



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515

Validity 09/01/2020 to 08/01/2022*

Page No 1 of 36

Last Amended on -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
Permanent Facility					
1	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (50Hz to 1kHz)	Using 6½ Digit Multimeter Direct/Comparison Method	1 A to 10 A	0.18 % to 0.35 %
2	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (50Hz to 1kHz)	Using 6½ Digit Multimeter Direct/Comparison Method	100 mA to 1 A	0.38 % to 0.18 %
3	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (50Hz to 1kHz)	Using 6½ Digit Multimeter Direct/Comparison Method	30 µA to 100 mA	0.88 % to 0.38 %
4	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (1kHz to 100kHz)	Using 6½ Digit Multimeter Direct Method	100 mV to 10 V	0.76 % to 0.77 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

2 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

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5	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (50Hz to 1kHz)	Using 6½ Digit Multimeter Direct Method	10 mV to 1000 V	0.13%
6	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1kHz to 5kHz)	Using Fluke Multifunction Calibrator by Direct Method	400 mA to 1 A	0.96 % to 0.79 %
7	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (50Hz to 1kHz)	Using Fluke Multifunction Calibrator 5080 by Direct Method	1 mA to 400 mA	2.1 % to 0.61 %
8	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (50Hz to 1kHz)	Using Fluke Multifunction Calibrator by Direct Method	100 µA to 3 mA	0.5%
9	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (50Hz to 1kHz)	Using Fluke Multifunction Calibrator by Direct Method	400 mA to 10 A	0.14%



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

3 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

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10	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (50Hz)	Using Fluke Multifunction Calibrator with current coil by Direct Method	10 A to 1000 A	1.16 % to 0.14 %
11	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Power 1-Ø P.F@0.2 lag	Using Fluke 5520A Multifunction Calibrator by Direct Method	8.4 W to 0.96 kW@50Hz,120V to 240V, 0.35A to 20A	5.7 % to 1.24 %
12	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Power 1-Ø P.F@0.5 lag	Using Fluke 5520A Multifunction Calibrator by Direct Method	21 W to 2.4 kW@50Hz,120V to 240V, 0.35A to 20A	2.92 % to 1.05 %
13	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Power 1-Ø P.F@0.8 lead	Using Fluke 5520A Multifunction Calibrator by Direct Method	34 W to 3.84 kW@50Hz,120V to 240V,0.35A to 20A	1.97 % to 6.02 %
14	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Power 1-Ø P.F@UPF	Using Fluke 5520A Multifunction Calibrator by Direct Method	42 W to 4.8 kW@50Hz,120V to 240V,0.35A to 20A	1.51 % to 0.62 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	MMA CALABS TECH LTD, 328,CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA		
Accreditation Standard	ISO/IEC 17025:2017		
Certificate Number	CC-2515	Page No	4 of 36
Validity	09/01/2020 to 08/01/2022*	Last Amended on	-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
15	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (10kHz to 450kHz)	Using Fluke 5520A Multifunction Calibrator by Direct Method	30 mV to 3 V	1.12 % to 0.25 %
16	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (1kHz to 10kHz)	Using Fluke 5520A Multifunction Calibrator by direct method	3 mV to 300 V	0.26 % to 0.05 %
17	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (50Hz to 1kHz)	Using Fluke 5520A Multifunction Calibrator by Direct Method	3 mv to 1000 V	0.39 % to 0.04 %
18	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance (1kHz)	Using Fluke 5520A Multifunction Calibrator by Direct Method	1 µF to 100 µF	0.48 % to 0.67 %
19	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance (1kHz)	Using Fluke 5520A Multifunction Calibrator by Direct Method	1 nF to 1 µF	1.63 % to 0.47 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

5 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
20	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using 6½ Digit Multimeter Direct/Comparison Method	1 A to 10 A	0.08 % to 0.29 %
21	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using 6½ Digit Multimeter Direct/Comparison Method	1 mA to 1 A	0.057 % to 0.08 %
22	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using 6½ Digit Multimeter Direct/Comparison Method	100 µA to 1 mA	0.09 % to 0.062 %
23	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance	Using 6½ Digit Multimeter Direct Method	1 MOhm to 100 MOhm	0.013 % to 0.91 %
24	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance	Using 6½ Digit Multimeter Direct Method	1 Ohm to 100 Ohm	0.35 % to 0.02 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

6 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

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25	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance	Using 6½ Digit Multimeter Direct Method	100 Ohm to 1 MOhm	0.02 % to 0.013 %
26	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC voltage	Using 6½ Digit Multimeter Direct Method	10 mV to 10 V	0.05 % to 0.003 %
27	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC voltage	Using 6½ Digit Multimeter Direct Method	10 V to 100 V	0.003 % to 0.005 %
28	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC voltage	Using 6½ Digit Multimeter Direct Method	100 V to 1000 V	0.005 % to 0.006 %
29	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5520A Multifunction Calibrator by Direct Method	1 A to 10 A	0.09%



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

7 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
30	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5080 Multifunction Calibrator by Direct Method	1 mA to 400 mA	0.4%
31	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5520A Multifunction Calibrator by Direct Method	10 µA to 329 µA	0.24 % to 0.025 %
32	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke Multifunction Calibrator with current coil by direct method	10 A to 1000 A	0.3 % to 0.6 %
33	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5520A Multifunction Calibrator by Direct Method	329 µA to 3 mA	0.1 % to 0.08 %
34	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5520A Multifunction Calibrator by Direct Method	400 mA to 1 A	0.08 % to 0.09 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

8 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

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35	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using milli /micro ohm meter 9409-CAL Direct Method	0.0001 Ohm	1.42%
36	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using milli /micro ohm meter 9409-CAL Direct Method	0.001 Ohm	0.4%
37	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using milli /micro ohm meter 9409-CAL Direct Method	0.01 Ohm	0.065%
38	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 7400 by Direct Method	0.01 Ohm to 0.5 Ohm	2.59 % to 0.8 %
39	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 7400 by Direct Method	0.5 Ohm to 100 kOhm	0.8 % to 0.06 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

9 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
40	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 8400-HV Direct Method	1 GOhm to 1 TOhm	8 % to 8.2 %
41	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 8400-HV Direct Method	1 TOhm to 10 TOhm	8.45 % to 10 %
42	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using Fluke 5520A Multifunction Calibrator by Direct Method	10 Ohm to 100 MOhm	0.018 % to 0.07 %
43	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 8400 by Direct Method	100 kOhm to 100 MOhm	2.3%
44	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 8400 by Direct Method	100 MOhm to 1 GOhm	2.3 % to 6.1 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	MMA CALABS TECH LTD, 328,CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA		
Accreditation Standard	ISO/IEC 17025:2017		
Certificate Number	CC-2515	Page No	10 of 36
Validity	09/01/2020 to 08/01/2022*	Last Amended on	-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
45	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using Fluke 5520A Multifunction Calibrator by Direct Method	2 Ohm to 10 Ohm	0.067 % to 0.018 %
46	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Fluke 5520A Multifunction Calibrator by Direct Method	10 mV to 10 V	0.019 % to 0.002 %
47	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Fluke 5520A Multifunction Calibrator by Direct Method	10 V to 100 V	0.002 % to 0.004 %
48	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Fluke 5520A Multifunction Calibrator by Direct Method	100 V to 1000 V	0.004 % to 0.023 %
49	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	Resistance	Using Fluke calibrator 5080 by direct method	1 Ohm to 1 Ohm	1.29%



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 11 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
50	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	Resistance	Using Fluke 5080A calibrator by Direct Method	100 MOhm to 190 MOhm	0.566 % to 1.14 %
51	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- E Type	Using Fluke,5520A Direct Method	-190 °C to 1000 °C	0.9°C
52	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- J Type	Using Fluke,5520ADirect Method	-190 °C to 1200 °C	0.8°C
53	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- K Type	Using Fluke,5520A Direct Method	-190 °C to 1350 °C	0.8°C
54	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- N Type	Using Fluke,5520A Direct Method	-190 °C to 1200 °C	0.9°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 12 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

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55	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- R Type	Using Fluke,5520A Direct Method	0 °C to 1300 °C	1.0°C
56	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- RTD	Using Fluke 8846A Direct Method	-190 °C to 800 °C	0.7°C
57	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- S Type	Using Fluke,5520A Direct Method	0 °C to 1300 °C	1.0°C
58	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- N Type	Using Fluke 5520A Multifunction Calibrator by Direct Method	-190 °C to 1200 °C	0.9°C
59	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- RTD	Using Fluke 5520A Multifunction Calibrator by Direct Method	-200 °C to 790 °C	0.3°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 13 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

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60	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- S Type	Using Fluke 5520A Multifunction Calibrator by Direct Method	0 °C to 1300 °C	0.7°C
61	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)-E Type	Using Fluke 5520A Multifunction Calibrator by Direct Method	-190 °C to 1000 °C	0.6°C
62	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)-J Type	Using Fluke 5520A Multifunction Calibrator by Direct Method	-190 °C to 1200 °C	0.8°C
63	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)-K Type	Using Fluke 5520A Multifunction Calibrator by Direct Method	-190 °C to 1350 °C	0.5°C
64	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)-R Type	Using Fluke 5520A Multifunction Calibrator by Direct Method	0 °C to 1300 °C	0.7°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

14 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
65	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Frequency	Using 6½ Digit Multimeter Direct Method	50 Hz to 100 kHz	0.06%
66	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Toaliser ,Beltronics 503,Comparison Method	10 sec to 30 sec	11.254 % to 3.777 %
67	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Totaliser , Beltronics 503,Comparison Method	30 sec to 60 sec	3.777 % to 1.890 %
68	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Totaliser Beltronics 503 comparision Method	360 sec to 7200 sec	0.332 % to 0.061 %
69	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Totaliser Beltronics 503 by Comparision Method	60 sec to 360 sec	1.890 % to 0.332 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	MMA CALABS TECH LTD, 328,CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA	Page No	15 of 36
Accreditation Standard	ISO/IEC 17025:2017	Last Amended on	-
Certificate Number	CC-2515		
Validity	09/01/2020 to 08/01/2022*		

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
70	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Totaliser Beltronics 503 comparison Method	7200 sec to 86400 sec	0.061 % to 0.057 %
71	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	Frequency	Using Fluke 5520A Multifunction Calibrator by Direct Method	50 Hz to 100 kHz	0.012 % to 0.006 %
72	MECHANICAL-ACCELERATION AND SPEED	RPM (Contact Type)-Tachometer	using Digital Tachometer (Lutron) and rpm generator by comparison method as per SANASTR 45	12 rpm to 100 rpm	1.5% to 1.66%
73	MECHANICAL-ACCELERATION AND SPEED	RPM(Contact Type)--Tachometer	Using Digital Tachometer (Lutron/Amprobe) as per SANAS TR 45-01	80 rpm to 100 rpm	1.66% rdg
74	MECHANICAL-ACCELERATION AND SPEED	RPM(Contact Type)-Tachometer	Using Digital Tachometer (Lutron/Amprobe) and rpm generator by comparison method as per SANAS TR 45	100 rpm to 5000 rpm	1.66% to 0.05%



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	MMA CALABS TECH LTD, 328,CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA		
Accreditation Standard	ISO/IEC 17025:2017		
Certificate Number	CC-2515	Page No	16 of 36
Validity	09/01/2020 to 08/01/2022*	Last Amended on	-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
75	MECHANICAL-ACCELERATION AND SPEED	RPM(Non-Contact Type)-Tachometer	Using Digital Tachometer (Amprobe) rpm generator by comparison method as per SANAS TR 45	1000 rpm to 90000 rpm	0.21% to 0.04%
76	MECHANICAL-ACCELERATION AND SPEED	RPM(Non-Contact Type)-Tachometer	Using Digital Tachometer (Amprobe) and rpm generator by comparison method as per SANAS TR 45	12 rpm to 60 rpm	1.65%
77	MECHANICAL-ACCELERATION AND SPEED	RPM(Non-Contact Type)-Tachometer	Using Digital Tachometer (Amprobe)and rpm generator by comparison method as per SANAS TR 45	60 rpm to 1000 rpm	1%
78	MECHANICAL-ACOUSTICS	Sound Level Meter	Using Casella Sound Calibrator as per SANAS TR 09-02	94dB and 114dB @1kHz	0.7% rdg
79	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Gauge (Analog/Digital)Pressure Gauges, sensor withTransducers/Tra nsmitters/Indicators	Using Comparator and Digital Pressure Gauge Additel 672 by comparison method As per DKD-R-6-2	0 bar to 0.7 bar	0.031 bar



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 17 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
80	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Gauge (Analog/Digital)Pressure Gauges, sensor withTransducers/Tra nsmitters/Indicators	Using Digital Pressure Calibrator Fluke 500G by comparison method As per DKD-R-6-1	0 bar to 30 bar	0.12 bar
81	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Gauge (Analog/Digital)Pressure Gauges, sensor withTransducers/Tra nsmitters/Indicators.	Using Comparator and Digital Pressure Gauge Additel681by comparison method As per DKD-R-6-1	0 bar to 700 bar	0. 4 bar
82	MECHANICAL-PRESSURE INDICATING DEVICES	Vacuum Pressure Gauge (Analog/Digital)Pressure Gauges, sensor withTransducers/Tra nsmitters/Indicators	Using Digital Pressure Calibrator Fluke 30G by comparison method As per DKD-R-6-2	-0.8 bar to 0 bar	0.006 bar
83	THERMAL-SPECIFIC HEAT & HUMIDITY	Hygrometers, Humidity Sensors with indicators	Using Temperature & Humidity Sensor with Temperature & Humidity Generator by Comparison Method.	10 °C to 45 °C @50% RH	0.47°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

18 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
84	THERMAL-SPECIFIC HEAT & HUMIDITY	Hygrometers, Humidity Sensors with indicators	Using Temperature & Humidity Sensor with Temperature & Humidity Generator by Comparison Method.	20 % RH to 90 % RH @25°C	1.8%RH
85	THERMAL-TEMPERATURE	dry bath, Liquid bath	Using Standard RTD sensor with fluke 6½ Digital Multi Meter by Comparison Method.	-25 °C to 50 °C	0.5°C
86	THERMAL-TEMPERATURE	IR Non-Contact Thermometer	IR Pyrometer & Black Body Source by Comparison Method	400 °C to 500 °C	1.81°C
87	THERMAL-TEMPERATURE	IR Non-Contact Thermometer	Using Standard IR thermometer and Blackbody Source (Emissivity 0.95) by Comparison Method.	50 °C to 400 °C	1.81°C
88	THERMAL-TEMPERATURE	IR Non-Contact Thermometer	Using IR Pyrometer & Black Body Source (Emissivity 0.99), Comparison Method	500 °C to 1200 °C	5.1°C
89	THERMAL-TEMPERATURE	Liquid Bath, Dry Bath	Using Standard RTD sensor with fluke 6½ Digital Multi Meter by Comparison Method.	50 °C to 400 °C	0.8°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 19 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
90	THERMAL-TEMPERATURE	Temperature RTD/Thermocouple sensor (with and without Indicators)	Using Standard RTD sensor with fluke 6½ Digital Multi Meter, Fluke dry baths by Comparison Method.	-25 °C to 50 °C	0.51°C
91	THERMAL-TEMPERATURE	Temperature RTD/Thermocouple sensor (with and without Indicators)	Using Standard RTD sensor with fluke 6½ Digital Multi Meter, Fluke dry baths by Comparison Method.	50 °C to 400 °C	0.8°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 20 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
Site Facility					
1	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (50Hz to 1kHz)	Using 6½ Digit Multimeter Direct/Comparison Method	1 A to 10 A	0.18 % to 0.35 %
2	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (50Hz to 1kHz)	Using 6½ Digit Multimeter Direct/Comparison Method	100 mA to 1 A	0.38 % to 0.18 %
3	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (50Hz to 1kHz)	Using 6½ Digit Multimeter Direct/Comparison Method	30 µA to 100 mA	0.88 % to 0.38 %
4	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (1kHz to 100kHz)	Using 6½ Digit Multimeter Direct Method	100 mV to 10 V	0.76 % to 0.77 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

21 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
5	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (50Hz to 1kHz)	Using 6½ Digit Multimeter Direct Method	10 mV to 1000 V	0.13%
6	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1kHz to 5kHz)	Using Fluke Multifunction Calibrator by Direct Method	400 mA to 1 A	0.96 % to 0.79 %
7	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (50Hz to 1kHz)	Using Fluke Multifunction Calibrator 5080 by Direct Method	1 mA to 400 mA	2.1 % to 0.61 %
8	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (50Hz to 1kHz)	Using Fluke Multifunction Calibrator by Direct Method	100 µA to 3 mA	0.5%
9	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (50Hz to 1kHz)	Using Fluke Multifunction Calibrator by Direct Method	400 mA to 10 A	0.14%



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

22 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
10	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (50Hz)	Using Fluke Multifunction Calibrator with current coil by Direct Method	10 A to 1000 A	1.16 % to 0.14 %
11	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Power 1-Ø P.F@0.2 lag	Using Fluke 5520A Multifunction Calibrator by Direct Method	8.4 W to 0.96 kW@50Hz,120V to 240V, 0.35A to 20A	5.7 % to 1.24 %
12	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Power 1-Ø P.F@0.5 lag	Using Fluke 5520A Multifunction Calibrator by Direct Method	21 W to 2.4 kW@50Hz,120V to 240V, 0.35A to 20A	2.92 % to 1.05 %
13	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Power 1-Ø P.F@0.8 lead	Using Fluke 5520A Multifunction Calibrator by Direct Method	34 W to 3.84 kW@50Hz,120V to 240V,0.35A to 20A	1.97 % to 6.02 %
14	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Power 1-Ø P.F@UPF	Using Fluke 5520A Multifunction Calibrator by Direct Method	42 W to 4.8 kW@50Hz,120V to 240V,0.35A to 20A	1.51 % to 0.62 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	MMA CALABS TECH LTD, 328,CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA		
Accreditation Standard	ISO/IEC 17025:2017		
Certificate Number	CC-2515	Page No	23 of 36
Validity	09/01/2020 to 08/01/2022*	Last Amended on	-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
15	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (10kHz to 450kHz)	Using Fluke 5520A Multifunction Calibrator by Direct Method	30 mV to 3 V	1.12 % to 0.25 %
16	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (1kHz to 10kHz)	Using Fluke 5520A Multifunction Calibrator by direct method	3 mV to 300 V	0.26 % to 0.05 %
17	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (50Hz to 1kHz)	Using Fluke 5520A Multifunction Calibrator by Direct Method	3 mv to 1000 V	0.39 % to 0.04 %
18	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance (1kHz)	Using Fluke 5520A Multifunction Calibrator by Direct Method	1 µF to 100 µF	0.48 % to 0.67 %
19	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance (1kHz)	Using Fluke 5520A Multifunction Calibrator by Direct Method	1 nF to 1 µF	1.63 % to 0.47 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	MMA CALABS TECH LTD, 328,CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA		
Accreditation Standard	ISO/IEC 17025:2017		
Certificate Number	CC-2515	Page No	24 of 36
Validity	09/01/2020 to 08/01/2022*	Last Amended on	-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
20	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using 6½ Digit Multimeter Direct/Comparison Method	1 A to 10 A	0.08 % to 0.29 %
21	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using 6½ Digit Multimeter Direct/Comparison Method	1 mA to 1 A	0.057 % to 0.08 %
22	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using 6½ Digit Multimeter Direct/Comparison Method	100 µA to 1 mA	0.09 % to 0.062 %
23	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance	Using 6½ Digit Multimeter Direct Method	1 MOhm to 100 MOhm	0.013 % to 0.91 %
24	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance	Using 6½ Digit Multimeter Direct Method	1 Ohm to 100 Ohm	0.35 % to 0.02 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

25 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
25	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance	Using 6½ Digit Multimeter Direct Method	100 Ohm to 1 MOhm	0.02 % to 0.013 %
26	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC voltage	Using 6½ Digit Multimeter Direct Method	10 mV to 10 V	0.05 % to 0.003 %
27	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC voltage	Using 6½ Digit Multimeter Direct Method	10 V to 100 V	0.003 % to 0.005 %
28	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC voltage	Using 6½ Digit Multimeter Direct Method	100 V to 1000 V	0.005 % to 0.006 %
29	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5520A Multifunction Calibrator by Direct Method	1 A to 10 A	0.09%



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 26 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
30	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5080 Multifunction Calibrator by Direct Method	1 mA to 400 mA	0.4%
31	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5520A Multifunction Calibrator by Direct Method	10 µA to 329 µA	0.24 % to 0.025 %
32	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke Multifunction Calibrator with current coil by direct method	10 A to 1000 A	0.3 % to 0.6 %
33	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5520A Multifunction Calibrator by Direct Method	329 µA to 3 mA	0.1 % to 0.08 %
34	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Fluke 5520A Multifunction Calibrator by Direct Method	400 mA to 1 A	0.08 % to 0.09 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

27 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
35	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using milli /micro ohm meter 9409-CAL Direct Method	0.0001 Ohm	1.42%
36	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using milli /micro ohm meter 9409-CAL Direct Method	0.001 Ohm	0.4%
37	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using milli /micro ohm meter 9409-CAL Direct Method	0.01 Ohm	0.065%
38	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 7400 by Direct Method	0.01 Ohm to 0.5 Ohm	2.59 % to 0.8 %
39	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 7400 by Direct Method	0.5 Ohm to 100 kOhm	0.8 % to 0.06 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

28 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
40	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 8400-HV Direct Method	1 GOhm to 1 TOhm	8 % to 8.2 %
41	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 8400-HV Direct Method	1 TOhm to 10 TOhm	8.45 % to 10 %
42	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using Fluke 5520A Multifunction Calibrator by Direct Method	10 Ohm to 100 MOhm	0.018 % to 0.07 %
43	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 8400 by Direct Method	100 kOhm to 100 MOhm	2.3%
44	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using DRB 8400 by Direct Method	100 MOhm to 1 GOhm	2.3 % to 6.1 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	MMA CALABS TECH LTD, 328,CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA	Page No	29 of 36
Accreditation Standard	ISO/IEC 17025:2017	Last Amended on	-
Certificate Number	CC-2515		
Validity	09/01/2020 to 08/01/2022*		

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
45	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance	Using Fluke 5520A Multifunction Calibrator by Direct Method	2 Ohm to 10 Ohm	0.067 % to 0.018 %
46	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Fluke 5520A Multifunction Calibrator by Direct Method	10 mV to 10 V	0.019 % to 0.002 %
47	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Fluke 5520A Multifunction Calibrator by Direct Method	10 V to 100 V	0.002 % to 0.004 %
48	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Fluke 5520A Multifunction Calibrator by Direct Method	100 V to 1000 V	0.004 % to 0.023 %
49	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	Resistance	Using Fluke calibrator 5080 by direct method	1 Ohm to 1 Ohm	1.29%



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 30 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
50	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	Resistance	Using Fluke 5080A calibrator by Direct Method	100 MOhm to 190 MOhm	0.566 % to 1.14 %
51	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- E Type	Using Fluke-725 Method	-190 °C to 950 °C	1.23°C
52	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- J Type	Using Fluke-725 Method	-190 °C to 1200 °C	1.41°C
53	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- K Type	Using Fluke-725 Method	-190 °C to 1350 °C	1.48°C
54	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- N Type	Using Fluke-725 Method	-190 °C to 1200 °C	1.94°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 31 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
55	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- R Type	Using Fluke-725 Method	0 °C to 1300 °C	2.94°C
56	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- RTD	Using Fluke-725 Method	-200 °C to 790 °C	0.66°C
57	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple (Indicator/Recorder/Controller)- S Type	Using Fluke-725 Method	0 °C to 1300 °C	2.94°C
58	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- E Type	Using Process Calibrator by Direct Method	-190 °C to 950 °C	1.4°C
59	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- J Type	Using Process Calibrator by Direct Method	-190 °C to 1200 °C	1.42°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2515 **Page No** 32 of 36

Validity 09/01/2020 to 08/01/2022* **Last Amended on** -

*The validity is extended for one year up to 08.01.2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
60	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- K Type	Using Process Calibrator by Direct Method	-190 °C to 1350 °C	1.60°C
61	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- N Type	Using Process Calibrator by Direct Method	-190 °C to 1200 °C	1.94°C
62	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- RTD	Using Process Calibrator by Direct Method	-200 °C to 790 °C	0.88°C
63	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)- S Type	Using Process Calibrator by Direct Method	0 °C to 1300 °C	3.03°C
64	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (Indicator/Recorder/Controller)-R Type	Using Process Calibrator by Direct Method	0 °C to 1300 °C	3.03°C



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :

MMA CALABS TECH LTD, 328, CHANDRALOK COMPLEX, HYDERABAD,
TELANGANA, INDIA

Accreditation Standard

ISO/IEC 17025:2017

Certificate Number

CC-2515

Page No

33 of 36

Validity

09/01/2020 to 08/01/2022*

Last Amended on

-

*The validity is extended for one year up to 08.01.2023

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65	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Frequency	Using 6½ Digit Multimeter Direct Method	50 Hz to 100 kHz	0.06%
66	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Toaliser ,Beltronics 503,Comparison Method	10 sec to 30 sec	11.254 % to 3.777 %
67	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Totaliser , Beltronics 503,Comparison Method	30 sec to 60 sec	3.777 % to 1.890 %
68	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Totaliser Beltronics 503 comparision Method	360 sec to 7200 sec	0.332 % to 0.061 %
69	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Totaliser Beltronics 503 by Comparision Method	60 sec to 360 sec	1.890 % to 0.332 %



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	MMA CALABS TECH LTD, 328,CHANDRALOK COMPLEX, HYDERABAD, TELANGANA, INDIA		
Accreditation Standard	ISO/IEC 17025:2017		
Certificate Number	CC-2515	Page No	34 of 36
Validity	09/01/2020 to 08/01/2022*	Last Amended on	-

*The validity is extended for one year up to 08.01.2023

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70	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time	Using Time Totaliser Beltronics 503 comparison Method	7200 sec to 86400 sec	0.061 % to 0.057 %
71	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	Frequency	Using Fluke 5520A Multifunction Calibrator by Direct Method	50 Hz to 100 kHz	0.012 % to 0.006 %
72	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Gauge (Analog/Digital)Pressure Gauges, sensor withTransducers/Tra nsmitters/Indicators	Using Comparator and Digital Pressure Gauge Additel 672 by comparison method As per DKD-R-6-2	0 bar to 0.7 bar	0.031 bar
73	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Gauge (Analog/Digital)Pressure Gauges, sensor withTransducers/Tra nsmitters/Indicators	Using Digital Pressure Calibrator Fluke 500G by comparison method As per DKD-R-6-1	0 bar to 30 bar	0.12 bar
74	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Gauge (Analog/Digital)Pressure Gauges, sensor withTransducers/Tra nsmitters/Indicators.	Using Comparator and Digital Pressure Gauge Additel681by comparison method As per DKD-R-6-1	0 bar to 700 bar	0. 4 bar



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CC-2515

Page No

35 of 36

Validity

09/01/2020 to 08/01/2022*

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75	MECHANICAL-PRESSURE INDICATING DEVICES	Vacuum Pressure Gauge (Analog/Digital)Pressure Gauges, sensor with Transducers/Transmitters/Indicators	Using Digital Pressure Calibrator Fluke 30G by comparison method As per DKD-R-6-2	-0.8 bar to 0 bar	0.006 bar
76	THERMAL-TEMPERATURE	Indicator of Liquid Bath, Dry Bath	Using Standard RTD sensor with DMM by comparison Method at specified location Single Point Calibration	-25 °C to 50 °C	0.51°C
77	THERMAL-TEMPERATURE	Indicator of Liquid Bath, Dry Bath	Using Standard RTD sensor with DMM by comparison method.	50 °C to 400 °C	0.8°C
78	THERMAL-TEMPERATURE	Temperature RTD/Thermocouple sensor (with and without Indicators)	Using Standard RTD sensor with fluke 6½ Digital Multi Meter, Fluke dry baths by Comparison Method.	-25 °C to 50 °C	0.51°C
79	THERMAL-TEMPERATURE	Temperature RTD/Thermocouple sensor (with and without Indicators)	Using Standard RTD sensor with fluke 6½ Digital Multi Meter, Fluke dry baths by Comparison Method.	50 °C to 400 °C	0.8°C



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80	THERMAL-TEMPERATURE	Temperature Indicator of Ovens, Furnace, Freezers, Refrigerators	Using Standard RTD sensor with Indicator by comparison Method. Single Point Calibration	-25 °C to 300 °C	0.5°C

* CMCs represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k = 2.