DEWA
EV CHARGING TECHNICAL REGULATIONS

Technical Specifications and Installation Requirements for Private and Public Electric Vehicle Supply Equipment (EVSE) in the Emirate of Dubai

VERSION 1.0

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1. TERMS, ABBREVIATIONS AND DEFINITIONS

Capitalised terms used but not defined herein shall have the meaning ascribed to them in Article 1 of the EV Charging Regulation. Most of the following words and expressions used in this document are defined in the IEC 61851-1 and the most relevant for this document are the following:

No	TERMS	DEFINITIONS
1	AC EV Supply Equipment (AC EVSE)	As defined in IEC 61851-1, refers to the EV Supply Equipment that supplies alternating current to an EV
2	Charge Point	The interface or connector that serves as the access point through which electricity flows from the EV charging station to the electric vehicle's battery.
3	Charger Point Management System (CPMS)	A software platform designed to manage, monitor and optimise the operation of EV charging stations. It enables functions such as starting or stopping charging sessions and managing energy use.
4	Charging Mode 1	As defined in IEC 61851-1, refers to the method for the connection of an EV to a standard socket-outlet of an AC supply network, utilising a cable and plug, both of which are not fitted with any supplementary pilot or auxiliary contacts.
5	Charging Mode 2	As defined in IEC 61851-1, refers to the method for the connection of an EV to a standard socket-outlet of an AC supply network utilising an AC EVSE with a cable and plug, with a control pilot function and system for personal protection against electric shock placed between the standard plug and the EV.
6	Charging Mode 3	As defined in IEC 61851-1, refers to method for the connection of an EV to an AC EVSE permanently connected to an AC supply network, with a control pilot function that extends from the AC EVSE to the EV.
7	Charging Mode 4	As defined in IEC 61851-1, refers to method for the connection of an EV to an AC or DC supply network utilising a DC EVSE, with a control pilot function that extends from the DC EVSE to the EV.
8	Charging Session	Refers to the period when an electric vehicle is connected to an EV charging point.
9	Combined Charging System 2 (CCS2) connector	The IEC 62196-2 CCS2 connector utilised to charge electric vehicles with direct current (DC) for rapid charging.
10	DC EV Supply Equipment (DC EVSE)	As defined in IEC 61851-1, refers to the EVSE that supplies direct current to an EV
11	DEWA	Dubai Electricity and Water Authority PJSC
13	Electric Vehicle Supply Equipment (EVSE)	As defined in IEC 61851-1, refers to the equipment or a combination of equipment, providing dedicated functions to supply electric energy from a fixed electrical installation or supply network to an EV for the purpose of charging.
14	Electromagnetic Compatibility (EMC) Performance	Refers to the ability of electrical and electronic systems to operate without causing or being affected by electromagnetic interference (EMI) in their environment.

No	TERMS	DEFINITIONS
15	EV Charging Regulation	The Electric Vehicles Charging Infrastructure Regulation for the Emirate of Dubai issued by DEWA.
16	EV Charging Station (EVCS)	As defined in IEC 61851-1, refers to the stationary part of EVSE connected to the supply network
17	IK Rating	The rating defined by the IEC 62262, used to measure the degree of protection provided by enclosures for electrical equipment against external mechanical impacts.
18	Independent Charge Point Operator (CPO)	Any legal person other than DEWA and DEWA's subsidiaries operating public charging equipment.
19	Ingress Protection Rating (IP Rating)	The rating defined by the international standard IEC 60529, which indicates the level of protection an enclosure provides against the intrusion of solid objects and liquids.
20	International Electrotechnical Commission (IEC)	International standards organisation that prepares and publishes standards for all electrical, electronic and related technologies.
21	Moulded Case Circuit Breaker (MCCB)	An electrical protection device that automatically switches off circuits during abnormal conditions such as overloads or short circuits.
22	Private EVSE	A stationary EVSE located in a restricted-access area for the exclusive use of individuals or groups. It can be AC or DC EVSE
23	Public EVSE	A stationary EVSE accessible to the general public or any third party other than those specified in the definition of private EVSE.
24	Pulse Width Modulation (PWM)	The PWM pilot signal conveys information about the maximum charging current that the EVSE can provide to the EV to ensure that the charging process is safe and efficient. The power delivery is adjusted based on the EV's requirements and the EVSE's capabilities.
25	Radio Frequency Identification (RFID)	This technology uses electromagnetic fields to identify and track tags attached to objects automatically.
26	Residual Current Device (RCD)	An electrical safety device that disconnects a circuit when it detects an imbalance between the live and neutral conductors.
27	RFID Card	A type of contactless smart card that uses radio waves to communicate with a reader.
28	RFID Reader	A contactless device that can read RFID Cards to authenticate users and enable access to EVSE.

2. RELEVANT TECHNICAL REFERENCES, STANDARDS AND REGULATIONS

Except where modified by this DEWA EVSE Technical Specifications and Installation Requirements guide, the EVSE in Dubai shall comply with the International Electrotechnical Commission (IEC) Standards (according to their latest applicable revisions) and with the other publications listed in this section:

No	DESCRIPTION
1	BS 7671 – Requirements for Electrical Installations. IET Wiring Regulations
2	BS EN 50160:2022 – Voltage characteristics of electricity supplied by public electricity networks
3	Combined Charging System v.2 (CCS2) – Defined in IEC 62196-31, the CCS2 connector is a standard for EVSE that combines charging plug-type 2 for AC (Type-2) and DC into a single connector capable of handling up to 500 kW
4	Decision No 768/2008/EC – Decision No 768/2008/EC of the European Parliament and of the Council of 9 July 2008 on a common framework for the marketing of products
5	DEWA Regulatory Framework for Electric Vehicle Charging Infrastructure in the Emirate of Dubai and Licensing of Independent Charge Point Operators
6	DIN 43620 – Low-voltage fuses
7	Directive 2014/30/EU – Directive 2014/30/EU of the European Parliament and the Council, adopted on 26 February 2014, focuses on the electromagnetic compatibility (EMC) of electrical and electronic equipment
8	Dubai Building Code (DBC)
9	Dubai Data Law
10	EU RoHS (2002/95/EC) – Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment
11	EV Ready 1.2 – Set of standards or requirements that ensure a parking space is prepared for installing a Level 2 EVSE
12	EV Ready 1.2 standard – Electric Vehicle Supply Equipment Version 1.2
13	IEC 60364 – Electrical Installations for Buildings
14	IEC 60529 Ed. 2.2 b:2013 – Degrees of protection provided by enclosures (IP Code)
15	IEC 61000-2-2 – Electromagnetic compatibility (EMC) – Part 2-2: Environment – Compatibility levels for low-frequency conducted disturbances in public low-voltage power supply systems
16	IEC 61000-3-11 – Specifies limits for harmonic currents in industrial equipment connected to public low-voltage networks to ensure electromagnetic compatibility
17	IEC 61000-4-7 – Electromagnetic compatibility (EMC) – Part 4-7: Testing and measurement techniques – General guide on harmonics and interharmonics measurements
18	IEC 61439 standard – Low-voltage switchgear and control gear assemblies
19	IEC 61851 – Electric vehicle conductive charging systems, covering requirements for charging infrastructure and vehicle connection
20	IEC 61851-1: Electric vehicle conductive charging system – Part 1: General requirements

No	DESCRIPTION
21	IEC 61851-21-2 standard – EMC requirements for off-board electric vehicle charging systems, is used to define the emission requirements for harmonic currents, voltage fluctuations, and flicker."
22	IEC 61980 – Standard for wireless power transfer (WPT) for electric vehicles, which is under development by IEC
23	IEC 62052- 11 – Electricity metering equipment (AC) – Particular requirements – Part 11: Electromechanical meters for active energy (classes 0,5, 1 and 2)
24	IEC 62053-41 – Electricity metering equipment – Particular requirements – Part 41: Static meters for DC energy (classes 0,5 and 1)
25	IEC 62196 – Plugs, socket outlets and vehicle connectors and vehicle inlets – Conductive charging of electric vehicles
26	IEC 62196-1:2022 – Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 1: General requirements
27	IEC 62196-2:2022 – Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 2: Dimensional compatibility requirements for AC pin and contact-tube accessories
28	IEC 62196-3:2022 – Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers
29	IEC 62474:2012 – Material declaration for products of and for the electrotechnical industry
30	IEC 63584 – Specifications for the Open Charge Point Protocol version 2.0.1ed3
31	IEC TS 62196-3-1:2020 – Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 3-1: Vehicle connector, vehicle inlet and cable assembly for DC charging intended to be used with a thermal management system
32	IEEE 802-2014 – IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture, IEEE, 2014
33	ISO 12944 – Classifies environments based on their corrosivity and the durability of protective coatings
34	ISO 3166-1 alpha-2 – Two-letter country codes, which are used most prominently for the internet's country code top-level domains
35	ISO/IEC 14443 – Identification cards – Contactless integrated circuit cards – Proximity cards
36	ISO/IEC 15118 – Road vehicles – Vehicle-to-grid communication interface
37	ISO/IEC 18092:2023 – Telecommunications and information exchange between systems – Near-field Communication Interface and Protocol 1 (NFCIP-1)
38	Open Charge Point Protocol (OCPP) – IT protocol for communication between EVSE and the IT back-end of the CPO (CPMS) application. Minimum version 1.6J. The OCPP is managed by the Open Charge Alliance (OCA)

3. INTRODUCTION

The EV Charging Regulation establishes a comprehensive framework to foster the development and operation of EV charging infrastructure within the Emirate, contributing to Dubai's vision of becoming a smarter city and reducing its carbon footprint to achieve net-zero emissions by 2050. Such regulation sets the foundation for the EV Charging Technical Regulations, which establish detailed technical specifications and procedures for public and private EVSE.

This DEWA EVSE Technical Specifications guide is an integral part of the EV Charging Technical Regulations. It focuses on:

- Safety: Ensuring all EVSE meet stringent safety standards to protect users, equipment and the electrical grid.
- Compatibility: Specifications include requirements for EVSE to be compatible with various types of EVs and accommodate future technological advancements and different charging needs.
- Performance: Standards for charging speed, efficiency and reliability are established to provide EV users with a consistent, high-quality charging experience.
- User Experience: Ensuring that the EVSE is user-friendly, with clear instructions for usage, and possibly including features like remote monitoring, payment systems and user authentication.
- Technical Standards: This document follows international standards for compatibility, safety and performance of EV charging equipment to ensure it meets the necessary technical criteria for integration with electric vehicles and DEWA's distribution system.
- Installation and Maintenance: Procedures for installation, maintenance and potential upgrades to ensure the infrastructure keeps pace with evolving technology and regulatory standards.

In setting out these technical specifications, DEWA aims to promote the development a robust, safe and efficient EV charging infrastructure to support a widespread adoption of electric vehicles and contribute to the UAE's broader environmental goals.

4. EVSE DESIGN CONSIDERATIONS

The EVSE shall be designed to ensure safety, compatibility, satisfactory user experience and environmental compatibility, which includes withstanding Dubai weather conditions for EVSE located outdoors.

4.1 IEC CERTIFICATIONS

Private and public charging equipment shall comply with the IEC standard referenced in Section 2.

4.2 AMBIENT AND POWER SUPPLY CONDITIONS

The EVSE shall be capable of operating at total capacity indoors or outdoors under the conditions below without affecting the equipment's performance and safety.

- Max ambient operating temperature – 55 °C
- Relative humidity – up to 95%
- Rated voltage – 230/400V
- No of phases – 3
- Frequency – 50Hz
- LV Earthing – TN
- 3-phase short circuit (rms) – 40kA
- Duration of short circuit – 1s
- Power frequency 1 min (rms) – 3kv

Following Dubai Municipality's technical guidelines, the materials and components used shall be environmentally friendly without causing undue environmental impact.

4.3 CONNECTOR TYPES

- Public charging equipment shall be limited exclusively to AC EVSE with Type-2 connectors and DC EVSE with CCS2 connectors. The use of other connector types, including SAE J1772, Type-1, CCS1, NACS, CHAdeMO and GBT, is strictly prohibited.
- Private charging equipment for restricted use does not have restrictions on the connector type as long as the EVSE meets DEWA's electrical requirements.

4.4 CHARGING MODES

Due to safety concerns, Charging Mode 1 and 2 cables with extension cords are restricted for EV charging. Extension cables can introduce additional risks such as overheating, increased resistance and potential electrical faults. These issues can compromise the safety and reliability of the charging process, which is why their use is discouraged.

Private and public EVSE shall be exclusively equipped with Type-2 connectors and CC2 connectors for Charging Mode 3 and 4, respectively, for indoor or outdoor applications.

4.5 EMC PERFORMANCE

The EVSE shall be connected to DEWA's grid and cannot add distortion, such as harmonics or flickers. The EV chargers shall fully comply with the voltage fluctuation and flicker performance according to the IEC 61851-21-2. IEC 61851-21-2 standard: EMC requirements for off-board electric vehicle charging systems, is used to define the emission requirements for harmonic currents, voltage fluctuations, and flicker.

5. EV SUPPLY EQUIPMENT SPECIFICATIONS

The EVSE shall comply with the standards of Section 1 and the below technical requirements:

5.1 AC EV SUPPLY EQUIPMENT SPECIFICATIONS

Technical Specifications	Description	Requirements
Nominal Input	Phases/lines	1P / 3P + N + PE
	Voltage	230 Vac ± 10 %/400 Vac ± 10 %
	Frequency	50 Hz
	Input current per phase	≤64 A
	Input power	≤44 kVA
	Power factor	≥0.95
AC Nominal Output	Charge points	≤2 nos.
	Voltage	230 Vac 1P + N + PE or 400 Vac 3P + N + PE
	Maximum current	≤32 A per phase
	Nominal power	≤22 kVA per charger point
	Connector type	IEC 62196-2 Type 2
Electrical Protection	Overcurrent protection	MCCB/isolator 4-pole 30kA With current breaking capacity
	Safety protection	RCD 30 mA auto recovery (class A)
General Specifications	Charging mode	Mode 3
	Communication with EV	PWM control according to IEC61851-1
	Place of installation	Indoor/Outdoor
	Protection degree	IP54/IK10
	Sound noise	<60 dB @ 1 metre in all directions

5.2 DC EV SUPPLY EQUIPMENT SPECIFICATIONS

Technical Specifications	Description	Requirements
Nominal Input	Phases/Lines	3P + N + PE
	Voltage	400 Vac ± 10 %
	Frequency	50 Hz
	Input current per phase	≤500
	Input power	>50 kVA
	Power factor	≥0.95
	Efficiency	≥95%
DC Nominal Output	Charge points	≥1 nos.
	Voltage	50 Vdc to 1,000 Vdc
	Maximum current	500 A
	Nominal power	≤500 kW
	Connector type	IEC-62196-3 CCS2 type
Electrical Protection	Overcurrent protection	MCCB/isolator 4-pole 30kA With current breaking capacity
	Safety protection	RCD 30 mA auto recovery (class A)
General Specifications	Charging Mode	Mode 4
	Communication with EV	PWM control according to IEC61851-1
	Place of Installation	Indoor/Outdoor
	Protection degree	IP54/IK10
	Sound noise	<60 dB @ 1 metre in all directions

6. ADDITIONAL TECHNICAL REQUIREMENTS FOR PUBLIC EVSE WITH PAID SERVICE

In addition to the above-mentioned technical specifications, the following additional technical requirements shall apply for AC and DC EVSE while providing paid services:

6.1 EVSE IDENTIFICATION - UNIQUE CHARGE POINT IDENTIFICATION (EVSE-ID)

The Electric Vehicle Supply Equipment Identifier (EVSE-ID) is a unique identifier assigned to each EVSE's Charge Points following the same structure used across Europe based on ISO 15118-2:2014 and eMI3 standards. This identification number must correspond with the one submitted during the licence application and shall be visible externally. The structure of the EVSE-ID includes:

	part one				part two	
Issued by:	**ID Registration Organisation in Dubai (DEWA)**				**CPO**	
Description	Country Code	Separator	Operator ID	Separator	ID Type	Charge point ID
Example	AE	"*"	DEW	"*"	E	2542AX8769
Explanation	2 characters (alphanumeric)	optional	3 characters (alphanumeric)	optional	1 character type identifier:	Up to 30 characters (alphanumeric)
Characters Allowed	as per ISO 3166-1 alpha-2 code	[*]	[A-Z ; 0-9]	[*]	E for EVSE	[A-Z ; a-z ; 0-9]
No. Characters = 18	2	1	3	1		Max 30

Mandatory fields

6.1.1 EVSE-ID – PART ONE:

- Country Code: A two-character ISO 3166-1 alpha-2 code representing the country where the charging station is located. As per ISO 3166-1 alpha-2, United Arab Emirates has the code "AE".
- Operator ID: A three-character alphanumeric code uniquely identifying the Charge Point Operator (CPO). DEWA reserves the right to manage and assign a unique identifier for the CPOs in Dubai.

6.1.2 EVSE-ID – PART TWO:

- ID Type: A single character, such as "E", that identifies each EVSE's Charge Point.
- Charge Point ID: Up to 30 alphanumeric characters uniquely identifying the specific EVSE's Charger Point within the operator's network.

6.2 EQUIPMENT NAMEPLATE

An indelibly engraved aluminium or stainless-steel nameplate shall be provided and the information on the nameplate should be legible and visible throughout the charger's lifetime. Additionally, an identical extra nameplate shall be fixed inside the chargers.

A nameplate shall be fixed to the charging station displaying the information not limited to:

- CPO's name
- CPO's service-desk contact details
- Manufacturer's name and model
- Rated voltage in V
- Rated frequency in Hz
- Rated current in A
- Number of phases

6.3 EVSE CHARGING SESSION INFORMATION

The EVSE should provide users with the status of the ongoing charging session and the energy consumed in kWh during the session:

- Via EVSE display
- Via CPO's app
- Integrated within the EV
- Via an alternative solution

6.4 EVSE INTERNAL ENERGY METERS METROLOGY

For Internal EVSE AC Energy Meters:

a. The Energy Meters shall be certified as per IEC 62052- 11
b. Accuracy class in Active Energy as per IEC 62053:
    - For Direct connection meters: Class 1
    - For LV CT meter: Class 0.5s
    - For HV CT/VT meters: Class 0.2s
c. Accuracy class in Reactive Energy as per IEC 62052- 11: Class 2

For Internal EVSE DC Energy Meters:

a. The Energy Meters shall be certified as per 62053-41
b. Accuracy class in Active Energy as per IEC 62053-41: For direct connection meters: Class 1

6.5 CHARGING SESSIONS AUTHORISATION METHODOLOGIES

The EVSE shall be provided with at least one of the following charging session authorisation methodologies:

- RFID System ISO / IEC14443A/B
- QR code
- CPO's app
- Plug & Charge (ISO 15118)

6.6 REQUIREMENTS FOR CPMS INTEGRATION AND COMPATIBILITY

The EVSE must be compatible with the Charge Point Management System (CPMS) implemented by the CPO, including its features and functionalities. The EVSE will report directly to the CPMS using secure communication through the OCPP protocol.

6.7 OCPP INTEROPERABILITY

Where applicable, the EVSE shall fully support OCPP 1.6J, at a minimum level, or a higher version and communicate with the CPMS using the same protocols.

6.8 DATA PROTECTION

EVSE shall be designed to protect users' data and follow Dubai Data Law guidelines.

7. INSTALLATION REQUIREMENTS

7.1 IET CODE OF PRACTICE

The EVSE must be installed according to the current edition of the IET Code of Practice (CP) for Electric Vehicle Charging Equipment Installations, the IET Wiring Regulations (BS 7671) and all other applicable standards.

7.2 DEWA SMART ELECTRICITY METER

During the design and installation of public charging equipment providing paid services, all EVSE shall have provision for a DEWA smart electricity meter. DEWA bills will be based on the energy consumed by the unit. The design and installation shall be according to G.4 on the "design erection and installation of electrical systems" stipulated in DBC.

7.3 INSTALLATION, TESTING & COMMISSIONING ASSISTANCE

The EVSE manufacturer shall train and certify the local representative/vendor technical team for the installation and maintenance of the EVSE, including civil works, mechanical installation, electrical installation and configuration, and conduct any other training required for installation and maintenance.

The EVSE manufacturer is responsible for providing precise and detailed installation instructions covering storage, transport, installation, commissioning, operation and maintenance of all supplied equipment.

The certified installation contractor is expected to handle the site-related design, installation and equipment commissioning, with oversight from the original equipment manufacturer. The manufacturer should review the electrical and civil designs to ensure compliance with operational requirements and perform a quality assurance inspection of the installed equipment. A qualified resource should also be available for training during the commissioning phase.

The contractor/consultant, on behalf of the EVSE owner, shall undertake to dispose of the debris associated with the construction and installation of the EVSE according to the regulations established in the Emirate of Dubai for such matters.

Installation should be done in a way that minimises disruption to the existing visual, architectural and structural integrity of the location following – but not limited to – the below procedure:

- Regulations for civil works and layout for EV charger station locations: As per sections "G.1 Performance statements", "G.2 Definitions", "G.3 References" and "G.4 on the design, erection and installation of electrical systems" in DBC.
- Regulation for electrical installations for EV charger stations: As per "G.5 Electric vehicle (EV) charge points" in DBC.
- To initiate the electric connection process, approach any DEWA enrolled consultants/contractors.
- Apply for a Building No-Objection Certificate for electricity in line with DEWA's procedures.
- Apply for an electricity connections as per DEWA's procedures.

7.4 ENVIRONMENTAL DESIGN AND HAZARDOUS SUBSTANCES MATERIAL HAZARDOUS SUBSTANCES

The EVSE owner should ensure that all substances classified as hazardous to health (e.g. carcinogens, toxic, radioactive, dermatitis-inducing) or to the environment (e.g. those that contribute to global warming, ozone depletion and water pollution) are managed according to the rules and procedures for the proper management of hazardous substances outlined in the "Code of Practice for the Management of Dangerous Goods in the Emirate of Dubai".

Hazardous substances used in the construction of the EVSE shall be classified according to the Code of Practice for the Management of Dangerous Goods in the Emirate of Dubai.

7.5 HAZARDOUS SUBSTANCES DISPOSAL

Suppose an EVSE manufacturer contains undeclared hazardous substances. In that case, the contractor/ consultant, on behalf of the EVSE owner, shall undertake to dispose of these dangerous substances at their own expense, following the proper management of hazardous substances outlined in the "Code of Practice for the Management of Dangerous Goods in the Emirate of Dubai".