Schedule of Accreditation

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Trescal Limited

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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
PRESSURE			
Hydraulic Pressure (Gauge)			
"Pressure equivalent" calibration of Dead Weight Testers (pressure balances supplied with an associated mass set) and determination of effective area of dead-weight testers	0.5 MPa to 7 MPa 7 MPa to 140 MPa 140 MPa to 500 MPa	0.0043 % 0.0050 % 0.0050 % + 0.16 ppm/MPa	Calibration of pressure measuring devices with an electrical output may be undertaken. Devices may be calibrated using the digital communication protocol including Fieldbus
Calibration of pressure indicating instruments and gauges			
Hydraulic Pressure (Absolute)			
Calibration of pressure indicating instruments and gauges	0.6 MPa to 7 MPa 7 MPa to 140 MPa 140 MPa to 500 MPa	0.0043 % + 25 Pa 0.0050 % 0.0050 % + 0.16 ppm/MPa	
Gas Pressure (Gauge)			
Calibration of pressure indicating instruments and gauges	-100 kPa to -2.5 kPa -2.5 kPa to 2.5 kPa 2.5 kPa to 7 MPa 7 MPa to 21 MPa 21 MPa to 80 MPa	0.0040 % 0.011 % + 0.030 Pa 0.0034 % 0.0036 % 0.0055 %	
"Pressure equivalent" calibration of Dead Weight Testers (pressure balances supplied with an associated mass set and Ametek gas Pressure standards) and determination of effective area of dead-weight testers			
Gas pressure (Absolute)			
"Pressure Equivalent" calibration or dead-weight testers and determination of effective area of dead weight testers	2.5 kPa to 7 MPa	0.0041 %	
Calibration of pressure indicating instruments and gauges	2.5 kPa to 21 MPa 21 MPa to 80 MPa	0.0039 % 0.0055 %	Thommen and capsule pressure gauges can be calibrated. Kew station, Fortin and Aneroid Barometers without a pressure port can be calibrated

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
PRESSURE (continued)			
Gas Pressure (Differential)			
Calibration of pressure indicating instruments and gauges	0 Pa to 1 MPa (line pressure 0 Pa to 40 MPa)	0.50 ppm/MPa of line pressure, plus 0.0040 % of differential pressure, plus 5 Pa	Differential pressure cells may be calibrated using the digital communication protocol including Fieldbus
VACUUM			
Calibration of indicating instruments and gauges	1.3×10^{-4} Pa to 1×10^{-3} Pa 1×10^{-3} Pa to 1×10^{0} Pa 1 Pa to 13.3 Pa 13.3 Pa to 133 Pa 133 Pa to 1333 Pa 1.33 kPa to 10 kPa 10 kPa to 133 kPa	15 % 6.0 % 9.0 % 2.0 % 1.5 % 0.50 % 0.30 %	Calibration using N_2 gas.
ELECTRICAL MEASUREMENTS			
DC VOLTAGE			
Specific Values			
Measurement	10 mV 100 mV 1 V 10 V 19 V 100 V 1 kV	15 ppm 6.0 ppm 3.0 ppm 2.3 ppm 2.5 ppm 2.8 ppm 2.8 ppm	
Other Values			
Measurement	0 V to 200 mV 200 mV to 20 V 20 V to 1 kV	13 ppm + 1.2 μV 11 ppm 24 ppm	
Specific Values			
Generation	100 mV 1 V 10 V 19 V 100 V 1 kV	6.2 ppm 3.1 ppm 2.5 ppm 3.0 ppm 3.0 ppm 3.5 ppm	
Other Values			
Generation	0 V to 200 mV 200 mV to 200 V 200 V to 1 kV	6.5 ppm + 0.50 μV 3.2 ppm 3.5 ppm	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
HIGH VOLTAGE	1 kV to 20 kV 20 kV to 30 kV 30 kV to 50 kV	0.30 % 0.50 % 0.50 %	Measurement only
DC CURRENT			
Specific Values			
Measurement	100 μA 1 mA 10 mA 100 mA 1 A 10 A	24 ppm 16 ppm 15 ppm 22 ppm 32 ppm 59 ppm	
Other Values			
Measurement	0 A to 200 μA 200 μA to 200 mA 200 mA to 2 A	77 ppm + 7.0 nA 75 ppm 86 ppm	
Specific Values			
Generation	100 μA 1 mA 10 mA 100 mA 1 A	30 ppm 17 ppm 17 ppm 25 ppm 37 ppm	
Other Values			
	0 A to 200 μA 200 μA to 20 mA 20 mA to 200 mA 200 mA to 2 A	31 ppm + 300 pA 19 ppm 26 ppm 38 ppm	
Measurement and Generation	2 A to 10 A 10 A to 20 A 20 A to 100 A	240 ppm 300 ppm 190 ppm	Clamp-on ammeters can be calibrated up to 2000 A dc with increased uncertainties.

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
AC VOLTAGE			
Specific Values			
Measurement	1 mV		
	20 Hz, 30 Hz, 40 Hz, 55 Hz, 300 Hz, 1 kHz and 10 kHz	570 ppm	
	20 kHz, 30 kHz and 50 kHz	780 ppm	
	100 kHz	0.11 %	
	10 mV		
	20 Hz, 30 Hz, 40 Hz, 300 Hz, 1 kHz, 10 kHz and 20 kHz	220 ppm	
	55 Hz	240 ppm	
	30 kHz and 50 kHz	270 ppm	
	100 kHz	400 ppm	
	100 mV		
	10 Hz, 20 Hz, 30 Hz, 40 Hz and 55 Hz	130 ppm	
	300 Hz, 1 kHz and 10 kHz	110 ppm	
	20 kHz	120 ppm	
	30 kHz and 50 kHz	180 ppm	
	100 kHz	340 ppm	
	1 V		
	10 Hz, 20 Hz and 30 Hz	40 ppm	
	40 Hz, 55 Hz, 300 Hz, 1 kHz, 10 kHz, 20 kHz and 30 kHz	29 ppm	
	50 kHz	34 ppm	
	100 kHz	37 ppm	
	300 kHz	140 ppm	
	500 kHz	330 ppm	
	1 MHz	0.11 %	
	10 V		
	10 Hz, 20 Hz, 30 Hz and 40 Hz	45 ppm	
	55 Hz, 300 Hz, 1 kHz, 10 kHz, 20 kHz, 30 kHz, 50 kHz and 100 kHz	35 ppm	
	300 kHz	120 ppm	
	500 kHz	320 ppm	
	1 MHz	0.11 %	
	19 V		
	1 kHz	40 ppm	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
AC VOLTAGE (continued)			
Measurement (continued)			
Specific values (continued)	100 V		
	10 Hz, 20 Hz, 30 Hz, 40 Hz and 55 Hz	50 ppm	
	300 Hz, 1 kHz, 10 kHz, 20 kHz and 30 kHz	45 ppm	
	50 kHz	50 ppm	
	100 kHz	80 ppm	
	700 V		
	50 kHz	120 ppm	
	100 kHz	400 ppm	
	1 kV		
	40 Hz, 55 Hz, 300 Hz and 1 kHz	50 ppm	
	10 kHz, 20 kHz	60 ppm	
	30 kHz	85 ppm	
Other values	100 mV to 200 mV		
	40 Hz to 30 kHz	200 ppm + 12 μV	
	200 mV to 2 V		
	40 Hz to 30 kHz	170 ppm	
	2 V to 200 V		
	40 Hz to 30 kHz	180 ppm	
	200 V to 1 kV		
	40 Hz to 30 kHz	440 ppm	
Specific Values			
Generation	1 mV		
	1 kHz and 10 kHz	0.14 %	
	100 kHz	0.27 %	
	10 mV		
	1 kHz and 10 kHz	220 ppm	
	100 kHz	410 ppm	
	100 mV		
	1 kHz	110 ppm	
	10 kHz	120 ppm	
	100 kHz	350 ppm	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
AC VOLTAGE (continued)			
Specific Values (continued)			
Generation (continued)	1 V		
	10 Hz	41 ppm	
	300 Hz, 1 kHz, 10 kHz & 30 kHz	32 ppm	
	100 kHz	41 ppm	
	300 kHz	160 ppm	
	1 MHz	0.14 %	
	10 V		
	10 Hz	49 ppm	
	300 Hz, 1 kHz, 10 kHz, 30 kHz and 100 kHz	43 ppm	
	300 kHz	140 ppm	
	1 MHz	0.15 %	
	19 V		
	1 kHz	56 ppm	
	100 V		
	10 Hz	51 ppm	
	300 Hz, 1 kHz, 10 kHz & 30 kHz	49 ppm	
	100 kHz	85 ppm	
	700 V		
	100 kHz	400 ppm	
	1 kV		
	40 Hz, 1 kHz and 10 kHz	68 ppm	
	30 kHz	87 ppm	
	1 mV to 200 mV		
	40 Hz to 30 kHz	140 ppm + 1.0 μV	
	200 mV to 2 V		
	40 Hz to 30 kHz	76 ppm	
	2 V to 20 V		
	40 Hz to 30 kHz	82 ppm	
	20 V to 200 V		
	40 Hz to 30 kHz	85 ppm	
	200 V to 1 kV		
	40 Hz to 30 kHz	120 ppm	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
HIGH VOLTAGE	1 kV to 20 kV *50 Hz*	0.80 %	For the calibration of high voltage probes, meters and sources
	20 kV to 35 kV *50 Hz*	0.90 %	
AC CURRENT			
Specific Values			
Measurement	100 μA *10 Hz and 20 Hz* *30 Hz* *40 Hz, 55 Hz, 300 Hz and 1 kHz* *5 kHz*	 130 ppm 120 ppm 110 ppm 140 ppm	
	1 mA *10 Hz and 20 Hz* *30 Hz* *40 Hz, 55 Hz, 300 Hz and 1 kHz* *5 kHz*	 120 ppm 110 ppm 90 ppm 140 ppm	
	10 mA *10 Hz and 20 Hz* *30 Hz* *40 Hz, 55 Hz, 300 Hz and 1 kHz* *5 kHz*	 120 ppm 110 ppm 90 ppm 140 ppm	
	100 mA *10 Hz and 20 Hz* *30 Hz* *40 Hz, 55 Hz and 300 Hz* *1 kHz* *5 kHz*	 120 ppm 110 ppm 90 ppm 90 ppm 140 ppm	
	1 A *10 Hz and 20 Hz* *30 Hz* *40 Hz, 55 Hz, 300 Hz and 1 kHz* *5 kHz*	 160 ppm 150 ppm 120 ppm 230 ppm	
	3 A *40 Hz, 95 Hz, 110 Hz and 440 Hz* *3 kHz*	 470 ppm 470 ppm	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
AC CURRENT (continued)			
Specific Values (continued)			
Measurement (continued)	10 A		
	10 Hz, 20 Hz and 30 Hz	270 ppm	
	40 Hz	250 ppm	
	55 Hz	240 ppm	
	95 Hz	470 ppm	
	300 Hz	240 ppm	
	440 Hz	470 ppm	
	1 kHz	240 ppm	
	5 kHz	300 ppm	
	10 kHz	420 ppm	
Other Values	100 μA to 200 μA		
	40 Hz to 1 kHz	200 ppm + 3.0 nA	
	1 kHz to 5 kHz	400 ppm + 4.0 nA	
	200 μA to 200 mA		
	40 Hz to 1 kHz	200 ppm	
	200 μA to 20 mA		
	1 kHz to 5 kHz	380 ppm	
	20 mA to 200 mA		
	1 kHz to 5 kHz	400 ppm	
	200 mA to 2 A		
	40 Hz to 1 kHz	900 ppm	
	1 kHz to 5 kHz	0.20 %	
Specific Values			
Generation	100 μA		
	300 Hz and 1 kHz	120 ppm	
	5 kHz	170 ppm	
	1 mA		
	300 Hz and 1 kHz	100 ppm	
	5 kHz	150 ppm	
	10 mA		
	300 Hz and 1 kHz	100 ppm	
	5 kHz	150 ppm	
	100 mA		
	300 Hz and 1 kHz	110 ppm	
	5 kHz	140 ppm	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
AC CURRENT (continued)			
Specific Values (continued)			
Generation (continued)	1 A		
	300 Hz	130 ppm	
	1 kHz	130 ppm	
	5 kHz	240 ppm	
Other Values			
Generation	9 μA to 200 μA		
	40 Hz to 1 kHz	130 ppm + 1.3 nA	
	1 kHz to 5 kHz	180 ppm + 1.7 nA	
	200 μA to 2 mA		
	40 Hz to 1 kHz	110 ppm	
	1 kHz to 5 kHz	170 ppm	
	2 mA to 20 mA		
	40 Hz to 1 kHz	110 ppm	
	1 kHz to 5 kHz	170 ppm	
	20 mA to 200 mA		
	40 Hz to 1 kHz	120 ppm	
	1 kHz to 5 kHz	160 ppm	
	200 mA to 2 A		
	40 Hz to 1 kHz	150 ppm	
	1 kHz to 5 kHz	230 ppm	
Measurement and generation	*40 Hz to 60 Hz:*		
	2 A to 10 A	0.19 %	Clamp-on ammeters can be calibrated up to 2000 A ac with increased uncertainties.
	10 A to 20 A	350 ppm	
	20 A to 100 A	390 ppm	
DC RESISTANCE			
Specific values			
Measurement	10 Ω	0.60 ppm	For the calibration of fixed resistors, including those comprising the resistance function of multifunction calibrators.
	100 Ω	0.65 ppm	
	1 k Ω	0.65 ppm	
	10 k Ω	3.5 ppm	
	100 kΩ	8.5 ppm	
	1 MΩ	13 ppm	
	10 MΩ	26 ppm	
	100 MΩ	110 ppm	
	1 GΩ	70 ppm	
	10 GΩ	140 ppm	
	100 GΩ	730 ppm	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
DC RESISTANCE (continued)			
Other values			
Measurement	0 Ω to 10 Ω	33 ppm + 12 μΩ	The capability shown is for measurement of unknown resistance values. Known resistances within this range can be generated, but the uncertainties will be increased.
	10 Ω to 1kΩ	0.65 ppm	
	1k Ω to 2 kΩ	11 ppm	
	2 kΩ to 20 kΩ	11 ppm	
	20 kΩ to 200 kΩ	16 ppm	
	200 kΩ to 2 MΩ	32 ppm	
	2 MΩ to 20 MΩ	80 ppm	
	20 MΩ to 100 MΩ	260 ppm + 9.0 kΩ	
	100 μΩ to 10 Ω Maximum current 100 A	130 ppm	4 terminal resistors in the range 100 μΩ to 10 Ω can be measured using a dc voltage and current technique. The uncertainty quoted will be the sum of the corresponding voltage and current uncertainties attributable to the resistor under test. Generation of resistance in the range 100 μΩ to 10 Ω will be at an increased uncertainty to the dc voltage/current technique uncertainties.
	100 MΩ to 1GΩ	70 ppm	100 MΩ to 100 GΩ can be measured using a dc voltage and current technique. The uncertainty quoted will be the sum of the corresponding voltage and current uncertainties. Values from 100 MΩ to 1GΩ can be generated with increased uncertainties.
	1GΩ to 10 GΩ	140 ppm	
	10 GΩ to 100 GΩ Voltages >250 V dc	730 ppm	
Specific Values			
Generation	10 Ω	15 ppm	For the calibration of the dc resistance ranges of multimeters, analogue and digital, and similar devices.
	100 Ω	7.5 ppm	
	1 kΩ	4.5 ppm	
	10 kΩ	4.5 ppm	
	100 kΩ	9.0 ppm	
	1 MΩ	16 ppm	
	10 MΩ	29 ppm	
	100 MΩ	110 ppm	
	1 GΩ	70 ppm	
	10 GΩ	140 ppm	
	100 GΩ	730 ppm	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
AC RESISTANCE NON-INDUCTIVE			
Specific Values	1 mΩ to 1 kΩ *40 Hz to 140 Hz*	800 ppm	Uncertainties are dependent on the test voltage, current and frequency employed
DC POWER	100 mV to 1 kV 5 mA to 100 A 20 W to 2 MW (simulated)	The sum of the individual voltage and current uncertainties	
AC POWER			Voltage up to 1 kV and Current up to 1 kA giving product power up to a maximum of 1 MW
	5 W to 1 MW *40 Hz to 100 Hz*	0.16 %	At unity power factor
	5 W to 1 MW *40 Hz to 100 Hz*	0.20 %	At power factors from 1 to 0
PHASE	0° To 360° *40 Hz to 1 kHz*	0.020°	
CAPACITANCE			
Sourcing Values at 1 kHz	50 pF to 100 nF 100 nF to 1 μF	0.070 % + 0.80 pF 0.47 %	Sources up to 250 V Other frequencies (100 Hz to 10 kHz) can be accommodated at increased uncertainties. 2 or 3 wire devices.
Measurement At 1 kHz	10 pF to 100 pF 100 pF to 1 μF 1 μF to 10 μF 10 μF to 100 μF	2.2 % 0.21 % 0.22 % 0.32 %	
FREQUENCY			
Generation	10 mHz to 1.2 GHz	2.0 parts in 10^9	
Measurement	10 mHz to 1.2 GHz	2.0 parts in 10^9 + 50 μHz	The uncertainties quoted for these parameters are particularly dependent on the stability and waveform.
PERIODIC TIME	20 ns to 100 s	2.0 parts in 10^9 + 3.0 ns	
TIME INTERVAL AVERAGE	60 ns to 100 s	2.0 parts in 10^9 + 5.0 ns	
Stop Watches	0 s to 10^4 s	0.025 s/d	Error and uncertainty expressed as seconds per day: (s/d) this uncertainty will be larger for mechanical devices, depending on stability.

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
Additional Parameters suitable for Oscilloscope calibration			
Rise Time and Fall Time	150 ps nominal *At 50 mV, 250 mV, 500 mV and 2.5 V*	50 ps	
	500 ps nominal *At 50 mV, 250 mV, 500 mV and 2.5 V*	60 ps	
Bandwidth	1 Hz to 1 GHz at 100 mV nominal	2.5 %	
AC Level flatness	With respect to a set point at a nominal 1 V, 1 kHz being the 0 dB reference. 1 kHz to 1 MHz	0.040 dB	
Parameters specific to 16th & 17th Edition equipment testing, not covered in the main schedule headings			
Trip times	20 ms to 500 ms	1.4 ms	
Trip Current	10 mA, 30 mA, 90 mA, 100 mA and 110 mA 300 mA, 1 A & 2 A	0.20 % + 1.0 mA 0.20 % + 1.0 mA	
AC resistance	*At 50 Hz:* Residual loop impedance and up to 1.5 Ω 5 Ω 10 Ω 100 Ω 1 kΩ	50 mΩ 150 mΩ 500 mΩ 1.2 Ω 3.5 Ω	
Charge Amplifiers	0.1 pC to 10 000 pC *20 Hz to 10 kHz* *10 kHz to 50 kHz*	0.050 % 0.11 %	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENTS (continued)			
Temperature indicators, calibration by electrical simulation			
Resistance thermometers (PT 100)	-200 °C to +800 °C	0.020 °C	
Thermocouples: Internal reference junction disabled			
Type K	-200 °C to +1300 °C	0.052 °C	
Type T	-200 °C to +400 °C	0.050 °C	
Type J	-200 °C to +1200 °C	0.043 °C	
Type E	-200 °C to +1000 °C	0.040 °C	
Type N	-200 °C to +1300 °C	0.069 °C	
Type R	500 °C to +1760 °C	0.13 °C	
Type S	500 °C to +1760 °C	0.13 °C	
Type B	500 °C to +1800 °C	0.17 °C	
Thermocouples: Internal reference junction enabled.			
Type K	-200 °C to +1300 °C	0.30 °C	
Type T	-200 °C to +400 °C	0.30 °C	
Type J	-200 °C to +1200 °C	0.30 °C	
Type E	-200 °C to +1300 °C	0.30 °C	
Type N	-200 °C to +1300 °C	0.31 °C	
Type R	500 °C to +1760 °C	0.33 °C	
Type S	500 °C to +1760 °C	0.33 °C	
Type B	500 °C to +1800 °C	0.34 °C	
Resistance thermometers (PT 100)	-200 °C to +800 °C	0.020 °C	
Thermocouples: Internal reference junction disabled			
Type K	-200 °C to +1300 °C	0.087 °C	
Type T	-200 °C to +400 °C	0.083 °C	
Type J	-200 °C to +1200 °C	0.065 °C	
Type E	-200 °C to +1000 °C	0.059 °C	
Type N	-200 °C to +1300 °C	0.13 °C	
Type R	500 °C to +1760 °C	0.16 °C	
Type S	500 °C to +1760 °C	0.17 °C	
Type B	500 °C to +1800 °C	0.27 °C	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
ELECTRICAL MEASUREMENT (continued)			
Temperature indicators, calibration by electrical simulation (continued)			
Resistance thermometers (PT 100)	-200 °C to +800 °C	0.020 °C	
Thermocouples: Internal reference junction enabled.			
Type K	-200 °C to +1300 °C	0.31 °C	
Type T	-200 °C to +400 °C	0.31 °C	
Type J	-200 °C to +1200 °C	0.31 °C	
Type E	-200 °C to +1300 °C	0.31 °C	
Type N	-200 °C to +1300 °C	0.33 °C	
Type R	500 °C to +1760 °C	0.34 °C	
Type S	500 °C to +1760 °C	0.35 °C	
Type B	500 °C to +1800 °C	0.40 °C	
Cold Junction Compensation	Nominal Ambient 17 °C to 23 °C	0.10 °C	
TEMPERATURE			
Resistance thermometers	-80 °C to -38 °C -38 °C to 0 °C 0 °C to 200 °C 200 °C to 300 °C 300 °C to 550 °C 550 °C to 660 °C 0.01 °C (triple point of water) 29.7646 °C (melting point of Gallium)	0.010 °C 0.010 °C 0.015 °C 0.015 °C 0.054 °C 0.30 °C 0.0010 °C 0.0050 °C	
Electronic temperature indicators with sensors	-80 °C to +660 °C 660 °C to 1100 °C	As for resistance thermometers … As for thermocouples ... … plus ½ scale division for analogue indicators.	Devices may be calibrated using the digital communication protocol including Fieldbus
Thermocouples Noble metal type	-50 °C to +200 °C 200 °C to 550 °C 550 °C to 660 °C 660 °C to 900 °C 900 °C to 1100 °C	0.40 °C 0.50 °C 0.75 °C 2.0 °C 2.3 °C	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
TEMPERATURE (continued)			
Thermocouples Base Metal	-80 °C to +200 °C 200 °C to 550 °C 550 °C to 660 °C 660 °C to 900 °C 900 °C to 1100 °C	0.45 °C 0.60 °C 0.85 °C 1.9 °C 2.4 °C	
Liquid-in-glass thermometers	-80 °C to +0 °C 0 °C to 100 °C 100 °C to 300 °C	0.023 °C 0.015 °C 0.024 °C plus ¼ scale division	
Temperature block calibrators and portable liquid baths	-80 °C to -38 °C -38 °C to +200 °C 200 °C to 660 °C 660 °C to 1100 °C	0.040 °C 0.040 °C 0.060 °C 1.2 °C	
Temperature in air	-70 °C to -40 °C -40 °C to -25 °C -25 °C to +10 °C 10 °C to 60 °C 60 °C to 100 °C	0.60 °C 0.41 °C 0.30 °C 0.15 °C 0.30 °C	
Radiation thermometers (Pyrometers)	-15 °C to 0 °C 0 °C to 120 °C 120 °C to 150 °C 150 °C to 250 °C 250 °C to 350 °C 350 °C to 500 °C	2.0 °C 1.5 °C 2.0 °C 2.5 °C 3.5 °C 4.5 °C	Only thermometers operating at an emissivity setting of 0.95 can be calibrated
HUMIDITY			
Relative Humidity	10 %rh to 40 %rh 40 %rh to 95 %rh for the temperature range 10 °C to 60 °C	0.6 %rh 1.3 % of reading	
Salt capsules	10 %rh and 95 %rh 20 °C ± 3.0 °C	1.6 %rh	
Dew point	-75 °C to - 50 °C -50 °C to - 20 °C -20 °C to 60 °C	0.30 °C 0.20 °C 0.15 °C	Including calculated units

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
DENSITY			
Density transducers -Nitrogen Gas	0.5 kg/m^3 to 300 kg/m^3 300 kg/m^3 to 360 kg/m^3	0.030 % 0.60 %	
Density transducers - Argon gas	25 kg/m^3 to 400 kg/m^3	0.035 %	
Liquid Density	700 kg/m^3 to 1000 kg/m^3	0.064 kg/m^3	Liquids with viscosity up to 100 mPa.s
Density transducers - Liquid	700 kg/m^3 to 1000 kg/m^3	0.064 kg/m^3	
AIR VELOCITY			
Calibration of anemometers	0.1 m/s to 0.2 m/s 0.2 m/s to 10 m/s 10 m/s to 30 m/s	0.090 m/s 1.5 % + 0.040 m/s 1.7 % + 0.070 m/s	Instruments up to 120 mm in diameter can be calibrated.
Calibration of pitot tubes	0.1 m/s to 0.2 m/s 0.2 m/s to 10 m/s 10 m/s to 30 m/s	0.090 m/s 1.5 % + 0.040 m/s 1.7 % + 0.070 m/s 0.13 Pa + 0.22 % of the pitot pressure	Uncertainty obtained will be a combination of the pressure and velocity uncertainty
FLOW (Mass or volume)			Fluid temperature can be controlled from 10 °C to 80 °C depending on the ambient conditions.
<u>Hydrocarbon oils</u>			
Mass - flow rate and quantity passed	0.6 kg/min to 60 kg/min 20 kg/min to 2000 kg/min 2000 kg/min to 2400 kg/min	0. 050 % 0.075 % 0.13 %	A range of oils is available covering the range 2 cSt to 150 cSt. Available oils: Kerosene, Gas oil, Shell Tellus 32, Shell Tellus 100. Devices with a Fieldbus output can be calibrated
Volume - flow rate and quantity passed	0.6 l/min to 75 l/min 25 l/min to 2500 l/min 2500 l/min to 3000 l/min	0.055 % 0.10 % 0.13 %	
<u>Water flow</u>			
Mass flow rate	0.6 kg/min to 4 kg/min 4 kg/min to 600 kg/min	0.27 % 0.20 %	
Volume flow rate	0.6 l/min to 4 l/min 4 l/min to 600 l/min	0.27 % 0.20 %	
<u>Gas flow</u>			
Flow-rate and quantity passed	0.2 l/min to 2 l/min 2 l/min to 1000 l/min	0.23 % 0.16 %	Calibration medium air Any inert gases may be used.
Flow rate	5 ml/min to 50 ml/min 50 ml/min to 500 ml/min 0.5 l/min to 5 l/min 3 l/min to 30 l/min 5 l/min to 100 l/min	0.25% + 0.01 ml/min 0.35% + 0.05 ml/min 0.32% + 0.002 l/min 0.39% + 0.02 l/min 0.37% + 0.03 l/min	Calibration medium nitrogen, dry air, argon

0489

Accredited to ISO/IEC 17025:2005

Trescal Limited

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Calibration performed at main address only

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks
DIMENSIONAL			
Orifice plates	BS EN ISO 5167-2:2003 Bore diameter d 12.5 mm to 750 mm	0.020 + (0.0060 x diameter in m) mm	
END			