

# FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



## CERTIFICATE OF ACCREDITATION (AS PER ISO/IEC 17025:2017)

This is to attest that

### **SUDUTT ELECTRICAL TESTING LABORATORY (OPC) PRIVATE LIMITED.**

GF-8, Tithi Heights, Opp. Rutva Height, Near Gayatri Party Plot,  
Gotri Road, Vadodara (Gujarat)390021, India

### **Calibration Laboratory**

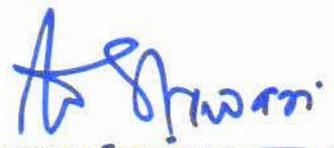
has demonstrated compliance with ISO/IEC Standard 17025:2017, General requirements for the competence of testing and calibration laboratories and supplementary criteria for Calibration laboratories.

**Certificate Number:** CL-147

**Issue Date:** 31.05.2025

**Valid Until:** 30.05.2027

The certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard and the relevant requirements of FDAS. (for scope of accreditation visit website [www.fdasindia.org](http://www.fdasindia.org)).

  
DEVI SARAN TEWARI  
Director

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## SCOPE OF ACCREDITATION

(Annexure to Certificate of CL - 147)

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GF-8, Tithi Heights, Opp. Rutva Height, Near Gayatri Party Plot,  
Gotri Road, Vadodara (Gujarat)-390021, India

**Validity:** 31.05.2025 to 30.05.2027

**Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement ( $\pm$ ) *
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### Electro-Technical Calibration (Laboratory Based/At Site)

<b>Group: Source Mode</b>				
01	AC Voltage @ 50 Hz	Using Single Phase Power Calibrator & Tester By Direct Method	3 to 500 V (P-N)	0.032 % to 0.026%
02	AC Current @ 50 Hz	Using Single Phase Power Calibrator & Tester By Direct Method	0.02 A to 120 A	0.29% to 0.026%
03	Power factor @ 240V/10A ,50 Hz	Using Single Phase Power Calibrator & Tester By Direct Method	0.01 to UPF lead/lag	0.0012 PF
04	Apparent Power Single Phase @ 30 to 550V/ 0.01 A to 120A	Using Single Phase Power Calibrator & Tester By Direct Method	0.5 VA to 66 kVA	0.019 % to 0.034%
05	Active Power Single Phase@ 30 to 550V/ 0.5A to 120 A / Cos $\phi$ = UPF to 0.01 lead/Lag	Using Single Phase Power Calibrator & Tester By Direct Method	0.15 W to 11 kW	1.156 % to 0.052 %
			10 W to 66 KW	1.156 % to 0.052 %
06	Active Power Single Phase @ 30 to 550V/ 0.05 A to 0.5A / Cos $\phi$ = 0.01 PF to UPF lead/Lag	Using Single Phase Power Calibrator & Tester By direct Method	0.015 W to 825 W	0.58 % to 0.077%
07	Reactive Power Single Phase @ 30 to 500V/0.05 A to 20A /Sin $\phi$ = 0.01 PF to UPF lead/Lag	Using Single Phase Power Calibrator & Tester By direct Method	0.015 VAR to 30 k VAR	1.06 % to 0.03%

*Jikendra Parmar*  
Dealing Officer

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### Electro-Technical Calibration (Laboratory Based/At Site)

08	Harmonics Voltage @ 100V AC Current @ 10A AC	Using Single Phase Power Calibrator & Tester by Direct Method	Order: 1 to 40	0.62%
09	DC Voltage	Using Multi-Function Calibrator by direct method	1 mV to 100 mV	0.47 % to 0.0093%
			100 mV to 10 V	0.0093 % to 0.0011%
			10 V to 1000 V	0.0011% to 0.0059%
10	DC Current	Using Multi-Function Calibrator	1 uA to 10mA	2.91% to 0.016%
			10mA to 1A	0.016% to 0.063%
			1 A to 20 A	0.063% to 0.3 %
		Using Multi-Function Calibrator with Clamp Meter Adaptor by direct method	20 A to 1000 A	0.3% to 0.81%
11	DC Resistance	Using Multi-Function Calibrator by direct method	1 ohm to 100 ohm	1.9 % to 0.062%
			100 ohm to 10 M ohm	0.062 % to 0.025%
			10 M ohm to 1 G ohm	0.025% to 2.32 %
12	AC Voltage @ 50 Hz to 1 kHz	Using Multi-Function Calibrator by direct method	1 mV to 100 mV	3.71% to 0.13%
			100 mV to 10 V	0.13 % to 0.065%
			10 V to 1000 V	0.065 % to 0.062%

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### Electro-Technical Calibration (Laboratory Based/At Site)

13	AC Voltage @ 10 KHZ	Using Multi-Function Calibrator by direct method	1 mV to 100 mV	3.71% to 0.16%
			100 mV to 20V	0.16 % to 0.065%
14	AC Voltage @ 100 KHZ	Using Multi-Function Calibrator by direct method	1 mV to 100 mV	3.71% to 0.14%
			100 mV to 20V	0.14 % to 0.065%
15	AC Current @ 50/60 Hz	Using Multi-Function Calibrator	10 uA to 10mA	1.89 % to 0.082%
			10 mA to 1A	0.082 % to 0.075%
			1A to 20A	0.075 % to 0.32%
		Using Multi-Function Calibrator with Clamp Meter Adaptor by direct method	20A to 1000A	0.32% to 0.29 %
16	AC Current @ 1 KHz	Using Multi-Function Calibrator	10 uA to 10mA	1.89 % to 0.082%
			10mA to 200mA	0.082 % to 0.075%
17	Capacitance @ 1kHz	Using Multi-Function Calibrator	1nF to 10nF	1.41% to 0.37 %
	Capacitance @ 100Hz	Using Multi-Function Calibrator	10 nF to 100 uF	0.37 % to 0.62%
18	Frequency	Using Multi-Function Calibrator /with scope option by direct method	1 Hz to 10 MHz	0.61% to 0.0058%
			10 MHz to 100 MHz	0.0058 %

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### Electro-Technical Calibration (Laboratory Based/At Site)

19	Temperature Simulation RTD	Using Multi-Function Calibrator by direct method	-180 to 850°C	0.22°C
	Thermocouple J Type		-200 to 1200°C	0.24°C
	Thermocouple K Type		-200 to 1300°C	0.30°C
	Thermocouple R Type		0 to 1750°C	1.16°C
	Thermocouple S Type		0 to 1750°C	1.04°C
	Thermocouple T- Type		-200 to 400°C	0.24°C
	Thermocouple N Type		-200to 1300°C	0.47°C
	Thermocouple B Type		600 to 1800°C	1.73°C
	Thermocouple E-Type		-200 to 1000°C	0.24°C
20	Oscilloscope	Using Multi-Function Calibrator by direct method	2 mV to 200 V DC	0.87% to 0.093%
	Amplitude		2 mV to 200 V AC @ 1 kHz	0.92% to 0.071%
	Time base		10 ns to 1 sec	0.00578 ns to 0.00058 s
	Bandwidth		10 MHz to 1.1 GHz (0.4 Vpp to 3.5 Vpp)	6.31 % to 7.59 %

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### Electro-Technical Calibration (Laboratory Based/At Site)

21	Ratio (Ratio Meter)	Using Standard Potential Transformer by Direct Method	1:1 Ratio 1:10 Ratio 1:100 Ratio 1:1000 Ratio 1:10000 Ratio	0.061 % 0.069 % 0.144 % 0.156 % 0.27 %
22	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	100 m Ohm Range: - Up to 5 Amp	0.038%
23	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	1 m Ohm Range: - Up to 30Amp	0.083%
24	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	10 mOhm Range :- Up to 14Amp	0.061%
25	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	100 Micro Ohm Range: - Up to 60A	0.14 %
26	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	1 Ohm Range: - Upto1.5 A	0.031%
27	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	10 Ohm Range: - Up to 0.5 A	0.03 %
28	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	100 Ohm Range: - Up to 0.15 A	0.03%
29	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	1 KOhm Range: - Up to 45 m A	0.038%
30	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	100 Micro Ohm Range: - Up to 100 A	0.14 %
31	DC Resistance (4 Wire)	Using Standard Resistor by Direct Method	1 mOhm Range: 50 to 200 Amp	0.183%
32	DC Resistance (2 Wire)	Using Standard Decade Resister Box by Direct Method	0.1 Mohm Range: - @1 kV	0.067%

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### Electro-Technical Calibration (Laboratory Based/At Site)

33	DC Resistance (2 Wire)	Using Standard Decade Resister Box by Direct Method	1 Mohm Range: - @1 kV	0.053%
34	DC Resistance (2 Wire)	Using Standard Decade Resister Box by Direct Method	10 Mohm Range: - @1 kV	0.053 %
35	DC Resistance (2 Wire)	Using Standard Decade Resister Box by Direct Method	100 Mohm Range: - @1 kV	0.116 %
36	DC Resistance (2 Wire)	Using Standard Decade Resister Box by Direct Method	1 G ohm Range: - @1 kV	0.236 %
37	DC Resistance (2 Wire)	Using Standard Decade Resister Box by Direct Method	10 G ohm Range: - @1 kV	0.625 %
38	DC Resistance (2 Wire)	Using Standard Decade Resister Box by Direct Method	100 G ohm Range: - @1 kV, @ 5KV	0.51%
39	DC Resistance (2 Wire)	Using Standard Decade Register Box by Direct Method	1 Tohm Range: - @1 kV, @5kV	3.46 %

#### Group: Measure

1	DC Voltage	6 ½ Digit Multi-meter by Direct Method	1 mV to 100 mV	0.42 % to 0.0078%
			100 mV to 10V	0.0078% to 0.0040%
			10V to 1000V	0.0040% to 0.0059%
2	DC Current	6 ½ Digit Multi-meter by Direct Method	1 uA to 1mA	0.11% to 0.061%
			1mA to 100 mA	0.061% to 0.0035%
			100 mA to 10A	0.035% to 0.29%
3	DC Resistance	6 ½ Digit Multi-meter by Direct Method	0.1 ohm to 100 ohm	0.082% to 0.012%
			100 to 100 k ohm	0.012 % to 0.009%
			100 k to 10 M ohm	0.009% to 0.049%
			10 M to 1 G ohm	0.049% to 0.25%

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### Electro-Technical Calibration (Laboratory Based/At Site)

4	AC Voltage @ 50 Hz to 1 kHz	6 ½ Digit Multi-meter by Direct Method	1 mV to 100mV	0.5% to 0.072%
			100 mV to 100V	0.072% to 0.1%
			100 V to 750 V	0.1% to 0.12%
5	AC Current @ 50 Hz to 500 Hz	6 ½ Digit Multi-meter by Direct Method	10 $\mu$ A to 10mA	0.20 % to 0.17%
			10mA to 1A	0.17 %
			1A to 10A	0.17 % to 0.54%
6	Frequency	6 ½ Digit Multi-meter by Direct Method	3 Hz to 1kHz	0.11 % to 0.012%
			1 kHz to 300 kHz	0.012% to 0.01%
7	Temperature Simulation RTD PT 100	6 ½ Digit Multi-meter by Direct Method	-200 to 850°C	0.076°C
	Thermocouple J Type		200 to 1200°C	0.27°C
	Thermocouple J Type		-200 to 1300°C	0.43°C
8	Impulse current Shunt	6 ½ Digit Multi-meter & Using Multi-Function Calibrator	0.01 ohm to 1 ohm @ 1 A to 10 A DC	0.091%

\*Expanded uncertainty expressed in coverage probability of approximately 95 % (coverage factor k=2)

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