V ELECTRIC POWER

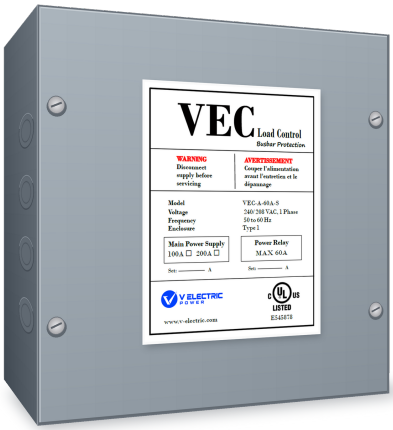
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INSTALLATION MANUAL

VEC Load Control

Solar PV Busbar Protection

Smart Energy Management



MODELS

- ☐ **VEC-A-60A-S** — Single Channel
- ☐ **VEC-A-60A-2C-S** — Dual Channel

www.v-electric.com
Made in Canada

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1. Disclaimer & Safety Warning

Disclaimer: While every precaution has been taken to ensure the accuracy of the contents of this guide, V Electric Power Inc. assumes no responsibility for errors or omissions. Specifications and product functionality are subject to change without notice.

> **⚠ WARNING**
>
> Read all instructions and warnings in this manual before starting installation. Improper installation can result in serious injury or death.

- Disconnect power before performing any installation, maintenance, or servicing.
- Installation and wiring must comply with the applicable electrical code (CEC in Canada or NEC in the USA) and all local regulations. Work must be performed by a certified technician.
- Proper grounding of the VEC must comply with all applicable local and regional codes.
- Do not install the device in hazardous locations or near flammable materials, fuels, or chemical vapours.
- The installer is responsible for understanding the device's purpose and ensuring all safety requirements are followed, including verifying correct CT orientation and proper installation of each CT.
- Ensure all connections are properly torqued and all wires are securely tightened.
- Immediately stop using the unit if it is defective, broken, or damaged.
- If unsure, consult a qualified electrician or the manufacturer before proceeding with installation.

2. Installation Location

- This device is suitable for **indoor installation only**. For outdoor installations, use the model with a Type 3R enclosure.
- Do not install the device in areas exposed to corrosive gases, acids, salt, or in hazardous locations. Refer to the applicable electrical code (CEC or NEC) for detailed requirements.
- This device is not dustproof — do not install it in areas with high levels of dust.
- Do not install the device in greenhouses or wet areas, and never spray water or any other liquid onto the VEC.
- Do not install the VEC outside its operating temperature range (−30 °C to +45 °C / −22 °F to 113 °F), for example in furnace rooms.

3. Description

The VEC-A-60A-S and VEC-A-60A-2C-S are advanced, all-in-one load control units engineered to safeguard the main breaker and busbar from overloading, particularly when integrated with solar PV panels. The VEC unit initiates load shedding when the main breaker's consumption exceeds 80% of its capacity, or PV solar shedding when the main busbar exceeds its rated current capacity. This is achieved by disconnecting one or two prioritized loads, or part of the solar array. Using the VEC not only prevents overloading of the panel, it also makes it possible to add more solar panels without upgrading the main panel.

> **NOTE**
>
> All VEC Load Control units are fully expandable. Whether supplied as a single-channel or dual-channel model, each unit can be expanded to support up to three controlled outputs. Depending on the application, the system can either shed connected loads, or limit/disconnect a portion of the solar PV system through a power relay to relieve busbar overloading. Expansion modules are optional accessories, purchased separately.

Single-Channel and Dual-Channel Models

Single Channel



Dual Channel



Typical units shown — see Connection Diagram & Termination for wiring details.

4. Technical Specifications

Parameter	Details
Rated Voltage	208 / 240 VAC, single phase (L1, L2, N, G)
Frequency	50 / 60 Hz
Operating Temperature	−30 °C to 45 °C (−22 °F to 113 °F)
Power Relay Rating*	60 A per channel
Main Supply Rating*	100 A ☐ 200 A ☐
Control Circuit Current*	Up to 60 A per channel
Turn-Off Delay	1 to 15 s
Turn-On Delay	1 to 60 min
Maximum Conductor Size***	2 AWG (L1, L2, N) (CU/AL) △
Maximum Terminal Lug Torque	50 in-lbf (5.6 N·m)
Approximate Weight**	Single Channel: 7.9 lb (3.6 kg) · Dual Channel: 13.2 lb (6 kg)
Enclosure Dimensions (in)*	8×8×4 ☐ 10×10×4 ☐ 12×12×4 ☐
Enclosure Type	Type 1 or Type 3R

* For additional sizes and ratings, contact V Electric Power. Custom configurations are available on request.
** Approximate and subject to change without notice.
*** Some versions use a 4 AWG neutral instead of 2 AWG.

△ CU/AL CONDUCTORS

VEC lugs are suitable for both copper and aluminum conductors. Install conductors in accordance with the applicable electrical code and VEC installation requirements. For aluminum conductors, remove the oxide layer and apply a suitable oxide-inhibiting compound before termination. Tighten all conductor terminals to the specified torque.

5. Product Overview — Intended Use

The VEC Load Control and Busbar Protection System monitors, in real time, both the power drawn from the grid and the power generated by a photovoltaic (PV) system. It manages connected circuits to prevent overloading the main electrical panel and its busbar.

How the system operates

- **Current monitoring:** the VEC continuously measures current on L1, L2, and the solar input using split-core current transformers (CTs).
- **Overload protection:** if total power consumption exceeds 80% of the main breaker's capacity, or the main busbar's rated capacity, the VEC automatically de-energizes the connected load/solar after a short, user-adjustable delay. This prevents excessive loading of the panel and protects the busbar from overheating or failure.
- **Automatic reconnection:** when total consumption drops below 80% of the panel's capacity and busbar loading returns within rated limits, the VEC automatically re-energizes the load/solar. Reconnection factors in total consumption and the connected circuits' size, with an adjustable delay to avoid rapid cycling.
- **User-defined settings:** authorized users can configure relay activation based on current thresholds and timing parameters.
- **Supported loads:** EV chargers, air conditioners (A/C), and similar equipment in load-shedding mode, within the rated capacity of the system.
- **Safety compliance:** for certain loads (for example, hot tubs), additional protective measures such as GFCI breakers or outlets must be installed in accordance with local electrical codes and standards, independently of the VEC.

> **NOTE 1** — The VEC continuously monitors real-time current through CT1, CT2 and CT3. If the measured current exceeds the defined threshold for either the main breaker or the busbar, the VEC automatically disconnects the designated non-essential load(s) or part of the solar array to prevent overload on both the busbar and the main breaker.

> **NOTE 2** — The electrical contractor shall perform the load calculation and determine the excess current to disconnect from the panel with the VEC unit, choosing either a single-channel or dual-channel configuration based on system requirements.

6. Connection Diagram & Termination

The installation uses **three current transformers (CTs)**: two in the main panel, ahead of the main breaker (CT1, CT2), and a third (CT3) dedicated to the solar input, placed on the line between the solar inverter and the main panel, or at any other suitable location where it measures the total current injected by the PV solar system.

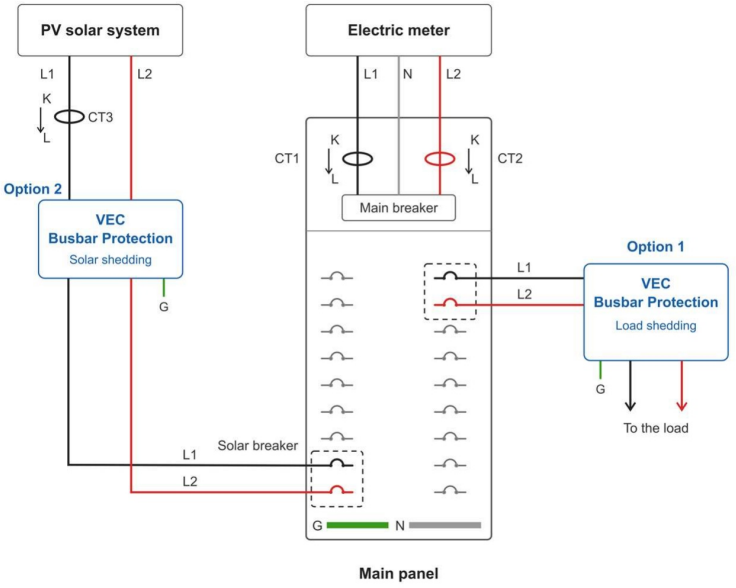


Figure 1 — Connection overview: Option 1 (load shedding) and Option 2 (solar shedding)

- **Two-pole breakers** must be installed in the main panel to supply the VEC. Size the breaker according to the load/solar rating.
- For both 120 V and 240 V loads, connect the supply to the L1 and L2 lugs and the load to the T1 and T2 lugs. Use the neutral lug only when a 240 V load requires a neutral; otherwise connect nothing to it.
- For 120 V loads, use the L2 and T2 lugs as the neutral terminals (N) of the device.
- Load 2 is available only on dual-channel models.

> **NOTE** — This diagram covers both busbar-protection methods described later in this manual: **load shedding (Option 1)** and **solar shedding (Option 2)**. The technician selects the option appropriate for the required busbar-protection method. For installations with multiple PV arrays, see *Typical Installation Configurations* (Configurations 3 and 4).

7. Installation Steps

7.1 Mount the VEC

- Select a location near the main panel that is dry, free from moisture, and protected from extreme temperatures and direct sunlight.
- Make sure the location is easily accessible for maintenance and repairs.
- Remove the cover by unscrewing the four screws.
- Position the VEC at the chosen location and secure it to the wall with suitable anchors and screws, making sure it is firmly attached.

7.2 Install the Cables and Breakers

- Use appropriately sized cable, according to the local electrical code, to connect the supply to the VEC and the VEC output terminals to the controlled power circuits.
- Install breakers of the correct size in the main electrical panel, based on the capacity of the connected loads/solar.

NOTE — Single- and multi-channel VEC units are suitable for a wide range of applications, with a maximum rating of 60 A per channel.

CAUTION — The maximum permissible current is 60 A per channel, based on the rated capacity of the power relays in the VEC-A-60A-S and VEC-A-60A-2C-S units. For outdoor installations, use only the model with a NEMA 3R enclosure.

7.3 CT Orientation and Wiring

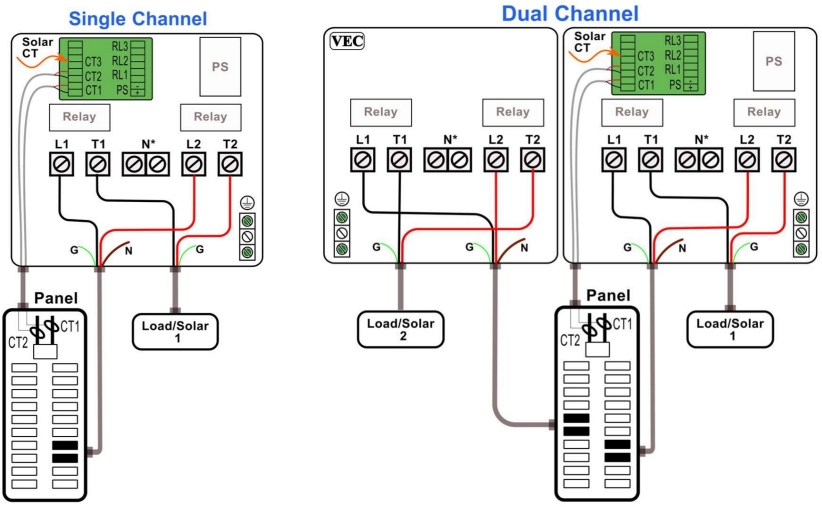
Before installation, disconnect power to the main panel at the electrical meter or upstream disconnect switch.

7.3.1 — CT1 & CT2 Installation (Main Panel)

- Install CT1 and CT2 around the main service conductors feeding the panel.
- Ensure both CTs are oriented in the same direction (K → L), with the CT arrow pointing toward the busbar (load center).
- CTs are split-core and can be opened for installation around the conductors.
- Terminate CT1 and CT2 using the following wiring pattern: CT1 — Black, then Red (or white); CT2 — Black, then Red (White).

7.3.2 — CT3 Installation (Solar PV)

- Single PV system: install CT3 around one of the solar inverter output conductors, oriented K → L toward the busbar.
- More than one PV system: CT3 must go around the same-phase conductor (e.g., L1) of every PV system, so that it measures the combined current injected by all PV systems. See **Detail A** on page 19.
- If CT3 is installed on L1, terminate it in the same orientation as CT1 or CT2.
- If CT3 is installed on L2, terminate it in the reverse orientation of CT1 or CT2.
- Refer to *CT Installation, Terminations & Color Coding* (Section 9) to confirm correct CT orientation.



Figures 2 and 3 — Single-channel and dual-channel wiring and terminations (L1, L2 = line input; T1, T2 = load/solar output; N = neutral; G = ground)*

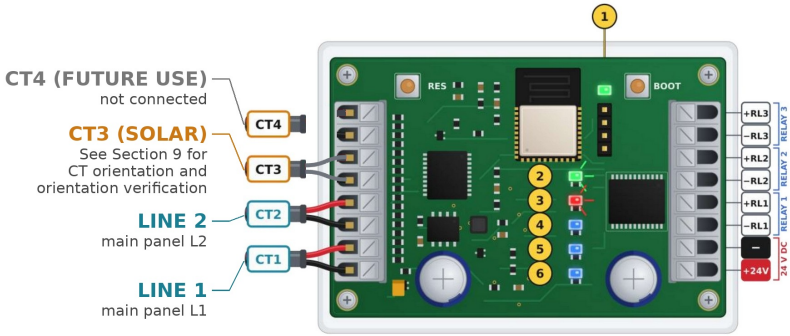


Figure 4 — CT terminals on the VEC board. CT1 and CT2: main panel lines L1 and L2; CT3: solar CT; CT4: reserved for future use (leave unconnected).

- Each CT cable has one red and one black wire. On some CTs the red wire is white.
- Connect each CT cable to the terminal pair with the same CT number.
- **CT3 is the solar CT**: connect the CT installed on the solar PV output to the CT3 terminals.
- **CT4 is for future use**: leave the CT4 terminals unconnected.

> **CAUTION** — The CTs provided with the unit (100 A or 200 A) are suitable only for panels with a main breaker rated up to the corresponding CT rating. Ensure the CT rating matches the panel's main breaker rating.

> **CAUTION** — If the CT cables are too short, extend them with a minimum 18 AWG, 300 V shielded cable or equivalent, using proper strain-relief cable connectors.

7.4 Connect to the VEC (Mobile Hotspot)

The VEC is pre-configured to connect to a mobile hotspot with the default network name and password. The following applies to both Android and iPhone:

- Make sure the VEC is powered on.
- Network names (SSID) and passwords are case-sensitive. Enter both in lowercase, exactly as `velectric`, with no spaces.
- When your phone is connected to the VEC, the Wi-Fi LED on the board blinks fast (see LED 2 in Section 9).
- For Google Pixel phones, use an app such as Net Analyzer to find the device IP address, then enter it in the browser address bar.

7.4.1 — Android

1. **Enable Mobile Hotspot:** go to **Settings > Connections** (or **Network & Internet**) **> Mobile Hotspot & Tethering**, and turn on Mobile Hotspot.
2. **Set the network name and password:** tap Mobile Hotspot to open its settings, set the SSID to `velectric` and the password to `velectric`, and tap Save.
3. **Connect the VEC:** the VEC connects automatically when the network name and password match.
4. **Verify the connection:** check that the VEC appears in the list of connected devices in the Mobile Hotspot settings.
5. **Open the VEC page:** tap the connected device, then the information icon (ⓘ) in the top-right corner to see its IP address. Once you have the VEC's IP address, type it directly into the address bar (URL field) of your phone's web browser, where you would normally type a website address such as www.v-electric.com. Do not type it into Google Search or any other search engine. Tap **Go** or **Enter** to open the VEC main page.

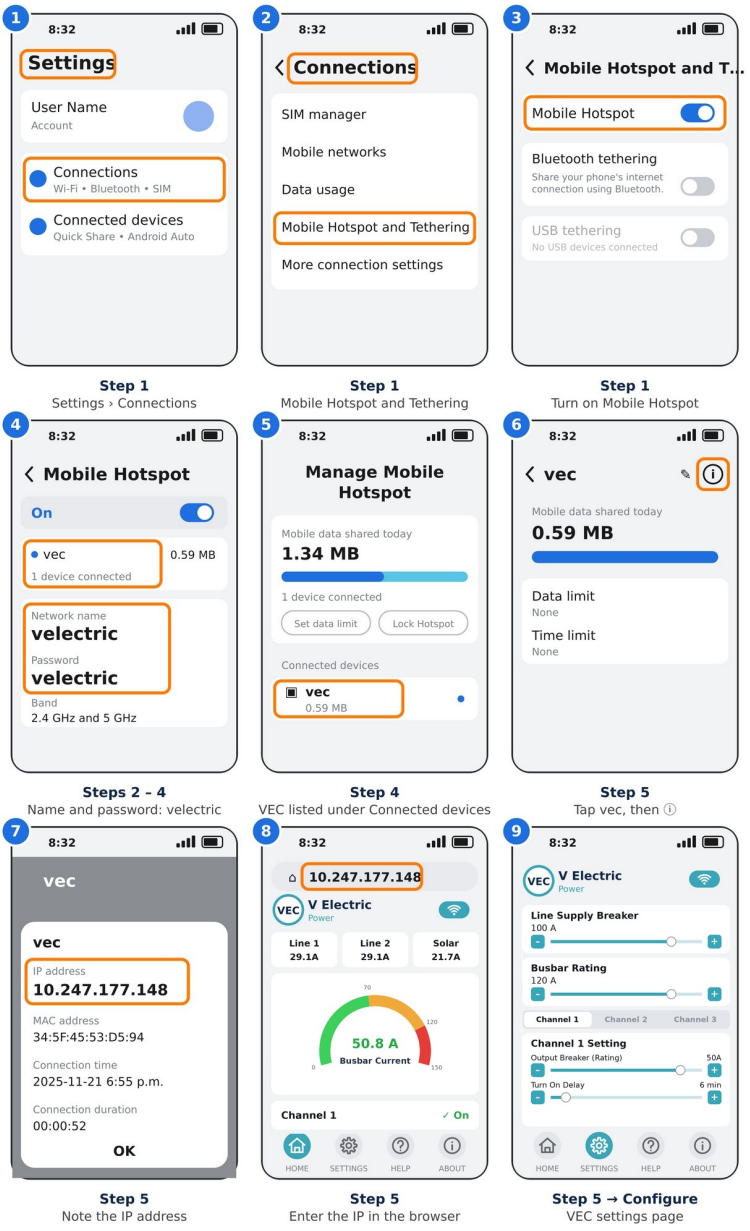


Figure 5 — Android: turning on the hotspot, setting the name and password, and opening the VEC page (step numbers refer to 7.4.1)

7.4.2 — iPhone

1. **Enable Personal Hotspot:** go to **Settings > Personal Hotspot** and turn it on. Make sure **Allow Others to Join** and **Maximize Compatibility** are both ON.
2. **Set the password:** enter `velectric` as the Wi-Fi Password (all lowercase).
3. **Change the iPhone name temporarily:** in some cases the iPhone name must be `velectric`. Go to **Settings > General > About > Name** and enter `velectric`.
4. **Wait for the connection:** the VEC connects to the iPhone's hotspot. When the connection succeeds, the Wi-Fi LED on the board blinks faster.
5. **Open the VEC page:** open Safari and type `http://vec.local` in the address bar. The VEC main page opens.

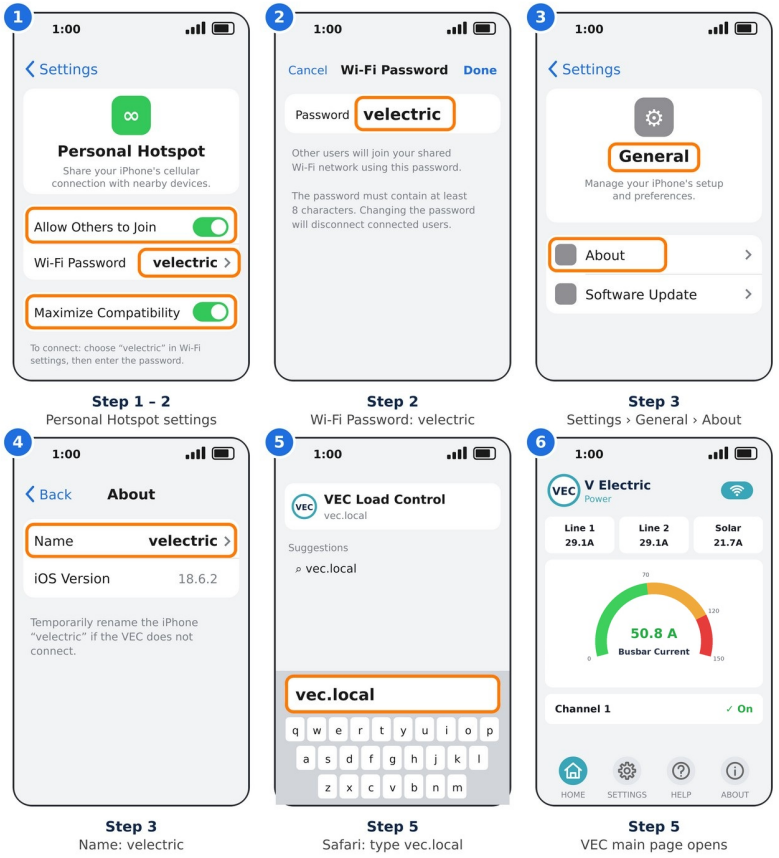


Figure 6 — iPhone: Personal Hotspot settings, iPhone name, and opening vec.local in Safari (step numbers refer to 7.4.2)

> **NOTE** — If the VEC does not appear, or the green chain icon is not shown, turn **Allow Others to Join** off and then on again. This refreshes the hotspot and often restores the connection.

7.5 VEC Overview (Settings)

Once the VEC main page appears on your phone, open Settings to complete the configuration. Depending on the model, the VEC controls 1 to 3 priority-based circuits. Default parameter values:

Parameter	Default	Adjustable Range	Notes
Line (Main) Supply Breaker	100 A	5–200 A* (step 5 A)	Select the actual main breaker size (consider CT size)
Busbar Rating	100 A	5–300 A (step 5 A)	From the panel nameplate; if unknown, use the main supply breaker rating
Output Breaker (Rating) — P1/P2/P3	50 / 50 / 50 A	0–60 A	Nominal load/solar rating; if unknown, use the channel's breaker size
Turn-On Delay — P1/P2/P3	6 / 8 / 10 min	0–60 min	Adjust per priority (see Note 4)
Turn-Off Delay — P1/P2/P3	10 / 8 / 6 s	0–15 s	Adjust per priority (see Note 4)

* Ensure the CTs provided with the VEC are appropriate for the selected range.

NOTE 1 — If the main panel current falls below 80% of the main breaker's rating, with sufficient capacity available for the controlled circuit, the relay re-energizes after the configured Turn-On Delay has elapsed.

NOTE 2 — If the main supply current exceeds 80% of the main breaker's rating for longer than the configured Turn-Off Delay, the relay disconnects the controlled circuit. This delay distinguishes temporary inrush current from a sustained overload.

NOTE 3 — Circuit 2 and Circuit 3 settings are available only on dual-channel and three-channel models.

NOTE 4 — Turn-On and Turn-Off delays also set circuit priority: for higher-priority circuits, set a *shorter* Turn-On Delay and a *longer* Turn-Off Delay.

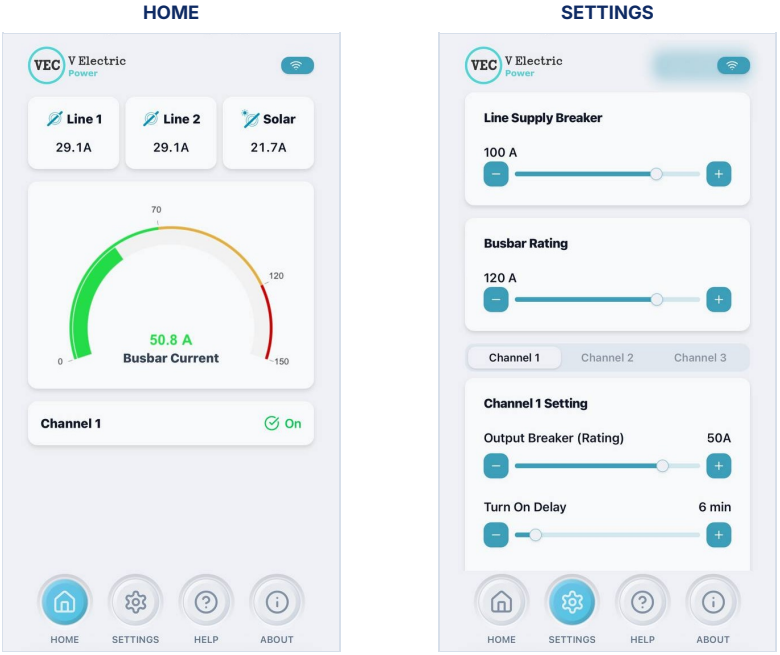


Figure 7 — VEC app (solar version): Home page with Line 1, Line 2, Solar and Busbar Current; Settings page with Line Supply Breaker, Busbar Rating and Channel settings

TERMS USED IN THIS MANUAL — The following terms have the same meaning and are used interchangeably in this manual and in the app:
Main Breaker = **Line Supply Breaker**
Line 1 (L1) = **CT1** · **Line 2** (L2) = **CT2** · **Solar** = **CT3**

Settings explained

- **Line (Main) Supply Breaker:** select the size of the main circuit breaker in the main electrical panel.
- **Busbar Rating:** enter the busbar rating specified on the panel nameplate. If unknown, use the rating of the panel's main supply breaker.
- **Output Breaker (Rating):** enter the rated current of the connected load or solar PV inverter. If unavailable, use the rating of the circuit breaker protecting that circuit.
- **Turn-On Delay:** once conditions are met, the relay energizes the controlled circuit after this delay.
- **Turn-Off Delay:** accommodates temporary inrush current, delays disconnection during overload, and sets circuit priority on multi-channel models. Start with 5 s and gradually increase if nuisance tripping occurs at startup — use the shortest delay that prevents unnecessary disconnections.
- Press **Save Settings** to permanently save all changes.

CAUTION — Turn-Off Delays over 10 seconds may trip the main breaker instead of the load. Adjust wisely. Do not use 100 A CTs with main breakers above 100 A.

Reading the Home Screen

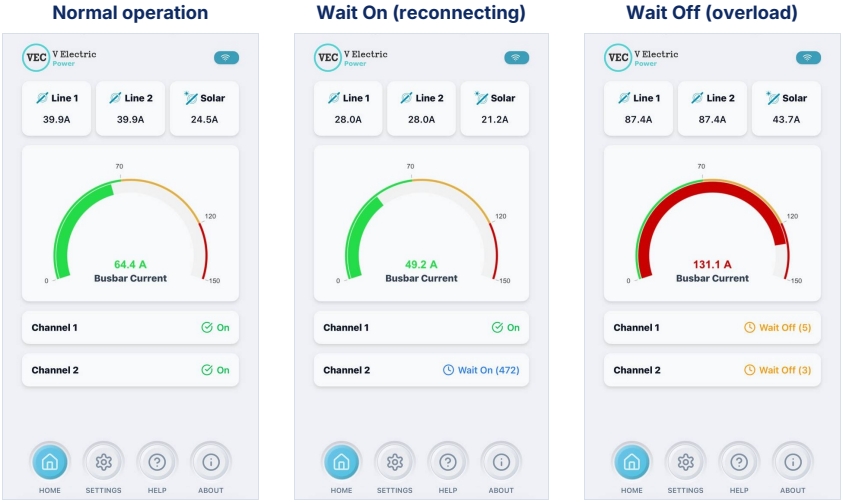


Figure 7b — Channel status examples: normal operation (both channels On), Channel 2 waiting to reconnect (Wait On), and overload with both channels counting down to turn off (Wait Off)

Status	Meaning
On	The relay is energized and the controlled circuit is ready for operation.
Off	The relay is de-energized because the panel has insufficient available capacity for the controlled circuit.
Wait On (...)	Conditions to energize the relay are met; the VEC is counting down the configured Turn-On Delay.
Wait Off (...)	The measured current has exceeded the configured threshold; the VEC is counting down the Turn-Off Delay. If the condition persists, the relay de-energizes (overload rather than inrush).

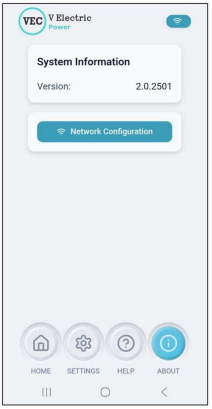
The number in brackets is the remaining delay in seconds (some versions show “Turning on in ... s” / “Turning off in ... s”). When it reaches zero, the relay energizes or de-energizes, provided the required current conditions are still met.

7.6 Change the Device Name, Network Name (SSID) and Password

The default SSID and password are `velectric`. If the unit has a different SSID and password, contact your installer. If they have been lost or forgotten, reset the VEC (Section 7.7). For security, change the default password at initial setup.

1. Connect your phone or computer to the VEC Wi-Fi network.
2. Tap **About** at the bottom of the page, then **Network Configuration**.
3. Enter a valid Device Name, Wi-Fi Network Name (SSID) and Password. The password must be at least 8 characters. All entries are case-sensitive.
4. From now on, use the new details: on iPhone, type `NewDeviceName.local` in Safari instead of `vec.local`; on Android, the connected device appears as `NewDeviceName` instead of `vec`.
5. Write down the new SSID and password for future reference.
6. Tap **Save Changes**. The changes take effect after the device restarts.

About page



Network Configuration

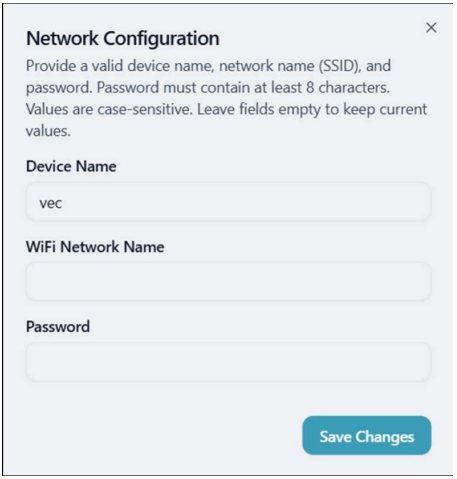


Figure 8 — About page and Network Configuration window

7.7 Reset the VEC (Optional)

To restore the factory device name, network name and password, press and hold the **BOOT button (SW2)** on the VEC board for 3 seconds.

7.8 Future Adjustments (Do Not Change During Initial Setup)

The CT size and channel-count settings are factory-configured to match the VEC unit and CTs supplied with your purchase. No changes are required during initial installation; leave these settings unchanged unless the electrical service is upgraded later, for example:

- Adding channels to control more circuits, or
- Upgrading the main electrical service (for example from 100 A to 125 A, 150 A or 200 A) with corresponding physical CT replacement.

⚠ IMPORTANT SAFETY NOTICE — CT SIZE
Changing the CT size setting without physically replacing the installed CTs results in incorrect current readings and may lead to unsafe operation. CT settings must always match the actual CT hardware installed. Do not modify the CT size unless the CTs have been replaced with the correct rating.

To access the configuration menu, press and hold the **About** button for more than 5 seconds. The Advanced Configuration window opens (Figure 9), where the channel count and CT settings can be adjusted.

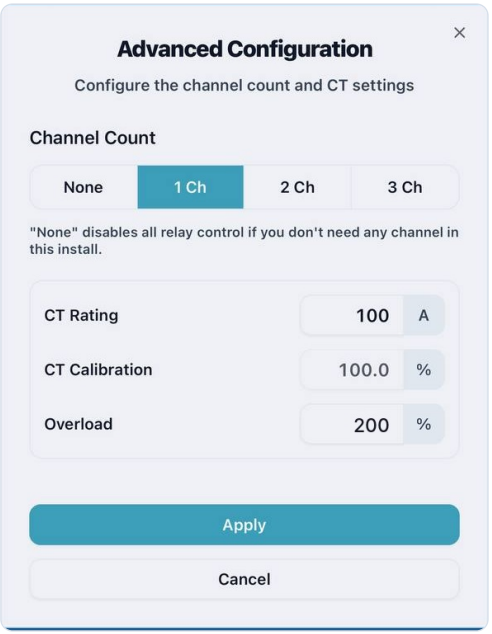


Figure 9 — Advanced Configuration window (Channel Count and CT settings)

Setting	Default	Description
Channel Count	Factory set	Number of controlled outputs: 1 Ch, 2 Ch or 3 Ch. Select only the channels actually wired. **None** disables all relay control (measurement only).
CT Rating	100 A	Rating of the installed CTs. Change only when the CTs are physically replaced (for example after a service upgrade).
CT Calibration	100.0 %	Factory calibrated. No adjustment needed.
Overload	200 %	Instantaneous shutdown limit. If the measured current reaches this percentage of the CT Rating, the output is shut down instantly. Example: 100 A × 200 % = 200 A.

After making valid, hardware-matched changes, press **Apply** (**Save Changes** in earlier app versions) to store the settings, then press **Save Settings** on the Settings page. Press **Cancel** or × to close the window without saving.

8. Single Line Diagram for Solar Busbar Protection

VEC Busbar Protection — complies with the CEC 120% / 125% rule.

The VEC supports two busbar-protection methods. The technician selects the option appropriate for the installation; for installations with multiple PV arrays, see *Typical Installation Configurations* (Section 10, Configurations 3 and 4).

Option 1: Busbar Protection Through Load Shedding

The VEC manages and protects the busbar by disconnecting one or more non-essential loads. When busbar current exceeds the defined threshold, the VEC automatically sheds these non-essential loads, reducing the overall load on the busbar and keeping it within the permissible range. This approach focuses on load management to prevent overload and keep the busbar stable.

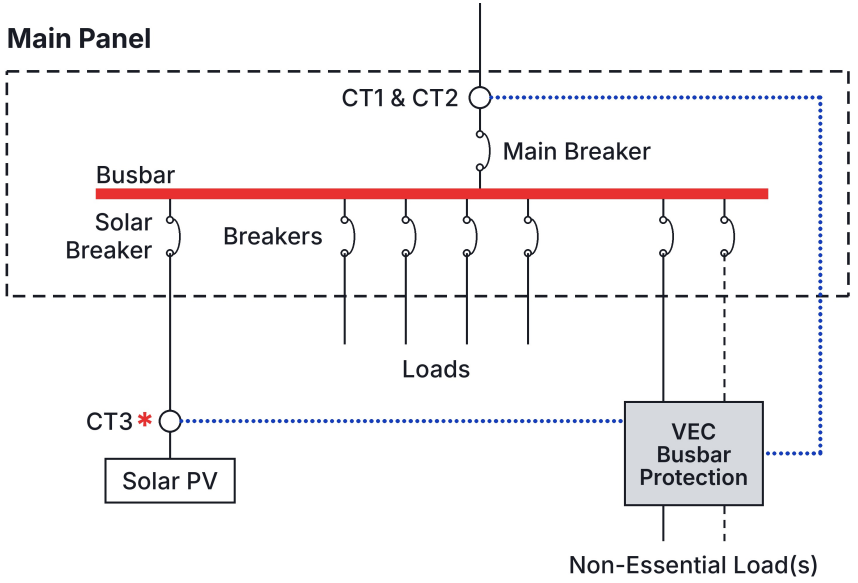


Figure 10 — Single-line diagram, Option 1: busbar protection through load shedding

*** CT3** — In Figure 10, CT3 is installed around either one of the two solar PV output conductors, L1 or L2 (one conductor only; see Section 9 for termination). With two or more PV systems, CT3 must measure the total PV current: the same leg (e.g., L1) of every PV system must pass through CT3, as shown in Detail A on the next page.

NOTE — The VEC can be configured and wired to disconnect one or more non-essential loads (**Option 1**), or to isolate a portion of the solar PV array (**Option 2**), to keep the busbar within its permissible operating range.

Option 2: Busbar Protection Through Solar Array Shedding

The VEC manages the busbar by selectively disconnecting a portion of the solar PV array. When busbar current exceeds the threshold, the VEC isolates one of the solar breakers, reducing the amount of solar power injected into the busbar. This method keeps the system within safe operating limits by controlling the solar input rather than the load.

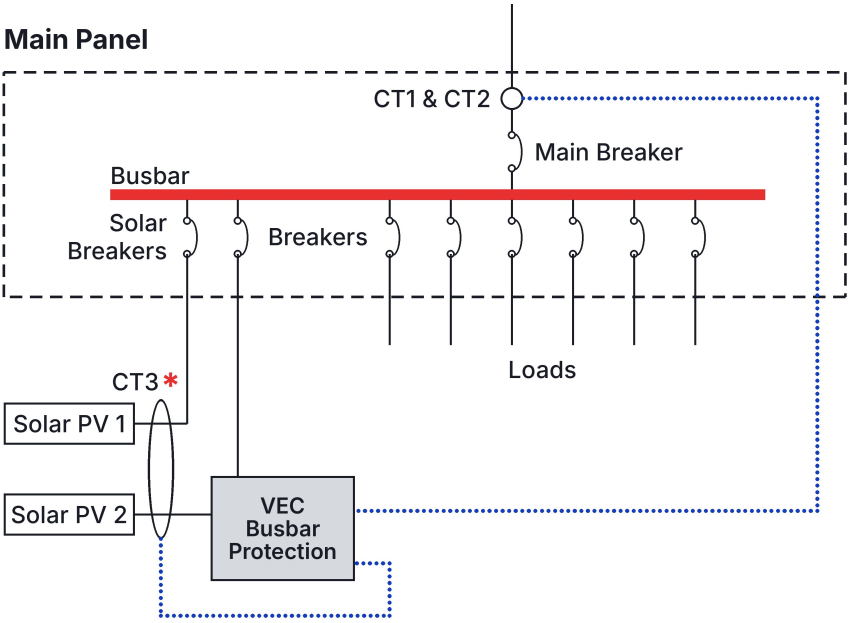
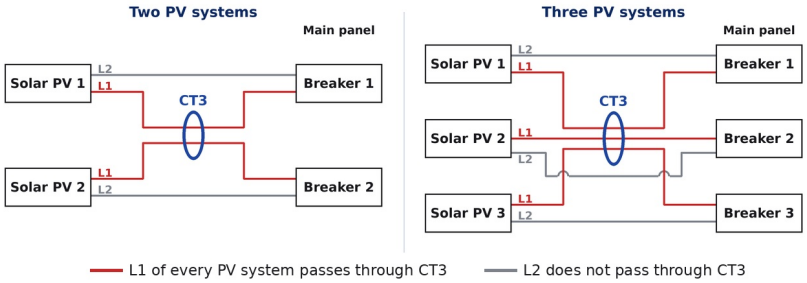


Figure 11 — Single-line diagram, Option 2: busbar protection through solar array shedding

*** CT3** — If the solar generation connects to the panel through two or more separate breakers (Option 2), CT3 must monitor the total PV output current: all conductors of the same phase (e.g., L1) must pass through CT3 for an accurate combined reading.



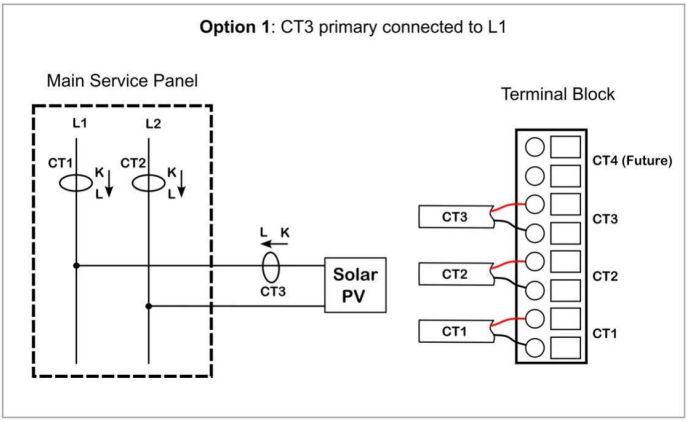
Detail A — CT3 with two or three PV systems: route one leg (L1) of each PV system through CT3, all in the same direction. The L2 conductors stay outside CT3. For simplicity, the VEC is not shown here.

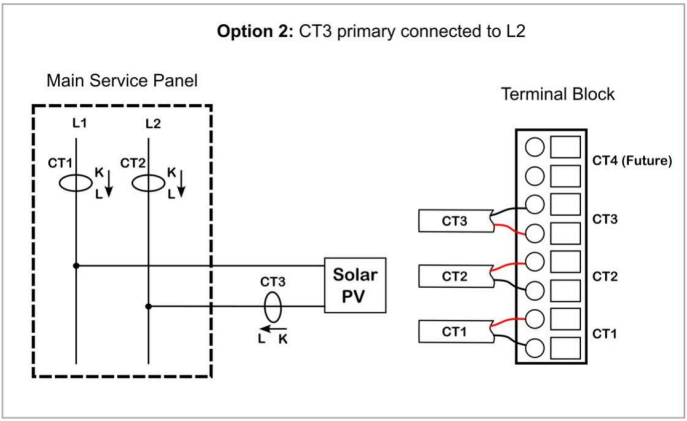
NOTE — For installations with multiple PV systems, use Configuration 3, or the dual-channel system (Configuration 4). See Section 10.

9. CT Installation, Terminations & Color Coding

CT	Connects to	Function
CT1	Supply line L1 (main panel)	Monitors grid current at the main panel
CT2	Supply line L2 (main panel)	Monitors grid current at the main panel
CT3 (Solar)	Solar PV conductor (L1 or L2)	Monitors current generated by the solar array
CT4 (Future)	Not connected	Reserved for future use

- Each CT cable has one red and one black wire. On some CTs the red wire is white.
- Connect each CT cable to the terminal pair with the matching CT number (CT1 cable to CT1 terminals, and so on).
- The three CTs (CT1–CT3) are identical.
- Depending on the number of channels, relays R2 and R3 may not be utilized.
- Install all CTs with the **K → L** arrow oriented as specified below, pointing toward the busbar (load center).





Figures 12 and 13 — CT3 termination: Option 1 (CT3 on L1) and Option 2 (CT3 on L2, reversed)

CT Orientation Verification

With the solar breakers **ON**, turn **OFF** all load breakers. CT1 and CT2 should display negative currents equal in magnitude to CT3's positive current (for example: CT3 = +40 A; CT1 and CT2 ≈ −40 A). If CT1 and CT2 display positive values, reverse the CT3 terminal connections to correct the polarity.

VEC LED Indicators

The VEC board has six status LEDs. After restoring power, check them against Figure 14 and the table below.

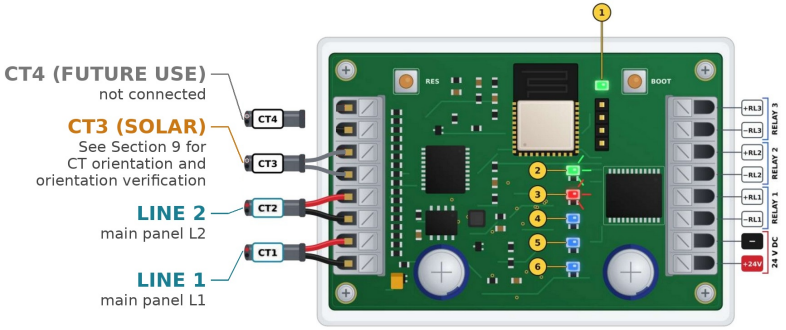


Figure 14 — VEC board: CT inputs (left), relay outputs and 24 VDC (right), and status LEDs 1 – 6. CT3 is the solar CT; CT4 is for future use.

LED	ON / BLINKING	OFF
1 Power	Board powered	No power – check supply
2 Wi-Fi	Fast (<1 s): connected Slow (5 s): not connected	—
3 CT status	CT fault – check wiring	CT OK (normal)
4 5 6 Load 1 · 2 · 3	Load ON	Load OFF

Figure 15 — LED status indicators (Load 1 · 2 · 3 = Channel 1 · 2 · 3, load or solar)

Before continuing, check that:

- **LED 1 (Power)** is on.
- **LED 2 (Wi-Fi)** blinks fast (less than 1 s) when a phone or laptop is connected, and slowly (about every 5 s) when it is not.
- **LED 3 (CT status)** is off. If it blinks, a CT is not connected correctly: turn off power and check the CT wiring.
- **LEDs 4 – 6** are on when the corresponding channel relay is energized.

10. Typical Installation Configurations

The technician selects the configuration based on the busbar-protection method required and the number of PV systems on site.

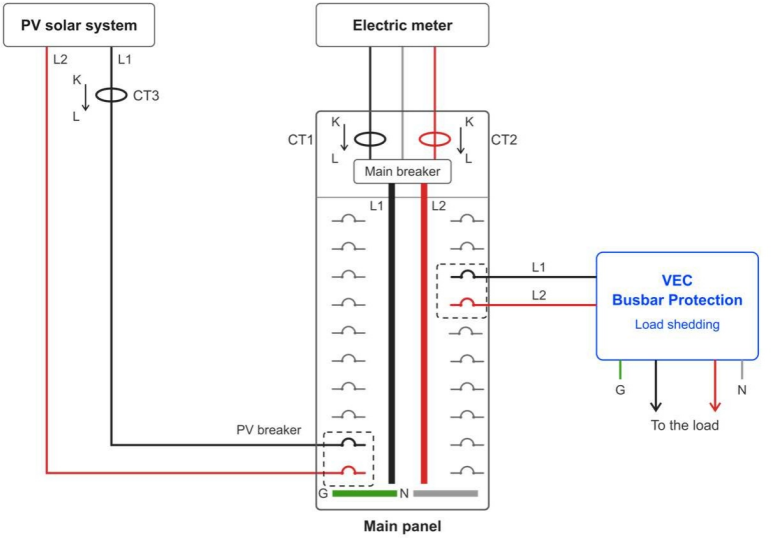
Configuration	PV systems	Busbar protection method	CT3 role
1	Single PV system	Option 1 — Load shedding	CT3 on the single PV inverter output
2	Single PV system	Option 2 — Solar array shedding	CT3 on the single PV inverter output
3	Multiple PV systems	Option 2 — Solar shedding, single-channel VEC	All PV L1 conductors pass through CT3; the VEC controls PV array 1 only
4	Multiple PV systems	Option 2 — Solar shedding, dual-channel VEC	All PV L1 conductors pass through CT3; each channel controls one PV system

NOTES

- CT1 and CT2 are installed on the utility service conductors (L1 and L2). CT3 is installed on the PV L1 (or L2) conductor(s). Install all CTs with the K → L arrow oriented as shown in Section 9.
- The technician shall select the configuration based on the busbar-protection method required for the installation.
- For installations with multiple PV systems, use Configuration 3, or the dual-channel system (Configuration 4).
- In multiple-PV installations, CT3 shall measure the total PV current.
- All installation work shall comply with the applicable electrical code and local utility requirements.

Configuration 1 – Load shedding (Single Channel)

The VEC disconnects a load to keep busbar current within its rating.



Configuration 2 – Solar shedding (Single Channel)

The VEC disconnects the PV system wired through it when the busbar limit is reached.

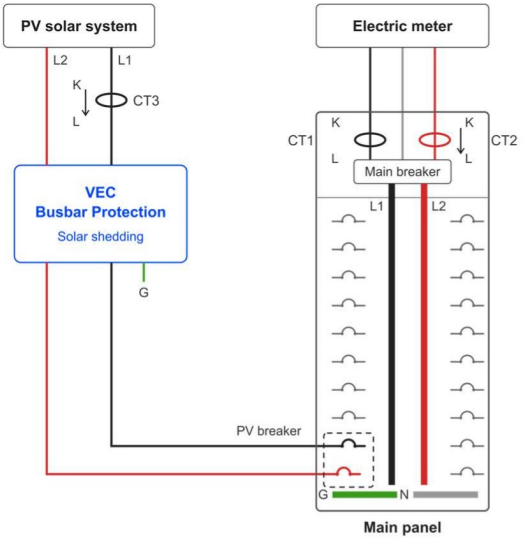
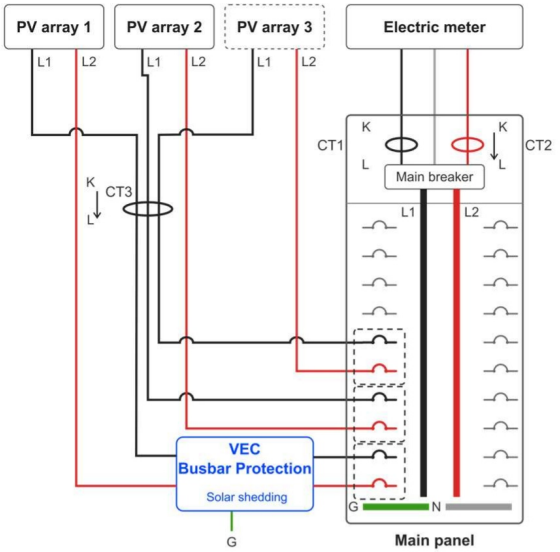


Figure 16 — Configuration 1 (load shedding) and Configuration 2 (solar shedding), single channel

Configuration 3 – Multiple PV systems (Single Channel)

All PV L1 conductors pass through CT3; the VEC controls PV-1 only.



Configuration 4 – Solar shedding (Dual Channel)

Two independent channels in one VEC enclosure; each controls a PV system.

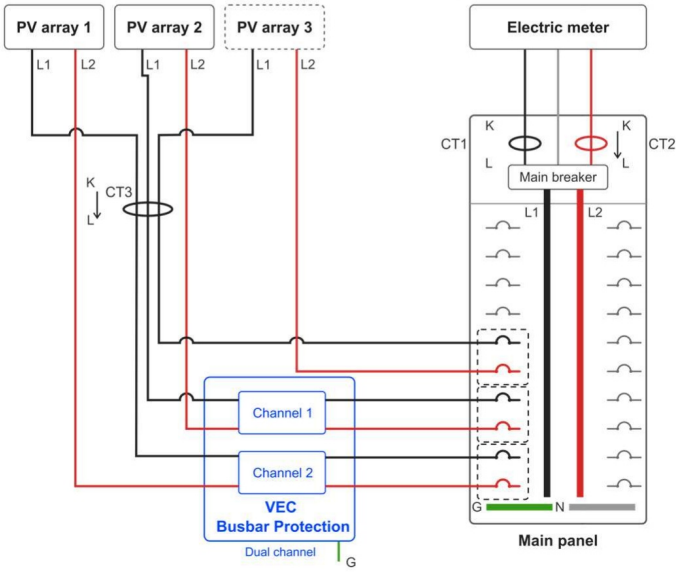


Figure 17 — Configuration 3 (multiple PV, single channel) and Configuration 4 (dual channel)

11. Explanation of VEC Parameters

- CT1 and CT2 measure the main panel current; CT3 measures the solar inverter current (true RMS, in amps).
- The status of Channel 1 (or Channel 2 and Channel 3, if applicable) is shown next to each channel:

Status	Meaning
Channel 1: On	The relay is energized, and the controlled circuit is ready for operation.
Channel 1: Off	The relay is de-energized because the panel has insufficient available capacity for the controlled circuit.
Channel 1: Wait On (...)	Conditions for energizing the relay are met; the system is counting down the configured Turn-On Delay.
Channel 1: Wait Off (...)	The measured current has exceeded the configured threshold; the system is counting down the Turn-Off Delay. If the condition persists, the relay de-energizes. This delay distinguishes temporary inrush current from a sustained overload.

NOTE — The number in brackets after “Wait On” or “Wait Off” is the remaining delay in seconds. When the countdown reaches zero, the relay energizes or de-energizes, provided the required current conditions are still met.

12. Model Number Structure

VEC-A-[1]-[2]-[3]-[4]

#	Field	Options
1	Current rating (max)	60A: up to 60 A per channel · 120A: up to 120 A per channel
2	Number of channels	Empty: single channel · 2C: dual channel
3	Busbar overload protection	Empty: no busbar overload protection · S: busbar overload protection
4	Enclosure type	Empty: Type 1 · 3R: Type 3R enclosure

13. Packaging Contents

- VEC-A-60A-S or VEC-A-60A-2C-S (model depends on the unit purchased)
- 3 × split-core current transformers (100 A or 200 A)
- Installation manual

14. Warranty — Limited One-Year Warranty

- This unit is warranted to the original purchaser to be free from defects in materials and workmanship for one year from the date of purchase, without additional charge.
- The warranty is automatically void for incorrect installation or installation by unauthorized personnel.
- V Electric Power Inc. will not be liable for any damages, delays, or transportation costs associated with defective devices.
- V Electric Power Inc. will not be responsible for any indirect damages or delays resulting from faulty workmanship or materials.
- All repairs and services must be performed at V Electric Power Inc.'s facility. V Electric Power Inc. will not cover any costs for repairs or replacements made by the customer.

15. Installation Record

Complete this record at commissioning and leave the manual with the owner.

Installation date	
Installer / company	
Licence / certificate no.	
Site address	
Model (VEC-A-...-S)	
Serial number	
Main supply breaker rating (A)	
Busbar rating (A)	
CT rating (A)	
Number of PV systems	
Configuration (1–4)	
Busbar protection option (1: load shedding / 2: solar shedding)	
Output 1 — description / rating (A)	
Output 2 — description / rating (A)	
Turn-On / Turn-Off delays	
Device name / SSID	

Do not record the Wi-Fi password here; keep it in a secure place.

Notes