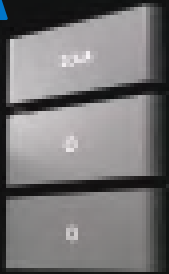
ZOLA EDGE



A modular power solution that integrates multiple power sources to deliver uninterrupted power.

Installation Manual

1. INTRODUCTION

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2. SAFETY

The product is designed and tested in accordance with international safety requirements, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the product. To reduce the risk of personal injury and to ensure the safe installation and operation of the product, you must carefully read and follow all instructions, cautions, and warnings in this manual.

Warning Terms in this Document

A warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all the ZOLA Electric equipment and/or other equipment connected to the ZOLA Electric equipment or personal injury.

TERM	DESCRIPTION
DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	WARNING indicates a hazardous situation which, if not avoided, may result in death or serious injury
CAUTION	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	NOTICE is used to address practices not related to personal injury.

Markings on EDGE

The following symbols are used as product markings with the following meanings:

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Protective Earth (PE) conductor terminal		Warning/ Caution, refer to documentation
	Danger/ Warning, risk of electric shock		Read the instruction manual

General Warnings

WARNING High Leakage Current
It is essential to make all Earthing conductor connections before connecting and energizing any other power supply, such as from Mains, Solar, or other EDGE Units. Earth conductors must be sized to comply with applicable local regulations for high leakage current equipment.

WARNING Solar Power Generation
If the installation site has one or more solar panels, ensure that these cables always remain securely connected to the EDGE system. When servicing the system, ensure that the uninsulated terminals of the PV cables are protected from any contact by persons or tools.

CAUTION Environmental Concerns
Do not operate an EDGE system in ambient temperatures above 45°C or below 5°C. Ensure that no water sources are located above or near EDGE Units, including downspouts, sprinklers, or faucets.

WARNING Do Not Open the Equipment
Do not attempt to repair EDGE, it contains no user-serviceable parts. Parts within EDGE contain hazardous voltages and electrical energy. If any EDGE Units fail, contact your ZOLA distributor's customer service. Tampering with or opening an EDGE component will void the warranty.

WARNING Do Not Dispose of Batteries in a Fire
Never dispose of EDGE BACKUPS (which contain batteries) in a fire. Proper disposal of batteries is required. Contact ZOLA customer service for disposal requirements.

WARNING The Battery is Not Serviceable or Replaceable
Batteries in the EDGE BACKUP are not serviceable or replaceable. Contact your installer or ZOLA customer service for repairs.

WARNING Maintain Proper Electrical Mains Connection
Wiring from the utility grid to EDGE must be made by qualified personnel only. Contact ZOLA customer service to identify a qualified installer.

WARNING For Indoor Use Only
EDGE is designed for use indoors. Installing in locations that are exposed to environmental conditions such as water, direct sunlight, extreme temperatures, pests, blown dirt or debris, or other physical damage will create a safety hazard and risk of compromised performance.

DANGER Ensure Protective Earthing
Improper earthing may result in serious injury or death due to high leakage current.

General Safety Instructions

- Only **ZOLA Electric** or **ZOLA Electric Trained Technical Partners**, can conduct installation/ uninstallation/ or servicing activities described in this document.

- Do not install/ uninstall/ or service EDGE until you have read this manual. Always execute steps in this manual in the order described.

- This system is not for for installation or operation by:
  - Children
  - People with impairments *(physical, sensory, mental)*
  - People with insufficient knowledge and training of the product.

- Do not dispose of this manual during the lifetime of the product and ensure it is available to all current and future users.

- Improper use of the system can compromise performance and damage components.

- Disconnect the EDGE system from the site's wiring by turning OFF the AC Input and Output breakers for each connected EDGE INVERTER and then switching the EDGE CONNECT to "**Bypass**".

- Call ZOLA customer service if any of the following conditions are discovered:
  - Any EDGE Unit does not function or shows any visible signs of physical damage, smoke, or leaking liquid.
  - Any visible damage to any system wiring
  - Any visible damage to the solar panels or their mounting structure

- Do not turn the system on before all system components have been installed, repaired or replaced as necessary, and inspected by a Trained Technical Partner authorized by ZOLA Electric.

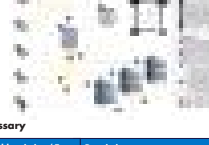
- Ensure proper clearances around the EDGE Units are maintained to ensure proper airflow is maintained for cooling. Never cover the system with any fabric or other material.

- Do not open any components of the system unless authorized by ZOLA Electric.
- Never remove or alter any markings or symbols applied to EDGE INVERTERS, EDGE BACKUPS, or EDGE CONNECT.
- Do not connect any power source not described in this document to the EDGE system unless authorized by ZOLA Electric. Incorrectly connected devices create risk of damage to the system. The connection of any other solar or battery equipment not supplied by ZOLA Electric for EDGE will void the warranty and may create a safety hazard.
- Ensure that the building or facility where EDGE will be installed and powered is properly grounded and ONLY power ON EDGE when the grounding cable has been connected to EDGE INVERTERS, EDGE BACKUPS and EDGE CONNECT.
- For any bodily injury, immediately seek emergency medical attention.

3. PRODUCT OVERVIEW

EDGE is a standalone electricity supply technology that can power alternating current (AC) appliances. The central components are the EDGE INVERTER and EDGE BACKUP. These components can be stacked to expand the system's power output and energy storage to meet the needs of multiple user profiles with diverse use cases, environments, and economics.

The following picture illustrates an expected EDGE configuration:



Glossary

Abbreviation / Term	Description
AC - Alternating Current	A type of electricity that's used in most public electric grids, and is adequate for generic appliances. Edge outputs AC electricity.
Bypass Switch	A switch within the EDGE CONNECT that allows the home's backed up load circuits to be directly powered from the Remote System (utility or generator) for any time when the EDGE system requires servicing.
DC - Direct Current	A type of electricity that's produced by PV panels and batteries. The Edge system does not output DC electricity.
EOL - End of Life	The moment when the performance of the battery is not acceptable to continue being used in each application. This can be determined from performance parameters such as:

	• Effective Ah capacity • Output resistance • Efficiency • Maximum power output
F Frequency	Cycles per second of an AC waveform. Measured in cycles per second (Hertz)
GSM - Global System Mobile	A global cellular radio communications standard
EDGE	The entire independent power system consists of EDGE INVERTERs, EDGE BACKUPS, EDGE CONNECT and wiring.
EDGE CONNECT	The wall-mounted panel that connects the home's wiring to the EDGE system wiring. Also contains the bypass switch and automatic generator start
Keypad	A user interface on the top of EDGE INVERTER that provides direct interaction with the system when needed *(setting changes, PAYGO unlocking, etc.)*
LCD Screen	Screen on the top of EDGE INVERTER that provides general reporting on system status and performance
EDGE INVERTER	The heart of any EDGE system. The inverter component of the EDGE system that also contains the Keypad and LCD Screen along with wiring connections to the External AC Power Source.
External AC Power Source	A power source, such as the public grid or a backup generator, which connects to an EDGE system
SoC - State of Charge	Energy content in the battery. Expressed in percent compared to the maximum possible energy content.
String	A power source circuit in EDGE consisting of an EDGE INVERTER and any interconnected EDGE BACKUPS.
EDGE BACKUP	The unit that contains the EDGE energy storage component *(battery)* of the EDGE Integrated Power System.
ZOLA VISION App	A smartphone app to monitor and control the EDGE system.
ZOLA LED	A light on the front of an EDGE INVERTER provides a quick and easy way to see the systems operational state.

Description of System Components and Operation

The first component within a string, called the EDGE INVERTER, contains the input and output ports that exchange power. Users will also purchase EDGE BACKUP(S) to support the system's desired autonomous runtime. An onboard computer in the EDGE INVERTER dispatches energy to the power output or storage to maximize the utilization of PV energy and reduce the energy taken from the utility grid or a backup generator while ensuring reliable electricity service under a wide range of weather and grid failure scenarios.

When purchased from ZOLA Electric, additional INVERTER and EDGE BACKUPS can be safely added over time by users using ZOLA Electric documentation and basic tools.

EDGE will supply power to your loads while the utility grid is operational, saving you money by reducing the power purchased from the utility. When the utility is lost *(blackout)*, EDGE will continue to power your loads within its capacity *(dependent on the quantity of EDGE INVERTERS and EDGE BACKUPS)* and the number of solar panels connected to the system. Alternatively, given adequate local solar and BACKUP generator capacity, an EDGE can be used for truly autonomous power supply in locations without access to an electric utility grid.

The EDGE CONNECT is offered to allow for the ease of installation and interconnection with the existing wiring. This box allows an EDGE system to easily connect to the building's wiring and provide continuous power to the loads, while also being immediately available as a BACKUP power supply when the utility mains are lost. Additionally, the BYPASS switch *(contained in the EDGE CONNECT)* allows a homeowner or qualified service technician to bypass the EDGE string in case the system requires any servicing. This switch should remain in the "NORMAL" position at all times. Only switch to the "BYPASS" position when instructed by ZOLA customer support or if there is a problem with the EDGE system.

When in bypass mode, this switch allows the home's load circuits to be supplied by the utility or BACKUP generator *(if present)* directly.

The EDGE CONNECT also includes an automatic transfer switch and generator start and stop *(2-wire)* function that enables the system to start and transfer external power input to a generator under a variety of circumstances that are set by the user.

Items in the EDGE packaging

Before beginning site setup and system installation, please familiarize yourself with the components in the system and what's included in the packaging. The contents of the packaging for the EDGE INVERTER, EDGE BACKUP and EDGE CONNECT are listed below.

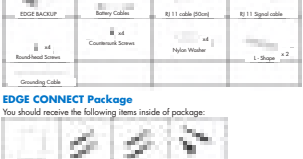
EDGE INVERTER Package

You should receive the following items inside of package:

EDGE INVERTER	RJ 45 BMS Cable **Note:** polarization labels	Manual	Battery Cables
RJ 50 Parallel Data Cable	x 3 WiFi Antenna	x 2 Cable Gland	Grounding Cable
1.4 Pin Connector Gen Control	x4 Round-head Screws	x4 Nylon Washer	RJ 9 Cable (150cm)
1.4 Pin Connector Gen Control			
RJ 45 to RS232 Cable			

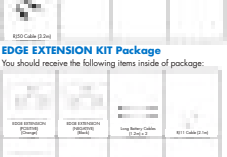
EDGE BACKUP Package

You should receive the following items inside of package:



EDGE CONNECT Package

You should receive the following items inside of package:



EDGE EXTENSION KIT Package

You should receive the following items inside of package:

Tool requirements

As you begin site preparation and installation, please make sure that you have the tools below to ensure a safe and effective installation of the EDGE system and the required electrical connections.

TOOL	TOOL USE
Philips #2 screwdriver	To remove the service panel and to install cables.
Flat head screwdriver	To install conductors on main terminal block of interface panel.
Precision mini flat screwdriver	14-pin connector and genset terminal blocks
AC Voltmeter with Current Clamp	Measuring and verifying of the AC voltages and currents in the system
Wire cutter	For cutting conductors at points of termination
Wire stripping tool	For stripping conductor at points of termination
Miscellaneous conduits, cables, cable tray and wires	Wiring and trunking is required to attach the EDGE INVERTERS to the EDGE CONNECT as well as to connect EDGE CONNECT to mains, load, and generator. See below for wire gauge sizing.
Power drill and bits	Used to attach wall-mounted equipment such as the EDGE CONNECT.

4. SITE SETUP

In preparing the site for installation, the technician must determine where the components of the EDGE system should be placed based on:

- Location of the PV array and cable run
- Location of the distribution (sub) panel
- Location of the Generator (if applicable)
- Available space at the installation site
- Users desired placement of the EDGE INVERTERS and BACKUPS

Notes on Positioning EDGE INVERTER and BACKUPS

Before installing the EDGE system, determine a location in the home that will be suitable for the final location considering the following:

- The pollution degree of the energy storage system is PD2. Select an appropriate location. Install the EDGE INVERTERS and EDGE BATTERIES in a protected area that is dry, free of excessive dust and with adequate air flow. Do NOT operate it in a place where the temperature and humidity is beyond the specific limits. *(Please check the specs for the limitations.)*

- All EDGE INVERTERs and EDGE BACKUPS must be placed indoors in a location free from water spray or pooling as the the system is designed with IP20 protection

- The location should be kept free of dirt and dust as dusty conditions may impair the performance of this inverter.

- Any EDGE Units must be placed on a solid floor or another flat surface capable of holding the combined weight of all units stacked together.

- Since EDGE uses GSM networks to communicate with ZOLA Electric servers, avoid concrete basements and enclosed spaces that could block mobile signals. A cellphone can be used to give a basic idea of the available signal level in the potential location.
    - The minimum clearance (in any direction) surrounding the antennas on the back of the EDGE INVERTER must be at least 20 cm to avoid disruption of device's GSM communication

- The minimum clearance *(in any direction)* between any electrically grounded equipment and the antennas on the back of the EDGE INVERTER must be at least 25 cm to avoid disruption of device's GSM communication

The inverter should be installed in the position where system shutdown and disconnection is easy

Use the following details to plan how to fit the needed number of EDGE Units in any space:

Name	Dimensions (W x H x D)	Weight
EDGE INVERTER	600mm x 255mm x 450mm	22 kg
EDGE BACKUP	600mm x 255mm x 450mm	56 kg

CAUTION Maximum Stacking
Do not stack more than 1 Edge INVERTER and 2 EDGE BACKUPS, or 3 EDGE BACKUPS, as shown in Figure 2

WARNING High Leakage Current
It is essential to make all Earthing conductor connections before making any other wiring connection.See EDGE System Installation section of this manual.

Maximum Stacking of EDGE Units

Figure 2.

EDGE component arrangement depends on the number of EDGE components in the system and the space available at the install site.

Option 1- Stacked:
EDGE INVERTER and EDGE BACKUPS can be stacked on each other with the EDGE INVERTER on top as shown in *Figure 2*.
The EDGE INVERTER must always be placed on top of any stack.

Option 2 - Fit to Space:
The EDGE INVERTER and EDGE BACKUPS can be arranged in other ways where there is limited space for stacking. *See Figure 3 next page.*

When installing EDGE in multiple stacks of EDGE INVERTERs and EDGE BACKUPS use the EDGE EXTENSION KIT to interconnect the stacks.

Alternate Stacking of EDGE INVERTER & EDGE BACKUPS

Figure 3: Stacking option I

Figure 4: Stacking option II

NOTICE Clearance Required.

The minimum clearance for suitable air flow on each side of any EDGE INVERTER or EDGE BACKUP is 40cm.

The minimum clearance between the back of an EDGE INVERTER or EDGE BACKUP and the wall is 15 cm.

The minimum clearance *(in any direction)* surrounding the antennas on the back of the EDGE INVERTER must be at least 20 cm to avoid disruption of device's GSM communication

The minimum clearance *(in any direction)* between any electrically grounded equipment and the antennas on the back of the EDGE INVERTER must be at least 25cm to avoid disruption of device's GSM communication

Recommended Clearances

Figure 5.

After determining the proper installation configuration method, ensure that the planned location will leave the top of the EDGE INVERTER easily accessible. The EDGE INVERTER has a keypad and screen that must remain accessible to a user after installation. If the stacking method was used, make sure that the EDGE INVERTER is on top, with the keypad easily accessible. *See Figure 6.*

Ensure the area around the units will remain free of objects and furniture during normal operation and that the ZOLA LED of each unit is oriented into the room so that it can easily be viewed by users.

Location of EDGE INVERTER Keypad and Screen

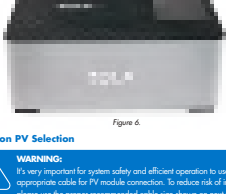


Figure 6.

Notes on PV Selection

WARNING:
It's very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size shown on next page.

WARNING: Because this inverter is non-isolated, only two types of PV modules are accepted, single crystalline, polycrystalline with class A-rated and CIGS modules. To avoid any malfunctions, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using CIGS modules, please be sure NO grounding connection.

CAUTION: It's requested to use a PV junction box with surge protection. Otherwise, it will cause damage to the inverter when lightning occurs on PV modules. It is highly recommended to use a diode in series with the output of each PV array, in either single or multi strings PV configurations, to prevent any inverter current leakage.

PV Module Selection:

When selecting proper PV modules, please be sure to consider the following parameters:

1. Open circuit Voltage (Voc) of PV modules not to exceed maximum PV array open circuit voltage of the inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than the start-up voltage.

Max. PV Array Power	6500W
Max. PV Array Open Circuit Voltage	450Vdc
PV Array MPPT Voltage Range	120Vdc~430Vdc
Start-up Voltage	110Vdc +/- 10Vdc

Recommended solar panel configuration:

Solar Panel Spec. *(reference)*	**SOLAR INPUT** Min in series: 4pcs, per input Max. in series: 12pcs, per input	**Qty of panels**	**Total Input Power**
- 250Wp	4pcs in series	4pcs	1000W
- Vmp: 30.7Vdc	8pcs in series	8pcs	2000W
- Imp: 8.3A	12pcs in series	12pcs	3000W
- Voc: 37.7Vdc	8pcs in series, 2 strings	16pcs	4000W
- Isc: 8.4A	10pcs in series, 2 strings	20pcs	5000W
- Cells: 60	12pcs in series, 2 strings	24pcs	6000W

Notes on Generator Selection

The EDGE CONNECT and the EDGE INVERTER support functionality allowing for a generator Manual or Automatic START/STOP. If the generator is equipped with an automatic Start/Stop feature. The recommended rating for the generator should be 10kVA (single phase) or 30kVA (3 phases) to ensure the best performance during the transition between the EDGE INVERTER and the Generator.The basic features that the generator has to provide are:

a. A START/STOP input that the EDGE INVERTER provided dry contact activates to start or stop the generator.

b. For more details, please refer to the generator wiring section in the manual (pages 29-30, 56-57).

Notes on Distribution (Sub) Panel

Before installing EDGE a local electrician should have installed an additional sub panel and rerouted some of the loads to the sub panel. Some homes might have an existing sub panel.

If rewiring or redistribution of loads is required:

- Ensure that the loads on circuits set for EDGE backup do not exceed the continuous or surge power output capacity of the EDGE system
- If the the loads on an EDGE supported circuit exceeds the capacity of the EDGE system, the user must be educated on what appliances can and cannot be used simultaneously to avoid an undesirable user experience

Preparing Electrical Connections to EDGE

When making electrical connections to the EDGE System, first determine the length of conductors required from the EDGE CONNECT to the utility/ generator mains distribution (sub) panel, EDGE INVERTER(ES).
Cut wire and conduit to length. Pull conductors through conduit. Attach conduit between the EDGE CONNECT and EDGE INVERTER(ES). Attach conduit between the EDGE CONNECT and the main distribution box. Attach conduit between the EDGE CONNECT and the distribution (sub) panel. Connect wiring to the identified terminals in the EDGE CONNECT and to a suitable circuit breaker at the distribution (sub) panel.

WARNING: The maximum circuit breaker or fuse size for the AC input to a single EDGE INVERTER is 40A. If multiple EDGE INVERTERS are connected in parallel, multiple 40A breakers must be used or 1 breaker rated at n*40A where n indicates the number of interconnected EDGE INVERTERS. Circuit breakers should be installed underneath EDGE CONNECT where the grid and generator routes into the panel. Use of a circuit breaker or fuse certified by accredited third parties (i.e. IEC/EN 60898-1) is required to comply with the EDGE product warranty.

5. EDGE SYSTEM INSTALLATION

Unpackaging the EDGE System

WARNING Heavy Equipment
Each EDGE INVERTER weighs 22kg and each EDGE BACKUP weighs 56kg. Two people should be used to remove each EDGE unit from its packaging and to place it in its final position to prevent personal injury.

1. Ensure packaging is placed close to its final position with any UP markings oriented correctly.
2. Open packaging and remove loose packing material.
3. Remove EDGE Unit from the packaging box using the straps wrapped around the unit in the packaging and place on the ground close to its final location with the top of the unit **(with the ZOLA name)** oriented upwards.
4. Ensure all extra parts and any documentation included in the package are put aside and kept for future use during installation.

WARNING Do Not Install Damaged Equipment
Inspect each EDGE INVERTER, BACKUP and CONNECT for any signs of physical damage or any signs of corrosion or liquid exposure. Do not install any EDGE component that you suspect was damaged. Contact ZOLA Technical Partner/ Distributor customer service with any questions or to report damaged equipment.

EDGE CONNECT

Positioning and Mounting the EDGE CONNECT

The Edge Connect should be mounted on the wall as close as possible to the users Distribution (Sub) Panel and/ or generator should the user want (and be able to) connect their generator to the automatic generator start in their EDGE CONNECT.

Installers should use the provided hardware to mount the EDGE CONNECT to the wall.

NOTE:
If the EDGE CONNECT is to be mounted to a wood surface then the installer should find their own suitable hardware.

Connecting EDGE CONNECT to the Distribution (Sub) Panel

For systems with EDGE CONNECT, place the switch into the **"BYPASS"** position to connect the BACKUP loads directly to the External AC Power Source Mains or Generator supply until the EDGE system has been fully installed and is operational.

WARNING

The maximum circuit breaker or fuse size for the AC input to a single EDGE INVERTER is 40A. If multiple EDGE INVERTERS are connected in parallel, multiple 40A breakers must be used or 1 breaker rated at n*40A where n indicates the number of interconnected EDGE INVERTERS. Circuit breakers should be installed underneath EDGE CONNECT where the grid and generator routes into the panel.Use of a circuit breaker or fuse certified by accredited third parties (i.e. IEC/EN 60898-1) is required to comply with the EDGE product warranty.

Suggested cabling for local (Ground, Line & Neutral) wires:

Number of EDGE Strings	Gauge	Use Bootlace Ferrule
1 String	8 AWG (10mm²)	
2 Strings	6 AWG (16mm²)	
3 Strings	4 AWG (25mm²)	

A wiring diagram of a typical sub panel install

Making the external source connection

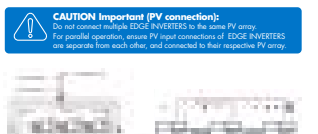
Install conduit between the utility/generator main distribution box and the EDGE CONNECT. Install conduit between the PV array and the EDGE CONNECT. Pull conductors through conduit. Connect the utility/generator wiring to the identified terminals in the EDGE CONNECT and to a suitable circuit breaker at the main distribution box. Connect PV wiring to the identified terminals in the EDGE CONNECT.

PV Connection with an EDGE CONNECT

The EDGE CONNECT 15S supports up to 3 strings connections.
The below chart shows wiring connections for 3 separate PV panels inputs.

Connect the PV wiring from Solar Panels PV output connection to the identified terminals in the EDGE CONNECT. Connect EDGE INVERTER PV wiring to the identified terminals in the EDGE CONNECT and EDGE INVERTER

CAUTION Important (PV connection):
Do not connect multiple EDGE INVERTERS to the same PV array.
For parallel operation, ensure PV input connections of EDGE INVERTERS are separate from each other, and connected to their respective PV array.



Suggested cable requirement for PV Panel input (Negative & Positive) wires:

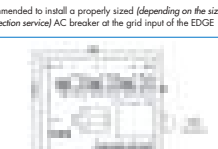
Gauge	Use Boaflace Ferrule
8 AWG (10mm²)	[redacted]

PV Panel connection to EDGE CONNECT

Grid Connection with EDGE CONNECT

Connect the utility wiring to the identified terminals in the EDGE CONNECT.
Connect EDGE INVERTER AC input & output wiring to the identified terminals in the EDGE CONNECT and EDGE INVERTER.

NOTE:
It is recommended to install a properly sized *(depending on the size of the grid connection service)* AC breaker at the grid input of the EDGE



Suggested cable requirement for Grid input (Ground, Line & Neutral) wires:

Number of EDGE Strings	Gauge	Use Bootlace Ferrule
1 String	8 AWG (10mm²)	
2 Strings	6 AWG (16mm²)	
3 Strings	4 AWG (25mm²)	

Generator Connection with an EDGE CONNECT

EDGE CONNECT includes an automatic transfer switch (ATS) for easy connection to a BACKUP generator. Connect the generator AC wiring to the identified terminals in the EDGE CONNECT. Connect the generator control signals to the identified terminals in the EDGE CONNECT. Connect the ATS and generator control signals from the EDGE CONNECT to the 14-pin Terminal block (T8) Header *(supplied in the EDGE INVERTER package)*. The suggested wiring size for control signals is 24AWG (0.25mm²).

Note:
It is recommended to install a properly sized *(depending on the generator size)* AC breaker at the AC output of the generator.

WARNING
The maximum circuit breaker or fuse size for the AC input to a single EDGE INVERTER is 40A. If multiple EDGE INVERTERS are connected in parallel, multiple 40A breakers must be used or 1 breaker rated at n*40A where n indicates the number of interconnected EDGE INVERTERS. Circuit breakers should be installed underneath EDGE CONNECT where the grid and generator routes into the panel.Use of a circuit breaker or fuse certified by accredited third parties (i.e. IEC/EN 60898-1) is required to comply with the EDGE product warranty.

Generator AC input connection to EDGE CONNECT

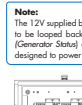
Suggested cable requirement for Generator input (Ground, Line & Neutral) wires

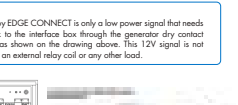
Number of EDGE Strings	Gauge	Use Bootlace Ferrule
1 String	8 AWG (10mm²)	
2 Strings	8 AWG (2.5mm²)	
3 Strings	6 AWG (25mm²)	

Generator control signals wiring

The EDGE CONNECT supports the functions for automatic START/STOP of generators equipped with this feature. The EDGE system provides a dry contact to START/STOP the generator, as described on the wiring diagram for the generator support. The dry contact remains closed for the total time the generator is in operating mode. To turn OFF the generator EDGE will open the dry contact of the START/STOP function. Regarding the Generator Status, EDGE automatically detects when the generator is up and running by checking the proper generator voltage.

Note:
The 12V supplied by EDGE CONNECT is only a low power signal that needs to be looped back to the interface box through the generator dry contact (Generator Status) as shown on the drawing above. This 12V signal is not designed to power an external relay coil or any other load.





Generator control signals connection to EDGE CONNECT

Note: The diagram above shows the default wiring scheme for connecting generator controls to the EDGE system. This mode is to be used with generators that support automatic START/STOP

Note: The diagram above shows the wiring scheme for connecting the controls of a generator that does NOT have automatic START/STOP function and requires manual intervention to start the generator. In this case pin 6 of the 14-Pin TB Header is populated to the EDGE CONNECT terminal as shown in the diagram.

EDGE INVERTER & BACKUP

Placing EDGE Units

Step 1: Remove wire cover on the left side of the EDGE BACKUP top panel.

Step 2: If there is only one EDGE BACKUP to stack on then fix two L-shaped brackets on the top-side with four screws.

Step 3: Put the second EDGE BACKUP module on the top of the first EDGE BACKUP. Using the provided screws, fix the second EDGE BACKUP to the two L-shaped brackets on the first EDGE BACKUP.

Step 4: Remove wire cover on the left side of the second EDGE BACKUP's top-panel.

Step 5: Fix the two L-shaped brackets on the second EDGE BACKUP, and put the EDGE INVERTER on the top of the second EDGE BACKUP.

Step 6: Using the provided screws, fix the EDGE INVERTER to the EDGE BACKUP's L-shaped brackets

WARNING
The maximum number of EDGE BACKUPS is 10 and the maximum number of EDGE INVERTERS in a single phase application is 5.

Preparation for Component Interconnection

Before connecting all wires, be sure to take off the wiring cover by removing 7 black phillips screws.

Refer to the chart to the right

WARNING
Prior to connecting any EDGE BACKUPS to the EDGE INVERTER make sure that EDGE protective earthing conductors are installed and connected to each EDGE INVERTER.

- Grounding an EDGE INVERTER is performed by attaching the earthing conductor between the EDGE CONNECT and EDGE INVERTER. Ensure a bonding path exists from the EDGE CONNECT to the main earthing connection for the home. Use Boxface Ferrule on cable ends for optimal connection to EDGE INVERTER and EDGE CONNECT.

- Grounding any EDGE BACKUP is done by connecting a copper conductor of 10mm² cross-sectional area with green/ yellow insulation, between the EDGE BACKUP and EDGE INVERTER or another EDGE BACKUP, as shown in the diagram next page.

DANGER
Avoid improper grounding. Improper grounding may result in serious injury or death due to high leakage current.

Figure 6: Grounding of EDGE Units

Suggested cabling for Ground wire between EDGE CONNECT and EDGE INVERTER.

Gauge	Use Bootlace Ferrule
8 AWG (10mm²)	

Connecting EDGE units within Strings

EDGE INVERTER AND EDGE BACKUP Connection

CAUTION:
Before connecting an EDGE BACKUP, please turn off the DC breaker from all EDGE INVERTERS and EDGE BACKUPS.

CAUTION:
Ensure all EDGE components are properly grounded as described above.

Connection Notes:

- All wiring required to connect EDGE units within a string is packaged with the EDGE INVERTER and EDGE BACKUP.
- The BMS cable is polarized and the port with **"BAT"** label must be connected to the EDGE BACKUP side. The side labeled **"INV"** plugs into the BMS port on the INVERTER.
- The BATTERY positive cable must be connected between the EDGE BACKUP & EDGE INVERTER positive terminals.
- The BATTERY negative cable must be connected between the EDGE BACKUP & EDGE INVERTER negative terminals.

Battery connection (Two EDGE BACKUPS in a string)

Step 1:
Use two battery cables *(supplied in EDGE INVERTER and EDGE BACKUP package).*

Follow the polarity of the battery printed near the battery terminal! Simply plug battery cable to battery terminals on EDGE INVERTER and first EDGE BACKUP as shown in the chart.

ORANGE cable to the positive terminal **(+)**
BLACK cable to the negative terminal **(-)**

WARNING
Wrong connections may damage the unit permanently.

Step 2:
Plug in battery cable to battery terminals on first EDGE BACKUP and second EDGE BACKUP.
Make sure the wires are securely connected.

Step 3:
The BMS cable is polarized and the port with **"BAT"** label must be connected to the EDGE BACKUP side.
Insert the **"INV"** labeled side of the BMS cable *(supplied in EDGE INVERTER package)* into the BMS port on the EDGE INVERTER.
The other end connects to the RS485 port on the first EDGE BACKUP.

Step 4:
Insert the RJ11 cable *(supplied in EDGE BACKUP package)* into one of the extension ports of the first EDGE BACKUP.

The other end connects to the RJ11 extension port of the second EDGE BACKUP.

Step 5:
Insert RJ11 signal cable (supplied in EDGE BACKUP package) into the RJ11 extension port of the second EDGE BACKUP in the string.

Step 6:
After all wiring installation is complete, set up an ID for each EDGE BACKUP. The ID code for each EDGE BACKUP MUST be unique. Start with ID 0 for the first EDGE BACKUP.

Do not use the same number for 2 EDGE BACKUPS in a parallel system.
Refer chart for the details.

NOTICE:
If connecting just one EDGE BACKUP, follow steps 1 and 3 above. Insert the RJ11 signal cable into one of the RJ11 extension ports of the EDGE BACKUP *(It does not matter which RJ11 extension port is used)*.

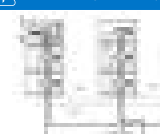
Multiple Battery Connection (EE):

If there are more EDGE BACKUP(S) to connect, please follow below steps to connect batteries.

Step 1:

Use EDGE EXTENSION KITS to connect additional EDGE BACKUP(S) as shown in below chart. Use long battery cables **(supplied in EDGE EXTENSION KIT package)** to connect EDGE BACKUP terminals to EDGE EXTENSION KITS. Use long battery cables to connect EDGE EXTENSION KITS of the same polarity. Follow the polarity to connect all EDGE BACKUPS and EDGE EXTENSION KITS.

WARNING: Wrong connections may damage the unit permanently.



Step 2:

Connect long RJ11 cables *(supplied in EDGE EXTENSION KIT package)* and long Ground cables *(supplied in EDGE EXTENSION KIT package)* as shown. Insert RJ11 signal cable into the RJ11 extension port of the last EDGE BACKUP.

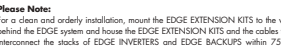
Step 3:

After all wiring installation is complete, set up an ID for each EDGE BACKUP. The ID code for each EDGE BACKUP MUST be unique. Start with ID 0 for the first EDGE BACKUP. Do not use the same number for 2 EDGE BACKUPS in a parallel system. Refer below chart for the details.

CAUTION:
To ensure proper operation, be sure to leave around 40cm distance between EDGE BACKUP installed side by side.

Attaching EDGE EXTENSION KIT(S) to wall

Please Note:
For a clean and orderly installation, mount the EDGE EXTENSION KITS to the wall behind the EDGE system and house the EDGE EXTENSION KITS and the cables that interconnect the stacks of EDGE INVERTERS and EDGE BACKUPS within 75mm trunking



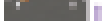
Step 1:
Place bus box terminal side down.

Step 2:
Remove 4 screws.

Step 3:
Remove mounting plate.

Step 4:
Place the mounting plate against the wall and trace the keyhole shape.

Step 5:
Insert the provided hardware into the outline on the wall. Do NOT drive the screw all the way into the wall.
Leave a 5-10mm gap between the head of the screw and the wall.



Step 6:
Assemble the mounting plate to the bus box. Make sure the keyholes are facing the correct direction.

Step 7:
Attach the mounting plate to the bus box using the 4 original screws.

Step 8:
Hang the bus on the screw heads by inserting the screw heads into the wider section of the keyholes and then sliding the EDGE EXTENSION KIT down.

Step 9:
Route the the cables that interconnect the stacks of EDGE INVERTERS and EDGE BACKUPS through the gap inbetween the bottom most EDGE BACKUP and the second unit in the stack *(either EDGE INVERTER or EDGE BACKUP)*.

BMS Communication Installation

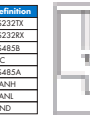
1. Introduction

The BMS cable delivers information and signals between the EDGE BACKUP and EDGE INVERTER. These information are listed below:

- Re-configure charging voltage, charging current and battery discharge cut-off voltage according to the battery parameters.
- Have the inverter start or stop charging according to the status of the battery.

2. Pin Assignment for BMS Communication Port

Pin No.	Definition
PIN 1	RS232TX
PIN 2	RS232RX
PIN 3	RS485B
PIN 4	NC
PIN 5	RS485A
PIN 6	CANH
PIN 7	CANL
PIN 8	GND



3. EDGE BACKUP Communication Configuration

ID Switch indicates the unique ID code for each EDGE BACKUP. It's required to assign a unique ID to each EDGE BACKUP for normal operation. We can set up the ID code for each EDGE BACKUP by rotating the PIN number on the ID switch. From number 0 to 9, the number can be random; no particular order.

Maximum 10 EDGE BACKUPS can be operated in parallel.

4. Installation and Operation

After ID no. is assigned for each EDGE BACKUP, install the wiring connection following the steps below.

Step 1:
Use supplied RJ11 signal cable to connect into the extension port (P1 or P2).

Step 2:
Use BMS cable *(supplied in EDGE INVERTER package)* to connect EDGE INVERTER and EDGE BACKUP

Step 3:
Turn the breaker switch **"ON"**.
Now, the EDGE BACKUP is ready for DC output.

Step 4:
Press Power **ON/ OFF** button on EDGE BACKUP for 5 secs, the EDGE BACKUP will start up.

Connecting EDGE Strings in Parallel

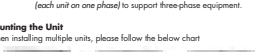
1. Introduction

The EDGE INVERTER can be used in parallel with two different operation modes.

1. Parallel operation in single phase with EDGE CONNECT 15S is with up to 3 units.
   The supported maximum output power is 1.5KW/1.5KVA.
2. Three phase operation where three units work together *(each unit on one phase)* to support three-phase equipment.

2. Mounting the Unit

When installing multiple units, please follow the below chart



NOTE:
For proper air circulation to dissipate heat, allow a clearance of approx. 40 cm to the side.

WARNING
It is REQUIRED to connect at least one EDGE BACKUP to each EDGE INVERTER for parallel operation.

WARNING
All wiring must be performed by a qualified personnel.

WARNING! For safety and efficiency, it's very important to use appropriate cables for AC input and output connection. To reduce risk of injury, please use the proper cable size recommended below. Use Bootface Ferrule at cable ends for optimal electrical connection.

3. Wiring Connection

The EDGE CONNECT simplifies and is recommended for the parallel interconnection of EDGE strings. The AC output/input of each string are each landed in the EDGE CONNECT. PV connection to each string can also be made from EDGE CONNECT.

CAUTION Important (PV connection):
Do not connect multiple EDGE INVERTERS to the same PV array. For parallel operation, ensure PV input connections of EDGE INVERTERS are separate from each other, and connected to their respective PV array.

Use EDGE EXTENSION KITS to connect EDGE strings in parallel. Use long battery cables (supplied in EDGE EXTENSION KIT package) to connect EDGE BACKUP terminals to EDGE EXTENSION KITS. Use long battery cables to connect DC BOXES of the same polarity. Follow the polarity to connect all EDGE BACKUPS and EDGE EXTENSION KITS.

WARNING: Wrong connections may damage the unit permanently.

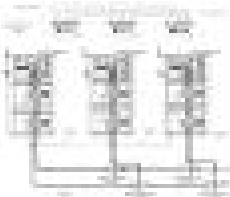
Connect ANALOG-RJ9 and CAN BusRJ50 cables (supplied in EDGE CONNECT package) between EDGE INVERTERS for parallel communication.

Use Long RJ11 cable (supplied in EDGE EXTENSION KIT package) between each string for BMS communication. Connect the RJ11 signal cable into the RJ11

Single Phase Parallel Connection

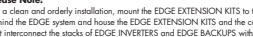
Parallel Operation in Single phase

Two EDGE strings in parallel



Three EDGE strings in parallel

Please Note:
For a clean and orderly installation, mount the EDGE EXTENSION KITS to the wall behind the EDGE system and house the EDGE EXTENSION KITS and the cables that interconnect the stacks of EDGE INVERTERS and EDGE BACKUPS within 75mm trunking



Step 1:
Place bus box terminal side down.

Step 2:
Remove 4 screws.

Step 3:
Remove mounting plate.

Step 4:
Place the mounting plate against the wall and trace the keyhole shape.

Step 5:
Insert the provided hardware into the outline on the wall. Do NOT drive the screw all the way into the wall.
Leave a 5 - 10mm gap between the head of the screw and the wall.

Step 6:
Assemble the mounting plate to the bus box. Make sure the keyholes are facing the correct direction.

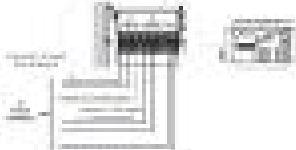
Step 7:
Attach the mounting plate to the bus box using the 4 original screws.

Step 8:
Hang the bus on the screw heads by inserting the screw heads into the wider section of the keyholes and then sliding the EDGE EXTENSION KIT down.

Step 9:
Route the the cables that interconnect the stacks of EDGE INVERTERS and EDGE BACKUPS through the gap inbetween the bottom most EDGE BACKUP and the second unit in the stack *(either EDGE INVERTER or EDGE BACKUP)*.

Parallel EDGE INVERTER AC input/output & PV connections

CAUTION:
Important (PV connection):
Do not connect multiple EDGE INVERTERS to the same PV array.
For parallel operation, ensure PV input connections of EDGE INVERTERS are separate from each other, and connected to their respective PV array.



Suggested cable requirement for EDGE INVERTER AC input/output wire:

Gauge	Use Boatface Ferrule
8 AWG (10mm²)	

Suggested cable requirement for EDGE INVERTER PV input wire:

Gauge	Use Boatface Ferrule
8 AWG (10mm²)	

5.3. INTERCONNECTION EDGE CONNECT TO EDGE INVERTER

Install conduit between the EDGE CONNECT and each of the EDGE INVERTERS in the SYSTEM. Pull EDGE INVERTER AC and PV conductors through conduit. Connect wiring to the identified terminals in the EDGE CONNECT and EDGE INVERTER.

Color coding of conductors to be connected to the EDGE CONNECT and EDGE INVERTER:

	COLOR	
	Green/Yellow:	Ground wire
	Brown:	Grid/generator/load Line (max 300V) wire
	Blue:	Grid/generator/load Neutral wire
	Red:	PV positive wire
	Black:	PV negative wire

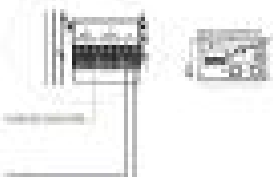
WARNING:
Confirm all circuit breakers are OFF and there is no voltage on any wire before making any connection to EDGE CONNECT and EDGE INVERTER.

Inverter PV connections to EDGE CONNECT

Suggested cable requirement for EDGE INVERTER PV input wire:

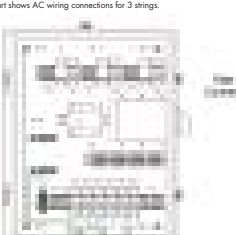
Gauge	Use Bootface Ferrule
8 AWG (10mm²)	

PV connections to EDGE INVERTER



Inverter AC input & output connections to EDGE CONNECT

The EDGE CONNECT 155 supports up to 3 inverters/strings connections.
Below chart shows AC wiring connections for 3 strings.



Suggested cable requirement for EDGE INVERTER PV input wire:

Gauge	Use Bootlace Ferrule
8 AWG (10mm²)	

Inverter AC input & output connections to EDGE INVERTER

ATS and generator control signals connection to EDGE INVERTER

See Generator control signals connection to EDGE CONNECT section for connection details.

Interconnection without EDGE CONNECT

Figure below depicts EDGE INVERTER AC and PV connections without an EDGE CONNECT. A 40A, 250VAC Circuit breaker is recommended at both AC input and AC output of the EDGE INVERTER. It is also recommended to install a 40A DC, 600V DC breaker and a 500V surge protection device at the PV input of the EDGE INVERTER.

WARNING
The maximum circuit breaker or fuse size for the AC input to a single EDGE INVERTER is 40A. If multiple EDGE INVERTERS are connected in parallel, multiple 40A breakers must be used or 1 breaker rated at (n*40A where n indicates the number of interconnected EDGE INVERTERS. Circuit breakers should be installed underneath EDGE CONNECT where the grid and generator routes into the panel Use of a circuit breaker or fuse certified by accredited third parties (i.e. IEC/EN 60898-1) is required to comply with the EDGE product warranty.

Connecting PV without EDGE CONNECT

Assuming that the EDGE Solar Panel installation had already taken place, the Installer will ensure PV wirings. from the EDGE Solar Panels are connected directly to the EDGE INVERTER (for a single EDGE Unit installation).
Install conduit between the EDGE SOLAR Panels PV output connection and EDGE INVERTER. Pull EDGE INVERTER PV conductors through conduit.
Connect PV wiring to the identified terminals in the EDGE INVERTER.

CAUTION Important (PV connection):
Do not connect multiple EDGE INVERTERS to the same PV array. For parallel operation, ensure PV input connections of EDGE INVERTERS are separate from each other, and connected to their respective PV array.

NOTICE:
The EDGE SOLAR PANELS only operate when connected to an EDGE INVERTER with at least one EDGE BACKUP. In the EDGE architecture, power produced by the EDGE SOLAR PANELS can only be used if they are connected to a functioning and unlocked EDGE INVERTER.

WARNING:
Do not connect any Solar PV to any EDGE equipment unless supplied by ZOLA Electric or a ZOLA Electric technical partner. Connecting any other power sources to EDGE will void warranty and may cause equipment damage and /or personal injury.

PV Module Wire Connection

Please take the following to implement PV module connection:

1. Remove the insulation sleeve for about 7mm on your positive and negative wires.
2. We recommend using bootlace ferrules on the wires for optimal performance.
3. Check polarities of wire connections from PV modules to PV input screw terminals.
4. Connect your wires as illustrated below.

Suggested cable requirement for EDGE INVERTER PV (Positive & Negative) wires:

Gauge	Use Bootlace Ferrule
8 AWG (10mm²)	

AC Input/Output Connection

Install conduit between the AC supply (utility/generator) main distribution box and the EDGE INVERTER . Install conduit between the EDGE INVERTER and distribution sub panel. Pull EDGE INVERTER AC conductors through conduit. Connnect wiring to the identified terminals in the EDGE INVERTER.

WARNING:
All wiring must be performed by a qualified personnel.
For safety and efficiency, it's very important to use appropriate cables for AC input and output connection. To reduce risk of injury, please use the proper cable size recommended below. For optimal electrical connection, use Boaface Ferrule at cable ends.

Step 1:
Insert AC input wires according to polarities indicated on the terminal block and tighten terminal screws. Be sure to connect the PE protective conductor (GND) first.

L - LINE (brown)
N - Neutral (blue)
G - Ground (yellow-green)

WARNING!
Remove insulation sleeve 10mm from four conductors and shorten phase L and neutral conductor N for 3mm. Refer to chart 1.

Step 2:
Insert AC output wires according to polarities indicated on the terminal block and tighten the terminal screws.

L - LINE (brown)
N - Neutral (blue)
G - Ground (yellow-green)

WARNING!
Be sure that the AC power source is disconnected before attempting to hardwire it to the unit.

Step 3:
Make sure the wires are securely connected.

Suggested cable requirement for EDGE INVERTER PV (Positive & Negative) wires:

Gauge	Use Bootlace Ferrule
8 AWG (10mm^2	

CAUTION: Important
Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility short-circuited when these inverters are worked in parallel operation.

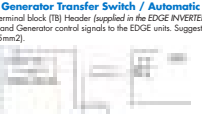
CAUTION:
Appliances such as air conditioners require at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it may cause damage to your connected appliances. To prevent this kind of damage, please check the manufacturer of the air conditioner if it's equipped with a time-delay function before installation.
Otherwise, this inverter/charger will trigger an overload fault and cut off output to protect your appliance but sometimes it may still cause internal damage to the air conditioner.

Generator Connection without an EDGE CONNECT

An automatic transfer switch is required to connect a generator to EDGE units. Follow below chart to connect a generator without an EDGE CONNECT to a third party automatic transfer switch. A 40A circuit breaker is recommended to protect the EDGE INVERTER.

Connecting Generator Transfer Switch / Automatic Start

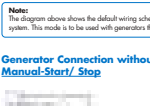
Use the 14-pin Terminal block (TB) Header *(supplied in the EDGE INVERTER package)* to connect the ATS and Generator control signals to the EDGE units. Suggested wire size is 24AWG (0.25mm2).



ATS and Generator control signals connections to EDGE INVERTER

Note:
The diagram above shows the default wiring scheme for connecting generator controls to the EDGE system. This mode is to be used with generators that support automatic START/STOP function.

Generator Connection without an EDGE Connect Manual-Start/ Stop



Note:
The diagram above shows the wiring scheme for connecting the controls of a generator that does NOT have automatic START/STOP function and requires manual intervention to start the generator. In this case pin 6 of the 14-Pin TB Header is populated as shown.

Note:
the EDGE INVERTER terminal block header only shows even numbers and row letters

ATS and Generator control signals connections to EDGE INVERTER

Final Assembly

After connecting all wirings, put side covers back to original positions by fixing screws as shown below.

6. INITIALIZATION, BYPASS & SHUTDOWN

Before energizing the supply circuit from the External AC Power Source all field-wiring connections to terminals in the EDGE CONNECT should be checked for correct polarity. All wire terminations, conduit and cable fittings should be made tight. Confirm External AC Power Source supply conductors have proper phase and voltage prior to connecting to EDGE wiring. Ensure that all String cable connections are made tight and that there are no unmated connectors or loose wire ends.

For systems with an EDGE CONNECT, place the switch into the **"Normal"** position after the system has been unlocked and is operational. This will connect the BACKUP load circuits to EDGE and also connects the External AC Power Source Mains or Generator supply to EDGE. For normal operation this switch should remain in the **"Normal"** position at all times.

Pre-Initialization Check-List

#	Verification Task	Reference	Status
1	Ensure that the building or facility where EDGE has been installed is properly grounded.	**Section:** General Safety Instructions *(Pg 9-8)* **Chapter 2:** Safety	
2	Ensure that the PV array (if applicable) uses either single crystalline or polycrystalline with class A-rated and CIGS modules.	**Section:** Notes on PV Selection *(Pg. 22)* **Chapter 4:** Site Setup	
3	Ensure that EDGE INVERTERS do not share PV arrays (each EDGE INVERTER must receive its own PV array if it utilizes solar)	**Section:** EDGE CONNECT *(Pg 9-8)* **Chapter 5:** EDGE System Installation	
4	Ensure that PV array(s) abide by the following: • PV array rating Does not exceed 6500Wp • Open circuit Voltage (Voc) does not exceed 450Vdc • PV Array operates within MPPT Voltage Range (120Vdc–430Vdc) • Open circuit Voltage (Voc) of PV modules is higher that startup voltage 110Vdc +/- 10Vdc	**Section:** Notes on PV Selection *(Pg. 22)* **Chapter 4:** Site Setup	

#	Verification Task	Reference	Status
5	Ensure that the loads on circuits supported by EDGE do not exceed the continuous or surge power output capacity of the EDGE system If the loads on an EDGE supported circuit exceeds the capacity of the EDGE system, the user must be educated on what appliances can and cannot be used simultaneously to avoid an undesirable user experience	**Section:** Notes on Distribution (Sub) Panel *(Pg. 24)* **Chapter 4:** Site Setup	
6	Ensure that generator connected to AGS utilizes a) A START/STOP input that the EDGE INVERTER provided dry contact activates to start or stop the generator	**Section:** Notes on Generator Selection *(Pg. 24)* **Chapter 4:** Site Setup	
7	Ensure that circuit breakers are placed on the grid and generator AC inputs that are equivalent to n*40A where n indicates the number of interconnected EDGE INVERTERS	**Section:** Preparing Electrical Connections *(Pg. 24)* **Chapter 4:** Site Setup	
8	Ensure that edge is placed in a safe location agreed to by the user - Indoors - Free from water spray or water pooling - Free of excessive dust - Good airflow - Appropriate Temperature (5°C to 45°C) - GSM signal	**Section:** Notes on Positioning EDGE INVERTER and BACKUPS *(Pg. 17-21)* **Chapter 4:** Site Setup	
9	Verify that no more than 3 units are stacked on top of one another *(e.g. no more than 1 EDGE INVERTER and 2 EDGE BACKUPS or 3 EDGE BACKUPS)*	**Section:** Notes on Positioning EDGE INVERTER and BACKUPS *(Pg. 17-21)* **Chapter 4:** Site Setup	

#	Verification Task	Reference	Status
10	Ensure EDGE INVERTER and EDGE BACKUP are securely attached with the 4 screws provided.	**Section:** EDGE INVERTER & BACKUP *(Pg. 31-47)* **Chapter 5:** EDGE System Installation	
11	Ensure that each stack of EDGE INVERTERS and/or BATTERIES has at least - 40cm of clearance on either side - 15cm of clearance between the Edge stack and the wall - 20cm of general clearance around the antennas on the EDGE INVERTER. - 25cm of clearance between the antennas on the EDGE INVERTER and any grounded electrical equipment	**Section:** Notes on Positioning EDGE INVERTER and BACKUPS *(Pg. 17-21)* **Chapter 4:** Site Setup	
12	Ensure that EDGE INVERTER LED Indicator is visible and LED screen and keypad are accessible for the user	**Section:** Notes on Positioning EDGE INVERTER and BACKUPS *(Pg. 17-21)* **Chapter 4:** Site Setup	
13	Ensure that all cables are properly secured and trunked for optimum site safety	**Chapter 5:** EDGE System Installation	
14	Ensure accuracy, security, gauge & grounding of all wiring connections to outside world - EDGE CONNECT output to load - PV input to EDGE CONNECT - Grid input to EDGE CONNECT - Generator input to EDGE CONNECT - Generator controls to EDGE CONNECT	**Section:** EDGE CONNECT *(Pg 9-8)* **Chapter 5:** EDGE System Installation	
15	Ensure accuracy, security, gauge and grounding of all wiring connections to between EDGE CONNECT and EDGE INVERTER(S) - EDGE CONNECT to EDGE INVERTER AC input and output - EDGE CONNECT to EDGE INVERTER PV input - EDGE CONNECT to EDGE INVERTER Generator controls	**Section:** Interconnection: EDGE CONNECT to EDGE INVERTERS *(Pg 48-51)* **Chapter 5:** EDGE System Installation	

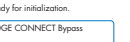
#	Verification Task	Reference	Status
16	Ensure accuracy, security, gauge and grounding of all wiring connections between EDGE INVERTERS and EDGE BACKUPS - Grounding - Battery Cables *(including use of EDGE EXTENSION KITS)* - BMS Cable *(ensure proper orientation with - INV end in the EDGE INVERTER and the BMS end in the EDGE BACKUP)* - RJ11 cable - RJ11 signal cable	**Section:** EDGE INVERTER & BACKUP *(Pg 31-47)* **Chapter 5:** EDGE System Installation	
17	Ensure EDGE BACKUPS have all been assigned exclusive dip switch IDs	**Section:** EDGE INVERTER & BACKUP *(Pg 31-47)* **Chapter 5:** EDGE System Installation	
18	Ensure that all power and communications running within the EDGE system are properly trunked and mounted to the wall in an orderly fashion	**Section:** EDGE INVERTER & BACKUP *(Pg 31-47)* **Chapter 5:** EDGE System Installation	
19	Ensure all breakers for EDGE supported circuits in the Distribution (Sub) Panel are open.		
20	Ensure all breakers in EDGE CONNNECT are open		
21	Ensure DC breaker in the EDGE INVERTER(S) are open		
22	Ensure DC breaker in the EDGE BACKUPS(S) are open		
23	Ensure that EDGE CONNECT BYPASS Switch is in the OFF position		

EDGE System Initialization

Once the checklist above is completed, EDGE is ready for initialization.

Note: The significance of the numbers on the EDGE CONNECT Bypass Switch are as follows:

Position 0 = OFF
(No power delivery to loads)



Position 1 = NORMAL
(EDGE supports loads)

Position 2 = BYPASS
(external AC supports loads)

Step 1:
Ensure that EDGE CONNECT Bypass Switch is in the OFF position

Step 2:
Turn on all input power sources

A. Turn ON *(switch up)* the DC breaker from each EDGE INVERTER to connect the battery bus to the inverter.

NOTE: Put DC breaker lever UP to turn ON breaker.

B. Turn ON *(switch up)* the DC breaker in each EDGE BACKUP

NOTE: Put DC breaker lever UP to turn ON breaker.

C. Press and hold the power button on each EDGE BACKUP for five seconds (or until all LED are turned ON)

D. Turn ON (switch up) all AC input and output breakers in the EDGE CONNECT

NOTE: Put AC breaker lever UP to turn ON breaker.

E. Turn ON (switch up) all PV input breakers within the EDGE CONNECT

NOTE: Put DC breaker lever UP to turn ON

Step 3.
Move the EDGE CONNECT Bypass Switch to the NORMAL position.

EDGE Bypass with EDGE CONNECT

Please follow these instructions to isolate EDGE from the home's wiring and External AC Power Source *(i.e. utility and/ or generator)*:

1. Ensure all loads are disconnected by turning **OFF** all circuit breakers supported by EDGE from the site's *(backup)* distribution board.

2. Move the selector on EDGE CONNECT to the **"BYPASS"** position.

3. Turn **OFF** *(switch down)* all AC input circuit breakers from EDGE CONNECT.

4. Turn **ON** circuit breakers from the distribution sub panel to power the load directly from the External AC Power Source *(utility or generator)*

EDGE System Shutdown

NOTE: The following steps are for ZOLA Electric technical partners only.

WARNING!
Do not remove any conductor end from its terminal until after all the following steps have been performed

To put the system into shutdown mode for the purposes of service, repair or replacement perform the following steps:

1. Follow instruction above and place EDGE in BYPASS MODE
   (Put the EDGE CONNECT selector in BYPASS position)

2. Disable all input power sources

   A. Turn OFF (switch down) all AC input and output breakers in the EDGE CONNECT

   NOTE: Put AC breaker lever DOWN to turn OFF breaker.

   B. Turn OFF (switch down) all PV input breakers within the EDGE CONNECT

   NOTE: Put DC breaker lever DOWN to turn OFF breaker.

   C. Turn OFF (switch down) the DC breaker from each EDGE INVERTER to disconnect the battery bus from the inverter.

   NOTE: Put DC breaker lever DOWN to turn OFF breaker.

   D. Turn OFF (switch down) DC breaker from each EDGE BACKUP

3. Press and hold the power button on each EDGE BACKUP for five seconds
   (Or until all LED are turned OFF)

NOTICE:
The wiring from the EDGE INVERTER to the EDGE CONNECT must be removed from the wiring terminations within the EDGE CONNECT.

NOTICE:
DO NOT OPEN ANY EDGE INVERTER (or EDGE BACKUP) otherwise you will void the warranty.

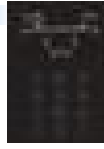
4. To remove an EDGE INVERTER after all steps above are performed

   A. Open the EDGE CONNECT cover and use a voltmeter to verify there is less than10V on any wiring terminal connecting the EDGE INVERTER to the EDGE CONNECT.

   B. After verifying there is no hazardous voltage, disconnect and remove the wiring ends mounted in the EDGE CONNECT that connect the EDGE INVERTER to the EDGE CONNECT. Secure the copper ends of all EDGE INVERTER wiring with insulating electrical tape or other insulating cap.

   C. Disconnect wiring that connects the EDGE INVERTER to any other units *(EDGE BACKUP or another EDGE INVERTER).*

7. EDGE USER INTERFACE



Display Panel

The operation and the LCD module, shown in the chart below, includes four touchable function keys and a LCD display to indicate the operating status and input/output power information.

Touchable function key

Function keys		Description
	ESC	Exit the setting
	Access USB setting mode	To enter USB setting mode
↑	Up	To last selection
↓	Down	To next selection
↵	Enter	To confirm/enter the selection in setting mode

LCD Display

Icon	Function description
Configuration Program and Fault Information	
	Indicates the setting programs.
	Indicates the warning and fault codes. **Warning:** Flashing with warning symbol. **Fault:** Lighting with fault character.
Output Information	
	Indicates the output load in VA and load out in Watt.
Battery Information	
	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.

When battery is charging, it will present battery charging status.

Battery capacity	LCD Display
25%	4 bars will flash in turns.
50%	The right bar will be on and the other three bars will flash in turns.
75%	The right two bars will be on and the other two bars will flash in turns.
100%	The right three bars will be on and the left bar will flash.

In battery mode, it will present battery capacity.

Icon	Battery Capacity	Icon	Battery Capacity
	25%		75%
	50%		100%

Load Information	
	Indicates the setting programs.
	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.
Charger Source Priority Setting Display	
	Indicates setting program 16 "Charger source priority" is selected as **"Solar first"**.
	Indicates setting program 16 "Charger source priority" is selected as **"Solar and Utility"**.
	Indicates setting program 16 "Charger source priority" is selected as **"Solar only"**.
Output source priority setting display	
	Indicates setting program 01 "Output source priority" is selected as **"Utility first"**.
	Indicates setting program 01 "Output source priority" is selected as **"Solar first"**.
	Indicates setting program 01 "Output source priority" is selected as **"SBU"**.
AC Input Voltage Range Setting Display	
UPS	Indicates setting program 03 is selected as **"UPS"**. The acceptable AC input voltage range will be within 170-280VAC
APL	Indicates setting program 03 is selected as **"APL"**. The acceptable AC input voltage range will be within 90-280VAC

Operation Status Information	
	Indicates unit connects to the mains.
	Indicates unit connects to the PV panel.
M C S	Indicates parallel operation is working.
	Indicates unit alarm is disabled.
	Indicates Wi-Fi transmission is working.
	Indicates USB disk is connected.

LCD Display Navigation

The LCD display information will be switched in turn by pressing the "▲" or "▼" button. The selectable information is switched as the following table in order.

Selectable information		LCD Display
Default Display Screen	PV Power	PV Power = 600W
Default Display Screen	Load in VA, load in Watt switch every 5 second	Load in VA = 2.4kVA

Selectable information		LCD Display
Default Display Screen	Output voltage, load in VA, load in Watt switch every 5 second/ Output frequency	Load in Watt=2.4kW
	Real date.	Real date Dec 14, 2020
Default Display Screen	Real time.	Real time 11:38
	PV energy generation today	PV energy generation today =888Wh

Selectable information		LCD Display
Default Display Screen	PV energy generation this month	PV energy generation this month = 8.88kWh
	PV energy generation this year	PV energy generation today = 88.8Wh
Default Display Screen	Total PV energy generation	Total PV energy generation =888kWh.
	Load output energy today	Load output energy today =888Wh

Selectable information		LCD Display
Default Display Screen	Load output energy this month	Load output energy this month =8.88kWh
	Load output energy this year	Load output energy this year =88.8kWh.
Default Display Screen	Total load output energy	Total load output energy =888kWh
	Main CPU version checking	Main CPU version 00050.72.

Selectable information		LCD Display
Default Display Screen	Secondary CPU version checking	Secondary CPU version 00022.01
	Wi-Fi version checking	Wi-Fi version 00088.88

EDGE Modes

EDGE transitions through different modes in the process of start up, normal operation and non-operational states.
Each of these modes corresponds to specific behaviors and supported power flows as seen below:

Mode	Description	AC Power Input	Solar PV (DC) Power Input	Battery Power Input	Battery Power Output	AC Power Output
Off	System is off with no power input and no power output	NO	NO	NO	NO	NO
Start Up	System is on and bringing-up internal components	YES	YES	YES	NO	NO
Standby	System is on but no power is delivered to loads.	YES	YES	YES	NO	NO
Normal Operation	System is on and able to charge batteries and power loads	YES	YES	YES	YES	YES
Low State of Charge	System is on but batteries have drained to LOW SOC threshold (default set to 5% of usable battery capacity). System can charge batteries and power loads but it cannot power loads with the batteries.	YES	YES	YES	NO	YES
Fault	System is on but a malfunction has occurred such as an internal circuit error or external reasons such as over temperature, output short circuited, tampering, etc.	NO	NO	NO	NO	NO
No Credit	System is on but payment credit has drained to 0 hours/days remaining. The system will continue to charge batteries and can pass-through energy from the grid or generator but not from the sun or batteries.	YES	YES	YES	NO	NO

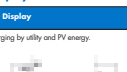
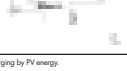
ZOLA LED Indicator Light

Each EDGE INVERTER has a ZOLA LED visible on the front of the unit.
It is important when placing EDGE Units in their final location to keep the area in front of each unit free from obstructions so the ZOLA LED remains visible.

The ZOLA LED will light up with different colors and patterns to provide a quick and effective way of indicating the mode.

	A ZOLA LED that is NOT illuminated means that the EDGE system is **OFF** and not producing power.
	A ZOLA LED that is illuminated YELLOW means that the EDGE system is in Boot or Start Up mode where the system will boot, initialize and support commissioning. • **Solid Yellow Light –** Boot mode • **Blinking Yellow Light –** Initialization mode • **Solid Yellow Light –** Commissioning mode
	A ZOLA LED that is illuminated BLUE means that the EDGE system is in Normal Operation mode.
	A ZOLA LED that is illuminated RED means that the EDGE system is in Temporary Overload, Fault, or No Credit mode. • **Blinking Red Light –** Temporary Overload mode • **Solid Red Light –** Fault and No Credit modes

Operating Mode and the LCD Display

Operation Mode	Description	LCD Display
Standby mode Note: *Standby mode: The inverter is not turned but the inverter can charge battery without AC output.	No output is supplied by the unit but it still can charge batteries.	Charging by utility and PV energy. 
		Charging by utility
		Charging by PV energy. 
		No Charging

Operation Mode	Description	LCD Display
Fault mode Note: *Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.	No charging at all no matter if grid or PV power is available.	Grid and PV power are available
		Grid is available
		PV power is available
		No charging

8. EDGE OPERATION

Commissioning

EDGE is designed to offer settings that support a wide variety of applications and user preferences *(see below)*

To enable out of the box operation, EDGE is pre-programmed to support single phase and single inverter use cases.

Defaults Setting will not support

- Parallel mode
- 3 phase support

Review and change defaults setting in the commissioning process should the defaults not support your desired application

Prog ram	Adapted to User	Behavior	Default Setting	Other options
01	YES	Output Source Priority	SUB (Solar - Utility - Battery)	USB (Utility - Solar - Battery) SBU (Solar - Battery - Utility) *Not Supported
03	YES	AC Input Voltage	UPS (170-280VAC)	Appliances Mode (90-280VAC)
06	YES	Overload Auto-Start	Enabled	Disabled
07	—	Over-Temperature Auto-Start	Disabled	Enabled
09	YES	Inverter Output Frequency	50HZ	60Hz
10	YES	Inverter Output Voltage	230Vac	220Vac 240Vac
11	YES	Maximum Utility Charging Current	30A	2A - 50A
12	—	Pre-Setting SOC Back to Utility Side	8% SOC	5% - 95%
13	—	Pre-Setting SOC Back to Battery	10% SOC	10% - 100%
16	YES	Charger Source Priority	Utility & Solar	Solar First Solar Only
18	YES	Buzzer Alarm	Enabled	Disabled
19	—	Auto Return to Default Display	Return to Default Display	Stay at Latest Screen
20	—	Backlight of LCD	ON	Off
22	—	Beeps when Primary Power Source is Interrupted	Disabled	Disabled
23	YES	Overload Bypass	Enabled	Disabled

Program	Adapted to User	Behavior	Default Setting	Other options
25	–	Fault Record	Enabled	Disabled
28	YES	AC Output Mode	SIG (Single Phase & Single String)	Pol (Single Phase Parallel String) 3P1 (Three Phase & Phase 1) 3P2 (Three Phase & Phase 2) 3P3 (Three Phase & Phase 3)
29	–	Low DC Cut Off Setting	5% SOC	0% - 90%
37	–	Reset PV and Load Energy Storage	Not Reset	Reset
41	–	Maximum Discharging Current	Disabled	30A 150A
83	–	Erase all data log	Reset	Not Reset
84	–	Data Log Stored Period	10 days	3 days 5 days 20 days 30 days

Single String Settings & Commissioning

EDGE is designed to offer settings that support a wide variety of applications and user preferences including:

- Overload Management
- Battery management
- Charging Power Source Control
- Output Power Source Control
- Generator Control
- Country Specific Voltage and Frequency

To enable out of the box operation, EDGE is pre-programmed with default settings designed to serve the broadest range of applications.

If desired, the installation technician or the customer can customize these settings via the the EDGE INVERTER LCD screen and keypad.

To change the settings, press and hold the ENTER button for 3 seconds on the EDGE INVERTER.

The system will enter the Setup Mode.
- Press **UP** or **DOWN** button to select setting programs.
- Press **ENTER** button to confirm your selection or the **EXIT** button to exit.

Overload and AC Output Control Commissioning

Overload Management

Program 06 - Overload Autostart:
When enabled, the system will attempt to return power to loads after output was stopped due to overload.
- **Default = Enabled**

Program 23 - Program Overload Bypass:
When enabled, the system will transfer output support to the utility if overload occurs when output supported by battery
- **Default = Enabled**

Battery Management

Program 11 - Maximum Utility Charging Current:
allows a technician or user to set the current at which the battery is charged *(Setting range is from 2A, then 10A to 120A. Increment of each click is 10A)*

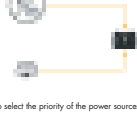
- If Maximum Charging Current Setting (Program 02) is smaller than that in Program 11, the EDGE INVERTER will apply Program 02 setting for utility charger.

- **Default = 30A**

Setting 29 - Threshold for DC Power Cutoff:
A user set the threshold for SOC where battery and solar output support halts when battery discharges

- No power to loads if SOC is below threshold and there is no AC input
- Solar can still charge the battery
- **Default Threshold = 5%**

Commissioning Power Management - Charger Source Priority (Program 16 & 100)

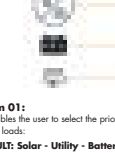


Program 16:
EDGE enables to user to select the priority of the power sources used to charge the battery:

- **Default = Solar and Utility**
  - Solar energy and utilities will charge the battery at the same time
- **Solar First**
  - Solar energy will charge the battery as the first priority.
  - Utility will charge the battery only when solar energy is not available
- **Only Solar**
  - Solar energy will be the only charger source no matter if the utility is available or not.

Program 100 - Charger Source Timer:
The user can set the charger source priority for each hour of the day accounting for 24 programmable blocks.

Power Management - Output Source Priority (Program 01)



Program 01:

EDGE enables the user to select the priority of the power sources used to power the loads:

- **DEFAULT: Solar - Utility - Battery (SUB) Priority**
  - Solar energy provides power to the loads as the first priority.
  - If solar energy is not sufficient to power loads, utility energy will supply power to the loads at the same time.

- **Utility - Solar - Battery (USB) Priority**
  - Utility will provide power to the loads as first priority.
  - Solar and battery energy will provide power to the loads only when utility power is not available

NOTE:
In the case where solar or battery is prioritized for output support but not sufficient to power the load, EDGE supplements the priority source with power from either the secondary or tertiary source.

Program 99 - Output Source Timer:

The user can set the output source priority for each hour of the day accounting for 24 programmable blocks.

Setting the Voltage and Frequency (Program 03, 09 & 10)

Program 03 - AC input voltage range:
Allows a technician to set the width of the voltage range that a EDGE will accept as an input

- **DEFAULT** UPS - If selected, acceptable AC input voltage range will be within 170-280VAC
- Appliances - If selected, acceptable AC input voltage range will be within 90-280VAC

Program 09 - Output Frequency:
technician can set the frequency that EDGE outputs to loads

- **DEFAULT: 50Hz**
- 60Hz

Program 10 - Output Voltage:
A technician can set the voltage that EDGE outputs to loads

- **Default:** 230V
- 220V
- 240V

Setting Time (Program 85-89)

Technicians must set the EDGE clock when commissioning a system to support accurate time stamping of data logs:

- Program 85: Minute - For minute setting, the range is from 0 to 59.
- Program 86: Hour - For hour setting, the range is from 0 to 23.
- Program 87: Day - For day setting, the range is from 1 to 31.
- Program 88: Month - For month setting, the range is from 1 to 12.
- Program 89: Year - For year setting, the range is from 17 to 99.

Parallel String Settings

Program	Description	Selectable Option	
28	**AC output mode** * This setting is only available when the inverter is in standby mode. The inverter is only in standby mode for approximately 60 seconds when the system first turns on. When the system transitions from standby to normal operation, you will hear a click caused by the closing of the load port. When the system transitions out of standby mode, you will no longer be able to change the AC output mode. If changing the mode from Single Inverter to Parallel Inverter or 3-Phase, all of the inverters must be shut off one the mode is set and turned on at the same time to enable synchronization		When the unit is operated alone, please select **"SIG"** in program 28.
			When the units are used in parallel for single phase application, please select **"PAL"** in program 28. Please refer to 5 - 1 for detailed information
			When the units are operated in 3-phase application, please choose "3PX" to define each inverter. It's required to have at least one inverter in each phase for three-phase application. Please refers to 5-2 for detailed information. Please select "3P1" in program 28 for the inverter connected to L1 phase, "3P2" in program 28 for the inverter connected to L2 phase and "3P3" in program 28 for the inverter connected to L3 phase. Be sure to connect share current cable to units which are on the same phase. Do NOT connect share current cable between units on different phases.

Parallel String Code Reference

Code	Description	Icon ON
NE	Unidentified unit main or secondary	NE
HS	Main unit	HS
SL	Secondary Unit	SL

Single Phase Parallel String Commissioning

Step 1:
Check the following requirements before commissioning:

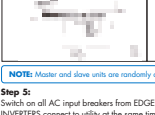
- Correct wire connection
- Ensure all breakers in wires of the Distribution *(Sub)* Panel are open and theNeutral wires of each load are connected together.
- Ensure all AC output breakers from EDGE CONNECT are open.

Step 2:
Turn on each unit and set **"PAL"** in LCD setting program 28 of each EDGE INVERTER

NOTE:
This setting is only available when the inverter is in standby mode. The inverter is only in standby mode for approximately 60 seconds when the system first turns on. When the system transitions from standby to normal operation, you will hear a click caused by the closing of the load port. When the system transitions out of standby mode, you will no longer be able to change the AC output mode.

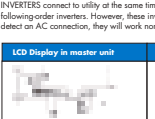
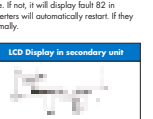
Step 3:
Once set to Parallel, shut down all EDGE INVERTERS. To shut down, Turn **OFF** all Power Sources *(AC input breakers and PV breakers from EDGE CONNECT, and DC Breaker from each EDGE INVERTER)*

Step 4:
Turn on the DC breaker of each EDGE INVERTER as close to the same time as possible

LCD Display in master unit	LCD Display in secondary unit
	

NOTE: Master and slave units are randomly defined

Step 5:
Switch on all AC input breakers from EDGE CONNECT. It's better to have all EDGE INVERTERS connect to utility at the same time. If not, it will display fault 82 in following-order inverters. However, these inverters will automatically restart. If they detect an AC connection, they will work normally.

LCD Display in master unit	LCD Display in secondary unit
	

Step 6: If there is no more fault alarm, the parallel system is completely installed.

Step 7: Switch on all AC output breakers from EDGE CONNECT.

Step 8: Switch on all breakers of Line wires from the distribution sub panel.
The Edge system will start to provide power to the load.

NOTE 1: To avoid overload occurring, before turning on breakers in the distribution sub panel, it's better to have the whole system in operation first.

NOTE 2: Transfer time for this operation exists. Power interruption may happen to critical devices, which cannot bear transfer time.

System

General Setting

After pressing and holding "↵" button for 3 seconds, the unit will enter the Setup Mode. Press "▼" or "▲" button to select setting programs. Press "↵" button to confirm your selection or "⏻/↺" button to exit.

Program	Description	Selectable Option	
00	Exit setting mode		
01	**Output source priority:** To configure load power source priority		Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.
			Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the loads at the same time.
			Please Note: This mode is not supported
02	***Maximum charging current:*** *To configure total charging current for solar and utility chargers.* *(Max. charging current = utility charging current + solar charging current)*		Determined by battery pack and cannot be adjusted

Program	Description	Selectable Option	
03	AC input voltage range		If selected, acceptable AC input voltage range will be within 90-280VAC
			If selected, acceptable AC input voltage range will be within 170-280VAC
05	Battery type		This program cannot be revised.
06	Auto restart when overload occurs		
07	Auto restart when over temperature occurs		
09	Output frequency		
10	Ouput voltage		

Program	Description	Selectable Option	
11	**Maximum utility charging current** **Note:** If setting value in program 02 is smaller than that in program in 11, the inverter will apply charging current from program 02 for utility charger.		Setting range is from 2A, then 10A to 50A. Increment of each click is 10A.
12	Setting SOC point back to utility source when selecting **"SBU"** (*SBU priority*) in program 01.	SOC 9% (default) 	**Please Note:** This mode is not supported
13	Setting SOC point back to battery mode when selecting **"SBU"** (*SBU priority*) in program 01.	SOC 10% (default) 	**Please Note:** This mode is not supported
16	**Charger source priority:** To configure charger source priority	If this inverter/charger is working in Line, Standby or Fault mode, charger source can be programmed as below: 	Solar energy will charge battery as first priority. Utility will charge battery only when solar energy is not available.
16	**Charger source priority:** To configure charger source priority		Solar energy and utility will charge battery at the same time.
			Solar energy will be the only charger source no matter utility is available or not.

Program	Description	Selectable Option	
18	Alarm control		
19	Auto return to default display screen		If selected, no matter how users switch display screen, it will automatically return to default display screen after no button is pressed for 1 minute.
			If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control		
22	Beeps while primary source is interrupted		
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.		
25	Record Fault code		

Program	Description	Selectable Option	
26	Bulk charging voltage (C.V voltage)		Determined by battery pack and cannot be adjusted
27	Floating charging voltage		Determined by battery pack and cannot be adjusted
28	AC output mode *This setting is only available when the inverter is in standby mode. The inverter is only in standby mode for approximately 60 seconds when the system first turns on. When the system transitions from standby to normal operation, you will hear a click caused by the closing of the load port. When the system transitions out of standby mode, you will no longer be able to change the AC output mode. If changing the mode from Single Inverter to Parallel Inverter or 3-Phase, all of the inverters must be shut off one the mode is set and turned on at the same time to enable		When the inverter is operated in 3-phase application, set up inverter to be operated in specific phase.
29	Low DC cutoff capacity: • If battery power is only power source available, inverter will shut down. • If PV energy & battery power are available, inverter will charge battery without AC output. If PV energy, battery power and utility are all available, inverter will transfer to line mode	SOC 0% (default) 29 PARA 5A SOC 0	Setting range is from 0% to 90%. Increment of each click is 1%

Program	Description	Selectable Option	
37	Reset all stored data for PV generated power and output load energy		
41	Maximum battery discharging current		If selected, battery discharge protection is disabled.
			The setting range is from 30 A to 180 A. Increment of each click is 10A. If discharging current is higher than setting value, battery will stop discharging. At this time, if the utility is available, the inverter will operate in bypass mode. If no utility is available, the inverter will shut down output after 5-minute operation in battery mode.
83	Erase all data log		
84	Data log recorded interval *The maximum data log number is 1200. If it's over 1200, it will rewrite the first log.		

Programm	Description	Selectable Option	
85	Time setting – Minute		For minute setting, the range is from 0 to 59.
86	Time setting – Hour		For hour setting, the range is from 0 to 23.
87	Time setting – Day		For day setting, the range is from 1 to 31.
88	Time setting – Month		For month setting, the range is from 1 to 12.
89	Time setting – Year		For year setting, the range is from 17 to 99.
90	EDGE PAYGo Code Insertion		

9. MAINTENANCE AND CARE

EDGE does not require regular maintenance besides clearing the air filters. The batteries are maintenance free. As systems age batteries can be replaced by ZOLA Technical Partners through a scheduled battery replacement. Please contact ZOLA customer support with any questions.

To allow for proper ventilation and to prevent corrosion keep the area around EDGE Units free from dust or moisture. If you suspect that any moisture or debris has leaked out of any EDGE Unit, please report to ZOLA customer service immediately.

Clearance and Maintenance for Anti-Dust Kit

Every inverter is already installed with an anti-dust kit from the factory. This kit keeps dusk from your inverter and increases product reliability in harsh environments.

Step 1:
Please remove the side cover and take out the air filter of the EDGE INVERTER.

Step 2:
Clean air filter foam and dustproof case. After clearance, reassemble the dust-kit back to the inverter.

NOTICE:
The anti-dust kit should be cleaned from dust every three months.

10. TROUBLESHOOTING

Warning Indicator Codes

Warning Code	LCD Icon Flashing	Warning Event	Audible Alarm
01	01	Fan is locked when inverter is ON	Beep 3x every second
02	02	Over temperature	none
03	03	Battery is overcharged	beep 1x every second
04	04	Low battery	beep 1x every second
07	07	Overload	beep 1x every 0.5 second
15	15	PV energy is low	beep 2x every second
16	16	High AC input (>280VCA) during BUS soft start	none
E9	E9	Battery equalization	none
10	10	Output power derating	beep 2x every second
32	32	Communication failure between inverter and display panel	none
60	60	If battery status is not allowed to charge and discharge after the communication between the inverter and battery is successful, it will show code 60 to stop charging and discharging battery	none
61	61	Communication lost After the battery is connected and the communication signal is not detected for 3 minutes, the buzzer will beep. After 10 minutes, the inverter will stop charging and discharging the battery. Communication loss occurs after the inverter and battery is connected successfully, buzzer beeps immediately.	none
62	62	Internal communication failure of batteries	none
69	69	If battery status is not allowed to charge after the communication between the inverter and battery is successful, it will show code 69 to stop charging the battery	none

Warning Code	LCD Icon Flashing	Warning Event	Audible Alarm
70	70 ⚠	If battery status must be charged after the communication between the inverter and battery is successful, it will show code 70 to charge the battery.	none
71	71 ⚠	If battery status is not allowed to discharge after the communication between the inverter and battery is successful, it will show code 71 to stop	none

Faults Reference Codes

Code #	LCD Icon	Cause	Description
1	F01	Fan Fault	Fan is locked
2	F02	Over Temperature	Internal temperature of Inverter is over 100 Celcius
3	F03	Battery Overcharged	Battery is overcharged
			Battery voltage is too high
4	F04	Low Battery	Battery has dropped to 0%
5	F05	Output short circuited	Output Short Circuited
			Temperature of internal converter component is over 120 Celsius
6	F06	Output voltage is too high.	Output is abnormal (inverter voltage above 250VAC)
7	F07	Overload time out	If overload exceeds 150% of continuous capacity for more than 10 seconds, or 200% of continuous capacity for more than 5 seconds, the system will transition to fault.
8	F08	Bus Voltage is too high	Internal Components Failed
9	F09	Bus soft start failed	Internal Components Failed
10	F10	PV over current	Current from solar array exceeds system input threshold
11	F11	PV over voltage	Voltage from solar array exceeds system input threshold

Code #	LCD Icon	Cause	Description
12	F12	DC / DC over current	
13	F13	Battery discharge over current	
31	F31	No Comms W/ Inverter & Display (watchdog timeout)	Internal component detected between two controllers
51	F51	Overcurrent	Overcurrent or surge
52	F52	Bus voltage is too low	Bus voltage is too low
53	F53	Inverter soft start failed	Internal Components Failed
55	F55	Over DC voltage in AC output	
57	F57	Current sensor failed	Internal Components Failed
58	F58	Output voltage is too low	Output is abnormal (inverter voltage is below 190VAC)
60	F60	Power Feedback Protection	
71	F71	Firmware version inconsistent	
72	F72	Current sharing fault	
80	F80	CAN fault	
81	F81	Host loss	
82	F82	Synchronization loss	
83	F83	Battery voltage detected different	
84	F84	AC input voltage and frequency detected different	
85	F85	AC output current unbalance	
86	F86	AC output mode setting is different	

General Troubleshooting

Problem	LCD/LED/ Buzzer	Explanation / Possible cause	What to do
No power from battery	No indication.	When receiving an EDGE BACKUP, there are no indicator lights that show if the battery is on or not. The EDGE BACKUP will not automatically turn on if the reset button is not pressed.	Hold reset until indicator lights show the state of charge.
Unit shuts down automatically during the startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91V/Cell)	1. Re-charge battery. 2. Replace battery.
No response after power ON.	No indication.	1. The battery voltage is far too low. (<1.4V/Cell) 2. Battery polarity is connected reversed.	1. Check if batteries and the wiring are connected well. 2. Re-charge battery. 3. Replace battery.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
System is energized but EDGE INVERTER is not reporting to ZOLA VISION.	No indication.	No data is coming from the inverter to the communication card.	Power cycle the EDGE INVERTER
Alert "**ALM**" is illuminated in red on EDGE BACKUP	Alert "**ALM**" is illuminated in red on EDGE BACKUP	Improper EDGE BACKUP ID assignment or wiring	1. Check if EDGE BACKUP wiring is connected well and correctly following instructions in this manual. 2. Check that all EDGE BACKUPS have unique dip switch IDs
Warning Code 61 ⚠	Warning Code 61 ⚠	EDGE BACKUP Communication is lost and	1. Check if EDGE BACKUP wiring is connected well and correctly following instructions in this manual. *(check the orientation of the BMS cable)*

Problem	LCD/LED/ Buzzer	Explanation / Possible cause	What to do
			2. If EDGE BACKUP LEDs are not illuminated, press and hold the **"Manual On/Off"** button on the battery for 10 seconds.
Warning Code 71	Warning Code 71	EDGE BACKUP is not allowed to discharge after the communication between the inverter and battery is successful. The power delivered to the loads cycles between on and off.	1. Check if EDGE BACKUP wiring is connected well and correctly following instructions in this manual. 2. Make sure all RJ11 cables are connected to the **"battery capacity expansion"** ports on the EDGE BACKUPS. These should be daisy chained from lowest BACKUP address to highest address, with a RJ11 terminator on the RJ11 port of the BACKUP with the highest address.
Buzzer beeps continuously and red LED is on.	Fault code 01	Fan fault	Replace the fan.
	Fault code 02	Internal temperature of the inverter component is over 100°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 03	Battery is overcharged.	Return to the repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries meet requirements.
	Fault code 04	An EDGE BACKUP's battery is depleted	Recharge the EDGE BACKUP. If the grid is available but the BACKUP is not charging, fully power cycle the inverter.
	Fault code 05	Output short circuited.	Check if the wiring is connected well and remove abnormal load.
		Temperature of the internal converter component is over 120°C. (Only available for 1.3KWA models.)	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 06	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	1. Reduce the connected load. 2. Return to repair center
	Fault code 07	Overload error. The inverter is overloaded 110% and time is up.	Reduce the connected load by switching off some equipment.
	Fault code 08	Internal components failed.	Return to the repair center.

Problem	LCD/LED/ Buzzer	Explanation / Possible cause	What to do
	Fault code 09	Internal components failed.	Return to the repair center.
	Fault code 51	Over current or surge.	Restart the unit, if the error happens again, please return to the repair center.
	Fault code 52	Bus voltage is too low.	
	Fault code 53	Internal components failed.	Return to the repair center.
	Fault code 55	Output voltage is unbalanced.	Restart the unit, if the error happens again, please return to the repair center.
	Fault code 57	Internal components failed.	Return to the repair center.
	Fault code 58	Output abnormal (Inverter voltage below than 190Vac or a higher than 260Vac)	1. Reduce the connected load. 2. Return to repair center

Parallel String Troubleshooting

Situation		Solution
Fault Code	**Fault Event Description**	
F6	Current feedback into the inverter is detected.	1. Restart the inverter. 2. Check that L/N cable connections are not reversed in all inverters. 3. For parallel systems in single phase, make sure the sharing cables are connected in all inverters. For supporting three-phase systems, make sure the sharing cables are connected in the inverters in the same phase, and disconnected in the inverters in different phases. 4. If the problem remains, please contact your installer.
F71	The firmware version of each inverter is not the same.	1. Update all inverter firmware to the same version. 2. Check the version of each inverter via LCD setting and make sure the CPU versions are the same. If not, please contact your installer to provide the firmware to update. 3. After updating, if the problem still remains, please contact your installer.
F72	The output current of each inverter is different.	1. Check if sharing cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer.
F80	CAN data loss	1. Check if communication cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer.
F81	Host data loss	
F82	Synchronization data loss	

Situation		Solution
Fault Code	**Fault Event Description**	
F83	The battery voltage of each inverter is not the same.	1. Make sure all inverters share the same groups of batteries together. 2. Remove all loads and disconnect AC input and PV input. Then, check the battery voltage of all inverters. If the values from all inverters are close, please check if all battery cables are the same length and same material type. Otherwise, please contact your installer to provide SCP to calibrate battery voltage of each inverter. 3. If the problem still remains, please contact your installer.
F84	AC input voltage and frequency are detected different.	1. Check the utility wiring connection and restart the inverter. 2. Make sure utility starts up at same time. If there are breakers installed between utility and inverters, please be sure all breakers can be turned on AC input at same time. 3. If the problem remains, please contact your installer.
F85	AC output current unbalance	1. Restart the inverter. 2. Remove some excessive loads and re-check load information from LCD of inverters. If the values are different, please check if AC input and output cables are in the same length and material type. 3. If the problem remains, please contact your installer.
F86	AC output mode setting is different.	1. Switch off the inverter and check LCD setting #28. 2. For parallel system in single phase, make sure no 3P1, 3P2 or 3P3 is set on #28. 3. For supporting three-phase system, make sure no "PAL" is set on #28. If the problem remains, please contact your installer.

Should your EDGE system develop problems that prevent it from powering loads, do not attempt to repair the system yourself.

WARNING:
Do not open the equipment unless authorized by ZOLA Electric.
Risk of electric shock!

Attempting to repair your EDGE system on your own could result in serious personal injury. Please contact ZOLA customer service *(see contact information below)* to schedule the repair of your system.

For systems with an EDGE CONNECT, place the switch into the **"Bypass"** position to connect the BACKUP loads directly to the Mains or Generator supply. This will ensure that the home loads can be powered even if the EDGE system is not operating.

11. SOFTWARE

ZOLA VISION

ZOLA Vision gives the fleet manager the ability to monitor and operate both a single device as well as an entire fleet, providing periodic updates to the performance of the system and creating alerts if the system is operating outside of the designed condition.

More details at https://vision.zolaelectric.com/

ZOLA APP

The best way to interact with EDGE as a homeowner is through the ZOLA App. This app is for use on a smartphone, downloadable via both iOS and Android platform under **"ZOLA Vision"**

The ZOLA App provides the following functionality:

1. Registration - assignment of EDGE strings to one or several mobile devices

2. Status - current status of system components and estimations of remaining runtime on battery power

3. Push notifications - notifications about grid and status of individual components of EDGE.

12. UNINSTALLATION AND RETURN

Should you require the removal of your EDGE system from your home, do not attempt to uninstall the system yourself.

WARNING:
Do not open the equipment unless authorized by ZOLA Electric.
Risk of electric shock!

Attempting to remove your EDGE system on your own could result in serious personal injury. Please contact ZOLA customer service *(see contact information above)* to schedule the removal of your system.

After receiving your removal request, your ZOLA Electric distributor will schedule an appointment to remove the system. A ZOLA Electric Technical Partner will remove EDGE from your home.

Always consult your electrician before trying to rewire your electricity supply in case of permanent removal of your EDGE system.

WARNING:
EDGE equipment contains power sources that store energy independent from any other source. During uninstallation, treat all parts of the EDGE system as an active and live AC power source, even when disconnected from other equipment.

WARNING:
Isolate all EDGE wiring from other sources before disassembly.

Place the selector switch in the EDGE CONNECT to the **"Bypass"** position to disconnect the EDGE string from both the mains and home wiring before uninstalling.

For qualified technical partners, see **"System Standby and Shutdown Instructions"** elsewhere in this manual for specific steps to follow to shutdown EDGE Units, and to disconnect wiring connections in the system.

13. PRODUCT SPECIFICATIONS

EDGE INVERTER & BACKUP SPECIFICATIONS

Type	EDGE
Rated Power per INVERTER	5 kVA
Output type	AC, single-phase & threephase
Scalability of INVERTER	*Single Phase: 1-5 units (5 kVA-25 kVA) Three Phase : 3 & 6 units (1.5kVA & 30kVA)*
Rated Storage Capacity per BACKUP	Nominal: 5.3kWh ; Usable: 4.8 kWh
Scalability of BACKUP	Up to 10 Units (Nominal: 53kWh / Usable: 48kWh)
AC input	
Acceptable voltage range	180 - 270 V RMS
Frequency	50 / 60 Hz
Maximum AC input current	40 A RMS
Generator Compatibility	Single Phase - 10kVA 3 Phase - 30kVA
DC Input (Solar PV)	
Type	Maximum Power Point Tracking
Number of arrays per inverter	1
Maximum PV array power per inverter	6,500W
MPPT Range @ Operating Voltage	120 - 430 V
Maximum PV array Open Circuit Voltage	450V
Maximum PV array current per inverter	26 A (diode required for each PV string in an array)
Output	
Voltage range	230 V RMS +/- 5%
Surge capacity	7.5 kVA for 10 seconds, 10 kVA for 5 seconds, >10kVA for 0.1 seconds
Efficiency (Peak)	90% Efficiency
Transfer Time	Single inverter: less than 20ms
Waveform	Pure sine wave
No load power consumption	<60W

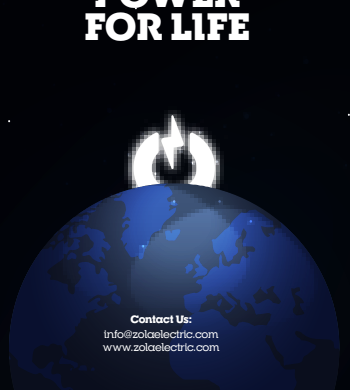
Battery module (BACKUP)	
Voltage	48V
Floating Charge Voltage	56V
Overcharge Protection	57.5V
Maximum discharge current	150 A per battery
Maximum charge current	30 A per battery
Cycle life at 80% capacity retention	2000 cycles at 100% depth of discharge.
Battery Chemistry	LiFePO4
Battery charging	
Maximum charge current from the PV input	80A per inverter, limited to a total 30A per battery
Maximum charge current from the AC input	50A per inverter, limited to a total 30A per battery
Physical	
Inverter Dimension (W x H x D)	600mm x 245mm x 450mm
Inverter Weight (kgs)	22kg
Battery Dimension (W x H x D)	600mm x 302mm x 450mm
Battery Weight (kgs)	56kg
Communication Interface	USB / RS232 / RS485 / GSM (WiFi coming soon)
Operating Environment	
Humidity	20% to 80%
Operation Temperature	5°C to 45°C
Storage Temperature	-20°C to 25°C for up to 18 months
Safety Compliance	IEC 62109, IEC 62619, UN 38.3, EN 61000, EN 300 328, EN 301 511, EN 62311

EDGE CONNECT 15S SPECIFICATIONS

ITEM	SPECIFICATION	COMMENTS
INPUT		
Bypass Switch	120A MAX	Single Phase The bypass switches the line & neutral
AC grid	Single-phase	
	180 - 270V AC	
	50/60Hz	
	120A Max	
Backup generator	Single-phase	Minimum Generator Requirement: Single Phase - 10kVA 3 Phase - 30kVA*
	180 - 270VAC	
	50/60 Hz	
	120A Max	
PV	480V max	Include 500V surge protection devices
	32A Max	Includes C40 DC breaker
From Inverters	Single-phase	
	180 - 270VAC	
	50/60 Hz	
	Up to 3 inverters AC connections	
	40A max/inverter	includes C40 AC breaker
OUTPUT		
To inverters	Single-phase	
	180-270VAC	
	50/60 Hz	
	Up to 3 inverters AC connections	
	40A max/inverter	Includes C40 AC breaker
Load	Single-phase	
	180-270V AC	
	50/60Hz	
	Up to 120A (3 inverters configuration)	

DATA		
Generator control	Two-wire start/stop	with voltfree, dry-contact relay
ATS status monitoring	Yes	12V digital
ENVIRONMENT		
IP protection	IP 20	
Operating temperature	-20 to 65 degrees C	
Operating Relative Humidity	5% to 95% (non condensing)	
MAINTENANCE		
Bypass switch	Yes	**For System Maintenance:** Bypass switch disconnects loads from inverter(s) and connect loads to AC grid/Backup generator
AC and DC breakers	Yes	**For System Maintenance:** AC & DC breakers are accessible from the front of the panel
SIZE & WEIGHT		
Dimension WxDxH (mm)	525mmx150mmx660mm	
Weight (kg)	25kg	

POWER FOR LIFE



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