AURORA®
PHOTOVOLTAIC INVERTERS

11/08/2012

Addendum:
VOLTAGE AND FREQUENCY TRIP LIMIT AND TRIP TIME ADJUSTMENTS

PVI-10.0/12.0-I-OUTD-(US/CAN, S, S1, S2)-208-XX
PVI-10.0/12.0-I-OUTD-(US/CAN, S, S1, S2)-480-XX
PVI-10.0/12.0-I-OUTD-(CAN, S, S1, S2)-600-XX

READER NOTES:

- This document is to be included and used in conjunction with the original installation manual, **PVI-10.0/12.0-I-OUTD-US/CAN**.

- All safety precautions in the full manual must be read and applied.

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Purpose: The purpose of this document is to describe the field adjustable limits for the Voltage and Frequency Trip Limits and Trip Times for the PVI-10.0/12.0-I-OUTD-(US, S, S1, S2)-208-XX , PVI-10.0/12.0-I-OUTD-(US/CAN, S, S1, S2)-480-XX and PVI-10.0/12.0-I-OUTD-(CAN, S, S1, S2)-600-XX models. Instructions for modifying these values are included.

Target Audience: This document is intended to support the qualified installer, licensed technician or certified field service engineer.

Validity: The information is valid for the PVI-10.0/12.0-I-OUTD-(US/CAN, S, S1, S2)-208-XX, PVI-10.0/12.0-I-OUTD-(US/CAN, S, S1, S2)-480-XX and PVI-10.0/12.0-I-OUTD-(CAN, S, S1, S2)-600-XX.

Safety: Keep this document in a safe place. All safety precautions in the full manual, PVI-10.0/12.0-I-OUTD-US/CAN, must be read, understood and applied. Modifications made to this unit outside the below described procedure may void warranty terms. Please see manufacturer for details.

This model provides adjustability of the voltage and frequency trip times and trip limits.

To modify these parameters it is necessary to access the **Service Menu** under the **Settings Display Menu** found on the user interface of the inverter. Instructions for accessing the display menu are included below and can be found in the Operations Guide of the technical manual for this product.

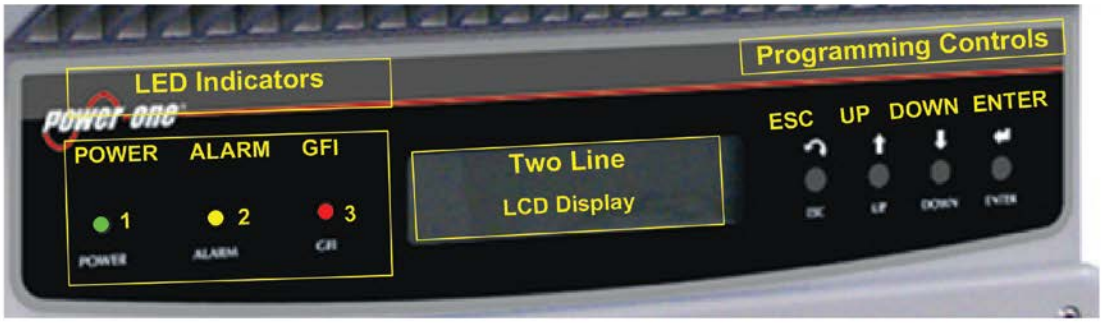
The Voltage and Frequency Trip Limit and Trip Time parameters are contained in Table 1 below.

NOTE: A four-digit password is necessary to access the *Settings Display Menu*. The default password provided at purchase is 0000 (four zeroes) and can be changed by the user.

The *Service* submenu requires an additional *Advanced Password* which is controlled by Power-One. Contact Power-One at 877-261-1374 to request this password.

The following information can be found in Part 4 of the original manual.

2.5.4 ACCESSING THE DISPLAY MENUS



Use the Programming controls on the inverter interface to access the display menus.

- Press the UP and DOWN keys to scroll through items.
- Press the ESC key to go back to the previous menu.
- Press ENTER to open the selected submenu.

Pressing the ESC key provides access to the following menus:

Statistics	Settings	Info

2.5.12 *SETTINGS MENU*

Press [ESC} and scroll DOWN to select ***SETTINGS*** from the Main Menu. Press [ENTER] to display the ***Password*** screen, which is required to access the Settings Menu:

Password ****	

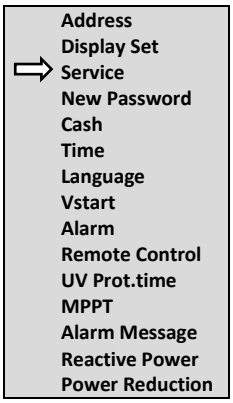
To enter this menu, the correct four digit password must be entered. At initial set up, enter the default password [0000] (unless the default password has been modified by the user in which case, enter the correct user password).

Follow the instructions below to enter password digits into their proper location:

- Use ENTER to move from one digit location to the next (from left to right).
- Use ESC to go back to the previous figure (from right to left).
- Press DOWN to scroll numbers backwards (from 9 to 0).
- Press UP to scroll numbers forwards (from 0 to 9).
- Press ESC repeatedly to go back to the previous menus.

After entering the required password, press ENTER to display the ***Settings submenus***:

The front panel display has only two lines and the control keys must be used to scroll through the menu items and/or open the corresponding submenus. An arrow on left side of the display highlights the current selection.



2.5.15 *SERVICE-MENU*

This is a controlled access area of the operating system used by the factory to set certain control functions. Access is via an Advanced Password.

Installers may need to access this menu for certain adjustments during the installation process, and Power-One will provide an Advanced Password to authorized installers to allow specific actions upon completion of required documentation. Contact Power-One at 877-261-1374 to request this password.

Below is additional information for insertion in Section 2.5.15, Part 4 of the original manual, PVI-10.0/12.0-I-OUTD-US/CAN.

Scroll to ***Service*** and press [ENTER] to be prompted for the ***Advanced Password*** to access the submenu.

The **Service menu** can be used to adjust the Voltage and Frequency Trip Limit and Trip Time Parameters according to the Grid requirements of the local installation. **This inverter has been factory programmed to automatically disconnect from the utility distribution system in compliance with UL 1741 and IEEE 1547 specifications. Default voltage and frequency trip limit and trip time settings to comply with these standards are shown in Table 1 below.**

WARNING

Power-One cannot be held responsible for any negative effects resulting from modifications of inverter set points.

The set points in Table 1 should only be changed with the written permission of the local utility.

Changes to the voltage and frequency trip limit and trip time parameters MUST be done by a qualified contractor or authorized personnel. Improper values entered could cause bodily harm and cause the inverter to shut down.

The following table describes the parameters available in the ***Service submenu*** and includes the default and adjustable values. Using the UP and DOWN keys on the inverter display panel, scroll to select the parameter for modification. After entering the required value for each parameter, press ENTER to confirm the selection.

Table 1: Service submenu

Parameter	Definition	Default Value	Adjustable Ranges
SET U>>	Indicates the value of the ***absolute over voltage set point*** beyond which the inverter disconnects from the grid ***[115% of Nominal line to neutral Voltage]***	**115% of Nominal line to neutral Voltage**	**Fixed**
SET U<<	Indicates the value of the ***absolute under voltage set point*** below which the inverter disconnects from the grid ***[50% of Nominal line to neutral Voltage]***	**50% of Nominal line to neutral Voltage**	**Fixed**
SET F>>	Indicates the value of the ***absolute over frequency set point*** beyond which the inverter disconnects from the grid	**63 Hz**	**Fixed**
SET F<<	Indicates the value of the ***absolute under frequency set point*** below which the inverter disconnects from the grid	**57 Hz**	**Fixed**
SET U>	Indicates the value of the ***intermediate over voltage set point*** beyond which the inverter disconnects from the grid ***[110% of Nominal line to neutral Voltage]***	**110% of Nominal line to neutral Voltage**	**(110% x V_{LN}) to (115% x V_{LN})**
SET U> (10 min)	Inverter disconnects from the grid after 10 minutes in case the average grid voltage overcomes the threshold value **(110% x V_{LN})**	**110% of Nominal line to neutral Voltage**	**(110% x V_{LN}) to (115% x V_{LN})**
SET U<	Indicates the value of the ***intermediate under voltage set point*** below which the inverter disconnects from the grid ***[88% of Nominal line to neutral Voltage]***	**88% of Nominal line to neutral Voltage**	**(50% x V_{LN}) to (88% x V_{LN})**
SET F>	Indicates the value of the ***intermediate over frequency set point*** beyond which the inverter disconnects from the grid	**60.5 Hz**	**60.2 Hz to 63.0 Hz**
SET F<	Indicates the value of the ***intermediate under frequency set point*** below which the inverter disconnects from the grid	**59.3 Hz**	**59.8 Hz to 57 Hz**
SET U Conn>	Indicates the value of the ***intermediate over voltage (line to neutral) set point*** to allow the inverter to connect to the grid for the first time.	**110% of Nominal line to neutral Voltage**	**(110% x V_{LN}) to (115% x V_{LN})**
SET U conn<	Indicates the value of the ***intermediate under voltage (line to neutral) set point*** to allow the inverter to connect to the grid for the first time.	**88% of Nominal line to neutral Voltage**	**(50% x V_{LN}) to (88% x V_{LN})**

Parameter	Definition	Default Value	Adjustable Ranges
SET F conn>	Indicates the value of the ***intermediate over frequency set point*** to allow the inverter to connect to the grid for the first time.	**60.5 Hz**	**60.2 Hz to 63.0 Hz**
SET F conn<	Indicates the value of the ***intermediate under frequency set point*** to allow the inverter to connect to the grid for the first time.	**59.3 Hz**	**59.8 Hz to 57 Hz**
SET TIME U>>	Indicates the value of the countdown timer associated with the **Absolute Over Voltage setpoint U>>**	**0.16 sec**	**Fixed**
SET TIME U<<	Indicates the value of the countdown timer associated with the **Absolute Under Voltage setpoint U<<**	**0.16 sec**	**Fixed**
SET TIME F>>	Indicates the value of the countdown timer associated with the **Absolute Over Frequency setpoint F>>**	**0.16 sec**	**Fixed**
SET TIME F<<	Indicates the value of the countdown timer associated with the **Absolute Under Frequency setpoint F<<**	**0.16 sec**	**Fixed**
SET TIME U>	Indicates the value of the countdown timer associated with the **Intermediate Over Voltage setpoint U>**	**1 sec**	**0.16 sec to 5 sec**
SET TIME U<	Indicates the value of the countdown timer associated with the **Intermediate Under Voltage setpoint U<**	**2 sec**	**0.16 sec to 5 sec**
SET TIME F>	Indicates the value of the countdown timer associated with the **Intermediate Over Frequency setpoint F>**	**0.16 sec**	**0.16 sec to 300 sec**
SET TIME F<	Indicates the value of the countdown timer associated with the **Intermediate Under Frequency setpoint F<**	**0.16 sec**	**0.16 sec to 300 sec**
SET TIME Conn 1	Indicates the time the inverter takes to connect to the grid for the first time (not after grid fault).	**30 sec**	**1 sec to 3600 sec**
SET TIME Conn 2	Indicates the time the inverter takes to connect to the grid after a grid fault.	**300 sec**	**1 sec to 3600 sec**
DISABLE U>>	Provides ability to enable/disable the ***Absolute Over Voltage Set point U>>***	**Enable**	**Disable or Enable**
DISABLE U<<	Provides ability to enable/disable the ***Absolute Under Voltage Set point U<<***	**Enable**	**Disable or Enable**
DISABLE F>>	Provides ability to enable/disable the ***Absolute Over Frequency Set point F>>***	**Enable**	**Disable or Enable**
DISABLE F<<	Provides ability to enable/disable the ***Absolute Under Frequency Set point F<<***	**Enable**	**Disable or Enable**
DISABLE U>	Provides ability to enable/disable the ***Intermediate Over Voltage Set point U>***	**Enable**	**Disable or Enable**
DISABLE U> (10 min)	Provides ability to enable/disable the parameter ***SET U> (10 min)***	**Disable**	**Disable or Enable**

Parameter	Definition	Default Value	Adjustable Ranges
DISABLE U<	Provides ability to enable/disable the ***Intermediate Under Voltage Set point U<***	**Enable**	**Disable or Enable**
DISABLE F>	Provides ability to enable/disable the ***Intermediate Over Frequency Set point F>***	**Enable**	**Disable or Enable**
DISABLE F<	Provides ability to enable/disable the ***Intermediate Under Frequency Set point F<***	**Enable**	**Disable or Enable**
U>(10 min) Der.	Provides ability to limit the power for 10 minutes due to the high average voltage value set by the parameter ***Set U>(10 min)***	**Disable**	**Disable or Enable**
Slow Ramp	Provides ability to slowly increase the Output power at connection (Soft start)	**Disable**	**Disable or Enable**
OF Derating	Provides ability to limit the Output Power due to the high grid frequency	**Disable**	**Disable or Enable**
Reset Country S	Provides ability to reset the country code	**Not Applicable**	**Not Applicable**

Note – For 208V, V_{LN} = 120V
For 480V, V_{LN} = 277V
For 600V, V_{LN} = 346V

Below are two additions to the Settings menu. These submenus can be inserted after Section 2.5.25, Part 4 of the original manual, PVI-10.0/12.0-I-OUTD-US/CAN.

2.5.26 Reactive Power

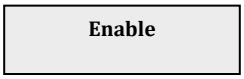
Selecting this function allows access to the procedures to manage the reactive power. Using the UP and DOWN keys, scroll through the options and press ENTER to select one of the five modes described below.

1. NO REGULATION MODE – There will be no regulation of the reactive power in this mode. This is the default setting and cannot be changed. In this mode the power factor (Cos-phi) is defaulted to “1”.

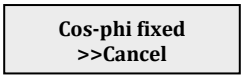
2. Cos-phi FIXED MODE – When this mode is selected, the “Cos-phi fixed setup” field is displayed.

Use the keys to adjust the Cos-phi value (Over excited from 0.8 to 1 or Under excited from 0.8 to 1).

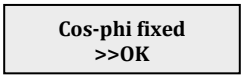
Upon selection the display will show ENABLE.
Press ENTER to display the screen below.



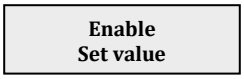
Arrow down to >>Cancel and use the UP or DOWN key to change the display to >>OK shown below.



Press ENTER to access the next screen as shown below.



Arrow down to >>Set value and press ENTER

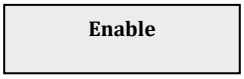


Arrow down. Press UnEx to switch between UnEx and OvEx.
Arrow over to change the value for:
OvEx from 0.8 to 1 or
UnEx from 0.8 to 1

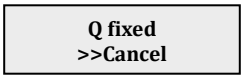
3. Q FIXED MODE – When this mode is selected, the "Q fixed setup" field is displayed.

Use the keys to adjust the tan-phi value (Over excited from 0.8 to 1 or Under excited from 0.8 to 1).

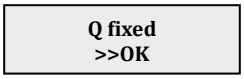
Upon selection the display will show ENABLE.
Press ENTER to display the screen below.



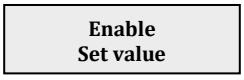
Arrow down to >>Cancel and use the UP or DOWN key to change the display to >>OK shown below.



Press ENTER to access the next screen as shown below.



Arrow down to >>Set value and press ENTER



Arrow down. Press UnEx to switch between UnEx and OvEx.
Arrow over to change the value for:
OvEx from 0.8 to 1 or
UnEx from 0.8 to 1

4. Cos-phi = f(P) MODE – This mode allows the user to set the power factor as a function of the active power generated by the inverter. This setting can only be modified using the "Aurora Manager Lite" software available on the CD.

5. Q (U) MODE – This mode allows the user to set the reactive power as a function of the grid voltage measured by the inverter. This setting can only be modified using the "Aurora Manager Lite" software available on the CD.

2.5.27 Power Reduction

Selecting this function allows the user to adjust the active power limitation. Default value is 100%. Adjustable ranges are from 1% to 100% of the active power.

For example, if the user sets the power reduction value to 70%, the output power will be 7000W for the 10kW unit and 8400W for the 12kW unit.

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