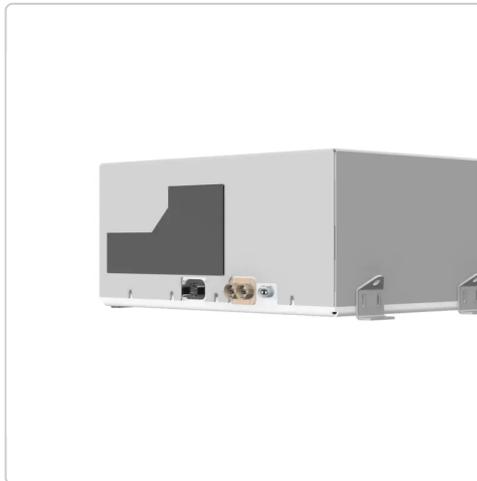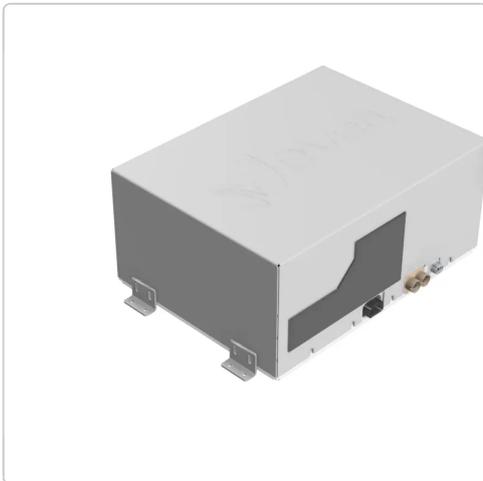# InnoTech - 48V 210Ah LFP Battery CANopen

Reference : INN-LFP-48V-210AH

Brand : INNOVATION TECH

Options :

No variants

3D Model : Available

EAN-13 : 3769182746508

The **INN-LFP-48V-210AH** is a "48 V class" **LiFePO4 (LFP) battery pack** designed for **traction** and **industrial** applications where stability, safety and system integration matter. The pack is **51.2 V nominal** at **210 Ah** (≈ **10.75 kWh**) and integrates a proprietary **CANopen BMS** with cell-level monitoring (voltage + temperature), **active balancing**, and **dynamic current limits** for charge, discharge and regeneration.

Built for integration, the BMS publishes operational data on CANopen (SOC, states, faults) and dynamic limits such as **IMD/IMR** so the **charger** and **drive** can adapt in real time. Stand-alone operation is possible, but optimal performance and robustness are achieved through proper CAN integration.

Key advantages

- **48 V class LFP battery, 210 Ah** (51.2 V nominal, ≈10.75 kWh): stable chemistry for industrial environments.
- **Isolated CANopen BMS**: supervision + diagnostics + **IMD/IMR** limits for real-time charge/traction control.
- **Cell-level sensing**: per-cell voltage + per-cell temperature (thermal mapping) for robust protection logic.
- **Active balancing** (up to 1 A, always on): maintains usable capacity and reduces cell drift.
- **High current capability**: 210 A continuous, 400 A peak (≤2 min), 600 A boost (≤30 s) depending on SOC/temperature.
- **CCCV charging** up to 200 A with automatic cold limitation (below ~10 ℃).
- **Regeneration** up to 200 A (≤90% SOC) with progressive limiting from 90% to 100%.
- **Integrated precharge**: controlled start-up sequence (wake → precharge → contactor → loads enable), critical with capacitive loads / DC-DC.
- **Series operation**: up to 2 packs (master/slave over CAN), factory configuration.

Overview

- Chemistry: LiFePO4 (LFP) — stable and safe operation
- Nominal voltage: 51.2 V (marketed as "48 V")
- Voltage window: 44 V to 57.6 V
- Capacity: 210 Ah (≈10.75 kWh)
- Continuous discharge: 210 A (reference at 35 ºC ambient)
- Peak discharge: 400 A (up to 2 min, typ. SOC > 10% and T < 35 ºC)
- Boost discharge: 600 A (up to 30 s, typ. SOC > 20% and T < 35 ºC)
- Max charge: 200 A (CCCV; automatic limitation below ~10 ºC)
- Regeneration: up to 200 A as long as SOC ≤ 90% (progressive limit 90–100%)
- Balancing: active, up to 1 A (always on)

System integration

Communication is via **isolated CANopen** for traction and charging integration. Dynamic current limits (**IMD/IMR**) are published on the bus so the charger and drive can adapt in real time. Stand-alone operation is possible, but optimal behaviour is achieved with CAN integration.

Recommended start-up sequence: wake → precharge → contactor close → loads enable. Do not allow downstream loads (especially a **DC-DC converter**) to draw current during precharge: if current is pulled before precharge completes, the pack may trigger a **precharge fault**. A **controllable DC-DC** (enable/command input) is recommended and should be enabled only once the pack is "READY".

- Drive compatibility: Zapi families (CAN control)
- Charger compatibility: Zivan RE (CAN slave), DeltaQ (CAN slave)
- Series operation: up to 2 packs (master/slave over CAN), factory configuration
- Parallel operation: not supported on this model

BMS & functional safety

- Fine measurements: per-cell voltage + one temperature sensor per cell (thermal mapping)
- SOC/SOH estimation: coulomb counting refined with cell voltages
- Active balancing (up to 1 A): always on to maximise usable capacity and reduce the impact of a weaker cell
- Event logging: internal fault report storage (up to ~100 entries)
- Protections: under/over-voltage, over-current, short-circuit, over-temperature
- Insulation monitoring: detection of insulation faults between the pack and the casing — **the DC bus must never be referenced to chassis** or the pack may not start
- **Integrated precharge:** controlled inrush limitation for capacitive loads — do not load the bus before precharge completion

Charge, discharge & regeneration limits

- **Start-up:** wake → precharge → contactor → loads enable. Avoid drawing current during precharge (precharge fault risk).
- Charging: CCCV profile; automatic limitation below ~10 ºC (≈15–20% of max current) until the pack warms up

- Regeneration: 200 A allowed as long as SOC ≤ 90%; progressive limitation from 90% to 100% (allowed current approaching 0 near 100%)
- **Charger priority:** if charger and drive are present on the bus, IMD is forced to 0; if measured current becomes outgoing while in charge mode, the **line contactor opens**
- Wake-up: close Pin 1–2 (discharge) and Pin 3–4 (charge) via the logic connector

Technical specifications

Part number	INN-LFP-48V-210AH
Chemistry	LiFePO4 (LFP)
Nominal voltage	51.2 V (48 V class)
Max voltage (end of charge)	57.6 V
Min voltage (cut-off)	44 V
Capacity	210 Ah
Nominal energy	≈10.75 kWh
Continuous discharge	210 A @ 35 °C ambient
Max discharge	400 A (up to 2 min)
Boost discharge	600 A (up to 30 s, typ. SOC > 20% and T < 35 °C)
Max charge	200 A (CCCV)
Max regen	200 A (≤ 90% SOC; progressive limit 90–100%)
Balancing	Active, up to 1 A
BMS standby consumption	≈40 mA
Enclosure	Aluminium
Mass	85 kg
Dimensions (W × D × H)	685 × 480 × 290 mm
Operating temperature	–20 °C to +45 °C
Charging temperature	0 °C to +45 °C (limitation below ~10 °C)
Storage	–20 °C to +50 °C
Protection rating	IP43
Cycle life	3000 cycles @ 100% DoD @ 1C ; 4500 cycles @ 80% DoD @ 1C

Connectivity & CANopen

- CANopen: 125 kbps default (factory configuration)
- Native PDO: SOC, OK/fault state, status (standby/charge/discharge), IMD/IMR limits
- **CAN termination:** two terminations at bus ends; one can be **enabled by jumper** at the battery connector (per wiring diagram)
- Discharge power connector: Amphenol PL-082X-301
- Charge power connector: Amphenol PL-082X-60
- Signal connector: TE Connectivity AMPSEAL 23-way (white)
- Interlocks: internal contactor will not close unless power connectors are engaged

Installation & mechanical integration

- Mounting: flat on its base; not intended for side or inverted mounting
- Fixing: 4 side mounting tabs (silentblocks possible)
- **Vibration:** if the machine generates significant vibration, mounting on **silentblocks** is recommended
- **Environment:** IP43 — protect the pack from **water splashes** and direct jets where possible
- **Maintenance:** keep power and signal connectors accessible for service and diagnostics
- **Lifting:** mounting tabs include **holes** allowing **lifting straps** to be routed for handling
- Applications: traction (vehicles), industrial equipment and machinery

Wiring & CAN bus

The CAN bus is isolated. Apply common wiring practices (bus topology, termination, separation between power and communication harnesses). In series master/slave operation, packs must share the same CAN bus.

CANopen (minimum recommended): use at least a dedicated **twisted pair** for CAN_H/CAN_L and **two terminations** at the bus ends. One termination can be **enabled by jumper at the battery connector** (per wiring diagram).

Critical insulation rule: the **DC power bus must never be referenced to chassis**. Any reference (direct or via downstream equipment) can trigger an **insulation fault** and prevent the pack from starting.

Precharge & downstream equipment: the pack includes an **integrated precharge**. Downstream loads (especially **DC-DC**) should be inhibited until precharge is complete. A **controllable** DC-DC (enable/command) is preferred: if current is drawn during precharge, the pack may declare the sequence invalid and trigger a **precharge fault**.

EMC: keep CAN and power physically separated, avoid large loops, cross at 90° if needed, and ensure strong harness strain relief and crimp quality. EMC robustness is validated at full-system level (harness + installation + protections).

Storage & service life

No scheduled maintenance is required. The pack does not include active heating: it naturally warms up in operation due to internal losses when current flows. Logistics: pallet shipment, road transport (lithium battery).

Service life depends on real usage (DoD, current levels, temperature). Cycle-life figures are reference values for system sizing and should be interpreted within the intended duty cycle.