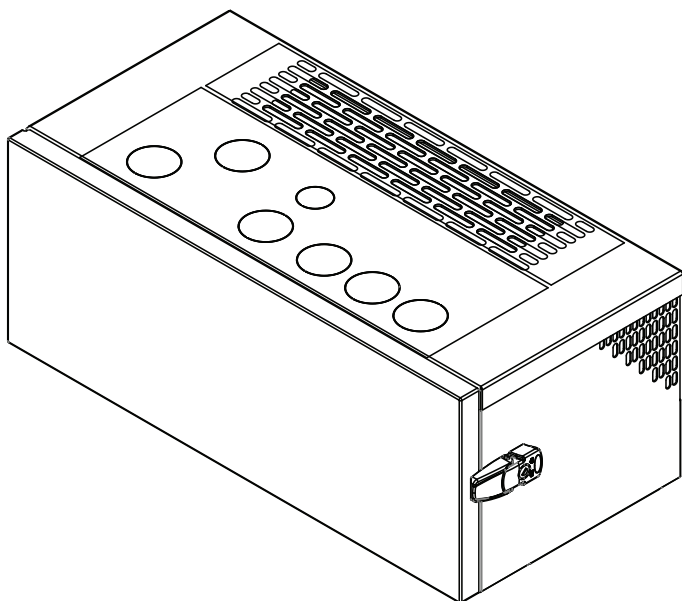




# HELIOS ESS SOL-ARK 15K-2P-N HYBRID INVERTER CONDUIT BOX MANUAL

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SOL-ARK 15K-2P-N HYBRID INVERTER CONDUIT BOX

950-0067

INTRODUCTION ..... 3

1. AUDIENCE, MESSAGES, WARNINGS, GENERAL SAFETY, PERSONAL PROTECTIVE  
EQUIPMENT ..... 3

1.1 Audience..... 3

1.2 Warning, Caution, Notice, and Note Messages ..... 3

1.3 General Warnings..... 4

1.4 Safe Handling Procedures ..... 5

1.5 Personal Protective Equipment ..... 6

1.6 Emergency Procedure ..... 6

2. DOCUMENTATION..... 6

3. ITEMS SHIPPED IN THE BOX ..... 7

4. SPECIFICATIONS ..... 8

5. CONDUIT BOX FEATURES..... 9

5.1 Battery Features..... 9

6. INSTALLATION .....10

6.1 Tools .....10

6.2 Optional Accessories.....10

6.3 Installing the Conduit Box .....11

6.4 Wiring.....13

# Introduction

The HELIOS ESS Sol-Ark 15K-2P-N Conduit Box is an accessory that enables a seamless connection between the Sol-Ark 15K-2P-N Hybrid Inverter and HELIOS ESS Lithium battery. The conduit box hides and protects the wiring in the energy storage system.

## 1. AUDIENCE, MESSAGES, WARNINGS, GENERAL SAFETY, PERSONAL PROTECTIVE EQUIPMENT

### 1.1 Audience

Configuration, installation, service, and operating tasks should only be performed by qualified personnel in consultation with local authorities having jurisdiction and authorized dealers. Qualified personnel should have training, knowledge, and experience in:

- Installing electrical equipment
- Applying applicable installation codes
- Analyzing and reducing hazards involved in performing electrical work
- Installing and configuring batteries
- Installing and configuring systems activated by relays

### 1.2 Warning, Caution, Notice, and Note Messages

Messages in this manual are formatted according to this structure.



Additional information concerning important procedures and features of the product. Read all the instructions before installation, operation, and maintenance.



Important information regarding hazardous conditions.

#### **WARNING**

Important information regarding hazardous conditions that may result in personal injury or death.

#### **CAUTION**

Important information regarding hazardous conditions that may result in personal injury.

#### **NOTICE**

Important information regarding conditions that may damage the equipment but not result in personal injury.

## NOTE

Ad hoc information concerning important procedures and features unrelated to personal injury or equipment damage.

### 1.3 General Warnings



Do not crush, disassemble or dispose of the battery in fire or the garbage.



This product is made of recyclable materials and must be recycled.



#### ⚠ WARNING

##### ELECTRIC SHOCK AND FIRE HAZARD

- This equipment must only be installed as specified.
- Connect the battery to isolated Power Conversion Systems (PCS) only.
- Do not install the battery in series.
- Do not disassemble or modify the battery.
- If there is damage to the battery case, do not touch exposed contents.
- There are no user-serviceable parts inside.

**Failure to follow these instructions may result in death or serious injury.**

#### ⚠ WARNING

##### CHEMICAL HAZARD

Do not touch the exposed contents of a Lithium cell.

**Failure to follow these instructions may result in death or serious injury.**

#### ⚠ WARNING

##### ELECTRIC SHOCK AND FIRE HAZARD

Do not lay tools or other metal parts across the terminals.

**Failure to follow these instructions may result in death or serious injury.**

#### ⚠ CAUTION

##### HEAVY OBJECT

Two-person or three-person lift is recommended for the battery.

**Failure to follow these instructions may result in injury.**

## CAUTION

### ELECTRIC SHOCK HAZARD

- Do not touch the energized surfaces of any electrical component in the battery system.
- Before servicing the battery, follow all procedures to fully de-energize the battery system.
- Follow the [Safe Handling Procedures](#) below when working with the battery.

**Failure to follow these instructions may result in injury.**

## 1.4 Safe Handling Procedures

Before using the battery, read all instructions and cautionary markings on the unit and all appropriate sections of this manual.

- Use personal protective equipment when working with batteries.
- Do not dispose of the battery in a fire.
- Promptly dispose of or recycle used batteries following local regulations.
- Do not crush, bend, deform, puncture or shred.
- Do not modify, re-manufacture, or attempt to insert foreign objects into the battery, immerse or expose the battery to water or other liquids, fire, explosion, or other hazards. If the user suspects damage to the battery due to water, heat, or other reason, take it to a service center for inspection.
- Only use the battery for the system for which it is specified.
- Do not lift or carry the battery while in operation.
- The battery is heavy. When lifting the battery, follow appropriate standards.
- Only lift, move, or mount following local regulations.
- Take care when handling battery terminals and cabling.
- Do not expose the battery to high temperatures.
- Do not submerge the battery.
- Do not install the battery with the faceplate down.
- Only use the battery with a charging system that meets specifications. Using a battery or charger that does not meet specifications may present a risk of fire, explosion, leakage, or other hazards.
- Do not short-circuit a battery or allow metallic conductive objects to contact battery terminals.
- Replace the battery with only another battery that meets the specifications of the system. Using a battery that does not meet specifications may present a risk of fire, explosion, leakage, or other hazards.
- Do not drop the device or battery. If the device or battery is dropped, especially on a hard surface, and the user suspects damage, take it to a service center for inspection.

## 1.5 Personal Protective Equipment

When handling or working near a battery:

- Use Personal Protective Equipment, including clothing, glasses, insulated gloves, and boots.
- Do not wear metal rings, watches, bracelets, or necklaces.

## 1.6 Emergency Procedure

### Unusual Odor

- If there is a burning smell
  - Turn OFF the power conversion equipment.
  - Call the installer and schedule an immediate inspection.

### Fire

- If there is smoke or other signs of fire:
  - Call 911 (or the emergency phone number in your area).
  - If there is an emergency STOP button, press it to shut down the system.
- Do not attempt to put out the fire.
- Do not spray water or other fire retardants.

## 2. DOCUMENTATION

Before installation and configuration, consult the relevant product documentation, including Manuals, Application Notes, Installation and Configuration Guides.

This document provides information about connecting the Sol-Ark 15K-2P-N Hybrid Inverter with the Discover Energy Systems HELIOS ESS battery.

### Sol-Ark Documentation

Visit [sol-ark.com](https://sol-ark.com) for the most recent version of published documents.

- Sol-Ark 15K-2P-N Hybrid Inverter  
[www.sol-ark.com/residential/15k-whole-home-inverter/](https://www.sol-ark.com/residential/15k-whole-home-inverter/)

### Discover Documentation

Visit <https://www.discoverenergysys.com> for the most recent version of published documents.

- [HELIOS ESS Installation and Operation Manual \(805-0090\)](#)
- [LYNK II Sol-Ark User Manual \(805-0038\)](#)

### 3. ITEMS SHIPPED IN THE BOX

Confirm the contents of the box. Discover does its best to maintain quality and accuracy in the shipment of its products. If anything is damaged or missing, please contact customer support immediately.

**Table 2-1, HELIOS ESS Sol-Ark Conduit Box Contents**

| Items | Description                                                                                                                                                         |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Sol-Ark Conduit Box (compatible with the Sol-Ark 15K-2P-N Hybrid Inverter)                                                                                          |
| 1     | Drilling template                                                                                                                                                   |
| 1     | CAT6 Cable (30.48 mm, 12 inch)                                                                                                                                      |
| 1     | Conduit box accessories <ul style="list-style-type: none"><li>• Grommets<ul style="list-style-type: none"><li>• RSB-50 x 6</li><li>• RSB-35 x 1</li></ul></li></ul> |

#### NOTE

The HELIOS ESS and the HELIOS ESS Conduit Box do not come with battery cables.

- The power cables (2 x positive and 2 x negative 2/0 AWG, 200 A Battery to Inverter Power Cables [950-0070]) for connecting the battery to the Sol-Ark 15K-2P-N Hybrid Inverter are sold separately.
- Paralleling multiple HELIOS ESS batteries through the Conduit Box requires the HELIOS ESS Parallel Wire Kit (Battery to Battery) (950-0068) (sold separately).  
The Parallel Wire Kit comes with 1 x positive and 1 x negative 2/0 AWG cables (with quick connects on both ends) and a CAT6 or higher cable.

For the list of accessories for the HELIOS ESS Sol-Ark Conduit Box, refer to [6.2 Optional Accessories](#).

# 4. SPECIFICATIONS

All specifications in this document are published @25°C / 77°F.

Table 4-1, HELIOS ESS Sol-Ark Conduit Box Specifications

| Specifications  | 950-0067               |
|-----------------|------------------------|
| Height          | 229 mm (9.016 in)      |
| Width           | 519 mm (20.433 in)     |
| Depth           | 278 mm (10.945 in)     |
| Weight          | 6 kg (13.23 lb)        |
| Shipping Weight | 9 kg (19.84 lb)        |
| Material        | Galvanized Steel Sheet |

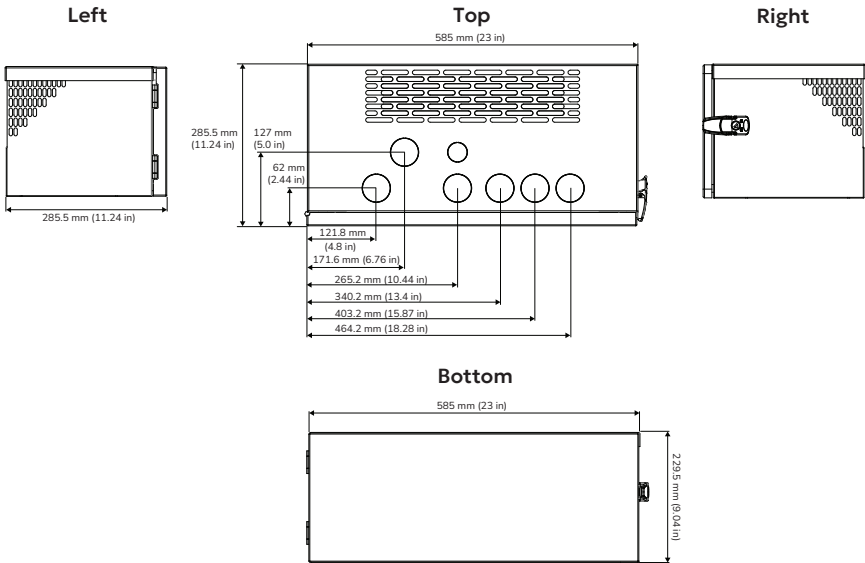


Figure 1. HELIOS ESS Sol-Ark Conduit Box Dimensions

# 5. CONDUIT BOX FEATURES

## 5.1 Battery Features

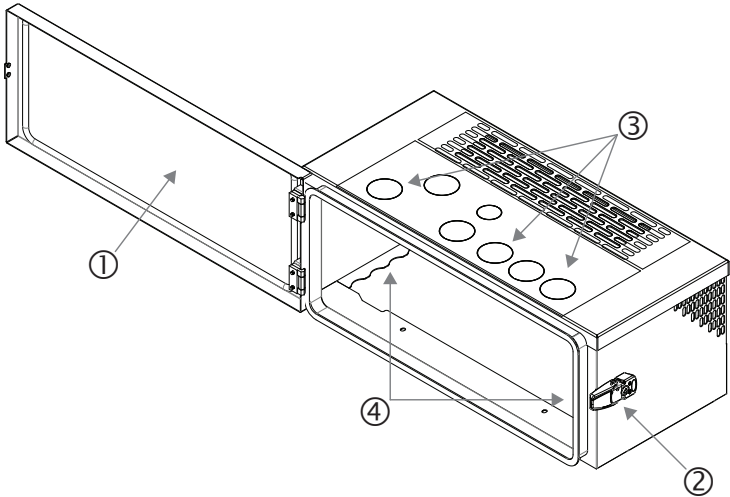


Figure 2. Conduit Box Components

| Item | Description                                                                                                    |
|------|----------------------------------------------------------------------------------------------------------------|
| 1    | Front door                                                                                                     |
| 2    | Door latch                                                                                                     |
| 3    | Knockouts <ul style="list-style-type: none"><li>• 6 x 50 mm (1.969 in)</li><li>• 2 x 35 mm (1.38 in)</li></ul> |
| 4    | Battery terminal access                                                                                        |

## 6. INSTALLATION

The following instructions describe how to connect a single or multiple HELIOS ESS batteries to the Sol-Ark 15K-2P-N Hybrid Inverter through the HELIOS ESS Sol-Ark 15K Conduit Box. Use these instructions alongside the instructions in the [HELIOS ESS Installation and Operation Manual \(805-0090\)](#).

### WARNING

#### ELECTRIC SHOCK AND FIRE HAZARD

- This equipment must only be installed as specified.
- Do not disassemble or modify the battery.
- Do not touch exposed contents if the battery case has been damaged.
- There are no user-serviceable parts inside.

**Failure to follow these instructions may result in injury.**

### NOTE

It is the responsibility of the installer to ensure that all applicable installation requirements and standards are met.

### 6.1 Tools

- Insulated tools sized to match nuts, bolts, and cables
- Wall stud finder
- Personal protective equipment

### 6.2 Optional Accessories

The following optional accessories are available for the HELIOS ESS Sol-Ark Conduit Box.

**Table 6-1, HELIOS ESS Sol-Ark Conduit Box Accessories**

| Accessory                                                                                                                                                                                                                                                                                                                                                     | Part Number |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| LYNK II Communication Gateway                                                                                                                                                                                                                                                                                                                                 | 950-0025    |
| HELIOS ESS Battery to Inverter Power Cables <ul style="list-style-type: none"><li>• 2 pairs of 200 A cables with lug and quick connect:<ul style="list-style-type: none"><li>• 2/0 AWG Positive Power Cable (1.0 m, 39.37 inch)</li><li>• 2/0 AWG Negative Power Cable (1.0 m, 39.37 inch)</li></ul></li></ul>                                                | 950-0070    |
| HELIOS ESS Parallel Wire Kit (battery to battery) <ul style="list-style-type: none"><li>• 1 pair of 200 A cables with quick connects:<ul style="list-style-type: none"><li>• 2/0 AWG Positive Battery Cable (1.35 m, 53 in)</li><li>• 2/0 AWG Negative Battery Cable (1.35 m, 53 inch)</li></ul></li><li>• CAT6 Cable (1.35 m, 53 inch) (COM3/COM4)</li></ul> | 950-0068    |
| HELIOS ESS Terminal Connector Set                                                                                                                                                                                                                                                                                                                             | 950-0072    |

## 6.3 Installing the Conduit Box

### ⚠ CAUTION

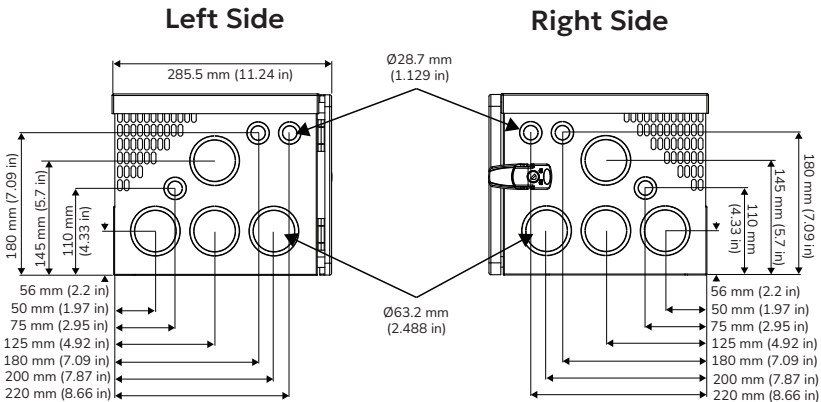
#### INSTALLATION HAZARDS

- Read the installation instructions in the HELIOS ESS Installation and Operation Manual (805-0090) prior to installing the conduit box.
- The following instructions do not provide the level of detail available in the HELIOS ESS Installation and Operation Manual. Reference the manual when installing the batteries and the conduit box.

**Failure to follow these instructions may result in injury.**

1. Prepare the conduit box. If installing multiple HELIOS ESS batteries with conduit boxes, plan on drilling holes on the sides for passing wires and cables between conduit boxes with batteries.

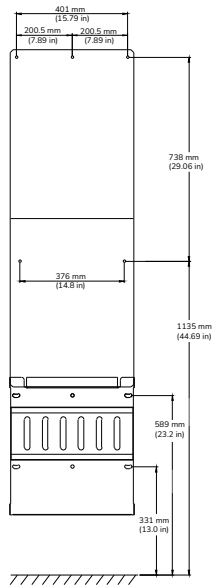
The diagram below is an **example** of the possible hole positions and sizes.



**Figure 3. Example Size and Location of Holes (Ø63.2 mm [2.488 in], Ø28.7 mm [1.13 in])**

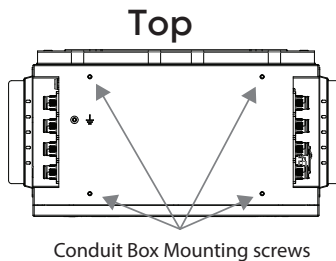
Depending on the installation plan, holes may not be required on both sides of a conduit box.

2. On the top side of the conduit box, punch out the knockouts required for the two positive and two negative inverter cables and the CAN communication cable.
3. Use a stud finder to locate the wall studs.  
Identify a location that optimizes usability and support for the inverter and battery. The battery's Wall-Mount Bracket requires at least 4 bolts supported by wall studs.
4. If the wall studs are not in ideal locations, consider adding appropriate structural supports to spread the weight of the 130 kg (286.6 lb) battery and the 62.5 kg (135 lb) inverter.
5. Use the template provided with the Conduit Box (see [3. ITEMS SHIPPED IN THE BOX](#)) and mark the location of holes for the battery and inverter wall-mount brackets.



**Figure 4. Drilling Template**

6. Verify the hole marks are level, at the correct height, and in an appropriate location against the wall.
7. Drill the holes for screws of the Wall-Mount Brackets of the Sol-Ark 15K-2P-N Hybrid Inverter and HELIOS ESS battery.
8. Secure the HELIOS ESS Wall-Mount Bracket to the wall using appropriate fasteners that can support the battery's weight and are compatible with the material of the wall or studs.
9. Attach the HELIOS ESS battery to the Wall-Mount Bracket. Refer to the [HELIOS ESS Installation and Operation Manual \(805-0090\)](#) for instructions.
10. On the top of the HELIOS ESS battery, unscrew the four conduit box mounting screws.



**Figure 5. Conduit Box Mounting Screws on the HELIOS ESS Battery**

11. Place the HELIOS ESS Sol-Ark Conduit Box on top of the battery and affix to the battery with the mounting screws.
12. Attach the Sol-Ark 15K-2P-N to the inverter Wall Mount Bracket. Refer to the inverter manufacturer's documentation for installation instructions.

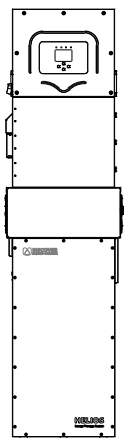


Figure 6. Sol-Ark 15K-2P-N Hybrid Inverter and Conduit Box Installed

13. Next, wire the batteries and the inverter.

## 6.4 Wiring

### ⚠ CAUTION

#### FIRE HAZARD

- Undersized fuses and disconnects may become overloaded and potentially cause a fire.
- Fuses and disconnects are required to open before the cable reaches its maximum current carrying capability.

**Failure to follow these instructions can result in injury.**

### ⚠ CAUTION

#### ELECTRIC SHOCK AND FIRE HAZARD

- Take precautions to avoid bridging the terminals.
- Do not contact the terminals with metal mountings, fixtures, or body parts.

**Failure to follow these instructions can result in injury.**

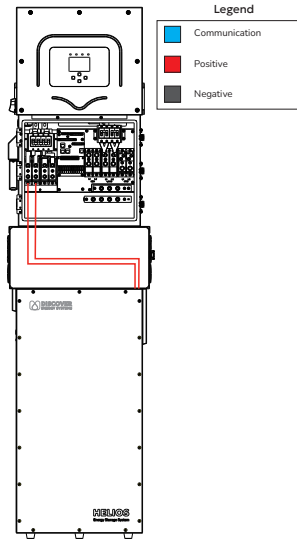
### NOTICE

- The Sol-Ark 15K-2P-N hybrid inverter requires two positive and two negative 2/0 AWG cables, as specified in the Sol-Ark documentation.
- The HELIOS ESS Battery to Inverter Power Cables (950-0070), with two sets of positive and negative 2/0 AWG cables, satisfy Sol-Ark's requirement for the battery to inverter cables.

Refer to the [HELIOS ESS Installation and Operation Manual \(805-0090\)](#) and the [LYNK II Sol-Ark User Manual \(805-0038\)](#) for information on wiring and configuring the batteries and inverter.

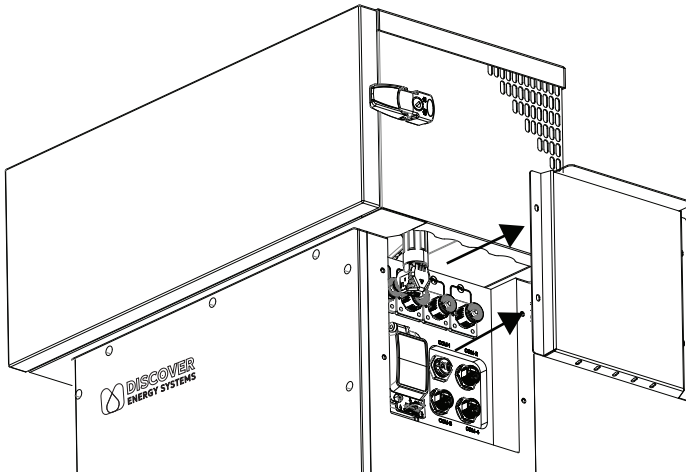
### 6.4.1 Wiring a Single-Battery

1. Pass the two positive battery cables in the HELIOS ESS Battery to Inverter Power Cable set (950-0070), from the inverter and through the conduit box.
2. Connect the lugs of these positive battery cables to the inverter's positive battery ports.



**Figure 7. Install Positive Battery Cables in a Single Battery**

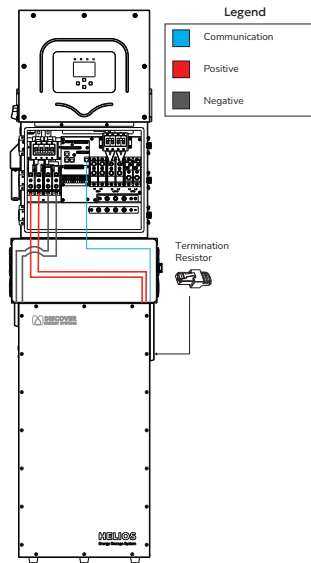
3. On the battery, unscrew the battery terminal cover plates to access the positive battery terminals.



**Figure 8. Remove Battery Terminal Cover Plate**

4. Connect the positive battery cable connectors to the positive terminals on the battery. Push the cable connectors against the receiving pins of the battery to secure the connections.

5. Repeat steps 2 to 5 for the negative battery cables (950-0070), connecting to the negative battery ports on the inverter and to the negative terminals on the battery.



**Figure 9. Wiring in a Single Battery Installation**

6. Connect the CAT6 or higher communication cable that came with the HELIOS ESS battery to the inverter's CAN port, and pass the other end of the cable through the conduit box to connect to the battery's COM2 port (CAN port).
7. If setting up closed-loop communication without the LYNK II Communication Gateway (950-0025), and the HELIOS ESS battery is supplied with a termination resistor, insert the resistor into either the COM3 or COM4 port.
8. Re-attach the battery terminal cover plates.

## NOTE

For shipping purposes, the cover plate is attached inside-out. Please attach the cover plate so that it juts out and provides room for the battery and communication cables.

## 6.4.2 Wiring Multiple Batteries

### NOTICE

- The Sol-Ark 15K-2P-N hybrid inverter requires two positive and two negative 2/0 AWG cables, as specified in the Sol-Ark documentation.
- The HELIOS ESS Battery to Inverter Power Cables (950-0070), with two sets of positive and negative 2/0 AWG cables, satisfy Sol-Ark's requirement for the battery to inverter cables.
- Paralleling batteries with the conduit box requires the HELIOS ESS Parallel Wire Kit (950-0068), which includes a pair of 2/0 AWG battery cables (positive and negative) and one CAT6 or higher cable.
- One parallel wire kit is required to parallel two batteries. Two kits are required to parallel three batteries, which is the maximum number of HELIOS ESS batteries you can connect in parallel with conduit boxes.

### NOTE

In a multiple battery installation with the conduit box, depending on the requirements in your area, you may have to connect conduit between each conduit box for the battery cables (required in the US and in Canada).

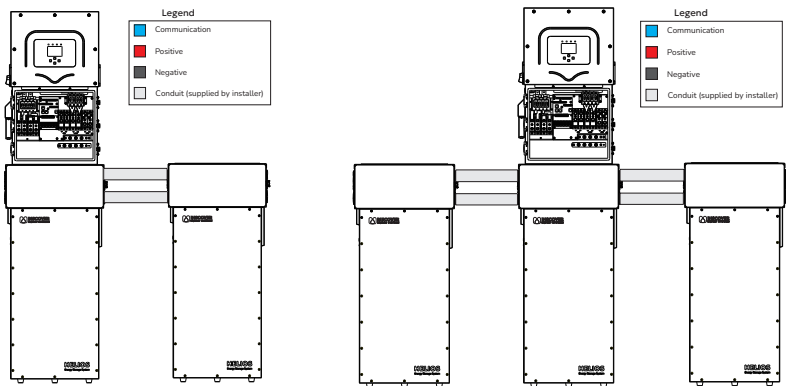


Figure 10. Conduit in Two and Three-Battery Systems

1. On the battery, unscrew the battery terminal cover plates to access the positive battery terminals.

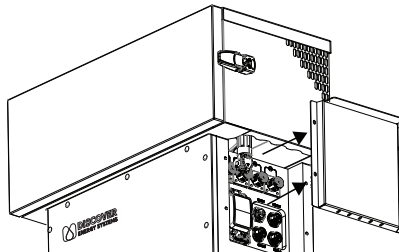
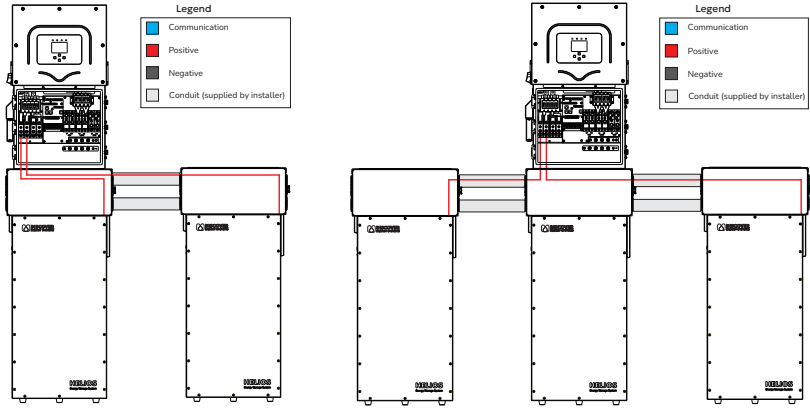


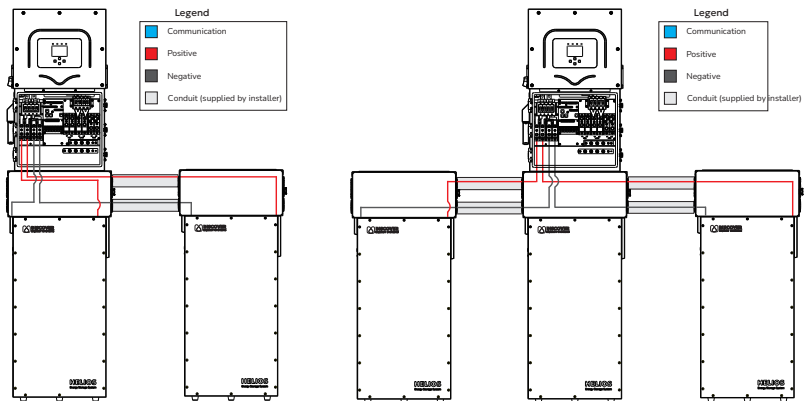
Figure 11. Remove Battery Terminal Cover Plate

2. Pass the two positive battery cables in the HELIOS ESS Battery to Inverter Power Cable set (950-0070), from the inverter, through the conduit box, and out the conduit to the sides of the conduit box, as required.
3. Connect one of these positive battery cables to a battery on one end of the battery bank, and connect the other positive battery cable to the battery on the other end of the battery bank. Push the cable connectors against the receiving pins of the batteries to secure the connections.
4. Connect the lugs of these positive battery cables to the inverter's positive battery ports.



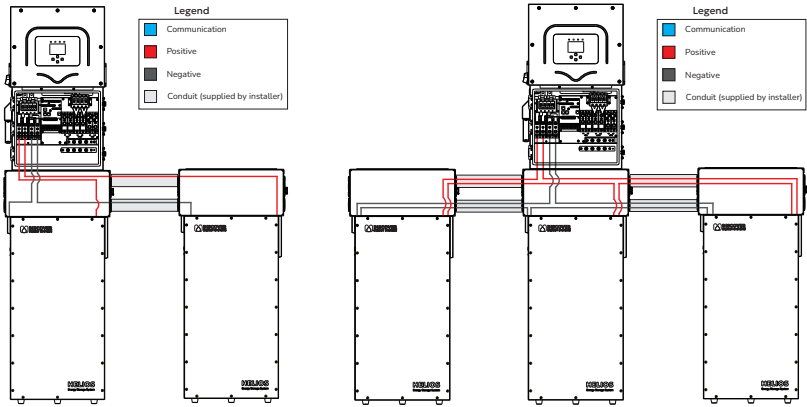
**Figure 12. Positive Battery Cables to Batteries at Opposite Ends**

5. Repeat steps 3 to 5 to connect the negative battery cables (950-0070) to the negative battery ports on the inverter and to the negative terminals on the batteries at opposite ends of the battery bank. Push the cable connectors against the receiving pins of the batteries to secure the connections.
6. Connect the lugs of these negative battery cables to the inverter's negative battery ports.



**Figure 13. Negative Battery Cables to Batteries at Opposite Ends**

7. Connect the positive battery cable in the HELIOS ESS Parallel Wire Kit (950-0068) to the receiving pins of the positive battery terminals as shown in the following diagrams. Similarly, connect the negative battery cable to the receiving pins of the negative battery terminals as shown in the following diagrams. Push the cable connectors against the receiving pins of the batteries to secure the connections.



**Figure 14. Parallel Battery Cables: Positive to Positive, Negative to Negative**

8. After all the battery cables are connected, connect the CAN communication cables. (See Section [6.4.3](#))

### 6.4.3 Setting Up Closed-Loop CAN Communication

There are two ways to set up closed-loop communication between the inverter and batteries.

- [Closed-Loop Communication with the LYNK II Communication Gateway \(950-0025\)](#)  
The LYNK II Gateway must be purchased separately from your Discover Energy Systems supplier.
- [Closed-Loop Communication Without LYNK II Communication Gateway](#)

## NOTICE

Mixing the LYNK Network (LYNK port on the LYNK II and COM3/COM4 on the HELIOS ESS battery) with other networks may result in equipment malfunction and damage.

## Closed-Loop Communication with the LYNK II Communication Gateway (950-0025)

Connect CAT6 communication cables from the inverter to the LYNK II Communication Gateway and then to each battery. For more information on setting up communication with the Sol-Ark 15K-2P-N hybrid inverter, refer to the [LYNK II Sol-Ark User Manual \(805-0038\)](#).

### NOTE

- The LYNK II Communication Gateway is terminated internally. When using the LYNK II, a termination resistor at the end of the LYNK Network is not required.
- This connection method requires you to provide one CAT6 or higher communication cable.

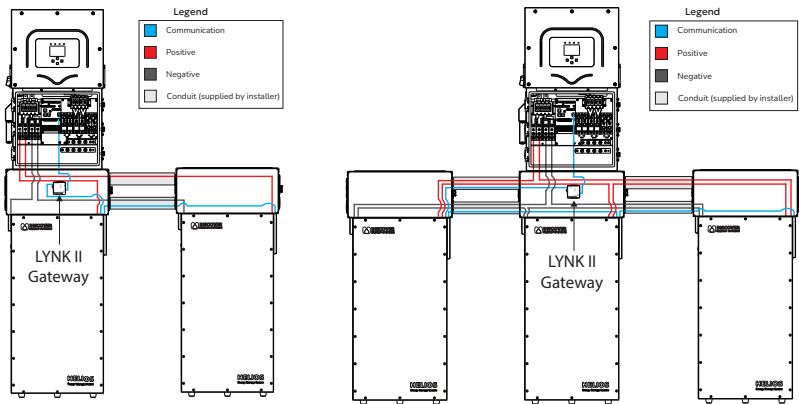


Figure 15. LYNK II Gateway for Closed-Loop Communication

1. Attach the CAT6 or higher cable that came with the HELIOS ESS, from the inverter's CANbus port to the LYNK II Communication Gateway's CAN port. You can mount the LYNK II to the inside of the Conduit Box.
2. Provide a CAT6 or higher cable and connect it from the LYNK II Communication Gateway's LYNK port, to either COM3 or COM4 (LYNK port) on the battery.
3. Network all the batteries by attaching the CAT6 or higher communication cables from the Parallel Wire Kits (950-0068) to the battery COM3 or COM4 ports (LYNK port) on the first battery, to COM3/COM4 on the next battery, and so on, until all the batteries are connected.

## Closed-Loop Communication Without LYNK II Communication Gateway

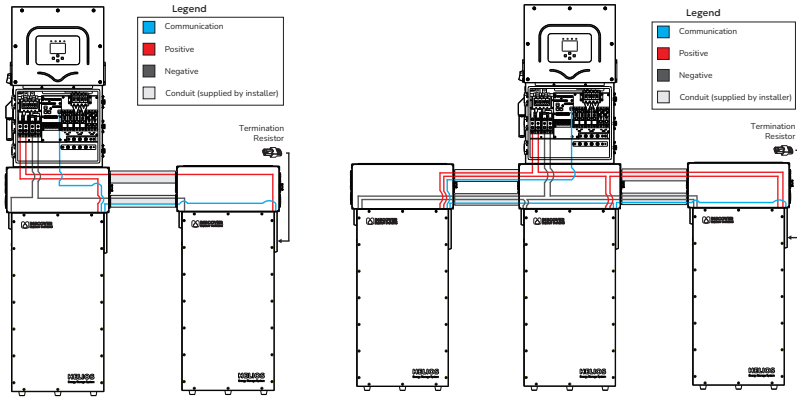
Closed-loop communication without the LYNK II Communication Gateway is available with the Sol-Ark 15K-2P-N.

Connect CAT6 or higher communication cables from the inverter to the first battery, then connect the first battery to the second battery, and then the second battery to the third battery. If required, terminate the LYNK network at the third battery.

### NOTE

- When setting up closed-loop communication without the LYNK II Communication Gateway, a termination resistor may be required at the end of the LYNK network.
- If your HELIOS ESS battery comes with a termination resistor in the box, attach the resistor to either the COM3 or COM4 of the last battery.

1. Attach the CAT6 or higher cable that came with the HELIOS ESS, from the inverter's CANbus port to the battery's COM2 port (CAN port).



**Figure 16. Direct Communication Between Inverter and Batteries**

2. Network all the batteries by attaching the CAT6 or higher communication cables from the Parallel Wire Kits (950-0068) to the battery COM3 or COM4 port (LYNK port) on the first battery, to COM3/COM4 on the next battery, and so on, until all the batteries are connected.
3. When using HELIOS ESS batteries that are supplied with a termination resistor, insert the termination resistor to either the COM3 or COM4 port on the last paralleled battery.