

evnex

X7 & X22 Installer Manual

Intelligent EV Charger
As well as standard electrical installation tools, the following is required:

• T20 TORX SECURITY BIT

• NO.2 SQUARE DRIVE BIT

• 7MM MASONRY BIT (FOR SOLID WALLS)

Introduction

Product description

The Evnex X Series charging stations are a cost effective connected charging solution, available in both single phase 7.4kW, and three phase 22kW configurations.

Please note

- Read all instructions before installing or using this product.
- Scan QR code to access latest manuals and datasheets:

docs.evnex.io

- Evnex Ltd. reserves the right to make changes to this document or the products described without notice.

Contact

For questions relating to this product, its use or installation, please refer to contact details below:

NZ Phone: 0800 395 007
Web: www.evnex.com

AU Phone: 1800 959 377
Web: www.evnex.com.au

Email: support@evnex.com

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Addington
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1. Wiring

This electrical installation must be performed by persons certified by local electrical regulatory authority

For minimum cross-sectional area of the protective conductor please refer to section 5.3.3 of current version of AS/NZS3000.

CT CABLE REQUIREMENTS: Overall screened, instrumentation cable, minimum 0.5mm² twisted pair, insulation rated at maximum voltage present at charger or switchboard (230/400VAC min)

Circuit protection notes can be found on the opposite side of this manual.

- The X Series are 'mode 3' chargers and must be supplied by a dedicated final sub-circuit
- Cable selection for three phase chargers must be considered as unbalanced, in case single phase vehicles are charged
- Each charger must be installed with a dedicated type A RCD/MCB or RCBO as per applicable local legislation
- RCD/RCBO should switch all live conductors, including neutral as per local legislation
- A dedicated RCD/RCBO satisfying the relevant standards is suitable for means of isolation of the charger
- Take extra care to avoid damage to internal components during installation
- Installer to use appropriate installation equipment and protective safety clothing as per local legislation

2. Mounting

INSTALLATION HEIGHT: The charger must be mounted at least 800mm above ground level

Opening the charger

Remove the fasteners securing the Front Cover. A T20 torx screwdriver is required.

Mounting examples

For timber framed walls, the screws should enter solid structural framing inside of the wall. If this is not possible, proper anchoring hardware, suitable for the wall material and thickness, should be used.

For concrete or other solid walls, use the supplied wall plugs. Recommended hole depth is 40mm with a 7mm masonry bit.

For plasterboard (GIB) the provided wall plugs are not suitable for this material. Select appropriate plugs for the type and thickness of plasterboard being used.

3. Charger connection

- Always ensure that the main supply is isolated before beginning work on the charger installation
- The installer must ensure that the charger is correctly earthed
- The charger is not to be powered on while the front cover is open, other than for testing

The X Series chargers are not designed to charge vehicles that require ventilation systems during charging

Single phase wiring example

Three phase wiring example

Care is required with 3 phase wire length to ensure that the input wires do not interfere with the front cover or charging socket when the charger is closed. Excess wire may cause interference and prevent the charger from being properly closed.

4. Setting the maximum charge current

All X Series charging stations are set to 32A maximum charge current as default. This maximum charge current is set via DIP switches on the PCB.

Depending on wiring or supply capacity limitations, the maximum output can be adjusted via the DIP switches.

Setting the charger to a maximum of 30A may be desirable to prevent inadvertent operation of the circuit protective device where ambient temperature exceeds device rating.

QUEENSLAND INSTALLATIONS: Queensland electricity connection regulations (QECM) require the maximum charge current to be set to 20A (or less) unless Active Device Management is present.

An exception applies if the charger is managed by one of the following arrangements in accordance with the current Queensland Electricity Connection Manual:

- Load control tariff using a network device
- Primary tariff with basic active management via a network device
- Primary tariff with a dynamic connection

For these arrangements the DIP switches inside the charger should remain at 32A (unless reduced for safety reasons). By setting the charger current limit above 20A, you declare that Active Device Management is present on-site and that it complies with the requirements of the current Queensland Electricity Connection Manual.

Current	Switch 1	Switch 2	Switch 3	DIP SWITCH EXAMPLES
10A	DOWN	DOWN	DOWN	
13A	DOWN	DOWN	UP	
16A	DOWN	UP	DOWN	
20A	DOWN	UP	UP	
24A	UP	DOWN	DOWN	
28A	UP	DOWN	UP	
30A	UP	UP	DOWN	
32A	UP	UP	UP	

5. Current transformer installation

Do not leave the charger powered on while wiring the current sensors to the main PCB

Incorrect polarity or location of the Current Transformer(s) (CTs) may result in supply overload. CT(s) to be installed to relevant mains supply phase conductor. See arrow on CT.

- Always ensure that the main supply is isolated before beginning work in the distribution box or on any high voltage wiring
- Terminate CT cables before placing CT around mains
- Install CT's in secure distribution box which limits access to unauthorized people and the general public by way of a lock or tool only access
- Install CT's in protective distribution box which limits exposure to moisture, dust or impact
- Seal any unused cable gland holes to maintain dust, fire and moisture integrity

Current transformer orientation (bottom view)

Current transformer wiring connection

CURRENT TRANSFORMER PHASE: A single phase charger installed on a three phase system and one CT requires that the CT be clipped to the same phase as the charger is wired to

- THREE PHASE INSTALLS:** If multiple CTs are included, ensure these are installed on all supply phases, even when installing an X7 single phase charger. This enables multi-phase monitoring and solar diversion.
- CT1 CONNECTION:** For a single phase charger, with a single CT only, always use the 'CT1' terminals on the PCB, regardless of which supply phase the charger (and CT) is connected to

Single phase supply - CT configuration

Three phase supply - CT configuration

6. Closing the charger

Follow the checklist below before installing the front cover

- Ensure all 5 mounting screws are installed with their sealing plugs and the charger is fixed securely against the wall.
- Install M25 blanking plugs wherever there are unused 25mm holes. Ensure there are no other water ingress paths.
- Check that the enclosure seal is properly pushed into the groove all the way around and that there is nothing preventing the cover closing or sealing properly.
- Ensure that the input wires from the mains supply are arranged in the enclosure with minimal excess length – too much extra wire can interfere with the front cover or charging socket and prevent the cover closing or sealing properly.
- Install the cover, tightening the ten cover fasteners to 2.5 N-m using a T20 Torx security bit. Do not over tighten.

7. Commissioning

You must configure the charger using the Evnex Installation App before it can be used for charging.

The app walks you through the process, and by the end the charger will be ready to go. The Driver can set up the Evnex App to view and control the charger via their phone should they wish to do so.

The Evnex Installation App is available on Android or iOS.
For complex load management or multi charger sites contact Evnex support for commissioning.

For more information on commissioning, visit the Installation section online:

docs.evnex.io

Please read both sides of this document before installing the charger

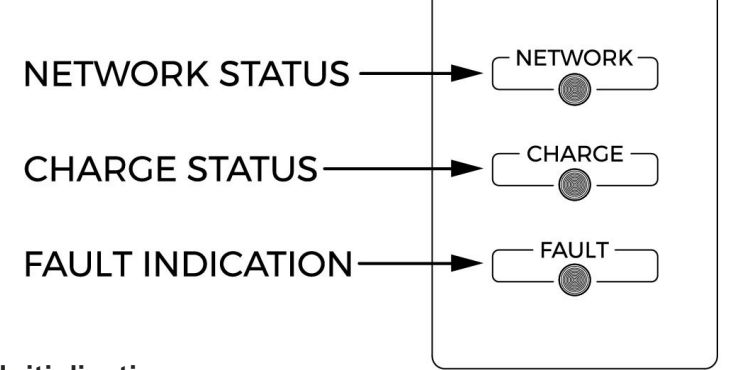
8. Additional information

Charging process

- Charger is not to be operated when there is debris in the charging connector
- Cables on non-tethered chargers are locked during charging. Excessive force must not be applied in an attempt to remove the charge cable. If cable is unexpectedly locked contact Evnex support.
- After charging, the tethered cable should be stored safely by looping it around charger. Non-tethered cables may be removed if preferred.
- Do not use the charger if the plug and lead is cracked, frayed, or damaged in any way

- For non tethered models, connect the type 2 end of the cable to the charging station, and the other end (depending on the make and model of your vehicle) to the charging socket of your vehicle.
- For tethered models, simply connect the attached cable to your vehicle charging socket.
- Under normal circumstances, your vehicle should request a charge immediately.
- During the charge, the CHARGE light on the charger will glow green

Operation



Initialisation

When first connected, or when rebooting, the blue (NETWORK) light will begin to flash slowly. This indicates that the charger is attempting to connect to the internet. When the NETWORK light flashes quickly (10 per second), this indicates that the charger has connected to the cellular network, and is attempting to establish a connection with an OCPP server. When the NETWORK light begins to fade in and out slowly, the charging station has successfully established a connection with the server.

LED status and fault conditions

Explanation of LED display status can be found in the User Guide, the Installation app & online under the GETTING STARTED section through this QR code.



Blue LED	Slow flash (2 per second)	Establishing connection with cellular network
	Fast flash (10 per second)	Connected to cellular network, establishing connection with OCPP server
	Slow pulse	Connected to server
	Single flash	RFID tag detected
Green LED	Slow flash (2 per second)	Vehicle plugged in, not charging
	On	Charge in progress
Red LED	Single flash	RFID tag detected
	On	Fault, consult app or back-office software for details
	Single flash	RFID tag detected
Red LED	5 flashes	RFID tag not recognised

Site selection notes

- Where possible, protect the charger from direct sunlight to prevent charging speed reduction or charging interruption due to overheating
- Do not cover the charger or install in an area with poor airflow, such as a cupboard
- Consider pedestrians and other traffic, ensure that the charging cable does not pose a tripping hazard
- If possible, avoid installing the charger in a place where it can be damaged by falling objects, doors, vehicles or machinery
- Although this charger is designed for indoor and outdoor installations, it is recommended that exposure to rain, snow, hail and direct sunlight is minimised where reasonable to increase lifespan
- Do not allow this charger to be subject to water spray such as water blasters or high-pressure hoses
- The attachment surface must be sufficiently strong to withstand normal use
- Ensure that the attachment surface is flat - an uneven surface may warp the enclosure and cause damage to the product i.e bend the PCB
- Install trip hazard warning sign where appropriate or as required by local legislation
- Install live electrical cable warning sign where appropriate or as required by local legislation
- The charger is to be installed with adequate clearance to prevent operator injury while using product. This includes wrapping and unwrapping cable.

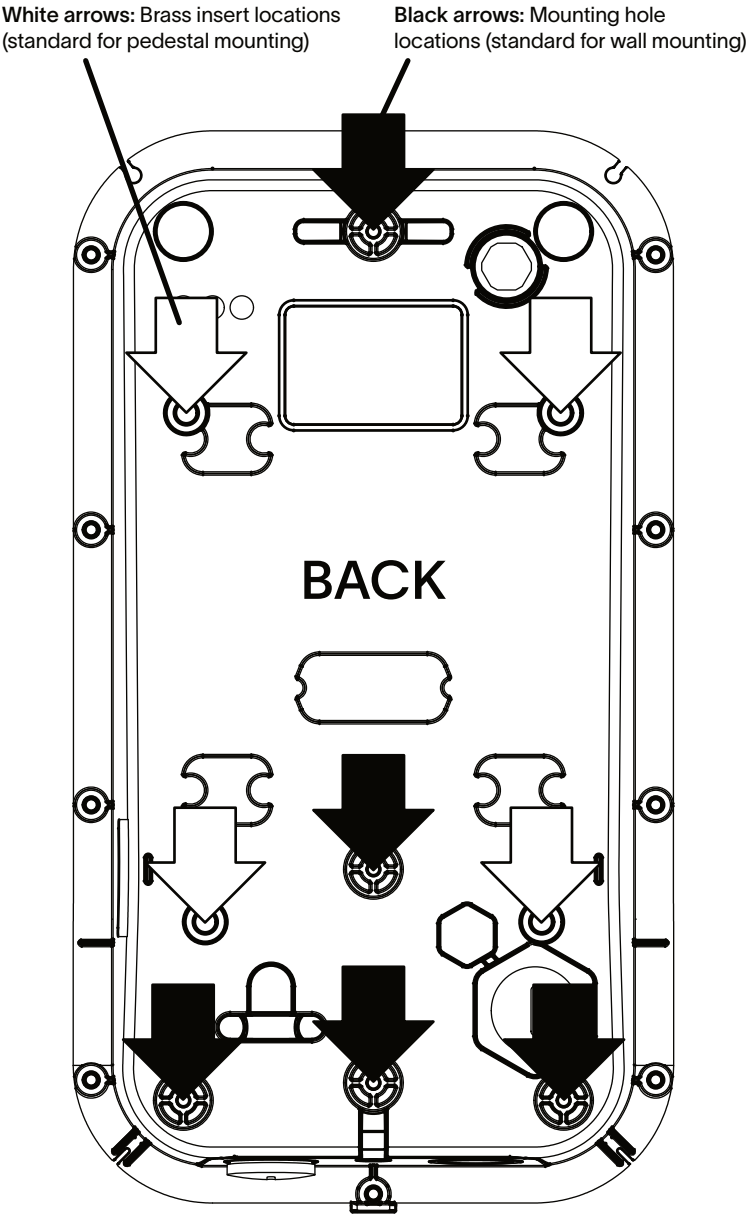
THERMAL LIMITING: Installing the charger in a location that is subject to direct sunlight may cause a reduction in charging power in warm weather. Where practical, install in a location that is protected from direct sunlight. See "Site selection" section for other notes on choosing a suitable location for the charger.

LEVELLING CHARGER: Use top surface to level the charger, the sides of the charger are not vertical. The template has flat sides suitable for placing a level against before drilling. The charger must be mounted vertically as per illustrations. Horizontal installation is not allowed.

HOLE SEALING: Do not drill holes in places other than the provided locations. See arrows showing the 5 drilling locations. It is the installers responsibility to ensure proper sealing of any drilled holes, including installation of provided sealing plugs.

GALVANISED STEEL AND BARE ALUMINIUM MOUNTING SURFACES MUST NOT BE BOLTED DIRECTLY TO THE BRASS MOUNTING INSERTS ON THE BACK OF THE CHARGER. Galvanic corrosion will occur between these dissimilar metals. Nylon or other non-metallic insulating washers must be used.

Mounting the charger



Do not drill when fixing via brass inserts. For wall mounting drill out predetermined fixing holes from the back with 5mm bit. Place the charger on a soft surface to prevent marking the charger while drilling the holes.

Ensure internal components are not damaged by the drill. Remove any plastic swarf from the charger as it could prevent water-tight installation of the sealing plugs and the front cover.

The mounting surface must be uniform to ensure that the charger is not twisted as it is fixed against the chosen wall. Extra care is required on weatherboard or uneven surfaces. Avoid over-tightening the mounting fasteners as this may cause the charger to twist and result in damage or prevent closing the charger.

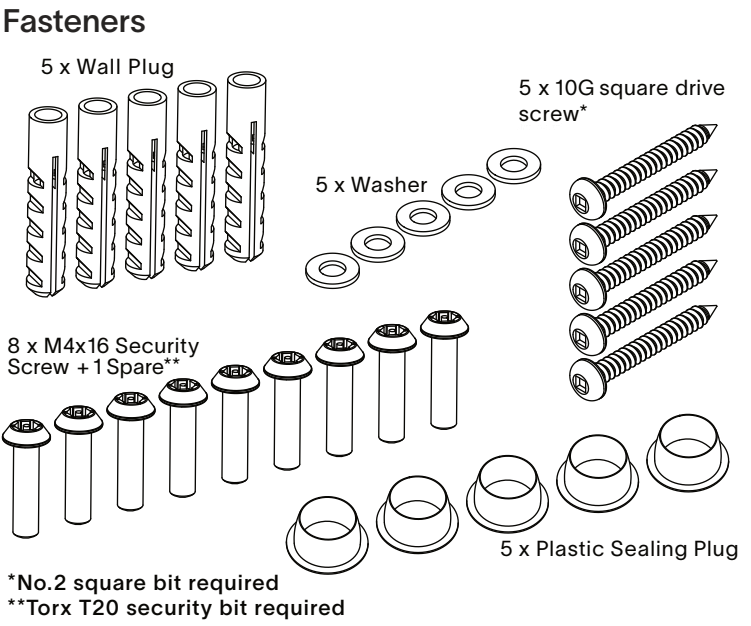
A cardboard drilling template is provided to allow easy marking out of the 5 mounting holes.

For timber framed walls, 3mm pilot holes are recommended. For concrete walls, a 7mm masonry bit is required to allow insertion of the supplied wall plugs.

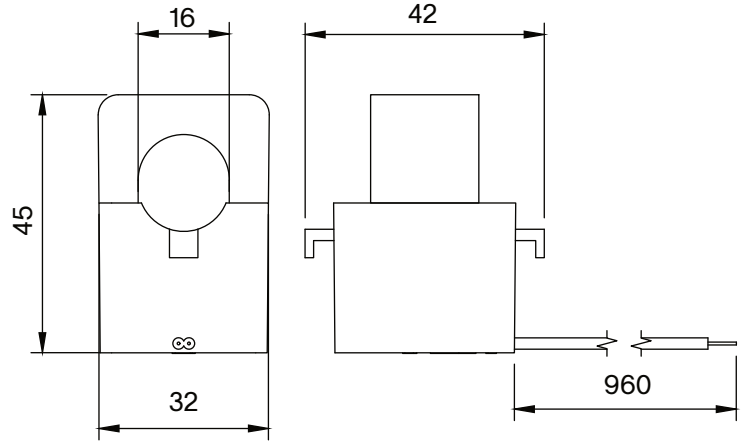
The location of the optional rear entry hole (M25 or M32) is also provided, along with the optional M12 hole location. M12 and M32 holes need to be drilled by the installer if required.

Do not drill cable entries in the enclosure other than in the predetermined locations

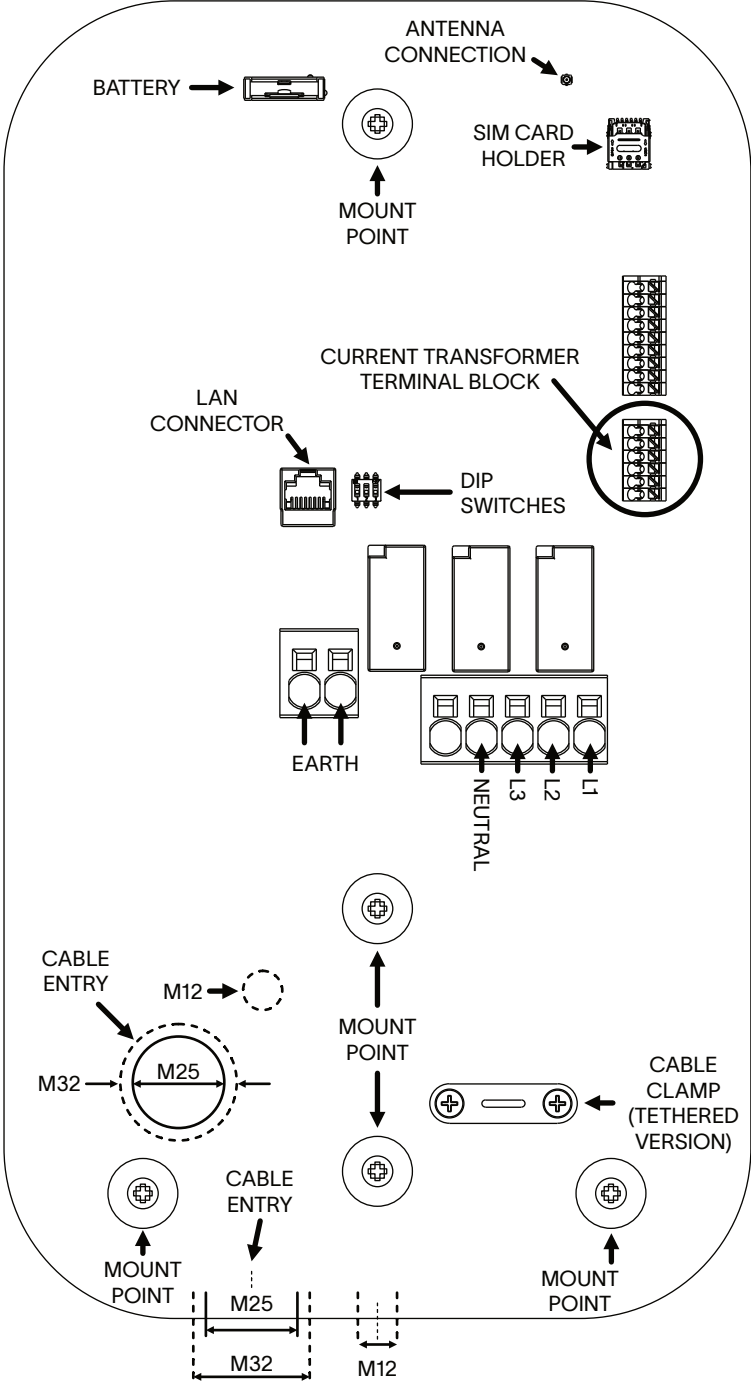
Included components



Current transformer



Key components



Upstream circuit protection - guide only

The following requirements are based on AS/NZS:3000 however local rules, regulations or guidelines must be followed and are the responsibility of the installer.

Residual current protection and a suitably rated means of over-current protection must **always** be installed at the origin of the final sub-circuit and be dedicated to the charger. This could be an MCB installed alongside an RCD or an RCBO.

All X Series chargers are set to 32A charge current as default. This maximum charge current is set via DIP switches on the PCB (see previous section on **Setting the maximum charge current**).

The tables below are advisory and based on the common availability of protection devices.

Overcurrent protection: MCB / RCBO

- Single-phase**
- For ≤ 16A: 1 x 20A, 1P, Energy Limiting Class 3, type C
 - For 20A to 24A: 1 x 25A, 1P, Energy Limiting Class 3, type C
 - For ≥ 24A: 1 x 32A*, 2P, Energy Limiting Class 3, type C

- Three-phase**
- For ≤ 16A: 1 x 20A, 3P, Energy Limiting Classes 3, type C
 - For 20A to 24A: 1 x 25A, 3P, Energy Limiting Classes 3, type C
 - For ≥ 24A: 1 x 32A*, 3P, Energy Limiting Classes 3, type C

- Notes**
- The MCB or RCBO should not be installed side by side with other high load circuit protective devices to prevent thermal deration when considering grouping factor of devices.
 - The circuit breaker must comply with one of the following standards: IEC 60898-1, IEC 60947-2, or IEC 61009-1.

*40A devices may be used where spacing cannot be achieved or ambient temperature may exceed device operating parameters. Integral overcurrent protection will limit current.

Fault protection: RCD / RCBO

- Single-phase**
- For ≤ 16A: 1 x ≥ 20A, 2P, Rated Residual Current 30mA, type A or B
 - For 20A to 24A: 1 x ≥ 25A, 2P, Rated Residual Current 30mA, type A or B
 - For ≥ 24A: 1 x ≥ 32A, 2P, Rated Residual Current 30mA, type A or B

- Three-phase**
- For ≤ 16A: 1 x ≥ 20A, 4P, Rated Residual Current 30mA, type A or B
 - For 20A to 24A: 1 x ≥ 25A, 4P, Rated Residual Current 30mA, type A or B
 - For ≥ 24A: 1 x ≥ 32A, 4P, Rated Residual Current 30mA, type A or B

- Notes**
- The RCD must comply with one of the following standards: IEC 61008-1, IEC61009-1, IEC 60947-2, or IEC 62423
 - The RCBO can be used instead of RCD and Circuit breaker. It must meet all RCD and Circuit breakers requirements as shown above.
 - RCD / RCBO must switch all live conductors including neutral
 - To avoid the requirement for more expensive type B RCDs, all E & X Series chargers have a 6mA DC current detection device (Residual Current Monitor) built in. This is to prevent the blinding of type A RCDs from potential DC leakage currents. In the event of detecting a DC leakage current, the charge point will immediately stop the charging session and transition into a fault state, requiring a reboot to clear the state.

Safety information

General

- This charger should only be installed by those who are appropriately qualified and competent to do so.
- This charger has been designed and tested in accordance with IEC 61000-6-3 and IEC 61000-6-2, however the installer is responsible for ensuring that all local regulations and standards are complied with.
- This product is to be serviced only by Evnex approved technicians using only Evnex supplied parts
- There are no user serviceable parts inside the charging station.
- Do not attempt to repair or modify the product
- It is the user's responsibility to ensure that the cable is stored safely, and not left where it could become a tripping hazard, or subject to stress or damage.
- This charging station should only be used to charge a vehicle with a compatible J1772 socket, or IEC 61851 type 1 or type 2 socket
- Only cables which comply with IEC 62196-1 and IEC 62196-2 may be used with this product
- Vehicle and charging cable shall be used as per the manufacturers instructions
- Vehicle on-board charger required to comply with IEC 61851-1 and IEC 61851-21-1
- Avoid excessive application of moisture to charging cable connectors, e.g. washing with hose
- Do not use harsh chemicals to clean this product. Periodic cleaning may be done with a damp cloth and mild detergent if required
- Warning labels must not be removed

Risk of electric shock

- Read all instructions before installing or using this product
- If this product appears to be damaged in any way, it should be electrically isolated and repaired or replaced. Damage includes fraying or broken insulation on the power cable or any signs of cracking or separation on the connector or charger
- This product should not be operated while in a "Fault" state and should be electrically isolated until serviced by a qualified technician
- Appropriate upstream protection is required as per local regulations
- Never insert foreign objects in the charging cable connectors or charging station socket
- Do not use extension cords or any kind of adapter with this product
- This product should not be used by children
- Avoid installing this product in locations that are prone to flooding

Disclaimer

Evnex Limited shall not be liable in any way for damage or injury that occurs when using the charger, and all warranties will be void where:

- The installation instructions have not been followed correctly
- The charger has been installed by an unqualified person
- The charger has been tampered with or modified
- The charger has been used for a purpose other than it was designed and intended for

Technical information

General

Charging mode.....	Mode 3 in accordance with IEC 61851-1
Protection against Electric shock.....	Class I equipment in accordance IEC 61851-1
Overvoltage category.....	III in accordance with IEC 61851-1
Protection class.....	IP54
Protection against mechanical impact.....	IK08
Residual direct current detecting device.....	6mA (characteristic in accordance with IEC 62955)
Rated diversity factor (RDF).....	1
Pollution degree.....	III
Earthing system.....	T/TTN/TT
Installation.....	Indoor/ outdoor
Type of construction.....	Stationary
Intended for use.....	Ordinary persons
Rated short-time withstand current (Icw).....	< 6kA (effective value in accordance with EN 61439-1)
External design.....	Enclosed assembly

Power supply

X7 series	
Nominal supply voltage.....	230VAC
Acceptable operating range.....	220 ~ 240VAC
Frequency.....	50/60 Hz
Rated Current.....	Adjustable (max 32A)
Rated Current (Queensland - No Active Device Management).....	Adjustable (max 20A)
X22 series	
Nominal supply voltage.....	230/400VAC (3P+N)
Acceptable operating range.....	400±10% VAC (3P+N)
Frequency.....	50/60 Hz
Rated Current.....	Adjustable (max 32A)
Rated Current (Queensland - No Active Device Management).....	Adjustable (max 20A)

Note that actual current draw may be less, as the vehicle may not request the full amount of current, depending on conditions.

Environment

Mounting environment.....	Indoor/Outdoor IP54
Installation altitude.....	≤ 2000m above sea level
Operating temperature range.....	-25°C to 55°C*

Cellular modem (X Series only)

X(7 or 22)-TXX	
LTE bands (LTE-M).....	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28 (R410M-02B)

Communication and protocols

OCPP version.....	1.6J (JSON)
Mobile app configuration.....	Bluetooth LE
RFID (X Series only).....	ISO/IEC 14443, 13.56MHz
Energy metering.....	Yes, MID certified
WiFi.....	802.11b/g/n
Ethernet.....	Yes

Protection & safety features

Over voltage cut-off.....	264V
Under voltage cut-off.....	190V
Over temperature cut-off.....	70 °C
Ground fault detection.....	Yes
Over current cut-off.....	Current/time curve*

* For example, if the vehicle draws 1.25A over the target current set by the charge point for a period exceeding 6 minutes, then an over current fault will be triggered and the charge session stopped. Alternatively, if the vehicle draws 0.25A over the target current, then the time that passes before an overcurrent fault is triggered will be greater than an hour.

Connections / terminals

Mains input.....	10mm2 max
SIM card.....	Nano SIM (4FF)

Regulatory

The charger complies with the following standards:

- IEC 61000-6-3:2011
- IEC 61000-6-2:2005
- IEC 61851-1:2017



EV supply equipment classification

Power supply input	EV supply equipment connected to AC supply network
Electrical connection method	Permanently connected
Power supply output	AC EV supply equipment as per IEC61851-1, Case B Type 2 Socket or Case C Type 1 Plug or Case C Type 2 Plug
Access	Locations with restricted and non-restricted access
Protection against electric shock	IEC61851-1 Class I equipment
Mounting method	Stationary equipment (Surface mounted on walls, poles or equivalent positions)
EVSE charging mode	IEC61851-1 Mode 3

Troubleshooting

- If this charger is not working as expected or you believe there is an issue, please review our troubleshooting guide by scanning this QR code:
- If you can't find what you're looking for please give our support team a call



docs.evnex.io

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