
ABB E-MOBILITY

A guide to Electric Vehicle charge point regulations



At ABB, we have 130 years of heritage in accessible technology leadership and a world-leading AC and DC charging portfolio – for safe, smart and sustainable mobility.

That's why some of the world's biggest brands trust us to provide market-leading e-mobility solutions from highway to home.

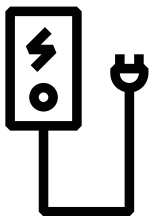
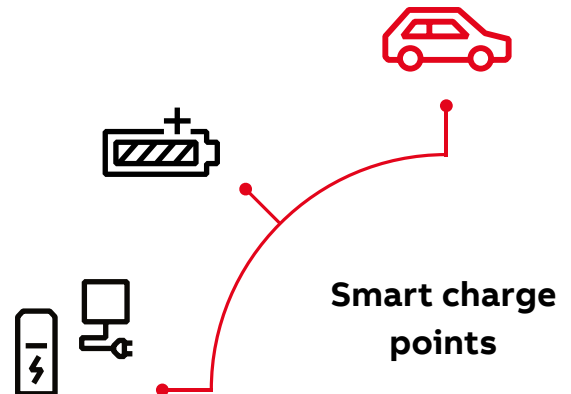
ABB: The home of charging

Smart charge points

Introduction

The EV charging market is evolving and there are now over three quarters of a million full Battery Electric Vehicles (BEVs) on the UK's roads (over 1.2 million when Plug-in Hybrid Electric Vehicles (PHEVs) are factored in).*

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* Source SMMT,
April 2023



Public charging sites are being built at a rapid pace and existing sites with old hardware are being renewed. It is also important that there is an increased access to destination chargers, whether at home or the workplace.

Why have the EV regulations been updated?

To support the UK in reaching its net-zero target, the changes in EV legislation are aimed at accelerating the development of charging infrastructure.

Not only do the regulations cover the increasing number of charge points being installed, but they also aim to minimise the impact of increased demand on the grid, caused by the larger numbers of installed chargers.

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**Schedule 1 security
requirements came
into effect on 30th
December 2022

What do the regulations now cover?

There are two elements to the new regulations:

- **Building Regulations**
 - **Part S of the Building Regulations** was published on 15th December 2021, taking effect on 15th June 2022 (England only)
or;
 - **Part 7 of Scotland's building regulations**, covering EV charging, came into effect on 5th June 2023.
- **Electric Vehicles (Smart Charge Points) Regulations 2021**, taking effect on 30th June 2022** (Great Britain Only)

The following pages provide an overview to both sets of regulations.

Building regulations

Part S (England only)

Part S of the Building Regulations was published on 15th December 2021, taking effect on 15th June 2022.



New residential buildings

For new builds, **Part S1** sets out the following requirements:

- a) A new residential building with associated parking must have a charger provided for each parking space associated with a dwelling.
- b) Where the number of parking spaces exceeds the number of dwellings, and there are more than ten spaces in total, a charger should be installed in each space associated with a dwelling and cable routes must be provided to the other spaces, to allow additional chargers to be easily installed at a later date.

Building Regulations are the remit of the devolved administrations in each of the home nations and so these regulations only apply in England. Although the requirements for residential buildings in Scotland are much the same as in England, for non-residential they will go further, with chargers installed in 10% of spaces and cable ways for 50% of spaces (if there are more than ten spaces in total). There is also a requirement for existing non-residential buildings with more than 20 spaces to do the same by 1st January 2025.

It is expected that Wales and Northern Ireland will announce their own changes in due course.

Part S applies to new residential and non-residential buildings, and to existing buildings undergoing major renovation.

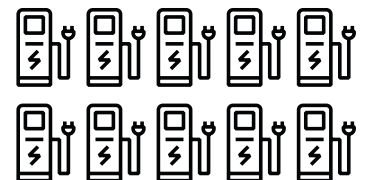
Example

A new block of **ten flats** is built, each flat having its own parking space. There are also **two** spaces for visitors. To meet building regulations, **ten chargers must be installed** (one for each flat), with cable routes provided for the visitors' spaces.



Block of **x10** flats

x10 chargers

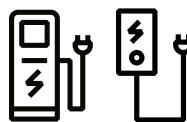


x2 visitor spaces



New non-residential buildings

New non-residential buildings and existing ones undergoing major renovation, which also have at least ten parking spaces, must have at least one charger installed, with cable routes installed to cover at least 20% of the remaining spaces.



Product requirements

In addition to setting out when and how many EV charge points need to be installed, **Part S** states that each charge point should meet all of the following requirements:

- Be designed and installed to BS EN 61851.
- Have a minimum output rating of 7kW.
- Be fitted with a universal socket (also known as an untethered electric vehicle charge point).
- Be fitted with an indicator to show the charging status.
- Be a minimum of a Mode 3 running from a dedicated circuit.
- The requirements of BS 7671.
- The requirements in the IET's Code of Practice: Electric Vehicle Charging

Example

An office block with **20 parking spaces** is built. To comply with building regulations, **one charger** must be installed, with cable routes provided for a further **four** spaces.



Office

x1 charger **x20** parking spaces

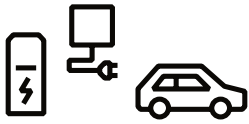


x4 visitor spaces

Smart charging legislation

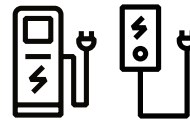
(Great Britain only)

Another big change for the EV charging industry in Great Britain (but not Northern Ireland) are the **Electric Vehicles (Smart Charge Points) Regulations 2021**, which apply to chargers sold on or after 30th June 2022 (except for the Schedule 1 security requirements, which came into effect on 30th December 2022).



These regulations apply to charge points used to charge cars, vans or both, except:

- a) Non-smart cables
- b) Public charge points
- c) Rapid charge points (50 kW and above)



A relevant charge point is deemed as smart, as long as it does all of the following:

- a) it is able to send and receive information via a communications network;
- b) it is able to respond to signals or other information received by it by:
 - i) increasing or decreasing the rate of electricity flowing through the charge point;
 - ii) changing the time at which electricity flows through the charge point;
- c) it is capable of using this functionality to provide demand side response services, including response DSR services; and
- d) has at least one user interface, which enables the charge point to be operated in accordance with these Regulations.





Schedule 1 Security



Chargers with smart functionality have been on the market for some time now, but the two major changes this legislation brings are designed to prevent chargers from operating at peak times. When they are commissioned, the charge point shall be set up to not charge during default peak times, which are 8–11 AM and 4–10 PM Monday to Friday. Furthermore, each charging session must begin with a randomised delayed start of up to ten minutes.

The owner of the charge point is allowed to edit or remove these peak times to suit their own needs, such as using energy generated from their own solar panels to charge the vehicle. However, while the randomised delay can be overridden for individual charging sessions, it can't be permanently removed.

Requirements for sellers

Crucially, the smart charging legislation places obligations on sellers of relevant charge points. For each sale, a statement of compliance, listing the specific part codes relevant to that order. The seller must also keep a record of sales for a period of ten years and, on request, provide a technical file.

These requirements apply each time a charger is sold, for example when a manufacturer sells a charge point to a wholesaler and again, when the wholesaler sells that charge point to an installer. More information about the legislation and requirements can be found on the government's website.

The **Schedule 1** Security requirements of the smart charging regulations came into effect on 30th December 2022. Chargers sold since then need to protect the personal data of the owner and users of the charge point, and also against the risk of harm or disruption of the charger or the electricity system.

The owner of the charge point must be notified about available software updates and the charger must provide an adequate level of protection against physical damage to the charge point.



Safety & security

This includes a **tamper protection** boundary to protect the internal components of the charger. The owner will be notified if the tamper protection boundary is breached and / or security sensitive components have been accessed.



With connectivity and smart functionality, the Terra AC wallbox is built to adapt to deliver the most optimised charge today and into the future.



Terra AC wallbox

Supporting a growing market

Reducing cost of EVs

EVs will be cheaper than internal combustion engine (ICE) alternatives by the mid-to-late 2020s **in almost every market**

Global EV sales

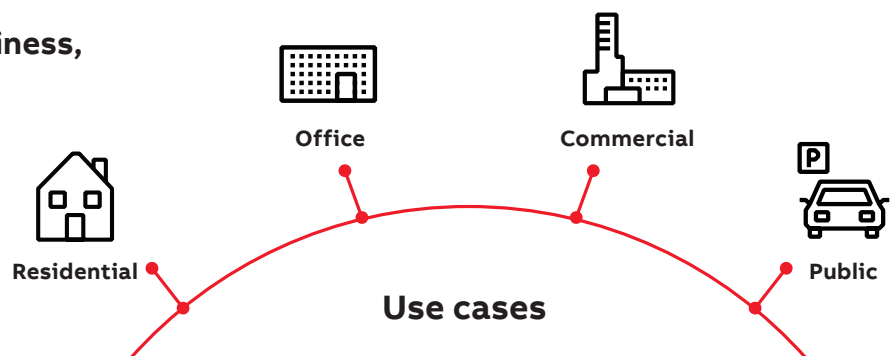
Electric vehicles will represent **57% of global** passenger **car sales by 2040**



Passenger EV sales

Passenger EV sales will rise to **28 million** in **2030** and **56 million** by **2040**

Terra AC wallbox provides tailored, intelligent and networked charging solutions for any business, home or location.



At home

From private homes to multi-tenant homes and residential communities

At work

From small offices to large offices, business parks and complexes

Commercial locations

From hotels to sports institutions and shopping centres

While parking

While on the street or in a car park

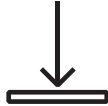
Terra AC wallbox

The benefits

High-value quality



The **best value AC charger** on the market, providing the exceptional quality expected of the world leader in EV charging.



Enabled for **remote software updates** to ensure optimal performance while minimising the need for onsite intervention.



Broad range of connectivity options
Including Wi-Fi, Bluetooth® and Ethernet for easy control and integration with existing infrastructure.

Futureproof flexibility



Smart functionality means the wallbox can adapt its power usage and provide optimal charging, today and into the future.



Set up for **energy meter integration** to provide dynamic load management, reducing energy costs and preventing nuisance tripping of distribution protective devices.



Dedicated ChargerSync™ app provides easy authentication and control of the AC charger, along with valuable insights for the charger owner and users.

Safety and protection



Evaluated and tested to the highest standards by independent, third party safety certification organisations.



Current limiting protection allows maximum charging power without nuisance tripping, aligned with the design of a given building's electrical distribution system.



Integrated protections including DC ground fault and over voltage protect both user and car.

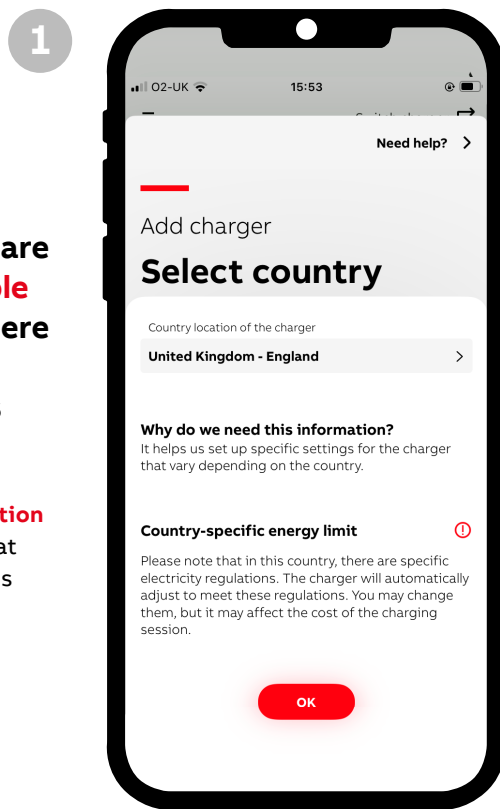
Terra AC wallbox

Installation and commissioning

Commissioning of the ABB Terra AC chargers is done using our Terra Config app. This takes the installer through the **steps** needed to achieve compliance with smart charging legislation. The charge point owner uses our Charger Sync app to operate the unit.

The chargers are sold in **multiple countries**, where different requirements might apply.

The **country detection** feature ensures that the correct settings are applied.



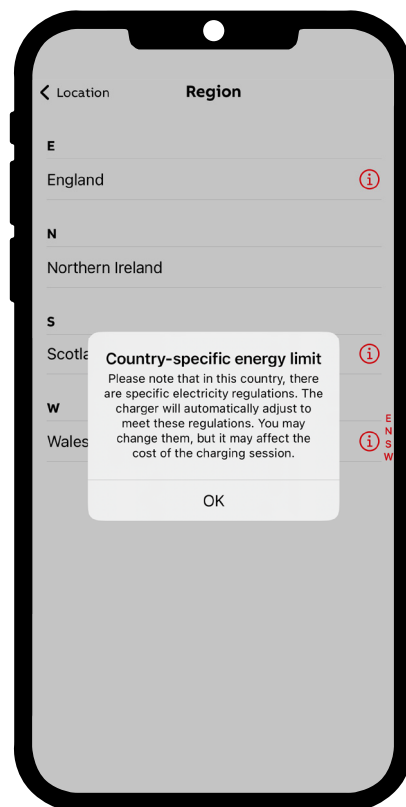
Mobile
ChargerSync™ app

Smarter by design

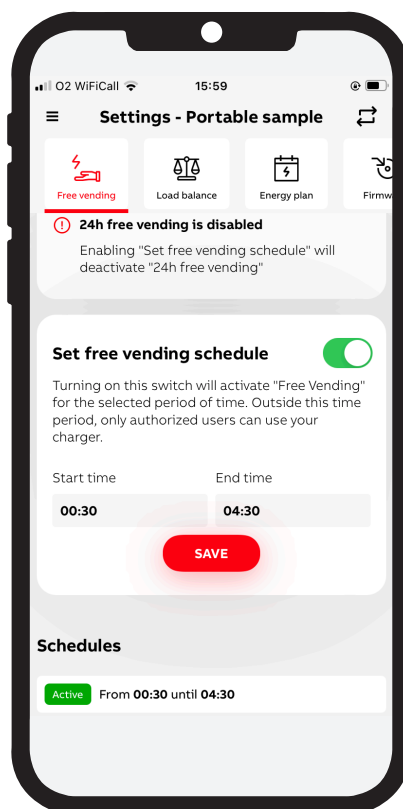
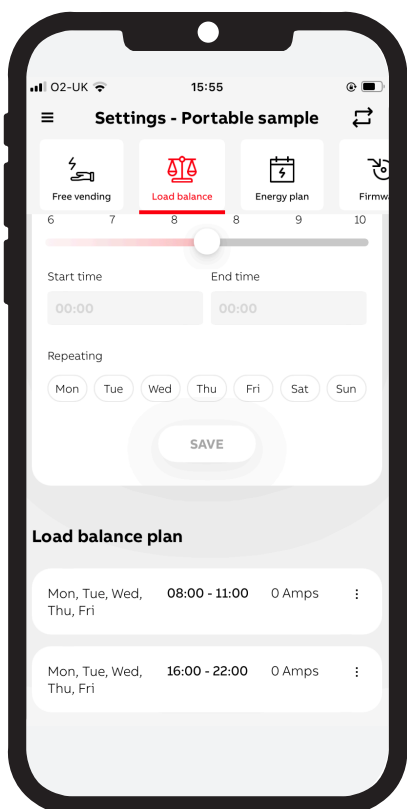
- The App allows streamlined charger configuration
- Ready for integration with advanced smart building energy system
- Simple software updates via the App makes the charger future-ready

With the user in mind

- Enables users to authenticate their charger via the App or RFID card. Configuration is easily done via the App or ABB web portal
- Sends charging status via the App
- Provides information about the status of chargers (availability, number of sessions, energy delivery)



2

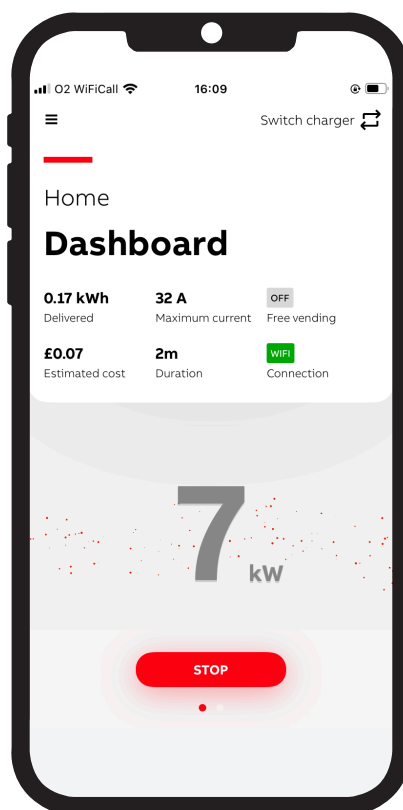
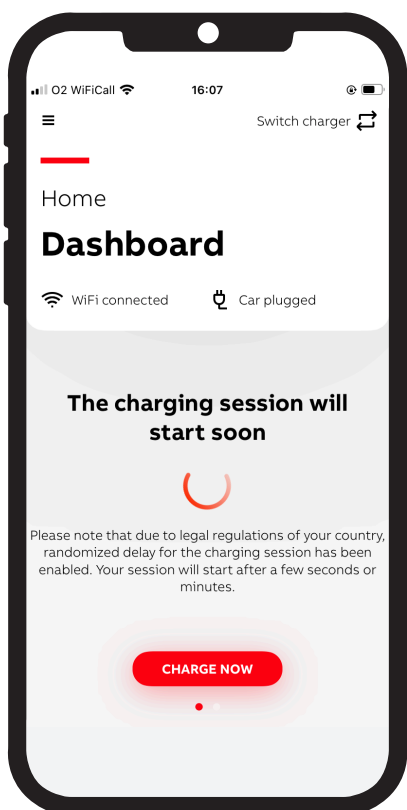


The user can also make **changes** to the default schedule, should they desire and/or take advantage of cheaper energy rates by scheduling a free vending session.



Schedules

3



For each charging session, progress can be **monitored**.

In the screenshot on the left, the session has not yet started, due to the randomised delay. The user can **override** this by pressing the change now button.



Monitoring

Terra AC wallbox

IEC portfolio

IEC portfolio

AC charger for electric vehicles, type 2

Power supply network: 220 ... 240 V single phase and 380 ... 415 V three phase, 50 / 60 Hz

	Rated power (kW)	Max. current (A)	Socket outlet or connector type	Other features	Type	Order Code	Weight Pkg (1pce) (kg)
	7.4	32	Socket, type 2	–	Terra AC W7-T-0	ABB6AGC081278	3
			Socket, type 2	RFID	Terra AC W7-T-R-0	ABB6AGC085382	3
			Socket, type 2	RFID, 4G	Terra AC W7-T-R-C-0	ABB6AGC085383	3
	Single phase with display and MID certification						
Terra AC W7-T-0	7.4	32	Socket, type 2	RFID, 4G, daisy-chain ethernet	Terra AC W7-T-RD-MC-0	ABB6AGC082174	3
	22	32	Socket, type 2	–	Terra AC W22-T-0	ABB6AGC081279	3
			Socket, type 2	RFID	Terra AC W22-T-R-0	ABB6AGC082152	3
			Socket, type 2	RFID, 4G	Terra AC W22-T-R-C-0	ABB6AGC082153	3
	Three phase with display and MID certification						
Terra AC W22-T-RD-M-0	22	32	Socket, type 2	RFID, daisy-chain ethernet	Terra AC W22-T-RD-M-0	ABB6AGC081280	3
			Socket, type 2	RFID, 4G, daisy-chain ethernet	Terra AC W22-T-RD-MC-0	ABB6AGC081281	3

Terra AC W7-T-0

Terra AC W22-T-RD-M-0

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Accessories

Pedestal	Current (A)	Type	Order code	Weight Pkg (1pce) (kg)
For floor standing installation				
Metal pedestal for 1 charger, free-standing	–	TAC pedestal single	ABB6AGC085345	9.12
Metal pedestal for 2 charger, back to back free-standing	–	TAC pedestal back to back	ABB6AGC085684	11
Metal pedestal for 2 charger, back to back free-standing IP54 rated for housing DIN rail components	–	TAC-P 1-2 rectangular	ABB6AGC082326	15.61
RFID card (MIFARE)				
RFID cards with ABB logo, pack of 5	–	SER-abbRFIDtags	ABB6AGC082175	0.07
RFID cards, blank, pack of 5	–	SER-blankRFIDtags	ABB6AGC082176	0.07
Charge cables				
Length: 7 m				
Cables with 2 connectors of same or different types				
Single phase				
Type 2 to type 2	32	TAC-cable T2-T2 7m1P32A	ABB6AGC082535	2.95
Type 2 to type 1	32	TAC-cable T2-T1 7m1P32A	ABB6AGC082539	3.77
Three phase				
Type 2 to type 2	32	TAC-cable T2-T2 7m3P32A	ABB6AGC082537	4.18
Spare parts				
Water and dust proofing set for cable entries including 1 * 32 mm and 2 * 25 mm grommets	–	SER-Grommet	ABB6AGC085387	0.04
Front cover (non-display), 2 screws included	–	SER-Front cover (non-display)	ABB6AGC085388	1.50
Maintenance cover, internal (non-display), 6 screws included	–	SER-Maintenance cover (non-display)	ABB6AGC085389	1.50
Warranty				
Total warranty time of 4 years (standard warranty 2 years + 2 years)		TAC extended warranty 4 yr	ABB6AGC084054	–
Total warranty time of 5 years (standard warranty 2 years + 3 years)		TAC extended warranty 5 yr	ABB6AGC084055	–

Terra AC wallbox

Technical specification

Product information	
Charging type	Mode 3 charging, level 2
Input/output power rating and current	IEC ratings: Single phase up to 7.4 kW / 32 A Three phase up to 22 kW / 32 A UL ratings up to 7.7 kW / 32 A
Input/output voltage	Single phase: 110 ... 240 V Three phase: 380 ... 415 V, 50 / 60 Hz
Network type	TT, TN
Socket outlet or connector type	Type 2 socket with or without shutter Type 1 or type 2 cable. Cable can be wrapped around the charger
Protection	Overcurrent, overvoltage, undervoltage, ground fault including DC residual current protection, integrated surge protection
Overvoltage category	III
Energy metering	Revenue grade energy meter Class B (+/- 1%) , MID certification on display variants only
Mobile communication with nano SIM socket	EU: GSM, 4G, LTE, WCDMA US: 4G, LTE, WCDMA
Available configurable contacts	1 input, 1 output
User Interface	
Connectivity	Wi-Fi, Ethernet (RJ45), Bluetooth, RS485, 4G / 3G
User authentication	ABB RFID card (1 included) or App
User interface	App, ABB web portal
Communication protocols	OCPP 1.6 and RS485 for energy meter connection
Status indication	5 LED's
Configuration	
Software update	OCPP 1.6, ABB web portal or App
Control and configuration	ABB web portal or App
General characteristics	
IP and IK rating	IP54, IK10 (IK8+ for operating temperature from -35 to -30 °C)
NEMA enclosure type	NEMA 3
Operating altitude	2000 m
Operating temperature range	-35...+50 °C (derating may apply)
Storage temperature range	-40...+80 °C
Mounting	Wall or floor using a pedestal
Dimensions	H x W x D 320 x 195 x 110 mm
	H x W x D 12.60 x 7.68 x 4.33 inches
Certification and standards	
Protection	IEC/EN 61851-1, EN 62311, EN 62479, IEC/EN 62955 TuV listed conforming to UL 2594, UL 2231-1, UL 2231-2, UL 1998, CSA C22.2. NO.280
Codes and standards	IEC 61851-21-2, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12 CE RED- WLAN / RFID / E-UTRA: EN 300 328 V2.1.1, EN 300 330 V2.1.1, EN 301 908-1 V11.1.2, EN 301 908-13 EN 50470-1, EN 50470-3 FCC Part 15 Class B ENERGY STAR
Certification	CE, CB, MID, UL
Warranty	36 months



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