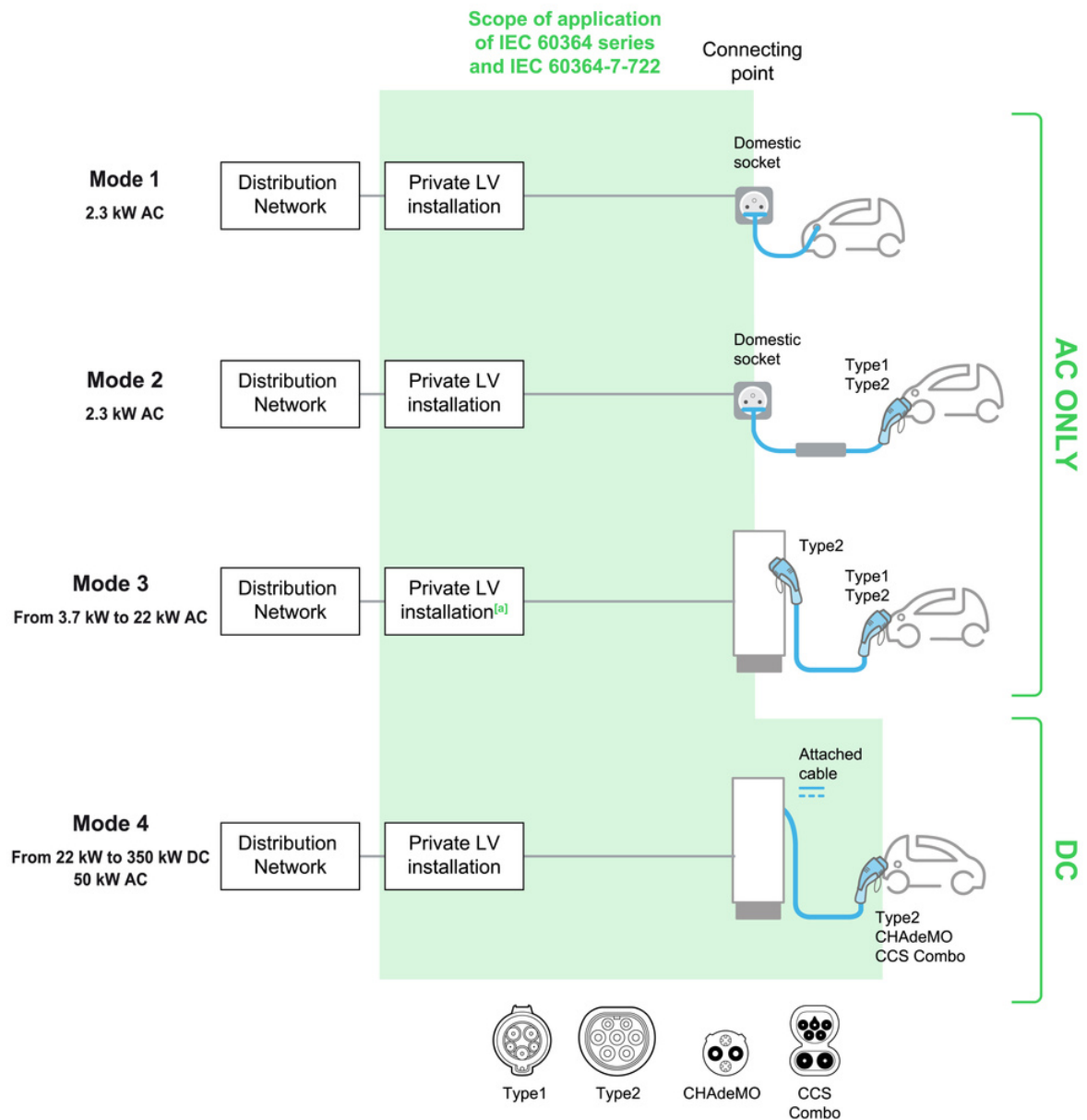


ELECTRIC

VEHICLE CHARGING GUIDE

A PRIMER FOR EV CHARGING ENTHUSIASTS, PROFESSIONALS AND BUSINESS PEOPLE



Electric Vehicle Charging Guide

**A primer for EV charging enthusiasts, professionals and
business people**

Trends, fundamentals (charging modes, charging time ...), design and characteristics of EV charging stations, integration of Electric Vehicle Supply Equipment (EVSE) into existing or new building electrical installations (sizing and protection rules, architecture guidelines and examples). And digital architectures (load management systems, advanced AI-based analytics, smart charging ...) to optimize the usage and efficiency of EV charging infrastructure)

Table of Contents

Chapter 1-Electric Vehicle Trends	1
1.1 Planetwide sustainability and environmental concerns.....	1
1.2 Government regulation and incentives in the European Union.....	2
1.3 Electric vehicle: Fast growth.....	3
1.4 Electric vehicle charging infrastructure: also growing fast	6
Chapter 2-Electric Vehicle and EV Charging Fundamentals.....	7
2.1 The different types of electric vehicles	7
2.2 How do electric vehicles work?.....	11
2.3 Electric vehicle connectors.....	12
2.4 Electric vehicle charging modes.....	14
2.5 How Long Does It Take to Charge an Electric Car?	18
2.6 Electric vehicle charging location.....	19
2.7 Charging modes - synthesis.....	22
Chapter 3-EV Charging Station Design	23
3.1 Charging station design – IEC standards	23
3.2 Charging station design - Mode 3 and Mode 4 common characteristics	23
3.3 Mode 3 charging station design.....	25
3.4 Mode 4 Fast Charging Station Design	26
Chapter 4-EV charging - Electrical Installation Design.	27
4.1 Impact of EV charging on maximum power demand and equipment sizing	28
4.2 Conductor arrangement and earthing systems.....	29
4.3 Protection against electric shocks	29
4.4 Protection against transient overvoltages.....	36
Chapter 5-EV charging - Electrical Architectures.....	41
5.1 Integration of EV supply equipment into an existing installation	41
5.2 Examples of EV charging installations	43
Chapter 6-EV Charging-Energy and Asset Management.....	51
6.1 EV charging Energy Management.....	51
6.2 EVSE Asset Management	58
Chapter 7-Smart charging perspectives for optimal EV integration	63
7.1 Defining smart charging.....	63
7.2 Advanced smart charging: V1G, V2x options.....	63
7.3 Value of smart charging	65
7.4 Strong barriers to smart charging	65

7.5 How soon will smart charging happen? 66