Generator Control box Installation and Wiring: v1.0

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DANGER: Turn off and lock out all electrical power before installation. Verify circuits are de-energized with an approved meter. Failure to follow proper electrical safety procedures can result in serious injury or death.

IMPORTANT SAFETY INFORMATION AND LIABILITY DISCLAIMER

WARNING

Improper installation or use of this product can result in electrical shock, fire, severe injury, death, property damage, or equipment damage.

Read this manual completely before beginning installation.

This Generator Relay Controller is intended for installation by individuals familiar with electrical systems and safe wiring practices. If you are not qualified to perform electrical work, do not install this product.

Installer Responsibilities

The installer is solely responsible for:

Complying with all applicable local, state, and national electrical codes.

Selecting appropriate relays, breakers, disconnects, overcurrent protection, wire sizes, and other electrical components.

Ensuring all electrical connections are properly made and securely tightened.

Verifying that the completed system operates safely before placing it into service.

Periodically inspecting the system for safe operation.

Safe Installation

Always:

Disconnect and verify all power sources are de-energized before servicing.

Use properly rated electrical components.

Use wire sizes appropriate for the connected loads.

Verify all wiring before applying power.

Test the complete system before placing it into normal operation.

Never work on energized equipment.

Intended Use

This Generator Relay Controller is designed solely to control generator-related electrical circuits as described in this manual.

It is not intended to replace required electrical protection devices, disconnecting means, grounding, bonding, or other safety equipment required by applicable electrical codes.

Any modification of this product or use outside its intended ratings is performed entirely at the user's own risk.

Limitation of Liability

To the fullest extent permitted by law, Sparxx Generator Rentals LLC shall not be liable for any injury, death, property damage, equipment damage, loss of income, loss of business, or any direct, indirect, incidental, special, or consequential damages arising from the installation, wiring, operation, maintenance, misuse, modification, or failure of this product.

The purchaser, installer, and end user assume all responsibility for ensuring that the complete electrical system is installed correctly, tested thoroughly, and operated safely.

Acceptance

By purchasing, installing, or operating this product, the purchaser and installer acknowledge that they have read and understood this manual and accept full responsibility for the installation and safe operation of the system.

Sparxx Generator Controller FAQs:

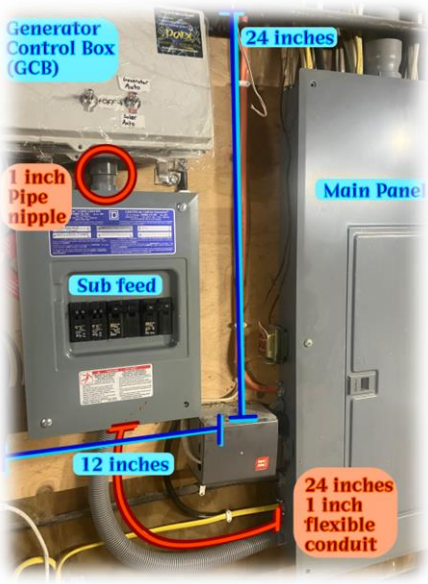
- What is the largest generator this controller operates? Maximum size gas or battery generator for this controller is 14kw 50 Amp 240VAC output.
- Does this controller operate automatically? Yes the generator control box (GCB) automatically detects power loss and starts any gas generator with 2 wire start feature. It will also transfer the loads automatically.
- Will the battery generator operate automatically? Yes you have two options for automatic operation. Solar load shedding during peak sunlight hours will control transfer automatically as well as power loss from the utility company.
- Does the generator need utility power? Yes constant utility power keeps generator warm in the winter, cool during operation and battery charged so it's ready to start when you lose power. The Inlet box is included with a 30 amp 240VAC twistlock receptacle to power the generators circuits.
- How does a generator connect electrically to the generator control box (GCB)? An inlet box installed outdoors with a 50 amp 240VAC twistlock cord and plug style connector is used.
- Do I have to install the Generator control box (GCB) and Inlet box to rent a Sparxx battery generator? Yes and the boxes must be wired exactly according to this manual or the generator will not operate correctly.

Selecting backup circuits:

Are the circuits for emergency, convenience, or load shedding?

- Emergency circuits may include; medical equipment, freezer, refrigerator, water pump, sump pump, furnace, etc;_____
- Convenience circuits may include; internet, water heater, lighting, bedroom, microwave, stovetop, etc;_____
- Load shedding circuits may include; air conditioner, Space heaters, refrigerator, freezer, etc;_____

Keep in mind circuits powered by generator will only be located in Sub feed panel. Maximum size 50 Amp breaker powering sub feed panel. Maximum generator control box (GCB) and sub feed panel full load is 9600 continuous watts. Find the wattage ratings of each selected circuit routed to the sub feed panel. Calculate the cumulative total wattage of all appliances or circuit loads to verify generator control box (GCB) rating is NOT exceeded (9600 watt max).



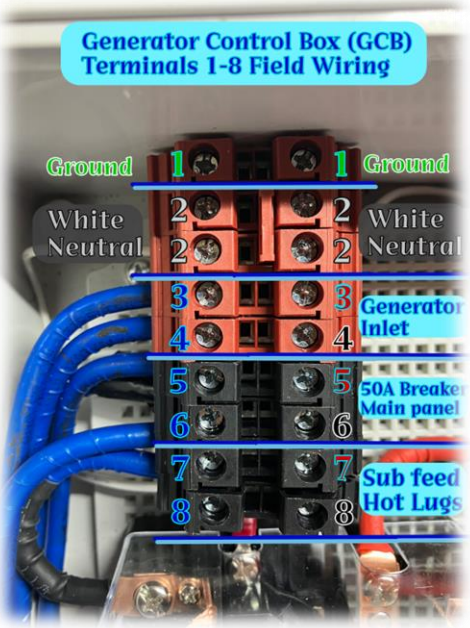
Installing Generator Control box (GCB):

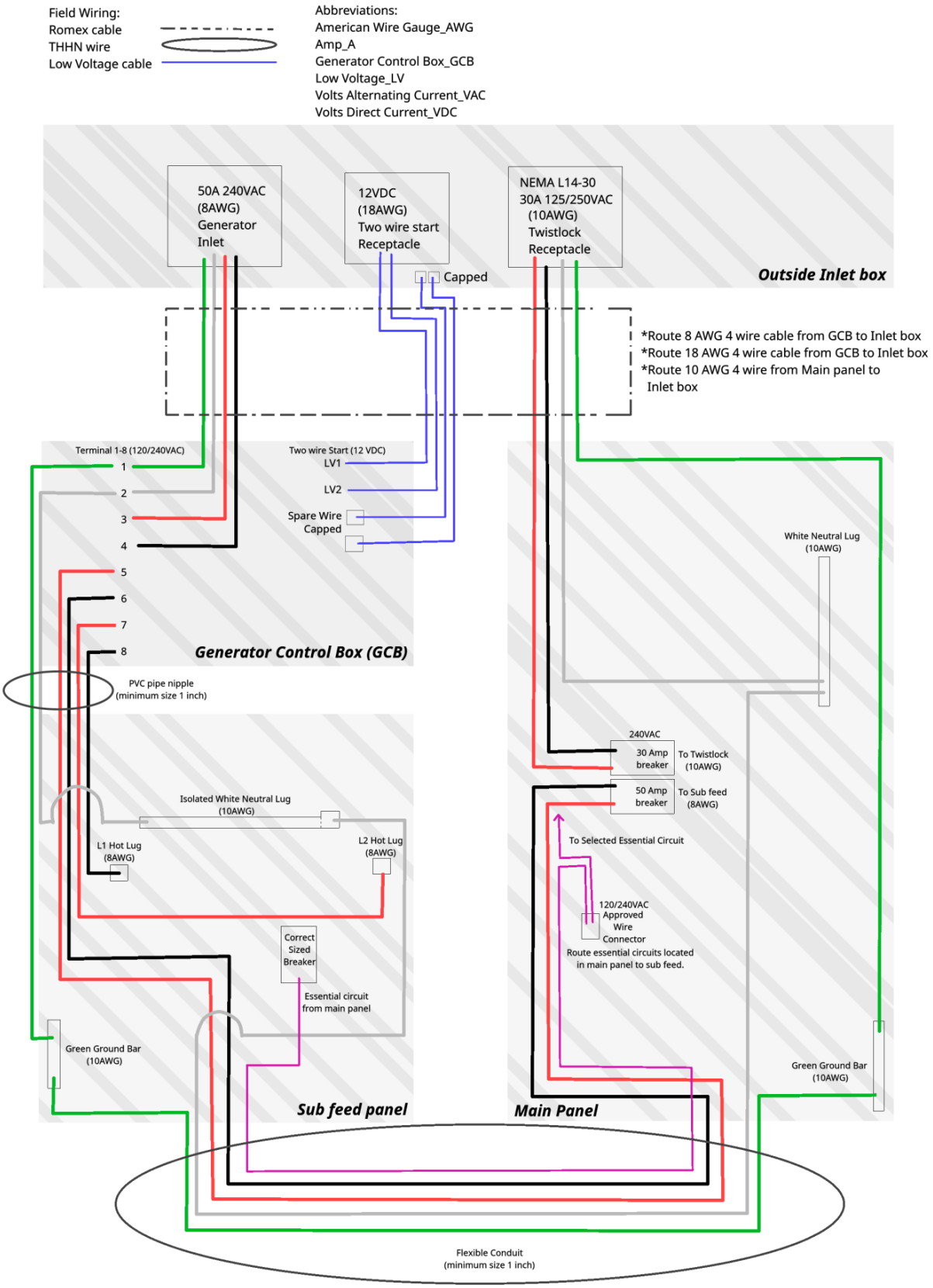
Find an open surface 22 inches high and 12 inches wide adjacent to the main electrical panel in the building or home. Minimum space needed to secure the GCB and sub feed panel. Position the GCB above the sub feed (see example1). Route 1 inch flexible conduit from the sub feed into the main panel. Use a 1 inch pvc pipe nipple to connect GCB with sub feed. Drill two holes for cable connectors on top of the GCB (one ½ inch, and one ¾ inch hole). Field wiring is routed through the cable connectors in GCB to Inlet box outside adjacent to generator.

Wiring Installation (start at top)(see example2):

- Open the generator control box (GCB) after installed and secured over sub feed panel.
- Locate Terminals 1-8 in GCB (high voltage 120/240VAC)(see example3)
- Locate wires labeled LV1 and LV2 (12VDC) on switch secured to GCB cover. (see example4)
- Route the field wired 8 awg 4 wire cable into GCB. Land Red and Black to terminal 3 and 4.
- From field wired cable land Green or bare copper wire to terminal 1.
- From field wired cable land White to terminal 2 (note terminal 2 has extended connections by a jumper)
- Route (black and red) 8 awg thhn in conduit from main panel (50A breaker) to GCB. Land the Red and Black to terminal 5 and 6.
- Route and land (green) 10 awg thhn in conduit from main panel green ground bar to sub feed panel green ground bar.
- Route and land (green) 10 awg thhn in conduit from sub feed green ground bar to GCB terminal number 1.
- Route and land (white) 10 awg thhn in conduit from main panel white neutral lug to sub feed panel isolated white neutral lug. (isolated is when white neutral lug and green ground bar are NOT connected)
- Route and land (white) 10 awg thhn in conduit from sub feed panel isolated white neutral lug to GCB terminal 2.
- Route (black and red) 8 awg thhn in conduit from sub feed (Hot Lugs L1 and L2) to GCB. Land the Red and Black to terminal 7 and 8.
- Route the field wired 18 awg 4 wire cable into GCB. Land white and red to terminal LV1 and LV2. Cap other spare wires in cable.
- Route the field wired 10 awg 4 wire cable into main panel. Land Red and Black to 30A breaker.
- From field wired 10 awg cable in main panel land Green or bare copper wire to green ground bar.
- From field wired 10 awg cable in main panel land White wire to white neutral lug.

1. Main panel Ground (green 10 THHN)_ Field wiring Ground (Green or Bare Copper wire)
2. Main panel Neutral (white 10 THHN)_ Field wiring Neutral (White)
3. Transfer switch Normally Open_ Field wiring 8 awg 4 wire cable Red L1 (from 50 amp inlet)
4. Transfer switch Normally Open_ Field wiring 8 awg 4 wire cable Black L2 (from 50 amp inlet)
5. Transfer switch Normally Close_ Panel 8 awg THHN Red L1 (from main panel 50 amp breaker)
6. Transfer switch Normally Close_ Panel 8 awg THHN Black L2 (from main panel 50 amp breaker)
7. Transfer switch Common_ Sub feed 8 awg THHN Red L1 (from sub feed L1 Hot lug)
8. Transfer switch Common_ Sub feed 8 awg THHN Black L2 (from sub feed L2 Hot lug)




Field Wiring:
Romex cable
THHN wire
Low Voltage cable
Abbreviations:
American Wire Gauge_AWG
Amp_A
Generator Control Box_GCB
Low Voltage_LV
Volts Alternating Current_VAC
Volts Direct Current_VDC
50A 240VAC (8AWG) Generator Inlet
12VDC (18AWG) Two wire start Receptacle
NEMA L14-30 30A 125/250VAC (10AWG) Twistlock Receptacle
Capped
Outside Inlet box
*Route 8 AWG 4 wire cable from GCB to Inlet box
*Route 18 AWG 4 wire cable from GCB to Inlet box
*Route 10 AWG 4 wire from Main panel to Inlet box
Terminal 1-8 (120/240VAC)
1
2
3
4
5
6
7
8
Two wire Start (12 VDC)
LV1
LV2
Spare Wire Capped
Generator Control Box (GCB)
PVC pipe nipple (minimum size 1 inch)
White Neutral Lug (10AWG)
240VAC
30 Amp breaker
To Twistlock (10AWG)
50 Amp breaker
To Sub feed (8AWG)
To Selected Essential Circuit
120/240VAC Approved Wire Connector
Route essential circuits located in main panel to sub feed.
Isolated White Neutral Lug (10AWG)
L1 Hot Lug (8AWG)
L2 Hot Lug (8AWG)
Correct Sized Breaker
Essential circuit from main panel
Green Ground Bar (10AWG)
Sub feed panel
Main Panel
Green Ground Bar (10AWG)
Flexible Conduit (minimum size 1 inch)

Installing Generator Inlet box:

- Look to install close to the main building service panel to reduce installation cost dramatically.
- Must install inlet box in a readily accessible place outdoors where a generator can be placed adjacent to the inlet box (5 feet x 3 feet needed for generator).
- Install away from areas of rain drainage on the East or North side of the house if possible (cooler in the summer and protected from the elements).
- Install where solar panels can be placed near the inlet box (open yard and abundant sunlight).

The hinged side should be facing up or to the left on Sparxx Inlet box. The receptacles will face down or be located on the right side. Drill two holes in back of inlet box for a 1 inch and ½ inch cord connector bushing. Also drill the holes in exterior wall to route into home for field wiring. Note the holes in the exterior wall will be larger than the holes in the back of box. Securing the Inlet box two or three feet maximum off the ground is recommended box height. Route the field wires into the cord connectors and seal connectors into home with approved sealant. Secure box well. (see example1) wiring installation to view the contents to be connected in the Inlet box.

Operation Instructions:

Left Toggle Gas Generator Start Control:
Up position_ Generator Start Automatic (generator will only start if power loss detected)
Center position_ Generator Start is OFF (generator will NOT start during power loss or manually)
Down positon_ Generator Start Manuel ON (Starts generator immediately by sending run command)

Right Toggle Transfer switch Control (controls sub feed power source):
Up position_ Transfer Automatic (transfer to generator only if power loss detected)
Center position_ Transfer is OFF (transfer switch will stay on utility power indefinitely)
Down positon_ Solar Automatic (transfer to battery generator when load shedding with solar panels or if power loss detected)

The generator control box (GCB) has two toggle switches. Configure the toggle switches in the desired run position. Both toggles up result in automatic control generator start command and transfer during power loss. Left toggle Center, Right toggle up controls a battery generator automatically without solar extension (utilizing time delays to control transfer switch). Left toggle Center, Right toggle down controls a battery generator automatically if solar extension available and daily load shedding of sub feed loads is desired (time delays are bypassed in solar automatic).

To test gas generator operation manually toggle left down, toggle right center. The generator will start and no transfer will occur. To test gas generator in automatic power loss simulation toggle left up and toggle right up. Then switch 50 amp breaker in main panel to OFF position. The generator will start and the transfer occurs within 10 seconds after the generator starts. After transfer occurs switch 50 amp breaker in main panel to ON positon. Wait 10 minutes. The transfer switch will shut down the gas generator and transfer loads back to utility.

Modifying the timers in the GCB may be advantageous for personal customization. There are two timers to adjust. Timer T1 controls time delay when utility power becomes present after a power outage. Example: Generator is currently running and utility power is lost/ utility power is restored/ timer t1 counts to set point (10 minutes)/ set point is reached/ de-energized transfer occurs/ sub feed is powered by utility. Timer T2 controls time delay of transfer after power loss event. Timer operates only after the generator starts. Example: Power loss/ generator starts/ timer t2 counts to set point (10 seconds)/ set point is reached/ energized transfer occurs/ sub feed is now powered on generator.

Parts list

Generator controller box (GCB): (included)

x1 8”x12”x4”deep box (plastic)
x1 On delay Timer T2; 120VAC coil, double pole double throw contacts
x1 On delay Timer T1; 240VAC coil, double pole double throw contacts
x1 Relay R1; 240VAC coil, double pole double throw contacts
x1 Contactor (Transfer switch); 120VAC coil, double pole double throw contacts (2 normally open contacts and 2 normally closed contacts), contacts need to be rated at no less than 80 Amp.
x2 ON-OFF-ON; Double pole double throw toggle switch, 10 Amp rated at 240VAC
x2 Din rail; 8” length (needed if you get din rail mount timer and relay)
x1 Terminal strip for splicing up to 8 awg wire; 50 Amp rated terminals.
x1 Terminal strip splice connectors
x1 8 awg copper lug crimps for Contactor connections
x1 8 awg stranded copper wire; 25 feet minimum needed. (Contactor)
x1 16 awg copper wire; 20 feet minimum needed. (relay wiring)

Inlet box: (included)

x1 8”x12”x4”deep box (plastic outdoor rated)
x1 240VAC 30 amp twistlock 4 wire receptacle (L14-30R)
x1 240VAC 50 amp inlet plug and cord receptacle
x1 2 wire 20 amp plug and receptacle

Sub feed Panel: (not included)

x1 HOM612100 (Choose same brand as main house panel)
x1 Homeline breakers; Whatever is needed for home circuit backup needs.
x1 50 Amp breaker 240VAC; To power subfeed panel from main panel.
x1 30 Amp breaker 240VAC; To power outside inlet box twistlock receptacle from main panel.
X1 1 inch Flexible conduit (3 feet)
X2 1 inch flexible conduit connectors
X4 1 inch locknuts
X2 1 inch pvc connectors
X4 1 inch cord connector, ¾ inch cord connector, ½ inch cord connector (need 2)
x1 12 awg copper wire; 25 feet minimum needed. (sub feed to main panel wiring)
x3 18, 10, 8 awg 4 wire cables for field wiring

Referral Responsibility:

Electricians or users who purchase and install generator control box in consumer applications be sure to take advantage of Sparxx referral program. Sign up with Sparxx to receive your referral code. Earn 20% of any rental contract listing your referral code. Place or print your referral code on generator control box and be sure to notify customer of your referral code and their 10% rate reduction for rental generators with that referral code. Referrals are not required and Sparxx is NOT responsible for marketing your referral code.

Scan the QR code on page 1 manual cover to learn more about or contact Sparxx, signup on a waitlist for a rental, receive a referral code, or purchase Sparxx generator control box (GCB).

Building Generator Control box:
Building Generator Inlet box: