

CERTIFICATE OF ACCREDITATION

This is to certify that:

CONCILIUM TECHNOLOGIES (PTY) LTD

Facility Accreditation Number: **106**

is a South African National Accreditation System accredited Calibration laboratory provided that all SANAS conditions and requirements are complied with.

This certificate is valid as per the scope on the accompanying schedule of accreditation bearing the above accreditation number for

DC LOW FREQUENCY METROLOGY

The facility complies with the general requirements of

ISO/IEC 17025:2005

A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements

The management system requirements in ISO/IEC 17025 (Section 4) meet the principles of ISO 9001:2000 and are aligned with its pertinent requirements

While this certificate remains valid, the Accredited Facility named above is authorised to use the relevant SANAS logo to issue facility reports and/or certificates

Chief Executive Officer

Initial Accreditation: 1980

Certificate Commences: February 2007

Certificate Expires: February 2012

"Recognised as the official national accreditation body by the Department of Trade and Industry of the Republic of South Africa"

This certificate is only valid when accompanied by its schedule of accreditation.

Accredited Laboratory Measuring Capabilities

SCHEDULE OF ACCREDITATION

DC LOW FREQUENCY METROLOGY

Laboratory Accreditation Number 106

<p>Permanent Address of Laboratory: Concilium Technologies (Pty) Ltd Building No 3 Highgrove Office Park 50 Tegel Avenue Highveld Technopark Centurion 0157</p> <p>Postal Address: PO Box 67611 Highveld 0169</p> <p>Tel : (012) 678-9211 / 9215 Fax : (012) 665-4160 Email : bart_bremmer@concilium.co.za</p>			<p>Technical Signatories : Mr B J H Bremmer : Mr G D Schuster : Mr P Hugo</p> <p>Nominated Representative : Mr B J H Bremmer</p> <p>Issue No. : 05 Date of issue : February 2007 Expiry date : February 2012</p>		
ITEM	FUNCTION	NOMINAL RANGE	NOMINAL FREQUENCY	MEASUREMENT CAPABILITIES EXPRESSED AS AN UNCERTAINTY (\pm)	NOTES
1	DC Voltage	Specific values: 1,018 V and 10 V 0 V to 10 V 10 V to 100 V 100 V to 1 kV 1 kV to 5 kV		$1 \cdot 10^{-6} \cdot U$ $1 \cdot 10^{-6} \cdot U + 0,3 \mu V$ $3 \cdot 10^{-6} \cdot U$ $5 \cdot 10^{-6} \cdot U$ $2 \cdot 10^{-2} \cdot U$	1
2	DC Current	1 pA to 100 pA 100 pA to 1 μA 1 μA to 100 mA 100 mA to 2 A 2 A to 10 A 10 A to 50 A 50 A to 1000 A		$1 \cdot 10^{-2} \cdot I$ $2 \cdot 10^{-3} \cdot I$ $5 \cdot 10^{-5} \cdot I$ $2 \cdot 10^{-4} \cdot I$ $2 \cdot 10^{-4} \cdot I$ $5 \cdot 10^{-4} \cdot I$ $2 \cdot 10^{-3} \cdot I$	2 2 1

Original date of accreditation: 1980

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Note 1: Measure only

Note 2: Generate only

The MC, expressed as an expanded uncertainty of measurement, is stated as the standard uncertainty of measurement multiplied by a coverage factor $k = 2$, corresponding to a confidence level of approximately 95%

Programme Manager

ITEM	FUNCTION	NOMINAL RANGE	NOMINAL FREQUENCY	MEASUREMENT CAPABILITIES EXPRESSED AS AN UNCERTAINTY (\pm)	NOTES	
3	Resistance	Specific values: 1 Ω and 10 k Ω 1 m Ω 10 m Ω , 0,1 Ω 1 Ω , 10 Ω , 100 Ω 1 k Ω , 10 k Ω 100 k Ω , 1 M Ω 10 M Ω 100 M Ω 1 G Ω 10 G Ω 100 G Ω		5•10 ⁻⁶ •R	2	
				2•10 ⁻⁴ •R		
				5•10 ⁻³ •R		
4	Capacitance	100 pF to 1 μ F 1 μ F to 10 μ F 10 μ F to 100 μ F	120 Hz to 10 kHz 120 Hz to 10 kHz 120 Hz to 1 kHz	1•10 ⁻³ •C	2	
				2•10 ⁻³ •C		
				2•10 ⁻³ •C		
		1 pF, 10 pF 100 pF, 1 nF	50 Hz to 1 kHz 1 kHz to 1 MHz	5•10 ⁻⁵ •C		
				5•10 ⁻⁴ •C		
		10 nF	50 Hz to 1 kHz 1 kHz to 100 kHz 100 kHz to 500 kHz 500 kHz to 1 MHz	5•10 ⁻⁵ •C		2
				5•10 ⁻⁴ •C		2
				1•10 ⁻³ •C		2
				1•10 ⁻² •C		2
		100 nF	50 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 200 kHz	5•10 ⁻⁵ •C		2
				5•10 ⁻⁴ •C		2
3•10 ⁻³ •C	2					
1 μ F	50 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 50 kHz	5•10 ⁻⁵ •C	2			
		1•10 ⁻³ •C	2			
		2•10 ⁻³ •C	2			
5	Inductance	1 mH to 1 H 1 H to 10 H	120 Hz to 1 kHz 120 Hz	2•10 ⁻³ •L		
				5•10 ⁻³ •L		

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ITEM	FUNCTION	NOMINAL RANGE	NOMINAL FREQUENCY	MEASUREMENT CAPABILITIES EXPRESSED AS AN UNCERTAINTY (\pm)	NOTES
6	AC Voltage	0 V to 10 V	30 Hz to 20 kHz	$1 \cdot 10^{-4} \cdot U + 10 \mu V$	
			20 kHz to 100 kHz	$2 \cdot 10^{-4} \cdot U + 10 \mu V$	
		10 V to 20 V	100 kHz to 1 MHz	$3 \cdot 10^{-4} \cdot U + 10 \mu V$	
			30 Hz to 20 kHz	$1 \cdot 10^{-4} \cdot U$	
		20 V to 200 V	20 kHz to 100 kHz	$2 \cdot 10^{-4} \cdot U$	
			100 kHz to 500 kHz	$3 \cdot 10^{-4} \cdot U$	
			500 kHz to 1 MHz	$4 \cdot 10^{-4} \cdot U$	
		200 V to 1 kV	30 Hz to 20 kHz	$1 \cdot 10^{-4} \cdot U$	
			20 kHz to 100 kHz	$2 \cdot 10^{-4} \cdot U$	
			30 Hz to 1 kHz	$3 \cdot 10^{-4} \cdot U$	
50 Hz to 1 kHz	$3 \cdot 10^{-4} \cdot U$				
		1 kHz to 20 kHz	$4 \cdot 10^{-4} \cdot U$	1	
		20 kHz to 100 kHz	$6 \cdot 10^{-4} \cdot U$	1	
7	AC Current	0 A to 2 A	30 Hz to 5kHz	$5 \cdot 10^{-4} \cdot I + 2 \mu A$	

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ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

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