

PC1

Charging Station Datasheet

Revision: 4.3

WARNING	Risk of injury or death! Installation or servicing of the charging station must be carried out only by adequately qualified or authorized personnel and according to the local laws and regulations.
WARNING	Risk of injury or death! Ensure the power cables are not live during the installation or servicing and adequate measures are taken so that they do not become live when not intended.
WARNING	Wear long gloves for hand protection as the internal components of the charging station may contain relatively sharp edges.
WARNING	Use adequate tools throughout the installation or servicing procedures to avoid injury or damage to the charging station.
WARNING	Use correct lifting techniques to prevent muscle strain or back injury during the installation.
WARNING	Wear safety boots for feet protection during the installation procedure.
WARNING	The charging station is fitted with internal RCDs that must be tested regularly according to the local laws and regulations, but not less frequently than once a year.
WARNING	Do not install or use the charging station if it is damaged.
WARNING	The sizes of power supply conductor presented here reflect the specification of the charger only and must be sized according to the local requirements and regulations, depending on various parameters of the installation site.
DISCLAIMER	Inbalance grid reserves the right to change this document without prior notice.

Intended Use

Inbalance PC1 charging station is an AC electric vehicle supply equipment, intended to be used for electric vehicle charging. The charging station can be used indoor as well as outdoor, in residential, commercial, and light-industrial environments. It is a stationary equipment.

The charging station is intended for electric vehicle charging only and must not be used for any other purposes.

Features

- Non-intrusive, minimalistic design
- Two socket-outlets, each capable of Mode 3 AC Charging at 22kW
- Fully flexible load balancing controlled by software that supports static, dynamic or BMS level load balancing
- Enhanced safety through continuous output voltage monitoring (detects contact welding)
- Integrated mini-UPS: unlocks charging cables and messages the cloud upon power down
- Integrated MID-certified energy meters
- Integrated IEC62955 compliant Residual current devices with 6mA DC detection
- Double input terminal blocks allow daisy chain connection of the charging stations without external junction boxes
- Overheat protection and condensation prevention by an advanced thermal control system
- Ethernet as well as optional 4G internet connectivities
- Fast installation with multiple ground fixture options
- OCPP protocol
- IK10, IP54 rated
- Optional NFC / RFID reader
- Optional 5" screen for ad hoc charging using dynamic QR code
- Optional Payment Terminal for ad hoc charging (card reader); supported are both local (through OCPP) as well as cloud-controlled (via payment vendor API or similar) Terminal integrations

PC1 Charger Specification

Inbalance grid PC1 is a public-oriented AC electric vehicle charger, designed to work either as a stand-alone device or be controlled by cloud solutions, using OCPP protocol. The summary of its technical specification is given below:

CHARGER CLASSIFICATION (IEC 61851)	
Supply network type	AC
Power output type	AC
Electric connection method	Permanently connected (no plug)
Environmental classification	Outdoor as well as indoor use
Special environmental conditions	N/A
Access classification	Locations with non-restricted access
Mounting method	Stationary: floor or ground mounted
Indoor charging ventilation control	Not supported
CHARGING SPECIFICATION	
EVSE type	Mode 3
No. of connection points	2
Maximum charging power	2 x 22 kW ^a
Maximum charging current	32 A ^a per socket
Type of EV connection	Case A and B (socket-outlet on charger)
Socket outlet type	Type 2, IEC 62196-2 with a cable locking and a closing lid
Load balancing	Supports static, dynamic or BMS level load balancing through ethernet/LTE connection ^b
Phase load balancing	Socket 1 outlet: Ph1, Ph2, Ph3 Socket 2 outlet: Ph2, Ph3, Ph1
ELECTRICAL SAFETY	
Protection against electric shock	Class 1 (Earthed metal enclosure)
Integrated residual current devices	30 mA + 6 mA DC, IEC 62955 compliant
Relay weld monitoring type	Optocouple based outlet voltage monitoring
Overcurrent protection	32 A rated, IEC 60269 compliant
METERING ACCURACY	
Active energy accuracy	Class 1 (EN 62053-21)
Reactive energy accuracy	Class 2 (EN 62053-23)
MID energy accuracy class	Class B (EN 50470)
POWER INPUT SPECIFICATION	
Rated voltage	230/400 V, 50 Hz
Overvoltage category	Cat III (max 4 kV)
Maximum input current	64 A
Power input terminals	PE, N, Ph1, Ph2, Ph3
Power input terminal block type	Screw-tightened, duplicated contacts, allowing for a daisy chain connection, 115A rated
Minimum power input conductor cross section	16 mm ² (6 AWG) ^{c, d}

Maximum power input conductor cross section	35 mm ² (2 AWG)
Termination type	Ferrule-crimped (for stranded cable) or solid end
Termination electrical contact length	12 – 18 mm
Terminal tightening torque	2.5 Nm
COMMUNICATION SPECIFICATION	
Ethernet connectivity	100 Mbit/s, 1 x RJ45 Jack
Wireless connectivity	LTE Cat 1 modem (4G, 3G, 2G compatible)
SIM card size	Nano (12.3 x 8.3 mm)
Communication protocol	OCPP 1.6
NFC / RFID READER (OPTIONAL) SPECIFICATION	
Compatible cards / tags	MIFARE Classic (1K, 4K); FeliCa; ISO/IEC 14443 A&B; NFC Forum types 1,2,3,4, 5 tags; ISO/IEC 15693
LCD SCREEN (OPTIONAL) SPECIFICATION	
Diagonal screen size	5 inches
Resolution	800 x 480 (Dynamic QR-code compliant)
Maximum brightness	850 nits (Sunlight-readable)
PAYMENT TERMINAL (OPTIONAL) SPECIFICATION	
Maximum payment terminal footprint	108 mm x 84 mm (height x width)
Compatible card entry direction	Front insertion only (for payment terminals with chip readers)
Supported payment terminal interfaces	USB, ETH (charger provides internet connectivity to the terminal); 12V power
MECHANICAL SPECIFICATION	
Dimensions	1147 mm x 170 mm x 302 (No screen) 1370 mm x 170 mm x 302 (with Opt. Screen or Card reader)
IK class	IK10
IP class	IP54 (outdoor-rated)
Weight	20 kg (No screen) 23 kg (with Opt. Screen or Card reader)
ENVIRONMENTAL SPECIFICATION	
Ambient operating temperature range	-30 to 50 C (outdoor-rated)
Ambient storage temperature range	-30 to 60 C
Overheat protection	Linear charging power derating at upper range ^e
Maximum operating altitude	2000 m
ELECTROMAGNETIC COMPATIBILITY EMISSION	
Applicable EMC emission environments	Residential, commercial, light-industrial
Conducted emission	Class B
Radiated emission	Class B
Voltage flicker, harmonics	IEC 61851-21-2 compliant
ELECTROMAGNETIC COMPATIBILITY IMMUNITY	

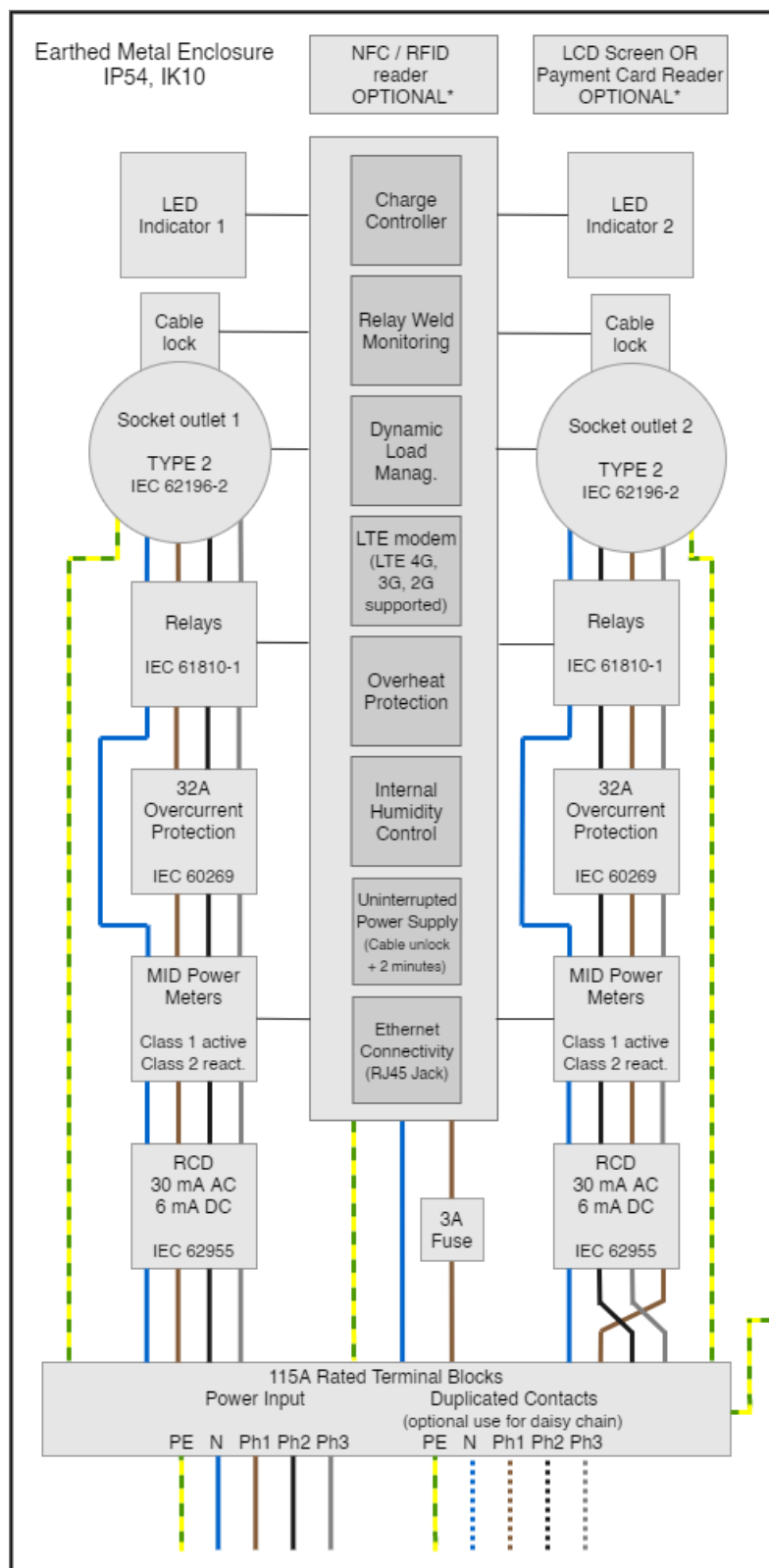
Applicable EMC immunity environments	Residential, commercial, light-industrial
Electrostatic discharge	IEC 61000-4-2, 8 kV air, 4kV contact, criteria A
Radio frequency field susceptibility	IEC 61000-4-3, 10 V/m to 1000 Mhz, 3 V/m to 6GHz, criteria A
Electrical fast transient bursts	IEC 61000-4-4, Level 4, Criteria B
Surge susceptibility	IEC 61000-4-5, Level 4, Criteria A and B
Conducted susceptibility	IEC 61000-4-6, Level 3, Criteria A
Magnetic field immunity	IEC 61000-4-8, Level 4, Criteria A
Voltage dips, interruptions	IEC 61000-4-34 compliant, Criteria B and C

Notes:

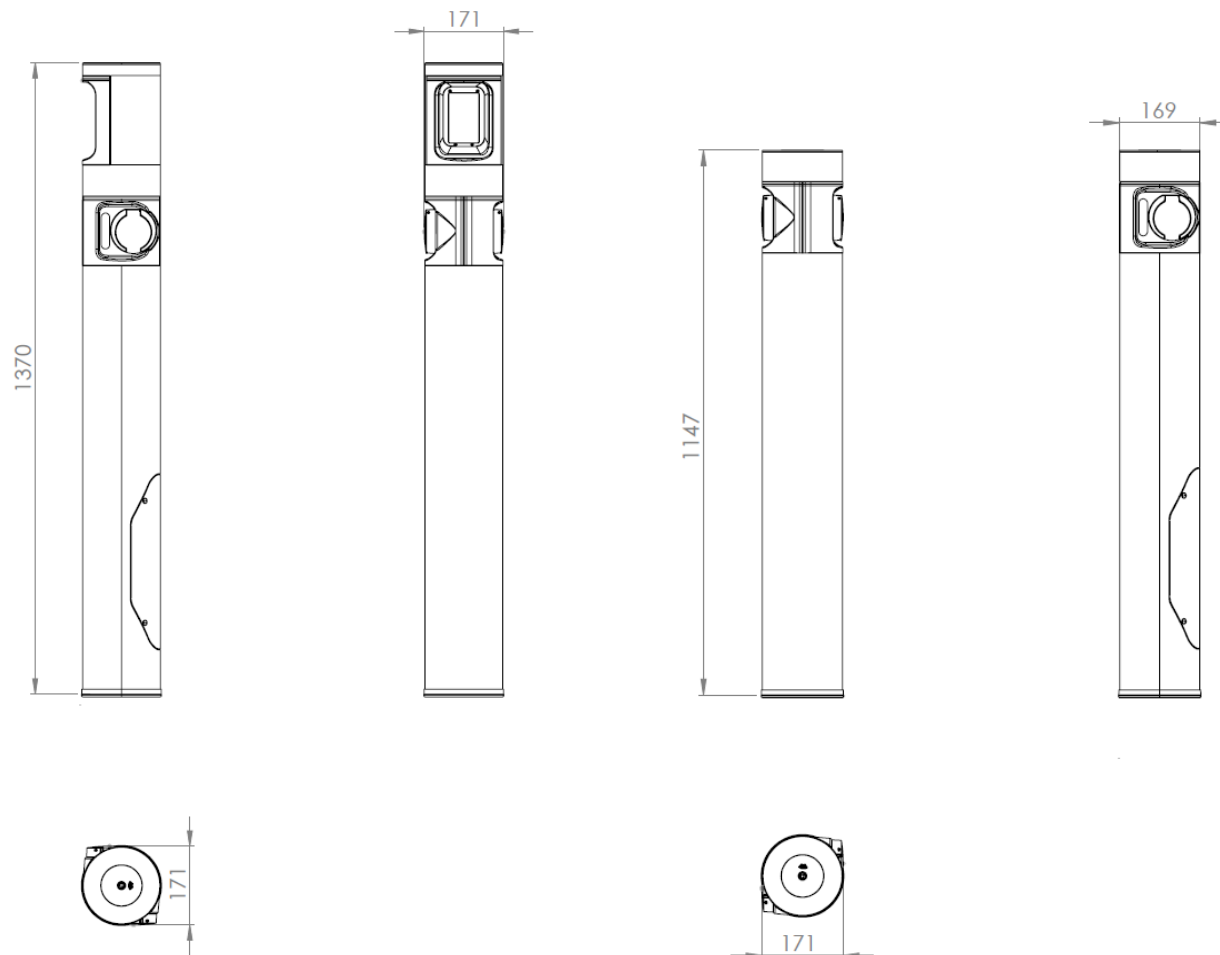
- a) These are maximum values, which can be limited by various balancing methods through cloud solutions.
- b) Requires Inbalance or 3rd party cloud balancing solutions.
- c) This is defined by the maximum charging power of a single charging station (44kW). For 16 mm² (6 AWG) the assumed conductor is copper. If aluminium is used, use a larger cross section conductor.
- d) In cases where the maximum charging power of the station is limited through software, the use of smaller cross section is allowed, however not smaller than 4 mm² (12 AWG) as it is limited by the clamping capability of internal terminal blocks. Inbalance grid does not take any responsibility for power supply conductor sizing as it requires individual sizing for each installation site.
- e) Automatic derating is likely on hot summer days with direct sun exposure and under heavy charging load.

TIP Inbalance PC1 charging station design allows for easy daisy-chain connection of multiple charging stations on a single power cable line as it features duplicated terminal points for both power inlet as well as outlet to the next station, eliminating the need for external junction boxes. The inlet as well as outlet terminals have the same specification in terms of cable requirements and are rated to 115A.

PC1 Charger Block Diagram



PC1 Charger Drawings



Compatible Accessories

Cables that are allowed to be used with the PC1 Charging station:

- Any cables that have IEC 62196-2 Type 2 connector suitable for mating the socket outlet of this charging station, support Mode 3 charging and that maintain the overall safety requirements of the IEC 61851-1 standard, can be used with the charging station.

Accessories that are **not** allowed to be used with the PC1 Charging station:

- Cord extension sets are not allowed to be used with this or any other IEC-61851 compliant charging station. Cord extension sets are assemblies of flexible cord fitted with plug and portable socket-outlet or a connector which can match each other.
- Adaptors or conversion adaptors are not to be used with this charging station. The user is at his own risk if adaptors or conversion adaptors were to be used.