TEST REPORT

(Development Test)

Non-Transferable

Test Report No | C | D | 0 | G | P | 8 | 3 | 3 | 3 |

Date: 23.11.2020

1.0	NAME AND ADDRESS OF THE CUSTOMER	:	**M/s. Okaya Power Pvt. Ltd.** D-8, Udyog Nagar, Peeraghari, Delhi
2.0	CUSTOMER REFERENCE	:	**CCDOKYAPLCSC122700** dated **28-Sep-2020**
3.0	DESCRIPTION OF DEVICE UNDER TEST DUT:	:	Refer DUT Details Page no. 2
	DUT Name:	:	AC Charger
	Model No/Part No..:	:	AC Charger 22kW Type 2 / ECFGA22SEA32000001
	Quantity:	:	01
4.0	DATE OF RECEIPT OF DUT	:	28.09.2020
5.0	CONDITION OF DUT ON RECIEPT	:	Satisfactory, No Physical Damage Observed.
6.0	TEST OBJECTIVE	:	Verification of AC Charger as per as EESL Tender
7.0	TEST METHOD	:	As per AIS -138, EESL Tender No. EESL/06/ICB-Elec-Charger-EV/192003043
8.0	FUNCTIONAL VERIFICATION	:	Satisfactory
9.0	TEST CONCLUSION	:	Complies with standard and requirement
10.0	TEST DESCRIPTION	:	As per AIS-138, EESL Tender No. EESI/06/ICB-Elec-Charger-EV/192003043
11.0	DATE OF PERFORMANCE OF TEST	:	29.09.2020 to 07.10.2020
12.0	TEST OBSERVATION AND RESULTS	:	For Test Observations/Results & Photographs refer Annexure-I to Annexure-IV of this test report.

Prepared By	Checked By		Approved By	
SURJEET VERMA	DEVESH PAREEK		PAMELA TIKKU	Page 1 of 16 + Drawing (01 No.) [122700]
Sr. Engineer	Manager		Sr. General Manager	

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

DUT Details:

DUT is as AC EV Charger with a maximum output capacity of 22kW AC Type 2. Charger is a wall/Pole mounted charger that operates on 415V, 3 phase, and 5 wire, 32A, AC supply and is provided with one AC output gun AC Type 2 -22 kW Max.

Gun used for AC charging with max output power 22 kW.

The charger will be supplied with offline and online authentication modes.
In online mode, charge point is authenticated by RFID card or through mobile app and makes the charger available for use.
In offline mode, the charge point can be plugged to the vehicle without a mobile app. makes the charges available for use. RFID cards or fixed password may be provided to start the charging process.

The charger is equipped with a surge protection device and RCD which prevent leakage current above 30mA.

The charger has an in-built metering system for the AC outlets. The charging session details from charge initiation to charge termination along with energy consumption details are set via OCPP 1.6J.

The charger is provided with a touch panel of resolution 800x480 Pixels.

Connector is provided with 5 colour LED indicators:

1. First LED out of 5 5LED's is Blue and always on: Standby state
2. All LED's are blue and always on: Charger gun connected
3. All LED's are blue and flashing: charging state
4. Fault Red light is always on: Fault state

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY * MANESAR *	DEVESH PAREEK Manager	Page 2 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

7.0 Clause Verification as per EESL Tender Specification: Test method

Sr. No.	Parameters	Observation	Results
General Requirements			
1	EVSE Type	Type-2 AC	Complies
2	Energy Transfer Mode	Conductive	Complies
3	Charging mode	AC – Type -2 Mode-3	Provided
4	Reliability and Serviceability	Modularity, self-diagnostic features, fault codes and easy serviceability in the field	Complies
System Structure			
1	Isolation	Each output isolated from each other with proper insulation	Single Output
2	Environmental conditions	Outdoor use	Outdoor use
3	Power supply	EV charging station connected to A.C. mains	Provided
4	AC output voltage rating	380-415 V	Complies
5	Charge control communication	Communicate by digital and analog signals	Provided
6	Interface inter-operability	Inter-operable with any EV supporting AC Type-2	Complies
Input Requirements			
1	AC Supply System	3-Phase, 5 Wire AC system (3Ph+N+E)	Provided
2	Nominal Input voltage	3Ø, 415V (+6% and -10%) as per IS 12360	Verified Vide Report No: TEST/R&D/CHG/01

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer		DEVESH PAREEK Manager	Page 3 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

Sr. No.	Parameters	Observation	Results
3	Input Frequency	50Hz, ±1.5Hz	Complies
4	Input Supply Failure backup	Battery backup for minimum 1 hour for control system and billing unit, to enable activities such as billing, to be provided.	Provided and verified
	Output Requirements		
1	Output Connector Compatibility	AC: IEC-61851-22, IEC 62196-2 Mode 3, Type 2	Complies
	Cable Requirements		
1	Charging Cable Length Usable	5 Meter, Straight Cable	Provided
2	Cable Type	Charging cable and connector permanently attached to EVSE Life of 10 years is required.	Complies
	Environmental Requirements		
1	Ambient Temperature Range	-20°C to 55°C	Based on manufacturer's declaration. Test conducted and it complies the requirements **Annexure-II**
2	Ambient Humidity	5 to 95%	
3	Ambient Pressure	86 kpa to 106 kpa	
4	Storage Temperature	0 to 60°C	
	Mechanical Requirements		
1	Ingress Protection	IP 54	Satisfactory **Annexure-III**

Prepared By		Checked By	
SURJEET PRAKASH		DEVESH PAREEK	Page 4 of 16 + Drawing (01 No.) [122700]
Sr. Engineer		Manager	

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

Sr. No.	Parameters	Observation	Results
2	Mechanical Stability	Shall not be damaged by mechanical impact as defined in Section 11.11.2 of IEC 61851-1	Satisfactory
3	Cooling	Air Cooled	Natural Cooling
4	Mechanical Impact	Shall not be damaged by mechanical impact as defined in Section 11.11.3 of IEC 61851-1	Complies
5	Dimension(W*H*D)/Weight	W:288mm X H: 130mmXD:398mm/ Weight: 14 kg	Verified
6	Mounting	AC Type 2 (22kW): Wall, pole and floor mounting with stand	Complies
User Interface & Display Requirements			
1	ON- OFF (Start-Stop) switches	Mandatory	Through Display touch screen option provided.
2	Emergency stop switch	Mushroom headed Push button type, latchable type in Red Color, visible and shall be protected by freely floating transparent acrylic sheet	Provided
3	Visual Indicators	Error indication, Presence of input supply indication, State of charge process indication	Complies
4	Support Language	English (with provision for additional regional languages including Hindi).	Provided
6	Display Messages	EVSE should display appropriate messages for user during the various charging states like:	Verified
		Vehicle plugged in / Vehicle plugged out	Verified
		Duration since start of charge, kWh.	Verified

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer		DEVESH PAREEK Manager	Page 5 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

Sr. No.	Parameters	Observation	Results
		• User authorization status	Verified
		• Idle / Charging in progress: SOC	Verified
		• Fault conditions	Verified
		• Metering Information: Consumption Units	Verified
7	Authentication	As per OCPP 1.6 or higher (through mobile application)	Through RFID , Offline OTP, Mobile APP and OCPP 1.6 J or Higher- Complies with RFID, Offline OTP, Mobile APP and Ocpp 1.6 J With provision to support future upgrade
Communication Requirements			
1	Communication between EVSE and Vehicle	AC: IEC-61851-22, IEC 62196-2 Mode 3, Type 2	Verified and complies
2	Communication interface between charger and central management system (CMS)	All of Ethernet, Wi-Fi, and2G,3G,4G	Provided
3	Communication between EVSE and Central Server	Open Charge Point Protocol (OCPP) 1.6 protocol or higher versions compatible to OCPP 1.6.	Verified
		Metering: Grid responsive metering	

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY • MANESAR •	DEVESH PAREEK Manager	Page 6 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

Sr. No.	Parameters	Observation	Results
Billing Requirements			
1	Software Solution	CMS and User App	Provided and verified
2	Billing	Grid responsive metering	Provided
3	Payment	BHIM / Bharat QR or UPI compliant mobile application payment	Provided
Protection & Safety Requirements			
1	Safety Parameters	Over current, under voltage, over voltage, Residual current, Surge protection, Short circuit, Earth fault at input and output, Input phase reversal, Emergency shut-down with alarm, Fire/Smoke shutdown with alarm, Over temperature, Protection against electric shock	Verified **Refer Annexure-I**
Marking of EVSE			
1	Marking Requirements	The EVSE shall bear the markings in a clear manner. Logo, markings and paint of EVSE have provision according to customer	Complies, Based on markings on charger

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY • MANESAR •	DEVESH PAREEK Manager	Page 7 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

ANNEXURE -I

1.1 TEST SPECIFICATIONS

TEST DETAILS	Safety Function Verification as per AIS-138 (Part-1): 2017	DUT Supply Voltage	415±5%

1.2 LABORATORY ENVIRONMENT TEST CONDITION

Ambient	25.6°C	Relative Humidity	55.8% RH

1.3 DUT Supply Voltage

A.C. Supply Voltage	415 A.C. System	Current Consumption
AC Mains Supply	(415±5V)	<50A

1.4 Test Results

Sr. no.	Test Title	Description	Observation
1	Earth Presence Detection (Socket - EVSE)	The EVSE should detect the vehicle chassis ground. Charging should not start if there is no earth detection. Also, the charging should be stopped if there earth presence detection is lost during charging.	Verified
2	Earth Continuity Check (EVSE-EV)	The EVSE earth pin should be having continuity with the vehicle chassis when the coupler is inserted. This is to ensure safety in situations where the vehicle chassis is exposed to hazardous high voltage	Verified
3	Over current and short-circuit protection	The EVSE should have active protection against an unlikely event like short-circuit one over-current	EVSE has multiple stages of protection in the form of circuit breakers, contactors and programmable safety limits which restricts current to safe operating limits Verified
4	Leakage current protection (RCD)	Residual current device should cut off the supply whenever the current through user accessible parts (enclosure) is measured to be more than 30 mA	RCD present in the EVSE output to vehicle ensuring safety. Component data-sheet were referred as well
5	Dielectric Withstand Voltage	AC withstand test is performed as per AIS 138-1. The Voltage level used is 2 kV rms as the equipment is class I as basic protection bonding is used	EVSE complies with the requirement. There was no breakdown observed

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY ICAT MANESAR	DEVESH PAREEK Manager	Page 8 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

ANNEXURE -II		
2.0 Environmental Tests		
2.1TEST Procedure	The DUTs were placed in the temperature and humidity cycle chamber and subjected to the climatic environmental test as given below:	
2.2 Ambient Air Temperature		
Test Reference: IEC 60068-2-14/IS 9000 (Part-14) –sec 2		
Temperature at start of test	25°C	
Test Temperature	-20°C	55°C
Ramp Rate	1°C per min	
No. of cycles	2	
DUT Condition	Power On with output loading for maximum power and current	
Ambient	26°C	
Start Date and End Date	26-10-2020to 26-10-2020	

2.3	**Acceptance Criteria:**
2.3.1	There shall be no visual deterioration to the DUT
2.3.2	No deviation is functionally must be observed during and after the test
2.4	**Test Observation:**
2.4.1	No Visual deterioration was observed on the DUT at the end of the test.
2.4.2	No deviation in functionality was observed during and after the test.

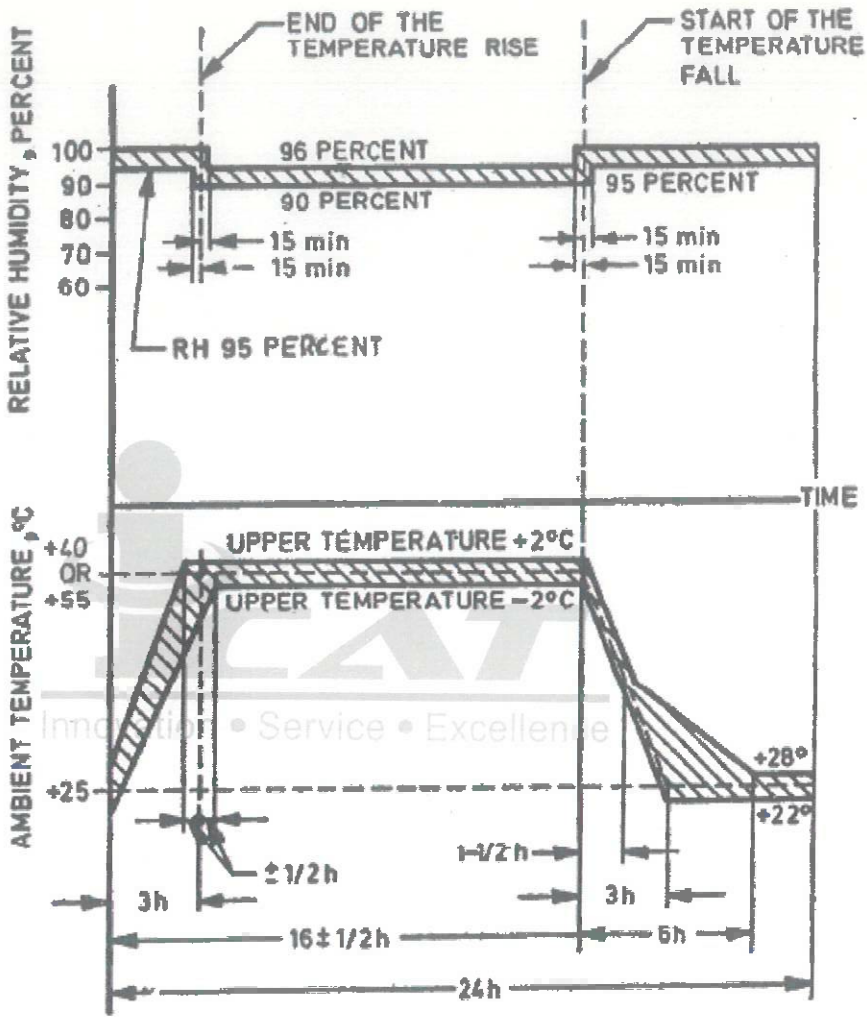
2.5 Ambient Humidity	
Test Reference: The test shall be carried out in accordance with IEC 60068-2-30/IS 9000 (Part-5 /sec 2). Test Db, @ 55°C for six cycles	
Temperature at start of test	25°C
Test Temperature	55°C
Humidity	95%
Ramp Rate	1°C per min
No. of cycles	6
DUT Condition	Power On with output loading for maximum power and current
Ambient	26°C
Start Date and End Date	20-10-2020to 26-10-2020

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY * MANESAR * ARDITCH	DEVESH PAREEK Manager	Page 9 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

2.6	Humidity Test profile



Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY MANESAR	DEVESH PAREEK Manager	Page 10 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

2.7	**Test Condition**
	• Insulation Resistance test was carried out before and after humidity test. The test was carried out immediately after humidity at room temperature. • A test voltage of 500V DC for duration of 60 seconds was applied between all inputs/outputs connected together (power source included) and the accessible parts
2.8	**Acceptance Criteria**
	• There shall be no visual deterioration to the DUT • No deviation in functionality must be observed during and after the test. • The Insulation resistance shall be >1 MΩ
2.9	• Test Observation:
	• No Visual deterioration was observed on the DUT at the end of the test • No deviation in functionality was observed during and after the test • DUT functionality OK • Insulation resistance found >1 MΩ and was observed within the limits of acceptance criteria

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY * MANESAR *	DEVESH PAREEK Manager	Page 11 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

ANNEXURE -III

3.0 Ingress Protection IP 54 as per IEC 60529

3.1 TEST Procedure	**Dust test for First Numeral '5':** On inspection after the test as per Clause 13.5 of IEC 60529, talcum powder should not accumulate in a quantity or location such that, as with any other kind of dust, It could interface with the correct operation of the equipment.
	Water for Second Numeral '4': On inspection after the test as per Clause 14.2.4 of Clause 14.3 of IEC 60529, water entered inside the equipment shall not ➢ Be sufficient to interfere with satisfactory operation of the equipment. ➢ Reach live part or windings not designated to operate when wet ➢ Accumulate near the conduit hole (Cable entry) or enter the cable
3.2	**Test Results**
3.3	Dust test for First Numeral '5'. No dust ingress was observed inside the charger
3.4	Water Test for second Numeral '4'. No water ingress was observed inside the charger
3.5	Conclusion: AC charger meets the requirements of IP 54 protection as per IEC 60529.

Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY • MANESAR •	DEVESH PAREEK Manager	Page 12 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

ANNEXURE -IV

4.0 PHOTOGRAPHS

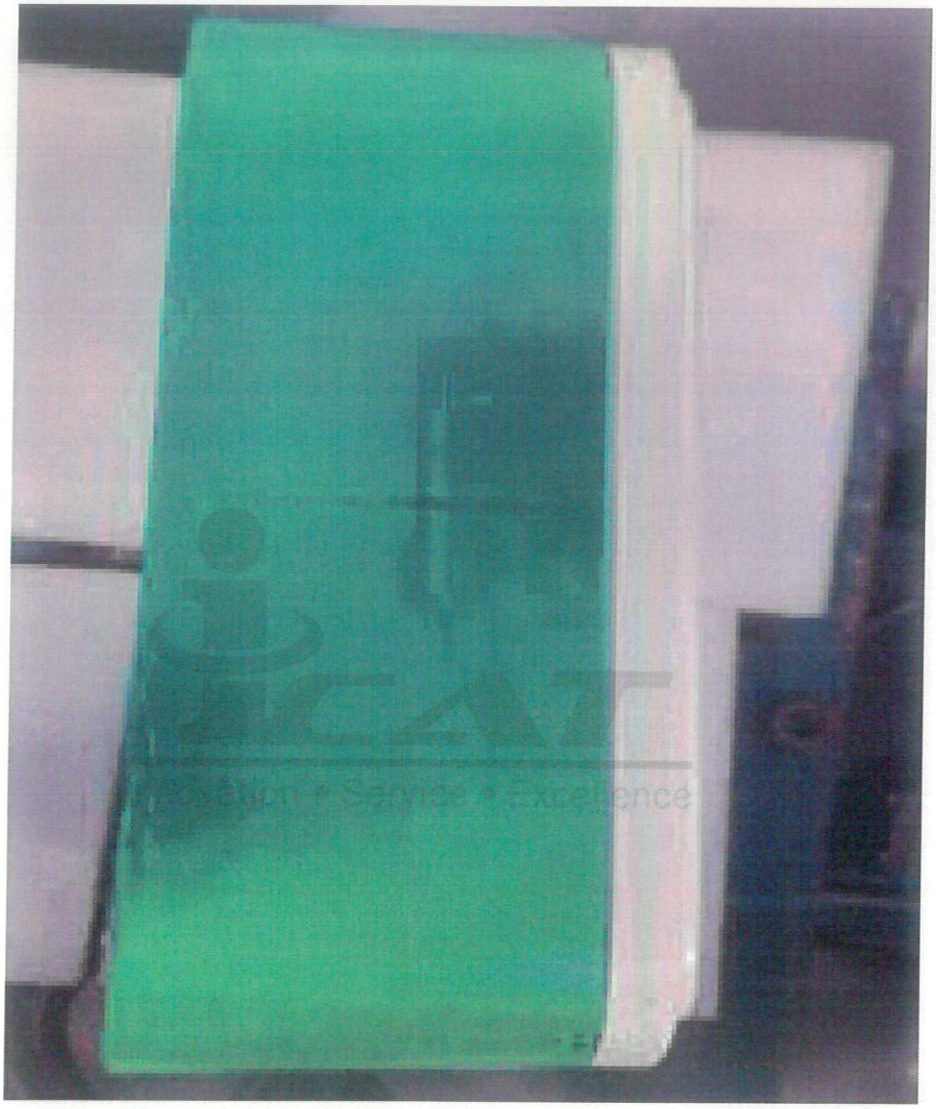
Front View

Prepared By		Checked By	
SURJEET PRAKASH		DEVESH PAREEK	Page 13 of 16 + Drawing (01 No.) [122700]
Sr. Engineer		Manager	

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

Side View

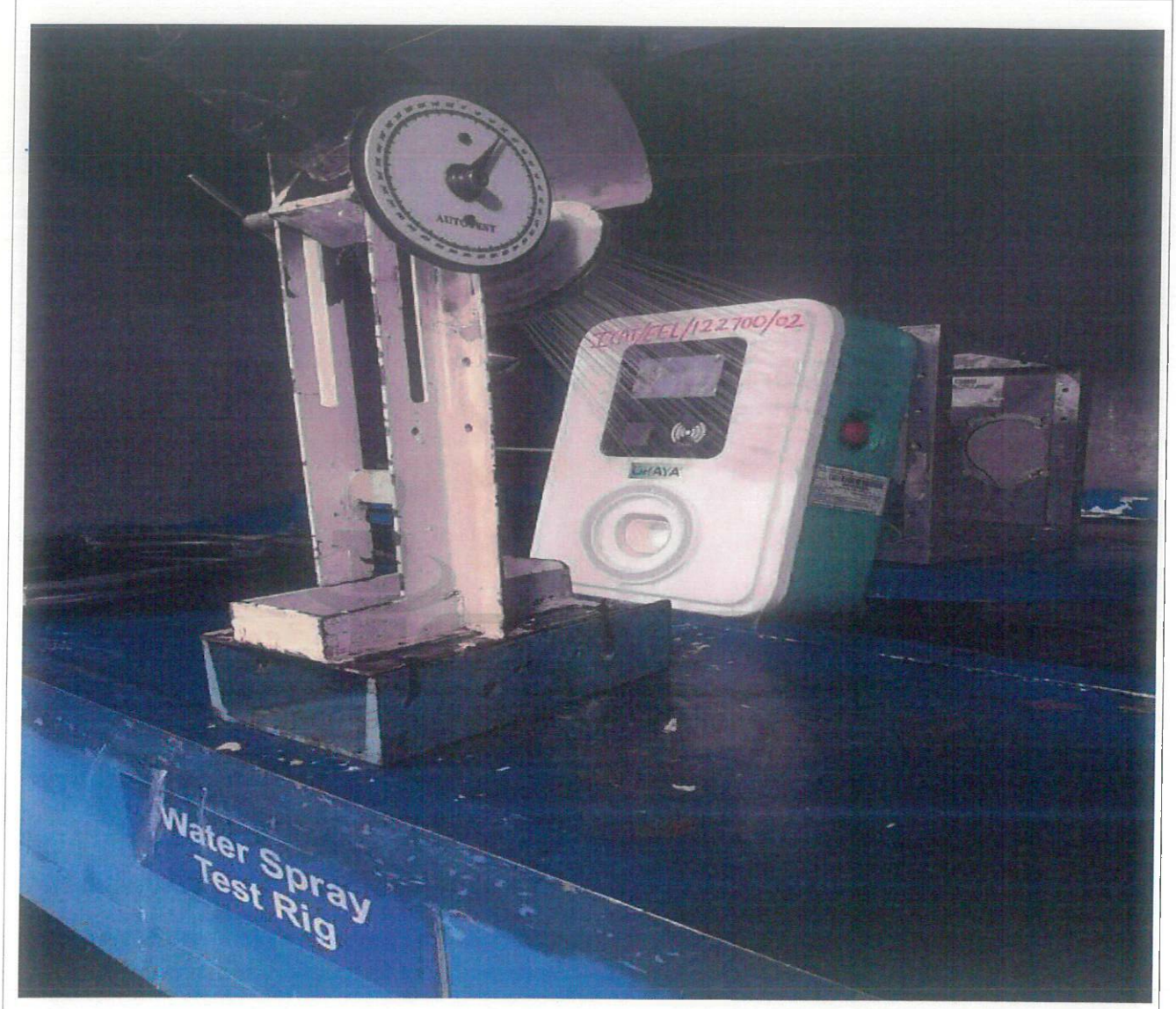


Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer	INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY * MANESAR *	DEVESH PAREEK Manager	Page 14 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

Water Test



Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer		DEVESH PAREEK Manager	Page 15 of 16 + Drawing (01 No.) [122700]

C	D	0	G	P	8	3	3	3

Date: 23.11.2020

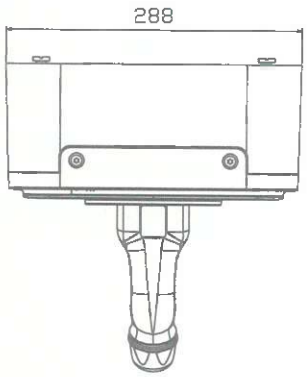
Dust Test

END OF REPORT

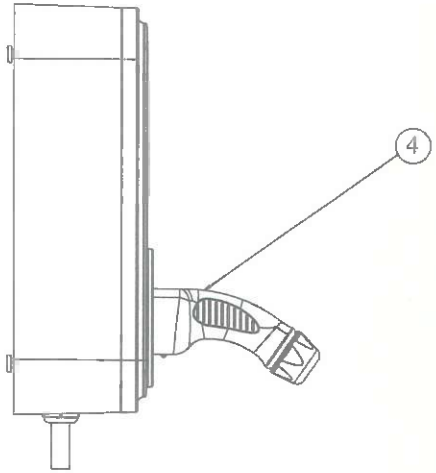
Prepared By		Checked By	
SURJEET PRAKASH Sr. Engineer		DEVESH PAREEK Manager	Page 16 of 16 + Drawing (01 No.) [122700]

S.NO.	PARTICULAR	QTY.	UOM	MATERIAL
1.	DISPLAY	01	EA	STD
2.	CARD READER	01	EA	STD
3.	CHARGER ENCLOSURE	01	EA	
4.	GUN	01	EA	STD
5.	EMERRGENCY STOP SWITCH	01	EA	STD
6.	LED	01	EA	STD

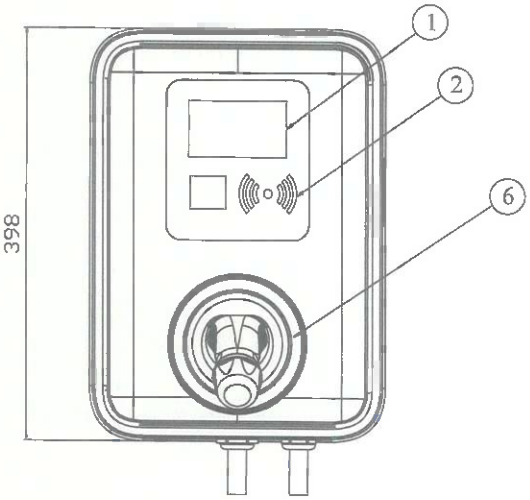
Test Report No: CDOGP8333
Date: 23.11.2020



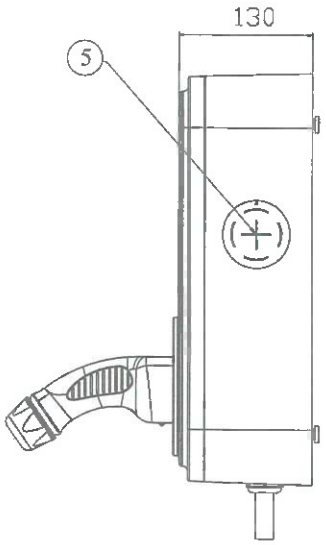
TOP-VIEW



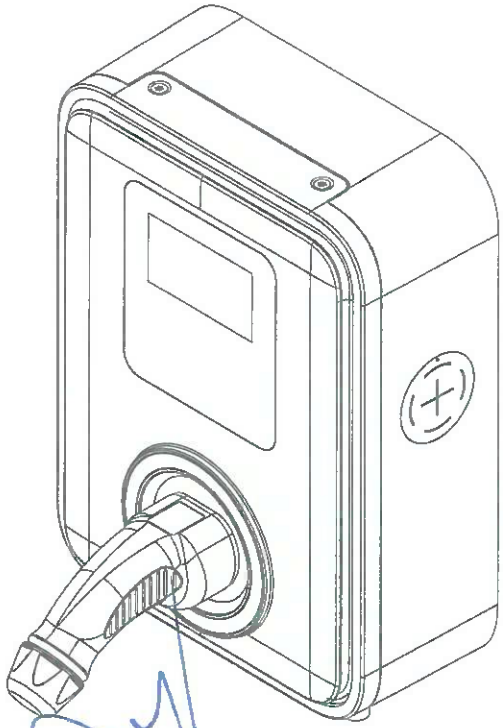
LEFT SIDE VIEW



FRONT-VIEW



RIGHT SIDE VIEW



ISOMETRIC VIEW

NOTES :-

ALL SHARP EDGE SHOULD BE REMOVED.
ALL SHARP EDGE SHOULD BE WELDED PROPERLY.
ALL DIMENSIONS ARE IN mm.

PLEASE DO NOT SCALE THE DRAWING, IF IN DOUBT, ASK.

DIMENSION	0-10	11-50	51-120	121-500	501-1000	1001-2000	2001-3150	>3150
FABRICATION (REF.IT 15)	±0.58	±1.2	±1.4	±2.8	±3.6	±6.0	±8.6	±0.3%
MACHINING REF. IT 12	±0.15	±0.3	±0.35	±0.7	±0.9	±1.5	±2.1	±0.1%

ALL ROUND WELD
FILLET WELD
SINGLE V-BUTT WELD
SPOT WELD

Grade	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
Ra µm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

Material: —
Surface: —
Unless Otherwise Stated:
Linear Tol.: ±0.2, Angular Tol.: 0°15'
Surface Finish: 0.8µm
All Dimensions:mm
Drawing Scale: NTS
Approx Weight:
Projection Method: THIRD ANGLE
Sheet Size: A0

Document Type: GAD

Legal Owner:
OKAYA
OKAYA POWER LTD.
H-19 UDYOG NAGAR, PEERAGARHI
NEW DELHI-110041

Description: 22kW EV CHARGER (AC Type-2)

Drawn by:	Drawn Date:
AV	16.10.2020
Checked/Approved by:	Checked/Approved Date:
DP	

Part Number:SAP ID/GC CODE

Drawing Number:	Sheet:	Revision:
OPG-022-1020-001	01 OF 01	00