

# i-G3N

INNOVATION GENERATION



# X-RANGE

User Manual

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# SPECIFICATIONS

Table 1 shows the specifications for the X-Range for each additional

Table 1: Specification sheet for X-Range

Product Name (X-Range)	X-21	X-43	X-64	X-86	X-107
Cell Type	Lithium Iron Phosphate (LiFePO <sub>4</sub> ) battery				
Nominal Capacity [Ah]	420	840	1260	1680	2100
Module Voltage [V]	51.2 V <sub>DC</sub> nominal				
Battery Nominal Capacity [kWh]	21.5	43	64.5	86	107.5
Capacity @ 80% DoD [kWh]	17.2	34.4	51.6	68.8	86
Design Life	> 16 years (> 6000 cycles) expected life at 80% DoD				
Warranty	> 10 years (4000 cycles) @ 25°C				
Max. Discharge Current (Continuous) [A]	400	800	1000	1000	1000
Max. Discharge Current (not Continuous – 3 sec) [A]	460	880	1000	1000	1000
Discharging cut-off voltage (LVD) [V]	49				
<b>Operating Conditions</b>					
Temperature range (recommended)	Charge – (0°C ~ 55°C) Discharge – (-20°C ~ 55°C)				
Protection Class	IP22 – no solid ingress and near vertical water droplets				
<b>Dimensions (L x H x W)</b>					
X-Range Storage Unit [mm]	685 x 745 x 287				
X-Range Storage Unit weight [kg]	± 200				

# INSTALLATION

This section elaborates on the process to install the X-Range energy storage system safely.

## TOOLS AND EQUIPMENT REQUIRED

- Hammer
- Phillips screw driver
- 19 socket (for busbars)
- 13 socket (for inverter cable connections)
- 70 – 95 mm<sup>2</sup> cabling with 70-95 to 8 lugs
  - o Cable size depending on inverter specifications
- M5 Allan Key wrench
- (Cable Size) – 8 lugs x 2 per phase

## QUICK INSTALLATION

### Wire Connections

Before connecting any wires, ensure the Battery is switched off at the Control Box, and the breakers on each Battery Box and all external breakers / fuses are open.

Connect the provided busbars to the front of the Battery Box, as shown in Figure 1. The Positive DC posts of the Battery Box is connected by the busbar and must be connected by cables from the first Battery Box to the positive Control Box busbar. The negative DC posts of the Battery Box is connected by the busbar and must be connected by cables from the last Battery Box to the negative Control Box busbar.

Each secondary box has 2 x RJ45 ports. Use the provided RJ45 flyleads to connect the consecutive units. The bottom unit must have the RJ45 terminator plug connected.

The battery is connected to the inverter with the busbars at the service hatch of the Control Box. Figure 2 & 3 shows the service hatch of the Control Box. To connect the battery to the inverter use cable sizing according to inverter specifications. M8 bolts are used to connect the cables to the Control Box.

Once all communication / power cables are connected, switch the battery on, but keep breaker / fuse going to the inverter open. This isolates the battery from the inverter.

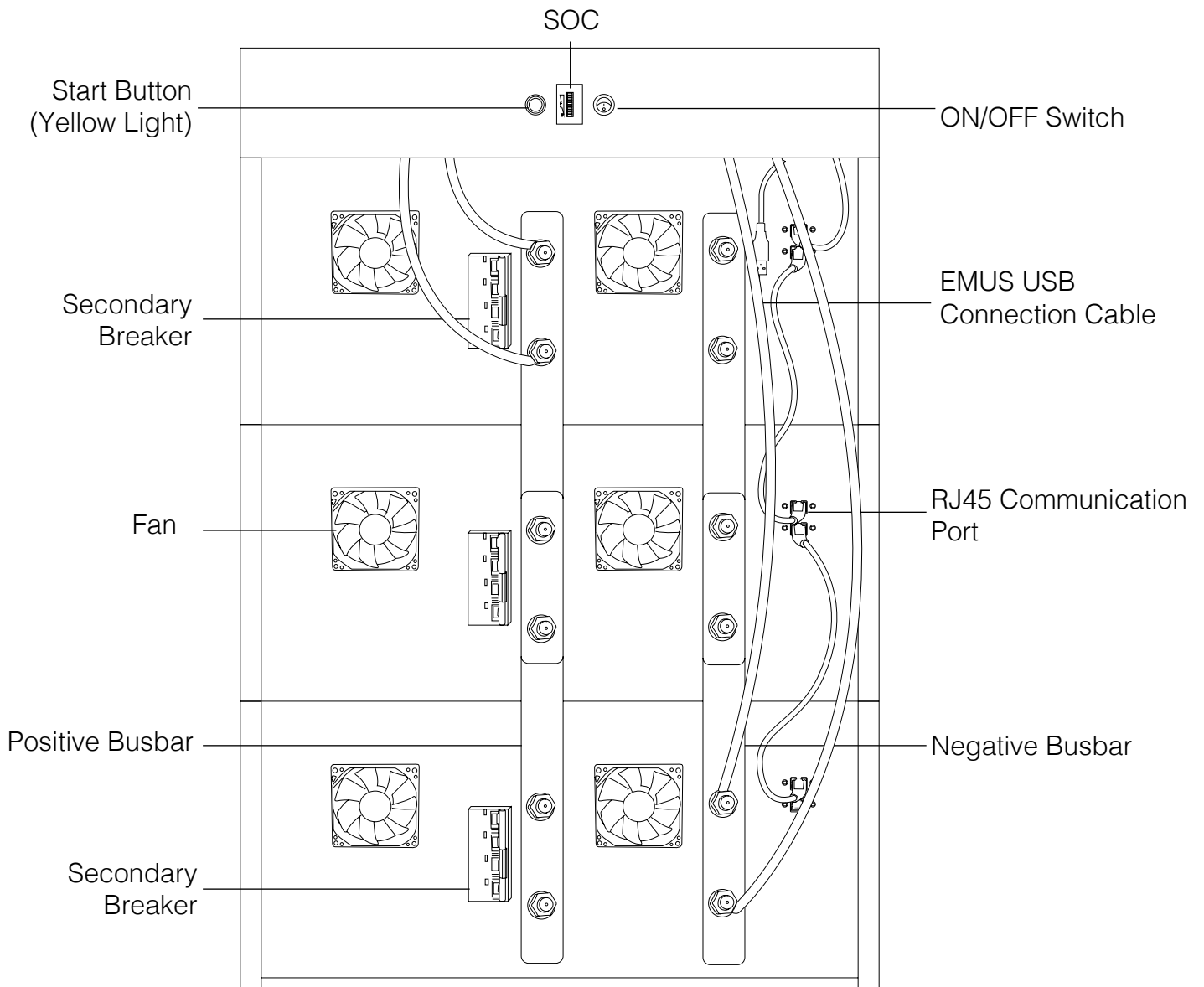


Figure 1: Layout Configuration for X-Range (64 kWh)

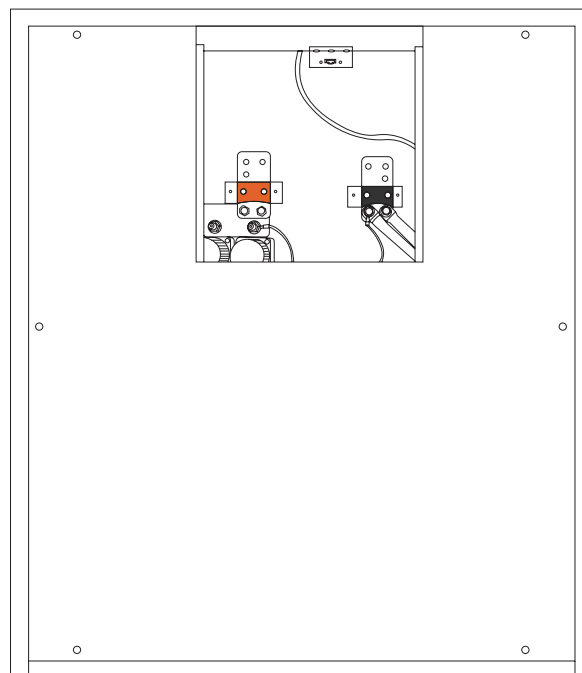


Figure 2: Top view of X-Range Control Box

## Start-up procedure

**Follow the entire procedure closely before closing the fuses to the inverter.**

(See Figure 1 showing the buttons used during the start-up procedure)

- 1 Verify polarity of connections between the units and the inverter
- 2 Close the breakers on the Battery Boxes to energise the battery.
- 3 Switch the ON/OFF button on the top unit to ON
  - o This brings the electronics out of storage mode / online
  - o A yellow light will glow on the Start button
- 4 Press the Start button to initialise boot up.
  - o The button will latch
  - o The SOC indicator indicates if the battery is on. The SOC will flicker red until the start-up procedure is complete.
- 5 Should all be in order, a pre-charge sequence will be started and applied for 25 seconds after which the main contactor will be engaged (A loud audible click can be heard).
- 6 After this, the Start button should be pressed to unlatch the button.
  - o The light should no longer be illuminated

## Additional

- 1 Press the Fan Test button on the side of the Control Box to check communication between the Control Box and the Battery Boxes.
- 2 The SOC indicates the battery charge level.

Once a voltage of  $\pm 54$  V is measured on the inverter side of the Control Box can the inverter fuse be closed, and the inverter be switched on.

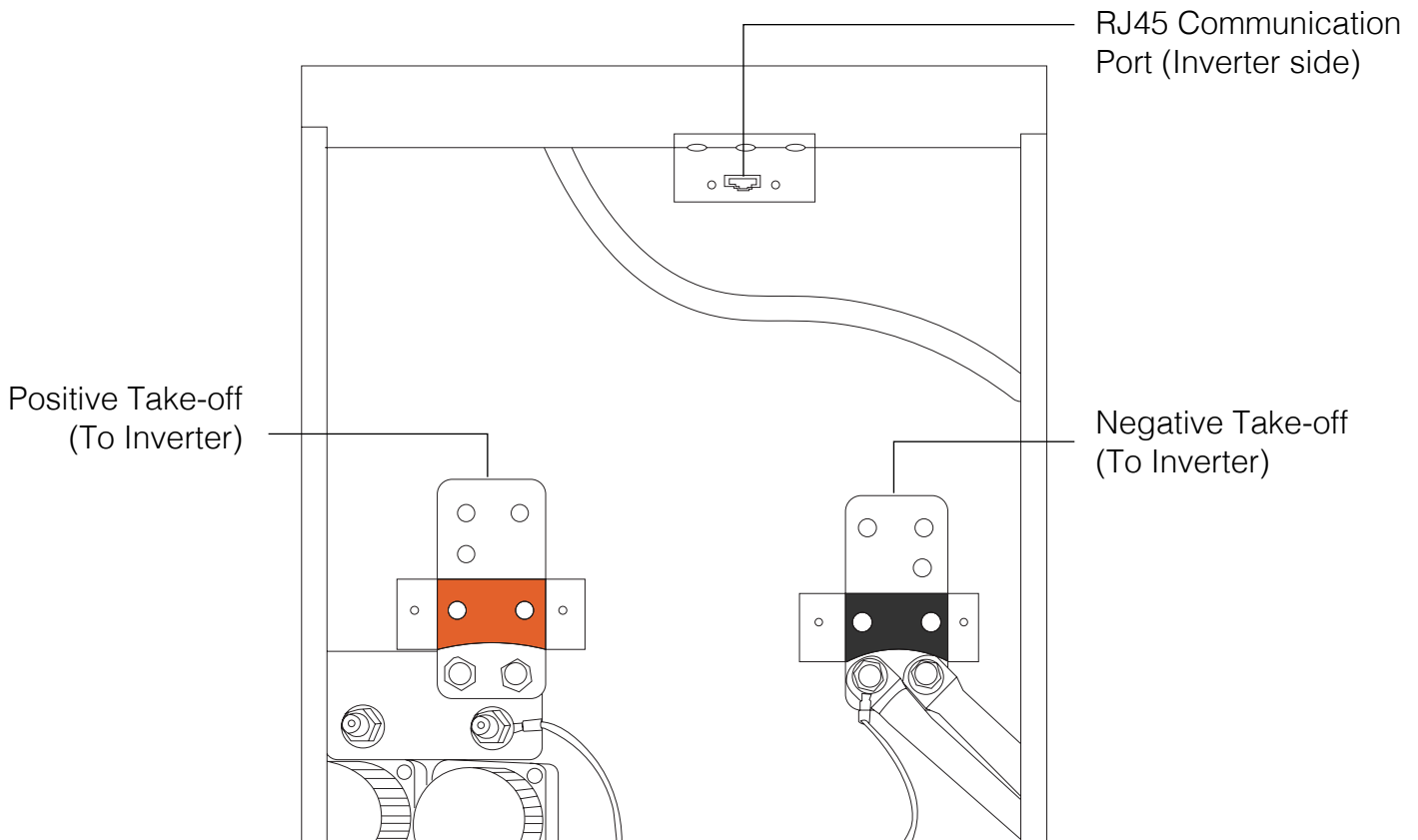


Figure 3: X-Range service hatch

## Restart Procedure for Fully Drained Battery

- 1 Switch off the system completely
  - o Disconnect the MPPT (if applicable)
  - o Isolate the battery from the inverter
    - Open the fuse / breaker between the battery and the inverter
  - o Switch off the battery
- 2 Disconnect all loads on the inverter
  - o Switch off AC supply from inverter to DC board
- 3 Restart battery with the Start-up procedure
- 4 Once battery is ON, connect MPPT and allow battery to charge and keep the inverter OFF
- 5 If no MPPT is present, switch ON the inverter and connect the battery to the inverter.
  - o Keep the loads disconnected during this stage
- 6 Loads can be added when the battery reaches 80% SOC

## Communication Connection

Battery communication is in a daisy chain methodology, with a termination at the very bottom unit. The blue lines in Figure 4 illustrates the wiring for the RJ45 cable between the 3 x X-Range boxes. Figure 4 shows the RJ45 ports on the backside of the unit for communication between the battery and the inverter.

## External Connections

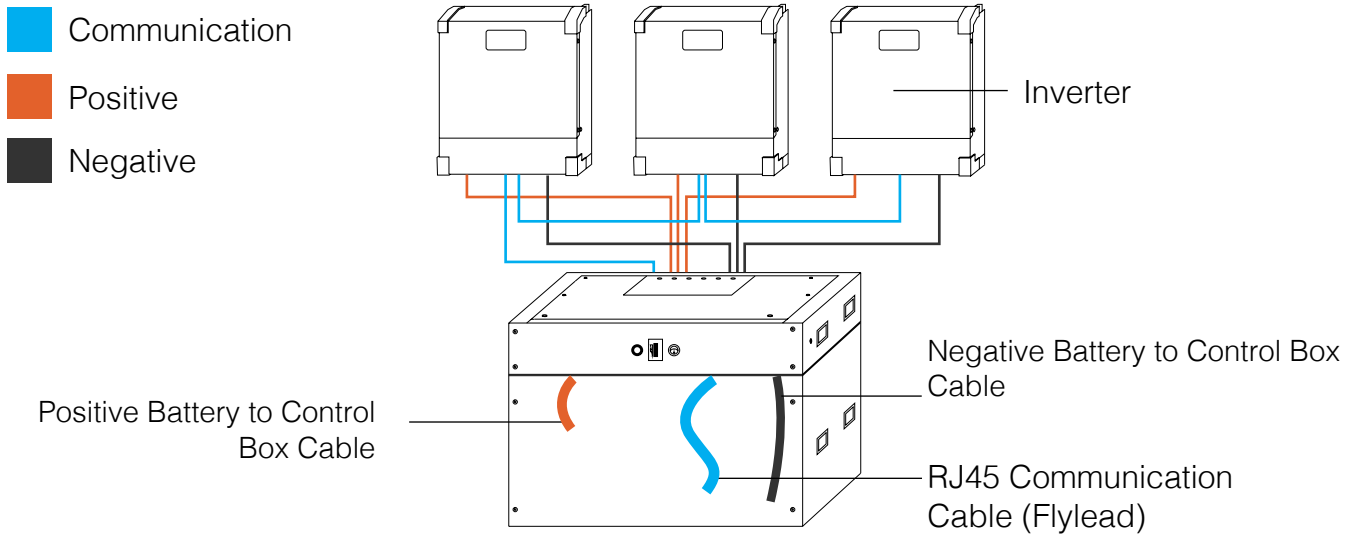


Figure 4: Configuration for X-Range 21 kWh

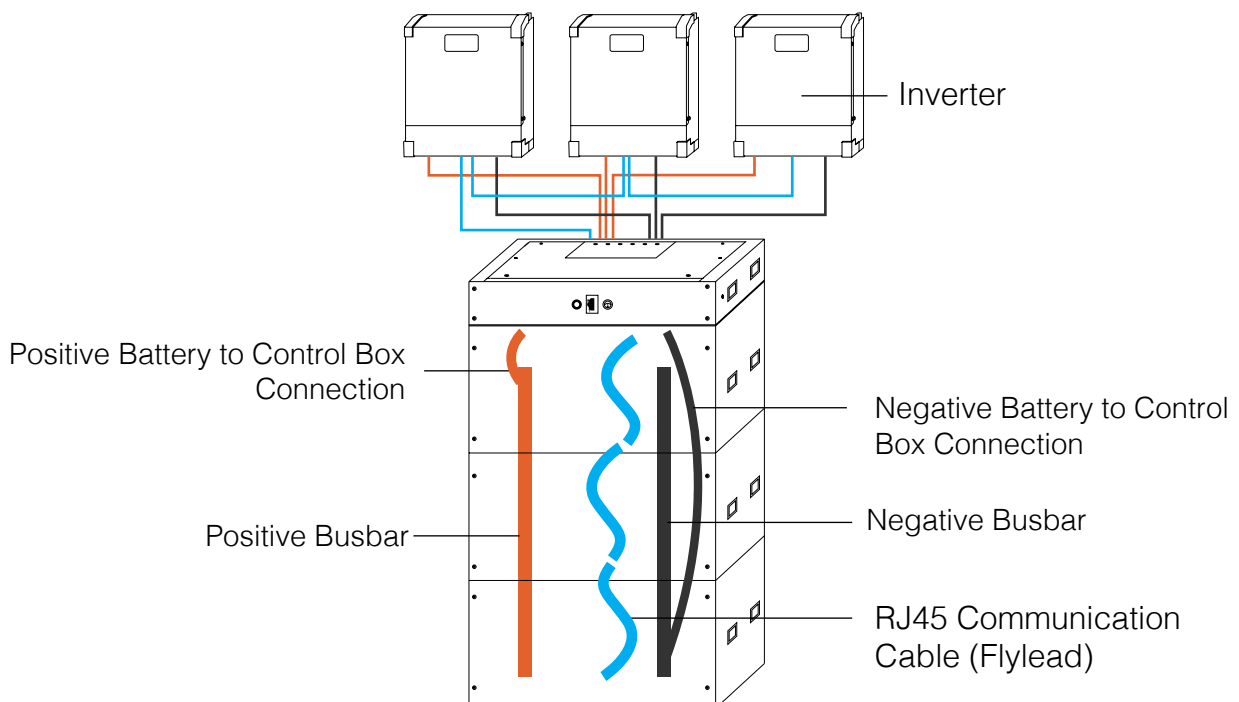


Figure 5: Configuration for X-Range 64 kWh



Figure 3 shows the service hatch of the Control Box where the cables from the inverter connect. The cables are connected to the busbars with the provided M8 studs. Each stud connects with a single phase.

## Stacking

The bottom Battery Box is placed on the provided feet. The subsequent units that are stacked use the locating pins and hole, as seen in Figure 7, to align the units when stacking. The studs are on the bottom of the units and the holes are on top of each unit.

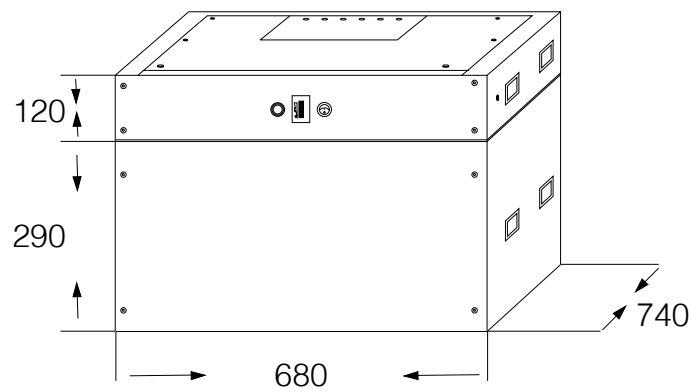


Figure 6: Dimentions of the X-Range

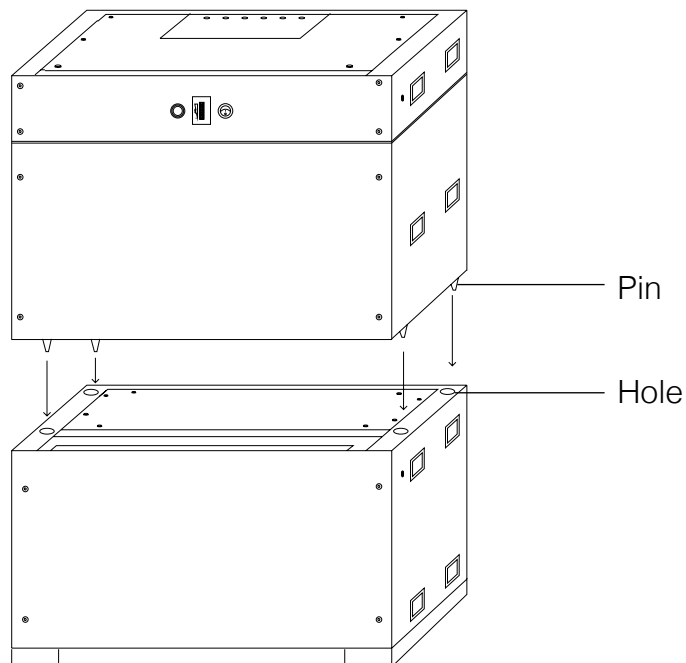


Figure 7: Stacking of the X-Range

# TRANSPORTATION AND STORAGE

This section elaborates more on conditions which are suitable to transport the X-Range boxes, as well as storing the units while they are not in use.

## **Transportation**

Avoid serious vibration or shock during transport

## **Storage**

It is recommended that the X-Range be stored at room temperature in a dry environment for a maximum period of 6 months with the isolators switched off. If the units are not stored under the correct conditions iG3N will not be held liable for any damage to the system.