % + 0.69 Ω 0.01 % + 0.70 Ω 0.01 % + 0.70 Ω 0.01 % + 7.0 Ω	Fluke 5500A Multi-Product Calibrator (EURAMET cg-15 ver 3.0)
DC Resistance – Generate <sup>3</sup> (2-wire)	110 kΩ to 329.999 kΩ 330 kΩ to 1.09999 MΩ 1.1 MΩ to 3.29999 MΩ 3.3 MΩ to 10.9999 MΩ 11 MΩ to 32.9999 MΩ 33 MΩ to 109.999 MΩ 110 MΩ to 330 MΩ	0.01 % + 6.95 Ω 0.02 % + 64 Ω 0.02 % + 64 Ω 0.07 % + 0.64 kΩ 0.12 % + 0.64 kΩ 0.58 % + 0.58 kΩ 0.58 % + 0.58 kΩ	Fluke 5500A Multi-Product Calibrator (EURAMET cg-15 ver 3.0)
Electrical DC Voltage - Measure <sup>4</sup>	0 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	0.01 % + 58 μV 0.003 % + 0.58 μV 0.003 % + 5.8 μV 0.005 % + 58 μV 0.01 % + 0.01 μV	Fluke 8846A Multi-meter (OEM user/service manual)
Electrical DC Current - Measure <sup>4</sup>	0 μA to 100 μA 100 μA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1.0 A 1.0 A to 3.0 A 3.0 A to 10.0 A	0.06 % + 58 μA 0.06 % + 0.58 μA 0.06 % + 5.8 μA 0.06 % + 58 μA 0.06 % + 0.58 μA 0.12 % + 5.8 μA 0.17 % + 5.8 μA	Fluke 8846A Multi-meter (OEM user/service manual)
Electrical AC Voltage – Measure <sup>4</sup>	0 mV to 100 mV (5 Hz to 10 Hz) (10 Hz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 300 kHz)  100 mV to 1 V (5 Hz to 10 Hz) (10 Hz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 300 kHz)	0.41 % + 58 μV 0.07 % + 58 μV 0.15 % + 58 μV 0.70 % + 58 μV 4.6 % + 0.58 μV  0.41 % + 0.58 μV 0.07 % + 0.58 μV 0.14 % + 0.58 μV 0.70 % + 0.58 μV 4.6 % + 0.58 μV	Fluke 8846A Multi-meter (OEM user/service manual)



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Electrical AC Voltage – Measure <sup>4</sup> continued	1 V to 10 V (5 Hz to 10 Hz) (10 Hz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)  10 V to 100 V (5 Hz to 10 Hz) (10 Hz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)  100 V to 1000 V (10 Hz to 20 kHz)	1.2 % + 5.8 $\mu$ V 0.08 % + 5.8 $\mu$ V 0.14 % + 5.8 $\mu$ V 0.13 % + 5.8 $\mu$ V  0.40 % + 58 $\mu$ V 0.08 % + 58 $\mu$ V 0.16 % + 58 $\mu$ V 0.74 % + 58 $\mu$ V  0.08 % + 0.67 $\mu$ V	Fluke 8846A Multi-meter (OEM user/service manual)
Electrical AC Current - Measure <sup>4</sup>	0 mA to 10 mA (5 Hz to 10 Hz) (10 Hz to 5 kHz) (5 kHz to 10 kHz)  10 mA to 100 mA (5 Hz to 10 Hz) (10 Hz to 5 kHz) (5 kHz to 10 kHz)  100 mA to 1.0 A (5 Hz to 10 Hz) (10 Hz to 5 kHz) (5 kHz to 10 kHz)  1.0 A to 3.0 A (5 Hz to 10 Hz) (10 Hz to 5 kHz)  3.0 A to 10.0 A (10 Hz to 5 kHz) (5 kHz to 10 kHz)	0.40 % + 5.8 $\mu$ A 0.15 % + 5.8 $\mu$ A 0.33 % + 5.8 $\mu$ A  0.40 % + 58 $\mu$ A 0.19 % + 58 $\mu$ A 0.38 % + 58 $\mu$ A  0.35 % + 0.58 $\mu$ A 0.71 % + 0.58 $\mu$ A 3.0 % + 0.58 $\mu$ A  0.41 % + 5.8 $\mu$ A 0.18 % + 5.8 $\mu$ A  0.19 % + 5.8 $\mu$ A 0.42 % + 5.8 $\mu$ A	Fluke 8846A Multi-meter (OEM user/service manual)
DC Resistance – Measure <sup>4</sup> (4 wire)	0 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 1 k $\Omega$ 1 k $\Omega$ to 10 k $\Omega$ 10 k $\Omega$ to 100 k $\Omega$	0.01 % + 58 $\Omega$ 0.01 % + 0.58 $\Omega$ 0.01 % + 5.8 $\Omega$ 0.01 % + 58 $\Omega$	Fluke 8846A Multi-meter (OEM user/service manual)
DC Resistance – Measure <sup>4</sup> (2 wire)	0 k $\Omega$ to 1 k $\Omega$ 1 k $\Omega$ to 10 k $\Omega$ 10 k $\Omega$ to 100 k $\Omega$ 100 k $\Omega$ to 1 M $\Omega$ 1 M $\Omega$ to 10 M $\Omega$ 10 M $\Omega$ to 100 M $\Omega$	0.01 % + 0.001 $\Omega$ 0.01 % + 0.01 $\Omega$ 0.01 % + 0.06 $\Omega$ 0.01 % + 0.58 $\Omega$ 0.05 % + 5.8 $\Omega$ 0.93 % + 58 $\Omega$	Fluke 8846A Multi-meter (OEM user/service manual)

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Capacitance – Generate <sup>3,5</sup>	(50 Hz to 1000 Hz)		Fluke 5500A Multi-Product Calibrator (OEM user/service manual)
	0.33 nF to 0.4999 nF	0.58 % + 0.01 nF	
	0.5 nF to 1.0999 nF	0.58 % + 0.01 nF	
	1.1 nF to 3.2999 nF	0.58 % + 0.01 nF	
	3.3 nF to 10.999 nF	0.58 % + 0.01 nF	
	11 nF to 32.999 nF	0.29 % + 0.12 nF	
	33 nF to 109.99 nF	0.29 % + 0.12 nF	
	110 nF to 329.99 nF	0.29 % + 0.35 nF	
	0.33 µF to 1.0999 µF	0.29 % + 1.2 nF	
	1.1 µF to 3.2999 µF	0.41 % + 3.5 nF	
	(50 Hz to 400 Hz)		
	3.3 µF to 10.999 µF	0.41 % + 12 nF	
	11 µF to 32.999 µF	0.47 % + 35 nF	
	(50 Hz to 200 Hz)		
	33 µF to 109.99 µF	0.60 % + 0.12 µF	
	(50 Hz to 100 Hz)		
110 µF to 329.99 µF	0.82 % + 0.35 µF		
330 mF to 1.0 mF	1.2 % + 0.35 µF		

<sup>1</sup>The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

<sup>2</sup>When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

<sup>3</sup>Capability is suitable for the calibration of measuring devices in the stated ranges.

<sup>4</sup>Capability is suitable for the calibration of devices intended to generate the indicated quantity in the stated ranges.

<sup>5</sup>Stated uncertainties are valid for the ranges of frequencies given, but the actual frequency applied by the calibrator may be dependent on the measurement device under calibration.

<sup>6</sup>Uncertainties for intermediate torque values may be determined via linear interpretation between closest individual uncertainty values stated.